bra: $= \langle \frac{1}{2}, \frac{1}{2}; s |, \langle \frac{1}{2}, -\frac{1}{2}; s |$
ket: $= | \frac{1}{2}, \frac{1}{2}; s \rangle, | \frac{1}{2}, -\frac{1}{2}; s \rangle$

Table 1: (s,s) block.

No.	multipole	matrix
1	symmetry	1
	$\mathbb{Q}_0^{(a)}(A_1)$	$\begin{bmatrix} \frac{\sqrt{2}}{2} & 0 \\ 0 & \frac{\sqrt{2}}{2} \end{bmatrix}$
2	symmetry	z
	$\mathbb{M}_1^{(1,-1;a)}(A_2)$	$\begin{bmatrix} \frac{\sqrt{2}}{2} & 0 \\ 0 & -\frac{\sqrt{2}}{2} \end{bmatrix}$
3	symmetry	x
	$\mathbb{M}_{1,1}^{(1,-1;a)}(E)$	$\begin{bmatrix} 0 & \frac{\sqrt{2}}{2} \\ \frac{\sqrt{2}}{2} & 0 \end{bmatrix}$
4	symmetry	$-y$
	$\mathbb{M}_{1,2}^{(1,-1;a)}(E)$	$\begin{bmatrix} 0 & \frac{\sqrt{2}i}{2} \\ -\frac{\sqrt{2}i}{2} & 0 \end{bmatrix}$

bra: $= \langle \frac{1}{2}, \frac{1}{2}; s |, \langle \frac{1}{2}, -\frac{1}{2}; s |$
ket: $= | \frac{1}{2}, \frac{1}{2}; p \rangle, | \frac{1}{2}, -\frac{1}{2}; p \rangle, | \frac{3}{2}, \frac{3}{2}; p \rangle, | \frac{3}{2}, \frac{1}{2}; p \rangle, | \frac{3}{2}, -\frac{1}{2}; p \rangle, | \frac{3}{2}, -\frac{3}{2}; p \rangle$

Table 2: (s,p) block.

No.	multipole	matrix
5	symmetry	z
	$\mathbb{Q}_1^{(a)}(B_2)$	$\begin{bmatrix} -\frac{\sqrt{3}}{6} & 0 & 0 & \frac{\sqrt{6}}{6} & 0 & 0 \\ 0 & \frac{\sqrt{3}}{6} & 0 & 0 & \frac{\sqrt{6}}{6} & 0 \end{bmatrix}$
6	symmetry	x
	$\mathbb{Q}_{1,1}^{(a)}(E)$	$\begin{bmatrix} 0 & -\frac{\sqrt{3}}{6} & -\frac{\sqrt{2}}{4} & 0 & \frac{\sqrt{6}}{12} & 0 \\ -\frac{\sqrt{3}}{6} & 0 & 0 & -\frac{\sqrt{6}}{12} & 0 & \frac{\sqrt{2}}{4} \end{bmatrix}$

continued ...

Table 2

No.	multipole	matrix
7	symmetry	y
	$\mathbb{Q}_{1,2}^{(a)}(E)$	$\begin{bmatrix} 0 & \frac{\sqrt{3}i}{6} & -\frac{\sqrt{2}i}{4} & 0 & -\frac{\sqrt{6}i}{12} & 0 \\ -\frac{\sqrt{3}i}{6} & 0 & 0 & -\frac{\sqrt{6}i}{12} & 0 & -\frac{\sqrt{2}i}{4} \end{bmatrix}$
8	symmetry	z
	$\mathbb{Q}_{1}^{(1,0;a)}(B_2)$	$\begin{bmatrix} \frac{\sqrt{6}}{6} & 0 & 0 & \frac{\sqrt{3}}{6} & 0 & 0 \\ 0 & -\frac{\sqrt{6}}{6} & 0 & 0 & \frac{\sqrt{3}}{6} & 0 \end{bmatrix}$
9	symmetry	x
	$\mathbb{Q}_{1,1}^{(1,0;a)}(E)$	$\begin{bmatrix} 0 & \frac{\sqrt{6}}{6} & -\frac{1}{4} & 0 & \frac{\sqrt{3}}{12} & 0 \\ \frac{\sqrt{6}}{6} & 0 & 0 & -\frac{\sqrt{3}}{12} & 0 & \frac{1}{4} \end{bmatrix}$
10	symmetry	y
	$\mathbb{Q}_{1,2}^{(1,0;a)}(E)$	$\begin{bmatrix} 0 & -\frac{\sqrt{6}i}{6} & -\frac{i}{4} & 0 & -\frac{\sqrt{3}i}{12} & 0 \\ \frac{\sqrt{6}i}{6} & 0 & 0 & -\frac{\sqrt{3}i}{12} & 0 & -\frac{i}{4} \end{bmatrix}$
11	symmetry	$\frac{\sqrt{3}(x-y)(x+y)}{2}$
	$\mathbb{G}_{2}^{(1,-1;a)}(A_1)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & \frac{i}{2} \\ 0 & 0 & -\frac{i}{2} & 0 & 0 & 0 \end{bmatrix}$
12	symmetry	$\sqrt{3}xy$
	$\mathbb{G}_{2}^{(1,-1;a)}(A_2)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & \frac{1}{2} & 0 & 0 & 0 \end{bmatrix}$
13	symmetry	$-\frac{x^2}{2} - \frac{y^2}{2} + z^2$
	$\mathbb{G}_{2}^{(1,-1;a)}(B_1)$	$\begin{bmatrix} 0 & 0 & 0 & \frac{i}{2} & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{i}{2} & 0 \end{bmatrix}$
14	symmetry	$\sqrt{3}yz$
	$\mathbb{G}_{2,1}^{(1,-1;a)}(E)$	$\begin{bmatrix} 0 & 0 & \frac{1}{4} & 0 & \frac{\sqrt{3}}{4} & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{3}}{4} & 0 & -\frac{1}{4} \end{bmatrix}$
15	symmetry	$-\sqrt{3}xz$
	$\mathbb{G}_{2,2}^{(1,-1;a)}(E)$	$\begin{bmatrix} 0 & 0 & \frac{i}{4} & 0 & -\frac{\sqrt{3}i}{4} & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{3}i}{4} & 0 & \frac{i}{4} \end{bmatrix}$
16	symmetry	1

2

Table 2

No.	multipole	matrix
	$\mathbb{G}_0^{(1,1;a)}(B_1)$	$\begin{bmatrix} -\frac{i}{2} & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{i}{2} & 0 & 0 & 0 & 0 \end{bmatrix}$
17	symmetry	z
	$\mathbb{T}_1^{(a)}(B_2)$	$\begin{bmatrix} -\frac{\sqrt{3}i}{6} & 0 & 0 & \frac{\sqrt{6}i}{6} & 0 & 0 \\ 0 & \frac{\sqrt{3}i}{6} & 0 & 0 & \frac{\sqrt{6}i}{6} & 0 \end{bmatrix}$
18	symmetry	x
	$\mathbb{T}_{1,1}^{(a)}(E)$	$\begin{bmatrix} 0 & -\frac{\sqrt{3}i}{6} & -\frac{\sqrt{2}i}{4} & 0 & \frac{\sqrt{6}i}{12} & 0 \\ -\frac{\sqrt{3}i}{6} & 0 & 0 & -\frac{\sqrt{6}i}{12} & 0 & \frac{\sqrt{2}i}{4} \end{bmatrix}$
19	symmetry	y
	$\mathbb{T}_{1,2}^{(a)}(E)$	$\begin{bmatrix} 0 & -\frac{\sqrt{3}}{6} & \frac{\sqrt{2}}{4} & 0 & \frac{\sqrt{6}}{12} & 0 \\ \frac{\sqrt{3}}{6} & 0 & 0 & \frac{\sqrt{6}}{12} & 0 & \frac{\sqrt{2}}{4} \end{bmatrix}$
20	symmetry	z
	$\mathbb{T}_1^{(1,0;a)}(B_2)$	$\begin{bmatrix} -\frac{\sqrt{6}i}{6} & 0 & 0 & -\frac{\sqrt{3}i}{6} & 0 & 0 \\ 0 & \frac{\sqrt{6}i}{6} & 0 & 0 & -\frac{\sqrt{3}i}{6} & 0 \end{bmatrix}$
21	symmetry	x
	$\mathbb{T}_{1,1}^{(1,0;a)}(E)$	$\begin{bmatrix} 0 & -\frac{\sqrt{6}i}{6} & \frac{i}{4} & 0 & -\frac{\sqrt{3}i}{12} & 0 \\ -\frac{\sqrt{6}i}{6} & 0 & 0 & \frac{\sqrt{3}i}{12} & 0 & -\frac{i}{4} \end{bmatrix}$
22	symmetry	y
	$\mathbb{T}_{1,2}^{(1,0;a)}(E)$	$\begin{bmatrix} 0 & -\frac{\sqrt{6}}{6} & -\frac{1}{4} & 0 & -\frac{\sqrt{3}}{12} & 0 \\ \frac{\sqrt{6}}{6} & 0 & 0 & -\frac{\sqrt{3}}{12} & 0 & -\frac{1}{4} \end{bmatrix}$
23	symmetry	$\frac{\sqrt{3}(x-y)(x+y)}{2}$
	$\mathbb{M}_2^{(1,-1;a)}(A_1)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -\frac{1}{2} & 0 & 0 & 0 \end{bmatrix}$
24	symmetry	$\sqrt{3}xy$
	$\mathbb{M}_2^{(1,-1;a)}(A_2)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & -\frac{i}{2} \\ 0 & 0 & -\frac{i}{2} & 0 & 0 & 0 \end{bmatrix}$
25	symmetry	$-\frac{x^2}{2} - \frac{y^2}{2} + z^2$

Table 2

No.	multipole	matrix
	$\mathbb{M}_2^{(1,-1;a)}(B_1)$	$\begin{bmatrix} 0 & 0 & 0 & \frac{1}{2} & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{1}{2} & 0 \end{bmatrix}$
26	symmetry	$\sqrt{3}yz$
	$\mathbb{M}_{2,1}^{(1,-1;a)}(E)$	$\begin{bmatrix} 0 & 0 & -\frac{i}{4} & 0 & -\frac{\sqrt{3}i}{4} & 0 \\ 0 & 0 & 0 & \frac{\sqrt{3}i}{4} & 0 & \frac{i}{4} \end{bmatrix}$
27	symmetry	$-\sqrt{3}xz$
	$\mathbb{M}_{2,2}^{(1,-1;a)}(E)$	$\begin{bmatrix} 0 & 0 & \frac{1}{4} & 0 & -\frac{\sqrt{3}}{4} & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{3}}{4} & 0 & \frac{1}{4} \end{bmatrix}$
28	symmetry	1
	$\mathbb{M}_0^{(1,1;a)}(B_1)$	$\begin{bmatrix} -\frac{1}{2} & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{1}{2} & 0 & 0 & 0 & 0 \end{bmatrix}$

bra: $= \langle \frac{1}{2}, \frac{1}{2}; s|, \langle \frac{1}{2}, -\frac{1}{2}; s|$

ket: $= |\frac{3}{2}, \frac{3}{2}; d\rangle, |\frac{3}{2}, \frac{1}{2}; d\rangle, |\frac{3}{2}, -\frac{1}{2}; d\rangle, |\frac{3}{2}, -\frac{3}{2}; d\rangle, |\frac{5}{2}, \frac{5}{2}; d\rangle, |\frac{5}{2}, \frac{3}{2}; d\rangle, |\frac{5}{2}, \frac{1}{2}; d\rangle, |\frac{5}{2}, -\frac{1}{2}; d\rangle, |\frac{5}{2}, -\frac{3}{2}; d\rangle, |\frac{5}{2}, -\frac{5}{2}; d\rangle$

Table 3: (s,d) block.

No.	multipole	matrix
29	symmetry	$-\frac{x^2}{2} - \frac{y^2}{2} + z^2$
	$\mathbb{Q}_2^{(a)}(A_1)$	$\begin{bmatrix} 0 & -\frac{\sqrt{10}}{10} & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{10} & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{10}}{10} & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{10} & 0 & 0 \end{bmatrix}$
30	symmetry	$\frac{\sqrt{3}(x-y)(x+y)}{2}$
	$\mathbb{Q}_2^{(a)}(B_1)$	$\begin{bmatrix} 0 & 0 & 0 & -\frac{\sqrt{10}}{10} & \frac{\sqrt{2}}{4} & 0 & 0 & 0 & \frac{\sqrt{10}}{20} & 0 \\ \frac{\sqrt{10}}{10} & 0 & 0 & 0 & 0 & \frac{\sqrt{10}}{20} & 0 & 0 & 0 & \frac{\sqrt{2}}{4} \end{bmatrix}$
31	symmetry	$\sqrt{3}xy$
	$\mathbb{Q}_2^{(a)}(B_2)$	$\begin{bmatrix} 0 & 0 & 0 & \frac{\sqrt{10}i}{10} & \frac{\sqrt{2}i}{4} & 0 & 0 & 0 & -\frac{\sqrt{10}i}{20} & 0 \\ \frac{\sqrt{10}i}{10} & 0 & 0 & 0 & 0 & \frac{\sqrt{10}i}{20} & 0 & 0 & 0 & -\frac{\sqrt{2}i}{4} \end{bmatrix}$
32	symmetry	$\sqrt{3}yz$

Table 3

No.	multipole	matrix
	$\mathbb{Q}_{2,1}^{(a)}(E)$	$\begin{bmatrix} \frac{\sqrt{10}i}{20} & 0 & \frac{\sqrt{30}i}{20} & 0 & 0 & -\frac{\sqrt{10}i}{10} & 0 & -\frac{\sqrt{5}i}{10} & 0 & 0 \\ 0 & -\frac{\sqrt{30}i}{20} & 0 & -\frac{\sqrt{10}i}{20} & 0 & 0 & -\frac{\sqrt{5}i}{10} & 0 & -\frac{\sqrt{10}i}{10} & 0 \end{bmatrix}$
33	symmetry	$\sqrt{3}xz$
	$\mathbb{Q}_{2,2}^{(a)}(E)$	$\begin{bmatrix} \frac{\sqrt{10}}{20} & 0 & -\frac{\sqrt{30}}{20} & 0 & 0 & -\frac{\sqrt{10}}{10} & 0 & \frac{\sqrt{5}}{10} & 0 & 0 \\ 0 & -\frac{\sqrt{30}}{20} & 0 & \frac{\sqrt{10}}{20} & 0 & 0 & -\frac{\sqrt{5}}{10} & 0 & \frac{\sqrt{10}}{10} & 0 \end{bmatrix}$
34	symmetry	$-\frac{x^2}{2} - \frac{y^2}{2} + z^2$
	$\mathbb{Q}_2^{(1,0;a)}(A_1)$	$\begin{bmatrix} 0 & \frac{\sqrt{15}}{10} & 0 & 0 & 0 & 0 & \frac{\sqrt{10}}{10} & 0 & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{15}}{10} & 0 & 0 & 0 & 0 & \frac{\sqrt{10}}{10} & 0 & 0 \end{bmatrix}$
35	symmetry	$\frac{\sqrt{3}(x-y)(x+y)}{2}$
	$\mathbb{Q}_2^{(1,0;a)}(B_1)$	$\begin{bmatrix} 0 & 0 & 0 & \frac{\sqrt{15}}{10} & \frac{\sqrt{3}}{6} & 0 & 0 & 0 & \frac{\sqrt{15}}{30} & 0 \\ -\frac{\sqrt{15}}{10} & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{30} & 0 & 0 & 0 & \frac{\sqrt{3}}{6} \end{bmatrix}$
36	symmetry	$\sqrt{3}xy$
	$\mathbb{Q}_2^{(1,0;a)}(B_2)$	$\begin{bmatrix} 0 & 0 & 0 & -\frac{\sqrt{15}i}{10} & \frac{\sqrt{3}i}{6} & 0 & 0 & 0 & -\frac{\sqrt{15}i}{30} & 0 \\ -\frac{\sqrt{15}i}{10} & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{30} & 0 & 0 & 0 & -\frac{\sqrt{3}i}{6} \end{bmatrix}$
37	symmetry	$\sqrt{3}yz$
	$\mathbb{Q}_{2,1}^{(1,0;a)}(E)$	$\begin{bmatrix} -\frac{\sqrt{15}i}{20} & 0 & -\frac{3\sqrt{5}i}{20} & 0 & 0 & -\frac{\sqrt{15}i}{15} & 0 & -\frac{\sqrt{30}i}{30} & 0 & 0 \\ 0 & \frac{3\sqrt{5}i}{20} & 0 & \frac{\sqrt{15}i}{20} & 0 & 0 & -\frac{\sqrt{30}i}{30} & 0 & -\frac{\sqrt{15}i}{15} & 0 \end{bmatrix}$
38	symmetry	$\sqrt{3}xz$
	$\mathbb{Q}_{2,2}^{(1,0;a)}(E)$	$\begin{bmatrix} -\frac{\sqrt{15}}{20} & 0 & \frac{3\sqrt{5}}{20} & 0 & 0 & -\frac{\sqrt{15}}{15} & 0 & \frac{\sqrt{30}}{30} & 0 & 0 \\ 0 & \frac{3\sqrt{5}}{20} & 0 & -\frac{\sqrt{15}}{20} & 0 & 0 & -\frac{\sqrt{30}}{30} & 0 & \frac{\sqrt{15}}{15} & 0 \end{bmatrix}$
39	symmetry	$-\frac{z\left(3x^2+3y^2-2z^2\right)}{2}$
	$\mathbb{G}_3^{(1,-1;a)}(A_2)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{i}{2} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{i}{2} & 0 & 0 \end{bmatrix}$
40	symmetry	$\sqrt{15}xyz$
	$\mathbb{G}_3^{(1,-1;a)}(B_1)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & -\frac{\sqrt{6}}{12} & 0 & 0 & 0 & \frac{\sqrt{30}}{12} & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{12} & 0 & 0 & 0 & -\frac{\sqrt{6}}{12} \end{bmatrix}$
41	symmetry	$\frac{\sqrt{15}z(x-y)(x+y)}{2}$

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Table 3

No.	multipole	matrix
	$\mathbb{G}_3^{(1,-1;a)}(B_2)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & \frac{\sqrt{6}i}{12} & 0 & 0 & 0 & \frac{\sqrt{30}i}{12} & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}i}{12} & 0 & 0 & 0 & -\frac{\sqrt{6}i}{12} \end{bmatrix}$
42	symmetry	$\frac{x(2x^2-3y^2-3z^2)}{2}$
	$\mathbb{G}_{3,1}^{(1,-1;a)}(E,1)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2}i}{8} & 0 & -\frac{i}{4} & 0 & \frac{\sqrt{10}i}{8} \\ 0 & 0 & 0 & 0 & \frac{\sqrt{10}i}{8} & 0 & -\frac{i}{4} & 0 & \frac{\sqrt{2}i}{8} & 0 \end{bmatrix}$
43	symmetry	$\frac{y(3x^2-2y^2+3z^2)}{2}$
	$\mathbb{G}_{3,2}^{(1,-1;a)}(E,1)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2}}{8} & 0 & \frac{1}{4} & 0 & \frac{\sqrt{10}}{8} \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{10}}{8} & 0 & -\frac{1}{4} & 0 & -\frac{\sqrt{2}}{8} & 0 \end{bmatrix}$
44	symmetry	$\frac{\sqrt{15}x(y-z)(y+z)}{2}$
	$\mathbb{G}_{3,1}^{(1,-1;a)}(E,2)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}i}{24} & 0 & -\frac{\sqrt{15}i}{12} & 0 & -\frac{\sqrt{6}i}{8} \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{8} & 0 & -\frac{\sqrt{15}i}{12} & 0 & \frac{\sqrt{30}i}{24} & 0 \end{bmatrix}$
45	symmetry	$-\frac{\sqrt{15}y(x-z)(x+z)}{2}$
	$\mathbb{G}_{3,2}^{(1,-1;a)}(E,2)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{24} & 0 & \frac{\sqrt{15}}{12} & 0 & -\frac{\sqrt{6}}{8} \\ 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{8} & 0 & -\frac{\sqrt{15}}{12} & 0 & -\frac{\sqrt{30}}{24} & 0 \end{bmatrix}$
46	symmetry	z
	$\mathbb{G}_1^{(1,1;a)}(A_2)$	$\begin{bmatrix} 0 & -\frac{i}{2} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{i}{2} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
47	symmetry	x
	$\mathbb{G}_{1,1}^{(1,1;a)}(E)$	$\begin{bmatrix} \frac{\sqrt{3}i}{4} & 0 & -\frac{i}{4} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{i}{4} & 0 & -\frac{\sqrt{3}i}{4} & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
48	symmetry	$-y$
	$\mathbb{G}_{1,2}^{(1,1;a)}(E)$	$\begin{bmatrix} \frac{\sqrt{3}}{4} & 0 & \frac{1}{4} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{1}{4} & 0 & \frac{\sqrt{3}}{4} & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
49	symmetry	$-\frac{x^2}{2}-\frac{y^2}{2}+z^2$
	$\mathbb{T}_2^{(a)}(A_1)$	$\begin{bmatrix} 0 & -\frac{\sqrt{10}i}{10} & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{10} & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{10}i}{10} & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{10} & 0 & 0 \end{bmatrix}$
50	symmetry	$\frac{\sqrt{3}(x-y)(x+y)}{2}$

Table 3

No.	multipole	matrix

$\mathbb{T}_2^{(a)}(B_1)$

$$\begin{bmatrix} 0 & 0 & 0 & -\frac{\sqrt{10}i}{10} & \frac{\sqrt{2}i}{4} & 0 & 0 & 0 & \frac{\sqrt{10}i}{20} & 0 \\ \frac{\sqrt{10}i}{10} & 0 & 0 & 0 & 0 & \frac{\sqrt{10}i}{20} & 0 & 0 & 0 & \frac{\sqrt{2}i}{4} \end{bmatrix}$$

| 51 | symmetry | $\sqrt{3}xy$ |

$\mathbb{T}_2^{(a)}(B_2)$

$$\begin{bmatrix} 0 & 0 & 0 & -\frac{\sqrt{10}}{10} & -\frac{\sqrt{2}}{4} & 0 & 0 & 0 & \frac{\sqrt{10}}{20} & 0 \\ -\frac{\sqrt{10}}{10} & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}}{20} & 0 & 0 & 0 & \frac{\sqrt{2}}{4} \end{bmatrix}$$

| 52 | symmetry | $\sqrt{3}yz$ |

$\mathbb{T}_{2,1}^{(a)}(E)$

$$\begin{bmatrix} -\frac{\sqrt{10}}{20} & 0 & -\frac{\sqrt{30}}{20} & 0 & 0 & \frac{\sqrt{10}}{10} & 0 & \frac{\sqrt{5}}{10} & 0 & 0 \\ 0 & \frac{\sqrt{30}}{20} & 0 & \frac{\sqrt{10}}{20} & 0 & 0 & \frac{\sqrt{5}}{10} & 0 & \frac{\sqrt{10}}{10} & 0 \end{bmatrix}$$

| 53 | symmetry | $\sqrt{3}xz$ |

$\mathbb{T}_{2,2}^{(a)}(E)$

$$\begin{bmatrix} \frac{\sqrt{10}i}{20} & 0 & -\frac{\sqrt{30}i}{20} & 0 & 0 & -\frac{\sqrt{10}i}{10} & 0 & \frac{\sqrt{5}i}{10} & 0 & 0 \\ 0 & -\frac{\sqrt{30}i}{20} & 0 & \frac{\sqrt{10}i}{20} & 0 & 0 & -\frac{\sqrt{5}i}{10} & 0 & \frac{\sqrt{10}i}{10} & 0 \end{bmatrix}$$

| 54 | symmetry | $-\frac{x^2}{2} - \frac{y^2}{2} + z^2$ |

$\mathbb{T}_2^{(1,0;a)}(A_1)$

$$\begin{bmatrix} 0 & -\frac{\sqrt{15}i}{10} & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}i}{10} & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{15}i}{10} & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}i}{10} & 0 & 0 \end{bmatrix}$$

| 55 | symmetry | $\frac{\sqrt{3}(x-y)(x+y)}{2}$ |

$\mathbb{T}_2^{(1,0;a)}(B_1)$

$$\begin{bmatrix} 0 & 0 & 0 & -\frac{\sqrt{15}i}{10} & -\frac{\sqrt{3}i}{6} & 0 & 0 & 0 & -\frac{\sqrt{15}i}{30} & 0 \\ \frac{\sqrt{15}i}{10} & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{30} & 0 & 0 & 0 & -\frac{\sqrt{3}i}{6} \end{bmatrix}$$

| 56 | symmetry | $\sqrt{3}xy$ |

$\mathbb{T}_2^{(1,0;a)}(B_2)$

$$\begin{bmatrix} 0 & 0 & 0 & -\frac{\sqrt{15}}{10} & \frac{\sqrt{3}}{6} & 0 & 0 & 0 & -\frac{\sqrt{15}}{30} & 0 \\ -\frac{\sqrt{15}}{10} & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{30} & 0 & 0 & 0 & -\frac{\sqrt{3}}{6} \end{bmatrix}$$

| 57 | symmetry | $\sqrt{3}yz$ |

$\mathbb{T}_{2,1}^{(1,0;a)}(E)$

$$\begin{bmatrix} -\frac{\sqrt{15}}{20} & 0 & -\frac{3\sqrt{5}}{20} & 0 & 0 & -\frac{\sqrt{15}}{15} & 0 & -\frac{\sqrt{30}}{30} & 0 & 0 \\ 0 & \frac{3\sqrt{5}}{20} & 0 & \frac{\sqrt{15}}{20} & 0 & 0 & -\frac{\sqrt{30}}{30} & 0 & -\frac{\sqrt{15}}{15} & 0 \end{bmatrix}$$

| 58 | symmetry | $\sqrt{3}xz$ |

$\mathbb{T}_{2,2}^{(1,0;a)}(E)$

$$\begin{bmatrix} \frac{\sqrt{15}i}{20} & 0 & -\frac{3\sqrt{5}i}{20} & 0 & 0 & \frac{\sqrt{15}i}{15} & 0 & -\frac{\sqrt{30}i}{30} & 0 & 0 \\ 0 & -\frac{3\sqrt{5}i}{20} & 0 & \frac{\sqrt{15}i}{20} & 0 & 0 & \frac{\sqrt{30}i}{30} & 0 & -\frac{\sqrt{15}i}{15} & 0 \end{bmatrix}$$

| 59 | symmetry | $-\frac{z\left(3x^2 + 3y^2 - 2z^2\right)}{2}$ |

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Table 3

No.	multipole	matrix
	$\mathbb{M}_3^{(1,-1;a)}(A_2)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{1}{2} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{1}{2} & 0 & 0 \end{bmatrix}$
60	symmetry	$\sqrt{15}xyz$
	$\mathbb{M}_3^{(1,-1;a)}(B_1)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & \frac{\sqrt{6}i}{12} & 0 & 0 & 0 & -\frac{\sqrt{30}i}{12} & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}i}{12} & 0 & 0 & 0 & \frac{\sqrt{6}i}{12} \end{bmatrix}$
61	symmetry	$\frac{\sqrt{15}z(x-y)(x+y)}{2}$
	$\mathbb{M}_3^{(1,-1;a)}(B_2)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{12} & 0 & 0 & 0 & \frac{\sqrt{30}}{12} & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}}{12} & 0 & 0 & 0 & -\frac{\sqrt{6}}{12} \end{bmatrix}$
62	symmetry	$\frac{x\left(2x^2-3y^2-3z^2\right)}{2}$
	$\mathbb{M}_{3,1}^{(1,-1;a)}(E,1)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2}}{8} & 0 & -\frac{1}{4} & 0 & \frac{\sqrt{10}}{8} \\ 0 & 0 & 0 & 0 & \frac{\sqrt{10}}{8} & 0 & -\frac{1}{4} & 0 & \frac{\sqrt{2}}{8} & 0 \end{bmatrix}$
63	symmetry	$\frac{y\left(3x^2-2y^2+3z^2\right)}{2}$
	$\mathbb{M}_{3,2}^{(1,-1;a)}(E,1)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}i}{8} & 0 & -\frac{i}{4} & 0 & -\frac{\sqrt{10}i}{8} \\ 0 & 0 & 0 & 0 & \frac{\sqrt{10}i}{8} & 0 & \frac{i}{4} & 0 & \frac{\sqrt{2}i}{8} & 0 \end{bmatrix}$
64	symmetry	$\frac{\sqrt{15}x(y-z)(y+z)}{2}$
	$\mathbb{M}_{3,1}^{(1,-1;a)}(E,2)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{24} & 0 & -\frac{\sqrt{15}}{12} & 0 & -\frac{\sqrt{6}}{8} \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{6}}{8} & 0 & -\frac{\sqrt{15}}{12} & 0 & \frac{\sqrt{30}}{24} & 0 \end{bmatrix}$
65	symmetry	$-\frac{\sqrt{15}y(x-z)(x+z)}{2}$
	$\mathbb{M}_{3,2}^{(1,-1;a)}(E,2)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}i}{24} & 0 & -\frac{\sqrt{15}i}{12} & 0 & \frac{\sqrt{6}i}{8} \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{8} & 0 & \frac{\sqrt{15}i}{12} & 0 & \frac{\sqrt{30}i}{24} & 0 \end{bmatrix}$
66	symmetry	z
	$\mathbb{M}_1^{(1,1;a)}(A_2)$	$\begin{bmatrix} 0 & -\frac{1}{2} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{1}{2} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
67	symmetry	x
	$\mathbb{M}_{1,1}^{(1,1;a)}(E)$	$\begin{bmatrix} \frac{\sqrt{3}}{4} & 0 & -\frac{1}{4} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{1}{4} & 0 & -\frac{\sqrt{3}}{4} & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
68	symmetry	$-y$

Table 3

No.	multipole	matrix
	$\mathbb{M}_{1,2}^{(1,1;a)}(E)$	$\begin{bmatrix} -\frac{\sqrt{3}i}{4} & 0 & -\frac{i}{4} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{i}{4} & 0 & -\frac{\sqrt{3}i}{4} & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$

bra: $= \langle \frac{1}{2}, \frac{1}{2}; s|\,,\, \langle \frac{1}{2}, -\frac{1}{2}; s|$

ket: $= |\frac{5}{2}, \frac{5}{2}; f\rangle\,,\, |\frac{5}{2}, \frac{3}{2}; f\rangle\,,\, |\frac{5}{2}, \frac{1}{2}; f\rangle\,,\, |\frac{5}{2}, -\frac{1}{2}; f\rangle\,,\, |\frac{5}{2}, -\frac{3}{2}; f\rangle\,,\, |\frac{5}{2}, -\frac{5}{2}; f\rangle\,,\, |\frac{7}{2}, \frac{7}{2}; f\rangle\,,\, |\frac{7}{2}, \frac{5}{2}; f\rangle\,,\, |\frac{7}{2}, \frac{3}{2}; f\rangle\,,\, |\frac{7}{2}, \frac{1}{2}; f\rangle\,,\, |\frac{7}{2}, -\frac{1}{2}; f\rangle\,,\, |\frac{7}{2}, -\frac{3}{2}; f\rangle\,,\, |\frac{7}{2}, -\frac{5}{2}; f\rangle\,,\, |\frac{7}{2}, -\frac{7}{2}; f\rangle$

Table 4: (s,f) block.

No.	multipole	matrix
69	symmetry	$\sqrt{15}xyz$
	$\mathbb{Q}_3^{(a)}(A_1)$	$\begin{bmatrix} -\frac{\sqrt{14}i}{28} & 0 & 0 & 0 & \frac{\sqrt{70}i}{28} & 0 & 0 & \frac{\sqrt{21}i}{14} & 0 & 0 & 0 & -\frac{\sqrt{7}i}{14} & 0 & 0 \\ 0 & \frac{\sqrt{70}i}{28} & 0 & 0 & 0 & -\frac{\sqrt{14}i}{28} & 0 & 0 & \frac{\sqrt{7}i}{14} & 0 & 0 & 0 & -\frac{\sqrt{21}i}{14} & 0 \end{bmatrix}$
70	symmetry	$\frac{\sqrt{15}z(x-y)(x+y)}{2}$
	$\mathbb{Q}_3^{(a)}(A_2)$	$\begin{bmatrix} -\frac{\sqrt{14}}{28} & 0 & 0 & 0 & -\frac{\sqrt{70}}{28} & 0 & 0 & \frac{\sqrt{21}}{14} & 0 & 0 & 0 & \frac{\sqrt{7}}{14} & 0 & 0 \\ 0 & \frac{\sqrt{70}}{28} & 0 & 0 & 0 & \frac{\sqrt{14}}{28} & 0 & 0 & \frac{\sqrt{7}}{14} & 0 & 0 & 0 & \frac{\sqrt{21}}{14} & 0 \end{bmatrix}$
71	symmetry	$-\frac{z(3x^2+3y^2-2z^2)}{2}$
	$\mathbb{Q}_3^{(a)}(B_2)$	$\begin{bmatrix} 0 & 0 & -\frac{\sqrt{21}}{14} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}}{7} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{21}}{14} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}}{7} & 0 & 0 & 0 \end{bmatrix}$
72	symmetry	$\frac{x(2x^2-3y^2-3z^2)}{2}$
	$\mathbb{Q}_{3,1}^{(a)}(E,1)$	$\begin{bmatrix} 0 & -\frac{\sqrt{42}}{56} & 0 & \frac{\sqrt{21}}{28} & 0 & -\frac{\sqrt{210}}{56} & -\frac{\sqrt{5}}{8} & 0 & \frac{\sqrt{105}}{56} & 0 & -\frac{3\sqrt{7}}{56} & 0 & \frac{\sqrt{35}}{56} & 0 \\ -\frac{\sqrt{210}}{56} & 0 & \frac{\sqrt{21}}{28} & 0 & -\frac{\sqrt{42}}{56} & 0 & 0 & -\frac{\sqrt{35}}{56} & 0 & \frac{3\sqrt{7}}{56} & 0 & -\frac{\sqrt{105}}{56} & 0 & \frac{\sqrt{5}}{8} \end{bmatrix}$
73	symmetry	$-\frac{y(3x^2-2y^2+3z^2)}{2}$
	$\mathbb{Q}_{3,2}^{(a)}(E,1)$	$\begin{bmatrix} 0 & -\frac{\sqrt{42}i}{56} & 0 & -\frac{\sqrt{21}i}{28} & 0 & -\frac{\sqrt{210}i}{56} & \frac{\sqrt{5}i}{8} & 0 & \frac{\sqrt{105}i}{56} & 0 & \frac{3\sqrt{7}i}{56} & 0 & \frac{\sqrt{35}i}{56} & 0 \\ \frac{\sqrt{210}i}{56} & 0 & \frac{\sqrt{21}i}{28} & 0 & \frac{\sqrt{42}i}{56} & 0 & 0 & \frac{\sqrt{35}i}{56} & 0 & \frac{3\sqrt{7}i}{56} & 0 & \frac{\sqrt{105}i}{56} & 0 & \frac{\sqrt{5}i}{8} \end{bmatrix}$
74	symmetry	$\frac{\sqrt{15}x(y-z)(y+z)}{2}$
	$\mathbb{Q}_{3,1}^{(a)}(E,2)$	$\begin{bmatrix} 0 & -\frac{\sqrt{70}}{56} & 0 & \frac{\sqrt{35}}{28} & 0 & \frac{3\sqrt{14}}{56} & \frac{\sqrt{3}}{8} & 0 & \frac{5\sqrt{7}}{56} & 0 & -\frac{\sqrt{105}}{56} & 0 & -\frac{\sqrt{21}}{56} & 0 \\ \frac{3\sqrt{14}}{56} & 0 & \frac{\sqrt{35}}{28} & 0 & -\frac{\sqrt{70}}{56} & 0 & 0 & \frac{\sqrt{21}}{56} & 0 & \frac{\sqrt{105}}{56} & 0 & -\frac{5\sqrt{7}}{56} & 0 & -\frac{\sqrt{3}}{8} \end{bmatrix}$
75	symmetry	$\frac{\sqrt{15}y(x-z)(x+z)}{2}$

continued …

Table 4

No.	multipole	matrix

$$\mathbb{Q}_{3,2}^{(a)}(E,2)$$

$$\begin{bmatrix} 0 & -\frac{\sqrt{70}i}{56} & 0 & -\frac{\sqrt{35}i}{28} & 0 & \frac{3\sqrt{14}i}{56} & -\frac{\sqrt{3}i}{8} & 0 & \frac{5\sqrt{7}i}{56} & 0 & \frac{\sqrt{105}i}{56} & 0 & -\frac{\sqrt{21}i}{56} & 0 \\ -\frac{3\sqrt{14}i}{56} & 0 & \frac{\sqrt{35}i}{28} & 0 & \frac{\sqrt{70}i}{56} & 0 & 0 & -\frac{\sqrt{21}i}{56} & 0 & \frac{\sqrt{105}i}{56} & 0 & \frac{5\sqrt{7}i}{56} & 0 & -\frac{\sqrt{3}i}{8} \end{bmatrix}$$

76   symmetry $\sqrt{15}xyz$

$$\mathbb{Q}_3^{(1,0;a)}(A_1)$$

$$\begin{bmatrix} \frac{\sqrt{42}i}{42} & 0 & 0 & 0 & -\frac{\sqrt{210}i}{42} & 0 & 0 & \frac{3\sqrt{7}i}{28} & 0 & 0 & 0 & -\frac{\sqrt{21}i}{28} & 0 & 0 \\ 0 & -\frac{\sqrt{210}i}{42} & 0 & 0 & 0 & \frac{\sqrt{42}i}{42} & 0 & 0 & \frac{\sqrt{21}i}{28} & 0 & 0 & 0 & -\frac{3\sqrt{7}i}{28} & 0 \end{bmatrix}$$

77   symmetry $\frac{\sqrt{15}z(x-y)(x+y)}{2}$

$$\mathbb{Q}_3^{(1,0;a)}(A_2)$$

$$\begin{bmatrix} \frac{\sqrt{42}}{42} & 0 & 0 & 0 & \frac{\sqrt{210}}{42} & 0 & 0 & \frac{3\sqrt{7}}{28} & 0 & 0 & 0 & \frac{\sqrt{21}}{28} & 0 & 0 \\ 0 & -\frac{\sqrt{210}}{42} & 0 & 0 & 0 & -\frac{\sqrt{42}}{42} & 0 & 0 & \frac{\sqrt{21}}{28} & 0 & 0 & 0 & \frac{3\sqrt{7}}{28} & 0 \end{bmatrix}$$

78   symmetry $-\frac{z(3x^2+3y^2-2z^2)}{2}$

$$\mathbb{Q}_3^{(1,0;a)}(B_2)$$

$$\begin{bmatrix} 0 & 0 & \frac{\sqrt{7}}{7} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{21}}{14} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{7}}{7} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{21}}{14} & 0 & 0 & 0 \end{bmatrix}$$

79   symmetry $\frac{x(2x^2-3y^2-3z^2)}{2}$

$$\mathbb{Q}_{3,1}^{(1,0;a)}(E,1)$$

$$\begin{bmatrix} 0 & \frac{\sqrt{14}}{28} & 0 & -\frac{\sqrt{7}}{14} & 0 & \frac{\sqrt{70}}{28} & -\frac{\sqrt{15}}{16} & 0 & \frac{3\sqrt{35}}{112} & 0 & -\frac{3\sqrt{21}}{112} & 0 & \frac{\sqrt{105}}{112} & 0 \\ \frac{\sqrt{70}}{28} & 0 & -\frac{\sqrt{7}}{14} & 0 & \frac{\sqrt{14}}{28} & 0 & 0 & -\frac{\sqrt{105}}{112} & 0 & \frac{3\sqrt{21}}{112} & 0 & -\frac{3\sqrt{35}}{112} & 0 & \frac{\sqrt{15}}{16} \end{bmatrix}$$

80   symmetry $-\frac{y(3x^2-2y^2+3z^2)}{2}$

$$\mathbb{Q}_{3,2}^{(1,0;a)}(E,1)$$

$$\begin{bmatrix} 0 & \frac{\sqrt{14}i}{28} & 0 & \frac{\sqrt{7}i}{14} & 0 & \frac{\sqrt{70}i}{28} & \frac{\sqrt{15}i}{16} & 0 & \frac{3\sqrt{35}i}{112} & 0 & \frac{3\sqrt{21}i}{112} & 0 & \frac{\sqrt{105}i}{112} & 0 \\ -\frac{\sqrt{70}i}{28} & 0 & -\frac{\sqrt{7}i}{14} & 0 & -\frac{\sqrt{14}i}{28} & 0 & 0 & \frac{\sqrt{105}i}{112} & 0 & \frac{3\sqrt{21}i}{112} & 0 & \frac{3\sqrt{35}i}{112} & 0 & \frac{\sqrt{15}i}{16} \end{bmatrix}$$

81   symmetry $\frac{\sqrt{15}x(y-z)(y+z)}{2}$

$$\mathbb{Q}_{3,1}^{(1,0;a)}(E,2)$$

$$\begin{bmatrix} 0 & \frac{\sqrt{210}}{84} & 0 & -\frac{\sqrt{105}}{42} & 0 & -\frac{\sqrt{42}}{28} & \frac{3}{16} & 0 & \frac{5\sqrt{21}}{112} & 0 & -\frac{3\sqrt{35}}{112} & 0 & -\frac{3\sqrt{7}}{112} & 0 \\ -\frac{\sqrt{42}}{28} & 0 & -\frac{\sqrt{105}}{42} & 0 & \frac{\sqrt{210}}{84} & 0 & 0 & \frac{3\sqrt{7}}{112} & 0 & \frac{3\sqrt{35}}{112} & 0 & -\frac{5\sqrt{21}}{112} & 0 & -\frac{3}{16} \end{bmatrix}$$

82   symmetry $\frac{\sqrt{15}y(x-z)(x+z)}{2}$

$$\mathbb{Q}_{3,2}^{(1,0;a)}(E,2)$$

$$\begin{bmatrix} 0 & \frac{\sqrt{210}i}{84} & 0 & \frac{\sqrt{105}i}{42} & 0 & -\frac{\sqrt{42}i}{28} & -\frac{3i}{16} & 0 & \frac{5\sqrt{21}i}{112} & 0 & \frac{3\sqrt{35}i}{112} & 0 & -\frac{3\sqrt{7}i}{112} & 0 \\ \frac{\sqrt{42}i}{28} & 0 & -\frac{\sqrt{105}i}{42} & 0 & -\frac{\sqrt{210}i}{84} & 0 & 0 & -\frac{3\sqrt{7}i}{112} & 0 & \frac{3\sqrt{35}i}{112} & 0 & \frac{5\sqrt{21}i}{112} & 0 & -\frac{3i}{16} \end{bmatrix}$$

83   symmetry $\frac{\sqrt{5}(x-y)(x+y)(x^2+y^2-6z^2)}{4}$

$$\mathbb{G}_4^{(1,-1;a)}(A_1)$$

$$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{i}{4} & 0 & 0 & 0 & -\frac{\sqrt{3}i}{4} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{4} & 0 & 0 & 0 & \frac{i}{4} & 0 \end{bmatrix}$$

84   symmetry $-\frac{\sqrt{5}xy(x^2+y^2-6z^2)}{2}$

Table 4

No.	multipole	matrix

$\mathbb{G}_4^{(1,-1;a)}(A_2)$

$$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{1}{4} & 0 & 0 & 0 & \frac{\sqrt{3}}{4} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{4} & 0 & 0 & 0 & -\frac{1}{4} & 0 \end{bmatrix}$$

85   symmetry

$$\frac{\sqrt{21}\left(x^4-3x^2y^2-3x^2z^2+y^4-3y^2z^2+z^4\right)}{6}$$

$\mathbb{G}_4^{(1,-1;a)}(B_1,1)$

$$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{21}i}{12} & 0 & 0 & 0 & \frac{\sqrt{15}i}{12} \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{12} & 0 & 0 & 0 & -\frac{\sqrt{21}i}{12} & 0 & 0 & 0 \end{bmatrix}$$

86   symmetry

$$-\frac{\sqrt{15}\left(x^4-12x^2y^2+6x^2z^2+y^4+6y^2z^2-2z^4\right)}{12}$$

$\mathbb{G}_4^{(1,-1;a)}(B_1,2)$

$$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{12} & 0 & 0 & 0 & -\frac{\sqrt{21}i}{12} \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{21}i}{12} & 0 & 0 & 0 & -\frac{\sqrt{15}i}{12} & 0 & 0 & 0 \end{bmatrix}$$

87   symmetry

$$\frac{\sqrt{35}xy(x-y)(x+y)}{2}$$

$\mathbb{G}_4^{(1,-1;a)}(B_2)$

$$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{1}{2} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$$

88   symmetry

$$\frac{\sqrt{35}yz(y-z)(y+z)}{2}$$

$\mathbb{G}_{4,1}^{(1,-1;a)}(E,1)$

$$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{1}{16} & 0 & -\frac{\sqrt{21}}{16} & 0 & -\frac{\sqrt{35}}{16} & 0 & -\frac{\sqrt{7}}{16} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}}{16} & 0 & \frac{\sqrt{35}}{16} & 0 & \frac{\sqrt{21}}{16} & 0 & \frac{1}{16} \end{bmatrix}$$

89   symmetry

$$-\frac{\sqrt{35}xz(x-z)(x+z)}{2}$$

$\mathbb{G}_{4,2}^{(1,-1;a)}(E,1)$

$$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{i}{16} & 0 & -\frac{\sqrt{21}i}{16} & 0 & \frac{\sqrt{35}i}{16} & 0 & -\frac{\sqrt{7}i}{16} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}i}{16} & 0 & \frac{\sqrt{35}i}{16} & 0 & -\frac{\sqrt{21}i}{16} & 0 & \frac{i}{16} \end{bmatrix}$$

90   symmetry

$$\frac{\sqrt{5}yz\left(6x^2-y^2-z^2\right)}{2}$$

$\mathbb{G}_{4,1}^{(1,-1;a)}(E,2)$

$$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}}{16} & 0 & -\frac{\sqrt{3}}{16} & 0 & -\frac{\sqrt{5}}{16} & 0 & \frac{7}{16} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{7}{16} & 0 & \frac{\sqrt{5}}{16} & 0 & \frac{\sqrt{3}}{16} & 0 & -\frac{\sqrt{7}}{16} \end{bmatrix}$$

91   symmetry

$$\frac{\sqrt{5}xz\left(x^2-6y^2+z^2\right)}{2}$$

$\mathbb{G}_{4,2}^{(1,-1;a)}(E,2)$

$$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}i}{16} & 0 & -\frac{\sqrt{3}i}{16} & 0 & \frac{\sqrt{5}i}{16} & 0 & \frac{7i}{16} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{7i}{16} & 0 & \frac{\sqrt{5}i}{16} & 0 & -\frac{\sqrt{3}i}{16} & 0 & -\frac{\sqrt{7}i}{16} \end{bmatrix}$$

92   symmetry

$$\frac{\sqrt{3}(x-y)(x+y)}{2}$$

$\mathbb{G}_2^{(1,1;a)}(A_1)$

$$\begin{bmatrix} -\frac{\sqrt{30}i}{12} & 0 & 0 & 0 & -\frac{\sqrt{6}i}{12} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{6}i}{12} & 0 & 0 & 0 & -\frac{\sqrt{30}i}{12} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$$

93   symmetry

$$\sqrt{3}xy$$

Table 4

No.	multipole	matrix

$\mathbb{G}_2^{(1,1;a)}(A_2)$

$$\begin{bmatrix} \frac{\sqrt{30}}{12} & 0 & 0 & 0 & -\frac{\sqrt{6}}{12} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{6}}{12} & 0 & 0 & 0 & -\frac{\sqrt{30}}{12} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$$

94 — symmetry $-\frac{x^2}{2}-\frac{y^2}{2}+z^2$

$\mathbb{G}_2^{(1,1;a)}(B_1)$

$$\begin{bmatrix} 0 & 0 & -\frac{i}{2} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{i}{2} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$$

95 — symmetry $\sqrt{3}yz$

$\mathbb{G}_{2,1}^{(1,1;a)}(E)$

$$\begin{bmatrix} 0 & -\frac{\sqrt{6}}{6} & 0 & -\frac{\sqrt{3}}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{3}}{6} & 0 & -\frac{\sqrt{6}}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$$

96 — symmetry $-\sqrt{3}xz$

$\mathbb{G}_{2,2}^{(1,1;a)}(E)$

$$\begin{bmatrix} 0 & -\frac{\sqrt{6}i}{6} & 0 & \frac{\sqrt{3}i}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{3}i}{6} & 0 & \frac{\sqrt{6}i}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$$

97 — symmetry $\sqrt{15}xyz$

$\mathbb{T}_3^{(a)}(A_1)$

$$\begin{bmatrix} \frac{\sqrt{14}}{28} & 0 & 0 & 0 & -\frac{\sqrt{70}}{28} & 0 & 0 & -\frac{\sqrt{21}}{14} & 0 & 0 & 0 & \frac{\sqrt{7}}{14} & 0 & 0 \\ 0 & -\frac{\sqrt{70}}{28} & 0 & 0 & 0 & \frac{\sqrt{14}}{28} & 0 & 0 & -\frac{\sqrt{7}}{14} & 0 & 0 & 0 & \frac{\sqrt{21}}{14} & 0 \end{bmatrix}$$

98 — symmetry $\frac{\sqrt{15}z(x-y)(x+y)}{2}$

$\mathbb{T}_3^{(a)}(A_2)$

$$\begin{bmatrix} -\frac{\sqrt{14}i}{28} & 0 & 0 & 0 & -\frac{\sqrt{70}i}{28} & 0 & 0 & \frac{\sqrt{21}i}{14} & 0 & 0 & 0 & \frac{\sqrt{7}i}{14} & 0 & 0 \\ 0 & \frac{\sqrt{70}i}{28} & 0 & 0 & 0 & \frac{\sqrt{14}i}{28} & 0 & 0 & \frac{\sqrt{7}i}{14} & 0 & 0 & 0 & \frac{\sqrt{21}i}{14} & 0 \end{bmatrix}$$

99 — symmetry $-\frac{z\left(3x^2+3y^2-2z^2\right)}{2}$

$\mathbb{T}_3^{(a)}(B_2)$

$$\begin{bmatrix} 0 & 0 & -\frac{\sqrt{21}i}{14} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}i}{7} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{21}i}{14} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}i}{7} & 0 & 0 & 0 \end{bmatrix}$$

100 — symmetry $\frac{x\left(2x^2-3y^2-3z^2\right)}{2}$

$\mathbb{T}_{3,1}^{(a)}(E,1)$

$$\begin{bmatrix} 0 & -\frac{\sqrt{42}i}{56} & 0 & \frac{\sqrt{21}i}{28} & 0 & -\frac{\sqrt{210}i}{56} & -\frac{\sqrt{5}i}{8} & 0 & \frac{\sqrt{105}i}{56} & 0 & -\frac{3\sqrt{7}i}{56} & 0 & \frac{\sqrt{35}i}{56} & 0 \\ -\frac{\sqrt{210}i}{56} & 0 & \frac{\sqrt{21}i}{28} & 0 & -\frac{\sqrt{42}i}{56} & 0 & 0 & -\frac{\sqrt{35}i}{56} & 0 & \frac{3\sqrt{7}i}{56} & 0 & -\frac{\sqrt{105}i}{56} & 0 & \frac{\sqrt{5}i}{8} \end{bmatrix}$$

101 — symmetry $-\frac{y\left(3x^2-2y^2+3z^2\right)}{2}$

$\mathbb{T}_{3,2}^{(a)}(E,1)$

$$\begin{bmatrix} 0 & \frac{\sqrt{42}}{56} & 0 & \frac{\sqrt{21}}{28} & 0 & \frac{\sqrt{210}}{56} & -\frac{\sqrt{5}}{8} & 0 & -\frac{\sqrt{105}}{56} & 0 & -\frac{3\sqrt{7}}{56} & 0 & -\frac{\sqrt{35}}{56} & 0 \\ -\frac{\sqrt{210}}{56} & 0 & -\frac{\sqrt{21}}{28} & 0 & -\frac{\sqrt{42}}{56} & 0 & 0 & -\frac{\sqrt{35}}{56} & 0 & -\frac{3\sqrt{7}}{56} & 0 & -\frac{\sqrt{105}}{56} & 0 & -\frac{\sqrt{5}}{8} \end{bmatrix}$$

102 — symmetry $\frac{\sqrt{15}x(y-z)(y+z)}{2}$

Table 4

No.	multipole	matrix

$\mathbb{T}_{3,1}^{(a)}(E,2)$

$$\begin{bmatrix} 0 & -\frac{\sqrt{70}i}{56} & 0 & \frac{\sqrt{35}i}{28} & 0 & \frac{3\sqrt{14}i}{56} & \frac{\sqrt{3}i}{8} & 0 & \frac{5\sqrt{7}i}{56} & 0 & -\frac{\sqrt{105}i}{56} & 0 & -\frac{\sqrt{21}i}{56} & 0 \\ \frac{3\sqrt{14}i}{56} & 0 & \frac{\sqrt{35}i}{28} & 0 & -\frac{\sqrt{70}i}{56} & 0 & 0 & \frac{\sqrt{21}i}{56} & 0 & \frac{\sqrt{105}i}{56} & 0 & -\frac{5\sqrt{7}i}{56} & 0 & -\frac{\sqrt{3}i}{8} \end{bmatrix}$$

103   symmetry $\frac{\sqrt{15}y(x-z)(x+z)}{2}$

$\mathbb{T}_{3,2}^{(a)}(E,2)$

$$\begin{bmatrix} 0 & \frac{\sqrt{70}}{56} & 0 & \frac{\sqrt{35}}{28} & 0 & -\frac{3\sqrt{14}}{56} & \frac{\sqrt{3}}{8} & 0 & -\frac{5\sqrt{7}}{56} & 0 & -\frac{\sqrt{105}}{56} & 0 & \frac{\sqrt{21}}{56} & 0 \\ \frac{3\sqrt{14}}{56} & 0 & -\frac{\sqrt{35}}{28} & 0 & -\frac{\sqrt{70}}{56} & 0 & 0 & \frac{\sqrt{21}}{56} & 0 & -\frac{\sqrt{105}}{56} & 0 & -\frac{5\sqrt{7}}{56} & 0 & \frac{\sqrt{3}}{8} \end{bmatrix}$$

104   symmetry $\sqrt{15}xyz$

$\mathbb{T}_3^{(1,0;a)}(A_1)$

$$\begin{bmatrix} \frac{\sqrt{42}}{42} & 0 & 0 & 0 & -\frac{\sqrt{210}}{42} & 0 & 0 & \frac{3\sqrt{7}}{28} & 0 & 0 & 0 & -\frac{\sqrt{21}}{28} & 0 & 0 \\ 0 & -\frac{\sqrt{210}}{42} & 0 & 0 & 0 & \frac{\sqrt{42}}{42} & 0 & 0 & \frac{\sqrt{21}}{28} & 0 & 0 & 0 & -\frac{3\sqrt{7}}{28} & 0 \end{bmatrix}$$

105   symmetry $\frac{\sqrt{15}z(x-y)(x+y)}{2}$

$\mathbb{T}_3^{(1,0;a)}(A_2)$

$$\begin{bmatrix} -\frac{\sqrt{42}i}{42} & 0 & 0 & 0 & -\frac{\sqrt{210}i}{42} & 0 & 0 & -\frac{3\sqrt{7}i}{28} & 0 & 0 & 0 & -\frac{\sqrt{21}i}{28} & 0 & 0 \\ 0 & \frac{\sqrt{210}i}{42} & 0 & 0 & 0 & \frac{\sqrt{42}i}{42} & 0 & 0 & -\frac{\sqrt{21}i}{28} & 0 & 0 & 0 & -\frac{3\sqrt{7}i}{28} & 0 \end{bmatrix}$$

106   symmetry $-\frac{z\left(3x^2+3y^2-2z^2\right)}{2}$

$\mathbb{T}_3^{(1,0;a)}(B_2)$

$$\begin{bmatrix} 0 & 0 & -\frac{\sqrt{7}i}{7} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{21}i}{14} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{7}i}{7} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{21}i}{14} & 0 & 0 & 0 \end{bmatrix}$$

107   symmetry $\frac{x\left(2x^2-3y^2-3z^2\right)}{2}$

$\mathbb{T}_{3,1}^{(1,0;a)}(E,1)$

$$\begin{bmatrix} 0 & -\frac{\sqrt{14}i}{28} & 0 & \frac{\sqrt{7}i}{14} & 0 & -\frac{\sqrt{70}i}{28} & \frac{\sqrt{15}i}{16} & 0 & -\frac{3\sqrt{35}i}{112} & 0 & \frac{3\sqrt{21}i}{112} & 0 & -\frac{\sqrt{105}i}{112} & 0 \\ -\frac{\sqrt{70}i}{28} & 0 & \frac{\sqrt{7}i}{14} & 0 & -\frac{\sqrt{14}i}{28} & 0 & 0 & \frac{\sqrt{105}i}{112} & 0 & -\frac{3\sqrt{21}i}{112} & 0 & \frac{3\sqrt{35}i}{112} & 0 & -\frac{\sqrt{15}i}{16} \end{bmatrix}$$

108   symmetry $-\frac{y\left(3x^2-2y^2+3z^2\right)}{2}$

$\mathbb{T}_{3,2}^{(1,0;a)}(E,1)$

$$\begin{bmatrix} 0 & \frac{\sqrt{14}}{28} & 0 & \frac{\sqrt{7}}{14} & 0 & \frac{\sqrt{70}}{28} & \frac{\sqrt{15}}{16} & 0 & \frac{3\sqrt{35}}{112} & 0 & \frac{3\sqrt{21}}{112} & 0 & \frac{\sqrt{105}}{112} & 0 \\ -\frac{\sqrt{70}}{28} & 0 & -\frac{\sqrt{7}}{14} & 0 & -\frac{\sqrt{14}}{28} & 0 & 0 & \frac{\sqrt{105}}{112} & 0 & \frac{3\sqrt{21}}{112} & 0 & \frac{3\sqrt{35}}{112} & 0 & \frac{\sqrt{15}}{16} \end{bmatrix}$$

109   symmetry $\frac{\sqrt{15}x(y-z)(y+z)}{2}$

$\mathbb{T}_{3,1}^{(1,0;a)}(E,2)$

$$\begin{bmatrix} 0 & -\frac{\sqrt{210}i}{84} & 0 & \frac{\sqrt{105}i}{42} & 0 & \frac{\sqrt{42}i}{28} & -\frac{3i}{16} & 0 & -\frac{5\sqrt{21}i}{112} & 0 & \frac{3\sqrt{35}i}{112} & 0 & \frac{3\sqrt{7}i}{112} & 0 \\ \frac{\sqrt{42}i}{28} & 0 & \frac{\sqrt{105}i}{42} & 0 & -\frac{\sqrt{210}i}{84} & 0 & 0 & -\frac{3\sqrt{7}i}{112} & 0 & -\frac{3\sqrt{35}i}{112} & 0 & \frac{5\sqrt{21}i}{112} & 0 & \frac{3i}{16} \end{bmatrix}$$

110   symmetry $\frac{\sqrt{15}y(x-z)(x+z)}{2}$

$\mathbb{T}_{3,2}^{(1,0;a)}(E,2)$

$$\begin{bmatrix} 0 & \frac{\sqrt{210}}{84} & 0 & \frac{\sqrt{105}}{42} & 0 & -\frac{\sqrt{42}}{28} & -\frac{3}{16} & 0 & \frac{5\sqrt{21}}{112} & 0 & \frac{3\sqrt{35}}{112} & 0 & -\frac{3\sqrt{7}}{112} & 0 \\ \frac{\sqrt{42}}{28} & 0 & -\frac{\sqrt{105}}{42} & 0 & -\frac{\sqrt{210}}{84} & 0 & 0 & -\frac{3\sqrt{7}}{112} & 0 & \frac{3\sqrt{35}}{112} & 0 & \frac{5\sqrt{21}}{112} & 0 & -\frac{3}{16} \end{bmatrix}$$

111   symmetry $\frac{\sqrt{5}(x-y)(x+y)\left(x^2+y^2-6z^2\right)}{4}$

continued ...

Table 4

No.	multipole	matrix

$\mathbb{M}_4^{(1,-1;a)}(A_1)$

$$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{1}{4} & 0 & 0 & 0 & -\frac{\sqrt{3}}{4} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{4} & 0 & 0 & 0 & \frac{1}{4} & 0 \end{bmatrix}$$

112   symmetry $-\frac{\sqrt{5}xy\left(x^2+y^2-6z^2\right)}{2}$

$\mathbb{M}_4^{(1,-1;a)}(A_2)$

$$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{i}{4} & 0 & 0 & 0 & -\frac{\sqrt{3}i}{4} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{4} & 0 & 0 & 0 & \frac{i}{4} & 0 \end{bmatrix}$$

113   symmetry $\frac{\sqrt{21}\left(x^4-3x^2y^2-3x^2z^2+y^4-3y^2z^2+z^4\right)}{6}$

$\mathbb{M}_4^{(1,-1;a)}(B_1,1)$

$$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{21}}{12} & 0 & 0 & 0 & \frac{\sqrt{15}}{12} \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{12} & 0 & 0 & 0 & -\frac{\sqrt{21}}{12} & 0 & 0 & 0 \end{bmatrix}$$

114   symmetry $-\frac{\sqrt{15}\left(x^4-12x^2y^2+6x^2z^2+y^4+6y^2z^2-2z^4\right)}{12}$

$\mathbb{M}_4^{(1,-1;a)}(B_1,2)$

$$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{12} & 0 & 0 & 0 & -\frac{\sqrt{21}}{12} \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{21}}{12} & 0 & 0 & 0 & -\frac{\sqrt{15}}{12} & 0 & 0 \end{bmatrix}$$

115   symmetry $\frac{\sqrt{35}xy(x-y)(x+y)}{2}$

$\mathbb{M}_4^{(1,-1;a)}(B_2)$

$$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{i}{2} \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{i}{2} & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$$

116   symmetry $\frac{\sqrt{35}yz(y-z)(y+z)}{2}$

$\mathbb{M}_{4,1}^{(1,-1;a)}(E,1)$

$$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & \frac{i}{16} & 0 & \frac{\sqrt{21}i}{16} & 0 & \frac{\sqrt{35}i}{16} & 0 & \frac{\sqrt{7}i}{16} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}i}{16} & 0 & -\frac{\sqrt{35}i}{16} & 0 & -\frac{\sqrt{21}i}{16} & 0 & -\frac{i}{16} \end{bmatrix}$$

117   symmetry $-\frac{\sqrt{35}xz(x-z)(x+z)}{2}$

$\mathbb{M}_{4,2}^{(1,-1;a)}(E,1)$

$$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & \frac{1}{16} & 0 & -\frac{\sqrt{21}}{16} & 0 & \frac{\sqrt{35}}{16} & 0 & -\frac{\sqrt{7}}{16} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}}{16} & 0 & \frac{\sqrt{35}}{16} & 0 & -\frac{\sqrt{21}}{16} & 0 & \frac{1}{16} \end{bmatrix}$$

118   symmetry $\frac{\sqrt{5}yz\left(6x^2-y^2-z^2\right)}{2}$

$\mathbb{M}_{4,1}^{(1,-1;a)}(E,2)$

$$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}i}{16} & 0 & \frac{\sqrt{3}i}{16} & 0 & \frac{\sqrt{5}i}{16} & 0 & -\frac{7i}{16} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{7i}{16} & 0 & -\frac{\sqrt{5}i}{16} & 0 & -\frac{\sqrt{3}i}{16} & 0 & \frac{\sqrt{7}i}{16} \end{bmatrix}$$

119   symmetry $\frac{\sqrt{5}xz\left(x^2-6y^2+z^2\right)}{2}$

$\mathbb{M}_{4,2}^{(1,-1;a)}(E,2)$

$$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}}{16} & 0 & -\frac{\sqrt{3}}{16} & 0 & \frac{\sqrt{5}}{16} & 0 & \frac{7}{16} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{7}{16} & 0 & \frac{\sqrt{5}}{16} & 0 & -\frac{\sqrt{3}}{16} & 0 & -\frac{\sqrt{7}}{16} \end{bmatrix}$$

120   symmetry $\frac{\sqrt{3}(x-y)(x+y)}{2}$

14

Table 4

No.	multipole	matrix
	$\mathbb{M}_2^{(1,1;a)}(A_1)$	$\begin{bmatrix} -\frac{\sqrt{30}}{12} & 0 & 0 & 0 & -\frac{\sqrt{6}}{12} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{6}}{12} & 0 & 0 & 0 & -\frac{\sqrt{30}}{12} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
121	symmetry	$\sqrt{3}xy$
	$\mathbb{M}_2^{(1,1;a)}(A_2)$	$\begin{bmatrix} -\frac{\sqrt{30}i}{12} & 0 & 0 & 0 & \frac{\sqrt{6}i}{12} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{6}i}{12} & 0 & 0 & 0 & \frac{\sqrt{30}i}{12} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
122	symmetry	$-\frac{x^2}{2} - \frac{y^2}{2} + z^2$
	$\mathbb{M}_2^{(1,1;a)}(B_1)$	$\begin{bmatrix} 0 & 0 & -\frac{1}{2} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{1}{2} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
123	symmetry	$\sqrt{3}yz$
	$\mathbb{M}_{2,1}^{(1,1;a)}(E)$	$\begin{bmatrix} 0 & \frac{\sqrt{6}i}{6} & 0 & \frac{\sqrt{3}i}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{3}i}{6} & 0 & \frac{\sqrt{6}i}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
124	symmetry	$-\sqrt{3}xz$
	$\mathbb{M}_{2,2}^{(1,1;a)}(E)$	$\begin{bmatrix} 0 & -\frac{\sqrt{6}}{6} & 0 & \frac{\sqrt{3}}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{3}}{6} & 0 & \frac{\sqrt{6}}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$

bra: $= \langle \frac{1}{2}, \frac{1}{2}; p|, \langle \frac{1}{2}, -\frac{1}{2}; p|, \langle \frac{3}{2}, \frac{3}{2}; p|, \langle \frac{3}{2}, \frac{1}{2}; p|, \langle \frac{3}{2}, -\frac{1}{2}; p|, \langle \frac{3}{2}, -\frac{3}{2}; p|$

ket: $= |\frac{1}{2}, \frac{1}{2}; p\rangle, |\frac{1}{2}, -\frac{1}{2}; p\rangle, |\frac{3}{2}, \frac{3}{2}; p\rangle, |\frac{3}{2}, \frac{1}{2}; p\rangle, |\frac{3}{2}, -\frac{1}{2}; p\rangle, |\frac{3}{2}, -\frac{3}{2}; p\rangle$

Table 5: (p,p) block.

No.	multipole	matrix
125	symmetry	1
	$\mathbb{Q}_0^{(a)}(A_1)$	$\begin{bmatrix} \frac{\sqrt{6}}{6} & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{6}}{6} & 0 & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{6}}{6} & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{6}}{6} & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{6} & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{6} \end{bmatrix}$

Table 5

No.	multipole	matrix

126 symmetry $-\frac{x^2}{2} - \frac{y^2}{2} + z^2$

$$\mathbb{Q}_2^{(a)}(A_1) = \begin{bmatrix} 0 & 0 & 0 & -\frac{\sqrt{6}}{6} & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{6} & 0 \\ 0 & 0 & -\frac{\sqrt{3}}{6} & 0 & 0 & 0 \\ -\frac{\sqrt{6}}{6} & 0 & 0 & \frac{\sqrt{3}}{6} & 0 & 0 \\ 0 & \frac{\sqrt{6}}{6} & 0 & 0 & \frac{\sqrt{3}}{6} & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{6} \end{bmatrix}$$

127 symmetry $\frac{\sqrt{3}(x-y)(x+y)}{2}$

$$\mathbb{Q}_2^{(a)}(B_1) = \begin{bmatrix} 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}}{6} \\ 0 & 0 & \frac{\sqrt{6}}{6} & 0 & 0 & 0 \\ 0 & \frac{\sqrt{6}}{6} & 0 & 0 & -\frac{\sqrt{3}}{6} & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{6} \\ 0 & 0 & -\frac{\sqrt{3}}{6} & 0 & 0 & 0 \\ -\frac{\sqrt{6}}{6} & 0 & 0 & -\frac{\sqrt{3}}{6} & 0 & 0 \end{bmatrix}$$

128 symmetry $\sqrt{3}xy$

$$\mathbb{Q}_2^{(a)}(B_2) = \begin{bmatrix} 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}i}{6} \\ 0 & 0 & \frac{\sqrt{6}i}{6} & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{6}i}{6} & 0 & 0 & \frac{\sqrt{3}i}{6} & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{6} \\ 0 & 0 & -\frac{\sqrt{3}i}{6} & 0 & 0 & 0 \\ -\frac{\sqrt{6}i}{6} & 0 & 0 & -\frac{\sqrt{3}i}{6} & 0 & 0 \end{bmatrix}$$

129 symmetry $\sqrt{3}yz$

$$\mathbb{Q}_{2,1}^{(a)}(E) = \begin{bmatrix} 0 & 0 & \frac{\sqrt{6}i}{12} & 0 & \frac{\sqrt{2}i}{4} & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{2}i}{4} & 0 & -\frac{\sqrt{6}i}{12} \\ -\frac{\sqrt{6}i}{12} & 0 & 0 & \frac{\sqrt{3}i}{6} & 0 & 0 \\ 0 & \frac{\sqrt{2}i}{4} & -\frac{\sqrt{3}i}{6} & 0 & 0 & 0 \\ -\frac{\sqrt{2}i}{4} & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{6} \\ 0 & \frac{\sqrt{6}i}{12} & 0 & 0 & \frac{\sqrt{3}i}{6} & 0 \end{bmatrix}$$

130 symmetry $\sqrt{3}xz$

Table 5

No.	multipole	matrix

$\mathbb{Q}_{2,2}^{(a)}(E)$

$$\begin{bmatrix} 0 & 0 & \frac{\sqrt{6}}{12} & 0 & -\frac{\sqrt{2}}{4} & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{2}}{4} & 0 & \frac{\sqrt{6}}{12} \\ \frac{\sqrt{6}}{12} & 0 & 0 & -\frac{\sqrt{3}}{6} & 0 & 0 \\ 0 & -\frac{\sqrt{2}}{4} & -\frac{\sqrt{3}}{6} & 0 & 0 & 0 \\ -\frac{\sqrt{2}}{4} & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{6} \\ 0 & \frac{\sqrt{6}}{12} & 0 & 0 & \frac{\sqrt{3}}{6} & 0 \end{bmatrix}$$

131	symmetry	$-\frac{x^2}{2} - \frac{y^2}{2} + z^2$

$\mathbb{Q}_{2}^{(1,-1;a)}(A_1)$

$$\begin{bmatrix} 0 & 0 & 0 & -\frac{\sqrt{3}}{6} & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{6} & 0 \\ 0 & 0 & \frac{\sqrt{6}}{6} & 0 & 0 & 0 \\ -\frac{\sqrt{3}}{6} & 0 & 0 & -\frac{\sqrt{6}}{6} & 0 & 0 \\ 0 & \frac{\sqrt{3}}{6} & 0 & 0 & -\frac{\sqrt{6}}{6} & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{6} \end{bmatrix}$$

132	symmetry	$\frac{\sqrt{3}(x-y)(x+y)}{2}$

$\mathbb{Q}_{2}^{(1,-1;a)}(B_1)$

$$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{6} \\ 0 & 0 & \frac{\sqrt{3}}{6} & 0 & 0 & 0 \\ 0 & \frac{\sqrt{3}}{6} & 0 & 0 & \frac{\sqrt{6}}{6} & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{6} \\ 0 & 0 & \frac{\sqrt{6}}{6} & 0 & 0 & 0 \\ -\frac{\sqrt{3}}{6} & 0 & 0 & \frac{\sqrt{6}}{6} & 0 & 0 \end{bmatrix}$$

133	symmetry	$\sqrt{3}xy$

$\mathbb{Q}_{2}^{(1,-1;a)}(B_2)$

$$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{6} \\ 0 & 0 & \frac{\sqrt{3}i}{6} & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{3}i}{6} & 0 & 0 & -\frac{\sqrt{6}i}{6} & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{6} \\ 0 & 0 & \frac{\sqrt{6}i}{6} & 0 & 0 & 0 \\ -\frac{\sqrt{3}i}{6} & 0 & 0 & \frac{\sqrt{6}i}{6} & 0 & 0 \end{bmatrix}$$

134	symmetry	$\sqrt{3}yz$

Table 5

No.	multipole	matrix

$$\mathbb{Q}_{2,1}^{(1,-1;a)}(E) \quad \begin{bmatrix} 0 & 0 & \frac{\sqrt{3}i}{12} & 0 & \frac{i}{4} & 0 \\ 0 & 0 & 0 & -\frac{i}{4} & 0 & -\frac{\sqrt{3}i}{12} \\ -\frac{\sqrt{3}i}{12} & 0 & 0 & -\frac{\sqrt{6}i}{6} & 0 & 0 \\ 0 & \frac{i}{4} & \frac{\sqrt{6}i}{6} & 0 & 0 & 0 \\ -\frac{i}{4} & 0 & 0 & 0 & 0 & \frac{\sqrt{6}i}{6} \\ 0 & \frac{\sqrt{3}i}{12} & 0 & 0 & -\frac{\sqrt{6}i}{6} & 0 \end{bmatrix}$$

135	symmetry	$\sqrt{3}xz$

$$\mathbb{Q}_{2,2}^{(1,-1;a)}(E) \quad \begin{bmatrix} 0 & 0 & \frac{\sqrt{3}}{12} & 0 & -\frac{1}{4} & 0 \\ 0 & 0 & 0 & -\frac{1}{4} & 0 & \frac{\sqrt{3}}{12} \\ \frac{\sqrt{3}}{12} & 0 & 0 & \frac{\sqrt{6}}{6} & 0 & 0 \\ 0 & -\frac{1}{4} & \frac{\sqrt{6}}{6} & 0 & 0 & 0 \\ -\frac{1}{4} & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}}{6} \\ 0 & \frac{\sqrt{3}}{12} & 0 & 0 & -\frac{\sqrt{6}}{6} & 0 \end{bmatrix}$$

136	symmetry	1

$$\mathbb{Q}_{0}^{(1,1;a)}(A_1) \quad \begin{bmatrix} -\frac{\sqrt{3}}{3} & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{3}}{3} & 0 & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{3}}{6} & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{3}}{6} & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{6} & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{6} \end{bmatrix}$$

137	symmetry	z

$$\mathbb{G}_{1}^{(1,0;a)}(A_2) \quad \begin{bmatrix} 0 & 0 & 0 & -\frac{i}{2} & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{i}{2} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 \\ \frac{i}{2} & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{i}{2} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$$

138	symmetry	x

Table 5

No.	multipole	matrix

$\mathbb{G}_{1,1}^{(1,0;a)}(E)$

$$\begin{bmatrix} 0 & 0 & \frac{\sqrt{3}i}{4} & 0 & -\frac{i}{4} & 0 \\ 0 & 0 & 0 & \frac{i}{4} & 0 & -\frac{\sqrt{3}i}{4} \\ -\frac{\sqrt{3}i}{4} & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{i}{4} & 0 & 0 & 0 & 0 \\ \frac{i}{4} & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{3}i}{4} & 0 & 0 & 0 & 0 \end{bmatrix}$$

| 139 | symmetry | $-y$ |

$\mathbb{G}_{1,2}^{(1,0;a)}(E)$

$$\begin{bmatrix} 0 & 0 & \frac{\sqrt{3}}{4} & 0 & \frac{1}{4} & 0 \\ 0 & 0 & 0 & \frac{1}{4} & 0 & \frac{\sqrt{3}}{4} \\ \frac{\sqrt{3}}{4} & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{1}{4} & 0 & 0 & 0 & 0 \\ \frac{1}{4} & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{3}}{4} & 0 & 0 & 0 & 0 \end{bmatrix}$$

| 140 | symmetry | $-\frac{x^2}{2} - \frac{y^2}{2} + z^2$ |

$\mathbb{T}_2^{(1,0;a)}(A_1)$

$$\begin{bmatrix} 0 & 0 & 0 & \frac{i}{2} & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{i}{2} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 \\ -\frac{i}{2} & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{i}{2} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$$

| 141 | symmetry | $\frac{\sqrt{3}(x-y)(x+y)}{2}$ |

$\mathbb{T}_2^{(1,0;a)}(B_1)$

$$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & \frac{i}{2} \\ 0 & 0 & -\frac{i}{2} & 0 & 0 & 0 \\ 0 & \frac{i}{2} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 \\ -\frac{i}{2} & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$$

| 142 | symmetry | $\sqrt{3}xy$ |

continued …

Table 5

No.	multipole	matrix
	$\mathbb{T}_2^{(1,0;a)}(B_2)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & \frac{1}{2} & 0 & 0 & 0 \\ 0 & \frac{1}{2} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 \\ \frac{1}{2} & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
143	symmetry	$\sqrt{3}yz$
	$\mathbb{T}_{2,1}^{(1,0;a)}(E)$	$\begin{bmatrix} 0 & 0 & \frac{1}{4} & 0 & \frac{\sqrt{3}}{4} & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{3}}{4} & 0 & -\frac{1}{4} \\ \frac{1}{4} & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{3}}{4} & 0 & 0 & 0 & 0 \\ \frac{\sqrt{3}}{4} & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{1}{4} & 0 & 0 & 0 & 0 \end{bmatrix}$
144	symmetry	$\sqrt{3}xz$
	$\mathbb{T}_{2,2}^{(1,0;a)}(E)$	$\begin{bmatrix} 0 & 0 & -\frac{i}{4} & 0 & \frac{\sqrt{3}i}{4} & 0 \\ 0 & 0 & 0 & \frac{\sqrt{3}i}{4} & 0 & -\frac{i}{4} \\ \frac{i}{4} & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{3}i}{4} & 0 & 0 & 0 & 0 \\ -\frac{\sqrt{3}i}{4} & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{i}{4} & 0 & 0 & 0 & 0 \end{bmatrix}$
145	symmetry	z
	$\mathbb{M}_1^{(a)}(A_2)$	$\begin{bmatrix} \frac{1}{3} & 0 & 0 & \frac{\sqrt{2}}{6} & 0 & 0 \\ 0 & -\frac{1}{3} & 0 & 0 & \frac{\sqrt{2}}{6} & 0 \\ 0 & 0 & \frac{1}{2} & 0 & 0 & 0 \\ \frac{\sqrt{2}}{6} & 0 & 0 & \frac{1}{6} & 0 & 0 \\ 0 & \frac{\sqrt{2}}{6} & 0 & 0 & -\frac{1}{6} & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{1}{2} \end{bmatrix}$
146	symmetry	x

20

Table 5

No.	multipole	matrix
	$\mathbb{M}_{1,1}^{(a)}(E)$	$\begin{bmatrix} 0 & \frac{1}{3} & -\frac{\sqrt{6}}{12} & 0 & \frac{\sqrt{2}}{12} & 0 \\ \frac{1}{3} & 0 & 0 & -\frac{\sqrt{2}}{12} & 0 & \frac{\sqrt{6}}{12} \\ -\frac{\sqrt{6}}{12} & 0 & 0 & \frac{\sqrt{3}}{6} & 0 & 0 \\ 0 & -\frac{\sqrt{2}}{12} & \frac{\sqrt{3}}{6} & 0 & \frac{1}{3} & 0 \\ \frac{\sqrt{2}}{12} & 0 & 0 & \frac{1}{3} & 0 & \frac{\sqrt{3}}{6} \\ 0 & \frac{\sqrt{6}}{12} & 0 & 0 & \frac{\sqrt{3}}{6} & 0 \end{bmatrix}$
147	symmetry	$-y$
	$\mathbb{M}_{1,2}^{(a)}(E)$	$\begin{bmatrix} 0 & \frac{i}{3} & \frac{\sqrt{6}i}{12} & 0 & \frac{\sqrt{2}i}{12} & 0 \\ -\frac{i}{3} & 0 & 0 & \frac{\sqrt{2}i}{12} & 0 & \frac{\sqrt{6}i}{12} \\ -\frac{\sqrt{6}i}{12} & 0 & 0 & \frac{\sqrt{3}i}{6} & 0 & 0 \\ 0 & -\frac{\sqrt{2}i}{12} & -\frac{\sqrt{3}i}{6} & 0 & \frac{i}{3} & 0 \\ -\frac{\sqrt{2}i}{12} & 0 & 0 & -\frac{i}{3} & 0 & \frac{\sqrt{3}i}{6} \\ 0 & -\frac{\sqrt{6}i}{12} & 0 & 0 & -\frac{\sqrt{3}i}{6} & 0 \end{bmatrix}$
148	symmetry	z
	$\mathbb{M}_1^{(1,-1;a)}(A_2)$	$\begin{bmatrix} -\frac{\sqrt{6}}{18} & 0 & 0 & -\frac{2\sqrt{3}}{9} & 0 & 0 \\ 0 & \frac{\sqrt{6}}{18} & 0 & 0 & -\frac{2\sqrt{3}}{9} & 0 \\ 0 & 0 & \frac{\sqrt{6}}{6} & 0 & 0 & 0 \\ -\frac{2\sqrt{3}}{9} & 0 & 0 & \frac{\sqrt{6}}{18} & 0 & 0 \\ 0 & -\frac{2\sqrt{3}}{9} & 0 & 0 & -\frac{\sqrt{6}}{18} & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}}{6} \end{bmatrix}$
149	symmetry	x
	$\mathbb{M}_{1,1}^{(1,-1;a)}(E)$	$\begin{bmatrix} 0 & -\frac{\sqrt{6}}{18} & \frac{1}{3} & 0 & -\frac{\sqrt{3}}{9} & 0 \\ -\frac{\sqrt{6}}{18} & 0 & 0 & \frac{\sqrt{3}}{9} & 0 & -\frac{1}{3} \\ \frac{1}{3} & 0 & 0 & \frac{\sqrt{2}}{6} & 0 & 0 \\ 0 & \frac{\sqrt{3}}{9} & \frac{\sqrt{2}}{6} & 0 & \frac{\sqrt{6}}{9} & 0 \\ -\frac{\sqrt{3}}{9} & 0 & 0 & \frac{\sqrt{6}}{9} & 0 & \frac{\sqrt{2}}{6} \\ 0 & -\frac{1}{3} & 0 & 0 & \frac{\sqrt{2}}{6} & 0 \end{bmatrix}$
150	symmetry	$-y$

continued …

Table 5

No.	multipole	matrix

$$\mathbb{M}_{1,2}^{(1,-1;a)}(E)$$

$$\begin{pmatrix} 0 & -\frac{\sqrt{6}i}{18} & -\frac{i}{3} & 0 & -\frac{\sqrt{3}i}{9} & 0 \\ \frac{\sqrt{6}i}{18} & 0 & 0 & -\frac{\sqrt{3}i}{9} & 0 & -\frac{i}{3} \\ \frac{i}{3} & 0 & 0 & \frac{\sqrt{2}i}{6} & 0 & 0 \\ 0 & \frac{\sqrt{3}i}{9} & -\frac{\sqrt{2}i}{6} & 0 & \frac{\sqrt{6}i}{9} & 0 \\ \frac{\sqrt{3}i}{9} & 0 & 0 & -\frac{\sqrt{6}i}{9} & 0 & \frac{\sqrt{2}i}{6} \\ 0 & \frac{i}{3} & 0 & 0 & -\frac{\sqrt{2}i}{6} & 0 \end{pmatrix}$$

| 151 | symmetry | $-\dfrac{z\left(3x^2+3y^2-2z^2\right)}{2}$ |

$$\mathbb{M}_{3}^{(1,-1;a)}(A_2)$$

$$\begin{pmatrix} 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{5}}{10} & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{3\sqrt{5}}{10} & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{3\sqrt{5}}{10} & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{5}}{10} \end{pmatrix}$$

| 152 | symmetry | $\sqrt{15}xyz$ |

$$\mathbb{M}_{3}^{(1,-1;a)}(B_1)$$

$$\begin{pmatrix} 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{i}{2} & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{i}{2} \\ 0 & 0 & -\frac{i}{2} & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{i}{2} & 0 & 0 \end{pmatrix}$$

| 153 | symmetry | $\dfrac{\sqrt{15}z(x-y)(x+y)}{2}$ |

$$\mathbb{M}_{3}^{(1,-1;a)}(B_2)$$

$$\begin{pmatrix} 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{1}{2} & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -\frac{1}{2} & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{1}{2} & 0 & 0 \end{pmatrix}$$

| 154 | symmetry | $\dfrac{x\left(2x^2-3y^2-3z^2\right)}{2}$ |

continued ...

Table 5

No.	multipole	matrix

$$\mathbb{M}_{3,1}^{(1,-1;a)}(E,1)$$

$$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{15}}{20} & 0 & -\frac{\sqrt{5}}{4} \\ 0 & 0 & \frac{\sqrt{15}}{20} & 0 & -\frac{3\sqrt{5}}{20} & 0 \\ 0 & 0 & 0 & -\frac{3\sqrt{5}}{20} & 0 & \frac{\sqrt{15}}{20} \\ 0 & 0 & -\frac{\sqrt{5}}{4} & 0 & \frac{\sqrt{15}}{20} & 0 \end{bmatrix}$$

| 155 | symmetry | $\frac{y\left(3x^2-2y^2+3z^2\right)}{2}$ |

$$\mathbb{M}_{3,2}^{(1,-1;a)}(E,1)$$

$$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{15}i}{20} & 0 & \frac{\sqrt{5}i}{4} \\ 0 & 0 & -\frac{\sqrt{15}i}{20} & 0 & -\frac{3\sqrt{5}i}{20} & 0 \\ 0 & 0 & 0 & \frac{3\sqrt{5}i}{20} & 0 & \frac{\sqrt{15}i}{20} \\ 0 & 0 & -\frac{\sqrt{5}i}{4} & 0 & -\frac{\sqrt{15}i}{20} & 0 \end{bmatrix}$$

| 156 | symmetry | $\frac{\sqrt{15}x(y-z)(y+z)}{2}$ |

$$\mathbb{M}_{3,1}^{(1,-1;a)}(E,2)$$

$$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{1}{4} & 0 & \frac{\sqrt{3}}{4} \\ 0 & 0 & \frac{1}{4} & 0 & -\frac{\sqrt{3}}{4} & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{3}}{4} & 0 & \frac{1}{4} \\ 0 & 0 & \frac{\sqrt{3}}{4} & 0 & \frac{1}{4} & 0 \end{bmatrix}$$

| 157 | symmetry | $-\frac{\sqrt{15}y(x-z)(x+z)}{2}$ |

$$\mathbb{M}_{3,2}^{(1,-1;a)}(E,2)$$

$$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{i}{4} & 0 & -\frac{\sqrt{3}i}{4} \\ 0 & 0 & -\frac{i}{4} & 0 & -\frac{\sqrt{3}i}{4} & 0 \\ 0 & 0 & 0 & \frac{\sqrt{3}i}{4} & 0 & \frac{i}{4} \\ 0 & 0 & \frac{\sqrt{3}i}{4} & 0 & -\frac{i}{4} & 0 \end{bmatrix}$$

| 158 | symmetry | z |

Table 5

No.	multipole	matrix

$$\mathbb{M}_1^{(1,1;a)}(A_2) = \begin{bmatrix} \frac{\sqrt{30}}{9} & 0 & 0 & -\frac{\sqrt{15}}{18} & 0 & 0 \\ 0 & -\frac{\sqrt{30}}{9} & 0 & 0 & -\frac{\sqrt{15}}{18} & 0 \\ 0 & 0 & -\frac{\sqrt{30}}{30} & 0 & 0 & 0 \\ -\frac{\sqrt{15}}{18} & 0 & 0 & -\frac{\sqrt{30}}{90} & 0 & 0 \\ 0 & -\frac{\sqrt{15}}{18} & 0 & 0 & \frac{\sqrt{30}}{90} & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{30} \end{bmatrix}$$

159	symmetry	x

$$\mathbb{M}_{1,1}^{(1,1;a)}(E) = \begin{bmatrix} 0 & \frac{\sqrt{30}}{9} & \frac{\sqrt{5}}{12} & 0 & -\frac{\sqrt{15}}{36} & 0 \\ \frac{\sqrt{30}}{9} & 0 & 0 & \frac{\sqrt{15}}{36} & 0 & -\frac{\sqrt{5}}{12} \\ \frac{\sqrt{5}}{12} & 0 & 0 & -\frac{\sqrt{10}}{30} & 0 & 0 \\ 0 & \frac{\sqrt{15}}{36} & -\frac{\sqrt{10}}{30} & 0 & -\frac{\sqrt{30}}{45} & 0 \\ -\frac{\sqrt{15}}{36} & 0 & 0 & -\frac{\sqrt{30}}{45} & 0 & -\frac{\sqrt{10}}{30} \\ 0 & -\frac{\sqrt{5}}{12} & 0 & 0 & -\frac{\sqrt{10}}{30} & 0 \end{bmatrix}$$

160	symmetry	$-y$

$$\mathbb{M}_{1,2}^{(1,1;a)}(E) = \begin{bmatrix} 0 & \frac{\sqrt{30}i}{9} & -\frac{\sqrt{5}i}{12} & 0 & -\frac{\sqrt{15}i}{36} & 0 \\ -\frac{\sqrt{30}i}{9} & 0 & 0 & -\frac{\sqrt{15}i}{36} & 0 & -\frac{\sqrt{5}i}{12} \\ \frac{\sqrt{5}i}{12} & 0 & 0 & -\frac{\sqrt{10}i}{30} & 0 & 0 \\ 0 & \frac{\sqrt{15}i}{36} & \frac{\sqrt{10}i}{30} & 0 & -\frac{\sqrt{30}i}{45} & 0 \\ \frac{\sqrt{15}i}{36} & 0 & 0 & \frac{\sqrt{30}i}{45} & 0 & -\frac{\sqrt{10}i}{30} \\ 0 & \frac{\sqrt{5}i}{12} & 0 & 0 & \frac{\sqrt{10}i}{30} & 0 \end{bmatrix}$$

bra: $= \langle \frac{1}{2},\frac{1}{2};p|\,,\langle \frac{1}{2},-\frac{1}{2};p|\,,\langle \frac{3}{2},\frac{3}{2};p|\,,\langle \frac{3}{2},\frac{1}{2};p|\,,\langle \frac{3}{2},-\frac{1}{2};p|\,,\langle \frac{3}{2},-\frac{3}{2};p|$

ket: $= |\frac{3}{2},\frac{3}{2};d\rangle\,,|\frac{3}{2},\frac{1}{2};d\rangle\,,|\frac{3}{2},-\frac{1}{2};d\rangle\,,|\frac{3}{2},-\frac{3}{2};d\rangle\,,|\frac{5}{2},\frac{5}{2};d\rangle\,,|\frac{5}{2},\frac{3}{2};d\rangle\,,|\frac{5}{2},\frac{1}{2};d\rangle\,,|\frac{5}{2},-\frac{1}{2};d\rangle\,,|\frac{5}{2},-\frac{3}{2};d\rangle\,,|\frac{5}{2},-\frac{5}{2};d\rangle$

Table 6: (p,d) block.

No.	multipole	matrix
161	symmetry	z

continued ...

Table 6

No.	multipole	matrix

$$\mathbb{Q}_1^{(a)}(B_2)$$

$$\begin{bmatrix}
0 & \frac{\sqrt{3}}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & \frac{\sqrt{3}}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
-\frac{\sqrt{6}}{20} & 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{10} & 0 & 0 & 0 & 0 \\
0 & -\frac{\sqrt{6}}{60} & 0 & 0 & 0 & 0 & \frac{3}{10} & 0 & 0 & 0 \\
0 & 0 & \frac{\sqrt{6}}{60} & 0 & 0 & 0 & 0 & \frac{3}{10} & 0 & 0 \\
0 & 0 & 0 & \frac{\sqrt{6}}{20} & 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{10} & 0
\end{bmatrix}$$

162 symmetry x

$$\mathbb{Q}_{1,1}^{(a)}(E)$$

$$\begin{bmatrix}
-\frac{1}{4} & 0 & \frac{\sqrt{3}}{12} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & -\frac{\sqrt{3}}{12} & 0 & \frac{1}{4} & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & -\frac{\sqrt{2}}{20} & 0 & 0 & -\frac{\sqrt{30}}{20} & 0 & \frac{\sqrt{3}}{20} & 0 & 0 & 0 \\
-\frac{\sqrt{2}}{20} & 0 & -\frac{\sqrt{6}}{30} & 0 & 0 & -\frac{3\sqrt{2}}{20} & 0 & \frac{3}{20} & 0 & 0 \\
0 & -\frac{\sqrt{6}}{30} & 0 & -\frac{\sqrt{2}}{20} & 0 & 0 & -\frac{3}{20} & 0 & \frac{3\sqrt{2}}{20} & 0 \\
0 & 0 & -\frac{\sqrt{2}}{20} & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{20} & 0 & \frac{\sqrt{30}}{20}
\end{bmatrix}$$

163 symmetry y

$$\mathbb{Q}_{1,2}^{(a)}(E)$$

$$\begin{bmatrix}
-\frac{i}{4} & 0 & -\frac{\sqrt{3}i}{12} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & -\frac{\sqrt{3}i}{12} & 0 & -\frac{i}{4} & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & \frac{\sqrt{2}i}{20} & 0 & 0 & -\frac{\sqrt{30}i}{20} & 0 & -\frac{\sqrt{3}i}{20} & 0 & 0 & 0 \\
-\frac{\sqrt{2}i}{20} & 0 & \frac{\sqrt{6}i}{30} & 0 & 0 & -\frac{3\sqrt{2}i}{20} & 0 & -\frac{3i}{20} & 0 & 0 \\
0 & -\frac{\sqrt{6}i}{30} & 0 & \frac{\sqrt{2}i}{20} & 0 & 0 & -\frac{3i}{20} & 0 & -\frac{3\sqrt{2}i}{20} & 0 \\
0 & 0 & -\frac{\sqrt{2}i}{20} & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{20} & 0 & -\frac{\sqrt{30}i}{20}
\end{bmatrix}$$

164 symmetry $\sqrt{15}xyz$

$$\mathbb{Q}_3^{(a)}(A_1)$$

$$\begin{bmatrix}
0 & 0 & 0 & 0 & -\frac{\sqrt{2}i}{12} & 0 & 0 & 0 & \frac{\sqrt{10}i}{12} & 0 \\
0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}i}{12} & 0 & 0 & 0 & -\frac{\sqrt{2}i}{12} \\
0 & 0 & -\frac{\sqrt{5}i}{10} & 0 & 0 & 0 & 0 & \frac{\sqrt{30}i}{30} & 0 & 0 \\
0 & 0 & 0 & \frac{\sqrt{5}i}{10} & \frac{i}{6} & 0 & 0 & 0 & \frac{\sqrt{5}i}{30} & 0 \\
\frac{\sqrt{5}i}{10} & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{30} & 0 & 0 & 0 & -\frac{i}{6} \\
0 & -\frac{\sqrt{5}i}{10} & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}i}{30} & 0 & 0 & 0
\end{bmatrix}$$

165 symmetry $\frac{\sqrt{15}z(x-y)(x+y)}{2}$

continued ...

Table 6

No.	multipole	matrix

$$\mathbb{Q}_3^{(a)}(A_2)$$

$$\begin{pmatrix}
0 & 0 & 0 & 0 & -\frac{\sqrt{2}}{12} & 0 & 0 & 0 & -\frac{\sqrt{10}}{12} & 0 \\
0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}}{12} & 0 & 0 & 0 & \frac{\sqrt{2}}{12} \\
0 & 0 & \frac{\sqrt{5}}{10} & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}}{30} & 0 & 0 \\
0 & 0 & 0 & -\frac{\sqrt{5}}{10} & \frac{1}{6} & 0 & 0 & 0 & -\frac{\sqrt{5}}{30} & 0 \\
\frac{\sqrt{5}}{10} & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}}{30} & 0 & 0 & 0 & \frac{1}{6} \\
0 & -\frac{\sqrt{5}}{10} & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}}{30} & 0 & 0 & 0
\end{pmatrix}$$

166   symmetry $-\frac{z\left(3x^2+3y^2-2z^2\right)}{2}$

$$\mathbb{Q}_3^{(a)}(B_2)$$

$$\begin{bmatrix}
0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{6} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{6} & 0 & 0 \\
\frac{1}{10} & 0 & 0 & 0 & 0 & -\frac{1}{5} & 0 & 0 & 0 & 0 \\
0 & -\frac{3}{10} & 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{15} & 0 & 0 & 0 \\
0 & 0 & \frac{3}{10} & 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{15} & 0 & 0 \\
0 & 0 & 0 & -\frac{1}{10} & 0 & 0 & 0 & 0 & -\frac{1}{5} & 0
\end{bmatrix}$$

167   symmetry $\frac{x\left(2x^2-3y^2-3z^2\right)}{2}$

$$\mathbb{Q}_{3,1}^{(a)}(E,1)$$

$$\begin{bmatrix}
0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}}{24} & 0 & \frac{\sqrt{3}}{12} & 0 & -\frac{\sqrt{30}}{24} \\
0 & 0 & 0 & 0 & -\frac{\sqrt{30}}{24} & 0 & \frac{\sqrt{3}}{12} & 0 & -\frac{\sqrt{6}}{24} & 0 \\
0 & -\frac{\sqrt{3}}{20} & 0 & \frac{1}{4} & -\frac{\sqrt{5}}{40} & 0 & \frac{3\sqrt{2}}{40} & 0 & -\frac{1}{8} & 0 \\
-\frac{\sqrt{3}}{20} & 0 & \frac{3}{20} & 0 & 0 & \frac{7\sqrt{3}}{120} & 0 & -\frac{\sqrt{6}}{120} & 0 & -\frac{\sqrt{15}}{24} \\
0 & \frac{3}{20} & 0 & -\frac{\sqrt{3}}{20} & \frac{\sqrt{15}}{24} & 0 & \frac{\sqrt{6}}{120} & 0 & -\frac{7\sqrt{3}}{120} & 0 \\
\frac{1}{4} & 0 & -\frac{\sqrt{3}}{20} & 0 & 0 & \frac{1}{8} & 0 & -\frac{3\sqrt{2}}{40} & 0 & \frac{\sqrt{5}}{40}
\end{bmatrix}$$

168   symmetry $-\frac{y\left(3x^2-2y^2+3z^2\right)}{2}$

$$\mathbb{Q}_{3,2}^{(a)}(E,1)$$

$$\begin{bmatrix}
0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{24} & 0 & -\frac{\sqrt{3}i}{12} & 0 & -\frac{\sqrt{30}i}{24} \\
0 & 0 & 0 & 0 & \frac{\sqrt{30}i}{24} & 0 & \frac{\sqrt{3}i}{12} & 0 & \frac{\sqrt{6}i}{24} & 0 \\
0 & \frac{\sqrt{3}i}{20} & 0 & \frac{i}{4} & -\frac{\sqrt{5}i}{40} & 0 & -\frac{3\sqrt{2}i}{40} & 0 & -\frac{i}{8} & 0 \\
-\frac{\sqrt{3}i}{20} & 0 & -\frac{3i}{20} & 0 & 0 & \frac{7\sqrt{3}i}{120} & 0 & \frac{\sqrt{6}i}{120} & 0 & -\frac{\sqrt{15}i}{24} \\
0 & \frac{3i}{20} & 0 & \frac{\sqrt{3}i}{20} & -\frac{\sqrt{15}i}{24} & 0 & \frac{\sqrt{6}i}{120} & 0 & \frac{7\sqrt{3}i}{120} & 0 \\
-\frac{i}{4} & 0 & -\frac{\sqrt{3}i}{20} & 0 & 0 & -\frac{i}{8} & 0 & -\frac{3\sqrt{2}i}{40} & 0 & -\frac{\sqrt{5}i}{40}
\end{bmatrix}$$

169   symmetry $\frac{\sqrt{15}x(y-z)(y+z)}{2}$

continued ...

Table 6

No.	multipole	matrix
	$\mathbb{Q}^{(a)}_{3,1}(E,2)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}}{24} & 0 & \frac{\sqrt{5}}{12} & 0 & \frac{\sqrt{2}}{8} \\ 0 & 0 & 0 & 0 & \frac{\sqrt{2}}{8} & 0 & \frac{\sqrt{5}}{12} & 0 & -\frac{\sqrt{10}}{24} & 0 \\ 0 & -\frac{\sqrt{5}}{20} & 0 & -\frac{\sqrt{15}}{20} & -\frac{\sqrt{3}}{24} & 0 & \frac{\sqrt{30}}{40} & 0 & \frac{\sqrt{15}}{40} & 0 \\ -\frac{\sqrt{5}}{20} & 0 & \frac{\sqrt{15}}{20} & 0 & 0 & \frac{7\sqrt{5}}{120} & 0 & -\frac{\sqrt{10}}{120} & 0 & \frac{1}{8} \\ 0 & \frac{\sqrt{15}}{20} & 0 & -\frac{\sqrt{5}}{20} & -\frac{1}{8} & 0 & \frac{\sqrt{10}}{120} & 0 & -\frac{7\sqrt{5}}{120} & 0 \\ -\frac{\sqrt{15}}{20} & 0 & -\frac{\sqrt{5}}{20} & 0 & 0 & -\frac{\sqrt{15}}{40} & 0 & -\frac{\sqrt{30}}{40} & 0 & \frac{\sqrt{3}}{24} \end{bmatrix}$
170	symmetry	$\frac{\sqrt{15}y(x-z)(x+z)}{2}$
	$\mathbb{Q}^{(a)}_{3,2}(E,2)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}i}{24} & 0 & -\frac{\sqrt{5}i}{12} & 0 & \frac{\sqrt{2}i}{8} \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{2}i}{8} & 0 & \frac{\sqrt{5}i}{12} & 0 & \frac{\sqrt{10}i}{24} & 0 \\ 0 & \frac{\sqrt{5}i}{20} & 0 & -\frac{\sqrt{15}i}{20} & -\frac{\sqrt{3}i}{24} & 0 & -\frac{\sqrt{30}i}{40} & 0 & \frac{\sqrt{15}i}{40} & 0 \\ -\frac{\sqrt{5}i}{20} & 0 & -\frac{\sqrt{15}i}{20} & 0 & 0 & \frac{7\sqrt{5}i}{120} & 0 & \frac{\sqrt{10}i}{120} & 0 & \frac{i}{8} \\ 0 & \frac{\sqrt{15}i}{20} & 0 & \frac{\sqrt{5}i}{20} & \frac{i}{8} & 0 & \frac{\sqrt{10}i}{120} & 0 & \frac{7\sqrt{5}i}{120} & 0 \\ \frac{\sqrt{15}i}{20} & 0 & -\frac{\sqrt{5}i}{20} & 0 & 0 & \frac{\sqrt{15}i}{40} & 0 & -\frac{\sqrt{30}i}{40} & 0 & -\frac{\sqrt{3}i}{24} \end{bmatrix}$
171	symmetry	$\sqrt{15}xyz$
	$\mathbb{Q}^{(1,-1;a)}_3(A_1)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{18} & 0 & 0 & 0 & \frac{\sqrt{15}i}{18} & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{18} & 0 & 0 & 0 & -\frac{\sqrt{3}i}{18} \\ 0 & 0 & -\frac{\sqrt{30}i}{60} & 0 & 0 & 0 & 0 & -\frac{2\sqrt{5}i}{15} & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{30}i}{60} & -\frac{\sqrt{6}i}{9} & 0 & 0 & 0 & -\frac{\sqrt{30}i}{45} & 0 \\ \frac{\sqrt{30}i}{60} & 0 & 0 & 0 & 0 & \frac{\sqrt{30}i}{45} & 0 & 0 & 0 & \frac{\sqrt{6}i}{9} \\ 0 & -\frac{\sqrt{30}i}{60} & 0 & 0 & 0 & 0 & \frac{2\sqrt{5}i}{15} & 0 & 0 & 0 \end{bmatrix}$
172	symmetry	$\frac{\sqrt{15}z(x-y)(x+y)}{2}$
	$\mathbb{Q}^{(1,-1;a)}_3(A_2)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{18} & 0 & 0 & 0 & -\frac{\sqrt{15}}{18} & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{18} & 0 & 0 & 0 & \frac{\sqrt{3}}{18} \\ 0 & 0 & \frac{\sqrt{30}}{60} & 0 & 0 & 0 & 0 & \frac{2\sqrt{5}}{15} & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{30}}{60} & -\frac{\sqrt{6}}{9} & 0 & 0 & 0 & \frac{\sqrt{30}}{45} & 0 \\ \frac{\sqrt{30}}{60} & 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{45} & 0 & 0 & 0 & -\frac{\sqrt{6}}{9} \\ 0 & -\frac{\sqrt{30}}{60} & 0 & 0 & 0 & 0 & \frac{2\sqrt{5}}{15} & 0 & 0 & 0 \end{bmatrix}$
173	symmetry	$-\frac{z\left(3x^2+3y^2-2z^2\right)}{2}$

continued …

Table 6

No.	multipole	matrix

$\mathbb{Q}_3^{(1,-1;a)}(B_2)$

$$\begin{pmatrix}
0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}}{6} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2}}{6} & 0 & 0 \\
\frac{\sqrt{6}}{60} & 0 & 0 & 0 & 0 & \frac{2\sqrt{6}}{15} & 0 & 0 & 0 & 0 \\
0 & -\frac{\sqrt{6}}{20} & 0 & 0 & 0 & 0 & -\frac{4}{15} & 0 & 0 & 0 \\
0 & 0 & \frac{\sqrt{6}}{20} & 0 & 0 & 0 & 0 & -\frac{4}{15} & 0 & 0 \\
0 & 0 & 0 & -\frac{\sqrt{6}}{60} & 0 & 0 & 0 & 0 & \frac{2\sqrt{6}}{15} & 0
\end{pmatrix}$$

174   symmetry $\dfrac{x\left(2x^2-3y^2-3z^2\right)}{2}$

$\mathbb{Q}_{3,1}^{(1,-1;a)}(E,1)$

$$\begin{pmatrix}
0 & 0 & 0 & 0 & 0 & -\frac{1}{12} & 0 & \frac{\sqrt{2}}{12} & 0 & -\frac{\sqrt{5}}{12} \\
0 & 0 & 0 & 0 & -\frac{\sqrt{5}}{12} & 0 & \frac{\sqrt{2}}{12} & 0 & -\frac{1}{12} & 0 \\
0 & -\frac{\sqrt{2}}{40} & 0 & \frac{\sqrt{6}}{24} & \frac{\sqrt{30}}{60} & 0 & -\frac{\sqrt{3}}{10} & 0 & \frac{\sqrt{6}}{12} & 0 \\
-\frac{\sqrt{2}}{40} & 0 & \frac{\sqrt{6}}{40} & 0 & 0 & -\frac{7\sqrt{2}}{60} & 0 & \frac{1}{30} & 0 & \frac{\sqrt{10}}{12} \\
0 & \frac{\sqrt{6}}{40} & 0 & -\frac{\sqrt{2}}{40} & -\frac{\sqrt{10}}{12} & 0 & -\frac{1}{30} & 0 & \frac{7\sqrt{2}}{60} & 0 \\
\frac{\sqrt{6}}{24} & 0 & -\frac{\sqrt{2}}{40} & 0 & 0 & -\frac{\sqrt{6}}{12} & 0 & \frac{\sqrt{3}}{10} & 0 & -\frac{\sqrt{30}}{60}
\end{pmatrix}$$

175   symmetry $-\dfrac{y\left(3x^2-2y^2+3z^2\right)}{2}$

$\mathbb{Q}_{3,2}^{(1,-1;a)}(E,1)$

$$\begin{pmatrix}
0 & 0 & 0 & 0 & 0 & -\frac{i}{12} & 0 & -\frac{\sqrt{2}i}{12} & 0 & -\frac{\sqrt{5}i}{12} \\
0 & 0 & 0 & 0 & \frac{\sqrt{5}i}{12} & 0 & \frac{\sqrt{2}i}{12} & 0 & \frac{i}{12} & 0 \\
0 & \frac{\sqrt{2}i}{40} & 0 & \frac{\sqrt{6}i}{24} & \frac{\sqrt{30}i}{60} & 0 & \frac{\sqrt{3}i}{10} & 0 & \frac{\sqrt{6}i}{12} & 0 \\
-\frac{\sqrt{2}i}{40} & 0 & -\frac{\sqrt{6}i}{40} & 0 & 0 & -\frac{7\sqrt{2}i}{60} & 0 & -\frac{i}{30} & 0 & \frac{\sqrt{10}i}{12} \\
0 & \frac{\sqrt{6}i}{40} & 0 & \frac{\sqrt{2}i}{40} & \frac{\sqrt{10}i}{12} & 0 & -\frac{i}{30} & 0 & -\frac{7\sqrt{2}i}{60} & 0 \\
-\frac{\sqrt{6}i}{24} & 0 & -\frac{\sqrt{2}i}{40} & 0 & 0 & \frac{\sqrt{6}i}{12} & 0 & \frac{\sqrt{3}i}{10} & 0 & \frac{\sqrt{30}i}{60}
\end{pmatrix}$$

176   symmetry $\dfrac{\sqrt{15}x(y-z)(y+z)}{2}$

$\mathbb{Q}_{3,1}^{(1,-1;a)}(E,2)$

$$\begin{pmatrix}
0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{36} & 0 & \frac{\sqrt{30}}{36} & 0 & \frac{\sqrt{3}}{12} \\
0 & 0 & 0 & 0 & \frac{\sqrt{3}}{12} & 0 & \frac{\sqrt{30}}{36} & 0 & -\frac{\sqrt{15}}{36} & 0 \\
0 & -\frac{\sqrt{30}}{120} & 0 & -\frac{\sqrt{10}}{40} & \frac{\sqrt{2}}{12} & 0 & -\frac{\sqrt{5}}{10} & 0 & -\frac{\sqrt{10}}{20} & 0 \\
-\frac{\sqrt{30}}{120} & 0 & \frac{\sqrt{10}}{40} & 0 & 0 & -\frac{7\sqrt{30}}{180} & 0 & \frac{\sqrt{15}}{90} & 0 & -\frac{\sqrt{6}}{12} \\
0 & \frac{\sqrt{10}}{40} & 0 & -\frac{\sqrt{30}}{120} & \frac{\sqrt{6}}{12} & 0 & -\frac{\sqrt{15}}{90} & 0 & \frac{7\sqrt{30}}{180} & 0 \\
-\frac{\sqrt{10}}{40} & 0 & -\frac{\sqrt{30}}{120} & 0 & 0 & \frac{\sqrt{10}}{20} & 0 & \frac{\sqrt{5}}{10} & 0 & -\frac{\sqrt{2}}{12}
\end{pmatrix}$$

177   symmetry $\dfrac{\sqrt{15}y(x-z)(x+z)}{2}$

continued ...

Table 6

No.	multipole	matrix

$\mathbb{Q}_{3,2}^{(1,-1;a)}(E,2)$

$$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{36} & 0 & -\frac{\sqrt{30}i}{36} & 0 & \frac{\sqrt{3}i}{12} \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{12} & 0 & \frac{\sqrt{30}i}{36} & 0 & \frac{\sqrt{15}i}{36} & 0 \\ 0 & \frac{\sqrt{30}i}{120} & 0 & -\frac{\sqrt{10}i}{40} & \frac{\sqrt{2}i}{12} & 0 & \frac{\sqrt{5}i}{10} & 0 & -\frac{\sqrt{10}i}{20} & 0 \\ -\frac{\sqrt{30}i}{120} & 0 & -\frac{\sqrt{10}i}{40} & 0 & 0 & -\frac{7\sqrt{30}i}{180} & 0 & -\frac{\sqrt{15}i}{90} & 0 & -\frac{\sqrt{6}i}{12} \\ 0 & \frac{\sqrt{10}i}{40} & 0 & \frac{\sqrt{30}i}{120} & -\frac{\sqrt{6}i}{12} & 0 & -\frac{\sqrt{15}i}{90} & 0 & -\frac{7\sqrt{30}i}{180} & 0 \\ \frac{\sqrt{10}i}{40} & 0 & -\frac{\sqrt{30}i}{120} & 0 & 0 & -\frac{\sqrt{10}i}{20} & 0 & \frac{\sqrt{5}i}{10} & 0 & \frac{\sqrt{2}i}{12} \end{bmatrix}$$

178	symmetry	z

$\mathbb{Q}_1^{(1,0;a)}(B_2)$

$$\begin{bmatrix} 0 & -\frac{\sqrt{6}}{12} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{6}}{12} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ \frac{\sqrt{3}}{5} & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{10} & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{3}}{15} & 0 & 0 & 0 & 0 & \frac{3\sqrt{2}}{20} & 0 & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{3}}{15} & 0 & 0 & 0 & 0 & \frac{3\sqrt{2}}{20} & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{3}}{5} & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{10} & 0 \end{bmatrix}$$

179	symmetry	x

$\mathbb{Q}_{1,1}^{(1,0;a)}(E)$

$$\begin{bmatrix} \frac{\sqrt{2}}{8} & 0 & -\frac{\sqrt{6}}{24} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{6}}{24} & 0 & -\frac{\sqrt{2}}{8} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{1}{5} & 0 & 0 & -\frac{\sqrt{15}}{20} & 0 & \frac{\sqrt{6}}{40} & 0 & 0 & 0 \\ \frac{1}{5} & 0 & \frac{2\sqrt{3}}{15} & 0 & 0 & -\frac{3}{20} & 0 & \frac{3\sqrt{2}}{40} & 0 & 0 \\ 0 & \frac{2\sqrt{3}}{15} & 0 & \frac{1}{5} & 0 & 0 & -\frac{3\sqrt{2}}{40} & 0 & \frac{3}{20} & 0 \\ 0 & 0 & \frac{1}{5} & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}}{40} & 0 & \frac{\sqrt{15}}{20} \end{bmatrix}$$

180	symmetry	y

$\mathbb{Q}_{1,2}^{(1,0;a)}(E)$

$$\begin{bmatrix} \frac{\sqrt{2}i}{8} & 0 & \frac{\sqrt{6}i}{24} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{6}i}{24} & 0 & \frac{\sqrt{2}i}{8} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{i}{5} & 0 & 0 & -\frac{\sqrt{15}i}{20} & 0 & -\frac{\sqrt{6}i}{40} & 0 & 0 & 0 \\ \frac{i}{5} & 0 & -\frac{2\sqrt{3}i}{15} & 0 & 0 & -\frac{3i}{20} & 0 & -\frac{3\sqrt{2}i}{40} & 0 & 0 \\ 0 & \frac{2\sqrt{3}i}{15} & 0 & -\frac{i}{5} & 0 & 0 & -\frac{3\sqrt{2}i}{40} & 0 & -\frac{3i}{20} & 0 \\ 0 & 0 & \frac{i}{5} & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{40} & 0 & -\frac{\sqrt{15}i}{20} \end{bmatrix}$$

181	symmetry	$\sqrt{15}xyz$

continued ...

Table 6

No.	multipole	matrix

$\mathbb{Q}_3^{(1,0;a)}(A_1)$

$$\begin{bmatrix}
0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{18} & 0 & 0 & 0 & \frac{\sqrt{30}i}{18} & 0 \\
0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}i}{18} & 0 & 0 & 0 & -\frac{\sqrt{6}i}{18} \\
0 & 0 & \frac{\sqrt{15}i}{15} & 0 & 0 & 0 & 0 & \frac{\sqrt{10}i}{60} & 0 & 0 \\
0 & 0 & 0 & -\frac{\sqrt{15}i}{15} & \frac{\sqrt{3}i}{36} & 0 & 0 & 0 & \frac{\sqrt{15}i}{180} & 0 \\
-\frac{\sqrt{15}i}{15} & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{180} & 0 & 0 & 0 & -\frac{\sqrt{3}i}{36} \\
0 & \frac{\sqrt{15}i}{15} & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}i}{60} & 0 & 0 & 0
\end{bmatrix}$$

182	symmetry	$\dfrac{\sqrt{15}z(x-y)(x+y)}{2}$

$\mathbb{Q}_3^{(1,0;a)}(A_2)$

$$\begin{bmatrix}
0 & 0 & 0 & 0 & -\frac{\sqrt{6}}{18} & 0 & 0 & 0 & -\frac{\sqrt{30}}{18} & 0 \\
0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{18} & 0 & 0 & 0 & \frac{\sqrt{6}}{18} \\
0 & 0 & -\frac{\sqrt{15}}{15} & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}}{60} & 0 & 0 \\
0 & 0 & 0 & \frac{\sqrt{15}}{15} & \frac{\sqrt{3}}{36} & 0 & 0 & 0 & -\frac{\sqrt{15}}{180} & 0 \\
-\frac{\sqrt{15}}{15} & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{180} & 0 & 0 & 0 & \frac{\sqrt{3}}{36} \\
0 & \frac{\sqrt{15}}{15} & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}}{60} & 0 & 0 & 0
\end{bmatrix}$$

183	symmetry	$-\dfrac{z(3x^2+3y^2-2z^2)}{2}$

$\mathbb{Q}_3^{(1,0;a)}(B_2)$

$$\begin{bmatrix}
0 & 0 & 0 & 0 & 0 & 0 & -\frac{1}{3} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{1}{3} & 0 & 0 \\
-\frac{\sqrt{3}}{15} & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{30} & 0 & 0 & 0 & 0 \\
0 & \frac{\sqrt{3}}{5} & 0 & 0 & 0 & 0 & \frac{\sqrt{2}}{30} & 0 & 0 & 0 \\
0 & 0 & -\frac{\sqrt{3}}{5} & 0 & 0 & 0 & 0 & \frac{\sqrt{2}}{30} & 0 & 0 \\
0 & 0 & 0 & \frac{\sqrt{3}}{15} & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{30} & 0
\end{bmatrix}$$

184	symmetry	$\dfrac{x(2x^2-3y^2-3z^2)}{2}$

$\mathbb{Q}_{3,1}^{(1,0;a)}(E,1)$

$$\begin{bmatrix}
0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}}{12} & 0 & \frac{1}{6} & 0 & -\frac{\sqrt{10}}{12} \\
0 & 0 & 0 & 0 & -\frac{\sqrt{10}}{12} & 0 & \frac{1}{6} & 0 & -\frac{\sqrt{2}}{12} & 0 \\
0 & \frac{1}{10} & 0 & -\frac{\sqrt{3}}{6} & -\frac{\sqrt{15}}{240} & 0 & \frac{\sqrt{6}}{80} & 0 & -\frac{\sqrt{3}}{48} & 0 \\
\frac{1}{10} & 0 & -\frac{\sqrt{3}}{10} & 0 & 0 & \frac{7}{240} & 0 & -\frac{\sqrt{2}}{240} & 0 & -\frac{\sqrt{5}}{48} \\
0 & -\frac{\sqrt{3}}{10} & 0 & \frac{1}{10} & \frac{\sqrt{5}}{48} & 0 & \frac{\sqrt{2}}{240} & 0 & -\frac{7}{240} & 0 \\
-\frac{\sqrt{3}}{6} & 0 & \frac{1}{10} & 0 & 0 & \frac{\sqrt{3}}{48} & 0 & -\frac{\sqrt{6}}{80} & 0 & \frac{\sqrt{15}}{240}
\end{bmatrix}$$

185	symmetry	$-\dfrac{y(3x^2-2y^2+3z^2)}{2}$

Table 6

No.	multipole	matrix

$\mathbb{Q}_{3,2}^{(1,0;a)}(E,1)$

$$\begin{bmatrix}
0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}i}{12} & 0 & -\frac{i}{6} & 0 & -\frac{\sqrt{10}i}{12} \\
0 & 0 & 0 & 0 & \frac{\sqrt{10}i}{12} & 0 & \frac{i}{6} & 0 & \frac{\sqrt{2}i}{12} & 0 \\
0 & -\frac{i}{10} & 0 & -\frac{\sqrt{3}i}{6} & -\frac{\sqrt{15}i}{240} & 0 & -\frac{\sqrt{6}i}{80} & 0 & -\frac{\sqrt{3}i}{48} & 0 \\
\frac{i}{10} & 0 & \frac{\sqrt{3}i}{10} & 0 & 0 & \frac{7i}{240} & 0 & \frac{\sqrt{2}i}{240} & 0 & -\frac{\sqrt{5}i}{48} \\
0 & -\frac{\sqrt{3}i}{10} & 0 & -\frac{i}{10} & -\frac{\sqrt{5}i}{48} & 0 & \frac{\sqrt{2}i}{240} & 0 & \frac{7i}{240} & 0 \\
\frac{\sqrt{3}i}{6} & 0 & \frac{i}{10} & 0 & 0 & -\frac{\sqrt{3}i}{48} & 0 & -\frac{\sqrt{6}i}{80} & 0 & -\frac{\sqrt{15}i}{240}
\end{bmatrix}$$

186   symmetry $\frac{\sqrt{15}x(y-z)(y+z)}{2}$

$\mathbb{Q}_{3,1}^{(1,0;a)}(E,2)$

$$\begin{bmatrix}
0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}}{36} & 0 & \frac{\sqrt{15}}{18} & 0 & \frac{\sqrt{6}}{12} \\
0 & 0 & 0 & 0 & \frac{\sqrt{6}}{12} & 0 & \frac{\sqrt{15}}{18} & 0 & -\frac{\sqrt{30}}{36} & 0 \\
0 & \frac{\sqrt{15}}{30} & 0 & \frac{\sqrt{5}}{10} & -\frac{1}{48} & 0 & \frac{\sqrt{10}}{80} & 0 & \frac{\sqrt{5}}{80} & 0 \\
\frac{\sqrt{15}}{30} & 0 & -\frac{\sqrt{5}}{10} & 0 & 0 & \frac{7\sqrt{15}}{720} & 0 & -\frac{\sqrt{30}}{720} & 0 & \frac{\sqrt{3}}{48} \\
0 & -\frac{\sqrt{5}}{10} & 0 & \frac{\sqrt{15}}{30} & -\frac{\sqrt{3}}{48} & 0 & \frac{\sqrt{30}}{720} & 0 & -\frac{7\sqrt{15}}{720} & 0 \\
\frac{\sqrt{5}}{10} & 0 & \frac{\sqrt{15}}{30} & 0 & 0 & -\frac{\sqrt{5}}{80} & 0 & -\frac{\sqrt{10}}{80} & 0 & \frac{1}{48}
\end{bmatrix}$$

187   symmetry $\frac{\sqrt{15}y(x-z)(x+z)}{2}$

$\mathbb{Q}_{3,2}^{(1,0;a)}(E,2)$

$$\begin{bmatrix}
0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}i}{36} & 0 & -\frac{\sqrt{15}i}{18} & 0 & \frac{\sqrt{6}i}{12} \\
0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{12} & 0 & \frac{\sqrt{15}i}{18} & 0 & \frac{\sqrt{30}i}{36} & 0 \\
0 & -\frac{\sqrt{15}i}{30} & 0 & \frac{\sqrt{5}i}{10} & -\frac{i}{48} & 0 & -\frac{\sqrt{10}i}{80} & 0 & \frac{\sqrt{5}i}{80} & 0 \\
\frac{\sqrt{15}i}{30} & 0 & \frac{\sqrt{5}i}{10} & 0 & 0 & \frac{7\sqrt{15}i}{720} & 0 & \frac{\sqrt{30}i}{720} & 0 & \frac{\sqrt{3}i}{48} \\
0 & -\frac{\sqrt{5}i}{10} & 0 & -\frac{\sqrt{15}i}{30} & \frac{\sqrt{3}i}{48} & 0 & \frac{\sqrt{30}i}{720} & 0 & \frac{7\sqrt{15}i}{720} & 0 \\
-\frac{\sqrt{5}i}{10} & 0 & \frac{\sqrt{15}i}{30} & 0 & 0 & \frac{\sqrt{5}i}{80} & 0 & -\frac{\sqrt{10}i}{80} & 0 & -\frac{i}{48}
\end{bmatrix}$$

188   symmetry z

$\mathbb{Q}_1^{(1,1;a)}(B_2)$

$$\begin{bmatrix}
0 & -\frac{\sqrt{2}}{4} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & -\frac{\sqrt{2}}{4} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
-\frac{3}{10} & 0 & 0 & 0 & 0 & \frac{1}{10} & 0 & 0 & 0 & 0 \\
0 & -\frac{1}{10} & 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{20} & 0 & 0 & 0 \\
0 & 0 & \frac{1}{10} & 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{20} & 0 & 0 \\
0 & 0 & 0 & \frac{3}{10} & 0 & 0 & 0 & 0 & \frac{1}{10} & 0
\end{bmatrix}$$

189   symmetry x

continued ...

Table 6

No.	multipole	matrix

$\mathbb{Q}_{1,1}^{(1,1;a)}(E)$

$$\begin{bmatrix} \frac{\sqrt{6}}{8} & 0 & -\frac{\sqrt{2}}{8} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{2}}{8} & 0 & -\frac{\sqrt{6}}{8} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{3}}{10} & 0 & 0 & -\frac{\sqrt{5}}{20} & 0 & \frac{\sqrt{2}}{40} & 0 & 0 & 0 \\ -\frac{\sqrt{3}}{10} & 0 & -\frac{1}{5} & 0 & 0 & -\frac{\sqrt{3}}{20} & 0 & \frac{\sqrt{6}}{40} & 0 & 0 \\ 0 & -\frac{1}{5} & 0 & -\frac{\sqrt{3}}{10} & 0 & 0 & -\frac{\sqrt{6}}{40} & 0 & \frac{\sqrt{3}}{20} & 0 \\ 0 & 0 & -\frac{\sqrt{3}}{10} & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}}{40} & 0 & \frac{\sqrt{5}}{20} \end{bmatrix}$$

190	symmetry	y

$\mathbb{Q}_{1,2}^{(1,1;a)}(E)$

$$\begin{bmatrix} \frac{\sqrt{6}i}{8} & 0 & \frac{\sqrt{2}i}{8} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{2}i}{8} & 0 & \frac{\sqrt{6}i}{8} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{3}i}{10} & 0 & 0 & -\frac{\sqrt{5}i}{20} & 0 & -\frac{\sqrt{2}i}{40} & 0 & 0 & 0 \\ -\frac{\sqrt{3}i}{10} & 0 & \frac{i}{5} & 0 & 0 & -\frac{\sqrt{3}i}{20} & 0 & -\frac{\sqrt{6}i}{40} & 0 & 0 \\ 0 & -\frac{i}{5} & 0 & \frac{\sqrt{3}i}{10} & 0 & 0 & -\frac{\sqrt{6}i}{40} & 0 & -\frac{\sqrt{3}i}{20} & 0 \\ 0 & 0 & -\frac{\sqrt{3}i}{10} & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}i}{40} & 0 & -\frac{\sqrt{5}i}{20} \end{bmatrix}$$

191	symmetry	$\frac{\sqrt{3}(x-y)(x+y)}{2}$

$\mathbb{G}_2^{(a)}(A_1)$

$$\begin{bmatrix} 0 & 0 & 0 & \frac{\sqrt{5}i}{10} & \frac{i}{6} & 0 & 0 & 0 & \frac{\sqrt{5}i}{30} & 0 \\ -\frac{\sqrt{5}i}{10} & 0 & 0 & 0 & 0 & \frac{\sqrt{5}i}{30} & 0 & 0 & 0 & \frac{i}{6} \\ 0 & 0 & -\frac{\sqrt{10}i}{20} & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{30} & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{10}i}{20} & -\frac{\sqrt{2}i}{6} & 0 & 0 & 0 & \frac{\sqrt{10}i}{15} & 0 \\ -\frac{\sqrt{10}i}{20} & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}i}{15} & 0 & 0 & 0 & \frac{\sqrt{2}i}{6} \\ 0 & -\frac{\sqrt{10}i}{20} & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{30} & 0 & 0 & 0 \end{bmatrix}$$

192	symmetry	$\sqrt{3}xy$

$\mathbb{G}_2^{(a)}(A_2)$

$$\begin{bmatrix} 0 & 0 & 0 & \frac{\sqrt{5}}{10} & -\frac{1}{6} & 0 & 0 & 0 & \frac{\sqrt{5}}{30} & 0 \\ \frac{\sqrt{5}}{10} & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}}{30} & 0 & 0 & 0 & \frac{1}{6} \\ 0 & 0 & -\frac{\sqrt{10}}{20} & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{30} & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{10}}{20} & \frac{\sqrt{2}}{6} & 0 & 0 & 0 & \frac{\sqrt{10}}{15} & 0 \\ \frac{\sqrt{10}}{20} & 0 & 0 & 0 & 0 & \frac{\sqrt{10}}{15} & 0 & 0 & 0 & \frac{\sqrt{2}}{6} \\ 0 & \frac{\sqrt{10}}{20} & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{30} & 0 & 0 & 0 \end{bmatrix}$$

193	symmetry	$-\frac{x^2}{2} - \frac{y^2}{2} + z^2$

continued ...

Table 6

No.	multipole	matrix
	$\mathbb{G}_2^{(a)}(B_1)$	$$\begin{bmatrix} 0 & \frac{\sqrt5 i}{10} & 0 & 0 & 0 & 0 & \frac{\sqrt{30}i}{30} & 0 & 0 & 0 \\ 0 & 0 & -\frac{\sqrt5 i}{10} & 0 & 0 & 0 & 0 & \frac{\sqrt{30}i}{30} & 0 & 0 \\ -\frac{\sqrt{10}i}{20} & 0 & 0 & 0 & 0 & \frac{\sqrt{10}i}{10} & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{10}i}{20} & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{30} & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{10}i}{20} & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{30} & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{10}i}{20} & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}i}{10} & 0 \end{bmatrix}$$
194	symmetry	$\sqrt3\,yz$
	$\mathbb{G}_{2,1}^{(a)}(E)$	$$\begin{bmatrix} \frac{\sqrt5}{20} & 0 & \frac{\sqrt{15}}{20} & 0 & 0 & \frac{\sqrt5}{15} & 0 & \frac{\sqrt{10}}{30} & 0 & 0 \\ 0 & -\frac{\sqrt{15}}{20} & 0 & -\frac{\sqrt5}{20} & 0 & 0 & \frac{\sqrt{10}}{30} & 0 & \frac{\sqrt5}{15} & 0 \\ 0 & -\frac{\sqrt{10}}{20} & 0 & 0 & \frac{\sqrt6}{12} & 0 & \frac{\sqrt{15}}{20} & 0 & 0 & 0 \\ \frac{\sqrt{10}}{20} & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}}{60} & 0 & \frac{\sqrt5}{12} & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{10}}{20} & 0 & 0 & -\frac{\sqrt5}{12} & 0 & \frac{\sqrt{10}}{60} & 0 \\ 0 & 0 & -\frac{\sqrt{10}}{20} & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{20} & 0 & -\frac{\sqrt6}{12} \end{bmatrix}$$
195	symmetry	$-\sqrt3\,xz$
	$\mathbb{G}_{2,2}^{(a)}(E)$	$$\begin{bmatrix} \frac{\sqrt5 i}{20} & 0 & -\frac{\sqrt{15}i}{20} & 0 & 0 & \frac{\sqrt5 i}{15} & 0 & -\frac{\sqrt{10}i}{30} & 0 & 0 \\ 0 & -\frac{\sqrt{15}i}{20} & 0 & \frac{\sqrt5 i}{20} & 0 & 0 & \frac{\sqrt{10}i}{30} & 0 & -\frac{\sqrt5 i}{15} & 0 \\ 0 & \frac{\sqrt{10}i}{20} & 0 & 0 & \frac{\sqrt6 i}{12} & 0 & -\frac{\sqrt{15}i}{20} & 0 & 0 & 0 \\ \frac{\sqrt{10}i}{20} & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}i}{60} & 0 & -\frac{\sqrt5 i}{12} & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{10}i}{20} & 0 & 0 & -\frac{\sqrt5 i}{12} & 0 & -\frac{\sqrt{10}i}{60} & 0 \\ 0 & 0 & -\frac{\sqrt{10}i}{20} & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{20} & 0 & \frac{\sqrt6 i}{12} \end{bmatrix}$$
196	symmetry	$\frac{\sqrt3(x-y)(x+y)}{2}$
	$\mathbb{G}_2^{(1,-1;a)}(A_1)$	$$\begin{bmatrix} 0 & 0 & 0 & -\frac{\sqrt2 i}{20} & -\frac{\sqrt{10}i}{10} & 0 & 0 & 0 & -\frac{\sqrt2 i}{10} & 0 \\ \frac{\sqrt2 i}{20} & 0 & 0 & 0 & 0 & -\frac{\sqrt2 i}{10} & 0 & 0 & 0 & -\frac{\sqrt{10}i}{10} \\ 0 & 0 & \frac{i}{10} & 0 & 0 & 0 & 0 & \frac{\sqrt6 i}{20} & 0 & 0 \\ 0 & 0 & 0 & \frac{i}{10} & -\frac{\sqrt5 i}{10} & 0 & 0 & 0 & \frac{i}{5} & 0 \\ \frac{i}{10} & 0 & 0 & 0 & 0 & -\frac{i}{5} & 0 & 0 & 0 & \frac{\sqrt5 i}{10} \\ 0 & \frac{i}{10} & 0 & 0 & 0 & 0 & -\frac{\sqrt6 i}{20} & 0 & 0 & 0 \end{bmatrix}$$
197	symmetry	$\sqrt3\,xy$

continued ...

Table 6

No.	multipole	matrix

$$\mathbb{G}_2^{(1,-1;a)}(A_2)$$

$$\begin{pmatrix}
0 & 0 & 0 & -\frac{\sqrt{2}}{20} & \frac{\sqrt{10}}{10} & 0 & 0 & 0 & -\frac{\sqrt{2}}{10} & 0 \\
-\frac{\sqrt{2}}{20} & 0 & 0 & 0 & 0 & \frac{\sqrt{2}}{10} & 0 & 0 & 0 & -\frac{\sqrt{10}}{10} \\
0 & 0 & \frac{1}{10} & 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{20} & 0 & 0 \\
0 & 0 & 0 & \frac{1}{10} & \frac{\sqrt{5}}{10} & 0 & 0 & 0 & \frac{1}{5} & 0 \\
-\frac{1}{10} & 0 & 0 & 0 & 0 & \frac{1}{5} & 0 & 0 & 0 & \frac{\sqrt{5}}{10} \\
0 & -\frac{1}{10} & 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{20} & 0 & 0 & 0
\end{pmatrix}$$

198	symmetry	$-\frac{x^2}{2} - \frac{y^2}{2} + z^2$

$$\mathbb{G}_2^{(1,-1;a)}(B_1)$$

$$\begin{pmatrix}
0 & -\frac{\sqrt{2}i}{20} & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{5} & 0 & 0 & 0 \\
0 & 0 & \frac{\sqrt{2}i}{20} & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{5} & 0 & 0 \\
\frac{i}{10} & 0 & 0 & 0 & 0 & \frac{3i}{10} & 0 & 0 & 0 & 0 \\
0 & -\frac{i}{10} & 0 & 0 & 0 & 0 & \frac{\sqrt{6}i}{20} & 0 & 0 & 0 \\
0 & 0 & -\frac{i}{10} & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{20} & 0 & 0 \\
0 & 0 & 0 & \frac{i}{10} & 0 & 0 & 0 & 0 & -\frac{3i}{10} & 0
\end{pmatrix}$$

199	symmetry	$\sqrt{3}yz$

$$\mathbb{G}_{2,1}^{(1,-1;a)}(E)$$

$$\begin{pmatrix}
-\frac{\sqrt{2}}{40} & 0 & -\frac{\sqrt{6}}{40} & 0 & 0 & -\frac{\sqrt{2}}{5} & 0 & -\frac{1}{5} & 0 & 0 \\
0 & \frac{\sqrt{6}}{40} & 0 & \frac{\sqrt{2}}{40} & 0 & 0 & -\frac{1}{5} & 0 & -\frac{\sqrt{2}}{5} & 0 \\
0 & \frac{1}{10} & 0 & 0 & \frac{\sqrt{15}}{20} & 0 & \frac{3\sqrt{6}}{40} & 0 & 0 & 0 \\
-\frac{1}{10} & 0 & 0 & 0 & 0 & -\frac{1}{20} & 0 & \frac{\sqrt{2}}{8} & 0 & 0 \\
0 & 0 & 0 & -\frac{1}{10} & 0 & 0 & -\frac{\sqrt{2}}{8} & 0 & \frac{1}{20} & 0 \\
0 & 0 & \frac{1}{10} & 0 & 0 & 0 & 0 & -\frac{3\sqrt{6}}{40} & 0 & -\frac{\sqrt{15}}{20}
\end{pmatrix}$$

200	symmetry	$-\sqrt{3}xz$

$$\mathbb{G}_{2,2}^{(1,-1;a)}(E)$$

$$\begin{pmatrix}
-\frac{\sqrt{2}i}{40} & 0 & \frac{\sqrt{6}i}{40} & 0 & 0 & -\frac{\sqrt{2}i}{5} & 0 & \frac{i}{5} & 0 & 0 \\
0 & \frac{\sqrt{6}i}{40} & 0 & -\frac{\sqrt{2}i}{40} & 0 & 0 & -\frac{i}{5} & 0 & \frac{\sqrt{2}i}{5} & 0 \\
0 & -\frac{i}{10} & 0 & 0 & \frac{\sqrt{15}i}{20} & 0 & -\frac{3\sqrt{6}i}{40} & 0 & 0 & 0 \\
-\frac{i}{10} & 0 & 0 & 0 & 0 & -\frac{i}{20} & 0 & -\frac{\sqrt{2}i}{8} & 0 & 0 \\
0 & 0 & 0 & \frac{i}{10} & 0 & 0 & -\frac{\sqrt{2}i}{8} & 0 & -\frac{i}{20} & 0 \\
0 & 0 & \frac{i}{10} & 0 & 0 & 0 & 0 & -\frac{3\sqrt{6}i}{40} & 0 & \frac{\sqrt{15}i}{20}
\end{pmatrix}$$

201	symmetry	$\frac{\sqrt{5}(x-y)(x+y)\left(x^2+y^2-6z^2\right)}{4}$

Table 6

No.	multipole	matrix
	$\mathbb{G}_4^{(1,-1;a)}(A_1)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{70}i}{28} & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{21}i}{28} & 0 & 0 & 0 & -\frac{\sqrt{105}i}{28} & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{105}i}{28} & 0 & 0 & 0 & \frac{\sqrt{21}i}{28} \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}i}{28} & 0 & 0 & 0 \end{bmatrix}$
202	symmetry	$-\frac{\sqrt{5}xy\left(x^2+y^2-6z^2\right)}{2}$
	$\mathbb{G}_4^{(1,-1;a)}(A_2)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}}{28} & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{21}}{28} & 0 & 0 & 0 & \frac{\sqrt{105}}{28} & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{105}}{28} & 0 & 0 & 0 & -\frac{\sqrt{21}}{28} \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}}{28} & 0 & 0 & 0 \end{bmatrix}$
203	symmetry	$\frac{\sqrt{21}\left(x^4-3x^2y^2-3x^2z^2+y^4-3y^2z^2+z^4\right)}{6}$
	$\mathbb{G}_4^{(1,-1;a)}(B_1,1)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{12} & 0 & 0 & 0 & -\frac{\sqrt{15}i}{12} \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2}i}{4} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}i}{4} & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{12} & 0 & 0 & 0 & \frac{\sqrt{3}i}{12} & 0 \end{bmatrix}$
204	symmetry	$-\frac{\sqrt{15}\left(x^4-12x^2y^2+6x^2z^2+y^4+6y^2z^2-2z^4\right)}{12}$
	$\mathbb{G}_4^{(1,-1;a)}(B_1,2)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{105}i}{84} & 0 & 0 & 0 & \frac{\sqrt{21}i}{12} \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{70}i}{28} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}i}{28} & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{21}i}{12} & 0 & 0 & 0 & \frac{\sqrt{105}i}{84} & 0 \end{bmatrix}$
205	symmetry	$\frac{\sqrt{35}xy(x-y)(x+y)}{2}$

continued ...

Table 6

No.	multipole	matrix

$\mathbb{G}_4^{(1,-1;a)}(B_2)$

$$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{1}{2} \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{1}{2} & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$$

206   symmetry $\dfrac{\sqrt{35}yz(y-z)(y+z)}{2}$

$\mathbb{G}_{4,1}^{(1,-1;a)}(E,1)$

$$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{1}{16} & 0 & \frac{\sqrt{10}}{16} & 0 & \frac{\sqrt{5}}{16} & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{16} & 0 & -\frac{\sqrt{30}}{16} & 0 & -\frac{\sqrt{3}}{16} \\ 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{16} & 0 & \frac{\sqrt{30}}{16} & 0 & \frac{\sqrt{15}}{16} & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}}{16} & 0 & -\frac{\sqrt{10}}{16} & 0 & -\frac{1}{16} \end{bmatrix}$$

207   symmetry $-\dfrac{\sqrt{35}xz(x-z)(x+z)}{2}$

$\mathbb{G}_{4,2}^{(1,-1;a)}(E,1)$

$$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{i}{16} & 0 & -\frac{\sqrt{10}i}{16} & 0 & \frac{\sqrt{5}i}{16} & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{16} & 0 & \frac{\sqrt{30}i}{16} & 0 & -\frac{\sqrt{3}i}{16} \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{16} & 0 & \frac{\sqrt{30}i}{16} & 0 & -\frac{\sqrt{15}i}{16} & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{5}i}{16} & 0 & -\frac{\sqrt{10}i}{16} & 0 & \frac{i}{16} \end{bmatrix}$$

208   symmetry $\dfrac{\sqrt{5}yz\left(6x^2-y^2-z^2\right)}{2}$

$\mathbb{G}_{4,1}^{(1,-1;a)}(E,2)$

$$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{7}}{112} & 0 & \frac{\sqrt{70}}{112} & 0 & -\frac{\sqrt{35}}{16} & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{105}}{112} & 0 & -\frac{\sqrt{210}}{112} & 0 & \frac{\sqrt{21}}{16} \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{21}}{16} & 0 & \frac{\sqrt{210}}{112} & 0 & \frac{\sqrt{105}}{112} & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{35}}{16} & 0 & -\frac{\sqrt{70}}{112} & 0 & -\frac{\sqrt{7}}{112} \end{bmatrix}$$

209   symmetry $\dfrac{\sqrt{5}xz\left(x^2-6y^2+z^2\right)}{2}$

continued …

Table 6

No.	multipole	matrix

$\mathbb{G}_{4,2}^{(1,-1;a)}(E,2)$

0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	$\frac{\sqrt{7}i}{112}$	0	$-\frac{\sqrt{70}i}{112}$	0	$-\frac{\sqrt{35}i}{16}$	0
0	0	0	0	0	$-\frac{\sqrt{105}i}{112}$	0	$\frac{\sqrt{210}i}{112}$	0	$\frac{\sqrt{21}i}{16}$
0	0	0	0	$\frac{\sqrt{21}i}{16}$	0	$\frac{\sqrt{210}i}{112}$	0	$-\frac{\sqrt{105}i}{112}$	0
0	0	0	0	0	$-\frac{\sqrt{35}i}{16}$	0	$-\frac{\sqrt{70}i}{112}$	0	$\frac{\sqrt{7}i}{112}$

210   symmetry $\frac{\sqrt{3}(x-y)(x+y)}{2}$

$\mathbb{G}_2^{(1,0;a)}(A_1)$

0	0	0	$\frac{\sqrt{30}i}{60}$	$-\frac{\sqrt{6}i}{9}$	0	0	0	$-\frac{\sqrt{30}i}{45}$	0
$-\frac{\sqrt{30}i}{60}$	0	0	0	0	$-\frac{\sqrt{30}i}{45}$	0	0	0	$-\frac{\sqrt{6}i}{9}$
0	0	$-\frac{\sqrt{15}i}{15}$	0	0	0	0	$-\frac{\sqrt{10}i}{60}$	0	0
0	0	0	$-\frac{\sqrt{15}i}{15}$	$\frac{\sqrt{3}i}{18}$	0	0	0	$-\frac{\sqrt{15}i}{45}$	0
$-\frac{\sqrt{15}i}{15}$	0	0	0	0	$\frac{\sqrt{15}i}{45}$	0	0	0	$-\frac{\sqrt{3}i}{18}$
0	$-\frac{\sqrt{15}i}{15}$	0	0	0	0	$\frac{\sqrt{10}i}{60}$	0	0	0

211   symmetry $\sqrt{3}xy$

$\mathbb{G}_2^{(1,0;a)}(A_2)$

0	0	0	$\frac{\sqrt{30}}{60}$	$\frac{\sqrt{6}}{9}$	0	0	0	$-\frac{\sqrt{30}}{45}$	0
$\frac{\sqrt{30}}{60}$	0	0	0	0	$\frac{\sqrt{30}}{45}$	0	0	0	$-\frac{\sqrt{6}}{9}$
0	0	$-\frac{\sqrt{15}}{15}$	0	0	0	0	$-\frac{\sqrt{10}}{60}$	0	0
0	0	0	$-\frac{\sqrt{15}}{15}$	$-\frac{\sqrt{3}}{18}$	0	0	0	$-\frac{\sqrt{15}}{45}$	0
$\frac{\sqrt{15}}{15}$	0	0	0	0	$-\frac{\sqrt{15}}{45}$	0	0	0	$-\frac{\sqrt{3}}{18}$
0	$\frac{\sqrt{15}}{15}$	0	0	0	0	$-\frac{\sqrt{10}}{60}$	0	0	0

212   symmetry $-\frac{x^2}{2} - \frac{y^2}{2} + z^2$

$\mathbb{G}_2^{(1,0;a)}(B_1)$

0	$\frac{\sqrt{30}i}{60}$	0	0	0	0	$-\frac{2\sqrt{5}i}{15}$	0	0	0
0	0	$-\frac{\sqrt{30}i}{60}$	0	0	0	0	$-\frac{2\sqrt{5}i}{15}$	0	0
$-\frac{\sqrt{15}i}{15}$	0	0	0	0	$-\frac{\sqrt{15}i}{30}$	0	0	0	0
0	$\frac{\sqrt{15}i}{15}$	0	0	0	0	$-\frac{\sqrt{10}i}{60}$	0	0	0
0	0	$\frac{\sqrt{15}i}{15}$	0	0	0	0	$\frac{\sqrt{10}i}{60}$	0	0
0	0	0	$-\frac{\sqrt{15}i}{15}$	0	0	0	0	$\frac{\sqrt{15}i}{30}$	0

213   symmetry $\sqrt{3}yz$

Table 6

No.	multipole	matrix
	$\mathbb{G}_{2,1}^{(1,0;a)}(E)$	$\begin{bmatrix} \frac{\sqrt{30}}{120} & 0 & \frac{\sqrt{10}}{40} & 0 & 0 & -\frac{2\sqrt{30}}{45} & 0 & -\frac{2\sqrt{15}}{45} & 0 & 0 \\ 0 & -\frac{\sqrt{10}}{40} & 0 & -\frac{\sqrt{30}}{120} & 0 & 0 & -\frac{2\sqrt{15}}{45} & 0 & -\frac{2\sqrt{30}}{45} & 0 \\ 0 & -\frac{\sqrt{15}}{15} & 0 & 0 & -\frac{1}{12} & 0 & -\frac{\sqrt{10}}{40} & 0 & 0 & 0 \\ \frac{\sqrt{15}}{15} & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{180} & 0 & -\frac{\sqrt{30}}{72} & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{15}}{15} & 0 & 0 & \frac{\sqrt{30}}{72} & 0 & -\frac{\sqrt{15}}{180} & 0 \\ 0 & 0 & -\frac{\sqrt{15}}{15} & 0 & 0 & 0 & 0 & \frac{\sqrt{10}}{40} & 0 & \frac{1}{12} \end{bmatrix}$
214	symmetry	$-\sqrt{3}xz$
	$\mathbb{G}_{2,2}^{(1,0;a)}(E)$	$\begin{bmatrix} \frac{\sqrt{30}i}{120} & 0 & -\frac{\sqrt{10}i}{40} & 0 & 0 & -\frac{2\sqrt{30}i}{45} & 0 & \frac{2\sqrt{15}i}{45} & 0 & 0 \\ 0 & -\frac{\sqrt{10}i}{40} & 0 & \frac{\sqrt{30}i}{120} & 0 & 0 & -\frac{2\sqrt{15}i}{45} & 0 & \frac{2\sqrt{30}i}{45} & 0 \\ 0 & \frac{\sqrt{15}i}{15} & 0 & 0 & -\frac{i}{12} & 0 & \frac{\sqrt{10}i}{40} & 0 & 0 & 0 \\ \frac{\sqrt{15}i}{15} & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{180} & 0 & \frac{\sqrt{30}i}{72} & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{15}i}{15} & 0 & 0 & \frac{\sqrt{30}i}{72} & 0 & \frac{\sqrt{15}i}{180} & 0 \\ 0 & 0 & -\frac{\sqrt{15}i}{15} & 0 & 0 & 0 & 0 & \frac{\sqrt{10}i}{40} & 0 & -\frac{i}{12} \end{bmatrix}$
215	symmetry	1
	$\mathbb{G}_{0}^{(1,1;a)}(B_1)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ -\frac{\sqrt{2}i}{4} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{2}i}{4} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{2}i}{4} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{2}i}{4} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
216	symmetry	$\frac{\sqrt{3}(x-y)(x+y)}{2}$
	$\mathbb{G}_{2}^{(1,1;a)}(A_1)$	$\begin{bmatrix} 0 & 0 & 0 & \frac{\sqrt{42}i}{15} & -\frac{\sqrt{210}i}{180} & 0 & 0 & 0 & -\frac{\sqrt{42}i}{180} & 0 \\ -\frac{\sqrt{42}i}{15} & 0 & 0 & 0 & 0 & -\frac{\sqrt{42}i}{180} & 0 & 0 & 0 & -\frac{\sqrt{210}i}{180} \\ 0 & 0 & \frac{\sqrt{21}i}{30} & 0 & 0 & 0 & 0 & -\frac{\sqrt{14}i}{105} & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{21}i}{30} & \frac{2\sqrt{105}i}{315} & 0 & 0 & 0 & -\frac{4\sqrt{21}i}{315} & 0 \\ \frac{\sqrt{21}i}{30} & 0 & 0 & 0 & 0 & \frac{4\sqrt{21}i}{315} & 0 & 0 & 0 & -\frac{2\sqrt{105}i}{315} \\ 0 & \frac{\sqrt{21}i}{30} & 0 & 0 & 0 & 0 & \frac{\sqrt{14}i}{105} & 0 & 0 & 0 \end{bmatrix}$
217	symmetry	$\sqrt{3}xy$

Table 6

No.	multipole	matrix

$\mathbb{G}_2^{(1,1;a)}(A_2)$

$$\begin{bmatrix}
0 & 0 & 0 & \frac{\sqrt{42}}{15} & \frac{\sqrt{210}}{180} & 0 & 0 & 0 & -\frac{\sqrt{42}}{180} & 0 \\
\frac{\sqrt{42}}{15} & 0 & 0 & 0 & 0 & \frac{\sqrt{42}}{180} & 0 & 0 & 0 & -\frac{\sqrt{210}}{180} \\
0 & 0 & \frac{\sqrt{21}}{30} & 0 & 0 & 0 & 0 & -\frac{\sqrt{14}}{105} & 0 & 0 \\
0 & 0 & 0 & \frac{\sqrt{21}}{30} & -\frac{2\sqrt{105}}{315} & 0 & 0 & 0 & -\frac{4\sqrt{21}}{315} & 0 \\
-\frac{\sqrt{21}}{30} & 0 & 0 & 0 & 0 & -\frac{4\sqrt{21}}{315} & 0 & 0 & 0 & -\frac{2\sqrt{105}}{315} \\
0 & -\frac{\sqrt{21}}{30} & 0 & 0 & 0 & 0 & -\frac{\sqrt{14}}{105} & 0 & 0 & 0
\end{bmatrix}$$

218	symmetry	$-\frac{x^2}{2} - \frac{y^2}{2} + z^2$

$\mathbb{G}_2^{(1,1;a)}(B_1)$

$$\begin{bmatrix}
0 & \frac{\sqrt{42}i}{15} & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}i}{30} & 0 & 0 & 0 \\
0 & 0 & -\frac{\sqrt{42}i}{15} & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}i}{30} & 0 & 0 \\
\frac{\sqrt{21}i}{30} & 0 & 0 & 0 & 0 & -\frac{2\sqrt{21}i}{105} & 0 & 0 & 0 & 0 \\
0 & -\frac{\sqrt{21}i}{30} & 0 & 0 & 0 & 0 & -\frac{\sqrt{14}i}{105} & 0 & 0 & 0 \\
0 & 0 & -\frac{\sqrt{21}i}{30} & 0 & 0 & 0 & 0 & \frac{\sqrt{14}i}{105} & 0 & 0 \\
0 & 0 & 0 & \frac{\sqrt{21}i}{30} & 0 & 0 & 0 & 0 & \frac{2\sqrt{21}i}{105} & 0
\end{bmatrix}$$

219	symmetry	$\sqrt{3}yz$

$\mathbb{G}_{2,1}^{(1,1;a)}(E)$

$$\begin{bmatrix}
\frac{\sqrt{42}}{30} & 0 & \frac{\sqrt{14}}{10} & 0 & 0 & -\frac{\sqrt{42}}{90} & 0 & -\frac{\sqrt{21}}{90} & 0 & 0 \\
0 & -\frac{\sqrt{14}}{10} & 0 & -\frac{\sqrt{42}}{30} & 0 & 0 & -\frac{\sqrt{21}}{90} & 0 & -\frac{\sqrt{42}}{90} & 0 \\
0 & \frac{\sqrt{21}}{30} & 0 & 0 & -\frac{\sqrt{35}}{105} & 0 & -\frac{\sqrt{14}}{70} & 0 & 0 & 0 \\
-\frac{\sqrt{21}}{30} & 0 & 0 & 0 & 0 & \frac{\sqrt{21}}{315} & 0 & -\frac{\sqrt{42}}{126} & 0 & 0 \\
0 & 0 & 0 & -\frac{\sqrt{21}}{30} & 0 & 0 & \frac{\sqrt{42}}{126} & 0 & -\frac{\sqrt{21}}{315} & 0 \\
0 & 0 & \frac{\sqrt{21}}{30} & 0 & 0 & 0 & 0 & \frac{\sqrt{14}}{70} & 0 & \frac{\sqrt{35}}{105}
\end{bmatrix}$$

220	symmetry	$-\sqrt{3}xz$

$\mathbb{G}_{2,2}^{(1,1;a)}(E)$

$$\begin{bmatrix}
\frac{\sqrt{42}i}{30} & 0 & -\frac{\sqrt{14}i}{10} & 0 & 0 & -\frac{\sqrt{42}i}{90} & 0 & \frac{\sqrt{21}i}{90} & 0 & 0 \\
0 & -\frac{\sqrt{14}i}{10} & 0 & \frac{\sqrt{42}i}{30} & 0 & 0 & -\frac{\sqrt{21}i}{90} & 0 & \frac{\sqrt{42}i}{90} & 0 \\
0 & -\frac{\sqrt{21}i}{30} & 0 & 0 & -\frac{\sqrt{35}i}{105} & 0 & \frac{\sqrt{14}i}{70} & 0 & 0 & 0 \\
-\frac{\sqrt{21}i}{30} & 0 & 0 & 0 & 0 & \frac{\sqrt{21}i}{315} & 0 & \frac{\sqrt{42}i}{126} & 0 & 0 \\
0 & 0 & 0 & \frac{\sqrt{21}i}{30} & 0 & 0 & \frac{\sqrt{42}i}{126} & 0 & \frac{\sqrt{21}i}{315} & 0 \\
0 & 0 & \frac{\sqrt{21}i}{30} & 0 & 0 & 0 & 0 & \frac{\sqrt{14}i}{70} & 0 & -\frac{\sqrt{35}i}{105}
\end{bmatrix}$$

221	symmetry	z

continued ...

Table 6

No.	multipole	matrix

$\mathbb{T}_1^{(a)}(B_2)$

$$\begin{bmatrix}
0 & \frac{\sqrt{3}i}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & \frac{\sqrt{3}i}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
-\frac{\sqrt{6}i}{20} & 0 & 0 & 0 & 0 & \frac{\sqrt{6}i}{10} & 0 & 0 & 0 & 0 \\
0 & -\frac{\sqrt{6}i}{60} & 0 & 0 & 0 & 0 & \frac{3i}{10} & 0 & 0 & 0 \\
0 & 0 & \frac{\sqrt{6}i}{60} & 0 & 0 & 0 & 0 & \frac{3i}{10} & 0 & 0 \\
0 & 0 & 0 & \frac{\sqrt{6}i}{20} & 0 & 0 & 0 & 0 & \frac{\sqrt{6}i}{10} & 0
\end{bmatrix}$$

222	symmetry	x

$\mathbb{T}_{1,1}^{(a)}(E)$

$$\begin{bmatrix}
-\frac{i}{4} & 0 & \frac{\sqrt{3}i}{12} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & -\frac{\sqrt{3}i}{12} & 0 & \frac{i}{4} & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & -\frac{\sqrt{2}i}{20} & 0 & 0 & -\frac{\sqrt{30}i}{20} & 0 & \frac{\sqrt{3}i}{20} & 0 & 0 & 0 \\
-\frac{\sqrt{2}i}{20} & 0 & -\frac{\sqrt{6}i}{30} & 0 & 0 & -\frac{3\sqrt{2}i}{20} & 0 & \frac{3i}{20} & 0 & 0 \\
0 & -\frac{\sqrt{6}i}{30} & 0 & -\frac{\sqrt{2}i}{20} & 0 & 0 & -\frac{3i}{20} & 0 & \frac{3\sqrt{2}i}{20} & 0 \\
0 & 0 & -\frac{\sqrt{2}i}{20} & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{20} & 0 & \frac{\sqrt{30}i}{20}
\end{bmatrix}$$

223	symmetry	y

$\mathbb{T}_{1,2}^{(a)}(E)$

$$\begin{bmatrix}
\frac{1}{4} & 0 & \frac{\sqrt{3}}{12} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & \frac{\sqrt{3}}{12} & 0 & \frac{1}{4} & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & -\frac{\sqrt{2}}{20} & 0 & 0 & \frac{\sqrt{30}}{20} & 0 & \frac{\sqrt{3}}{20} & 0 & 0 & 0 \\
\frac{\sqrt{2}}{20} & 0 & -\frac{\sqrt{6}}{30} & 0 & 0 & \frac{3\sqrt{2}}{20} & 0 & \frac{3}{20} & 0 & 0 \\
0 & \frac{\sqrt{6}}{30} & 0 & -\frac{\sqrt{2}}{20} & 0 & 0 & \frac{3}{20} & 0 & \frac{3\sqrt{2}}{20} & 0 \\
0 & 0 & \frac{\sqrt{2}}{20} & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{20} & 0 & \frac{\sqrt{30}}{20}
\end{bmatrix}$$

224	symmetry	$\sqrt{15}xyz$

$\mathbb{T}_3^{(a)}(A_1)$

$$\begin{bmatrix}
0 & 0 & 0 & 0 & \frac{\sqrt{2}}{12} & 0 & 0 & 0 & -\frac{\sqrt{10}}{12} & 0 \\
0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}}{12} & 0 & 0 & 0 & \frac{\sqrt{2}}{12} \\
0 & 0 & \frac{\sqrt{5}}{10} & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}}{30} & 0 & 0 \\
0 & 0 & 0 & -\frac{\sqrt{5}}{10} & -\frac{1}{6} & 0 & 0 & 0 & -\frac{\sqrt{5}}{30} & 0 \\
-\frac{\sqrt{5}}{10} & 0 & 0 & 0 & 0 & \frac{\sqrt{5}}{30} & 0 & 0 & 0 & \frac{1}{6} \\
0 & \frac{\sqrt{5}}{10} & 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{30} & 0 & 0 & 0
\end{bmatrix}$$

225	symmetry	$\frac{\sqrt{15}z(x-y)(x+y)}{2}$

continued ...

Table 6

No.	multipole	matrix
	$\mathbb{T}_3^{(a)}(A_2)$	$$\begin{bmatrix} 0 & 0 & 0 & 0 & -\frac{\sqrt{2}i}{12} & 0 & 0 & 0 & -\frac{\sqrt{10}i}{12} & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}i}{12} & 0 & 0 & 0 & \frac{\sqrt{2}i}{12} \\ 0 & 0 & \frac{\sqrt{5}i}{10} & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}i}{30} & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{5}i}{10} & \frac{i}{6} & 0 & 0 & 0 & -\frac{\sqrt{5}i}{30} & 0 \\ \frac{\sqrt{5}i}{10} & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{30} & 0 & 0 & 0 & \frac{i}{6} \\ 0 & -\frac{\sqrt{5}i}{10} & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}i}{30} & 0 & 0 & 0 \end{bmatrix}$$
226	symmetry	$-\frac{z\left(3x^2+3y^2-2z^2\right)}{2}$
	$\mathbb{T}_3^{(a)}(B_2)$	$$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{6} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{6} & 0 & 0 \\ \frac{i}{10} & 0 & 0 & 0 & 0 & -\frac{i}{5} & 0 & 0 & 0 & 0 \\ 0 & -\frac{3i}{10} & 0 & 0 & 0 & 0 & \frac{\sqrt{6}i}{15} & 0 & 0 & 0 \\ 0 & 0 & \frac{3i}{10} & 0 & 0 & 0 & 0 & \frac{\sqrt{6}i}{15} & 0 & 0 \\ 0 & 0 & 0 & -\frac{i}{10} & 0 & 0 & 0 & 0 & -\frac{i}{5} & 0 \end{bmatrix}$$
227	symmetry	$\frac{x\left(2x^2-3y^2-3z^2\right)}{2}$
	$\mathbb{T}_{3,1}^{(a)}(E,1)$	$$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{24} & 0 & \frac{\sqrt{3}i}{12} & 0 & -\frac{\sqrt{30}i}{24} \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{30}i}{24} & 0 & \frac{\sqrt{3}i}{12} & 0 & -\frac{\sqrt{6}i}{24} & 0 \\ 0 & -\frac{\sqrt{3}i}{20} & 0 & \frac{i}{4} & -\frac{\sqrt{5}i}{40} & 0 & \frac{3\sqrt{2}i}{40} & 0 & -\frac{i}{8} & 0 \\ -\frac{\sqrt{3}i}{20} & 0 & \frac{3i}{20} & 0 & 0 & \frac{7\sqrt{3}i}{120} & 0 & -\frac{\sqrt{6}i}{120} & 0 & -\frac{\sqrt{15}i}{24} \\ 0 & \frac{3i}{20} & 0 & -\frac{\sqrt{3}i}{20} & \frac{\sqrt{15}i}{24} & 0 & \frac{\sqrt{6}i}{120} & 0 & -\frac{7\sqrt{3}i}{120} & 0 \\ \frac{i}{4} & 0 & -\frac{\sqrt{3}i}{20} & 0 & 0 & \frac{i}{8} & 0 & -\frac{3\sqrt{2}i}{40} & 0 & \frac{\sqrt{5}i}{40} \end{bmatrix}$$
228	symmetry	$-\frac{y\left(3x^2-2y^2+3z^2\right)}{2}$
	$\mathbb{T}_{3,2}^{(a)}(E,1)$	$$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{24} & 0 & \frac{\sqrt{3}}{12} & 0 & \frac{\sqrt{30}}{24} \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{30}}{24} & 0 & -\frac{\sqrt{3}}{12} & 0 & -\frac{\sqrt{6}}{24} & 0 \\ 0 & -\frac{\sqrt{3}}{20} & 0 & -\frac{1}{4} & \frac{\sqrt{5}}{40} & 0 & \frac{3\sqrt{2}}{40} & 0 & \frac{1}{8} & 0 \\ \frac{\sqrt{3}}{20} & 0 & \frac{3}{20} & 0 & 0 & -\frac{7\sqrt{3}}{120} & 0 & -\frac{\sqrt{6}}{120} & 0 & \frac{\sqrt{15}}{24} \\ 0 & -\frac{3}{20} & 0 & -\frac{\sqrt{3}}{20} & \frac{\sqrt{15}}{24} & 0 & -\frac{\sqrt{6}}{120} & 0 & -\frac{7\sqrt{3}}{120} & 0 \\ \frac{1}{4} & 0 & \frac{\sqrt{3}}{20} & 0 & 0 & \frac{1}{8} & 0 & \frac{3\sqrt{2}}{40} & 0 & \frac{\sqrt{5}}{40} \end{bmatrix}$$
229	symmetry	$\frac{\sqrt{15}x(y-z)(y+z)}{2}$

Table 6

No.	multipole	matrix
	$\mathbb{T}_{3,1}^{(a)}(E,2)$	$\begin{pmatrix} 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}i}{24} & 0 & \frac{\sqrt{5}i}{12} & 0 & \frac{\sqrt{2}i}{8} \\ 0 & 0 & 0 & 0 & \frac{\sqrt{2}i}{8} & 0 & \frac{\sqrt{5}i}{12} & 0 & -\frac{\sqrt{10}i}{24} & 0 \\ 0 & -\frac{\sqrt{5}i}{20} & 0 & -\frac{\sqrt{15}i}{20} & -\frac{\sqrt{3}i}{24} & 0 & \frac{\sqrt{30}i}{40} & 0 & \frac{\sqrt{15}i}{40} & 0 \\ -\frac{\sqrt{5}i}{20} & 0 & \frac{\sqrt{15}i}{20} & 0 & 0 & \frac{7\sqrt{5}i}{120} & 0 & -\frac{\sqrt{10}i}{120} & 0 & \frac{i}{8} \\ 0 & \frac{\sqrt{15}i}{20} & 0 & -\frac{\sqrt{5}i}{20} & -\frac{i}{8} & 0 & \frac{\sqrt{10}i}{120} & 0 & -\frac{7\sqrt{5}i}{120} & 0 \\ -\frac{\sqrt{15}i}{20} & 0 & -\frac{\sqrt{5}i}{20} & 0 & 0 & -\frac{\sqrt{15}i}{40} & 0 & -\frac{\sqrt{30}i}{40} & 0 & \frac{\sqrt{3}i}{24} \end{pmatrix}$
230	symmetry	$\frac{\sqrt{15}\,y(x-z)(x+z)}{2}$
	$\mathbb{T}_{3,2}^{(a)}(E,2)$	$\begin{pmatrix} 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}}{24} & 0 & \frac{\sqrt{5}}{12} & 0 & -\frac{\sqrt{2}}{8} \\ 0 & 0 & 0 & 0 & \frac{\sqrt{2}}{8} & 0 & -\frac{\sqrt{5}}{12} & 0 & -\frac{\sqrt{10}}{24} & 0 \\ 0 & -\frac{\sqrt{5}}{20} & 0 & \frac{\sqrt{15}}{20} & \frac{\sqrt{3}}{24} & 0 & \frac{\sqrt{30}}{40} & 0 & -\frac{\sqrt{15}}{40} & 0 \\ \frac{\sqrt{5}}{20} & 0 & \frac{\sqrt{15}}{20} & 0 & 0 & -\frac{7\sqrt{5}}{120} & 0 & -\frac{\sqrt{10}}{120} & 0 & -\frac{1}{8} \\ 0 & -\frac{\sqrt{15}}{20} & 0 & -\frac{\sqrt{5}}{20} & -\frac{1}{8} & 0 & -\frac{\sqrt{10}}{120} & 0 & -\frac{7\sqrt{5}}{120} & 0 \\ -\frac{\sqrt{15}}{20} & 0 & \frac{\sqrt{5}}{20} & 0 & 0 & -\frac{\sqrt{15}}{40} & 0 & \frac{\sqrt{30}}{40} & 0 & \frac{\sqrt{3}}{24} \end{pmatrix}$
231	symmetry	$\sqrt{15}\,xyz$
	$\mathbb{T}_3^{(1,-1;a)}(A_1)$	$\begin{pmatrix} 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{18} & 0 & 0 & 0 & -\frac{\sqrt{15}}{18} & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{18} & 0 & 0 & 0 & \frac{\sqrt{3}}{18} \\ 0 & 0 & \frac{\sqrt{30}}{60} & 0 & 0 & 0 & 0 & \frac{2\sqrt{5}}{15} & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{30}}{60} & \frac{\sqrt{6}}{9} & 0 & 0 & 0 & \frac{\sqrt{30}}{45} & 0 \\ -\frac{\sqrt{30}}{60} & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}}{45} & 0 & 0 & 0 & -\frac{\sqrt{6}}{9} \\ 0 & \frac{\sqrt{30}}{60} & 0 & 0 & 0 & 0 & -\frac{2\sqrt{5}}{15} & 0 & 0 & 0 \end{pmatrix}$
232	symmetry	$\frac{\sqrt{15}\,z(x-y)(x+y)}{2}$
	$\mathbb{T}_3^{(1,-1;a)}(A_2)$	$\begin{pmatrix} 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{18} & 0 & 0 & 0 & -\frac{\sqrt{15}i}{18} & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{18} & 0 & 0 & 0 & \frac{\sqrt{3}i}{18} \\ 0 & 0 & \frac{\sqrt{30}i}{60} & 0 & 0 & 0 & 0 & \frac{2\sqrt{5}i}{15} & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{30}i}{60} & -\frac{\sqrt{6}i}{9} & 0 & 0 & 0 & \frac{\sqrt{30}i}{45} & 0 \\ \frac{\sqrt{30}i}{60} & 0 & 0 & 0 & 0 & \frac{\sqrt{30}i}{45} & 0 & 0 & 0 & -\frac{\sqrt{6}i}{9} \\ 0 & -\frac{\sqrt{30}i}{60} & 0 & 0 & 0 & 0 & \frac{2\sqrt{5}i}{15} & 0 & 0 & 0 \end{pmatrix}$
233	symmetry	$-\frac{z\left(3x^2+3y^2-2z^2\right)}{2}$

continued ...

No.	multipole	matrix

Table 6

$\mathbb{T}_3^{(1,-1;a)}(B_2)$

$$\begin{bmatrix}
0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}i}{6} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2}i}{6} & 0 & 0 \\
\frac{\sqrt{6}i}{60} & 0 & 0 & 0 & 0 & \frac{2\sqrt{6}i}{15} & 0 & 0 & 0 & 0 \\
0 & -\frac{\sqrt{6}i}{20} & 0 & 0 & 0 & 0 & -\frac{4i}{15} & 0 & 0 & 0 \\
0 & 0 & \frac{\sqrt{6}i}{20} & 0 & 0 & 0 & 0 & -\frac{4i}{15} & 0 & 0 \\
0 & 0 & 0 & -\frac{\sqrt{6}i}{60} & 0 & 0 & 0 & 0 & \frac{2\sqrt{6}i}{15} & 0
\end{bmatrix}$$

234 symmetry $\dfrac{x\left(2x^2-3y^2-3z^2\right)}{2}$

$\mathbb{T}_{3,1}^{(1,-1;a)}(E,1)$

$$\begin{bmatrix}
0 & 0 & 0 & 0 & 0 & -\frac{i}{12} & 0 & \frac{\sqrt{2}i}{12} & 0 & -\frac{\sqrt{5}i}{12} \\
0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{12} & 0 & \frac{\sqrt{2}i}{12} & 0 & -\frac{i}{12} & 0 \\
0 & -\frac{\sqrt{2}i}{40} & 0 & \frac{\sqrt{6}i}{24} & \frac{\sqrt{30}i}{60} & 0 & -\frac{\sqrt{3}i}{10} & 0 & \frac{\sqrt{6}i}{12} & 0 \\
-\frac{\sqrt{2}i}{40} & 0 & \frac{\sqrt{6}i}{40} & 0 & 0 & -\frac{7\sqrt{2}i}{60} & 0 & \frac{i}{30} & 0 & \frac{\sqrt{10}i}{12} \\
0 & \frac{\sqrt{6}i}{40} & 0 & -\frac{\sqrt{2}i}{40} & -\frac{\sqrt{10}i}{12} & 0 & -\frac{i}{30} & 0 & \frac{7\sqrt{2}i}{60} & 0 \\
\frac{\sqrt{6}i}{24} & 0 & -\frac{\sqrt{2}i}{40} & 0 & 0 & -\frac{\sqrt{6}i}{12} & 0 & \frac{\sqrt{3}i}{10} & 0 & -\frac{\sqrt{30}i}{60}
\end{bmatrix}$$

235 symmetry $-\dfrac{y\left(3x^2-2y^2+3z^2\right)}{2}$

$\mathbb{T}_{3,2}^{(1,-1;a)}(E,1)$

$$\begin{bmatrix}
0 & 0 & 0 & 0 & 0 & \frac{1}{12} & 0 & \frac{\sqrt{2}}{12} & 0 & \frac{\sqrt{5}}{12} \\
0 & 0 & 0 & 0 & -\frac{\sqrt{5}}{12} & 0 & -\frac{\sqrt{2}}{12} & 0 & -\frac{1}{12} & 0 \\
0 & -\frac{\sqrt{2}}{40} & 0 & -\frac{\sqrt{6}}{24} & -\frac{\sqrt{30}}{60} & 0 & -\frac{\sqrt{3}}{10} & 0 & -\frac{\sqrt{6}}{12} & 0 \\
\frac{\sqrt{2}}{40} & 0 & \frac{\sqrt{6}}{40} & 0 & 0 & \frac{7\sqrt{2}}{60} & 0 & \frac{1}{30} & 0 & -\frac{\sqrt{10}}{12} \\
0 & -\frac{\sqrt{6}}{40} & 0 & -\frac{\sqrt{2}}{40} & -\frac{\sqrt{10}}{12} & 0 & \frac{1}{30} & 0 & \frac{7\sqrt{2}}{60} & 0 \\
\frac{\sqrt{6}}{24} & 0 & \frac{\sqrt{2}}{40} & 0 & 0 & -\frac{\sqrt{6}}{12} & 0 & -\frac{\sqrt{3}}{10} & 0 & -\frac{\sqrt{30}}{60}
\end{bmatrix}$$

236 symmetry $\dfrac{\sqrt{15}x(y-z)(y+z)}{2}$

$\mathbb{T}_{3,1}^{(1,-1;a)}(E,2)$

$$\begin{bmatrix}
0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{36} & 0 & \frac{\sqrt{30}i}{36} & 0 & \frac{\sqrt{3}i}{12} \\
0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{12} & 0 & \frac{\sqrt{30}i}{36} & 0 & -\frac{\sqrt{15}i}{36} & 0 \\
0 & -\frac{\sqrt{30}i}{120} & 0 & -\frac{\sqrt{10}i}{40} & \frac{\sqrt{2}i}{12} & 0 & -\frac{\sqrt{5}i}{10} & 0 & -\frac{\sqrt{10}i}{20} & 0 \\
-\frac{\sqrt{30}i}{120} & 0 & \frac{\sqrt{10}i}{40} & 0 & 0 & -\frac{7\sqrt{30}i}{180} & 0 & \frac{\sqrt{15}i}{90} & 0 & -\frac{\sqrt{6}i}{12} \\
0 & \frac{\sqrt{10}i}{40} & 0 & -\frac{\sqrt{30}i}{120} & \frac{\sqrt{6}i}{12} & 0 & -\frac{\sqrt{15}i}{90} & 0 & \frac{7\sqrt{30}i}{180} & 0 \\
-\frac{\sqrt{10}i}{40} & 0 & -\frac{\sqrt{30}i}{120} & 0 & 0 & \frac{\sqrt{10}i}{20} & 0 & \frac{\sqrt{5}i}{10} & 0 & -\frac{\sqrt{2}i}{12}
\end{bmatrix}$$

237 symmetry $\dfrac{\sqrt{15}y(x-z)(x+z)}{2}$

continued ...

Table 6

No.	multipole	matrix

$\mathbb{T}_{3,2}^{(1,-1;a)}(E,2)$

$$\begin{pmatrix}
0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{36} & 0 & \frac{\sqrt{30}}{36} & 0 & -\frac{\sqrt{3}}{12} \\
0 & 0 & 0 & 0 & \frac{\sqrt{3}}{12} & 0 & -\frac{\sqrt{30}}{36} & 0 & -\frac{\sqrt{15}}{36} & 0 \\
0 & -\frac{\sqrt{30}}{120} & 0 & \frac{\sqrt{10}}{40} & -\frac{\sqrt{2}}{12} & 0 & -\frac{\sqrt{5}}{10} & 0 & \frac{\sqrt{10}}{20} & 0 \\
\frac{\sqrt{30}}{120} & 0 & \frac{\sqrt{10}}{40} & 0 & 0 & \frac{7\sqrt{30}}{180} & 0 & \frac{\sqrt{15}}{90} & 0 & \frac{\sqrt{6}}{12} \\
0 & -\frac{\sqrt{10}}{40} & 0 & -\frac{\sqrt{30}}{120} & \frac{\sqrt{6}}{12} & 0 & \frac{\sqrt{15}}{90} & 0 & \frac{7\sqrt{30}}{180} & 0 \\
-\frac{\sqrt{10}}{40} & 0 & \frac{\sqrt{30}}{120} & 0 & 0 & \frac{\sqrt{10}}{20} & 0 & -\frac{\sqrt{5}}{10} & 0 & -\frac{\sqrt{2}}{12}
\end{pmatrix}$$

| 238 | symmetry | z |

$\mathbb{T}_1^{(1,0;a)}(B_2)$

$$\begin{pmatrix}
0 & \frac{\sqrt{6}i}{12} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & \frac{\sqrt{6}i}{12} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
-\frac{\sqrt{3}i}{5} & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{10} & 0 & 0 & 0 & 0 \\
0 & -\frac{\sqrt{3}i}{15} & 0 & 0 & 0 & 0 & -\frac{3\sqrt{2}i}{20} & 0 & 0 & 0 \\
0 & 0 & \frac{\sqrt{3}i}{15} & 0 & 0 & 0 & 0 & -\frac{3\sqrt{2}i}{20} & 0 & 0 \\
0 & 0 & 0 & \frac{\sqrt{3}i}{5} & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{10} & 0
\end{pmatrix}$$

| 239 | symmetry | x |

$\mathbb{T}_{1,1}^{(1,0;a)}(E)$

$$\begin{pmatrix}
-\frac{\sqrt{2}i}{8} & 0 & \frac{\sqrt{6}i}{24} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & -\frac{\sqrt{6}i}{24} & 0 & \frac{\sqrt{2}i}{8} & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & -\frac{i}{5} & 0 & 0 & \frac{\sqrt{15}i}{20} & 0 & -\frac{\sqrt{6}i}{40} & 0 & 0 & 0 \\
-\frac{i}{5} & 0 & -\frac{2\sqrt{3}i}{15} & 0 & 0 & \frac{3i}{20} & 0 & -\frac{3\sqrt{2}i}{40} & 0 & 0 \\
0 & -\frac{2\sqrt{3}i}{15} & 0 & -\frac{i}{5} & 0 & 0 & \frac{3\sqrt{2}i}{40} & 0 & -\frac{3i}{20} & 0 \\
0 & 0 & -\frac{i}{5} & 0 & 0 & 0 & 0 & \frac{\sqrt{6}i}{40} & 0 & -\frac{\sqrt{15}i}{20}
\end{pmatrix}$$

| 240 | symmetry | y |

$\mathbb{T}_{1,2}^{(1,0;a)}(E)$

$$\begin{pmatrix}
\frac{\sqrt{2}}{8} & 0 & \frac{\sqrt{6}}{24} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & \frac{\sqrt{6}}{24} & 0 & \frac{\sqrt{2}}{8} & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & -\frac{1}{5} & 0 & 0 & -\frac{\sqrt{15}}{20} & 0 & -\frac{\sqrt{6}}{40} & 0 & 0 & 0 \\
\frac{1}{5} & 0 & -\frac{2\sqrt{3}}{15} & 0 & 0 & -\frac{3}{20} & 0 & -\frac{3\sqrt{2}}{40} & 0 & 0 \\
0 & \frac{2\sqrt{3}}{15} & 0 & -\frac{1}{5} & 0 & 0 & -\frac{3\sqrt{2}}{40} & 0 & -\frac{3}{20} & 0 \\
0 & 0 & \frac{1}{5} & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}}{40} & 0 & -\frac{\sqrt{15}}{20}
\end{pmatrix}$$

| 241 | symmetry | $\sqrt{15}xyz$ |

44

Table 6

No.	multipole	matrix

$$\mathbb{T}_3^{(1,0;a)}(A_1)$$

$$\begin{pmatrix}
0 & 0 & 0 & 0 & -\frac{\sqrt{6}}{18} & 0 & 0 & 0 & \frac{\sqrt{30}}{18} & 0 \\
0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{18} & 0 & 0 & 0 & -\frac{\sqrt{6}}{18} \\
0 & 0 & \frac{\sqrt{15}}{15} & 0 & 0 & 0 & 0 & \frac{\sqrt{10}}{60} & 0 & 0 \\
0 & 0 & 0 & -\frac{\sqrt{15}}{15} & \frac{\sqrt{3}}{36} & 0 & 0 & 0 & \frac{\sqrt{15}}{180} & 0 \\
-\frac{\sqrt{15}}{15} & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{180} & 0 & 0 & 0 & -\frac{\sqrt{3}}{36} \\
0 & \frac{\sqrt{15}}{15} & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}}{60} & 0 & 0 & 0
\end{pmatrix}$$

| 242 | symmetry | $\dfrac{\sqrt{15}z(x-y)(x+y)}{2}$ |

$$\mathbb{T}_3^{(1,0;a)}(A_2)$$

$$\begin{pmatrix}
0 & 0 & 0 & 0 & \frac{\sqrt{6}i}{18} & 0 & 0 & 0 & \frac{\sqrt{30}i}{18} & 0 \\
0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}i}{18} & 0 & 0 & 0 & -\frac{\sqrt{6}i}{18} \\
0 & 0 & \frac{\sqrt{15}i}{15} & 0 & 0 & 0 & 0 & \frac{\sqrt{10}i}{60} & 0 & 0 \\
0 & 0 & 0 & -\frac{\sqrt{15}i}{15} & -\frac{\sqrt{3}i}{36} & 0 & 0 & 0 & \frac{\sqrt{15}i}{180} & 0 \\
\frac{\sqrt{15}i}{15} & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{180} & 0 & 0 & 0 & -\frac{\sqrt{3}i}{36} \\
0 & -\frac{\sqrt{15}i}{15} & 0 & 0 & 0 & 0 & \frac{\sqrt{10}i}{60} & 0 & 0 & 0
\end{pmatrix}$$

| 243 | symmetry | $-\dfrac{z\left(3x^2+3y^2-2z^2\right)}{2}$ |

$$\mathbb{T}_3^{(1,0;a)}(B_2)$$

$$\begin{pmatrix}
0 & 0 & 0 & 0 & 0 & 0 & \frac{i}{3} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{i}{3} & 0 & 0 \\
\frac{\sqrt{3}i}{15} & 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{30} & 0 & 0 & 0 & 0 \\
0 & -\frac{\sqrt{3}i}{5} & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}i}{30} & 0 & 0 & 0 \\
0 & 0 & \frac{\sqrt{3}i}{5} & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}i}{30} & 0 & 0 \\
0 & 0 & 0 & -\frac{\sqrt{3}i}{15} & 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{30} & 0
\end{pmatrix}$$

| 244 | symmetry | $\dfrac{x\left(2x^2-3y^2-3z^2\right)}{2}$ |

$$\mathbb{T}_{3,1}^{(1,0;a)}(E,1)$$

$$\begin{pmatrix}
0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2}i}{12} & 0 & -\frac{i}{6} & 0 & \frac{\sqrt{10}i}{12} \\
0 & 0 & 0 & 0 & \frac{\sqrt{10}i}{12} & 0 & -\frac{i}{6} & 0 & \frac{\sqrt{2}i}{12} & 0 \\
0 & -\frac{i}{10} & 0 & \frac{\sqrt{3}i}{6} & \frac{\sqrt{15}i}{240} & 0 & -\frac{\sqrt{6}i}{80} & 0 & \frac{\sqrt{3}i}{48} & 0 \\
-\frac{i}{10} & 0 & \frac{\sqrt{3}i}{10} & 0 & 0 & -\frac{7i}{240} & 0 & \frac{\sqrt{2}i}{240} & 0 & \frac{\sqrt{5}i}{48} \\
0 & \frac{\sqrt{3}i}{10} & 0 & -\frac{i}{10} & -\frac{\sqrt{5}i}{48} & 0 & -\frac{\sqrt{2}i}{240} & 0 & \frac{7i}{240} & 0 \\
\frac{\sqrt{3}i}{6} & 0 & -\frac{i}{10} & 0 & 0 & -\frac{\sqrt{3}i}{48} & 0 & \frac{\sqrt{6}i}{80} & 0 & -\frac{\sqrt{15}i}{240}
\end{pmatrix}$$

| 245 | symmetry | $-\dfrac{y\left(3x^2-2y^2+3z^2\right)}{2}$ |

continued ...

Table 6

No.	multipole	matrix

$\mathbb{T}_{3,2}^{(1,0;a)}(E,1)$

$$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}}{12} & 0 & -\frac{1}{6} & 0 & -\frac{\sqrt{10}}{12} \\ 0 & 0 & 0 & 0 & \frac{\sqrt{10}}{12} & 0 & \frac{1}{6} & 0 & \frac{\sqrt{2}}{12} & 0 \\ 0 & -\frac{1}{10} & 0 & -\frac{\sqrt{3}}{6} & -\frac{\sqrt{15}}{240} & 0 & -\frac{\sqrt{6}}{80} & 0 & -\frac{\sqrt{3}}{48} & 0 \\ \frac{1}{10} & 0 & \frac{\sqrt{3}}{10} & 0 & 0 & \frac{7}{240} & 0 & \frac{\sqrt{2}}{240} & 0 & -\frac{\sqrt{5}}{48} \\ 0 & -\frac{\sqrt{3}}{10} & 0 & -\frac{1}{10} & -\frac{\sqrt{5}}{48} & 0 & \frac{\sqrt{2}}{240} & 0 & \frac{7}{240} & 0 \\ \frac{\sqrt{3}}{6} & 0 & \frac{1}{10} & 0 & 0 & -\frac{\sqrt{3}}{48} & 0 & -\frac{\sqrt{6}}{80} & 0 & -\frac{\sqrt{15}}{240} \end{bmatrix}$$

246	symmetry	$\frac{\sqrt{15}x(y-z)(y+z)}{2}$

$\mathbb{T}_{3,1}^{(1,0;a)}(E,2)$

$$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}i}{36} & 0 & -\frac{\sqrt{15}i}{18} & 0 & -\frac{\sqrt{6}i}{12} \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{12} & 0 & -\frac{\sqrt{15}i}{18} & 0 & \frac{\sqrt{30}i}{36} & 0 \\ 0 & -\frac{\sqrt{15}i}{30} & 0 & -\frac{\sqrt{5}i}{10} & \frac{i}{48} & 0 & -\frac{\sqrt{10}i}{80} & 0 & -\frac{\sqrt{5}i}{80} & 0 \\ -\frac{\sqrt{15}i}{30} & 0 & \frac{\sqrt{5}i}{10} & 0 & 0 & -\frac{7\sqrt{15}i}{720} & 0 & \frac{\sqrt{30}i}{720} & 0 & -\frac{\sqrt{3}i}{48} \\ 0 & \frac{\sqrt{5}i}{10} & 0 & -\frac{\sqrt{15}i}{30} & \frac{\sqrt{3}i}{48} & 0 & -\frac{\sqrt{30}i}{720} & 0 & \frac{7\sqrt{15}i}{720} & 0 \\ -\frac{\sqrt{5}i}{10} & 0 & -\frac{\sqrt{15}i}{30} & 0 & 0 & \frac{\sqrt{5}i}{80} & 0 & \frac{\sqrt{10}i}{80} & 0 & -\frac{i}{48} \end{bmatrix}$$

247	symmetry	$\frac{\sqrt{15}y(x-z)(x+z)}{2}$

$\mathbb{T}_{3,2}^{(1,0;a)}(E,2)$

$$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}}{36} & 0 & -\frac{\sqrt{15}}{18} & 0 & \frac{\sqrt{6}}{12} \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{6}}{12} & 0 & \frac{\sqrt{15}}{18} & 0 & \frac{\sqrt{30}}{36} & 0 \\ 0 & -\frac{\sqrt{15}}{30} & 0 & \frac{\sqrt{5}}{10} & -\frac{1}{48} & 0 & -\frac{\sqrt{10}}{80} & 0 & \frac{\sqrt{5}}{80} & 0 \\ \frac{\sqrt{15}}{30} & 0 & \frac{\sqrt{5}}{10} & 0 & 0 & \frac{7\sqrt{15}}{720} & 0 & \frac{\sqrt{30}}{720} & 0 & \frac{\sqrt{3}}{48} \\ 0 & -\frac{\sqrt{5}}{10} & 0 & -\frac{\sqrt{15}}{30} & \frac{\sqrt{3}}{48} & 0 & \frac{\sqrt{30}}{720} & 0 & \frac{7\sqrt{15}}{720} & 0 \\ -\frac{\sqrt{5}}{10} & 0 & \frac{\sqrt{15}}{30} & 0 & 0 & \frac{\sqrt{5}}{80} & 0 & -\frac{\sqrt{10}}{80} & 0 & -\frac{1}{48} \end{bmatrix}$$

248	symmetry	z

$\mathbb{T}_{1}^{(1,1;a)}(B_2)$

$$\begin{bmatrix} 0 & -\frac{\sqrt{2}i}{4} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{2}i}{4} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ -\frac{3i}{10} & 0 & 0 & 0 & 0 & \frac{i}{10} & 0 & 0 & 0 & 0 \\ 0 & -\frac{i}{10} & 0 & 0 & 0 & 0 & \frac{\sqrt{6}i}{20} & 0 & 0 & 0 \\ 0 & 0 & \frac{i}{10} & 0 & 0 & 0 & 0 & \frac{\sqrt{6}i}{20} & 0 & 0 \\ 0 & 0 & 0 & \frac{3i}{10} & 0 & 0 & 0 & 0 & \frac{i}{10} & 0 \end{bmatrix}$$

249	symmetry	x

continued ...

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Table 6

No.	multipole	matrix
	$\mathbb{T}_{1,1}^{(1,1;a)}(E)$	$\begin{pmatrix} \frac{\sqrt{6}i}{8} & 0 & -\frac{\sqrt{2}i}{8} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{2}i}{8} & 0 & -\frac{\sqrt{6}i}{8} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{3}i}{10} & 0 & 0 & -\frac{\sqrt{5}i}{20} & 0 & \frac{\sqrt{2}i}{40} & 0 & 0 & 0 \\ -\frac{\sqrt{3}i}{10} & 0 & -\frac{i}{5} & 0 & 0 & -\frac{\sqrt{3}i}{20} & 0 & \frac{\sqrt{6}i}{40} & 0 & 0 \\ 0 & -\frac{i}{5} & 0 & -\frac{\sqrt{3}i}{10} & 0 & 0 & -\frac{\sqrt{6}i}{40} & 0 & \frac{\sqrt{3}i}{20} & 0 \\ 0 & 0 & -\frac{\sqrt{3}i}{10} & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}i}{40} & 0 & \frac{\sqrt{5}i}{20} \end{pmatrix}$
250	symmetry	y
	$\mathbb{T}_{1,2}^{(1,1;a)}(E)$	$\begin{pmatrix} -\frac{\sqrt{6}}{8} & 0 & -\frac{\sqrt{2}}{8} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{2}}{8} & 0 & -\frac{\sqrt{6}}{8} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{3}}{10} & 0 & 0 & \frac{\sqrt{5}}{20} & 0 & \frac{\sqrt{2}}{40} & 0 & 0 & 0 \\ \frac{\sqrt{3}}{10} & 0 & -\frac{1}{5} & 0 & 0 & \frac{\sqrt{3}}{20} & 0 & \frac{\sqrt{6}}{40} & 0 & 0 \\ 0 & \frac{1}{5} & 0 & -\frac{\sqrt{3}}{10} & 0 & 0 & \frac{\sqrt{6}}{40} & 0 & \frac{\sqrt{3}}{20} & 0 \\ 0 & 0 & \frac{\sqrt{3}}{10} & 0 & 0 & 0 & 0 & \frac{\sqrt{2}}{40} & 0 & \frac{\sqrt{5}}{20} \end{pmatrix}$
251	symmetry	$\frac{\sqrt{3}(x-y)(x+y)}{2}$
	$\mathbb{M}_2^{(a)}(A_1)$	$\begin{pmatrix} 0 & 0 & 0 & \frac{\sqrt{5}}{10} & \frac{1}{6} & 0 & 0 & 0 & \frac{\sqrt{5}}{30} & 0 \\ -\frac{\sqrt{5}}{10} & 0 & 0 & 0 & 0 & \frac{\sqrt{5}}{30} & 0 & 0 & 0 & \frac{1}{6} \\ 0 & 0 & -\frac{\sqrt{10}}{20} & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{30} & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{10}}{20} & -\frac{\sqrt{2}}{6} & 0 & 0 & 0 & \frac{\sqrt{10}}{15} & 0 \\ -\frac{\sqrt{10}}{20} & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}}{15} & 0 & 0 & 0 & \frac{\sqrt{2}}{6} \\ 0 & -\frac{\sqrt{10}}{20} & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{30} & 0 & 0 & 0 \end{pmatrix}$
252	symmetry	$\sqrt{3}xy$
	$\mathbb{M}_2^{(a)}(A_2)$	$\begin{pmatrix} 0 & 0 & 0 & -\frac{\sqrt{5}i}{10} & \frac{i}{6} & 0 & 0 & 0 & -\frac{\sqrt{5}i}{30} & 0 \\ -\frac{\sqrt{5}i}{10} & 0 & 0 & 0 & 0 & \frac{\sqrt{5}i}{30} & 0 & 0 & 0 & -\frac{i}{6} \\ 0 & 0 & \frac{\sqrt{10}i}{20} & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{30} & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{10}i}{20} & -\frac{\sqrt{2}i}{6} & 0 & 0 & 0 & -\frac{\sqrt{10}i}{15} & 0 \\ -\frac{\sqrt{10}i}{20} & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}i}{15} & 0 & 0 & 0 & -\frac{\sqrt{2}i}{6} \\ 0 & -\frac{\sqrt{10}i}{20} & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{30} & 0 & 0 & 0 \end{pmatrix}$
253	symmetry	$-\frac{x^2}{2}-\frac{y^2}{2}+z^2$

continued ...

Table 6

No.	multipole	matrix

$$\mathbb{M}_2^{(a)}(B_1)$$

$$\begin{bmatrix}
0 & \frac{\sqrt{5}}{10} & 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{30} & 0 & 0 & 0 \\
0 & 0 & -\frac{\sqrt{5}}{10} & 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{30} & 0 & 0 \\
-\frac{\sqrt{10}}{20} & 0 & 0 & 0 & 0 & \frac{\sqrt{10}}{10} & 0 & 0 & 0 & 0 \\
0 & \frac{\sqrt{10}}{20} & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{30} & 0 & 0 & 0 \\
0 & 0 & \frac{\sqrt{10}}{20} & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{30} & 0 & 0 \\
0 & 0 & 0 & -\frac{\sqrt{10}}{20} & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}}{10} & 0
\end{bmatrix}$$

254	symmetry	$\sqrt{3}yz$

$$\mathbb{M}_{2,1}^{(a)}(E)$$

$$\begin{bmatrix}
-\frac{\sqrt{5}i}{20} & 0 & -\frac{\sqrt{15}i}{20} & 0 & 0 & -\frac{\sqrt{5}i}{15} & 0 & -\frac{\sqrt{10}i}{30} & 0 & 0 \\
0 & \frac{\sqrt{15}i}{20} & 0 & \frac{\sqrt{5}i}{20} & 0 & 0 & -\frac{\sqrt{10}i}{30} & 0 & -\frac{\sqrt{5}i}{15} & 0 \\
0 & \frac{\sqrt{10}i}{20} & 0 & 0 & -\frac{\sqrt{6}i}{12} & 0 & -\frac{\sqrt{15}i}{20} & 0 & 0 & 0 \\
-\frac{\sqrt{10}i}{20} & 0 & 0 & 0 & 0 & \frac{\sqrt{10}i}{60} & 0 & -\frac{\sqrt{5}i}{12} & 0 & 0 \\
0 & 0 & 0 & -\frac{\sqrt{10}i}{20} & 0 & 0 & \frac{\sqrt{5}i}{12} & 0 & -\frac{\sqrt{10}i}{60} & 0 \\
0 & 0 & \frac{\sqrt{10}i}{20} & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{20} & 0 & \frac{\sqrt{6}i}{12}
\end{bmatrix}$$

255	symmetry	$-\sqrt{3}xz$

$$\mathbb{M}_{2,2}^{(a)}(E)$$

$$\begin{bmatrix}
\frac{\sqrt{5}}{20} & 0 & -\frac{\sqrt{15}}{20} & 0 & 0 & \frac{\sqrt{5}}{15} & 0 & -\frac{\sqrt{10}}{30} & 0 & 0 \\
0 & -\frac{\sqrt{15}}{20} & 0 & \frac{\sqrt{5}}{20} & 0 & 0 & \frac{\sqrt{10}}{30} & 0 & -\frac{\sqrt{5}}{15} & 0 \\
0 & \frac{\sqrt{10}}{20} & 0 & 0 & \frac{\sqrt{6}}{12} & 0 & -\frac{\sqrt{15}}{20} & 0 & 0 & 0 \\
\frac{\sqrt{10}}{20} & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}}{60} & 0 & -\frac{\sqrt{5}}{12} & 0 & 0 \\
0 & 0 & 0 & -\frac{\sqrt{10}}{20} & 0 & 0 & -\frac{\sqrt{5}}{12} & 0 & -\frac{\sqrt{10}}{60} & 0 \\
0 & 0 & -\frac{\sqrt{10}}{20} & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{20} & 0 & \frac{\sqrt{6}}{12}
\end{bmatrix}$$

256	symmetry	$\frac{\sqrt{3}(x-y)(x+y)}{2}$

$$\mathbb{M}_2^{(1,-1;a)}(A_1)$$

$$\begin{bmatrix}
0 & 0 & 0 & -\frac{\sqrt{2}}{20} & -\frac{\sqrt{10}}{10} & 0 & 0 & 0 & -\frac{\sqrt{2}}{10} & 0 \\
\frac{\sqrt{2}}{20} & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}}{10} & 0 & 0 & 0 & -\frac{\sqrt{10}}{10} \\
0 & 0 & \frac{1}{10} & 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{20} & 0 & 0 \\
0 & 0 & 0 & \frac{1}{10} & -\frac{\sqrt{5}}{10} & 0 & 0 & 0 & \frac{1}{5} & 0 \\
\frac{1}{10} & 0 & 0 & 0 & 0 & -\frac{1}{5} & 0 & 0 & 0 & \frac{\sqrt{5}}{10} \\
0 & \frac{1}{10} & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}}{20} & 0 & 0 & 0
\end{bmatrix}$$

257	symmetry	$\sqrt{3}xy$

continued ...

No.	multipole	matrix

$$\mathbb{M}_2^{(1,-1;a)}(A_2)$$

$$\begin{bmatrix} 0 & 0 & 0 & \frac{\sqrt{2}i}{20} & -\frac{\sqrt{10}i}{10} & 0 & 0 & 0 & \frac{\sqrt{2}i}{10} & 0 \\ \frac{\sqrt{2}i}{20} & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}i}{10} & 0 & 0 & 0 & \frac{\sqrt{10}i}{10} \\ 0 & 0 & -\frac{i}{10} & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{20} & 0 & 0 \\ 0 & 0 & 0 & -\frac{i}{10} & -\frac{\sqrt{5}i}{10} & 0 & 0 & 0 & -\frac{i}{5} & 0 \\ \frac{i}{10} & 0 & 0 & 0 & 0 & -\frac{i}{5} & 0 & 0 & 0 & -\frac{\sqrt{5}i}{10} \\ 0 & \frac{i}{10} & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{20} & 0 & 0 & 0 \end{bmatrix}$$

258	symmetry	$-\frac{x^2}{2} - \frac{y^2}{2} + z^2$

$$\mathbb{M}_2^{(1,-1;a)}(B_1)$$

$$\begin{bmatrix} 0 & -\frac{\sqrt{2}}{20} & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{5} & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{2}}{20} & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{5} & 0 & 0 \\ \frac{1}{10} & 0 & 0 & 0 & 0 & \frac{3}{10} & 0 & 0 & 0 & 0 \\ 0 & -\frac{1}{10} & 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{20} & 0 & 0 & 0 \\ 0 & 0 & -\frac{1}{10} & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}}{20} & 0 & 0 \\ 0 & 0 & 0 & \frac{1}{10} & 0 & 0 & 0 & 0 & -\frac{3}{10} & 0 \end{bmatrix}$$

259	symmetry	$\sqrt{3}yz$

$$\mathbb{M}_{2,1}^{(1,-1;a)}(E)$$

$$\begin{bmatrix} \frac{\sqrt{2}i}{40} & 0 & \frac{\sqrt{6}i}{40} & 0 & 0 & \frac{\sqrt{2}i}{5} & 0 & \frac{i}{5} & 0 & 0 \\ 0 & -\frac{\sqrt{6}i}{40} & 0 & -\frac{\sqrt{2}i}{40} & 0 & 0 & \frac{i}{5} & 0 & \frac{\sqrt{2}i}{5} & 0 \\ 0 & -\frac{i}{10} & 0 & 0 & -\frac{\sqrt{15}i}{20} & 0 & -\frac{3\sqrt{6}i}{40} & 0 & 0 & 0 \\ \frac{i}{10} & 0 & 0 & 0 & 0 & \frac{i}{20} & 0 & -\frac{\sqrt{2}i}{8} & 0 & 0 \\ 0 & 0 & 0 & \frac{i}{10} & 0 & 0 & \frac{\sqrt{2}i}{8} & 0 & -\frac{i}{20} & 0 \\ 0 & 0 & -\frac{i}{10} & 0 & 0 & 0 & 0 & \frac{3\sqrt{6}i}{40} & 0 & \frac{\sqrt{15}i}{20} \end{bmatrix}$$

260	symmetry	$-\sqrt{3}xz$

$$\mathbb{M}_{2,2}^{(1,-1;a)}(E)$$

$$\begin{bmatrix} -\frac{\sqrt{2}}{40} & 0 & \frac{\sqrt{6}}{40} & 0 & 0 & -\frac{\sqrt{2}}{5} & 0 & \frac{1}{5} & 0 & 0 \\ 0 & \frac{\sqrt{6}}{40} & 0 & -\frac{\sqrt{2}}{40} & 0 & 0 & -\frac{1}{5} & 0 & \frac{\sqrt{2}}{5} & 0 \\ 0 & -\frac{1}{10} & 0 & 0 & \frac{\sqrt{15}}{20} & 0 & -\frac{3\sqrt{6}}{40} & 0 & 0 & 0 \\ -\frac{1}{10} & 0 & 0 & 0 & 0 & -\frac{1}{20} & 0 & -\frac{\sqrt{2}}{8} & 0 & 0 \\ 0 & 0 & 0 & \frac{1}{10} & 0 & 0 & -\frac{\sqrt{2}}{8} & 0 & -\frac{1}{20} & 0 \\ 0 & 0 & \frac{1}{10} & 0 & 0 & 0 & 0 & -\frac{3\sqrt{6}}{40} & 0 & \frac{\sqrt{15}}{20} \end{bmatrix}$$

261	symmetry	$\frac{\sqrt{5}(x-y)(x+y)\left(x^2+y^2-6z^2\right)}{4}$

continued ...

Table 6

No.	multipole	matrix									
	$\mathbb{M}_4^{(1,-1;a)}(A_1)$	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	$\frac{\sqrt{70}}{28}$	0	0
		0	0	0	0	$-\frac{\sqrt{21}}{28}$	0	0	0	$-\frac{\sqrt{105}}{28}$	0
		0	0	0	0	0	$\frac{\sqrt{105}}{28}$	0	0	0	$\frac{\sqrt{21}}{28}$
		0	0	0	0	0	0	$-\frac{\sqrt{70}}{28}$	0	0	0

| 262 | symmetry | $-\frac{\sqrt{5}xy\left(x^2+y^2-6z^2\right)}{2}$ |

No.	multipole	matrix									
	$\mathbb{M}_4^{(1,-1;a)}(A_2)$	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	$\frac{\sqrt{70}i}{28}$	0	0
		0	0	0	0	$\frac{\sqrt{21}i}{28}$	0	0	0	$-\frac{\sqrt{105}i}{28}$	0
		0	0	0	0	0	$-\frac{\sqrt{105}i}{28}$	0	0	0	$\frac{\sqrt{21}i}{28}$
		0	0	0	0	0	0	$\frac{\sqrt{70}i}{28}$	0	0	0

| 263 | symmetry | $\frac{\sqrt{21}\left(x^4-3x^2y^2-3x^2z^2+y^4-3y^2z^2+z^4\right)}{6}$ |

No.	multipole	matrix									
	$\mathbb{M}_4^{(1,-1;a)}(B_1,1)$	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	$-\frac{\sqrt{3}}{12}$	0	0	0	$-\frac{\sqrt{15}}{12}$
		0	0	0	0	0	0	$\frac{\sqrt{2}}{4}$	0	0	0
		0	0	0	0	0	0	0	$-\frac{\sqrt{2}}{4}$	0	0
		0	0	0	0	$\frac{\sqrt{15}}{12}$	0	0	0	$\frac{\sqrt{3}}{12}$	0

| 264 | symmetry | $-\frac{\sqrt{15}\left(x^4-12x^2y^2+6x^2z^2+y^4+6y^2z^2-2z^4\right)}{12}$ |

No.	multipole	matrix									
	$\mathbb{M}_4^{(1,-1;a)}(B_1,2)$	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	$-\frac{\sqrt{105}}{84}$	0	0	0	$\frac{\sqrt{21}}{12}$
		0	0	0	0	0	0	$\frac{\sqrt{70}}{28}$	0	0	0
		0	0	0	0	0	0	0	$-\frac{\sqrt{70}}{28}$	0	0
		0	0	0	0	$-\frac{\sqrt{21}}{12}$	0	0	0	$\frac{\sqrt{105}}{84}$	0

| 265 | symmetry | $\frac{\sqrt{35}xy(x-y)(x+y)}{2}$ |

Table 6

No.	multipole	matrix
	$\mathbb{M}_4^{(1,-1;a)}(B_2)$	$\begin{array}{ccccccccccc} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{i}{2} \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{i}{2} & 0 & 0 & 0 & 0 & 0 & 0 \end{array}$
266	symmetry	$\dfrac{\sqrt{35}yz(y-z)(y+z)}{2}$
	$\mathbb{M}_{4,1}^{(1,-1;a)}(E,1)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{i}{16} & 0 & -\frac{\sqrt{10}i}{16} & 0 & -\frac{\sqrt{5}i}{16} & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{16} & 0 & \frac{\sqrt{30}i}{16} & 0 & \frac{\sqrt{3}i}{16} \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{16} & 0 & -\frac{\sqrt{30}i}{16} & 0 & -\frac{\sqrt{15}i}{16} & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{5}i}{16} & 0 & \frac{\sqrt{10}i}{16} & 0 & \frac{i}{16} \end{bmatrix}$
267	symmetry	$-\dfrac{\sqrt{35}xz(x-z)(x+z)}{2}$
	$\mathbb{M}_{4,2}^{(1,-1;a)}(E,1)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{1}{16} & 0 & -\frac{\sqrt{10}}{16} & 0 & \frac{\sqrt{5}}{16} & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{16} & 0 & \frac{\sqrt{30}}{16} & 0 & -\frac{\sqrt{3}}{16} \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{16} & 0 & \frac{\sqrt{30}}{16} & 0 & -\frac{\sqrt{15}}{16} & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{5}}{16} & 0 & -\frac{\sqrt{10}}{16} & 0 & \frac{1}{16} \end{bmatrix}$
268	symmetry	$\dfrac{\sqrt{5}yz\left(6x^2-y^2-z^2\right)}{2}$
	$\mathbb{M}_{4,1}^{(1,-1;a)}(E,2)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{7}i}{112} & 0 & -\frac{\sqrt{70}i}{112} & 0 & \frac{\sqrt{35}i}{16} & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{105}i}{112} & 0 & \frac{\sqrt{210}i}{112} & 0 & -\frac{\sqrt{21}i}{16} \\ 0 & 0 & 0 & 0 & \frac{\sqrt{21}i}{16} & 0 & -\frac{\sqrt{210}i}{112} & 0 & -\frac{\sqrt{105}i}{112} & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{35}i}{16} & 0 & \frac{\sqrt{70}i}{112} & 0 & \frac{\sqrt{7}i}{112} \end{bmatrix}$
269	symmetry	$\dfrac{\sqrt{5}xz\left(x^2-6y^2+z^2\right)}{2}$

Table 6

No.	multipole	matrix

$\mathbb{M}_{4,2}^{(1,-1;a)}(E,2)$

$$\begin{bmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & \frac{\sqrt{7}}{112} & 0 & -\frac{\sqrt{70}}{112} & 0 & -\frac{\sqrt{35}}{16} & 0 \\
0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{105}}{112} & 0 & \frac{\sqrt{210}}{112} & 0 & \frac{\sqrt{21}}{16} \\
0 & 0 & 0 & 0 & \frac{\sqrt{21}}{16} & 0 & \frac{\sqrt{210}}{112} & 0 & -\frac{\sqrt{105}}{112} & 0 \\
0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{35}}{16} & 0 & -\frac{\sqrt{70}}{112} & 0 & \frac{\sqrt{7}}{112}
\end{bmatrix}$$

270   symmetry $\frac{\sqrt{3}(x-y)(x+y)}{2}$

$\mathbb{M}_2^{(1,0;a)}(A_1)$

$$\begin{bmatrix}
0 & 0 & 0 & -\frac{\sqrt{30}}{60} & \frac{\sqrt{6}}{9} & 0 & 0 & 0 & \frac{\sqrt{30}}{45} & 0 \\
\frac{\sqrt{30}}{60} & 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{45} & 0 & 0 & 0 & \frac{\sqrt{6}}{9} \\
0 & 0 & \frac{\sqrt{15}}{15} & 0 & 0 & 0 & 0 & \frac{\sqrt{10}}{60} & 0 & 0 \\
0 & 0 & 0 & \frac{\sqrt{15}}{15} & -\frac{\sqrt{3}}{18} & 0 & 0 & 0 & \frac{\sqrt{15}}{45} & 0 \\
\frac{\sqrt{15}}{15} & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{45} & 0 & 0 & 0 & \frac{\sqrt{3}}{18} \\
0 & \frac{\sqrt{15}}{15} & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}}{60} & 0 & 0 & 0
\end{bmatrix}$$

271   symmetry $\sqrt{3}xy$

$\mathbb{M}_2^{(1,0;a)}(A_2)$

$$\begin{bmatrix}
0 & 0 & 0 & \frac{\sqrt{30}i}{60} & \frac{\sqrt{6}i}{9} & 0 & 0 & 0 & -\frac{\sqrt{30}i}{45} & 0 \\
\frac{\sqrt{30}i}{60} & 0 & 0 & 0 & 0 & \frac{\sqrt{30}i}{45} & 0 & 0 & 0 & -\frac{\sqrt{6}i}{9} \\
0 & 0 & -\frac{\sqrt{15}i}{15} & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}i}{60} & 0 & 0 \\
0 & 0 & 0 & -\frac{\sqrt{15}i}{15} & -\frac{\sqrt{3}i}{18} & 0 & 0 & 0 & -\frac{\sqrt{15}i}{45} & 0 \\
\frac{\sqrt{15}i}{15} & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{45} & 0 & 0 & 0 & -\frac{\sqrt{3}i}{18} \\
0 & \frac{\sqrt{15}i}{15} & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}i}{60} & 0 & 0 & 0
\end{bmatrix}$$

272   symmetry $-\frac{x^2}{2}-\frac{y^2}{2}+z^2$

$\mathbb{M}_2^{(1,0;a)}(B_1)$

$$\begin{bmatrix}
0 & -\frac{\sqrt{30}}{60} & 0 & 0 & 0 & 0 & \frac{2\sqrt{5}}{15} & 0 & 0 & 0 \\
0 & 0 & \frac{\sqrt{30}}{60} & 0 & 0 & 0 & 0 & \frac{2\sqrt{5}}{15} & 0 & 0 \\
\frac{\sqrt{15}}{15} & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{30} & 0 & 0 & 0 & 0 \\
0 & -\frac{\sqrt{15}}{15} & 0 & 0 & 0 & 0 & \frac{\sqrt{10}}{60} & 0 & 0 & 0 \\
0 & 0 & -\frac{\sqrt{15}}{15} & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}}{60} & 0 & 0 \\
0 & 0 & 0 & \frac{\sqrt{15}}{15} & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{30} & 0
\end{bmatrix}$$

273   symmetry $\sqrt{3}yz$

continued ...

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Table 6

No.	multipole	matrix

$\mathbb{M}_{2,1}^{(1,0;a)}(E)$

$$\begin{bmatrix} \frac{\sqrt{30}i}{120} & 0 & \frac{\sqrt{10}i}{40} & 0 & 0 & -\frac{2\sqrt{30}i}{45} & 0 & -\frac{2\sqrt{15}i}{45} & 0 & 0 \\ 0 & -\frac{\sqrt{10}i}{40} & 0 & -\frac{\sqrt{30}i}{120} & 0 & 0 & -\frac{2\sqrt{15}i}{45} & 0 & -\frac{2\sqrt{30}i}{45} & 0 \\ 0 & -\frac{\sqrt{15}i}{15} & 0 & 0 & -\frac{i}{12} & 0 & -\frac{\sqrt{10}i}{40} & 0 & 0 & 0 \\ \frac{\sqrt{15}i}{15} & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{180} & 0 & -\frac{\sqrt{30}i}{72} & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{15}i}{15} & 0 & 0 & \frac{\sqrt{30}i}{72} & 0 & -\frac{\sqrt{15}i}{180} & 0 \\ 0 & 0 & -\frac{\sqrt{15}i}{15} & 0 & 0 & 0 & 0 & \frac{\sqrt{10}i}{40} & 0 & \frac{i}{12} \end{bmatrix}$$

| 274 | symmetry | $-\sqrt{3}xz$ |

$\mathbb{M}_{2,2}^{(1,0;a)}(E)$

$$\begin{bmatrix} -\frac{\sqrt{30}}{120} & 0 & \frac{\sqrt{10}}{40} & 0 & 0 & \frac{2\sqrt{30}}{45} & 0 & -\frac{2\sqrt{15}}{45} & 0 & 0 \\ 0 & \frac{\sqrt{10}}{40} & 0 & -\frac{\sqrt{30}}{120} & 0 & 0 & \frac{2\sqrt{15}}{45} & 0 & -\frac{2\sqrt{30}}{45} & 0 \\ 0 & -\frac{\sqrt{15}}{15} & 0 & 0 & \frac{1}{12} & 0 & -\frac{\sqrt{10}}{40} & 0 & 0 & 0 \\ -\frac{\sqrt{15}}{15} & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{180} & 0 & -\frac{\sqrt{30}}{72} & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{15}}{15} & 0 & 0 & -\frac{\sqrt{30}}{72} & 0 & -\frac{\sqrt{15}}{180} & 0 \\ 0 & 0 & \frac{\sqrt{15}}{15} & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}}{40} & 0 & \frac{1}{12} \end{bmatrix}$$

| 275 | symmetry | 1 |

$\mathbb{M}_0^{(1,1;a)}(B_1)$

$$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ -\frac{\sqrt{2}}{4} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{2}}{4} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{2}}{4} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{2}}{4} & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$$

| 276 | symmetry | $\frac{\sqrt{3}(x-y)(x+y)}{2}$ |

$\mathbb{M}_2^{(1,1;a)}(A_1)$

$$\begin{bmatrix} 0 & 0 & 0 & \frac{\sqrt{42}}{15} & -\frac{\sqrt{210}}{180} & 0 & 0 & 0 & -\frac{\sqrt{42}}{180} & 0 \\ -\frac{\sqrt{42}}{15} & 0 & 0 & 0 & 0 & -\frac{\sqrt{42}}{180} & 0 & 0 & 0 & -\frac{\sqrt{210}}{180} \\ 0 & 0 & \frac{\sqrt{21}}{30} & 0 & 0 & 0 & 0 & -\frac{\sqrt{14}}{105} & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{21}}{30} & \frac{2\sqrt{105}}{315} & 0 & 0 & 0 & -\frac{4\sqrt{21}}{315} & 0 \\ \frac{\sqrt{21}}{30} & 0 & 0 & 0 & 0 & \frac{4\sqrt{21}}{315} & 0 & 0 & 0 & -\frac{2\sqrt{105}}{315} \\ 0 & \frac{\sqrt{21}}{30} & 0 & 0 & 0 & 0 & \frac{\sqrt{14}}{105} & 0 & 0 & 0 \end{bmatrix}$$

| 277 | symmetry | $\sqrt{3}xy$ |

continued …

Table 6

No.	multipole	matrix
	$\mathbb{M}_2^{(1,1;a)}(A_2)$	$\begin{bmatrix} 0 & 0 & 0 & -\frac{\sqrt{42}i}{15} & -\frac{\sqrt{210}i}{180} & 0 & 0 & 0 & \frac{\sqrt{42}i}{180} & 0 \\ -\frac{\sqrt{42}i}{15} & 0 & 0 & 0 & 0 & -\frac{\sqrt{42}i}{180} & 0 & 0 & 0 & \frac{\sqrt{210}i}{180} \\ 0 & 0 & -\frac{\sqrt{21}i}{30} & 0 & 0 & 0 & 0 & \frac{\sqrt{14}i}{105} & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{21}i}{30} & \frac{2\sqrt{105}i}{315} & 0 & 0 & 0 & \frac{4\sqrt{21}i}{315} & 0 \\ \frac{\sqrt{21}i}{30} & 0 & 0 & 0 & 0 & \frac{4\sqrt{21}i}{315} & 0 & 0 & 0 & \frac{2\sqrt{105}i}{315} \\ 0 & \frac{\sqrt{21}i}{30} & 0 & 0 & 0 & 0 & \frac{\sqrt{14}i}{105} & 0 & 0 & 0 \end{bmatrix}$
278	symmetry	$-\frac{x^2}{2} - \frac{y^2}{2} + z^2$
	$\mathbb{M}_2^{(1,1;a)}(B_1)$	$\begin{bmatrix} 0 & \frac{\sqrt{42}}{15} & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}}{30} & 0 & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{42}}{15} & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}}{30} & 0 & 0 \\ \frac{\sqrt{21}}{30} & 0 & 0 & 0 & 0 & -\frac{2\sqrt{21}}{105} & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{21}}{30} & 0 & 0 & 0 & 0 & -\frac{\sqrt{14}}{105} & 0 & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{21}}{30} & 0 & 0 & 0 & 0 & \frac{\sqrt{14}}{105} & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{21}}{30} & 0 & 0 & 0 & 0 & \frac{2\sqrt{21}}{105} & 0 \end{bmatrix}$
279	symmetry	$\sqrt{3}yz$
	$\mathbb{M}_{2,1}^{(1,1;a)}(E)$	$\begin{bmatrix} -\frac{\sqrt{42}i}{30} & 0 & -\frac{\sqrt{14}i}{10} & 0 & 0 & \frac{\sqrt{42}i}{90} & 0 & \frac{\sqrt{21}i}{90} & 0 & 0 \\ 0 & \frac{\sqrt{14}i}{10} & 0 & \frac{\sqrt{42}i}{30} & 0 & 0 & \frac{\sqrt{21}i}{90} & 0 & \frac{\sqrt{42}i}{90} & 0 \\ 0 & -\frac{\sqrt{21}i}{30} & 0 & 0 & \frac{\sqrt{35}i}{105} & 0 & \frac{\sqrt{14}i}{70} & 0 & 0 & 0 \\ \frac{\sqrt{21}i}{30} & 0 & 0 & 0 & 0 & -\frac{\sqrt{21}i}{315} & 0 & \frac{\sqrt{42}i}{126} & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{21}i}{30} & 0 & 0 & -\frac{\sqrt{42}i}{126} & 0 & \frac{\sqrt{21}i}{315} & 0 \\ 0 & 0 & -\frac{\sqrt{21}i}{30} & 0 & 0 & 0 & 0 & -\frac{\sqrt{14}i}{70} & 0 & -\frac{\sqrt{35}i}{105} \end{bmatrix}$
280	symmetry	$-\sqrt{3}xz$
	$\mathbb{M}_{2,2}^{(1,1;a)}(E)$	$\begin{bmatrix} \frac{\sqrt{42}}{30} & 0 & -\frac{\sqrt{14}}{10} & 0 & 0 & -\frac{\sqrt{42}}{90} & 0 & \frac{\sqrt{21}}{90} & 0 & 0 \\ 0 & -\frac{\sqrt{14}}{10} & 0 & \frac{\sqrt{42}}{30} & 0 & 0 & -\frac{\sqrt{21}}{90} & 0 & \frac{\sqrt{42}}{90} & 0 \\ 0 & -\frac{\sqrt{21}}{30} & 0 & 0 & -\frac{\sqrt{35}}{105} & 0 & \frac{\sqrt{14}}{70} & 0 & 0 & 0 \\ -\frac{\sqrt{21}}{30} & 0 & 0 & 0 & 0 & \frac{\sqrt{21}}{315} & 0 & \frac{\sqrt{42}}{126} & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{21}}{30} & 0 & 0 & \frac{\sqrt{42}}{126} & 0 & \frac{\sqrt{21}}{315} & 0 \\ 0 & 0 & \frac{\sqrt{21}}{30} & 0 & 0 & 0 & 0 & \frac{\sqrt{14}}{70} & 0 & -\frac{\sqrt{35}}{105} \end{bmatrix}$

bra: $= \langle\frac{1}{2},\frac{1}{2};p|, \langle\frac{1}{2},-\frac{1}{2};p|, \langle\frac{3}{2},\frac{3}{2};p|, \langle\frac{3}{2},\frac{1}{2};p|, \langle\frac{3}{2},-\frac{1}{2};p|, \langle\frac{3}{2},-\frac{3}{2};p|$

ket: $= |\frac{5}{2},\frac{5}{2};f\rangle, |\frac{5}{2},\frac{3}{2};f\rangle, |\frac{5}{2},\frac{1}{2};f\rangle, |\frac{5}{2},-\frac{1}{2};f\rangle, |\frac{5}{2},-\frac{3}{2};f\rangle, |\frac{5}{2},-\frac{5}{2};f\rangle, |\frac{7}{2},\frac{7}{2};f\rangle, |\frac{7}{2},\frac{5}{2};f\rangle, |\frac{7}{2},\frac{3}{2};f\rangle, |\frac{7}{2},\frac{1}{2};f\rangle, |\frac{7}{2},-\frac{1}{2};f\rangle, |\frac{7}{2},-\frac{3}{2};f\rangle, |\frac{7}{2},-\frac{5}{2};f\rangle, |\frac{7}{2},-\frac{7}{2};f\rangle$

Table 7: (p,f) block.

No.	multipole	matrix
281	symmetry	$-\frac{x^2}{2} - \frac{y^2}{2} + z^2$
	$\mathbb{Q}_2^{(a)}(A_1)$	$\begin{bmatrix} 0 & 0 & \frac{\sqrt{3}}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{3}}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{1}{7} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}}{14} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{6}}{42} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{2}}{14} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{6}}{42} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{2}}{14} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{1}{7} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}}{14} & 0 & 0 \end{bmatrix}$
282	symmetry	$\frac{\sqrt{3}(x-y)(x+y)}{2}$
	$\mathbb{Q}_2^{(a)}(B_1)$	$\begin{bmatrix} \frac{\sqrt{10}}{12} & 0 & 0 & 0 & \frac{\sqrt{2}}{12} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{2}}{12} & 0 & 0 & 0 & \frac{\sqrt{10}}{12} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{6}}{42} & 0 & 0 & \frac{\sqrt{70}}{28} & 0 & 0 & 0 & \frac{\sqrt{2}}{28} & 0 & 0 & 0 \\ \frac{\sqrt{5}}{21} & 0 & 0 & 0 & -\frac{2}{21} & 0 & 0 & \frac{\sqrt{30}}{28} & 0 & 0 & 0 & \frac{\sqrt{10}}{28} & 0 & 0 \\ 0 & \frac{2}{21} & 0 & 0 & 0 & -\frac{\sqrt{5}}{21} & 0 & 0 & \frac{\sqrt{10}}{28} & 0 & 0 & 0 & \frac{\sqrt{30}}{28} & 0 \\ 0 & 0 & \frac{\sqrt{6}}{42} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2}}{28} & 0 & 0 & 0 & \frac{\sqrt{70}}{28} \end{bmatrix}$
283	symmetry	$\sqrt{3}xy$
	$\mathbb{Q}_2^{(a)}(B_2)$	$\begin{bmatrix} \frac{\sqrt{10}i}{12} & 0 & 0 & 0 & -\frac{\sqrt{2}i}{12} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{2}i}{12} & 0 & 0 & 0 & -\frac{\sqrt{10}i}{12} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{6}i}{42} & 0 & 0 & \frac{\sqrt{70}i}{28} & 0 & 0 & 0 & -\frac{\sqrt{2}i}{28} & 0 & 0 & 0 \\ \frac{\sqrt{5}i}{21} & 0 & 0 & 0 & \frac{2i}{21} & 0 & 0 & \frac{\sqrt{30}i}{28} & 0 & 0 & 0 & -\frac{\sqrt{10}i}{28} & 0 & 0 \\ 0 & \frac{2i}{21} & 0 & 0 & 0 & \frac{\sqrt{5}i}{21} & 0 & 0 & \frac{\sqrt{10}i}{28} & 0 & 0 & 0 & -\frac{\sqrt{30}i}{28} & 0 \\ 0 & 0 & \frac{\sqrt{6}i}{42} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2}i}{28} & 0 & 0 & 0 & -\frac{\sqrt{70}i}{28} \end{bmatrix}$
284	symmetry	$\sqrt{3}yz$

No.	multipole	matrix

$\mathbb{Q}^{(a)}_{2,1}(E)$

$$\begin{pmatrix}
0 & -\frac{\sqrt2 i}{6} & 0 & -\frac{i}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & -\frac{i}{6} & 0 & -\frac{\sqrt2 i}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
\frac{\sqrt{15}i}{42} & 0 & \frac{\sqrt6 i}{28} & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}i}{14} & 0 & -\frac{\sqrt2 i}{14} & 0 & 0 & 0 & 0 \\
0 & -\frac{i}{42} & 0 & \frac{5\sqrt2 i}{84} & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}i}{14} & 0 & -\frac{\sqrt6 i}{14} & 0 & 0 & 0 \\
0 & 0 & -\frac{5\sqrt2 i}{84} & 0 & \frac{i}{42} & 0 & 0 & 0 & 0 & -\frac{\sqrt6 i}{14} & 0 & -\frac{\sqrt{10}i}{14} & 0 & 0 \\
0 & 0 & 0 & -\frac{\sqrt6 i}{28} & 0 & -\frac{\sqrt{15}i}{42} & 0 & 0 & 0 & 0 & -\frac{\sqrt2 i}{14} & 0 & -\frac{\sqrt{10}i}{14} & 0
\end{pmatrix}$$

285 symmetry $\sqrt{3}\,xz$

$\mathbb{Q}^{(a)}_{2,2}(E)$

$$\begin{pmatrix}
0 & -\frac{\sqrt2}{6} & 0 & \frac{1}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & -\frac{1}{6} & 0 & \frac{\sqrt2}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
\frac{\sqrt{15}}{42} & 0 & -\frac{\sqrt6}{28} & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}}{14} & 0 & \frac{\sqrt2}{14} & 0 & 0 & 0 & 0 \\
0 & -\frac{1}{42} & 0 & -\frac{5\sqrt2}{84} & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}}{14} & 0 & \frac{\sqrt6}{14} & 0 & 0 & 0 \\
0 & 0 & -\frac{5\sqrt2}{84} & 0 & -\frac{1}{42} & 0 & 0 & 0 & 0 & -\frac{\sqrt6}{14} & 0 & \frac{\sqrt{10}}{14} & 0 & 0 \\
0 & 0 & 0 & -\frac{\sqrt6}{28} & 0 & \frac{\sqrt{15}}{42} & 0 & 0 & 0 & 0 & -\frac{\sqrt2}{14} & 0 & \frac{\sqrt{10}}{14} & 0
\end{pmatrix}$$

286 symmetry $\dfrac{\sqrt{21}\left(x^4-3x^2y^2-3x^2z^2+y^4-3y^2z^2+z^4\right)}{6}$

$\mathbb{Q}^{(a)}_{4}(A_1,1)$

$$\begin{pmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt7}{12} & 0 & 0 & 0 & -\frac{\sqrt5}{12} \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt5}{12} & 0 & 0 & 0 & \frac{\sqrt7}{12} & 0 & 0 & 0 \\
0 & \frac{\sqrt7}{28} & 0 & 0 & 0 & \frac{\sqrt{35}}{28} & 0 & 0 & -\frac{\sqrt{70}}{56} & 0 & 0 & 0 & -\frac{\sqrt{210}}{168} & 0 \\
0 & 0 & -\frac{\sqrt{42}}{28} & 0 & 0 & 0 & 0 & 0 & \frac{5\sqrt{14}}{168} & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}}{24} \\
0 & 0 & 0 & \frac{\sqrt{42}}{28} & 0 & 0 & -\frac{\sqrt{10}}{24} & 0 & 0 & 0 & \frac{5\sqrt{14}}{168} & 0 & 0 & 0 \\
-\frac{\sqrt{35}}{28} & 0 & 0 & 0 & -\frac{\sqrt7}{28} & 0 & 0 & -\frac{\sqrt{210}}{168} & 0 & 0 & 0 & -\frac{\sqrt{70}}{56} & 0 & 0
\end{pmatrix}$$

287 symmetry $-\dfrac{\sqrt{15}\left(x^4-12x^2y^2+6x^2z^2+y^4+6y^2z^2-2z^4\right)}{12}$

$\mathbb{Q}^{(a)}_{4}(A_1,2)$

$$\begin{pmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt5}{12} & 0 & 0 & 0 & \frac{\sqrt7}{12} \\
0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt7}{12} & 0 & 0 & 0 & \frac{\sqrt5}{12} & 0 & 0 & 0 \\
0 & \frac{\sqrt5}{28} & 0 & 0 & 0 & -\frac{1}{4} & 0 & 0 & -\frac{5\sqrt2}{56} & 0 & 0 & 0 & \frac{\sqrt6}{24} & 0 \\
0 & 0 & -\frac{\sqrt{30}}{28} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{5\sqrt{10}}{168} & 0 & 0 & 0 & \frac{\sqrt{14}}{24} \\
0 & 0 & 0 & \frac{\sqrt{30}}{28} & 0 & 0 & \frac{\sqrt{14}}{24} & 0 & 0 & 0 & \frac{5\sqrt{10}}{168} & 0 & 0 & 0 \\
\frac{1}{4} & 0 & 0 & 0 & -\frac{\sqrt5}{28} & 0 & 0 & \frac{\sqrt6}{24} & 0 & 0 & 0 & -\frac{5\sqrt2}{56} & 0 & 0
\end{pmatrix}$$

288 symmetry $\dfrac{\sqrt{35}\,xy(x-y)(x+y)}{2}$

Table 7

No.	multipole	matrix

$\mathbb{Q}_4^{(a)}(A_2)$

$$\begin{pmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{6} \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{21}i}{14} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{14}i}{28} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}i}{12} \\
0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{12} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
-\frac{\sqrt{21}i}{14} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{14}i}{28} & 0 & 0 & 0 & 0 & 0 & 0
\end{pmatrix}$$

| 289 | symmetry | $\frac{\sqrt{5}(x-y)(x+y)\left(x^2+y^2-6z^2\right)}{4}$ |

$\mathbb{Q}_4^{(a)}(B_1)$

$$\begin{pmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{12} & 0 & 0 & 0 & \frac{1}{4} & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{1}{4} & 0 & 0 & 0 & -\frac{\sqrt{3}}{12} & 0 \\
0 & 0 & 0 & -\frac{\sqrt{30}}{28} & 0 & 0 & \frac{\sqrt{14}}{56} & 0 & 0 & 0 & \frac{3\sqrt{10}}{56} & 0 & 0 & 0 \\
\frac{3}{28} & 0 & 0 & 0 & \frac{3\sqrt{5}}{28} & 0 & 0 & -\frac{11\sqrt{6}}{168} & 0 & 0 & 0 & \frac{\sqrt{2}}{56} & 0 & 0 \\
0 & -\frac{3\sqrt{5}}{28} & 0 & 0 & 0 & -\frac{3}{28} & 0 & 0 & \frac{\sqrt{2}}{56} & 0 & 0 & 0 & -\frac{11\sqrt{6}}{168} & 0 \\
0 & 0 & \frac{\sqrt{30}}{28} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{10}}{56} & 0 & 0 & 0 & \frac{\sqrt{14}}{56}
\end{pmatrix}$$

| 290 | symmetry | $-\frac{\sqrt{5}xy\left(x^2+y^2-6z^2\right)}{2}$ |

$\mathbb{Q}_4^{(a)}(B_2)$

$$\begin{pmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{12} & 0 & 0 & 0 & \frac{i}{4} & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{i}{4} & 0 & 0 & 0 & -\frac{\sqrt{3}i}{12} & 0 \\
0 & 0 & 0 & -\frac{\sqrt{30}i}{28} & 0 & 0 & -\frac{\sqrt{14}i}{56} & 0 & 0 & 0 & \frac{3\sqrt{10}i}{56} & 0 & 0 & 0 \\
-\frac{3i}{28} & 0 & 0 & 0 & \frac{3\sqrt{5}i}{28} & 0 & 0 & \frac{11\sqrt{6}i}{168} & 0 & 0 & 0 & \frac{\sqrt{2}i}{56} & 0 & 0 \\
0 & \frac{3\sqrt{5}i}{28} & 0 & 0 & 0 & -\frac{3i}{28} & 0 & 0 & -\frac{\sqrt{2}i}{56} & 0 & 0 & 0 & -\frac{11\sqrt{6}i}{168} & 0 \\
0 & 0 & -\frac{\sqrt{30}i}{28} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{10}i}{56} & 0 & 0 & 0 & \frac{\sqrt{14}i}{56}
\end{pmatrix}$$

| 291 | symmetry | $\frac{\sqrt{35}yz(y-z)(y+z)}{2}$ |

$\mathbb{Q}_{4,1}^{(a)}(E,1)$

$$\begin{pmatrix}
0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{48} & 0 & -\frac{\sqrt{7}i}{16} & 0 & -\frac{\sqrt{105}i}{48} & 0 & -\frac{\sqrt{21}i}{48} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{21}i}{48} & 0 & \frac{\sqrt{105}i}{48} & 0 & \frac{\sqrt{7}i}{16} & 0 & \frac{\sqrt{3}i}{48} \\
\frac{\sqrt{21}i}{112} & 0 & \frac{\sqrt{210}i}{112} & 0 & \frac{\sqrt{105}i}{112} & 0 & 0 & -\frac{3\sqrt{14}i}{112} & 0 & -\frac{\sqrt{70}i}{56} & 0 & -\frac{\sqrt{42}i}{112} & 0 & 0 \\
0 & -\frac{3\sqrt{35}i}{112} & 0 & -\frac{3\sqrt{70}i}{112} & 0 & -\frac{3\sqrt{7}i}{112} & \frac{\sqrt{6}i}{48} & 0 & \frac{\sqrt{14}i}{28} & 0 & \frac{\sqrt{210}i}{336} & 0 & -\frac{\sqrt{42}i}{168} & 0 \\
\frac{3\sqrt{7}i}{112} & 0 & \frac{3\sqrt{70}i}{112} & 0 & \frac{3\sqrt{35}i}{112} & 0 & 0 & -\frac{\sqrt{42}i}{168} & 0 & \frac{\sqrt{210}i}{336} & 0 & \frac{\sqrt{14}i}{28} & 0 & \frac{\sqrt{6}i}{48} \\
0 & -\frac{\sqrt{105}i}{112} & 0 & -\frac{\sqrt{210}i}{112} & 0 & -\frac{\sqrt{21}i}{112} & 0 & 0 & -\frac{\sqrt{42}i}{112} & 0 & -\frac{\sqrt{70}i}{56} & 0 & -\frac{3\sqrt{14}i}{112} & 0
\end{pmatrix}$$

| 292 | symmetry | $\frac{\sqrt{35}xz(x-z)(x+z)}{2}$ |

Table 7

No.	multipole	matrix

$\mathbb{Q}_{4,2}^{(a)}(E,1)$

$$\begin{bmatrix}
0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{48} & 0 & -\frac{\sqrt{7}}{16} & 0 & \frac{\sqrt{105}}{48} & 0 & -\frac{\sqrt{21}}{48} & 0 \\[4pt]
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{21}}{48} & 0 & \frac{\sqrt{105}}{48} & 0 & -\frac{\sqrt{7}}{16} & 0 & \frac{\sqrt{3}}{48} \\[4pt]
\frac{\sqrt{21}}{112} & 0 & -\frac{\sqrt{210}}{112} & 0 & \frac{\sqrt{105}}{112} & 0 & 0 & -\frac{3\sqrt{14}}{112} & 0 & \frac{\sqrt{70}}{56} & 0 & -\frac{\sqrt{42}}{112} & 0 & 0 \\[4pt]
0 & -\frac{3\sqrt{35}}{112} & 0 & \frac{3\sqrt{70}}{112} & 0 & -\frac{3\sqrt{7}}{112} & -\frac{\sqrt{6}}{48} & 0 & \frac{\sqrt{14}}{28} & 0 & -\frac{\sqrt{210}}{336} & 0 & -\frac{\sqrt{42}}{168} & 0 \\[4pt]
-\frac{3\sqrt{7}}{112} & 0 & \frac{3\sqrt{70}}{112} & 0 & -\frac{3\sqrt{35}}{112} & 0 & 0 & \frac{\sqrt{42}}{168} & 0 & \frac{\sqrt{210}}{336} & 0 & -\frac{\sqrt{14}}{28} & 0 & \frac{\sqrt{6}}{48} \\[4pt]
0 & \frac{\sqrt{105}}{112} & 0 & -\frac{\sqrt{210}}{112} & 0 & \frac{\sqrt{21}}{112} & 0 & 0 & \frac{\sqrt{42}}{112} & 0 & -\frac{\sqrt{70}}{56} & 0 & \frac{3\sqrt{14}}{112} & 0
\end{bmatrix}$$

293   symmetry $\dfrac{\sqrt{5}yz(6x^2-y^2-z^2)}{2}$

$\mathbb{Q}_{4,1}^{(a)}(E,2)$

$$\begin{bmatrix}
0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{21}i}{48} & 0 & -\frac{i}{16} & 0 & -\frac{\sqrt{15}i}{48} & 0 & \frac{7\sqrt{3}i}{48} & 0 \\[4pt]
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{7\sqrt{3}i}{48} & 0 & \frac{\sqrt{15}i}{48} & 0 & \frac{i}{16} & 0 & -\frac{\sqrt{21}i}{48} \\[4pt]
\frac{\sqrt{3}i}{112} & 0 & \frac{\sqrt{30}i}{112} & 0 & -\frac{\sqrt{15}i}{16} & 0 & 0 & -\frac{3\sqrt{2}i}{112} & 0 & -\frac{\sqrt{10}i}{56} & 0 & \frac{\sqrt{6}i}{16} & 0 & 0 \\[4pt]
0 & -\frac{3\sqrt{5}i}{112} & 0 & -\frac{3\sqrt{10}i}{112} & 0 & \frac{3i}{16} & -\frac{\sqrt{42}i}{48} & 0 & \frac{\sqrt{2}i}{28} & 0 & \frac{\sqrt{30}i}{336} & 0 & \frac{\sqrt{6}i}{24} & 0 \\[4pt]
-\frac{3i}{16} & 0 & \frac{3\sqrt{10}i}{112} & 0 & \frac{3\sqrt{5}i}{112} & 0 & 0 & \frac{\sqrt{6}i}{24} & 0 & \frac{\sqrt{30}i}{336} & 0 & \frac{\sqrt{2}i}{28} & 0 & -\frac{\sqrt{42}i}{48} \\[4pt]
0 & \frac{\sqrt{15}i}{16} & 0 & -\frac{\sqrt{30}i}{112} & 0 & -\frac{\sqrt{3}i}{112} & 0 & 0 & \frac{\sqrt{6}i}{16} & 0 & -\frac{\sqrt{10}i}{56} & 0 & -\frac{3\sqrt{2}i}{112} & 0
\end{bmatrix}$$

294   symmetry $-\dfrac{\sqrt{5}xz(x^2-6y^2+z^2)}{2}$

$\mathbb{Q}_{4,2}^{(a)}(E,2)$

$$\begin{bmatrix}
0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{21}}{48} & 0 & -\frac{1}{16} & 0 & \frac{\sqrt{15}}{48} & 0 & \frac{7\sqrt{3}}{48} & 0 \\[4pt]
0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{7\sqrt{3}}{48} & 0 & \frac{\sqrt{15}}{48} & 0 & -\frac{1}{16} & 0 & -\frac{\sqrt{21}}{48} \\[4pt]
\frac{\sqrt{3}}{112} & 0 & -\frac{\sqrt{30}}{112} & 0 & -\frac{\sqrt{15}}{16} & 0 & 0 & -\frac{3\sqrt{2}}{112} & 0 & \frac{\sqrt{10}}{56} & 0 & \frac{\sqrt{6}}{16} & 0 & 0 \\[4pt]
0 & -\frac{3\sqrt{5}}{112} & 0 & \frac{3\sqrt{10}}{112} & 0 & \frac{3}{16} & \frac{\sqrt{42}}{48} & 0 & \frac{\sqrt{2}}{28} & 0 & -\frac{\sqrt{30}}{336} & 0 & \frac{\sqrt{6}}{24} & 0 \\[4pt]
\frac{3}{16} & 0 & \frac{3\sqrt{10}}{112} & 0 & -\frac{3\sqrt{5}}{112} & 0 & 0 & -\frac{\sqrt{6}}{24} & 0 & \frac{\sqrt{30}}{336} & 0 & -\frac{\sqrt{2}}{28} & 0 & -\frac{\sqrt{42}}{48} \\[4pt]
0 & -\frac{\sqrt{15}}{16} & 0 & -\frac{\sqrt{30}}{112} & 0 & \frac{\sqrt{3}}{112} & 0 & 0 & -\frac{\sqrt{6}}{16} & 0 & -\frac{\sqrt{10}}{56} & 0 & \frac{3\sqrt{2}}{112} & 0
\end{bmatrix}$$

295   symmetry $\dfrac{\sqrt{21}(x^4-3x^2y^2-3x^2z^2+y^4-3y^2z^2+z^4)}{6}$

$\mathbb{Q}_{4}^{(1,-1;a)}(A_1,1)$

$$\begin{bmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{21}}{24} & 0 & 0 & 0 & -\frac{\sqrt{15}}{24} \\[4pt]
0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{24} & 0 & 0 & 0 & \frac{\sqrt{21}}{24} & 0 & 0 & 0 \\[4pt]
0 & \frac{\sqrt{21}}{168} & 0 & 0 & 0 & \frac{\sqrt{105}}{168} & 0 & 0 & \frac{\sqrt{210}}{56} & 0 & 0 & 0 & \frac{\sqrt{70}}{56} & 0 \\[4pt]
0 & 0 & -\frac{\sqrt{14}}{56} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{5\sqrt{42}}{168} & 0 & 0 & 0 & \frac{\sqrt{30}}{24} \\[4pt]
0 & 0 & 0 & \frac{\sqrt{14}}{56} & 0 & 0 & \frac{\sqrt{30}}{24} & 0 & 0 & 0 & -\frac{5\sqrt{42}}{168} & 0 & 0 & 0 \\[4pt]
-\frac{\sqrt{105}}{168} & 0 & 0 & 0 & -\frac{\sqrt{21}}{168} & 0 & 0 & \frac{\sqrt{70}}{56} & 0 & 0 & 0 & \frac{\sqrt{210}}{56} & 0 & 0
\end{bmatrix}$$

296   symmetry $-\dfrac{\sqrt{15}(x^4-12x^2y^2+6x^2z^2+y^4+6y^2z^2-2z^4)}{12}$

Table 7

No.	multipole	matrix

$\mathbb{Q}_4^{(1,-1;a)}(A_1,2)$

$$\begin{pmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{24} & 0 & 0 & 0 & \frac{\sqrt{21}}{24} \\
0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{21}}{24} & 0 & 0 & 0 & \frac{\sqrt{15}}{24} & 0 & 0 & 0 \\
0 & \frac{\sqrt{15}}{168} & 0 & 0 & 0 & -\frac{\sqrt{3}}{24} & 0 & 0 & \frac{5\sqrt{6}}{56} & 0 & 0 & 0 & -\frac{\sqrt{2}}{8} & 0 \\
0 & 0 & -\frac{\sqrt{10}}{56} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{5\sqrt{30}}{168} & 0 & 0 & 0 & -\frac{\sqrt{42}}{24} \\
0 & 0 & 0 & \frac{\sqrt{10}}{56} & 0 & 0 & -\frac{\sqrt{42}}{24} & 0 & 0 & 0 & -\frac{5\sqrt{30}}{168} & 0 & 0 & 0 \\
\frac{\sqrt{3}}{24} & 0 & 0 & 0 & -\frac{\sqrt{15}}{168} & 0 & 0 & -\frac{\sqrt{2}}{8} & 0 & 0 & 0 & \frac{5\sqrt{6}}{56} & 0 & 0
\end{pmatrix}$$

| 297 | symmetry | $\dfrac{\sqrt{35}xy(x-y)(x+y)}{2}$ |

$\mathbb{Q}_4^{(1,-1;a)}(A_2)$

$$\begin{pmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{i}{4} \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{i}{4} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}i}{28} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{42}i}{28} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}i}{4} \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2}i}{4} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
-\frac{\sqrt{7}i}{28} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{42}i}{28} & 0 & 0 & 0 & 0 & 0 & 0
\end{pmatrix}$$

| 298 | symmetry | $\dfrac{\sqrt{5}(x-y)(x+y)\left(x^2+y^2-6z^2\right)}{4}$ |

$\mathbb{Q}_4^{(1,-1;a)}(B_1)$

$$\begin{pmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{1}{8} & 0 & 0 & 0 & \frac{\sqrt{3}}{8} & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{8} & 0 & 0 & 0 & -\frac{1}{8} & 0 \\
0 & 0 & 0 & -\frac{\sqrt{10}}{56} & 0 & 0 & -\frac{\sqrt{42}}{56} & 0 & 0 & 0 & -\frac{3\sqrt{30}}{56} & 0 & 0 & 0 \\
\frac{\sqrt{3}}{56} & 0 & 0 & 0 & \frac{\sqrt{15}}{56} & 0 & 0 & \frac{11\sqrt{2}}{56} & 0 & 0 & 0 & -\frac{\sqrt{6}}{56} & 0 & 0 \\
0 & -\frac{\sqrt{15}}{56} & 0 & 0 & 0 & -\frac{\sqrt{3}}{56} & 0 & 0 & -\frac{\sqrt{6}}{56} & 0 & 0 & 0 & \frac{11\sqrt{2}}{56} & 0 \\
0 & 0 & \frac{\sqrt{10}}{56} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{30}}{56} & 0 & 0 & 0 & -\frac{\sqrt{42}}{56}
\end{pmatrix}$$

| 299 | symmetry | $-\dfrac{\sqrt{5}xy\left(x^2+y^2-6z^2\right)}{2}$ |

$\mathbb{Q}_4^{(1,-1;a)}(B_2)$

$$\begin{pmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{i}{8} & 0 & 0 & 0 & \frac{\sqrt{3}i}{8} & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{8} & 0 & 0 & 0 & -\frac{i}{8} & 0 \\
0 & 0 & 0 & -\frac{\sqrt{10}i}{56} & 0 & 0 & \frac{\sqrt{42}i}{56} & 0 & 0 & 0 & -\frac{3\sqrt{30}i}{56} & 0 & 0 & 0 \\
-\frac{\sqrt{3}i}{56} & 0 & 0 & 0 & \frac{\sqrt{15}i}{56} & 0 & 0 & -\frac{11\sqrt{2}i}{56} & 0 & 0 & 0 & -\frac{\sqrt{6}i}{56} & 0 & 0 \\
0 & \frac{\sqrt{15}i}{56} & 0 & 0 & 0 & -\frac{\sqrt{3}i}{56} & 0 & 0 & \frac{\sqrt{6}i}{56} & 0 & 0 & 0 & \frac{11\sqrt{2}i}{56} & 0 \\
0 & 0 & -\frac{\sqrt{10}i}{56} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{30}i}{56} & 0 & 0 & 0 & -\frac{\sqrt{42}i}{56}
\end{pmatrix}$$

| 300 | symmetry | $\dfrac{\sqrt{35}yz(y-z)(y+z)}{2}$ |

Table 7

No.	multipole	matrix

$\mathbb{Q}_{4,1}^{(1,-1;a)}(E,1)$

$$\begin{bmatrix}
0 & 0 & 0 & 0 & 0 & 0 & -\frac{i}{32} & 0 & -\frac{\sqrt{21}i}{32} & 0 & -\frac{\sqrt{35}i}{32} & 0 & -\frac{\sqrt{7}i}{32} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}i}{32} & 0 & \frac{\sqrt{35}i}{32} & 0 & \frac{\sqrt{21}i}{32} & 0 & \frac{i}{32} \\
\frac{\sqrt{7}i}{224} & 0 & \frac{\sqrt{70}i}{224} & 0 & \frac{\sqrt{35}i}{224} & 0 & 0 & \frac{3\sqrt{42}i}{112} & 0 & \frac{\sqrt{210}i}{56} & 0 & \frac{3\sqrt{14}i}{112} & 0 & 0 \\
0 & -\frac{\sqrt{105}i}{224} & 0 & -\frac{\sqrt{210}i}{224} & 0 & -\frac{\sqrt{21}i}{224} & -\frac{\sqrt{2}i}{16} & 0 & -\frac{\sqrt{42}i}{28} & 0 & -\frac{\sqrt{70}i}{112} & 0 & \frac{\sqrt{14}i}{56} & 0 \\
\frac{\sqrt{21}i}{224} & 0 & \frac{\sqrt{210}i}{224} & 0 & \frac{\sqrt{105}i}{224} & 0 & 0 & \frac{\sqrt{14}i}{56} & 0 & -\frac{\sqrt{70}i}{112} & 0 & -\frac{\sqrt{42}i}{28} & 0 & -\frac{\sqrt{2}i}{16} \\
0 & -\frac{\sqrt{35}i}{224} & 0 & -\frac{\sqrt{70}i}{224} & 0 & -\frac{\sqrt{7}i}{224} & 0 & 0 & \frac{3\sqrt{14}i}{112} & 0 & \frac{\sqrt{210}i}{56} & 0 & \frac{3\sqrt{42}i}{112} & 0
\end{bmatrix}$$

301 symmetry $\quad \dfrac{\sqrt{35}xz(x-z)(x+z)}{2}$

$\mathbb{Q}_{4,2}^{(1,-1;a)}(E,1)$

$$\begin{bmatrix}
0 & 0 & 0 & 0 & 0 & 0 & \frac{1}{32} & 0 & -\frac{\sqrt{21}}{32} & 0 & \frac{\sqrt{35}}{32} & 0 & -\frac{\sqrt{7}}{32} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}}{32} & 0 & \frac{\sqrt{35}}{32} & 0 & -\frac{\sqrt{21}}{32} & 0 & \frac{1}{32} \\
\frac{\sqrt{7}}{224} & 0 & -\frac{\sqrt{70}}{224} & 0 & \frac{\sqrt{35}}{224} & 0 & 0 & \frac{3\sqrt{42}}{112} & 0 & -\frac{\sqrt{210}}{56} & 0 & \frac{3\sqrt{14}}{112} & 0 & 0 \\
0 & -\frac{\sqrt{105}}{224} & 0 & \frac{\sqrt{210}}{224} & 0 & -\frac{\sqrt{21}}{224} & \frac{\sqrt{2}}{16} & 0 & -\frac{\sqrt{42}}{28} & 0 & \frac{\sqrt{70}}{112} & 0 & \frac{\sqrt{14}}{56} & 0 \\
-\frac{\sqrt{21}}{224} & 0 & \frac{\sqrt{210}}{224} & 0 & -\frac{\sqrt{105}}{224} & 0 & 0 & -\frac{\sqrt{14}}{56} & 0 & -\frac{\sqrt{70}}{112} & 0 & \frac{\sqrt{42}}{28} & 0 & -\frac{\sqrt{2}}{16} \\
0 & \frac{\sqrt{35}}{224} & 0 & -\frac{\sqrt{70}}{224} & 0 & \frac{\sqrt{7}}{224} & 0 & 0 & -\frac{3\sqrt{14}}{112} & 0 & \frac{\sqrt{210}}{56} & 0 & -\frac{3\sqrt{42}}{112} & 0
\end{bmatrix}$$

302 symmetry $\quad \dfrac{\sqrt{5}yz\left(6x^2-y^2-z^2\right)}{2}$

$\mathbb{Q}_{4,1}^{(1,-1;a)}(E,2)$

$$\begin{bmatrix}
0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}i}{32} & 0 & -\frac{\sqrt{3}i}{32} & 0 & -\frac{\sqrt{5}i}{32} & 0 & \frac{7i}{32} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{7i}{32} & 0 & \frac{\sqrt{5}i}{32} & 0 & \frac{\sqrt{3}i}{32} & 0 & -\frac{\sqrt{7}i}{32} \\
\frac{i}{224} & 0 & \frac{\sqrt{10}i}{224} & 0 & -\frac{\sqrt{5}i}{32} & 0 & 0 & \frac{3\sqrt{6}i}{112} & 0 & \frac{\sqrt{30}i}{56} & 0 & -\frac{3\sqrt{2}i}{16} & 0 & 0 \\
0 & -\frac{\sqrt{15}i}{224} & 0 & -\frac{\sqrt{30}i}{224} & 0 & \frac{\sqrt{3}i}{32} & \frac{\sqrt{14}i}{16} & 0 & -\frac{\sqrt{6}i}{28} & 0 & -\frac{\sqrt{10}i}{112} & 0 & -\frac{\sqrt{2}i}{8} & 0 \\
-\frac{\sqrt{3}i}{32} & 0 & \frac{\sqrt{30}i}{224} & 0 & \frac{\sqrt{15}i}{224} & 0 & 0 & -\frac{\sqrt{2}i}{8} & 0 & -\frac{\sqrt{10}i}{112} & 0 & -\frac{\sqrt{6}i}{28} & 0 & \frac{\sqrt{14}i}{16} \\
0 & \frac{\sqrt{5}i}{32} & 0 & -\frac{\sqrt{10}i}{224} & 0 & -\frac{i}{224} & 0 & 0 & -\frac{3\sqrt{2}i}{16} & 0 & \frac{\sqrt{30}i}{56} & 0 & \frac{3\sqrt{6}i}{112} & 0
\end{bmatrix}$$

303 symmetry $\quad -\dfrac{\sqrt{5}xz\left(x^2-6y^2+z^2\right)}{2}$

$\mathbb{Q}_{4,2}^{(1,-1;a)}(E,2)$

$$\begin{bmatrix}
0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}}{32} & 0 & -\frac{\sqrt{3}}{32} & 0 & \frac{\sqrt{5}}{32} & 0 & \frac{7}{32} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{7}{32} & 0 & \frac{\sqrt{5}}{32} & 0 & -\frac{\sqrt{3}}{32} & 0 & -\frac{\sqrt{7}}{32} \\
\frac{1}{224} & 0 & -\frac{\sqrt{10}}{224} & 0 & -\frac{\sqrt{5}}{32} & 0 & 0 & \frac{3\sqrt{6}}{112} & 0 & -\frac{\sqrt{30}}{56} & 0 & -\frac{3\sqrt{2}}{16} & 0 & 0 \\
0 & -\frac{\sqrt{15}}{224} & 0 & \frac{\sqrt{30}}{224} & 0 & \frac{\sqrt{3}}{32} & -\frac{\sqrt{14}}{16} & 0 & -\frac{\sqrt{6}}{28} & 0 & \frac{\sqrt{10}}{112} & 0 & -\frac{\sqrt{2}}{8} & 0 \\
\frac{\sqrt{3}}{32} & 0 & \frac{\sqrt{30}}{224} & 0 & -\frac{\sqrt{15}}{224} & 0 & 0 & \frac{\sqrt{2}}{8} & 0 & -\frac{\sqrt{10}}{112} & 0 & \frac{\sqrt{6}}{28} & 0 & \frac{\sqrt{14}}{16} \\
0 & -\frac{\sqrt{5}}{32} & 0 & -\frac{\sqrt{10}}{224} & 0 & \frac{1}{224} & 0 & 0 & \frac{3\sqrt{2}}{16} & 0 & \frac{\sqrt{30}}{56} & 0 & -\frac{3\sqrt{6}}{112} & 0
\end{bmatrix}$$

304 symmetry $\quad -\dfrac{x^2}{2}-\dfrac{y^2}{2}+z^2$

continued …

Table 7

No.	multipole	matrix

$$\mathbb{Q}_2^{(1,0;a)}(A_1)$$

$$\begin{bmatrix}
0 & 0 & -\frac{\sqrt{2}}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & -\frac{\sqrt{2}}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & \frac{5\sqrt{6}}{42} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{21} & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & \frac{5}{42} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{7} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & -\frac{5}{42} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{7} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & -\frac{5\sqrt{6}}{42} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{21} & 0 & 0
\end{bmatrix}$$

| 305 | symmetry | $\frac{\sqrt{3}(x-y)(x+y)}{2}$ |

$$\mathbb{Q}_2^{(1,0;a)}(B_1)$$

$$\begin{bmatrix}
-\frac{\sqrt{15}}{18} & 0 & 0 & 0 & -\frac{\sqrt{3}}{18} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & -\frac{\sqrt{3}}{18} & 0 & 0 & 0 & -\frac{\sqrt{15}}{18} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & \frac{5}{42} & 0 & 0 & \frac{\sqrt{105}}{42} & 0 & 0 & 0 & \frac{\sqrt{3}}{42} & 0 & 0 & 0 \\
-\frac{5\sqrt{30}}{126} & 0 & 0 & 0 & \frac{5\sqrt{6}}{63} & 0 & 0 & \frac{\sqrt{5}}{14} & 0 & 0 & 0 & \frac{\sqrt{15}}{42} & 0 & 0 \\
0 & -\frac{5\sqrt{6}}{63} & 0 & 0 & 0 & \frac{5\sqrt{30}}{126} & 0 & 0 & \frac{\sqrt{15}}{42} & 0 & 0 & 0 & \frac{\sqrt{5}}{14} & 0 \\
0 & 0 & -\frac{5}{42} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{42} & 0 & 0 & 0 & \frac{\sqrt{105}}{42}
\end{bmatrix}$$

| 306 | symmetry | $\sqrt{3}xy$ |

$$\mathbb{Q}_2^{(1,0;a)}(B_2)$$

$$\begin{bmatrix}
-\frac{\sqrt{15}i}{18} & 0 & 0 & 0 & \frac{\sqrt{3}i}{18} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & -\frac{\sqrt{3}i}{18} & 0 & 0 & 0 & \frac{\sqrt{15}i}{18} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & -\frac{5i}{42} & 0 & 0 & \frac{\sqrt{105}i}{42} & 0 & 0 & 0 & -\frac{\sqrt{3}i}{42} & 0 & 0 & 0 \\
-\frac{5\sqrt{30}i}{126} & 0 & 0 & 0 & -\frac{5\sqrt{6}i}{63} & 0 & 0 & \frac{\sqrt{5}i}{14} & 0 & 0 & 0 & -\frac{\sqrt{15}i}{42} & 0 & 0 \\
0 & -\frac{5\sqrt{6}i}{63} & 0 & 0 & 0 & -\frac{5\sqrt{30}i}{126} & 0 & 0 & \frac{\sqrt{15}i}{42} & 0 & 0 & 0 & -\frac{\sqrt{5}i}{14} & 0 \\
0 & 0 & -\frac{5i}{42} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{42} & 0 & 0 & 0 & -\frac{\sqrt{105}i}{42}
\end{bmatrix}$$

| 307 | symmetry | $\sqrt{3}yz$ |

$$\mathbb{Q}_{2,1}^{(1,0;a)}(E)$$

$$\begin{bmatrix}
0 & \frac{\sqrt{3}i}{9} & 0 & \frac{\sqrt{6}i}{18} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & \frac{\sqrt{6}i}{18} & 0 & \frac{\sqrt{3}i}{9} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
-\frac{5\sqrt{10}i}{84} & 0 & -\frac{5i}{28} & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{21} & 0 & -\frac{\sqrt{3}i}{21} & 0 & 0 & 0 & 0 \\
0 & \frac{5\sqrt{6}i}{252} & 0 & -\frac{25\sqrt{3}i}{252} & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{21} & 0 & -\frac{i}{7} & 0 & 0 & 0 \\
0 & 0 & \frac{25\sqrt{3}i}{252} & 0 & -\frac{5\sqrt{6}i}{252} & 0 & 0 & 0 & 0 & -\frac{i}{7} & 0 & -\frac{\sqrt{15}i}{21} & 0 & 0 \\
0 & 0 & 0 & \frac{5i}{28} & 0 & \frac{5\sqrt{10}i}{84} & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{21} & 0 & -\frac{\sqrt{15}i}{21} & 0
\end{bmatrix}$$

| 308 | symmetry | $\sqrt{3}xz$ |

continued …

Table 7

No.	multipole	matrix

$$\mathbb{Q}_{2,2}^{(1,0;a)}(E)$$

$$
\begin{bmatrix}
0 & \frac{\sqrt{3}}{9} & 0 & -\frac{\sqrt{6}}{18} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & \frac{\sqrt{6}}{18} & 0 & -\frac{\sqrt{3}}{9} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
-\frac{5\sqrt{10}}{84} & 0 & \frac{5}{28} & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{21} & 0 & \frac{\sqrt{3}}{21} & 0 & 0 & 0 & 0 \\
0 & \frac{5\sqrt{6}}{252} & 0 & \frac{25\sqrt{3}}{252} & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{21} & 0 & \frac{1}{7} & 0 & 0 & 0 \\
0 & 0 & \frac{25\sqrt{3}}{252} & 0 & \frac{5\sqrt{6}}{252} & 0 & 0 & 0 & 0 & -\frac{1}{7} & 0 & \frac{\sqrt{15}}{21} & 0 & 0 \\
0 & 0 & 0 & \frac{5}{28} & 0 & -\frac{5\sqrt{10}}{84} & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{21} & 0 & \frac{\sqrt{15}}{21} & 0
\end{bmatrix}
$$

309 symmetry

$$\frac{\sqrt{21}\left(x^4-3x^2y^2-3x^2z^2+y^4-3y^2z^2+z^4\right)}{6}$$

$$\mathbb{Q}_4^{(1,0;a)}(A_1,1)$$

$$
\begin{bmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{35}}{24} & 0 & 0 & 0 & -\frac{5}{24} \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{5}{24} & 0 & 0 & 0 & \frac{\sqrt{35}}{24} & 0 & 0 & 0 \\
0 & -\frac{\sqrt{35}}{56} & 0 & 0 & 0 & -\frac{5\sqrt{7}}{56} & 0 & 0 & -\frac{\sqrt{14}}{56} & 0 & 0 & 0 & -\frac{\sqrt{42}}{168} & 0 \\
0 & 0 & \frac{\sqrt{210}}{56} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{70}}{168} & 0 & 0 & 0 & -\frac{\sqrt{2}}{24} \\
0 & 0 & 0 & -\frac{\sqrt{210}}{56} & 0 & 0 & -\frac{\sqrt{2}}{24} & 0 & 0 & 0 & \frac{\sqrt{70}}{168} & 0 & 0 & 0 \\
\frac{5\sqrt{7}}{56} & 0 & 0 & 0 & \frac{\sqrt{35}}{56} & 0 & 0 & -\frac{\sqrt{42}}{168} & 0 & 0 & 0 & -\frac{\sqrt{14}}{56} & 0 & 0
\end{bmatrix}
$$

310 symmetry

$$-\frac{\sqrt{15}\left(x^4-12x^2y^2+6x^2z^2+y^4+6y^2z^2-2z^4\right)}{12}$$

$$\mathbb{Q}_4^{(1,0;a)}(A_1,2)$$

$$
\begin{bmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{5}{24} & 0 & 0 & 0 & \frac{\sqrt{35}}{24} \\
0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{35}}{24} & 0 & 0 & 0 & \frac{5}{24} & 0 & 0 & 0 \\
0 & -\frac{5}{56} & 0 & 0 & 0 & \frac{\sqrt{5}}{8} & 0 & 0 & -\frac{\sqrt{10}}{56} & 0 & 0 & 0 & \frac{\sqrt{30}}{120} & 0 \\
0 & 0 & \frac{5\sqrt{6}}{56} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{5\sqrt{2}}{168} & 0 & 0 & 0 & \frac{\sqrt{70}}{120} \\
0 & 0 & 0 & -\frac{5\sqrt{6}}{56} & 0 & 0 & \frac{\sqrt{70}}{120} & 0 & 0 & 0 & \frac{5\sqrt{2}}{168} & 0 & 0 & 0 \\
-\frac{\sqrt{5}}{8} & 0 & 0 & 0 & \frac{5}{56} & 0 & 0 & \frac{\sqrt{30}}{120} & 0 & 0 & 0 & -\frac{\sqrt{10}}{56} & 0 & 0
\end{bmatrix}
$$

311 symmetry

$$\frac{\sqrt{35}xy(x-y)(x+y)}{2}$$

$$\mathbb{Q}_4^{(1,0;a)}(A_2)$$

$$
\begin{bmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{12} \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{12} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & \frac{\sqrt{105}i}{28} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{70}i}{140} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}i}{60} \\
0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}i}{60} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
\frac{\sqrt{105}i}{28} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}i}{140} & 0 & 0 & 0 & 0 & 0 & 0
\end{bmatrix}
$$

312 symmetry

$$\frac{\sqrt{5}(x-y)(x+y)\left(x^2+y^2-6z^2\right)}{4}$$

continued …

Table 7

No.	multipole	matrix
	$\mathbb{Q}_4^{(1,0;a)}(B_1)$	$$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{24} & 0 & 0 & 0 & \frac{\sqrt{5}}{8} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}}{8} & 0 & 0 & 0 & -\frac{\sqrt{15}}{24} & 0 \\ 0 & 0 & 0 & \frac{5\sqrt{6}}{56} & 0 & 0 & \frac{\sqrt{70}}{280} & 0 & 0 & 0 & \frac{3\sqrt{2}}{56} & 0 & 0 & 0 \\ -\frac{3\sqrt{5}}{56} & 0 & 0 & 0 & -\frac{15}{56} & 0 & 0 & -\frac{11\sqrt{30}}{840} & 0 & 0 & 0 & \frac{\sqrt{10}}{280} & 0 & 0 \\ 0 & \frac{15}{56} & 0 & 0 & 0 & \frac{3\sqrt{5}}{56} & 0 & 0 & \frac{\sqrt{10}}{280} & 0 & 0 & 0 & -\frac{11\sqrt{30}}{840} & 0 \\ 0 & 0 & -\frac{5\sqrt{6}}{56} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{2}}{56} & 0 & 0 & 0 & \frac{\sqrt{70}}{280} \end{bmatrix}$$
313	symmetry	$-\frac{\sqrt{5}xy\left(x^2+y^2-6z^2\right)}{2}$
	$\mathbb{Q}_4^{(1,0;a)}(B_2)$	$$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{24} & 0 & 0 & 0 & \frac{\sqrt{5}i}{8} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{5}i}{8} & 0 & 0 & 0 & -\frac{\sqrt{15}i}{24} & 0 \\ 0 & 0 & 0 & \frac{5\sqrt{6}i}{56} & 0 & 0 & -\frac{\sqrt{70}i}{280} & 0 & 0 & 0 & \frac{3\sqrt{2}i}{56} & 0 & 0 & 0 \\ \frac{3\sqrt{5}i}{56} & 0 & 0 & 0 & -\frac{15i}{56} & 0 & 0 & \frac{11\sqrt{30}i}{840} & 0 & 0 & 0 & \frac{\sqrt{10}i}{280} & 0 & 0 \\ 0 & -\frac{15i}{56} & 0 & 0 & 0 & \frac{3\sqrt{5}i}{56} & 0 & 0 & -\frac{\sqrt{10}i}{280} & 0 & 0 & 0 & -\frac{11\sqrt{30}i}{840} & 0 \\ 0 & 0 & \frac{5\sqrt{6}i}{56} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{2}i}{56} & 0 & 0 & 0 & \frac{\sqrt{70}i}{280} \end{bmatrix}$$
314	symmetry	$\frac{\sqrt{35}yz(y-z)(y+z)}{2}$
	$\mathbb{Q}_{4,1}^{(1,0;a)}(E,1)$	$$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{96} & 0 & -\frac{\sqrt{35}i}{32} & 0 & -\frac{5\sqrt{21}i}{96} & 0 & -\frac{\sqrt{105}i}{96} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{105}i}{96} & 0 & \frac{5\sqrt{21}i}{96} & 0 & \frac{\sqrt{35}i}{32} & 0 & \frac{\sqrt{15}i}{96} \\ -\frac{\sqrt{105}i}{224} & 0 & -\frac{5\sqrt{42}i}{224} & 0 & -\frac{5\sqrt{21}i}{224} & 0 & 0 & -\frac{3\sqrt{70}i}{560} & 0 & -\frac{\sqrt{14}i}{56} & 0 & -\frac{\sqrt{210}i}{560} & 0 & 0 \\ 0 & \frac{15\sqrt{7}i}{224} & 0 & \frac{15\sqrt{14}i}{224} & 0 & \frac{3\sqrt{35}i}{224} & \frac{\sqrt{30}i}{240} & 0 & \frac{\sqrt{70}i}{140} & 0 & \frac{\sqrt{42}i}{336} & 0 & -\frac{\sqrt{210}i}{840} & 0 \\ -\frac{3\sqrt{35}i}{224} & 0 & -\frac{15\sqrt{14}i}{224} & 0 & -\frac{15\sqrt{7}i}{224} & 0 & 0 & -\frac{\sqrt{210}i}{840} & 0 & \frac{\sqrt{42}i}{336} & 0 & \frac{\sqrt{70}i}{140} & 0 & \frac{\sqrt{30}i}{240} \\ 0 & \frac{5\sqrt{21}i}{224} & 0 & \frac{5\sqrt{42}i}{224} & 0 & \frac{\sqrt{105}i}{224} & 0 & 0 & -\frac{\sqrt{210}i}{560} & 0 & -\frac{\sqrt{14}i}{56} & 0 & -\frac{3\sqrt{70}i}{560} & 0 \end{bmatrix}$$
315	symmetry	$\frac{\sqrt{35}xz(x-z)(x+z)}{2}$
	$\mathbb{Q}_{4,2}^{(1,0;a)}(E,1)$	$$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{96} & 0 & -\frac{\sqrt{35}}{32} & 0 & \frac{5\sqrt{21}}{96} & 0 & -\frac{\sqrt{105}}{96} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{105}}{96} & 0 & \frac{5\sqrt{21}}{96} & 0 & -\frac{\sqrt{35}}{32} & 0 & \frac{\sqrt{15}}{96} \\ -\frac{\sqrt{105}}{224} & 0 & \frac{5\sqrt{42}}{224} & 0 & -\frac{5\sqrt{21}}{224} & 0 & 0 & -\frac{3\sqrt{70}}{560} & 0 & \frac{\sqrt{14}}{56} & 0 & -\frac{\sqrt{210}}{560} & 0 & 0 \\ 0 & \frac{15\sqrt{7}}{224} & 0 & -\frac{15\sqrt{14}}{224} & 0 & \frac{3\sqrt{35}}{224} & -\frac{\sqrt{30}}{240} & 0 & \frac{\sqrt{70}}{140} & 0 & -\frac{\sqrt{42}}{336} & 0 & -\frac{\sqrt{210}}{840} & 0 \\ \frac{3\sqrt{35}}{224} & 0 & -\frac{15\sqrt{14}}{224} & 0 & \frac{15\sqrt{7}}{224} & 0 & 0 & \frac{\sqrt{210}}{840} & 0 & \frac{\sqrt{42}}{336} & 0 & -\frac{\sqrt{70}}{140} & 0 & \frac{\sqrt{30}}{240} \\ 0 & -\frac{5\sqrt{21}}{224} & 0 & \frac{5\sqrt{42}}{224} & 0 & -\frac{\sqrt{105}}{224} & 0 & 0 & \frac{\sqrt{210}}{560} & 0 & -\frac{\sqrt{14}}{56} & 0 & \frac{3\sqrt{70}}{560} & 0 \end{bmatrix}$$
316	symmetry	$\frac{\sqrt{5}yz\left(6x^2-y^2-z^2\right)}{2}$

continued …

Table 7

No.	multipole	matrix

$\mathbb{Q}_{4,1}^{(1,0;a)}(E,2)$

$$\begin{bmatrix}
0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{105}i}{96} & 0 & -\frac{\sqrt{5}i}{32} & 0 & -\frac{5\sqrt{3}i}{96} & 0 & \frac{7\sqrt{15}i}{96} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{7\sqrt{15}i}{96} & 0 & \frac{5\sqrt{3}i}{96} & 0 & \frac{\sqrt{5}i}{32} & 0 & -\frac{\sqrt{105}i}{96} \\
-\frac{\sqrt{15}i}{224} & 0 & -\frac{5\sqrt{6}i}{224} & 0 & \frac{5\sqrt{3}i}{32} & 0 & 0 & -\frac{3\sqrt{10}i}{560} & 0 & -\frac{\sqrt{2}i}{56} & 0 & \frac{\sqrt{30}i}{80} & 0 & 0 \\
0 & \frac{15i}{224} & 0 & \frac{15\sqrt{2}i}{224} & 0 & -\frac{3\sqrt{5}i}{32} & -\frac{\sqrt{210}i}{240} & 0 & \frac{\sqrt{10}i}{140} & 0 & \frac{\sqrt{6}i}{336} & 0 & \frac{\sqrt{30}i}{120} & 0 \\
\frac{3\sqrt{5}i}{32} & 0 & -\frac{15\sqrt{2}i}{224} & 0 & -\frac{15i}{224} & 0 & 0 & \frac{\sqrt{30}i}{120} & 0 & \frac{\sqrt{6}i}{336} & 0 & \frac{\sqrt{10}i}{140} & 0 & -\frac{\sqrt{210}i}{240} \\
0 & -\frac{5\sqrt{3}i}{32} & 0 & \frac{5\sqrt{6}i}{224} & 0 & \frac{\sqrt{15}i}{224} & 0 & 0 & \frac{\sqrt{30}i}{80} & 0 & -\frac{\sqrt{2}i}{56} & 0 & -\frac{3\sqrt{10}i}{560} & 0
\end{bmatrix}$$

317   symmetry $-\frac{\sqrt{5}xz(x^2-6y^2+z^2)}{2}$

$\mathbb{Q}_{4,2}^{(1,0;a)}(E,2)$

$$\begin{bmatrix}
0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{105}}{96} & 0 & -\frac{\sqrt{5}}{32} & 0 & \frac{5\sqrt{3}}{96} & 0 & \frac{7\sqrt{15}}{96} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{7\sqrt{15}}{96} & 0 & \frac{5\sqrt{3}}{96} & 0 & -\frac{\sqrt{5}}{32} & 0 & -\frac{\sqrt{105}}{96} \\
-\frac{\sqrt{15}}{224} & 0 & \frac{5\sqrt{6}}{224} & 0 & \frac{5\sqrt{3}}{32} & 0 & 0 & -\frac{3\sqrt{10}}{560} & 0 & \frac{\sqrt{2}}{56} & 0 & \frac{\sqrt{30}}{80} & 0 & 0 \\
0 & \frac{15}{224} & 0 & -\frac{15\sqrt{2}}{224} & 0 & -\frac{3\sqrt{5}}{32} & \frac{\sqrt{210}}{240} & 0 & \frac{\sqrt{10}}{140} & 0 & -\frac{\sqrt{6}}{336} & 0 & \frac{\sqrt{30}}{120} & 0 \\
-\frac{3\sqrt{5}}{32} & 0 & -\frac{15\sqrt{2}}{224} & 0 & \frac{15}{224} & 0 & 0 & -\frac{\sqrt{30}}{120} & 0 & \frac{\sqrt{6}}{336} & 0 & -\frac{\sqrt{10}}{140} & 0 & -\frac{\sqrt{210}}{240} \\
0 & \frac{5\sqrt{3}}{32} & 0 & \frac{5\sqrt{6}}{224} & 0 & -\frac{\sqrt{15}}{224} & 0 & 0 & -\frac{\sqrt{30}}{80} & 0 & -\frac{\sqrt{2}}{56} & 0 & \frac{3\sqrt{10}}{560} & 0
\end{bmatrix}$$

318   symmetry $-\frac{x^2}{2} - \frac{y^2}{2} + z^2$

$\mathbb{Q}_2^{(1,1;a)}(A_1)$

$$\begin{bmatrix}
0 & 0 & -\frac{1}{3} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & -\frac{1}{3} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & -\frac{4\sqrt{3}}{21} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{84} & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & -\frac{2\sqrt{2}}{21} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{28} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & \frac{2\sqrt{2}}{21} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{28} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & \frac{4\sqrt{3}}{21} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{84} & 0 & 0
\end{bmatrix}$$

319   symmetry $\frac{\sqrt{3}(x-y)(x+y)}{2}$

$\mathbb{Q}_2^{(1,1;a)}(B_1)$

$$\begin{bmatrix}
-\frac{\sqrt{30}}{18} & 0 & 0 & 0 & -\frac{\sqrt{6}}{18} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & -\frac{\sqrt{6}}{18} & 0 & 0 & 0 & -\frac{\sqrt{30}}{18} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & -\frac{2\sqrt{2}}{21} & 0 & 0 & \frac{\sqrt{210}}{168} & 0 & 0 & 0 & \frac{\sqrt{6}}{168} & 0 & 0 & 0 \\
\frac{4\sqrt{15}}{63} & 0 & 0 & 0 & -\frac{8\sqrt{3}}{63} & 0 & 0 & \frac{\sqrt{10}}{56} & 0 & 0 & 0 & \frac{\sqrt{30}}{168} & 0 & 0 \\
0 & \frac{8\sqrt{3}}{63} & 0 & 0 & 0 & -\frac{4\sqrt{15}}{63} & 0 & 0 & \frac{\sqrt{30}}{168} & 0 & 0 & 0 & \frac{\sqrt{10}}{56} & 0 \\
0 & 0 & \frac{2\sqrt{2}}{21} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{168} & 0 & 0 & 0 & \frac{\sqrt{210}}{168}
\end{bmatrix}$$

320   symmetry $\sqrt{3}xy$

continued ...

Table 7

No.	multipole	matrix

$$\mathbb{Q}_2^{(1,1;a)}(B_2)$$

$$\begin{bmatrix}
-\frac{\sqrt{30}i}{18} & 0 & 0 & 0 & \frac{\sqrt{6}i}{18} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & -\frac{\sqrt{6}i}{18} & 0 & 0 & 0 & \frac{\sqrt{30}i}{18} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & \frac{2\sqrt{2}i}{21} & 0 & 0 & \frac{\sqrt{210}i}{168} & 0 & 0 & 0 & -\frac{\sqrt{6}i}{168} & 0 & 0 & 0 \\
\frac{4\sqrt{15}i}{63} & 0 & 0 & 0 & \frac{8\sqrt{3}i}{63} & 0 & 0 & \frac{\sqrt{10}i}{56} & 0 & 0 & 0 & -\frac{\sqrt{30}i}{168} & 0 & 0 \\
0 & \frac{8\sqrt{3}i}{63} & 0 & 0 & 0 & \frac{4\sqrt{15}i}{63} & 0 & 0 & \frac{\sqrt{30}i}{168} & 0 & 0 & 0 & -\frac{\sqrt{10}i}{56} & 0 \\
0 & 0 & \frac{2\sqrt{2}i}{21} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}i}{168} & 0 & 0 & 0 & -\frac{\sqrt{210}i}{168}
\end{bmatrix}$$

No.		
321	symmetry	$\sqrt{3}yz$

$$\mathbb{Q}_{2,1}^{(1,1;a)}(E)$$

$$\begin{bmatrix}
0 & \frac{\sqrt{6}i}{9} & 0 & \frac{\sqrt{3}i}{9} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & \frac{\sqrt{3}i}{9} & 0 & \frac{\sqrt{6}i}{9} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
\frac{2\sqrt{5}i}{21} & 0 & \frac{\sqrt{2}i}{7} & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}i}{84} & 0 & -\frac{\sqrt{6}i}{84} & 0 & 0 & 0 & 0 \\
0 & -\frac{2\sqrt{3}i}{63} & 0 & \frac{5\sqrt{6}i}{63} & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}i}{84} & 0 & -\frac{\sqrt{2}i}{28} & 0 & 0 & 0 \\
0 & 0 & -\frac{5\sqrt{6}i}{63} & 0 & \frac{2\sqrt{3}i}{63} & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}i}{28} & 0 & -\frac{\sqrt{30}i}{84} & 0 & 0 \\
0 & 0 & 0 & -\frac{\sqrt{2}i}{7} & 0 & -\frac{2\sqrt{5}i}{21} & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{84} & 0 & -\frac{\sqrt{30}i}{84} & 0
\end{bmatrix}$$

No.		
322	symmetry	$\sqrt{3}xz$

$$\mathbb{Q}_{2,2}^{(1,1;a)}(E)$$

$$\begin{bmatrix}
0 & \frac{\sqrt{6}}{9} & 0 & -\frac{\sqrt{3}}{9} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & \frac{\sqrt{3}}{9} & 0 & -\frac{\sqrt{6}}{9} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
\frac{2\sqrt{5}}{21} & 0 & -\frac{\sqrt{2}}{7} & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}}{84} & 0 & \frac{\sqrt{6}}{84} & 0 & 0 & 0 & 0 \\
0 & -\frac{2\sqrt{3}}{63} & 0 & -\frac{5\sqrt{6}}{63} & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}}{84} & 0 & \frac{\sqrt{2}}{28} & 0 & 0 & 0 \\
0 & 0 & -\frac{5\sqrt{6}}{63} & 0 & -\frac{2\sqrt{3}}{63} & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}}{28} & 0 & \frac{\sqrt{30}}{84} & 0 & 0 \\
0 & 0 & 0 & -\frac{\sqrt{2}}{7} & 0 & \frac{2\sqrt{5}}{21} & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}}{84} & 0 & \frac{\sqrt{30}}{84} & 0
\end{bmatrix}$$

No.		
323	symmetry	$-\dfrac{z\left(3x^2+3y^2-2z^2\right)}{2}$

$$\mathbb{G}_3^{(a)}(A_2)$$

$$\begin{bmatrix}
0 & 0 & \frac{\sqrt{21}i}{21} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}i}{14} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & -\frac{\sqrt{21}i}{21} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}i}{14} & 0 & 0 & 0 \\
0 & -\frac{\sqrt{7}i}{14} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{70}i}{28} & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & \frac{\sqrt{42}i}{42} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{14}i}{28} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & \frac{\sqrt{42}i}{42} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{14}i}{28} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & -\frac{\sqrt{7}i}{14} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}i}{28} & 0 & 0
\end{bmatrix}$$

No.		
324	symmetry	$\sqrt{15}xyz$

continued ...

Table 7

No.	multipole	matrix

$\mathbb{G}_3^{(a)}(B_1)$

$$\begin{bmatrix}
-\frac{\sqrt{14}}{42} & 0 & 0 & 0 & \frac{\sqrt{70}}{42} & 0 & 0 & -\frac{\sqrt{21}}{28} & 0 & 0 & 0 & \frac{\sqrt{7}}{28} & 0 & 0 \\
0 & \frac{\sqrt{70}}{42} & 0 & 0 & 0 & -\frac{\sqrt{14}}{42} & 0 & 0 & -\frac{\sqrt{7}}{28} & 0 & 0 & 0 & \frac{\sqrt{21}}{28} & 0 \\
0 & 0 & 0 & -\frac{\sqrt{210}}{84} & 0 & 0 & -\frac{\sqrt{2}}{8} & 0 & 0 & 0 & \frac{\sqrt{70}}{56} & 0 & 0 & 0 \\
-\frac{5\sqrt{7}}{84} & 0 & 0 & 0 & -\frac{\sqrt{35}}{84} & 0 & 0 & \frac{\sqrt{42}}{56} & 0 & 0 & 0 & \frac{3\sqrt{14}}{56} & 0 & 0 \\
0 & \frac{\sqrt{35}}{84} & 0 & 0 & 0 & \frac{5\sqrt{7}}{84} & 0 & 0 & \frac{3\sqrt{14}}{56} & 0 & 0 & 0 & \frac{\sqrt{42}}{56} & 0 \\
0 & 0 & \frac{\sqrt{210}}{84} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{70}}{56} & 0 & 0 & 0 & -\frac{\sqrt{2}}{8}
\end{bmatrix}$$

325 symmetry

$$\frac{\sqrt{15}z(x-y)(x+y)}{2}$$

$\mathbb{G}_3^{(a)}(B_2)$

$$\begin{bmatrix}
\frac{\sqrt{14}i}{42} & 0 & 0 & 0 & \frac{\sqrt{70}i}{42} & 0 & 0 & \frac{\sqrt{21}i}{28} & 0 & 0 & 0 & \frac{\sqrt{7}i}{28} & 0 & 0 \\
0 & -\frac{\sqrt{70}i}{42} & 0 & 0 & 0 & -\frac{\sqrt{14}i}{42} & 0 & 0 & \frac{\sqrt{7}i}{28} & 0 & 0 & 0 & \frac{\sqrt{21}i}{28} & 0 \\
0 & 0 & 0 & -\frac{\sqrt{210}i}{84} & 0 & 0 & \frac{\sqrt{2}i}{8} & 0 & 0 & 0 & \frac{\sqrt{70}i}{56} & 0 & 0 & 0 \\
\frac{5\sqrt{7}i}{84} & 0 & 0 & 0 & -\frac{\sqrt{35}i}{84} & 0 & 0 & -\frac{\sqrt{42}i}{56} & 0 & 0 & 0 & \frac{3\sqrt{14}i}{56} & 0 & 0 \\
0 & -\frac{\sqrt{35}i}{84} & 0 & 0 & 0 & \frac{5\sqrt{7}i}{84} & 0 & 0 & -\frac{3\sqrt{14}i}{56} & 0 & 0 & 0 & \frac{\sqrt{42}i}{56} & 0 \\
0 & 0 & -\frac{\sqrt{210}i}{84} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}i}{56} & 0 & 0 & 0 & -\frac{\sqrt{2}i}{8}
\end{bmatrix}$$

326 symmetry

$$\frac{x(2x^2-3y^2-3z^2)}{2}$$

$\mathbb{G}_{3,1}^{(a)}(E,1)$

$$\begin{bmatrix}
0 & \frac{\sqrt{42}i}{84} & 0 & -\frac{\sqrt{21}i}{42} & 0 & \frac{\sqrt{210}i}{84} & -\frac{\sqrt{5}i}{16} & 0 & \frac{\sqrt{105}i}{112} & 0 & -\frac{3\sqrt{7}i}{112} & 0 & \frac{\sqrt{35}i}{112} & 0 \\
\frac{\sqrt{210}i}{84} & 0 & -\frac{\sqrt{21}i}{42} & 0 & \frac{\sqrt{42}i}{84} & 0 & 0 & -\frac{\sqrt{35}i}{112} & 0 & \frac{3\sqrt{7}i}{112} & 0 & -\frac{\sqrt{105}i}{112} & 0 & \frac{\sqrt{5}i}{16} \\
-\frac{\sqrt{35}i}{112} & 0 & \frac{3\sqrt{14}i}{112} & 0 & -\frac{5\sqrt{7}i}{112} & 0 & 0 & \frac{\sqrt{210}i}{112} & 0 & -\frac{\sqrt{42}i}{56} & 0 & \frac{\sqrt{70}i}{112} & 0 & 0 \\
0 & \frac{\sqrt{21}i}{48} & 0 & -\frac{\sqrt{42}i}{336} & 0 & -\frac{5\sqrt{105}i}{336} & \frac{\sqrt{10}i}{16} & 0 & 0 & 0 & -\frac{3\sqrt{14}i}{112} & 0 & \frac{\sqrt{70}i}{56} & 0 \\
\frac{5\sqrt{105}i}{336} & 0 & \frac{\sqrt{42}i}{336} & 0 & -\frac{\sqrt{21}i}{48} & 0 & 0 & \frac{\sqrt{70}i}{56} & 0 & -\frac{3\sqrt{14}i}{112} & 0 & 0 & 0 & \frac{\sqrt{10}i}{16} \\
0 & \frac{5\sqrt{7}i}{112} & 0 & -\frac{3\sqrt{14}i}{112} & 0 & \frac{\sqrt{35}i}{112} & 0 & 0 & \frac{\sqrt{70}i}{112} & 0 & -\frac{\sqrt{42}i}{56} & 0 & \frac{\sqrt{210}i}{112} & 0
\end{bmatrix}$$

327 symmetry

$$\frac{y(3x^2-2y^2+3z^2)}{2}$$

$\mathbb{G}_{3,2}^{(a)}(E,1)$

$$\begin{bmatrix}
0 & \frac{\sqrt{42}}{84} & 0 & \frac{\sqrt{21}}{42} & 0 & \frac{\sqrt{210}}{84} & \frac{\sqrt{5}}{16} & 0 & \frac{\sqrt{105}}{112} & 0 & \frac{3\sqrt{7}}{112} & 0 & \frac{\sqrt{35}}{112} & 0 \\
-\frac{\sqrt{210}}{84} & 0 & -\frac{\sqrt{21}}{42} & 0 & -\frac{\sqrt{42}}{84} & 0 & 0 & \frac{\sqrt{35}}{112} & 0 & \frac{3\sqrt{7}}{112} & 0 & \frac{\sqrt{105}}{112} & 0 & \frac{\sqrt{5}}{16} \\
-\frac{\sqrt{35}}{112} & 0 & -\frac{3\sqrt{14}}{112} & 0 & -\frac{5\sqrt{7}}{112} & 0 & 0 & \frac{\sqrt{210}}{112} & 0 & \frac{\sqrt{42}}{56} & 0 & \frac{\sqrt{70}}{112} & 0 & 0 \\
0 & \frac{\sqrt{21}}{48} & 0 & \frac{\sqrt{42}}{336} & 0 & -\frac{5\sqrt{105}}{336} & -\frac{\sqrt{10}}{16} & 0 & 0 & 0 & \frac{3\sqrt{14}}{112} & 0 & \frac{\sqrt{70}}{56} & 0 \\
-\frac{5\sqrt{105}}{336} & 0 & \frac{\sqrt{42}}{336} & 0 & \frac{\sqrt{21}}{48} & 0 & 0 & -\frac{\sqrt{70}}{56} & 0 & -\frac{3\sqrt{14}}{112} & 0 & 0 & 0 & \frac{\sqrt{10}}{16} \\
0 & -\frac{5\sqrt{7}}{112} & 0 & -\frac{3\sqrt{14}}{112} & 0 & -\frac{\sqrt{35}}{112} & 0 & 0 & -\frac{\sqrt{70}}{112} & 0 & -\frac{\sqrt{42}}{56} & 0 & -\frac{\sqrt{210}}{112} & 0
\end{bmatrix}$$

328 symmetry

$$\frac{\sqrt{15}x(y-z)(y+z)}{2}$$

continued …

Table 7

No.	multipole	matrix

$$\mathbb{G}_{3,1}^{(a)}(E,2)$$

$$\begin{bmatrix}
0 & \frac{\sqrt{70}i}{84} & 0 & -\frac{\sqrt{35}i}{42} & 0 & -\frac{\sqrt{14}i}{28} & \frac{\sqrt{3}i}{16} & 0 & \frac{5\sqrt{7}i}{112} & 0 & -\frac{\sqrt{105}i}{112} & 0 & -\frac{\sqrt{21}i}{112} & 0 \\
-\frac{\sqrt{14}i}{28} & 0 & -\frac{\sqrt{35}i}{42} & 0 & \frac{\sqrt{70}i}{84} & 0 & 0 & \frac{\sqrt{21}i}{112} & 0 & \frac{\sqrt{105}i}{112} & 0 & -\frac{5\sqrt{7}i}{112} & 0 & -\frac{\sqrt{3}i}{16} \\
-\frac{5\sqrt{21}i}{336} & 0 & \frac{\sqrt{210}i}{112} & 0 & \frac{\sqrt{105}i}{112} & 0 & 0 & \frac{5\sqrt{14}i}{112} & 0 & -\frac{\sqrt{70}i}{56} & 0 & -\frac{\sqrt{42}i}{112} & 0 & 0 \\
0 & \frac{\sqrt{35}i}{48} & 0 & -\frac{\sqrt{70}i}{336} & 0 & \frac{5\sqrt{7}i}{112} & -\frac{\sqrt{6}i}{16} & 0 & 0 & 0 & -\frac{\sqrt{210}i}{112} & 0 & -\frac{\sqrt{42}i}{56} & 0 \\
-\frac{5\sqrt{7}i}{112} & 0 & \frac{\sqrt{70}i}{336} & 0 & -\frac{\sqrt{35}i}{48} & 0 & 0 & -\frac{\sqrt{42}i}{56} & 0 & -\frac{\sqrt{210}i}{112} & 0 & 0 & 0 & -\frac{\sqrt{6}i}{16} \\
0 & -\frac{\sqrt{105}i}{112} & 0 & -\frac{\sqrt{210}i}{112} & 0 & \frac{5\sqrt{21}i}{336} & 0 & 0 & -\frac{\sqrt{42}i}{112} & 0 & -\frac{\sqrt{70}i}{56} & 0 & \frac{5\sqrt{14}i}{112} & 0
\end{bmatrix}$$

329	symmetry	$-\dfrac{\sqrt{15}y(x-z)(x+z)}{2}$

$$\mathbb{G}_{3,2}^{(a)}(E,2)$$

$$\begin{bmatrix}
0 & \frac{\sqrt{70}}{84} & 0 & \frac{\sqrt{35}}{42} & 0 & -\frac{\sqrt{14}}{28} & -\frac{\sqrt{3}}{16} & 0 & \frac{5\sqrt{7}}{112} & 0 & \frac{\sqrt{105}}{112} & 0 & -\frac{\sqrt{21}}{112} & 0 \\
\frac{\sqrt{14}}{28} & 0 & -\frac{\sqrt{35}}{42} & 0 & -\frac{\sqrt{70}}{84} & 0 & 0 & -\frac{\sqrt{21}}{112} & 0 & \frac{\sqrt{105}}{112} & 0 & \frac{5\sqrt{7}}{112} & 0 & -\frac{\sqrt{3}}{16} \\
-\frac{5\sqrt{21}}{336} & 0 & -\frac{\sqrt{210}}{112} & 0 & \frac{\sqrt{105}}{112} & 0 & 0 & \frac{5\sqrt{14}}{112} & 0 & \frac{\sqrt{70}}{56} & 0 & -\frac{\sqrt{42}}{112} & 0 & 0 \\
0 & \frac{\sqrt{35}}{48} & 0 & \frac{\sqrt{70}}{336} & 0 & \frac{5\sqrt{7}}{112} & \frac{\sqrt{6}}{16} & 0 & 0 & 0 & \frac{\sqrt{210}}{112} & 0 & -\frac{\sqrt{42}}{56} & 0 \\
\frac{5\sqrt{7}}{112} & 0 & \frac{\sqrt{70}}{336} & 0 & \frac{\sqrt{35}}{48} & 0 & 0 & \frac{\sqrt{42}}{56} & 0 & -\frac{\sqrt{210}}{112} & 0 & 0 & 0 & -\frac{\sqrt{6}}{16} \\
0 & \frac{\sqrt{105}}{112} & 0 & -\frac{\sqrt{210}}{112} & 0 & -\frac{5\sqrt{21}}{336} & 0 & 0 & \frac{\sqrt{42}}{112} & 0 & -\frac{\sqrt{70}}{56} & 0 & -\frac{5\sqrt{14}}{112} & 0
\end{bmatrix}$$

330	symmetry	$-\dfrac{z\left(3x^2+3y^2-2z^2\right)}{2}$

$$\mathbb{G}_3^{(1,-1;a)}(A_2)$$

$$\begin{bmatrix}
0 & 0 & -\frac{\sqrt{5}i}{42} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{2\sqrt{15}i}{21} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & \frac{\sqrt{5}i}{42} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{2\sqrt{15}i}{21} & 0 & 0 & 0 \\
0 & \frac{2\sqrt{15}i}{105} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{5\sqrt{6}i}{42} & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & -\frac{2\sqrt{10}i}{105} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}i}{42} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & -\frac{2\sqrt{10}i}{105} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}i}{42} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & \frac{2\sqrt{15}i}{105} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{5\sqrt{6}i}{42} & 0 & 0
\end{bmatrix}$$

331	symmetry	$\sqrt{15}xyz$

$$\mathbb{G}_3^{(1,-1;a)}(B_1)$$

$$\begin{bmatrix}
\frac{\sqrt{30}}{252} & 0 & 0 & 0 & -\frac{5\sqrt{6}}{252} & 0 & 0 & \frac{\sqrt{5}}{7} & 0 & 0 & 0 & -\frac{\sqrt{15}}{21} & 0 & 0 \\
0 & -\frac{5\sqrt{6}}{252} & 0 & 0 & 0 & \frac{\sqrt{30}}{252} & 0 & 0 & \frac{\sqrt{15}}{21} & 0 & 0 & 0 & -\frac{\sqrt{5}}{7} & 0 \\
0 & 0 & 0 & \frac{\sqrt{2}}{21} & 0 & 0 & -\frac{\sqrt{210}}{84} & 0 & 0 & 0 & \frac{5\sqrt{6}}{84} & 0 & 0 & 0 \\
\frac{\sqrt{15}}{63} & 0 & 0 & 0 & \frac{\sqrt{3}}{63} & 0 & 0 & \frac{\sqrt{10}}{28} & 0 & 0 & 0 & \frac{\sqrt{30}}{28} & 0 & 0 \\
0 & -\frac{\sqrt{3}}{63} & 0 & 0 & 0 & -\frac{\sqrt{15}}{63} & 0 & 0 & \frac{\sqrt{30}}{28} & 0 & 0 & 0 & \frac{\sqrt{10}}{28} & 0 \\
0 & 0 & -\frac{\sqrt{2}}{21} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{5\sqrt{6}}{84} & 0 & 0 & 0 & -\frac{\sqrt{210}}{84}
\end{bmatrix}$$

332	symmetry	$\dfrac{\sqrt{15}z(x-y)(x+y)}{2}$

Table 7

No.	multipole	matrix

$$\mathbb{G}_3^{(1,-1;a)}(B_2) = \begin{bmatrix} -\frac{\sqrt{30}i}{252} & 0 & 0 & 0 & -\frac{5\sqrt{6}i}{252} & 0 & 0 & -\frac{\sqrt{5}i}{7} & 0 & 0 & 0 & -\frac{\sqrt{15}i}{21} & 0 & 0 \\ 0 & \frac{5\sqrt{6}i}{252} & 0 & 0 & 0 & \frac{\sqrt{30}i}{252} & 0 & 0 & -\frac{\sqrt{15}i}{21} & 0 & 0 & 0 & -\frac{\sqrt{5}i}{7} & 0 \\ 0 & 0 & 0 & \frac{\sqrt{2}i}{21} & 0 & 0 & \frac{\sqrt{210}i}{84} & 0 & 0 & 0 & \frac{5\sqrt{6}i}{84} & 0 & 0 & 0 \\ -\frac{\sqrt{15}i}{63} & 0 & 0 & 0 & \frac{\sqrt{3}i}{63} & 0 & 0 & -\frac{\sqrt{10}i}{28} & 0 & 0 & 0 & \frac{\sqrt{30}i}{28} & 0 & 0 \\ 0 & \frac{\sqrt{3}i}{63} & 0 & 0 & 0 & -\frac{\sqrt{15}i}{63} & 0 & 0 & -\frac{\sqrt{30}i}{28} & 0 & 0 & 0 & \frac{\sqrt{10}i}{28} & 0 \\ 0 & 0 & \frac{\sqrt{2}i}{21} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{5\sqrt{6}i}{84} & 0 & 0 & 0 & -\frac{\sqrt{210}i}{84} \end{bmatrix}$$

333 symmetry $\quad \dfrac{x\left(2x^2-3y^2-3z^2\right)}{2}$

$$\mathbb{G}_{3,1}^{(1,-1;a)}(E,1) = \begin{bmatrix} 0 & -\frac{\sqrt{10}i}{168} & 0 & \frac{\sqrt{5}i}{84} & 0 & -\frac{5\sqrt{2}i}{168} & \frac{5\sqrt{21}i}{84} & 0 & -\frac{5i}{28} & 0 & \frac{\sqrt{15}i}{28} & 0 & -\frac{5\sqrt{3}i}{84} & 0 \\ -\frac{5\sqrt{2}i}{168} & 0 & \frac{\sqrt{5}i}{84} & 0 & -\frac{\sqrt{10}i}{168} & 0 & 0 & \frac{5\sqrt{3}i}{84} & 0 & -\frac{\sqrt{15}i}{28} & 0 & \frac{5i}{28} & 0 & -\frac{5\sqrt{21}i}{84} \\ \frac{\sqrt{3}i}{84} & 0 & -\frac{\sqrt{30}i}{140} & 0 & \frac{\sqrt{15}i}{84} & 0 & 0 & \frac{5\sqrt{2}i}{56} & 0 & -\frac{\sqrt{10}i}{28} & 0 & \frac{5\sqrt{6}i}{168} & 0 & 0 \\ 0 & -\frac{\sqrt{5}i}{60} & 0 & \frac{\sqrt{10}i}{420} & 0 & \frac{5i}{84} & \frac{5\sqrt{42}i}{168} & 0 & 0 & 0 & -\frac{\sqrt{30}i}{56} & 0 & \frac{5\sqrt{6}i}{84} & 0 \\ -\frac{5i}{84} & 0 & -\frac{\sqrt{10}i}{420} & 0 & \frac{\sqrt{5}i}{60} & 0 & 0 & \frac{5\sqrt{6}i}{84} & 0 & -\frac{\sqrt{30}i}{56} & 0 & 0 & 0 & \frac{5\sqrt{42}i}{168} \\ 0 & -\frac{\sqrt{15}i}{84} & 0 & \frac{\sqrt{30}i}{140} & 0 & -\frac{\sqrt{3}i}{84} & 0 & 0 & \frac{5\sqrt{6}i}{168} & 0 & -\frac{\sqrt{10}i}{28} & 0 & \frac{5\sqrt{2}i}{56} & 0 \end{bmatrix}$$

334 symmetry $\quad \dfrac{y\left(3x^2-2y^2+3z^2\right)}{2}$

$$\mathbb{G}_{3,2}^{(1,-1;a)}(E,1) = \begin{bmatrix} 0 & -\frac{\sqrt{10}}{168} & 0 & -\frac{\sqrt{5}}{84} & 0 & -\frac{5\sqrt{2}}{168} & -\frac{5\sqrt{21}}{84} & 0 & -\frac{5}{28} & 0 & -\frac{\sqrt{15}}{28} & 0 & -\frac{5\sqrt{3}}{84} & 0 \\ \frac{5\sqrt{2}}{168} & 0 & \frac{\sqrt{5}}{84} & 0 & \frac{\sqrt{10}}{168} & 0 & 0 & -\frac{5\sqrt{3}}{84} & 0 & -\frac{\sqrt{15}}{28} & 0 & -\frac{5}{28} & 0 & -\frac{5\sqrt{21}}{84} \\ \frac{\sqrt{3}}{84} & 0 & \frac{\sqrt{30}}{140} & 0 & \frac{\sqrt{15}}{84} & 0 & 0 & \frac{5\sqrt{2}}{56} & 0 & \frac{\sqrt{10}}{28} & 0 & \frac{5\sqrt{6}}{168} & 0 & 0 \\ 0 & -\frac{\sqrt{5}}{60} & 0 & -\frac{\sqrt{10}}{420} & 0 & \frac{5}{84} & -\frac{5\sqrt{42}}{168} & 0 & 0 & 0 & \frac{\sqrt{30}}{56} & 0 & \frac{5\sqrt{6}}{84} & 0 \\ \frac{5}{84} & 0 & -\frac{\sqrt{10}}{420} & 0 & -\frac{\sqrt{5}}{60} & 0 & 0 & -\frac{5\sqrt{6}}{84} & 0 & -\frac{\sqrt{30}}{56} & 0 & 0 & 0 & \frac{5\sqrt{42}}{168} \\ 0 & \frac{\sqrt{15}}{84} & 0 & \frac{\sqrt{30}}{140} & 0 & \frac{\sqrt{3}}{84} & 0 & 0 & -\frac{5\sqrt{6}}{168} & 0 & -\frac{\sqrt{10}}{28} & 0 & -\frac{5\sqrt{2}}{56} & 0 \end{bmatrix}$$

335 symmetry $\quad \dfrac{\sqrt{15}x(y-z)(y+z)}{2}$

$$\mathbb{G}_{3,1}^{(1,-1;a)}(E,2) = \begin{bmatrix} 0 & -\frac{5\sqrt{6}i}{504} & 0 & \frac{5\sqrt{3}i}{252} & 0 & \frac{\sqrt{30}i}{168} & -\frac{\sqrt{35}i}{28} & 0 & -\frac{5\sqrt{15}i}{84} & 0 & \frac{5i}{28} & 0 & \frac{\sqrt{5}i}{28} & 0 \\ \frac{\sqrt{30}i}{168} & 0 & \frac{5\sqrt{3}i}{252} & 0 & -\frac{5\sqrt{6}i}{504} & 0 & 0 & -\frac{\sqrt{5}i}{28} & 0 & -\frac{5i}{28} & 0 & \frac{5\sqrt{15}i}{84} & 0 & \frac{\sqrt{35}i}{28} \\ \frac{\sqrt{5}i}{84} & 0 & -\frac{\sqrt{2}i}{28} & 0 & -\frac{i}{28} & 0 & 0 & \frac{5\sqrt{30}i}{168} & 0 & -\frac{5\sqrt{6}i}{84} & 0 & -\frac{\sqrt{10}i}{56} & 0 & 0 \\ 0 & -\frac{\sqrt{3}i}{36} & 0 & \frac{\sqrt{6}i}{252} & 0 & -\frac{\sqrt{15}i}{84} & -\frac{\sqrt{70}i}{56} & 0 & 0 & 0 & -\frac{5\sqrt{2}i}{56} & 0 & -\frac{\sqrt{10}i}{28} & 0 \\ \frac{\sqrt{15}i}{84} & 0 & -\frac{\sqrt{6}i}{252} & 0 & \frac{\sqrt{3}i}{36} & 0 & 0 & -\frac{\sqrt{10}i}{28} & 0 & -\frac{5\sqrt{2}i}{56} & 0 & 0 & 0 & -\frac{\sqrt{70}i}{56} \\ 0 & \frac{i}{28} & 0 & \frac{\sqrt{2}i}{28} & 0 & -\frac{\sqrt{5}i}{84} & 0 & 0 & -\frac{\sqrt{10}i}{56} & 0 & -\frac{5\sqrt{6}i}{84} & 0 & \frac{5\sqrt{30}i}{168} & 0 \end{bmatrix}$$

336 symmetry $\quad -\dfrac{\sqrt{15}y(x-z)(x+z)}{2}$

continued …

Table 7

No.	multipole	matrix

$\mathbb{G}_{3,2}^{(1,-1;a)}(E,2)$

$$\begin{pmatrix}
0 & -\frac{5\sqrt{6}}{504} & 0 & -\frac{5\sqrt{3}}{252} & 0 & \frac{\sqrt{30}}{168} & \frac{\sqrt{35}}{28} & 0 & -\frac{5\sqrt{15}}{84} & 0 & -\frac{5}{28} & 0 & \frac{\sqrt{5}}{28} & 0 \\
-\frac{\sqrt{30}}{168} & 0 & \frac{5\sqrt{3}}{252} & 0 & \frac{5\sqrt{6}}{504} & 0 & 0 & \frac{\sqrt{5}}{28} & 0 & -\frac{5}{28} & 0 & -\frac{5\sqrt{15}}{84} & 0 & \frac{\sqrt{35}}{28} \\
\frac{\sqrt{5}}{84} & 0 & \frac{\sqrt{2}}{28} & 0 & -\frac{1}{28} & 0 & 0 & \frac{5\sqrt{30}}{168} & 0 & \frac{5\sqrt{6}}{84} & 0 & -\frac{\sqrt{10}}{56} & 0 & 0 \\
0 & -\frac{\sqrt{3}}{36} & 0 & -\frac{\sqrt{6}}{252} & 0 & -\frac{\sqrt{15}}{84} & \frac{\sqrt{70}}{56} & 0 & 0 & 0 & \frac{5\sqrt{2}}{56} & 0 & -\frac{\sqrt{10}}{28} & 0 \\
-\frac{\sqrt{15}}{84} & 0 & -\frac{\sqrt{6}}{252} & 0 & -\frac{\sqrt{3}}{36} & 0 & 0 & \frac{\sqrt{10}}{28} & 0 & -\frac{5\sqrt{2}}{56} & 0 & 0 & 0 & -\frac{\sqrt{70}}{56} \\
0 & -\frac{1}{28} & 0 & \frac{\sqrt{2}}{28} & 0 & \frac{\sqrt{5}}{84} & 0 & 0 & \frac{\sqrt{10}}{56} & 0 & -\frac{5\sqrt{6}}{84} & 0 & -\frac{5\sqrt{30}}{168} & 0
\end{pmatrix}$$

337 symmetry

$$\frac{3\sqrt{35}xyz(x-y)(x+y)}{2}$$

$\mathbb{G}_5^{(1,-1;a)}(A_1)$

$$\begin{pmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}}{20} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{20} \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{20} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}}{20} & 0 & 0 & 0 & 0 & 0 & 0
\end{pmatrix}$$

338 symmetry

$$\frac{z\left(15x^4+30x^2y^2-40x^2z^2+15y^4-40y^2z^2+8z^4\right)}{8}$$

$\mathbb{G}_5^{(1,-1;a)}(A_2,1)$

$$\begin{pmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{12} & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}i}{12} & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}i}{12} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}i}{12} & 0 & 0 & 0
\end{pmatrix}$$

339 symmetry

$$\frac{3\sqrt{35}z\left(x^2-2xy-y^2\right)\left(x^2+2xy-y^2\right)}{8}$$

$\mathbb{G}_5^{(1,-1;a)}(A_2,2)$

$$\begin{pmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}i}{20} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}i}{20} \\
0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}i}{20} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{70}i}{20} & 0 & 0 & 0 & 0 & 0 & 0
\end{pmatrix}$$

340 symmetry

$$\frac{\sqrt{105}xyz\left(x^2+y^2-2z^2\right)}{2}$$

continued …

Table 7

No.	multipole	matrix

$\mathbb{G}_5^{(1,-1;a)}(B_1)$

$$\begin{bmatrix}
0&0&0&0&0&0&0&0&0&0&0&0&0&0\\
0&0&0&0&0&0&0&0&0&0&0&0&0&0\\
0&0&0&0&0&0&-\frac{\sqrt{30}}{120}&0&0&0&\frac{\sqrt{42}}{24}&0&0&0\\
0&0&0&0&0&0&0&\frac{\sqrt{70}}{40}&0&0&0&-\frac{\sqrt{210}}{40}&0&0\\
0&0&0&0&0&0&0&0&-\frac{\sqrt{210}}{40}&0&0&0&\frac{\sqrt{70}}{40}&0\\
0&0&0&0&0&0&0&0&0&\frac{\sqrt{42}}{24}&0&0&0&-\frac{\sqrt{30}}{120}
\end{bmatrix}$$

341   symmetry

$$-\frac{\sqrt{105}\,z(x-y)(x+y)\left(x^2+y^2-2z^2\right)}{4}$$

$\mathbb{G}_5^{(1,-1;a)}(B_2)$

$$\begin{bmatrix}
0&0&0&0&0&0&0&0&0&0&0&0&0&0\\
0&0&0&0&0&0&0&0&0&0&0&0&0&0\\
0&0&0&0&0&0&-\frac{\sqrt{30}i}{120}&0&0&0&-\frac{\sqrt{42}i}{24}&0&0&0\\
0&0&0&0&0&0&0&\frac{\sqrt{70}i}{40}&0&0&0&\frac{\sqrt{210}i}{40}&0&0\\
0&0&0&0&0&0&0&0&-\frac{\sqrt{210}i}{40}&0&0&0&-\frac{\sqrt{70}i}{40}&0\\
0&0&0&0&0&0&0&0&0&\frac{\sqrt{42}i}{24}&0&0&0&\frac{\sqrt{30}i}{120}
\end{bmatrix}$$

342   symmetry

$$\frac{x\left(8x^4-40x^2y^2-40x^2z^2+15y^4+30y^2z^2+15z^4\right)}{8}$$

$\mathbb{G}_{5,1}^{(1,-1;a)}(E,1)$

$$\begin{bmatrix}
0&0&0&0&0&0&0&0&0&0&0&0&0&0\\
0&0&0&0&0&0&0&0&0&0&0&0&0&0\\
0&0&0&0&0&0&0&\frac{\sqrt{2}i}{32}&0&-\frac{\sqrt{10}i}{32}&0&\frac{7\sqrt{6}i}{96}&0&-\frac{3\sqrt{14}i}{32}\\
0&0&0&0&0&0&\frac{\sqrt{42}i}{96}&0&-\frac{3\sqrt{2}i}{32}&0&\frac{\sqrt{30}i}{32}&0&-\frac{7\sqrt{6}i}{96}&0\\
0&0&0&0&0&0&0&-\frac{7\sqrt{6}i}{96}&0&\frac{\sqrt{30}i}{32}&0&-\frac{3\sqrt{2}i}{32}&0&\frac{\sqrt{42}i}{96}\\
0&0&0&0&0&0&-\frac{3\sqrt{14}i}{32}&0&\frac{7\sqrt{6}i}{96}&0&-\frac{\sqrt{10}i}{32}&0&\frac{\sqrt{2}i}{32}&0
\end{bmatrix}$$

343   symmetry

$$-\frac{y\left(15x^4-40x^2y^2+30x^2z^2+8y^4-40y^2z^2+15z^4\right)}{8}$$

$\mathbb{G}_{5,2}^{(1,-1;a)}(E,1)$

$$\begin{bmatrix}
0&0&0&0&0&0&0&0&0&0&0&0&0&0\\
0&0&0&0&0&0&0&0&0&0&0&0&0&0\\
0&0&0&0&0&0&0&\frac{\sqrt{2}}{32}&0&\frac{\sqrt{10}}{32}&0&\frac{7\sqrt{6}}{96}&0&\frac{3\sqrt{14}}{32}\\
0&0&0&0&0&0&-\frac{\sqrt{42}}{96}&0&-\frac{3\sqrt{2}}{32}&0&-\frac{\sqrt{30}}{32}&0&-\frac{7\sqrt{6}}{96}&0\\
0&0&0&0&0&0&0&\frac{7\sqrt{6}}{96}&0&\frac{\sqrt{30}}{32}&0&\frac{3\sqrt{2}}{32}&0&\frac{\sqrt{42}}{96}\\
0&0&0&0&0&0&-\frac{3\sqrt{14}}{32}&0&-\frac{7\sqrt{6}}{96}&0&-\frac{\sqrt{10}}{32}&0&-\frac{\sqrt{2}}{32}&0
\end{bmatrix}$$

344   symmetry

$$\frac{3\sqrt{35}\,x\left(y^2-2yz-z^2\right)\left(y^2+2yz-z^2\right)}{8}$$

continued …

Table 7

No.	multipole	matrix

$$\mathbb{G}_{5,1}^{(1,-1;a)}(E,2)$$

$$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{70}i}{160} & 0 & -\frac{\sqrt{14}i}{32} & 0 & -\frac{3\sqrt{210}i}{160} & 0 & -\frac{\sqrt{10}i}{32} \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{30}i}{160} & 0 & -\frac{3\sqrt{70}i}{160} & 0 & \frac{\sqrt{42}i}{32} & 0 & \frac{3\sqrt{210}i}{160} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{210}i}{160} & 0 & \frac{\sqrt{42}i}{32} & 0 & -\frac{3\sqrt{70}i}{160} & 0 & -\frac{3\sqrt{30}i}{160} \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}i}{32} & 0 & -\frac{3\sqrt{210}i}{160} & 0 & -\frac{\sqrt{14}i}{32} & 0 & \frac{\sqrt{70}i}{160} & 0 \end{bmatrix}$$

345   symmetry

$$-\frac{3\sqrt{35}y\left(x^2-2xz-z^2\right)\left(x^2+2xz-z^2\right)}{8}$$

$$\mathbb{G}_{5,2}^{(1,-1;a)}(E,2)$$

$$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{70}}{160} & 0 & \frac{\sqrt{14}}{32} & 0 & -\frac{3\sqrt{210}}{160} & 0 & \frac{\sqrt{10}}{32} \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{30}}{160} & 0 & -\frac{3\sqrt{70}}{160} & 0 & -\frac{\sqrt{42}}{32} & 0 & \frac{3\sqrt{210}}{160} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{210}}{160} & 0 & \frac{\sqrt{42}}{32} & 0 & \frac{3\sqrt{70}}{160} & 0 & -\frac{3\sqrt{30}}{160} \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}}{32} & 0 & \frac{3\sqrt{210}}{160} & 0 & -\frac{\sqrt{14}}{32} & 0 & -\frac{\sqrt{70}}{160} & 0 \end{bmatrix}$$

346   symmetry

$$\frac{\sqrt{105}x(y-z)(y+z)\left(2x^2-y^2-z^2\right)}{4}$$

$$\mathbb{G}_{5,1}^{(1,-1;a)}(E,3)$$

$$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{210}i}{240} & 0 & -\frac{\sqrt{42}i}{48} & 0 & \frac{\sqrt{70}i}{80} & 0 & \frac{\sqrt{30}i}{16} \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}i}{80} & 0 & -\frac{\sqrt{210}i}{80} & 0 & \frac{\sqrt{14}i}{16} & 0 & -\frac{\sqrt{70}i}{80} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}i}{80} & 0 & \frac{\sqrt{14}i}{16} & 0 & -\frac{\sqrt{210}i}{80} & 0 & \frac{\sqrt{10}i}{80} \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}i}{16} & 0 & \frac{\sqrt{70}i}{80} & 0 & -\frac{\sqrt{42}i}{48} & 0 & \frac{\sqrt{210}i}{240} & 0 \end{bmatrix}$$

347   symmetry

$$\frac{\sqrt{105}y(x-z)(x+z)\left(x^2-2y^2+z^2\right)}{4}$$

$$\mathbb{G}_{5,2}^{(1,-1;a)}(E,3)$$

$$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{210}}{240} & 0 & \frac{\sqrt{42}}{48} & 0 & \frac{\sqrt{70}}{80} & 0 & -\frac{\sqrt{30}}{16} \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}}{80} & 0 & -\frac{\sqrt{210}}{80} & 0 & -\frac{\sqrt{14}}{16} & 0 & -\frac{\sqrt{70}}{80} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{70}}{80} & 0 & \frac{\sqrt{14}}{16} & 0 & \frac{\sqrt{210}}{80} & 0 & \frac{\sqrt{10}}{80} \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{16} & 0 & -\frac{\sqrt{70}}{80} & 0 & -\frac{\sqrt{42}}{48} & 0 & -\frac{\sqrt{210}}{240} & 0 \end{bmatrix}$$

348   symmetry

$$-\frac{z\left(3x^2+3y^2-2z^2\right)}{2}$$

continued …

Table 7

No.	multipole	matrix

$\mathbb{G}_3^{(1,0;a)}(A_2)$

$$\begin{pmatrix}
0 & 0 & \frac{\sqrt{7}i}{21} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{5\sqrt{21}i}{84} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & -\frac{\sqrt{7}i}{21} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{5\sqrt{21}i}{84} & 0 & 0 & 0 \\
0 & -\frac{5\sqrt{21}i}{84} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{210}i}{84} & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & \frac{5\sqrt{14}i}{84} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{42}i}{84} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & \frac{5\sqrt{14}i}{84} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{42}i}{84} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & -\frac{5\sqrt{21}i}{84} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{210}i}{84} & 0 & 0
\end{pmatrix}$$

349   symmetry $\sqrt{15}xyz$

$\mathbb{G}_3^{(1,0;a)}(B_1)$

$$\begin{pmatrix}
-\frac{\sqrt{42}}{126} & 0 & 0 & 0 & \frac{\sqrt{210}}{126} & 0 & 0 & \frac{5\sqrt{7}}{56} & 0 & 0 & 0 & -\frac{5\sqrt{21}}{168} & 0 & 0 \\
0 & \frac{\sqrt{210}}{126} & 0 & 0 & 0 & -\frac{\sqrt{42}}{126} & 0 & 0 & \frac{5\sqrt{21}}{168} & 0 & 0 & 0 & -\frac{5\sqrt{7}}{56} & 0 \\
0 & 0 & 0 & -\frac{5\sqrt{70}}{168} & 0 & 0 & \frac{\sqrt{6}}{24} & 0 & 0 & 0 & -\frac{\sqrt{210}}{168} & 0 & 0 & 0 \\
-\frac{25\sqrt{21}}{504} & 0 & 0 & 0 & -\frac{5\sqrt{105}}{504} & 0 & 0 & -\frac{\sqrt{14}}{56} & 0 & 0 & 0 & -\frac{\sqrt{42}}{56} & 0 & 0 \\
0 & \frac{5\sqrt{105}}{504} & 0 & 0 & 0 & \frac{25\sqrt{21}}{504} & 0 & 0 & -\frac{\sqrt{42}}{56} & 0 & 0 & 0 & -\frac{\sqrt{14}}{56} & 0 \\
0 & 0 & \frac{5\sqrt{70}}{168} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{210}}{168} & 0 & 0 & 0 & \frac{\sqrt{6}}{24}
\end{pmatrix}$$

350   symmetry $\frac{\sqrt{15}z(x-y)(x+y)}{2}$

$\mathbb{G}_3^{(1,0;a)}(B_2)$

$$\begin{pmatrix}
\frac{\sqrt{42}i}{126} & 0 & 0 & 0 & \frac{\sqrt{210}i}{126} & 0 & 0 & -\frac{5\sqrt{7}i}{56} & 0 & 0 & 0 & -\frac{5\sqrt{21}i}{168} & 0 & 0 \\
0 & -\frac{\sqrt{210}i}{126} & 0 & 0 & 0 & -\frac{\sqrt{42}i}{126} & 0 & 0 & -\frac{5\sqrt{21}i}{168} & 0 & 0 & 0 & -\frac{5\sqrt{7}i}{56} & 0 \\
0 & 0 & 0 & -\frac{5\sqrt{70}i}{168} & 0 & 0 & -\frac{\sqrt{6}i}{24} & 0 & 0 & 0 & -\frac{\sqrt{210}i}{168} & 0 & 0 & 0 \\
\frac{25\sqrt{21}i}{504} & 0 & 0 & 0 & -\frac{5\sqrt{105}i}{504} & 0 & 0 & \frac{\sqrt{14}i}{56} & 0 & 0 & 0 & -\frac{\sqrt{42}i}{56} & 0 & 0 \\
0 & -\frac{5\sqrt{105}i}{504} & 0 & 0 & 0 & \frac{25\sqrt{21}i}{504} & 0 & 0 & \frac{\sqrt{42}i}{56} & 0 & 0 & 0 & -\frac{\sqrt{14}i}{56} & 0 \\
0 & 0 & -\frac{5\sqrt{70}i}{168} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{210}i}{168} & 0 & 0 & 0 & \frac{\sqrt{6}i}{24}
\end{pmatrix}$$

351   symmetry $\frac{x(2x^2-3y^2-3z^2)}{2}$

$\mathbb{G}_{3,1}^{(1,0;a)}(E,1)$

$$\begin{pmatrix}
0 & \frac{\sqrt{14}i}{84} & 0 & -\frac{\sqrt{7}i}{42} & 0 & \frac{\sqrt{70}i}{84} & \frac{5\sqrt{15}i}{96} & 0 & -\frac{5\sqrt{35}i}{224} & 0 & \frac{5\sqrt{21}i}{224} & 0 & -\frac{5\sqrt{105}i}{672} & 0 \\
\frac{\sqrt{70}i}{84} & 0 & -\frac{\sqrt{7}i}{42} & 0 & \frac{\sqrt{14}i}{84} & 0 & 0 & \frac{5\sqrt{105}i}{672} & 0 & -\frac{5\sqrt{21}i}{224} & 0 & \frac{5\sqrt{35}i}{224} & 0 & -\frac{5\sqrt{15}i}{96} \\
-\frac{5\sqrt{105}i}{672} & 0 & \frac{5\sqrt{42}i}{224} & 0 & -\frac{25\sqrt{21}i}{672} & 0 & 0 & -\frac{\sqrt{70}i}{112} & 0 & \frac{\sqrt{14}i}{56} & 0 & -\frac{\sqrt{210}i}{336} & 0 & 0 \\
0 & \frac{5\sqrt{7}i}{96} & 0 & -\frac{5\sqrt{14}i}{672} & 0 & -\frac{25\sqrt{35}i}{672} & -\frac{\sqrt{30}i}{48} & 0 & 0 & 0 & \frac{\sqrt{42}i}{112} & 0 & -\frac{\sqrt{210}i}{168} & 0 \\
\frac{25\sqrt{35}i}{672} & 0 & \frac{5\sqrt{14}i}{672} & 0 & -\frac{5\sqrt{7}i}{96} & 0 & 0 & -\frac{\sqrt{210}i}{168} & 0 & \frac{\sqrt{42}i}{112} & 0 & 0 & 0 & -\frac{\sqrt{30}i}{48} \\
0 & \frac{25\sqrt{21}i}{672} & 0 & -\frac{5\sqrt{42}i}{224} & 0 & \frac{5\sqrt{105}i}{672} & 0 & 0 & -\frac{\sqrt{210}i}{336} & 0 & \frac{\sqrt{14}i}{56} & 0 & -\frac{\sqrt{70}i}{112} & 0
\end{pmatrix}$$

352   symmetry $\frac{y(3x^2-2y^2+3z^2)}{2}$

continued ...

Table 7

No.	multipole	matrix

$$\mathbb{G}_{3,2}^{(1,0;a)}(E,1)$$

$$\begin{pmatrix}
0 & \frac{\sqrt{14}}{84} & 0 & \frac{\sqrt{7}}{42} & 0 & \frac{\sqrt{70}}{84} & -\frac{5\sqrt{15}}{96} & 0 & -\frac{5\sqrt{35}}{224} & 0 & -\frac{5\sqrt{21}}{224} & 0 & -\frac{5\sqrt{105}}{672} & 0 \\
-\frac{\sqrt{70}}{84} & 0 & -\frac{\sqrt{7}}{42} & 0 & -\frac{\sqrt{14}}{84} & 0 & 0 & -\frac{5\sqrt{105}}{672} & 0 & -\frac{5\sqrt{21}}{224} & 0 & -\frac{5\sqrt{35}}{224} & 0 & -\frac{5\sqrt{15}}{96} \\
-\frac{5\sqrt{105}}{672} & 0 & -\frac{5\sqrt{42}}{224} & 0 & -\frac{25\sqrt{21}}{672} & 0 & 0 & -\frac{\sqrt{70}}{112} & 0 & -\frac{\sqrt{14}}{56} & 0 & -\frac{\sqrt{210}}{336} & 0 & 0 \\
0 & \frac{5\sqrt{7}}{96} & 0 & \frac{5\sqrt{14}}{672} & 0 & -\frac{25\sqrt{35}}{672} & \frac{\sqrt{30}}{48} & 0 & 0 & 0 & -\frac{\sqrt{42}}{112} & 0 & -\frac{\sqrt{210}}{168} & 0 \\
-\frac{25\sqrt{35}}{672} & 0 & \frac{5\sqrt{14}}{672} & 0 & \frac{5\sqrt{7}}{96} & 0 & 0 & \frac{\sqrt{210}}{168} & 0 & \frac{\sqrt{42}}{112} & 0 & 0 & 0 & -\frac{\sqrt{30}}{48} \\
0 & -\frac{25\sqrt{21}}{672} & 0 & -\frac{5\sqrt{42}}{224} & 0 & -\frac{5\sqrt{105}}{672} & 0 & 0 & \frac{\sqrt{210}}{336} & 0 & \frac{\sqrt{14}}{56} & 0 & \frac{\sqrt{70}}{112} & 0
\end{pmatrix}$$

353	symmetry	$\dfrac{\sqrt{15}x(y-z)(y+z)}{2}$

$$\mathbb{G}_{3,1}^{(1,0;a)}(E,2)$$

$$\begin{pmatrix}
0 & \frac{\sqrt{210}i}{252} & 0 & -\frac{\sqrt{105}i}{126} & 0 & -\frac{\sqrt{42}i}{84} & -\frac{5i}{32} & 0 & -\frac{25\sqrt{21}i}{672} & 0 & \frac{5\sqrt{35}i}{224} & 0 & \frac{5\sqrt{7}i}{224} & 0 \\
-\frac{\sqrt{42}i}{84} & 0 & -\frac{\sqrt{105}i}{126} & 0 & \frac{\sqrt{210}i}{252} & 0 & 0 & -\frac{5\sqrt{7}i}{224} & 0 & -\frac{5\sqrt{35}i}{224} & 0 & \frac{25\sqrt{21}i}{672} & 0 & \frac{5i}{32} \\
-\frac{25\sqrt{7}i}{672} & 0 & \frac{5\sqrt{70}i}{224} & 0 & \frac{5\sqrt{35}i}{224} & 0 & 0 & -\frac{5\sqrt{42}i}{336} & 0 & \frac{\sqrt{210}i}{168} & 0 & \frac{\sqrt{14}i}{112} & 0 & 0 \\
0 & \frac{5\sqrt{105}i}{288} & 0 & -\frac{5\sqrt{210}i}{2016} & 0 & \frac{25\sqrt{21}i}{672} & \frac{\sqrt{2}i}{16} & 0 & 0 & 0 & \frac{\sqrt{70}i}{112} & 0 & \frac{\sqrt{14}i}{56} & 0 \\
-\frac{25\sqrt{21}i}{672} & 0 & \frac{5\sqrt{210}i}{2016} & 0 & -\frac{5\sqrt{105}i}{288} & 0 & 0 & \frac{\sqrt{14}i}{56} & 0 & \frac{\sqrt{70}i}{112} & 0 & 0 & 0 & \frac{\sqrt{2}i}{16} \\
0 & -\frac{5\sqrt{35}i}{224} & 0 & -\frac{5\sqrt{70}i}{224} & 0 & \frac{25\sqrt{7}i}{672} & 0 & 0 & \frac{\sqrt{14}i}{112} & 0 & \frac{\sqrt{210}i}{168} & 0 & -\frac{5\sqrt{42}i}{336} & 0
\end{pmatrix}$$

354	symmetry	$-\dfrac{\sqrt{15}y(x-z)(x+z)}{2}$

$$\mathbb{G}_{3,2}^{(1,0;a)}(E,2)$$

$$\begin{pmatrix}
0 & \frac{\sqrt{210}}{252} & 0 & \frac{\sqrt{105}}{126} & 0 & -\frac{\sqrt{42}}{84} & \frac{5}{32} & 0 & -\frac{25\sqrt{21}}{672} & 0 & -\frac{5\sqrt{35}}{224} & 0 & \frac{5\sqrt{7}}{224} & 0 \\
\frac{\sqrt{42}}{84} & 0 & -\frac{\sqrt{105}}{126} & 0 & -\frac{\sqrt{210}}{252} & 0 & 0 & \frac{5\sqrt{7}}{224} & 0 & -\frac{5\sqrt{35}}{224} & 0 & -\frac{25\sqrt{21}}{672} & 0 & \frac{5}{32} \\
-\frac{25\sqrt{7}}{672} & 0 & -\frac{5\sqrt{70}}{224} & 0 & \frac{5\sqrt{35}}{224} & 0 & 0 & -\frac{5\sqrt{42}}{336} & 0 & -\frac{\sqrt{210}}{168} & 0 & \frac{\sqrt{14}}{112} & 0 & 0 \\
0 & \frac{5\sqrt{105}}{288} & 0 & \frac{5\sqrt{210}}{2016} & 0 & \frac{25\sqrt{21}}{672} & -\frac{\sqrt{2}}{16} & 0 & 0 & 0 & -\frac{\sqrt{70}}{112} & 0 & \frac{\sqrt{14}}{56} & 0 \\
\frac{25\sqrt{21}}{672} & 0 & \frac{5\sqrt{210}}{2016} & 0 & \frac{5\sqrt{105}}{288} & 0 & 0 & -\frac{\sqrt{14}}{56} & 0 & \frac{\sqrt{70}}{112} & 0 & 0 & 0 & \frac{\sqrt{2}}{16} \\
0 & \frac{5\sqrt{35}}{224} & 0 & -\frac{5\sqrt{70}}{224} & 0 & -\frac{25\sqrt{7}}{672} & 0 & 0 & -\frac{\sqrt{14}}{112} & 0 & \frac{\sqrt{210}}{168} & 0 & \frac{5\sqrt{42}}{336} & 0
\end{pmatrix}$$

355	symmetry	z

$$\mathbb{G}_{1}^{(1,1;a)}(A_2)$$

$$\begin{pmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & -\frac{\sqrt{10}i}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & -\frac{\sqrt{15}i}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & -\frac{\sqrt{15}i}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & -\frac{\sqrt{10}i}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0
\end{pmatrix}$$

356	symmetry	x

Table 7

No.	multipole	matrix
	$\mathbb{G}_{1,1}^{(1,1;a)}(E)$	$\begin{pmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ \frac{\sqrt{2}i}{4} & 0 & -\frac{\sqrt{5}i}{20} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{30}i}{20} & 0 & -\frac{\sqrt{15}i}{20} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{15}i}{20} & 0 & -\frac{\sqrt{30}i}{20} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{5}i}{20} & 0 & -\frac{\sqrt{2}i}{4} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{pmatrix}$
357	symmetry	$-y$
	$\mathbb{G}_{1,2}^{(1,1;a)}(E)$	$\begin{pmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ \frac{\sqrt{2}}{4} & 0 & \frac{\sqrt{5}}{20} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{30}}{20} & 0 & \frac{\sqrt{15}}{20} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{15}}{20} & 0 & \frac{\sqrt{30}}{20} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{5}}{20} & 0 & \frac{\sqrt{2}}{4} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{pmatrix}$
358	symmetry	$-\frac{z\left(3x^2+3y^2-2z^2\right)}{2}$
	$\mathbb{G}_{3}^{(1,1;a)}(A_2)$	$\begin{pmatrix} 0 & 0 & \frac{3i}{7} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{28} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{3i}{7} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{28} & 0 & 0 & 0 \\ 0 & \frac{3\sqrt{3}i}{28} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}i}{84} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{3\sqrt{2}i}{28} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{84} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{3\sqrt{2}i}{28} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}i}{84} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{3\sqrt{3}i}{28} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}i}{84} & 0 & 0 \end{pmatrix}$
359	symmetry	$\sqrt{15}xyz$
	$\mathbb{G}_{3}^{(1,1;a)}(B_1)$	$\begin{pmatrix} -\frac{\sqrt{6}}{14} & 0 & 0 & 0 & \frac{\sqrt{30}}{14} & 0 & 0 & \frac{3}{56} & 0 & 0 & 0 & -\frac{\sqrt{3}}{56} & 0 & 0 \\ 0 & \frac{\sqrt{30}}{14} & 0 & 0 & 0 & -\frac{\sqrt{6}}{14} & 0 & 0 & \frac{\sqrt{3}}{56} & 0 & 0 & 0 & -\frac{3}{56} & 0 \\ 0 & 0 & 0 & \frac{3\sqrt{10}}{56} & 0 & 0 & \frac{\sqrt{42}}{168} & 0 & 0 & 0 & -\frac{\sqrt{30}}{168} & 0 & 0 & 0 \\ \frac{5\sqrt{3}}{56} & 0 & 0 & 0 & \frac{\sqrt{15}}{56} & 0 & 0 & -\frac{\sqrt{2}}{56} & 0 & 0 & 0 & -\frac{\sqrt{6}}{56} & 0 & 0 \\ 0 & -\frac{\sqrt{15}}{56} & 0 & 0 & 0 & -\frac{5\sqrt{3}}{56} & 0 & 0 & -\frac{\sqrt{6}}{56} & 0 & 0 & 0 & -\frac{\sqrt{2}}{56} & 0 \\ 0 & 0 & -\frac{3\sqrt{10}}{56} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}}{168} & 0 & 0 & 0 & \frac{\sqrt{42}}{168} \end{pmatrix}$
360	symmetry	$\frac{\sqrt{15}z(x-y)(x+y)}{2}$

continued …

Table 7

No.	multipole	matrix

$\mathbb{G}_3^{(1,1;a)}(B_2)$

$$\begin{pmatrix}
\frac{\sqrt{6}i}{14} & 0 & 0 & 0 & \frac{\sqrt{30}i}{14} & 0 & 0 & -\frac{3i}{56} & 0 & 0 & 0 & -\frac{\sqrt{3}i}{56} & 0 & 0 \\
0 & -\frac{\sqrt{30}i}{14} & 0 & 0 & 0 & -\frac{\sqrt{6}i}{14} & 0 & 0 & -\frac{\sqrt{3}i}{56} & 0 & 0 & 0 & -\frac{3i}{56} & 0 \\
0 & 0 & 0 & \frac{3\sqrt{10}i}{56} & 0 & 0 & -\frac{\sqrt{42}i}{168} & 0 & 0 & 0 & -\frac{\sqrt{30}i}{168} & 0 & 0 & 0 \\
-\frac{5\sqrt{3}i}{56} & 0 & 0 & 0 & \frac{\sqrt{15}i}{56} & 0 & 0 & \frac{\sqrt{2}i}{56} & 0 & 0 & 0 & -\frac{\sqrt{6}i}{56} & 0 & 0 \\
0 & \frac{\sqrt{15}i}{56} & 0 & 0 & 0 & -\frac{5\sqrt{3}i}{56} & 0 & 0 & \frac{\sqrt{6}i}{56} & 0 & 0 & 0 & -\frac{\sqrt{2}i}{56} & 0 \\
0 & 0 & \frac{3\sqrt{10}i}{56} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}i}{168} & 0 & 0 & 0 & \frac{\sqrt{42}i}{168}
\end{pmatrix}$$

361   symmetry
$$\frac{x\left(2x^2-3y^2-3z^2\right)}{2}$$

$\mathbb{G}_{3,1}^{(1,1;a)}(E,1)$

$$\begin{bmatrix}
0 & \frac{3\sqrt{2}i}{28} & 0 & -\frac{3i}{14} & 0 & \frac{3\sqrt{10}i}{28} & \frac{\sqrt{105}i}{224} & 0 & -\frac{3\sqrt{5}i}{224} & 0 & \frac{3\sqrt{3}i}{224} & 0 & -\frac{\sqrt{15}i}{224} & 0 \\
\frac{3\sqrt{10}i}{28} & 0 & -\frac{3i}{14} & 0 & \frac{3\sqrt{2}i}{28} & 0 & 0 & \frac{\sqrt{15}i}{224} & 0 & -\frac{3\sqrt{3}i}{224} & 0 & \frac{3\sqrt{5}i}{224} & 0 & -\frac{\sqrt{105}i}{224} \\
\frac{3\sqrt{15}i}{224} & 0 & -\frac{9\sqrt{6}i}{224} & 0 & \frac{15\sqrt{3}i}{224} & 0 & 0 & -\frac{\sqrt{10}i}{112} & 0 & \frac{\sqrt{2}i}{56} & 0 & -\frac{\sqrt{30}i}{336} & 0 & 0 \\
0 & -\frac{3i}{32} & 0 & \frac{3\sqrt{2}i}{224} & 0 & \frac{15\sqrt{5}i}{224} & -\frac{\sqrt{210}i}{336} & 0 & 0 & 0 & \frac{\sqrt{6}i}{112} & 0 & -\frac{\sqrt{30}i}{168} & 0 \\
-\frac{15\sqrt{5}i}{224} & 0 & -\frac{3\sqrt{2}i}{224} & 0 & \frac{3i}{32} & 0 & 0 & -\frac{\sqrt{30}i}{168} & 0 & \frac{\sqrt{6}i}{112} & 0 & 0 & 0 & -\frac{\sqrt{210}i}{336} \\
0 & -\frac{15\sqrt{3}i}{224} & 0 & \frac{9\sqrt{6}i}{224} & 0 & -\frac{3\sqrt{15}i}{224} & 0 & 0 & -\frac{\sqrt{30}i}{336} & 0 & \frac{\sqrt{2}i}{56} & 0 & -\frac{\sqrt{10}i}{112} & 0
\end{bmatrix}$$

362   symmetry
$$\frac{y\left(3x^2-2y^2+3z^2\right)}{2}$$

$\mathbb{G}_{3,2}^{(1,1;a)}(E,1)$

$$\begin{bmatrix}
0 & \frac{3\sqrt{2}}{28} & 0 & \frac{3}{14} & 0 & \frac{3\sqrt{10}}{28} & -\frac{\sqrt{105}}{224} & 0 & -\frac{3\sqrt{5}}{224} & 0 & -\frac{3\sqrt{3}}{224} & 0 & -\frac{\sqrt{15}}{224} & 0 \\
-\frac{3\sqrt{10}}{28} & 0 & -\frac{3}{14} & 0 & -\frac{3\sqrt{2}}{28} & 0 & 0 & -\frac{\sqrt{15}}{224} & 0 & -\frac{3\sqrt{3}}{224} & 0 & -\frac{3\sqrt{5}}{224} & 0 & -\frac{\sqrt{105}}{224} \\
\frac{3\sqrt{15}}{224} & 0 & \frac{9\sqrt{6}}{224} & 0 & \frac{15\sqrt{3}}{224} & 0 & 0 & -\frac{\sqrt{10}}{112} & 0 & -\frac{\sqrt{2}}{56} & 0 & -\frac{\sqrt{30}}{336} & 0 & 0 \\
0 & -\frac{3}{32} & 0 & -\frac{3\sqrt{2}}{224} & 0 & \frac{15\sqrt{5}}{224} & \frac{\sqrt{210}}{336} & 0 & 0 & 0 & -\frac{\sqrt{6}}{112} & 0 & -\frac{\sqrt{30}}{168} & 0 \\
\frac{15\sqrt{5}}{224} & 0 & -\frac{3\sqrt{2}}{224} & 0 & -\frac{3}{32} & 0 & 0 & \frac{\sqrt{30}}{168} & 0 & \frac{\sqrt{6}}{112} & 0 & 0 & 0 & -\frac{\sqrt{210}}{336} \\
0 & \frac{15\sqrt{3}}{224} & 0 & \frac{9\sqrt{6}}{224} & 0 & \frac{3\sqrt{15}}{224} & 0 & 0 & \frac{\sqrt{30}}{336} & 0 & \frac{\sqrt{2}}{56} & 0 & \frac{\sqrt{10}}{112} & 0
\end{bmatrix}$$

363   symmetry
$$\frac{\sqrt{15}\,x(y-z)(y+z)}{2}$$

$\mathbb{G}_{3,1}^{(1,1;a)}(E,2)$

$$\begin{bmatrix}
0 & \frac{\sqrt{30}i}{28} & 0 & -\frac{\sqrt{15}i}{14} & 0 & -\frac{3\sqrt{6}i}{28} & -\frac{3\sqrt{7}i}{224} & 0 & -\frac{5\sqrt{3}i}{224} & 0 & \frac{3\sqrt{5}i}{224} & 0 & \frac{3i}{224} & 0 \\
-\frac{3\sqrt{6}i}{28} & 0 & -\frac{\sqrt{15}i}{14} & 0 & \frac{\sqrt{30}i}{28} & 0 & 0 & -\frac{3i}{224} & 0 & -\frac{3\sqrt{5}i}{224} & 0 & \frac{5\sqrt{3}i}{224} & 0 & \frac{3\sqrt{7}i}{224} \\
\frac{15i}{224} & 0 & -\frac{9\sqrt{10}i}{224} & 0 & -\frac{9\sqrt{5}i}{224} & 0 & 0 & -\frac{5\sqrt{6}i}{336} & 0 & \frac{\sqrt{30}i}{168} & 0 & \frac{\sqrt{2}i}{112} & 0 & 0 \\
0 & -\frac{\sqrt{15}i}{32} & 0 & \frac{\sqrt{30}i}{224} & 0 & -\frac{15\sqrt{3}i}{224} & \frac{\sqrt{14}i}{112} & 0 & 0 & 0 & \frac{\sqrt{10}i}{112} & 0 & \frac{\sqrt{2}i}{56} & 0 \\
\frac{15\sqrt{3}i}{224} & 0 & -\frac{\sqrt{30}i}{224} & 0 & \frac{\sqrt{15}i}{32} & 0 & 0 & \frac{\sqrt{2}i}{56} & 0 & \frac{\sqrt{10}i}{112} & 0 & 0 & 0 & \frac{\sqrt{14}i}{112} \\
0 & \frac{9\sqrt{5}i}{224} & 0 & \frac{9\sqrt{10}i}{224} & 0 & -\frac{15i}{224} & 0 & 0 & \frac{\sqrt{2}i}{112} & 0 & \frac{\sqrt{30}i}{168} & 0 & -\frac{5\sqrt{6}i}{336} & 0
\end{bmatrix}$$

364   symmetry
$$-\frac{\sqrt{15}\,y(x-z)(x+z)}{2}$$

continued …

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Table 7

No.	multipole	matrix

$$\mathbb{G}_{3,2}^{(1,1;a)}(E,2)$$

$$\begin{bmatrix}
0 & \frac{\sqrt{30}}{28} & 0 & \frac{\sqrt{15}}{14} & 0 & -\frac{3\sqrt{6}}{28} & \frac{3\sqrt{7}}{224} & 0 & -\frac{5\sqrt{3}}{224} & 0 & -\frac{3\sqrt{5}}{224} & 0 & \frac{3}{224} & 0 \\
\frac{3\sqrt{6}}{28} & 0 & -\frac{\sqrt{15}}{14} & 0 & -\frac{\sqrt{30}}{28} & 0 & 0 & \frac{3}{224} & 0 & -\frac{3\sqrt{5}}{224} & 0 & -\frac{5\sqrt{3}}{224} & 0 & \frac{3\sqrt{7}}{224} \\
\frac{15}{224} & 0 & \frac{9\sqrt{10}}{224} & 0 & -\frac{9\sqrt{5}}{224} & 0 & 0 & -\frac{5\sqrt{6}}{336} & 0 & -\frac{\sqrt{30}}{168} & 0 & \frac{\sqrt{2}}{112} & 0 & 0 \\
0 & -\frac{\sqrt{15}}{32} & 0 & -\frac{\sqrt{30}}{224} & 0 & -\frac{15\sqrt{3}}{224} & -\frac{\sqrt{14}}{112} & 0 & 0 & 0 & -\frac{\sqrt{10}}{112} & 0 & \frac{\sqrt{2}}{56} & 0 \\
-\frac{15\sqrt{3}}{224} & 0 & -\frac{\sqrt{30}}{224} & 0 & -\frac{\sqrt{15}}{32} & 0 & 0 & -\frac{\sqrt{2}}{56} & 0 & \frac{\sqrt{10}}{112} & 0 & 0 & 0 & \frac{\sqrt{14}}{112} \\
0 & -\frac{9\sqrt{5}}{224} & 0 & \frac{9\sqrt{10}}{224} & 0 & \frac{15}{224} & 0 & 0 & -\frac{\sqrt{2}}{112} & 0 & \frac{\sqrt{30}}{168} & 0 & \frac{5\sqrt{6}}{336} & 0
\end{bmatrix}$$

365 symmetry $-\frac{x^2}{2} - \frac{y^2}{2} + z^2$

$$\mathbb{T}_2^{(a)}(A_1)$$

$$\begin{bmatrix}
0 & 0 & \frac{\sqrt{3}i}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & \frac{\sqrt{3}i}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & -\frac{i}{7} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}i}{14} & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & -\frac{\sqrt{6}i}{42} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{2}i}{14} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & \frac{\sqrt{6}i}{42} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{2}i}{14} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & \frac{i}{7} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}i}{14} & 0 & 0
\end{bmatrix}$$

366 symmetry $\frac{\sqrt{3}(x-y)(x+y)}{2}$

$$\mathbb{T}_2^{(a)}(B_1)$$

$$\begin{bmatrix}
\frac{\sqrt{10}i}{12} & 0 & 0 & 0 & \frac{\sqrt{2}i}{12} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & \frac{\sqrt{2}i}{12} & 0 & 0 & 0 & \frac{\sqrt{10}i}{12} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & -\frac{\sqrt{6}i}{42} & 0 & 0 & \frac{\sqrt{70}i}{28} & 0 & 0 & 0 & \frac{\sqrt{2}i}{28} & 0 & 0 & 0 \\
\frac{\sqrt{5}i}{21} & 0 & 0 & 0 & -\frac{2i}{21} & 0 & 0 & \frac{\sqrt{30}i}{28} & 0 & 0 & 0 & \frac{\sqrt{10}i}{28} & 0 & 0 \\
0 & \frac{2i}{21} & 0 & 0 & 0 & -\frac{\sqrt{5}i}{21} & 0 & 0 & \frac{\sqrt{10}i}{28} & 0 & 0 & 0 & \frac{\sqrt{30}i}{28} & 0 \\
0 & 0 & \frac{\sqrt{6}i}{42} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2}i}{28} & 0 & 0 & 0 & \frac{\sqrt{70}i}{28}
\end{bmatrix}$$

367 symmetry $\sqrt{3}xy$

$$\mathbb{T}_2^{(a)}(B_2)$$

$$\begin{bmatrix}
-\frac{\sqrt{10}}{12} & 0 & 0 & 0 & \frac{\sqrt{2}}{12} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & -\frac{\sqrt{2}}{12} & 0 & 0 & 0 & \frac{\sqrt{10}}{12} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & -\frac{\sqrt{6}}{42} & 0 & 0 & -\frac{\sqrt{70}}{28} & 0 & 0 & 0 & \frac{\sqrt{2}}{28} & 0 & 0 & 0 \\
-\frac{\sqrt{5}}{21} & 0 & 0 & 0 & -\frac{2}{21} & 0 & 0 & -\frac{\sqrt{30}}{28} & 0 & 0 & 0 & \frac{\sqrt{10}}{28} & 0 & 0 \\
0 & -\frac{2}{21} & 0 & 0 & 0 & -\frac{\sqrt{5}}{21} & 0 & 0 & -\frac{\sqrt{10}}{28} & 0 & 0 & 0 & \frac{\sqrt{30}}{28} & 0 \\
0 & 0 & -\frac{\sqrt{6}}{42} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}}{28} & 0 & 0 & 0 & \frac{\sqrt{70}}{28}
\end{bmatrix}$$

368 symmetry $\sqrt{3}yz$

continued ...

Table 7

No.	multipole	matrix

$\mathbb{T}_{2,1}^{(a)}(E)$

$$\begin{bmatrix} 0 & \frac{\sqrt{2}}{6} & 0 & \frac{1}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & \frac{1}{6} & 0 & \frac{\sqrt{2}}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ -\frac{\sqrt{15}}{42} & 0 & -\frac{\sqrt{6}}{28} & 0 & 0 & 0 & 0 & \frac{\sqrt{10}}{14} & 0 & \frac{\sqrt{2}}{14} & 0 & 0 & 0 & 0 \\ 0 & \frac{1}{42} & 0 & -\frac{5\sqrt{2}}{84} & 0 & 0 & 0 & 0 & \frac{\sqrt{10}}{14} & 0 & \frac{\sqrt{6}}{14} & 0 & 0 & 0 \\ 0 & 0 & \frac{5\sqrt{2}}{84} & 0 & -\frac{1}{42} & 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{14} & 0 & \frac{\sqrt{10}}{14} & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{6}}{28} & 0 & \frac{\sqrt{15}}{42} & 0 & 0 & 0 & 0 & \frac{\sqrt{2}}{14} & 0 & \frac{\sqrt{10}}{14} & 0 \end{bmatrix}$$

369   symmetry $\sqrt{3}xz$

$\mathbb{T}_{2,2}^{(a)}(E)$

$$\begin{bmatrix} 0 & -\frac{\sqrt{2}i}{6} & 0 & \frac{i}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{i}{6} & 0 & \frac{\sqrt{2}i}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ \frac{\sqrt{15}i}{42} & 0 & -\frac{\sqrt{6}i}{28} & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}i}{14} & 0 & \frac{\sqrt{2}i}{14} & 0 & 0 & 0 & 0 \\ 0 & -\frac{i}{42} & 0 & -\frac{5\sqrt{2}i}{84} & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}i}{14} & 0 & \frac{\sqrt{6}i}{14} & 0 & 0 & 0 \\ 0 & 0 & -\frac{5\sqrt{2}i}{84} & 0 & -\frac{i}{42} & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{14} & 0 & \frac{\sqrt{10}i}{14} & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{6}i}{28} & 0 & \frac{\sqrt{15}i}{42} & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}i}{14} & 0 & \frac{\sqrt{10}i}{14} & 0 \end{bmatrix}$$

370   symmetry $\frac{\sqrt{21}\left(x^4-3x^2y^2-3x^2z^2+y^4-3y^2z^2+z^4\right)}{6}$

$\mathbb{T}_{4}^{(a)}(A_1,1)$

$$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}i}{12} & 0 & 0 & 0 & -\frac{\sqrt{5}i}{12} \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{5}i}{12} & 0 & 0 & 0 & \frac{\sqrt{7}i}{12} & 0 & 0 & 0 \\ 0 & \frac{\sqrt{7}i}{28} & 0 & 0 & 0 & \frac{\sqrt{35}i}{28} & 0 & 0 & -\frac{\sqrt{70}i}{56} & 0 & 0 & 0 & -\frac{\sqrt{210}i}{168} & 0 \\ 0 & 0 & -\frac{\sqrt{42}i}{28} & 0 & 0 & 0 & 0 & 0 & \frac{5\sqrt{14}i}{168} & 0 & 0 & 0 & -\frac{\sqrt{10}i}{24} \\ 0 & 0 & 0 & \frac{\sqrt{42}i}{28} & 0 & 0 & -\frac{\sqrt{10}i}{24} & 0 & 0 & 0 & \frac{5\sqrt{14}i}{168} & 0 & 0 & 0 \\ -\frac{\sqrt{35}i}{28} & 0 & 0 & 0 & -\frac{\sqrt{7}i}{28} & 0 & 0 & -\frac{\sqrt{210}i}{168} & 0 & 0 & 0 & -\frac{\sqrt{70}i}{56} & 0 & 0 \end{bmatrix}$$

371   symmetry $-\frac{\sqrt{15}\left(x^4-12x^2y^2+6x^2z^2+y^4+6y^2z^2-2z^4\right)}{12}$

$\mathbb{T}_{4}^{(a)}(A_1,2)$

$$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{12} & 0 & 0 & 0 & \frac{\sqrt{7}i}{12} \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}i}{12} & 0 & 0 & 0 & \frac{\sqrt{5}i}{12} & 0 & 0 & 0 \\ 0 & \frac{\sqrt{5}i}{28} & 0 & 0 & 0 & -\frac{i}{4} & 0 & 0 & -\frac{5\sqrt{2}i}{56} & 0 & 0 & 0 & \frac{\sqrt{6}i}{24} & 0 \\ 0 & 0 & -\frac{\sqrt{30}i}{28} & 0 & 0 & 0 & 0 & 0 & \frac{5\sqrt{10}i}{168} & 0 & 0 & 0 & \frac{\sqrt{14}i}{24} \\ 0 & 0 & 0 & \frac{\sqrt{30}i}{28} & 0 & 0 & \frac{\sqrt{14}i}{24} & 0 & 0 & 0 & \frac{5\sqrt{10}i}{168} & 0 & 0 & 0 \\ \frac{i}{4} & 0 & 0 & 0 & -\frac{\sqrt{5}i}{28} & 0 & 0 & \frac{\sqrt{6}i}{24} & 0 & 0 & 0 & -\frac{5\sqrt{2}i}{56} & 0 & 0 \end{bmatrix}$$

372   symmetry $\frac{\sqrt{35}xy(x-y)(x+y)}{2}$

Table 7

No.	multipole	matrix

$$\mathbb{T}_4^{(a)}(A_2)=\begin{bmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt3}{6}\\
0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt3}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0\\
0 & 0 & 0 & 0 & 0 & \frac{\sqrt{21}}{14} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{14}}{28} & 0\\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt6}{12}\\
0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt6}{12} & 0 & 0 & 0 & 0 & 0 & 0 & 0\\
\frac{\sqrt{21}}{14} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{14}}{28} & 0 & 0 & 0 & 0 & 0 & 0
\end{bmatrix}$$

373 symmetry

$$\frac{\sqrt5(x-y)(x+y)\left(x^2+y^2-6z^2\right)}{4}$$

$$\mathbb{T}_4^{(a)}(B_1)=\begin{bmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt3 i}{12} & 0 & 0 & 0 & \frac{i}{4} & 0 & 0\\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{i}{4} & 0 & 0 & 0 & -\frac{\sqrt3 i}{12} & 0\\
0 & 0 & 0 & -\frac{\sqrt{30}i}{28} & 0 & 0 & \frac{\sqrt{14}i}{56} & 0 & 0 & 0 & \frac{3\sqrt{10}i}{56} & 0 & 0 & 0\\
\frac{3i}{28} & 0 & 0 & 0 & \frac{3\sqrt5 i}{28} & 0 & 0 & -\frac{11\sqrt6 i}{168} & 0 & 0 & 0 & \frac{\sqrt2 i}{56} & 0 & 0\\
0 & -\frac{3\sqrt5 i}{28} & 0 & 0 & 0 & -\frac{3i}{28} & 0 & 0 & \frac{\sqrt2 i}{56} & 0 & 0 & 0 & -\frac{11\sqrt6 i}{168} & 0\\
0 & 0 & \frac{\sqrt{30}i}{28} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{10}i}{56} & 0 & 0 & 0 & \frac{\sqrt{14}i}{56}
\end{bmatrix}$$

374 symmetry

$$-\frac{\sqrt5 xy\left(x^2+y^2-6z^2\right)}{2}$$

$$\mathbb{T}_4^{(a)}(B_2)=\begin{bmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt3}{12} & 0 & 0 & 0 & -\frac{1}{4} & 0 & 0\\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{1}{4} & 0 & 0 & 0 & \frac{\sqrt3}{12} & 0\\
0 & 0 & 0 & \frac{\sqrt{30}}{28} & 0 & 0 & \frac{\sqrt{14}}{56} & 0 & 0 & 0 & -\frac{3\sqrt{10}}{56} & 0 & 0 & 0\\
\frac{3}{28} & 0 & 0 & 0 & -\frac{3\sqrt5}{28} & 0 & 0 & -\frac{11\sqrt6}{168} & 0 & 0 & 0 & -\frac{\sqrt2}{56} & 0 & 0\\
0 & -\frac{3\sqrt5}{28} & 0 & 0 & 0 & \frac{3}{28} & 0 & 0 & \frac{\sqrt2}{56} & 0 & 0 & 0 & \frac{11\sqrt6}{168} & 0\\
0 & 0 & \frac{\sqrt{30}}{28} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{10}}{56} & 0 & 0 & 0 & -\frac{\sqrt{14}}{56}
\end{bmatrix}$$

375 symmetry

$$\frac{\sqrt{35}\,yz(y-z)(y+z)}{2}$$

$$\mathbb{T}_{4,1}^{(a)}(E,1)=\begin{bmatrix}
0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt3}{48} & 0 & \frac{\sqrt7}{16} & 0 & \frac{\sqrt{105}}{48} & 0 & \frac{\sqrt{21}}{48} & 0\\
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{21}}{48} & 0 & -\frac{\sqrt{105}}{48} & 0 & -\frac{\sqrt7}{16} & 0 & -\frac{\sqrt3}{48}\\
-\frac{\sqrt{21}}{112} & 0 & -\frac{\sqrt{210}}{112} & 0 & -\frac{\sqrt{105}}{112} & 0 & 0 & \frac{3\sqrt{14}}{112} & 0 & \frac{\sqrt{70}}{56} & 0 & \frac{\sqrt{42}}{112} & 0 & 0\\
0 & \frac{3\sqrt{35}}{112} & 0 & \frac{3\sqrt{70}}{112} & 0 & \frac{3\sqrt7}{112} & -\frac{\sqrt6}{48} & 0 & -\frac{\sqrt{14}}{28} & 0 & -\frac{\sqrt{210}}{336} & 0 & \frac{\sqrt{42}}{168} & 0\\
-\frac{3\sqrt7}{112} & 0 & -\frac{3\sqrt{70}}{112} & 0 & -\frac{3\sqrt{35}}{112} & 0 & 0 & \frac{\sqrt{42}}{168} & 0 & -\frac{\sqrt{210}}{336} & 0 & -\frac{\sqrt{14}}{28} & 0 & -\frac{\sqrt6}{48}\\
0 & \frac{\sqrt{105}}{112} & 0 & \frac{\sqrt{210}}{112} & 0 & \frac{\sqrt{21}}{112} & 0 & 0 & \frac{\sqrt{42}}{112} & 0 & \frac{\sqrt{70}}{56} & 0 & \frac{3\sqrt{14}}{112} & 0
\end{bmatrix}$$

376 symmetry

$$\frac{\sqrt{35}\,xz(x-z)(x+z)}{2}$$

continued …

Table 7

No.	multipole	matrix

$$\mathbb{T}_{4,2}^{(a)}(E,1)\;=\;\begin{pmatrix}
0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{48} & 0 & -\frac{\sqrt{7}i}{16} & 0 & \frac{\sqrt{105}i}{48} & 0 & -\frac{\sqrt{21}i}{48} & 0 \\[4pt]
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{21}i}{48} & 0 & \frac{\sqrt{105}i}{48} & 0 & -\frac{\sqrt{7}i}{16} & 0 & \frac{\sqrt{3}i}{48} \\[4pt]
\frac{\sqrt{21}i}{112} & 0 & -\frac{\sqrt{210}i}{112} & 0 & \frac{\sqrt{105}i}{112} & 0 & 0 & -\frac{3\sqrt{14}i}{112} & 0 & \frac{\sqrt{70}i}{56} & 0 & -\frac{\sqrt{42}i}{112} & 0 & 0 \\[4pt]
0 & -\frac{3\sqrt{35}i}{112} & 0 & \frac{3\sqrt{70}i}{112} & 0 & -\frac{3\sqrt{7}i}{112} & -\frac{\sqrt{6}i}{48} & 0 & \frac{\sqrt{14}i}{28} & 0 & -\frac{\sqrt{210}i}{336} & 0 & -\frac{\sqrt{42}i}{168} & 0 \\[4pt]
-\frac{3\sqrt{7}i}{112} & 0 & \frac{3\sqrt{70}i}{112} & 0 & -\frac{3\sqrt{35}i}{112} & 0 & 0 & \frac{\sqrt{42}i}{168} & 0 & \frac{\sqrt{210}i}{336} & 0 & -\frac{\sqrt{14}i}{28} & 0 & \frac{\sqrt{6}i}{48} \\[4pt]
0 & \frac{\sqrt{105}i}{112} & 0 & -\frac{\sqrt{210}i}{112} & 0 & \frac{\sqrt{21}i}{112} & 0 & 0 & \frac{\sqrt{42}i}{112} & 0 & -\frac{\sqrt{70}i}{56} & 0 & \frac{3\sqrt{14}i}{112} & 0
\end{pmatrix}$$

377 symmetry $\dfrac{\sqrt{5}\,yz\left(6x^2-y^2-z^2\right)}{2}$

$$\mathbb{T}_{4,1}^{(a)}(E,2)\;=\;\begin{pmatrix}
0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{21}}{48} & 0 & \frac{1}{16} & 0 & \frac{\sqrt{15}}{48} & 0 & -\frac{7\sqrt{3}}{48} & 0 \\[4pt]
0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{7\sqrt{3}}{48} & 0 & -\frac{\sqrt{15}}{48} & 0 & -\frac{1}{16} & 0 & \frac{\sqrt{21}}{48} \\[4pt]
-\frac{\sqrt{3}}{112} & 0 & -\frac{\sqrt{30}}{112} & 0 & \frac{\sqrt{15}}{16} & 0 & 0 & \frac{3\sqrt{2}}{112} & 0 & \frac{\sqrt{10}}{56} & 0 & -\frac{\sqrt{6}}{16} & 0 & 0 \\[4pt]
0 & \frac{3\sqrt{5}}{112} & 0 & \frac{3\sqrt{10}}{112} & 0 & -\frac{3}{16} & \frac{\sqrt{42}}{48} & 0 & -\frac{\sqrt{2}}{28} & 0 & -\frac{\sqrt{30}}{336} & 0 & -\frac{\sqrt{6}}{24} & 0 \\[4pt]
\frac{3}{16} & 0 & -\frac{3\sqrt{10}}{112} & 0 & -\frac{3\sqrt{5}}{112} & 0 & 0 & -\frac{\sqrt{6}}{24} & 0 & -\frac{\sqrt{30}}{336} & 0 & -\frac{\sqrt{2}}{28} & 0 & \frac{\sqrt{42}}{48} \\[4pt]
0 & -\frac{\sqrt{15}}{16} & 0 & \frac{\sqrt{30}}{112} & 0 & \frac{\sqrt{3}}{112} & 0 & 0 & -\frac{\sqrt{6}}{16} & 0 & \frac{\sqrt{10}}{56} & 0 & \frac{3\sqrt{2}}{112} & 0
\end{pmatrix}$$

378 symmetry $-\dfrac{\sqrt{5}\,xz\left(x^2-6y^2+z^2\right)}{2}$

$$\mathbb{T}_{4,2}^{(a)}(E,2)\;=\;\begin{pmatrix}
0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{21}i}{48} & 0 & -\frac{i}{16} & 0 & \frac{\sqrt{15}i}{48} & 0 & \frac{7\sqrt{3}i}{48} & 0 \\[4pt]
0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{7\sqrt{3}i}{48} & 0 & \frac{\sqrt{15}i}{48} & 0 & -\frac{i}{16} & 0 & -\frac{\sqrt{21}i}{48} \\[4pt]
\frac{\sqrt{3}i}{112} & 0 & -\frac{\sqrt{30}i}{112} & 0 & -\frac{\sqrt{15}i}{16} & 0 & 0 & -\frac{3\sqrt{2}i}{112} & 0 & \frac{\sqrt{10}i}{56} & 0 & \frac{\sqrt{6}i}{16} & 0 & 0 \\[4pt]
0 & -\frac{3\sqrt{5}i}{112} & 0 & \frac{3\sqrt{10}i}{112} & 0 & \frac{3i}{16} & \frac{\sqrt{42}i}{48} & 0 & \frac{\sqrt{2}i}{28} & 0 & -\frac{\sqrt{30}i}{336} & 0 & \frac{\sqrt{6}i}{24} & 0 \\[4pt]
\frac{3i}{16} & 0 & \frac{3\sqrt{10}i}{112} & 0 & -\frac{3\sqrt{5}i}{112} & 0 & 0 & -\frac{\sqrt{6}i}{24} & 0 & \frac{\sqrt{30}i}{336} & 0 & -\frac{\sqrt{2}i}{28} & 0 & -\frac{\sqrt{42}i}{48} \\[4pt]
0 & -\frac{\sqrt{15}i}{16} & 0 & -\frac{\sqrt{30}i}{112} & 0 & \frac{\sqrt{3}i}{112} & 0 & 0 & -\frac{\sqrt{6}i}{16} & 0 & -\frac{\sqrt{10}i}{56} & 0 & \frac{3\sqrt{2}i}{112} & 0
\end{pmatrix}$$

379 symmetry $\dfrac{\sqrt{21}\left(x^4-3x^2y^2-3x^2z^2+y^4-3y^2z^2+z^4\right)}{6}$

$$\mathbb{T}_{4}^{(1,-1;a)}(A_1,1)\;=\;\begin{pmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{21}i}{24} & 0 & 0 & 0 & -\frac{\sqrt{15}i}{24} \\[4pt]
0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{24} & 0 & 0 & 0 & \frac{\sqrt{21}i}{24} & 0 & 0 & 0 \\[4pt]
0 & \frac{\sqrt{21}i}{168} & 0 & 0 & 0 & \frac{\sqrt{105}i}{168} & 0 & 0 & \frac{\sqrt{210}i}{56} & 0 & 0 & 0 & \frac{\sqrt{70}i}{56} & 0 \\[4pt]
0 & 0 & -\frac{\sqrt{14}i}{56} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{5\sqrt{42}i}{168} & 0 & 0 & 0 & \frac{\sqrt{30}i}{24} \\[4pt]
0 & 0 & 0 & \frac{\sqrt{14}i}{56} & 0 & 0 & \frac{\sqrt{30}i}{24} & 0 & 0 & 0 & -\frac{5\sqrt{42}i}{168} & 0 & 0 & 0 \\[4pt]
-\frac{\sqrt{105}i}{168} & 0 & 0 & 0 & -\frac{\sqrt{21}i}{168} & 0 & 0 & \frac{\sqrt{70}i}{56} & 0 & 0 & 0 & \frac{\sqrt{210}i}{56} & 0 & 0
\end{pmatrix}$$

380 symmetry $-\dfrac{\sqrt{15}\left(x^4-12x^2y^2+6x^2z^2+y^4+6y^2z^2-2z^4\right)}{12}$

Table 7

No.	multipole	matrix

$\mathbb{T}_4^{(1,-1;a)}(A_1,2)$

$$\begin{pmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{24} & 0 & 0 & 0 & \frac{\sqrt{21}i}{24}\\
0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{21}i}{24} & 0 & 0 & 0 & \frac{\sqrt{15}i}{24} & 0 & 0 & 0\\
0 & \frac{\sqrt{15}i}{168} & 0 & 0 & 0 & -\frac{\sqrt{3}i}{24} & 0 & 0 & \frac{5\sqrt{6}i}{56} & 0 & 0 & 0 & -\frac{\sqrt{2}i}{8} & 0\\
0 & 0 & -\frac{\sqrt{10}i}{56} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{5\sqrt{30}i}{168} & 0 & 0 & 0 & -\frac{\sqrt{42}i}{24}\\
0 & 0 & 0 & \frac{\sqrt{10}i}{56} & 0 & 0 & -\frac{\sqrt{42}i}{24} & 0 & 0 & 0 & -\frac{5\sqrt{30}i}{168} & 0 & 0 & 0\\
\frac{\sqrt{3}i}{24} & 0 & 0 & 0 & -\frac{\sqrt{15}i}{168} & 0 & 0 & -\frac{\sqrt{2}i}{8} & 0 & 0 & 0 & \frac{5\sqrt{6}i}{56} & 0 & 0
\end{pmatrix}$$

381 symmetry

$$\frac{\sqrt{35}xy(x-y)(x+y)}{2}$$

$\mathbb{T}_4^{(1,-1;a)}(A_2)$

$$\begin{pmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{1}{4}\\
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{1}{4} & 0 & 0 & 0 & 0 & 0 & 0\\
0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}}{28} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{42}}{28} & 0\\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2}}{4}\\
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}}{4} & 0 & 0 & 0 & 0 & 0 & 0\\
\frac{\sqrt{7}}{28} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{42}}{28} & 0 & 0 & 0 & 0 & 0 & 0
\end{pmatrix}$$

382 symmetry

$$\frac{\sqrt{5}(x-y)(x+y)\left(x^2+y^2-6z^2\right)}{4}$$

$\mathbb{T}_4^{(1,-1;a)}(B_1)$

$$\begin{pmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{i}{8} & 0 & 0 & 0 & \frac{\sqrt{3}i}{8} & 0 & 0\\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{8} & 0 & 0 & 0 & -\frac{i}{8} & 0\\
0 & 0 & 0 & -\frac{\sqrt{10}i}{56} & 0 & 0 & -\frac{\sqrt{42}i}{56} & 0 & 0 & 0 & -\frac{3\sqrt{30}i}{56} & 0 & 0 & 0\\
\frac{\sqrt{3}i}{56} & 0 & 0 & 0 & \frac{\sqrt{15}i}{56} & 0 & 0 & \frac{11\sqrt{2}i}{56} & 0 & 0 & 0 & -\frac{\sqrt{6}i}{56} & 0 & 0\\
0 & -\frac{\sqrt{15}i}{56} & 0 & 0 & 0 & -\frac{\sqrt{3}i}{56} & 0 & 0 & -\frac{\sqrt{6}i}{56} & 0 & 0 & 0 & \frac{11\sqrt{2}i}{56} & 0\\
0 & 0 & \frac{\sqrt{10}i}{56} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{30}i}{56} & 0 & 0 & 0 & -\frac{\sqrt{42}i}{56}
\end{pmatrix}$$

383 symmetry

$$-\frac{\sqrt{5}xy\left(x^2+y^2-6z^2\right)}{2}$$

$\mathbb{T}_4^{(1,-1;a)}(B_2)$

$$\begin{pmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{1}{8} & 0 & 0 & 0 & -\frac{\sqrt{3}}{8} & 0 & 0\\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{8} & 0 & 0 & 0 & \frac{1}{8} & 0\\
0 & 0 & 0 & \frac{\sqrt{10}}{56} & 0 & 0 & -\frac{\sqrt{42}}{56} & 0 & 0 & 0 & \frac{3\sqrt{30}}{56} & 0 & 0 & 0\\
\frac{\sqrt{3}}{56} & 0 & 0 & 0 & -\frac{\sqrt{15}}{56} & 0 & 0 & \frac{11\sqrt{2}}{56} & 0 & 0 & 0 & \frac{\sqrt{6}}{56} & 0 & 0\\
0 & -\frac{\sqrt{15}}{56} & 0 & 0 & 0 & \frac{\sqrt{3}}{56} & 0 & 0 & -\frac{\sqrt{6}}{56} & 0 & 0 & 0 & -\frac{11\sqrt{2}}{56} & 0\\
0 & 0 & \frac{\sqrt{10}}{56} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{30}}{56} & 0 & 0 & 0 & \frac{\sqrt{42}}{56}
\end{pmatrix}$$

384 symmetry

$$\frac{\sqrt{35}yz(y-z)(y+z)}{2}$$

continued ...

Table 7

No.	multipole	matrix
	$\mathbb{T}_{4,1}^{(1,-1;a)}(E,1)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & \frac{1}{32} & 0 & \frac{\sqrt{21}}{32} & 0 & \frac{\sqrt{35}}{32} & 0 & \frac{\sqrt{7}}{32} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}}{32} & 0 & -\frac{\sqrt{35}}{32} & 0 & -\frac{\sqrt{21}}{32} & 0 & -\frac{1}{32} \\ -\frac{\sqrt{7}}{224} & 0 & -\frac{\sqrt{70}}{224} & 0 & -\frac{\sqrt{35}}{224} & 0 & 0 & -\frac{3\sqrt{42}}{112} & 0 & -\frac{\sqrt{210}}{56} & 0 & -\frac{3\sqrt{14}}{112} & 0 & 0 \\ 0 & \frac{\sqrt{105}}{224} & 0 & \frac{\sqrt{210}}{224} & 0 & \frac{\sqrt{21}}{224} & \frac{\sqrt{2}}{16} & 0 & \frac{\sqrt{42}}{28} & 0 & \frac{\sqrt{70}}{112} & 0 & -\frac{\sqrt{14}}{56} & 0 \\ -\frac{\sqrt{21}}{224} & 0 & -\frac{\sqrt{210}}{224} & 0 & -\frac{\sqrt{105}}{224} & 0 & 0 & -\frac{\sqrt{14}}{56} & 0 & \frac{\sqrt{70}}{112} & 0 & \frac{\sqrt{42}}{28} & 0 & \frac{\sqrt{2}}{16} \\ 0 & \frac{\sqrt{35}}{224} & 0 & \frac{\sqrt{70}}{224} & 0 & \frac{\sqrt{7}}{224} & 0 & 0 & -\frac{3\sqrt{14}}{112} & 0 & -\frac{\sqrt{210}}{56} & 0 & -\frac{3\sqrt{42}}{112} & 0 \end{bmatrix}$
385	symmetry	$\frac{\sqrt{35}xz(x-z)(x+z)}{2}$
	$\mathbb{T}_{4,2}^{(1,-1;a)}(E,1)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & \frac{i}{32} & 0 & -\frac{\sqrt{21}i}{32} & 0 & \frac{\sqrt{35}i}{32} & 0 & -\frac{\sqrt{7}i}{32} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}i}{32} & 0 & \frac{\sqrt{35}i}{32} & 0 & -\frac{\sqrt{21}i}{32} & 0 & \frac{i}{32} \\ \frac{\sqrt{7}i}{224} & 0 & -\frac{\sqrt{70}i}{224} & 0 & \frac{\sqrt{35}i}{224} & 0 & 0 & \frac{3\sqrt{42}i}{112} & 0 & -\frac{\sqrt{210}i}{56} & 0 & \frac{3\sqrt{14}i}{112} & 0 & 0 \\ 0 & -\frac{\sqrt{105}i}{224} & 0 & \frac{\sqrt{210}i}{224} & 0 & -\frac{\sqrt{21}i}{224} & \frac{\sqrt{2}i}{16} & 0 & -\frac{\sqrt{42}i}{28} & 0 & \frac{\sqrt{70}i}{112} & 0 & \frac{\sqrt{14}i}{56} & 0 \\ -\frac{\sqrt{21}i}{224} & 0 & \frac{\sqrt{210}i}{224} & 0 & -\frac{\sqrt{105}i}{224} & 0 & 0 & -\frac{\sqrt{14}i}{56} & 0 & -\frac{\sqrt{70}i}{112} & 0 & \frac{\sqrt{42}i}{28} & 0 & -\frac{\sqrt{2}i}{16} \\ 0 & \frac{\sqrt{35}i}{224} & 0 & -\frac{\sqrt{70}i}{224} & 0 & \frac{\sqrt{7}i}{224} & 0 & 0 & -\frac{3\sqrt{14}i}{112} & 0 & \frac{\sqrt{210}i}{56} & 0 & -\frac{3\sqrt{42}i}{112} & 0 \end{bmatrix}$
386	symmetry	$\frac{\sqrt{5}yz\left(6x^2-y^2-z^2\right)}{2}$
	$\mathbb{T}_{4,1}^{(1,-1;a)}(E,2)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}}{32} & 0 & \frac{\sqrt{3}}{32} & 0 & \frac{\sqrt{5}}{32} & 0 & -\frac{7}{32} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{7}{32} & 0 & -\frac{\sqrt{5}}{32} & 0 & -\frac{\sqrt{3}}{32} & 0 & \frac{\sqrt{7}}{32} \\ -\frac{1}{224} & 0 & -\frac{\sqrt{10}}{224} & 0 & \frac{\sqrt{5}}{32} & 0 & 0 & -\frac{3\sqrt{6}}{112} & 0 & -\frac{\sqrt{30}}{56} & 0 & \frac{3\sqrt{2}}{16} & 0 & 0 \\ 0 & \frac{\sqrt{15}}{224} & 0 & \frac{\sqrt{30}}{224} & 0 & -\frac{\sqrt{3}}{32} & -\frac{\sqrt{14}}{16} & 0 & \frac{\sqrt{6}}{28} & 0 & \frac{\sqrt{10}}{112} & 0 & \frac{\sqrt{2}}{8} & 0 \\ \frac{\sqrt{3}}{32} & 0 & -\frac{\sqrt{30}}{224} & 0 & -\frac{\sqrt{15}}{224} & 0 & 0 & \frac{\sqrt{2}}{8} & 0 & \frac{\sqrt{10}}{112} & 0 & \frac{\sqrt{6}}{28} & 0 & -\frac{\sqrt{14}}{16} \\ 0 & -\frac{\sqrt{5}}{32} & 0 & \frac{\sqrt{10}}{224} & 0 & \frac{1}{224} & 0 & 0 & \frac{3\sqrt{2}}{16} & 0 & -\frac{\sqrt{30}}{56} & 0 & -\frac{3\sqrt{6}}{112} & 0 \end{bmatrix}$
387	symmetry	$-\frac{\sqrt{5}xz\left(x^2-6y^2+z^2\right)}{2}$
	$\mathbb{T}_{4,2}^{(1,-1;a)}(E,2)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}i}{32} & 0 & -\frac{\sqrt{3}i}{32} & 0 & \frac{\sqrt{5}i}{32} & 0 & \frac{7i}{32} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{7i}{32} & 0 & \frac{\sqrt{5}i}{32} & 0 & -\frac{\sqrt{3}i}{32} & 0 & -\frac{\sqrt{7}i}{32} \\ \frac{i}{224} & 0 & -\frac{\sqrt{10}i}{224} & 0 & -\frac{\sqrt{5}i}{32} & 0 & 0 & \frac{3\sqrt{6}i}{112} & 0 & -\frac{\sqrt{30}i}{56} & 0 & -\frac{3\sqrt{2}i}{16} & 0 & 0 \\ 0 & -\frac{\sqrt{15}i}{224} & 0 & \frac{\sqrt{30}i}{224} & 0 & \frac{\sqrt{3}i}{32} & -\frac{\sqrt{14}i}{16} & 0 & -\frac{\sqrt{6}i}{28} & 0 & \frac{\sqrt{10}i}{112} & 0 & -\frac{\sqrt{2}i}{8} & 0 \\ \frac{\sqrt{3}i}{32} & 0 & \frac{\sqrt{30}i}{224} & 0 & -\frac{\sqrt{15}i}{224} & 0 & 0 & \frac{\sqrt{2}i}{8} & 0 & -\frac{\sqrt{10}i}{112} & 0 & \frac{\sqrt{6}i}{28} & 0 & \frac{\sqrt{14}i}{16} \\ 0 & -\frac{\sqrt{5}i}{32} & 0 & -\frac{\sqrt{10}i}{224} & 0 & \frac{i}{224} & 0 & 0 & \frac{3\sqrt{2}i}{16} & 0 & \frac{\sqrt{30}i}{56} & 0 & -\frac{3\sqrt{6}i}{112} & 0 \end{bmatrix}$
388	symmetry	$-\frac{x^2}{2}-\frac{y^2}{2}+z^2$

continued ...

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Table 7

No.	multipole	matrix

$$\mathbb{T}_2^{(1,0;a)}(A_1)\quad
\begin{bmatrix}
0 & 0 & \frac{\sqrt{2}i}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & \frac{\sqrt{2}i}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & -\frac{5\sqrt{6}i}{42} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{21} & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & -\frac{5i}{42} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{7} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & \frac{5i}{42} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{7} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & \frac{5\sqrt{6}i}{42} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{21} & 0 & 0
\end{bmatrix}$$

389	symmetry	$\frac{\sqrt{3}(x-y)(x+y)}{2}$

$$\mathbb{T}_2^{(1,0;a)}(B_1)\quad
\begin{bmatrix}
\frac{\sqrt{15}i}{18} & 0 & 0 & 0 & \frac{\sqrt{3}i}{18} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & \frac{\sqrt{3}i}{18} & 0 & 0 & 0 & \frac{\sqrt{15}i}{18} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & -\frac{5i}{42} & 0 & -\frac{\sqrt{105}i}{42} & 0 & 0 & 0 & -\frac{\sqrt{3}i}{42} & 0 & 0 & 0 & 0 \\
\frac{5\sqrt{30}i}{126} & 0 & 0 & 0 & -\frac{5\sqrt{6}i}{63} & 0 & 0 & -\frac{\sqrt{5}i}{14} & 0 & 0 & 0 & -\frac{\sqrt{15}i}{42} & 0 & 0 \\
0 & \frac{5\sqrt{6}i}{63} & 0 & 0 & 0 & -\frac{5\sqrt{30}i}{126} & 0 & 0 & -\frac{\sqrt{15}i}{42} & 0 & 0 & 0 & -\frac{\sqrt{5}i}{14} & 0 \\
0 & 0 & \frac{5i}{42} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{42} & 0 & 0 & 0 & -\frac{\sqrt{105}i}{42}
\end{bmatrix}$$

390	symmetry	$\sqrt{3}xy$

$$\mathbb{T}_2^{(1,0;a)}(B_2)\quad
\begin{bmatrix}
-\frac{\sqrt{15}}{18} & 0 & 0 & 0 & \frac{\sqrt{3}}{18} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & -\frac{\sqrt{3}}{18} & 0 & 0 & 0 & \frac{\sqrt{15}}{18} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & -\frac{5}{42} & 0 & 0 & \frac{\sqrt{105}}{42} & 0 & 0 & 0 & -\frac{\sqrt{3}}{42} & 0 & 0 & 0 \\
-\frac{5\sqrt{30}}{126} & 0 & 0 & 0 & -\frac{5\sqrt{6}}{63} & 0 & 0 & \frac{\sqrt{5}}{14} & 0 & 0 & 0 & -\frac{\sqrt{15}}{42} & 0 & 0 \\
0 & -\frac{5\sqrt{6}}{63} & 0 & 0 & 0 & -\frac{5\sqrt{30}}{126} & 0 & 0 & \frac{\sqrt{15}}{42} & 0 & 0 & 0 & -\frac{\sqrt{5}}{14} & 0 \\
0 & 0 & -\frac{5}{42} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{42} & 0 & 0 & 0 & -\frac{\sqrt{105}}{42}
\end{bmatrix}$$

391	symmetry	$\sqrt{3}yz$

$$\mathbb{T}_{2,1}^{(1,0;a)}(E)\quad
\begin{bmatrix}
0 & \frac{\sqrt{3}}{9} & 0 & \frac{\sqrt{6}}{18} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & \frac{\sqrt{6}}{18} & 0 & \frac{\sqrt{3}}{9} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
-\frac{5\sqrt{10}}{84} & 0 & -\frac{5}{28} & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{21} & 0 & -\frac{\sqrt{3}}{21} & 0 & 0 & 0 & 0 \\
0 & \frac{5\sqrt{6}}{252} & 0 & -\frac{25\sqrt{3}}{252} & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{21} & 0 & -\frac{1}{7} & 0 & 0 & 0 \\
0 & 0 & \frac{25\sqrt{3}}{252} & 0 & -\frac{5\sqrt{6}}{252} & 0 & 0 & 0 & 0 & -\frac{1}{7} & 0 & -\frac{\sqrt{15}}{21} & 0 & 0 \\
0 & 0 & 0 & \frac{5}{28} & 0 & \frac{5\sqrt{10}}{84} & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{21} & 0 & -\frac{\sqrt{15}}{21} & 0
\end{bmatrix}$$

392	symmetry	$\sqrt{3}xz$

continued …

Table 7

No.	multipole	matrix

$\mathbb{T}_{2,2}^{(1,0;a)}(E)$

$$\begin{bmatrix}
0 & -\frac{\sqrt{3}i}{9} & 0 & \frac{\sqrt{6}i}{18} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & -\frac{\sqrt{6}i}{18} & 0 & \frac{\sqrt{3}i}{9} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
\frac{5\sqrt{10}i}{84} & 0 & -\frac{5i}{28} & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{21} & 0 & -\frac{\sqrt{3}i}{21} & 0 & 0 & 0 & 0 \\
0 & -\frac{5\sqrt{6}i}{252} & 0 & -\frac{25\sqrt{3}i}{252} & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{21} & 0 & -\frac{i}{7} & 0 & 0 & 0 \\
0 & 0 & -\frac{25\sqrt{3}i}{252} & 0 & -\frac{5\sqrt{6}i}{252} & 0 & 0 & 0 & 0 & \frac{i}{7} & 0 & -\frac{\sqrt{15}i}{21} & 0 & 0 \\
0 & 0 & 0 & -\frac{5i}{28} & 0 & \frac{5\sqrt{10}i}{84} & 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{21} & 0 & -\frac{\sqrt{15}i}{21} & 0
\end{bmatrix}$$

393	symmetry	$\dfrac{\sqrt{21}\left(x^4-3x^2y^2-3x^2z^2+y^4-3y^2z^2+z^4\right)}{6}$

$\mathbb{T}_4^{(1,0;a)}(A_1,1)$

$$\begin{bmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{35}i}{24} & 0 & 0 & 0 & \frac{5i}{24} \\
0 & 0 & 0 & 0 & 0 & 0 & -\frac{5i}{24} & 0 & 0 & 0 & -\frac{\sqrt{35}i}{24} & 0 & 0 & 0 \\
0 & \frac{\sqrt{35}i}{56} & 0 & 0 & 0 & \frac{5\sqrt{7}i}{56} & 0 & 0 & \frac{\sqrt{14}i}{56} & 0 & 0 & 0 & \frac{\sqrt{42}i}{168} & 0 \\
0 & 0 & -\frac{\sqrt{210}i}{56} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}i}{168} & 0 & 0 & 0 & \frac{\sqrt{2}i}{24} \\
0 & 0 & 0 & \frac{\sqrt{210}i}{56} & 0 & 0 & \frac{\sqrt{2}i}{24} & 0 & 0 & 0 & -\frac{\sqrt{70}i}{168} & 0 & 0 & 0 \\
-\frac{5\sqrt{7}i}{56} & 0 & 0 & 0 & -\frac{\sqrt{35}i}{56} & 0 & 0 & \frac{\sqrt{42}i}{168} & 0 & 0 & 0 & \frac{\sqrt{14}i}{56} & 0 & 0
\end{bmatrix}$$

394	symmetry	$-\dfrac{\sqrt{15}\left(x^4-12x^2y^2+6x^2z^2+y^4+6y^2z^2-2z^4\right)}{12}$

$\mathbb{T}_4^{(1,0;a)}(A_1,2)$

$$\begin{bmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{5i}{24} & 0 & 0 & 0 & -\frac{\sqrt{35}i}{24} \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{35}i}{24} & 0 & 0 & 0 & -\frac{5i}{24} & 0 & 0 & 0 \\
0 & \frac{5i}{56} & 0 & 0 & 0 & -\frac{\sqrt{5}i}{8} & 0 & 0 & \frac{\sqrt{10}i}{56} & 0 & 0 & 0 & -\frac{\sqrt{30}i}{120} & 0 \\
0 & 0 & -\frac{5\sqrt{6}i}{56} & 0 & 0 & 0 & 0 & 0 & -\frac{5\sqrt{2}i}{168} & 0 & 0 & 0 & -\frac{\sqrt{70}i}{120} \\
0 & 0 & 0 & \frac{5\sqrt{6}i}{56} & 0 & 0 & -\frac{\sqrt{70}i}{120} & 0 & 0 & 0 & -\frac{5\sqrt{2}i}{168} & 0 & 0 & 0 \\
\frac{\sqrt{5}i}{8} & 0 & 0 & 0 & -\frac{5i}{56} & 0 & 0 & -\frac{\sqrt{30}i}{120} & 0 & 0 & 0 & \frac{\sqrt{10}i}{56} & 0 & 0
\end{bmatrix}$$

395	symmetry	$\dfrac{\sqrt{35}xy(x-y)(x+y)}{2}$

$\mathbb{T}_4^{(1,0;a)}(A_2)$

$$\begin{bmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{12} \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{12} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & \frac{\sqrt{105}}{28} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{70}}{140} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{60} \\
0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}}{60} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
\frac{\sqrt{105}}{28} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}}{140} & 0 & 0 & 0 & 0 & 0 & 0
\end{bmatrix}$$

396	symmetry	$\dfrac{\sqrt{5}(x-y)(x+y)\left(x^2+y^2-6z^2\right)}{4}$

continued …

Table 7

No.	multipole	matrix
	$\mathbb{T}_4^{(1,0;a)}(B_1)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{24} & 0 & 0 & 0 & -\frac{\sqrt{5}i}{8} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{5}i}{8} & 0 & 0 & 0 & \frac{\sqrt{15}i}{24} & 0 \\ 0 & 0 & 0 & -\frac{5\sqrt{6}i}{56} & 0 & 0 & -\frac{\sqrt{70}i}{280} & 0 & 0 & 0 & -\frac{3\sqrt{2}i}{56} & 0 & 0 & 0 \\ \frac{3\sqrt{5}i}{56} & 0 & 0 & 0 & \frac{15i}{56} & 0 & 0 & \frac{11\sqrt{30}i}{840} & 0 & 0 & 0 & -\frac{\sqrt{10}i}{280} & 0 & 0 \\ 0 & -\frac{15i}{56} & 0 & 0 & 0 & -\frac{3\sqrt{5}i}{56} & 0 & 0 & -\frac{\sqrt{10}i}{280} & 0 & 0 & 0 & \frac{11\sqrt{30}i}{840} & 0 \\ 0 & 0 & \frac{5\sqrt{6}i}{56} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{2}i}{56} & 0 & 0 & 0 & -\frac{\sqrt{70}i}{280} \end{bmatrix}$
397	symmetry	$-\frac{\sqrt{5}xy\left(x^2+y^2-6z^2\right)}{2}$
	$\mathbb{T}_4^{(1,0;a)}(B_2)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{24} & 0 & 0 & 0 & \frac{\sqrt{5}}{8} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{5}}{8} & 0 & 0 & 0 & -\frac{\sqrt{15}}{24} & 0 \\ 0 & 0 & 0 & \frac{5\sqrt{6}}{56} & 0 & 0 & -\frac{\sqrt{70}}{280} & 0 & 0 & 0 & \frac{3\sqrt{2}}{56} & 0 & 0 & 0 \\ \frac{3\sqrt{5}}{56} & 0 & 0 & 0 & -\frac{15}{56} & 0 & 0 & \frac{11\sqrt{30}}{840} & 0 & 0 & 0 & \frac{\sqrt{10}}{280} & 0 & 0 \\ 0 & -\frac{15}{56} & 0 & 0 & 0 & \frac{3\sqrt{5}}{56} & 0 & 0 & -\frac{\sqrt{10}}{280} & 0 & 0 & 0 & -\frac{11\sqrt{30}}{840} & 0 \\ 0 & 0 & \frac{5\sqrt{6}}{56} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{2}}{56} & 0 & 0 & 0 & \frac{\sqrt{70}}{280} \end{bmatrix}$
398	symmetry	$\frac{\sqrt{35}yz(y-z)(y+z)}{2}$
	$\mathbb{T}_{4,1}^{(1,0;a)}(E,1)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{96} & 0 & -\frac{\sqrt{35}}{32} & 0 & -\frac{5\sqrt{21}}{96} & 0 & -\frac{\sqrt{105}}{96} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{105}}{96} & 0 & \frac{5\sqrt{21}}{96} & 0 & \frac{\sqrt{35}}{32} & 0 & \frac{\sqrt{15}}{96} \\ -\frac{\sqrt{105}}{224} & 0 & -\frac{5\sqrt{42}}{224} & 0 & -\frac{5\sqrt{21}}{224} & 0 & 0 & -\frac{3\sqrt{70}}{560} & 0 & -\frac{\sqrt{14}}{56} & 0 & -\frac{\sqrt{210}}{560} & 0 & 0 \\ 0 & \frac{15\sqrt{7}}{224} & 0 & \frac{15\sqrt{14}}{224} & 0 & \frac{3\sqrt{35}}{224} & \frac{\sqrt{30}}{240} & 0 & \frac{\sqrt{70}}{140} & 0 & \frac{\sqrt{42}}{336} & 0 & -\frac{\sqrt{210}}{840} & 0 \\ -\frac{3\sqrt{35}}{224} & 0 & -\frac{15\sqrt{14}}{224} & 0 & -\frac{15\sqrt{7}}{224} & 0 & 0 & -\frac{\sqrt{210}}{840} & 0 & \frac{\sqrt{42}}{336} & 0 & \frac{\sqrt{70}}{140} & 0 & \frac{\sqrt{30}}{240} \\ 0 & \frac{5\sqrt{21}}{224} & 0 & \frac{5\sqrt{42}}{224} & 0 & \frac{\sqrt{105}}{224} & 0 & 0 & -\frac{\sqrt{210}}{560} & 0 & -\frac{\sqrt{14}}{56} & 0 & -\frac{3\sqrt{70}}{560} & 0 \end{bmatrix}$
399	symmetry	$\frac{\sqrt{35}xz(x-z)(x+z)}{2}$
	$\mathbb{T}_{4,2}^{(1,0;a)}(E,1)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{96} & 0 & \frac{\sqrt{35}i}{32} & 0 & -\frac{5\sqrt{21}i}{96} & 0 & \frac{\sqrt{105}i}{96} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{105}i}{96} & 0 & -\frac{5\sqrt{21}i}{96} & 0 & \frac{\sqrt{35}i}{32} & 0 & -\frac{\sqrt{15}i}{96} \\ \frac{\sqrt{105}i}{224} & 0 & -\frac{5\sqrt{42}i}{224} & 0 & \frac{5\sqrt{21}i}{224} & 0 & 0 & \frac{3\sqrt{70}i}{560} & 0 & -\frac{\sqrt{14}i}{56} & 0 & \frac{\sqrt{210}i}{560} & 0 & 0 \\ 0 & -\frac{15\sqrt{7}i}{224} & 0 & \frac{15\sqrt{14}i}{224} & 0 & -\frac{3\sqrt{35}i}{224} & \frac{\sqrt{30}i}{240} & 0 & -\frac{\sqrt{70}i}{140} & 0 & \frac{\sqrt{42}i}{336} & 0 & \frac{\sqrt{210}i}{840} & 0 \\ -\frac{3\sqrt{35}i}{224} & 0 & \frac{15\sqrt{14}i}{224} & 0 & -\frac{15\sqrt{7}i}{224} & 0 & 0 & -\frac{\sqrt{210}i}{840} & 0 & -\frac{\sqrt{42}i}{336} & 0 & \frac{\sqrt{70}i}{140} & 0 & -\frac{\sqrt{30}i}{240} \\ 0 & \frac{5\sqrt{21}i}{224} & 0 & -\frac{5\sqrt{42}i}{224} & 0 & \frac{\sqrt{105}i}{224} & 0 & 0 & -\frac{\sqrt{210}i}{560} & 0 & \frac{\sqrt{14}i}{56} & 0 & -\frac{3\sqrt{70}i}{560} & 0 \end{bmatrix}$
400	symmetry	$\frac{\sqrt{5}yz\left(6x^2-y^2-z^2\right)}{2}$

continued ...

Table 7

No.	multipole	matrix

$\mathbb{T}_{4,1}^{(1,0;a)}(E,2)$

$$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{105}}{96} & 0 & -\frac{\sqrt5}{32} & 0 & -\frac{5\sqrt3}{96} & 0 & \frac{7\sqrt{15}}{96} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{7\sqrt{15}}{96} & 0 & \frac{5\sqrt3}{96} & 0 & \frac{\sqrt5}{32} & 0 & -\frac{\sqrt{105}}{96} \\ -\frac{\sqrt{15}}{224} & 0 & -\frac{5\sqrt6}{224} & 0 & \frac{5\sqrt3}{32} & 0 & 0 & -\frac{3\sqrt{10}}{560} & 0 & -\frac{\sqrt2}{56} & 0 & \frac{\sqrt{30}}{80} & 0 & 0 \\ 0 & \frac{15}{224} & 0 & \frac{15\sqrt2}{224} & 0 & -\frac{3\sqrt5}{32} & -\frac{\sqrt{210}}{240} & 0 & \frac{\sqrt{10}}{140} & 0 & \frac{\sqrt6}{336} & 0 & \frac{\sqrt{30}}{120} & 0 \\ \frac{3\sqrt5}{32} & 0 & -\frac{15\sqrt2}{224} & 0 & -\frac{15}{224} & 0 & 0 & \frac{\sqrt{30}}{120} & 0 & \frac{\sqrt6}{336} & 0 & \frac{\sqrt{10}}{140} & 0 & -\frac{\sqrt{210}}{240} \\ 0 & -\frac{5\sqrt3}{32} & 0 & \frac{5\sqrt6}{224} & 0 & \frac{\sqrt{15}}{224} & 0 & 0 & \frac{\sqrt{30}}{80} & 0 & -\frac{\sqrt2}{56} & 0 & -\frac{3\sqrt{10}}{560} & 0 \end{bmatrix}$$

401   symmetry $-\frac{\sqrt5\,xz\left(x^2-6y^2+z^2\right)}{2}$

$\mathbb{T}_{4,2}^{(1,0;a)}(E,2)$

$$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{105}i}{96} & 0 & \frac{\sqrt5 i}{32} & 0 & -\frac{5\sqrt3 i}{96} & 0 & -\frac{7\sqrt{15}i}{96} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{7\sqrt{15}i}{96} & 0 & -\frac{5\sqrt3 i}{96} & 0 & \frac{\sqrt5 i}{32} & 0 & \frac{\sqrt{105}i}{96} \\ \frac{\sqrt{15}i}{224} & 0 & -\frac{5\sqrt6 i}{224} & 0 & -\frac{5\sqrt3 i}{32} & 0 & 0 & \frac{3\sqrt{10}i}{560} & 0 & -\frac{\sqrt2 i}{56} & 0 & -\frac{\sqrt{30}i}{80} & 0 & 0 \\ 0 & -\frac{15 i}{224} & 0 & \frac{15\sqrt2 i}{224} & 0 & \frac{3\sqrt5 i}{32} & -\frac{\sqrt{210}i}{240} & 0 & -\frac{\sqrt{10}i}{140} & 0 & \frac{\sqrt6 i}{336} & 0 & -\frac{\sqrt{30}i}{120} & 0 \\ \frac{3\sqrt5 i}{32} & 0 & \frac{15\sqrt2 i}{224} & 0 & -\frac{15 i}{224} & 0 & 0 & \frac{\sqrt{30}i}{120} & 0 & -\frac{\sqrt6 i}{336} & 0 & \frac{\sqrt{10}i}{140} & 0 & \frac{\sqrt{210}i}{240} \\ 0 & -\frac{5\sqrt3 i}{32} & 0 & -\frac{5\sqrt6 i}{224} & 0 & \frac{\sqrt{15}i}{224} & 0 & 0 & \frac{\sqrt{30}i}{80} & 0 & \frac{\sqrt2 i}{56} & 0 & -\frac{3\sqrt{10}i}{560} & 0 \end{bmatrix}$$

402   symmetry $-\frac{x^2}{2}-\frac{y^2}{2}+z^2$

$\mathbb{T}_{2}^{(1,1;a)}(A_1)$

$$\begin{bmatrix} 0 & 0 & -\frac{i}{3} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{i}{3} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{4\sqrt3 i}{21} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}i}{84} & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{2\sqrt2 i}{21} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt6 i}{28} & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{2\sqrt2 i}{21} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt6 i}{28} & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{4\sqrt3 i}{21} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}i}{84} & 0 \end{bmatrix}$$

403   symmetry $\frac{\sqrt3(x-y)(x+y)}{2}$

$\mathbb{T}_{2}^{(1,1;a)}(B_1)$

$$\begin{bmatrix} -\frac{\sqrt{30}i}{18} & 0 & 0 & 0 & -\frac{\sqrt6 i}{18} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt6 i}{18} & 0 & 0 & 0 & -\frac{\sqrt{30}i}{18} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{2\sqrt2 i}{21} & 0 & 0 & \frac{\sqrt{210}i}{168} & 0 & 0 & 0 & \frac{\sqrt6 i}{168} & 0 & 0 & 0 \\ \frac{4\sqrt{15}i}{63} & 0 & 0 & 0 & -\frac{8\sqrt3 i}{63} & 0 & 0 & \frac{\sqrt{10}i}{56} & 0 & 0 & 0 & \frac{\sqrt{30}i}{168} & 0 & 0 \\ 0 & \frac{8\sqrt3 i}{63} & 0 & 0 & 0 & -\frac{4\sqrt{15}i}{63} & 0 & 0 & \frac{\sqrt{30}i}{168} & 0 & 0 & 0 & \frac{\sqrt{10}i}{56} & 0 \\ 0 & 0 & \frac{2\sqrt2 i}{21} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt6 i}{168} & 0 & 0 & 0 & \frac{\sqrt{210}i}{168} \end{bmatrix}$$

404   symmetry $\sqrt3\,xy$

continued …

Table 7

No.	multipole	matrix

$\mathbb{T}_2^{(1,1;a)}(B_2)$

$$\begin{pmatrix}
\frac{\sqrt{30}}{18} & 0 & 0 & 0 & -\frac{\sqrt{6}}{18} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & \frac{\sqrt{6}}{18} & 0 & 0 & 0 & -\frac{\sqrt{30}}{18} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & -\frac{2\sqrt{2}}{21} & 0 & 0 & -\frac{\sqrt{210}}{168} & 0 & 0 & 0 & \frac{\sqrt{6}}{168} & 0 & 0 & 0 \\
-\frac{4\sqrt{15}}{63} & 0 & 0 & 0 & -\frac{8\sqrt{3}}{63} & 0 & 0 & -\frac{\sqrt{10}}{56} & 0 & 0 & 0 & \frac{\sqrt{30}}{168} & 0 & 0 \\
0 & -\frac{8\sqrt{3}}{63} & 0 & 0 & 0 & -\frac{4\sqrt{15}}{63} & 0 & 0 & -\frac{\sqrt{30}}{168} & 0 & 0 & 0 & \frac{\sqrt{10}}{56} & 0 \\
0 & 0 & -\frac{2\sqrt{2}}{21} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}}{168} & 0 & 0 & 0 & \frac{\sqrt{210}}{168}
\end{pmatrix}$$

405   symmetry $\sqrt{3}yz$

$\mathbb{T}_{2,1}^{(1,1;a)}(E)$

$$\begin{bmatrix}
0 & -\frac{\sqrt{6}}{9} & 0 & -\frac{\sqrt{3}}{9} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & -\frac{\sqrt{3}}{9} & 0 & -\frac{\sqrt{6}}{9} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
-\frac{2\sqrt{5}}{21} & 0 & -\frac{\sqrt{2}}{7} & 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{84} & 0 & \frac{\sqrt{6}}{84} & 0 & 0 & 0 & 0 \\
0 & \frac{2\sqrt{3}}{63} & 0 & -\frac{5\sqrt{6}}{63} & 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{84} & 0 & \frac{\sqrt{2}}{28} & 0 & 0 & 0 \\
0 & 0 & \frac{5\sqrt{6}}{63} & 0 & -\frac{2\sqrt{3}}{63} & 0 & 0 & 0 & 0 & \frac{\sqrt{2}}{28} & 0 & \frac{\sqrt{30}}{84} & 0 & 0 \\
0 & 0 & 0 & \frac{\sqrt{2}}{7} & 0 & \frac{2\sqrt{5}}{21} & 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{84} & 0 & \frac{\sqrt{30}}{84} & 0
\end{bmatrix}$$

406   symmetry $\sqrt{3}xz$

$\mathbb{T}_{2,2}^{(1,1;a)}(E)$

$$\begin{bmatrix}
0 & \frac{\sqrt{6}i}{9} & 0 & -\frac{\sqrt{3}i}{9} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & \frac{\sqrt{3}i}{9} & 0 & -\frac{\sqrt{6}i}{9} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
\frac{2\sqrt{5}i}{21} & 0 & -\frac{\sqrt{2}i}{7} & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}i}{84} & 0 & \frac{\sqrt{6}i}{84} & 0 & 0 & 0 & 0 \\
0 & -\frac{2\sqrt{3}i}{63} & 0 & -\frac{5\sqrt{6}i}{63} & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}i}{84} & 0 & \frac{\sqrt{2}i}{28} & 0 & 0 & 0 \\
0 & 0 & -\frac{5\sqrt{6}i}{63} & 0 & -\frac{2\sqrt{3}i}{63} & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}i}{28} & 0 & \frac{\sqrt{30}i}{84} & 0 & 0 \\
0 & 0 & 0 & -\frac{\sqrt{2}i}{7} & 0 & \frac{2\sqrt{5}i}{21} & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{84} & 0 & \frac{\sqrt{30}i}{84} & 0
\end{bmatrix}$$

407   symmetry $-\frac{z\left(3x^2+3y^2-2z^2\right)}{2}$

$\mathbb{M}_3^{(a)}(A_2)$

$$\begin{bmatrix}
0 & 0 & \frac{\sqrt{21}}{21} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}}{14} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & -\frac{\sqrt{21}}{21} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}}{14} & 0 & 0 & 0 \\
0 & -\frac{\sqrt{7}}{14} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{70}}{28} & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & \frac{\sqrt{42}}{42} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{14}}{28} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & \frac{\sqrt{42}}{42} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{14}}{28} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & -\frac{\sqrt{7}}{14} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}}{28} & 0 & 0
\end{bmatrix}$$

408   symmetry $\sqrt{15}xyz$

continued ...

Table 7

No.	multipole	matrix

$\mathbb{M}_3^{(a)}(B_1)$

$$\begin{bmatrix}
\frac{\sqrt{14}i}{42} & 0 & 0 & 0 & -\frac{\sqrt{70}i}{42} & 0 & 0 & \frac{\sqrt{21}i}{28} & 0 & 0 & 0 & -\frac{\sqrt{7}i}{28} & 0 & 0 \\
0 & -\frac{\sqrt{70}i}{42} & 0 & 0 & 0 & \frac{\sqrt{14}i}{42} & 0 & 0 & \frac{\sqrt{7}i}{28} & 0 & 0 & 0 & -\frac{\sqrt{21}i}{28} & 0 \\
0 & 0 & 0 & \frac{\sqrt{210}i}{84} & 0 & 0 & \frac{\sqrt{2}i}{8} & 0 & 0 & 0 & -\frac{\sqrt{70}i}{56} & 0 & 0 & 0 \\
\frac{5\sqrt{7}i}{84} & 0 & 0 & 0 & \frac{\sqrt{35}i}{84} & 0 & 0 & -\frac{\sqrt{42}i}{56} & 0 & 0 & 0 & -\frac{3\sqrt{14}i}{56} & 0 & 0 \\
0 & -\frac{\sqrt{35}i}{84} & 0 & 0 & 0 & -\frac{5\sqrt{7}i}{84} & 0 & 0 & -\frac{3\sqrt{14}i}{56} & 0 & 0 & 0 & -\frac{\sqrt{42}i}{56} & 0 \\
0 & 0 & -\frac{\sqrt{210}i}{84} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}i}{56} & 0 & 0 & 0 & \frac{\sqrt{2}i}{8}
\end{bmatrix}$$

409 symmetry $\qquad \dfrac{\sqrt{15}z(x-y)(x+y)}{2}$

$\mathbb{M}_3^{(a)}(B_2)$

$$\begin{bmatrix}
\frac{\sqrt{14}}{42} & 0 & 0 & 0 & \frac{\sqrt{70}}{42} & 0 & 0 & \frac{\sqrt{21}}{28} & 0 & 0 & 0 & \frac{\sqrt{7}}{28} & 0 & 0 \\
0 & -\frac{\sqrt{70}}{42} & 0 & 0 & 0 & -\frac{\sqrt{14}}{42} & 0 & 0 & \frac{\sqrt{7}}{28} & 0 & 0 & 0 & \frac{\sqrt{21}}{28} & 0 \\
0 & 0 & 0 & -\frac{\sqrt{210}}{84} & 0 & 0 & \frac{\sqrt{2}}{8} & 0 & 0 & 0 & \frac{\sqrt{70}}{56} & 0 & 0 & 0 \\
\frac{5\sqrt{7}}{84} & 0 & 0 & 0 & -\frac{\sqrt{35}}{84} & 0 & 0 & -\frac{\sqrt{42}}{56} & 0 & 0 & 0 & \frac{3\sqrt{14}}{56} & 0 & 0 \\
0 & -\frac{\sqrt{35}}{84} & 0 & 0 & 0 & \frac{5\sqrt{7}}{84} & 0 & 0 & -\frac{3\sqrt{14}}{56} & 0 & 0 & 0 & \frac{\sqrt{42}}{56} & 0 \\
0 & 0 & -\frac{\sqrt{210}}{84} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}}{56} & 0 & 0 & 0 & -\frac{\sqrt{2}}{8}
\end{bmatrix}$$

410 symmetry $\qquad \dfrac{x(2x^2-3y^2-3z^2)}{2}$

$\mathbb{M}_{3,1}^{(a)}(E,1)$

$$\begin{bmatrix}
0 & \frac{\sqrt{42}}{84} & 0 & -\frac{\sqrt{21}}{42} & 0 & \frac{\sqrt{210}}{84} & -\frac{\sqrt{5}}{16} & 0 & \frac{\sqrt{105}}{112} & 0 & -\frac{3\sqrt{7}}{112} & 0 & \frac{\sqrt{35}}{112} & 0 \\
\frac{\sqrt{210}}{84} & 0 & -\frac{\sqrt{21}}{42} & 0 & \frac{\sqrt{42}}{84} & 0 & 0 & -\frac{\sqrt{35}}{112} & 0 & \frac{3\sqrt{7}}{112} & 0 & -\frac{\sqrt{105}}{112} & 0 & \frac{\sqrt{5}}{16} \\
-\frac{\sqrt{35}}{112} & 0 & \frac{3\sqrt{14}}{112} & 0 & -\frac{5\sqrt{7}}{112} & 0 & 0 & \frac{\sqrt{210}}{112} & 0 & -\frac{\sqrt{42}}{56} & 0 & \frac{\sqrt{70}}{112} & 0 & 0 \\
0 & \frac{\sqrt{21}}{48} & 0 & -\frac{\sqrt{42}}{336} & 0 & -\frac{5\sqrt{105}}{336} & \frac{\sqrt{10}}{16} & 0 & 0 & 0 & -\frac{3\sqrt{14}}{112} & 0 & \frac{\sqrt{70}}{56} & 0 \\
\frac{5\sqrt{105}}{336} & 0 & \frac{\sqrt{42}}{336} & 0 & -\frac{\sqrt{21}}{48} & 0 & 0 & \frac{\sqrt{70}}{56} & 0 & -\frac{3\sqrt{14}}{112} & 0 & 0 & 0 & \frac{\sqrt{10}}{16} \\
0 & \frac{5\sqrt{7}}{112} & 0 & -\frac{3\sqrt{14}}{112} & 0 & \frac{\sqrt{35}}{112} & 0 & 0 & \frac{\sqrt{70}}{112} & 0 & -\frac{\sqrt{42}}{56} & 0 & \frac{\sqrt{210}}{112} & 0
\end{bmatrix}$$

411 symmetry $\qquad \dfrac{y(3x^2-2y^2+3z^2)}{2}$

$\mathbb{M}_{3,2}^{(a)}(E,1)$

$$\begin{bmatrix}
0 & -\frac{\sqrt{42}i}{84} & 0 & -\frac{\sqrt{21}i}{42} & 0 & -\frac{\sqrt{210}i}{84} & -\frac{\sqrt{5}i}{16} & 0 & -\frac{\sqrt{105}i}{112} & 0 & -\frac{3\sqrt{7}i}{112} & 0 & -\frac{\sqrt{35}i}{112} & 0 \\
\frac{\sqrt{210}i}{84} & 0 & \frac{\sqrt{21}i}{42} & 0 & \frac{\sqrt{42}i}{84} & 0 & 0 & -\frac{\sqrt{35}i}{112} & 0 & -\frac{3\sqrt{7}i}{112} & 0 & -\frac{\sqrt{105}i}{112} & 0 & -\frac{\sqrt{5}i}{16} \\
\frac{\sqrt{35}i}{112} & 0 & \frac{3\sqrt{14}i}{112} & 0 & \frac{5\sqrt{7}i}{112} & 0 & 0 & -\frac{\sqrt{210}i}{112} & 0 & -\frac{\sqrt{42}i}{56} & 0 & -\frac{\sqrt{70}i}{112} & 0 & 0 \\
0 & -\frac{\sqrt{21}i}{48} & 0 & -\frac{\sqrt{42}i}{336} & 0 & \frac{5\sqrt{105}i}{336} & \frac{\sqrt{10}i}{16} & 0 & 0 & 0 & -\frac{3\sqrt{14}i}{112} & 0 & -\frac{\sqrt{70}i}{56} & 0 \\
\frac{5\sqrt{105}i}{336} & 0 & -\frac{\sqrt{42}i}{336} & 0 & -\frac{\sqrt{21}i}{48} & 0 & 0 & \frac{\sqrt{70}i}{56} & 0 & \frac{3\sqrt{14}i}{112} & 0 & 0 & 0 & -\frac{\sqrt{10}i}{16} \\
0 & \frac{5\sqrt{7}i}{112} & 0 & \frac{3\sqrt{14}i}{112} & 0 & \frac{\sqrt{35}i}{112} & 0 & 0 & \frac{\sqrt{70}i}{112} & 0 & \frac{\sqrt{42}i}{56} & 0 & \frac{\sqrt{210}i}{112} & 0
\end{bmatrix}$$

412 symmetry $\qquad \dfrac{\sqrt{15}x(y-z)(y+z)}{2}$

continued …

Table 7

No.	multipole	matrix

$\mathbb{M}_{3,1}^{(a)}(E,2)$

$$\begin{bmatrix}
0 & \frac{\sqrt{70}}{84} & 0 & -\frac{\sqrt{35}}{42} & 0 & -\frac{\sqrt{14}}{28} & \frac{\sqrt{3}}{16} & 0 & \frac{5\sqrt{7}}{112} & 0 & -\frac{\sqrt{105}}{112} & 0 & -\frac{\sqrt{21}}{112} & 0 \\
-\frac{\sqrt{14}}{28} & 0 & -\frac{\sqrt{35}}{42} & 0 & \frac{\sqrt{70}}{84} & 0 & 0 & \frac{\sqrt{21}}{112} & 0 & \frac{\sqrt{105}}{112} & 0 & -\frac{5\sqrt{7}}{112} & 0 & -\frac{\sqrt{3}}{16} \\
-\frac{5\sqrt{21}}{336} & 0 & \frac{\sqrt{210}}{112} & 0 & \frac{\sqrt{105}}{112} & 0 & 0 & \frac{5\sqrt{14}}{112} & 0 & -\frac{\sqrt{70}}{56} & 0 & -\frac{\sqrt{42}}{112} & 0 & 0 \\
0 & \frac{\sqrt{35}}{48} & 0 & -\frac{\sqrt{70}}{336} & 0 & \frac{5\sqrt{7}}{112} & -\frac{\sqrt{6}}{16} & 0 & 0 & 0 & -\frac{\sqrt{210}}{112} & 0 & -\frac{\sqrt{42}}{56} & 0 \\
-\frac{5\sqrt{7}}{112} & 0 & \frac{\sqrt{70}}{336} & 0 & -\frac{\sqrt{35}}{48} & 0 & 0 & -\frac{\sqrt{42}}{56} & 0 & -\frac{\sqrt{210}}{112} & 0 & 0 & 0 & -\frac{\sqrt{6}}{16} \\
0 & -\frac{\sqrt{105}}{112} & 0 & -\frac{\sqrt{210}}{112} & 0 & \frac{5\sqrt{21}}{336} & 0 & 0 & -\frac{\sqrt{42}}{112} & 0 & -\frac{\sqrt{70}}{56} & 0 & \frac{5\sqrt{14}}{112} & 0
\end{bmatrix}$$

413   symmetry $-\frac{\sqrt{15}y(x-z)(x+z)}{2}$

$\mathbb{M}_{3,2}^{(a)}(E,2)$

$$\begin{bmatrix}
0 & -\frac{\sqrt{70}i}{84} & 0 & -\frac{\sqrt{35}i}{42} & 0 & \frac{\sqrt{14}i}{28} & \frac{\sqrt{3}i}{16} & 0 & -\frac{5\sqrt{7}i}{112} & 0 & -\frac{\sqrt{105}i}{112} & 0 & \frac{\sqrt{21}i}{112} & 0 \\
-\frac{\sqrt{14}i}{28} & 0 & \frac{\sqrt{35}i}{42} & 0 & \frac{\sqrt{70}i}{84} & 0 & 0 & \frac{\sqrt{21}i}{112} & 0 & -\frac{\sqrt{105}i}{112} & 0 & -\frac{5\sqrt{7}i}{112} & 0 & \frac{\sqrt{3}i}{16} \\
\frac{5\sqrt{21}i}{336} & 0 & \frac{\sqrt{210}i}{112} & 0 & -\frac{\sqrt{105}i}{112} & 0 & 0 & -\frac{5\sqrt{14}i}{112} & 0 & -\frac{\sqrt{70}i}{56} & 0 & \frac{\sqrt{42}i}{112} & 0 & 0 \\
0 & -\frac{\sqrt{35}i}{48} & 0 & -\frac{\sqrt{70}i}{336} & 0 & -\frac{5\sqrt{7}i}{112} & -\frac{\sqrt{6}i}{16} & 0 & 0 & 0 & -\frac{\sqrt{210}i}{112} & 0 & \frac{\sqrt{42}i}{56} & 0 \\
-\frac{5\sqrt{7}i}{112} & 0 & -\frac{\sqrt{70}i}{336} & 0 & -\frac{\sqrt{35}i}{48} & 0 & 0 & -\frac{\sqrt{42}i}{56} & 0 & \frac{\sqrt{210}i}{112} & 0 & 0 & 0 & \frac{\sqrt{6}i}{16} \\
0 & -\frac{\sqrt{105}i}{112} & 0 & \frac{\sqrt{210}i}{112} & 0 & \frac{5\sqrt{21}i}{336} & 0 & 0 & -\frac{\sqrt{42}i}{112} & 0 & \frac{\sqrt{70}i}{56} & 0 & \frac{5\sqrt{14}i}{112} & 0
\end{bmatrix}$$

414   symmetry $-\frac{z\left(3x^2+3y^2-2z^2\right)}{2}$

$\mathbb{M}_{3}^{(1,-1;a)}(A_2)$

$$\begin{bmatrix}
0 & 0 & -\frac{\sqrt{5}}{42} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{2\sqrt{15}}{21} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & \frac{\sqrt{5}}{42} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{2\sqrt{15}}{21} & 0 & 0 & 0 \\
0 & \frac{2\sqrt{15}}{105} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{5\sqrt{6}}{42} & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & -\frac{2\sqrt{10}}{105} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{42} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & -\frac{2\sqrt{10}}{105} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}}{42} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & \frac{2\sqrt{15}}{105} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{5\sqrt{6}}{42} & 0 & 0
\end{bmatrix}$$

415   symmetry $\sqrt{15}xyz$

$\mathbb{M}_{3}^{(1,-1;a)}(B_1)$

$$\begin{bmatrix}
-\frac{\sqrt{30}i}{252} & 0 & 0 & 0 & \frac{5\sqrt{6}i}{252} & 0 & 0 & -\frac{\sqrt{5}i}{7} & 0 & 0 & 0 & \frac{\sqrt{15}i}{21} & 0 & 0 \\
0 & \frac{5\sqrt{6}i}{252} & 0 & 0 & 0 & -\frac{\sqrt{30}i}{252} & 0 & 0 & -\frac{\sqrt{15}i}{21} & 0 & 0 & 0 & \frac{\sqrt{5}i}{7} & 0 \\
0 & 0 & 0 & -\frac{\sqrt{2}i}{21} & 0 & 0 & \frac{\sqrt{210}i}{84} & 0 & 0 & 0 & -\frac{5\sqrt{6}i}{84} & 0 & 0 & 0 \\
-\frac{\sqrt{15}i}{63} & 0 & 0 & 0 & -\frac{\sqrt{3}i}{63} & 0 & 0 & -\frac{\sqrt{10}i}{28} & 0 & 0 & 0 & -\frac{\sqrt{30}i}{28} & 0 & 0 \\
0 & \frac{\sqrt{3}i}{63} & 0 & 0 & 0 & \frac{\sqrt{15}i}{63} & 0 & 0 & -\frac{\sqrt{30}i}{28} & 0 & 0 & 0 & -\frac{\sqrt{10}i}{28} & 0 \\
0 & 0 & \frac{\sqrt{2}i}{21} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{5\sqrt{6}i}{84} & 0 & 0 & 0 & \frac{\sqrt{210}i}{84}
\end{bmatrix}$$

416   symmetry $\frac{\sqrt{15}z(x-y)(x+y)}{2}$

continued …

Table 7

No.	multipole	matrix

$\mathbb{M}_3^{(1,-1;a)}(B_2)$

$$\begin{bmatrix}
-\frac{\sqrt{30}}{252} & 0 & 0 & 0 & -\frac{5\sqrt{6}}{252} & 0 & 0 & -\frac{\sqrt{5}}{7} & 0 & 0 & 0 & -\frac{\sqrt{15}}{21} & 0 & 0 \\
0 & \frac{5\sqrt{6}}{252} & 0 & 0 & 0 & \frac{\sqrt{30}}{252} & 0 & 0 & -\frac{\sqrt{15}}{21} & 0 & 0 & 0 & -\frac{\sqrt{5}}{7} & 0 \\
0 & 0 & 0 & \frac{\sqrt{2}}{21} & 0 & 0 & \frac{\sqrt{210}}{84} & 0 & 0 & 0 & \frac{5\sqrt{6}}{84} & 0 & 0 & 0 \\
-\frac{\sqrt{15}}{63} & 0 & 0 & 0 & \frac{\sqrt{3}}{63} & 0 & 0 & -\frac{\sqrt{10}}{28} & 0 & 0 & 0 & \frac{\sqrt{30}}{28} & 0 & 0 \\
0 & \frac{\sqrt{3}}{63} & 0 & 0 & 0 & -\frac{\sqrt{15}}{63} & 0 & 0 & -\frac{\sqrt{30}}{28} & 0 & 0 & 0 & \frac{\sqrt{10}}{28} & 0 \\
0 & 0 & \frac{\sqrt{2}}{21} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{5\sqrt{6}}{84} & 0 & 0 & 0 & -\frac{\sqrt{210}}{84}
\end{bmatrix}$$

417   symmetry

$$\frac{x\left(2x^2-3y^2-3z^2\right)}{2}$$

$\mathbb{M}_{3,1}^{(1,-1;a)}(E,1)$

$$\begin{bmatrix}
0 & -\frac{\sqrt{10}}{168} & 0 & \frac{\sqrt{5}}{84} & 0 & -\frac{5\sqrt{2}}{168} & \frac{5\sqrt{21}}{84} & 0 & -\frac{5}{28} & 0 & \frac{\sqrt{15}}{28} & 0 & -\frac{5\sqrt{3}}{84} & 0 \\
-\frac{5\sqrt{2}}{168} & 0 & \frac{\sqrt{5}}{84} & 0 & -\frac{\sqrt{10}}{168} & 0 & 0 & \frac{5\sqrt{3}}{84} & 0 & -\frac{\sqrt{15}}{28} & 0 & \frac{5}{28} & 0 & -\frac{5\sqrt{21}}{84} \\
\frac{\sqrt{3}}{84} & 0 & -\frac{\sqrt{30}}{140} & 0 & \frac{\sqrt{15}}{84} & 0 & 0 & \frac{5\sqrt{2}}{56} & 0 & -\frac{\sqrt{10}}{28} & 0 & \frac{5\sqrt{6}}{168} & 0 & 0 \\
0 & -\frac{\sqrt{5}}{60} & 0 & \frac{\sqrt{10}}{420} & 0 & \frac{5}{84} & \frac{5\sqrt{42}}{168} & 0 & 0 & 0 & -\frac{\sqrt{30}}{56} & 0 & \frac{5\sqrt{6}}{84} & 0 \\
-\frac{5}{84} & 0 & -\frac{\sqrt{10}}{420} & 0 & \frac{\sqrt{5}}{60} & 0 & 0 & \frac{5\sqrt{6}}{84} & 0 & -\frac{\sqrt{30}}{56} & 0 & 0 & 0 & \frac{5\sqrt{42}}{168} \\
0 & -\frac{\sqrt{15}}{84} & 0 & \frac{\sqrt{30}}{140} & 0 & -\frac{\sqrt{3}}{84} & 0 & 0 & \frac{5\sqrt{6}}{168} & 0 & -\frac{\sqrt{10}}{28} & 0 & \frac{5\sqrt{2}}{56} & 0
\end{bmatrix}$$

418   symmetry

$$\frac{y\left(3x^2-2y^2+3z^2\right)}{2}$$

$\mathbb{M}_{3,2}^{(1,-1;a)}(E,1)$

$$\begin{bmatrix}
0 & \frac{\sqrt{10}i}{168} & 0 & \frac{\sqrt{5}i}{84} & 0 & \frac{5\sqrt{2}i}{168} & \frac{5\sqrt{21}i}{84} & 0 & \frac{5i}{28} & 0 & \frac{\sqrt{15}i}{28} & 0 & \frac{5\sqrt{3}i}{84} & 0 \\
-\frac{5\sqrt{2}i}{168} & 0 & -\frac{\sqrt{5}i}{84} & 0 & -\frac{\sqrt{10}i}{168} & 0 & 0 & \frac{5\sqrt{3}i}{84} & 0 & \frac{\sqrt{15}i}{28} & 0 & \frac{5i}{28} & 0 & \frac{5\sqrt{21}i}{84} \\
-\frac{\sqrt{3}i}{84} & 0 & -\frac{\sqrt{30}i}{140} & 0 & -\frac{\sqrt{15}i}{84} & 0 & 0 & -\frac{5\sqrt{2}i}{56} & 0 & -\frac{\sqrt{10}i}{28} & 0 & -\frac{5\sqrt{6}i}{168} & 0 & 0 \\
0 & \frac{\sqrt{5}i}{60} & 0 & \frac{\sqrt{10}i}{420} & 0 & -\frac{5i}{84} & \frac{5\sqrt{42}i}{168} & 0 & 0 & 0 & -\frac{\sqrt{30}i}{56} & 0 & -\frac{5\sqrt{6}i}{84} & 0 \\
-\frac{5i}{84} & 0 & \frac{\sqrt{10}i}{420} & 0 & \frac{\sqrt{5}i}{60} & 0 & 0 & \frac{5\sqrt{6}i}{84} & 0 & \frac{\sqrt{30}i}{56} & 0 & 0 & 0 & -\frac{5\sqrt{42}i}{168} \\
0 & -\frac{\sqrt{15}i}{84} & 0 & -\frac{\sqrt{30}i}{140} & 0 & -\frac{\sqrt{3}i}{84} & 0 & 0 & \frac{5\sqrt{6}i}{168} & 0 & \frac{\sqrt{10}i}{28} & 0 & \frac{5\sqrt{2}i}{56} & 0
\end{bmatrix}$$

419   symmetry

$$\frac{\sqrt{15}x(y-z)(y+z)}{2}$$

$\mathbb{M}_{3,1}^{(1,-1;a)}(E,2)$

$$\begin{bmatrix}
0 & -\frac{5\sqrt{6}}{504} & 0 & \frac{5\sqrt{3}}{252} & 0 & \frac{\sqrt{30}}{168} & -\frac{\sqrt{35}}{28} & 0 & -\frac{5\sqrt{15}}{84} & 0 & \frac{5}{28} & 0 & \frac{\sqrt{5}}{28} & 0 \\
\frac{\sqrt{30}}{168} & 0 & \frac{5\sqrt{3}}{252} & 0 & -\frac{5\sqrt{6}}{504} & 0 & 0 & -\frac{\sqrt{5}}{28} & 0 & -\frac{5}{28} & 0 & \frac{5\sqrt{15}}{84} & 0 & \frac{\sqrt{35}}{28} \\
\frac{\sqrt{5}}{84} & 0 & -\frac{\sqrt{2}}{28} & 0 & -\frac{1}{28} & 0 & 0 & \frac{5\sqrt{30}}{168} & 0 & -\frac{5\sqrt{6}}{84} & 0 & -\frac{\sqrt{10}}{56} & 0 & 0 \\
0 & -\frac{\sqrt{3}}{36} & 0 & \frac{\sqrt{6}}{252} & 0 & -\frac{\sqrt{15}}{84} & -\frac{\sqrt{70}}{56} & 0 & 0 & 0 & -\frac{5\sqrt{2}}{56} & 0 & -\frac{\sqrt{10}}{28} & 0 \\
\frac{\sqrt{15}}{84} & 0 & -\frac{\sqrt{6}}{252} & 0 & \frac{\sqrt{3}}{36} & 0 & 0 & -\frac{\sqrt{10}}{28} & 0 & -\frac{5\sqrt{2}}{56} & 0 & 0 & 0 & -\frac{\sqrt{70}}{56} \\
0 & \frac{1}{28} & 0 & \frac{\sqrt{2}}{28} & 0 & -\frac{\sqrt{5}}{84} & 0 & 0 & -\frac{\sqrt{10}}{56} & 0 & -\frac{5\sqrt{6}}{84} & 0 & \frac{5\sqrt{30}}{168} & 0
\end{bmatrix}$$

420   symmetry

$$-\frac{\sqrt{15}y(x-z)(x+z)}{2}$$

Table 7

No.	multipole	matrix

$\mathbb{M}_{3,2}^{(1,-1;a)}(E,2)$

$$\begin{pmatrix}
0 & \frac{5\sqrt{6}i}{504} & 0 & \frac{5\sqrt{3}i}{252} & 0 & -\frac{\sqrt{30}i}{168} & -\frac{\sqrt{35}i}{28} & 0 & \frac{5\sqrt{15}i}{84} & 0 & \frac{5i}{28} & 0 & -\frac{\sqrt{5}i}{28} & 0 \\[4pt]
\frac{\sqrt{30}i}{168} & 0 & -\frac{5\sqrt{3}i}{252} & 0 & -\frac{5\sqrt{6}i}{504} & 0 & 0 & -\frac{\sqrt{5}i}{28} & 0 & \frac{5i}{28} & 0 & \frac{5\sqrt{15}i}{84} & 0 & -\frac{\sqrt{35}i}{28} \\[4pt]
-\frac{\sqrt{5}i}{84} & 0 & -\frac{\sqrt{2}i}{28} & 0 & \frac{i}{28} & 0 & 0 & -\frac{5\sqrt{30}i}{168} & 0 & -\frac{5\sqrt{6}i}{84} & 0 & \frac{\sqrt{10}i}{56} & 0 & 0 \\[4pt]
0 & \frac{\sqrt{3}i}{36} & 0 & \frac{\sqrt{6}i}{252} & 0 & \frac{\sqrt{15}i}{84} & -\frac{\sqrt{70}i}{56} & 0 & 0 & 0 & -\frac{5\sqrt{2}i}{56} & 0 & \frac{\sqrt{10}i}{28} & 0 \\[4pt]
\frac{\sqrt{15}i}{84} & 0 & \frac{\sqrt{6}i}{252} & 0 & \frac{\sqrt{3}i}{36} & 0 & 0 & -\frac{\sqrt{10}i}{28} & 0 & \frac{5\sqrt{2}i}{56} & 0 & 0 & 0 & \frac{\sqrt{70}i}{56} \\[4pt]
0 & \frac{i}{28} & 0 & -\frac{\sqrt{2}i}{28} & 0 & -\frac{\sqrt{5}i}{84} & 0 & 0 & -\frac{\sqrt{10}i}{56} & 0 & \frac{5\sqrt{6}i}{84} & 0 & \frac{5\sqrt{30}i}{168} & 0
\end{pmatrix}$$

421 symmetry

$$\frac{3\sqrt{35}\,xyz(x-y)(x+y)}{2}$$

$\mathbb{M}_5^{(1,-1;a)}(A_1)$

$$\begin{bmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{70}i}{20} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}i}{20} \\
0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}i}{20} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{70}i}{20} & 0 & 0 & 0 & 0 & 0 & 0
\end{bmatrix}$$

422 symmetry

$$\frac{z\left(15x^4+30x^2y^2-40x^2z^2+15y^4-40y^2z^2+8z^4\right)}{8}$$

$\mathbb{M}_5^{(1,-1;a)}(A_2,1)$

$$\begin{bmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}}{12} & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{12} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}}{12} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{12} & 0 & 0
\end{bmatrix}$$

423 symmetry

$$\frac{3\sqrt{35}\,z\left(x^2-2xy-y^2\right)\left(x^2+2xy-y^2\right)}{8}$$

$\mathbb{M}_5^{(1,-1;a)}(A_2,2)$

$$\begin{bmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}}{20} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{20} \\
0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}}{20} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{70}}{20} & 0 & 0 & 0 & 0 & 0 & 0
\end{bmatrix}$$

424 symmetry

$$\frac{\sqrt{105}\,xyz\left(x^2+y^2-2z^2\right)}{2}$$

continued …

Table 7

No.	multipole	matrix

$\mathbb{M}_5^{(1,-1;a)}(B_1)$

$$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}i}{120} & 0 & 0 & 0 & -\frac{\sqrt{42}i}{24} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}i}{40} & 0 & 0 & 0 & \frac{\sqrt{210}i}{40} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{210}i}{40} & 0 & 0 & 0 & -\frac{\sqrt{70}i}{40} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{42}i}{24} & 0 & 0 & 0 & \frac{\sqrt{30}i}{120} \end{bmatrix}$$

| 425 | symmetry | $-\frac{\sqrt{105}z(x-y)(x+y)\left(x^2+y^2-2z^2\right)}{4}$ |

$\mathbb{M}_5^{(1,-1;a)}(B_2)$

$$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}}{120} & 0 & 0 & 0 & -\frac{\sqrt{42}}{24} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{70}}{40} & 0 & 0 & 0 & \frac{\sqrt{210}}{40} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{210}}{40} & 0 & 0 & 0 & -\frac{\sqrt{70}}{40} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{42}}{24} & 0 & 0 & 0 & \frac{\sqrt{30}}{120} \end{bmatrix}$$

| 426 | symmetry | $\frac{x\left(8x^4-40x^2y^2-40x^2z^2+15y^4+30y^2z^2+15z^4\right)}{8}$ |

$\mathbb{M}_{5,1}^{(1,-1;a)}(E,1)$

$$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2}}{32} & 0 & -\frac{\sqrt{10}}{32} & 0 & \frac{7\sqrt{6}}{96} & 0 & -\frac{3\sqrt{14}}{32} \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{42}}{96} & 0 & -\frac{3\sqrt{2}}{32} & 0 & \frac{\sqrt{30}}{32} & 0 & -\frac{7\sqrt{6}}{96} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{7\sqrt{6}}{96} & 0 & \frac{\sqrt{30}}{32} & 0 & -\frac{3\sqrt{2}}{32} & 0 & \frac{\sqrt{42}}{96} \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{14}}{32} & 0 & \frac{7\sqrt{6}}{96} & 0 & -\frac{\sqrt{10}}{32} & 0 & \frac{\sqrt{2}}{32} & 0 \end{bmatrix}$$

| 427 | symmetry | $-\frac{y\left(15x^4-40x^2y^2+30x^2z^2+8y^4-40y^2z^2+15z^4\right)}{8}$ |

$\mathbb{M}_{5,2}^{(1,-1;a)}(E,1)$

$$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}i}{32} & 0 & -\frac{\sqrt{10}i}{32} & 0 & -\frac{7\sqrt{6}i}{96} & 0 & -\frac{3\sqrt{14}i}{32} \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{42}i}{96} & 0 & \frac{3\sqrt{2}i}{32} & 0 & \frac{\sqrt{30}i}{32} & 0 & \frac{7\sqrt{6}i}{96} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{7\sqrt{6}i}{96} & 0 & -\frac{\sqrt{30}i}{32} & 0 & -\frac{3\sqrt{2}i}{32} & 0 & -\frac{\sqrt{42}i}{96} \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{14}i}{32} & 0 & \frac{7\sqrt{6}i}{96} & 0 & \frac{\sqrt{10}i}{32} & 0 & \frac{\sqrt{2}i}{32} & 0 \end{bmatrix}$$

| 428 | symmetry | $\frac{3\sqrt{35}x\left(y^2-2yz-z^2\right)\left(y^2+2yz-z^2\right)}{8}$ |

Table 7

No.	multipole	matrix

$\mathbb{M}_{5,1}^{(1,-1;a)}(E,2)$

$$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{70}}{160} & 0 & -\frac{\sqrt{14}}{32} & 0 & -\frac{3\sqrt{210}}{160} & 0 & -\frac{\sqrt{10}}{32} \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{30}}{160} & 0 & -\frac{3\sqrt{70}}{160} & 0 & \frac{\sqrt{42}}{32} & 0 & \frac{3\sqrt{210}}{160} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{210}}{160} & 0 & \frac{\sqrt{42}}{32} & 0 & -\frac{3\sqrt{70}}{160} & 0 & -\frac{3\sqrt{30}}{160} \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}}{32} & 0 & -\frac{3\sqrt{210}}{160} & 0 & -\frac{\sqrt{14}}{32} & 0 & \frac{\sqrt{70}}{160} & 0 \end{bmatrix}$$

| 429 | symmetry | $-\frac{3\sqrt{35}\,y\left(x^2-2xz-z^2\right)\left(x^2+2xz-z^2\right)}{8}$ |

$\mathbb{M}_{5,2}^{(1,-1;a)}(E,2)$

$$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}i}{160} & 0 & -\frac{\sqrt{14}i}{32} & 0 & \frac{3\sqrt{210}i}{160} & 0 & -\frac{\sqrt{10}i}{32} \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{30}i}{160} & 0 & \frac{3\sqrt{70}i}{160} & 0 & \frac{\sqrt{42}i}{32} & 0 & -\frac{3\sqrt{210}i}{160} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{210}i}{160} & 0 & -\frac{\sqrt{42}i}{32} & 0 & -\frac{3\sqrt{70}i}{160} & 0 & \frac{3\sqrt{30}i}{160} \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}i}{32} & 0 & -\frac{3\sqrt{210}i}{160} & 0 & \frac{\sqrt{14}i}{32} & 0 & \frac{\sqrt{70}i}{160} & 0 \end{bmatrix}$$

| 430 | symmetry | $\frac{\sqrt{105}\,x(y-z)(y+z)\left(2x^2-y^2-z^2\right)}{4}$ |

$\mathbb{M}_{5,1}^{(1,-1;a)}(E,3)$

$$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{210}}{240} & 0 & -\frac{\sqrt{42}}{48} & 0 & \frac{\sqrt{70}}{80} & 0 & \frac{\sqrt{30}}{16} \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}}{80} & 0 & -\frac{\sqrt{210}}{80} & 0 & \frac{\sqrt{14}}{16} & 0 & -\frac{\sqrt{70}}{80} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}}{80} & 0 & \frac{\sqrt{14}}{16} & 0 & -\frac{\sqrt{210}}{80} & 0 & \frac{\sqrt{10}}{80} \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{16} & 0 & \frac{\sqrt{70}}{80} & 0 & -\frac{\sqrt{42}}{48} & 0 & \frac{\sqrt{210}}{240} & 0 \end{bmatrix}$$

| 431 | symmetry | $\frac{\sqrt{105}\,y(x-z)(x+z)\left(x^2-2y^2+z^2\right)}{4}$ |

$\mathbb{M}_{5,2}^{(1,-1;a)}(E,3)$

$$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{210}i}{240} & 0 & -\frac{\sqrt{42}i}{48} & 0 & -\frac{\sqrt{70}i}{80} & 0 & \frac{\sqrt{30}i}{16} \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}i}{80} & 0 & \frac{\sqrt{210}i}{80} & 0 & \frac{\sqrt{14}i}{16} & 0 & \frac{\sqrt{70}i}{80} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}i}{80} & 0 & -\frac{\sqrt{14}i}{16} & 0 & -\frac{\sqrt{210}i}{80} & 0 & -\frac{\sqrt{10}i}{80} \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}i}{16} & 0 & \frac{\sqrt{70}i}{80} & 0 & \frac{\sqrt{42}i}{48} & 0 & \frac{\sqrt{210}i}{240} & 0 \end{bmatrix}$$

| 432 | symmetry | $-\frac{z\left(3x^2+3y^2-2z^2\right)}{2}$ |

continued ...

Table 7

No.	multipole	matrix
	$\mathbb{M}_3^{(1,0;a)}(A_2)$	$$\begin{bmatrix} 0 & 0 & -\frac{\sqrt7}{21} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{5\sqrt{21}}{84} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt7}{21} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{5\sqrt{21}}{84} & 0 & 0 & 0 \\ 0 & \frac{5\sqrt{21}}{84} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{210}}{84} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{5\sqrt{14}}{84} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{42}}{84} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{5\sqrt{14}}{84} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{42}}{84} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{5\sqrt{21}}{84} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{210}}{84} & 0 & 0 \end{bmatrix}$$
433	symmetry	$\sqrt{15}xyz$
	$\mathbb{M}_3^{(1,0;a)}(B_1)$	$$\begin{bmatrix} -\frac{\sqrt{42}i}{126} & 0 & 0 & 0 & \frac{\sqrt{210}i}{126} & 0 & 0 & \frac{5\sqrt7 i}{56} & 0 & 0 & 0 & -\frac{5\sqrt{21}i}{168} & 0 & 0 \\ 0 & \frac{\sqrt{210}i}{126} & 0 & 0 & 0 & -\frac{\sqrt{42}i}{126} & 0 & 0 & \frac{5\sqrt{21}i}{168} & 0 & 0 & 0 & -\frac{5\sqrt7 i}{56} & 0 \\ 0 & 0 & 0 & -\frac{5\sqrt{70}i}{168} & 0 & 0 & \frac{\sqrt6 i}{24} & 0 & 0 & 0 & -\frac{\sqrt{210}i}{168} & 0 & 0 & 0 \\ -\frac{25\sqrt{21}i}{504} & 0 & 0 & 0 & -\frac{5\sqrt{105}i}{504} & 0 & 0 & -\frac{\sqrt{14}i}{56} & 0 & 0 & 0 & -\frac{\sqrt{42}i}{56} & 0 & 0 \\ 0 & \frac{5\sqrt{105}i}{504} & 0 & 0 & 0 & \frac{25\sqrt{21}i}{504} & 0 & 0 & -\frac{\sqrt{42}i}{56} & 0 & 0 & 0 & -\frac{\sqrt{14}i}{56} & 0 \\ 0 & 0 & \frac{5\sqrt{70}i}{168} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{210}i}{168} & 0 & 0 & 0 & \frac{\sqrt6 i}{24} \end{bmatrix}$$
434	symmetry	$\frac{\sqrt{15}z(x-y)(x+y)}{2}$
	$\mathbb{M}_3^{(1,0;a)}(B_2)$	$$\begin{bmatrix} -\frac{\sqrt{42}}{126} & 0 & 0 & 0 & -\frac{\sqrt{210}}{126} & 0 & 0 & \frac{5\sqrt7}{56} & 0 & 0 & 0 & \frac{5\sqrt{21}}{168} & 0 & 0 \\ 0 & \frac{\sqrt{210}}{126} & 0 & 0 & 0 & \frac{\sqrt{42}}{126} & 0 & 0 & \frac{5\sqrt{21}}{168} & 0 & 0 & 0 & \frac{5\sqrt7}{56} & 0 \\ 0 & 0 & 0 & \frac{5\sqrt{70}}{168} & 0 & 0 & \frac{\sqrt6}{24} & 0 & 0 & 0 & \frac{\sqrt{210}}{168} & 0 & 0 & 0 \\ -\frac{25\sqrt{21}}{504} & 0 & 0 & 0 & \frac{5\sqrt{105}}{504} & 0 & 0 & -\frac{\sqrt{14}}{56} & 0 & 0 & 0 & \frac{\sqrt{42}}{56} & 0 & 0 \\ 0 & \frac{5\sqrt{105}}{504} & 0 & 0 & 0 & -\frac{25\sqrt{21}}{504} & 0 & 0 & -\frac{\sqrt{42}}{56} & 0 & 0 & 0 & \frac{\sqrt{14}}{56} & 0 \\ 0 & 0 & \frac{5\sqrt{70}}{168} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{210}}{168} & 0 & 0 & 0 & -\frac{\sqrt6}{24} \end{bmatrix}$$
435	symmetry	$\frac{x(2x^2-3y^2-3z^2)}{2}$
	$\mathbb{M}_{3,1}^{(1,0;a)}(E,1)$	$$\begin{bmatrix} 0 & -\frac{\sqrt{14}}{84} & 0 & \frac{\sqrt7}{42} & 0 & -\frac{\sqrt{70}}{84} & -\frac{5\sqrt{15}}{96} & 0 & \frac{5\sqrt{35}}{224} & 0 & -\frac{5\sqrt{21}}{224} & 0 & \frac{5\sqrt{105}}{672} & 0 \\ -\frac{\sqrt{70}}{84} & 0 & \frac{\sqrt7}{42} & 0 & -\frac{\sqrt{14}}{84} & 0 & 0 & -\frac{5\sqrt{105}}{672} & 0 & \frac{5\sqrt{21}}{224} & 0 & -\frac{5\sqrt{35}}{224} & 0 & \frac{5\sqrt{15}}{96} \\ \frac{5\sqrt{105}}{672} & 0 & -\frac{5\sqrt{42}}{224} & 0 & \frac{25\sqrt{21}}{672} & 0 & 0 & \frac{\sqrt{70}}{112} & 0 & -\frac{\sqrt{14}}{56} & 0 & \frac{\sqrt{210}}{336} & 0 & 0 \\ 0 & -\frac{5\sqrt7}{96} & 0 & \frac{5\sqrt{14}}{672} & 0 & \frac{25\sqrt{35}}{672} & \frac{\sqrt{30}}{48} & 0 & 0 & 0 & -\frac{\sqrt{42}}{112} & 0 & \frac{\sqrt{210}}{168} & 0 \\ -\frac{25\sqrt{35}}{672} & 0 & -\frac{5\sqrt{14}}{672} & 0 & \frac{5\sqrt7}{96} & 0 & 0 & \frac{\sqrt{210}}{168} & 0 & -\frac{\sqrt{42}}{112} & 0 & 0 & 0 & \frac{\sqrt{30}}{48} \\ 0 & -\frac{25\sqrt{21}}{672} & 0 & \frac{5\sqrt{42}}{224} & 0 & -\frac{5\sqrt{105}}{672} & 0 & 0 & \frac{\sqrt{210}}{336} & 0 & -\frac{\sqrt{14}}{56} & 0 & \frac{\sqrt{70}}{112} & 0 \end{bmatrix}$$
436	symmetry	$\frac{y(3x^2-2y^2+3z^2)}{2}$

continued …

Table 7

No.	multipole	matrix

$$\mathbb{M}_{3,2}^{(1,0;a)}(E,1)$$

$$
\begin{bmatrix}
0 & \frac{\sqrt{14}i}{84} & 0 & \frac{\sqrt{7}i}{42} & 0 & \frac{\sqrt{70}i}{84} & -\frac{5\sqrt{15}i}{96} & 0 & -\frac{5\sqrt{35}i}{224} & 0 & -\frac{5\sqrt{21}i}{224} & 0 & -\frac{5\sqrt{105}i}{672} & 0 \\[4pt]
-\frac{\sqrt{70}i}{84} & 0 & -\frac{\sqrt{7}i}{42} & 0 & -\frac{\sqrt{14}i}{84} & 0 & 0 & -\frac{5\sqrt{105}i}{672} & 0 & -\frac{5\sqrt{21}i}{224} & 0 & -\frac{5\sqrt{35}i}{224} & 0 & -\frac{5\sqrt{15}i}{96} \\[4pt]
-\frac{5\sqrt{105}i}{672} & 0 & -\frac{5\sqrt{42}i}{224} & 0 & -\frac{25\sqrt{21}i}{672} & 0 & 0 & -\frac{\sqrt{70}i}{112} & 0 & -\frac{\sqrt{14}i}{56} & 0 & -\frac{\sqrt{210}i}{336} & 0 & 0 \\[4pt]
0 & \frac{5\sqrt{7}i}{96} & 0 & \frac{5\sqrt{14}i}{672} & 0 & -\frac{25\sqrt{35}i}{672} & \frac{\sqrt{30}i}{48} & 0 & 0 & 0 & -\frac{\sqrt{42}i}{112} & 0 & -\frac{\sqrt{210}i}{168} & 0 \\[4pt]
-\frac{25\sqrt{35}i}{672} & 0 & \frac{5\sqrt{14}i}{672} & 0 & \frac{5\sqrt{7}i}{96} & 0 & 0 & \frac{\sqrt{210}i}{168} & 0 & \frac{\sqrt{42}i}{112} & 0 & 0 & 0 & -\frac{\sqrt{30}i}{48} \\[4pt]
0 & -\frac{25\sqrt{21}i}{672} & 0 & -\frac{5\sqrt{42}i}{224} & 0 & -\frac{5\sqrt{105}i}{672} & 0 & 0 & \frac{\sqrt{210}i}{336} & 0 & \frac{\sqrt{14}i}{56} & 0 & \frac{\sqrt{70}i}{112} & 0
\end{bmatrix}
$$

437	symmetry	$\dfrac{\sqrt{15}x(y-z)(y+z)}{2}$

$$\mathbb{M}_{3,1}^{(1,0;a)}(E,2)$$

$$
\begin{bmatrix}
0 & -\frac{\sqrt{210}}{252} & 0 & \frac{\sqrt{105}}{126} & 0 & \frac{\sqrt{42}}{84} & \frac{5}{32} & 0 & \frac{25\sqrt{21}}{672} & 0 & -\frac{5\sqrt{35}}{224} & 0 & -\frac{5\sqrt{7}}{224} & 0 \\[4pt]
\frac{\sqrt{42}}{84} & 0 & \frac{\sqrt{105}}{126} & 0 & -\frac{\sqrt{210}}{252} & 0 & 0 & \frac{5\sqrt{7}}{224} & 0 & \frac{5\sqrt{35}}{224} & 0 & -\frac{25\sqrt{21}}{672} & 0 & -\frac{5}{32} \\[4pt]
\frac{25\sqrt{7}}{672} & 0 & -\frac{5\sqrt{70}}{224} & 0 & -\frac{5\sqrt{35}}{224} & 0 & 0 & \frac{5\sqrt{42}}{336} & 0 & -\frac{\sqrt{210}}{168} & 0 & -\frac{\sqrt{14}}{112} & 0 & 0 \\[4pt]
0 & -\frac{5\sqrt{105}}{288} & 0 & \frac{5\sqrt{210}}{2016} & 0 & -\frac{25\sqrt{21}}{672} & -\frac{\sqrt{2}}{16} & 0 & 0 & 0 & -\frac{\sqrt{70}}{112} & 0 & -\frac{\sqrt{14}}{56} & 0 \\[4pt]
\frac{25\sqrt{21}}{672} & 0 & -\frac{5\sqrt{210}}{2016} & 0 & \frac{5\sqrt{105}}{288} & 0 & 0 & -\frac{\sqrt{14}}{56} & 0 & -\frac{\sqrt{70}}{112} & 0 & 0 & 0 & -\frac{\sqrt{2}}{16} \\[4pt]
0 & \frac{5\sqrt{35}}{224} & 0 & \frac{5\sqrt{70}}{224} & 0 & -\frac{25\sqrt{7}}{672} & 0 & 0 & -\frac{\sqrt{14}}{112} & 0 & -\frac{\sqrt{210}}{168} & 0 & \frac{5\sqrt{42}}{336} & 0
\end{bmatrix}
$$

438	symmetry	$-\dfrac{\sqrt{15}y(x-z)(x+z)}{2}$

$$\mathbb{M}_{3,2}^{(1,0;a)}(E,2)$$

$$
\begin{bmatrix}
0 & \frac{\sqrt{210}i}{252} & 0 & \frac{\sqrt{105}i}{126} & 0 & -\frac{\sqrt{42}i}{84} & \frac{5i}{32} & 0 & -\frac{25\sqrt{21}i}{672} & 0 & -\frac{5\sqrt{35}i}{224} & 0 & \frac{5\sqrt{7}i}{224} & 0 \\[4pt]
\frac{\sqrt{42}i}{84} & 0 & -\frac{\sqrt{105}i}{126} & 0 & -\frac{\sqrt{210}i}{252} & 0 & 0 & \frac{5\sqrt{7}i}{224} & 0 & -\frac{5\sqrt{35}i}{224} & 0 & -\frac{25\sqrt{21}i}{672} & 0 & \frac{5i}{32} \\[4pt]
-\frac{25\sqrt{7}i}{672} & 0 & -\frac{5\sqrt{70}i}{224} & 0 & \frac{5\sqrt{35}i}{224} & 0 & 0 & -\frac{5\sqrt{42}i}{336} & 0 & -\frac{\sqrt{210}i}{168} & 0 & \frac{\sqrt{14}i}{112} & 0 & 0 \\[4pt]
0 & \frac{5\sqrt{105}i}{288} & 0 & \frac{5\sqrt{210}i}{2016} & 0 & \frac{25\sqrt{21}i}{672} & -\frac{\sqrt{2}i}{16} & 0 & 0 & 0 & -\frac{\sqrt{70}i}{112} & 0 & \frac{\sqrt{14}i}{56} & 0 \\[4pt]
\frac{25\sqrt{21}i}{672} & 0 & \frac{5\sqrt{210}i}{2016} & 0 & \frac{5\sqrt{105}i}{288} & 0 & 0 & -\frac{\sqrt{14}i}{56} & 0 & \frac{\sqrt{70}i}{112} & 0 & 0 & 0 & \frac{\sqrt{2}i}{16} \\[4pt]
0 & \frac{5\sqrt{35}i}{224} & 0 & -\frac{5\sqrt{70}i}{224} & 0 & -\frac{25\sqrt{7}i}{672} & 0 & 0 & -\frac{\sqrt{14}i}{112} & 0 & \frac{\sqrt{210}i}{168} & 0 & \frac{5\sqrt{42}i}{336} & 0
\end{bmatrix}
$$

439	symmetry	z

$$\mathbb{M}_{1}^{(1,1;a)}(A_2)$$

$$
\begin{bmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\[4pt]
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\[4pt]
0 & -\frac{\sqrt{10}}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\[4pt]
0 & 0 & -\frac{\sqrt{15}}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\[4pt]
0 & 0 & 0 & -\frac{\sqrt{15}}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\[4pt]
0 & 0 & 0 & 0 & -\frac{\sqrt{10}}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0
\end{bmatrix}
$$

440	symmetry	x

Table 7

No.	multipole	matrix

$\mathbb{M}_{1,1}^{(1,1;a)}(E)$

$$\begin{bmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
\frac{\sqrt{2}}{4} & 0 & -\frac{\sqrt{5}}{20} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & \frac{\sqrt{30}}{20} & 0 & -\frac{\sqrt{15}}{20} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & \frac{\sqrt{15}}{20} & 0 & -\frac{\sqrt{30}}{20} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & \frac{\sqrt{5}}{20} & 0 & -\frac{\sqrt{2}}{4} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0
\end{bmatrix}$$

441	symmetry	$-y$

$\mathbb{M}_{1,2}^{(1,1;a)}(E)$

$$\begin{bmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
-\frac{\sqrt{2}i}{4} & 0 & -\frac{\sqrt{5}i}{20} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & -\frac{\sqrt{30}i}{20} & 0 & -\frac{\sqrt{15}i}{20} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & -\frac{\sqrt{15}i}{20} & 0 & -\frac{\sqrt{30}i}{20} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & -\frac{\sqrt{5}i}{20} & 0 & -\frac{\sqrt{2}i}{4} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0
\end{bmatrix}$$

442	symmetry	$-\frac{z\left(3x^2+3y^2-2z^2\right)}{2}$

$\mathbb{M}_3^{(1,1;a)}(A_2)$

$$\begin{bmatrix}
0 & 0 & \frac{3}{7} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{28} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & -\frac{3}{7} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{28} & 0 & 0 & 0 \\
0 & \frac{3\sqrt{3}}{28} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}}{84} & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & -\frac{3\sqrt{2}}{28} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}}{84} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & -\frac{3\sqrt{2}}{28} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{84} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & \frac{3\sqrt{3}}{28} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{84} & 0 & 0
\end{bmatrix}$$

443	symmetry	$\sqrt{15}xyz$

$\mathbb{M}_3^{(1,1;a)}(B_1)$

$$\begin{bmatrix}
\frac{\sqrt{6}i}{14} & 0 & 0 & 0 & -\frac{\sqrt{30}i}{14} & 0 & 0 & -\frac{3i}{56} & 0 & 0 & 0 & \frac{\sqrt{3}i}{56} & 0 & 0 \\
0 & -\frac{\sqrt{30}i}{14} & 0 & 0 & 0 & \frac{\sqrt{6}i}{14} & 0 & 0 & -\frac{\sqrt{3}i}{56} & 0 & 0 & 0 & \frac{3i}{56} & 0 \\
0 & 0 & 0 & -\frac{3\sqrt{10}i}{56} & 0 & 0 & -\frac{\sqrt{42}i}{168} & 0 & 0 & 0 & \frac{\sqrt{30}i}{168} & 0 & 0 & 0 \\
-\frac{5\sqrt{3}i}{56} & 0 & 0 & 0 & -\frac{\sqrt{15}i}{56} & 0 & 0 & \frac{\sqrt{2}i}{56} & 0 & 0 & 0 & \frac{\sqrt{6}i}{56} & 0 & 0 \\
0 & \frac{\sqrt{15}i}{56} & 0 & 0 & 0 & \frac{5\sqrt{3}i}{56} & 0 & 0 & \frac{\sqrt{6}i}{56} & 0 & 0 & 0 & \frac{\sqrt{2}i}{56} & 0 \\
0 & 0 & \frac{3\sqrt{10}i}{56} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}i}{168} & 0 & 0 & 0 & -\frac{\sqrt{42}i}{168}
\end{bmatrix}$$

444	symmetry	$\frac{\sqrt{15}z(x-y)(x+y)}{2}$

continued ...

Table 7

No.	multipole	matrix

$$\mathbb{M}_3^{(1,1;a)}(B_2)$$

$$
\begin{bmatrix}
\frac{\sqrt{6}}{14} & 0 & 0 & 0 & \frac{\sqrt{30}}{14} & 0 & 0 & -\frac{3}{56} & 0 & 0 & 0 & -\frac{\sqrt{3}}{56} & 0 & 0 \\
0 & -\frac{\sqrt{30}}{14} & 0 & 0 & 0 & -\frac{\sqrt{6}}{14} & 0 & 0 & -\frac{\sqrt{3}}{56} & 0 & 0 & 0 & -\frac{3}{56} & 0 \\
0 & 0 & 0 & \frac{3\sqrt{10}}{56} & 0 & 0 & -\frac{\sqrt{42}}{168} & 0 & 0 & 0 & -\frac{\sqrt{30}}{168} & 0 & 0 & 0 \\
-\frac{5\sqrt{3}}{56} & 0 & 0 & 0 & \frac{\sqrt{15}}{56} & 0 & 0 & \frac{\sqrt{2}}{56} & 0 & 0 & 0 & -\frac{\sqrt{6}}{56} & 0 & 0 \\
0 & \frac{\sqrt{15}}{56} & 0 & 0 & 0 & -\frac{5\sqrt{3}}{56} & 0 & 0 & \frac{\sqrt{6}}{56} & 0 & 0 & 0 & -\frac{\sqrt{2}}{56} & 0 \\
0 & 0 & \frac{3\sqrt{10}}{56} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{168} & 0 & 0 & 0 & \frac{\sqrt{42}}{168}
\end{bmatrix}
$$

445   symmetry

$$\frac{x\left(2x^2-3y^2-3z^2\right)}{2}$$

$$\mathbb{M}_{3,1}^{(1,1;a)}(E,1)$$

$$
\begin{bmatrix}
0 & \frac{3\sqrt{2}}{28} & 0 & -\frac{3}{14} & 0 & \frac{3\sqrt{10}}{28} & \frac{\sqrt{105}}{224} & 0 & -\frac{3\sqrt{5}}{224} & 0 & \frac{3\sqrt{3}}{224} & 0 & -\frac{\sqrt{15}}{224} & 0 \\
\frac{3\sqrt{10}}{28} & 0 & -\frac{3}{14} & 0 & \frac{3\sqrt{2}}{28} & 0 & 0 & \frac{\sqrt{15}}{224} & 0 & -\frac{3\sqrt{3}}{224} & 0 & \frac{3\sqrt{5}}{224} & 0 & -\frac{\sqrt{105}}{224} \\
\frac{3\sqrt{15}}{224} & 0 & -\frac{9\sqrt{6}}{224} & 0 & \frac{15\sqrt{3}}{224} & 0 & 0 & -\frac{\sqrt{10}}{112} & 0 & \frac{\sqrt{2}}{56} & 0 & -\frac{\sqrt{30}}{336} & 0 & 0 \\
0 & -\frac{3}{32} & 0 & \frac{3\sqrt{2}}{224} & 0 & \frac{15\sqrt{5}}{224} & -\frac{\sqrt{210}}{336} & 0 & 0 & 0 & \frac{\sqrt{6}}{112} & 0 & -\frac{\sqrt{30}}{168} & 0 \\
-\frac{15\sqrt{5}}{224} & 0 & -\frac{3\sqrt{2}}{224} & 0 & \frac{3}{32} & 0 & 0 & -\frac{\sqrt{30}}{168} & 0 & \frac{\sqrt{6}}{112} & 0 & 0 & 0 & -\frac{\sqrt{210}}{336} \\
0 & -\frac{15\sqrt{3}}{224} & 0 & \frac{9\sqrt{6}}{224} & 0 & -\frac{3\sqrt{15}}{224} & 0 & 0 & -\frac{\sqrt{30}}{336} & 0 & \frac{\sqrt{2}}{56} & 0 & -\frac{\sqrt{10}}{112} & 0
\end{bmatrix}
$$

446   symmetry

$$\frac{y\left(3x^2-2y^2+3z^2\right)}{2}$$

$$\mathbb{M}_{3,2}^{(1,1;a)}(E,1)$$

$$
\begin{bmatrix}
0 & -\frac{3\sqrt{2}i}{28} & 0 & -\frac{3i}{14} & 0 & -\frac{3\sqrt{10}i}{28} & \frac{\sqrt{105}i}{224} & 0 & \frac{3\sqrt{5}i}{224} & 0 & \frac{3\sqrt{3}i}{224} & 0 & \frac{\sqrt{15}i}{224} & 0 \\
\frac{3\sqrt{10}i}{28} & 0 & \frac{3i}{14} & 0 & \frac{3\sqrt{2}i}{28} & 0 & 0 & \frac{\sqrt{15}i}{224} & 0 & \frac{3\sqrt{3}i}{224} & 0 & \frac{3\sqrt{5}i}{224} & 0 & \frac{\sqrt{105}i}{224} \\
-\frac{3\sqrt{15}i}{224} & 0 & -\frac{9\sqrt{6}i}{224} & 0 & -\frac{15\sqrt{3}i}{224} & 0 & 0 & \frac{\sqrt{10}i}{112} & 0 & \frac{\sqrt{2}i}{56} & 0 & \frac{\sqrt{30}i}{336} & 0 & 0 \\
0 & \frac{3i}{32} & 0 & \frac{3\sqrt{2}i}{224} & 0 & -\frac{15\sqrt{5}i}{224} & -\frac{\sqrt{210}i}{336} & 0 & 0 & 0 & \frac{\sqrt{6}i}{112} & 0 & \frac{\sqrt{30}i}{168} & 0 \\
-\frac{15\sqrt{5}i}{224} & 0 & \frac{3\sqrt{2}i}{224} & 0 & \frac{3i}{32} & 0 & 0 & -\frac{\sqrt{30}i}{168} & 0 & -\frac{\sqrt{6}i}{112} & 0 & 0 & 0 & \frac{\sqrt{210}i}{336} \\
0 & -\frac{15\sqrt{3}i}{224} & 0 & -\frac{9\sqrt{6}i}{224} & 0 & -\frac{3\sqrt{15}i}{224} & 0 & 0 & -\frac{\sqrt{30}i}{336} & 0 & -\frac{\sqrt{2}i}{56} & 0 & -\frac{\sqrt{10}i}{112} & 0
\end{bmatrix}
$$

447   symmetry

$$\frac{\sqrt{15}x(y-z)(y+z)}{2}$$

$$\mathbb{M}_{3,1}^{(1,1;a)}(E,2)$$

$$
\begin{bmatrix}
0 & \frac{\sqrt{30}}{28} & 0 & -\frac{\sqrt{15}}{14} & 0 & -\frac{3\sqrt{6}}{28} & -\frac{3\sqrt{7}}{224} & 0 & -\frac{5\sqrt{3}}{224} & 0 & \frac{3\sqrt{5}}{224} & 0 & \frac{3}{224} & 0 \\
-\frac{3\sqrt{6}}{28} & 0 & -\frac{\sqrt{15}}{14} & 0 & \frac{\sqrt{30}}{28} & 0 & 0 & -\frac{3}{224} & 0 & -\frac{3\sqrt{5}}{224} & 0 & \frac{5\sqrt{3}}{224} & 0 & \frac{3\sqrt{7}}{224} \\
\frac{15}{224} & 0 & -\frac{9\sqrt{10}}{224} & 0 & -\frac{9\sqrt{5}}{224} & 0 & 0 & -\frac{5\sqrt{6}}{336} & 0 & \frac{\sqrt{30}}{168} & 0 & \frac{\sqrt{2}}{112} & 0 & 0 \\
0 & -\frac{\sqrt{15}}{32} & 0 & \frac{\sqrt{30}}{224} & 0 & -\frac{15\sqrt{3}}{224} & \frac{\sqrt{14}}{112} & 0 & 0 & 0 & \frac{\sqrt{10}}{112} & 0 & \frac{\sqrt{2}}{56} & 0 \\
\frac{15\sqrt{3}}{224} & 0 & -\frac{\sqrt{30}}{224} & 0 & \frac{\sqrt{15}}{32} & 0 & 0 & \frac{\sqrt{2}}{56} & 0 & \frac{\sqrt{10}}{112} & 0 & 0 & 0 & \frac{\sqrt{14}}{112} \\
0 & \frac{9\sqrt{5}}{224} & 0 & \frac{9\sqrt{10}}{224} & 0 & -\frac{15}{224} & 0 & 0 & \frac{\sqrt{2}}{112} & 0 & \frac{\sqrt{30}}{168} & 0 & -\frac{5\sqrt{6}}{336} & 0
\end{bmatrix}
$$

448   symmetry

$$-\frac{\sqrt{15}y(x-z)(x+z)}{2}$$

continued ...

Table 7

No.	multipole	matrix												
	$\mathbb{M}_{3,2}^{(1,1;a)}(E,2)$	0	$-\frac{\sqrt{30}i}{28}$	0	$-\frac{\sqrt{15}i}{14}$	0	$\frac{3\sqrt{6}i}{28}$	$-\frac{3\sqrt{7}i}{224}$	0	$\frac{5\sqrt{3}i}{224}$	0	$\frac{3\sqrt{5}i}{224}$	0	$-\frac{3i}{224}$	0
		$-\frac{3\sqrt{6}i}{28}$	0	$\frac{\sqrt{15}i}{14}$	0	$\frac{\sqrt{30}i}{28}$	0	0	$-\frac{3i}{224}$	0	$\frac{3\sqrt{5}i}{224}$	0	$\frac{5\sqrt{3}i}{224}$	0	$-\frac{3\sqrt{7}i}{224}$
		$-\frac{15i}{224}$	0	$-\frac{9\sqrt{10}i}{224}$	0	$\frac{9\sqrt{5}i}{224}$	0	0	$\frac{5\sqrt{6}i}{336}$	0	$\frac{\sqrt{30}i}{168}$	0	$-\frac{\sqrt{2}i}{112}$	0	0
		0	$\frac{\sqrt{15}i}{32}$	0	$\frac{\sqrt{30}i}{224}$	0	$\frac{15\sqrt{3}i}{224}$	$\frac{\sqrt{14}i}{112}$	0	0	0	$\frac{\sqrt{10}i}{112}$	0	$-\frac{\sqrt{2}i}{56}$	0
		$\frac{15\sqrt{3}i}{224}$	0	$\frac{\sqrt{30}i}{224}$	0	$\frac{\sqrt{15}i}{32}$	0	0	$\frac{\sqrt{2}i}{56}$	0	$-\frac{\sqrt{10}i}{112}$	0	0	0	$-\frac{\sqrt{14}i}{112}$
		0	$\frac{9\sqrt{5}i}{224}$	0	$-\frac{9\sqrt{10}i}{224}$	0	$-\frac{15i}{224}$	0	0	$\frac{\sqrt{2}i}{112}$	0	$-\frac{\sqrt{30}i}{168}$	0	$-\frac{5\sqrt{6}i}{336}$	0

bra: $= \langle\frac{3}{2},\frac{3}{2};d|\,,\langle\frac{3}{2},\frac{1}{2};d|\,,\langle\frac{3}{2},-\frac{1}{2};d|\,,\langle\frac{3}{2},-\frac{3}{2};d|\,,\langle\frac{5}{2},\frac{5}{2};d|\,,\langle\frac{5}{2},\frac{3}{2};d|\,,\langle\frac{5}{2},\frac{1}{2};d|\,,\langle\frac{5}{2},-\frac{1}{2};d|\,,\langle\frac{5}{2},-\frac{3}{2};d|\,,\langle\frac{5}{2},-\frac{5}{2};d|$

ket: $= |\frac{3}{2},\frac{3}{2};d\rangle\,,|\frac{3}{2},\frac{1}{2};d\rangle\,,|\frac{3}{2},-\frac{1}{2};d\rangle\,,|\frac{3}{2},-\frac{3}{2};d\rangle\,,|\frac{5}{2},\frac{5}{2};d\rangle\,,|\frac{5}{2},\frac{3}{2};d\rangle\,,|\frac{5}{2},\frac{1}{2};d\rangle\,,|\frac{5}{2},-\frac{1}{2};d\rangle\,,|\frac{5}{2},-\frac{3}{2};d\rangle\,,|\frac{5}{2},-\frac{5}{2};d\rangle$

Table 8: (d,d) block.

No.	multipole	matrix
449	symmetry	1
	$\mathbb{Q}_0^{(a)}(A_1)$	$\begin{bmatrix} \frac{\sqrt{10}}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{10}}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{10}}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{10}}{10} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{10}}{10} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}}{10} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}}{10} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}}{10} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}}{10} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}}{10} \end{bmatrix}$
450	symmetry	$-\frac{x^2}{2}-\frac{y^2}{2}+z^2$

continued ...

Table 8

No.	multipole	matrix									

$\mathbb{Q}_2^{(a)}(A_1)$

$$\begin{pmatrix} -\frac{\sqrt{7}}{10} & 0 & 0 & 0 & 0 & -\frac{3\sqrt{7}}{35} & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{7}}{10} & 0 & 0 & 0 & 0 & -\frac{\sqrt{42}}{70} & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{7}}{10} & 0 & 0 & 0 & 0 & \frac{\sqrt{42}}{70} & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{7}}{10} & 0 & 0 & 0 & 0 & \frac{3\sqrt{7}}{35} & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{7}}{7} & 0 & 0 & 0 & 0 & 0 \\ -\frac{3\sqrt{7}}{35} & 0 & 0 & 0 & 0 & \frac{\sqrt{7}}{35} & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{42}}{70} & 0 & 0 & 0 & 0 & \frac{4\sqrt{7}}{35} & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{42}}{70} & 0 & 0 & 0 & 0 & \frac{4\sqrt{7}}{35} & 0 & 0 \\ 0 & 0 & 0 & \frac{3\sqrt{7}}{35} & 0 & 0 & 0 & 0 & \frac{\sqrt{7}}{35} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}}{7} \end{pmatrix}$$

451	symmetry	$\frac{\sqrt{3}(x-y)(x+y)}{2}$

$\mathbb{Q}_2^{(a)}(B_1)$

$$\begin{bmatrix} 0 & 0 & -\frac{\sqrt{7}}{10} & 0 & 0 & 0 & 0 & -\frac{\sqrt{42}}{70} & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{7}}{10} & \frac{\sqrt{35}}{35} & 0 & 0 & 0 & -\frac{2\sqrt{7}}{35} & 0 \\ -\frac{\sqrt{7}}{10} & 0 & 0 & 0 & 0 & \frac{2\sqrt{7}}{35} & 0 & 0 & 0 & -\frac{\sqrt{35}}{35} \\ 0 & -\frac{\sqrt{7}}{10} & 0 & 0 & 0 & 0 & \frac{\sqrt{42}}{70} & 0 & 0 & 0 \\ 0 & \frac{\sqrt{35}}{35} & 0 & 0 & 0 & 0 & -\frac{\sqrt{210}}{70} & 0 & 0 & 0 \\ 0 & 0 & \frac{2\sqrt{7}}{35} & 0 & 0 & 0 & 0 & -\frac{3\sqrt{42}}{70} & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{42}}{70} & -\frac{\sqrt{210}}{70} & 0 & 0 & 0 & -\frac{3\sqrt{42}}{70} & 0 \\ -\frac{\sqrt{42}}{70} & 0 & 0 & 0 & 0 & -\frac{3\sqrt{42}}{70} & 0 & 0 & 0 & -\frac{\sqrt{210}}{70} \\ 0 & -\frac{2\sqrt{7}}{35} & 0 & 0 & 0 & 0 & -\frac{3\sqrt{42}}{70} & 0 & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{35}}{35} & 0 & 0 & 0 & 0 & -\frac{\sqrt{210}}{70} & 0 & 0 \end{bmatrix}$$

452	symmetry	$\sqrt{3}xy$

continued …

Table 8

No.	multipole	matrix

$\mathbb{Q}_2^{(a)}(B_2)$

$$\begin{bmatrix} 0 & 0 & \frac{\sqrt{7}i}{10} & 0 & 0 & 0 & 0 & \frac{\sqrt{42}i}{70} & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{7}i}{10} & \frac{\sqrt{35}i}{35} & 0 & 0 & 0 & \frac{2\sqrt{7}i}{35} & 0 \\ -\frac{\sqrt{7}i}{10} & 0 & 0 & 0 & 0 & \frac{2\sqrt{7}i}{35} & 0 & 0 & 0 & \frac{\sqrt{35}i}{35} \\ 0 & -\frac{\sqrt{7}i}{10} & 0 & 0 & 0 & 0 & \frac{\sqrt{42}i}{70} & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{35}i}{35} & 0 & 0 & 0 & 0 & \frac{\sqrt{210}i}{70} & 0 & 0 & 0 \\ 0 & 0 & -\frac{2\sqrt{7}i}{35} & 0 & 0 & 0 & 0 & \frac{3\sqrt{42}i}{70} & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{42}i}{70} & -\frac{\sqrt{210}i}{70} & 0 & 0 & 0 & \frac{3\sqrt{42}i}{70} & 0 \\ -\frac{\sqrt{42}i}{70} & 0 & 0 & 0 & 0 & -\frac{3\sqrt{42}i}{70} & 0 & 0 & 0 & \frac{\sqrt{210}i}{70} \\ 0 & -\frac{2\sqrt{7}i}{35} & 0 & 0 & 0 & 0 & -\frac{3\sqrt{42}i}{70} & 0 & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{35}i}{35} & 0 & 0 & 0 & 0 & -\frac{\sqrt{210}i}{70} & 0 & 0 \end{bmatrix}$$

453	symmetry	$\sqrt{3}yz$

$\mathbb{Q}_{2,1}^{(a)}(E)$

$$\begin{bmatrix} 0 & \frac{\sqrt{7}i}{10} & 0 & 0 & \frac{\sqrt{105}i}{70} & 0 & \frac{3\sqrt{42}i}{140} & 0 & 0 & 0 \\ -\frac{\sqrt{7}i}{10} & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}i}{70} & 0 & \frac{\sqrt{14}i}{28} & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{7}i}{10} & 0 & 0 & -\frac{\sqrt{14}i}{28} & 0 & \frac{\sqrt{7}i}{70} & 0 \\ 0 & 0 & \frac{\sqrt{7}i}{10} & 0 & 0 & 0 & 0 & -\frac{3\sqrt{42}i}{140} & 0 & -\frac{\sqrt{105}i}{70} \\ -\frac{\sqrt{105}i}{70} & 0 & 0 & 0 & 0 & \frac{\sqrt{105}i}{35} & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{7}i}{70} & 0 & 0 & -\frac{\sqrt{105}i}{35} & 0 & \frac{\sqrt{42}i}{35} & 0 & 0 & 0 \\ -\frac{3\sqrt{42}i}{140} & 0 & \frac{\sqrt{14}i}{28} & 0 & 0 & -\frac{\sqrt{42}i}{35} & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{14}i}{28} & 0 & \frac{3\sqrt{42}i}{140} & 0 & 0 & 0 & 0 & -\frac{\sqrt{42}i}{35} & 0 \\ 0 & 0 & -\frac{\sqrt{7}i}{70} & 0 & 0 & 0 & 0 & \frac{\sqrt{42}i}{35} & 0 & -\frac{\sqrt{105}i}{35} \\ 0 & 0 & 0 & \frac{\sqrt{105}i}{70} & 0 & 0 & 0 & 0 & \frac{\sqrt{105}i}{35} & 0 \end{bmatrix}$$

454	symmetry	$\sqrt{3}xz$

Table 8

No.	multipole	matrix

$\mathbb{Q}_{2,2}^{(a)}(E)$

$$\begin{bmatrix} 0 & -\frac{\sqrt{7}}{10} & 0 & 0 & \frac{\sqrt{105}}{70} & 0 & -\frac{3\sqrt{42}}{140} & 0 & 0 & 0 \\ -\frac{\sqrt{7}}{10} & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}}{70} & 0 & -\frac{\sqrt{14}}{28} & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{7}}{10} & 0 & 0 & -\frac{\sqrt{14}}{28} & 0 & -\frac{\sqrt{7}}{70} & 0 \\ 0 & 0 & \frac{\sqrt{7}}{10} & 0 & 0 & 0 & 0 & -\frac{3\sqrt{42}}{140} & 0 & \frac{\sqrt{105}}{70} \\ \frac{\sqrt{105}}{70} & 0 & 0 & 0 & 0 & -\frac{\sqrt{105}}{35} & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{7}}{70} & 0 & 0 & -\frac{\sqrt{105}}{35} & 0 & -\frac{\sqrt{42}}{35} & 0 & 0 & 0 \\ -\frac{3\sqrt{42}}{140} & 0 & -\frac{\sqrt{14}}{28} & 0 & 0 & -\frac{\sqrt{42}}{35} & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{14}}{28} & 0 & -\frac{3\sqrt{42}}{140} & 0 & 0 & 0 & 0 & \frac{\sqrt{42}}{35} & 0 \\ 0 & 0 & -\frac{\sqrt{7}}{70} & 0 & 0 & 0 & 0 & \frac{\sqrt{42}}{35} & 0 & \frac{\sqrt{105}}{35} \\ 0 & 0 & 0 & \frac{\sqrt{105}}{70} & 0 & 0 & 0 & 0 & \frac{\sqrt{105}}{35} & 0 \end{bmatrix}$$

| 455 | symmetry | $\dfrac{\sqrt{21}\left(x^4-3x^2y^2-3x^2z^2+y^4-3y^2z^2+z^4\right)}{6}$ |

$\mathbb{Q}_4^{(a)}(A_1,1)$

$$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{30} & 0 & 0 & 0 & \frac{\sqrt{3}}{6} \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}}{10} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}}{10} & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{6} & 0 & 0 & 0 & -\frac{\sqrt{15}}{30} & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{3}}{6} & \frac{\sqrt{15}}{60} & 0 & 0 & 0 & \frac{\sqrt{3}}{12} & 0 \\ \frac{\sqrt{15}}{30} & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{20} & 0 & 0 & 0 & \frac{\sqrt{3}}{12} \\ 0 & -\frac{\sqrt{10}}{10} & 0 & 0 & 0 & \frac{\sqrt{15}}{30} & 0 & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{10}}{10} & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{30} & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{15}}{30} & \frac{\sqrt{3}}{12} & 0 & 0 & 0 & -\frac{\sqrt{15}}{20} & 0 \\ \frac{\sqrt{3}}{6} & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{12} & 0 & 0 & 0 & \frac{\sqrt{15}}{60} \end{bmatrix}$$

| 456 | symmetry | $-\dfrac{\sqrt{15}\left(x^4-12x^2y^2+6x^2z^2+y^4+6y^2z^2-2z^4\right)}{12}$ |

continued ...

Table 8

No.	multipole	matrix

$\mathbb{Q}_4^{(a)}(A_1,2)$

$$\begin{bmatrix}
0 & 0 & 0 & 0 & 0 & \frac{\sqrt{21}}{42} & 0 & 0 & 0 & -\frac{\sqrt{105}}{30} \\
0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{14}}{14} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{14}}{14} & 0 & 0 \\
0 & 0 & 0 & 0 & \frac{\sqrt{105}}{30} & 0 & 0 & 0 & -\frac{\sqrt{21}}{42} & 0 \\
0 & 0 & 0 & \frac{\sqrt{105}}{30} & \frac{\sqrt{21}}{84} & 0 & 0 & 0 & -\frac{\sqrt{105}}{60} & 0 \\
\frac{\sqrt{21}}{42} & 0 & 0 & 0 & 0 & -\frac{\sqrt{21}}{28} & 0 & 0 & 0 & -\frac{\sqrt{105}}{60} \\
0 & -\frac{\sqrt{14}}{14} & 0 & 0 & 0 & 0 & \frac{\sqrt{21}}{42} & 0 & 0 & 0 \\
0 & 0 & \frac{\sqrt{14}}{14} & 0 & 0 & 0 & 0 & \frac{\sqrt{21}}{42} & 0 & 0 \\
0 & 0 & 0 & -\frac{\sqrt{21}}{42} & -\frac{\sqrt{105}}{60} & 0 & 0 & 0 & -\frac{\sqrt{21}}{28} & 0 \\
-\frac{\sqrt{105}}{30} & 0 & 0 & 0 & 0 & -\frac{\sqrt{105}}{60} & 0 & 0 & 0 & \frac{\sqrt{21}}{84}
\end{bmatrix}$$

| 457 | symmetry | $\frac{\sqrt{35}xy(x-y)(x+y)}{2}$ |

$\mathbb{Q}_4^{(a)}(A_2)$

$$\begin{bmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{5} \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{5} & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & \frac{\sqrt{5}i}{5} & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{10} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{10} \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & \frac{\sqrt{5}i}{10} & 0 & 0 & 0 & 0 & 0 \\
\frac{\sqrt{5}i}{5} & 0 & 0 & 0 & 0 & \frac{\sqrt{5}i}{10} & 0 & 0 & 0 & 0
\end{bmatrix}$$

| 458 | symmetry | $\frac{\sqrt{5}(x-y)(x+y)\left(x^2+y^2-6z^2\right)}{4}$ |

continued ...

Table 8

No.	multipole	matrix

$\mathbb{Q}_4^{(a)}(B_1)$

$$\begin{bmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{14}}{14} & 0 & 0 \\
0 & 0 & 0 & 0 & \frac{\sqrt{105}}{70} & 0 & 0 & 0 & \frac{\sqrt{21}}{14} & 0 \\
0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{21}}{14} & 0 & 0 & 0 & -\frac{\sqrt{105}}{70} \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{14}}{14} & 0 & 0 & 0 \\
0 & \frac{\sqrt{105}}{70} & 0 & 0 & 0 & 0 & -\frac{3\sqrt{70}}{140} & 0 & 0 & 0 \\
0 & 0 & -\frac{\sqrt{21}}{14} & 0 & 0 & 0 & 0 & \frac{\sqrt{14}}{28} & 0 & 0 \\
0 & 0 & 0 & \frac{\sqrt{14}}{14} & -\frac{3\sqrt{70}}{140} & 0 & 0 & 0 & \frac{\sqrt{14}}{28} & 0 \\
-\frac{\sqrt{14}}{14} & 0 & 0 & 0 & 0 & \frac{\sqrt{14}}{28} & 0 & 0 & 0 & -\frac{3\sqrt{70}}{140} \\
0 & \frac{\sqrt{21}}{14} & 0 & 0 & 0 & 0 & \frac{\sqrt{14}}{28} & 0 & 0 & 0 \\
0 & 0 & -\frac{\sqrt{105}}{70} & 0 & 0 & 0 & 0 & -\frac{3\sqrt{70}}{140} & 0 & 0
\end{bmatrix}$$

| 459 | symmetry | $-\dfrac{\sqrt{5}\,xy\left(x^2+y^2-6z^2\right)}{2}$ |

$\mathbb{Q}_4^{(a)}(B_2)$

$$\begin{bmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{14}i}{14} & 0 & 0 \\
0 & 0 & 0 & 0 & -\frac{\sqrt{105}i}{70} & 0 & 0 & 0 & \frac{\sqrt{21}i}{14} & 0 \\
0 & 0 & 0 & 0 & 0 & \frac{\sqrt{21}i}{14} & 0 & 0 & 0 & -\frac{\sqrt{105}i}{70} \\
0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{14}i}{14} & 0 & 0 & 0 \\
0 & \frac{\sqrt{105}i}{70} & 0 & 0 & 0 & 0 & -\frac{3\sqrt{70}i}{140} & 0 & 0 & 0 \\
0 & 0 & -\frac{\sqrt{21}i}{14} & 0 & 0 & 0 & 0 & \frac{\sqrt{14}i}{28} & 0 & 0 \\
0 & 0 & 0 & \frac{\sqrt{14}i}{14} & \frac{3\sqrt{70}i}{140} & 0 & 0 & 0 & \frac{\sqrt{14}i}{28} & 0 \\
\frac{\sqrt{14}i}{14} & 0 & 0 & 0 & 0 & -\frac{\sqrt{14}i}{28} & 0 & 0 & 0 & -\frac{3\sqrt{70}i}{140} \\
0 & -\frac{\sqrt{21}i}{14} & 0 & 0 & 0 & 0 & -\frac{\sqrt{14}i}{28} & 0 & 0 & 0 \\
0 & 0 & \frac{\sqrt{105}i}{70} & 0 & 0 & 0 & 0 & \frac{3\sqrt{70}i}{140} & 0 & 0
\end{bmatrix}$$

| 460 | symmetry | $\dfrac{\sqrt{35}\,yz(y-z)(y+z)}{2}$ |

Table 8

No.	multipole	matrix

$\mathbb{Q}_{4,1}^{(a)}(E,1)$

$$\begin{bmatrix}
0 & 0 & 0 & 0 & \frac{\sqrt{5}i}{40} & 0 & \frac{\sqrt{2}i}{8} & 0 & \frac{i}{8} & 0 \\
0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{8} & 0 & -\frac{\sqrt{6}i}{8} & 0 & -\frac{\sqrt{15}i}{40} \\
0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{40} & 0 & \frac{\sqrt{6}i}{8} & 0 & \frac{\sqrt{3}i}{8} & 0 \\
0 & 0 & 0 & 0 & 0 & -\frac{i}{8} & 0 & -\frac{\sqrt{2}i}{8} & 0 & -\frac{\sqrt{5}i}{40} \\
-\frac{\sqrt{5}i}{40} & 0 & -\frac{\sqrt{15}i}{40} & 0 & 0 & \frac{\sqrt{5}i}{20} & 0 & \frac{\sqrt{10}i}{40} & 0 & 0 \\
0 & \frac{\sqrt{3}i}{8} & 0 & \frac{i}{8} & -\frac{\sqrt{5}i}{20} & 0 & -\frac{\sqrt{2}i}{8} & 0 & 0 & 0 \\
-\frac{\sqrt{2}i}{8} & 0 & -\frac{\sqrt{6}i}{8} & 0 & 0 & \frac{\sqrt{2}i}{8} & 0 & 0 & 0 & -\frac{\sqrt{10}i}{40} \\
0 & \frac{\sqrt{6}i}{8} & 0 & \frac{\sqrt{2}i}{8} & -\frac{\sqrt{10}i}{40} & 0 & 0 & 0 & \frac{\sqrt{2}i}{8} & 0 \\
-\frac{i}{8} & 0 & -\frac{\sqrt{3}i}{8} & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}i}{8} & 0 & -\frac{\sqrt{5}i}{20} \\
0 & \frac{\sqrt{15}i}{40} & 0 & \frac{\sqrt{5}i}{40} & 0 & 0 & \frac{\sqrt{10}i}{40} & 0 & \frac{\sqrt{5}i}{20} & 0
\end{bmatrix}$$

461	symmetry	$\frac{\sqrt{35}xz(x-z)(x+z)}{2}$

$\mathbb{Q}_{4,2}^{(a)}(E,1)$

$$\begin{bmatrix}
0 & 0 & 0 & 0 & \frac{\sqrt{5}}{40} & 0 & -\frac{\sqrt{2}}{8} & 0 & \frac{1}{8} & 0 \\
0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{8} & 0 & \frac{\sqrt{6}}{8} & 0 & -\frac{\sqrt{15}}{40} \\
0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{40} & 0 & \frac{\sqrt{6}}{8} & 0 & -\frac{\sqrt{3}}{8} & 0 \\
0 & 0 & 0 & 0 & 0 & \frac{1}{8} & 0 & -\frac{\sqrt{2}}{8} & 0 & \frac{\sqrt{5}}{40} \\
\frac{\sqrt{5}}{40} & 0 & -\frac{\sqrt{15}}{40} & 0 & 0 & -\frac{\sqrt{5}}{20} & 0 & \frac{\sqrt{10}}{40} & 0 & 0 \\
0 & -\frac{\sqrt{3}}{8} & 0 & \frac{1}{8} & -\frac{\sqrt{5}}{20} & 0 & \frac{\sqrt{2}}{8} & 0 & 0 & 0 \\
-\frac{\sqrt{2}}{8} & 0 & \frac{\sqrt{6}}{8} & 0 & 0 & \frac{\sqrt{2}}{8} & 0 & 0 & 0 & -\frac{\sqrt{10}}{40} \\
0 & \frac{\sqrt{6}}{8} & 0 & -\frac{\sqrt{2}}{8} & \frac{\sqrt{10}}{40} & 0 & 0 & 0 & -\frac{\sqrt{2}}{8} & 0 \\
\frac{1}{8} & 0 & -\frac{\sqrt{3}}{8} & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}}{8} & 0 & \frac{\sqrt{5}}{20} \\
0 & -\frac{\sqrt{15}}{40} & 0 & \frac{\sqrt{5}}{40} & 0 & 0 & -\frac{\sqrt{10}}{40} & 0 & \frac{\sqrt{5}}{20} & 0
\end{bmatrix}$$

462	symmetry	$\frac{\sqrt{5}yz\left(6x^2-y^2-z^2\right)}{2}$

Table 8

No.	multipole	matrix

$\mathbb{Q}_{4,1}^{(a)}(E,2)$

$$\begin{bmatrix}
0 & 0 & 0 & 0 & \frac{\sqrt{35}i}{280} & 0 & \frac{\sqrt{14}i}{56} & 0 & -\frac{\sqrt{7}i}{8} & 0 \\[4pt]
0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{21}i}{56} & 0 & -\frac{\sqrt{42}i}{56} & 0 & \frac{\sqrt{105}i}{40} \\[4pt]
0 & 0 & 0 & 0 & -\frac{\sqrt{105}i}{40} & 0 & \frac{\sqrt{42}i}{56} & 0 & \frac{\sqrt{21}i}{56} & 0 \\[4pt]
0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}i}{8} & 0 & -\frac{\sqrt{14}i}{56} & 0 & -\frac{\sqrt{35}i}{280} \\[4pt]
-\frac{\sqrt{35}i}{280} & 0 & \frac{\sqrt{105}i}{40} & 0 & 0 & \frac{\sqrt{35}i}{140} & 0 & -\frac{\sqrt{70}i}{40} & 0 & 0 \\[4pt]
0 & \frac{\sqrt{21}i}{56} & 0 & -\frac{\sqrt{7}i}{8} & -\frac{\sqrt{35}i}{140} & 0 & -\frac{\sqrt{14}i}{56} & 0 & 0 & 0 \\[4pt]
-\frac{\sqrt{14}i}{56} & 0 & -\frac{\sqrt{42}i}{56} & 0 & 0 & \frac{\sqrt{14}i}{56} & 0 & 0 & 0 & \frac{\sqrt{70}i}{40} \\[4pt]
0 & \frac{\sqrt{42}i}{56} & 0 & \frac{\sqrt{14}i}{56} & \frac{\sqrt{70}i}{40} & 0 & 0 & 0 & \frac{\sqrt{14}i}{56} & 0 \\[4pt]
\frac{\sqrt{7}i}{8} & 0 & -\frac{\sqrt{21}i}{56} & 0 & 0 & 0 & 0 & -\frac{\sqrt{14}i}{56} & 0 & -\frac{\sqrt{35}i}{140} \\[4pt]
0 & -\frac{\sqrt{105}i}{40} & 0 & \frac{\sqrt{35}i}{280} & 0 & 0 & -\frac{\sqrt{70}i}{40} & 0 & \frac{\sqrt{35}i}{140} & 0
\end{bmatrix}$$

| 463 | symmetry | $-\dfrac{\sqrt{5}xz\left(x^2-6y^2+z^2\right)}{2}$ |

$\mathbb{Q}_{4,2}^{(a)}(E,2)$

$$\begin{bmatrix}
0 & 0 & 0 & 0 & \frac{\sqrt{35}}{280} & 0 & -\frac{\sqrt{14}}{56} & 0 & -\frac{\sqrt{7}}{8} & 0 \\[4pt]
0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{21}}{56} & 0 & \frac{\sqrt{42}}{56} & 0 & \frac{\sqrt{105}}{40} \\[4pt]
0 & 0 & 0 & 0 & \frac{\sqrt{105}}{40} & 0 & \frac{\sqrt{42}}{56} & 0 & -\frac{\sqrt{21}}{56} & 0 \\[4pt]
0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}}{8} & 0 & -\frac{\sqrt{14}}{56} & 0 & \frac{\sqrt{35}}{280} \\[4pt]
\frac{\sqrt{35}}{280} & 0 & \frac{\sqrt{105}}{40} & 0 & 0 & -\frac{\sqrt{35}}{140} & 0 & -\frac{\sqrt{70}}{40} & 0 & 0 \\[4pt]
0 & -\frac{\sqrt{21}}{56} & 0 & -\frac{\sqrt{7}}{8} & -\frac{\sqrt{35}}{140} & 0 & \frac{\sqrt{14}}{56} & 0 & 0 & 0 \\[4pt]
-\frac{\sqrt{14}}{56} & 0 & \frac{\sqrt{42}}{56} & 0 & 0 & \frac{\sqrt{14}}{56} & 0 & 0 & 0 & \frac{\sqrt{70}}{40} \\[4pt]
0 & \frac{\sqrt{42}}{56} & 0 & -\frac{\sqrt{14}}{56} & -\frac{\sqrt{70}}{40} & 0 & 0 & 0 & -\frac{\sqrt{14}}{56} & 0 \\[4pt]
-\frac{\sqrt{7}}{8} & 0 & -\frac{\sqrt{21}}{56} & 0 & 0 & 0 & 0 & -\frac{\sqrt{14}}{56} & 0 & \frac{\sqrt{35}}{140} \\[4pt]
0 & \frac{\sqrt{105}}{40} & 0 & \frac{\sqrt{35}}{280} & 0 & 0 & \frac{\sqrt{70}}{40} & 0 & \frac{\sqrt{35}}{140} & 0
\end{bmatrix}$$

| 464 | symmetry | $-\dfrac{x^2}{2}-\dfrac{y^2}{2}+z^2$ |

continued ...

No.	multipole	matrix

Table 8

$\mathbb{Q}_2^{(1,-1;a)}(A_1)$

$$
\begin{bmatrix}
-\frac{\sqrt{30}}{50} & 0 & 0 & 0 & 0 & -\frac{3\sqrt{30}}{50} & 0 & 0 & 0 & 0 \\
0 & \frac{\sqrt{30}}{50} & 0 & 0 & 0 & 0 & -\frac{3\sqrt{5}}{50} & 0 & 0 & 0 \\
0 & 0 & \frac{\sqrt{30}}{50} & 0 & 0 & 0 & 0 & \frac{3\sqrt{5}}{50} & 0 & 0 \\
0 & 0 & 0 & -\frac{\sqrt{30}}{50} & 0 & 0 & 0 & 0 & \frac{3\sqrt{30}}{50} & 0 \\
0 & 0 & 0 & 0 & \frac{\sqrt{30}}{15} & 0 & 0 & 0 & 0 & 0 \\
-\frac{3\sqrt{30}}{50} & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}}{75} & 0 & 0 & 0 & 0 \\
0 & -\frac{3\sqrt{5}}{50} & 0 & 0 & 0 & 0 & -\frac{4\sqrt{30}}{75} & 0 & 0 & 0 \\
0 & 0 & \frac{3\sqrt{5}}{50} & 0 & 0 & 0 & 0 & -\frac{4\sqrt{30}}{75} & 0 & 0 \\
0 & 0 & 0 & \frac{3\sqrt{30}}{50} & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}}{75} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{15}
\end{bmatrix}
$$

465   symmetry $\frac{\sqrt{3}(x-y)(x+y)}{2}$

$\mathbb{Q}_2^{(1,-1;a)}(B_1)$

$$
\begin{bmatrix}
0 & 0 & -\frac{\sqrt{30}}{50} & 0 & 0 & 0 & 0 & -\frac{3\sqrt{5}}{50} & 0 & 0 \\
0 & 0 & 0 & -\frac{\sqrt{30}}{50} & \frac{\sqrt{6}}{10} & 0 & 0 & 0 & -\frac{\sqrt{30}}{25} & 0 \\
-\frac{\sqrt{30}}{50} & 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{25} & 0 & 0 & 0 & -\frac{\sqrt{6}}{10} \\
0 & -\frac{\sqrt{30}}{50} & 0 & 0 & 0 & 0 & \frac{3\sqrt{5}}{50} & 0 & 0 & 0 \\
0 & \frac{\sqrt{6}}{10} & 0 & 0 & 0 & 0 & \frac{1}{5} & 0 & 0 & 0 \\
0 & 0 & \frac{\sqrt{30}}{25} & 0 & 0 & 0 & 0 & \frac{3\sqrt{5}}{25} & 0 & 0 \\
0 & 0 & 0 & \frac{3\sqrt{5}}{50} & \frac{1}{5} & 0 & 0 & 0 & \frac{3\sqrt{5}}{25} & 0 \\
-\frac{3\sqrt{5}}{50} & 0 & 0 & 0 & 0 & \frac{3\sqrt{5}}{25} & 0 & 0 & 0 & \frac{1}{5} \\
0 & -\frac{\sqrt{30}}{25} & 0 & 0 & 0 & 0 & \frac{3\sqrt{5}}{25} & 0 & 0 & 0 \\
0 & 0 & -\frac{\sqrt{6}}{10} & 0 & 0 & 0 & 0 & \frac{1}{5} & 0 & 0
\end{bmatrix}
$$

466   symmetry $\sqrt{3}xy$

continued …

Table 8

No.	multipole	matrix

$\mathbb{Q}_2^{(1,-1;a)}(B_2)$

$$\begin{bmatrix}
0 & 0 & \frac{\sqrt{30}i}{50} & 0 & 0 & 0 & 0 & \frac{3\sqrt{5}i}{50} & 0 & 0 \\
0 & 0 & 0 & \frac{\sqrt{30}i}{50} & \frac{\sqrt{6}i}{10} & 0 & 0 & 0 & \frac{\sqrt{30}i}{25} & 0 \\
-\frac{\sqrt{30}i}{50} & 0 & 0 & 0 & 0 & \frac{\sqrt{30}i}{25} & 0 & 0 & 0 & \frac{\sqrt{6}i}{10} \\
0 & -\frac{\sqrt{30}i}{50} & 0 & 0 & 0 & 0 & \frac{3\sqrt{5}i}{50} & 0 & 0 & 0 \\
0 & -\frac{\sqrt{6}i}{10} & 0 & 0 & 0 & 0 & -\frac{i}{5} & 0 & 0 & 0 \\
0 & 0 & -\frac{\sqrt{30}i}{25} & 0 & 0 & 0 & 0 & -\frac{3\sqrt{5}i}{25} & 0 & 0 \\
0 & 0 & 0 & -\frac{3\sqrt{5}i}{50} & \frac{i}{5} & 0 & 0 & 0 & -\frac{3\sqrt{5}i}{25} & 0 \\
-\frac{3\sqrt{5}i}{50} & 0 & 0 & 0 & 0 & \frac{3\sqrt{5}i}{25} & 0 & 0 & 0 & -\frac{i}{5} \\
0 & -\frac{\sqrt{30}i}{25} & 0 & 0 & 0 & 0 & \frac{3\sqrt{5}i}{25} & 0 & 0 & 0 \\
0 & 0 & -\frac{\sqrt{6}i}{10} & 0 & 0 & 0 & 0 & \frac{i}{5} & 0 & 0
\end{bmatrix}$$

| 467 | symmetry | $\sqrt{3}yz$ |

$\mathbb{Q}_{2,1}^{(1,-1;a)}(E)$

$$\begin{bmatrix}
0 & \frac{\sqrt{30}i}{50} & 0 & 0 & \frac{3\sqrt{2}i}{20} & 0 & \frac{9\sqrt{5}i}{100} & 0 & 0 & 0 \\
-\frac{\sqrt{30}i}{50} & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}i}{100} & 0 & \frac{\sqrt{15}i}{20} & 0 & 0 \\
0 & 0 & 0 & -\frac{\sqrt{30}i}{50} & 0 & 0 & -\frac{\sqrt{15}i}{20} & 0 & \frac{\sqrt{30}i}{100} & 0 \\
0 & 0 & \frac{\sqrt{30}i}{50} & 0 & 0 & 0 & 0 & -\frac{9\sqrt{5}i}{100} & 0 & -\frac{3\sqrt{2}i}{20} \\
-\frac{3\sqrt{2}i}{20} & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}i}{5} & 0 & 0 & 0 & 0 \\
0 & \frac{\sqrt{30}i}{100} & 0 & 0 & \frac{\sqrt{2}i}{5} & 0 & -\frac{2\sqrt{5}i}{25} & 0 & 0 & 0 \\
-\frac{9\sqrt{5}i}{100} & 0 & \frac{\sqrt{15}i}{20} & 0 & 0 & \frac{2\sqrt{5}i}{25} & 0 & 0 & 0 & 0 \\
0 & -\frac{\sqrt{15}i}{20} & 0 & \frac{9\sqrt{5}i}{100} & 0 & 0 & 0 & 0 & \frac{2\sqrt{5}i}{25} & 0 \\
0 & 0 & -\frac{\sqrt{30}i}{100} & 0 & 0 & 0 & 0 & -\frac{2\sqrt{5}i}{25} & 0 & \frac{\sqrt{2}i}{5} \\
0 & 0 & 0 & \frac{3\sqrt{2}i}{20} & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}i}{5} & 0
\end{bmatrix}$$

| 468 | symmetry | $\sqrt{3}xz$ |

continued ...

106

No.	multipole	matrix

$\mathbb{Q}_{2,2}^{(1,-1;a)}(E)$

$$\begin{bmatrix} 0 & -\frac{\sqrt{30}}{50} & 0 & 0 & \frac{3\sqrt{2}}{20} & 0 & -\frac{9\sqrt{5}}{100} & 0 & 0 & 0 \\ -\frac{\sqrt{30}}{50} & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}}{100} & 0 & -\frac{\sqrt{15}}{20} & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{30}}{50} & 0 & 0 & -\frac{\sqrt{15}}{20} & 0 & -\frac{\sqrt{30}}{100} & 0 \\ 0 & 0 & \frac{\sqrt{30}}{50} & 0 & 0 & 0 & 0 & -\frac{9\sqrt{5}}{100} & 0 & \frac{3\sqrt{2}}{20} \\ \frac{3\sqrt{2}}{20} & 0 & 0 & 0 & 0 & \frac{\sqrt{2}}{5} & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{30}}{100} & 0 & 0 & \frac{\sqrt{2}}{5} & 0 & \frac{2\sqrt{5}}{25} & 0 & 0 & 0 \\ -\frac{9\sqrt{5}}{100} & 0 & -\frac{\sqrt{15}}{20} & 0 & 0 & \frac{2\sqrt{5}}{25} & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{15}}{20} & 0 & -\frac{9\sqrt{5}}{100} & 0 & 0 & 0 & 0 & -\frac{2\sqrt{5}}{25} & 0 \\ 0 & 0 & -\frac{\sqrt{30}}{100} & 0 & 0 & 0 & 0 & -\frac{2\sqrt{5}}{25} & 0 & -\frac{\sqrt{2}}{5} \\ 0 & 0 & 0 & \frac{3\sqrt{2}}{20} & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}}{5} & 0 \end{bmatrix}$$

| 469 | symmetry | $\dfrac{\sqrt{21}\left(x^4-3x^2y^2-3x^2z^2+y^4-3y^2z^2+z^4\right)}{6}$ |

$\mathbb{Q}_4^{(1,-1;a)}(A_1,1)$

$$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{60} & 0 & 0 & 0 & \frac{\sqrt{3}}{12} \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}}{20} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}}{20} & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{12} & 0 & 0 & 0 & -\frac{\sqrt{15}}{60} & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{3}}{12} & -\frac{\sqrt{15}}{30} & 0 & 0 & 0 & -\frac{\sqrt{3}}{6} & 0 \\ \frac{\sqrt{15}}{60} & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{10} & 0 & 0 & 0 & -\frac{\sqrt{3}}{6} \\ 0 & -\frac{\sqrt{10}}{20} & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{15} & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{10}}{20} & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{15} & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{15}}{60} & -\frac{\sqrt{3}}{6} & 0 & 0 & 0 & \frac{\sqrt{15}}{10} & 0 \\ \frac{\sqrt{3}}{12} & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{6} & 0 & 0 & 0 & -\frac{\sqrt{15}}{30} \end{bmatrix}$$

| 470 | symmetry | $-\dfrac{\sqrt{15}\left(x^4-12x^2y^2+6x^2z^2+y^4+6y^2z^2-2z^4\right)}{12}$ |

continued …

Table 8

No.	multipole	matrix

$\mathbb{Q}_4^{(1,-1;a)}(A_1,2)$

$$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{21}}{84} & 0 & 0 & 0 & -\frac{\sqrt{105}}{60} \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{14}}{28} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{14}}{28} & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{105}}{60} & 0 & 0 & 0 & -\frac{\sqrt{21}}{84} & 0 \\ 0 & 0 & 0 & \frac{\sqrt{105}}{60} & -\frac{\sqrt{21}}{42} & 0 & 0 & 0 & \frac{\sqrt{105}}{30} & 0 \\ \frac{\sqrt{21}}{84} & 0 & 0 & 0 & 0 & \frac{\sqrt{21}}{14} & 0 & 0 & 0 & \frac{\sqrt{105}}{30} \\ 0 & -\frac{\sqrt{14}}{28} & 0 & 0 & 0 & 0 & -\frac{\sqrt{21}}{21} & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{14}}{28} & 0 & 0 & 0 & 0 & -\frac{\sqrt{21}}{21} & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{21}}{84} & \frac{\sqrt{105}}{30} & 0 & 0 & 0 & \frac{\sqrt{21}}{14} & 0 \\ -\frac{\sqrt{105}}{60} & 0 & 0 & 0 & 0 & \frac{\sqrt{105}}{30} & 0 & 0 & 0 & -\frac{\sqrt{21}}{42} \end{bmatrix}$$

471	symmetry	$\frac{\sqrt{35}xy(x-y)(x+y)}{2}$

$\mathbb{Q}_4^{(1,-1;a)}(A_2)$

$$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{10} \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{10} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{5}i}{10} & 0 & 0 & 0 & 0 & \frac{\sqrt{5}i}{5} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{5}i}{5} \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{5} & 0 & 0 & 0 & 0 & 0 \\ \frac{\sqrt{5}i}{10} & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{5} & 0 & 0 & 0 & 0 \end{bmatrix}$$

472	symmetry	$\frac{\sqrt{5}(x-y)(x+y)\left(x^2+y^2-6z^2\right)}{4}$

Table 8

No.	multipole	matrix

$\mathbb{Q}_4^{(1,-1;a)}(B_1)$

$$\begin{bmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{14}}{28} & 0 & 0 \\
0 & 0 & 0 & 0 & \frac{\sqrt{105}}{140} & 0 & 0 & 0 & \frac{\sqrt{21}}{28} & 0 \\
0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{21}}{28} & 0 & 0 & 0 & -\frac{\sqrt{105}}{140} \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{14}}{28} & 0 & 0 & 0 \\
0 & \frac{\sqrt{105}}{140} & 0 & 0 & 0 & 0 & \frac{3\sqrt{70}}{70} & 0 & 0 & 0 \\
0 & 0 & -\frac{\sqrt{21}}{28} & 0 & 0 & 0 & 0 & -\frac{\sqrt{14}}{14} & 0 & 0 \\
0 & 0 & 0 & \frac{\sqrt{14}}{28} & \frac{3\sqrt{70}}{70} & 0 & 0 & 0 & -\frac{\sqrt{14}}{14} & 0 \\
-\frac{\sqrt{14}}{28} & 0 & 0 & 0 & 0 & -\frac{\sqrt{14}}{14} & 0 & 0 & 0 & \frac{3\sqrt{70}}{70} \\
0 & \frac{\sqrt{21}}{28} & 0 & 0 & 0 & 0 & -\frac{\sqrt{14}}{14} & 0 & 0 & 0 \\
0 & 0 & -\frac{\sqrt{105}}{140} & 0 & 0 & 0 & 0 & \frac{3\sqrt{70}}{70} & 0 & 0
\end{bmatrix}$$

| 473 | symmetry | $-\frac{\sqrt{5}xy\left(x^2+y^2-6z^2\right)}{2}$ |

$\mathbb{Q}_4^{(1,-1;a)}(B_2)$

$$\begin{bmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{14}i}{28} & 0 & 0 \\
0 & 0 & 0 & 0 & -\frac{\sqrt{105}i}{140} & 0 & 0 & 0 & \frac{\sqrt{21}i}{28} & 0 \\
0 & 0 & 0 & 0 & 0 & \frac{\sqrt{21}i}{28} & 0 & 0 & 0 & -\frac{\sqrt{105}i}{140} \\
0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{14}i}{28} & 0 & 0 & 0 \\
0 & \frac{\sqrt{105}i}{140} & 0 & 0 & 0 & 0 & \frac{3\sqrt{70}i}{70} & 0 & 0 & 0 \\
0 & 0 & -\frac{\sqrt{21}i}{28} & 0 & 0 & 0 & 0 & -\frac{\sqrt{14}i}{14} & 0 & 0 \\
0 & 0 & 0 & \frac{\sqrt{14}i}{28} & -\frac{3\sqrt{70}i}{70} & 0 & 0 & 0 & -\frac{\sqrt{14}i}{14} & 0 \\
\frac{\sqrt{14}i}{28} & 0 & 0 & 0 & 0 & \frac{\sqrt{14}i}{14} & 0 & 0 & 0 & \frac{3\sqrt{70}i}{70} \\
0 & -\frac{\sqrt{21}i}{28} & 0 & 0 & 0 & 0 & \frac{\sqrt{14}i}{14} & 0 & 0 & 0 \\
0 & 0 & \frac{\sqrt{105}i}{140} & 0 & 0 & 0 & 0 & -\frac{3\sqrt{70}i}{70} & 0 & 0
\end{bmatrix}$$

| 474 | symmetry | $\frac{\sqrt{35}yz(y-z)(y+z)}{2}$ |

continued ...

Table 8

No.	multipole	matrix

$\mathbb{Q}_{4,1}^{(1,-1;a)}(E,1)$

$$\begin{bmatrix}
0 & 0 & 0 & 0 & \frac{\sqrt{5}i}{80} & 0 & \frac{\sqrt{2}i}{16} & 0 & \frac{i}{16} & 0 \\
0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{16} & 0 & -\frac{\sqrt{6}i}{16} & 0 & -\frac{\sqrt{15}i}{80} \\
0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{80} & 0 & \frac{\sqrt{6}i}{16} & 0 & \frac{\sqrt{3}i}{16} & 0 \\
0 & 0 & 0 & 0 & 0 & -\frac{i}{16} & 0 & -\frac{\sqrt{2}i}{16} & 0 & -\frac{\sqrt{5}i}{80} \\
-\frac{\sqrt{5}i}{80} & 0 & -\frac{\sqrt{15}i}{80} & 0 & 0 & -\frac{\sqrt{5}i}{10} & 0 & -\frac{\sqrt{10}i}{20} & 0 & 0 \\
0 & \frac{\sqrt{3}i}{16} & 0 & \frac{i}{16} & \frac{\sqrt{5}i}{10} & 0 & \frac{\sqrt{2}i}{4} & 0 & 0 & 0 \\
-\frac{\sqrt{2}i}{16} & 0 & -\frac{\sqrt{6}i}{16} & 0 & 0 & -\frac{\sqrt{2}i}{4} & 0 & 0 & 0 & \frac{\sqrt{10}i}{20} \\
0 & \frac{\sqrt{6}i}{16} & 0 & \frac{\sqrt{2}i}{16} & \frac{\sqrt{10}i}{20} & 0 & 0 & 0 & -\frac{\sqrt{2}i}{4} & 0 \\
-\frac{i}{16} & 0 & -\frac{\sqrt{3}i}{16} & 0 & 0 & 0 & 0 & \frac{\sqrt{2}i}{4} & 0 & \frac{\sqrt{5}i}{10} \\
0 & \frac{\sqrt{15}i}{80} & 0 & \frac{\sqrt{5}i}{80} & 0 & 0 & -\frac{\sqrt{10}i}{20} & 0 & -\frac{\sqrt{5}i}{10} & 0
\end{bmatrix}$$

| 475 | symmetry | $\dfrac{\sqrt{35}xz(x-z)(x+z)}{2}$ |

$\mathbb{Q}_{4,2}^{(1,-1;a)}(E,1)$

$$\begin{bmatrix}
0 & 0 & 0 & 0 & \frac{\sqrt{5}}{80} & 0 & -\frac{\sqrt{2}}{16} & 0 & \frac{1}{16} & 0 \\
0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{16} & 0 & \frac{\sqrt{6}}{16} & 0 & -\frac{\sqrt{15}}{80} \\
0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{80} & 0 & \frac{\sqrt{6}}{16} & 0 & -\frac{\sqrt{3}}{16} & 0 \\
0 & 0 & 0 & 0 & 0 & \frac{1}{16} & 0 & -\frac{\sqrt{2}}{16} & 0 & \frac{\sqrt{5}}{80} \\
\frac{\sqrt{5}}{80} & 0 & -\frac{\sqrt{15}}{80} & 0 & 0 & \frac{\sqrt{5}}{10} & 0 & -\frac{\sqrt{10}}{20} & 0 & 0 \\
0 & -\frac{\sqrt{3}}{16} & 0 & \frac{1}{16} & \frac{\sqrt{5}}{10} & 0 & -\frac{\sqrt{2}}{4} & 0 & 0 & 0 \\
-\frac{\sqrt{2}}{16} & 0 & \frac{\sqrt{6}}{16} & 0 & 0 & -\frac{\sqrt{2}}{4} & 0 & 0 & 0 & \frac{\sqrt{10}}{20} \\
0 & \frac{\sqrt{6}}{16} & 0 & -\frac{\sqrt{2}}{16} & -\frac{\sqrt{10}}{20} & 0 & 0 & 0 & \frac{\sqrt{2}}{4} & 0 \\
\frac{1}{16} & 0 & -\frac{\sqrt{3}}{16} & 0 & 0 & 0 & 0 & \frac{\sqrt{2}}{4} & 0 & -\frac{\sqrt{5}}{10} \\
0 & -\frac{\sqrt{15}}{80} & 0 & \frac{\sqrt{5}}{80} & 0 & 0 & \frac{\sqrt{10}}{20} & 0 & -\frac{\sqrt{5}}{10} & 0
\end{bmatrix}$$

| 476 | symmetry | $\dfrac{\sqrt{5}yz\left(6x^2-y^2-z^2\right)}{2}$ |

continued ...

Table 8

No.	multipole	matrix
	$\mathbb{Q}_{4,1}^{(1,-1;a)}(E,2)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & \frac{\sqrt{35}i}{560} & 0 & \frac{\sqrt{14}i}{112} & 0 & -\frac{\sqrt{7}i}{16} & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{21}i}{112} & 0 & -\frac{\sqrt{42}i}{112} & 0 & \frac{\sqrt{105}i}{80} \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{105}i}{80} & 0 & \frac{\sqrt{42}i}{112} & 0 & \frac{\sqrt{21}i}{112} & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}i}{16} & 0 & -\frac{\sqrt{14}i}{112} & 0 & -\frac{\sqrt{35}i}{560} \\ -\frac{\sqrt{35}i}{560} & 0 & \frac{\sqrt{105}i}{80} & 0 & 0 & -\frac{\sqrt{35}i}{70} & 0 & \frac{\sqrt{70}i}{20} & 0 & 0 \\ 0 & \frac{\sqrt{21}i}{112} & 0 & -\frac{\sqrt{7}i}{16} & \frac{\sqrt{35}i}{70} & 0 & \frac{\sqrt{14}i}{28} & 0 & 0 & 0 \\ -\frac{\sqrt{14}i}{112} & 0 & -\frac{\sqrt{42}i}{112} & 0 & 0 & -\frac{\sqrt{14}i}{28} & 0 & 0 & 0 & -\frac{\sqrt{70}i}{20} \\ 0 & \frac{\sqrt{42}i}{112} & 0 & \frac{\sqrt{14}i}{112} & -\frac{\sqrt{70}i}{20} & 0 & 0 & 0 & -\frac{\sqrt{14}i}{28} & 0 \\ \frac{\sqrt{7}i}{16} & 0 & -\frac{\sqrt{21}i}{112} & 0 & 0 & 0 & 0 & \frac{\sqrt{14}i}{28} & 0 & \frac{\sqrt{35}i}{70} \\ 0 & -\frac{\sqrt{105}i}{80} & 0 & \frac{\sqrt{35}i}{560} & 0 & 0 & \frac{\sqrt{70}i}{20} & 0 & -\frac{\sqrt{35}i}{70} & 0 \end{bmatrix}$
477	symmetry	$-\frac{\sqrt{5}xz\left(x^2-6y^2+z^2\right)}{2}$
	$\mathbb{Q}_{4,2}^{(1,-1;a)}(E,2)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & \frac{\sqrt{35}}{560} & 0 & -\frac{\sqrt{14}}{112} & 0 & -\frac{\sqrt{7}}{16} & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{21}}{112} & 0 & \frac{\sqrt{42}}{112} & 0 & \frac{\sqrt{105}}{80} \\ 0 & 0 & 0 & 0 & \frac{\sqrt{105}}{80} & 0 & \frac{\sqrt{42}}{112} & 0 & -\frac{\sqrt{21}}{112} & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}}{16} & 0 & -\frac{\sqrt{14}}{112} & 0 & \frac{\sqrt{35}}{560} \\ \frac{\sqrt{35}}{560} & 0 & \frac{\sqrt{105}}{80} & 0 & 0 & \frac{\sqrt{35}}{70} & 0 & \frac{\sqrt{70}}{20} & 0 & 0 \\ 0 & -\frac{\sqrt{21}}{112} & 0 & -\frac{\sqrt{7}}{16} & \frac{\sqrt{35}}{70} & 0 & -\frac{\sqrt{14}}{28} & 0 & 0 & 0 \\ -\frac{\sqrt{14}}{112} & 0 & \frac{\sqrt{42}}{112} & 0 & 0 & -\frac{\sqrt{14}}{28} & 0 & 0 & 0 & -\frac{\sqrt{70}}{20} \\ 0 & \frac{\sqrt{42}}{112} & 0 & -\frac{\sqrt{14}}{112} & \frac{\sqrt{70}}{20} & 0 & 0 & 0 & \frac{\sqrt{14}}{28} & 0 \\ -\frac{\sqrt{7}}{16} & 0 & -\frac{\sqrt{21}}{112} & 0 & 0 & 0 & 0 & \frac{\sqrt{14}}{28} & 0 & -\frac{\sqrt{35}}{70} \\ 0 & \frac{\sqrt{105}}{80} & 0 & \frac{\sqrt{35}}{560} & 0 & 0 & -\frac{\sqrt{70}}{20} & 0 & -\frac{\sqrt{35}}{70} & 0 \end{bmatrix}$
478	symmetry	1

continued ...

Table 8

No.	multipole	matrix

$$\mathbb{Q}_0^{(1,1;a)}(A_1)$$

$$\begin{bmatrix}
-\frac{\sqrt{15}}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & -\frac{\sqrt{15}}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & -\frac{\sqrt{15}}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & -\frac{\sqrt{15}}{10} & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & \frac{\sqrt{15}}{15} & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{15} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{15} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{15} & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{15} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{15}
\end{bmatrix}$$

| 479 | symmetry | $-\frac{x^2}{2} - \frac{y^2}{2} + z^2$ |

$$\mathbb{Q}_2^{(1,1;a)}(A_1)$$

$$\begin{bmatrix}
\frac{\sqrt{105}}{25} & 0 & 0 & 0 & 0 & -\frac{4\sqrt{105}}{175} & 0 & 0 & 0 & 0 \\
0 & -\frac{\sqrt{105}}{25} & 0 & 0 & 0 & 0 & -\frac{2\sqrt{70}}{175} & 0 & 0 & 0 \\
0 & 0 & -\frac{\sqrt{105}}{25} & 0 & 0 & 0 & 0 & \frac{2\sqrt{70}}{175} & 0 & 0 \\
0 & 0 & 0 & \frac{\sqrt{105}}{25} & 0 & 0 & 0 & 0 & \frac{4\sqrt{105}}{175} & 0 \\
0 & 0 & 0 & 0 & -\frac{\sqrt{105}}{70} & 0 & 0 & 0 & 0 & 0 \\
-\frac{4\sqrt{105}}{175} & 0 & 0 & 0 & 0 & \frac{\sqrt{105}}{350} & 0 & 0 & 0 & 0 \\
0 & -\frac{2\sqrt{70}}{175} & 0 & 0 & 0 & 0 & \frac{2\sqrt{105}}{175} & 0 & 0 & 0 \\
0 & 0 & \frac{2\sqrt{70}}{175} & 0 & 0 & 0 & 0 & \frac{2\sqrt{105}}{175} & 0 & 0 \\
0 & 0 & 0 & \frac{4\sqrt{105}}{175} & 0 & 0 & 0 & 0 & \frac{\sqrt{105}}{350} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{105}}{70}
\end{bmatrix}$$

| 480 | symmetry | $\frac{\sqrt{3}(x-y)(x+y)}{2}$ |

continued ...

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Table 8

No.	multipole	matrix

$$\mathbb{Q}_2^{(1,1;a)}(B_1) \quad \begin{bmatrix} 0 & 0 & \frac{\sqrt{105}}{25} & 0 & 0 & 0 & 0 & -\frac{2\sqrt{70}}{175} & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{105}}{25} & \frac{4\sqrt{21}}{105} & 0 & 0 & 0 & -\frac{8\sqrt{105}}{525} & 0 \\ \frac{\sqrt{105}}{25} & 0 & 0 & 0 & 0 & \frac{8\sqrt{105}}{525} & 0 & 0 & 0 & -\frac{4\sqrt{21}}{105} \\ 0 & \frac{\sqrt{105}}{25} & 0 & 0 & 0 & 0 & \frac{2\sqrt{70}}{175} & 0 & 0 & 0 \\ 0 & \frac{4\sqrt{21}}{105} & 0 & 0 & 0 & 0 & -\frac{3\sqrt{14}}{140} & 0 & 0 & 0 \\ 0 & 0 & \frac{8\sqrt{105}}{525} & 0 & 0 & 0 & 0 & -\frac{9\sqrt{70}}{700} & 0 & 0 \\ 0 & 0 & 0 & \frac{2\sqrt{70}}{175} & -\frac{3\sqrt{14}}{140} & 0 & 0 & 0 & -\frac{9\sqrt{70}}{700} & 0 \\ -\frac{2\sqrt{70}}{175} & 0 & 0 & 0 & 0 & -\frac{9\sqrt{70}}{700} & 0 & 0 & 0 & -\frac{3\sqrt{14}}{140} \\ 0 & -\frac{8\sqrt{105}}{525} & 0 & 0 & 0 & 0 & -\frac{9\sqrt{70}}{700} & 0 & 0 & 0 \\ 0 & 0 & -\frac{4\sqrt{21}}{105} & 0 & 0 & 0 & 0 & -\frac{3\sqrt{14}}{140} & 0 & 0 \end{bmatrix}$$

481	symmetry	$\sqrt{3}xy$

$$\mathbb{Q}_2^{(1,1;a)}(B_2) \quad \begin{bmatrix} 0 & 0 & -\frac{\sqrt{105}i}{25} & 0 & 0 & 0 & 0 & \frac{2\sqrt{70}i}{175} & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{105}i}{25} & \frac{4\sqrt{21}i}{105} & 0 & 0 & 0 & \frac{8\sqrt{105}i}{525} & 0 \\ \frac{\sqrt{105}i}{25} & 0 & 0 & 0 & 0 & \frac{8\sqrt{105}i}{525} & 0 & 0 & 0 & \frac{4\sqrt{21}i}{105} \\ 0 & \frac{\sqrt{105}i}{25} & 0 & 0 & 0 & 0 & \frac{2\sqrt{70}i}{175} & 0 & 0 & 0 \\ 0 & -\frac{4\sqrt{21}i}{105} & 0 & 0 & 0 & 0 & \frac{3\sqrt{14}i}{140} & 0 & 0 & 0 \\ 0 & 0 & -\frac{8\sqrt{105}i}{525} & 0 & 0 & 0 & 0 & \frac{9\sqrt{70}i}{700} & 0 & 0 \\ 0 & 0 & 0 & -\frac{2\sqrt{70}i}{175} & -\frac{3\sqrt{14}i}{140} & 0 & 0 & 0 & \frac{9\sqrt{70}i}{700} & 0 \\ -\frac{2\sqrt{70}i}{175} & 0 & 0 & 0 & 0 & -\frac{9\sqrt{70}i}{700} & 0 & 0 & 0 & \frac{3\sqrt{14}i}{140} \\ 0 & -\frac{8\sqrt{105}i}{525} & 0 & 0 & 0 & 0 & -\frac{9\sqrt{70}i}{700} & 0 & 0 & 0 \\ 0 & 0 & -\frac{4\sqrt{21}i}{105} & 0 & 0 & 0 & 0 & -\frac{3\sqrt{14}i}{140} & 0 & 0 \end{bmatrix}$$

482	symmetry	$\sqrt{3}yz$

continued ...

Table 8

No.	multipole	matrix

$\mathbb{Q}_{2,1}^{(1,1;a)}(E)$

$$
\begin{bmatrix}
0 & -\frac{\sqrt{105}i}{25} & 0 & 0 & \frac{2\sqrt{7}i}{35} & 0 & \frac{3\sqrt{70}i}{175} & 0 & 0 & 0 \\[4pt]
\frac{\sqrt{105}i}{25} & 0 & 0 & 0 & 0 & -\frac{2\sqrt{105}i}{525} & 0 & \frac{\sqrt{210}i}{105} & 0 & 0 \\[4pt]
0 & 0 & 0 & \frac{\sqrt{105}i}{25} & 0 & 0 & -\frac{\sqrt{210}i}{105} & 0 & \frac{2\sqrt{105}i}{525} & 0 \\[4pt]
0 & 0 & -\frac{\sqrt{105}i}{25} & 0 & 0 & 0 & 0 & -\frac{3\sqrt{70}i}{175} & 0 & -\frac{2\sqrt{7}i}{35} \\[4pt]
-\frac{2\sqrt{7}i}{35} & 0 & 0 & 0 & 0 & \frac{3\sqrt{7}i}{70} & 0 & 0 & 0 & 0 \\[4pt]
0 & \frac{2\sqrt{105}i}{525} & 0 & 0 & -\frac{3\sqrt{7}i}{70} & 0 & \frac{3\sqrt{70}i}{350} & 0 & 0 & 0 \\[4pt]
-\frac{3\sqrt{70}i}{175} & 0 & \frac{\sqrt{210}i}{105} & 0 & 0 & -\frac{3\sqrt{70}i}{350} & 0 & 0 & 0 & 0 \\[4pt]
0 & -\frac{\sqrt{210}i}{105} & 0 & \frac{3\sqrt{70}i}{175} & 0 & 0 & 0 & 0 & -\frac{3\sqrt{70}i}{350} & 0 \\[4pt]
0 & 0 & -\frac{2\sqrt{105}i}{525} & 0 & 0 & 0 & 0 & \frac{3\sqrt{70}i}{350} & 0 & -\frac{3\sqrt{7}i}{70} \\[4pt]
0 & 0 & 0 & \frac{2\sqrt{7}i}{35} & 0 & 0 & 0 & 0 & \frac{3\sqrt{7}i}{70} & 0
\end{bmatrix}
$$

483	symmetry	$\sqrt{3}xz$

$\mathbb{Q}_{2,2}^{(1,1;a)}(E)$

$$
\begin{bmatrix}
0 & \frac{\sqrt{105}}{25} & 0 & 0 & \frac{2\sqrt{7}}{35} & 0 & -\frac{3\sqrt{70}}{175} & 0 & 0 & 0 \\[4pt]
\frac{\sqrt{105}}{25} & 0 & 0 & 0 & 0 & -\frac{2\sqrt{105}}{525} & 0 & -\frac{\sqrt{210}}{105} & 0 & 0 \\[4pt]
0 & 0 & 0 & -\frac{\sqrt{105}}{25} & 0 & 0 & -\frac{\sqrt{210}}{105} & 0 & -\frac{2\sqrt{105}}{525} & 0 \\[4pt]
0 & 0 & -\frac{\sqrt{105}}{25} & 0 & 0 & 0 & 0 & -\frac{3\sqrt{70}}{175} & 0 & \frac{2\sqrt{7}}{35} \\[4pt]
\frac{2\sqrt{7}}{35} & 0 & 0 & 0 & 0 & -\frac{3\sqrt{7}}{70} & 0 & 0 & 0 & 0 \\[4pt]
0 & -\frac{2\sqrt{105}}{525} & 0 & 0 & -\frac{3\sqrt{7}}{70} & 0 & -\frac{3\sqrt{70}}{350} & 0 & 0 & 0 \\[4pt]
-\frac{3\sqrt{70}}{175} & 0 & -\frac{\sqrt{210}}{105} & 0 & 0 & -\frac{3\sqrt{70}}{350} & 0 & 0 & 0 & 0 \\[4pt]
0 & -\frac{\sqrt{210}}{105} & 0 & -\frac{3\sqrt{70}}{175} & 0 & 0 & 0 & 0 & \frac{3\sqrt{70}}{350} & 0 \\[4pt]
0 & 0 & -\frac{2\sqrt{105}}{525} & 0 & 0 & 0 & 0 & \frac{3\sqrt{70}}{350} & 0 & \frac{3\sqrt{7}}{70} \\[4pt]
0 & 0 & 0 & \frac{2\sqrt{7}}{35} & 0 & 0 & 0 & 0 & \frac{3\sqrt{7}}{70} & 0
\end{bmatrix}
$$

484	symmetry	z

continued ...

Table 8

No.	multipole	matrix

$\mathbb{G}_1^{(1,0;a)}(A_2)$

$$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}i}{10} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{10} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{10} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}i}{10} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ \frac{\sqrt{10}i}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{15}i}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{15}i}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{10}i}{10} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$$

485	symmetry	x

$\mathbb{G}_{1,1}^{(1,0;a)}(E)$

$$\begin{bmatrix} 0 & 0 & 0 & 0 & \frac{\sqrt{2}i}{4} & 0 & -\frac{\sqrt{5}i}{20} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}i}{20} & 0 & -\frac{\sqrt{15}i}{20} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{20} & 0 & -\frac{\sqrt{30}i}{20} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{5}i}{20} & 0 & -\frac{\sqrt{2}i}{4} \\ -\frac{\sqrt{2}i}{4} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{30}i}{20} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ \frac{\sqrt{5}i}{20} & 0 & -\frac{\sqrt{15}i}{20} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{15}i}{20} & 0 & -\frac{\sqrt{5}i}{20} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{30}i}{20} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{2}i}{4} & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$$

486	symmetry	$-y$

continued ...

No.	multipole	matrix

$\mathbb{G}_{1,2}^{(1,0;a)}(E)$

$$\begin{bmatrix} 0 & 0 & 0 & 0 & \frac{\sqrt{2}}{4} & 0 & \frac{\sqrt{5}}{20} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{20} & 0 & \frac{\sqrt{15}}{20} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{20} & 0 & \frac{\sqrt{30}}{20} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{5}}{20} & 0 & \frac{\sqrt{2}}{4} \\ \frac{\sqrt{2}}{4} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{30}}{20} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ \frac{\sqrt{5}}{20} & 0 & \frac{\sqrt{15}}{20} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{15}}{20} & 0 & \frac{\sqrt{5}}{20} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{30}}{20} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{2}}{4} & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$$

487	symmetry	$-\frac{z\left(3x^2+3y^2-2z^2\right)}{2}$

$\mathbb{G}_{3}^{(1,0;a)}(A_2)$

$$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{10} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}i}{10} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}i}{10} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{10} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ -\frac{\sqrt{15}i}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{10}i}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{10}i}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{15}i}{10} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$$

488	symmetry	$\sqrt{15}xyz$

Table 8

No.	multipole	matrix

$$\mathbb{G}_3^{(1,0;a)}(B_1)$$

$$\begin{bmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2}}{4} & 0 & 0 \\
0 & 0 & 0 & 0 & \frac{\sqrt{15}}{12} & 0 & 0 & 0 & \frac{\sqrt{3}}{12} & 0 \\
0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{12} & 0 & 0 & 0 & -\frac{\sqrt{15}}{12} \\
0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}}{4} & 0 & 0 & 0 \\
0 & \frac{\sqrt{15}}{12} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & -\frac{\sqrt{3}}{12} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & -\frac{\sqrt{2}}{4} & 0 & 0 & 0 & 0 & 0 & 0 \\
\frac{\sqrt{2}}{4} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & \frac{\sqrt{3}}{12} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & -\frac{\sqrt{15}}{12} & 0 & 0 & 0 & 0 & 0 & 0 & 0
\end{bmatrix}$$

489	symmetry	$\frac{\sqrt{15}z(x-y)(x+y)}{2}$

$$\mathbb{G}_3^{(1,0;a)}(B_2)$$

$$\begin{bmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2}i}{4} & 0 & 0 \\
0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{12} & 0 & 0 & 0 & \frac{\sqrt{3}i}{12} & 0 \\
0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{12} & 0 & 0 & 0 & -\frac{\sqrt{15}i}{12} \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2}i}{4} & 0 & 0 & 0 \\
0 & \frac{\sqrt{15}i}{12} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & -\frac{\sqrt{3}i}{12} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & -\frac{\sqrt{2}i}{4} & 0 & 0 & 0 & 0 & 0 & 0 \\
-\frac{\sqrt{2}i}{4} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & -\frac{\sqrt{3}i}{12} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & \frac{\sqrt{15}i}{12} & 0 & 0 & 0 & 0 & 0 & 0 & 0
\end{bmatrix}$$

490	symmetry	$\frac{x\left(2x^2-3y^2-3z^2\right)}{2}$

continued …

Table 8

No.	multipole	matrix

$\mathbb{G}_{3,1}^{(1,0;a)}(E,1)$

$$\begin{pmatrix}
0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{16} & 0 & -\frac{3\sqrt{30}i}{80} & 0 & \frac{\sqrt{15}i}{16} & 0 \\
0 & 0 & 0 & 0 & 0 & -\frac{7\sqrt{5}i}{80} & 0 & \frac{\sqrt{10}i}{80} & 0 & \frac{5i}{16} \\
0 & 0 & 0 & 0 & -\frac{5i}{16} & 0 & -\frac{\sqrt{10}i}{80} & 0 & \frac{7\sqrt{5}i}{80} & 0 \\
0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{16} & 0 & \frac{3\sqrt{30}i}{80} & 0 & -\frac{\sqrt{3}i}{16} \\
-\frac{\sqrt{3}i}{16} & 0 & \frac{5i}{16} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & \frac{7\sqrt{5}i}{80} & 0 & \frac{\sqrt{15}i}{16} & 0 & 0 & 0 & 0 & 0 & 0 \\
\frac{3\sqrt{30}i}{80} & 0 & \frac{\sqrt{10}i}{80} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & -\frac{\sqrt{10}i}{80} & 0 & -\frac{3\sqrt{30}i}{80} & 0 & 0 & 0 & 0 & 0 & 0 \\
-\frac{\sqrt{15}i}{16} & 0 & -\frac{7\sqrt{5}i}{80} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & -\frac{5i}{16} & 0 & \frac{\sqrt{3}i}{16} & 0 & 0 & 0 & 0 & 0 & 0
\end{pmatrix}$$

491	symmetry	$\dfrac{y\left(3x^2-2y^2+3z^2\right)}{2}$

$\mathbb{G}_{3,2}^{(1,0;a)}(E,1)$

$$\begin{pmatrix}
0 & 0 & 0 & 0 & \frac{\sqrt{3}}{16} & 0 & \frac{3\sqrt{30}}{80} & 0 & \frac{\sqrt{15}}{16} & 0 \\
0 & 0 & 0 & 0 & 0 & -\frac{7\sqrt{5}}{80} & 0 & -\frac{\sqrt{10}}{80} & 0 & \frac{5}{16} \\
0 & 0 & 0 & 0 & \frac{5}{16} & 0 & -\frac{\sqrt{10}}{80} & 0 & -\frac{7\sqrt{5}}{80} & 0 \\
0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{16} & 0 & \frac{3\sqrt{30}}{80} & 0 & \frac{\sqrt{3}}{16} \\
\frac{\sqrt{3}}{16} & 0 & \frac{5}{16} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & -\frac{7\sqrt{5}}{80} & 0 & \frac{\sqrt{15}}{16} & 0 & 0 & 0 & 0 & 0 & 0 \\
\frac{3\sqrt{30}}{80} & 0 & -\frac{\sqrt{10}}{80} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & -\frac{\sqrt{10}}{80} & 0 & \frac{3\sqrt{30}}{80} & 0 & 0 & 0 & 0 & 0 & 0 \\
\frac{\sqrt{15}}{16} & 0 & -\frac{7\sqrt{5}}{80} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & \frac{5}{16} & 0 & \frac{\sqrt{3}}{16} & 0 & 0 & 0 & 0 & 0 & 0
\end{pmatrix}$$

492	symmetry	$\dfrac{\sqrt{15}x(y-z)(y+z)}{2}$

continued ...

Table 8

No.	multipole	matrix

$\mathbb{G}_{3,1}^{(1,0;a)}(E,2)$

$$\begin{pmatrix}
0 & 0 & 0 & 0 & \frac{\sqrt{5}i}{16} & 0 & -\frac{3\sqrt{2}i}{16} & 0 & -\frac{3i}{16} & 0 \\
0 & 0 & 0 & 0 & 0 & -\frac{7\sqrt{3}i}{48} & 0 & \frac{\sqrt{6}i}{48} & 0 & -\frac{\sqrt{15}i}{16} \\
0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{16} & 0 & -\frac{\sqrt{6}i}{48} & 0 & \frac{7\sqrt{3}i}{48} & 0 \\
0 & 0 & 0 & 0 & 0 & \frac{3i}{16} & 0 & \frac{3\sqrt{2}i}{16} & 0 & -\frac{\sqrt{5}i}{16} \\
-\frac{\sqrt{5}i}{16} & 0 & -\frac{\sqrt{15}i}{16} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & \frac{7\sqrt{3}i}{48} & 0 & -\frac{3i}{16} & 0 & 0 & 0 & 0 & 0 & 0 \\
\frac{3\sqrt{2}i}{16} & 0 & \frac{\sqrt{6}i}{48} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & -\frac{\sqrt{6}i}{48} & 0 & -\frac{3\sqrt{2}i}{16} & 0 & 0 & 0 & 0 & 0 & 0 \\
\frac{3i}{16} & 0 & -\frac{7\sqrt{3}i}{48} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & \frac{\sqrt{15}i}{16} & 0 & \frac{\sqrt{5}i}{16} & 0 & 0 & 0 & 0 & 0 & 0
\end{pmatrix}$$

493	symmetry	$-\frac{\sqrt{15}y(x-z)(x+z)}{2}$

$\mathbb{G}_{3,2}^{(1,0;a)}(E,2)$

$$\begin{pmatrix}
0 & 0 & 0 & 0 & \frac{\sqrt{5}}{16} & 0 & \frac{3\sqrt{2}}{16} & 0 & -\frac{3}{16} & 0 \\
0 & 0 & 0 & 0 & 0 & -\frac{7\sqrt{3}}{48} & 0 & -\frac{\sqrt{6}}{48} & 0 & -\frac{\sqrt{15}}{16} \\
0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{16} & 0 & -\frac{\sqrt{6}}{48} & 0 & -\frac{7\sqrt{3}}{48} & 0 \\
0 & 0 & 0 & 0 & 0 & -\frac{3}{16} & 0 & \frac{3\sqrt{2}}{16} & 0 & \frac{\sqrt{5}}{16} \\
\frac{\sqrt{5}}{16} & 0 & -\frac{\sqrt{15}}{16} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & -\frac{7\sqrt{3}}{48} & 0 & -\frac{3}{16} & 0 & 0 & 0 & 0 & 0 & 0 \\
\frac{3\sqrt{2}}{16} & 0 & -\frac{\sqrt{6}}{48} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & -\frac{\sqrt{6}}{48} & 0 & \frac{3\sqrt{2}}{16} & 0 & 0 & 0 & 0 & 0 & 0 \\
-\frac{3}{16} & 0 & -\frac{7\sqrt{3}}{48} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & -\frac{\sqrt{15}}{16} & 0 & \frac{\sqrt{5}}{16} & 0 & 0 & 0 & 0 & 0 & 0
\end{pmatrix}$$

494	symmetry	$-\frac{x^2}{2} - \frac{y^2}{2} + z^2$

continued ...

Table 8

No.	multipole	matrix
	$\mathbb{T}_2^{(1,0;a)}(A_1)$	$$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{42}i}{14} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}i}{14} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}i}{14} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{42}i}{14} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ -\frac{\sqrt{42}i}{14} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{7}i}{14} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{7}i}{14} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{42}i}{14} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$$
495	symmetry	$\frac{\sqrt{3}(x-y)(x+y)}{2}$
	$\mathbb{T}_2^{(1,0;a)}(B_1)$	$$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}i}{14} & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{210}i}{42} & 0 & 0 & 0 & \frac{\sqrt{42}i}{21} & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{42}i}{21} & 0 & 0 & 0 & \frac{\sqrt{210}i}{42} \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}i}{14} & 0 & 0 & 0 \\ 0 & \frac{\sqrt{210}i}{42} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{42}i}{21} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{7}i}{14} & 0 & 0 & 0 & 0 & 0 & 0 \\ -\frac{\sqrt{7}i}{14} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{42}i}{21} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{210}i}{42} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$$
496	symmetry	$\sqrt{3}xy$

continued …

No.	multipole	matrix

$$\mathbb{T}_2^{(1,0;a)}(B_2) \quad \begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}}{14} & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{210}}{42} & 0 & 0 & 0 & \frac{\sqrt{42}}{21} & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{42}}{21} & 0 & 0 & 0 & \frac{\sqrt{210}}{42} \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}}{14} & 0 & 0 & 0 \\ 0 & \frac{\sqrt{210}}{42} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{42}}{21} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{7}}{14} & 0 & 0 & 0 & 0 & 0 & 0 \\ \frac{\sqrt{7}}{14} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{42}}{21} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{210}}{42} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$$

497	symmetry	$\sqrt{3}yz$

$$\mathbb{T}_{2,1}^{(1,0;a)}(E) \quad \begin{bmatrix} 0 & 0 & 0 & 0 & \frac{\sqrt{70}}{28} & 0 & \frac{3\sqrt{7}}{28} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{42}}{84} & 0 & \frac{5\sqrt{21}}{84} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{5\sqrt{21}}{84} & 0 & \frac{\sqrt{42}}{84} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{7}}{28} & 0 & -\frac{\sqrt{70}}{28} \\ \frac{\sqrt{70}}{28} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{42}}{84} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ \frac{3\sqrt{7}}{28} & 0 & -\frac{5\sqrt{21}}{84} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{5\sqrt{21}}{84} & 0 & -\frac{3\sqrt{7}}{28} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{42}}{84} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{70}}{28} & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$$

498	symmetry	$\sqrt{3}xz$

continued ...

Table 8

No.	multipole	matrix
	$\mathbb{T}_{2,2}^{(1,0;a)}(E)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & -\frac{\sqrt{70}i}{28} & 0 & \frac{3\sqrt{7}i}{28} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{42}i}{84} & 0 & \frac{5\sqrt{21}i}{84} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{5\sqrt{21}i}{84} & 0 & \frac{\sqrt{42}i}{84} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{7}i}{28} & 0 & -\frac{\sqrt{70}i}{28} \\ \frac{\sqrt{70}i}{28} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{42}i}{84} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ -\frac{3\sqrt{7}i}{28} & 0 & -\frac{5\sqrt{21}i}{84} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{5\sqrt{21}i}{84} & 0 & -\frac{3\sqrt{7}i}{28} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{42}i}{84} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{70}i}{28} & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
499	symmetry	$\dfrac{\sqrt{21}\left(x^4-3x^2y^2-3x^2z^2+y^4-3y^2z^2+z^4\right)}{6}$
	$\mathbb{T}_4^{(1,0;a)}(A_1,1)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{12} & 0 & 0 & 0 & -\frac{\sqrt{15}i}{12} \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2}i}{4} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}i}{4} & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{12} & 0 & 0 & 0 & \frac{\sqrt{3}i}{12} & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{15}i}{12} & 0 & 0 & 0 & 0 & 0 & 0 \\ \frac{\sqrt{3}i}{12} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{2}i}{4} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{2}i}{4} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{3}i}{12} & 0 & 0 & 0 & 0 & 0 & 0 \\ \frac{\sqrt{15}i}{12} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
500	symmetry	$-\dfrac{\sqrt{15}\left(x^4-12x^2y^2+6x^2z^2+y^4+6y^2z^2-2z^4\right)}{12}$

continued ...

Table 8

No.	multipole	matrix
	$\mathbb{T}_4^{(1,0;a)}(A_1,2)$	$\begin{pmatrix} 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{105}i}{84} & 0 & 0 & 0 & \frac{\sqrt{21}i}{12} \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{70}i}{28} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}i}{28} & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{21}i}{12} & 0 & 0 & 0 & \frac{\sqrt{105}i}{84} & 0 \\ 0 & 0 & 0 & \frac{\sqrt{21}i}{12} & 0 & 0 & 0 & 0 & 0 & 0 \\ \frac{\sqrt{105}i}{84} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{70}i}{28} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{70}i}{28} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{105}i}{84} & 0 & 0 & 0 & 0 & 0 & 0 \\ -\frac{\sqrt{21}i}{12} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{pmatrix}$
501	symmetry	$\frac{\sqrt{35}xy(x-y)(x+y)}{2}$
	$\mathbb{T}_4^{(1,0;a)}(A_2)$	$\begin{pmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{1}{2} \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{1}{2} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{1}{2} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ -\frac{1}{2} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{pmatrix}$
502	symmetry	$\frac{\sqrt{5}(x-y)(x+y)\left(x^2+y^2-6z^2\right)}{4}$

continued ...

Table 8

No.	multipole	matrix									

$\mathbb{T}_4^{(1,0;a)}(B_1)$

$$\begin{bmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{70}i}{28} & 0 & 0 \\
0 & 0 & 0 & 0 & -\frac{\sqrt{21}i}{28} & 0 & 0 & 0 & -\frac{\sqrt{105}i}{28} & 0 \\
0 & 0 & 0 & 0 & 0 & \frac{\sqrt{105}i}{28} & 0 & 0 & 0 & \frac{\sqrt{21}i}{28} \\
0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}i}{28} & 0 & 0 & 0 \\
0 & \frac{\sqrt{21}i}{28} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & -\frac{\sqrt{105}i}{28} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & \frac{\sqrt{70}i}{28} & 0 & 0 & 0 & 0 & 0 & 0 \\
-\frac{\sqrt{70}i}{28} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & \frac{\sqrt{105}i}{28} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & -\frac{\sqrt{21}i}{28} & 0 & 0 & 0 & 0 & 0 & 0 & 0
\end{bmatrix}$$

| 503 | symmetry | $-\frac{\sqrt{5}xy\left(x^2+y^2-6z^2\right)}{2}$ |

$\mathbb{T}_4^{(1,0;a)}(B_2)$

$$\begin{bmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}}{28} & 0 & 0 \\
0 & 0 & 0 & 0 & -\frac{\sqrt{21}}{28} & 0 & 0 & 0 & \frac{\sqrt{105}}{28} & 0 \\
0 & 0 & 0 & 0 & 0 & \frac{\sqrt{105}}{28} & 0 & 0 & 0 & -\frac{\sqrt{21}}{28} \\
0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}}{28} & 0 & 0 & 0 \\
0 & -\frac{\sqrt{21}}{28} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & \frac{\sqrt{105}}{28} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & -\frac{\sqrt{70}}{28} & 0 & 0 & 0 & 0 & 0 & 0 \\
-\frac{\sqrt{70}}{28} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & \frac{\sqrt{105}}{28} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & -\frac{\sqrt{21}}{28} & 0 & 0 & 0 & 0 & 0 & 0 & 0
\end{bmatrix}$$

| 504 | symmetry | $\frac{\sqrt{35}yz(y-z)(y+z)}{2}$ |

Table 8

No.	multipole	matrix

$\mathbb{T}_{4,1}^{(1,0;a)}(E,1)$

$$\begin{bmatrix}
0 & 0 & 0 & 0 & \frac{1}{16} & 0 & \frac{\sqrt{10}}{16} & 0 & \frac{\sqrt{5}}{16} & 0 \\
0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{16} & 0 & -\frac{\sqrt{30}}{16} & 0 & -\frac{\sqrt{3}}{16} \\
0 & 0 & 0 & 0 & \frac{\sqrt{3}}{16} & 0 & \frac{\sqrt{30}}{16} & 0 & \frac{\sqrt{15}}{16} & 0 \\
0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}}{16} & 0 & -\frac{\sqrt{10}}{16} & 0 & -\frac{1}{16} \\
\frac{1}{16} & 0 & \frac{\sqrt{3}}{16} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & -\frac{\sqrt{15}}{16} & 0 & -\frac{\sqrt{5}}{16} & 0 & 0 & 0 & 0 & 0 & 0 \\
\frac{\sqrt{10}}{16} & 0 & \frac{\sqrt{30}}{16} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & -\frac{\sqrt{30}}{16} & 0 & -\frac{\sqrt{10}}{16} & 0 & 0 & 0 & 0 & 0 & 0 \\
\frac{\sqrt{5}}{16} & 0 & \frac{\sqrt{15}}{16} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & -\frac{\sqrt{3}}{16} & 0 & -\frac{1}{16} & 0 & 0 & 0 & 0 & 0 & 0
\end{bmatrix}$$

505   symmetry $\frac{\sqrt{35}xz(x-z)(x+z)}{2}$

$\mathbb{T}_{4,2}^{(1,0;a)}(E,1)$

$$\begin{bmatrix}
0 & 0 & 0 & 0 & -\frac{i}{16} & 0 & \frac{\sqrt{10}i}{16} & 0 & -\frac{\sqrt{5}i}{16} & 0 \\
0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{16} & 0 & -\frac{\sqrt{30}i}{16} & 0 & \frac{\sqrt{3}i}{16} \\
0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{16} & 0 & -\frac{\sqrt{30}i}{16} & 0 & \frac{\sqrt{15}i}{16} & 0 \\
0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{16} & 0 & \frac{\sqrt{10}i}{16} & 0 & -\frac{i}{16} \\
\frac{i}{16} & 0 & -\frac{\sqrt{3}i}{16} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & -\frac{\sqrt{15}i}{16} & 0 & \frac{\sqrt{5}i}{16} & 0 & 0 & 0 & 0 & 0 & 0 \\
-\frac{\sqrt{10}i}{16} & 0 & \frac{\sqrt{30}i}{16} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & \frac{\sqrt{30}i}{16} & 0 & -\frac{\sqrt{10}i}{16} & 0 & 0 & 0 & 0 & 0 & 0 \\
\frac{\sqrt{5}i}{16} & 0 & -\frac{\sqrt{15}i}{16} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & -\frac{\sqrt{3}i}{16} & 0 & \frac{i}{16} & 0 & 0 & 0 & 0 & 0 & 0
\end{bmatrix}$$

506   symmetry $\frac{\sqrt{5}yz\left(6x^2-y^2-z^2\right)}{2}$

Table 8

No.	multipole	matrix
	$\mathbb{T}_{4,1}^{(1,0;a)}(E,2)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & \frac{\sqrt{7}}{112} & 0 & \frac{\sqrt{70}}{112} & 0 & -\frac{\sqrt{35}}{16} & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{105}}{112} & 0 & -\frac{\sqrt{210}}{112} & 0 & \frac{\sqrt{21}}{16} \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{21}}{16} & 0 & \frac{\sqrt{210}}{112} & 0 & \frac{\sqrt{105}}{112} & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{35}}{16} & 0 & -\frac{\sqrt{70}}{112} & 0 & -\frac{\sqrt{7}}{112} \\ \frac{\sqrt{7}}{112} & 0 & -\frac{\sqrt{21}}{16} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{105}}{112} & 0 & \frac{\sqrt{35}}{16} & 0 & 0 & 0 & 0 & 0 & 0 \\ \frac{\sqrt{70}}{112} & 0 & \frac{\sqrt{210}}{112} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{210}}{112} & 0 & -\frac{\sqrt{70}}{112} & 0 & 0 & 0 & 0 & 0 & 0 \\ -\frac{\sqrt{35}}{16} & 0 & \frac{\sqrt{105}}{112} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{21}}{16} & 0 & -\frac{\sqrt{7}}{112} & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$

507   symmetry

$$-\frac{\sqrt{5}\,xz\left(x^2-6y^2+z^2\right)}{2}$$

No.	multipole	matrix
	$\mathbb{T}_{4,2}^{(1,0;a)}(E,2)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & -\frac{\sqrt{7}i}{112} & 0 & \frac{\sqrt{70}i}{112} & 0 & \frac{\sqrt{35}i}{16} & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{105}i}{112} & 0 & -\frac{\sqrt{210}i}{112} & 0 & -\frac{\sqrt{21}i}{16} \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{21}i}{16} & 0 & -\frac{\sqrt{210}i}{112} & 0 & \frac{\sqrt{105}i}{112} & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{35}i}{16} & 0 & \frac{\sqrt{70}i}{112} & 0 & -\frac{\sqrt{7}i}{112} \\ \frac{\sqrt{7}i}{112} & 0 & \frac{\sqrt{21}i}{16} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{105}i}{112} & 0 & -\frac{\sqrt{35}i}{16} & 0 & 0 & 0 & 0 & 0 & 0 \\ -\frac{\sqrt{70}i}{112} & 0 & \frac{\sqrt{210}i}{112} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{210}i}{112} & 0 & -\frac{\sqrt{70}i}{112} & 0 & 0 & 0 & 0 & 0 & 0 \\ -\frac{\sqrt{35}i}{16} & 0 & -\frac{\sqrt{105}i}{112} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{21}i}{16} & 0 & \frac{\sqrt{7}i}{112} & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$

508   symmetry

$$z$$

continued ...

Table 8

No.	multipole	matrix									
	$\mathbb{M}_1^{(a)}(A_2)$	$\frac{9\sqrt{5}}{50}$	0	0	0	0	$\frac{\sqrt{5}}{25}$	0	0	0	0
		0	$\frac{3\sqrt{5}}{50}$	0	0	0	0	$\frac{\sqrt{30}}{50}$	0	0	0
		0	0	$-\frac{3\sqrt{5}}{50}$	0	0	0	0	$\frac{\sqrt{30}}{50}$	0	0
		0	0	0	$-\frac{9\sqrt{5}}{50}$	0	0	0	0	$\frac{\sqrt{5}}{25}$	0
		0	0	0	0	$\frac{\sqrt{5}}{5}$	0	0	0	0	0
		$\frac{\sqrt{5}}{25}$	0	0	0	0	$\frac{3\sqrt{5}}{25}$	0	0	0	0
		0	$\frac{\sqrt{30}}{50}$	0	0	0	0	$\frac{\sqrt{5}}{25}$	0	0	0
		0	0	$\frac{\sqrt{30}}{50}$	0	0	0	0	$-\frac{\sqrt{5}}{25}$	0	0
		0	0	0	$\frac{\sqrt{5}}{25}$	0	0	0	0	$-\frac{3\sqrt{5}}{25}$	0
		0	0	0	0	0	0	0	0	0	$-\frac{\sqrt{5}}{5}$

509	symmetry	x

	$\mathbb{M}_{1,1}^{(a)}(E)$	0	$\frac{3\sqrt{15}}{50}$	0	0	$-\frac{1}{10}$	0	$\frac{\sqrt{10}}{100}$	0	0	0
		$\frac{3\sqrt{15}}{50}$	0	$\frac{3\sqrt{5}}{25}$	0	0	$-\frac{\sqrt{15}}{50}$	0	$\frac{\sqrt{30}}{100}$	0	0
		0	$\frac{3\sqrt{5}}{25}$	0	$\frac{3\sqrt{15}}{50}$	0	0	$-\frac{\sqrt{30}}{100}$	0	$\frac{\sqrt{15}}{50}$	0
		0	0	$\frac{3\sqrt{15}}{50}$	0	0	0	0	$-\frac{\sqrt{10}}{100}$	0	$\frac{1}{10}$
		$-\frac{1}{10}$	0	0	0	0	$\frac{1}{5}$	0	0	0	0
		0	$-\frac{\sqrt{15}}{50}$	0	0	$\frac{1}{5}$	0	$\frac{2\sqrt{10}}{25}$	0	0	0
		$\frac{\sqrt{10}}{100}$	0	$-\frac{\sqrt{30}}{100}$	0	0	$\frac{2\sqrt{10}}{25}$	0	$\frac{3\sqrt{5}}{25}$	0	0
		0	$\frac{\sqrt{30}}{100}$	0	$-\frac{\sqrt{10}}{100}$	0	0	$\frac{3\sqrt{5}}{25}$	0	$\frac{2\sqrt{10}}{25}$	0
		0	0	$\frac{\sqrt{15}}{50}$	0	0	0	0	$\frac{2\sqrt{10}}{25}$	0	$\frac{1}{5}$
		0	0	0	$\frac{1}{10}$	0	0	0	0	$\frac{1}{5}$	0

510	symmetry	$-y$

continued …

No.	multipole	matrix

$$\mathbb{M}_{1,2}^{(a)}(E) = \begin{bmatrix}
0 & \frac{3\sqrt{15}i}{50} & 0 & 0 & \frac{i}{10} & 0 & \frac{\sqrt{10}i}{100} & 0 & 0 & 0 \\
-\frac{3\sqrt{15}i}{50} & 0 & \frac{3\sqrt{5}i}{25} & 0 & 0 & \frac{\sqrt{15}i}{50} & 0 & \frac{\sqrt{30}i}{100} & 0 & 0 \\
0 & -\frac{3\sqrt{5}i}{25} & 0 & \frac{3\sqrt{15}i}{50} & 0 & 0 & \frac{\sqrt{30}i}{100} & 0 & \frac{\sqrt{15}i}{50} & 0 \\
0 & 0 & -\frac{3\sqrt{15}i}{50} & 0 & 0 & 0 & 0 & \frac{\sqrt{10}i}{100} & 0 & \frac{i}{10} \\
-\frac{i}{10} & 0 & 0 & 0 & 0 & \frac{i}{5} & 0 & 0 & 0 & 0 \\
0 & -\frac{\sqrt{15}i}{50} & 0 & 0 & -\frac{i}{5} & 0 & \frac{2\sqrt{10}i}{25} & 0 & 0 & 0 \\
-\frac{\sqrt{10}i}{100} & 0 & -\frac{\sqrt{30}i}{100} & 0 & 0 & -\frac{2\sqrt{10}i}{25} & 0 & \frac{3\sqrt{5}i}{25} & 0 & 0 \\
0 & -\frac{\sqrt{30}i}{100} & 0 & -\frac{\sqrt{10}i}{100} & 0 & 0 & -\frac{3\sqrt{5}i}{25} & 0 & \frac{2\sqrt{10}i}{25} & 0 \\
0 & 0 & -\frac{\sqrt{15}i}{50} & 0 & 0 & 0 & 0 & -\frac{2\sqrt{10}i}{25} & 0 & \frac{i}{5} \\
0 & 0 & 0 & -\frac{i}{10} & 0 & 0 & 0 & 0 & -\frac{i}{5} & 0
\end{bmatrix}$$

511   symmetry $-\frac{z\left(3x^2+3y^2-2z^2\right)}{2}$

$$\mathbb{M}_{3}^{(a)}(A_2) = \begin{bmatrix}
-\frac{\sqrt{5}}{25} & 0 & 0 & 0 & 0 & -\frac{3\sqrt{5}}{25} & 0 & 0 & 0 & 0 \\
0 & \frac{3\sqrt{5}}{25} & 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{25} & 0 & 0 & 0 \\
0 & 0 & -\frac{3\sqrt{5}}{25} & 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{25} & 0 & 0 \\
0 & 0 & 0 & \frac{\sqrt{5}}{25} & 0 & 0 & 0 & 0 & -\frac{3\sqrt{5}}{25} & 0 \\
0 & 0 & 0 & 0 & -\frac{\sqrt{5}}{10} & 0 & 0 & 0 & 0 & 0 \\
-\frac{3\sqrt{5}}{25} & 0 & 0 & 0 & 0 & \frac{7\sqrt{5}}{50} & 0 & 0 & 0 & 0 \\
0 & \frac{\sqrt{30}}{25} & 0 & 0 & 0 & 0 & \frac{2\sqrt{5}}{25} & 0 & 0 & 0 \\
0 & 0 & \frac{\sqrt{30}}{25} & 0 & 0 & 0 & 0 & -\frac{2\sqrt{5}}{25} & 0 & 0 \\
0 & 0 & 0 & -\frac{3\sqrt{5}}{25} & 0 & 0 & 0 & 0 & -\frac{7\sqrt{5}}{50} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{5}}{10}
\end{bmatrix}$$

512   symmetry $\sqrt{15}xyz$

continued ...

Table 8

No.	multipole	matrix

$$\mathbb{M}_3^{(a)}(B_1)$$

$$\begin{pmatrix}
0 & 0 & \frac{i}{5} & 0 & 0 & 0 & 0 & \frac{\sqrt{6}i}{10} & 0 & 0 \\
0 & 0 & 0 & -\frac{i}{5} & \frac{\sqrt{5}i}{10} & 0 & 0 & 0 & \frac{i}{10} & 0 \\
-\frac{i}{5} & 0 & 0 & 0 & 0 & -\frac{i}{10} & 0 & 0 & 0 & -\frac{\sqrt{5}i}{10} \\
0 & \frac{i}{5} & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{10} & 0 & 0 & 0 \\
0 & -\frac{\sqrt{5}i}{10} & 0 & 0 & 0 & 0 & \frac{\sqrt{30}i}{20} & 0 & 0 & 0 \\
0 & 0 & \frac{i}{10} & 0 & 0 & 0 & 0 & \frac{\sqrt{6}i}{20} & 0 & 0 \\
0 & 0 & 0 & \frac{\sqrt{6}i}{10} & -\frac{\sqrt{30}i}{20} & 0 & 0 & 0 & -\frac{\sqrt{6}i}{20} & 0 \\
-\frac{\sqrt{6}i}{10} & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{20} & 0 & 0 & 0 & -\frac{\sqrt{30}i}{20} \\
0 & -\frac{i}{10} & 0 & 0 & 0 & 0 & \frac{\sqrt{6}i}{20} & 0 & 0 & 0 \\
0 & 0 & \frac{\sqrt{5}i}{10} & 0 & 0 & 0 & 0 & \frac{\sqrt{30}i}{20} & 0 & 0
\end{pmatrix}$$

| 513 | symmetry | $\frac{\sqrt{15}z(x-y)(x+y)}{2}$ |

$$\mathbb{M}_3^{(a)}(B_2)$$

$$\begin{bmatrix}
0 & 0 & -\frac{1}{5} & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}}{10} & 0 & 0 \\
0 & 0 & 0 & \frac{1}{5} & \frac{\sqrt{5}}{10} & 0 & 0 & 0 & -\frac{1}{10} & 0 \\
-\frac{1}{5} & 0 & 0 & 0 & 0 & -\frac{1}{10} & 0 & 0 & 0 & \frac{\sqrt{5}}{10} \\
0 & \frac{1}{5} & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}}{10} & 0 & 0 & 0 \\
0 & \frac{\sqrt{5}}{10} & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}}{20} & 0 & 0 & 0 \\
0 & 0 & -\frac{1}{10} & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}}{20} & 0 & 0 \\
0 & 0 & 0 & -\frac{\sqrt{6}}{10} & -\frac{\sqrt{30}}{20} & 0 & 0 & 0 & \frac{\sqrt{6}}{20} & 0 \\
-\frac{\sqrt{6}}{10} & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}}{20} & 0 & 0 & 0 & \frac{\sqrt{30}}{20} \\
0 & -\frac{1}{10} & 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{20} & 0 & 0 & 0 \\
0 & 0 & \frac{\sqrt{5}}{10} & 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{20} & 0 & 0
\end{bmatrix}$$

| 514 | symmetry | $\frac{x\left(2x^2-3y^2-3z^2\right)}{2}$ |

continued …

Table 8

No.	multipole	matrix

$\mathbb{M}_{3,1}^{(a)}(E,1)$

$$\begin{pmatrix}
0 & \frac{\sqrt{15}}{50} & 0 & -\frac{\sqrt{5}}{10} & -\frac{3}{40} & 0 & \frac{9\sqrt{10}}{200} & 0 & -\frac{3\sqrt{5}}{40} & 0 \\
\frac{\sqrt{15}}{50} & 0 & -\frac{3\sqrt{5}}{50} & 0 & 0 & \frac{7\sqrt{15}}{200} & 0 & -\frac{\sqrt{30}}{200} & 0 & -\frac{\sqrt{3}}{8} \\
0 & -\frac{3\sqrt{5}}{50} & 0 & \frac{\sqrt{15}}{50} & \frac{\sqrt{3}}{8} & 0 & \frac{\sqrt{30}}{200} & 0 & -\frac{7\sqrt{15}}{200} & 0 \\
-\frac{\sqrt{5}}{10} & 0 & \frac{\sqrt{15}}{50} & 0 & 0 & \frac{3\sqrt{5}}{40} & 0 & -\frac{9\sqrt{10}}{200} & 0 & \frac{3}{40} \\
-\frac{3}{40} & 0 & \frac{\sqrt{3}}{8} & 0 & 0 & \frac{3}{20} & 0 & -\frac{\sqrt{2}}{8} & 0 & 0 \\
0 & \frac{7\sqrt{15}}{200} & 0 & \frac{3\sqrt{5}}{40} & \frac{3}{20} & 0 & -\frac{3\sqrt{10}}{200} & 0 & -\frac{\sqrt{5}}{10} & 0 \\
\frac{9\sqrt{10}}{200} & 0 & \frac{\sqrt{30}}{200} & 0 & 0 & -\frac{3\sqrt{10}}{200} & 0 & -\frac{3\sqrt{5}}{50} & 0 & -\frac{\sqrt{2}}{8} \\
0 & -\frac{\sqrt{30}}{200} & 0 & -\frac{9\sqrt{10}}{200} & -\frac{\sqrt{2}}{8} & 0 & -\frac{3\sqrt{5}}{50} & 0 & -\frac{3\sqrt{10}}{200} & 0 \\
-\frac{3\sqrt{5}}{40} & 0 & -\frac{7\sqrt{15}}{200} & 0 & 0 & -\frac{\sqrt{5}}{10} & 0 & -\frac{3\sqrt{10}}{200} & 0 & \frac{3}{20} \\
0 & -\frac{\sqrt{3}}{8} & 0 & \frac{3}{40} & 0 & 0 & -\frac{\sqrt{2}}{8} & 0 & \frac{3}{20} & 0
\end{pmatrix}$$

515	symmetry	$\dfrac{y\left(3x^2-2y^2+3z^2\right)}{2}$

$\mathbb{M}_{3,2}^{(a)}(E,1)$

$$\begin{pmatrix}
0 & \frac{\sqrt{15}i}{50} & 0 & \frac{\sqrt{5}i}{10} & \frac{3i}{40} & 0 & \frac{9\sqrt{10}i}{200} & 0 & \frac{3\sqrt{5}i}{40} & 0 \\
-\frac{\sqrt{15}i}{50} & 0 & -\frac{3\sqrt{5}i}{50} & 0 & 0 & -\frac{7\sqrt{15}i}{200} & 0 & -\frac{\sqrt{30}i}{200} & 0 & \frac{\sqrt{3}i}{8} \\
0 & \frac{3\sqrt{5}i}{50} & 0 & \frac{\sqrt{15}i}{50} & \frac{\sqrt{3}i}{8} & 0 & -\frac{\sqrt{30}i}{200} & 0 & -\frac{7\sqrt{15}i}{200} & 0 \\
-\frac{\sqrt{5}i}{10} & 0 & -\frac{\sqrt{15}i}{50} & 0 & 0 & \frac{3\sqrt{5}i}{40} & 0 & \frac{9\sqrt{10}i}{200} & 0 & \frac{3i}{40} \\
-\frac{3i}{40} & 0 & -\frac{\sqrt{3}i}{8} & 0 & 0 & \frac{3i}{20} & 0 & \frac{\sqrt{2}i}{8} & 0 & 0 \\
0 & \frac{7\sqrt{15}i}{200} & 0 & -\frac{3\sqrt{5}i}{40} & -\frac{3i}{20} & 0 & -\frac{3\sqrt{10}i}{200} & 0 & \frac{\sqrt{5}i}{10} & 0 \\
-\frac{9\sqrt{10}i}{200} & 0 & \frac{\sqrt{30}i}{200} & 0 & 0 & \frac{3\sqrt{10}i}{200} & 0 & -\frac{3\sqrt{5}i}{50} & 0 & \frac{\sqrt{2}i}{8} \\
0 & \frac{\sqrt{30}i}{200} & 0 & -\frac{9\sqrt{10}i}{200} & -\frac{\sqrt{2}i}{8} & 0 & \frac{3\sqrt{5}i}{50} & 0 & -\frac{3\sqrt{10}i}{200} & 0 \\
-\frac{3\sqrt{5}i}{40} & 0 & \frac{7\sqrt{15}i}{200} & 0 & 0 & -\frac{\sqrt{5}i}{10} & 0 & \frac{3\sqrt{10}i}{200} & 0 & \frac{3i}{20} \\
0 & -\frac{\sqrt{3}i}{8} & 0 & -\frac{3i}{40} & 0 & 0 & -\frac{\sqrt{2}i}{8} & 0 & -\frac{3i}{20} & 0
\end{pmatrix}$$

516	symmetry	$\dfrac{\sqrt{15}x(y-z)(y+z)}{2}$

continued ...

Table 8

No.	multipole	matrix

$$\mathbb{M}^{(a)}_{3,1}(E,2) = \begin{bmatrix}
0 & \frac{1}{10} & 0 & \frac{\sqrt{3}}{10} & -\frac{\sqrt{15}}{40} & 0 & \frac{3\sqrt{6}}{40} & 0 & \frac{3\sqrt{3}}{40} & 0 \\[4pt]
\frac{1}{10} & 0 & -\frac{\sqrt{3}}{10} & 0 & 0 & \frac{7}{40} & 0 & -\frac{\sqrt{2}}{40} & 0 & \frac{3\sqrt{5}}{40} \\[4pt]
0 & -\frac{\sqrt{3}}{10} & 0 & \frac{1}{10} & -\frac{3\sqrt{5}}{40} & 0 & \frac{\sqrt{2}}{40} & 0 & -\frac{7}{40} & 0 \\[4pt]
\frac{\sqrt{3}}{10} & 0 & \frac{1}{10} & 0 & 0 & -\frac{3\sqrt{3}}{40} & 0 & -\frac{3\sqrt{6}}{40} & 0 & \frac{\sqrt{15}}{40} \\[4pt]
-\frac{\sqrt{15}}{40} & 0 & -\frac{3\sqrt{5}}{40} & 0 & 0 & \frac{\sqrt{15}}{20} & 0 & \frac{\sqrt{30}}{40} & 0 & 0 \\[4pt]
0 & \frac{7}{40} & 0 & -\frac{3\sqrt{3}}{40} & \frac{\sqrt{15}}{20} & 0 & -\frac{\sqrt{6}}{40} & 0 & \frac{\sqrt{3}}{10} & 0 \\[4pt]
\frac{3\sqrt{6}}{40} & 0 & \frac{\sqrt{2}}{40} & 0 & 0 & -\frac{\sqrt{6}}{40} & 0 & -\frac{\sqrt{3}}{10} & 0 & \frac{\sqrt{30}}{40} \\[4pt]
0 & -\frac{\sqrt{2}}{40} & 0 & -\frac{3\sqrt{6}}{40} & \frac{\sqrt{30}}{40} & 0 & -\frac{\sqrt{3}}{10} & 0 & -\frac{\sqrt{6}}{40} & 0 \\[4pt]
\frac{3\sqrt{3}}{40} & 0 & -\frac{7}{40} & 0 & 0 & \frac{\sqrt{3}}{10} & 0 & -\frac{\sqrt{6}}{40} & 0 & \frac{\sqrt{15}}{20} \\[4pt]
0 & \frac{3\sqrt{5}}{40} & 0 & \frac{\sqrt{15}}{40} & 0 & 0 & \frac{\sqrt{30}}{40} & 0 & \frac{\sqrt{15}}{20} & 0
\end{bmatrix}$$

| 517 | symmetry | $-\dfrac{\sqrt{15}\,y(x-z)(x+z)}{2}$ |

$$\mathbb{M}^{(a)}_{3,2}(E,2) = \begin{bmatrix}
0 & \frac{i}{10} & 0 & -\frac{\sqrt{3}i}{10} & \frac{\sqrt{15}i}{40} & 0 & \frac{3\sqrt{6}i}{40} & 0 & -\frac{3\sqrt{3}i}{40} & 0 \\[4pt]
-\frac{i}{10} & 0 & -\frac{\sqrt{3}i}{10} & 0 & 0 & -\frac{7i}{40} & 0 & -\frac{\sqrt{2}i}{40} & 0 & -\frac{3\sqrt{5}i}{40} \\[4pt]
0 & \frac{\sqrt{3}i}{10} & 0 & \frac{i}{10} & -\frac{3\sqrt{5}i}{40} & 0 & -\frac{\sqrt{2}i}{40} & 0 & -\frac{7i}{40} & 0 \\[4pt]
\frac{\sqrt{3}i}{10} & 0 & -\frac{i}{10} & 0 & 0 & -\frac{3\sqrt{3}i}{40} & 0 & \frac{3\sqrt{6}i}{40} & 0 & \frac{\sqrt{15}i}{40} \\[4pt]
-\frac{\sqrt{15}i}{40} & 0 & \frac{3\sqrt{5}i}{40} & 0 & 0 & \frac{\sqrt{15}i}{20} & 0 & -\frac{\sqrt{30}i}{40} & 0 & 0 \\[4pt]
0 & \frac{7i}{40} & 0 & \frac{3\sqrt{3}i}{40} & -\frac{\sqrt{15}i}{20} & 0 & -\frac{\sqrt{6}i}{40} & 0 & -\frac{\sqrt{3}i}{10} & 0 \\[4pt]
-\frac{3\sqrt{6}i}{40} & 0 & \frac{\sqrt{2}i}{40} & 0 & 0 & \frac{\sqrt{6}i}{40} & 0 & -\frac{\sqrt{3}i}{10} & 0 & -\frac{\sqrt{30}i}{40} \\[4pt]
0 & \frac{\sqrt{2}i}{40} & 0 & -\frac{3\sqrt{6}i}{40} & \frac{\sqrt{30}i}{40} & 0 & \frac{\sqrt{3}i}{10} & 0 & -\frac{\sqrt{6}i}{40} & 0 \\[4pt]
\frac{3\sqrt{3}i}{40} & 0 & \frac{7i}{40} & 0 & 0 & \frac{\sqrt{3}i}{10} & 0 & \frac{\sqrt{6}i}{40} & 0 & \frac{\sqrt{15}i}{20} \\[4pt]
0 & \frac{3\sqrt{5}i}{40} & 0 & -\frac{\sqrt{15}i}{40} & 0 & 0 & \frac{\sqrt{30}i}{40} & 0 & -\frac{\sqrt{15}i}{20} & 0
\end{bmatrix}$$

| 518 | symmetry | z |

continued ...

Table 8

No.	multipole	matrix

$$\mathbb{M}_1^{(1,-1;a)}(A_2) = \begin{bmatrix}
-\frac{3\sqrt{10}}{50} & 0 & 0 & 0 & 0 & -\frac{2\sqrt{10}}{25} & 0 & 0 & 0 & 0 \\
0 & -\frac{\sqrt{10}}{50} & 0 & 0 & 0 & 0 & -\frac{2\sqrt{15}}{25} & 0 & 0 & 0 \\
0 & 0 & \frac{\sqrt{10}}{50} & 0 & 0 & 0 & 0 & -\frac{2\sqrt{15}}{25} & 0 & 0 \\
0 & 0 & 0 & \frac{3\sqrt{10}}{50} & 0 & 0 & 0 & 0 & -\frac{2\sqrt{10}}{25} & 0 \\
0 & 0 & 0 & 0 & \frac{\sqrt{10}}{10} & 0 & 0 & 0 & 0 & 0 \\
-\frac{2\sqrt{10}}{25} & 0 & 0 & 0 & 0 & \frac{3\sqrt{10}}{50} & 0 & 0 & 0 & 0 \\
0 & -\frac{2\sqrt{15}}{25} & 0 & 0 & 0 & 0 & \frac{\sqrt{10}}{50} & 0 & 0 & 0 \\
0 & 0 & -\frac{2\sqrt{15}}{25} & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}}{50} & 0 & 0 \\
0 & 0 & 0 & -\frac{2\sqrt{10}}{25} & 0 & 0 & 0 & 0 & -\frac{3\sqrt{10}}{50} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}}{10}
\end{bmatrix}$$

519	symmetry	x

$$\mathbb{M}_{1,1}^{(1,-1;a)}(E) = \begin{bmatrix}
0 & -\frac{\sqrt{30}}{50} & 0 & 0 & \frac{\sqrt{2}}{5} & 0 & -\frac{\sqrt{5}}{25} & 0 & 0 & 0 \\
-\frac{\sqrt{30}}{50} & 0 & -\frac{\sqrt{10}}{25} & 0 & 0 & \frac{\sqrt{30}}{25} & 0 & -\frac{\sqrt{15}}{25} & 0 & 0 \\
0 & -\frac{\sqrt{10}}{25} & 0 & -\frac{\sqrt{30}}{50} & 0 & 0 & \frac{\sqrt{15}}{25} & 0 & -\frac{\sqrt{30}}{25} & 0 \\
0 & 0 & -\frac{\sqrt{30}}{50} & 0 & 0 & 0 & 0 & \frac{\sqrt{5}}{25} & 0 & -\frac{\sqrt{2}}{5} \\
\frac{\sqrt{2}}{5} & 0 & 0 & 0 & 0 & \frac{\sqrt{2}}{10} & 0 & 0 & 0 & 0 \\
0 & \frac{\sqrt{30}}{25} & 0 & 0 & \frac{\sqrt{2}}{10} & 0 & \frac{2\sqrt{5}}{25} & 0 & 0 & 0 \\
-\frac{\sqrt{5}}{25} & 0 & \frac{\sqrt{15}}{25} & 0 & 0 & \frac{2\sqrt{5}}{25} & 0 & \frac{3\sqrt{10}}{50} & 0 & 0 \\
0 & -\frac{\sqrt{15}}{25} & 0 & \frac{\sqrt{5}}{25} & 0 & 0 & \frac{3\sqrt{10}}{50} & 0 & \frac{2\sqrt{5}}{25} & 0 \\
0 & 0 & -\frac{\sqrt{30}}{25} & 0 & 0 & 0 & 0 & \frac{2\sqrt{5}}{25} & 0 & \frac{\sqrt{2}}{10} \\
0 & 0 & 0 & -\frac{\sqrt{2}}{5} & 0 & 0 & 0 & 0 & \frac{\sqrt{2}}{10} & 0
\end{bmatrix}$$

520	symmetry	$-y$

continued …

Table 8

No.	multipole	matrix

$\mathbb{M}_{1,2}^{(1,-1;a)}(E)$

$$\begin{bmatrix}
0 & -\frac{\sqrt{30}i}{50} & 0 & 0 & -\frac{\sqrt{2}i}{5} & 0 & -\frac{\sqrt{5}i}{25} & 0 & 0 & 0 \\
\frac{\sqrt{30}i}{50} & 0 & -\frac{\sqrt{10}i}{25} & 0 & 0 & -\frac{\sqrt{30}i}{25} & 0 & -\frac{\sqrt{15}i}{25} & 0 & 0 \\
0 & \frac{\sqrt{10}i}{25} & 0 & -\frac{\sqrt{30}i}{50} & 0 & 0 & -\frac{\sqrt{15}i}{25} & 0 & -\frac{\sqrt{30}i}{25} & 0 \\
0 & 0 & \frac{\sqrt{30}i}{50} & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{25} & 0 & -\frac{\sqrt{2}i}{5} \\
\frac{\sqrt{2}i}{5} & 0 & 0 & 0 & 0 & \frac{\sqrt{2}i}{10} & 0 & 0 & 0 & 0 \\
0 & \frac{\sqrt{30}i}{25} & 0 & 0 & -\frac{\sqrt{2}i}{10} & 0 & \frac{2\sqrt{5}i}{25} & 0 & 0 & 0 \\
\frac{\sqrt{5}i}{25} & 0 & \frac{\sqrt{15}i}{25} & 0 & 0 & -\frac{2\sqrt{5}i}{25} & 0 & \frac{3\sqrt{10}i}{50} & 0 & 0 \\
0 & \frac{\sqrt{15}i}{25} & 0 & \frac{\sqrt{5}i}{25} & 0 & 0 & -\frac{3\sqrt{10}i}{50} & 0 & \frac{2\sqrt{5}i}{25} & 0 \\
0 & 0 & \frac{\sqrt{30}i}{25} & 0 & 0 & 0 & 0 & -\frac{2\sqrt{5}i}{25} & 0 & \frac{\sqrt{2}i}{10} \\
0 & 0 & 0 & \frac{\sqrt{2}i}{5} & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}i}{10} & 0
\end{bmatrix}$$

521   symmetry

$$-\frac{z\left(3x^2+3y^2-2z^2\right)}{2}$$

$\mathbb{M}_3^{(1,-1;a)}(A_2)$

$$\begin{bmatrix}
\frac{\sqrt{105}}{350} & 0 & 0 & 0 & 0 & \frac{4\sqrt{105}}{175} & 0 & 0 & 0 & 0 \\
0 & -\frac{3\sqrt{105}}{350} & 0 & 0 & 0 & 0 & -\frac{4\sqrt{70}}{175} & 0 & 0 & 0 \\
0 & 0 & \frac{3\sqrt{105}}{350} & 0 & 0 & 0 & 0 & -\frac{4\sqrt{70}}{175} & 0 & 0 \\
0 & 0 & 0 & -\frac{\sqrt{105}}{350} & 0 & 0 & 0 & 0 & \frac{4\sqrt{105}}{175} & 0 \\
0 & 0 & 0 & 0 & -\frac{\sqrt{105}}{35} & 0 & 0 & 0 & 0 & 0 \\
\frac{4\sqrt{105}}{175} & 0 & 0 & 0 & 0 & \frac{\sqrt{105}}{25} & 0 & 0 & 0 & 0 \\
0 & -\frac{4\sqrt{70}}{175} & 0 & 0 & 0 & 0 & \frac{4\sqrt{105}}{175} & 0 & 0 & 0 \\
0 & 0 & -\frac{4\sqrt{70}}{175} & 0 & 0 & 0 & 0 & -\frac{4\sqrt{105}}{175} & 0 & 0 \\
0 & 0 & 0 & \frac{4\sqrt{105}}{175} & 0 & 0 & 0 & 0 & -\frac{\sqrt{105}}{25} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{105}}{35}
\end{bmatrix}$$

522   symmetry $\sqrt{15}xyz$

continued …

Table 8

No.	multipole	matrix
	$\mathbb{M}_3^{(1,-1;a)}(B_1)$	$$\begin{bmatrix} 0 & 0 & -\frac{\sqrt{21}i}{70} & 0 & 0 & 0 & 0 & -\frac{2\sqrt{14}i}{35} & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{21}i}{70} & -\frac{2\sqrt{105}i}{105} & 0 & 0 & 0 & -\frac{2\sqrt{21}i}{105} & 0 \\ \frac{\sqrt{21}i}{70} & 0 & 0 & 0 & 0 & \frac{2\sqrt{21}i}{105} & 0 & 0 & 0 & \frac{2\sqrt{105}i}{105} \\ 0 & -\frac{\sqrt{21}i}{70} & 0 & 0 & 0 & 0 & \frac{2\sqrt{14}i}{35} & 0 & 0 & 0 \\ 0 & \frac{2\sqrt{105}i}{105} & 0 & 0 & 0 & 0 & \frac{3\sqrt{70}i}{70} & 0 & 0 & 0 \\ 0 & 0 & -\frac{2\sqrt{21}i}{105} & 0 & 0 & 0 & 0 & \frac{3\sqrt{14}i}{70} & 0 & 0 \\ 0 & 0 & 0 & -\frac{2\sqrt{14}i}{35} & -\frac{3\sqrt{70}i}{70} & 0 & 0 & 0 & -\frac{3\sqrt{14}i}{70} & 0 \\ \frac{2\sqrt{14}i}{35} & 0 & 0 & 0 & 0 & -\frac{3\sqrt{14}i}{70} & 0 & 0 & 0 & -\frac{3\sqrt{70}i}{70} \\ 0 & \frac{2\sqrt{21}i}{105} & 0 & 0 & 0 & 0 & \frac{3\sqrt{14}i}{70} & 0 & 0 & 0 \\ 0 & 0 & -\frac{2\sqrt{105}i}{105} & 0 & 0 & 0 & 0 & \frac{3\sqrt{70}i}{70} & 0 & 0 \end{bmatrix}$$
523	symmetry	$\frac{\sqrt{15}z(x-y)(x+y)}{2}$
	$\mathbb{M}_3^{(1,-1;a)}(B_2)$	$$\begin{bmatrix} 0 & 0 & \frac{\sqrt{21}}{70} & 0 & 0 & 0 & 0 & \frac{2\sqrt{14}}{35} & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{21}}{70} & -\frac{2\sqrt{105}}{105} & 0 & 0 & 0 & \frac{2\sqrt{21}}{105} & 0 \\ \frac{\sqrt{21}}{70} & 0 & 0 & 0 & 0 & \frac{2\sqrt{21}}{105} & 0 & 0 & 0 & -\frac{2\sqrt{105}}{105} \\ 0 & -\frac{\sqrt{21}}{70} & 0 & 0 & 0 & 0 & \frac{2\sqrt{14}}{35} & 0 & 0 & 0 \\ 0 & -\frac{2\sqrt{105}}{105} & 0 & 0 & 0 & 0 & -\frac{3\sqrt{70}}{70} & 0 & 0 & 0 \\ 0 & 0 & \frac{2\sqrt{21}}{105} & 0 & 0 & 0 & 0 & -\frac{3\sqrt{14}}{70} & 0 & 0 \\ 0 & 0 & 0 & \frac{2\sqrt{14}}{35} & -\frac{3\sqrt{70}}{70} & 0 & 0 & 0 & \frac{3\sqrt{14}}{70} & 0 \\ \frac{2\sqrt{14}}{35} & 0 & 0 & 0 & 0 & -\frac{3\sqrt{14}}{70} & 0 & 0 & 0 & \frac{3\sqrt{70}}{70} \\ 0 & \frac{2\sqrt{21}}{105} & 0 & 0 & 0 & 0 & \frac{3\sqrt{14}}{70} & 0 & 0 & 0 \\ 0 & 0 & -\frac{2\sqrt{105}}{105} & 0 & 0 & 0 & 0 & \frac{3\sqrt{70}}{70} & 0 & 0 \end{bmatrix}$$
524	symmetry	$\frac{x\left(2x^2-3y^2-3z^2\right)}{2}$

continued ...

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Table 8

No.	multipole	matrix
	$\mathbb{M}_{3,1}^{(1,-1;a)}(E,1)$	$\begin{pmatrix} 0 & -\frac{3\sqrt{35}}{700} & 0 & \frac{\sqrt{105}}{140} & \frac{\sqrt{21}}{70} & 0 & -\frac{3\sqrt{210}}{350} & 0 & \frac{\sqrt{105}}{70} & 0 \\ -\frac{3\sqrt{35}}{700} & 0 & \frac{3\sqrt{105}}{700} & 0 & 0 & -\frac{\sqrt{35}}{50} & 0 & \frac{\sqrt{70}}{350} & 0 & \frac{\sqrt{7}}{14} \\ 0 & \frac{3\sqrt{105}}{700} & 0 & -\frac{3\sqrt{35}}{700} & -\frac{\sqrt{7}}{14} & 0 & -\frac{\sqrt{70}}{350} & 0 & \frac{\sqrt{35}}{50} & 0 \\ \frac{\sqrt{105}}{140} & 0 & -\frac{3\sqrt{35}}{700} & 0 & 0 & -\frac{\sqrt{105}}{70} & 0 & \frac{3\sqrt{210}}{350} & 0 & -\frac{\sqrt{21}}{70} \\ \frac{\sqrt{21}}{70} & 0 & -\frac{\sqrt{7}}{14} & 0 & 0 & \frac{3\sqrt{21}}{70} & 0 & -\frac{\sqrt{42}}{28} & 0 & 0 \\ 0 & -\frac{\sqrt{35}}{50} & 0 & -\frac{\sqrt{105}}{70} & \frac{3\sqrt{21}}{70} & 0 & -\frac{3\sqrt{210}}{700} & 0 & -\frac{\sqrt{105}}{35} & 0 \\ -\frac{3\sqrt{210}}{350} & 0 & -\frac{\sqrt{70}}{350} & 0 & 0 & -\frac{3\sqrt{210}}{700} & 0 & -\frac{3\sqrt{105}}{175} & 0 & -\frac{\sqrt{42}}{28} \\ 0 & \frac{\sqrt{70}}{350} & 0 & \frac{3\sqrt{210}}{350} & -\frac{\sqrt{42}}{28} & 0 & -\frac{3\sqrt{105}}{175} & 0 & -\frac{3\sqrt{210}}{700} & 0 \\ \frac{\sqrt{105}}{70} & 0 & \frac{\sqrt{35}}{50} & 0 & 0 & -\frac{\sqrt{105}}{35} & 0 & -\frac{3\sqrt{210}}{700} & 0 & \frac{3\sqrt{21}}{70} \\ 0 & \frac{\sqrt{7}}{14} & 0 & -\frac{\sqrt{21}}{70} & 0 & 0 & -\frac{\sqrt{42}}{28} & 0 & \frac{3\sqrt{21}}{70} & 0 \end{pmatrix}$
525	symmetry	$\dfrac{y\left(3x^2-2y^2+3z^2\right)}{2}$
	$\mathbb{M}_{3,2}^{(1,-1;a)}(E,1)$	$\begin{pmatrix} 0 & -\frac{3\sqrt{35}i}{700} & 0 & -\frac{\sqrt{105}i}{140} & -\frac{\sqrt{21}i}{70} & 0 & -\frac{3\sqrt{210}i}{350} & 0 & -\frac{\sqrt{105}i}{70} & 0 \\ \frac{3\sqrt{35}i}{700} & 0 & \frac{3\sqrt{105}i}{700} & 0 & 0 & \frac{\sqrt{35}i}{50} & 0 & \frac{\sqrt{70}i}{350} & 0 & -\frac{\sqrt{7}i}{14} \\ 0 & -\frac{3\sqrt{105}i}{700} & 0 & -\frac{3\sqrt{35}i}{700} & -\frac{\sqrt{7}i}{14} & 0 & \frac{\sqrt{70}i}{350} & 0 & \frac{\sqrt{35}i}{50} & 0 \\ \frac{\sqrt{105}i}{140} & 0 & \frac{3\sqrt{35}i}{700} & 0 & 0 & -\frac{\sqrt{105}i}{70} & 0 & -\frac{3\sqrt{210}i}{350} & 0 & -\frac{\sqrt{21}i}{70} \\ \frac{\sqrt{21}i}{70} & 0 & \frac{\sqrt{7}i}{14} & 0 & 0 & \frac{3\sqrt{21}i}{70} & 0 & \frac{\sqrt{42}i}{28} & 0 & 0 \\ 0 & -\frac{\sqrt{35}i}{50} & 0 & \frac{\sqrt{105}i}{70} & -\frac{3\sqrt{21}i}{70} & 0 & -\frac{3\sqrt{210}i}{700} & 0 & \frac{\sqrt{105}i}{35} & 0 \\ \frac{3\sqrt{210}i}{350} & 0 & -\frac{\sqrt{70}i}{350} & 0 & 0 & \frac{3\sqrt{210}i}{700} & 0 & -\frac{3\sqrt{105}i}{175} & 0 & \frac{\sqrt{42}i}{28} \\ 0 & -\frac{\sqrt{70}i}{350} & 0 & \frac{3\sqrt{210}i}{350} & -\frac{\sqrt{42}i}{28} & 0 & \frac{3\sqrt{105}i}{175} & 0 & -\frac{3\sqrt{210}i}{700} & 0 \\ \frac{\sqrt{105}i}{70} & 0 & -\frac{\sqrt{35}i}{50} & 0 & 0 & -\frac{\sqrt{105}i}{35} & 0 & \frac{3\sqrt{210}i}{700} & 0 & \frac{3\sqrt{21}i}{70} \\ 0 & \frac{\sqrt{7}i}{14} & 0 & \frac{\sqrt{21}i}{70} & 0 & 0 & -\frac{\sqrt{42}i}{28} & 0 & -\frac{3\sqrt{21}i}{70} & 0 \end{pmatrix}$
526	symmetry	$\dfrac{\sqrt{15}x(y-z)(y+z)}{2}$

continued ...

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Table 8

No.	multipole	matrix

$\mathbb{M}_{3,1}^{(1,-1;a)}(E,2)$

$$\begin{bmatrix}
0 & -\frac{\sqrt{21}}{140} & 0 & -\frac{3\sqrt{7}}{140} & \frac{\sqrt{35}}{70} & 0 & -\frac{3\sqrt{14}}{70} & 0 & -\frac{3\sqrt{7}}{70} & 0 \\[4pt]
-\frac{\sqrt{21}}{140} & 0 & \frac{3\sqrt{7}}{140} & 0 & 0 & -\frac{\sqrt{21}}{30} & 0 & \frac{\sqrt{42}}{210} & 0 & -\frac{\sqrt{105}}{70} \\[4pt]
0 & \frac{3\sqrt{7}}{140} & 0 & -\frac{\sqrt{21}}{140} & \frac{\sqrt{105}}{70} & 0 & -\frac{\sqrt{42}}{210} & 0 & \frac{\sqrt{21}}{30} & 0 \\[4pt]
-\frac{3\sqrt{7}}{140} & 0 & -\frac{\sqrt{21}}{140} & 0 & 0 & \frac{3\sqrt{7}}{70} & 0 & \frac{3\sqrt{14}}{70} & 0 & -\frac{\sqrt{35}}{70} \\[4pt]
\frac{\sqrt{35}}{70} & 0 & \frac{\sqrt{105}}{70} & 0 & 0 & \frac{3\sqrt{35}}{70} & 0 & \frac{3\sqrt{70}}{140} & 0 & 0 \\[4pt]
0 & -\frac{\sqrt{21}}{30} & 0 & \frac{3\sqrt{7}}{70} & \frac{3\sqrt{35}}{70} & 0 & -\frac{3\sqrt{14}}{140} & 0 & \frac{3\sqrt{7}}{35} & 0 \\[4pt]
-\frac{3\sqrt{14}}{70} & 0 & -\frac{\sqrt{42}}{210} & 0 & 0 & -\frac{3\sqrt{14}}{140} & 0 & -\frac{3\sqrt{7}}{35} & 0 & \frac{3\sqrt{70}}{140} \\[4pt]
0 & \frac{\sqrt{42}}{210} & 0 & \frac{3\sqrt{14}}{70} & \frac{3\sqrt{70}}{140} & 0 & -\frac{3\sqrt{7}}{35} & 0 & -\frac{3\sqrt{14}}{140} & 0 \\[4pt]
-\frac{3\sqrt{7}}{70} & 0 & \frac{\sqrt{21}}{30} & 0 & 0 & \frac{3\sqrt{7}}{35} & 0 & -\frac{3\sqrt{14}}{140} & 0 & \frac{3\sqrt{35}}{70} \\[4pt]
0 & -\frac{\sqrt{105}}{70} & 0 & -\frac{\sqrt{35}}{70} & 0 & 0 & \frac{3\sqrt{70}}{140} & 0 & \frac{3\sqrt{35}}{70} & 0
\end{bmatrix}$$

527	symmetry	$-\frac{\sqrt{15}y(x-z)(x+z)}{2}$

$\mathbb{M}_{3,2}^{(1,-1;a)}(E,2)$

$$\begin{bmatrix}
0 & -\frac{\sqrt{21}i}{140} & 0 & \frac{3\sqrt{7}i}{140} & -\frac{\sqrt{35}i}{70} & 0 & -\frac{3\sqrt{14}i}{70} & 0 & \frac{3\sqrt{7}i}{70} & 0 \\[4pt]
\frac{\sqrt{21}i}{140} & 0 & \frac{3\sqrt{7}i}{140} & 0 & 0 & \frac{\sqrt{21}i}{30} & 0 & \frac{\sqrt{42}i}{210} & 0 & \frac{\sqrt{105}i}{70} \\[4pt]
0 & -\frac{3\sqrt{7}i}{140} & 0 & -\frac{\sqrt{21}i}{140} & \frac{\sqrt{105}i}{70} & 0 & \frac{\sqrt{42}i}{210} & 0 & \frac{\sqrt{21}i}{30} & 0 \\[4pt]
-\frac{3\sqrt{7}i}{140} & 0 & \frac{\sqrt{21}i}{140} & 0 & 0 & \frac{3\sqrt{7}i}{70} & 0 & -\frac{3\sqrt{14}i}{70} & 0 & -\frac{\sqrt{35}i}{70} \\[4pt]
\frac{\sqrt{35}i}{70} & 0 & -\frac{\sqrt{105}i}{70} & 0 & 0 & \frac{3\sqrt{35}i}{70} & 0 & -\frac{3\sqrt{70}i}{140} & 0 & 0 \\[4pt]
0 & -\frac{\sqrt{21}i}{30} & 0 & -\frac{3\sqrt{7}i}{70} & -\frac{3\sqrt{35}i}{70} & 0 & -\frac{3\sqrt{14}i}{140} & 0 & -\frac{3\sqrt{7}i}{35} & 0 \\[4pt]
\frac{3\sqrt{14}i}{70} & 0 & -\frac{\sqrt{42}i}{210} & 0 & 0 & \frac{3\sqrt{14}i}{140} & 0 & -\frac{3\sqrt{7}i}{35} & 0 & -\frac{3\sqrt{70}i}{140} \\[4pt]
0 & -\frac{\sqrt{42}i}{210} & 0 & \frac{3\sqrt{14}i}{70} & \frac{3\sqrt{70}i}{140} & 0 & \frac{3\sqrt{7}i}{35} & 0 & -\frac{3\sqrt{14}i}{140} & 0 \\[4pt]
-\frac{3\sqrt{7}i}{70} & 0 & -\frac{\sqrt{21}i}{30} & 0 & 0 & \frac{3\sqrt{7}i}{35} & 0 & \frac{3\sqrt{14}i}{140} & 0 & \frac{3\sqrt{35}i}{70} \\[4pt]
0 & -\frac{\sqrt{105}i}{70} & 0 & \frac{\sqrt{35}i}{70} & 0 & 0 & \frac{3\sqrt{70}i}{140} & 0 & -\frac{3\sqrt{35}i}{70} & 0
\end{bmatrix}$$

528	symmetry	$\frac{3\sqrt{35}xyz(x-y)(x+y)}{2}$

continued ...

Table 8

No.	multipole	matrix

$$\mathbb{M}_5^{(1,-1;a)}(A_1) \quad \begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{i}{2} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{i}{2} \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{i}{2} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{i}{2} & 0 & 0 & 0 & 0 \end{bmatrix}$$

| 529 | symmetry | $\dfrac{z\left(15x^4+30x^2y^2-40x^2z^2+15y^4-40y^2z^2+8z^4\right)}{8}$ |

$$\mathbb{M}_5^{(1,-1;a)}(A_2,1) \quad \begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{7}}{42} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{5\sqrt{7}}{42} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{5\sqrt{7}}{21} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{5\sqrt{7}}{21} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{5\sqrt{7}}{42} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}}{42} \end{bmatrix}$$

| 530 | symmetry | $\dfrac{3\sqrt{35}z\left(x^2-2xy-y^2\right)\left(x^2+2xy-y^2\right)}{8}$ |

continued …

Table 8

No.	multipole	matrix
	$\mathbb{M}_5^{(1,-1;a)}(A_2,2)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{1}{2} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{1}{2} \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{1}{2} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{1}{2} & 0 & 0 & 0 & 0 \end{bmatrix}$
531	symmetry	$\dfrac{\sqrt{105}\,xyz\left(x^2+y^2-2z^2\right)}{2}$
	$\mathbb{M}_5^{(1,-1;a)}(B_1)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}i}{12} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}i}{12} & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{12} & 0 & 0 & 0 & \frac{\sqrt{30}i}{12} & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}i}{12} & 0 & 0 & 0 & -\frac{\sqrt{6}i}{12} \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}i}{12} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}i}{12} & 0 & 0 \end{bmatrix}$
532	symmetry	$-\dfrac{\sqrt{105}\,z(x-y)(x+y)\left(x^2+y^2-2z^2\right)}{4}$

continued ...

Table 8

No.	multipole	matrix

$\mathbb{M}_5^{(1,-1;a)}(B_2)$

$$\begin{pmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{12} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}}{12} & 0 & 0 \\
0 & 0 & 0 & 0 & \frac{\sqrt{6}}{12} & 0 & 0 & 0 & \frac{\sqrt{30}}{12} & 0 \\
0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}}{12} & 0 & 0 & 0 & -\frac{\sqrt{6}}{12} \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{12} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}}{12} & 0 & 0
\end{pmatrix}$$

| 533 | symmetry | $\dfrac{x\left(8x^4-40x^2y^2-40x^2z^2+15y^4+30y^2z^2+15z^4\right)}{8}$ |

$\mathbb{M}_{5,1}^{(1,-1;a)}(E,1)$

$$\begin{bmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & \frac{\sqrt{35}}{112} & 0 & -\frac{\sqrt{70}}{48} & 0 & \frac{3\sqrt{7}}{16} \\
0 & 0 & 0 & 0 & \frac{\sqrt{35}}{112} & 0 & -\frac{5\sqrt{14}}{112} & 0 & \frac{5\sqrt{7}}{48} & 0 \\
0 & 0 & 0 & 0 & 0 & -\frac{5\sqrt{14}}{112} & 0 & \frac{5\sqrt{7}}{56} & 0 & -\frac{\sqrt{70}}{48} \\
0 & 0 & 0 & 0 & -\frac{\sqrt{70}}{48} & 0 & \frac{5\sqrt{7}}{56} & 0 & -\frac{5\sqrt{14}}{112} & 0 \\
0 & 0 & 0 & 0 & 0 & \frac{5\sqrt{7}}{48} & 0 & -\frac{5\sqrt{14}}{112} & 0 & \frac{\sqrt{35}}{112} \\
0 & 0 & 0 & 0 & \frac{3\sqrt{7}}{16} & 0 & -\frac{\sqrt{70}}{48} & 0 & \frac{\sqrt{35}}{112} & 0
\end{bmatrix}$$

| 534 | symmetry | $-\dfrac{y\left(15x^4-40x^2y^2+30x^2z^2+8y^4-40y^2z^2+15z^4\right)}{8}$ |

139

No.	multipole	matrix

$$\mathbb{M}_{5,2}^{(1,-1;a)}(E,1)$$

$$\begin{bmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & \frac{\sqrt{35}i}{112} & 0 & \frac{\sqrt{70}i}{48} & 0 & \frac{3\sqrt{7}i}{16} \\
0 & 0 & 0 & 0 & -\frac{\sqrt{35}i}{112} & 0 & -\frac{5\sqrt{14}i}{112} & 0 & -\frac{5\sqrt{7}i}{48} & 0 \\
0 & 0 & 0 & 0 & 0 & \frac{5\sqrt{14}i}{112} & 0 & \frac{5\sqrt{7}i}{56} & 0 & \frac{\sqrt{70}i}{48} \\
0 & 0 & 0 & 0 & -\frac{\sqrt{70}i}{48} & 0 & -\frac{5\sqrt{7}i}{56} & 0 & -\frac{5\sqrt{14}i}{112} & 0 \\
0 & 0 & 0 & 0 & 0 & \frac{5\sqrt{7}i}{48} & 0 & \frac{5\sqrt{14}i}{112} & 0 & \frac{\sqrt{35}i}{112} \\
0 & 0 & 0 & 0 & -\frac{3\sqrt{7}i}{16} & 0 & -\frac{\sqrt{70}i}{48} & 0 & -\frac{\sqrt{35}i}{112} & 0
\end{bmatrix}$$

| 535 | symmetry | $\dfrac{3\sqrt{35}x\left(y^2-2yz-z^2\right)\left(y^2+2yz-z^2\right)}{8}$ |

$$\mathbb{M}_{5,1}^{(1,-1;a)}(E,2)$$

$$\begin{bmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & \frac{1}{16} & 0 & \frac{3\sqrt{2}}{16} & 0 & \frac{\sqrt{5}}{16} \\
0 & 0 & 0 & 0 & \frac{1}{16} & 0 & -\frac{\sqrt{10}}{16} & 0 & -\frac{3\sqrt{5}}{16} & 0 \\
0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}}{16} & 0 & \frac{\sqrt{5}}{8} & 0 & \frac{3\sqrt{2}}{16} \\
0 & 0 & 0 & 0 & \frac{3\sqrt{2}}{16} & 0 & \frac{\sqrt{5}}{8} & 0 & -\frac{\sqrt{10}}{16} & 0 \\
0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{5}}{16} & 0 & -\frac{\sqrt{10}}{16} & 0 & \frac{1}{16} \\
0 & 0 & 0 & 0 & \frac{\sqrt{5}}{16} & 0 & \frac{3\sqrt{2}}{16} & 0 & \frac{1}{16} & 0
\end{bmatrix}$$

| 536 | symmetry | $-\dfrac{3\sqrt{35}y\left(x^2-2xz-z^2\right)\left(x^2+2xz-z^2\right)}{8}$ |

continued ...

Table 8

Table 8

No.	multipole	matrix
	$\mathbb{M}_{5,2}^{(1,-1;a)}(E,2)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{i}{16} & 0 & -\frac{3\sqrt{2}i}{16} & 0 & \frac{\sqrt{5}i}{16} \\ 0 & 0 & 0 & 0 & -\frac{i}{16} & 0 & -\frac{\sqrt{10}i}{16} & 0 & \frac{3\sqrt{5}i}{16} & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}i}{16} & 0 & \frac{\sqrt{5}i}{8} & 0 & -\frac{3\sqrt{2}i}{16} \\ 0 & 0 & 0 & 0 & \frac{3\sqrt{2}i}{16} & 0 & -\frac{\sqrt{5}i}{8} & 0 & -\frac{\sqrt{10}i}{16} & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{5}i}{16} & 0 & \frac{\sqrt{10}i}{16} & 0 & \frac{i}{16} \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{16} & 0 & \frac{3\sqrt{2}i}{16} & 0 & -\frac{i}{16} & 0 \end{bmatrix}$
537	symmetry	$\dfrac{\sqrt{105}x(y-z)(y+z)\left(2x^2-y^2-z^2\right)}{4}$
	$\mathbb{M}_{5,1}^{(1,-1;a)}(E,3)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{24} & 0 & -\frac{\sqrt{6}}{24} & 0 & -\frac{\sqrt{15}}{8} \\ 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{24} & 0 & -\frac{\sqrt{30}}{24} & 0 & \frac{\sqrt{15}}{24} & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}}{24} & 0 & \frac{\sqrt{15}}{12} & 0 & -\frac{\sqrt{6}}{24} \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{6}}{24} & 0 & \frac{\sqrt{15}}{12} & 0 & -\frac{\sqrt{30}}{24} & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{24} & 0 & -\frac{\sqrt{30}}{24} & 0 & \frac{\sqrt{3}}{24} \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{8} & 0 & -\frac{\sqrt{6}}{24} & 0 & \frac{\sqrt{3}}{24} & 0 \end{bmatrix}$
538	symmetry	$\dfrac{\sqrt{105}y(x-z)(x+z)\left(x^2-2y^2+z^2\right)}{4}$

continued ...

No.	multipole	matrix									
	$\mathbb{M}_{5,2}^{(1,-1;a)}(E,3)$	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	$\frac{\sqrt{3}i}{24}$	0	$\frac{\sqrt{6}i}{24}$	0	$-\frac{\sqrt{15}i}{8}$
		0	0	0	0	$-\frac{\sqrt{3}i}{24}$	0	$-\frac{\sqrt{30}i}{24}$	0	$-\frac{\sqrt{15}i}{24}$	0
		0	0	0	0	0	$\frac{\sqrt{30}i}{24}$	0	$\frac{\sqrt{15}i}{12}$	0	$\frac{\sqrt{6}i}{24}$
		0	0	0	0	$-\frac{\sqrt{6}i}{24}$	0	$-\frac{\sqrt{15}i}{12}$	0	$-\frac{\sqrt{30}i}{24}$	0
		0	0	0	0	0	$\frac{\sqrt{15}i}{24}$	0	$\frac{\sqrt{30}i}{24}$	0	$\frac{\sqrt{3}i}{24}$
		0	0	0	0	$\frac{\sqrt{15}i}{8}$	0	$-\frac{\sqrt{6}i}{24}$	0	$-\frac{\sqrt{3}i}{24}$	0

539	symmetry	z									
	$\mathbb{M}_{1}^{(1,1;a)}(A_2)$	$\frac{3\sqrt{70}}{50}$	0	0	0	0	$-\frac{\sqrt{70}}{50}$	0	0	0	0
		0	$\frac{\sqrt{70}}{50}$	0	0	0	0	$-\frac{\sqrt{105}}{50}$	0	0	0
		0	0	$-\frac{\sqrt{70}}{50}$	0	0	0	0	$-\frac{\sqrt{105}}{50}$	0	0
		0	0	0	$-\frac{3\sqrt{70}}{50}$	0	0	0	0	$-\frac{\sqrt{70}}{50}$	0
		0	0	0	0	$-\frac{\sqrt{70}}{35}$	0	0	0	0	0
		$-\frac{\sqrt{70}}{50}$	0	0	0	0	$-\frac{3\sqrt{70}}{175}$	0	0	0	0
		0	$-\frac{\sqrt{105}}{50}$	0	0	0	0	$-\frac{\sqrt{70}}{175}$	0	0	0
		0	0	$-\frac{\sqrt{105}}{50}$	0	0	0	0	$\frac{\sqrt{70}}{175}$	0	0
		0	0	0	$-\frac{\sqrt{70}}{50}$	0	0	0	0	$\frac{3\sqrt{70}}{175}$	0
		0	0	0	0	0	0	0	0	0	$\frac{\sqrt{70}}{35}$

540	symmetry	x

continued …

Table 8

No.	multipole	matrix

$\mathbb{M}_{1,1}^{(1,1;a)}(E)$

$$\begin{bmatrix}
0 & \frac{\sqrt{210}}{50} & 0 & 0 & \frac{\sqrt{14}}{20} & 0 & -\frac{\sqrt{35}}{100} & 0 & 0 & 0 \\[4pt]
\frac{\sqrt{210}}{50} & 0 & \frac{\sqrt{70}}{25} & 0 & 0 & \frac{\sqrt{210}}{100} & 0 & -\frac{\sqrt{105}}{100} & 0 & 0 \\[4pt]
0 & \frac{\sqrt{70}}{25} & 0 & \frac{\sqrt{210}}{50} & 0 & 0 & \frac{\sqrt{105}}{100} & 0 & -\frac{\sqrt{210}}{100} & 0 \\[4pt]
0 & 0 & \frac{\sqrt{210}}{50} & 0 & 0 & 0 & 0 & \frac{\sqrt{35}}{100} & 0 & -\frac{\sqrt{14}}{20} \\[4pt]
\frac{\sqrt{14}}{20} & 0 & 0 & 0 & 0 & -\frac{\sqrt{14}}{35} & 0 & 0 & 0 & 0 \\[4pt]
0 & \frac{\sqrt{210}}{100} & 0 & 0 & -\frac{\sqrt{14}}{35} & 0 & -\frac{4\sqrt{35}}{175} & 0 & 0 & 0 \\[4pt]
-\frac{\sqrt{35}}{100} & 0 & \frac{\sqrt{105}}{100} & 0 & 0 & -\frac{4\sqrt{35}}{175} & 0 & -\frac{3\sqrt{70}}{175} & 0 & 0 \\[4pt]
0 & -\frac{\sqrt{105}}{100} & 0 & \frac{\sqrt{35}}{100} & 0 & 0 & -\frac{3\sqrt{70}}{175} & 0 & -\frac{4\sqrt{35}}{175} & 0 \\[4pt]
0 & 0 & -\frac{\sqrt{210}}{100} & 0 & 0 & 0 & 0 & -\frac{4\sqrt{35}}{175} & 0 & -\frac{\sqrt{14}}{35} \\[4pt]
0 & 0 & 0 & -\frac{\sqrt{14}}{20} & 0 & 0 & 0 & 0 & -\frac{\sqrt{14}}{35} & 0
\end{bmatrix}$$

541	symmetry	$-y$

$\mathbb{M}_{1,2}^{(1,1;a)}(E)$

$$\begin{bmatrix}
0 & \frac{\sqrt{210}i}{50} & 0 & 0 & -\frac{\sqrt{14}i}{20} & 0 & -\frac{\sqrt{35}i}{100} & 0 & 0 & 0 \\[4pt]
-\frac{\sqrt{210}i}{50} & 0 & \frac{\sqrt{70}i}{25} & 0 & 0 & -\frac{\sqrt{210}i}{100} & 0 & -\frac{\sqrt{105}i}{100} & 0 & 0 \\[4pt]
0 & -\frac{\sqrt{70}i}{25} & 0 & \frac{\sqrt{210}i}{50} & 0 & 0 & -\frac{\sqrt{105}i}{100} & 0 & -\frac{\sqrt{210}i}{100} & 0 \\[4pt]
0 & 0 & -\frac{\sqrt{210}i}{50} & 0 & 0 & 0 & 0 & -\frac{\sqrt{35}i}{100} & 0 & -\frac{\sqrt{14}i}{20} \\[4pt]
\frac{\sqrt{14}i}{20} & 0 & 0 & 0 & 0 & -\frac{\sqrt{14}i}{35} & 0 & 0 & 0 & 0 \\[4pt]
0 & \frac{\sqrt{210}i}{100} & 0 & 0 & \frac{\sqrt{14}i}{35} & 0 & -\frac{4\sqrt{35}i}{175} & 0 & 0 & 0 \\[4pt]
\frac{\sqrt{35}i}{100} & 0 & \frac{\sqrt{105}i}{100} & 0 & 0 & \frac{4\sqrt{35}i}{175} & 0 & -\frac{3\sqrt{70}i}{175} & 0 & 0 \\[4pt]
0 & \frac{\sqrt{105}i}{100} & 0 & \frac{\sqrt{35}i}{100} & 0 & 0 & \frac{3\sqrt{70}i}{175} & 0 & -\frac{4\sqrt{35}i}{175} & 0 \\[4pt]
0 & 0 & \frac{\sqrt{210}i}{100} & 0 & 0 & 0 & 0 & \frac{4\sqrt{35}i}{175} & 0 & -\frac{\sqrt{14}i}{35} \\[4pt]
0 & 0 & 0 & \frac{\sqrt{14}i}{20} & 0 & 0 & 0 & 0 & \frac{\sqrt{14}i}{35} & 0
\end{bmatrix}$$

542	symmetry	$-\frac{z\left(3x^2+3y^2-2z^2\right)}{2}$

continued …

Table 8

No.	multipole	matrix

$$\mathbb{M}_3^{(1,1;a)}(A_2)$$

$$\begin{bmatrix}
-\frac{6\sqrt{35}}{175} & 0 & 0 & 0 & 0 & \frac{9\sqrt{35}}{350} & 0 & 0 & 0 \\
0 & \frac{18\sqrt{35}}{175} & 0 & 0 & 0 & 0 & -\frac{3\sqrt{210}}{350} & 0 & 0 \\
0 & 0 & -\frac{18\sqrt{35}}{175} & 0 & 0 & 0 & 0 & -\frac{3\sqrt{210}}{350} & 0 \\
0 & 0 & 0 & \frac{6\sqrt{35}}{175} & 0 & 0 & 0 & 0 & \frac{9\sqrt{35}}{350} \\
0 & 0 & 0 & 0 & \frac{\sqrt{35}}{105} & 0 & 0 & 0 & 0 \\
\frac{9\sqrt{35}}{350} & 0 & 0 & 0 & 0 & -\frac{\sqrt{35}}{75} & 0 & 0 & 0 \\
0 & -\frac{3\sqrt{210}}{350} & 0 & 0 & 0 & 0 & -\frac{4\sqrt{35}}{525} & 0 & 0 \\
0 & 0 & -\frac{3\sqrt{210}}{350} & 0 & 0 & 0 & 0 & \frac{4\sqrt{35}}{525} & 0 \\
0 & 0 & 0 & \frac{9\sqrt{35}}{350} & 0 & 0 & 0 & 0 & \frac{\sqrt{35}}{75} \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{35}}{105}
\end{bmatrix}$$

543   symmetry $\sqrt{15}xyz$

$$\mathbb{M}_3^{(1,1;a)}(B_1)$$

$$\begin{bmatrix}
0 & 0 & \frac{6\sqrt{7}i}{35} & 0 & 0 & 0 & 0 & -\frac{3\sqrt{42}i}{140} & 0 & 0 \\
0 & 0 & 0 & -\frac{6\sqrt{7}i}{35} & -\frac{3\sqrt{35}i}{140} & 0 & 0 & 0 & -\frac{3\sqrt{7}i}{140} & 0 \\
-\frac{6\sqrt{7}i}{35} & 0 & 0 & 0 & 0 & \frac{3\sqrt{7}i}{140} & 0 & 0 & 0 & \frac{3\sqrt{35}i}{140} \\
0 & \frac{6\sqrt{7}i}{35} & 0 & 0 & 0 & 0 & \frac{3\sqrt{42}i}{140} & 0 & 0 & 0 \\
0 & \frac{3\sqrt{35}i}{140} & 0 & 0 & 0 & 0 & -\frac{\sqrt{210}i}{210} & 0 & 0 & 0 \\
0 & 0 & -\frac{3\sqrt{7}i}{140} & 0 & 0 & 0 & 0 & -\frac{\sqrt{42}i}{210} & 0 & 0 \\
0 & 0 & 0 & -\frac{3\sqrt{42}i}{140} & \frac{\sqrt{210}i}{210} & 0 & 0 & 0 & \frac{\sqrt{42}i}{210} & 0 \\
\frac{3\sqrt{42}i}{140} & 0 & 0 & 0 & 0 & \frac{\sqrt{42}i}{210} & 0 & 0 & 0 & \frac{\sqrt{210}i}{210} \\
0 & \frac{3\sqrt{7}i}{140} & 0 & 0 & 0 & 0 & -\frac{\sqrt{42}i}{210} & 0 & 0 & 0 \\
0 & 0 & -\frac{3\sqrt{35}i}{140} & 0 & 0 & 0 & 0 & -\frac{\sqrt{210}i}{210} & 0 & 0
\end{bmatrix}$$

544   symmetry $\frac{\sqrt{15}z(x-y)(x+y)}{2}$

continued ...

Table 8

No.	multipole	matrix
	$\mathbb{M}_3^{(1,1;a)}(B_2)$	$\begin{pmatrix} 0 & 0 & -\frac{6\sqrt{7}}{35} & 0 & 0 & 0 & 0 & \frac{3\sqrt{42}}{140} & 0 & 0 \\ 0 & 0 & 0 & \frac{6\sqrt{7}}{35} & -\frac{3\sqrt{35}}{140} & 0 & 0 & 0 & \frac{3\sqrt{7}}{140} & 0 \\ -\frac{6\sqrt{7}}{35} & 0 & 0 & 0 & 0 & \frac{3\sqrt{7}}{140} & 0 & 0 & 0 & -\frac{3\sqrt{35}}{140} \\ 0 & \frac{6\sqrt{7}}{35} & 0 & 0 & 0 & 0 & \frac{3\sqrt{42}}{140} & 0 & 0 & 0 \\ 0 & -\frac{3\sqrt{35}}{140} & 0 & 0 & 0 & 0 & \frac{\sqrt{210}}{210} & 0 & 0 & 0 \\ 0 & 0 & \frac{3\sqrt{7}}{140} & 0 & 0 & 0 & 0 & \frac{\sqrt{42}}{210} & 0 & 0 \\ 0 & 0 & 0 & \frac{3\sqrt{42}}{140} & \frac{\sqrt{210}}{210} & 0 & 0 & 0 & -\frac{\sqrt{42}}{210} & 0 \\ \frac{3\sqrt{42}}{140} & 0 & 0 & 0 & 0 & \frac{\sqrt{42}}{210} & 0 & 0 & 0 & -\frac{\sqrt{210}}{210} \\ 0 & \frac{3\sqrt{7}}{140} & 0 & 0 & 0 & 0 & -\frac{\sqrt{42}}{210} & 0 & 0 & 0 \\ 0 & 0 & -\frac{3\sqrt{35}}{140} & 0 & 0 & 0 & 0 & -\frac{\sqrt{210}}{210} & 0 & 0 \end{pmatrix}$
545	symmetry	$\frac{x(2x^2-3y^2-3z^2)}{2}$
	$\mathbb{M}_{3,1}^{(1,1;a)}(E,1)$	$\begin{bmatrix} 0 & \frac{3\sqrt{105}}{175} & 0 & -\frac{3\sqrt{35}}{35} & \frac{9\sqrt{7}}{560} & 0 & -\frac{27\sqrt{70}}{2800} & 0 & \frac{9\sqrt{35}}{560} & 0 \\ \frac{3\sqrt{105}}{175} & 0 & -\frac{9\sqrt{35}}{175} & 0 & 0 & -\frac{3\sqrt{105}}{400} & 0 & \frac{3\sqrt{210}}{2800} & 0 & \frac{3\sqrt{21}}{112} \\ 0 & -\frac{9\sqrt{35}}{175} & 0 & \frac{3\sqrt{105}}{175} & -\frac{3\sqrt{21}}{112} & 0 & -\frac{3\sqrt{210}}{2800} & 0 & \frac{3\sqrt{105}}{400} & 0 \\ -\frac{3\sqrt{35}}{35} & 0 & \frac{3\sqrt{105}}{175} & 0 & 0 & -\frac{9\sqrt{35}}{560} & 0 & \frac{27\sqrt{70}}{2800} & 0 & -\frac{9\sqrt{7}}{560} \\ \frac{9\sqrt{7}}{560} & 0 & -\frac{3\sqrt{21}}{112} & 0 & 0 & -\frac{\sqrt{7}}{70} & 0 & \frac{\sqrt{14}}{84} & 0 & 0 \\ 0 & -\frac{3\sqrt{105}}{400} & 0 & -\frac{9\sqrt{35}}{560} & -\frac{\sqrt{7}}{70} & 0 & \frac{\sqrt{70}}{700} & 0 & \frac{\sqrt{35}}{105} & 0 \\ -\frac{27\sqrt{70}}{2800} & 0 & -\frac{3\sqrt{210}}{2800} & 0 & 0 & \frac{\sqrt{70}}{700} & 0 & \frac{\sqrt{35}}{175} & 0 & \frac{\sqrt{14}}{84} \\ 0 & \frac{3\sqrt{210}}{2800} & 0 & \frac{27\sqrt{70}}{2800} & \frac{\sqrt{14}}{84} & 0 & \frac{\sqrt{35}}{175} & 0 & \frac{\sqrt{70}}{700} & 0 \\ \frac{9\sqrt{35}}{560} & 0 & \frac{3\sqrt{105}}{400} & 0 & 0 & \frac{\sqrt{35}}{105} & 0 & \frac{\sqrt{70}}{700} & 0 & -\frac{\sqrt{7}}{70} \\ 0 & \frac{3\sqrt{21}}{112} & 0 & -\frac{9\sqrt{7}}{560} & 0 & 0 & \frac{\sqrt{14}}{84} & 0 & -\frac{\sqrt{7}}{70} & 0 \end{bmatrix}$
546	symmetry	$\frac{y(3x^2-2y^2+3z^2)}{2}$

continued …

Table 8

No.	multipole	matrix

$\mathbb{M}_{3,2}^{(1,1;a)}(E,1)$

0	$\frac{3\sqrt{105}i}{175}$	0	$\frac{3\sqrt{35}i}{35}$	$-\frac{9\sqrt{7}i}{560}$	0	$-\frac{27\sqrt{70}i}{2800}$	0	$-\frac{9\sqrt{35}i}{560}$	0
$-\frac{3\sqrt{105}i}{175}$	0	$-\frac{9\sqrt{35}i}{175}$	0	0	$\frac{3\sqrt{105}i}{400}$	0	$\frac{3\sqrt{210}i}{2800}$	0	$-\frac{3\sqrt{21}i}{112}$
0	$\frac{9\sqrt{35}i}{175}$	0	$\frac{3\sqrt{105}i}{175}$	$-\frac{3\sqrt{21}i}{112}$	0	$\frac{3\sqrt{210}i}{2800}$	0	$\frac{3\sqrt{105}i}{400}$	0
$-\frac{3\sqrt{35}i}{35}$	0	$-\frac{3\sqrt{105}i}{175}$	0	0	$-\frac{9\sqrt{35}i}{560}$	0	$-\frac{27\sqrt{70}i}{2800}$	0	$-\frac{9\sqrt{7}i}{560}$
$\frac{9\sqrt{7}i}{560}$	0	$\frac{3\sqrt{21}i}{112}$	0	0	$-\frac{\sqrt{7}i}{70}$	0	$-\frac{\sqrt{14}i}{84}$	0	0
0	$-\frac{3\sqrt{105}i}{400}$	0	$\frac{9\sqrt{35}i}{560}$	$\frac{\sqrt{7}i}{70}$	0	$\frac{\sqrt{70}i}{700}$	0	$-\frac{\sqrt{35}i}{105}$	0
$\frac{27\sqrt{70}i}{2800}$	0	$-\frac{3\sqrt{210}i}{2800}$	0	0	$-\frac{\sqrt{70}i}{700}$	0	$\frac{\sqrt{35}i}{175}$	0	$-\frac{\sqrt{14}i}{84}$
0	$-\frac{3\sqrt{210}i}{2800}$	0	$\frac{27\sqrt{70}i}{2800}$	$\frac{\sqrt{14}i}{84}$	0	$-\frac{\sqrt{35}i}{175}$	0	$\frac{\sqrt{70}i}{700}$	0
$\frac{9\sqrt{35}i}{560}$	0	$-\frac{3\sqrt{105}i}{400}$	0	0	$\frac{\sqrt{35}i}{105}$	0	$-\frac{\sqrt{70}i}{700}$	0	$-\frac{\sqrt{7}i}{70}$
0	$\frac{3\sqrt{21}i}{112}$	0	$\frac{9\sqrt{7}i}{560}$	0	0	$\frac{\sqrt{14}i}{84}$	0	$\frac{\sqrt{7}i}{70}$	0

547	symmetry	$\frac{\sqrt{15}x(y-z)(y+z)}{2}$

$\mathbb{M}_{3,1}^{(1,1;a)}(E,2)$

0	$\frac{3\sqrt{7}}{35}$	0	$\frac{3\sqrt{21}}{35}$	$\frac{3\sqrt{105}}{560}$	0	$-\frac{9\sqrt{42}}{560}$	0	$-\frac{9\sqrt{21}}{560}$	0
$\frac{3\sqrt{7}}{35}$	0	$-\frac{3\sqrt{21}}{35}$	0	0	$-\frac{3\sqrt{7}}{80}$	0	$\frac{3\sqrt{14}}{560}$	0	$-\frac{9\sqrt{35}}{560}$
0	$-\frac{3\sqrt{21}}{35}$	0	$\frac{3\sqrt{7}}{35}$	$\frac{9\sqrt{35}}{560}$	0	$-\frac{3\sqrt{14}}{560}$	0	$\frac{3\sqrt{7}}{80}$	0
$\frac{3\sqrt{21}}{35}$	0	$\frac{3\sqrt{7}}{35}$	0	0	$\frac{9\sqrt{21}}{560}$	0	$\frac{9\sqrt{42}}{560}$	0	$-\frac{3\sqrt{105}}{560}$
$\frac{3\sqrt{105}}{560}$	0	$\frac{9\sqrt{35}}{560}$	0	0	$-\frac{\sqrt{105}}{210}$	0	$-\frac{\sqrt{210}}{420}$	0	0
0	$-\frac{3\sqrt{7}}{80}$	0	$\frac{9\sqrt{21}}{560}$	$-\frac{\sqrt{105}}{210}$	0	$\frac{\sqrt{42}}{420}$	0	$-\frac{\sqrt{21}}{105}$	0
$-\frac{9\sqrt{42}}{560}$	0	$-\frac{3\sqrt{14}}{560}$	0	0	$\frac{\sqrt{42}}{420}$	0	$\frac{\sqrt{21}}{105}$	0	$-\frac{\sqrt{210}}{420}$
0	$\frac{3\sqrt{14}}{560}$	0	$\frac{9\sqrt{42}}{560}$	$-\frac{\sqrt{210}}{420}$	0	$\frac{\sqrt{21}}{105}$	0	$\frac{\sqrt{42}}{420}$	0
$-\frac{9\sqrt{21}}{560}$	0	$\frac{3\sqrt{7}}{80}$	0	0	$-\frac{\sqrt{21}}{105}$	0	$\frac{\sqrt{42}}{420}$	0	$-\frac{\sqrt{105}}{210}$
0	$-\frac{9\sqrt{35}}{560}$	0	$-\frac{3\sqrt{105}}{560}$	0	0	$-\frac{\sqrt{210}}{420}$	0	$-\frac{\sqrt{105}}{210}$	0

548	symmetry	$-\frac{\sqrt{15}y(x-z)(x+z)}{2}$

Table 8

No.	multipole	matrix

$\mathbb{M}_{3,2}^{(1,1;a)}(E,2)$

$$\begin{pmatrix}
0 & \frac{3\sqrt{7}i}{35} & 0 & -\frac{3\sqrt{21}i}{35} & -\frac{3\sqrt{105}i}{560} & 0 & -\frac{9\sqrt{42}i}{560} & 0 & \frac{9\sqrt{21}i}{560} & 0 \\
-\frac{3\sqrt{7}i}{35} & 0 & -\frac{3\sqrt{21}i}{35} & 0 & 0 & \frac{3\sqrt{7}i}{80} & 0 & \frac{3\sqrt{14}i}{560} & 0 & \frac{9\sqrt{35}i}{560} \\
0 & \frac{3\sqrt{21}i}{35} & 0 & \frac{3\sqrt{7}i}{35} & \frac{9\sqrt{35}i}{560} & 0 & \frac{3\sqrt{14}i}{560} & 0 & \frac{3\sqrt{7}i}{80} & 0 \\
\frac{3\sqrt{21}i}{35} & 0 & -\frac{3\sqrt{7}i}{35} & 0 & 0 & \frac{9\sqrt{21}i}{560} & 0 & -\frac{9\sqrt{42}i}{560} & 0 & -\frac{3\sqrt{105}i}{560} \\
\frac{3\sqrt{105}i}{560} & 0 & -\frac{9\sqrt{35}i}{560} & 0 & 0 & -\frac{\sqrt{105}i}{210} & 0 & \frac{\sqrt{210}i}{420} & 0 & 0 \\
0 & -\frac{3\sqrt{7}i}{80} & 0 & -\frac{9\sqrt{21}i}{560} & \frac{\sqrt{105}i}{210} & 0 & \frac{\sqrt{42}i}{420} & 0 & \frac{\sqrt{21}i}{105} & 0 \\
\frac{9\sqrt{42}i}{560} & 0 & -\frac{3\sqrt{14}i}{560} & 0 & 0 & -\frac{\sqrt{42}i}{420} & 0 & \frac{\sqrt{21}i}{105} & 0 & \frac{\sqrt{210}i}{420} \\
0 & -\frac{3\sqrt{14}i}{560} & 0 & \frac{9\sqrt{42}i}{560} & -\frac{\sqrt{210}i}{420} & 0 & -\frac{\sqrt{21}i}{105} & 0 & \frac{\sqrt{42}i}{420} & 0 \\
-\frac{9\sqrt{21}i}{560} & 0 & -\frac{3\sqrt{7}i}{80} & 0 & 0 & -\frac{\sqrt{21}i}{105} & 0 & -\frac{\sqrt{42}i}{420} & 0 & -\frac{\sqrt{105}i}{210} \\
0 & -\frac{9\sqrt{35}i}{560} & 0 & \frac{3\sqrt{105}i}{560} & 0 & 0 & -\frac{\sqrt{210}i}{420} & 0 & \frac{\sqrt{105}i}{210} & 0
\end{pmatrix}$$

bra: $= \langle\frac{3}{2},\frac{3}{2};d|, \langle\frac{3}{2},\frac{1}{2};d|, \langle\frac{3}{2},-\frac{1}{2};d|, \langle\frac{3}{2},-\frac{3}{2};d|, \langle\frac{5}{2},\frac{5}{2};d|, \langle\frac{5}{2},\frac{3}{2};d|, \langle\frac{5}{2},\frac{1}{2};d|, \langle\frac{5}{2},-\frac{1}{2};d|, \langle\frac{5}{2},-\frac{3}{2};d|, \langle\frac{5}{2},-\frac{5}{2};d|$

ket: $= |\frac{5}{2},\frac{5}{2};f\rangle, |\frac{5}{2},\frac{3}{2};f\rangle, |\frac{5}{2},\frac{1}{2};f\rangle, |\frac{5}{2},-\frac{1}{2};f\rangle, |\frac{5}{2},-\frac{3}{2};f\rangle, |\frac{5}{2},-\frac{5}{2};f\rangle, |\frac{7}{2},\frac{7}{2};f\rangle, |\frac{7}{2},\frac{5}{2};f\rangle, |\frac{7}{2},\frac{3}{2};f\rangle, |\frac{7}{2},\frac{1}{2};f\rangle, |\frac{7}{2},-\frac{1}{2};f\rangle, |\frac{7}{2},-\frac{3}{2};f\rangle, |\frac{7}{2},-\frac{5}{2};f\rangle, |\frac{7}{2},-\frac{7}{2};f\rangle$

Table 9: (d,f) block.

No.	multipole	matrix
549	symmetry	z

$\mathbb{Q}_1^{(a)}(B_2)$

$$\begin{pmatrix}
0 & \frac{1}{5} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & \frac{\sqrt{6}}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & \frac{\sqrt{6}}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & \frac{1}{5} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
-\frac{1}{14} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{14} & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & -\frac{3}{70} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}}{14} & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & -\frac{1}{70} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{7} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & \frac{1}{70} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{7} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & \frac{3}{70} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}}{14} & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & \frac{1}{14} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{14} & 0
\end{pmatrix}$$

Table 9

No.	multipole	matrix
550	symmetry	x

$$\mathbb{Q}_{1,1}^{(a)}(E) = \begin{bmatrix}
-\frac{\sqrt{5}}{10} & 0 & \frac{\sqrt{2}}{20} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & -\frac{\sqrt{3}}{10} & 0 & \frac{\sqrt{6}}{20} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & -\frac{\sqrt{6}}{20} & 0 & \frac{\sqrt{3}}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & -\frac{\sqrt{2}}{20} & 0 & \frac{\sqrt{5}}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & -\frac{\sqrt{5}}{70} & 0 & 0 & 0 & 0 & -\frac{\sqrt{42}}{28} & 0 & \frac{\sqrt{2}}{28} & 0 & 0 & 0 & 0 & 0 \\
-\frac{\sqrt{5}}{70} & 0 & -\frac{\sqrt{2}}{35} & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}}{28} & 0 & \frac{\sqrt{6}}{28} & 0 & 0 & 0 & 0 \\
0 & -\frac{\sqrt{2}}{35} & 0 & -\frac{3}{70} & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}}{14} & 0 & \frac{\sqrt{3}}{14} & 0 & 0 & 0 \\
0 & 0 & -\frac{3}{70} & 0 & -\frac{\sqrt{2}}{35} & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{14} & 0 & \frac{\sqrt{5}}{14} & 0 & 0 \\
0 & 0 & 0 & -\frac{\sqrt{2}}{35} & 0 & -\frac{\sqrt{5}}{70} & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}}{28} & 0 & \frac{\sqrt{30}}{28} & 0 \\
0 & 0 & 0 & 0 & -\frac{\sqrt{5}}{70} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}}{28} & 0 & \frac{\sqrt{42}}{28}
\end{bmatrix}$$

No.	multipole	matrix
551	symmetry	y

$$\mathbb{Q}_{1,2}^{(a)}(E) = \begin{bmatrix}
-\frac{\sqrt{5}i}{10} & 0 & -\frac{\sqrt{2}i}{20} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & -\frac{\sqrt{3}i}{10} & 0 & -\frac{\sqrt{6}i}{20} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & -\frac{\sqrt{6}i}{20} & 0 & -\frac{\sqrt{3}i}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & -\frac{\sqrt{2}i}{20} & 0 & -\frac{\sqrt{5}i}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & \frac{\sqrt{5}i}{70} & 0 & 0 & 0 & 0 & -\frac{\sqrt{42}i}{28} & 0 & -\frac{\sqrt{2}i}{28} & 0 & 0 & 0 & 0 & 0 \\
-\frac{\sqrt{5}i}{70} & 0 & \frac{\sqrt{2}i}{35} & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}i}{28} & 0 & -\frac{\sqrt{6}i}{28} & 0 & 0 & 0 & 0 \\
0 & -\frac{\sqrt{2}i}{35} & 0 & \frac{3i}{70} & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{14} & 0 & -\frac{\sqrt{3}i}{14} & 0 & 0 & 0 \\
0 & 0 & -\frac{3i}{70} & 0 & \frac{\sqrt{2}i}{35} & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{14} & 0 & -\frac{\sqrt{5}i}{14} & 0 & 0 \\
0 & 0 & 0 & -\frac{\sqrt{2}i}{35} & 0 & \frac{\sqrt{5}i}{70} & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{28} & 0 & -\frac{\sqrt{30}i}{28} & 0 \\
0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{70} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}i}{28} & 0 & -\frac{\sqrt{42}i}{28}
\end{bmatrix}$$

No.	multipole	matrix
552	symmetry	$\sqrt{15}xyz$

Table 9

No.	multipole	matrix

$$\mathbb{Q}_3^{(a)}(A_1)=\begin{pmatrix}
0 & 0 & 0 & \frac{3\sqrt{70}i}{140} & 0 & 0 & -\frac{\sqrt{6}i}{24} & 0 & 0 & 0 & \frac{\sqrt{210}i}{168} & 0 & 0 & 0 \\
\frac{\sqrt{21}i}{28} & 0 & 0 & 0 & \frac{\sqrt{105}i}{140} & 0 & 0 & \frac{\sqrt{14}i}{56} & 0 & 0 & 0 & \frac{\sqrt{42}i}{56} & 0 & 0 \\
0 & -\frac{\sqrt{105}i}{140} & 0 & 0 & 0 & -\frac{\sqrt{21}i}{28} & 0 & 0 & \frac{\sqrt{42}i}{56} & 0 & 0 & 0 & \frac{\sqrt{14}i}{56} & 0 \\
0 & 0 & -\frac{3\sqrt{70}i}{140} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{210}i}{168} & 0 & 0 & 0 & -\frac{\sqrt{6}i}{24} \\
0 & 0 & -\frac{\sqrt{14}i}{28} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{42}i}{42} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & -\frac{\sqrt{70}i}{140} & 0 & 0 & \frac{\sqrt{6}i}{12} & 0 & 0 & 0 & \frac{\sqrt{210}i}{84} & 0 & 0 & 0 \\
\frac{\sqrt{14}i}{28} & 0 & 0 & 0 & \frac{\sqrt{70}i}{140} & 0 & 0 & \frac{\sqrt{21}i}{84} & 0 & 0 & 0 & \frac{\sqrt{7}i}{28} & 0 & 0 \\
0 & \frac{\sqrt{70}i}{140} & 0 & 0 & 0 & \frac{\sqrt{14}i}{28} & 0 & 0 & -\frac{\sqrt{7}i}{28} & 0 & 0 & 0 & -\frac{\sqrt{21}i}{84} & 0 \\
0 & 0 & -\frac{\sqrt{70}i}{140} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{210}i}{84} & 0 & 0 & 0 & -\frac{\sqrt{6}i}{12} \\
0 & 0 & 0 & -\frac{\sqrt{14}i}{28} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{42}i}{42} & 0 & 0 & 0
\end{pmatrix}$$

No.	symmetry
553	$\dfrac{\sqrt{15}z(x-y)(x+y)}{2}$

$$\mathbb{Q}_3^{(a)}(A_2)=\begin{pmatrix}
0 & 0 & 0 & -\frac{3\sqrt{70}}{140} & 0 & 0 & -\frac{\sqrt{6}}{24} & 0 & 0 & 0 & -\frac{\sqrt{210}}{168} & 0 & 0 & 0 \\
\frac{\sqrt{21}}{28} & 0 & 0 & 0 & -\frac{\sqrt{105}}{140} & 0 & 0 & \frac{\sqrt{14}}{56} & 0 & 0 & 0 & -\frac{\sqrt{42}}{56} & 0 & 0 \\
0 & -\frac{\sqrt{105}}{140} & 0 & 0 & 0 & \frac{\sqrt{21}}{28} & 0 & 0 & \frac{\sqrt{42}}{56} & 0 & 0 & 0 & -\frac{\sqrt{14}}{56} & 0 \\
0 & 0 & -\frac{3\sqrt{70}}{140} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{210}}{168} & 0 & 0 & 0 & \frac{\sqrt{6}}{24} \\
0 & 0 & \frac{\sqrt{14}}{28} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{42}}{42} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & \frac{\sqrt{70}}{140} & 0 & 0 & \frac{\sqrt{6}}{12} & 0 & 0 & 0 & -\frac{\sqrt{210}}{84} & 0 & 0 & 0 \\
\frac{\sqrt{14}}{28} & 0 & 0 & 0 & -\frac{\sqrt{70}}{140} & 0 & 0 & \frac{\sqrt{21}}{84} & 0 & 0 & 0 & -\frac{\sqrt{7}}{28} & 0 & 0 \\
0 & \frac{\sqrt{70}}{140} & 0 & 0 & 0 & -\frac{\sqrt{14}}{28} & 0 & 0 & -\frac{\sqrt{7}}{28} & 0 & 0 & 0 & \frac{\sqrt{21}}{84} & 0 \\
0 & 0 & -\frac{\sqrt{70}}{140} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{210}}{84} & 0 & 0 & 0 & \frac{\sqrt{6}}{12} \\
0 & 0 & 0 & -\frac{\sqrt{14}}{28} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{42}}{42} & 0 & 0 & 0
\end{pmatrix}$$

No.	symmetry
554	$-\dfrac{z\left(3x^2+3y^2-2z^2\right)}{2}$

Table 9

No.	multipole	matrix

$\mathbb{Q}_3^{(a)}(B_2)$

$$\begin{bmatrix}
0 & -\frac{3\sqrt{21}}{70} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{210}}{84} & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & \frac{3\sqrt{14}}{70} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{42}}{84} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & \frac{3\sqrt{14}}{70} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{42}}{84} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & -\frac{3\sqrt{21}}{70} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{210}}{84} & 0 & 0 \\
\frac{\sqrt{21}}{42} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{14}}{14} & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & -\frac{\sqrt{21}}{30} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & -\frac{2\sqrt{21}}{105} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}}{14} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & \frac{2\sqrt{21}}{105} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}}{14} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & \frac{\sqrt{21}}{30} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{21}}{42} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{14}}{14} & 0
\end{bmatrix}$$

555	symmetry	$\dfrac{x(2x^2-3y^2-3z^2)}{2}$

$\mathbb{Q}_{3,1}^{(a)}(E,1)$

$$\begin{bmatrix}
-\frac{3\sqrt{105}}{560} & 0 & \frac{9\sqrt{42}}{560} & 0 & -\frac{3\sqrt{21}}{112} & 0 & 0 & -\frac{\sqrt{70}}{112} & 0 & \frac{\sqrt{14}}{56} & 0 & -\frac{\sqrt{210}}{336} & 0 & 0 \\
0 & \frac{3\sqrt{7}}{80} & 0 & -\frac{3\sqrt{14}}{560} & 0 & -\frac{3\sqrt{35}}{112} & -\frac{\sqrt{30}}{48} & 0 & 0 & 0 & \frac{\sqrt{42}}{112} & 0 & -\frac{\sqrt{210}}{168} & 0 \\
\frac{3\sqrt{35}}{112} & 0 & \frac{3\sqrt{14}}{560} & 0 & -\frac{3\sqrt{7}}{80} & 0 & 0 & -\frac{\sqrt{210}}{168} & 0 & \frac{\sqrt{42}}{112} & 0 & 0 & 0 & -\frac{\sqrt{30}}{48} \\
0 & \frac{3\sqrt{21}}{112} & 0 & -\frac{9\sqrt{42}}{560} & 0 & \frac{3\sqrt{105}}{560} & 0 & 0 & -\frac{\sqrt{210}}{336} & 0 & \frac{\sqrt{14}}{56} & 0 & -\frac{\sqrt{70}}{112} & 0 \\
0 & -\frac{\sqrt{105}}{140} & 0 & \frac{\sqrt{210}}{168} & 0 & 0 & -\frac{\sqrt{2}}{16} & 0 & \frac{\sqrt{42}}{56} & 0 & -\frac{\sqrt{70}}{112} & 0 & 0 & 0 \\
-\frac{\sqrt{105}}{140} & 0 & \frac{\sqrt{42}}{280} & 0 & \frac{\sqrt{21}}{42} & 0 & 0 & \frac{\sqrt{70}}{112} & 0 & \frac{\sqrt{14}}{56} & 0 & -\frac{\sqrt{210}}{112} & 0 & 0 \\
0 & \frac{\sqrt{42}}{280} & 0 & \frac{\sqrt{21}}{70} & 0 & \frac{\sqrt{210}}{168} & \frac{\sqrt{5}}{16} & 0 & \frac{\sqrt{105}}{112} & 0 & -\frac{\sqrt{7}}{112} & 0 & -\frac{3\sqrt{35}}{112} & 0 \\
\frac{\sqrt{210}}{168} & 0 & \frac{\sqrt{21}}{70} & 0 & \frac{\sqrt{42}}{280} & 0 & 0 & \frac{3\sqrt{35}}{112} & 0 & \frac{\sqrt{7}}{112} & 0 & -\frac{\sqrt{105}}{112} & 0 & -\frac{\sqrt{5}}{16} \\
0 & \frac{\sqrt{21}}{42} & 0 & \frac{\sqrt{42}}{280} & 0 & -\frac{\sqrt{105}}{140} & 0 & 0 & \frac{\sqrt{210}}{112} & 0 & -\frac{\sqrt{14}}{56} & 0 & -\frac{\sqrt{70}}{112} & 0 \\
0 & 0 & \frac{\sqrt{210}}{168} & 0 & -\frac{\sqrt{105}}{140} & 0 & 0 & 0 & 0 & \frac{\sqrt{70}}{112} & 0 & -\frac{\sqrt{42}}{56} & 0 & \frac{\sqrt{2}}{16}
\end{bmatrix}$$

556	symmetry	$-\dfrac{y(3x^2-2y^2+3z^2)}{2}$

Table 9

No.	multipole	matrix

$\mathbb{Q}_{3,2}^{(a)}(E,1)$

$$\begin{bmatrix}
-\frac{3\sqrt{105}i}{560} & 0 & -\frac{9\sqrt{42}i}{560} & 0 & -\frac{3\sqrt{21}i}{112} & 0 & 0 & -\frac{\sqrt{70}i}{112} & 0 & -\frac{\sqrt{14}i}{56} & 0 & -\frac{\sqrt{210}i}{336} & 0 & 0 \\
0 & \frac{3\sqrt{7}i}{80} & 0 & \frac{3\sqrt{14}i}{560} & 0 & -\frac{3\sqrt{35}i}{112} & \frac{\sqrt{30}i}{48} & 0 & 0 & 0 & -\frac{\sqrt{42}i}{112} & 0 & -\frac{\sqrt{210}i}{168} & 0 \\
-\frac{3\sqrt{35}i}{112} & 0 & \frac{3\sqrt{14}i}{560} & 0 & \frac{3\sqrt{7}i}{80} & 0 & 0 & \frac{\sqrt{210}i}{168} & 0 & \frac{\sqrt{42}i}{112} & 0 & 0 & 0 & -\frac{\sqrt{30}i}{48} \\
0 & -\frac{3\sqrt{21}i}{112} & 0 & -\frac{9\sqrt{42}i}{560} & 0 & -\frac{3\sqrt{105}i}{560} & 0 & 0 & \frac{\sqrt{210}i}{336} & 0 & \frac{\sqrt{14}i}{56} & 0 & \frac{\sqrt{70}i}{112} & 0 \\
0 & \frac{\sqrt{105}i}{140} & 0 & \frac{\sqrt{210}i}{168} & 0 & 0 & -\frac{\sqrt{2}i}{16} & 0 & -\frac{\sqrt{42}i}{56} & 0 & -\frac{\sqrt{70}i}{112} & 0 & 0 & 0 \\
-\frac{\sqrt{105}i}{140} & 0 & -\frac{\sqrt{42}i}{280} & 0 & \frac{\sqrt{21}i}{42} & 0 & 0 & \frac{\sqrt{70}i}{112} & 0 & -\frac{\sqrt{14}i}{56} & 0 & -\frac{\sqrt{210}i}{112} & 0 & 0 \\
0 & \frac{\sqrt{42}i}{280} & 0 & -\frac{\sqrt{21}i}{70} & 0 & \frac{\sqrt{210}i}{168} & -\frac{\sqrt{5}i}{16} & 0 & \frac{\sqrt{105}i}{112} & 0 & \frac{\sqrt{7}i}{112} & 0 & -\frac{3\sqrt{35}i}{112} & 0 \\
-\frac{\sqrt{210}i}{168} & 0 & \frac{\sqrt{21}i}{70} & 0 & -\frac{\sqrt{42}i}{280} & 0 & 0 & -\frac{3\sqrt{35}i}{112} & 0 & \frac{\sqrt{7}i}{112} & 0 & \frac{\sqrt{105}i}{112} & 0 & -\frac{\sqrt{5}i}{16} \\
0 & -\frac{\sqrt{21}i}{42} & 0 & \frac{\sqrt{42}i}{280} & 0 & \frac{\sqrt{105}i}{140} & 0 & 0 & -\frac{\sqrt{210}i}{112} & 0 & -\frac{\sqrt{14}i}{56} & 0 & \frac{\sqrt{70}i}{112} & 0 \\
0 & 0 & -\frac{\sqrt{210}i}{168} & 0 & -\frac{\sqrt{105}i}{140} & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}i}{112} & 0 & -\frac{\sqrt{42}i}{56} & 0 & -\frac{\sqrt{2}i}{16}
\end{bmatrix}$$

| 557 | symmetry | $\dfrac{\sqrt{15}x(y-z)(y+z)}{2}$ |

$\mathbb{Q}_{3,1}^{(a)}(E,2)$

$$\begin{bmatrix}
-\frac{3\sqrt{7}}{112} & 0 & \frac{9\sqrt{70}}{560} & 0 & \frac{9\sqrt{35}}{560} & 0 & 0 & -\frac{5\sqrt{42}}{336} & 0 & \frac{\sqrt{210}}{168} & 0 & \frac{\sqrt{14}}{112} & 0 & 0 \\
0 & \frac{\sqrt{105}}{80} & 0 & -\frac{\sqrt{210}}{560} & 0 & \frac{3\sqrt{21}}{112} & \frac{\sqrt{2}}{16} & 0 & 0 & 0 & \frac{\sqrt{70}}{112} & 0 & \frac{\sqrt{14}}{56} & 0 \\
-\frac{3\sqrt{21}}{112} & 0 & \frac{\sqrt{210}}{560} & 0 & -\frac{\sqrt{105}}{80} & 0 & 0 & \frac{\sqrt{14}}{56} & 0 & \frac{\sqrt{70}}{112} & 0 & 0 & 0 & \frac{\sqrt{2}}{16} \\
0 & -\frac{9\sqrt{35}}{560} & 0 & -\frac{9\sqrt{70}}{560} & 0 & \frac{3\sqrt{7}}{112} & 0 & 0 & \frac{\sqrt{14}}{112} & 0 & \frac{\sqrt{210}}{168} & 0 & -\frac{5\sqrt{42}}{336} & 0 \\
0 & -\frac{\sqrt{7}}{28} & 0 & -\frac{\sqrt{14}}{56} & 0 & 0 & -\frac{\sqrt{30}}{48} & 0 & \frac{\sqrt{70}}{56} & 0 & \frac{\sqrt{42}}{112} & 0 & 0 & 0 \\
-\frac{\sqrt{7}}{28} & 0 & \frac{\sqrt{70}}{280} & 0 & -\frac{\sqrt{35}}{70} & 0 & 0 & \frac{5\sqrt{42}}{336} & 0 & \frac{\sqrt{210}}{168} & 0 & \frac{3\sqrt{14}}{112} & 0 & 0 \\
0 & \frac{\sqrt{70}}{280} & 0 & \frac{\sqrt{35}}{70} & 0 & -\frac{\sqrt{14}}{56} & -\frac{\sqrt{3}}{16} & 0 & \frac{5\sqrt{7}}{112} & 0 & -\frac{\sqrt{105}}{336} & 0 & \frac{3\sqrt{21}}{112} & 0 \\
-\frac{\sqrt{14}}{56} & 0 & \frac{\sqrt{35}}{70} & 0 & \frac{\sqrt{70}}{280} & 0 & 0 & -\frac{3\sqrt{21}}{112} & 0 & \frac{\sqrt{105}}{336} & 0 & -\frac{5\sqrt{7}}{112} & 0 & \frac{\sqrt{3}}{16} \\
0 & -\frac{\sqrt{35}}{70} & 0 & \frac{\sqrt{70}}{280} & 0 & -\frac{\sqrt{7}}{28} & 0 & 0 & -\frac{3\sqrt{14}}{112} & 0 & -\frac{\sqrt{210}}{168} & 0 & -\frac{5\sqrt{42}}{336} & 0 \\
0 & 0 & -\frac{\sqrt{14}}{56} & 0 & -\frac{\sqrt{7}}{28} & 0 & 0 & 0 & 0 & -\frac{\sqrt{42}}{112} & 0 & -\frac{\sqrt{70}}{56} & 0 & \frac{\sqrt{30}}{48}
\end{bmatrix}$$

| 558 | symmetry | $\dfrac{\sqrt{15}y(x-z)(x+z)}{2}$ |

Table 9

No.	multipole	matrix

$\mathbb{Q}_{3,2}^{(a)}(E,2)$

$-\frac{3\sqrt{7}i}{112}$	0	$-\frac{9\sqrt{70}i}{560}$	0	$\frac{9\sqrt{35}i}{560}$	0	0	$-\frac{5\sqrt{42}i}{336}$	0	$-\frac{\sqrt{210}i}{168}$	0	$\frac{\sqrt{14}i}{112}$	0	0
0	$\frac{\sqrt{105}i}{80}$	0	$\frac{\sqrt{210}i}{560}$	0	$\frac{3\sqrt{21}i}{112}$	$-\frac{\sqrt{2}i}{16}$	0	0	0	$-\frac{\sqrt{70}i}{112}$	0	$\frac{\sqrt{14}i}{56}$	0
$\frac{3\sqrt{21}i}{112}$	0	$\frac{\sqrt{210}i}{560}$	0	$\frac{\sqrt{105}i}{80}$	0	0	$-\frac{\sqrt{14}i}{56}$	0	$\frac{\sqrt{70}i}{112}$	0	0	0	$\frac{\sqrt{2}i}{16}$
0	$\frac{9\sqrt{35}i}{560}$	0	$-\frac{9\sqrt{70}i}{560}$	0	$-\frac{3\sqrt{7}i}{112}$	0	0	$-\frac{\sqrt{14}i}{112}$	0	$\frac{\sqrt{210}i}{168}$	0	$\frac{5\sqrt{42}i}{336}$	0
0	$\frac{\sqrt{7}i}{28}$	0	$-\frac{\sqrt{14}i}{56}$	0	0	$-\frac{\sqrt{30}i}{48}$	0	$-\frac{\sqrt{70}i}{56}$	0	$\frac{\sqrt{42}i}{112}$	0	0	0
$-\frac{\sqrt{7}i}{28}$	0	$-\frac{\sqrt{70}i}{280}$	0	$-\frac{\sqrt{35}i}{70}$	0	0	$\frac{5\sqrt{42}i}{336}$	0	$-\frac{\sqrt{210}i}{168}$	0	$\frac{3\sqrt{14}i}{112}$	0	0
0	$\frac{\sqrt{70}i}{280}$	0	$-\frac{\sqrt{35}i}{70}$	0	$-\frac{\sqrt{14}i}{56}$	$\frac{\sqrt{3}i}{16}$	0	$\frac{5\sqrt{7}i}{112}$	0	$\frac{\sqrt{105}i}{336}$	0	$\frac{3\sqrt{21}i}{112}$	0
$\frac{\sqrt{14}i}{56}$	0	$\frac{\sqrt{35}i}{70}$	0	$-\frac{\sqrt{70}i}{280}$	0	0	$\frac{3\sqrt{21}i}{112}$	0	$\frac{\sqrt{105}i}{336}$	0	$\frac{5\sqrt{7}i}{112}$	0	$\frac{\sqrt{3}i}{16}$
0	$\frac{\sqrt{35}i}{70}$	0	$\frac{\sqrt{70}i}{280}$	0	$\frac{\sqrt{7}i}{28}$	0	0	$\frac{3\sqrt{14}i}{112}$	0	$-\frac{\sqrt{210}i}{168}$	0	$\frac{5\sqrt{42}i}{336}$	0
0	0	$\frac{\sqrt{14}i}{56}$	0	$-\frac{\sqrt{7}i}{28}$	0	0	0	0	$\frac{\sqrt{42}i}{112}$	0	$-\frac{\sqrt{70}i}{56}$	0	$-\frac{\sqrt{30}i}{48}$

559	symmetry	$\frac{\sqrt{105}xyz\left(x^2+y^2-2z^2\right)}{2}$

$\mathbb{Q}_5^{(a)}(A_1)$

0	0	0	0	0	0	$-\frac{\sqrt{3}i}{60}$	0	0	0	$\frac{\sqrt{105}i}{60}$	0	0	0
0	0	0	0	0	0	0	$\frac{\sqrt{7}i}{20}$	0	0	0	$-\frac{\sqrt{21}i}{20}$	0	0
0	0	0	0	0	0	0	0	$-\frac{\sqrt{21}i}{20}$	0	0	0	$\frac{\sqrt{7}i}{20}$	0
0	0	0	0	0	0	0	0	0	$\frac{\sqrt{105}i}{60}$	0	0	0	$-\frac{\sqrt{3}i}{60}$
0	0	$-\frac{\sqrt{7}i}{28}$	0	0	0	0	0	0	$\frac{\sqrt{21}i}{42}$	0	0	0	0
0	0	0	$\frac{\sqrt{35}i}{28}$	0	0	$\frac{\sqrt{3}i}{30}$	0	0	0	$-\frac{\sqrt{105}i}{105}$	0	0	0
$\frac{\sqrt{7}i}{28}$	0	0	0	$-\frac{\sqrt{35}i}{28}$	0	0	$-\frac{2\sqrt{42}i}{105}$	0	0	0	$-\frac{\sqrt{14}i}{70}$	0	0
0	$-\frac{\sqrt{35}i}{28}$	0	0	0	$\frac{\sqrt{7}i}{28}$	0	0	$\frac{\sqrt{14}i}{70}$	0	0	0	$\frac{2\sqrt{42}i}{105}$	0
0	0	$\frac{\sqrt{35}i}{28}$	0	0	0	0	0	0	$\frac{\sqrt{105}i}{105}$	0	0	0	$-\frac{\sqrt{3}i}{30}$
0	0	0	$-\frac{\sqrt{7}i}{28}$	0	0	0	0	0	0	$-\frac{\sqrt{21}i}{42}$	0	0	0

560	symmetry	$-\frac{\sqrt{105}z(x-y)(x+y)\left(x^2+y^2-2z^2\right)}{4}$

Table 9

No.	multipole	matrix
	$\mathbb{Q}_5^{(a)}(A_2)$	$$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{60} & 0 & 0 & 0 & \frac{\sqrt{105}}{60} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}}{20} & 0 & 0 & 0 & -\frac{\sqrt{21}}{20} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{21}}{20} & 0 & 0 & 0 & \frac{\sqrt{7}}{20} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{105}}{60} & 0 & 0 & 0 & -\frac{\sqrt{3}}{60} \\ 0 & 0 & -\frac{\sqrt{7}}{28} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{21}}{42} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{35}}{28} & 0 & 0 & -\frac{\sqrt{3}}{30} & 0 & 0 & 0 & -\frac{\sqrt{105}}{105} & 0 & 0 & 0 \\ -\frac{\sqrt{7}}{28} & 0 & 0 & 0 & -\frac{\sqrt{35}}{28} & 0 & 0 & \frac{2\sqrt{42}}{105} & 0 & 0 & 0 & -\frac{\sqrt{14}}{70} & 0 & 0 \\ 0 & \frac{\sqrt{35}}{28} & 0 & 0 & 0 & \frac{\sqrt{7}}{28} & 0 & 0 & -\frac{\sqrt{14}}{70} & 0 & 0 & 0 & \frac{2\sqrt{42}}{105} & 0 \\ 0 & 0 & -\frac{\sqrt{35}}{28} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{105}}{105} & 0 & 0 & 0 & -\frac{\sqrt{3}}{30} \\ 0 & 0 & 0 & \frac{\sqrt{7}}{28} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{21}}{42} & 0 & 0 & 0 \end{bmatrix}$$
561	symmetry	$\dfrac{3\sqrt{35}xyz(x-y)(x+y)}{2}$
	$\mathbb{Q}_5^{(a)}(B_1)$	$$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}i}{10} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{10} \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}i}{10} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{42}i}{28} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{105}i}{70} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{42}i}{28} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}i}{70} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2}i}{10} \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}i}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ -\frac{\sqrt{42}i}{28} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}i}{70} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{42}i}{28} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{105}i}{70} & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$$
562	symmetry	$\dfrac{z\left(15x^4+30x^2y^2-40x^2z^2+15y^4-40y^2z^2+8z^4\right)}{8}$

continued …

Table 9

No.	multipole	matrix

$\mathbb{Q}_5^{(a)}(B_2,1)$

$$\begin{pmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{30} & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{6} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{6} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{30} & 0 & 0 \\
-\frac{\sqrt{6}}{84} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{1}{14} & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & \frac{5\sqrt{6}}{84} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{15}}{70} & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & -\frac{5\sqrt{6}}{42} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2}}{14} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & \frac{5\sqrt{6}}{42} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2}}{14} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & -\frac{5\sqrt{6}}{84} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{15}}{70} & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{84} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{1}{14} & 0
\end{pmatrix}$$

563	symmetry	$\dfrac{3\sqrt{35}z\left(x^2-2xy-y^2\right)\left(x^2+2xy-y^2\right)}{8}$

$\mathbb{Q}_5^{(a)}(B_2,2)$

$$\begin{pmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}}{10} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{10} \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}}{10} & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & -\frac{\sqrt{42}}{28} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{105}}{70} & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & \frac{\sqrt{42}}{28} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}}{70} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}}{10} \\
0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
-\frac{\sqrt{42}}{28} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}}{70} & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & \frac{\sqrt{42}}{28} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{105}}{70} & 0 & 0 & 0 & 0 & 0
\end{pmatrix}$$

564	symmetry	$\dfrac{x\left(8x^4-40x^2y^2-40x^2z^2+15y^4+30y^2z^2+15z^4\right)}{8}$

Table 9

No.	multipole	matrix

$\mathbb{Q}_{5,1}^{(a)}(E,1)$:

$$\begin{bmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt5}{80} & 0 & \frac{1}{16} & 0 & -\frac{7\sqrt{15}}{240} & 0 & \frac{3\sqrt{35}}{80}\\[4pt]
0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{105}}{240} & 0 & \frac{3\sqrt5}{80} & 0 & -\frac{\sqrt3}{16} & 0 & \frac{7\sqrt{15}}{240} & 0\\[4pt]
0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{7\sqrt{15}}{240} & 0 & -\frac{\sqrt3}{16} & 0 & \frac{3\sqrt5}{80} & 0 & -\frac{\sqrt{105}}{240}\\[4pt]
0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{35}}{80} & 0 & -\frac{7\sqrt{15}}{240} & 0 & \frac{1}{16} & 0 & -\frac{\sqrt5}{80} & 0\\[4pt]
0 & -\frac{\sqrt{30}}{224} & 0 & \frac{\sqrt{15}}{48} & 0 & -\frac{3\sqrt6}{32} & -\frac{\sqrt7}{224} & 0 & \frac{5\sqrt3}{224} & 0 & -\frac{\sqrt5}{32} & 0 & \frac{3}{32} & 0\\[4pt]
-\frac{\sqrt{30}}{224} & 0 & \frac{5\sqrt3}{112} & 0 & -\frac{5\sqrt6}{96} & 0 & 0 & \frac{23\sqrt5}{1120} & 0 & -\frac{13}{224} & 0 & \frac{\sqrt{15}}{160} & 0 & \frac{3\sqrt{35}}{160}\\[4pt]
0 & \frac{5\sqrt3}{112} & 0 & -\frac{5\sqrt6}{112} & 0 & \frac{\sqrt{15}}{48} & \frac{\sqrt{70}}{160} & 0 & -\frac{11\sqrt{30}}{1120} & 0 & \frac{\sqrt2}{224} & 0 & \frac{3\sqrt{10}}{160} & 0\\[4pt]
\frac{\sqrt{15}}{48} & 0 & -\frac{5\sqrt6}{112} & 0 & \frac{5\sqrt3}{112} & 0 & 0 & -\frac{3\sqrt{10}}{160} & 0 & -\frac{\sqrt2}{224} & 0 & \frac{11\sqrt{30}}{1120} & 0 & -\frac{\sqrt{70}}{160}\\[4pt]
0 & -\frac{5\sqrt6}{96} & 0 & \frac{5\sqrt3}{112} & 0 & -\frac{\sqrt{30}}{224} & -\frac{3\sqrt{35}}{160} & 0 & -\frac{\sqrt{15}}{160} & 0 & \frac{13}{224} & 0 & -\frac{23\sqrt5}{1120} & 0\\[4pt]
-\frac{3\sqrt6}{32} & 0 & \frac{\sqrt{15}}{48} & 0 & -\frac{\sqrt{30}}{224} & 0 & 0 & -\frac{3}{32} & 0 & \frac{\sqrt5}{32} & 0 & -\frac{5\sqrt3}{224} & 0 & \frac{\sqrt7}{224}
\end{bmatrix}$$

565	symmetry	$\dfrac{y\left(15x^4-40x^2y^2+30x^2z^2+8y^4-40y^2z^2+15z^4\right)}{8}$

$\mathbb{Q}_{5,2}^{(a)}(E,1)$:

$$\begin{bmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt5 i}{80} & 0 & -\frac{i}{16} & 0 & -\frac{7\sqrt{15}i}{240} & 0 & -\frac{3\sqrt{35}i}{80}\\[4pt]
0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{105}i}{240} & 0 & \frac{3\sqrt5 i}{80} & 0 & \frac{\sqrt3 i}{16} & 0 & \frac{7\sqrt{15}i}{240} & 0\\[4pt]
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{7\sqrt{15}i}{240} & 0 & -\frac{\sqrt3 i}{16} & 0 & -\frac{3\sqrt5 i}{80} & 0 & -\frac{\sqrt{105}i}{240}\\[4pt]
0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{35}i}{80} & 0 & \frac{7\sqrt{15}i}{240} & 0 & \frac{i}{16} & 0 & \frac{\sqrt5 i}{80} & 0\\[4pt]
0 & \frac{\sqrt{30}i}{224} & 0 & \frac{\sqrt{15}i}{48} & 0 & \frac{3\sqrt6 i}{32} & -\frac{\sqrt7 i}{224} & 0 & -\frac{5\sqrt3 i}{224} & 0 & -\frac{\sqrt5 i}{32} & 0 & -\frac{3i}{32} & 0\\[4pt]
-\frac{\sqrt{30}i}{224} & 0 & -\frac{5\sqrt3 i}{112} & 0 & -\frac{5\sqrt6 i}{96} & 0 & 0 & \frac{23\sqrt5 i}{1120} & 0 & \frac{13i}{224} & 0 & \frac{\sqrt{15}i}{160} & 0 & -\frac{3\sqrt{35}i}{160}\\[4pt]
0 & \frac{5\sqrt3 i}{112} & 0 & \frac{5\sqrt6 i}{112} & 0 & \frac{\sqrt{15}i}{48} & -\frac{\sqrt{70}i}{160} & 0 & -\frac{11\sqrt{30}i}{1120} & 0 & -\frac{\sqrt2 i}{224} & 0 & \frac{3\sqrt{10}i}{160} & 0\\[4pt]
-\frac{\sqrt{15}i}{48} & 0 & -\frac{5\sqrt6 i}{112} & 0 & -\frac{5\sqrt3 i}{112} & 0 & 0 & \frac{3\sqrt{10}i}{160} & 0 & -\frac{\sqrt2 i}{224} & 0 & -\frac{11\sqrt{30}i}{1120} & 0 & -\frac{\sqrt{70}i}{160}\\[4pt]
0 & \frac{5\sqrt6 i}{96} & 0 & \frac{5\sqrt3 i}{112} & 0 & \frac{\sqrt{30}i}{224} & -\frac{3\sqrt{35}i}{160} & 0 & \frac{\sqrt{15}i}{160} & 0 & \frac{13i}{224} & 0 & \frac{23\sqrt5 i}{1120} & 0\\[4pt]
-\frac{3\sqrt6 i}{32} & 0 & -\frac{\sqrt{15}i}{48} & 0 & -\frac{\sqrt{30}i}{224} & 0 & 0 & -\frac{3i}{32} & 0 & -\frac{\sqrt5 i}{32} & 0 & -\frac{5\sqrt3 i}{224} & 0 & -\frac{\sqrt7 i}{224}
\end{bmatrix}$$

566	symmetry	$\dfrac{3\sqrt{35}x\left(y^2-2yz-z^2\right)\left(y^2+2yz-z^2\right)}{8}$

Table 9

No.	multipole	matrix
	$\mathbb{Q}_{5,1}^{(a)}(E,2)$	$\begin{pmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt7}{80} & 0 & \frac{\sqrt{35}}{80} & 0 & \frac{3\sqrt{21}}{80} & 0 & \frac{1}{16} \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt3}{80} & 0 & \frac{3\sqrt7}{80} & 0 & -\frac{\sqrt{105}}{80} & 0 & -\frac{3\sqrt{21}}{80} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{21}}{80} & 0 & -\frac{\sqrt{105}}{80} & 0 & \frac{3\sqrt7}{80} & 0 & \frac{3\sqrt3}{80} \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{1}{16} & 0 & \frac{3\sqrt{21}}{80} & 0 & \frac{\sqrt{35}}{80} & 0 & -\frac{\sqrt7}{80} & 0 \\ 0 & -\frac{\sqrt{42}}{224} & 0 & -\frac{3\sqrt{21}}{112} & 0 & -\frac{\sqrt{210}}{224} & -\frac{\sqrt5}{160} & 0 & \frac{\sqrt{105}}{224} & 0 & \frac{9\sqrt7}{224} & 0 & \frac{\sqrt{35}}{224} & 0 \\ -\frac{\sqrt{42}}{224} & 0 & \frac{\sqrt{105}}{112} & 0 & \frac{3\sqrt{210}}{224} & 0 & 0 & \frac{23\sqrt7}{1120} & 0 & -\frac{13\sqrt{35}}{1120} & 0 & -\frac{9\sqrt{21}}{1120} & 0 & \frac{1}{32} \\ 0 & \frac{\sqrt{105}}{112} & 0 & -\frac{\sqrt{210}}{112} & 0 & -\frac{3\sqrt{21}}{112} & -\frac{9\sqrt2}{160} & 0 & -\frac{11\sqrt{42}}{1120} & 0 & \frac{\sqrt{70}}{1120} & 0 & -\frac{27\sqrt{14}}{1120} & 0 \\ -\frac{3\sqrt{21}}{112} & 0 & -\frac{\sqrt{210}}{112} & 0 & \frac{\sqrt{105}}{112} & 0 & 0 & \frac{27\sqrt{14}}{1120} & 0 & -\frac{\sqrt{70}}{1120} & 0 & \frac{11\sqrt{42}}{1120} & 0 & \frac{9\sqrt2}{160} \\ 0 & \frac{3\sqrt{210}}{224} & 0 & \frac{\sqrt{105}}{112} & 0 & -\frac{\sqrt{42}}{224} & -\frac{1}{32} & 0 & \frac{9\sqrt{21}}{1120} & 0 & \frac{13\sqrt{35}}{1120} & 0 & -\frac{23\sqrt7}{1120} & 0 \\ -\frac{\sqrt{210}}{224} & 0 & -\frac{3\sqrt{21}}{112} & 0 & -\frac{\sqrt{42}}{224} & 0 & 0 & -\frac{\sqrt{35}}{224} & 0 & -\frac{9\sqrt7}{224} & 0 & -\frac{\sqrt{105}}{224} & 0 & \frac{\sqrt5}{160} \end{pmatrix}$
567	symmetry	$\dfrac{3\sqrt{35}\,y\left(x^2-2xz-z^2\right)\left(x^2+2xz-z^2\right)}{8}$
	$\mathbb{Q}_{5,2}^{(a)}(E,2)$	$\begin{pmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt7 i}{80} & 0 & -\frac{\sqrt{35}i}{80} & 0 & \frac{3\sqrt{21}i}{80} & 0 & -\frac{i}{16} \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt3 i}{80} & 0 & \frac{3\sqrt7 i}{80} & 0 & \frac{\sqrt{105}i}{80} & 0 & -\frac{3\sqrt{21}i}{80} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{21}i}{80} & 0 & -\frac{\sqrt{105}i}{80} & 0 & -\frac{3\sqrt7 i}{80} & 0 & \frac{3\sqrt3 i}{80} \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{i}{16} & 0 & -\frac{3\sqrt{21}i}{80} & 0 & \frac{\sqrt{35}i}{80} & 0 & \frac{\sqrt7 i}{80} & 0 \\ 0 & \frac{\sqrt{42}i}{224} & 0 & -\frac{3\sqrt{21}i}{112} & 0 & \frac{\sqrt{210}i}{224} & -\frac{\sqrt5 i}{160} & 0 & -\frac{\sqrt{105}i}{224} & 0 & \frac{9\sqrt7 i}{224} & 0 & -\frac{\sqrt{35}i}{224} & 0 \\ -\frac{\sqrt{42}i}{224} & 0 & -\frac{\sqrt{105}i}{112} & 0 & \frac{3\sqrt{210}i}{224} & 0 & 0 & \frac{23\sqrt7 i}{1120} & 0 & \frac{13\sqrt{35}i}{1120} & 0 & -\frac{9\sqrt{21}i}{1120} & 0 & -\frac{i}{32} \\ 0 & \frac{\sqrt{105}i}{112} & 0 & \frac{\sqrt{210}i}{112} & 0 & -\frac{3\sqrt{21}i}{112} & \frac{9\sqrt2 i}{160} & 0 & -\frac{11\sqrt{42}i}{1120} & 0 & -\frac{\sqrt{70}i}{1120} & 0 & -\frac{27\sqrt{14}i}{1120} & 0 \\ \frac{3\sqrt{21}i}{112} & 0 & -\frac{\sqrt{210}i}{112} & 0 & -\frac{\sqrt{105}i}{112} & 0 & 0 & -\frac{27\sqrt{14}i}{1120} & 0 & -\frac{\sqrt{70}i}{1120} & 0 & -\frac{11\sqrt{42}i}{1120} & 0 & \frac{9\sqrt2 i}{160} \\ 0 & -\frac{3\sqrt{210}i}{224} & 0 & \frac{\sqrt{105}i}{112} & 0 & \frac{\sqrt{42}i}{224} & -\frac{i}{32} & 0 & -\frac{9\sqrt{21}i}{1120} & 0 & \frac{13\sqrt{35}i}{1120} & 0 & \frac{23\sqrt7 i}{1120} & 0 \\ -\frac{\sqrt{210}i}{224} & 0 & \frac{3\sqrt{21}i}{112} & 0 & -\frac{\sqrt{42}i}{224} & 0 & 0 & -\frac{\sqrt{35}i}{224} & 0 & \frac{9\sqrt7 i}{224} & 0 & -\frac{\sqrt{105}i}{224} & 0 & -\frac{\sqrt5 i}{160} \end{pmatrix}$
568	symmetry	$\dfrac{\sqrt{105}\,x(y-z)(y+z)\left(2x^2-y^2-z^2\right)}{4}$

continued ...

Table 9

No.	multipole	matrix

$\mathbb{Q}_{5,1}^{(a)}(E,3)$

$$\begin{bmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{21}}{120} & 0 & \frac{\sqrt{105}}{120} & 0 & -\frac{\sqrt{7}}{40} & 0 & -\frac{\sqrt{3}}{8} \\
0 & 0 & 0 & 0 & 0 & 0 & -\frac{1}{40} & 0 & \frac{\sqrt{21}}{40} & 0 & -\frac{\sqrt{35}}{40} & 0 & \frac{\sqrt{7}}{40} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}}{40} & 0 & -\frac{\sqrt{35}}{40} & 0 & \frac{\sqrt{21}}{40} & 0 & -\frac{1}{40} \\
0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{8} & 0 & -\frac{\sqrt{7}}{40} & 0 & \frac{\sqrt{105}}{120} & 0 & -\frac{\sqrt{21}}{120} & 0 \\
0 & -\frac{\sqrt{14}}{112} & 0 & \frac{\sqrt{7}}{56} & 0 & \frac{3\sqrt{70}}{112} & -\frac{\sqrt{15}}{240} & 0 & \frac{\sqrt{35}}{112} & 0 & -\frac{\sqrt{21}}{112} & 0 & -\frac{\sqrt{105}}{112} & 0 \\
-\frac{\sqrt{14}}{112} & 0 & \frac{\sqrt{35}}{56} & 0 & -\frac{\sqrt{70}}{112} & 0 & 0 & \frac{23\sqrt{21}}{1680} & 0 & -\frac{13\sqrt{105}}{1680} & 0 & \frac{3\sqrt{7}}{560} & 0 & -\frac{\sqrt{3}}{16} \\
0 & \frac{\sqrt{35}}{56} & 0 & -\frac{\sqrt{70}}{56} & 0 & \frac{\sqrt{7}}{56} & \frac{\sqrt{6}}{80} & 0 & -\frac{11\sqrt{14}}{560} & 0 & \frac{\sqrt{210}}{1680} & 0 & \frac{3\sqrt{42}}{560} & 0 \\
\frac{\sqrt{7}}{56} & 0 & -\frac{\sqrt{70}}{56} & 0 & \frac{\sqrt{35}}{56} & 0 & 0 & -\frac{3\sqrt{42}}{560} & 0 & -\frac{\sqrt{210}}{1680} & 0 & \frac{11\sqrt{14}}{560} & 0 & -\frac{\sqrt{6}}{80} \\
0 & -\frac{\sqrt{70}}{112} & 0 & \frac{\sqrt{35}}{56} & 0 & -\frac{\sqrt{14}}{112} & \frac{\sqrt{3}}{16} & 0 & -\frac{3\sqrt{7}}{560} & 0 & \frac{13\sqrt{105}}{1680} & 0 & -\frac{23\sqrt{21}}{1680} & 0 \\
\frac{3\sqrt{70}}{112} & 0 & \frac{\sqrt{7}}{56} & 0 & -\frac{\sqrt{14}}{112} & 0 & 0 & \frac{\sqrt{105}}{112} & 0 & \frac{\sqrt{21}}{112} & 0 & -\frac{\sqrt{35}}{112} & 0 & \frac{\sqrt{15}}{240}
\end{bmatrix}$$

| 569 | symmetry | $-\dfrac{\sqrt{105}\,y(x-z)(x+z)\left(x^2-2y^2+z^2\right)}{4}$ |

$\mathbb{Q}_{5,2}^{(a)}(E,3)$

$$\begin{bmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{21}i}{120} & 0 & -\frac{\sqrt{105}i}{120} & 0 & -\frac{\sqrt{7}i}{40} & 0 & \frac{\sqrt{3}i}{8} \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{i}{40} & 0 & \frac{\sqrt{21}i}{40} & 0 & \frac{\sqrt{35}i}{40} & 0 & \frac{\sqrt{7}i}{40} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}i}{40} & 0 & -\frac{\sqrt{35}i}{40} & 0 & -\frac{\sqrt{21}i}{40} & 0 & -\frac{i}{40} \\
0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{8} & 0 & \frac{\sqrt{7}i}{40} & 0 & \frac{\sqrt{105}i}{120} & 0 & \frac{\sqrt{21}i}{120} & 0 \\
0 & \frac{\sqrt{14}i}{112} & 0 & \frac{\sqrt{7}i}{56} & 0 & -\frac{3\sqrt{70}i}{112} & -\frac{\sqrt{15}i}{240} & 0 & -\frac{\sqrt{35}i}{112} & 0 & -\frac{\sqrt{21}i}{112} & 0 & \frac{\sqrt{105}i}{112} & 0 \\
-\frac{\sqrt{14}i}{112} & 0 & -\frac{\sqrt{35}i}{56} & 0 & -\frac{\sqrt{70}i}{112} & 0 & 0 & \frac{23\sqrt{21}i}{1680} & 0 & \frac{13\sqrt{105}i}{1680} & 0 & \frac{3\sqrt{7}i}{560} & 0 & \frac{\sqrt{3}i}{16} \\
0 & \frac{\sqrt{35}i}{56} & 0 & \frac{\sqrt{70}i}{56} & 0 & \frac{\sqrt{7}i}{56} & -\frac{\sqrt{6}i}{80} & 0 & -\frac{11\sqrt{14}i}{560} & 0 & -\frac{\sqrt{210}i}{1680} & 0 & \frac{3\sqrt{42}i}{560} & 0 \\
-\frac{\sqrt{7}i}{56} & 0 & -\frac{\sqrt{70}i}{56} & 0 & -\frac{\sqrt{35}i}{56} & 0 & 0 & \frac{3\sqrt{42}i}{560} & 0 & -\frac{\sqrt{210}i}{1680} & 0 & -\frac{11\sqrt{14}i}{560} & 0 & -\frac{\sqrt{6}i}{80} \\
0 & \frac{\sqrt{70}i}{112} & 0 & \frac{\sqrt{35}i}{56} & 0 & \frac{\sqrt{14}i}{112} & \frac{\sqrt{3}i}{16} & 0 & \frac{3\sqrt{7}i}{560} & 0 & \frac{13\sqrt{105}i}{1680} & 0 & \frac{23\sqrt{21}i}{1680} & 0 \\
\frac{3\sqrt{70}i}{112} & 0 & -\frac{\sqrt{7}i}{56} & 0 & -\frac{\sqrt{14}i}{112} & 0 & 0 & \frac{\sqrt{105}i}{112} & 0 & -\frac{\sqrt{21}i}{112} & 0 & -\frac{\sqrt{35}i}{112} & 0 & -\frac{\sqrt{15}i}{240}
\end{bmatrix}$$

| 570 | symmetry | $\sqrt{15}\,xyz$ |

continued ...

Table 9

No.	multipole	matrix

$\mathbb{Q}_3^{(1,-1;a)}(A_1)$

$$\begin{pmatrix}
0 & 0 & 0 & \frac{\sqrt{5}i}{35} & 0 & 0 & -\frac{\sqrt{21}i}{28} & 0 & 0 & 0 & \frac{\sqrt{15}i}{28} & 0 & 0 & 0 \\
\frac{\sqrt{6}i}{42} & 0 & 0 & 0 & \frac{\sqrt{30}i}{210} & 0 & 0 & \frac{3i}{28} & 0 & 0 & 0 & \frac{3\sqrt{3}i}{28} & 0 & 0 \\
0 & -\frac{\sqrt{30}i}{210} & 0 & 0 & 0 & -\frac{\sqrt{6}i}{42} & 0 & 0 & \frac{3\sqrt{3}i}{28} & 0 & 0 & 0 & \frac{3i}{28} & 0 \\
0 & 0 & -\frac{\sqrt{5}i}{35} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{28} & 0 & 0 & 0 & -\frac{\sqrt{21}i}{28} \\
0 & 0 & -\frac{3i}{28} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{2\sqrt{3}i}{21} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & -\frac{3\sqrt{5}i}{140} & 0 & 0 & -\frac{\sqrt{21}i}{21} & 0 & 0 & 0 & -\frac{\sqrt{15}i}{21} & 0 & 0 & 0 \\
\frac{3i}{28} & 0 & 0 & 0 & \frac{3\sqrt{5}i}{140} & 0 & 0 & -\frac{\sqrt{6}i}{42} & 0 & 0 & 0 & -\frac{\sqrt{2}i}{14} & 0 & 0 \\
0 & \frac{3\sqrt{5}i}{140} & 0 & 0 & 0 & \frac{3i}{28} & 0 & 0 & \frac{\sqrt{2}i}{14} & 0 & 0 & 0 & \frac{\sqrt{6}i}{42} & 0 \\
0 & 0 & -\frac{3\sqrt{5}i}{140} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{21} & 0 & 0 & 0 & \frac{\sqrt{21}i}{21} \\
0 & 0 & 0 & -\frac{3i}{28} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{2\sqrt{3}i}{21} & 0 & 0 & 0
\end{pmatrix}$$

571 symmetry $\frac{\sqrt{15}z(x-y)(x+y)}{2}$

$\mathbb{Q}_3^{(1,-1;a)}(A_2)$

$$\begin{pmatrix}
0 & 0 & 0 & -\frac{\sqrt{5}}{35} & 0 & 0 & -\frac{\sqrt{21}}{28} & 0 & 0 & 0 & -\frac{\sqrt{15}}{28} & 0 & 0 & 0 \\
\frac{\sqrt{6}}{42} & 0 & 0 & 0 & -\frac{\sqrt{30}}{210} & 0 & 0 & \frac{3}{28} & 0 & 0 & 0 & -\frac{3\sqrt{3}}{28} & 0 & 0 \\
0 & -\frac{\sqrt{30}}{210} & 0 & 0 & 0 & \frac{\sqrt{6}}{42} & 0 & 0 & \frac{3\sqrt{3}}{28} & 0 & 0 & 0 & -\frac{3}{28} & 0 \\
0 & 0 & -\frac{\sqrt{5}}{35} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{28} & 0 & 0 & 0 & \frac{\sqrt{21}}{28} \\
0 & 0 & \frac{3}{28} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{2\sqrt{3}}{21} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & \frac{3\sqrt{5}}{140} & 0 & 0 & -\frac{\sqrt{21}}{21} & 0 & 0 & 0 & \frac{\sqrt{15}}{21} & 0 & 0 & 0 \\
\frac{3}{28} & 0 & 0 & 0 & -\frac{3\sqrt{5}}{140} & 0 & 0 & -\frac{\sqrt{6}}{42} & 0 & 0 & 0 & \frac{\sqrt{2}}{14} & 0 & 0 \\
0 & \frac{3\sqrt{5}}{140} & 0 & 0 & 0 & -\frac{3}{28} & 0 & 0 & \frac{\sqrt{2}}{14} & 0 & 0 & 0 & -\frac{\sqrt{6}}{42} & 0 \\
0 & 0 & -\frac{3\sqrt{5}}{140} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{21} & 0 & 0 & 0 & -\frac{\sqrt{21}}{21} \\
0 & 0 & 0 & -\frac{3}{28} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{2\sqrt{3}}{21} & 0 & 0 & 0
\end{pmatrix}$$

572 symmetry $-\frac{z(3x^2+3y^2-2z^2)}{2}$

continued ...

Table 9

No.	multipole	matrix
	$\mathbb{Q}_3^{(1,-1;a)}(B_2)$	(matrix below)

$$
\begin{pmatrix}
0 & -\frac{\sqrt{6}}{35} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{14} & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & \frac{2}{35} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{14} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & \frac{2}{35} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{14} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & -\frac{\sqrt{6}}{35} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{14} & 0 & 0 \\
\frac{\sqrt{6}}{28} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{2}{7} & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & -\frac{\sqrt{6}}{20} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & -\frac{\sqrt{6}}{35} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}}{7} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & \frac{\sqrt{6}}{35} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}}{7} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & \frac{\sqrt{6}}{20} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}}{28} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{2}{7} & 0
\end{pmatrix}
$$

| 573 | symmetry | $\dfrac{x(2x^2-3y^2-3z^2)}{2}$ |

| | $\mathbb{Q}_{3,1}^{(1,-1;a)}(E,1)$ | (matrix below) |

$$
\begin{bmatrix}
-\frac{\sqrt{30}}{280} & 0 & \frac{3\sqrt{3}}{140} & 0 & -\frac{\sqrt{6}}{56} & 0 & 0 & -\frac{3\sqrt{5}}{56} & 0 & \frac{3}{28} & 0 & -\frac{\sqrt{15}}{56} & 0 & 0 \\
0 & \frac{\sqrt{2}}{40} & 0 & -\frac{1}{140} & 0 & -\frac{\sqrt{10}}{56} & -\frac{\sqrt{105}}{56} & 0 & 0 & 0 & \frac{3\sqrt{3}}{56} & 0 & -\frac{\sqrt{15}}{28} & 0 \\
\frac{\sqrt{10}}{56} & 0 & \frac{1}{140} & 0 & -\frac{\sqrt{2}}{40} & 0 & 0 & -\frac{\sqrt{15}}{28} & 0 & \frac{3\sqrt{3}}{56} & 0 & 0 & 0 & -\frac{\sqrt{105}}{56} \\
0 & \frac{\sqrt{6}}{56} & 0 & -\frac{3\sqrt{3}}{140} & 0 & \frac{\sqrt{30}}{280} & 0 & 0 & -\frac{\sqrt{15}}{56} & 0 & \frac{3}{28} & 0 & -\frac{3\sqrt{5}}{56} & 0 \\
0 & -\frac{3\sqrt{30}}{280} & 0 & \frac{\sqrt{15}}{56} & 0 & 0 & \frac{\sqrt{7}}{28} & 0 & -\frac{\sqrt{3}}{14} & 0 & \frac{\sqrt{5}}{28} & 0 & 0 & 0 \\
-\frac{3\sqrt{30}}{280} & 0 & \frac{3\sqrt{3}}{280} & 0 & \frac{\sqrt{6}}{28} & 0 & 0 & -\frac{\sqrt{5}}{28} & 0 & -\frac{1}{14} & 0 & \frac{\sqrt{15}}{28} & 0 & 0 \\
0 & \frac{3\sqrt{3}}{280} & 0 & \frac{3\sqrt{6}}{140} & 0 & \frac{\sqrt{15}}{56} & -\frac{\sqrt{70}}{56} & 0 & -\frac{\sqrt{30}}{56} & 0 & \frac{\sqrt{2}}{56} & 0 & \frac{3\sqrt{10}}{56} & 0 \\
\frac{\sqrt{15}}{56} & 0 & \frac{3\sqrt{6}}{140} & 0 & \frac{3\sqrt{3}}{280} & 0 & 0 & -\frac{3\sqrt{10}}{56} & 0 & -\frac{\sqrt{2}}{56} & 0 & \frac{\sqrt{30}}{56} & 0 & \frac{\sqrt{70}}{56} \\
0 & \frac{\sqrt{6}}{28} & 0 & \frac{3\sqrt{3}}{280} & 0 & -\frac{3\sqrt{30}}{280} & 0 & 0 & -\frac{\sqrt{15}}{28} & 0 & \frac{1}{14} & 0 & \frac{\sqrt{5}}{28} & 0 \\
0 & 0 & \frac{\sqrt{15}}{56} & 0 & -\frac{3\sqrt{30}}{280} & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}}{28} & 0 & \frac{\sqrt{3}}{14} & 0 & -\frac{\sqrt{7}}{28}
\end{bmatrix}
$$

| 574 | symmetry | $-\dfrac{y(3x^2-2y^2+3z^2)}{2}$ |

159

Table 9

No.	multipole	matrix

$\mathbb{Q}_{3,2}^{(1,-1;a)}(E,1)$

$$\begin{bmatrix}
-\frac{\sqrt{30}i}{280} & 0 & -\frac{3\sqrt{3}i}{140} & 0 & -\frac{\sqrt{6}i}{56} & 0 & 0 & -\frac{3\sqrt{5}i}{56} & 0 & -\frac{3i}{28} & 0 & -\frac{\sqrt{15}i}{56} & 0 & 0 \\
0 & \frac{\sqrt{2}i}{40} & 0 & \frac{i}{140} & 0 & -\frac{\sqrt{10}i}{56} & \frac{\sqrt{105}i}{56} & 0 & 0 & 0 & -\frac{3\sqrt{3}i}{56} & 0 & -\frac{\sqrt{15}i}{28} & 0 \\
-\frac{\sqrt{10}i}{56} & 0 & \frac{i}{140} & 0 & \frac{\sqrt{2}i}{40} & 0 & 0 & \frac{\sqrt{15}i}{28} & 0 & \frac{3\sqrt{3}i}{56} & 0 & 0 & 0 & -\frac{\sqrt{105}i}{56} \\
0 & -\frac{\sqrt{6}i}{56} & 0 & -\frac{3\sqrt{3}i}{140} & 0 & -\frac{\sqrt{30}i}{280} & 0 & 0 & \frac{\sqrt{15}i}{56} & 0 & \frac{3i}{28} & 0 & \frac{3\sqrt{5}i}{56} & 0 \\
0 & \frac{3\sqrt{30}i}{280} & 0 & \frac{\sqrt{15}i}{56} & 0 & 0 & \frac{\sqrt{7}i}{28} & 0 & \frac{\sqrt{3}i}{14} & 0 & \frac{\sqrt{5}i}{28} & 0 & 0 & 0 \\
-\frac{3\sqrt{30}i}{280} & 0 & -\frac{3\sqrt{3}i}{280} & 0 & \frac{\sqrt{6}i}{28} & 0 & 0 & -\frac{\sqrt{5}i}{28} & 0 & \frac{i}{14} & 0 & \frac{\sqrt{15}i}{28} & 0 & 0 \\
0 & \frac{3\sqrt{3}i}{280} & 0 & -\frac{3\sqrt{6}i}{140} & 0 & \frac{\sqrt{15}i}{56} & \frac{\sqrt{70}i}{56} & 0 & -\frac{\sqrt{30}i}{56} & 0 & -\frac{\sqrt{2}i}{56} & 0 & \frac{3\sqrt{10}i}{56} & 0 \\
-\frac{\sqrt{15}i}{56} & 0 & \frac{3\sqrt{6}i}{140} & 0 & -\frac{3\sqrt{3}i}{280} & 0 & 0 & \frac{3\sqrt{10}i}{56} & 0 & -\frac{\sqrt{2}i}{56} & 0 & -\frac{\sqrt{30}i}{56} & 0 & \frac{\sqrt{70}i}{56} \\
0 & -\frac{\sqrt{6}i}{28} & 0 & \frac{3\sqrt{3}i}{280} & 0 & \frac{3\sqrt{30}i}{280} & 0 & 0 & \frac{\sqrt{15}i}{28} & 0 & \frac{i}{14} & 0 & -\frac{\sqrt{5}i}{28} & 0 \\
0 & 0 & -\frac{\sqrt{15}i}{56} & 0 & -\frac{3\sqrt{30}i}{280} & 0 & 0 & 0 & \frac{\sqrt{5}i}{28} & 0 & \frac{\sqrt{3}i}{14} & 0 & \frac{\sqrt{7}i}{28} & 0
\end{bmatrix}$$

575	symmetry	$\dfrac{\sqrt{15}x(y-z)(y+z)}{2}$

$\mathbb{Q}_{3,1}^{(1,-1;a)}(E,2)$

$$\begin{bmatrix}
-\frac{\sqrt{2}}{56} & 0 & \frac{3\sqrt{5}}{140} & 0 & \frac{3\sqrt{10}}{280} & 0 & 0 & -\frac{5\sqrt{3}}{56} & 0 & \frac{\sqrt{15}}{28} & 0 & \frac{3}{56} & 0 & 0 \\
0 & \frac{\sqrt{30}}{120} & 0 & -\frac{\sqrt{15}}{420} & 0 & \frac{\sqrt{6}}{56} & \frac{3\sqrt{7}}{56} & 0 & 0 & 0 & \frac{3\sqrt{5}}{56} & 0 & \frac{3}{28} & 0 \\
-\frac{\sqrt{6}}{56} & 0 & \frac{\sqrt{15}}{420} & 0 & -\frac{\sqrt{30}}{120} & 0 & 0 & \frac{3}{28} & 0 & \frac{3\sqrt{5}}{56} & 0 & 0 & 0 & \frac{3\sqrt{7}}{56} \\
0 & -\frac{3\sqrt{10}}{280} & 0 & -\frac{3\sqrt{5}}{140} & 0 & \frac{\sqrt{2}}{56} & 0 & 0 & \frac{3}{56} & 0 & \frac{\sqrt{15}}{28} & 0 & -\frac{5\sqrt{3}}{56} & 0 \\
0 & -\frac{3\sqrt{2}}{56} & 0 & -\frac{3}{56} & 0 & 0 & \frac{\sqrt{105}}{84} & 0 & -\frac{\sqrt{5}}{14} & 0 & -\frac{\sqrt{3}}{28} & 0 & 0 & 0 \\
-\frac{3\sqrt{2}}{56} & 0 & \frac{3\sqrt{5}}{280} & 0 & -\frac{3\sqrt{10}}{140} & 0 & 0 & -\frac{5\sqrt{3}}{84} & 0 & -\frac{\sqrt{15}}{42} & 0 & -\frac{3}{28} & 0 & 0 \\
0 & \frac{3\sqrt{5}}{280} & 0 & \frac{3\sqrt{10}}{140} & 0 & -\frac{3}{56} & \frac{\sqrt{42}}{56} & 0 & -\frac{5\sqrt{2}}{56} & 0 & \frac{\sqrt{30}}{168} & 0 & -\frac{3\sqrt{6}}{56} & 0 \\
-\frac{3}{56} & 0 & \frac{3\sqrt{10}}{140} & 0 & \frac{3\sqrt{5}}{280} & 0 & 0 & \frac{3\sqrt{6}}{56} & 0 & -\frac{\sqrt{30}}{168} & 0 & \frac{5\sqrt{2}}{56} & 0 & -\frac{\sqrt{42}}{56} \\
0 & -\frac{3\sqrt{10}}{140} & 0 & \frac{3\sqrt{5}}{280} & 0 & -\frac{3\sqrt{2}}{56} & 0 & 0 & \frac{3}{28} & 0 & \frac{\sqrt{15}}{42} & 0 & \frac{5\sqrt{3}}{84} & 0 \\
0 & 0 & -\frac{3}{56} & 0 & -\frac{3\sqrt{2}}{56} & 0 & 0 & 0 & \frac{\sqrt{3}}{28} & 0 & \frac{\sqrt{5}}{14} & 0 & -\frac{\sqrt{105}}{84} & 0
\end{bmatrix}$$

576	symmetry	$\dfrac{\sqrt{15}y(x-z)(x+z)}{2}$

continued …

Table 9

No.	multipole	matrix

$\mathbb{Q}_{3,2}^{(1,-1;a)}(E,2)$

$$
\begin{pmatrix}
-\frac{\sqrt{2}i}{56} & 0 & -\frac{3\sqrt{5}i}{140} & 0 & \frac{3\sqrt{10}i}{280} & 0 & 0 & -\frac{5\sqrt{3}i}{56} & 0 & -\frac{\sqrt{15}i}{28} & 0 & \frac{3i}{56} & 0 & 0 \\
0 & \frac{\sqrt{30}i}{120} & 0 & \frac{\sqrt{15}i}{420} & 0 & \frac{\sqrt{6}i}{56} & -\frac{3\sqrt{7}i}{56} & 0 & 0 & 0 & -\frac{3\sqrt{5}i}{56} & 0 & \frac{3i}{28} & 0 \\
\frac{\sqrt{6}i}{56} & 0 & \frac{\sqrt{15}i}{420} & 0 & \frac{\sqrt{30}i}{120} & 0 & 0 & -\frac{3i}{28} & 0 & \frac{3\sqrt{5}i}{56} & 0 & 0 & 0 & \frac{3\sqrt{7}i}{56} \\
0 & \frac{3\sqrt{10}i}{280} & 0 & -\frac{3\sqrt{5}i}{140} & 0 & -\frac{\sqrt{2}i}{56} & 0 & 0 & -\frac{3i}{56} & 0 & \frac{\sqrt{15}i}{28} & 0 & \frac{5\sqrt{3}i}{56} & 0 \\
0 & \frac{3\sqrt{2}i}{56} & 0 & -\frac{3i}{56} & 0 & 0 & \frac{\sqrt{105}i}{84} & 0 & \frac{\sqrt{5}i}{14} & 0 & -\frac{\sqrt{3}i}{28} & 0 & 0 & 0 \\
-\frac{3\sqrt{2}i}{56} & 0 & -\frac{3\sqrt{5}i}{280} & 0 & -\frac{3\sqrt{10}i}{140} & 0 & 0 & -\frac{5\sqrt{3}i}{84} & 0 & \frac{\sqrt{15}i}{42} & 0 & -\frac{3i}{28} & 0 & 0 \\
0 & \frac{3\sqrt{5}i}{280} & 0 & -\frac{3\sqrt{10}i}{140} & 0 & -\frac{3i}{56} & -\frac{\sqrt{42}i}{56} & 0 & -\frac{5\sqrt{2}i}{56} & 0 & -\frac{\sqrt{30}i}{168} & 0 & -\frac{3\sqrt{6}i}{56} & 0 \\
\frac{3i}{56} & 0 & \frac{3\sqrt{10}i}{140} & 0 & -\frac{3\sqrt{5}i}{280} & 0 & 0 & -\frac{3\sqrt{6}i}{56} & 0 & -\frac{\sqrt{30}i}{168} & 0 & -\frac{5\sqrt{2}i}{56} & 0 & -\frac{\sqrt{42}i}{56} \\
0 & \frac{3\sqrt{10}i}{140} & 0 & \frac{3\sqrt{5}i}{280} & 0 & \frac{3\sqrt{2}i}{56} & 0 & 0 & -\frac{3i}{28} & 0 & \frac{\sqrt{15}i}{42} & 0 & -\frac{5\sqrt{3}i}{84} & 0 \\
0 & 0 & \frac{3i}{56} & 0 & -\frac{3\sqrt{2}i}{56} & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{28} & 0 & \frac{\sqrt{5}i}{14} & 0 & \frac{\sqrt{105}i}{84}
\end{pmatrix}
$$

577	symmetry	$\dfrac{\sqrt{105}xyz\left(x^2+y^2-2z^2\right)}{2}$

$\mathbb{Q}_5^{(1,-1;a)}(A_1)$

$$
\begin{pmatrix}
0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}i}{200} & 0 & 0 & 0 & \frac{\sqrt{14}i}{40} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{210}i}{200} & 0 & 0 & 0 & -\frac{3\sqrt{70}i}{200} & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{70}i}{200} & 0 & 0 & 0 & \frac{\sqrt{210}i}{200} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{14}i}{40} & 0 & 0 & 0 & -\frac{\sqrt{10}i}{200} \\
0 & 0 & -\frac{\sqrt{210}i}{420} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}i}{35} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & \frac{\sqrt{42}i}{84} & 0 & 0 & -\frac{\sqrt{10}i}{25} & 0 & 0 & 0 & \frac{2\sqrt{14}i}{35} & 0 & 0 & 0 \\
\frac{\sqrt{210}i}{420} & 0 & 0 & 0 & -\frac{\sqrt{42}i}{84} & 0 & 0 & \frac{8\sqrt{35}i}{175} & 0 & 0 & 0 & \frac{2\sqrt{105}i}{175} & 0 & 0 \\
0 & -\frac{\sqrt{42}i}{84} & 0 & 0 & 0 & \frac{\sqrt{210}i}{420} & 0 & 0 & -\frac{2\sqrt{105}i}{175} & 0 & 0 & 0 & -\frac{8\sqrt{35}i}{175} & 0 \\
0 & 0 & \frac{\sqrt{42}i}{84} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{2\sqrt{14}i}{35} & 0 & 0 & 0 & \frac{\sqrt{10}i}{25} \\
0 & 0 & 0 & -\frac{\sqrt{210}i}{420} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{70}i}{35} & 0 & 0 & 0
\end{pmatrix}
$$

578	symmetry	$-\dfrac{\sqrt{105}z(x-y)(x+y)\left(x^2+y^2-2z^2\right)}{4}$

Table 9

No.	multipole	matrix
	$\mathbb{Q}_5^{(1,-1;a)}(A_2)$	$\begin{pmatrix} 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}}{200} & 0 & 0 & 0 & \frac{\sqrt{14}}{40} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{210}}{200} & 0 & 0 & 0 & -\frac{3\sqrt{70}}{200} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{70}}{200} & 0 & 0 & 0 & \frac{\sqrt{210}}{200} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{14}}{40} & 0 & 0 & 0 & -\frac{\sqrt{10}}{200} \\ 0 & 0 & -\frac{\sqrt{210}}{420} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}}{35} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{42}}{84} & 0 & 0 & \frac{\sqrt{10}}{25} & 0 & 0 & 0 & \frac{2\sqrt{14}}{35} & 0 & 0 & 0 \\ -\frac{\sqrt{210}}{420} & 0 & 0 & 0 & -\frac{\sqrt{42}}{84} & 0 & 0 & -\frac{8\sqrt{35}}{175} & 0 & 0 & 0 & \frac{2\sqrt{105}}{175} & 0 & 0 \\ 0 & \frac{\sqrt{42}}{84} & 0 & 0 & 0 & \frac{\sqrt{210}}{420} & 0 & 0 & \frac{2\sqrt{105}}{175} & 0 & 0 & 0 & -\frac{8\sqrt{35}}{175} & 0 \\ 0 & 0 & -\frac{\sqrt{42}}{84} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{2\sqrt{14}}{35} & 0 & 0 & 0 & \frac{\sqrt{10}}{25} \\ 0 & 0 & 0 & \frac{\sqrt{210}}{420} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}}{35} & 0 & 0 & 0 \end{pmatrix}$
579	symmetry	$\dfrac{3\sqrt{35}\,xyz(x-y)(x+y)}{2}$
	$\mathbb{Q}_5^{(1,-1;a)}(B_1)$	$\begin{pmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{210}i}{100} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{10}i}{100} \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{10}i}{100} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{210}i}{100} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{35}i}{70} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{14}i}{35} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{35}i}{70} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{210}i}{175} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{2\sqrt{15}i}{25} \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{2\sqrt{15}i}{25} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ -\frac{\sqrt{35}i}{70} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{210}i}{175} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{35}i}{70} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{14}i}{35} & 0 & 0 & 0 & 0 & 0 \end{pmatrix}$
580	symmetry	$\dfrac{z\left(15x^4+30x^2y^2-40x^2z^2+15y^4-40y^2z^2+8z^4\right)}{8}$

Table 9

No.	multipole	matrix

$\mathbb{Q}_5^{(1,-1;a)}(B_2,1)$

$$\begin{bmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2}}{20} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}}{20} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}}{20} & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}}{20} & 0 \\
-\frac{\sqrt{5}}{210} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}}{35} & 0 & 0 & 0 & 0 & 0 \\
0 & \frac{\sqrt{5}}{42} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{9\sqrt{2}}{35} & 0 & 0 & 0 & 0 \\
0 & 0 & -\frac{\sqrt{5}}{21} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{2\sqrt{15}}{35} & 0 & 0 & 0 \\
0 & 0 & 0 & \frac{\sqrt{5}}{21} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{2\sqrt{15}}{35} & 0 & 0 \\
0 & 0 & 0 & 0 & -\frac{\sqrt{5}}{42} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{9\sqrt{2}}{35} & 0 \\
0 & 0 & 0 & 0 & 0 & \frac{\sqrt{5}}{210} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}}{35}
\end{bmatrix}$$

581	symmetry	$\dfrac{3\sqrt{35}\,z\left(x^2-2xy-y^2\right)\left(x^2+2xy-y^2\right)}{8}$

$\mathbb{Q}_5^{(1,-1;a)}(B_2,2)$

$$\begin{bmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{210}}{100} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{10}}{100} \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{10}}{100} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{210}}{100} & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & -\frac{\sqrt{35}}{70} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{14}}{35} & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & \frac{\sqrt{35}}{70} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{210}}{175} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{2\sqrt{15}}{25} \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{2\sqrt{15}}{25} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
-\frac{\sqrt{35}}{70} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{210}}{175} & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & \frac{\sqrt{35}}{70} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{14}}{35} & 0 & 0 & 0 & 0 & 0
\end{bmatrix}$$

582	symmetry	$\dfrac{x\left(8x^4-40x^2y^2-40x^2z^2+15y^4+30y^2z^2+15z^4\right)}{8}$

Table 9

No.	multipole	matrix

$\mathbb{Q}_{5,1}^{(1,-1;a)}(E,1)$

$$\begin{bmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}}{160} & 0 & \frac{\sqrt{30}}{160} & 0 & -\frac{7\sqrt{2}}{160} & 0 & \frac{3\sqrt{42}}{160} \\
0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{14}}{160} & 0 & \frac{3\sqrt{6}}{160} & 0 & -\frac{3\sqrt{10}}{160} & 0 & \frac{7\sqrt{2}}{160} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{7\sqrt{2}}{160} & 0 & -\frac{3\sqrt{10}}{160} & 0 & \frac{3\sqrt{6}}{160} & 0 & -\frac{\sqrt{14}}{160} \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{42}}{160} & 0 & -\frac{7\sqrt{2}}{160} & 0 & \frac{\sqrt{30}}{160} & 0 & -\frac{\sqrt{6}}{160} & 0 \\
0 & -\frac{1}{112} & 0 & \frac{\sqrt{2}}{48} & 0 & -\frac{3\sqrt{5}}{80} & \frac{\sqrt{210}}{560} & 0 & -\frac{3\sqrt{10}}{112} & 0 & \frac{\sqrt{6}}{16} & 0 & -\frac{3\sqrt{30}}{80} & 0 \\
-\frac{1}{112} & 0 & \frac{\sqrt{10}}{112} & 0 & -\frac{\sqrt{5}}{48} & 0 & 0 & -\frac{23\sqrt{6}}{560} & 0 & \frac{13\sqrt{30}}{560} & 0 & -\frac{3\sqrt{2}}{80} & 0 & -\frac{3\sqrt{42}}{80} \\
0 & \frac{\sqrt{10}}{112} & 0 & -\frac{\sqrt{5}}{56} & 0 & \frac{\sqrt{2}}{48} & -\frac{\sqrt{21}}{40} & 0 & \frac{33}{280} & 0 & -\frac{\sqrt{15}}{280} & 0 & -\frac{3\sqrt{3}}{40} & 0 \\
\frac{\sqrt{2}}{48} & 0 & -\frac{\sqrt{5}}{56} & 0 & \frac{\sqrt{10}}{112} & 0 & 0 & \frac{3\sqrt{3}}{40} & 0 & \frac{\sqrt{15}}{280} & 0 & -\frac{33}{280} & 0 & \frac{\sqrt{21}}{40} \\
0 & -\frac{\sqrt{5}}{48} & 0 & \frac{\sqrt{10}}{112} & 0 & -\frac{1}{112} & \frac{3\sqrt{42}}{80} & 0 & \frac{3\sqrt{2}}{80} & 0 & -\frac{13\sqrt{30}}{560} & 0 & \frac{23\sqrt{6}}{560} & 0 \\
-\frac{3\sqrt{5}}{80} & 0 & \frac{\sqrt{2}}{48} & 0 & -\frac{1}{112} & 0 & 0 & \frac{3\sqrt{30}}{80} & 0 & -\frac{\sqrt{6}}{16} & 0 & \frac{3\sqrt{10}}{112} & 0 & -\frac{\sqrt{210}}{560}
\end{bmatrix}$$

583	symmetry	$\dfrac{y\left(15x^4-40x^2y^2+30x^2z^2+8y^4-40y^2z^2+15z^4\right)}{8}$

$\mathbb{Q}_{5,2}^{(1,-1;a)}(E,1)$

$$\begin{bmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{160} & 0 & -\frac{\sqrt{30}i}{160} & 0 & -\frac{7\sqrt{2}i}{160} & 0 & -\frac{3\sqrt{42}i}{160} \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{14}i}{160} & 0 & \frac{3\sqrt{6}i}{160} & 0 & \frac{3\sqrt{10}i}{160} & 0 & \frac{7\sqrt{2}i}{160} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{7\sqrt{2}i}{160} & 0 & -\frac{3\sqrt{10}i}{160} & 0 & -\frac{3\sqrt{6}i}{160} & 0 & -\frac{\sqrt{14}i}{160} \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{42}i}{160} & 0 & \frac{7\sqrt{2}i}{160} & 0 & \frac{\sqrt{30}i}{160} & 0 & \frac{\sqrt{6}i}{160} & 0 \\
0 & \frac{i}{112} & 0 & \frac{\sqrt{2}i}{48} & 0 & \frac{3\sqrt{5}i}{80} & \frac{\sqrt{210}i}{560} & 0 & \frac{3\sqrt{10}i}{112} & 0 & \frac{\sqrt{6}i}{16} & 0 & \frac{3\sqrt{30}i}{80} & 0 \\
-\frac{i}{112} & 0 & -\frac{\sqrt{10}i}{112} & 0 & -\frac{\sqrt{5}i}{48} & 0 & 0 & -\frac{23\sqrt{6}i}{560} & 0 & -\frac{13\sqrt{30}i}{560} & 0 & -\frac{3\sqrt{2}i}{80} & 0 & \frac{3\sqrt{42}i}{80} \\
0 & \frac{\sqrt{10}i}{112} & 0 & \frac{\sqrt{5}i}{56} & 0 & \frac{\sqrt{2}i}{48} & \frac{\sqrt{21}i}{40} & 0 & \frac{33i}{280} & 0 & \frac{\sqrt{15}i}{280} & 0 & -\frac{3\sqrt{3}i}{40} & 0 \\
-\frac{\sqrt{2}i}{48} & 0 & -\frac{\sqrt{5}i}{56} & 0 & -\frac{\sqrt{10}i}{112} & 0 & 0 & -\frac{3\sqrt{3}i}{40} & 0 & \frac{\sqrt{15}i}{280} & 0 & \frac{33i}{280} & 0 & \frac{\sqrt{21}i}{40} \\
0 & \frac{\sqrt{5}i}{48} & 0 & \frac{\sqrt{10}i}{112} & 0 & \frac{i}{112} & \frac{3\sqrt{42}i}{80} & 0 & -\frac{3\sqrt{2}i}{80} & 0 & -\frac{13\sqrt{30}i}{560} & 0 & -\frac{23\sqrt{6}i}{560} & 0 \\
-\frac{3\sqrt{5}i}{80} & 0 & -\frac{\sqrt{2}i}{48} & 0 & -\frac{i}{112} & 0 & 0 & \frac{3\sqrt{30}i}{80} & 0 & \frac{\sqrt{6}i}{16} & 0 & \frac{3\sqrt{10}i}{112} & 0 & \frac{\sqrt{210}i}{560}
\end{bmatrix}$$

584	symmetry	$\dfrac{3\sqrt{35}x\left(y^2-2yz-z^2\right)\left(y^2+2yz-z^2\right)}{8}$

Table 9

No.	multipole	matrix

$\mathbb{Q}_{5,1}^{(1,-1;a)}(E,2)$

0	0	0	0	0	0	0	$-\frac{\sqrt{210}}{800}$	0	$\frac{\sqrt{42}}{160}$	0	$\frac{9\sqrt{70}}{800}$	0	$\frac{\sqrt{30}}{160}$
0	0	0	0	0	0	$\frac{9\sqrt{10}}{800}$	0	$\frac{3\sqrt{210}}{800}$	0	$-\frac{3\sqrt{14}}{160}$	0	$-\frac{9\sqrt{70}}{800}$	0
0	0	0	0	0	0	0	$-\frac{9\sqrt{70}}{800}$	0	$-\frac{3\sqrt{14}}{160}$	0	$\frac{3\sqrt{210}}{800}$	0	$\frac{9\sqrt{10}}{800}$
0	0	0	0	0	0	$\frac{\sqrt{30}}{160}$	0	$\frac{9\sqrt{70}}{800}$	0	$\frac{\sqrt{42}}{160}$	0	$-\frac{\sqrt{210}}{800}$	0
0	$-\frac{\sqrt{35}}{560}$	0	$-\frac{3\sqrt{70}}{560}$	0	$-\frac{\sqrt{7}}{112}$	$\frac{\sqrt{6}}{80}$	0	$-\frac{3\sqrt{14}}{112}$	0	$-\frac{9\sqrt{210}}{560}$	0	$-\frac{\sqrt{42}}{112}$	0
$-\frac{\sqrt{35}}{560}$	0	$\frac{\sqrt{14}}{112}$	0	$\frac{3\sqrt{7}}{112}$	0	0	$-\frac{23\sqrt{210}}{2800}$	0	$\frac{13\sqrt{42}}{560}$	0	$\frac{27\sqrt{70}}{2800}$	0	$-\frac{\sqrt{30}}{80}$
0	$\frac{\sqrt{14}}{112}$	0	$-\frac{\sqrt{7}}{56}$	0	$-\frac{3\sqrt{70}}{560}$	$\frac{9\sqrt{15}}{200}$	0	$\frac{33\sqrt{35}}{1400}$	0	$-\frac{\sqrt{21}}{280}$	0	$\frac{27\sqrt{105}}{1400}$	0
$-\frac{3\sqrt{70}}{560}$	0	$-\frac{\sqrt{7}}{56}$	0	$\frac{\sqrt{14}}{112}$	0	0	$-\frac{27\sqrt{105}}{1400}$	0	$\frac{\sqrt{21}}{280}$	0	$-\frac{33\sqrt{35}}{1400}$	0	$-\frac{9\sqrt{15}}{200}$
0	$\frac{3\sqrt{7}}{112}$	0	$\frac{\sqrt{14}}{112}$	0	$-\frac{\sqrt{35}}{560}$	$\frac{\sqrt{30}}{80}$	0	$-\frac{27\sqrt{70}}{2800}$	0	$-\frac{13\sqrt{42}}{560}$	0	$\frac{23\sqrt{210}}{2800}$	0
$-\frac{\sqrt{7}}{112}$	0	$-\frac{3\sqrt{70}}{560}$	0	$-\frac{\sqrt{35}}{560}$	0	0	$\frac{\sqrt{42}}{112}$	0	$\frac{9\sqrt{210}}{560}$	0	$\frac{3\sqrt{14}}{112}$	0	$-\frac{\sqrt{6}}{80}$

585	symmetry	$\frac{3\sqrt{35}\,y\left(x^2-2xz-z^2\right)\left(x^2+2xz-z^2\right)}{8}$

$\mathbb{Q}_{5,2}^{(1,-1;a)}(E,2)$

0	0	0	0	0	0	0	$-\frac{\sqrt{210}i}{800}$	0	$-\frac{\sqrt{42}i}{160}$	0	$\frac{9\sqrt{70}i}{800}$	0	$-\frac{\sqrt{30}i}{160}$
0	0	0	0	0	0	$-\frac{9\sqrt{10}i}{800}$	0	$\frac{3\sqrt{210}i}{800}$	0	$\frac{3\sqrt{14}i}{160}$	0	$-\frac{9\sqrt{70}i}{800}$	0
0	0	0	0	0	0	0	$\frac{9\sqrt{70}i}{800}$	0	$-\frac{3\sqrt{14}i}{160}$	0	$-\frac{3\sqrt{210}i}{800}$	0	$\frac{9\sqrt{10}i}{800}$
0	0	0	0	0	0	$\frac{\sqrt{30}i}{160}$	0	$-\frac{9\sqrt{70}i}{800}$	0	$\frac{\sqrt{42}i}{160}$	0	$\frac{\sqrt{210}i}{800}$	0
0	$\frac{\sqrt{35}i}{560}$	0	$-\frac{3\sqrt{70}i}{560}$	0	$\frac{\sqrt{7}i}{112}$	$\frac{\sqrt{6}i}{80}$	0	$\frac{3\sqrt{14}i}{112}$	0	$-\frac{9\sqrt{210}i}{560}$	0	$\frac{\sqrt{42}i}{112}$	0
$-\frac{\sqrt{35}i}{560}$	0	$-\frac{\sqrt{14}i}{112}$	0	$\frac{3\sqrt{7}i}{112}$	0	0	$-\frac{23\sqrt{210}i}{2800}$	0	$-\frac{13\sqrt{42}i}{560}$	0	$\frac{27\sqrt{70}i}{2800}$	0	$\frac{\sqrt{30}i}{80}$
0	$\frac{\sqrt{14}i}{112}$	0	$\frac{\sqrt{7}i}{56}$	0	$-\frac{3\sqrt{70}i}{560}$	$-\frac{9\sqrt{15}i}{200}$	0	$\frac{33\sqrt{35}i}{1400}$	0	$\frac{\sqrt{21}i}{280}$	0	$\frac{27\sqrt{105}i}{1400}$	0
$\frac{3\sqrt{70}i}{560}$	0	$-\frac{\sqrt{7}i}{56}$	0	$-\frac{\sqrt{14}i}{112}$	0	0	$\frac{27\sqrt{105}i}{1400}$	0	$\frac{\sqrt{21}i}{280}$	0	$\frac{33\sqrt{35}i}{1400}$	0	$-\frac{9\sqrt{15}i}{200}$
0	$-\frac{3\sqrt{7}i}{112}$	0	$\frac{\sqrt{14}i}{112}$	0	$\frac{\sqrt{35}i}{560}$	$\frac{\sqrt{30}i}{80}$	0	$\frac{27\sqrt{70}i}{2800}$	0	$-\frac{13\sqrt{42}i}{560}$	0	$-\frac{23\sqrt{210}i}{2800}$	0
$-\frac{\sqrt{7}i}{112}$	0	$\frac{3\sqrt{70}i}{560}$	0	$-\frac{\sqrt{35}i}{560}$	0	0	$\frac{\sqrt{42}i}{112}$	0	$-\frac{9\sqrt{210}i}{560}$	0	$\frac{3\sqrt{14}i}{112}$	0	$\frac{\sqrt{6}i}{80}$

586	symmetry	$\frac{\sqrt{105}\,x(y-z)(y+z)\left(2x^2-y^2-z^2\right)}{4}$

continued …

Table 9

No.	multipole	matrix

$\mathbb{Q}_{5,1}^{(1,-1;a)}(E,3)$

$$
\begin{bmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}}{400} & 0 & \frac{\sqrt{14}}{80} & 0 & -\frac{\sqrt{210}}{400} & 0 & -\frac{3\sqrt{10}}{80} \\
0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}}{400} & 0 & \frac{3\sqrt{70}}{400} & 0 & -\frac{\sqrt{42}}{80} & 0 & \frac{\sqrt{210}}{400} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{210}}{400} & 0 & -\frac{\sqrt{42}}{80} & 0 & \frac{3\sqrt{70}}{400} & 0 & -\frac{\sqrt{30}}{400} \\
0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{10}}{80} & 0 & -\frac{\sqrt{210}}{400} & 0 & \frac{\sqrt{14}}{80} & 0 & -\frac{\sqrt{70}}{400} & 0 \\
0 & -\frac{\sqrt{105}}{840} & 0 & \frac{\sqrt{210}}{840} & 0 & \frac{\sqrt{21}}{56} & \frac{\sqrt{2}}{40} & 0 & -\frac{\sqrt{42}}{56} & 0 & \frac{3\sqrt{70}}{280} & 0 & \frac{3\sqrt{14}}{56} & 0 \\
-\frac{\sqrt{105}}{840} & 0 & \frac{\sqrt{42}}{168} & 0 & -\frac{\sqrt{21}}{168} & 0 & 0 & -\frac{23\sqrt{70}}{1400} & 0 & \frac{13\sqrt{14}}{280} & 0 & -\frac{3\sqrt{210}}{1400} & 0 & \frac{3\sqrt{10}}{40} \\
0 & \frac{\sqrt{42}}{168} & 0 & -\frac{\sqrt{21}}{84} & 0 & \frac{\sqrt{210}}{840} & -\frac{3\sqrt{5}}{100} & 0 & \frac{11\sqrt{105}}{700} & 0 & -\frac{\sqrt{7}}{140} & 0 & -\frac{9\sqrt{35}}{700} & 0 \\
\frac{\sqrt{210}}{840} & 0 & -\frac{\sqrt{21}}{84} & 0 & \frac{\sqrt{42}}{168} & 0 & 0 & \frac{9\sqrt{35}}{700} & 0 & \frac{\sqrt{7}}{140} & 0 & -\frac{11\sqrt{105}}{700} & 0 & \frac{3\sqrt{5}}{100} \\
0 & -\frac{\sqrt{21}}{168} & 0 & \frac{\sqrt{42}}{168} & 0 & -\frac{\sqrt{105}}{840} & -\frac{3\sqrt{10}}{40} & 0 & \frac{3\sqrt{210}}{1400} & 0 & -\frac{13\sqrt{14}}{280} & 0 & \frac{23\sqrt{70}}{1400} & 0 \\
\frac{\sqrt{21}}{56} & 0 & \frac{\sqrt{210}}{840} & 0 & -\frac{\sqrt{105}}{840} & 0 & 0 & -\frac{3\sqrt{14}}{56} & 0 & -\frac{3\sqrt{70}}{280} & 0 & \frac{\sqrt{42}}{56} & 0 & -\frac{\sqrt{2}}{40}
\end{bmatrix}
$$

587	symmetry	$-\frac{\sqrt{105}\,y(x-z)(x+z)\left(x^2-2y^2+z^2\right)}{4}$

$\mathbb{Q}_{5,2}^{(1,-1;a)}(E,3)$

$$
\begin{bmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}i}{400} & 0 & -\frac{\sqrt{14}i}{80} & 0 & -\frac{\sqrt{210}i}{400} & 0 & \frac{3\sqrt{10}i}{80} \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}i}{400} & 0 & \frac{3\sqrt{70}i}{400} & 0 & \frac{\sqrt{42}i}{80} & 0 & \frac{\sqrt{210}i}{400} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{210}i}{400} & 0 & -\frac{\sqrt{42}i}{80} & 0 & -\frac{3\sqrt{70}i}{400} & 0 & -\frac{\sqrt{30}i}{400} \\
0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{10}i}{80} & 0 & \frac{\sqrt{210}i}{400} & 0 & \frac{\sqrt{14}i}{80} & 0 & \frac{\sqrt{70}i}{400} & 0 \\
0 & \frac{\sqrt{105}i}{840} & 0 & \frac{\sqrt{210}i}{840} & 0 & -\frac{\sqrt{21}i}{56} & \frac{\sqrt{2}i}{40} & 0 & \frac{\sqrt{42}i}{56} & 0 & \frac{3\sqrt{70}i}{280} & 0 & -\frac{3\sqrt{14}i}{56} & 0 \\
-\frac{\sqrt{105}i}{840} & 0 & -\frac{\sqrt{42}i}{168} & 0 & -\frac{\sqrt{21}i}{168} & 0 & 0 & -\frac{23\sqrt{70}i}{1400} & 0 & -\frac{13\sqrt{14}i}{280} & 0 & -\frac{3\sqrt{210}i}{1400} & 0 & -\frac{3\sqrt{10}i}{40} \\
0 & \frac{\sqrt{42}i}{168} & 0 & \frac{\sqrt{21}i}{84} & 0 & \frac{\sqrt{210}i}{840} & \frac{3\sqrt{5}i}{100} & 0 & \frac{11\sqrt{105}i}{700} & 0 & \frac{\sqrt{7}i}{140} & 0 & -\frac{9\sqrt{35}i}{700} & 0 \\
-\frac{\sqrt{210}i}{840} & 0 & -\frac{\sqrt{21}i}{84} & 0 & -\frac{\sqrt{42}i}{168} & 0 & 0 & -\frac{9\sqrt{35}i}{700} & 0 & \frac{\sqrt{7}i}{140} & 0 & \frac{11\sqrt{105}i}{700} & 0 & \frac{3\sqrt{5}i}{100} \\
0 & \frac{\sqrt{21}i}{168} & 0 & \frac{\sqrt{42}i}{168} & 0 & \frac{\sqrt{105}i}{840} & -\frac{3\sqrt{10}i}{40} & 0 & -\frac{3\sqrt{210}i}{1400} & 0 & -\frac{13\sqrt{14}i}{280} & 0 & -\frac{23\sqrt{70}i}{1400} & 0 \\
\frac{\sqrt{21}i}{56} & 0 & -\frac{\sqrt{210}i}{840} & 0 & -\frac{\sqrt{105}i}{840} & 0 & 0 & -\frac{3\sqrt{14}i}{56} & 0 & \frac{3\sqrt{70}i}{280} & 0 & \frac{\sqrt{42}i}{56} & 0 & \frac{\sqrt{2}i}{40}
\end{bmatrix}
$$

588	symmetry	z

continued …

Table 9

No.	multipole	matrix

$$\mathbb{Q}_1^{(1,0;a)}(B_2) = \begin{bmatrix}
0 & -\frac{\sqrt{2}}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & -\frac{\sqrt{3}}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & -\frac{\sqrt{3}}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & -\frac{\sqrt{2}}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
\frac{3\sqrt{2}}{14} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{14} & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & \frac{9\sqrt{2}}{70} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{5}}{14} & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & \frac{3\sqrt{2}}{70} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{14} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & -\frac{3\sqrt{2}}{70} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{14} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & -\frac{9\sqrt{2}}{70} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{5}}{14} & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{2}}{14} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{14} & 0
\end{bmatrix}$$

589	symmetry	x

$$\mathbb{Q}_{1,1}^{(1,0;a)}(E) = \begin{bmatrix}
\frac{\sqrt{10}}{20} & 0 & -\frac{1}{20} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & \frac{\sqrt{6}}{20} & 0 & -\frac{\sqrt{3}}{20} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & \frac{\sqrt{3}}{20} & 0 & -\frac{\sqrt{6}}{20} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & \frac{1}{20} & 0 & -\frac{\sqrt{10}}{20} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & \frac{3\sqrt{10}}{70} & 0 & 0 & 0 & 0 & -\frac{\sqrt{21}}{28} & 0 & \frac{1}{28} & 0 & 0 & 0 & 0 & 0 \\
\frac{3\sqrt{10}}{70} & 0 & \frac{6}{35} & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{28} & 0 & \frac{\sqrt{3}}{28} & 0 & 0 & 0 & 0 \\
0 & \frac{6}{35} & 0 & \frac{9\sqrt{2}}{70} & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}}{28} & 0 & \frac{\sqrt{6}}{28} & 0 & 0 & 0 \\
0 & 0 & \frac{9\sqrt{2}}{70} & 0 & \frac{6}{35} & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}}{28} & 0 & \frac{\sqrt{10}}{28} & 0 & 0 \\
0 & 0 & 0 & \frac{6}{35} & 0 & \frac{3\sqrt{10}}{70} & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{28} & 0 & \frac{\sqrt{15}}{28} & 0 \\
0 & 0 & 0 & 0 & \frac{3\sqrt{10}}{70} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{1}{28} & 0 & \frac{\sqrt{21}}{28}
\end{bmatrix}$$

590	symmetry	y

continued …

Table 9

No.	multipole	matrix

$\mathbb{Q}_{1,2}^{(1,0;a)}(E)$

$$\begin{pmatrix}
\frac{\sqrt{10}i}{20} & 0 & \frac{i}{20} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & \frac{\sqrt{6}i}{20} & 0 & \frac{\sqrt{3}i}{20} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & \frac{\sqrt{3}i}{20} & 0 & \frac{\sqrt{6}i}{20} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & \frac{i}{20} & 0 & \frac{\sqrt{10}i}{20} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & -\frac{3\sqrt{10}i}{70} & 0 & 0 & 0 & 0 & -\frac{\sqrt{21}i}{28} & 0 & -\frac{i}{28} & 0 & 0 & 0 & 0 & 0 \\
\frac{3\sqrt{10}i}{70} & 0 & -\frac{6i}{35} & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{28} & 0 & -\frac{\sqrt{3}i}{28} & 0 & 0 & 0 & 0 \\
0 & \frac{6i}{35} & 0 & -\frac{9\sqrt{2}i}{70} & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}i}{28} & 0 & -\frac{\sqrt{6}i}{28} & 0 & 0 & 0 \\
0 & 0 & \frac{9\sqrt{2}i}{70} & 0 & -\frac{6i}{35} & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{28} & 0 & -\frac{\sqrt{10}i}{28} & 0 & 0 \\
0 & 0 & 0 & \frac{6i}{35} & 0 & -\frac{3\sqrt{10}i}{70} & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{28} & 0 & -\frac{\sqrt{15}i}{28} & 0 \\
0 & 0 & 0 & 0 & \frac{3\sqrt{10}i}{70} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{i}{28} & 0 & -\frac{\sqrt{21}i}{28}
\end{pmatrix}$$

591	symmetry	$\sqrt{15}xyz$

$\mathbb{Q}_3^{(1,0;a)}(A_1)$

$$\begin{pmatrix}
0 & 0 & 0 & -\frac{\sqrt{210}i}{280} & 0 & 0 & -\frac{\sqrt{2}i}{8} & 0 & 0 & 0 & \frac{\sqrt{70}i}{56} & 0 & 0 & 0 \\
-\frac{\sqrt{7}i}{56} & 0 & 0 & 0 & -\frac{\sqrt{35}i}{280} & 0 & 0 & \frac{\sqrt{42}i}{56} & 0 & 0 & 0 & \frac{3\sqrt{14}i}{56} & 0 & 0 \\
0 & \frac{\sqrt{35}i}{280} & 0 & 0 & 0 & \frac{\sqrt{7}i}{56} & 0 & 0 & \frac{3\sqrt{14}i}{56} & 0 & 0 & 0 & \frac{\sqrt{42}i}{56} & 0 \\
0 & 0 & \frac{\sqrt{210}i}{280} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{70}i}{56} & 0 & 0 & 0 & -\frac{\sqrt{2}i}{8} \\
0 & 0 & \frac{\sqrt{42}i}{28} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{14}i}{84} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & \frac{\sqrt{210}i}{140} & 0 & 0 & \frac{\sqrt{2}i}{24} & 0 & 0 & 0 & \frac{\sqrt{70}i}{168} & 0 & 0 & 0 \\
-\frac{\sqrt{42}i}{28} & 0 & 0 & 0 & -\frac{\sqrt{210}i}{140} & 0 & 0 & \frac{\sqrt{7}i}{168} & 0 & 0 & 0 & \frac{\sqrt{21}i}{168} & 0 & 0 \\
0 & -\frac{\sqrt{210}i}{140} & 0 & 0 & 0 & -\frac{\sqrt{42}i}{28} & 0 & 0 & -\frac{\sqrt{21}i}{168} & 0 & 0 & 0 & -\frac{\sqrt{7}i}{168} & 0 \\
0 & 0 & \frac{\sqrt{210}i}{140} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}i}{168} & 0 & 0 & 0 & -\frac{\sqrt{2}i}{24} \\
0 & 0 & 0 & \frac{\sqrt{42}i}{28} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{14}i}{84} & 0 & 0 & 0
\end{pmatrix}$$

592	symmetry	$\frac{\sqrt{15}z(x-y)(x+y)}{2}$

Table 9

No.	multipole	matrix

$\mathbb{Q}_3^{(1,0;a)}(A_2)$

$$\begin{bmatrix}
0 & 0 & 0 & \frac{\sqrt{210}}{280} & 0 & 0 & -\frac{\sqrt{2}}{8} & 0 & 0 & 0 & -\frac{\sqrt{70}}{56} & 0 & 0 & 0 \\
-\frac{\sqrt{7}}{56} & 0 & 0 & 0 & \frac{\sqrt{35}}{280} & 0 & 0 & \frac{\sqrt{42}}{56} & 0 & 0 & 0 & -\frac{3\sqrt{14}}{56} & 0 & 0 \\
0 & \frac{\sqrt{35}}{280} & 0 & 0 & 0 & -\frac{\sqrt{7}}{56} & 0 & 0 & \frac{3\sqrt{14}}{56} & 0 & 0 & 0 & -\frac{\sqrt{42}}{56} & 0 \\
0 & 0 & \frac{\sqrt{210}}{280} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{70}}{56} & 0 & 0 & 0 & \frac{\sqrt{2}}{8} \\
0 & 0 & -\frac{\sqrt{42}}{28} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{14}}{84} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & -\frac{\sqrt{210}}{140} & 0 & 0 & \frac{\sqrt{2}}{24} & 0 & 0 & 0 & -\frac{\sqrt{70}}{168} & 0 & 0 & 0 \\
-\frac{\sqrt{42}}{28} & 0 & 0 & 0 & \frac{\sqrt{210}}{140} & 0 & 0 & \frac{\sqrt{7}}{168} & 0 & 0 & 0 & -\frac{\sqrt{21}}{168} & 0 & 0 \\
0 & -\frac{\sqrt{210}}{140} & 0 & 0 & 0 & \frac{\sqrt{42}}{28} & 0 & 0 & -\frac{\sqrt{21}}{168} & 0 & 0 & 0 & \frac{\sqrt{7}}{168} & 0 \\
0 & 0 & \frac{\sqrt{210}}{140} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}}{168} & 0 & 0 & 0 & \frac{\sqrt{2}}{24} \\
0 & 0 & 0 & \frac{\sqrt{42}}{28} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{14}}{84} & 0 & 0 & 0
\end{bmatrix}$$

593	symmetry	$-\frac{z\left(3x^2+3y^2-2z^2\right)}{2}$

$\mathbb{Q}_3^{(1,0;a)}(B_2)$

$$\begin{bmatrix}
0 & \frac{3\sqrt{7}}{140} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}}{28} & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & -\frac{\sqrt{42}}{140} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{14}}{28} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & -\frac{\sqrt{42}}{140} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{14}}{28} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & \frac{3\sqrt{7}}{140} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{70}}{28} & 0 & 0 \\
-\frac{\sqrt{7}}{14} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{42}}{84} & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & \frac{\sqrt{7}}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & \frac{2\sqrt{7}}{35} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{21}}{84} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & -\frac{2\sqrt{7}}{35} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{21}}{84} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & -\frac{\sqrt{7}}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}}{14} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{42}}{84} & 0
\end{bmatrix}$$

594	symmetry	$\frac{x\left(2x^2-3y^2-3z^2\right)}{2}$

Table 9

No.	multipole	matrix

$\mathbb{Q}_{3,1}^{(1,0;a)}(E,1)$

$$\begin{bmatrix}
\frac{3\sqrt{35}}{1120} & 0 & -\frac{9\sqrt{14}}{1120} & 0 & \frac{3\sqrt{7}}{224} & 0 & 0 & -\frac{\sqrt{210}}{112} & 0 & \frac{\sqrt{42}}{56} & 0 & -\frac{\sqrt{70}}{112} & 0 & 0 \\[4pt]
0 & -\frac{\sqrt{21}}{160} & 0 & \frac{\sqrt{42}}{1120} & 0 & \frac{\sqrt{105}}{224} & -\frac{\sqrt{10}}{16} & 0 & 0 & 0 & \frac{3\sqrt{14}}{112} & 0 & -\frac{\sqrt{70}}{56} & 0 \\[4pt]
-\frac{\sqrt{105}}{224} & 0 & -\frac{\sqrt{42}}{1120} & 0 & \frac{\sqrt{21}}{160} & 0 & 0 & -\frac{\sqrt{70}}{56} & 0 & \frac{3\sqrt{14}}{112} & 0 & 0 & 0 & -\frac{\sqrt{10}}{16} \\[4pt]
0 & -\frac{3\sqrt{7}}{224} & 0 & \frac{9\sqrt{14}}{1120} & 0 & -\frac{3\sqrt{35}}{1120} & 0 & 0 & -\frac{\sqrt{70}}{112} & 0 & \frac{\sqrt{42}}{56} & 0 & -\frac{\sqrt{210}}{112} & 0 \\[4pt]
0 & \frac{3\sqrt{35}}{140} & 0 & -\frac{\sqrt{70}}{56} & 0 & 0 & -\frac{\sqrt{6}}{96} & 0 & \frac{\sqrt{14}}{112} & 0 & -\frac{\sqrt{210}}{672} & 0 & 0 & 0 \\[4pt]
\frac{3\sqrt{35}}{140} & 0 & -\frac{3\sqrt{14}}{280} & 0 & -\frac{\sqrt{7}}{14} & 0 & 0 & \frac{\sqrt{210}}{672} & 0 & \frac{\sqrt{42}}{336} & 0 & -\frac{\sqrt{70}}{224} & 0 & 0 \\[4pt]
0 & -\frac{3\sqrt{14}}{280} & 0 & -\frac{3\sqrt{7}}{70} & 0 & -\frac{\sqrt{70}}{56} & \frac{\sqrt{15}}{96} & 0 & \frac{\sqrt{35}}{224} & 0 & -\frac{\sqrt{21}}{672} & 0 & -\frac{\sqrt{105}}{224} & 0 \\[4pt]
-\frac{\sqrt{70}}{56} & 0 & -\frac{3\sqrt{7}}{70} & 0 & -\frac{3\sqrt{14}}{280} & 0 & 0 & \frac{\sqrt{105}}{224} & 0 & \frac{\sqrt{21}}{672} & 0 & -\frac{\sqrt{35}}{224} & 0 & -\frac{\sqrt{15}}{96} \\[4pt]
0 & -\frac{\sqrt{7}}{14} & 0 & -\frac{3\sqrt{14}}{280} & 0 & \frac{3\sqrt{35}}{140} & 0 & 0 & \frac{\sqrt{70}}{224} & 0 & -\frac{\sqrt{42}}{336} & 0 & -\frac{\sqrt{210}}{672} & 0 \\[4pt]
0 & 0 & -\frac{\sqrt{70}}{56} & 0 & \frac{3\sqrt{35}}{140} & 0 & 0 & 0 & 0 & \frac{\sqrt{210}}{672} & 0 & -\frac{\sqrt{14}}{112} & 0 & \frac{\sqrt{6}}{96}
\end{bmatrix}$$

595	symmetry	$-\dfrac{y\left(3x^2-2y^2+3z^2\right)}{2}$

$\mathbb{Q}_{3,2}^{(1,0;a)}(E,1)$

$$\begin{bmatrix}
\frac{3\sqrt{35}i}{1120} & 0 & \frac{9\sqrt{14}i}{1120} & 0 & \frac{3\sqrt{7}i}{224} & 0 & 0 & -\frac{\sqrt{210}i}{112} & 0 & -\frac{\sqrt{42}i}{56} & 0 & -\frac{\sqrt{70}i}{112} & 0 & 0 \\[4pt]
0 & -\frac{\sqrt{21}i}{160} & 0 & -\frac{\sqrt{42}i}{1120} & 0 & \frac{\sqrt{105}i}{224} & \frac{\sqrt{10}i}{16} & 0 & 0 & 0 & -\frac{3\sqrt{14}i}{112} & 0 & -\frac{\sqrt{70}i}{56} & 0 \\[4pt]
\frac{\sqrt{105}i}{224} & 0 & -\frac{\sqrt{42}i}{1120} & 0 & -\frac{\sqrt{21}i}{160} & 0 & 0 & \frac{\sqrt{70}i}{56} & 0 & \frac{3\sqrt{14}i}{112} & 0 & 0 & 0 & -\frac{\sqrt{10}i}{16} \\[4pt]
0 & \frac{3\sqrt{7}i}{224} & 0 & \frac{9\sqrt{14}i}{1120} & 0 & \frac{3\sqrt{35}i}{1120} & 0 & 0 & \frac{\sqrt{70}i}{112} & 0 & \frac{\sqrt{42}i}{56} & 0 & \frac{\sqrt{210}i}{112} & 0 \\[4pt]
0 & -\frac{3\sqrt{35}i}{140} & 0 & -\frac{\sqrt{70}i}{56} & 0 & 0 & -\frac{\sqrt{6}i}{96} & 0 & -\frac{\sqrt{14}i}{112} & 0 & -\frac{\sqrt{210}i}{672} & 0 & 0 & 0 \\[4pt]
\frac{3\sqrt{35}i}{140} & 0 & \frac{3\sqrt{14}i}{280} & 0 & -\frac{\sqrt{7}i}{14} & 0 & 0 & \frac{\sqrt{210}i}{672} & 0 & -\frac{\sqrt{42}i}{336} & 0 & -\frac{\sqrt{70}i}{224} & 0 & 0 \\[4pt]
0 & -\frac{3\sqrt{14}i}{280} & 0 & \frac{3\sqrt{7}i}{70} & 0 & -\frac{\sqrt{70}i}{56} & -\frac{\sqrt{15}i}{96} & 0 & \frac{\sqrt{35}i}{224} & 0 & \frac{\sqrt{21}i}{672} & 0 & -\frac{\sqrt{105}i}{224} & 0 \\[4pt]
\frac{\sqrt{70}i}{56} & 0 & -\frac{3\sqrt{7}i}{70} & 0 & \frac{3\sqrt{14}i}{280} & 0 & 0 & -\frac{\sqrt{105}i}{224} & 0 & \frac{\sqrt{21}i}{672} & 0 & \frac{\sqrt{35}i}{224} & 0 & -\frac{\sqrt{15}i}{96} \\[4pt]
0 & \frac{\sqrt{7}i}{14} & 0 & -\frac{3\sqrt{14}i}{280} & 0 & -\frac{3\sqrt{35}i}{140} & 0 & 0 & -\frac{\sqrt{70}i}{224} & 0 & -\frac{\sqrt{42}i}{336} & 0 & \frac{\sqrt{210}i}{672} & 0 \\[4pt]
0 & 0 & \frac{\sqrt{70}i}{56} & 0 & \frac{3\sqrt{35}i}{140} & 0 & 0 & 0 & 0 & -\frac{\sqrt{210}i}{672} & 0 & -\frac{\sqrt{14}i}{112} & 0 & -\frac{\sqrt{6}i}{96}
\end{bmatrix}$$

596	symmetry	$\dfrac{\sqrt{15}\,x(y-z)(y+z)}{2}$

Table 9

No.	multipole	matrix

$\mathbb{Q}_{3,1}^{(1,0;a)}(E,2)$

$$\begin{bmatrix}
\frac{\sqrt{21}}{224} & 0 & -\frac{3\sqrt{210}}{1120} & 0 & -\frac{3\sqrt{105}}{1120} & 0 & 0 & -\frac{5\sqrt{14}}{112} & 0 & \frac{\sqrt{70}}{56} & 0 & \frac{\sqrt{42}}{112} & 0 & 0 \\[4pt]
0 & -\frac{\sqrt{35}}{160} & 0 & \frac{\sqrt{70}}{1120} & 0 & -\frac{3\sqrt{7}}{224} & \frac{\sqrt{6}}{16} & 0 & 0 & 0 & \frac{\sqrt{210}}{112} & 0 & \frac{\sqrt{42}}{56} & 0 \\[4pt]
\frac{3\sqrt{7}}{224} & 0 & -\frac{\sqrt{70}}{1120} & 0 & \frac{\sqrt{35}}{160} & 0 & 0 & \frac{\sqrt{42}}{56} & 0 & \frac{\sqrt{210}}{112} & 0 & 0 & 0 & \frac{\sqrt{6}}{16} \\[4pt]
0 & \frac{3\sqrt{105}}{1120} & 0 & \frac{3\sqrt{210}}{1120} & 0 & -\frac{\sqrt{21}}{224} & 0 & 0 & \frac{\sqrt{42}}{112} & 0 & \frac{\sqrt{70}}{56} & 0 & -\frac{5\sqrt{14}}{112} & 0 \\[4pt]
0 & \frac{\sqrt{21}}{28} & 0 & \frac{\sqrt{42}}{56} & 0 & 0 & -\frac{\sqrt{10}}{96} & 0 & \frac{\sqrt{210}}{336} & 0 & \frac{\sqrt{14}}{224} & 0 & 0 & 0 \\[4pt]
\frac{\sqrt{21}}{28} & 0 & -\frac{\sqrt{210}}{280} & 0 & \frac{\sqrt{105}}{70} & 0 & 0 & \frac{5\sqrt{14}}{672} & 0 & \frac{\sqrt{70}}{336} & 0 & \frac{\sqrt{42}}{224} & 0 & 0 \\[4pt]
0 & -\frac{\sqrt{210}}{280} & 0 & -\frac{\sqrt{105}}{70} & 0 & \frac{\sqrt{42}}{56} & -\frac{1}{32} & 0 & \frac{5\sqrt{21}}{672} & 0 & -\frac{\sqrt{35}}{672} & 0 & \frac{3\sqrt{7}}{224} & 0 \\[4pt]
\frac{\sqrt{42}}{56} & 0 & -\frac{\sqrt{105}}{70} & 0 & -\frac{\sqrt{210}}{280} & 0 & 0 & -\frac{3\sqrt{7}}{224} & 0 & \frac{\sqrt{35}}{672} & 0 & -\frac{5\sqrt{21}}{672} & 0 & \frac{1}{32} \\[4pt]
0 & \frac{\sqrt{105}}{70} & 0 & -\frac{\sqrt{210}}{280} & 0 & \frac{\sqrt{21}}{28} & 0 & 0 & -\frac{\sqrt{42}}{224} & 0 & -\frac{\sqrt{70}}{336} & 0 & -\frac{5\sqrt{14}}{672} & 0 \\[4pt]
0 & 0 & \frac{\sqrt{42}}{56} & 0 & \frac{\sqrt{21}}{28} & 0 & 0 & 0 & 0 & -\frac{\sqrt{14}}{224} & 0 & -\frac{\sqrt{210}}{336} & 0 & \frac{\sqrt{10}}{96}
\end{bmatrix}$$

597	symmetry	$\dfrac{\sqrt{15}y(x-z)(x+z)}{2}$

$\mathbb{Q}_{3,2}^{(1,0;a)}(E,2)$

$$\begin{bmatrix}
\frac{\sqrt{21}i}{224} & 0 & \frac{3\sqrt{210}i}{1120} & 0 & -\frac{3\sqrt{105}i}{1120} & 0 & 0 & -\frac{5\sqrt{14}i}{112} & 0 & -\frac{\sqrt{70}i}{56} & 0 & \frac{\sqrt{42}i}{112} & 0 & 0 \\[4pt]
0 & -\frac{\sqrt{35}i}{160} & 0 & -\frac{\sqrt{70}i}{1120} & 0 & -\frac{3\sqrt{7}i}{224} & -\frac{\sqrt{6}i}{16} & 0 & 0 & 0 & -\frac{\sqrt{210}i}{112} & 0 & \frac{\sqrt{42}i}{56} & 0 \\[4pt]
-\frac{3\sqrt{7}i}{224} & 0 & -\frac{\sqrt{70}i}{1120} & 0 & -\frac{\sqrt{35}i}{160} & 0 & 0 & -\frac{\sqrt{42}i}{56} & 0 & \frac{\sqrt{210}i}{112} & 0 & 0 & 0 & \frac{\sqrt{6}i}{16} \\[4pt]
0 & -\frac{3\sqrt{105}i}{1120} & 0 & \frac{3\sqrt{210}i}{1120} & 0 & \frac{\sqrt{21}i}{224} & 0 & 0 & -\frac{\sqrt{42}i}{112} & 0 & \frac{\sqrt{70}i}{56} & 0 & \frac{5\sqrt{14}i}{112} & 0 \\[4pt]
0 & -\frac{\sqrt{21}i}{28} & 0 & \frac{\sqrt{42}i}{56} & 0 & 0 & -\frac{\sqrt{10}i}{96} & 0 & -\frac{\sqrt{210}i}{336} & 0 & \frac{\sqrt{14}i}{224} & 0 & 0 & 0 \\[4pt]
\frac{\sqrt{21}i}{28} & 0 & \frac{\sqrt{210}i}{280} & 0 & \frac{\sqrt{105}i}{70} & 0 & 0 & \frac{5\sqrt{14}i}{672} & 0 & -\frac{\sqrt{70}i}{336} & 0 & \frac{\sqrt{42}i}{224} & 0 & 0 \\[4pt]
0 & -\frac{\sqrt{210}i}{280} & 0 & \frac{\sqrt{105}i}{70} & 0 & \frac{\sqrt{42}i}{56} & \frac{i}{32} & 0 & \frac{5\sqrt{21}i}{672} & 0 & \frac{\sqrt{35}i}{672} & 0 & \frac{3\sqrt{7}i}{224} & 0 \\[4pt]
-\frac{\sqrt{42}i}{56} & 0 & -\frac{\sqrt{105}i}{70} & 0 & \frac{\sqrt{210}i}{280} & 0 & 0 & \frac{3\sqrt{7}i}{224} & 0 & \frac{\sqrt{35}i}{672} & 0 & \frac{5\sqrt{21}i}{672} & 0 & \frac{i}{32} \\[4pt]
0 & -\frac{\sqrt{105}i}{70} & 0 & -\frac{\sqrt{210}i}{280} & 0 & -\frac{\sqrt{21}i}{28} & 0 & 0 & \frac{\sqrt{42}i}{224} & 0 & -\frac{\sqrt{70}i}{336} & 0 & \frac{5\sqrt{14}i}{672} & 0 \\[4pt]
0 & 0 & -\frac{\sqrt{42}i}{56} & 0 & \frac{\sqrt{21}i}{28} & 0 & 0 & 0 & 0 & \frac{\sqrt{14}i}{224} & 0 & -\frac{\sqrt{210}i}{336} & 0 & -\frac{\sqrt{10}i}{96}
\end{bmatrix}$$

598	symmetry	$\dfrac{\sqrt{105}xyz(x^2+y^2-2z^2)}{2}$

continued …

Table 9

No.	multipole	matrix

$\mathbb{Q}_5^{(1,0;a)}(A_1)$

$$\begin{bmatrix}
0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}i}{100} & 0 & 0 & 0 & \frac{\sqrt{14}i}{20} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{210}i}{100} & 0 & 0 & 0 & -\frac{3\sqrt{70}i}{100} & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{70}i}{100} & 0 & 0 & 0 & \frac{\sqrt{210}i}{100} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{14}i}{20} & 0 & 0 & 0 & -\frac{\sqrt{10}i}{100} \\
0 & 0 & \frac{\sqrt{210}i}{140} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{70}i}{420} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & -\frac{\sqrt{42}i}{28} & 0 & 0 & \frac{\sqrt{10}i}{300} & 0 & 0 & 0 & -\frac{\sqrt{14}i}{210} & 0 & 0 & 0 \\
-\frac{\sqrt{210}i}{140} & 0 & 0 & 0 & \frac{\sqrt{42}i}{28} & 0 & 0 & -\frac{2\sqrt{35}i}{525} & 0 & 0 & 0 & -\frac{\sqrt{105}i}{1050} & 0 & 0 \\
0 & \frac{\sqrt{42}i}{28} & 0 & 0 & 0 & -\frac{\sqrt{210}i}{140} & 0 & 0 & \frac{\sqrt{105}i}{1050} & 0 & 0 & 0 & \frac{2\sqrt{35}i}{525} & 0 \\
0 & 0 & -\frac{\sqrt{42}i}{28} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{14}i}{210} & 0 & 0 & 0 & -\frac{\sqrt{10}i}{300} \\
0 & 0 & 0 & \frac{\sqrt{210}i}{140} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}i}{420} & 0 & 0 & 0 & 0
\end{bmatrix}$$

No.		
599	symmetry	$-\dfrac{\sqrt{105}z(x-y)(x+y)\left(x^2+y^2-2z^2\right)}{4}$

$\mathbb{Q}_5^{(1,0;a)}(A_2)$

$$\begin{bmatrix}
0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}}{100} & 0 & 0 & 0 & \frac{\sqrt{14}}{20} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{210}}{100} & 0 & 0 & 0 & -\frac{3\sqrt{70}}{100} & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{70}}{100} & 0 & 0 & 0 & \frac{\sqrt{210}}{100} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{14}}{20} & 0 & 0 & 0 & -\frac{\sqrt{10}}{100} \\
0 & 0 & \frac{\sqrt{210}}{140} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{70}}{420} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & -\frac{\sqrt{42}}{28} & 0 & 0 & -\frac{\sqrt{10}}{300} & 0 & 0 & 0 & -\frac{\sqrt{14}}{210} & 0 & 0 & 0 \\
\frac{\sqrt{210}}{140} & 0 & 0 & 0 & \frac{\sqrt{42}}{28} & 0 & 0 & \frac{2\sqrt{35}}{525} & 0 & 0 & 0 & -\frac{\sqrt{105}}{1050} & 0 & 0 \\
0 & -\frac{\sqrt{42}}{28} & 0 & 0 & 0 & -\frac{\sqrt{210}}{140} & 0 & 0 & -\frac{\sqrt{105}}{1050} & 0 & 0 & 0 & \frac{2\sqrt{35}}{525} & 0 \\
0 & 0 & \frac{\sqrt{42}}{28} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{14}}{210} & 0 & 0 & 0 & -\frac{\sqrt{10}}{300} \\
0 & 0 & 0 & -\frac{\sqrt{210}}{140} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{70}}{420} & 0 & 0 & 0 & 0
\end{bmatrix}$$

No.		
600	symmetry	$\dfrac{3\sqrt{35}xyz(x-y)(x+y)}{2}$

continued …

Table 9

No.	multipole	matrix

$\mathbb{Q}_5^{(1,0;a)}(B_1)$

$$\begin{bmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{210}i}{50} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{10}i}{50} \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{10}i}{50} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{210}i}{50} & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & -\frac{3\sqrt{35}i}{70} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{14}i}{140} & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{35}i}{70} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{210}i}{2100} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{150} \\
0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{150} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
\frac{3\sqrt{35}i}{70} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{210}i}{2100} & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & -\frac{3\sqrt{35}i}{70} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{14}i}{140} & 0 & 0 & 0 & 0 & 0
\end{bmatrix}$$

601   symmetry $\dfrac{z\left(15x^4+30x^2y^2-40x^2z^2+15y^4-40y^2z^2+8z^4\right)}{8}$

$\mathbb{Q}_5^{(1,0;a)}(B_2,1)$

$$\begin{bmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2}}{10} & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}}{10} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}}{10} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}}{10} & 0 & 0 \\
\frac{\sqrt{5}}{70} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{420} & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & -\frac{\sqrt{5}}{14} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{2}}{140} & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & \frac{\sqrt{5}}{7} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{210} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & -\frac{\sqrt{5}}{7} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{210} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & \frac{\sqrt{5}}{14} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{2}}{140} & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}}{70} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{420} & 0
\end{bmatrix}$$

602   symmetry $\dfrac{3\sqrt{35}z\left(x^2-2xy-y^2\right)\left(x^2+2xy-y^2\right)}{8}$

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Table 9

No.	multipole	matrix													
	$\mathbb{Q}_5^{(1,0;a)}(B_2,2)$	0	0	0	0	0	0	0	0	0	0	0	0	$\frac{\sqrt{210}}{50}$	0
		0	0	0	0	0	0	0	0	0	0	0	0	0	$-\frac{3\sqrt{10}}{50}$
		0	0	0	0	0	0	$\frac{3\sqrt{10}}{50}$	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	$-\frac{\sqrt{210}}{50}$	0	0	0	0	0	0
		0	0	0	0	$\frac{3\sqrt{35}}{70}$	0	0	0	0	0	0	$\frac{\sqrt{14}}{140}$	0	0
		0	0	0	0	0	$-\frac{3\sqrt{35}}{70}$	0	0	0	0	0	0	$\frac{\sqrt{210}}{2100}$	0
		0	0	0	0	0	0	0	0	0	0	0	0	0	$-\frac{\sqrt{15}}{150}$
		0	0	0	0	0	0	$-\frac{\sqrt{15}}{150}$	0	0	0	0	0	0	0
		$\frac{3\sqrt{35}}{70}$	0	0	0	0	0	0	$\frac{\sqrt{210}}{2100}$	0	0	0	0	0	0
		0	$-\frac{3\sqrt{35}}{70}$	0	0	0	0	0	0	$\frac{\sqrt{14}}{140}$	0	0	0	0	0

No.	symmetry	
603	symmetry	$\frac{x\left(8x^4-40x^2y^2-40x^2z^2+15y^4+30y^2z^2+15z^4\right)}{8}$

multipole	matrix													
$\mathbb{Q}_{5,1}^{(1,0;a)}(E,1)$	0	0	0	0	0	0	0	$-\frac{\sqrt{6}}{80}$	0	$\frac{\sqrt{30}}{80}$	0	$-\frac{7\sqrt{2}}{80}$	0	$\frac{3\sqrt{42}}{80}$
	0	0	0	0	0	0	$-\frac{\sqrt{14}}{80}$	0	$\frac{3\sqrt{6}}{80}$	0	$-\frac{3\sqrt{10}}{80}$	0	$\frac{7\sqrt{2}}{80}$	0
	0	0	0	0	0	0	0	$\frac{7\sqrt{2}}{80}$	0	$-\frac{3\sqrt{10}}{80}$	0	$\frac{3\sqrt{6}}{80}$	0	$-\frac{\sqrt{14}}{80}$
	0	0	0	0	0	0	$\frac{3\sqrt{42}}{80}$	0	$-\frac{7\sqrt{2}}{80}$	0	$\frac{\sqrt{30}}{80}$	0	$-\frac{\sqrt{6}}{80}$	0
	0	$\frac{3}{112}$	0	$-\frac{\sqrt{2}}{16}$	0	$\frac{9\sqrt{5}}{80}$	$-\frac{\sqrt{210}}{6720}$	0	$\frac{\sqrt{10}}{448}$	0	$-\frac{\sqrt{6}}{192}$	0	$\frac{\sqrt{30}}{320}$	0
	$\frac{3}{112}$	0	$-\frac{3\sqrt{10}}{112}$	0	$\frac{\sqrt{5}}{16}$	0	0	$\frac{23\sqrt{6}}{6720}$	0	$-\frac{13\sqrt{30}}{6720}$	0	$\frac{\sqrt{2}}{320}$	0	$\frac{\sqrt{42}}{320}$
	0	$-\frac{3\sqrt{10}}{112}$	0	$\frac{3\sqrt{5}}{56}$	0	$-\frac{\sqrt{2}}{16}$	$\frac{\sqrt{21}}{480}$	0	$-\frac{11}{1120}$	0	$\frac{\sqrt{15}}{3360}$	0	$\frac{\sqrt{3}}{160}$	0
	$-\frac{\sqrt{2}}{16}$	0	$\frac{3\sqrt{5}}{56}$	0	$-\frac{3\sqrt{10}}{112}$	0	0	$-\frac{\sqrt{3}}{160}$	0	$-\frac{\sqrt{15}}{3360}$	0	$\frac{11}{1120}$	0	$-\frac{\sqrt{21}}{480}$
	0	$\frac{\sqrt{5}}{16}$	0	$-\frac{3\sqrt{10}}{112}$	0	$\frac{3}{112}$	$-\frac{\sqrt{42}}{320}$	0	$-\frac{\sqrt{2}}{320}$	0	$\frac{13\sqrt{30}}{6720}$	0	$-\frac{23\sqrt{6}}{6720}$	0
	$\frac{9\sqrt{5}}{80}$	0	$-\frac{\sqrt{2}}{16}$	0	$\frac{3}{112}$	0	0	$-\frac{\sqrt{30}}{320}$	0	$\frac{\sqrt{6}}{192}$	0	$-\frac{\sqrt{10}}{448}$	0	$\frac{\sqrt{210}}{6720}$

No.	symmetry	
604	symmetry	$\frac{y\left(15x^4-40x^2y^2+30x^2z^2+8y^4-40y^2z^2+15z^4\right)}{8}$

continued ...

Table 9

No.	multipole	matrix

$\mathbb{Q}_{5,2}^{(1,0;a)}(E,1)$

0	0	0	0	0	0	0	$-\frac{\sqrt6 i}{80}$	0	$-\frac{\sqrt{30}i}{80}$	0	$-\frac{7\sqrt2 i}{80}$	0	$-\frac{3\sqrt{42}i}{80}$
0	0	0	0	0	0	$\frac{\sqrt{14}i}{80}$	0	$\frac{3\sqrt6 i}{80}$	0	$\frac{3\sqrt{10}i}{80}$	0	$\frac{7\sqrt2 i}{80}$	0
0	0	0	0	0	0	0	$-\frac{7\sqrt2 i}{80}$	0	$-\frac{3\sqrt{10}i}{80}$	0	$-\frac{3\sqrt6 i}{80}$	0	$-\frac{\sqrt{14}i}{80}$
0	0	0	0	0	0	$\frac{3\sqrt{42}i}{80}$	0	$\frac{7\sqrt2 i}{80}$	0	$\frac{\sqrt{30}i}{80}$	0	$\frac{\sqrt6 i}{80}$	0
0	$-\frac{3i}{112}$	0	$-\frac{\sqrt2 i}{16}$	0	$-\frac{9\sqrt5 i}{80}$	$-\frac{\sqrt{210}i}{6720}$	0	$-\frac{\sqrt{10}i}{448}$	0	$-\frac{\sqrt6 i}{192}$	0	$-\frac{\sqrt{30}i}{320}$	0
$\frac{3i}{112}$	0	$\frac{3\sqrt{10}i}{112}$	0	$\frac{\sqrt5 i}{16}$	0	0	$\frac{23\sqrt6 i}{6720}$	0	$\frac{13\sqrt{30}i}{6720}$	0	$\frac{\sqrt2 i}{320}$	0	$-\frac{\sqrt{42}i}{320}$
0	$-\frac{3\sqrt{10}i}{112}$	0	$-\frac{3\sqrt5 i}{56}$	0	$-\frac{\sqrt2 i}{16}$	$-\frac{\sqrt{21}i}{480}$	0	$-\frac{11i}{1120}$	0	$-\frac{\sqrt{15}i}{3360}$	0	$\frac{\sqrt3 i}{160}$	0
$\frac{\sqrt2 i}{16}$	0	$\frac{3\sqrt5 i}{56}$	0	$\frac{3\sqrt{10}i}{112}$	0	0	$\frac{\sqrt3 i}{160}$	0	$-\frac{\sqrt{15}i}{3360}$	0	$-\frac{11i}{1120}$	0	$-\frac{\sqrt{21}i}{480}$
0	$-\frac{\sqrt5 i}{16}$	0	$-\frac{3\sqrt{10}i}{112}$	0	$-\frac{3i}{112}$	$-\frac{\sqrt{42}i}{320}$	0	$\frac{\sqrt2 i}{320}$	0	$\frac{13\sqrt{30}i}{6720}$	0	$\frac{23\sqrt6 i}{6720}$	0
$\frac{9\sqrt5 i}{80}$	0	$\frac{\sqrt2 i}{16}$	0	$\frac{3i}{112}$	0	0	$-\frac{\sqrt{30}i}{320}$	0	$-\frac{\sqrt6 i}{192}$	0	$-\frac{\sqrt{10}i}{448}$	0	$-\frac{\sqrt{210}i}{6720}$

605	symmetry	$\frac{3\sqrt{35}x\left(y^2-2yz-z^2\right)\left(y^2+2yz-z^2\right)}{8}$

$\mathbb{Q}_{5,1}^{(1,0;a)}(E,2)$

0	0	0	0	0	0	0	$-\frac{\sqrt{210}}{400}$	0	$\frac{\sqrt{42}}{80}$	0	$\frac{9\sqrt{70}}{400}$	0	$\frac{\sqrt{30}}{80}$
0	0	0	0	0	0	$\frac{9\sqrt{10}}{400}$	0	$\frac{3\sqrt{210}}{400}$	0	$-\frac{3\sqrt{14}}{80}$	0	$-\frac{9\sqrt{70}}{400}$	0
0	0	0	0	0	0	0	$-\frac{9\sqrt{70}}{400}$	0	$-\frac{3\sqrt{14}}{80}$	0	$\frac{3\sqrt{210}}{400}$	0	$\frac{9\sqrt{10}}{400}$
0	0	0	0	0	0	$\frac{\sqrt{30}}{80}$	0	$\frac{9\sqrt{70}}{400}$	0	$\frac{\sqrt{42}}{80}$	0	$-\frac{\sqrt{210}}{400}$	0
0	$\frac{3\sqrt{35}}{560}$	0	$\frac{9\sqrt{70}}{560}$	0	$\frac{3\sqrt7}{112}$	$-\frac{\sqrt6}{960}$	0	$\frac{\sqrt{14}}{448}$	0	$\frac{3\sqrt{210}}{2240}$	0	$\frac{\sqrt{42}}{1344}$	0
$\frac{3\sqrt{35}}{560}$	0	$-\frac{3\sqrt{14}}{112}$	0	$-\frac{9\sqrt7}{112}$	0	0	$\frac{23\sqrt{210}}{33600}$	0	$-\frac{13\sqrt{42}}{6720}$	0	$-\frac{9\sqrt{70}}{11200}$	0	$\frac{\sqrt{30}}{960}$
0	$-\frac{3\sqrt{14}}{112}$	0	$\frac{3\sqrt7}{56}$	0	$\frac{9\sqrt{70}}{560}$	$-\frac{3\sqrt{15}}{800}$	0	$-\frac{11\sqrt{35}}{5600}$	0	$\frac{\sqrt{21}}{3360}$	0	$-\frac{9\sqrt{105}}{5600}$	0
$\frac{9\sqrt{70}}{560}$	0	$\frac{3\sqrt7}{56}$	0	$-\frac{3\sqrt{14}}{112}$	0	0	$\frac{9\sqrt{105}}{5600}$	0	$-\frac{\sqrt{21}}{3360}$	0	$\frac{11\sqrt{35}}{5600}$	0	$\frac{3\sqrt{15}}{800}$
0	$-\frac{9\sqrt7}{112}$	0	$-\frac{3\sqrt{14}}{112}$	0	$\frac{3\sqrt{35}}{560}$	$-\frac{\sqrt{30}}{960}$	0	$\frac{9\sqrt{70}}{11200}$	0	$\frac{13\sqrt{42}}{6720}$	0	$-\frac{23\sqrt{210}}{33600}$	0
$\frac{3\sqrt7}{112}$	0	$\frac{9\sqrt{70}}{560}$	0	$\frac{3\sqrt{35}}{560}$	0	0	$-\frac{\sqrt{42}}{1344}$	0	$-\frac{3\sqrt{210}}{2240}$	0	$-\frac{\sqrt{14}}{448}$	0	$\frac{\sqrt6}{960}$

606	symmetry	$\frac{3\sqrt{35}y\left(x^2-2xz-z^2\right)\left(x^2+2xz-z^2\right)}{8}$

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Table 9

No.	multipole	matrix

$\mathbb{Q}_{5,2}^{(1,0;a)}(E,2)$

$$\begin{pmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{210}i}{400} & 0 & -\frac{\sqrt{42}i}{80} & 0 & \frac{9\sqrt{70}i}{400} & 0 & -\frac{\sqrt{30}i}{80} \\
0 & 0 & 0 & 0 & 0 & 0 & -\frac{9\sqrt{10}i}{400} & 0 & \frac{3\sqrt{210}i}{400} & 0 & \frac{3\sqrt{14}i}{80} & 0 & -\frac{9\sqrt{70}i}{400} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{9\sqrt{70}i}{400} & 0 & -\frac{3\sqrt{14}i}{80} & 0 & -\frac{3\sqrt{210}i}{400} & 0 & \frac{9\sqrt{10}i}{400} \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}i}{80} & 0 & -\frac{9\sqrt{70}i}{400} & 0 & \frac{\sqrt{42}i}{80} & 0 & \frac{\sqrt{210}i}{400} & 0 \\
0 & -\frac{3\sqrt{35}i}{560} & 0 & \frac{9\sqrt{70}i}{560} & 0 & -\frac{3\sqrt{7}i}{112} & -\frac{\sqrt{6}i}{960} & 0 & -\frac{\sqrt{14}i}{448} & 0 & \frac{3\sqrt{210}i}{2240} & 0 & -\frac{\sqrt{42}i}{1344} & 0 \\
\frac{3\sqrt{35}i}{560} & 0 & \frac{3\sqrt{14}i}{112} & 0 & -\frac{9\sqrt{7}i}{112} & 0 & 0 & \frac{23\sqrt{210}i}{33600} & 0 & \frac{13\sqrt{42}i}{6720} & 0 & -\frac{9\sqrt{70}i}{11200} & 0 & -\frac{\sqrt{30}i}{960} \\
0 & -\frac{3\sqrt{14}i}{112} & 0 & -\frac{3\sqrt{7}i}{56} & 0 & \frac{9\sqrt{70}i}{560} & \frac{3\sqrt{15}i}{800} & 0 & -\frac{11\sqrt{35}i}{5600} & 0 & -\frac{\sqrt{21}i}{3360} & 0 & -\frac{9\sqrt{105}i}{5600} & 0 \\
-\frac{9\sqrt{70}i}{560} & 0 & \frac{3\sqrt{7}i}{56} & 0 & \frac{3\sqrt{14}i}{112} & 0 & 0 & -\frac{9\sqrt{105}i}{5600} & 0 & -\frac{\sqrt{21}i}{3360} & 0 & -\frac{11\sqrt{35}i}{5600} & 0 & \frac{3\sqrt{15}i}{800} \\
0 & \frac{9\sqrt{7}i}{112} & 0 & -\frac{3\sqrt{14}i}{112} & 0 & -\frac{3\sqrt{35}i}{560} & -\frac{\sqrt{30}i}{960} & 0 & -\frac{9\sqrt{70}i}{11200} & 0 & \frac{13\sqrt{42}i}{6720} & 0 & \frac{23\sqrt{210}i}{33600} & 0 \\
\frac{3\sqrt{7}i}{112} & 0 & -\frac{9\sqrt{70}i}{560} & 0 & \frac{3\sqrt{35}i}{560} & 0 & 0 & -\frac{\sqrt{42}i}{1344} & 0 & \frac{3\sqrt{210}i}{2240} & 0 & -\frac{\sqrt{14}i}{448} & 0 & -\frac{\sqrt{6}i}{960}
\end{pmatrix}$$

607	symmetry	$\dfrac{\sqrt{105}x(y-z)(y+z)\left(2x^2-y^2-z^2\right)}{4}$

$\mathbb{Q}_{5,1}^{(1,0;a)}(E,3)$

$$\begin{pmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}}{200} & 0 & \frac{\sqrt{14}}{40} & 0 & -\frac{\sqrt{210}}{200} & 0 & -\frac{3\sqrt{10}}{40} \\
0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}}{200} & 0 & \frac{3\sqrt{70}}{200} & 0 & -\frac{\sqrt{42}}{40} & 0 & \frac{\sqrt{210}}{200} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{210}}{200} & 0 & -\frac{\sqrt{42}}{40} & 0 & \frac{3\sqrt{70}}{200} & 0 & -\frac{\sqrt{30}}{200} \\
0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{10}}{40} & 0 & -\frac{\sqrt{210}}{200} & 0 & \frac{\sqrt{14}}{40} & 0 & -\frac{\sqrt{70}}{200} & 0 \\
0 & \frac{\sqrt{105}}{280} & 0 & -\frac{\sqrt{210}}{280} & 0 & -\frac{3\sqrt{21}}{56} & -\frac{\sqrt{2}}{480} & 0 & \frac{\sqrt{42}}{672} & 0 & -\frac{\sqrt{70}}{1120} & 0 & -\frac{\sqrt{14}}{224} & 0 \\
\frac{\sqrt{105}}{280} & 0 & -\frac{\sqrt{42}}{56} & 0 & \frac{\sqrt{21}}{56} & 0 & 0 & \frac{23\sqrt{70}}{16800} & 0 & -\frac{13\sqrt{14}}{3360} & 0 & \frac{\sqrt{210}}{5600} & 0 & -\frac{\sqrt{10}}{160} \\
0 & -\frac{\sqrt{42}}{56} & 0 & \frac{\sqrt{21}}{28} & 0 & -\frac{\sqrt{210}}{280} & \frac{\sqrt{5}}{400} & 0 & -\frac{11\sqrt{105}}{8400} & 0 & \frac{\sqrt{7}}{1680} & 0 & \frac{3\sqrt{35}}{2800} & 0 \\
-\frac{\sqrt{210}}{280} & 0 & \frac{\sqrt{21}}{28} & 0 & -\frac{\sqrt{42}}{56} & 0 & 0 & -\frac{3\sqrt{35}}{2800} & 0 & -\frac{\sqrt{7}}{1680} & 0 & \frac{11\sqrt{105}}{8400} & 0 & -\frac{\sqrt{5}}{400} \\
0 & \frac{\sqrt{21}}{56} & 0 & -\frac{\sqrt{42}}{56} & 0 & \frac{\sqrt{105}}{280} & \frac{\sqrt{10}}{160} & 0 & -\frac{\sqrt{210}}{5600} & 0 & \frac{13\sqrt{14}}{3360} & 0 & -\frac{23\sqrt{70}}{16800} & 0 \\
-\frac{3\sqrt{21}}{56} & 0 & -\frac{\sqrt{210}}{280} & 0 & \frac{\sqrt{105}}{280} & 0 & 0 & \frac{\sqrt{14}}{224} & 0 & \frac{\sqrt{70}}{1120} & 0 & -\frac{\sqrt{42}}{672} & 0 & \frac{\sqrt{2}}{480}
\end{pmatrix}$$

608	symmetry	$-\dfrac{\sqrt{105}y(x-z)(x+z)\left(x^2-2y^2+z^2\right)}{4}$

Table 9

No.	multipole	matrix												
	$\mathbb{Q}_{5,2}^{(1,0;a)}(E,3)$	0	0	0	0	0	0	0	$-\frac{\sqrt{70}i}{200}$	0	$-\frac{\sqrt{14}i}{40}$	0	$-\frac{\sqrt{210}i}{200}$	0	$\frac{3\sqrt{10}i}{40}$
		0	0	0	0	0	0	$\frac{\sqrt{30}i}{200}$	0	$\frac{3\sqrt{70}i}{200}$	0	$\frac{\sqrt{42}i}{40}$	0	$\frac{\sqrt{210}i}{200}$	0
		0	0	0	0	0	0	0	$-\frac{\sqrt{210}i}{200}$	0	$-\frac{\sqrt{42}i}{40}$	0	$-\frac{3\sqrt{70}i}{200}$	0	$-\frac{\sqrt{30}i}{200}$
		0	0	0	0	0	0	$-\frac{3\sqrt{10}i}{40}$	0	$\frac{\sqrt{210}i}{200}$	0	$\frac{\sqrt{14}i}{40}$	0	$\frac{\sqrt{70}i}{200}$	0
		0	$-\frac{\sqrt{105}i}{280}$	0	$-\frac{\sqrt{210}i}{280}$	0	$\frac{3\sqrt{21}i}{56}$	$-\frac{\sqrt{2}i}{480}$	0	$-\frac{\sqrt{42}i}{672}$	0	$-\frac{\sqrt{70}i}{1120}$	0	$\frac{\sqrt{14}i}{224}$	0
		$\frac{\sqrt{105}i}{280}$	0	$\frac{\sqrt{42}i}{56}$	0	$\frac{\sqrt{21}i}{56}$	0	0	$\frac{23\sqrt{70}i}{16800}$	0	$\frac{13\sqrt{14}i}{3360}$	0	$\frac{\sqrt{210}i}{5600}$	0	$\frac{\sqrt{10}i}{160}$
		0	$-\frac{\sqrt{42}i}{56}$	0	$-\frac{\sqrt{21}i}{28}$	0	$-\frac{\sqrt{210}i}{280}$	$-\frac{\sqrt{5}i}{400}$	0	$-\frac{11\sqrt{105}i}{8400}$	0	$-\frac{\sqrt{7}i}{1680}$	0	$\frac{3\sqrt{35}i}{2800}$	0
		$\frac{\sqrt{210}i}{280}$	0	$\frac{\sqrt{21}i}{28}$	0	$\frac{\sqrt{42}i}{56}$	0	0	$\frac{3\sqrt{35}i}{2800}$	0	$-\frac{\sqrt{7}i}{1680}$	0	$-\frac{11\sqrt{105}i}{8400}$	0	$-\frac{\sqrt{5}i}{400}$
		0	$-\frac{\sqrt{21}i}{56}$	0	$-\frac{\sqrt{42}i}{56}$	0	$-\frac{\sqrt{105}i}{280}$	$\frac{\sqrt{10}i}{160}$	0	$\frac{\sqrt{210}i}{5600}$	0	$\frac{13\sqrt{14}i}{3360}$	0	$\frac{23\sqrt{70}i}{16800}$	0
		$-\frac{3\sqrt{21}i}{56}$	0	$\frac{\sqrt{210}i}{280}$	0	$\frac{\sqrt{105}i}{280}$	0	0	$\frac{\sqrt{14}i}{224}$	0	$-\frac{\sqrt{70}i}{1120}$	0	$-\frac{\sqrt{42}i}{672}$	0	$-\frac{\sqrt{2}i}{480}$

No.	multipole	matrix												
609	symmetry	z												
	$\mathbb{Q}_1^{(1,1;a)}(B_2)$	0	$-\frac{1}{5}$	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	$-\frac{\sqrt{6}}{10}$	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	$-\frac{\sqrt{6}}{10}$	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	$-\frac{1}{5}$	0	0	0	0	0	0	0	0	0
		$-\frac{2}{7}$	0	0	0	0	0	0	$\frac{\sqrt{6}}{28}$	0	0	0	0	0	0
		0	$-\frac{6}{35}$	0	0	0	0	0	0	$\frac{\sqrt{10}}{28}$	0	0	0	0	0
		0	0	$-\frac{2}{35}$	0	0	0	0	0	0	$\frac{\sqrt{3}}{14}$	0	0	0	0
		0	0	0	$\frac{2}{35}$	0	0	0	0	0	0	$\frac{\sqrt{3}}{14}$	0	0	0
		0	0	0	0	$\frac{6}{35}$	0	0	0	0	0	0	$\frac{\sqrt{10}}{28}$	0	0
		0	0	0	0	0	$\frac{2}{7}$	0	0	0	0	0	0	$\frac{\sqrt{6}}{28}$	0

No.	multipole	matrix
610	symmetry	x

Table 9

No.	multipole	matrix

$\mathbb{Q}_{1,1}^{(1,1;a)}(E)$

$$\begin{bmatrix}
\frac{\sqrt{5}}{10} & 0 & -\frac{\sqrt{2}}{20} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & \frac{\sqrt{3}}{10} & 0 & -\frac{\sqrt{6}}{20} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & \frac{\sqrt{6}}{20} & 0 & -\frac{\sqrt{3}}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & \frac{\sqrt{2}}{20} & 0 & -\frac{\sqrt{5}}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & -\frac{2\sqrt{5}}{35} & 0 & 0 & 0 & 0 & -\frac{\sqrt{42}}{56} & 0 & \frac{\sqrt{2}}{56} & 0 & 0 & 0 & 0 & 0 \\
-\frac{2\sqrt{5}}{35} & 0 & -\frac{4\sqrt{2}}{35} & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}}{56} & 0 & \frac{\sqrt{6}}{56} & 0 & 0 & 0 & 0 \\
0 & -\frac{4\sqrt{2}}{35} & 0 & -\frac{6}{35} & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}}{28} & 0 & \frac{\sqrt{3}}{28} & 0 & 0 & 0 \\
0 & 0 & -\frac{6}{35} & 0 & -\frac{4\sqrt{2}}{35} & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{28} & 0 & \frac{\sqrt{5}}{28} & 0 & 0 \\
0 & 0 & 0 & -\frac{4\sqrt{2}}{35} & 0 & -\frac{2\sqrt{5}}{35} & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}}{56} & 0 & \frac{\sqrt{30}}{56} & 0 \\
0 & 0 & 0 & 0 & -\frac{2\sqrt{5}}{35} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}}{56} & 0 & \frac{\sqrt{42}}{56}
\end{bmatrix}$$

611	symmetry	y

$\mathbb{Q}_{1,2}^{(1,1;a)}(E)$

$$\begin{bmatrix}
\frac{\sqrt{5}i}{10} & 0 & \frac{\sqrt{2}i}{20} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & \frac{\sqrt{3}i}{10} & 0 & \frac{\sqrt{6}i}{20} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & \frac{\sqrt{6}i}{20} & 0 & \frac{\sqrt{3}i}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & \frac{\sqrt{2}i}{20} & 0 & \frac{\sqrt{5}i}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & \frac{2\sqrt{5}i}{35} & 0 & 0 & 0 & 0 & -\frac{\sqrt{42}i}{56} & 0 & -\frac{\sqrt{2}i}{56} & 0 & 0 & 0 & 0 & 0 \\
-\frac{2\sqrt{5}i}{35} & 0 & \frac{4\sqrt{2}i}{35} & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}i}{56} & 0 & -\frac{\sqrt{6}i}{56} & 0 & 0 & 0 & 0 \\
0 & -\frac{4\sqrt{2}i}{35} & 0 & \frac{6i}{35} & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{28} & 0 & -\frac{\sqrt{3}i}{28} & 0 & 0 & 0 \\
0 & 0 & -\frac{6i}{35} & 0 & \frac{4\sqrt{2}i}{35} & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{28} & 0 & -\frac{\sqrt{5}i}{28} & 0 & 0 \\
0 & 0 & 0 & -\frac{4\sqrt{2}i}{35} & 0 & \frac{2\sqrt{5}i}{35} & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{56} & 0 & -\frac{\sqrt{30}i}{56} & 0 \\
0 & 0 & 0 & 0 & -\frac{2\sqrt{5}i}{35} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}i}{56} & 0 & -\frac{\sqrt{42}i}{56}
\end{bmatrix}$$

612	symmetry	$\sqrt{15}xyz$

continued ...

Table 9

No.	multipole	matrix

$\mathbb{Q}_3^{(1,1;a)}(A_1)$

$$\begin{pmatrix}
0 & 0 & 0 & -\frac{3\sqrt{30}i}{56} & 0 & 0 & -\frac{\sqrt{14}i}{56} & 0 & 0 & 0 & \frac{\sqrt{10}i}{56} & 0 & 0 & 0 \\
-\frac{15i}{56} & 0 & 0 & 0 & -\frac{3\sqrt{5}i}{56} & 0 & 0 & \frac{\sqrt{6}i}{56} & 0 & 0 & 0 & \frac{3\sqrt{2}i}{56} & 0 & 0 \\
0 & \frac{3\sqrt{5}i}{56} & 0 & 0 & 0 & \frac{15i}{56} & 0 & 0 & \frac{3\sqrt{2}i}{56} & 0 & 0 & 0 & \frac{\sqrt{6}i}{56} & 0 \\
0 & 0 & \frac{3\sqrt{30}i}{56} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}i}{56} & 0 & 0 & 0 & -\frac{\sqrt{14}i}{56} \\
0 & 0 & -\frac{5\sqrt{6}i}{84} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2}i}{28} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & -\frac{\sqrt{30}i}{84} & 0 & 0 & \frac{\sqrt{14}i}{56} & 0 & 0 & 0 & \frac{\sqrt{10}i}{56} & 0 & 0 & 0 \\
\frac{5\sqrt{6}i}{84} & 0 & 0 & 0 & \frac{\sqrt{30}i}{84} & 0 & 0 & \frac{i}{56} & 0 & 0 & 0 & \frac{\sqrt{3}i}{56} & 0 & 0 \\
0 & \frac{\sqrt{30}i}{84} & 0 & 0 & 0 & \frac{5\sqrt{6}i}{84} & 0 & 0 & -\frac{\sqrt{3}i}{56} & 0 & 0 & 0 & -\frac{i}{56} & 0 \\
0 & 0 & -\frac{\sqrt{30}i}{84} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}i}{56} & 0 & 0 & 0 & -\frac{\sqrt{14}i}{56} \\
0 & 0 & 0 & -\frac{5\sqrt{6}i}{84} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}i}{28} & 0 & 0 & 0
\end{pmatrix}$$

613	symmetry	$\dfrac{\sqrt{15}z(x-y)(x+y)}{2}$

$\mathbb{Q}_3^{(1,1;a)}(A_2)$

$$\begin{bmatrix}
0 & 0 & 0 & \frac{3\sqrt{30}}{56} & 0 & 0 & -\frac{\sqrt{14}}{56} & 0 & 0 & 0 & -\frac{\sqrt{10}}{56} & 0 & 0 & 0 \\
-\frac{15}{56} & 0 & 0 & 0 & \frac{3\sqrt{5}}{56} & 0 & 0 & \frac{\sqrt{6}}{56} & 0 & 0 & 0 & -\frac{3\sqrt{2}}{56} & 0 & 0 \\
0 & \frac{3\sqrt{5}}{56} & 0 & 0 & 0 & -\frac{15}{56} & 0 & 0 & \frac{3\sqrt{2}}{56} & 0 & 0 & 0 & -\frac{\sqrt{6}}{56} & 0 \\
0 & 0 & \frac{3\sqrt{30}}{56} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}}{56} & 0 & 0 & 0 & \frac{\sqrt{14}}{56} \\
0 & 0 & \frac{5\sqrt{6}}{84} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}}{28} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & \frac{\sqrt{30}}{84} & 0 & 0 & \frac{\sqrt{14}}{56} & 0 & 0 & 0 & -\frac{\sqrt{10}}{56} & 0 & 0 & 0 \\
\frac{5\sqrt{6}}{84} & 0 & 0 & 0 & -\frac{\sqrt{30}}{84} & 0 & 0 & \frac{1}{56} & 0 & 0 & 0 & -\frac{\sqrt{3}}{56} & 0 & 0 \\
0 & \frac{\sqrt{30}}{84} & 0 & 0 & 0 & -\frac{5\sqrt{6}}{84} & 0 & 0 & -\frac{\sqrt{3}}{56} & 0 & 0 & 0 & \frac{1}{56} & 0 \\
0 & 0 & -\frac{\sqrt{30}}{84} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}}{56} & 0 & 0 & 0 & \frac{\sqrt{14}}{56} \\
0 & 0 & 0 & -\frac{5\sqrt{6}}{84} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}}{28} & 0 & 0 & 0
\end{bmatrix}$$

614	symmetry	$-\dfrac{z\left(3x^2+3y^2-2z^2\right)}{2}$

continued ...

179

No.	multipole	matrix

$$\mathbb{Q}_3^{(1,1;a)}(B_2)$$

$$
\begin{bmatrix}
0 & \frac{9}{28} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}}{28} & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & -\frac{3\sqrt{6}}{28} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}}{28} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & -\frac{3\sqrt{6}}{28} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2}}{28} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & \frac{9}{28} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}}{28} & 0 & 0 \\
\frac{5}{42} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}}{28} & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & -\frac{1}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & -\frac{2}{21} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{28} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & \frac{2}{21} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{28} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & \frac{1}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & -\frac{5}{42} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}}{28} & 0
\end{bmatrix}
$$

615	symmetry	$\dfrac{x\left(2x^2-3y^2-3z^2\right)}{2}$

$$\mathbb{Q}_{3,1}^{(1,1;a)}(E,1)$$

$$
\begin{bmatrix}
\frac{9\sqrt{5}}{224} & 0 & -\frac{27\sqrt{2}}{224} & 0 & \frac{45}{224} & 0 & 0 & -\frac{\sqrt{30}}{112} & 0 & \frac{\sqrt{6}}{56} & 0 & -\frac{\sqrt{10}}{112} & 0 & 0 \\
0 & -\frac{3\sqrt{3}}{32} & 0 & \frac{3\sqrt{6}}{224} & 0 & \frac{15\sqrt{15}}{224} & -\frac{\sqrt{70}}{112} & 0 & 0 & 0 & \frac{3\sqrt{2}}{112} & 0 & -\frac{\sqrt{10}}{56} & 0 \\
-\frac{15\sqrt{15}}{224} & 0 & -\frac{3\sqrt{6}}{224} & 0 & \frac{3\sqrt{3}}{32} & 0 & 0 & -\frac{\sqrt{10}}{56} & 0 & \frac{3\sqrt{2}}{112} & 0 & 0 & 0 & -\frac{\sqrt{70}}{112} \\
0 & -\frac{45}{224} & 0 & \frac{27\sqrt{2}}{224} & 0 & -\frac{9\sqrt{5}}{224} & 0 & 0 & -\frac{\sqrt{10}}{112} & 0 & \frac{\sqrt{6}}{56} & 0 & -\frac{\sqrt{30}}{112} & 0 \\
0 & -\frac{\sqrt{5}}{28} & 0 & \frac{5\sqrt{10}}{168} & 0 & 0 & -\frac{\sqrt{42}}{224} & 0 & \frac{3\sqrt{2}}{112} & 0 & -\frac{\sqrt{30}}{224} & 0 & 0 & 0 \\
-\frac{\sqrt{5}}{28} & 0 & \frac{\sqrt{2}}{56} & 0 & \frac{5}{42} & 0 & 0 & \frac{\sqrt{30}}{224} & 0 & \frac{\sqrt{6}}{112} & 0 & -\frac{3\sqrt{10}}{224} & 0 & 0 \\
0 & \frac{\sqrt{2}}{56} & 0 & \frac{1}{14} & 0 & \frac{5\sqrt{10}}{168} & \frac{\sqrt{105}}{224} & 0 & \frac{3\sqrt{5}}{224} & 0 & -\frac{\sqrt{3}}{224} & 0 & -\frac{3\sqrt{15}}{224} & 0 \\
\frac{5\sqrt{10}}{168} & 0 & \frac{1}{14} & 0 & \frac{\sqrt{2}}{56} & 0 & 0 & \frac{3\sqrt{15}}{224} & 0 & \frac{\sqrt{3}}{224} & 0 & -\frac{3\sqrt{5}}{224} & 0 & -\frac{\sqrt{105}}{224} \\
0 & \frac{5}{42} & 0 & \frac{\sqrt{2}}{56} & 0 & -\frac{\sqrt{5}}{28} & 0 & 0 & \frac{3\sqrt{10}}{224} & 0 & -\frac{\sqrt{6}}{112} & 0 & -\frac{\sqrt{30}}{224} & 0 \\
0 & 0 & \frac{5\sqrt{10}}{168} & 0 & -\frac{\sqrt{5}}{28} & 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{224} & 0 & -\frac{3\sqrt{2}}{112} & 0 & \frac{\sqrt{42}}{224}
\end{bmatrix}
$$

616	symmetry	$-\dfrac{y\left(3x^2-2y^2+3z^2\right)}{2}$

Table 9

No.	multipole	matrix
	$\mathbb{Q}_{3,2}^{(1,1;a)}(E,1)$	$$\begin{bmatrix} \frac{9\sqrt5 i}{224} & 0 & \frac{27\sqrt2 i}{224} & 0 & \frac{45i}{224} & 0 & 0 & -\frac{\sqrt{30}i}{112} & 0 & -\frac{\sqrt6 i}{56} & 0 & -\frac{\sqrt{10}i}{112} & 0 & 0 \\ 0 & -\frac{3\sqrt3 i}{32} & 0 & -\frac{3\sqrt6 i}{224} & 0 & \frac{15\sqrt{15}i}{224} & \frac{\sqrt{70}i}{112} & 0 & 0 & 0 & -\frac{3\sqrt2 i}{112} & 0 & -\frac{\sqrt{10}i}{56} & 0 \\ \frac{15\sqrt{15}i}{224} & 0 & -\frac{3\sqrt6 i}{224} & 0 & -\frac{3\sqrt3 i}{32} & 0 & 0 & \frac{\sqrt{10}i}{56} & 0 & \frac{3\sqrt2 i}{112} & 0 & 0 & 0 & -\frac{\sqrt{70}i}{112} \\ 0 & \frac{45i}{224} & 0 & \frac{27\sqrt2 i}{224} & 0 & \frac{9\sqrt5 i}{224} & 0 & 0 & \frac{\sqrt{10}i}{112} & 0 & \frac{\sqrt6 i}{56} & 0 & \frac{\sqrt{30}i}{112} & 0 \\ 0 & \frac{\sqrt5 i}{28} & 0 & \frac{5\sqrt{10}i}{168} & 0 & 0 & -\frac{\sqrt{42}i}{224} & 0 & -\frac{3\sqrt2 i}{112} & 0 & -\frac{\sqrt{30}i}{224} & 0 & 0 & 0 \\ -\frac{\sqrt5 i}{28} & 0 & -\frac{\sqrt2 i}{56} & 0 & \frac{5i}{42} & 0 & 0 & \frac{\sqrt{30}i}{224} & 0 & -\frac{\sqrt6 i}{112} & 0 & -\frac{3\sqrt{10}i}{224} & 0 & 0 \\ 0 & \frac{\sqrt2 i}{56} & 0 & -\frac{i}{14} & 0 & \frac{5\sqrt{10}i}{168} & -\frac{\sqrt{105}i}{224} & 0 & \frac{3\sqrt5 i}{224} & 0 & \frac{\sqrt3 i}{224} & 0 & -\frac{3\sqrt{15}i}{224} & 0 \\ -\frac{5\sqrt{10}i}{168} & 0 & \frac{i}{14} & 0 & -\frac{\sqrt2 i}{56} & 0 & 0 & -\frac{3\sqrt{15}i}{224} & 0 & \frac{\sqrt3 i}{224} & 0 & \frac{3\sqrt5 i}{224} & 0 & -\frac{\sqrt{105}i}{224} \\ 0 & -\frac{5i}{42} & 0 & \frac{\sqrt2 i}{56} & 0 & \frac{\sqrt5 i}{28} & 0 & 0 & -\frac{3\sqrt{10}i}{224} & 0 & -\frac{\sqrt6 i}{112} & 0 & \frac{\sqrt{30}i}{224} & 0 \\ 0 & 0 & -\frac{5\sqrt{10}i}{168} & 0 & -\frac{\sqrt5 i}{28} & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}i}{224} & 0 & -\frac{3\sqrt2 i}{112} & 0 & -\frac{\sqrt{42}i}{224} \end{bmatrix}$$
617	symmetry	$\dfrac{\sqrt{15}x(y-z)(y+z)}{2}$
	$\mathbb{Q}_{3,1}^{(1,1;a)}(E,2)$	$$\begin{bmatrix} \frac{15\sqrt3}{224} & 0 & -\frac{9\sqrt{30}}{224} & 0 & -\frac{9\sqrt{15}}{224} & 0 & 0 & -\frac{5\sqrt2}{112} & 0 & \frac{\sqrt{10}}{56} & 0 & \frac{\sqrt6}{112} & 0 & 0 \\ 0 & -\frac{3\sqrt5}{32} & 0 & \frac{3\sqrt{10}}{224} & 0 & -\frac{45}{224} & \frac{\sqrt{42}}{112} & 0 & 0 & 0 & \frac{\sqrt{30}}{112} & 0 & \frac{\sqrt6}{56} & 0 \\ \frac{45}{224} & 0 & -\frac{3\sqrt{10}}{224} & 0 & \frac{3\sqrt5}{32} & 0 & 0 & \frac{\sqrt6}{56} & 0 & \frac{\sqrt{30}}{112} & 0 & 0 & 0 & \frac{\sqrt{42}}{112} \\ 0 & \frac{9\sqrt{15}}{224} & 0 & \frac{9\sqrt{30}}{224} & 0 & -\frac{15\sqrt3}{224} & 0 & 0 & \frac{\sqrt6}{112} & 0 & \frac{\sqrt{10}}{56} & 0 & -\frac{5\sqrt2}{112} & 0 \\ 0 & -\frac{5\sqrt3}{84} & 0 & -\frac{5\sqrt6}{168} & 0 & 0 & -\frac{\sqrt{70}}{224} & 0 & \frac{\sqrt{30}}{112} & 0 & \frac{3\sqrt2}{224} & 0 & 0 & 0 \\ -\frac{5\sqrt3}{84} & 0 & \frac{\sqrt{30}}{168} & 0 & -\frac{\sqrt{15}}{42} & 0 & 0 & \frac{5\sqrt2}{224} & 0 & \frac{\sqrt{10}}{112} & 0 & \frac{3\sqrt6}{224} & 0 & 0 \\ 0 & \frac{\sqrt{30}}{168} & 0 & \frac{\sqrt{15}}{42} & 0 & -\frac{5\sqrt6}{168} & -\frac{3\sqrt7}{224} & 0 & \frac{5\sqrt3}{224} & 0 & -\frac{\sqrt5}{224} & 0 & \frac{9}{224} & 0 \\ -\frac{5\sqrt6}{168} & 0 & \frac{\sqrt{15}}{42} & 0 & \frac{\sqrt{30}}{168} & 0 & 0 & -\frac{9}{224} & 0 & \frac{\sqrt5}{224} & 0 & -\frac{5\sqrt3}{224} & 0 & \frac{3\sqrt7}{224} \\ 0 & -\frac{\sqrt{15}}{42} & 0 & \frac{\sqrt{30}}{168} & 0 & -\frac{5\sqrt3}{84} & 0 & 0 & -\frac{3\sqrt6}{224} & 0 & -\frac{\sqrt{10}}{112} & 0 & -\frac{5\sqrt2}{224} & 0 \\ 0 & 0 & -\frac{5\sqrt6}{168} & 0 & -\frac{5\sqrt3}{84} & 0 & 0 & 0 & 0 & -\frac{3\sqrt2}{224} & 0 & -\frac{\sqrt{30}}{112} & 0 & \frac{\sqrt{70}}{224} \end{bmatrix}$$
618	symmetry	$\dfrac{\sqrt{15}y(x-z)(x+z)}{2}$

Table 9

No.	multipole	matrix
	$\mathbb{Q}_{3,2}^{(1,1;a)}(E,2)$	

$$\mathbb{Q}_{3,2}^{(1,1;a)}(E,2):$$

$\frac{15\sqrt{3}i}{224}$	0	$\frac{9\sqrt{30}i}{224}$	0	$-\frac{9\sqrt{15}i}{224}$	0	0	$-\frac{5\sqrt{2}i}{112}$	0	$-\frac{\sqrt{10}i}{56}$	0	$\frac{\sqrt{6}i}{112}$	0	0
0	$-\frac{3\sqrt{5}i}{32}$	0	$-\frac{3\sqrt{10}i}{224}$	0	$-\frac{45i}{224}$	$-\frac{\sqrt{42}i}{112}$	0	0	0	$-\frac{\sqrt{30}i}{112}$	0	$\frac{\sqrt{6}i}{56}$	0
$-\frac{45i}{224}$	0	$-\frac{3\sqrt{10}i}{224}$	0	$-\frac{3\sqrt{5}i}{32}$	0	0	$-\frac{\sqrt{6}i}{56}$	0	$\frac{\sqrt{30}i}{112}$	0	0	0	$\frac{\sqrt{42}i}{112}$
0	$-\frac{9\sqrt{15}i}{224}$	0	$\frac{9\sqrt{30}i}{224}$	0	$\frac{15\sqrt{3}i}{224}$	0	0	$-\frac{\sqrt{6}i}{112}$	0	$\frac{\sqrt{10}i}{56}$	0	$\frac{5\sqrt{2}i}{112}$	0
0	$\frac{5\sqrt{3}i}{84}$	0	$-\frac{5\sqrt{6}i}{168}$	0	0	$-\frac{\sqrt{70}i}{224}$	0	$-\frac{\sqrt{30}i}{112}$	0	$\frac{3\sqrt{2}i}{224}$	0	0	0
$-\frac{5\sqrt{3}i}{84}$	0	$-\frac{\sqrt{30}i}{168}$	0	$-\frac{\sqrt{15}i}{42}$	0	0	$\frac{5\sqrt{2}i}{224}$	0	$-\frac{\sqrt{10}i}{112}$	0	$\frac{3\sqrt{6}i}{224}$	0	0
0	$\frac{\sqrt{30}i}{168}$	0	$-\frac{\sqrt{15}i}{42}$	0	$-\frac{5\sqrt{6}i}{168}$	$\frac{3\sqrt{7}i}{224}$	0	$\frac{5\sqrt{3}i}{224}$	0	$\frac{\sqrt{5}i}{224}$	0	$\frac{9i}{224}$	0
$\frac{5\sqrt{6}i}{168}$	0	$\frac{\sqrt{15}i}{42}$	0	$-\frac{\sqrt{30}i}{168}$	0	0	$\frac{9i}{224}$	0	$\frac{\sqrt{5}i}{224}$	0	$\frac{5\sqrt{3}i}{224}$	0	$\frac{3\sqrt{7}i}{224}$
0	$\frac{\sqrt{15}i}{42}$	0	$\frac{\sqrt{30}i}{168}$	0	$\frac{5\sqrt{3}i}{84}$	0	0	$\frac{3\sqrt{6}i}{224}$	0	$-\frac{\sqrt{10}i}{112}$	0	$\frac{5\sqrt{2}i}{224}$	0
0	0	$\frac{5\sqrt{6}i}{168}$	0	$-\frac{5\sqrt{3}i}{84}$	0	0	0	0	$\frac{3\sqrt{2}i}{224}$	0	$-\frac{\sqrt{30}i}{112}$	0	$-\frac{\sqrt{70}i}{224}$

No.	multipole	matrix
619	symmetry	$\frac{\sqrt{3}(x-y)(x+y)}{2}$

$$\mathbb{G}_{2}^{(a)}(A_1):$$

0	0	0	$\frac{\sqrt{15}i}{35}$	0	0	$\frac{\sqrt{7}i}{28}$	0	0	0	$\frac{\sqrt{5}i}{140}$	0	0	0
$-\frac{\sqrt{2}i}{7}$	0	0	0	$\frac{2\sqrt{10}i}{35}$	0	0	$\frac{\sqrt{3}i}{28}$	0	0	0	$\frac{i}{28}$	0	0
0	$-\frac{2\sqrt{10}i}{35}$	0	0	0	$\frac{\sqrt{2}i}{7}$	0	0	$\frac{i}{28}$	0	0	0	$\frac{\sqrt{3}i}{28}$	0
0	0	$-\frac{\sqrt{15}i}{35}$	0	0	0	0	0	0	$\frac{\sqrt{5}i}{140}$	0	0	0	$\frac{\sqrt{7}i}{28}$
0	0	$-\frac{\sqrt{3}i}{28}$	0	0	0	0	0	0	$\frac{i}{14}$	0	0	0	0
0	0	0	$-\frac{3\sqrt{15}i}{140}$	0	0	$-\frac{\sqrt{7}i}{14}$	0	0	0	$\frac{2\sqrt{5}i}{35}$	0	0	0
$-\frac{\sqrt{3}i}{28}$	0	0	0	$-\frac{3\sqrt{15}i}{140}$	0	0	$-\frac{\sqrt{2}i}{7}$	0	0	0	$\frac{\sqrt{6}i}{14}$	0	0
0	$-\frac{3\sqrt{15}i}{140}$	0	0	0	$-\frac{\sqrt{3}i}{28}$	0	0	$-\frac{\sqrt{6}i}{14}$	0	0	0	$\frac{\sqrt{2}i}{7}$	0
0	0	$-\frac{3\sqrt{15}i}{140}$	0	0	0	0	0	0	$-\frac{2\sqrt{5}i}{35}$	0	0	0	$\frac{\sqrt{7}i}{14}$
0	0	0	$-\frac{\sqrt{3}i}{28}$	0	0	0	0	0	0	$-\frac{i}{14}$	0	0	0

No.	multipole	matrix
620	symmetry	$\sqrt{3}xy$

182

Table 9

No.	multipole	matrix

$\mathbb{G}_2^{(a)}(A_2)$

$$\begin{bmatrix}
0 & 0 & 0 & \frac{\sqrt{15}}{35} & 0 & 0 & -\frac{\sqrt{7}}{28} & 0 & 0 & 0 & \frac{\sqrt{5}}{140} & 0 & 0 & 0 \\
\frac{\sqrt{2}}{7} & 0 & 0 & 0 & \frac{2\sqrt{10}}{35} & 0 & 0 & -\frac{\sqrt{3}}{28} & 0 & 0 & 0 & \frac{1}{28} & 0 & 0 \\
0 & \frac{2\sqrt{10}}{35} & 0 & 0 & 0 & \frac{\sqrt{2}}{7} & 0 & 0 & -\frac{1}{28} & 0 & 0 & 0 & \frac{\sqrt{3}}{28} & 0 \\
0 & 0 & \frac{\sqrt{15}}{35} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}}{140} & 0 & 0 & 0 & \frac{\sqrt{7}}{28} \\
0 & 0 & -\frac{\sqrt{3}}{28} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{1}{14} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & -\frac{3\sqrt{15}}{140} & 0 & 0 & \frac{\sqrt{7}}{14} & 0 & 0 & 0 & \frac{2\sqrt{5}}{35} & 0 & 0 & 0 \\
\frac{\sqrt{3}}{28} & 0 & 0 & 0 & -\frac{3\sqrt{15}}{140} & 0 & 0 & \frac{\sqrt{2}}{7} & 0 & 0 & 0 & \frac{\sqrt{6}}{14} & 0 & 0 \\
0 & \frac{3\sqrt{15}}{140} & 0 & 0 & 0 & -\frac{\sqrt{3}}{28} & 0 & 0 & \frac{\sqrt{6}}{14} & 0 & 0 & 0 & \frac{\sqrt{2}}{7} & 0 \\
0 & 0 & \frac{3\sqrt{15}}{140} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{2\sqrt{5}}{35} & 0 & 0 & 0 & \frac{\sqrt{7}}{14} \\
0 & 0 & 0 & \frac{\sqrt{3}}{28} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{1}{14} & 0 & 0 & 0
\end{bmatrix}$$

621	symmetry	$-\frac{x^2}{2} - \frac{y^2}{2} + z^2$

$\mathbb{G}_2^{(a)}(B_1)$

$$\begin{bmatrix}
0 & \frac{3\sqrt{10}i}{35} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{i}{14} & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & \frac{\sqrt{15}i}{35} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{5}i}{70} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & -\frac{\sqrt{15}i}{35} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{5}i}{70} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & -\frac{3\sqrt{10}i}{35} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{i}{14} & 0 & 0 \\
-\frac{\sqrt{10}i}{28} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{14} & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & \frac{\sqrt{10}i}{140} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3i}{14} & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & \frac{\sqrt{10}i}{35} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}i}{70} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & \frac{\sqrt{10}i}{35} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}i}{70} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & \frac{\sqrt{10}i}{140} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3i}{14} & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}i}{28} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{14} & 0
\end{bmatrix}$$

622	symmetry	$\sqrt{3}yz$

183

Table 9

No.	multipole	matrix
	$\mathbb{G}_{2,1}^{(a)}(E)$	$\begin{pmatrix} \frac{\sqrt{6}}{14} & 0 & \frac{3\sqrt{15}}{70} & 0 & 0 & 0 & 0 & \frac{1}{14} & 0 & \frac{\sqrt{5}}{70} & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{10}}{70} & 0 & \frac{\sqrt{5}}{14} & 0 & 0 & 0 & 0 & \frac{1}{14} & 0 & \frac{\sqrt{15}}{70} & 0 & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{5}}{14} & 0 & \frac{\sqrt{10}}{70} & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{70} & 0 & \frac{1}{14} & 0 & 0 \\ 0 & 0 & 0 & -\frac{3\sqrt{15}}{70} & 0 & -\frac{\sqrt{6}}{14} & 0 & 0 & 0 & 0 & \frac{\sqrt{5}}{70} & 0 & \frac{1}{14} & 0 \\ 0 & -\frac{\sqrt{6}}{28} & 0 & 0 & 0 & 0 & \frac{\sqrt{35}}{28} & 0 & \frac{\sqrt{15}}{28} & 0 & 0 & 0 & 0 & 0 \\ \frac{\sqrt{6}}{28} & 0 & -\frac{\sqrt{15}}{70} & 0 & 0 & 0 & 0 & \frac{1}{28} & 0 & \frac{11\sqrt{5}}{140} & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{15}}{70} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}}{28} & 0 & \frac{\sqrt{10}}{20} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{70} & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}}{20} & 0 & \frac{\sqrt{6}}{28} & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{15}}{70} & 0 & \frac{\sqrt{6}}{28} & 0 & 0 & 0 & 0 & -\frac{11\sqrt{5}}{140} & 0 & -\frac{1}{28} & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{6}}{28} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{28} & 0 & -\frac{\sqrt{35}}{28} \end{pmatrix}$
623	symmetry	$-\sqrt{3}xz$
	$\mathbb{G}_{2,2}^{(a)}(E)$	$\begin{pmatrix} \frac{\sqrt{6}i}{14} & 0 & -\frac{3\sqrt{15}i}{70} & 0 & 0 & 0 & 0 & \frac{i}{14} & 0 & -\frac{\sqrt{5}i}{70} & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{10}i}{70} & 0 & -\frac{\sqrt{5}i}{14} & 0 & 0 & 0 & 0 & \frac{i}{14} & 0 & -\frac{\sqrt{15}i}{70} & 0 & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{5}i}{14} & 0 & -\frac{\sqrt{10}i}{70} & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{70} & 0 & -\frac{i}{14} & 0 & 0 \\ 0 & 0 & 0 & -\frac{3\sqrt{15}i}{70} & 0 & \frac{\sqrt{6}i}{14} & 0 & 0 & 0 & 0 & \frac{\sqrt{5}i}{70} & 0 & -\frac{i}{14} & 0 \\ 0 & \frac{\sqrt{6}i}{28} & 0 & 0 & 0 & 0 & \frac{\sqrt{35}i}{28} & 0 & -\frac{\sqrt{15}i}{28} & 0 & 0 & 0 & 0 & 0 \\ \frac{\sqrt{6}i}{28} & 0 & \frac{\sqrt{15}i}{70} & 0 & 0 & 0 & 0 & \frac{i}{28} & 0 & -\frac{11\sqrt{5}i}{140} & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{15}i}{70} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{28} & 0 & -\frac{\sqrt{10}i}{20} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{70} & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}i}{20} & 0 & -\frac{\sqrt{6}i}{28} & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{15}i}{70} & 0 & -\frac{\sqrt{6}i}{28} & 0 & 0 & 0 & 0 & -\frac{11\sqrt{5}i}{140} & 0 & \frac{i}{28} & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{28} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{28} & 0 & \frac{\sqrt{35}i}{28} \end{pmatrix}$
624	symmetry	$\frac{\sqrt{5}(x-y)(x+y)\left(x^2+y^2-6z^2\right)}{4}$

Table 9

No.	multipole	matrix

$\mathbb{G}_4^{(a)}(A_1)$

$$\begin{pmatrix}
0 & 0 & 0 & \frac{\sqrt{10}i}{28} & 0 & 0 & \frac{3\sqrt{42}i}{280} & 0 & 0 & 0 & \frac{9\sqrt{30}i}{280} & 0 & 0 \\
-\frac{\sqrt{3}i}{28} & 0 & 0 & 0 & -\frac{\sqrt{15}i}{28} & 0 & 0 & -\frac{33\sqrt{2}i}{280} & 0 & 0 & 0 & \frac{3\sqrt{6}i}{280} & 0 \\
0 & \frac{\sqrt{15}i}{28} & 0 & 0 & 0 & \frac{\sqrt{3}i}{28} & 0 & 0 & \frac{3\sqrt{6}i}{280} & 0 & 0 & 0 & -\frac{33\sqrt{2}i}{280} \\
0 & 0 & -\frac{\sqrt{10}i}{28} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{9\sqrt{30}i}{280} & 0 & 0 & \frac{3\sqrt{42}i}{280} \\
0 & 0 & -\frac{3\sqrt{2}i}{28} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}i}{14} & 0 & 0 & 0 \\
0 & 0 & 0 & \frac{\sqrt{10}i}{28} & 0 & 0 & -\frac{3\sqrt{42}i}{140} & 0 & 0 & 0 & \frac{\sqrt{30}i}{140} & 0 & 0 \\
-\frac{3\sqrt{2}i}{28} & 0 & 0 & 0 & \frac{\sqrt{10}i}{28} & 0 & 0 & \frac{9\sqrt{3}i}{140} & 0 & 0 & 0 & -\frac{17i}{140} & 0 \\
0 & \frac{\sqrt{10}i}{28} & 0 & 0 & 0 & -\frac{3\sqrt{2}i}{28} & 0 & 0 & \frac{17i}{140} & 0 & 0 & 0 & -\frac{9\sqrt{3}i}{140} \\
0 & 0 & \frac{\sqrt{10}i}{28} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}i}{140} & 0 & 0 & \frac{3\sqrt{42}i}{140} \\
0 & 0 & 0 & -\frac{3\sqrt{2}i}{28} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{14} & 0 & 0
\end{pmatrix}$$

| 625 | symmetry | $-\dfrac{\sqrt{5}xy\left(x^2+y^2-6z^2\right)}{2}$ |

$\mathbb{G}_4^{(a)}(A_2)$

$$\begin{pmatrix}
0 & 0 & 0 & -\frac{\sqrt{10}}{28} & 0 & 0 & \frac{3\sqrt{42}}{280} & 0 & 0 & 0 & -\frac{9\sqrt{30}}{280} & 0 & 0 \\
-\frac{\sqrt{3}}{28} & 0 & 0 & 0 & \frac{\sqrt{15}}{28} & 0 & 0 & -\frac{33\sqrt{2}}{280} & 0 & 0 & 0 & -\frac{3\sqrt{6}}{280} & 0 \\
0 & \frac{\sqrt{15}}{28} & 0 & 0 & 0 & -\frac{\sqrt{3}}{28} & 0 & 0 & \frac{3\sqrt{6}}{280} & 0 & 0 & 0 & \frac{33\sqrt{2}}{280} \\
0 & 0 & -\frac{\sqrt{10}}{28} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{9\sqrt{30}}{280} & 0 & 0 & -\frac{3\sqrt{42}}{280} \\
0 & 0 & \frac{3\sqrt{2}}{28} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}}{14} & 0 & 0 & 0 \\
0 & 0 & 0 & -\frac{\sqrt{10}}{28} & 0 & 0 & -\frac{3\sqrt{42}}{140} & 0 & 0 & 0 & -\frac{\sqrt{30}}{140} & 0 & 0 \\
-\frac{3\sqrt{2}}{28} & 0 & 0 & 0 & -\frac{\sqrt{10}}{28} & 0 & 0 & \frac{9\sqrt{3}}{140} & 0 & 0 & 0 & \frac{17}{140} & 0 \\
0 & \frac{\sqrt{10}}{28} & 0 & 0 & 0 & \frac{3\sqrt{2}}{28} & 0 & 0 & \frac{17}{140} & 0 & 0 & 0 & \frac{9\sqrt{3}}{140} \\
0 & 0 & \frac{\sqrt{10}}{28} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}}{140} & 0 & 0 & -\frac{3\sqrt{42}}{140} \\
0 & 0 & 0 & -\frac{3\sqrt{2}}{28} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}}{14} & 0 & 0
\end{pmatrix}$$

| 626 | symmetry | $\dfrac{\sqrt{21}\left(x^4-3x^2y^2-3x^2z^2+y^4-3y^2z^2+z^4\right)}{6}$ |

Table 9

No.	multipole	matrix

$\mathbb{G}_4^{(a)}(B_1,1)$

$$\begin{bmatrix}
0 & -\frac{\sqrt{21}i}{84} & 0 & 0 & 0 & -\frac{\sqrt{105}i}{84} & 0 & 0 & -\frac{3\sqrt{210}i}{280} & 0 & 0 & 0 & -\frac{3\sqrt{70}i}{280} & 0 \\
0 & 0 & \frac{\sqrt{14}i}{28} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{42}i}{56} & 0 & 0 & 0 & -\frac{\sqrt{30}i}{40} \\
0 & 0 & 0 & -\frac{\sqrt{14}i}{28} & 0 & 0 & -\frac{\sqrt{30}i}{40} & 0 & 0 & 0 & \frac{\sqrt{42}i}{56} & 0 & 0 & 0 \\
\frac{\sqrt{105}i}{84} & 0 & 0 & 0 & \frac{\sqrt{21}i}{84} & 0 & 0 & -\frac{3\sqrt{70}i}{280} & 0 & 0 & 0 & -\frac{3\sqrt{210}i}{280} & 0 & 0 \\
\frac{\sqrt{21}i}{84} & 0 & 0 & 0 & \frac{\sqrt{105}i}{84} & 0 & 0 & -\frac{\sqrt{14}i}{28} & 0 & 0 & 0 & -\frac{\sqrt{42}i}{84} & 0 & 0 \\
0 & -\frac{\sqrt{21}i}{28} & 0 & 0 & 0 & \frac{\sqrt{105}i}{84} & 0 & 0 & \frac{\sqrt{210}i}{105} & 0 & 0 & 0 & -\frac{\sqrt{70}i}{70} & 0 \\
0 & 0 & \frac{\sqrt{21}i}{42} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}i}{28} & 0 & 0 & 0 & -\frac{\sqrt{5}i}{20} \\
0 & 0 & 0 & \frac{\sqrt{21}i}{42} & 0 & 0 & \frac{\sqrt{5}i}{20} & 0 & 0 & 0 & -\frac{\sqrt{7}i}{28} & 0 & 0 & 0 \\
\frac{\sqrt{105}i}{84} & 0 & 0 & 0 & -\frac{\sqrt{21}i}{28} & 0 & 0 & \frac{\sqrt{70}i}{70} & 0 & 0 & 0 & -\frac{\sqrt{210}i}{105} & 0 & 0 \\
0 & \frac{\sqrt{105}i}{84} & 0 & 0 & 0 & \frac{\sqrt{21}i}{84} & 0 & 0 & \frac{\sqrt{42}i}{84} & 0 & 0 & 0 & \frac{\sqrt{14}i}{28} & 0
\end{bmatrix}$$

627	symmetry	$-\dfrac{\sqrt{15}\left(x^4-12x^2y^2+6x^2z^2+y^4+6y^2z^2-2z^4\right)}{12}$

$\mathbb{G}_4^{(a)}(B_1,2)$

$$\begin{bmatrix}
0 & -\frac{\sqrt{15}i}{84} & 0 & 0 & 0 & \frac{\sqrt{3}i}{12} & 0 & 0 & -\frac{3\sqrt{6}i}{56} & 0 & 0 & 0 & \frac{3\sqrt{2}i}{40} & 0 \\
0 & 0 & \frac{\sqrt{10}i}{28} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}i}{56} & 0 & 0 & 0 & \frac{\sqrt{42}i}{40} \\
0 & 0 & 0 & -\frac{\sqrt{10}i}{28} & 0 & 0 & \frac{\sqrt{42}i}{40} & 0 & 0 & 0 & \frac{\sqrt{30}i}{56} & 0 & 0 & 0 \\
-\frac{\sqrt{3}i}{12} & 0 & 0 & 0 & \frac{\sqrt{15}i}{84} & 0 & 0 & \frac{3\sqrt{2}i}{40} & 0 & 0 & 0 & -\frac{3\sqrt{6}i}{56} & 0 & 0 \\
\frac{\sqrt{15}i}{84} & 0 & 0 & 0 & -\frac{\sqrt{3}i}{12} & 0 & 0 & -\frac{\sqrt{10}i}{28} & 0 & 0 & 0 & \frac{\sqrt{30}i}{60} & 0 & 0 \\
0 & -\frac{\sqrt{15}i}{28} & 0 & 0 & 0 & -\frac{\sqrt{3}i}{12} & 0 & 0 & \frac{\sqrt{6}i}{21} & 0 & 0 & 0 & \frac{\sqrt{2}i}{10} & 0 \\
0 & 0 & \frac{\sqrt{15}i}{42} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{5}i}{28} & 0 & 0 & 0 & \frac{\sqrt{7}i}{20} \\
0 & 0 & 0 & \frac{\sqrt{15}i}{42} & 0 & 0 & -\frac{\sqrt{7}i}{20} & 0 & 0 & 0 & -\frac{\sqrt{5}i}{28} & 0 & 0 & 0 \\
-\frac{\sqrt{3}i}{12} & 0 & 0 & 0 & -\frac{\sqrt{15}i}{28} & 0 & 0 & -\frac{\sqrt{2}i}{10} & 0 & 0 & 0 & -\frac{\sqrt{6}i}{21} & 0 & 0 \\
0 & -\frac{\sqrt{3}i}{12} & 0 & 0 & 0 & \frac{\sqrt{15}i}{84} & 0 & 0 & -\frac{\sqrt{30}i}{60} & 0 & 0 & 0 & \frac{\sqrt{10}i}{28} & 0
\end{bmatrix}$$

628	symmetry	$\dfrac{\sqrt{35}xy(x-y)(x+y)}{2}$

continued …

Table 9

No.	multipole	matrix

$$\mathbb{G}_4^{(a)}(B_2) = \begin{bmatrix}
0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}}{14} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{42}}{140} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{2}}{20} \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{2}}{20} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
-\frac{\sqrt{7}}{14} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{42}}{140} & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & \frac{\sqrt{7}}{14} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}}{70} & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}}{14} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{42}}{35} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{10} \\
0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
-\frac{\sqrt{7}}{14} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{42}}{35} & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & -\frac{\sqrt{7}}{14} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}}{70} & 0 & 0 & 0 & 0 & 0
\end{bmatrix}$$

No.	multipole	matrix
629	symmetry	$\dfrac{\sqrt{35}\,yz(y-z)(y+z)}{2}$

$$\mathbb{G}_{4,1}^{(a)}(E,1) = \begin{bmatrix}
\frac{\sqrt{7}}{112} & 0 & \frac{\sqrt{70}}{112} & 0 & \frac{\sqrt{35}}{112} & 0 & 0 & \frac{9\sqrt{42}}{560} & 0 & \frac{3\sqrt{210}}{280} & 0 & \frac{9\sqrt{14}}{560} & 0 & 0 \\
0 & -\frac{\sqrt{105}}{112} & 0 & -\frac{\sqrt{210}}{112} & 0 & -\frac{\sqrt{21}}{112} & -\frac{3\sqrt{2}}{80} & 0 & -\frac{3\sqrt{42}}{140} & 0 & -\frac{3\sqrt{70}}{560} & 0 & \frac{3\sqrt{14}}{280} & 0 \\
\frac{\sqrt{21}}{112} & 0 & \frac{\sqrt{210}}{112} & 0 & \frac{\sqrt{105}}{112} & 0 & 0 & \frac{3\sqrt{14}}{280} & 0 & -\frac{3\sqrt{70}}{560} & 0 & -\frac{3\sqrt{42}}{140} & 0 & -\frac{3\sqrt{2}}{80} \\
0 & -\frac{\sqrt{35}}{112} & 0 & -\frac{\sqrt{70}}{112} & 0 & -\frac{\sqrt{7}}{112} & 0 & 0 & \frac{9\sqrt{14}}{560} & 0 & \frac{3\sqrt{210}}{280} & 0 & \frac{9\sqrt{42}}{560} & 0 \\
0 & -\frac{\sqrt{7}}{28} & 0 & -\frac{\sqrt{14}}{56} & 0 & 0 & \frac{\sqrt{30}}{80} & 0 & \frac{\sqrt{70}}{56} & 0 & \frac{\sqrt{42}}{112} & 0 & 0 & 0 \\
\frac{\sqrt{7}}{28} & 0 & \frac{\sqrt{70}}{56} & 0 & 0 & 0 & 0 & -\frac{13\sqrt{42}}{560} & 0 & -\frac{\sqrt{210}}{280} & 0 & \frac{\sqrt{14}}{80} & 0 & 0 \\
0 & -\frac{\sqrt{70}}{56} & 0 & 0 & 0 & \frac{\sqrt{14}}{56} & \frac{3\sqrt{3}}{80} & 0 & \frac{\sqrt{7}}{560} & 0 & -\frac{\sqrt{105}}{80} & 0 & -\frac{\sqrt{21}}{560} & 0 \\
\frac{\sqrt{14}}{56} & 0 & 0 & 0 & -\frac{\sqrt{70}}{56} & 0 & 0 & \frac{\sqrt{21}}{560} & 0 & \frac{\sqrt{105}}{80} & 0 & -\frac{\sqrt{7}}{560} & 0 & -\frac{3\sqrt{3}}{80} \\
0 & 0 & 0 & \frac{\sqrt{70}}{56} & 0 & \frac{\sqrt{7}}{28} & 0 & 0 & -\frac{\sqrt{14}}{80} & 0 & \frac{\sqrt{210}}{280} & 0 & \frac{13\sqrt{42}}{560} & 0 \\
0 & 0 & -\frac{\sqrt{14}}{56} & 0 & -\frac{\sqrt{7}}{28} & 0 & 0 & 0 & 0 & -\frac{\sqrt{42}}{112} & 0 & -\frac{\sqrt{70}}{56} & 0 & -\frac{\sqrt{30}}{80}
\end{bmatrix}$$

No.	multipole	matrix
630	symmetry	$-\dfrac{\sqrt{35}\,xz(x-z)(x+z)}{2}$

Table 9

No.	multipole	matrix

$\mathbb{G}_{4,2}^{(a)}(E,1)$

$$\begin{pmatrix}
\frac{\sqrt{7}i}{112} & 0 & -\frac{\sqrt{70}i}{112} & 0 & \frac{\sqrt{35}i}{112} & 0 & 0 & \frac{9\sqrt{42}i}{560} & 0 & -\frac{3\sqrt{210}i}{280} & 0 & \frac{9\sqrt{14}i}{560} & 0 & 0 \\
0 & -\frac{\sqrt{105}i}{112} & 0 & \frac{\sqrt{210}i}{112} & 0 & -\frac{\sqrt{21}i}{112} & \frac{3\sqrt{2}i}{80} & 0 & -\frac{3\sqrt{42}i}{140} & 0 & \frac{3\sqrt{70}i}{560} & 0 & \frac{3\sqrt{14}i}{280} & 0 \\
-\frac{\sqrt{21}i}{112} & 0 & \frac{\sqrt{210}i}{112} & 0 & -\frac{\sqrt{105}i}{112} & 0 & 0 & -\frac{3\sqrt{14}i}{280} & 0 & -\frac{3\sqrt{70}i}{560} & 0 & \frac{3\sqrt{42}i}{140} & 0 & -\frac{3\sqrt{2}i}{80} \\
0 & \frac{\sqrt{35}i}{112} & 0 & -\frac{\sqrt{70}i}{112} & 0 & \frac{\sqrt{7}i}{112} & 0 & 0 & -\frac{9\sqrt{14}i}{560} & 0 & \frac{3\sqrt{210}i}{280} & 0 & -\frac{9\sqrt{42}i}{560} & 0 \\
0 & \frac{\sqrt{7}i}{28} & 0 & -\frac{\sqrt{14}i}{56} & 0 & 0 & \frac{\sqrt{30}i}{80} & 0 & -\frac{\sqrt{70}i}{56} & 0 & \frac{\sqrt{42}i}{112} & 0 & 0 & 0 \\
\frac{\sqrt{7}i}{28} & 0 & -\frac{\sqrt{70}i}{56} & 0 & 0 & 0 & 0 & -\frac{13\sqrt{42}i}{560} & 0 & \frac{\sqrt{210}i}{280} & 0 & \frac{\sqrt{14}i}{80} & 0 & 0 \\
0 & -\frac{\sqrt{70}i}{56} & 0 & 0 & 0 & \frac{\sqrt{14}i}{56} & -\frac{3\sqrt{3}i}{80} & 0 & \frac{\sqrt{7}i}{560} & 0 & \frac{\sqrt{105}i}{80} & 0 & -\frac{\sqrt{21}i}{560} & 0 \\
-\frac{\sqrt{14}i}{56} & 0 & 0 & 0 & \frac{\sqrt{70}i}{56} & 0 & 0 & -\frac{\sqrt{21}i}{560} & 0 & \frac{\sqrt{105}i}{80} & 0 & \frac{\sqrt{7}i}{560} & 0 & -\frac{3\sqrt{3}i}{80} \\
0 & 0 & 0 & \frac{\sqrt{70}i}{56} & 0 & -\frac{\sqrt{7}i}{28} & 0 & 0 & \frac{\sqrt{14}i}{80} & 0 & \frac{\sqrt{210}i}{280} & 0 & -\frac{13\sqrt{42}i}{560} & 0 \\
0 & 0 & \frac{\sqrt{14}i}{56} & 0 & -\frac{\sqrt{7}i}{28} & 0 & 0 & 0 & 0 & \frac{\sqrt{42}i}{112} & 0 & -\frac{\sqrt{70}i}{56} & 0 & \frac{\sqrt{30}i}{80}
\end{pmatrix}$$

| 631 | symmetry | $\dfrac{\sqrt{5}yz\left(6x^2-y^2-z^2\right)}{2}$ |

$\mathbb{G}_{4,1}^{(a)}(E,2)$

$$\begin{pmatrix}
\frac{1}{112} & 0 & \frac{\sqrt{10}}{112} & 0 & -\frac{\sqrt{5}}{16} & 0 & 0 & \frac{9\sqrt{6}}{560} & 0 & \frac{3\sqrt{30}}{280} & 0 & -\frac{9\sqrt{2}}{80} & 0 & 0 \\
0 & -\frac{\sqrt{15}}{112} & 0 & -\frac{\sqrt{30}}{112} & 0 & \frac{\sqrt{3}}{16} & \frac{3\sqrt{14}}{80} & 0 & -\frac{3\sqrt{6}}{140} & 0 & -\frac{3\sqrt{10}}{560} & 0 & -\frac{3\sqrt{2}}{40} & 0 \\
-\frac{\sqrt{3}}{16} & 0 & \frac{\sqrt{30}}{112} & 0 & \frac{\sqrt{15}}{112} & 0 & 0 & -\frac{3\sqrt{2}}{40} & 0 & -\frac{3\sqrt{10}}{560} & 0 & -\frac{3\sqrt{6}}{140} & 0 & \frac{3\sqrt{14}}{80} \\
0 & \frac{\sqrt{5}}{16} & 0 & -\frac{\sqrt{10}}{112} & 0 & -\frac{1}{112} & 0 & 0 & -\frac{9\sqrt{2}}{80} & 0 & \frac{3\sqrt{30}}{280} & 0 & \frac{9\sqrt{6}}{560} & 0 \\
0 & -\frac{1}{28} & 0 & \frac{\sqrt{2}}{8} & 0 & 0 & \frac{\sqrt{210}}{560} & 0 & \frac{\sqrt{10}}{56} & 0 & -\frac{\sqrt{6}}{16} & 0 & 0 & 0 \\
\frac{1}{28} & 0 & \frac{\sqrt{10}}{56} & 0 & 0 & 0 & 0 & -\frac{13\sqrt{6}}{560} & 0 & -\frac{\sqrt{30}}{280} & 0 & -\frac{7\sqrt{2}}{80} & 0 & 0 \\
0 & -\frac{\sqrt{10}}{56} & 0 & 0 & 0 & -\frac{\sqrt{2}}{8} & -\frac{3\sqrt{21}}{80} & 0 & \frac{1}{560} & 0 & -\frac{\sqrt{15}}{80} & 0 & \frac{\sqrt{3}}{80} & 0 \\
-\frac{\sqrt{2}}{8} & 0 & 0 & 0 & -\frac{\sqrt{10}}{56} & 0 & 0 & -\frac{\sqrt{3}}{80} & 0 & \frac{\sqrt{15}}{80} & 0 & -\frac{1}{560} & 0 & \frac{3\sqrt{21}}{80} \\
0 & 0 & 0 & \frac{\sqrt{10}}{56} & 0 & \frac{1}{28} & 0 & 0 & \frac{7\sqrt{2}}{80} & 0 & \frac{\sqrt{30}}{280} & 0 & \frac{13\sqrt{6}}{560} & 0 \\
0 & 0 & \frac{\sqrt{2}}{8} & 0 & -\frac{1}{28} & 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{16} & 0 & -\frac{\sqrt{10}}{56} & 0 & -\frac{\sqrt{210}}{560}
\end{pmatrix}$$

| 632 | symmetry | $\dfrac{\sqrt{5}xz\left(x^2-6y^2+z^2\right)}{2}$ |

Table 9

No.	multipole	matrix
	$\mathbb{G}_{4,2}^{(a)}(E,2)$	(matrix below)

$$\begin{pmatrix}
\frac{i}{112} & 0 & -\frac{\sqrt{10}i}{112} & 0 & -\frac{\sqrt{5}i}{16} & 0 & 0 & \frac{9\sqrt{6}i}{560} & 0 & -\frac{3\sqrt{30}i}{280} & 0 & -\frac{9\sqrt{2}i}{80} & 0 & 0 \\
0 & -\frac{\sqrt{15}i}{112} & 0 & \frac{\sqrt{30}i}{112} & 0 & \frac{\sqrt{3}i}{16} & -\frac{3\sqrt{14}i}{80} & 0 & -\frac{3\sqrt{6}i}{140} & 0 & \frac{3\sqrt{10}i}{560} & 0 & -\frac{3\sqrt{2}i}{40} & 0 \\
\frac{\sqrt{3}i}{16} & 0 & \frac{\sqrt{30}i}{112} & 0 & -\frac{\sqrt{15}i}{112} & 0 & 0 & \frac{3\sqrt{2}i}{40} & 0 & -\frac{3\sqrt{10}i}{560} & 0 & \frac{3\sqrt{6}i}{140} & 0 & \frac{3\sqrt{14}i}{80} \\
0 & -\frac{\sqrt{5}i}{16} & 0 & -\frac{\sqrt{10}i}{112} & 0 & \frac{i}{112} & 0 & 0 & \frac{9\sqrt{2}i}{80} & 0 & \frac{3\sqrt{30}i}{280} & 0 & -\frac{9\sqrt{6}i}{560} & 0 \\
0 & \frac{i}{28} & 0 & \frac{\sqrt{2}i}{8} & 0 & 0 & \frac{\sqrt{210}i}{560} & 0 & -\frac{\sqrt{10}i}{56} & 0 & -\frac{\sqrt{6}i}{16} & 0 & 0 & 0 \\
\frac{i}{28} & 0 & -\frac{\sqrt{10}i}{56} & 0 & 0 & 0 & 0 & -\frac{13\sqrt{6}i}{560} & 0 & \frac{\sqrt{30}i}{280} & 0 & -\frac{7\sqrt{2}i}{80} & 0 & 0 \\
0 & -\frac{\sqrt{10}i}{56} & 0 & 0 & 0 & -\frac{\sqrt{2}i}{8} & \frac{3\sqrt{21}i}{80} & 0 & \frac{i}{560} & 0 & \frac{\sqrt{15}i}{80} & 0 & \frac{\sqrt{3}i}{80} & 0 \\
\frac{\sqrt{2}i}{8} & 0 & 0 & 0 & \frac{\sqrt{10}i}{56} & 0 & 0 & \frac{\sqrt{3}i}{80} & 0 & \frac{\sqrt{15}i}{80} & 0 & \frac{i}{560} & 0 & \frac{3\sqrt{21}i}{80} \\
0 & 0 & 0 & \frac{\sqrt{10}i}{56} & 0 & -\frac{i}{28} & 0 & 0 & -\frac{7\sqrt{2}i}{80} & 0 & \frac{\sqrt{30}i}{280} & 0 & -\frac{13\sqrt{6}i}{560} & 0 \\
0 & 0 & -\frac{\sqrt{2}i}{8} & 0 & -\frac{i}{28} & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{16} & 0 & -\frac{\sqrt{10}i}{56} & 0 & \frac{\sqrt{210}i}{560}
\end{pmatrix}$$

No.	multipole	matrix
633	symmetry	$\frac{\sqrt{3}(x-y)(x+y)}{2}$
	$\mathbb{G}_2^{(1,-1;a)}(A_1)$	(matrix below)

$$\begin{pmatrix}
0 & 0 & 0 & -\frac{3i}{70} & 0 & 0 & -\frac{\sqrt{105}i}{35} & 0 & 0 & 0 & -\frac{\sqrt{3}i}{35} & 0 & 0 & 0 \\
\frac{\sqrt{30}i}{70} & 0 & 0 & 0 & -\frac{\sqrt{6}i}{35} & 0 & 0 & -\frac{3\sqrt{5}i}{35} & 0 & 0 & 0 & -\frac{\sqrt{15}i}{35} & 0 & 0 \\
0 & \frac{\sqrt{6}i}{35} & 0 & 0 & 0 & -\frac{\sqrt{30}i}{70} & 0 & 0 & -\frac{\sqrt{15}i}{35} & 0 & 0 & 0 & -\frac{3\sqrt{5}i}{35} & 0 \\
0 & 0 & \frac{3i}{70} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{35} & 0 & 0 & 0 & -\frac{\sqrt{105}i}{35} \\
0 & 0 & \frac{\sqrt{5}i}{35} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{70} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & \frac{3i}{35} & 0 & 0 & -\frac{\sqrt{105}i}{70} & 0 & 0 & 0 & \frac{2\sqrt{3}i}{35} & 0 & 0 & 0 \\
\frac{\sqrt{5}i}{35} & 0 & 0 & 0 & \frac{3i}{35} & 0 & 0 & -\frac{\sqrt{30}i}{35} & 0 & 0 & 0 & \frac{3\sqrt{10}i}{70} & 0 & 0 \\
0 & \frac{3i}{35} & 0 & 0 & 0 & \frac{\sqrt{5}i}{35} & 0 & 0 & -\frac{3\sqrt{10}i}{70} & 0 & 0 & 0 & \frac{\sqrt{30}i}{35} & 0 \\
0 & 0 & \frac{3i}{35} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{2\sqrt{3}i}{35} & 0 & 0 & 0 & \frac{\sqrt{105}i}{70} \\
0 & 0 & 0 & \frac{\sqrt{5}i}{35} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{70} & 0 & 0 & 0
\end{pmatrix}$$

No.	multipole	matrix
634	symmetry	$\sqrt{3}xy$

continued …

Table 9

No.	multipole	matrix

$\mathbb{G}_2^{(1,-1;a)}(A_2)$:

$$\begin{bmatrix}
0 & 0 & 0 & -\frac{3}{70} & 0 & 0 & \frac{\sqrt{105}}{35} & 0 & 0 & 0 & -\frac{\sqrt{3}}{35} & 0 & 0 & 0 \\
-\frac{\sqrt{30}}{70} & 0 & 0 & 0 & -\frac{\sqrt{6}}{35} & 0 & 0 & \frac{3\sqrt{5}}{35} & 0 & 0 & 0 & -\frac{\sqrt{15}}{35} & 0 & 0 \\
0 & -\frac{\sqrt{6}}{35} & 0 & 0 & 0 & -\frac{\sqrt{30}}{70} & 0 & 0 & \frac{\sqrt{15}}{35} & 0 & 0 & 0 & -\frac{3\sqrt{5}}{35} & 0 \\
0 & 0 & -\frac{3}{70} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{35} & 0 & 0 & 0 & -\frac{\sqrt{105}}{35} \\
0 & 0 & \frac{\sqrt{5}}{35} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{70} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & \frac{3}{35} & 0 & 0 & \frac{\sqrt{105}}{70} & 0 & 0 & 0 & \frac{2\sqrt{3}}{35} & 0 & 0 & 0 \\
-\frac{\sqrt{5}}{35} & 0 & 0 & 0 & \frac{3}{35} & 0 & 0 & \frac{\sqrt{30}}{35} & 0 & 0 & 0 & \frac{3\sqrt{10}}{70} & 0 & 0 \\
0 & -\frac{3}{35} & 0 & 0 & 0 & \frac{\sqrt{5}}{35} & 0 & 0 & \frac{3\sqrt{10}}{70} & 0 & 0 & 0 & \frac{\sqrt{30}}{35} & 0 \\
0 & 0 & -\frac{3}{35} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{2\sqrt{3}}{35} & 0 & 0 & 0 & \frac{\sqrt{105}}{70} \\
0 & 0 & 0 & -\frac{\sqrt{5}}{35} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{70} & 0 & 0 & 0
\end{bmatrix}$$

No.		
635	symmetry	$-\frac{x^2}{2} - \frac{y^2}{2} + z^2$

$\mathbb{G}_2^{(1,-1;a)}(B_1)$:

$$\begin{bmatrix}
0 & -\frac{3\sqrt{6}i}{70} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{2\sqrt{15}i}{35} & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & -\frac{3i}{70} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{6\sqrt{3}i}{35} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & \frac{3i}{70} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{6\sqrt{3}i}{35} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & \frac{3\sqrt{6}i}{70} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{2\sqrt{15}i}{35} & 0 & 0 \\
\frac{\sqrt{6}i}{21} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3i}{14} & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & -\frac{\sqrt{6}i}{105} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{15}i}{70} & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & -\frac{4\sqrt{6}i}{105} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{2}i}{70} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & -\frac{4\sqrt{6}i}{105} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{2}i}{70} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{105} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{15}i}{70} & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}i}{21} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3i}{14} & 0
\end{bmatrix}$$

No.		
636	symmetry	$\sqrt{3}yz$

190

Table 9

No.	multipole	matrix

$\mathbb{G}_{2,1}^{(1,-1;a)}(E)$

$$\begin{bmatrix}
-\frac{3\sqrt{10}}{140} & 0 & -\frac{9}{140} & 0 & 0 & 0 & 0 & -\frac{2\sqrt{15}}{35} & 0 & -\frac{2\sqrt{3}}{35} & 0 & 0 & 0 \\[4pt]
0 & \frac{\sqrt{6}}{140} & 0 & -\frac{\sqrt{3}}{28} & 0 & 0 & 0 & 0 & -\frac{2\sqrt{15}}{35} & 0 & -\frac{6}{35} & 0 & 0 \\[4pt]
0 & 0 & \frac{\sqrt{3}}{28} & 0 & -\frac{\sqrt{6}}{140} & 0 & 0 & 0 & 0 & -\frac{6}{35} & 0 & -\frac{2\sqrt{15}}{35} & 0 \\[4pt]
0 & 0 & 0 & \frac{9}{140} & 0 & \frac{3\sqrt{10}}{140} & 0 & 0 & 0 & 0 & -\frac{2\sqrt{3}}{35} & 0 & -\frac{2\sqrt{15}}{35} \\[4pt]
0 & \frac{\sqrt{10}}{35} & 0 & 0 & 0 & 0 & \frac{\sqrt{21}}{28} & 0 & \frac{3}{28} & 0 & 0 & 0 & 0 \\[4pt]
-\frac{\sqrt{10}}{35} & 0 & \frac{2}{35} & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{140} & 0 & \frac{11\sqrt{3}}{140} & 0 & 0 & 0 \\[4pt]
0 & -\frac{2}{35} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{10}}{140} & 0 & \frac{\sqrt{6}}{20} & 0 & 0 \\[4pt]
0 & 0 & 0 & 0 & -\frac{2}{35} & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}}{20} & 0 & \frac{3\sqrt{10}}{140} & 0 \\[4pt]
0 & 0 & 0 & \frac{2}{35} & 0 & -\frac{\sqrt{10}}{35} & 0 & 0 & 0 & 0 & -\frac{11\sqrt{3}}{140} & 0 & -\frac{\sqrt{15}}{140} \\[4pt]
0 & 0 & 0 & 0 & \frac{\sqrt{10}}{35} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3}{28} & 0 & -\frac{\sqrt{21}}{28}
\end{bmatrix}$$

| 637 | symmetry | $-\sqrt{3}\,xz$ |

$\mathbb{G}_{2,2}^{(1,-1;a)}(E)$

$$\begin{bmatrix}
-\frac{3\sqrt{10}i}{140} & 0 & \frac{9i}{140} & 0 & 0 & 0 & 0 & -\frac{2\sqrt{15}i}{35} & 0 & \frac{2\sqrt{3}i}{35} & 0 & 0 & 0 \\[4pt]
0 & \frac{\sqrt{6}i}{140} & 0 & \frac{\sqrt{3}i}{28} & 0 & 0 & 0 & 0 & -\frac{2\sqrt{15}i}{35} & 0 & \frac{6i}{35} & 0 & 0 \\[4pt]
0 & 0 & \frac{\sqrt{3}i}{28} & 0 & \frac{\sqrt{6}i}{140} & 0 & 0 & 0 & 0 & -\frac{6i}{35} & 0 & \frac{2\sqrt{15}i}{35} & 0 \\[4pt]
0 & 0 & 0 & \frac{9i}{140} & 0 & -\frac{3\sqrt{10}i}{140} & 0 & 0 & 0 & 0 & -\frac{2\sqrt{3}i}{35} & 0 & \frac{2\sqrt{15}i}{35} \\[4pt]
0 & -\frac{\sqrt{10}i}{35} & 0 & 0 & 0 & 0 & \frac{\sqrt{21}i}{28} & 0 & -\frac{3i}{28} & 0 & 0 & 0 & 0 \\[4pt]
-\frac{\sqrt{10}i}{35} & 0 & -\frac{2i}{35} & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{140} & 0 & -\frac{11\sqrt{3}i}{140} & 0 & 0 & 0 \\[4pt]
0 & -\frac{2i}{35} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{10}i}{140} & 0 & -\frac{\sqrt{6}i}{20} & 0 & 0 \\[4pt]
0 & 0 & 0 & 0 & \frac{2i}{35} & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{20} & 0 & -\frac{3\sqrt{10}i}{140} & 0 \\[4pt]
0 & 0 & 0 & \frac{2i}{35} & 0 & \frac{\sqrt{10}i}{35} & 0 & 0 & 0 & 0 & -\frac{11\sqrt{3}i}{140} & 0 & \frac{\sqrt{15}i}{140} \\[4pt]
0 & 0 & 0 & 0 & \frac{\sqrt{10}i}{35} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3i}{28} & 0 & \frac{\sqrt{21}i}{28}
\end{bmatrix}$$

| 638 | symmetry | $\frac{\sqrt{5}(x-y)(x+y)\left(x^2+y^2-6z^2\right)}{4}$ |

Table 9

No.	multipole	matrix

$\mathbb{G}_4^{(1,-1;a)}(A_1)$

$$
\begin{bmatrix}
0 & 0 & 0 & -\frac{\sqrt{30}\,i}{168} & 0 & 0 & -\frac{\sqrt{14}\,i}{56} & 0 & 0 & 0 & -\frac{3\sqrt{10}\,i}{56} & 0 & 0 & 0 \\[4pt]
\frac{i}{56} & 0 & 0 & 0 & \frac{\sqrt{5}\,i}{56} & 0 & 0 & \frac{11\sqrt{6}\,i}{168} & 0 & 0 & 0 & -\frac{\sqrt{2}\,i}{56} & 0 & 0 \\[4pt]
0 & -\frac{\sqrt{5}\,i}{56} & 0 & 0 & 0 & -\frac{i}{56} & 0 & 0 & -\frac{\sqrt{2}\,i}{56} & 0 & 0 & 0 & \frac{11\sqrt{6}\,i}{168} & 0 \\[4pt]
0 & 0 & \frac{\sqrt{30}\,i}{168} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{10}\,i}{56} & 0 & 0 & 0 & -\frac{\sqrt{14}\,i}{56} \\[4pt]
0 & 0 & \frac{\sqrt{6}\,i}{28} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{5\sqrt{2}\,i}{28} & 0 & 0 & 0 & 0 \\[4pt]
0 & 0 & 0 & -\frac{\sqrt{30}\,i}{84} & 0 & 0 & -\frac{3\sqrt{14}\,i}{56} & 0 & 0 & 0 & \frac{\sqrt{10}\,i}{56} & 0 & 0 & 0 \\[4pt]
\frac{\sqrt{6}\,i}{28} & 0 & 0 & 0 & -\frac{\sqrt{30}\,i}{84} & 0 & 0 & \frac{9i}{56} & 0 & 0 & 0 & -\frac{17\sqrt{3}\,i}{168} & 0 & 0 \\[4pt]
0 & -\frac{\sqrt{30}\,i}{84} & 0 & 0 & 0 & \frac{\sqrt{6}\,i}{28} & 0 & 0 & \frac{17\sqrt{3}\,i}{168} & 0 & 0 & 0 & -\frac{9i}{56} & 0 \\[4pt]
0 & 0 & -\frac{\sqrt{30}\,i}{84} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}\,i}{56} & 0 & 0 & 0 & \frac{3\sqrt{14}\,i}{56} \\[4pt]
0 & 0 & 0 & \frac{\sqrt{6}\,i}{28} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{5\sqrt{2}\,i}{28} & 0 & 0 & 0
\end{bmatrix}
$$

| 639 | symmetry | $-\dfrac{\sqrt{5}\,xy\left(x^2+y^2-6z^2\right)}{2}$ |

$\mathbb{G}_4^{(1,-1;a)}(A_2)$

$$
\begin{bmatrix}
0 & 0 & 0 & \frac{\sqrt{30}}{168} & 0 & 0 & -\frac{\sqrt{14}}{56} & 0 & 0 & 0 & \frac{3\sqrt{10}}{56} & 0 & 0 & 0 \\[4pt]
\frac{1}{56} & 0 & 0 & 0 & -\frac{\sqrt{5}}{56} & 0 & 0 & \frac{11\sqrt{6}}{168} & 0 & 0 & 0 & \frac{\sqrt{2}}{56} & 0 & 0 \\[4pt]
0 & -\frac{\sqrt{5}}{56} & 0 & 0 & 0 & \frac{1}{56} & 0 & 0 & -\frac{\sqrt{2}}{56} & 0 & 0 & 0 & -\frac{11\sqrt{6}}{168} & 0 \\[4pt]
0 & 0 & \frac{\sqrt{30}}{168} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{10}}{56} & 0 & 0 & 0 & \frac{\sqrt{14}}{56} \\[4pt]
0 & 0 & -\frac{\sqrt{6}}{28} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{5\sqrt{2}}{28} & 0 & 0 & 0 & 0 \\[4pt]
0 & 0 & 0 & \frac{\sqrt{30}}{84} & 0 & 0 & -\frac{3\sqrt{14}}{56} & 0 & 0 & 0 & -\frac{\sqrt{10}}{56} & 0 & 0 & 0 \\[4pt]
\frac{\sqrt{6}}{28} & 0 & 0 & 0 & \frac{\sqrt{30}}{84} & 0 & 0 & \frac{9}{56} & 0 & 0 & 0 & \frac{17\sqrt{3}}{168} & 0 & 0 \\[4pt]
0 & -\frac{\sqrt{30}}{84} & 0 & 0 & 0 & -\frac{\sqrt{6}}{28} & 0 & 0 & \frac{17\sqrt{3}}{168} & 0 & 0 & 0 & \frac{9}{56} & 0 \\[4pt]
0 & 0 & -\frac{\sqrt{30}}{84} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}}{56} & 0 & 0 & 0 & -\frac{3\sqrt{14}}{56} \\[4pt]
0 & 0 & 0 & \frac{\sqrt{6}}{28} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{5\sqrt{2}}{28} & 0 & 0 & 0
\end{bmatrix}
$$

| 640 | symmetry | $\dfrac{\sqrt{21}\left(x^4-3x^2y^2-3x^2z^2+y^4-3y^2z^2+z^4\right)}{6}$ |

Table 9

No.	multipole	matrix												

$\mathbb{G}_4^{(1,-1;a)}(B_1,1)$

0	$\frac{\sqrt{7}i}{168}$	0	0	0	$\frac{\sqrt{35}i}{168}$	0	0	$\frac{\sqrt{70}i}{56}$	0	0	0	$\frac{\sqrt{210}i}{168}$	0
0	0	$-\frac{\sqrt{42}i}{168}$	0	0	0	0	0	0	$-\frac{5\sqrt{14}i}{168}$	0	0	0	$\frac{\sqrt{10}i}{24}$
0	0	0	$\frac{\sqrt{42}i}{168}$	0	0	$\frac{\sqrt{10}i}{24}$	0	0	0	$-\frac{5\sqrt{14}i}{168}$	0	0	0
$-\frac{\sqrt{35}i}{168}$	0	0	0	$-\frac{\sqrt{7}i}{168}$	0	0	$\frac{\sqrt{210}i}{168}$	0	0	0	$\frac{\sqrt{70}i}{56}$	0	0
$-\frac{\sqrt{7}i}{84}$	0	0	0	$-\frac{\sqrt{35}i}{84}$	0	0	$-\frac{5\sqrt{42}i}{168}$	0	0	0	$-\frac{5\sqrt{14}i}{168}$	0	0
0	$\frac{\sqrt{7}i}{28}$	0	0	0	$-\frac{\sqrt{35}i}{84}$	0	0	$\frac{\sqrt{70}i}{42}$	0	0	0	$-\frac{\sqrt{210}i}{84}$	0
0	0	$-\frac{\sqrt{7}i}{42}$	0	0	0	0	0	0	$\frac{5\sqrt{21}i}{168}$	0	0	0	$-\frac{\sqrt{15}i}{24}$
0	0	0	$-\frac{\sqrt{7}i}{42}$	0	0	$\frac{\sqrt{15}i}{24}$	0	0	0	$-\frac{5\sqrt{21}i}{168}$	0	0	0
$-\frac{\sqrt{35}i}{84}$	0	0	0	$\frac{\sqrt{7}i}{28}$	0	0	$\frac{\sqrt{210}i}{84}$	0	0	0	$-\frac{\sqrt{70}i}{42}$	0	0
0	$-\frac{\sqrt{35}i}{84}$	0	0	0	$-\frac{\sqrt{7}i}{84}$	0	0	$\frac{5\sqrt{14}i}{168}$	0	0	0	$\frac{5\sqrt{42}i}{168}$	0

641	symmetry	$-\frac{\sqrt{15}\left(x^4-12x^2y^2+6x^2z^2+y^4+6y^2z^2-2z^4\right)}{12}$

$\mathbb{G}_4^{(1,-1;a)}(B_1,2)$

0	$\frac{\sqrt{5}i}{168}$	0	0	0	$-\frac{i}{24}$	0	0	$\frac{5\sqrt{2}i}{56}$	0	0	0	$-\frac{\sqrt{6}i}{24}$	0
0	0	$-\frac{\sqrt{30}i}{168}$	0	0	0	0	0	0	$-\frac{5\sqrt{10}i}{168}$	0	0	0	$-\frac{\sqrt{14}i}{24}$
0	0	0	$\frac{\sqrt{30}i}{168}$	0	0	$-\frac{\sqrt{14}i}{24}$	0	0	0	$-\frac{5\sqrt{10}i}{168}$	0	0	0
$\frac{i}{24}$	0	0	0	$-\frac{\sqrt{5}i}{168}$	0	0	$-\frac{\sqrt{6}i}{24}$	0	0	0	$\frac{5\sqrt{2}i}{56}$	0	0
$-\frac{\sqrt{5}i}{84}$	0	0	0	$\frac{i}{12}$	0	0	$-\frac{5\sqrt{30}i}{168}$	0	0	0	$\frac{\sqrt{10}i}{24}$	0	0
0	$\frac{\sqrt{5}i}{28}$	0	0	0	$\frac{i}{12}$	0	0	$\frac{5\sqrt{2}i}{42}$	0	0	0	$\frac{\sqrt{6}i}{12}$	0
0	0	$-\frac{\sqrt{5}i}{42}$	0	0	0	0	0	0	$\frac{5\sqrt{15}i}{168}$	0	0	0	$\frac{\sqrt{21}i}{24}$
0	0	0	$-\frac{\sqrt{5}i}{42}$	0	0	$-\frac{\sqrt{21}i}{24}$	0	0	0	$-\frac{5\sqrt{15}i}{168}$	0	0	0
$\frac{i}{12}$	0	0	0	$\frac{\sqrt{5}i}{28}$	0	0	$-\frac{\sqrt{6}i}{12}$	0	0	0	$-\frac{5\sqrt{2}i}{42}$	0	0
0	$\frac{i}{12}$	0	0	0	$-\frac{\sqrt{5}i}{84}$	0	0	$-\frac{\sqrt{10}i}{24}$	0	0	0	$\frac{5\sqrt{30}i}{168}$	0

642	symmetry	$\frac{\sqrt{35}xy(x-y)(x+y)}{2}$

continued …

Table 9

No.	multipole	matrix

$\mathbb{G}_4^{(1,-1;a)}(B_2)$

$$\begin{pmatrix}
0 & 0 & 0 & 0 & 0 & \frac{\sqrt{21}}{84} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{14}}{28} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{12} \\
0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}}{12} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
\frac{\sqrt{21}}{84} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{14}}{28} & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & -\frac{\sqrt{21}}{42} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{210}}{84} & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{21}}{42} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{14}}{14} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{1}{4} \\
0 & 0 & 0 & 0 & 0 & 0 & -\frac{1}{4} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
\frac{\sqrt{21}}{42} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{14}}{14} & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & \frac{\sqrt{21}}{42} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{210}}{84} & 0 & 0 & 0 & 0 & 0
\end{pmatrix}$$

643	symmetry	$\dfrac{\sqrt{35}\,yz(y-z)(y+z)}{2}$

$\mathbb{G}_{4,1}^{(1,-1;a)}(E,1)$

$$\begin{pmatrix}
-\frac{\sqrt{21}}{672} & 0 & -\frac{\sqrt{210}}{672} & 0 & -\frac{\sqrt{105}}{672} & 0 & 0 & -\frac{3\sqrt{14}}{112} & 0 & -\frac{\sqrt{70}}{56} & 0 & -\frac{\sqrt{42}}{112} & 0 & 0 \\
0 & \frac{\sqrt{35}}{224} & 0 & \frac{\sqrt{70}}{224} & 0 & \frac{\sqrt{7}}{224} & \frac{\sqrt{6}}{48} & 0 & \frac{\sqrt{14}}{28} & 0 & \frac{\sqrt{210}}{336} & 0 & -\frac{\sqrt{42}}{168} & 0 \\
-\frac{\sqrt{7}}{224} & 0 & -\frac{\sqrt{70}}{224} & 0 & -\frac{\sqrt{35}}{224} & 0 & 0 & -\frac{\sqrt{42}}{168} & 0 & \frac{\sqrt{210}}{336} & 0 & \frac{\sqrt{14}}{28} & 0 & \frac{\sqrt{6}}{48} \\
0 & \frac{\sqrt{105}}{672} & 0 & \frac{\sqrt{210}}{672} & 0 & \frac{\sqrt{21}}{672} & 0 & 0 & -\frac{\sqrt{42}}{112} & 0 & -\frac{\sqrt{70}}{56} & 0 & -\frac{3\sqrt{14}}{112} & 0 \\
0 & \frac{\sqrt{21}}{84} & 0 & \frac{\sqrt{42}}{168} & 0 & 0 & \frac{\sqrt{10}}{32} & 0 & \frac{5\sqrt{210}}{336} & 0 & \frac{5\sqrt{14}}{224} & 0 & 0 & 0 \\
-\frac{\sqrt{21}}{84} & 0 & -\frac{\sqrt{210}}{168} & 0 & 0 & 0 & 0 & -\frac{13\sqrt{14}}{224} & 0 & -\frac{\sqrt{70}}{112} & 0 & \frac{\sqrt{42}}{96} & 0 & 0 \\
0 & \frac{\sqrt{210}}{168} & 0 & 0 & 0 & -\frac{\sqrt{42}}{168} & \frac{3}{32} & 0 & \frac{\sqrt{21}}{672} & 0 & -\frac{\sqrt{35}}{32} & 0 & -\frac{\sqrt{7}}{224} & 0 \\
-\frac{\sqrt{42}}{168} & 0 & 0 & 0 & \frac{\sqrt{210}}{168} & 0 & 0 & \frac{\sqrt{7}}{224} & 0 & \frac{\sqrt{35}}{32} & 0 & -\frac{\sqrt{21}}{672} & 0 & -\frac{3}{32} \\
0 & 0 & 0 & -\frac{\sqrt{210}}{168} & 0 & -\frac{\sqrt{21}}{84} & 0 & 0 & -\frac{\sqrt{42}}{96} & 0 & \frac{\sqrt{70}}{112} & 0 & \frac{13\sqrt{14}}{224} & 0 \\
0 & 0 & \frac{\sqrt{42}}{168} & 0 & \frac{\sqrt{21}}{84} & 0 & 0 & 0 & 0 & -\frac{5\sqrt{14}}{224} & 0 & -\frac{5\sqrt{210}}{336} & 0 & -\frac{\sqrt{10}}{32}
\end{pmatrix}$$

644	symmetry	$-\dfrac{\sqrt{35}\,xz(x-z)(x+z)}{2}$

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Table 9

No.	multipole	matrix

$$\mathbb{G}_{4,2}^{(1,-1;a)}(E,1) =
\begin{pmatrix}
-\frac{\sqrt{21}i}{672} & 0 & \frac{\sqrt{210}i}{672} & 0 & -\frac{\sqrt{105}i}{672} & 0 & 0 & -\frac{3\sqrt{14}i}{112} & 0 & \frac{\sqrt{70}i}{56} & 0 & -\frac{\sqrt{42}i}{112} & 0 & 0 \\
0 & \frac{\sqrt{35}i}{224} & 0 & -\frac{\sqrt{70}i}{224} & 0 & \frac{\sqrt{7}i}{224} & -\frac{\sqrt{6}i}{48} & 0 & \frac{\sqrt{14}i}{28} & 0 & -\frac{\sqrt{210}i}{336} & 0 & -\frac{\sqrt{42}i}{168} & 0 \\
\frac{\sqrt{7}i}{224} & 0 & -\frac{\sqrt{70}i}{224} & 0 & \frac{\sqrt{35}i}{224} & 0 & 0 & \frac{\sqrt{42}i}{168} & 0 & \frac{\sqrt{210}i}{336} & 0 & -\frac{\sqrt{14}i}{28} & 0 & \frac{\sqrt{6}i}{48} \\
0 & -\frac{\sqrt{105}i}{672} & 0 & \frac{\sqrt{210}i}{672} & 0 & -\frac{\sqrt{21}i}{672} & 0 & 0 & \frac{\sqrt{42}i}{112} & 0 & -\frac{\sqrt{70}i}{56} & 0 & \frac{3\sqrt{14}i}{112} & 0 \\
0 & -\frac{\sqrt{21}i}{84} & 0 & \frac{\sqrt{42}i}{168} & 0 & 0 & \frac{\sqrt{10}i}{32} & 0 & -\frac{5\sqrt{210}i}{336} & 0 & \frac{5\sqrt{14}i}{224} & 0 & 0 & 0 \\
-\frac{\sqrt{21}i}{84} & 0 & \frac{\sqrt{210}i}{168} & 0 & 0 & 0 & 0 & -\frac{13\sqrt{14}i}{224} & 0 & \frac{\sqrt{70}i}{112} & 0 & \frac{\sqrt{42}i}{96} & 0 & 0 \\
0 & \frac{\sqrt{210}i}{168} & 0 & 0 & 0 & -\frac{\sqrt{42}i}{168} & -\frac{3i}{32} & 0 & \frac{\sqrt{21}i}{672} & 0 & \frac{\sqrt{35}i}{32} & 0 & -\frac{\sqrt{7}i}{224} & 0 \\
\frac{\sqrt{42}i}{168} & 0 & 0 & 0 & -\frac{\sqrt{210}i}{168} & 0 & 0 & -\frac{\sqrt{7}i}{224} & 0 & \frac{\sqrt{35}i}{32} & 0 & \frac{\sqrt{21}i}{672} & 0 & -\frac{3i}{32} \\
0 & 0 & 0 & -\frac{\sqrt{210}i}{168} & 0 & \frac{\sqrt{21}i}{84} & 0 & 0 & \frac{\sqrt{42}i}{96} & 0 & \frac{\sqrt{70}i}{112} & 0 & -\frac{13\sqrt{14}i}{224} & 0 \\
0 & 0 & -\frac{\sqrt{42}i}{168} & 0 & \frac{\sqrt{21}i}{84} & 0 & 0 & 0 & 0 & \frac{5\sqrt{14}i}{224} & 0 & -\frac{5\sqrt{210}i}{336} & 0 & \frac{\sqrt{10}i}{32}
\end{pmatrix}$$

645	symmetry	$\dfrac{\sqrt{5}yz\left(6x^2-y^2-z^2\right)}{2}$

$$\mathbb{G}_{4,1}^{(1,-1;a)}(E,2) =
\begin{pmatrix}
-\frac{\sqrt{3}}{672} & 0 & -\frac{\sqrt{30}}{672} & 0 & \frac{\sqrt{15}}{96} & 0 & 0 & -\frac{3\sqrt{2}}{112} & 0 & -\frac{\sqrt{10}}{56} & 0 & \frac{\sqrt{6}}{16} & 0 & 0 \\
0 & \frac{\sqrt{5}}{224} & 0 & \frac{\sqrt{10}}{224} & 0 & -\frac{1}{32} & -\frac{\sqrt{42}}{48} & 0 & \frac{\sqrt{2}}{28} & 0 & \frac{\sqrt{30}}{336} & 0 & \frac{\sqrt{6}}{24} & 0 \\
\frac{1}{32} & 0 & -\frac{\sqrt{10}}{224} & 0 & -\frac{\sqrt{5}}{224} & 0 & 0 & \frac{\sqrt{6}}{24} & 0 & \frac{\sqrt{30}}{336} & 0 & \frac{\sqrt{2}}{28} & 0 & -\frac{\sqrt{42}}{48} \\
0 & -\frac{\sqrt{15}}{96} & 0 & \frac{\sqrt{30}}{672} & 0 & \frac{\sqrt{3}}{672} & 0 & 0 & \frac{\sqrt{6}}{16} & 0 & -\frac{\sqrt{10}}{56} & 0 & -\frac{3\sqrt{2}}{112} & 0 \\
0 & \frac{\sqrt{3}}{84} & 0 & -\frac{\sqrt{6}}{24} & 0 & 0 & \frac{\sqrt{70}}{224} & 0 & \frac{5\sqrt{30}}{336} & 0 & -\frac{5\sqrt{2}}{32} & 0 & 0 & 0 \\
-\frac{\sqrt{3}}{84} & 0 & -\frac{\sqrt{30}}{168} & 0 & 0 & 0 & 0 & -\frac{13\sqrt{2}}{224} & 0 & -\frac{\sqrt{10}}{112} & 0 & -\frac{7\sqrt{6}}{96} & 0 & 0 \\
0 & \frac{\sqrt{30}}{168} & 0 & 0 & 0 & \frac{\sqrt{6}}{24} & -\frac{3\sqrt{7}}{32} & 0 & \frac{\sqrt{3}}{672} & 0 & -\frac{\sqrt{5}}{32} & 0 & \frac{1}{32} & 0 \\
\frac{\sqrt{6}}{24} & 0 & 0 & 0 & \frac{\sqrt{30}}{168} & 0 & 0 & -\frac{1}{32} & 0 & \frac{\sqrt{5}}{32} & 0 & -\frac{\sqrt{3}}{672} & 0 & \frac{3\sqrt{7}}{32} \\
0 & 0 & 0 & -\frac{\sqrt{30}}{168} & 0 & -\frac{\sqrt{3}}{84} & 0 & 0 & \frac{7\sqrt{6}}{96} & 0 & \frac{\sqrt{10}}{112} & 0 & \frac{13\sqrt{2}}{224} & 0 \\
0 & 0 & -\frac{\sqrt{6}}{24} & 0 & \frac{\sqrt{3}}{84} & 0 & 0 & 0 & 0 & \frac{5\sqrt{2}}{32} & 0 & -\frac{5\sqrt{30}}{336} & 0 & -\frac{\sqrt{70}}{224}
\end{pmatrix}$$

646	symmetry	$\dfrac{\sqrt{5}xz\left(x^2-6y^2+z^2\right)}{2}$

continued ...

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Table 9

No.	multipole	matrix

$\mathbb{G}_{4,2}^{(1,-1;a)}(E,2)$

$$\begin{bmatrix}
-\frac{\sqrt{3}i}{672} & 0 & \frac{\sqrt{30}i}{672} & 0 & \frac{\sqrt{15}i}{96} & 0 & 0 & -\frac{3\sqrt{2}i}{112} & 0 & \frac{\sqrt{10}i}{56} & 0 & \frac{\sqrt{6}i}{16} & 0 & 0 \\
0 & \frac{\sqrt{5}i}{224} & 0 & -\frac{\sqrt{10}i}{224} & 0 & -\frac{i}{32} & \frac{\sqrt{42}i}{48} & 0 & \frac{\sqrt{2}i}{28} & 0 & -\frac{\sqrt{30}i}{336} & 0 & \frac{\sqrt{6}i}{24} & 0 \\
-\frac{i}{32} & 0 & -\frac{\sqrt{10}i}{224} & 0 & \frac{\sqrt{5}i}{224} & 0 & 0 & -\frac{\sqrt{6}i}{24} & 0 & \frac{\sqrt{30}i}{336} & 0 & -\frac{\sqrt{2}i}{28} & 0 & -\frac{\sqrt{42}i}{48} \\
0 & \frac{\sqrt{15}i}{96} & 0 & \frac{\sqrt{30}i}{672} & 0 & -\frac{\sqrt{3}i}{672} & 0 & 0 & -\frac{\sqrt{6}i}{16} & 0 & -\frac{\sqrt{10}i}{56} & 0 & \frac{3\sqrt{2}i}{112} & 0 \\
0 & -\frac{\sqrt{3}i}{84} & 0 & -\frac{\sqrt{6}i}{24} & 0 & 0 & \frac{\sqrt{70}i}{224} & 0 & -\frac{5\sqrt{30}i}{336} & 0 & -\frac{5\sqrt{2}i}{32} & 0 & 0 & 0 \\
-\frac{\sqrt{3}i}{84} & 0 & \frac{\sqrt{30}i}{168} & 0 & 0 & 0 & 0 & -\frac{13\sqrt{2}i}{224} & 0 & \frac{\sqrt{10}i}{112} & 0 & -\frac{7\sqrt{6}i}{96} & 0 & 0 \\
0 & \frac{\sqrt{30}i}{168} & 0 & 0 & 0 & \frac{\sqrt{6}i}{24} & \frac{3\sqrt{7}i}{32} & 0 & \frac{\sqrt{3}i}{672} & 0 & \frac{\sqrt{5}i}{32} & 0 & \frac{i}{32} & 0 \\
-\frac{\sqrt{6}i}{24} & 0 & 0 & 0 & -\frac{\sqrt{30}i}{168} & 0 & 0 & \frac{i}{32} & 0 & \frac{\sqrt{5}i}{32} & 0 & \frac{\sqrt{3}i}{672} & 0 & \frac{3\sqrt{7}i}{32} \\
0 & 0 & 0 & -\frac{\sqrt{30}i}{168} & 0 & \frac{\sqrt{3}i}{84} & 0 & 0 & -\frac{7\sqrt{6}i}{96} & 0 & \frac{\sqrt{10}i}{112} & 0 & -\frac{13\sqrt{2}i}{224} & 0 \\
0 & 0 & \frac{\sqrt{6}i}{24} & 0 & \frac{\sqrt{3}i}{84} & 0 & 0 & 0 & 0 & -\frac{5\sqrt{2}i}{32} & 0 & -\frac{5\sqrt{30}i}{336} & 0 & \frac{\sqrt{70}i}{224}
\end{bmatrix}$$

647 symmetry

$$-\frac{\sqrt{2310}(x-y)(x+y)(x-z)(x+z)(y-z)(y+z)}{8}$$

$\mathbb{G}_{6}^{(1,-1;a)}(A_1,1)$

$$\begin{bmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}i}{24} & 0 & 0 & 0 & \frac{\sqrt{5}i}{8} \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{i}{24} & 0 & 0 & 0 & \frac{\sqrt{35}i}{24} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{14}i}{24} & 0 & 0 & 0 & -\frac{\sqrt{42}i}{24} & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{42}i}{24} & 0 & 0 & 0 & \frac{\sqrt{14}i}{24} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{35}i}{24} & 0 & 0 & 0 & -\frac{i}{24} \\
0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{8} & 0 & 0 & 0 & \frac{\sqrt{7}i}{24} & 0 & 0 & 0
\end{bmatrix}$$

648 symmetry

$$\frac{\sqrt{42}(x-y)(x+y)\left(x^4-9x^2y^2-5x^2z^2+y^4-5y^2z^2+5z^4\right)}{8}$$

Table 9

No.	multipole	matrix

$\mathbb{G}_6^{(1,-1;a)}(A_1,2)$

$$\begin{bmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{385}i}{264} & 0 & 0 & 0 & \frac{\sqrt{11}i}{8} \\
0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{55}i}{264} & 0 & 0 & 0 & -\frac{5\sqrt{77}i}{264} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{770}i}{264} & 0 & 0 & 0 & \frac{\sqrt{2310}i}{264} & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2310}i}{264} & 0 & 0 & 0 & -\frac{\sqrt{770}i}{264} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{5\sqrt{77}i}{264} & 0 & 0 & 0 & \frac{\sqrt{55}i}{264} \\
0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{11}i}{8} & 0 & 0 & 0 & -\frac{\sqrt{385}i}{264} & 0 & 0 & 0
\end{bmatrix}$$

| 649 | symmetry | $\frac{\sqrt{462}xy(x^2-3y^2)(3x^2-y^2)}{16}$ |

$\mathbb{G}_6^{(1,-1;a)}(A_2,1)$

$$\begin{bmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{1}{2} \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{1}{2} & 0 & 0 & 0 & 0 & 0 & 0 & 0
\end{bmatrix}$$

| 650 | symmetry | $\frac{\sqrt{210}xy(x^4+2x^2y^2-16x^2z^2+y^4-16y^2z^2+16z^4)}{16}$ |

Table 9

No.	multipole	matrix

$\mathbb{G}_6^{(1,-1;a)}(A_2,2)$

$$\begin{bmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{77}}{66} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{11}}{66} & 0 & 0 & 0 & -\frac{\sqrt{385}}{66} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{154}}{66} & 0 & 0 & 0 & \frac{\sqrt{462}}{66} & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{462}}{66} & 0 & 0 & 0 & -\frac{\sqrt{154}}{66} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{385}}{66} & 0 & 0 & 0 & \frac{\sqrt{11}}{66} \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{77}}{66} & 0 & 0 & 0
\end{bmatrix}$$

| 651 | symmetry | $\dfrac{\sqrt{2}\left(2x^6-15x^4y^2-15x^4z^2-15x^2y^4+180x^2y^2z^2-15x^2z^4+2y^6-15y^4z^2-15y^2z^4+2z^6\right)}{8}$ |

$\mathbb{G}_6^{(1,-1;a)}(B_1,1)$

$$\begin{bmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{33}i}{264} & 0 & 0 & 0 & -\frac{7\sqrt{11}i}{88} & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{55}i}{88} & 0 & 0 & 0 & \frac{7\sqrt{165}i}{264} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{5\sqrt{66}i}{264} & 0 & 0 & 0 & -\frac{\sqrt{2310}i}{264} \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2310}i}{264} & 0 & 0 & 0 & -\frac{5\sqrt{66}i}{264} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{7\sqrt{165}i}{264} & 0 & 0 & 0 & \frac{\sqrt{55}i}{88} & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{7\sqrt{11}i}{88} & 0 & 0 & 0 & -\frac{\sqrt{33}i}{264} & 0
\end{bmatrix}$$

| 652 | symmetry | $-\dfrac{\sqrt{14}\left(x^6-15x^4z^2+15x^2z^4+y^6-15y^4z^2+15y^2z^4-2z^6\right)}{8}$ |

continued …

Table 9

No.	multipole	matrix

$\mathbb{G}_6^{(1,-1;a)}(B_1,2)$

$$\begin{pmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{231}i}{264} & 0 & 0 & 0 & \frac{\sqrt{77}i}{88} & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{385}i}{88} & 0 & 0 & 0 & -\frac{\sqrt{1155}i}{264} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{5\sqrt{462}i}{264} & 0 & 0 & 0 & \frac{\sqrt{330}i}{264} \\
0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{330}i}{264} & 0 & 0 & 0 & -\frac{5\sqrt{462}i}{264} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{1155}i}{264} & 0 & 0 & 0 & \frac{\sqrt{385}i}{88} & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{77}i}{88} & 0 & 0 & 0 & -\frac{\sqrt{231}i}{264} & 0 \\
\end{pmatrix}$$

| 653 | symmetry | $-\frac{3\sqrt{7}xy(x-y)(x+y)\left(x^2+y^2-10z^2\right)}{4}$ |

$\mathbb{G}_6^{(1,-1;a)}(B_2)$

$$\begin{bmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{154}}{44} & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2310}}{132} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{165}}{66} \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{165}}{66} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2310}}{132} & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{154}}{44} & 0 & 0 & 0 & 0 & 0 \\
\end{bmatrix}$$

| 654 | symmetry | $\frac{3\sqrt{7}yz(y-z)(y+z)\left(10x^2-y^2-z^2\right)}{4}$ |

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Table 9

No.	multipole	matrix

$\mathbb{G}_{6,1}^{(1,-1;a)}(E,1)$

$$\begin{bmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{66}}{1056} & 0 & \frac{\sqrt{154}}{352} & 0 & -\frac{\sqrt{2310}}{352} & 0 & -\frac{\sqrt{462}}{96} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2310}}{1056} & 0 & -\frac{5\sqrt{462}}{1056} & 0 & \frac{3\sqrt{770}}{352} & 0 & \frac{\sqrt{330}}{96} \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{165}}{176} & 0 & \frac{\sqrt{385}}{176} & 0 & \frac{5\sqrt{231}}{528} & 0 & -\frac{\sqrt{1155}}{176} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{1155}}{176} & 0 & -\frac{5\sqrt{231}}{528} & 0 & -\frac{\sqrt{385}}{176} & 0 & \frac{\sqrt{165}}{176} \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{330}}{96} & 0 & -\frac{3\sqrt{770}}{352} & 0 & \frac{5\sqrt{462}}{1056} & 0 & \frac{\sqrt{2310}}{1056} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{462}}{96} & 0 & \frac{\sqrt{2310}}{352} & 0 & -\frac{\sqrt{154}}{352} & 0 & -\frac{\sqrt{66}}{1056}
\end{bmatrix}$$

| 655 | symmetry | $\dfrac{3\sqrt{7}xz(x-z)(x+z)\left(x^2-10y^2+z^2\right)}{4}$ |

$\mathbb{G}_{6,2}^{(1,-1;a)}(E,1)$

$$\begin{bmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{66}i}{1056} & 0 & -\frac{\sqrt{154}i}{352} & 0 & -\frac{\sqrt{2310}i}{352} & 0 & \frac{\sqrt{462}i}{96} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2310}i}{1056} & 0 & \frac{5\sqrt{462}i}{1056} & 0 & \frac{3\sqrt{770}i}{352} & 0 & -\frac{\sqrt{330}i}{96} \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{165}i}{176} & 0 & \frac{\sqrt{385}i}{176} & 0 & -\frac{5\sqrt{231}i}{528} & 0 & -\frac{\sqrt{1155}i}{176} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{1155}i}{176} & 0 & -\frac{5\sqrt{231}i}{528} & 0 & \frac{\sqrt{385}i}{176} & 0 & \frac{\sqrt{165}i}{176} \\
0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{330}i}{96} & 0 & \frac{3\sqrt{770}i}{352} & 0 & \frac{5\sqrt{462}i}{1056} & 0 & -\frac{\sqrt{2310}i}{1056} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{462}i}{96} & 0 & -\frac{\sqrt{2310}i}{352} & 0 & -\frac{\sqrt{154}i}{352} & 0 & \frac{\sqrt{66}i}{1056}
\end{bmatrix}$$

| 656 | symmetry | $\dfrac{\sqrt{462}yz\left(y^2-3z^2\right)\left(3y^2-z^2\right)}{16}$ |

Table 9

No.	multipole	matrix

$\mathbb{G}_{6,1}^{(1,-1;a)}(E,2)$

$$\begin{pmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{1}{64} & 0 & \frac{\sqrt{21}}{64} & 0 & \frac{\sqrt{35}}{64} & 0 & \frac{\sqrt{7}}{64} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{35}}{64} & 0 & -\frac{5\sqrt{7}}{64} & 0 & -\frac{\sqrt{105}}{64} & 0 & -\frac{\sqrt{5}}{64} \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}}{64} & 0 & \frac{\sqrt{210}}{64} & 0 & \frac{5\sqrt{14}}{64} & 0 & \frac{\sqrt{70}}{64} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}}{64} & 0 & -\frac{5\sqrt{14}}{64} & 0 & -\frac{\sqrt{210}}{64} & 0 & -\frac{\sqrt{10}}{64} \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{5}}{64} & 0 & \frac{\sqrt{105}}{64} & 0 & \frac{5\sqrt{7}}{64} & 0 & \frac{\sqrt{35}}{64} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}}{64} & 0 & -\frac{\sqrt{35}}{64} & 0 & -\frac{\sqrt{21}}{64} & 0 & -\frac{1}{64}
\end{pmatrix}$$

657   symmetry $-\dfrac{\sqrt{462}\,xz\left(x^2-3z^2\right)\left(3x^2-z^2\right)}{16}$

$\mathbb{G}_{6,2}^{(1,-1;a)}(E,2)$

$$\begin{pmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{i}{64} & 0 & -\frac{\sqrt{21}i}{64} & 0 & \frac{\sqrt{35}i}{64} & 0 & -\frac{\sqrt{7}i}{64} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{35}i}{64} & 0 & \frac{5\sqrt{7}i}{64} & 0 & -\frac{\sqrt{105}i}{64} & 0 & \frac{\sqrt{5}i}{64} \\
0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}i}{64} & 0 & \frac{\sqrt{210}i}{64} & 0 & -\frac{5\sqrt{14}i}{64} & 0 & \frac{\sqrt{70}i}{64} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{70}i}{64} & 0 & -\frac{5\sqrt{14}i}{64} & 0 & \frac{\sqrt{210}i}{64} & 0 & -\frac{\sqrt{10}i}{64} \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{5}i}{64} & 0 & -\frac{\sqrt{105}i}{64} & 0 & \frac{5\sqrt{7}i}{64} & 0 & -\frac{\sqrt{35}i}{64} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}i}{64} & 0 & \frac{\sqrt{35}i}{64} & 0 & -\frac{\sqrt{21}i}{64} & 0 & \frac{i}{64}
\end{pmatrix}$$

658   symmetry $\dfrac{\sqrt{210}\,yz\left(16x^4-16x^2y^2-16x^2z^2+y^4+2y^2z^2+z^4\right)}{16}$

Table 9

No.	multipole	matrix													

		0	0	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0	0	0
	$\mathbb{G}_{6,1}^{(1,-1;a)}(E,3)$	0	0	0	0	0	0	0	$\frac{\sqrt{55}}{2112}$	0	$\frac{\sqrt{1155}}{2112}$	0	$-\frac{9\sqrt{77}}{704}$	0	$\frac{\sqrt{385}}{64}$	0
		0	0	0	0	0	0	0	0	$-\frac{5\sqrt{77}}{2112}$	0	$-\frac{5\sqrt{385}}{2112}$	0	$\frac{9\sqrt{231}}{704}$	0	$-\frac{5\sqrt{11}}{64}$
		0	0	0	0	0	0	0	$-\frac{9\sqrt{22}}{704}$	0	$\frac{5\sqrt{462}}{2112}$	0	$\frac{5\sqrt{770}}{2112}$	0	$-\frac{9\sqrt{154}}{704}$	0
		0	0	0	0	0	0	0	0	$\frac{9\sqrt{154}}{704}$	0	$-\frac{5\sqrt{770}}{2112}$	0	$-\frac{5\sqrt{462}}{2112}$	0	$\frac{9\sqrt{22}}{704}$
		0	0	0	0	0	0	0	$\frac{5\sqrt{11}}{64}$	0	$-\frac{9\sqrt{231}}{704}$	0	$\frac{5\sqrt{385}}{2112}$	0	$\frac{5\sqrt{77}}{2112}$	0
		0	0	0	0	0	0	0	0	$-\frac{\sqrt{385}}{64}$	0	$\frac{9\sqrt{77}}{704}$	0	$-\frac{\sqrt{1155}}{2112}$	0	$-\frac{\sqrt{55}}{2112}$

659	symmetry	$-\frac{\sqrt{210}xz\left(x^4-16x^2y^2+2x^2z^2+16y^4-16y^2z^2+z^4\right)}{16}$

		0	0	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0	0	0
	$\mathbb{G}_{6,2}^{(1,-1;a)}(E,3)$	0	0	0	0	0	0	0	$\frac{\sqrt{55}i}{2112}$	0	$-\frac{\sqrt{1155}i}{2112}$	0	$-\frac{9\sqrt{77}i}{704}$	0	$-\frac{\sqrt{385}i}{64}$	0
		0	0	0	0	0	0	0	0	$-\frac{5\sqrt{77}i}{2112}$	0	$\frac{5\sqrt{385}i}{2112}$	0	$\frac{9\sqrt{231}i}{704}$	0	$\frac{5\sqrt{11}i}{64}$
		0	0	0	0	0	0	0	$\frac{9\sqrt{22}i}{704}$	0	$\frac{5\sqrt{462}i}{2112}$	0	$-\frac{5\sqrt{770}i}{2112}$	0	$-\frac{9\sqrt{154}i}{704}$	0
		0	0	0	0	0	0	0	0	$-\frac{9\sqrt{154}i}{704}$	0	$-\frac{5\sqrt{770}i}{2112}$	0	$\frac{5\sqrt{462}i}{2112}$	0	$\frac{9\sqrt{22}i}{704}$
		0	0	0	0	0	0	0	$\frac{5\sqrt{11}i}{64}$	0	$\frac{9\sqrt{231}i}{704}$	0	$\frac{5\sqrt{385}i}{2112}$	0	$-\frac{5\sqrt{77}i}{2112}$	0
		0	0	0	0	0	0	0	0	$-\frac{\sqrt{385}i}{64}$	0	$-\frac{9\sqrt{77}i}{704}$	0	$-\frac{\sqrt{1155}i}{2112}$	0	$\frac{\sqrt{55}i}{2112}$

660	symmetry	$\frac{\sqrt{3}(x-y)(x+y)}{2}$

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Table 9

No.	multipole	matrix

$\mathbb{G}_2^{(1,0;a)}(A_1)$

$$\begin{pmatrix}
0 & 0 & 0 & \frac{\sqrt{10}i}{70} & 0 & 0 & -\frac{\sqrt{42}i}{28} & 0 & 0 & 0 & -\frac{\sqrt{30}i}{140} & 0 & 0 & 0 \\
-\frac{\sqrt{3}i}{21} & 0 & 0 & 0 & \frac{2\sqrt{15}i}{105} & 0 & 0 & -\frac{3\sqrt{2}i}{28} & 0 & 0 & 0 & -\frac{\sqrt{6}i}{28} & 0 & 0 \\
0 & -\frac{2\sqrt{15}i}{105} & 0 & 0 & 0 & \frac{\sqrt{3}i}{21} & 0 & 0 & -\frac{\sqrt{6}i}{28} & 0 & 0 & 0 & -\frac{3\sqrt{2}i}{28} & 0 \\
0 & 0 & -\frac{\sqrt{10}i}{70} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}i}{140} & 0 & 0 & 0 & -\frac{\sqrt{42}i}{28} \\
0 & 0 & -\frac{3\sqrt{2}i}{28} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{84} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & -\frac{9\sqrt{10}i}{140} & 0 & 0 & \frac{\sqrt{42}i}{84} & 0 & 0 & 0 & -\frac{\sqrt{30}i}{105} & 0 & 0 & 0 \\
-\frac{3\sqrt{2}i}{28} & 0 & 0 & 0 & -\frac{9\sqrt{10}i}{140} & 0 & 0 & \frac{\sqrt{3}i}{21} & 0 & 0 & 0 & -\frac{i}{14} & 0 & 0 \\
0 & -\frac{9\sqrt{10}i}{140} & 0 & 0 & 0 & -\frac{3\sqrt{2}i}{28} & 0 & 0 & \frac{i}{14} & 0 & 0 & 0 & -\frac{\sqrt{3}i}{21} & 0 \\
0 & 0 & -\frac{9\sqrt{10}i}{140} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}i}{105} & 0 & 0 & 0 & -\frac{\sqrt{42}i}{84} \\
0 & 0 & 0 & -\frac{3\sqrt{2}i}{28} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}i}{84} & 0 & 0 & 0
\end{pmatrix}$$

661   symmetry $\sqrt{3}xy$

$\mathbb{G}_2^{(1,0;a)}(A_2)$

$$\begin{pmatrix}
0 & 0 & 0 & \frac{\sqrt{10}}{70} & 0 & 0 & \frac{\sqrt{42}}{28} & 0 & 0 & 0 & -\frac{\sqrt{30}}{140} & 0 & 0 & 0 \\
\frac{\sqrt{3}}{21} & 0 & 0 & 0 & \frac{2\sqrt{15}}{105} & 0 & 0 & \frac{3\sqrt{2}}{28} & 0 & 0 & 0 & -\frac{\sqrt{6}}{28} & 0 & 0 \\
0 & \frac{2\sqrt{15}}{105} & 0 & 0 & 0 & \frac{\sqrt{3}}{21} & 0 & 0 & \frac{\sqrt{6}}{28} & 0 & 0 & 0 & -\frac{3\sqrt{2}}{28} & 0 \\
0 & 0 & \frac{\sqrt{10}}{70} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{140} & 0 & 0 & 0 & -\frac{\sqrt{42}}{28} \\
0 & 0 & -\frac{3\sqrt{2}}{28} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}}{84} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & -\frac{9\sqrt{10}}{140} & 0 & 0 & -\frac{\sqrt{42}}{84} & 0 & 0 & 0 & -\frac{\sqrt{30}}{105} & 0 & 0 & 0 \\
\frac{3\sqrt{2}}{28} & 0 & 0 & 0 & -\frac{9\sqrt{10}}{140} & 0 & 0 & -\frac{\sqrt{3}}{21} & 0 & 0 & 0 & -\frac{1}{14} & 0 & 0 \\
0 & \frac{9\sqrt{10}}{140} & 0 & 0 & 0 & -\frac{3\sqrt{2}}{28} & 0 & 0 & -\frac{1}{14} & 0 & 0 & 0 & -\frac{\sqrt{3}}{21} & 0 \\
0 & 0 & \frac{9\sqrt{10}}{140} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}}{105} & 0 & 0 & 0 & -\frac{\sqrt{42}}{84} \\
0 & 0 & 0 & \frac{3\sqrt{2}}{28} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}}{84} & 0 & 0 & 0
\end{pmatrix}$$

662   symmetry $-\frac{x^2}{2} - \frac{y^2}{2} + z^2$

Table 9

No.	multipole	matrix

$$\mathbb{G}_2^{(1,0;a)}(B_1) = \begin{bmatrix}
0 & \frac{\sqrt{15}i}{35} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{14} & 0 & 0 & 0 & 0 \\
0 & 0 & \frac{\sqrt{10}i}{70} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{30}i}{70} & 0 & 0 & 0 \\
0 & 0 & 0 & -\frac{\sqrt{10}i}{70} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{30}i}{70} & 0 & 0 \\
0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{35} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{14} & 0 \\
-\frac{\sqrt{15}i}{14} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}i}{28} & 0 & 0 & 0 & 0 & 0 \\
0 & \frac{\sqrt{15}i}{70} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{28} & 0 & 0 & 0 & 0 \\
0 & 0 & \frac{2\sqrt{15}i}{35} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{70} & 0 & 0 & 0 \\
0 & 0 & 0 & \frac{2\sqrt{15}i}{35} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{5}i}{70} & 0 & 0 \\
0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{70} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}i}{28} & 0 \\
0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{14} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}i}{28}
\end{bmatrix}$$

663	symmetry	$\sqrt{3}yz$

$$\mathbb{G}_{2,1}^{(1,0;a)}(E) = \begin{bmatrix}
\frac{1}{14} & 0 & \frac{3\sqrt{10}}{140} & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}}{14} & 0 & -\frac{\sqrt{30}}{70} & 0 & 0 & 0 \\
0 & -\frac{\sqrt{15}}{210} & 0 & \frac{\sqrt{30}}{84} & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}}{14} & 0 & -\frac{3\sqrt{10}}{70} & 0 & 0 \\
0 & 0 & -\frac{\sqrt{30}}{84} & 0 & \frac{\sqrt{15}}{210} & 0 & 0 & 0 & 0 & -\frac{3\sqrt{10}}{70} & 0 & -\frac{\sqrt{6}}{14} & 0 \\
0 & 0 & 0 & -\frac{3\sqrt{10}}{140} & 0 & -\frac{1}{14} & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}}{70} & 0 & -\frac{\sqrt{6}}{14} \\
0 & -\frac{3}{14} & 0 & 0 & 0 & 0 & -\frac{\sqrt{210}}{168} & 0 & -\frac{\sqrt{10}}{56} & 0 & 0 & 0 & 0 \\
\frac{3}{14} & 0 & -\frac{3\sqrt{10}}{70} & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}}{168} & 0 & -\frac{11\sqrt{30}}{840} & 0 & 0 & 0 \\
0 & \frac{3\sqrt{10}}{70} & 0 & 0 & 0 & 0 & 0 & \frac{1}{28} & 0 & -\frac{\sqrt{15}}{60} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & \frac{3\sqrt{10}}{70} & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{60} & 0 & -\frac{1}{28} & 0 \\
0 & 0 & 0 & -\frac{3\sqrt{10}}{70} & 0 & \frac{3}{14} & 0 & 0 & 0 & 0 & \frac{11\sqrt{30}}{840} & 0 & \frac{\sqrt{6}}{168} \\
0 & 0 & 0 & 0 & -\frac{3}{14} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}}{56} & 0 & \frac{\sqrt{210}}{168}
\end{bmatrix}$$

664	symmetry	$-\sqrt{3}xz$

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Table 9

No.	multipole	matrix

$\mathbb{G}_{2,2}^{(1,0;a)}(E)$

$$\begin{pmatrix}
\frac{i}{14} & 0 & -\frac{3\sqrt{10}i}{140} & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{14} & 0 & \frac{\sqrt{30}i}{70} & 0 & 0 & 0 & 0 \\
0 & -\frac{\sqrt{15}i}{210} & 0 & -\frac{\sqrt{30}i}{84} & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{14} & 0 & \frac{3\sqrt{10}i}{70} & 0 & 0 & 0 \\
0 & 0 & -\frac{\sqrt{30}i}{84} & 0 & -\frac{\sqrt{15}i}{210} & 0 & 0 & 0 & 0 & -\frac{3\sqrt{10}i}{70} & 0 & \frac{\sqrt{6}i}{14} & 0 & 0 \\
0 & 0 & 0 & -\frac{3\sqrt{10}i}{140} & 0 & \frac{i}{14} & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}i}{70} & 0 & \frac{\sqrt{6}i}{14} & 0 \\
0 & \frac{3i}{14} & 0 & 0 & 0 & 0 & -\frac{\sqrt{210}i}{168} & 0 & \frac{\sqrt{10}i}{56} & 0 & 0 & 0 & 0 & 0 \\
\frac{3i}{14} & 0 & \frac{3\sqrt{10}i}{70} & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{168} & 0 & \frac{11\sqrt{30}i}{840} & 0 & 0 & 0 & 0 \\
0 & \frac{3\sqrt{10}i}{70} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{i}{28} & 0 & \frac{\sqrt{15}i}{60} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & -\frac{3\sqrt{10}i}{70} & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{60} & 0 & \frac{i}{28} & 0 & 0 \\
0 & 0 & 0 & -\frac{3\sqrt{10}i}{70} & 0 & -\frac{3i}{14} & 0 & 0 & 0 & 0 & \frac{11\sqrt{30}i}{840} & 0 & -\frac{\sqrt{6}i}{168} & 0 \\
0 & 0 & 0 & 0 & -\frac{3i}{14} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}i}{56} & 0 & -\frac{\sqrt{210}i}{168}
\end{pmatrix}$$

665	symmetry	$\dfrac{\sqrt{5}(x-y)(x+y)\left(x^2+y^2-6z^2\right)}{4}$

$\mathbb{G}_4^{(1,0;a)}(A_1)$

$$\begin{pmatrix}
0 & 0 & 0 & \frac{\sqrt{2}i}{56} & 0 & 0 & -\frac{9\sqrt{210}i}{1400} & 0 & 0 & 0 & -\frac{27\sqrt{6}i}{280} & 0 & 0 & 0 \\
-\frac{\sqrt{15}i}{280} & 0 & 0 & 0 & -\frac{\sqrt{3}i}{56} & 0 & 0 & \frac{99\sqrt{10}i}{1400} & 0 & 0 & 0 & -\frac{9\sqrt{30}i}{1400} & 0 & 0 \\
0 & \frac{\sqrt{3}i}{56} & 0 & 0 & 0 & \frac{\sqrt{15}i}{280} & 0 & 0 & -\frac{9\sqrt{30}i}{1400} & 0 & 0 & 0 & \frac{99\sqrt{10}i}{1400} & 0 \\
0 & 0 & -\frac{\sqrt{2}i}{56} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{27\sqrt{6}i}{280} & 0 & 0 & 0 & -\frac{9\sqrt{210}i}{1400} \\
0 & 0 & -\frac{9\sqrt{10}i}{140} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}i}{140} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & \frac{3\sqrt{2}i}{28} & 0 & 0 & \frac{3\sqrt{210}i}{1400} & 0 & 0 & 0 & -\frac{\sqrt{6}i}{280} & 0 & 0 & 0 \\
-\frac{9\sqrt{10}i}{140} & 0 & 0 & 0 & \frac{3\sqrt{2}i}{28} & 0 & 0 & -\frac{9\sqrt{15}i}{1400} & 0 & 0 & 0 & \frac{17\sqrt{5}i}{1400} & 0 & 0 \\
0 & \frac{3\sqrt{2}i}{28} & 0 & 0 & 0 & -\frac{9\sqrt{10}i}{140} & 0 & 0 & -\frac{17\sqrt{5}i}{1400} & 0 & 0 & 0 & \frac{9\sqrt{15}i}{1400} & 0 \\
0 & 0 & \frac{3\sqrt{2}i}{28} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}i}{280} & 0 & 0 & 0 & -\frac{3\sqrt{210}i}{1400} \\
0 & 0 & 0 & -\frac{9\sqrt{10}i}{140} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}i}{140} & 0 & 0 & 0
\end{pmatrix}$$

666	symmetry	$-\dfrac{\sqrt{5}xy\left(x^2+y^2-6z^2\right)}{2}$

continued …

Table 9

No.	multipole	matrix
	$\mathbb{G}_4^{(1,0;a)}(A_2)$	$$\begin{bmatrix} 0 & 0 & 0 & -\frac{\sqrt{2}}{56} & 0 & 0 & -\frac{9\sqrt{210}}{1400} & 0 & 0 & 0 & \frac{27\sqrt{6}}{280} & 0 & 0 & 0 \\ -\frac{\sqrt{15}}{280} & 0 & 0 & 0 & \frac{\sqrt{3}}{56} & 0 & 0 & \frac{99\sqrt{10}}{1400} & 0 & 0 & 0 & \frac{9\sqrt{30}}{1400} & 0 & 0 \\ 0 & \frac{\sqrt{3}}{56} & 0 & 0 & 0 & -\frac{\sqrt{15}}{280} & 0 & 0 & -\frac{9\sqrt{30}}{1400} & 0 & 0 & 0 & -\frac{99\sqrt{10}}{1400} & 0 \\ 0 & 0 & -\frac{\sqrt{2}}{56} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{27\sqrt{6}}{280} & 0 & 0 & 0 & \frac{9\sqrt{210}}{1400} \\ 0 & 0 & \frac{9\sqrt{10}}{140} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{140} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{3\sqrt{2}}{28} & 0 & 0 & \frac{3\sqrt{210}}{1400} & 0 & 0 & 0 & \frac{\sqrt{6}}{280} & 0 & 0 & 0 \\ -\frac{9\sqrt{10}}{140} & 0 & 0 & 0 & -\frac{3\sqrt{2}}{28} & 0 & 0 & -\frac{9\sqrt{15}}{1400} & 0 & 0 & 0 & -\frac{17\sqrt{5}}{1400} & 0 & 0 \\ 0 & \frac{3\sqrt{2}}{28} & 0 & 0 & 0 & \frac{9\sqrt{10}}{140} & 0 & 0 & -\frac{17\sqrt{5}}{1400} & 0 & 0 & 0 & -\frac{9\sqrt{15}}{1400} & 0 \\ 0 & 0 & \frac{3\sqrt{2}}{28} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{280} & 0 & 0 & 0 & \frac{3\sqrt{210}}{1400} \\ 0 & 0 & 0 & -\frac{9\sqrt{10}}{140} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{140} & 0 & 0 & 0 \end{bmatrix}$$
667	symmetry	$\dfrac{\sqrt{21}\left(x^4-3x^2y^2-3x^2z^2+y^4-3y^2z^2+z^4\right)}{6}$
	$\mathbb{G}_4^{(1,0;a)}(B_1,1)$	$$\begin{bmatrix} 0 & -\frac{\sqrt{105}i}{840} & 0 & 0 & 0 & -\frac{\sqrt{21}i}{168} & 0 & 0 & \frac{9\sqrt{42}i}{280} & 0 & 0 & 0 & \frac{9\sqrt{14}i}{280} & 0 \\ 0 & 0 & \frac{\sqrt{70}i}{280} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{210}i}{280} & 0 & 0 & 0 & \frac{3\sqrt{6}i}{40} \\ 0 & 0 & 0 & -\frac{\sqrt{70}i}{280} & 0 & 0 & \frac{3\sqrt{6}i}{40} & 0 & 0 & 0 & -\frac{3\sqrt{210}i}{280} & 0 & 0 & 0 \\ \frac{\sqrt{21}i}{168} & 0 & 0 & 0 & \frac{\sqrt{105}i}{840} & 0 & 0 & \frac{9\sqrt{14}i}{280} & 0 & 0 & 0 & \frac{9\sqrt{42}i}{280} & 0 & 0 \\ \frac{\sqrt{105}i}{140} & 0 & 0 & 0 & \frac{\sqrt{21}i}{28} & 0 & 0 & \frac{\sqrt{70}i}{280} & 0 & 0 & 0 & \frac{\sqrt{210}i}{840} & 0 & 0 \\ 0 & -\frac{3\sqrt{105}i}{140} & 0 & 0 & 0 & \frac{\sqrt{21}i}{28} & 0 & 0 & -\frac{\sqrt{42}i}{210} & 0 & 0 & 0 & \frac{\sqrt{14}i}{140} & 0 \\ 0 & 0 & \frac{\sqrt{105}i}{70} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{35}i}{280} & 0 & 0 & 0 & \frac{i}{40} \\ 0 & 0 & 0 & \frac{\sqrt{105}i}{70} & 0 & 0 & -\frac{i}{40} & 0 & 0 & 0 & \frac{\sqrt{35}i}{280} & 0 & 0 & 0 \\ \frac{\sqrt{21}i}{28} & 0 & 0 & 0 & -\frac{3\sqrt{105}i}{140} & 0 & 0 & -\frac{\sqrt{14}i}{140} & 0 & 0 & 0 & \frac{\sqrt{42}i}{210} & 0 & 0 \\ 0 & \frac{\sqrt{21}i}{28} & 0 & 0 & 0 & \frac{\sqrt{105}i}{140} & 0 & 0 & -\frac{\sqrt{210}i}{840} & 0 & 0 & 0 & -\frac{\sqrt{70}i}{280} & 0 \end{bmatrix}$$
668	symmetry	$-\dfrac{\sqrt{15}\left(x^4-12x^2y^2+6x^2z^2+y^4+6y^2z^2-2z^4\right)}{12}$

continued …

Table 9

No.	multipole	matrix
	$\mathbb{G}_4^{(1,0;a)}(B_1,2)$	(matrix below)

$$
\begin{bmatrix}
0 & -\frac{\sqrt{3}i}{168} & 0 & 0 & 0 & \frac{\sqrt{15}i}{120} & 0 & 0 & \frac{9\sqrt{30}i}{280} & 0 & 0 & 0 & -\frac{9\sqrt{10}i}{200} & 0 \\[4pt]
0 & 0 & \frac{\sqrt{2}i}{56} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{6}i}{56} & 0 & 0 & 0 & -\frac{3\sqrt{210}i}{200} \\[4pt]
0 & 0 & 0 & -\frac{\sqrt{2}i}{56} & 0 & 0 & -\frac{3\sqrt{210}i}{200} & 0 & 0 & 0 & -\frac{3\sqrt{6}i}{56} & 0 & 0 & 0 \\[4pt]
-\frac{\sqrt{15}i}{120} & 0 & 0 & 0 & \frac{\sqrt{3}i}{168} & 0 & 0 & -\frac{9\sqrt{10}i}{200} & 0 & 0 & 0 & \frac{9\sqrt{30}i}{280} & 0 & 0 \\[4pt]
\frac{\sqrt{3}i}{28} & 0 & 0 & 0 & -\frac{\sqrt{15}i}{20} & 0 & 0 & \frac{\sqrt{2}i}{56} & 0 & 0 & 0 & -\frac{\sqrt{6}i}{120} & 0 & 0 \\[4pt]
0 & -\frac{3\sqrt{3}i}{28} & 0 & 0 & 0 & -\frac{\sqrt{15}i}{20} & 0 & 0 & -\frac{\sqrt{30}i}{210} & 0 & 0 & 0 & -\frac{\sqrt{10}i}{100} & 0 \\[4pt]
0 & 0 & \frac{\sqrt{3}i}{14} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{i}{56} & 0 & 0 & 0 & -\frac{\sqrt{35}i}{200} \\[4pt]
0 & 0 & 0 & \frac{\sqrt{3}i}{14} & 0 & 0 & \frac{\sqrt{35}i}{200} & 0 & 0 & 0 & \frac{i}{56} & 0 & 0 & 0 \\[4pt]
-\frac{\sqrt{15}i}{20} & 0 & 0 & 0 & -\frac{3\sqrt{3}i}{28} & 0 & 0 & \frac{\sqrt{10}i}{100} & 0 & 0 & 0 & \frac{\sqrt{30}i}{210} & 0 & 0 \\[4pt]
0 & -\frac{\sqrt{15}i}{20} & 0 & 0 & 0 & \frac{\sqrt{3}i}{28} & 0 & 0 & \frac{\sqrt{6}i}{120} & 0 & 0 & 0 & -\frac{\sqrt{2}i}{56} & 0
\end{bmatrix}
$$

669	symmetry	$\dfrac{\sqrt{35}xy(x-y)(x+y)}{2}$
	$\mathbb{G}_4^{(1,0;a)}(B_2)$	(matrix below)

$$
\begin{bmatrix}
0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{35}}{140} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{9\sqrt{210}}{700} & 0 \\[4pt]
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{9\sqrt{10}}{100} \\[4pt]
0 & 0 & 0 & 0 & 0 & 0 & -\frac{9\sqrt{10}}{100} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\[4pt]
-\frac{\sqrt{35}}{140} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{9\sqrt{210}}{700} & 0 & 0 & 0 & 0 & 0 & 0 \\[4pt]
0 & 0 & 0 & 0 & \frac{3\sqrt{35}}{70} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{14}}{140} & 0 & 0 \\[4pt]
0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{35}}{70} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{210}}{350} & 0 \\[4pt]
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{100} \\[4pt]
0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{100} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\[4pt]
-\frac{3\sqrt{35}}{70} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{210}}{350} & 0 & 0 & 0 & 0 & 0 & 0 \\[4pt]
0 & -\frac{3\sqrt{35}}{70} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{14}}{140} & 0 & 0 & 0 & 0 & 0
\end{bmatrix}
$$

670	symmetry	$\dfrac{\sqrt{35}yz(y-z)(y+z)}{2}$

continued …

Table 9

No.	multipole	matrix

$\mathbb{G}_{4,1}^{(1,0;a)}(E,1)$

$$\begin{bmatrix}
\frac{\sqrt{35}}{1120} & 0 & \frac{\sqrt{14}}{224} & 0 & \frac{\sqrt{7}}{224} & 0 & 0 & -\frac{27\sqrt{210}}{2800} & 0 & -\frac{9\sqrt{42}}{280} & 0 & -\frac{27\sqrt{70}}{2800} & 0 & 0 \\
0 & -\frac{\sqrt{21}}{224} & 0 & -\frac{\sqrt{42}}{224} & 0 & -\frac{\sqrt{105}}{1120} & \frac{9\sqrt{10}}{400} & 0 & \frac{9\sqrt{210}}{700} & 0 & \frac{9\sqrt{14}}{560} & 0 & -\frac{9\sqrt{70}}{1400} & 0 \\
\frac{\sqrt{105}}{1120} & 0 & \frac{\sqrt{42}}{224} & 0 & \frac{\sqrt{21}}{224} & 0 & 0 & -\frac{9\sqrt{70}}{1400} & 0 & \frac{9\sqrt{14}}{560} & 0 & \frac{9\sqrt{210}}{700} & 0 & \frac{9\sqrt{10}}{400} \\
0 & -\frac{\sqrt{7}}{224} & 0 & -\frac{\sqrt{14}}{224} & 0 & -\frac{\sqrt{35}}{1120} & 0 & 0 & -\frac{27\sqrt{70}}{2800} & 0 & -\frac{9\sqrt{42}}{280} & 0 & -\frac{27\sqrt{210}}{2800} & 0 \\
0 & -\frac{3\sqrt{35}}{140} & 0 & -\frac{3\sqrt{70}}{280} & 0 & 0 & -\frac{\sqrt{6}}{160} & 0 & -\frac{\sqrt{14}}{112} & 0 & -\frac{\sqrt{210}}{1120} & 0 & 0 & 0 \\
\frac{3\sqrt{35}}{140} & 0 & \frac{3\sqrt{14}}{56} & 0 & 0 & 0 & 0 & \frac{13\sqrt{210}}{5600} & 0 & \frac{\sqrt{42}}{560} & 0 & -\frac{\sqrt{70}}{800} & 0 & 0 \\
0 & -\frac{3\sqrt{14}}{56} & 0 & 0 & 0 & \frac{3\sqrt{70}}{280} & -\frac{3\sqrt{15}}{800} & 0 & -\frac{\sqrt{35}}{5600} & 0 & \frac{\sqrt{21}}{160} & 0 & \frac{\sqrt{105}}{5600} & 0 \\
\frac{3\sqrt{70}}{280} & 0 & 0 & 0 & -\frac{3\sqrt{14}}{56} & 0 & 0 & -\frac{\sqrt{105}}{5600} & 0 & -\frac{\sqrt{21}}{160} & 0 & \frac{\sqrt{35}}{5600} & 0 & \frac{3\sqrt{15}}{800} \\
0 & 0 & 0 & \frac{3\sqrt{14}}{56} & 0 & \frac{3\sqrt{35}}{140} & 0 & 0 & \frac{\sqrt{70}}{800} & 0 & -\frac{\sqrt{42}}{560} & 0 & -\frac{13\sqrt{210}}{5600} & 0 \\
0 & 0 & -\frac{3\sqrt{70}}{280} & 0 & -\frac{3\sqrt{35}}{140} & 0 & 0 & 0 & 0 & \frac{\sqrt{210}}{1120} & 0 & \frac{\sqrt{14}}{112} & 0 & \frac{\sqrt{6}}{160}
\end{bmatrix}$$

No.	symmetry	
671	symmetry	$-\frac{\sqrt{35}xz(x-z)(x+z)}{2}$

$\mathbb{G}_{4,2}^{(1,0;a)}(E,1)$

$$\begin{bmatrix}
\frac{\sqrt{35}i}{1120} & 0 & -\frac{\sqrt{14}i}{224} & 0 & \frac{\sqrt{7}i}{224} & 0 & 0 & -\frac{27\sqrt{210}i}{2800} & 0 & \frac{9\sqrt{42}i}{280} & 0 & -\frac{27\sqrt{70}i}{2800} & 0 & 0 \\
0 & -\frac{\sqrt{21}i}{224} & 0 & \frac{\sqrt{42}i}{224} & 0 & -\frac{\sqrt{105}i}{1120} & -\frac{9\sqrt{10}i}{400} & 0 & \frac{9\sqrt{210}i}{700} & 0 & -\frac{9\sqrt{14}i}{560} & 0 & -\frac{9\sqrt{70}i}{1400} & 0 \\
-\frac{\sqrt{105}i}{1120} & 0 & \frac{\sqrt{42}i}{224} & 0 & -\frac{\sqrt{21}i}{224} & 0 & 0 & \frac{9\sqrt{70}i}{1400} & 0 & \frac{9\sqrt{14}i}{560} & 0 & -\frac{9\sqrt{210}i}{700} & 0 & \frac{9\sqrt{10}i}{400} \\
0 & \frac{\sqrt{7}i}{224} & 0 & -\frac{\sqrt{14}i}{224} & 0 & \frac{\sqrt{35}i}{1120} & 0 & 0 & \frac{27\sqrt{70}i}{2800} & 0 & -\frac{9\sqrt{42}i}{280} & 0 & \frac{27\sqrt{210}i}{2800} & 0 \\
0 & \frac{3\sqrt{35}i}{140} & 0 & -\frac{3\sqrt{70}i}{280} & 0 & 0 & -\frac{\sqrt{6}i}{160} & 0 & \frac{\sqrt{14}i}{112} & 0 & -\frac{\sqrt{210}i}{1120} & 0 & 0 & 0 \\
\frac{3\sqrt{35}i}{140} & 0 & -\frac{3\sqrt{14}i}{56} & 0 & 0 & 0 & 0 & \frac{13\sqrt{210}i}{5600} & 0 & -\frac{\sqrt{42}i}{560} & 0 & -\frac{\sqrt{70}i}{800} & 0 & 0 \\
0 & -\frac{3\sqrt{14}i}{56} & 0 & 0 & 0 & \frac{3\sqrt{70}i}{280} & \frac{3\sqrt{15}i}{800} & 0 & -\frac{\sqrt{35}i}{5600} & 0 & -\frac{\sqrt{21}i}{160} & 0 & \frac{\sqrt{105}i}{5600} & 0 \\
-\frac{3\sqrt{70}i}{280} & 0 & 0 & 0 & \frac{3\sqrt{14}i}{56} & 0 & 0 & \frac{\sqrt{105}i}{5600} & 0 & -\frac{\sqrt{21}i}{160} & 0 & -\frac{\sqrt{35}i}{5600} & 0 & \frac{3\sqrt{15}i}{800} \\
0 & 0 & 0 & \frac{3\sqrt{14}i}{56} & 0 & -\frac{3\sqrt{35}i}{140} & 0 & 0 & -\frac{\sqrt{70}i}{800} & 0 & -\frac{\sqrt{42}i}{560} & 0 & \frac{13\sqrt{210}i}{5600} & 0 \\
0 & 0 & \frac{3\sqrt{70}i}{280} & 0 & -\frac{3\sqrt{35}i}{140} & 0 & 0 & 0 & 0 & -\frac{\sqrt{210}i}{1120} & 0 & \frac{\sqrt{14}i}{112} & 0 & -\frac{\sqrt{6}i}{160}
\end{bmatrix}$$

No.	symmetry	
672	symmetry	$\frac{\sqrt{5}yz(6x^2-y^2-z^2)}{2}$

Table 9

No.	multipole	matrix

$$\mathbb{G}_{4,1}^{(1,0;a)}(E,2) = \begin{bmatrix} \frac{\sqrt{5}}{1120} & 0 & \frac{\sqrt{2}}{224} & 0 & -\frac{1}{32} & 0 & 0 & -\frac{27\sqrt{30}}{2800} & 0 & -\frac{9\sqrt{6}}{280} & 0 & \frac{27\sqrt{10}}{400} & 0 & 0 \\ 0 & -\frac{\sqrt{3}}{224} & 0 & -\frac{\sqrt{6}}{224} & 0 & \frac{\sqrt{15}}{160} & -\frac{9\sqrt{70}}{400} & 0 & \frac{9\sqrt{30}}{700} & 0 & \frac{9\sqrt{2}}{560} & 0 & \frac{9\sqrt{10}}{200} & 0 \\ -\frac{\sqrt{15}}{160} & 0 & \frac{\sqrt{6}}{224} & 0 & \frac{\sqrt{3}}{224} & 0 & 0 & \frac{9\sqrt{10}}{200} & 0 & \frac{9\sqrt{2}}{560} & 0 & \frac{9\sqrt{30}}{700} & 0 & -\frac{9\sqrt{70}}{400} \\ 0 & \frac{1}{32} & 0 & -\frac{\sqrt{2}}{224} & 0 & -\frac{\sqrt{5}}{1120} & 0 & 0 & \frac{27\sqrt{10}}{400} & 0 & -\frac{9\sqrt{6}}{280} & 0 & -\frac{27\sqrt{30}}{2800} & 0 \\ 0 & -\frac{3\sqrt{5}}{140} & 0 & \frac{3\sqrt{10}}{40} & 0 & 0 & -\frac{\sqrt{42}}{1120} & 0 & -\frac{\sqrt{2}}{112} & 0 & \frac{\sqrt{30}}{160} & 0 & 0 & 0 \\ \frac{3\sqrt{5}}{140} & 0 & \frac{3\sqrt{2}}{56} & 0 & 0 & 0 & 0 & \frac{13\sqrt{30}}{5600} & 0 & \frac{\sqrt{6}}{560} & 0 & \frac{7\sqrt{10}}{800} & 0 & 0 \\ 0 & -\frac{3\sqrt{2}}{56} & 0 & 0 & 0 & -\frac{3\sqrt{10}}{40} & \frac{3\sqrt{105}}{800} & 0 & -\frac{\sqrt{5}}{5600} & 0 & \frac{\sqrt{3}}{160} & 0 & -\frac{\sqrt{15}}{800} & 0 \\ -\frac{3\sqrt{10}}{40} & 0 & 0 & 0 & -\frac{3\sqrt{2}}{56} & 0 & 0 & \frac{\sqrt{15}}{800} & 0 & -\frac{\sqrt{3}}{160} & 0 & \frac{\sqrt{5}}{5600} & 0 & -\frac{3\sqrt{105}}{800} \\ 0 & 0 & 0 & \frac{3\sqrt{2}}{56} & 0 & \frac{3\sqrt{5}}{140} & 0 & 0 & -\frac{7\sqrt{10}}{800} & 0 & -\frac{\sqrt{6}}{560} & 0 & -\frac{13\sqrt{30}}{5600} & 0 \\ 0 & 0 & \frac{3\sqrt{10}}{40} & 0 & -\frac{3\sqrt{5}}{140} & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}}{160} & 0 & \frac{\sqrt{2}}{112} & 0 & \frac{\sqrt{42}}{1120} \end{bmatrix}$$

673	symmetry	$\frac{\sqrt{5}xz\left(x^2-6y^2+z^2\right)}{2}$

$$\mathbb{G}_{4,2}^{(1,0;a)}(E,2) = \begin{bmatrix} \frac{\sqrt{5}i}{1120} & 0 & -\frac{\sqrt{2}i}{224} & 0 & -\frac{i}{32} & 0 & 0 & -\frac{27\sqrt{30}i}{2800} & 0 & \frac{9\sqrt{6}i}{280} & 0 & \frac{27\sqrt{10}i}{400} & 0 & 0 \\ 0 & -\frac{\sqrt{3}i}{224} & 0 & \frac{\sqrt{6}i}{224} & 0 & \frac{\sqrt{15}i}{160} & \frac{9\sqrt{70}i}{400} & 0 & \frac{9\sqrt{30}i}{700} & 0 & -\frac{9\sqrt{2}i}{560} & 0 & \frac{9\sqrt{10}i}{200} & 0 \\ \frac{\sqrt{15}i}{160} & 0 & \frac{\sqrt{6}i}{224} & 0 & -\frac{\sqrt{3}i}{224} & 0 & 0 & -\frac{9\sqrt{10}i}{200} & 0 & \frac{9\sqrt{2}i}{560} & 0 & -\frac{9\sqrt{30}i}{700} & 0 & -\frac{9\sqrt{70}i}{400} \\ 0 & -\frac{i}{32} & 0 & -\frac{\sqrt{2}i}{224} & 0 & \frac{\sqrt{5}i}{1120} & 0 & 0 & -\frac{27\sqrt{10}i}{400} & 0 & -\frac{9\sqrt{6}i}{280} & 0 & \frac{27\sqrt{30}i}{2800} & 0 \\ 0 & \frac{3\sqrt{5}i}{140} & 0 & \frac{3\sqrt{10}i}{40} & 0 & 0 & -\frac{\sqrt{42}i}{1120} & 0 & \frac{\sqrt{2}i}{112} & 0 & \frac{\sqrt{30}i}{160} & 0 & 0 & 0 \\ \frac{3\sqrt{5}i}{140} & 0 & -\frac{3\sqrt{2}i}{56} & 0 & 0 & 0 & 0 & \frac{13\sqrt{30}i}{5600} & 0 & -\frac{\sqrt{6}i}{560} & 0 & \frac{7\sqrt{10}i}{800} & 0 & 0 \\ 0 & -\frac{3\sqrt{2}i}{56} & 0 & 0 & 0 & -\frac{3\sqrt{10}i}{40} & -\frac{3\sqrt{105}i}{800} & 0 & -\frac{\sqrt{5}i}{5600} & 0 & -\frac{\sqrt{3}i}{160} & 0 & -\frac{\sqrt{15}i}{800} & 0 \\ \frac{3\sqrt{10}i}{40} & 0 & 0 & 0 & \frac{3\sqrt{2}i}{56} & 0 & 0 & -\frac{\sqrt{15}i}{800} & 0 & -\frac{\sqrt{3}i}{160} & 0 & -\frac{\sqrt{5}i}{5600} & 0 & -\frac{3\sqrt{105}i}{800} \\ 0 & 0 & 0 & \frac{3\sqrt{2}i}{56} & 0 & -\frac{3\sqrt{5}i}{140} & 0 & 0 & \frac{7\sqrt{10}i}{800} & 0 & -\frac{\sqrt{6}i}{560} & 0 & \frac{13\sqrt{30}i}{5600} & 0 \\ 0 & 0 & -\frac{3\sqrt{10}i}{40} & 0 & -\frac{3\sqrt{5}i}{140} & 0 & 0 & 0 & 0 & \frac{\sqrt{30}i}{160} & 0 & \frac{\sqrt{2}i}{112} & 0 & -\frac{\sqrt{42}i}{1120} \end{bmatrix}$$

674	symmetry	1

continued …

Table 9

<table>
<tr><td>No.</td><td>multipole</td><td>matrix</td></tr>
</table>

$\mathbb{G}_0^{(1,1;a)}(B_1)$

$$\begin{pmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
-\frac{\sqrt{3}i}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & -\frac{\sqrt{3}i}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & -\frac{\sqrt{3}i}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & -\frac{\sqrt{3}i}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0
\end{pmatrix}$$

675 symmetry $\dfrac{\sqrt{3}(x-y)(x+y)}{2}$

$\mathbb{G}_2^{(1,1;a)}(A_1)$

$$\begin{pmatrix}
0 & 0 & 0 & \frac{2\sqrt{6}i}{35} & 0 & 0 & -\frac{3\sqrt{70}i}{280} & 0 & 0 & 0 & -\frac{3\sqrt{2}i}{280} & 0 & 0 & 0 \\
-\frac{4\sqrt{5}i}{35} & 0 & 0 & 0 & \frac{8i}{35} & 0 & 0 & -\frac{3\sqrt{30}i}{280} & 0 & 0 & 0 & -\frac{3\sqrt{10}i}{280} & 0 & 0 \\
0 & -\frac{8i}{35} & 0 & 0 & 0 & \frac{4\sqrt{5}i}{35} & 0 & 0 & -\frac{3\sqrt{10}i}{280} & 0 & 0 & 0 & -\frac{3\sqrt{30}i}{280} & 0 \\
0 & 0 & -\frac{2\sqrt{6}i}{35} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{2}i}{280} & 0 & 0 & 0 & -\frac{3\sqrt{70}i}{280} \\
0 & 0 & \frac{3\sqrt{30}i}{140} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}i}{105} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & \frac{9\sqrt{6}i}{140} & 0 & 0 & \frac{\sqrt{70}i}{105} & 0 & 0 & 0 & -\frac{4\sqrt{2}i}{105} & 0 & 0 & 0 \\
\frac{3\sqrt{30}i}{140} & 0 & 0 & 0 & \frac{9\sqrt{6}i}{140} & 0 & 0 & \frac{4\sqrt{5}i}{105} & 0 & 0 & 0 & -\frac{2\sqrt{15}i}{105} & 0 & 0 \\
0 & \frac{9\sqrt{6}i}{140} & 0 & 0 & 0 & \frac{3\sqrt{30}i}{140} & 0 & 0 & \frac{2\sqrt{15}i}{105} & 0 & 0 & 0 & -\frac{4\sqrt{5}i}{105} & 0 \\
0 & 0 & \frac{9\sqrt{6}i}{140} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{4\sqrt{2}i}{105} & 0 & 0 & 0 & -\frac{\sqrt{70}i}{105} \\
0 & 0 & 0 & \frac{3\sqrt{30}i}{140} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}i}{105} & 0 & 0 & 0
\end{pmatrix}$$

676 symmetry $\sqrt{3}xy$

Table 9

No.	multipole	matrix
	$\mathbb{G}_2^{(1,1;a)}(A_2)$	$$\begin{pmatrix} 0 & 0 & 0 & \frac{2\sqrt{6}}{35} & 0 & 0 & \frac{3\sqrt{70}}{280} & 0 & 0 & 0 & -\frac{3\sqrt{2}}{280} & 0 & 0 & 0 \\ \frac{4\sqrt{5}}{35} & 0 & 0 & 0 & \frac{8}{35} & 0 & 0 & \frac{3\sqrt{30}}{280} & 0 & 0 & 0 & -\frac{3\sqrt{10}}{280} & 0 & 0 \\ 0 & \frac{8}{35} & 0 & 0 & 0 & \frac{4\sqrt{5}}{35} & 0 & 0 & \frac{3\sqrt{10}}{280} & 0 & 0 & 0 & -\frac{3\sqrt{30}}{280} & 0 \\ 0 & 0 & \frac{2\sqrt{6}}{35} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{2}}{280} & 0 & 0 & 0 & -\frac{3\sqrt{70}}{280} \\ 0 & 0 & \frac{3\sqrt{30}}{140} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}}{105} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{9\sqrt{6}}{140} & 0 & 0 & -\frac{\sqrt{70}}{105} & 0 & 0 & 0 & -\frac{4\sqrt{2}}{105} & 0 & 0 & 0 \\ -\frac{3\sqrt{30}}{140} & 0 & 0 & 0 & \frac{9\sqrt{6}}{140} & 0 & 0 & -\frac{4\sqrt{5}}{105} & 0 & 0 & 0 & -\frac{2\sqrt{15}}{105} & 0 & 0 \\ 0 & -\frac{9\sqrt{6}}{140} & 0 & 0 & 0 & \frac{3\sqrt{30}}{140} & 0 & 0 & -\frac{2\sqrt{15}}{105} & 0 & 0 & 0 & -\frac{4\sqrt{5}}{105} & 0 \\ 0 & 0 & -\frac{9\sqrt{6}}{140} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{4\sqrt{2}}{105} & 0 & 0 & 0 & -\frac{\sqrt{70}}{105} \\ 0 & 0 & 0 & -\frac{3\sqrt{30}}{140} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}}{105} & 0 & 0 & 0 & 0 \end{pmatrix}$$
677	symmetry	$-\frac{x^2}{2}-\frac{y^2}{2}+z^2$
	$\mathbb{G}_2^{(1,1;a)}(B_1)$	$$\begin{pmatrix} 0 & \frac{12i}{35} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{10}i}{140} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & \frac{2\sqrt{6}i}{35} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{9\sqrt{2}i}{140} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{2\sqrt{6}i}{35} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{9\sqrt{2}i}{140} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{12i}{35} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{10}i}{140} & 0 & 0 \\ \frac{3i}{14} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{21} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{3i}{70} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}i}{35} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{6i}{35} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{2\sqrt{3}i}{105} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{6i}{35} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{2\sqrt{3}i}{105} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{3i}{70} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}i}{35} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{3i}{14} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}i}{21} & 0 \end{pmatrix}$$
678	symmetry	$\sqrt{3}yz$

Table 9

No.	multipole	matrix

$\mathbb{G}_{2,1}^{(1,1;a)}(E)$

$$\begin{bmatrix}
\frac{2\sqrt{15}}{35} & 0 & \frac{3\sqrt{6}}{35} & 0 & 0 & 0 & 0 & -\frac{3\sqrt{10}}{140} & 0 & -\frac{3\sqrt{2}}{140} & 0 & 0 & 0 \\
0 & -\frac{2}{35} & 0 & \frac{\sqrt{2}}{7} & 0 & 0 & 0 & 0 & -\frac{3\sqrt{10}}{140} & 0 & -\frac{3\sqrt{6}}{140} & 0 & 0 \\
0 & 0 & -\frac{\sqrt{2}}{7} & 0 & \frac{2}{35} & 0 & 0 & 0 & 0 & -\frac{3\sqrt{6}}{140} & 0 & -\frac{3\sqrt{10}}{140} & 0 \\
0 & 0 & 0 & -\frac{3\sqrt{6}}{35} & 0 & -\frac{2\sqrt{15}}{35} & 0 & 0 & 0 & 0 & -\frac{3\sqrt{2}}{140} & 0 & -\frac{3\sqrt{10}}{140} \\
0 & \frac{3\sqrt{15}}{70} & 0 & 0 & 0 & 0 & -\frac{\sqrt{14}}{42} & 0 & -\frac{\sqrt{6}}{42} & 0 & 0 & 0 & 0 \\
-\frac{3\sqrt{15}}{70} & 0 & \frac{3\sqrt{6}}{70} & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}}{210} & 0 & -\frac{11\sqrt{2}}{210} & 0 & 0 & 0 \\
0 & -\frac{3\sqrt{6}}{70} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{105} & 0 & -\frac{1}{15} & 0 & 0 \\
0 & 0 & 0 & 0 & -\frac{3\sqrt{6}}{70} & 0 & 0 & 0 & 0 & \frac{1}{15} & 0 & -\frac{\sqrt{15}}{105} & 0 \\
0 & 0 & 0 & \frac{3\sqrt{6}}{70} & 0 & -\frac{3\sqrt{15}}{70} & 0 & 0 & 0 & 0 & \frac{11\sqrt{2}}{210} & 0 & \frac{\sqrt{10}}{210} \\
0 & 0 & 0 & 0 & \frac{3\sqrt{15}}{70} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{42} & 0 & \frac{\sqrt{14}}{42}
\end{bmatrix}$$

679	symmetry	$-\sqrt{3}xz$

$\mathbb{G}_{2,2}^{(1,1;a)}(E)$

$$\begin{bmatrix}
\frac{2\sqrt{15}i}{35} & 0 & -\frac{3\sqrt{6}i}{35} & 0 & 0 & 0 & 0 & -\frac{3\sqrt{10}i}{140} & 0 & \frac{3\sqrt{2}i}{140} & 0 & 0 & 0 \\
0 & -\frac{2i}{35} & 0 & -\frac{\sqrt{2}i}{7} & 0 & 0 & 0 & 0 & -\frac{3\sqrt{10}i}{140} & 0 & \frac{3\sqrt{6}i}{140} & 0 & 0 \\
0 & 0 & -\frac{\sqrt{2}i}{7} & 0 & -\frac{2i}{35} & 0 & 0 & 0 & 0 & -\frac{3\sqrt{6}i}{140} & 0 & \frac{3\sqrt{10}i}{140} & 0 \\
0 & 0 & 0 & -\frac{3\sqrt{6}i}{35} & 0 & \frac{2\sqrt{15}i}{35} & 0 & 0 & 0 & 0 & -\frac{3\sqrt{2}i}{140} & 0 & \frac{3\sqrt{10}i}{140} \\
0 & -\frac{3\sqrt{15}i}{70} & 0 & 0 & 0 & 0 & -\frac{\sqrt{14}i}{42} & 0 & \frac{\sqrt{6}i}{42} & 0 & 0 & 0 & 0 \\
-\frac{3\sqrt{15}i}{70} & 0 & -\frac{3\sqrt{6}i}{70} & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}i}{210} & 0 & \frac{11\sqrt{2}i}{210} & 0 & 0 & 0 \\
0 & -\frac{3\sqrt{6}i}{70} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{105} & 0 & \frac{i}{15} & 0 & 0 \\
0 & 0 & 0 & 0 & \frac{3\sqrt{6}i}{70} & 0 & 0 & 0 & 0 & \frac{i}{15} & 0 & \frac{\sqrt{15}i}{105} & 0 \\
0 & 0 & 0 & \frac{3\sqrt{6}i}{70} & 0 & \frac{3\sqrt{15}i}{70} & 0 & 0 & 0 & 0 & \frac{11\sqrt{2}i}{210} & 0 & -\frac{\sqrt{10}i}{210} \\
0 & 0 & 0 & 0 & \frac{3\sqrt{15}i}{70} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}i}{42} & 0 & -\frac{\sqrt{14}i}{42}
\end{bmatrix}$$

680	symmetry	$\frac{\sqrt{5}(x-y)(x+y)\left(x^2+y^2-6z^2\right)}{4}$

continued …

Table 9

No.	multipole	matrix

$\mathbb{G}_4^{(1,1;a)}(A_1)$

$$
\begin{bmatrix}
0 & 0 & 0 & \frac{\sqrt{33}i}{21} & 0 & 0 & -\frac{\sqrt{385}i}{700} & 0 & 0 & 0 & -\frac{3\sqrt{11}i}{140} & 0 & 0 & 0 \\
-\frac{\sqrt{110}i}{70} & 0 & 0 & 0 & -\frac{\sqrt{22}i}{14} & 0 & 0 & \frac{11\sqrt{165}i}{2100} & 0 & 0 & 0 & -\frac{\sqrt{55}i}{700} & 0 & 0 \\
0 & \frac{\sqrt{22}i}{14} & 0 & 0 & 0 & \frac{\sqrt{110}i}{70} & 0 & 0 & -\frac{\sqrt{55}i}{700} & 0 & 0 & 0 & \frac{11\sqrt{165}i}{2100} & 0 \\
0 & 0 & -\frac{\sqrt{33}i}{21} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{11}i}{140} & 0 & 0 & 0 & -\frac{\sqrt{385}i}{700} \\
0 & 0 & \frac{\sqrt{165}i}{140} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{2\sqrt{55}i}{385} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & -\frac{\sqrt{33}i}{84} & 0 & 0 & \frac{3\sqrt{385}i}{1925} & 0 & 0 & 0 & -\frac{\sqrt{11}i}{385} & 0 & 0 & 0 \\
\frac{\sqrt{165}i}{140} & 0 & 0 & 0 & -\frac{\sqrt{33}i}{84} & 0 & 0 & -\frac{9\sqrt{110}i}{3850} & 0 & 0 & 0 & \frac{17\sqrt{330}i}{11550} & 0 & 0 \\
0 & -\frac{\sqrt{33}i}{84} & 0 & 0 & 0 & \frac{\sqrt{165}i}{140} & 0 & 0 & -\frac{17\sqrt{330}i}{11550} & 0 & 0 & 0 & \frac{9\sqrt{110}i}{3850} & 0 \\
0 & 0 & -\frac{\sqrt{33}i}{84} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{11}i}{385} & 0 & 0 & 0 & -\frac{3\sqrt{385}i}{1925} \\
0 & 0 & 0 & \frac{\sqrt{165}i}{140} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{2\sqrt{55}i}{385} & 0 & 0 & 0
\end{bmatrix}
$$

681	symmetry	$-\frac{\sqrt{5}xy(x^2+y^2-6z^2)}{2}$

$\mathbb{G}_4^{(1,1;a)}(A_2)$

$$
\begin{bmatrix}
0 & 0 & 0 & -\frac{\sqrt{33}}{21} & 0 & 0 & -\frac{\sqrt{385}}{700} & 0 & 0 & 0 & \frac{3\sqrt{11}}{140} & 0 & 0 & 0 \\
-\frac{\sqrt{110}}{70} & 0 & 0 & 0 & \frac{\sqrt{22}}{14} & 0 & 0 & \frac{11\sqrt{165}}{2100} & 0 & 0 & 0 & \frac{\sqrt{55}}{700} & 0 & 0 \\
0 & \frac{\sqrt{22}}{14} & 0 & 0 & 0 & -\frac{\sqrt{110}}{70} & 0 & 0 & -\frac{\sqrt{55}}{700} & 0 & 0 & 0 & -\frac{11\sqrt{165}}{2100} & 0 \\
0 & 0 & -\frac{\sqrt{33}}{21} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{11}}{140} & 0 & 0 & 0 & \frac{\sqrt{385}}{700} \\
0 & 0 & -\frac{\sqrt{165}}{140} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{2\sqrt{55}}{385} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & \frac{\sqrt{33}}{84} & 0 & 0 & \frac{3\sqrt{385}}{1925} & 0 & 0 & 0 & \frac{\sqrt{11}}{385} & 0 & 0 & 0 \\
\frac{\sqrt{165}}{140} & 0 & 0 & 0 & \frac{\sqrt{33}}{84} & 0 & 0 & -\frac{9\sqrt{110}}{3850} & 0 & 0 & 0 & -\frac{17\sqrt{330}}{11550} & 0 & 0 \\
0 & -\frac{\sqrt{33}}{84} & 0 & 0 & 0 & -\frac{\sqrt{165}}{140} & 0 & 0 & -\frac{17\sqrt{330}}{11550} & 0 & 0 & 0 & -\frac{9\sqrt{110}}{3850} & 0 \\
0 & 0 & -\frac{\sqrt{33}}{84} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{11}}{385} & 0 & 0 & 0 & \frac{3\sqrt{385}}{1925} \\
0 & 0 & 0 & \frac{\sqrt{165}}{140} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{2\sqrt{55}}{385} & 0 & 0 & 0
\end{bmatrix}
$$

682	symmetry	$\frac{\sqrt{21}(x^4-3x^2y^2-3x^2z^2+y^4-3y^2z^2+z^4)}{6}$

continued ...

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Table 9

No.	multipole	matrix
	$\mathbb{G}_4^{(1,1;a)}(B_1,1)$	$\begin{bmatrix} 0 & -\frac{\sqrt{770}i}{210} & 0 & 0 & 0 & -\frac{\sqrt{154}i}{42} & 0 & 0 & \frac{\sqrt{77}i}{140} & 0 & 0 & 0 & \frac{\sqrt{231}i}{420} & 0 \\ 0 & 0 & \frac{\sqrt{1155}i}{105} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{385}i}{420} & 0 & 0 & 0 & \frac{\sqrt{11}i}{60} \\ 0 & 0 & 0 & -\frac{\sqrt{1155}i}{105} & 0 & 0 & \frac{\sqrt{11}i}{60} & 0 & 0 & 0 & -\frac{\sqrt{385}i}{420} & 0 & 0 & 0 \\ \frac{\sqrt{154}i}{42} & 0 & 0 & 0 & \frac{\sqrt{770}i}{210} & 0 & 0 & \frac{\sqrt{231}i}{420} & 0 & 0 & 0 & \frac{\sqrt{77}i}{140} & 0 & 0 \\ -\frac{\sqrt{770}i}{840} & 0 & 0 & 0 & -\frac{\sqrt{154}i}{168} & 0 & 0 & \frac{\sqrt{1155}i}{1155} & 0 & 0 & 0 & \frac{\sqrt{385}i}{1155} & 0 & 0 \\ 0 & \frac{\sqrt{770}i}{280} & 0 & 0 & 0 & -\frac{\sqrt{154}i}{168} & 0 & 0 & -\frac{4\sqrt{77}i}{1155} & 0 & 0 & 0 & \frac{2\sqrt{231}i}{1155} & 0 \\ 0 & 0 & -\frac{\sqrt{770}i}{420} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2310}i}{2310} & 0 & 0 & 0 & \frac{\sqrt{66}i}{330} \\ 0 & 0 & 0 & -\frac{\sqrt{770}i}{420} & 0 & 0 & -\frac{\sqrt{66}i}{330} & 0 & 0 & 0 & \frac{\sqrt{2310}i}{2310} & 0 & 0 & 0 \\ -\frac{\sqrt{154}i}{168} & 0 & 0 & 0 & \frac{\sqrt{770}i}{280} & 0 & 0 & -\frac{2\sqrt{231}i}{1155} & 0 & 0 & 0 & \frac{4\sqrt{77}i}{1155} & 0 & 0 \\ 0 & -\frac{\sqrt{154}i}{168} & 0 & 0 & 0 & -\frac{\sqrt{770}i}{840} & 0 & 0 & -\frac{\sqrt{385}i}{1155} & 0 & 0 & 0 & -\frac{\sqrt{1155}i}{1155} & 0 \end{bmatrix}$
683	symmetry	$-\frac{\sqrt{15}\left(x^4-12x^2y^2+6x^2z^2+y^4+6y^2z^2-2z^4\right)}{12}$
	$\mathbb{G}_4^{(1,1;a)}(B_1,2)$	$\begin{bmatrix} 0 & -\frac{\sqrt{22}i}{42} & 0 & 0 & 0 & \frac{\sqrt{110}i}{30} & 0 & 0 & \frac{\sqrt{55}i}{140} & 0 & 0 & 0 & -\frac{\sqrt{165}i}{300} & 0 \\ 0 & 0 & \frac{\sqrt{33}i}{21} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{11}i}{84} & 0 & 0 & 0 & -\frac{\sqrt{385}i}{300} \\ 0 & 0 & 0 & -\frac{\sqrt{33}i}{21} & 0 & 0 & -\frac{\sqrt{385}i}{300} & 0 & 0 & 0 & -\frac{\sqrt{11}i}{84} & 0 & 0 & 0 \\ -\frac{\sqrt{110}i}{30} & 0 & 0 & 0 & \frac{\sqrt{22}i}{42} & 0 & 0 & -\frac{\sqrt{165}i}{300} & 0 & 0 & 0 & \frac{\sqrt{55}i}{140} & 0 & 0 \\ -\frac{\sqrt{22}i}{168} & 0 & 0 & 0 & \frac{\sqrt{110}i}{120} & 0 & 0 & \frac{\sqrt{33}i}{231} & 0 & 0 & 0 & -\frac{\sqrt{11}i}{165} & 0 & 0 \\ 0 & \frac{\sqrt{22}i}{56} & 0 & 0 & 0 & \frac{\sqrt{110}i}{120} & 0 & 0 & -\frac{4\sqrt{55}i}{1155} & 0 & 0 & 0 & -\frac{2\sqrt{165}i}{825} & 0 \\ 0 & 0 & -\frac{\sqrt{22}i}{84} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{66}i}{462} & 0 & 0 & 0 & -\frac{\sqrt{2310}i}{1650} \\ 0 & 0 & 0 & -\frac{\sqrt{22}i}{84} & 0 & 0 & \frac{\sqrt{2310}i}{1650} & 0 & 0 & 0 & \frac{\sqrt{66}i}{462} & 0 & 0 & 0 \\ \frac{\sqrt{110}i}{120} & 0 & 0 & 0 & \frac{\sqrt{22}i}{56} & 0 & 0 & \frac{2\sqrt{165}i}{825} & 0 & 0 & 0 & \frac{4\sqrt{55}i}{1155} & 0 & 0 \\ 0 & \frac{\sqrt{110}i}{120} & 0 & 0 & 0 & -\frac{\sqrt{22}i}{168} & 0 & 0 & \frac{\sqrt{11}i}{165} & 0 & 0 & 0 & -\frac{\sqrt{33}i}{231} & 0 \end{bmatrix}$
684	symmetry	$\frac{\sqrt{35}xy(x-y)(x+y)}{2}$

Table 9

No.	multipole	matrix

$\mathbb{G}_4^{(1,1;a)}(B_2)$

$$\begin{bmatrix}
0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2310}}{105} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{385}}{350} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{165}}{150} \\
0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{165}}{150} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
-\frac{\sqrt{2310}}{105} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{385}}{350} & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & -\frac{\sqrt{2310}}{420} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{2\sqrt{231}}{1155} & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2310}}{420} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{4\sqrt{385}}{1925} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{110}}{275} \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{110}}{275} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
\frac{\sqrt{2310}}{420} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{4\sqrt{385}}{1925} & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & \frac{\sqrt{2310}}{420} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{2\sqrt{231}}{1155} & 0 & 0 & 0 & 0 & 0
\end{bmatrix}$$

685	symmetry	$\dfrac{\sqrt{35}yz(y-z)(y+z)}{2}$

$\mathbb{G}_{4,1}^{(1,1;a)}(E,1)$

$$\begin{bmatrix}
\frac{\sqrt{2310}}{840} & 0 & \frac{\sqrt{231}}{84} & 0 & \frac{\sqrt{462}}{168} & 0 & 0 & -\frac{3\sqrt{385}}{1400} & 0 & -\frac{\sqrt{77}}{140} & 0 & -\frac{\sqrt{1155}}{1400} & 0 & 0 \\
0 & -\frac{\sqrt{154}}{56} & 0 & -\frac{\sqrt{77}}{28} & 0 & -\frac{\sqrt{770}}{280} & \frac{\sqrt{165}}{600} & 0 & \frac{\sqrt{385}}{350} & 0 & \frac{\sqrt{231}}{840} & 0 & -\frac{\sqrt{1155}}{2100} & 0 \\
\frac{\sqrt{770}}{280} & 0 & \frac{\sqrt{77}}{28} & 0 & \frac{\sqrt{154}}{56} & 0 & 0 & -\frac{\sqrt{1155}}{2100} & 0 & \frac{\sqrt{231}}{840} & 0 & \frac{\sqrt{385}}{350} & 0 & \frac{\sqrt{165}}{600} \\
0 & -\frac{\sqrt{462}}{168} & 0 & -\frac{\sqrt{231}}{84} & 0 & -\frac{\sqrt{2310}}{840} & 0 & 0 & -\frac{\sqrt{1155}}{1400} & 0 & -\frac{\sqrt{77}}{140} & 0 & -\frac{3\sqrt{385}}{1400} & 0 \\
0 & \frac{\sqrt{2310}}{840} & 0 & \frac{\sqrt{1155}}{840} & 0 & 0 & -\frac{\sqrt{11}}{220} & 0 & -\frac{\sqrt{231}}{462} & 0 & -\frac{\sqrt{385}}{1540} & 0 & 0 & 0 \\
-\frac{\sqrt{2310}}{840} & 0 & -\frac{\sqrt{231}}{168} & 0 & 0 & 0 & 0 & \frac{13\sqrt{385}}{7700} & 0 & \frac{\sqrt{77}}{770} & 0 & -\frac{\sqrt{1155}}{3300} & 0 & 0 \\
0 & \frac{\sqrt{231}}{168} & 0 & 0 & 0 & -\frac{\sqrt{1155}}{840} & -\frac{3\sqrt{110}}{2200} & 0 & -\frac{\sqrt{2310}}{46200} & 0 & \frac{\sqrt{154}}{440} & 0 & \frac{\sqrt{770}}{15400} & 0 \\
-\frac{\sqrt{1155}}{840} & 0 & 0 & 0 & \frac{\sqrt{231}}{168} & 0 & 0 & -\frac{\sqrt{770}}{15400} & 0 & -\frac{\sqrt{154}}{440} & 0 & \frac{\sqrt{2310}}{46200} & 0 & \frac{3\sqrt{110}}{2200} \\
0 & 0 & 0 & -\frac{\sqrt{231}}{168} & 0 & -\frac{\sqrt{2310}}{840} & 0 & 0 & \frac{\sqrt{1155}}{3300} & 0 & -\frac{\sqrt{77}}{770} & 0 & -\frac{13\sqrt{385}}{7700} & 0 \\
0 & 0 & \frac{\sqrt{1155}}{840} & 0 & \frac{\sqrt{2310}}{840} & 0 & 0 & 0 & 0 & \frac{\sqrt{385}}{1540} & 0 & \frac{\sqrt{231}}{462} & 0 & \frac{\sqrt{11}}{220}
\end{bmatrix}$$

686	symmetry	$-\dfrac{\sqrt{35}xz(x-z)(x+z)}{2}$

Table 9

No.	multipole	matrix

$\mathbb{G}_{4,2}^{(1,1;a)}(E,1)$

$\frac{\sqrt{2310}i}{840}$	0	$-\frac{\sqrt{231}i}{84}$	0	$\frac{\sqrt{462}i}{168}$	0	0	$-\frac{3\sqrt{385}i}{1400}$	0	$\frac{\sqrt{77}i}{140}$	0	$-\frac{\sqrt{1155}i}{1400}$	0	0
0	$-\frac{\sqrt{154}i}{56}$	0	$\frac{\sqrt{77}i}{28}$	0	$-\frac{\sqrt{770}i}{280}$	$-\frac{\sqrt{165}i}{600}$	0	$\frac{\sqrt{385}i}{350}$	0	$-\frac{\sqrt{231}i}{840}$	0	$-\frac{\sqrt{1155}i}{2100}$	0
$-\frac{\sqrt{770}i}{280}$	0	$\frac{\sqrt{77}i}{28}$	0	$-\frac{\sqrt{154}i}{56}$	0	0	$\frac{\sqrt{1155}i}{2100}$	0	$\frac{\sqrt{231}i}{840}$	0	$-\frac{\sqrt{385}i}{350}$	0	$\frac{\sqrt{165}i}{600}$
0	$\frac{\sqrt{462}i}{168}$	0	$-\frac{\sqrt{231}i}{84}$	0	$\frac{\sqrt{2310}i}{840}$	0	0	$\frac{\sqrt{1155}i}{1400}$	0	$-\frac{\sqrt{77}i}{140}$	0	$\frac{3\sqrt{385}i}{1400}$	0
0	$-\frac{\sqrt{2310}i}{840}$	0	$\frac{\sqrt{1155}i}{840}$	0	0	$-\frac{\sqrt{11}i}{220}$	0	$\frac{\sqrt{231}i}{462}$	0	$-\frac{\sqrt{385}i}{1540}$	0	0	0
$-\frac{\sqrt{2310}i}{840}$	0	$\frac{\sqrt{231}i}{168}$	0	0	0	0	$\frac{13\sqrt{385}i}{7700}$	0	$-\frac{\sqrt{77}i}{770}$	0	$-\frac{\sqrt{1155}i}{3300}$	0	0
0	$\frac{\sqrt{231}i}{168}$	0	0	0	$-\frac{\sqrt{1155}i}{840}$	$\frac{3\sqrt{110}i}{2200}$	0	$-\frac{\sqrt{2310}i}{46200}$	0	$-\frac{\sqrt{154}i}{440}$	0	$\frac{\sqrt{770}i}{15400}$	0
$\frac{\sqrt{1155}i}{840}$	0	0	0	$-\frac{\sqrt{231}i}{168}$	0	0	$\frac{\sqrt{770}i}{15400}$	0	$-\frac{\sqrt{154}i}{440}$	0	$-\frac{\sqrt{2310}i}{46200}$	0	$\frac{3\sqrt{110}i}{2200}$
0	0	0	$-\frac{\sqrt{231}i}{168}$	0	$\frac{\sqrt{2310}i}{840}$	0	0	$-\frac{\sqrt{1155}i}{3300}$	0	$-\frac{\sqrt{77}i}{770}$	0	$\frac{13\sqrt{385}i}{7700}$	0
0	0	$-\frac{\sqrt{1155}i}{840}$	0	$\frac{\sqrt{2310}i}{840}$	0	0	0	0	$-\frac{\sqrt{385}i}{1540}$	0	$\frac{\sqrt{231}i}{462}$	0	$-\frac{\sqrt{11}i}{220}$

687	symmetry	$\dfrac{\sqrt{5}yz\left(6x^2-y^2-z^2\right)}{2}$

$\mathbb{G}_{4,1}^{(1,1;a)}(E,2)$

$\frac{\sqrt{330}}{840}$	0	$\frac{\sqrt{33}}{84}$	0	$-\frac{\sqrt{66}}{24}$	0	0	$-\frac{3\sqrt{55}}{1400}$	0	$-\frac{\sqrt{11}}{140}$	0	$\frac{\sqrt{165}}{200}$	0	0
0	$-\frac{\sqrt{22}}{56}$	0	$-\frac{\sqrt{11}}{28}$	0	$\frac{\sqrt{110}}{40}$	$-\frac{\sqrt{1155}}{600}$	0	$\frac{\sqrt{55}}{350}$	0	$\frac{\sqrt{33}}{840}$	0	$\frac{\sqrt{165}}{300}$	0
$-\frac{\sqrt{110}}{40}$	0	$\frac{\sqrt{11}}{28}$	0	$\frac{\sqrt{22}}{56}$	0	0	$\frac{\sqrt{165}}{300}$	0	$\frac{\sqrt{33}}{840}$	0	$\frac{\sqrt{55}}{350}$	0	$-\frac{\sqrt{1155}}{600}$
0	$\frac{\sqrt{66}}{24}$	0	$-\frac{\sqrt{33}}{84}$	0	$-\frac{\sqrt{330}}{840}$	0	0	$\frac{\sqrt{165}}{200}$	0	$-\frac{\sqrt{11}}{140}$	0	$-\frac{3\sqrt{55}}{1400}$	0
0	$\frac{\sqrt{330}}{840}$	0	$-\frac{\sqrt{165}}{120}$	0	0	$-\frac{\sqrt{77}}{1540}$	0	$-\frac{\sqrt{33}}{462}$	0	$\frac{\sqrt{55}}{220}$	0	0	0
$-\frac{\sqrt{330}}{840}$	0	$-\frac{\sqrt{33}}{168}$	0	0	0	0	$\frac{13\sqrt{55}}{7700}$	0	$\frac{\sqrt{11}}{770}$	0	$\frac{7\sqrt{165}}{3300}$	0	0
0	$\frac{\sqrt{33}}{168}$	0	0	0	$\frac{\sqrt{165}}{120}$	$\frac{3\sqrt{770}}{2200}$	0	$-\frac{\sqrt{330}}{46200}$	0	$\frac{\sqrt{22}}{440}$	0	$-\frac{\sqrt{110}}{2200}$	0
$\frac{\sqrt{165}}{120}$	0	0	0	$\frac{\sqrt{33}}{168}$	0	0	$\frac{\sqrt{110}}{2200}$	0	$-\frac{\sqrt{22}}{440}$	0	$\frac{\sqrt{330}}{46200}$	0	$-\frac{3\sqrt{770}}{2200}$
0	0	0	$-\frac{\sqrt{33}}{168}$	0	$-\frac{\sqrt{330}}{840}$	0	0	$-\frac{7\sqrt{165}}{3300}$	0	$-\frac{\sqrt{11}}{770}$	0	$-\frac{13\sqrt{55}}{7700}$	0
0	0	$-\frac{\sqrt{165}}{120}$	0	$\frac{\sqrt{330}}{840}$	0	0	0	0	$-\frac{\sqrt{55}}{220}$	0	$\frac{\sqrt{33}}{462}$	0	$\frac{\sqrt{77}}{1540}$

688	symmetry	$\dfrac{\sqrt{5}xz\left(x^2-6y^2+z^2\right)}{2}$

No.	multipole	matrix

$\mathbb{G}_{4,2}^{(1,1;a)}(E,2)$

$$
\begin{bmatrix}
\frac{\sqrt{330}i}{840} & 0 & -\frac{\sqrt{33}i}{84} & 0 & -\frac{\sqrt{66}i}{24} & 0 & 0 & -\frac{3\sqrt{55}i}{1400} & 0 & \frac{\sqrt{11}i}{140} & 0 & \frac{\sqrt{165}i}{200} & 0 & 0 \\[4pt]
0 & -\frac{\sqrt{22}i}{56} & 0 & \frac{\sqrt{11}i}{28} & 0 & \frac{\sqrt{110}i}{40} & \frac{\sqrt{1155}i}{600} & 0 & \frac{\sqrt{55}i}{350} & 0 & -\frac{\sqrt{33}i}{840} & 0 & \frac{\sqrt{165}i}{300} & 0 \\[4pt]
\frac{\sqrt{110}i}{40} & 0 & \frac{\sqrt{11}i}{28} & 0 & -\frac{\sqrt{22}i}{56} & 0 & 0 & -\frac{\sqrt{165}i}{300} & 0 & \frac{\sqrt{33}i}{840} & 0 & -\frac{\sqrt{55}i}{350} & 0 & -\frac{\sqrt{1155}i}{600} \\[4pt]
0 & -\frac{\sqrt{66}i}{24} & 0 & -\frac{\sqrt{33}i}{84} & 0 & \frac{\sqrt{330}i}{840} & 0 & 0 & -\frac{\sqrt{165}i}{200} & 0 & -\frac{\sqrt{11}i}{140} & 0 & \frac{3\sqrt{55}i}{1400} & 0 \\[4pt]
0 & -\frac{\sqrt{330}i}{840} & 0 & -\frac{\sqrt{165}i}{120} & 0 & 0 & -\frac{\sqrt{77}i}{1540} & 0 & \frac{\sqrt{33}i}{462} & 0 & \frac{\sqrt{55}i}{220} & 0 & 0 & 0 \\[4pt]
-\frac{\sqrt{330}i}{840} & 0 & \frac{\sqrt{33}i}{168} & 0 & 0 & 0 & 0 & \frac{13\sqrt{55}i}{7700} & 0 & -\frac{\sqrt{11}i}{770} & 0 & \frac{7\sqrt{165}i}{3300} & 0 & 0 \\[4pt]
0 & \frac{\sqrt{33}i}{168} & 0 & 0 & 0 & \frac{\sqrt{165}i}{120} & -\frac{3\sqrt{770}i}{2200} & 0 & -\frac{\sqrt{330}i}{46200} & 0 & -\frac{\sqrt{22}i}{440} & 0 & -\frac{\sqrt{110}i}{2200} & 0 \\[4pt]
-\frac{\sqrt{165}i}{120} & 0 & 0 & 0 & -\frac{\sqrt{33}i}{168} & 0 & 0 & -\frac{\sqrt{110}i}{2200} & 0 & -\frac{\sqrt{22}i}{440} & 0 & -\frac{\sqrt{330}i}{46200} & 0 & -\frac{3\sqrt{770}i}{2200} \\[4pt]
0 & 0 & 0 & -\frac{\sqrt{33}i}{168} & 0 & \frac{\sqrt{330}i}{840} & 0 & 0 & \frac{7\sqrt{165}i}{3300} & 0 & -\frac{\sqrt{11}i}{770} & 0 & \frac{13\sqrt{55}i}{7700} & 0 \\[4pt]
0 & 0 & \frac{\sqrt{165}i}{120} & 0 & \frac{\sqrt{330}i}{840} & 0 & 0 & 0 & 0 & \frac{\sqrt{55}i}{220} & 0 & \frac{\sqrt{33}i}{462} & 0 & -\frac{\sqrt{77}i}{1540}
\end{bmatrix}
$$

689	symmetry	z

$\mathbb{T}_1^{(a)}(B_2)$

$$
\begin{bmatrix}
0 & \frac{i}{5} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\[4pt]
0 & 0 & \frac{\sqrt{6}i}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\[4pt]
0 & 0 & 0 & \frac{\sqrt{6}i}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\[4pt]
0 & 0 & 0 & 0 & \frac{i}{5} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\[4pt]
-\frac{i}{14} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}i}{14} & 0 & 0 & 0 & 0 & 0 \\[4pt]
0 & -\frac{3i}{70} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}i}{14} & 0 & 0 & 0 & 0 \\[4pt]
0 & 0 & -\frac{i}{70} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{7} & 0 & 0 & 0 \\[4pt]
0 & 0 & 0 & \frac{i}{70} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{7} & 0 & 0 \\[4pt]
0 & 0 & 0 & 0 & \frac{3i}{70} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}i}{14} & 0 \\[4pt]
0 & 0 & 0 & 0 & 0 & \frac{i}{14} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}i}{14}
\end{bmatrix}
$$

690	symmetry	x

Table 9

No.	multipole	matrix
	$\mathbb{T}^{(a)}_{1,1}(E)$	$\begin{bmatrix} -\frac{\sqrt{5}i}{10} & 0 & \frac{\sqrt{2}i}{20} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{3}i}{10} & 0 & \frac{\sqrt{6}i}{20} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{6}i}{20} & 0 & \frac{\sqrt{3}i}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{2}i}{20} & 0 & \frac{\sqrt{5}i}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{5}i}{70} & 0 & 0 & 0 & 0 & -\frac{\sqrt{42}i}{28} & 0 & \frac{\sqrt{2}i}{28} & 0 & 0 & 0 & 0 & 0 \\ -\frac{\sqrt{5}i}{70} & 0 & -\frac{\sqrt{2}i}{35} & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}i}{28} & 0 & \frac{\sqrt{6}i}{28} & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{2}i}{35} & 0 & -\frac{3i}{70} & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{14} & 0 & \frac{\sqrt{3}i}{14} & 0 & 0 & 0 \\ 0 & 0 & -\frac{3i}{70} & 0 & -\frac{\sqrt{2}i}{35} & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{14} & 0 & \frac{\sqrt{5}i}{14} & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{2}i}{35} & 0 & -\frac{\sqrt{5}i}{70} & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{28} & 0 & \frac{\sqrt{30}i}{28} & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{70} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}i}{28} & 0 & \frac{\sqrt{42}i}{28} \end{bmatrix}$
691	symmetry	y
	$\mathbb{T}^{(a)}_{1,2}(E)$	$\begin{bmatrix} \frac{\sqrt{5}}{10} & 0 & \frac{\sqrt{2}}{20} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{3}}{10} & 0 & \frac{\sqrt{6}}{20} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{6}}{20} & 0 & \frac{\sqrt{3}}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{2}}{20} & 0 & \frac{\sqrt{5}}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{5}}{70} & 0 & 0 & 0 & 0 & \frac{\sqrt{42}}{28} & 0 & \frac{\sqrt{2}}{28} & 0 & 0 & 0 & 0 & 0 \\ \frac{\sqrt{5}}{70} & 0 & -\frac{\sqrt{2}}{35} & 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{28} & 0 & \frac{\sqrt{6}}{28} & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{2}}{35} & 0 & -\frac{3}{70} & 0 & 0 & 0 & 0 & \frac{\sqrt{5}}{14} & 0 & \frac{\sqrt{3}}{14} & 0 & 0 & 0 \\ 0 & 0 & \frac{3}{70} & 0 & -\frac{\sqrt{2}}{35} & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{14} & 0 & \frac{\sqrt{5}}{14} & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{2}}{35} & 0 & -\frac{\sqrt{5}}{70} & 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{28} & 0 & \frac{\sqrt{30}}{28} & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{5}}{70} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2}}{28} & 0 & \frac{\sqrt{42}}{28} \end{bmatrix}$
692	symmetry	$\sqrt{15}xyz$

Table 9

No.	multipole	matrix

$$\mathbb{T}_3^{(a)}(A_1) = \begin{bmatrix}
0 & 0 & 0 & -\frac{3\sqrt{70}}{140} & 0 & 0 & \frac{\sqrt{6}}{24} & 0 & 0 & 0 & -\frac{\sqrt{210}}{168} & 0 & 0 & 0 \\
-\frac{\sqrt{21}}{28} & 0 & 0 & 0 & -\frac{\sqrt{105}}{140} & 0 & 0 & -\frac{\sqrt{14}}{56} & 0 & 0 & 0 & -\frac{\sqrt{42}}{56} & 0 & 0 \\
0 & \frac{\sqrt{105}}{140} & 0 & 0 & 0 & \frac{\sqrt{21}}{28} & 0 & 0 & -\frac{\sqrt{42}}{56} & 0 & 0 & 0 & -\frac{\sqrt{14}}{56} & 0 \\
0 & 0 & \frac{3\sqrt{70}}{140} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{210}}{168} & 0 & 0 & 0 & \frac{\sqrt{6}}{24} \\
0 & 0 & \frac{\sqrt{14}}{28} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{42}}{42} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & \frac{\sqrt{70}}{140} & 0 & 0 & -\frac{\sqrt{6}}{12} & 0 & 0 & 0 & -\frac{\sqrt{210}}{84} & 0 & 0 & 0 \\
-\frac{\sqrt{14}}{28} & 0 & 0 & 0 & -\frac{\sqrt{70}}{140} & 0 & 0 & -\frac{\sqrt{21}}{84} & 0 & 0 & 0 & -\frac{\sqrt{7}}{28} & 0 & 0 \\
0 & -\frac{\sqrt{70}}{140} & 0 & 0 & 0 & -\frac{\sqrt{14}}{28} & 0 & 0 & \frac{\sqrt{7}}{28} & 0 & 0 & 0 & \frac{\sqrt{21}}{84} & 0 \\
0 & 0 & \frac{\sqrt{70}}{140} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{210}}{84} & 0 & 0 & 0 & \frac{\sqrt{6}}{12} \\
0 & 0 & 0 & \frac{\sqrt{14}}{28} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{42}}{42} & 0 & 0 & 0
\end{bmatrix}$$

693	symmetry	$\frac{\sqrt{15}z(x-y)(x+y)}{2}$

$$\mathbb{T}_3^{(a)}(A_2) = \begin{bmatrix}
0 & 0 & 0 & -\frac{3\sqrt{70}i}{140} & 0 & 0 & -\frac{\sqrt{6}i}{24} & 0 & 0 & 0 & -\frac{\sqrt{210}i}{168} & 0 & 0 & 0 \\
\frac{\sqrt{21}i}{28} & 0 & 0 & 0 & -\frac{\sqrt{105}i}{140} & 0 & 0 & \frac{\sqrt{14}i}{56} & 0 & 0 & 0 & -\frac{\sqrt{42}i}{56} & 0 & 0 \\
0 & -\frac{\sqrt{105}i}{140} & 0 & 0 & 0 & \frac{\sqrt{21}i}{28} & 0 & 0 & \frac{\sqrt{42}i}{56} & 0 & 0 & 0 & -\frac{\sqrt{14}i}{56} & 0 \\
0 & 0 & -\frac{3\sqrt{70}i}{140} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{210}i}{168} & 0 & 0 & 0 & \frac{\sqrt{6}i}{24} \\
0 & 0 & \frac{\sqrt{14}i}{28} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{42}i}{42} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & \frac{\sqrt{70}i}{140} & 0 & 0 & \frac{\sqrt{6}i}{12} & 0 & 0 & 0 & -\frac{\sqrt{210}i}{84} & 0 & 0 & 0 \\
\frac{\sqrt{14}i}{28} & 0 & 0 & 0 & -\frac{\sqrt{70}i}{140} & 0 & 0 & \frac{\sqrt{21}i}{84} & 0 & 0 & 0 & -\frac{\sqrt{7}i}{28} & 0 & 0 \\
0 & \frac{\sqrt{70}i}{140} & 0 & 0 & 0 & -\frac{\sqrt{14}i}{28} & 0 & 0 & -\frac{\sqrt{7}i}{28} & 0 & 0 & 0 & \frac{\sqrt{21}i}{84} & 0 \\
0 & 0 & -\frac{\sqrt{70}i}{140} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{210}i}{84} & 0 & 0 & 0 & \frac{\sqrt{6}i}{12} \\
0 & 0 & 0 & -\frac{\sqrt{14}i}{28} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{42}i}{42} & 0 & 0 & 0
\end{bmatrix}$$

694	symmetry	$-\frac{z\left(3x^2+3y^2-2z^2\right)}{2}$

219

Table 9

No.	multipole	matrix

$$\mathbb{T}_3^{(a)}(B_2) = \begin{bmatrix}
0 & -\frac{3\sqrt{21}i}{70} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{210}i}{84} & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & \frac{3\sqrt{14}i}{70} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{42}i}{84} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & \frac{3\sqrt{14}i}{70} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{42}i}{84} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & -\frac{3\sqrt{21}i}{70} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{210}i}{84} & 0 & 0 \\
\frac{\sqrt{21}i}{42} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{14}i}{14} & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & -\frac{\sqrt{21}i}{30} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & -\frac{2\sqrt{21}i}{105} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}i}{14} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & \frac{2\sqrt{21}i}{105} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}i}{14} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & \frac{\sqrt{21}i}{30} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{21}i}{42} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{14}i}{14} & 0
\end{bmatrix}$$

| 695 | symmetry | $\dfrac{x\left(2x^2-3y^2-3z^2\right)}{2}$ |

$$\mathbb{T}_{3,1}^{(a)}(E,1) = \begin{bmatrix}
-\frac{3\sqrt{105}i}{560} & 0 & \frac{9\sqrt{42}i}{560} & 0 & -\frac{3\sqrt{21}i}{112} & 0 & 0 & -\frac{\sqrt{70}i}{112} & 0 & \frac{\sqrt{14}i}{56} & 0 & -\frac{\sqrt{210}i}{336} & 0 & 0 \\
0 & \frac{3\sqrt{7}i}{80} & 0 & -\frac{3\sqrt{14}i}{560} & 0 & -\frac{3\sqrt{35}i}{112} & -\frac{\sqrt{30}i}{48} & 0 & 0 & 0 & \frac{\sqrt{42}i}{112} & 0 & -\frac{\sqrt{210}i}{168} & 0 \\
\frac{3\sqrt{35}i}{112} & 0 & \frac{3\sqrt{14}i}{560} & 0 & -\frac{3\sqrt{7}i}{80} & 0 & 0 & -\frac{\sqrt{210}i}{168} & 0 & \frac{\sqrt{42}i}{112} & 0 & 0 & 0 & -\frac{\sqrt{30}i}{48} \\
0 & \frac{3\sqrt{21}i}{112} & 0 & -\frac{9\sqrt{42}i}{560} & 0 & \frac{3\sqrt{105}i}{560} & 0 & 0 & -\frac{\sqrt{210}i}{336} & 0 & \frac{\sqrt{14}i}{56} & 0 & -\frac{\sqrt{70}i}{112} & 0 \\
0 & -\frac{\sqrt{105}i}{140} & 0 & \frac{\sqrt{210}i}{168} & 0 & 0 & -\frac{\sqrt{2}i}{16} & 0 & \frac{\sqrt{42}i}{56} & 0 & -\frac{\sqrt{70}i}{112} & 0 & 0 & 0 \\
-\frac{\sqrt{105}i}{140} & 0 & \frac{\sqrt{42}i}{280} & 0 & \frac{\sqrt{21}i}{42} & 0 & 0 & \frac{\sqrt{70}i}{112} & 0 & \frac{\sqrt{14}i}{56} & 0 & -\frac{\sqrt{210}i}{112} & 0 & 0 \\
0 & \frac{\sqrt{42}i}{280} & 0 & \frac{\sqrt{21}i}{70} & 0 & \frac{\sqrt{210}i}{168} & \frac{\sqrt{5}i}{16} & 0 & \frac{\sqrt{105}i}{112} & 0 & -\frac{\sqrt{7}i}{112} & 0 & -\frac{3\sqrt{35}i}{112} & 0 \\
\frac{\sqrt{210}i}{168} & 0 & \frac{\sqrt{21}i}{70} & 0 & \frac{\sqrt{42}i}{280} & 0 & 0 & \frac{3\sqrt{35}i}{112} & 0 & \frac{\sqrt{7}i}{112} & 0 & -\frac{\sqrt{105}i}{112} & 0 & -\frac{\sqrt{5}i}{16} \\
0 & \frac{\sqrt{21}i}{42} & 0 & \frac{\sqrt{42}i}{280} & 0 & -\frac{\sqrt{105}i}{140} & 0 & 0 & \frac{\sqrt{210}i}{112} & 0 & -\frac{\sqrt{14}i}{56} & 0 & -\frac{\sqrt{70}i}{112} & 0 \\
0 & 0 & \frac{\sqrt{210}i}{168} & 0 & -\frac{\sqrt{105}i}{140} & 0 & 0 & 0 & 0 & \frac{\sqrt{70}i}{112} & 0 & -\frac{\sqrt{42}i}{56} & 0 & \frac{\sqrt{2}i}{16}
\end{bmatrix}$$

| 696 | symmetry | $-\dfrac{y\left(3x^2-2y^2+3z^2\right)}{2}$ |

Table 9

No.	multipole	matrix

$\mathbb{T}_{3,2}^{(a)}(E,1)$

$\frac{3\sqrt{105}}{560}$	0	$\frac{9\sqrt{42}}{560}$	0	$\frac{3\sqrt{21}}{112}$	0	0	$\frac{\sqrt{70}}{112}$	0	$\frac{\sqrt{14}}{56}$	0	$\frac{\sqrt{210}}{336}$	0	0
0	$-\frac{3\sqrt{7}}{80}$	0	$-\frac{3\sqrt{14}}{560}$	0	$\frac{3\sqrt{35}}{112}$	$-\frac{\sqrt{30}}{48}$	0	0	0	$\frac{\sqrt{42}}{112}$	0	$\frac{\sqrt{210}}{168}$	0
$\frac{3\sqrt{35}}{112}$	0	$-\frac{3\sqrt{14}}{560}$	0	$-\frac{3\sqrt{7}}{80}$	0	0	$-\frac{\sqrt{210}}{168}$	0	$-\frac{\sqrt{42}}{112}$	0	0	0	$\frac{\sqrt{30}}{48}$
0	$\frac{3\sqrt{21}}{112}$	0	$\frac{9\sqrt{42}}{560}$	0	$\frac{3\sqrt{105}}{560}$	0	0	$-\frac{\sqrt{210}}{336}$	0	$-\frac{\sqrt{14}}{56}$	0	$-\frac{\sqrt{70}}{112}$	0
0	$-\frac{\sqrt{105}}{140}$	0	$-\frac{\sqrt{210}}{168}$	0	0	$\frac{\sqrt{2}}{16}$	0	$\frac{\sqrt{42}}{56}$	0	$\frac{\sqrt{70}}{112}$	0	0	0
$\frac{\sqrt{105}}{140}$	0	$\frac{\sqrt{42}}{280}$	0	$-\frac{\sqrt{21}}{42}$	0	0	$-\frac{\sqrt{70}}{112}$	0	$\frac{\sqrt{14}}{56}$	0	$\frac{\sqrt{210}}{112}$	0	0
0	$-\frac{\sqrt{42}}{280}$	0	$\frac{\sqrt{21}}{70}$	0	$-\frac{\sqrt{210}}{168}$	$\frac{\sqrt{5}}{16}$	0	$-\frac{\sqrt{105}}{112}$	0	$-\frac{\sqrt{7}}{112}$	0	$\frac{3\sqrt{35}}{112}$	0
$\frac{\sqrt{210}}{168}$	0	$-\frac{\sqrt{21}}{70}$	0	$\frac{\sqrt{42}}{280}$	0	0	$\frac{3\sqrt{35}}{112}$	0	$-\frac{\sqrt{7}}{112}$	0	$-\frac{\sqrt{105}}{112}$	0	$\frac{\sqrt{5}}{16}$
0	$\frac{\sqrt{21}}{42}$	0	$-\frac{\sqrt{42}}{280}$	0	$-\frac{\sqrt{105}}{140}$	0	0	$\frac{\sqrt{210}}{112}$	0	$\frac{\sqrt{14}}{56}$	0	$-\frac{\sqrt{70}}{112}$	0
0	0	$\frac{\sqrt{210}}{168}$	0	$\frac{\sqrt{105}}{140}$	0	0	0	0	$\frac{\sqrt{70}}{112}$	0	$\frac{\sqrt{42}}{56}$	0	$\frac{\sqrt{2}}{16}$

697	symmetry	$\dfrac{\sqrt{15}x(y-z)(y+z)}{2}$

$\mathbb{T}_{3,1}^{(a)}(E,2)$

$-\frac{3\sqrt{7}i}{112}$	0	$\frac{9\sqrt{70}i}{560}$	0	$\frac{9\sqrt{35}i}{560}$	0	0	$-\frac{5\sqrt{42}i}{336}$	0	$\frac{\sqrt{210}i}{168}$	0	$\frac{\sqrt{14}i}{112}$	0	0
0	$\frac{\sqrt{105}i}{80}$	0	$-\frac{\sqrt{210}i}{560}$	0	$\frac{3\sqrt{21}i}{112}$	$\frac{\sqrt{2}i}{16}$	0	0	0	$\frac{\sqrt{70}i}{112}$	0	$\frac{\sqrt{14}i}{56}$	0
$-\frac{3\sqrt{21}i}{112}$	0	$\frac{\sqrt{210}i}{560}$	0	$-\frac{\sqrt{105}i}{80}$	0	0	$\frac{\sqrt{14}i}{56}$	0	$\frac{\sqrt{70}i}{112}$	0	0	0	$\frac{\sqrt{2}i}{16}$
0	$-\frac{9\sqrt{35}i}{560}$	0	$-\frac{9\sqrt{70}i}{560}$	0	$\frac{3\sqrt{7}i}{112}$	0	0	$\frac{\sqrt{14}i}{112}$	0	$\frac{\sqrt{210}i}{168}$	0	$-\frac{5\sqrt{42}i}{336}$	0
0	$-\frac{\sqrt{7}i}{28}$	0	$-\frac{\sqrt{14}i}{56}$	0	0	$-\frac{\sqrt{30}i}{48}$	0	$\frac{\sqrt{70}i}{56}$	0	$\frac{\sqrt{42}i}{112}$	0	0	0
$-\frac{\sqrt{7}i}{28}$	0	$\frac{\sqrt{70}i}{280}$	0	$-\frac{\sqrt{35}i}{70}$	0	0	$\frac{5\sqrt{42}i}{336}$	0	$\frac{\sqrt{210}i}{168}$	0	$\frac{3\sqrt{14}i}{112}$	0	0
0	$\frac{\sqrt{70}i}{280}$	0	$\frac{\sqrt{35}i}{70}$	0	$-\frac{\sqrt{14}i}{56}$	$-\frac{\sqrt{3}i}{16}$	0	$\frac{5\sqrt{7}i}{112}$	0	$-\frac{\sqrt{105}i}{336}$	0	$\frac{3\sqrt{21}i}{112}$	0
$-\frac{\sqrt{14}i}{56}$	0	$\frac{\sqrt{35}i}{70}$	0	$\frac{\sqrt{70}i}{280}$	0	0	$-\frac{3\sqrt{21}i}{112}$	0	$\frac{\sqrt{105}i}{336}$	0	$-\frac{5\sqrt{7}i}{112}$	0	$\frac{\sqrt{3}i}{16}$
0	$-\frac{\sqrt{35}i}{70}$	0	$\frac{\sqrt{70}i}{280}$	0	$-\frac{\sqrt{7}i}{28}$	0	0	$-\frac{3\sqrt{14}i}{112}$	0	$-\frac{\sqrt{210}i}{168}$	0	$-\frac{5\sqrt{42}i}{336}$	0
0	0	$-\frac{\sqrt{14}i}{56}$	0	$-\frac{\sqrt{7}i}{28}$	0	0	0	0	$-\frac{\sqrt{42}i}{112}$	0	$-\frac{\sqrt{70}i}{56}$	0	$\frac{\sqrt{30}i}{48}$

698	symmetry	$\dfrac{\sqrt{15}y(x-z)(x+z)}{2}$

continued …

Table 9

No.	multipole	matrix

$\mathbb{T}_{3,2}^{(a)}(E,2)$

$$\begin{pmatrix}
\frac{3\sqrt{7}}{112} & 0 & \frac{9\sqrt{70}}{560} & 0 & -\frac{9\sqrt{35}}{560} & 0 & 0 & \frac{5\sqrt{42}}{336} & 0 & \frac{\sqrt{210}}{168} & 0 & -\frac{\sqrt{14}}{112} & 0 & 0 \\
0 & -\frac{\sqrt{105}}{80} & 0 & -\frac{\sqrt{210}}{560} & 0 & -\frac{3\sqrt{21}}{112} & \frac{\sqrt{2}}{16} & 0 & 0 & 0 & \frac{\sqrt{70}}{112} & 0 & -\frac{\sqrt{14}}{56} & 0 \\
-\frac{3\sqrt{21}}{112} & 0 & -\frac{\sqrt{210}}{560} & 0 & -\frac{\sqrt{105}}{80} & 0 & 0 & \frac{\sqrt{14}}{56} & 0 & -\frac{\sqrt{70}}{112} & 0 & 0 & 0 & -\frac{\sqrt{2}}{16} \\
0 & -\frac{9\sqrt{35}}{560} & 0 & \frac{9\sqrt{70}}{560} & 0 & \frac{3\sqrt{7}}{112} & 0 & 0 & \frac{\sqrt{14}}{112} & 0 & -\frac{\sqrt{210}}{168} & 0 & -\frac{5\sqrt{42}}{336} & 0 \\
0 & -\frac{\sqrt{7}}{28} & 0 & \frac{\sqrt{14}}{56} & 0 & 0 & \frac{\sqrt{30}}{48} & 0 & \frac{\sqrt{70}}{56} & 0 & -\frac{\sqrt{42}}{112} & 0 & 0 & 0 \\
\frac{\sqrt{7}}{28} & 0 & \frac{\sqrt{70}}{280} & 0 & \frac{\sqrt{35}}{70} & 0 & 0 & -\frac{5\sqrt{42}}{336} & 0 & \frac{\sqrt{210}}{168} & 0 & -\frac{3\sqrt{14}}{112} & 0 & 0 \\
0 & -\frac{\sqrt{70}}{280} & 0 & \frac{\sqrt{35}}{70} & 0 & \frac{\sqrt{14}}{56} & -\frac{\sqrt{3}}{16} & 0 & -\frac{5\sqrt{7}}{112} & 0 & -\frac{\sqrt{105}}{336} & 0 & -\frac{3\sqrt{21}}{112} & 0 \\
-\frac{\sqrt{14}}{56} & 0 & -\frac{\sqrt{35}}{70} & 0 & \frac{\sqrt{70}}{280} & 0 & 0 & -\frac{3\sqrt{21}}{112} & 0 & -\frac{\sqrt{105}}{336} & 0 & -\frac{5\sqrt{7}}{112} & 0 & -\frac{\sqrt{3}}{16} \\
0 & -\frac{\sqrt{35}}{70} & 0 & -\frac{\sqrt{70}}{280} & 0 & -\frac{\sqrt{7}}{28} & 0 & 0 & -\frac{3\sqrt{14}}{112} & 0 & \frac{\sqrt{210}}{168} & 0 & -\frac{5\sqrt{42}}{336} & 0 \\
0 & 0 & -\frac{\sqrt{14}}{56} & 0 & \frac{\sqrt{7}}{28} & 0 & 0 & 0 & 0 & -\frac{\sqrt{42}}{112} & 0 & \frac{\sqrt{70}}{56} & 0 & \frac{\sqrt{30}}{48}
\end{pmatrix}$$

699	symmetry	$\dfrac{\sqrt{105}\,xyz\left(x^2+y^2-2z^2\right)}{2}$

$\mathbb{T}_5^{(a)}(A_1)$

$$\begin{pmatrix}
0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{60} & 0 & 0 & 0 & -\frac{\sqrt{105}}{60} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}}{20} & 0 & 0 & 0 & \frac{\sqrt{21}}{20} & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{21}}{20} & 0 & 0 & 0 & -\frac{\sqrt{7}}{20} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{105}}{60} & 0 & 0 & 0 & \frac{\sqrt{3}}{60} \\
0 & 0 & \frac{\sqrt{7}}{28} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{21}}{42} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & -\frac{\sqrt{35}}{28} & 0 & 0 & -\frac{\sqrt{3}}{30} & 0 & 0 & 0 & \frac{\sqrt{105}}{105} & 0 & 0 & 0 \\
-\frac{\sqrt{7}}{28} & 0 & 0 & 0 & \frac{\sqrt{35}}{28} & 0 & 0 & \frac{2\sqrt{42}}{105} & 0 & 0 & 0 & \frac{\sqrt{14}}{70} & 0 & 0 \\
0 & \frac{\sqrt{35}}{28} & 0 & 0 & 0 & -\frac{\sqrt{7}}{28} & 0 & 0 & -\frac{\sqrt{14}}{70} & 0 & 0 & 0 & -\frac{2\sqrt{42}}{105} & 0 \\
0 & 0 & -\frac{\sqrt{35}}{28} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{105}}{105} & 0 & 0 & 0 & \frac{\sqrt{3}}{30} \\
0 & 0 & 0 & \frac{\sqrt{7}}{28} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{21}}{42} & 0 & 0 & 0
\end{pmatrix}$$

700	symmetry	$-\dfrac{\sqrt{105}\,z(x-y)(x+y)\left(x^2+y^2-2z^2\right)}{4}$

continued …

Table 9

No.	multipole	matrix

$$\mathbb{T}_5^{(a)}(A_2)=\begin{bmatrix}
0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{60} & 0 & 0 & 0 & \frac{\sqrt{105}i}{60} & 0 & 0 & 0\\
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}i}{20} & 0 & 0 & 0 & -\frac{\sqrt{21}i}{20} & 0 & 0\\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{21}i}{20} & 0 & 0 & 0 & \frac{\sqrt{7}i}{20} & 0\\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{105}i}{60} & 0 & 0 & 0 & -\frac{\sqrt{3}i}{60}\\
0 & 0 & -\frac{\sqrt{7}i}{28} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{21}i}{42} & 0 & 0 & 0 & 0\\
0 & 0 & 0 & \frac{\sqrt{35}i}{28} & 0 & 0 & -\frac{\sqrt{3}i}{30} & 0 & 0 & 0 & -\frac{\sqrt{105}i}{105} & 0 & 0 & 0\\
-\frac{\sqrt{7}i}{28} & 0 & 0 & 0 & -\frac{\sqrt{35}i}{28} & 0 & 0 & \frac{2\sqrt{42}i}{105} & 0 & 0 & 0 & -\frac{\sqrt{14}i}{70} & 0 & 0\\
0 & \frac{\sqrt{35}i}{28} & 0 & 0 & 0 & \frac{\sqrt{7}i}{28} & 0 & 0 & -\frac{\sqrt{14}i}{70} & 0 & 0 & 0 & \frac{2\sqrt{42}i}{105} & 0\\
0 & 0 & -\frac{\sqrt{35}i}{28} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{105}i}{105} & 0 & 0 & 0 & -\frac{\sqrt{3}i}{30}\\
0 & 0 & 0 & \frac{\sqrt{7}i}{28} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{21}i}{42} & 0 & 0 & 0
\end{bmatrix}$$

| 701 | symmetry | $\frac{3\sqrt{35}xyz(x-y)(x+y)}{2}$ |

$$\mathbb{T}_5^{(a)}(B_1)=\begin{bmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}}{10} & 0\\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{10}\\
0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0\\
0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}}{10} & 0 & 0 & 0 & 0 & 0 & 0\\
0 & 0 & 0 & 0 & -\frac{\sqrt{42}}{28} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{105}}{70} & 0 & 0\\
0 & 0 & 0 & 0 & 0 & \frac{\sqrt{42}}{28} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}}{70} & 0\\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}}{10}\\
0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2}}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0\\
\frac{\sqrt{42}}{28} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}}{70} & 0 & 0 & 0 & 0 & 0 & 0\\
0 & -\frac{\sqrt{42}}{28} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{105}}{70} & 0 & 0 & 0 & 0 & 0
\end{bmatrix}$$

| 702 | symmetry | $\frac{z\left(15x^4+30x^2y^2-40x^2z^2+15y^4-40y^2z^2+8z^4\right)}{8}$ |

223

Table 9

No.	multipole	matrix

$\mathbb{T}_5^{(a)}(B_2,1)$

$$
\begin{pmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{30} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{6} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{6} & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{30} & 0 \\
-\frac{\sqrt{6}i}{84} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{i}{14} & 0 & 0 & 0 & 0 & 0 \\
0 & \frac{5\sqrt{6}i}{84} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{15}i}{70} & 0 & 0 & 0 & 0 \\
0 & 0 & -\frac{5\sqrt{6}i}{42} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2}i}{14} & 0 & 0 & 0 \\
0 & 0 & 0 & \frac{5\sqrt{6}i}{42} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2}i}{14} & 0 & 0 \\
0 & 0 & 0 & 0 & -\frac{5\sqrt{6}i}{84} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{15}i}{70} & 0 \\
0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}i}{84} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{i}{14}
\end{pmatrix}
$$

| 703 | symmetry | $\dfrac{3\sqrt{35}\,z\left(x^2-2xy-y^2\right)\left(x^2+2xy-y^2\right)}{8}$ |

$\mathbb{T}_5^{(a)}(B_2,2)$

$$
\begin{pmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}i}{10} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{10} \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{10} & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}i}{10} & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & -\frac{\sqrt{42}i}{28} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{105}i}{70} & 0 \\
0 & 0 & 0 & 0 & 0 & \frac{\sqrt{42}i}{28} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}i}{70} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}i}{10} \\
0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}i}{10} & 0 & 0 & 0 & 0 & 0 & 0 \\
-\frac{\sqrt{42}i}{28} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}i}{70} & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & \frac{\sqrt{42}i}{28} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{105}i}{70} & 0 & 0 & 0 & 0 & 0
\end{pmatrix}
$$

| 704 | symmetry | $\dfrac{x\left(8x^4-40x^2y^2-40x^2z^2+15y^4+30y^2z^2+15z^4\right)}{8}$ |

224

Table 9

No.	multipole	matrix

$\mathbb{T}_{5,1}^{(a)}(E,1)$

$$\begin{pmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{80} & 0 & \frac{i}{16} & 0 & -\frac{7\sqrt{15}i}{240} & 0 & \frac{3\sqrt{35}i}{80} \\
0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{105}i}{240} & 0 & \frac{3\sqrt{5}i}{80} & 0 & -\frac{\sqrt{3}i}{16} & 0 & \frac{7\sqrt{15}i}{240} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{7\sqrt{15}i}{240} & 0 & -\frac{\sqrt{3}i}{16} & 0 & \frac{3\sqrt{5}i}{80} & 0 & -\frac{\sqrt{105}i}{240} \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{35}i}{80} & 0 & -\frac{7\sqrt{15}i}{240} & 0 & \frac{i}{16} & 0 & -\frac{\sqrt{5}i}{80} & 0 \\
0 & -\frac{\sqrt{30}i}{224} & 0 & \frac{\sqrt{15}i}{48} & 0 & -\frac{3\sqrt{6}i}{32} & -\frac{\sqrt{7}i}{224} & 0 & \frac{5\sqrt{3}i}{224} & 0 & -\frac{\sqrt{5}i}{32} & 0 & \frac{3i}{32} & 0 \\
-\frac{\sqrt{30}i}{224} & 0 & \frac{5\sqrt{3}i}{112} & 0 & -\frac{5\sqrt{6}i}{96} & 0 & 0 & \frac{23\sqrt{5}i}{1120} & 0 & -\frac{13i}{224} & 0 & \frac{\sqrt{15}i}{160} & 0 & \frac{3\sqrt{35}i}{160} \\
0 & \frac{5\sqrt{3}i}{112} & 0 & -\frac{5\sqrt{6}i}{112} & 0 & \frac{\sqrt{15}i}{48} & \frac{\sqrt{70}i}{160} & 0 & -\frac{11\sqrt{30}i}{1120} & 0 & \frac{\sqrt{2}i}{224} & 0 & \frac{3\sqrt{10}i}{160} & 0 \\
\frac{\sqrt{15}i}{48} & 0 & -\frac{5\sqrt{6}i}{112} & 0 & \frac{5\sqrt{3}i}{112} & 0 & 0 & -\frac{3\sqrt{10}i}{160} & 0 & -\frac{\sqrt{2}i}{224} & 0 & \frac{11\sqrt{30}i}{1120} & 0 & -\frac{\sqrt{70}i}{160} \\
0 & -\frac{5\sqrt{6}i}{96} & 0 & \frac{5\sqrt{3}i}{112} & 0 & -\frac{\sqrt{30}i}{224} & -\frac{3\sqrt{35}i}{160} & 0 & -\frac{\sqrt{15}i}{160} & 0 & \frac{13i}{224} & 0 & -\frac{23\sqrt{5}i}{1120} & 0 \\
-\frac{3\sqrt{6}i}{32} & 0 & \frac{\sqrt{15}i}{48} & 0 & -\frac{\sqrt{30}i}{224} & 0 & 0 & -\frac{3i}{32} & 0 & \frac{\sqrt{5}i}{32} & 0 & -\frac{5\sqrt{3}i}{224} & 0 & \frac{\sqrt{7}i}{224}
\end{pmatrix}$$

705	symmetry	$\dfrac{y\left(15x^4-40x^2y^2+30x^2z^2+8y^4-40y^2z^2+15z^4\right)}{8}$

$\mathbb{T}_{5,2}^{(a)}(E,1)$

$$\begin{pmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{5}}{80} & 0 & \frac{1}{16} & 0 & \frac{7\sqrt{15}}{240} & 0 & \frac{3\sqrt{35}}{80} \\
0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{105}}{240} & 0 & -\frac{3\sqrt{5}}{80} & 0 & -\frac{\sqrt{3}}{16} & 0 & -\frac{7\sqrt{15}}{240} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{7\sqrt{15}}{240} & 0 & \frac{\sqrt{3}}{16} & 0 & \frac{3\sqrt{5}}{80} & 0 & \frac{\sqrt{105}}{240} \\
0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{35}}{80} & 0 & -\frac{7\sqrt{15}}{240} & 0 & -\frac{1}{16} & 0 & -\frac{\sqrt{5}}{80} & 0 \\
0 & -\frac{\sqrt{30}}{224} & 0 & -\frac{\sqrt{15}}{48} & 0 & -\frac{3\sqrt{6}}{32} & \frac{\sqrt{7}}{224} & 0 & \frac{5\sqrt{3}}{224} & 0 & \frac{\sqrt{5}}{32} & 0 & \frac{3}{32} & 0 \\
\frac{\sqrt{30}}{224} & 0 & \frac{5\sqrt{3}}{112} & 0 & \frac{5\sqrt{6}}{96} & 0 & 0 & -\frac{23\sqrt{5}}{1120} & 0 & -\frac{13}{224} & 0 & -\frac{\sqrt{15}}{160} & 0 & \frac{3\sqrt{35}}{160} \\
0 & -\frac{5\sqrt{3}}{112} & 0 & -\frac{5\sqrt{6}}{112} & 0 & -\frac{\sqrt{15}}{48} & \frac{\sqrt{70}}{160} & 0 & \frac{11\sqrt{30}}{1120} & 0 & \frac{\sqrt{2}}{224} & 0 & -\frac{3\sqrt{10}}{160} & 0 \\
\frac{\sqrt{15}}{48} & 0 & \frac{5\sqrt{6}}{112} & 0 & \frac{5\sqrt{3}}{112} & 0 & 0 & -\frac{3\sqrt{10}}{160} & 0 & \frac{\sqrt{2}}{224} & 0 & \frac{11\sqrt{30}}{1120} & 0 & \frac{\sqrt{70}}{160} \\
0 & -\frac{5\sqrt{6}}{96} & 0 & -\frac{5\sqrt{3}}{112} & 0 & -\frac{\sqrt{30}}{224} & \frac{3\sqrt{35}}{160} & 0 & -\frac{\sqrt{15}}{160} & 0 & -\frac{13}{224} & 0 & -\frac{23\sqrt{5}}{1120} & 0 \\
\frac{3\sqrt{6}}{32} & 0 & \frac{\sqrt{15}}{48} & 0 & \frac{\sqrt{30}}{224} & 0 & 0 & \frac{3}{32} & 0 & \frac{\sqrt{5}}{32} & 0 & \frac{5\sqrt{3}}{224} & 0 & \frac{\sqrt{7}}{224}
\end{pmatrix}$$

706	symmetry	$\dfrac{3\sqrt{35}x\left(y^2-2yz-z^2\right)\left(y^2+2yz-z^2\right)}{8}$

Table 9

No.	multipole	matrix

$$\mathbb{T}_{5,1}^{(a)}(E,2) = \begin{pmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}i}{80} & 0 & \frac{\sqrt{35}i}{80} & 0 & \frac{3\sqrt{21}i}{80} & 0 & \frac{i}{16} \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{3}i}{80} & 0 & \frac{3\sqrt{7}i}{80} & 0 & -\frac{\sqrt{105}i}{80} & 0 & -\frac{3\sqrt{21}i}{80} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{21}i}{80} & 0 & -\frac{\sqrt{105}i}{80} & 0 & \frac{3\sqrt{7}i}{80} & 0 & \frac{3\sqrt{3}i}{80} \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{i}{16} & 0 & \frac{3\sqrt{21}i}{80} & 0 & \frac{\sqrt{35}i}{80} & 0 & -\frac{\sqrt{7}i}{80} & 0 \\
0 & -\frac{\sqrt{42}i}{224} & 0 & -\frac{3\sqrt{21}i}{112} & 0 & -\frac{\sqrt{210}i}{224} & -\frac{\sqrt{5}i}{160} & 0 & \frac{\sqrt{105}i}{224} & 0 & \frac{9\sqrt{7}i}{224} & 0 & \frac{\sqrt{35}i}{224} & 0 \\
-\frac{\sqrt{42}i}{224} & 0 & \frac{\sqrt{105}i}{112} & 0 & \frac{3\sqrt{210}i}{224} & 0 & 0 & \frac{23\sqrt{7}i}{1120} & 0 & -\frac{13\sqrt{35}i}{1120} & 0 & -\frac{9\sqrt{21}i}{1120} & 0 & \frac{i}{32} \\
0 & \frac{\sqrt{105}i}{112} & 0 & -\frac{\sqrt{210}i}{112} & 0 & -\frac{3\sqrt{21}i}{112} & -\frac{9\sqrt{2}i}{160} & 0 & -\frac{11\sqrt{42}i}{1120} & 0 & \frac{\sqrt{70}i}{1120} & 0 & -\frac{27\sqrt{14}i}{1120} & 0 \\
-\frac{3\sqrt{21}i}{112} & 0 & -\frac{\sqrt{210}i}{112} & 0 & \frac{\sqrt{105}i}{112} & 0 & 0 & \frac{27\sqrt{14}i}{1120} & 0 & -\frac{\sqrt{70}i}{1120} & 0 & \frac{11\sqrt{42}i}{1120} & 0 & \frac{9\sqrt{2}i}{160} \\
0 & \frac{3\sqrt{210}i}{224} & 0 & \frac{\sqrt{105}i}{112} & 0 & -\frac{\sqrt{42}i}{224} & -\frac{i}{32} & 0 & \frac{9\sqrt{21}i}{1120} & 0 & \frac{13\sqrt{35}i}{1120} & 0 & -\frac{23\sqrt{7}i}{1120} & 0 \\
-\frac{\sqrt{210}i}{224} & 0 & -\frac{3\sqrt{21}i}{112} & 0 & -\frac{\sqrt{42}i}{224} & 0 & 0 & -\frac{\sqrt{35}i}{224} & 0 & -\frac{9\sqrt{7}i}{224} & 0 & -\frac{\sqrt{105}i}{224} & 0 & \frac{\sqrt{5}i}{160}
\end{pmatrix}$$

707 symmetry

$$\frac{3\sqrt{35}\,y\left(x^2-2xz-z^2\right)\left(x^2+2xz-z^2\right)}{8}$$

$$\mathbb{T}_{5,2}^{(a)}(E,2) = \begin{pmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}}{80} & 0 & \frac{\sqrt{35}}{80} & 0 & -\frac{3\sqrt{21}}{80} & 0 & \frac{1}{16} \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{3}}{80} & 0 & -\frac{3\sqrt{7}}{80} & 0 & -\frac{\sqrt{105}}{80} & 0 & \frac{3\sqrt{21}}{80} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{21}}{80} & 0 & \frac{\sqrt{105}}{80} & 0 & \frac{3\sqrt{7}}{80} & 0 & -\frac{3\sqrt{3}}{80} \\
0 & 0 & 0 & 0 & 0 & 0 & -\frac{1}{16} & 0 & \frac{3\sqrt{21}}{80} & 0 & -\frac{\sqrt{35}}{80} & 0 & -\frac{\sqrt{7}}{80} & 0 \\
0 & -\frac{\sqrt{42}}{224} & 0 & \frac{3\sqrt{21}}{112} & 0 & -\frac{\sqrt{210}}{224} & \frac{\sqrt{5}}{160} & 0 & \frac{\sqrt{105}}{224} & 0 & -\frac{9\sqrt{7}}{224} & 0 & \frac{\sqrt{35}}{224} & 0 \\
\frac{\sqrt{42}}{224} & 0 & \frac{\sqrt{105}}{112} & 0 & -\frac{3\sqrt{210}}{224} & 0 & 0 & -\frac{23\sqrt{7}}{1120} & 0 & -\frac{13\sqrt{35}}{1120} & 0 & \frac{9\sqrt{21}}{1120} & 0 & \frac{1}{32} \\
0 & -\frac{\sqrt{105}}{112} & 0 & -\frac{\sqrt{210}}{112} & 0 & \frac{3\sqrt{21}}{112} & -\frac{9\sqrt{2}}{160} & 0 & \frac{11\sqrt{42}}{1120} & 0 & \frac{\sqrt{70}}{1120} & 0 & \frac{27\sqrt{14}}{1120} & 0 \\
-\frac{3\sqrt{21}}{112} & 0 & \frac{\sqrt{210}}{112} & 0 & \frac{\sqrt{105}}{112} & 0 & 0 & \frac{27\sqrt{14}}{1120} & 0 & \frac{\sqrt{70}}{1120} & 0 & \frac{11\sqrt{42}}{1120} & 0 & -\frac{9\sqrt{2}}{160} \\
0 & \frac{3\sqrt{210}}{224} & 0 & -\frac{\sqrt{105}}{112} & 0 & -\frac{\sqrt{42}}{224} & \frac{1}{32} & 0 & \frac{9\sqrt{21}}{1120} & 0 & -\frac{13\sqrt{35}}{1120} & 0 & -\frac{23\sqrt{7}}{1120} & 0 \\
\frac{\sqrt{210}}{224} & 0 & -\frac{3\sqrt{21}}{112} & 0 & \frac{\sqrt{42}}{224} & 0 & 0 & \frac{\sqrt{35}}{224} & 0 & -\frac{9\sqrt{7}}{224} & 0 & \frac{\sqrt{105}}{224} & 0 & \frac{\sqrt{5}}{160}
\end{pmatrix}$$

708 symmetry

$$\frac{\sqrt{105}\,x(y-z)(y+z)\left(2x^2-y^2-z^2\right)}{4}$$

Table 9

No.	multipole	matrix
	$\mathbb{T}_{5,1}^{(a)}(E,3)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{21}i}{120} & 0 & \frac{\sqrt{105}i}{120} & 0 & -\frac{\sqrt{7}i}{40} & 0 & -\frac{\sqrt{3}i}{8} \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{i}{40} & 0 & \frac{\sqrt{21}i}{40} & 0 & -\frac{\sqrt{35}i}{40} & 0 & \frac{\sqrt{7}i}{40} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}i}{40} & 0 & -\frac{\sqrt{35}i}{40} & 0 & \frac{\sqrt{21}i}{40} & 0 & -\frac{i}{40} \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{8} & 0 & -\frac{\sqrt{7}i}{40} & 0 & \frac{\sqrt{105}i}{120} & 0 & -\frac{\sqrt{21}i}{120} & 0 \\ 0 & -\frac{\sqrt{14}i}{112} & 0 & \frac{\sqrt{7}i}{56} & 0 & \frac{3\sqrt{70}i}{112} & -\frac{\sqrt{15}i}{240} & 0 & \frac{\sqrt{35}i}{112} & 0 & -\frac{\sqrt{21}i}{112} & 0 & -\frac{\sqrt{105}i}{112} & 0 \\ -\frac{\sqrt{14}i}{112} & 0 & \frac{\sqrt{35}i}{56} & 0 & -\frac{\sqrt{70}i}{112} & 0 & 0 & \frac{23\sqrt{21}i}{1680} & 0 & -\frac{13\sqrt{105}i}{1680} & 0 & \frac{3\sqrt{7}i}{560} & 0 & -\frac{\sqrt{3}i}{16} \\ 0 & \frac{\sqrt{35}i}{56} & 0 & -\frac{\sqrt{70}i}{56} & 0 & \frac{\sqrt{7}i}{56} & \frac{\sqrt{6}i}{80} & 0 & -\frac{11\sqrt{14}i}{560} & 0 & \frac{\sqrt{210}i}{1680} & 0 & \frac{3\sqrt{42}i}{560} & 0 \\ \frac{\sqrt{7}i}{56} & 0 & -\frac{\sqrt{70}i}{56} & 0 & \frac{\sqrt{35}i}{56} & 0 & 0 & -\frac{3\sqrt{42}i}{560} & 0 & -\frac{\sqrt{210}i}{1680} & 0 & \frac{11\sqrt{14}i}{560} & 0 & -\frac{\sqrt{6}i}{80} \\ 0 & -\frac{\sqrt{70}i}{112} & 0 & \frac{\sqrt{35}i}{56} & 0 & -\frac{\sqrt{14}i}{112} & \frac{\sqrt{3}i}{16} & 0 & -\frac{3\sqrt{7}i}{560} & 0 & \frac{13\sqrt{105}i}{1680} & 0 & -\frac{23\sqrt{21}i}{1680} & 0 \\ \frac{3\sqrt{70}i}{112} & 0 & \frac{\sqrt{7}i}{56} & 0 & -\frac{\sqrt{14}i}{112} & 0 & 0 & \frac{\sqrt{105}i}{112} & 0 & \frac{\sqrt{21}i}{112} & 0 & -\frac{\sqrt{35}i}{112} & 0 & \frac{\sqrt{15}i}{240} \end{bmatrix}$
709	symmetry	$-\frac{\sqrt{105}\,y(x-z)(x+z)\left(x^2-2y^2+z^2\right)}{4}$
	$\mathbb{T}_{5,2}^{(a)}(E,3)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{21}}{120} & 0 & \frac{\sqrt{105}}{120} & 0 & \frac{\sqrt{7}}{40} & 0 & -\frac{\sqrt{3}}{8} \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{1}{40} & 0 & -\frac{\sqrt{21}}{40} & 0 & -\frac{\sqrt{35}}{40} & 0 & -\frac{\sqrt{7}}{40} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}}{40} & 0 & \frac{\sqrt{35}}{40} & 0 & \frac{\sqrt{21}}{40} & 0 & \frac{1}{40} \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{8} & 0 & -\frac{\sqrt{7}}{40} & 0 & -\frac{\sqrt{105}}{120} & 0 & -\frac{\sqrt{21}}{120} & 0 \\ 0 & -\frac{\sqrt{14}}{112} & 0 & -\frac{\sqrt{7}}{56} & 0 & \frac{3\sqrt{70}}{112} & \frac{\sqrt{15}}{240} & 0 & \frac{\sqrt{35}}{112} & 0 & \frac{\sqrt{21}}{112} & 0 & -\frac{\sqrt{105}}{112} & 0 \\ \frac{\sqrt{14}}{112} & 0 & \frac{\sqrt{35}}{56} & 0 & \frac{\sqrt{70}}{112} & 0 & 0 & -\frac{23\sqrt{21}}{1680} & 0 & -\frac{13\sqrt{105}}{1680} & 0 & -\frac{3\sqrt{7}}{560} & 0 & -\frac{\sqrt{3}}{16} \\ 0 & -\frac{\sqrt{35}}{56} & 0 & -\frac{\sqrt{70}}{56} & 0 & -\frac{\sqrt{7}}{56} & \frac{\sqrt{6}}{80} & 0 & \frac{11\sqrt{14}}{560} & 0 & \frac{\sqrt{210}}{1680} & 0 & -\frac{3\sqrt{42}}{560} & 0 \\ \frac{\sqrt{7}}{56} & 0 & \frac{\sqrt{70}}{56} & 0 & \frac{\sqrt{35}}{56} & 0 & 0 & -\frac{3\sqrt{42}}{560} & 0 & \frac{\sqrt{210}}{1680} & 0 & \frac{11\sqrt{14}}{560} & 0 & \frac{\sqrt{6}}{80} \\ 0 & -\frac{\sqrt{70}}{112} & 0 & -\frac{\sqrt{35}}{56} & 0 & -\frac{\sqrt{14}}{112} & -\frac{\sqrt{3}}{16} & 0 & -\frac{3\sqrt{7}}{560} & 0 & -\frac{13\sqrt{105}}{1680} & 0 & -\frac{23\sqrt{21}}{1680} & 0 \\ -\frac{3\sqrt{70}}{112} & 0 & \frac{\sqrt{7}}{56} & 0 & \frac{\sqrt{14}}{112} & 0 & 0 & -\frac{\sqrt{105}}{112} & 0 & \frac{\sqrt{21}}{112} & 0 & \frac{\sqrt{35}}{112} & 0 & \frac{\sqrt{15}}{240} \end{bmatrix}$
710	symmetry	$\sqrt{15}\,xyz$

continued ...

Table 9

No.	multipole	matrix

$\mathbb{T}_3^{(1,-1;a)}(A_1)$

$$\begin{pmatrix}
0 & 0 & 0 & -\frac{\sqrt{5}}{35} & 0 & 0 & \frac{\sqrt{21}}{28} & 0 & 0 & 0 & -\frac{\sqrt{15}}{28} & 0 & 0 & 0 \\
-\frac{\sqrt{6}}{42} & 0 & 0 & 0 & -\frac{\sqrt{30}}{210} & 0 & 0 & -\frac{3}{28} & 0 & 0 & 0 & -\frac{3\sqrt{3}}{28} & 0 & 0 \\
0 & \frac{\sqrt{30}}{210} & 0 & 0 & 0 & \frac{\sqrt{6}}{42} & 0 & 0 & -\frac{3\sqrt{3}}{28} & 0 & 0 & 0 & -\frac{3}{28} & 0 \\
0 & 0 & \frac{\sqrt{5}}{35} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{28} & 0 & 0 & 0 & \frac{\sqrt{21}}{28} \\
0 & 0 & \frac{3}{28} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{2\sqrt{3}}{21} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & \frac{3\sqrt{5}}{140} & 0 & 0 & \frac{\sqrt{21}}{21} & 0 & 0 & 0 & \frac{\sqrt{15}}{21} & 0 & 0 & 0 \\
-\frac{3}{28} & 0 & 0 & 0 & -\frac{3\sqrt{5}}{140} & 0 & 0 & \frac{\sqrt{6}}{42} & 0 & 0 & 0 & \frac{\sqrt{2}}{14} & 0 & 0 \\
0 & -\frac{3\sqrt{5}}{140} & 0 & 0 & 0 & -\frac{3}{28} & 0 & 0 & -\frac{\sqrt{2}}{14} & 0 & 0 & 0 & -\frac{\sqrt{6}}{42} & 0 \\
0 & 0 & \frac{3\sqrt{5}}{140} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{21} & 0 & 0 & 0 & -\frac{\sqrt{21}}{21} \\
0 & 0 & 0 & \frac{3}{28} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{2\sqrt{3}}{21} & 0 & 0 & 0
\end{pmatrix}$$

711	symmetry	$\dfrac{\sqrt{15}z(x-y)(x+y)}{2}$

$\mathbb{T}_3^{(1,-1;a)}(A_2)$

$$\begin{pmatrix}
0 & 0 & 0 & -\frac{\sqrt{5}i}{35} & 0 & 0 & -\frac{\sqrt{21}i}{28} & 0 & 0 & 0 & -\frac{\sqrt{15}i}{28} & 0 & 0 & 0 \\
\frac{\sqrt{6}i}{42} & 0 & 0 & 0 & -\frac{\sqrt{30}i}{210} & 0 & 0 & \frac{3i}{28} & 0 & 0 & 0 & -\frac{3\sqrt{3}i}{28} & 0 & 0 \\
0 & -\frac{\sqrt{30}i}{210} & 0 & 0 & 0 & \frac{\sqrt{6}i}{42} & 0 & 0 & \frac{3\sqrt{3}i}{28} & 0 & 0 & 0 & -\frac{3i}{28} & 0 \\
0 & 0 & -\frac{\sqrt{5}i}{35} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{28} & 0 & 0 & 0 & \frac{\sqrt{21}i}{28} \\
0 & 0 & \frac{3i}{28} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{2\sqrt{3}i}{21} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & \frac{3\sqrt{5}i}{140} & 0 & 0 & -\frac{\sqrt{21}i}{21} & 0 & 0 & 0 & \frac{\sqrt{15}i}{21} & 0 & 0 & 0 \\
\frac{3i}{28} & 0 & 0 & 0 & -\frac{3\sqrt{5}i}{140} & 0 & 0 & -\frac{\sqrt{6}i}{42} & 0 & 0 & 0 & \frac{\sqrt{2}i}{14} & 0 & 0 \\
0 & \frac{3\sqrt{5}i}{140} & 0 & 0 & 0 & -\frac{3i}{28} & 0 & 0 & \frac{\sqrt{2}i}{14} & 0 & 0 & 0 & -\frac{\sqrt{6}i}{42} & 0 \\
0 & 0 & -\frac{3\sqrt{5}i}{140} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{21} & 0 & 0 & 0 & -\frac{\sqrt{21}i}{21} \\
0 & 0 & 0 & -\frac{3i}{28} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{2\sqrt{3}i}{21} & 0 & 0 & 0
\end{pmatrix}$$

712	symmetry	$-\dfrac{z\left(3x^2+3y^2-2z^2\right)}{2}$

Table 9

No.	multipole	matrix

$\mathbb{T}_3^{(1,-1;a)}(B_2)$

$$
\begin{pmatrix}
0 & -\frac{\sqrt{6}i}{35} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{14} & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & \frac{2i}{35} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{14} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & \frac{2i}{35} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{14} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{35} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{14} & 0 & 0 \\
\frac{\sqrt{6}i}{28} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{2i}{7} & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & -\frac{\sqrt{6}i}{20} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & -\frac{\sqrt{6}i}{35} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}i}{7} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & \frac{\sqrt{6}i}{35} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}i}{7} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & \frac{\sqrt{6}i}{20} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{28} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{2i}{7} & 0 \\
\end{pmatrix}
$$

713	symmetry	$\dfrac{x\left(2x^2-3y^2-3z^2\right)}{2}$

$\mathbb{T}_{3,1}^{(1,-1;a)}(E,1)$

$$
\begin{pmatrix}
-\frac{\sqrt{30}i}{280} & 0 & \frac{3\sqrt{3}i}{140} & 0 & -\frac{\sqrt{6}i}{56} & 0 & 0 & -\frac{3\sqrt{5}i}{56} & 0 & \frac{3i}{28} & 0 & -\frac{\sqrt{15}i}{56} & 0 & 0 \\
0 & \frac{\sqrt{2}i}{40} & 0 & -\frac{i}{140} & 0 & -\frac{\sqrt{10}i}{56} & -\frac{\sqrt{105}i}{56} & 0 & 0 & 0 & \frac{3\sqrt{3}i}{56} & 0 & -\frac{\sqrt{15}i}{28} & 0 \\
\frac{\sqrt{10}i}{56} & 0 & \frac{i}{140} & 0 & -\frac{\sqrt{2}i}{40} & 0 & 0 & -\frac{\sqrt{15}i}{28} & 0 & \frac{3\sqrt{3}i}{56} & 0 & 0 & 0 & -\frac{\sqrt{105}i}{56} \\
0 & \frac{\sqrt{6}i}{56} & 0 & -\frac{3\sqrt{3}i}{140} & 0 & \frac{\sqrt{30}i}{280} & 0 & 0 & -\frac{\sqrt{15}i}{56} & 0 & \frac{3i}{28} & 0 & -\frac{3\sqrt{5}i}{56} & 0 \\
0 & -\frac{3\sqrt{30}i}{280} & 0 & \frac{\sqrt{15}i}{56} & 0 & 0 & \frac{\sqrt{7}i}{28} & 0 & -\frac{\sqrt{3}i}{14} & 0 & \frac{\sqrt{5}i}{28} & 0 & 0 & 0 \\
-\frac{3\sqrt{30}i}{280} & 0 & \frac{3\sqrt{3}i}{280} & 0 & \frac{\sqrt{6}i}{28} & 0 & 0 & -\frac{\sqrt{5}i}{28} & 0 & -\frac{i}{14} & 0 & \frac{\sqrt{15}i}{28} & 0 & 0 \\
0 & \frac{3\sqrt{3}i}{280} & 0 & \frac{3\sqrt{6}i}{140} & 0 & \frac{\sqrt{15}i}{56} & -\frac{\sqrt{70}i}{56} & 0 & -\frac{\sqrt{30}i}{56} & 0 & \frac{\sqrt{2}i}{56} & 0 & \frac{3\sqrt{10}i}{56} & 0 \\
\frac{\sqrt{15}i}{56} & 0 & \frac{3\sqrt{6}i}{140} & 0 & \frac{3\sqrt{3}i}{280} & 0 & 0 & -\frac{3\sqrt{10}i}{56} & 0 & -\frac{\sqrt{2}i}{56} & 0 & \frac{\sqrt{30}i}{56} & 0 & \frac{\sqrt{70}i}{56} \\
0 & \frac{\sqrt{6}i}{28} & 0 & \frac{3\sqrt{3}i}{280} & 0 & -\frac{3\sqrt{30}i}{280} & 0 & 0 & -\frac{\sqrt{15}i}{28} & 0 & \frac{i}{14} & 0 & \frac{\sqrt{5}i}{28} & 0 \\
0 & 0 & \frac{\sqrt{15}i}{56} & 0 & -\frac{3\sqrt{30}i}{280} & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{28} & 0 & \frac{\sqrt{3}i}{14} & 0 & -\frac{\sqrt{7}i}{28} \\
\end{pmatrix}
$$

714	symmetry	$-\dfrac{y\left(3x^2-2y^2+3z^2\right)}{2}$

229

Table 9

No.	multipole	matrix

$\mathbb{T}_{3,2}^{(1,-1;a)}(E,1)$

$$\begin{bmatrix}
\frac{\sqrt{30}}{280} & 0 & \frac{3\sqrt{3}}{140} & 0 & \frac{\sqrt{6}}{56} & 0 & 0 & \frac{3\sqrt{5}}{56} & 0 & \frac{3}{28} & 0 & \frac{\sqrt{15}}{56} & 0 & 0 \\[4pt]
0 & -\frac{\sqrt{2}}{40} & 0 & -\frac{1}{140} & 0 & \frac{\sqrt{10}}{56} & -\frac{\sqrt{105}}{56} & 0 & 0 & 0 & \frac{3\sqrt{3}}{56} & 0 & \frac{\sqrt{15}}{28} & 0 \\[4pt]
\frac{\sqrt{10}}{56} & 0 & -\frac{1}{140} & 0 & -\frac{\sqrt{2}}{40} & 0 & 0 & -\frac{\sqrt{15}}{28} & 0 & -\frac{3\sqrt{3}}{56} & 0 & 0 & 0 & \frac{\sqrt{105}}{56} \\[4pt]
0 & \frac{\sqrt{6}}{56} & 0 & \frac{3\sqrt{3}}{140} & 0 & \frac{\sqrt{30}}{280} & 0 & 0 & -\frac{\sqrt{15}}{56} & 0 & -\frac{3}{28} & 0 & -\frac{3\sqrt{5}}{56} & 0 \\[4pt]
0 & -\frac{3\sqrt{30}}{280} & 0 & -\frac{\sqrt{15}}{56} & 0 & 0 & -\frac{\sqrt{7}}{28} & 0 & -\frac{\sqrt{3}}{14} & 0 & -\frac{\sqrt{5}}{28} & 0 & 0 & 0 \\[4pt]
\frac{3\sqrt{30}}{280} & 0 & \frac{3\sqrt{3}}{280} & 0 & -\frac{\sqrt{6}}{28} & 0 & 0 & \frac{\sqrt{5}}{28} & 0 & -\frac{1}{14} & 0 & -\frac{\sqrt{15}}{28} & 0 & 0 \\[4pt]
0 & -\frac{3\sqrt{3}}{280} & 0 & \frac{3\sqrt{6}}{140} & 0 & -\frac{\sqrt{15}}{56} & -\frac{\sqrt{70}}{56} & 0 & \frac{\sqrt{30}}{56} & 0 & \frac{\sqrt{2}}{56} & 0 & -\frac{3\sqrt{10}}{56} & 0 \\[4pt]
\frac{\sqrt{15}}{56} & 0 & -\frac{3\sqrt{6}}{140} & 0 & \frac{3\sqrt{3}}{280} & 0 & 0 & -\frac{3\sqrt{10}}{56} & 0 & \frac{\sqrt{2}}{56} & 0 & \frac{\sqrt{30}}{56} & 0 & -\frac{\sqrt{70}}{56} \\[4pt]
0 & \frac{\sqrt{6}}{28} & 0 & -\frac{3\sqrt{3}}{280} & 0 & -\frac{3\sqrt{30}}{280} & 0 & 0 & -\frac{\sqrt{15}}{28} & 0 & -\frac{1}{14} & 0 & \frac{\sqrt{5}}{28} & 0 \\[4pt]
0 & 0 & \frac{\sqrt{15}}{56} & 0 & \frac{3\sqrt{30}}{280} & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}}{28} & 0 & -\frac{\sqrt{3}}{14} & 0 & -\frac{\sqrt{7}}{28}
\end{bmatrix}$$

715   symmetry $\dfrac{\sqrt{15}\,x(y-z)(y+z)}{2}$

$\mathbb{T}_{3,1}^{(1,-1;a)}(E,2)$

$$\begin{bmatrix}
-\frac{\sqrt{2}i}{56} & 0 & \frac{3\sqrt{5}i}{140} & 0 & \frac{3\sqrt{10}i}{280} & 0 & 0 & -\frac{5\sqrt{3}i}{56} & 0 & \frac{\sqrt{15}i}{28} & 0 & \frac{3i}{56} & 0 & 0 \\[4pt]
0 & \frac{\sqrt{30}i}{120} & 0 & -\frac{\sqrt{15}i}{420} & 0 & \frac{\sqrt{6}i}{56} & \frac{3\sqrt{7}i}{56} & 0 & 0 & 0 & \frac{3\sqrt{5}i}{56} & 0 & \frac{3i}{28} & 0 \\[4pt]
-\frac{\sqrt{6}i}{56} & 0 & \frac{\sqrt{15}i}{420} & 0 & -\frac{\sqrt{30}i}{120} & 0 & 0 & \frac{3i}{28} & 0 & \frac{3\sqrt{5}i}{56} & 0 & 0 & 0 & \frac{3\sqrt{7}i}{56} \\[4pt]
0 & -\frac{3\sqrt{10}i}{280} & 0 & -\frac{3\sqrt{5}i}{140} & 0 & \frac{\sqrt{2}i}{56} & 0 & 0 & \frac{3i}{56} & 0 & \frac{\sqrt{15}i}{28} & 0 & -\frac{5\sqrt{3}i}{56} & 0 \\[4pt]
0 & -\frac{3\sqrt{2}i}{56} & 0 & -\frac{3i}{56} & 0 & 0 & \frac{\sqrt{105}i}{84} & 0 & -\frac{\sqrt{5}i}{14} & 0 & -\frac{\sqrt{3}i}{28} & 0 & 0 & 0 \\[4pt]
-\frac{3\sqrt{2}i}{56} & 0 & \frac{3\sqrt{5}i}{280} & 0 & -\frac{3\sqrt{10}i}{140} & 0 & 0 & -\frac{5\sqrt{3}i}{84} & 0 & -\frac{\sqrt{15}i}{42} & 0 & -\frac{3i}{28} & 0 & 0 \\[4pt]
0 & \frac{3\sqrt{5}i}{280} & 0 & \frac{3\sqrt{10}i}{140} & 0 & -\frac{3i}{56} & \frac{\sqrt{42}i}{56} & 0 & -\frac{5\sqrt{2}i}{56} & 0 & \frac{\sqrt{30}i}{168} & 0 & -\frac{3\sqrt{6}i}{56} & 0 \\[4pt]
-\frac{3i}{56} & 0 & \frac{3\sqrt{10}i}{140} & 0 & \frac{3\sqrt{5}i}{280} & 0 & 0 & \frac{3\sqrt{6}i}{56} & 0 & -\frac{\sqrt{30}i}{168} & 0 & \frac{5\sqrt{2}i}{56} & 0 & -\frac{\sqrt{42}i}{56} \\[4pt]
0 & -\frac{3\sqrt{10}i}{140} & 0 & \frac{3\sqrt{5}i}{280} & 0 & -\frac{3\sqrt{2}i}{56} & 0 & 0 & \frac{3i}{28} & 0 & \frac{\sqrt{15}i}{42} & 0 & \frac{5\sqrt{3}i}{84} & 0 \\[4pt]
0 & 0 & -\frac{3i}{56} & 0 & -\frac{3\sqrt{2}i}{56} & 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{28} & 0 & \frac{\sqrt{5}i}{14} & 0 & -\frac{\sqrt{105}i}{84}
\end{bmatrix}$$

716   symmetry $\dfrac{\sqrt{15}\,y(x-z)(x+z)}{2}$

continued …

Table 9

No.	multipole	matrix

$\mathbb{T}_{3,2}^{(1,-1;a)}(E,2)$

$\frac{\sqrt{2}}{56}$	0	$\frac{3\sqrt{5}}{140}$	0	$-\frac{3\sqrt{10}}{280}$	0	0	$\frac{5\sqrt{3}}{56}$	0	$\frac{\sqrt{15}}{28}$	0	$-\frac{3}{56}$	0	0
0	$-\frac{\sqrt{30}}{120}$	0	$-\frac{\sqrt{15}}{420}$	0	$-\frac{\sqrt{6}}{56}$	$\frac{3\sqrt{7}}{56}$	0	0	0	$\frac{3\sqrt{5}}{56}$	0	$-\frac{3}{28}$	0
$-\frac{\sqrt{6}}{56}$	0	$-\frac{\sqrt{15}}{420}$	0	$-\frac{\sqrt{30}}{120}$	0	0	$\frac{3}{28}$	0	$-\frac{3\sqrt{5}}{56}$	0	0	0	$-\frac{3\sqrt{7}}{56}$
0	$-\frac{3\sqrt{10}}{280}$	0	$\frac{3\sqrt{5}}{140}$	0	$\frac{\sqrt{2}}{56}$	0	0	$\frac{3}{56}$	0	$-\frac{\sqrt{15}}{28}$	0	$-\frac{5\sqrt{3}}{56}$	0
0	$-\frac{3\sqrt{2}}{56}$	0	$\frac{3}{56}$	0	0	$-\frac{\sqrt{105}}{84}$	0	$-\frac{\sqrt{5}}{14}$	0	$\frac{\sqrt{3}}{28}$	0	0	0
$\frac{3\sqrt{2}}{56}$	0	$\frac{3\sqrt{5}}{280}$	0	$\frac{3\sqrt{10}}{140}$	0	0	$\frac{5\sqrt{3}}{84}$	0	$-\frac{\sqrt{15}}{42}$	0	$\frac{3}{28}$	0	0
0	$-\frac{3\sqrt{5}}{280}$	0	$\frac{3\sqrt{10}}{140}$	0	$\frac{3}{56}$	$\frac{\sqrt{42}}{56}$	0	$\frac{5\sqrt{2}}{56}$	0	$\frac{\sqrt{30}}{168}$	0	$\frac{3\sqrt{6}}{56}$	0
$-\frac{3}{56}$	0	$-\frac{3\sqrt{10}}{140}$	0	$\frac{3\sqrt{5}}{280}$	0	0	$\frac{3\sqrt{6}}{56}$	0	$\frac{\sqrt{30}}{168}$	0	$\frac{5\sqrt{2}}{56}$	0	$\frac{\sqrt{42}}{56}$
0	$-\frac{3\sqrt{10}}{140}$	0	$-\frac{3\sqrt{5}}{280}$	0	$-\frac{3\sqrt{2}}{56}$	0	0	$\frac{3}{28}$	0	$-\frac{\sqrt{15}}{42}$	0	$\frac{5\sqrt{3}}{84}$	0
0	0	$-\frac{3}{56}$	0	$\frac{3\sqrt{2}}{56}$	0	0	0	0	$\frac{\sqrt{3}}{28}$	0	$-\frac{\sqrt{5}}{14}$	0	$-\frac{\sqrt{105}}{84}$

717	symmetry	$\dfrac{\sqrt{105}\,xyz\left(x^2+y^2-2z^2\right)}{2}$

$\mathbb{T}_5^{(1,-1;a)}(A_1)$

0	0	0	0	0	0	$\frac{\sqrt{10}}{200}$	0	0	0	$-\frac{\sqrt{14}}{40}$	0	0	0
0	0	0	0	0	0	0	$-\frac{\sqrt{210}}{200}$	0	0	0	$\frac{3\sqrt{70}}{200}$	0	0
0	0	0	0	0	0	0	0	$\frac{3\sqrt{70}}{200}$	0	0	0	$-\frac{\sqrt{210}}{200}$	0
0	0	0	0	0	0	0	0	0	$-\frac{\sqrt{14}}{40}$	0	0	0	$\frac{\sqrt{10}}{200}$
0	0	$\frac{\sqrt{210}}{420}$	0	0	0	0	0	0	$\frac{\sqrt{70}}{35}$	0	0	0	0
0	0	0	$-\frac{\sqrt{42}}{84}$	0	0	$\frac{\sqrt{10}}{25}$	0	0	0	$-\frac{2\sqrt{14}}{35}$	0	0	0
$-\frac{\sqrt{210}}{420}$	0	0	0	$\frac{\sqrt{42}}{84}$	0	0	$-\frac{8\sqrt{35}}{175}$	0	0	0	$-\frac{2\sqrt{105}}{175}$	0	0
0	$\frac{\sqrt{42}}{84}$	0	0	0	$-\frac{\sqrt{210}}{420}$	0	0	$\frac{2\sqrt{105}}{175}$	0	0	0	$\frac{8\sqrt{35}}{175}$	0
0	0	$-\frac{\sqrt{42}}{84}$	0	0	0	0	0	0	$\frac{2\sqrt{14}}{35}$	0	0	0	$-\frac{\sqrt{10}}{25}$
0	0	0	$\frac{\sqrt{210}}{420}$	0	0	0	0	0	0	$-\frac{\sqrt{70}}{35}$	0	0	0

718	symmetry	$-\dfrac{\sqrt{105}\,z(x-y)(x+y)\left(x^2+y^2-2z^2\right)}{4}$

continued ...

Table 9

No.	multipole	matrix

$\mathbb{T}_5^{(1,-1;a)}(A_2)$

$$\begin{pmatrix}
0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}i}{200} & 0 & 0 & 0 & \frac{\sqrt{14}i}{40} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{210}i}{200} & 0 & 0 & 0 & -\frac{3\sqrt{70}i}{200} & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{70}i}{200} & 0 & 0 & 0 & \frac{\sqrt{210}i}{200} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{14}i}{40} & 0 & 0 & 0 & -\frac{\sqrt{10}i}{200} \\
0 & 0 & -\frac{\sqrt{210}i}{420} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}i}{35} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & \frac{\sqrt{42}i}{84} & 0 & 0 & \frac{\sqrt{10}i}{25} & 0 & 0 & 0 & \frac{2\sqrt{14}i}{35} & 0 & 0 & 0 \\
-\frac{\sqrt{210}i}{420} & 0 & 0 & 0 & -\frac{\sqrt{42}i}{84} & 0 & 0 & -\frac{8\sqrt{35}i}{175} & 0 & 0 & 0 & \frac{2\sqrt{105}i}{175} & 0 & 0 \\
0 & \frac{\sqrt{42}i}{84} & 0 & 0 & 0 & \frac{\sqrt{210}i}{420} & 0 & 0 & \frac{2\sqrt{105}i}{175} & 0 & 0 & 0 & -\frac{8\sqrt{35}i}{175} & 0 \\
0 & 0 & -\frac{\sqrt{42}i}{84} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{2\sqrt{14}i}{35} & 0 & 0 & 0 & \frac{\sqrt{10}i}{25} \\
0 & 0 & 0 & \frac{\sqrt{210}i}{420} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}i}{35} & 0 & 0 & 0
\end{pmatrix}$$

| 719 | symmetry | $\frac{3\sqrt{35}xyz(x-y)(x+y)}{2}$ |

$\mathbb{T}_5^{(1,-1;a)}(B_1)$

$$\begin{pmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{210}}{100} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{10}}{100} \\
0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{10}}{100} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{210}}{100} & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & -\frac{\sqrt{35}}{70} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{14}}{35} & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & \frac{\sqrt{35}}{70} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{210}}{175} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{2\sqrt{15}}{25} \\
0 & 0 & 0 & 0 & 0 & 0 & -\frac{2\sqrt{15}}{25} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
\frac{\sqrt{35}}{70} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{210}}{175} & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & -\frac{\sqrt{35}}{70} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{14}}{35} & 0 & 0 & 0 & 0 & 0
\end{pmatrix}$$

| 720 | symmetry | $\frac{z\left(15x^4+30x^2y^2-40x^2z^2+15y^4-40y^2z^2+8z^4\right)}{8}$ |

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Table 9

No.	multipole	matrix

$\mathbb{T}_5^{(1,-1;a)}(B_2,1)$

$$\begin{bmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2}i}{20} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}i}{20} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}i}{20} & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}i}{20} & 0 \\
-\frac{\sqrt{5}i}{210} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}i}{35} & 0 & 0 & 0 & 0 & 0 \\
0 & \frac{\sqrt{5}i}{42} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{9\sqrt{2}i}{35} & 0 & 0 & 0 & 0 \\
0 & 0 & -\frac{\sqrt{5}i}{21} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{2\sqrt{15}i}{35} & 0 & 0 & 0 \\
0 & 0 & 0 & \frac{\sqrt{5}i}{21} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{2\sqrt{15}i}{35} & 0 & 0 \\
0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{42} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{9\sqrt{2}i}{35} & 0 \\
0 & 0 & 0 & 0 & 0 & \frac{\sqrt{5}i}{210} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}i}{35}
\end{bmatrix}$$

721	symmetry	$\dfrac{3\sqrt{35}z\left(x^2-2xy-y^2\right)\left(x^2+2xy-y^2\right)}{8}$

$\mathbb{T}_5^{(1,-1;a)}(B_2,2)$

$$\begin{bmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{210}i}{100} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{10}i}{100} \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{10}i}{100} & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{210}i}{100} & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & -\frac{\sqrt{35}i}{70} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{14}i}{35} & 0 \\
0 & 0 & 0 & 0 & 0 & \frac{\sqrt{35}i}{70} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{210}i}{175} \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{2\sqrt{15}i}{25} \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{2\sqrt{15}i}{25} & 0 & 0 & 0 & 0 & 0 & 0 \\
-\frac{\sqrt{35}i}{70} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{210}i}{175} & 0 & 0 & 0 & 0 & 0 \\
0 & \frac{\sqrt{35}i}{70} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{14}i}{35} & 0 & 0 & 0 & 0
\end{bmatrix}$$

722	symmetry	$\dfrac{x\left(8x^4-40x^2y^2-40x^2z^2+15y^4+30y^2z^2+15z^4\right)}{8}$

continued ...

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Table 9

No.	multipole	matrix

$\mathbb{T}_{5,1}^{(1,-1;a)}(E,1)$

0	0	0	0	0	0	0	$-\frac{\sqrt{6}i}{160}$	0	$\frac{\sqrt{30}i}{160}$	0	$-\frac{7\sqrt{2}i}{160}$	0	$\frac{3\sqrt{42}i}{160}$
0	0	0	0	0	0	$-\frac{\sqrt{14}i}{160}$	0	$\frac{3\sqrt{6}i}{160}$	0	$-\frac{3\sqrt{10}i}{160}$	0	$\frac{7\sqrt{2}i}{160}$	0
0	0	0	0	0	0	0	$\frac{7\sqrt{2}i}{160}$	0	$-\frac{3\sqrt{10}i}{160}$	0	$\frac{3\sqrt{6}i}{160}$	0	$-\frac{\sqrt{14}i}{160}$
0	0	0	0	0	0	$\frac{3\sqrt{42}i}{160}$	0	$-\frac{7\sqrt{2}i}{160}$	0	$\frac{\sqrt{30}i}{160}$	0	$-\frac{\sqrt{6}i}{160}$	0
0	$-\frac{i}{112}$	0	$\frac{\sqrt{2}i}{48}$	0	$-\frac{3\sqrt{5}i}{80}$	$\frac{\sqrt{210}i}{560}$	0	$-\frac{3\sqrt{10}i}{112}$	0	$\frac{\sqrt{6}i}{16}$	0	$-\frac{3\sqrt{30}i}{80}$	0
$-\frac{i}{112}$	0	$\frac{\sqrt{10}i}{112}$	0	$-\frac{\sqrt{5}i}{48}$	0	0	$-\frac{23\sqrt{6}i}{560}$	0	$\frac{13\sqrt{30}i}{560}$	0	$-\frac{3\sqrt{2}i}{80}$	0	$-\frac{3\sqrt{42}i}{80}$
0	$\frac{\sqrt{10}i}{112}$	0	$-\frac{\sqrt{5}i}{56}$	0	$\frac{\sqrt{2}i}{48}$	$-\frac{\sqrt{21}i}{40}$	0	$\frac{33i}{280}$	0	$-\frac{\sqrt{15}i}{280}$	0	$-\frac{3\sqrt{3}i}{40}$	0
$\frac{\sqrt{2}i}{48}$	0	$-\frac{\sqrt{5}i}{56}$	0	$\frac{\sqrt{10}i}{112}$	0	0	$\frac{3\sqrt{3}i}{40}$	0	$\frac{\sqrt{15}i}{280}$	0	$-\frac{33i}{280}$	0	$\frac{\sqrt{21}i}{40}$
0	$-\frac{\sqrt{5}i}{48}$	0	$\frac{\sqrt{10}i}{112}$	0	$-\frac{i}{112}$	$\frac{3\sqrt{42}i}{80}$	0	$\frac{3\sqrt{2}i}{80}$	0	$-\frac{13\sqrt{30}i}{560}$	0	$\frac{23\sqrt{6}i}{560}$	0
$-\frac{3\sqrt{5}i}{80}$	0	$\frac{\sqrt{2}i}{48}$	0	$-\frac{i}{112}$	0	0	$\frac{3\sqrt{30}i}{80}$	0	$-\frac{\sqrt{6}i}{16}$	0	$\frac{3\sqrt{10}i}{112}$	0	$-\frac{\sqrt{210}i}{560}$

No.		
723	symmetry	$\frac{y\left(15x^4-40x^2y^2+30x^2z^2+8y^4-40y^2z^2+15z^4\right)}{8}$

$\mathbb{T}_{5,2}^{(1,-1;a)}(E,1)$

0	0	0	0	0	0	0	$\frac{\sqrt{6}}{160}$	0	$\frac{\sqrt{30}}{160}$	0	$\frac{7\sqrt{2}}{160}$	0	$\frac{3\sqrt{42}}{160}$
0	0	0	0	0	0	$-\frac{\sqrt{14}}{160}$	0	$-\frac{3\sqrt{6}}{160}$	0	$-\frac{3\sqrt{10}}{160}$	0	$-\frac{7\sqrt{2}}{160}$	0
0	0	0	0	0	0	0	$\frac{7\sqrt{2}}{160}$	0	$\frac{3\sqrt{10}}{160}$	0	$\frac{3\sqrt{6}}{160}$	0	$\frac{\sqrt{14}}{160}$
0	0	0	0	0	0	$-\frac{3\sqrt{42}}{160}$	0	$-\frac{7\sqrt{2}}{160}$	0	$-\frac{\sqrt{30}}{160}$	0	$-\frac{\sqrt{6}}{160}$	0
0	$-\frac{1}{112}$	0	$-\frac{\sqrt{2}}{48}$	0	$-\frac{3\sqrt{5}}{80}$	$-\frac{\sqrt{210}}{560}$	0	$-\frac{3\sqrt{10}}{112}$	0	$-\frac{\sqrt{6}}{16}$	0	$-\frac{3\sqrt{30}}{80}$	0
$\frac{1}{112}$	0	$\frac{\sqrt{10}}{112}$	0	$\frac{\sqrt{5}}{48}$	0	0	$\frac{23\sqrt{6}}{560}$	0	$\frac{13\sqrt{30}}{560}$	0	$\frac{3\sqrt{2}}{80}$	0	$-\frac{3\sqrt{42}}{80}$
0	$-\frac{\sqrt{10}}{112}$	0	$-\frac{\sqrt{5}}{56}$	0	$-\frac{\sqrt{2}}{48}$	$-\frac{\sqrt{21}}{40}$	0	$-\frac{33}{280}$	0	$-\frac{\sqrt{15}}{280}$	0	$\frac{3\sqrt{3}}{40}$	0
$\frac{\sqrt{2}}{48}$	0	$\frac{\sqrt{5}}{56}$	0	$\frac{\sqrt{10}}{112}$	0	0	$\frac{3\sqrt{3}}{40}$	0	$-\frac{\sqrt{15}}{280}$	0	$-\frac{33}{280}$	0	$-\frac{\sqrt{21}}{40}$
0	$-\frac{\sqrt{5}}{48}$	0	$-\frac{\sqrt{10}}{112}$	0	$-\frac{1}{112}$	$-\frac{3\sqrt{42}}{80}$	0	$\frac{3\sqrt{2}}{80}$	0	$\frac{13\sqrt{30}}{560}$	0	$\frac{23\sqrt{6}}{560}$	0
$\frac{3\sqrt{5}}{80}$	0	$\frac{\sqrt{2}}{48}$	0	$\frac{1}{112}$	0	0	$-\frac{3\sqrt{30}}{80}$	0	$-\frac{\sqrt{6}}{16}$	0	$-\frac{3\sqrt{10}}{112}$	0	$-\frac{\sqrt{210}}{560}$

No.		
724	symmetry	$\frac{3\sqrt{35}x\left(y^2-2yz-z^2\right)\left(y^2+2yz-z^2\right)}{8}$

continued ...

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Table 9

No.	multipole	matrix

$\mathbb{T}_{5,1}^{(1,-1;a)}(E,2)$

0	0	0	0	0	0	0	$-\frac{\sqrt{210}i}{800}$	0	$\frac{\sqrt{42}i}{160}$	0	$\frac{9\sqrt{70}i}{800}$	0	$\frac{\sqrt{30}i}{160}$
0	0	0	0	0	0	$\frac{9\sqrt{10}i}{800}$	0	$\frac{3\sqrt{210}i}{800}$	0	$-\frac{3\sqrt{14}i}{160}$	0	$-\frac{9\sqrt{70}i}{800}$	0
0	0	0	0	0	0	0	$-\frac{9\sqrt{70}i}{800}$	0	$-\frac{3\sqrt{14}i}{160}$	0	$\frac{3\sqrt{210}i}{800}$	0	$\frac{9\sqrt{10}i}{800}$
0	0	0	0	0	0	$\frac{\sqrt{30}i}{160}$	0	$\frac{9\sqrt{70}i}{800}$	0	$\frac{\sqrt{42}i}{160}$	0	$-\frac{\sqrt{210}i}{800}$	0
0	$-\frac{\sqrt{35}i}{560}$	0	$-\frac{3\sqrt{70}i}{560}$	0	$-\frac{\sqrt{7}i}{112}$	$\frac{\sqrt{6}i}{80}$	0	$-\frac{3\sqrt{14}i}{112}$	0	$-\frac{9\sqrt{210}i}{560}$	0	$-\frac{\sqrt{42}i}{112}$	0
$-\frac{\sqrt{35}i}{560}$	0	$\frac{\sqrt{14}i}{112}$	0	$\frac{3\sqrt{7}i}{112}$	0	0	$-\frac{23\sqrt{210}i}{2800}$	0	$\frac{13\sqrt{42}i}{560}$	0	$\frac{27\sqrt{70}i}{2800}$	0	$-\frac{\sqrt{30}i}{80}$
0	$\frac{\sqrt{14}i}{112}$	0	$-\frac{\sqrt{7}i}{56}$	0	$-\frac{3\sqrt{70}i}{560}$	$\frac{9\sqrt{15}i}{200}$	0	$\frac{33\sqrt{35}i}{1400}$	0	$-\frac{\sqrt{21}i}{280}$	0	$\frac{27\sqrt{105}i}{1400}$	0
$-\frac{3\sqrt{70}i}{560}$	0	$-\frac{\sqrt{7}i}{56}$	0	$\frac{\sqrt{14}i}{112}$	0	0	$-\frac{27\sqrt{105}i}{1400}$	0	$\frac{\sqrt{21}i}{280}$	0	$-\frac{33\sqrt{35}i}{1400}$	0	$-\frac{9\sqrt{15}i}{200}$
0	$\frac{3\sqrt{7}i}{112}$	0	$\frac{\sqrt{14}i}{112}$	0	$-\frac{\sqrt{35}i}{560}$	$\frac{\sqrt{30}i}{80}$	0	$-\frac{27\sqrt{70}i}{2800}$	0	$-\frac{13\sqrt{42}i}{560}$	0	$\frac{23\sqrt{210}i}{2800}$	0
$-\frac{\sqrt{7}i}{112}$	0	$-\frac{3\sqrt{70}i}{560}$	0	$-\frac{\sqrt{35}i}{560}$	0	0	$\frac{\sqrt{42}i}{112}$	0	$\frac{9\sqrt{210}i}{560}$	0	$\frac{3\sqrt{14}i}{112}$	0	$-\frac{\sqrt{6}i}{80}$

No.		
725	symmetry	$\frac{3\sqrt{35}y\left(x^2-2xz-z^2\right)\left(x^2+2xz-z^2\right)}{8}$

$\mathbb{T}_{5,2}^{(1,-1;a)}(E,2)$

0	0	0	0	0	0	0	$\frac{\sqrt{210}}{800}$	0	$\frac{\sqrt{42}}{160}$	0	$-\frac{9\sqrt{70}}{800}$	0	$\frac{\sqrt{30}}{160}$
0	0	0	0	0	0	$\frac{9\sqrt{10}}{800}$	0	$-\frac{3\sqrt{210}}{800}$	0	$-\frac{3\sqrt{14}}{160}$	0	$\frac{9\sqrt{70}}{800}$	0
0	0	0	0	0	0	0	$-\frac{9\sqrt{70}}{800}$	0	$\frac{3\sqrt{14}}{160}$	0	$\frac{3\sqrt{210}}{800}$	0	$-\frac{9\sqrt{10}}{800}$
0	0	0	0	0	0	$-\frac{\sqrt{30}}{160}$	0	$\frac{9\sqrt{70}}{800}$	0	$-\frac{\sqrt{42}}{160}$	0	$-\frac{\sqrt{210}}{800}$	0
0	$-\frac{\sqrt{35}}{560}$	0	$\frac{3\sqrt{70}}{560}$	0	$-\frac{\sqrt{7}}{112}$	$-\frac{\sqrt{6}}{80}$	0	$-\frac{3\sqrt{14}}{112}$	0	$\frac{9\sqrt{210}}{560}$	0	$-\frac{\sqrt{42}}{112}$	0
$\frac{\sqrt{35}}{560}$	0	$\frac{\sqrt{14}}{112}$	0	$-\frac{3\sqrt{7}}{112}$	0	0	$\frac{23\sqrt{210}}{2800}$	0	$\frac{13\sqrt{42}}{560}$	0	$-\frac{27\sqrt{70}}{2800}$	0	$-\frac{\sqrt{30}}{80}$
0	$-\frac{\sqrt{14}}{112}$	0	$-\frac{\sqrt{7}}{56}$	0	$\frac{3\sqrt{70}}{560}$	$\frac{9\sqrt{15}}{200}$	0	$-\frac{33\sqrt{35}}{1400}$	0	$-\frac{\sqrt{21}}{280}$	0	$-\frac{27\sqrt{105}}{1400}$	0
$-\frac{3\sqrt{70}}{560}$	0	$\frac{\sqrt{7}}{56}$	0	$\frac{\sqrt{14}}{112}$	0	0	$-\frac{27\sqrt{105}}{1400}$	0	$-\frac{\sqrt{21}}{280}$	0	$-\frac{33\sqrt{35}}{1400}$	0	$\frac{9\sqrt{15}}{200}$
0	$\frac{3\sqrt{7}}{112}$	0	$-\frac{\sqrt{14}}{112}$	0	$-\frac{\sqrt{35}}{560}$	$-\frac{\sqrt{30}}{80}$	0	$-\frac{27\sqrt{70}}{2800}$	0	$\frac{13\sqrt{42}}{560}$	0	$\frac{23\sqrt{210}}{2800}$	0
$\frac{\sqrt{7}}{112}$	0	$-\frac{3\sqrt{70}}{560}$	0	$\frac{\sqrt{35}}{560}$	0	0	$-\frac{\sqrt{42}}{112}$	0	$\frac{9\sqrt{210}}{560}$	0	$-\frac{3\sqrt{14}}{112}$	0	$-\frac{\sqrt{6}}{80}$

No.		
726	symmetry	$\frac{\sqrt{105}x(y-z)(y+z)\left(2x^2-y^2-z^2\right)}{4}$

continued ...

Table 9

No.	multipole	matrix													

$\mathbb{T}_{5,1}^{(1,-1;a)}(E,3)$

0	0	0	0	0	0	0	$-\frac{\sqrt{70}i}{400}$	0	$\frac{\sqrt{14}i}{80}$	0	$-\frac{\sqrt{210}i}{400}$	0	$-\frac{3\sqrt{10}i}{80}$
0	0	0	0	0	0	$-\frac{\sqrt{30}i}{400}$	0	$\frac{3\sqrt{70}i}{400}$	0	$-\frac{\sqrt{42}i}{80}$	0	$\frac{\sqrt{210}i}{400}$	0
0	0	0	0	0	0	0	$\frac{\sqrt{210}i}{400}$	0	$-\frac{\sqrt{42}i}{80}$	0	$\frac{3\sqrt{70}i}{400}$	0	$-\frac{\sqrt{30}i}{400}$
0	0	0	0	0	0	$-\frac{3\sqrt{10}i}{80}$	0	$-\frac{\sqrt{210}i}{400}$	0	$\frac{\sqrt{14}i}{80}$	0	$-\frac{\sqrt{70}i}{400}$	0
0	$-\frac{\sqrt{105}i}{840}$	0	$\frac{\sqrt{210}i}{840}$	0	$\frac{\sqrt{21}i}{56}$	$\frac{\sqrt{2}i}{40}$	0	$-\frac{\sqrt{42}i}{56}$	0	$\frac{3\sqrt{70}i}{280}$	0	$\frac{3\sqrt{14}i}{56}$	0
$-\frac{\sqrt{105}i}{840}$	0	$\frac{\sqrt{42}i}{168}$	0	$-\frac{\sqrt{21}i}{168}$	0	0	$-\frac{23\sqrt{70}i}{1400}$	0	$\frac{13\sqrt{14}i}{280}$	0	$-\frac{3\sqrt{210}i}{1400}$	0	$\frac{3\sqrt{10}i}{40}$
0	$\frac{\sqrt{42}i}{168}$	0	$-\frac{\sqrt{21}i}{84}$	0	$\frac{\sqrt{210}i}{840}$	$-\frac{3\sqrt{5}i}{100}$	0	$\frac{11\sqrt{105}i}{700}$	0	$-\frac{\sqrt{7}i}{140}$	0	$-\frac{9\sqrt{35}i}{700}$	0
$\frac{\sqrt{210}i}{840}$	0	$-\frac{\sqrt{21}i}{84}$	0	$\frac{\sqrt{42}i}{168}$	0	0	$\frac{9\sqrt{35}i}{700}$	0	$\frac{\sqrt{7}i}{140}$	0	$-\frac{11\sqrt{105}i}{700}$	0	$\frac{3\sqrt{5}i}{100}$
0	$-\frac{\sqrt{21}i}{168}$	0	$\frac{\sqrt{42}i}{168}$	0	$-\frac{\sqrt{105}i}{840}$	$-\frac{3\sqrt{10}i}{40}$	0	$\frac{3\sqrt{210}i}{1400}$	0	$-\frac{13\sqrt{14}i}{280}$	0	$\frac{23\sqrt{70}i}{1400}$	0
$\frac{\sqrt{21}i}{56}$	0	$\frac{\sqrt{210}i}{840}$	0	$-\frac{\sqrt{105}i}{840}$	0	0	$-\frac{3\sqrt{14}i}{56}$	0	$-\frac{3\sqrt{70}i}{280}$	0	$\frac{\sqrt{42}i}{56}$	0	$-\frac{\sqrt{2}i}{40}$

727	symmetry	$-\frac{\sqrt{105}y(x-z)(x+z)\left(x^2-2y^2+z^2\right)}{4}$

$\mathbb{T}_{5,2}^{(1,-1;a)}(E,3)$

0	0	0	0	0	0	0	$\frac{\sqrt{70}}{400}$	0	$\frac{\sqrt{14}}{80}$	0	$\frac{\sqrt{210}}{400}$	0	$-\frac{3\sqrt{10}}{80}$
0	0	0	0	0	0	$-\frac{\sqrt{30}}{400}$	0	$-\frac{3\sqrt{70}}{400}$	0	$-\frac{\sqrt{42}}{80}$	0	$-\frac{\sqrt{210}}{400}$	0
0	0	0	0	0	0	0	$\frac{\sqrt{210}}{400}$	0	$\frac{\sqrt{42}}{80}$	0	$\frac{3\sqrt{70}}{400}$	0	$\frac{\sqrt{30}}{400}$
0	0	0	0	0	0	$\frac{3\sqrt{10}}{80}$	0	$-\frac{\sqrt{210}}{400}$	0	$-\frac{\sqrt{14}}{80}$	0	$-\frac{\sqrt{70}}{400}$	0
0	$-\frac{\sqrt{105}}{840}$	0	$-\frac{\sqrt{210}}{840}$	0	$\frac{\sqrt{21}}{56}$	$-\frac{\sqrt{2}}{40}$	0	$-\frac{\sqrt{42}}{56}$	0	$-\frac{3\sqrt{70}}{280}$	0	$\frac{3\sqrt{14}}{56}$	0
$\frac{\sqrt{105}}{840}$	0	$\frac{\sqrt{42}}{168}$	0	$\frac{\sqrt{21}}{168}$	0	0	$\frac{23\sqrt{70}}{1400}$	0	$\frac{13\sqrt{14}}{280}$	0	$\frac{3\sqrt{210}}{1400}$	0	$\frac{3\sqrt{10}}{40}$
0	$-\frac{\sqrt{42}}{168}$	0	$-\frac{\sqrt{21}}{84}$	0	$-\frac{\sqrt{210}}{840}$	$-\frac{3\sqrt{5}}{100}$	0	$-\frac{11\sqrt{105}}{700}$	0	$-\frac{\sqrt{7}}{140}$	0	$\frac{9\sqrt{35}}{700}$	0
$\frac{\sqrt{210}}{840}$	0	$\frac{\sqrt{21}}{84}$	0	$\frac{\sqrt{42}}{168}$	0	0	$\frac{9\sqrt{35}}{700}$	0	$-\frac{\sqrt{7}}{140}$	0	$-\frac{11\sqrt{105}}{700}$	0	$-\frac{3\sqrt{5}}{100}$
0	$-\frac{\sqrt{21}}{168}$	0	$-\frac{\sqrt{42}}{168}$	0	$-\frac{\sqrt{105}}{840}$	$\frac{3\sqrt{10}}{40}$	0	$\frac{3\sqrt{210}}{1400}$	0	$\frac{13\sqrt{14}}{280}$	0	$\frac{23\sqrt{70}}{1400}$	0
$-\frac{\sqrt{21}}{56}$	0	$\frac{\sqrt{210}}{840}$	0	$\frac{\sqrt{105}}{840}$	0	0	$\frac{3\sqrt{14}}{56}$	0	$-\frac{3\sqrt{70}}{280}$	0	$-\frac{\sqrt{42}}{56}$	0	$-\frac{\sqrt{2}}{40}$

728	symmetry	z

continued ...

Table 9

No.	multipole	matrix

$\mathbb{T}_1^{(1,0;a)}(B_2)$

$$\begin{pmatrix}
0 & \frac{\sqrt{2}i}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & \frac{\sqrt{3}i}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & \frac{\sqrt{3}i}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & \frac{\sqrt{2}i}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
-\frac{3\sqrt{2}i}{14} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{14} & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & -\frac{9\sqrt{2}i}{70} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{14} & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & -\frac{3\sqrt{2}i}{70} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{14} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & \frac{3\sqrt{2}i}{70} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{14} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & \frac{9\sqrt{2}i}{70} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{14} & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{2}i}{14} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{14} & 0
\end{pmatrix}$$

729	symmetry	x

$\mathbb{T}_{1,1}^{(1,0;a)}(E)$

$$\begin{bmatrix}
-\frac{\sqrt{10}i}{20} & 0 & \frac{i}{20} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & -\frac{\sqrt{6}i}{20} & 0 & \frac{\sqrt{3}i}{20} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & -\frac{\sqrt{3}i}{20} & 0 & \frac{\sqrt{6}i}{20} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & -\frac{i}{20} & 0 & \frac{\sqrt{10}i}{20} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & -\frac{3\sqrt{10}i}{70} & 0 & 0 & 0 & 0 & \frac{\sqrt{21}i}{28} & 0 & -\frac{i}{28} & 0 & 0 & 0 & 0 & 0 \\
-\frac{3\sqrt{10}i}{70} & 0 & -\frac{6i}{35} & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{28} & 0 & -\frac{\sqrt{3}i}{28} & 0 & 0 & 0 & 0 \\
0 & -\frac{6i}{35} & 0 & -\frac{9\sqrt{2}i}{70} & 0 & 0 & 0 & 0 & \frac{\sqrt{10}i}{28} & 0 & -\frac{\sqrt{6}i}{28} & 0 & 0 & 0 \\
0 & 0 & -\frac{9\sqrt{2}i}{70} & 0 & -\frac{6i}{35} & 0 & 0 & 0 & 0 & \frac{\sqrt{6}i}{28} & 0 & -\frac{\sqrt{10}i}{28} & 0 & 0 \\
0 & 0 & 0 & -\frac{6i}{35} & 0 & -\frac{3\sqrt{10}i}{70} & 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{28} & 0 & -\frac{\sqrt{15}i}{28} & 0 \\
0 & 0 & 0 & 0 & -\frac{3\sqrt{10}i}{70} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{i}{28} & 0 & -\frac{\sqrt{21}i}{28}
\end{bmatrix}$$

730	symmetry	y

Table 9

No.	multipole	matrix

$\mathbb{T}_{1,2}^{(1,0;a)}(E)$

$$\begin{pmatrix}
\frac{\sqrt{10}}{20} & 0 & \frac{1}{20} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & \frac{\sqrt{6}}{20} & 0 & \frac{\sqrt{3}}{20} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & \frac{\sqrt{3}}{20} & 0 & \frac{\sqrt{6}}{20} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & \frac{1}{20} & 0 & \frac{\sqrt{10}}{20} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & -\frac{3\sqrt{10}}{70} & 0 & 0 & 0 & 0 & -\frac{\sqrt{21}}{28} & 0 & -\frac{1}{28} & 0 & 0 & 0 & 0 & 0 \\
\frac{3\sqrt{10}}{70} & 0 & -\frac{6}{35} & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{28} & 0 & -\frac{\sqrt{3}}{28} & 0 & 0 & 0 & 0 \\
0 & \frac{6}{35} & 0 & -\frac{9\sqrt{2}}{70} & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}}{28} & 0 & -\frac{\sqrt{6}}{28} & 0 & 0 & 0 \\
0 & 0 & \frac{9\sqrt{2}}{70} & 0 & -\frac{6}{35} & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}}{28} & 0 & -\frac{\sqrt{10}}{28} & 0 & 0 \\
0 & 0 & 0 & \frac{6}{35} & 0 & -\frac{3\sqrt{10}}{70} & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{28} & 0 & -\frac{\sqrt{15}}{28} & 0 \\
0 & 0 & 0 & 0 & \frac{3\sqrt{10}}{70} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{1}{28} & 0 & -\frac{\sqrt{21}}{28}
\end{pmatrix}$$

731	symmetry	$\sqrt{15}xyz$

$\mathbb{T}_{3}^{(1,0;a)}(A_1)$

$$\begin{pmatrix}
0 & 0 & 0 & -\frac{\sqrt{210}}{280} & 0 & 0 & -\frac{\sqrt{2}}{8} & 0 & 0 & 0 & \frac{\sqrt{70}}{56} & 0 & 0 & 0 \\
-\frac{\sqrt{7}}{56} & 0 & 0 & 0 & -\frac{\sqrt{35}}{280} & 0 & 0 & \frac{\sqrt{42}}{56} & 0 & 0 & 0 & \frac{3\sqrt{14}}{56} & 0 & 0 \\
0 & \frac{\sqrt{35}}{280} & 0 & 0 & 0 & \frac{\sqrt{7}}{56} & 0 & 0 & \frac{3\sqrt{14}}{56} & 0 & 0 & 0 & \frac{\sqrt{42}}{56} & 0 \\
0 & 0 & \frac{\sqrt{210}}{280} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{70}}{56} & 0 & 0 & 0 & -\frac{\sqrt{2}}{8} \\
0 & 0 & \frac{\sqrt{42}}{28} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{14}}{84} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & \frac{\sqrt{210}}{140} & 0 & 0 & \frac{\sqrt{2}}{24} & 0 & 0 & 0 & \frac{\sqrt{70}}{168} & 0 & 0 & 0 \\
-\frac{\sqrt{42}}{28} & 0 & 0 & 0 & -\frac{\sqrt{210}}{140} & 0 & 0 & \frac{\sqrt{7}}{168} & 0 & 0 & 0 & \frac{\sqrt{21}}{168} & 0 & 0 \\
0 & -\frac{\sqrt{210}}{140} & 0 & 0 & 0 & -\frac{\sqrt{42}}{28} & 0 & 0 & -\frac{\sqrt{21}}{168} & 0 & 0 & 0 & -\frac{\sqrt{7}}{168} & 0 \\
0 & 0 & \frac{\sqrt{210}}{140} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}}{168} & 0 & 0 & 0 & -\frac{\sqrt{2}}{24} \\
0 & 0 & 0 & \frac{\sqrt{42}}{28} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{14}}{84} & 0 & 0 & 0
\end{pmatrix}$$

732	symmetry	$\frac{\sqrt{15}z(x-y)(x+y)}{2}$

No.	multipole	matrix
	$\mathbb{T}_3^{(1,0;a)}(A_2)$	$$\begin{bmatrix} 0 & 0 & 0 & -\frac{\sqrt{210}i}{280} & 0 & 0 & \frac{\sqrt{2}i}{8} & 0 & 0 & 0 & \frac{\sqrt{70}i}{56} & 0 & 0 & 0 \\ \frac{\sqrt{7}i}{56} & 0 & 0 & 0 & -\frac{\sqrt{35}i}{280} & 0 & 0 & -\frac{\sqrt{42}i}{56} & 0 & 0 & 0 & \frac{3\sqrt{14}i}{56} & 0 & 0 \\ 0 & -\frac{\sqrt{35}i}{280} & 0 & 0 & 0 & \frac{\sqrt{7}i}{56} & 0 & 0 & -\frac{3\sqrt{14}i}{56} & 0 & 0 & 0 & \frac{\sqrt{42}i}{56} & 0 \\ 0 & 0 & -\frac{\sqrt{210}i}{280} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}i}{56} & 0 & 0 & 0 & -\frac{\sqrt{2}i}{8} \\ 0 & 0 & \frac{\sqrt{42}i}{28} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{14}i}{84} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{210}i}{140} & 0 & 0 & -\frac{\sqrt{2}i}{24} & 0 & 0 & 0 & \frac{\sqrt{70}i}{168} & 0 & 0 & 0 \\ \frac{\sqrt{42}i}{28} & 0 & 0 & 0 & -\frac{\sqrt{210}i}{140} & 0 & 0 & -\frac{\sqrt{7}i}{168} & 0 & 0 & 0 & \frac{\sqrt{21}i}{168} & 0 & 0 \\ 0 & \frac{\sqrt{210}i}{140} & 0 & 0 & 0 & -\frac{\sqrt{42}i}{28} & 0 & 0 & \frac{\sqrt{21}i}{168} & 0 & 0 & 0 & -\frac{\sqrt{7}i}{168} & 0 \\ 0 & 0 & -\frac{\sqrt{210}i}{140} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{70}i}{168} & 0 & 0 & 0 & -\frac{\sqrt{2}i}{24} \\ 0 & 0 & 0 & -\frac{\sqrt{42}i}{28} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{14}i}{84} & 0 & 0 & 0 \end{bmatrix}$$
733	symmetry	$-\frac{z\left(3x^2+3y^2-2z^2\right)}{2}$
	$\mathbb{T}_3^{(1,0;a)}(B_2)$	$$\begin{bmatrix} 0 & -\frac{3\sqrt{7}i}{140} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{70}i}{28} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{42}i}{140} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{14}i}{28} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{42}i}{140} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{14}i}{28} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{3\sqrt{7}i}{140} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}i}{28} & 0 & 0 \\ \frac{\sqrt{7}i}{14} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{42}i}{84} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{7}i}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{2\sqrt{7}i}{35} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{21}i}{84} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{2\sqrt{7}i}{35} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{21}i}{84} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{7}i}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}i}{14} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{42}i}{84} & 0 \end{bmatrix}$$
734	symmetry	$\frac{x\left(2x^2-3y^2-3z^2\right)}{2}$

Table 9

continued …

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Table 9

No.	multipole	matrix
	$\mathbb{T}_{3,1}^{(1,0;a)}(E,1)$	(matrix below)

$$
\begin{bmatrix}
-\frac{3\sqrt{35}i}{1120} & 0 & \frac{9\sqrt{14}i}{1120} & 0 & -\frac{3\sqrt{7}i}{224} & 0 & 0 & \frac{\sqrt{210}i}{112} & 0 & -\frac{\sqrt{42}i}{56} & 0 & \frac{\sqrt{70}i}{112} & 0 & 0 \\
0 & \frac{\sqrt{21}i}{160} & 0 & -\frac{\sqrt{42}i}{1120} & 0 & -\frac{\sqrt{105}i}{224} & \frac{\sqrt{10}i}{16} & 0 & 0 & 0 & -\frac{3\sqrt{14}i}{112} & 0 & \frac{\sqrt{70}i}{56} & 0 \\
\frac{\sqrt{105}i}{224} & 0 & \frac{\sqrt{42}i}{1120} & 0 & -\frac{\sqrt{21}i}{160} & 0 & 0 & \frac{\sqrt{70}i}{56} & 0 & -\frac{3\sqrt{14}i}{112} & 0 & 0 & 0 & \frac{\sqrt{10}i}{16} \\
0 & \frac{3\sqrt{7}i}{224} & 0 & -\frac{9\sqrt{14}i}{1120} & 0 & \frac{3\sqrt{35}i}{1120} & 0 & 0 & \frac{\sqrt{70}i}{112} & 0 & -\frac{\sqrt{42}i}{56} & 0 & \frac{\sqrt{210}i}{112} & 0 \\
0 & -\frac{3\sqrt{35}i}{140} & 0 & \frac{\sqrt{70}i}{56} & 0 & 0 & \frac{\sqrt{6}i}{96} & 0 & -\frac{\sqrt{14}i}{112} & 0 & \frac{\sqrt{210}i}{672} & 0 & 0 & 0 \\
-\frac{3\sqrt{35}i}{140} & 0 & \frac{3\sqrt{14}i}{280} & 0 & \frac{\sqrt{7}i}{14} & 0 & 0 & -\frac{\sqrt{210}i}{672} & 0 & -\frac{\sqrt{42}i}{336} & 0 & \frac{\sqrt{70}i}{224} & 0 & 0 \\
0 & \frac{3\sqrt{14}i}{280} & 0 & \frac{3\sqrt{7}i}{70} & 0 & \frac{\sqrt{70}i}{56} & -\frac{\sqrt{15}i}{96} & 0 & -\frac{\sqrt{35}i}{224} & 0 & \frac{\sqrt{21}i}{672} & 0 & \frac{\sqrt{105}i}{224} & 0 \\
\frac{\sqrt{70}i}{56} & 0 & \frac{3\sqrt{7}i}{70} & 0 & \frac{3\sqrt{14}i}{280} & 0 & 0 & -\frac{\sqrt{105}i}{224} & 0 & -\frac{\sqrt{21}i}{672} & 0 & \frac{\sqrt{35}i}{224} & 0 & \frac{\sqrt{15}i}{96} \\
0 & \frac{\sqrt{7}i}{14} & 0 & \frac{3\sqrt{14}i}{280} & 0 & -\frac{3\sqrt{35}i}{140} & 0 & 0 & -\frac{\sqrt{70}i}{224} & 0 & \frac{\sqrt{42}i}{336} & 0 & \frac{\sqrt{210}i}{672} & 0 \\
0 & 0 & \frac{\sqrt{70}i}{56} & 0 & -\frac{3\sqrt{35}i}{140} & 0 & 0 & 0 & 0 & -\frac{\sqrt{210}i}{672} & 0 & \frac{\sqrt{14}i}{112} & 0 & -\frac{\sqrt{6}i}{96}
\end{bmatrix}
$$

No.	multipole	matrix
735	symmetry	$-\dfrac{y\left(3x^2-2y^2+3z^2\right)}{2}$

No.	multipole	matrix
	$\mathbb{T}_{3,2}^{(1,0;a)}(E,1)$	(matrix below)

$$
\begin{bmatrix}
\frac{3\sqrt{35}}{1120} & 0 & \frac{9\sqrt{14}}{1120} & 0 & \frac{3\sqrt{7}}{224} & 0 & 0 & -\frac{\sqrt{210}}{112} & 0 & -\frac{\sqrt{42}}{56} & 0 & -\frac{\sqrt{70}}{112} & 0 & 0 \\
0 & -\frac{\sqrt{21}}{160} & 0 & -\frac{\sqrt{42}}{1120} & 0 & \frac{\sqrt{105}}{224} & \frac{\sqrt{10}}{16} & 0 & 0 & 0 & -\frac{3\sqrt{14}}{112} & 0 & -\frac{\sqrt{70}}{56} & 0 \\
\frac{\sqrt{105}}{224} & 0 & -\frac{\sqrt{42}}{1120} & 0 & -\frac{\sqrt{21}}{160} & 0 & 0 & \frac{\sqrt{70}}{56} & 0 & \frac{3\sqrt{14}}{112} & 0 & 0 & 0 & -\frac{\sqrt{10}}{16} \\
0 & \frac{3\sqrt{7}}{224} & 0 & \frac{9\sqrt{14}}{1120} & 0 & \frac{3\sqrt{35}}{1120} & 0 & 0 & \frac{\sqrt{70}}{112} & 0 & \frac{\sqrt{42}}{56} & 0 & \frac{\sqrt{210}}{112} & 0 \\
0 & -\frac{3\sqrt{35}}{140} & 0 & -\frac{\sqrt{70}}{56} & 0 & 0 & -\frac{\sqrt{6}}{96} & 0 & -\frac{\sqrt{14}}{112} & 0 & -\frac{\sqrt{210}}{672} & 0 & 0 & 0 \\
\frac{3\sqrt{35}}{140} & 0 & \frac{3\sqrt{14}}{280} & 0 & -\frac{\sqrt{7}}{14} & 0 & 0 & \frac{\sqrt{210}}{672} & 0 & -\frac{\sqrt{42}}{336} & 0 & -\frac{\sqrt{70}}{224} & 0 & 0 \\
0 & -\frac{3\sqrt{14}}{280} & 0 & \frac{3\sqrt{7}}{70} & 0 & -\frac{\sqrt{70}}{56} & -\frac{\sqrt{15}}{96} & 0 & \frac{\sqrt{35}}{224} & 0 & \frac{\sqrt{21}}{672} & 0 & -\frac{\sqrt{105}}{224} & 0 \\
\frac{\sqrt{70}}{56} & 0 & -\frac{3\sqrt{7}}{70} & 0 & \frac{3\sqrt{14}}{280} & 0 & 0 & -\frac{\sqrt{105}}{224} & 0 & \frac{\sqrt{21}}{672} & 0 & \frac{\sqrt{35}}{224} & 0 & -\frac{\sqrt{15}}{96} \\
0 & \frac{\sqrt{7}}{14} & 0 & -\frac{3\sqrt{14}}{280} & 0 & -\frac{3\sqrt{35}}{140} & 0 & 0 & -\frac{\sqrt{70}}{224} & 0 & -\frac{\sqrt{42}}{336} & 0 & \frac{\sqrt{210}}{672} & 0 \\
0 & 0 & \frac{\sqrt{70}}{56} & 0 & \frac{3\sqrt{35}}{140} & 0 & 0 & 0 & 0 & -\frac{\sqrt{210}}{672} & 0 & -\frac{\sqrt{14}}{112} & 0 & -\frac{\sqrt{6}}{96}
\end{bmatrix}
$$

No.	multipole	matrix
736	symmetry	$\dfrac{\sqrt{15}\,x(y-z)(y+z)}{2}$

Table 9

No.	multipole	matrix

$$\mathbb{T}_{3,1}^{(1,0;a)}(E,2):$$

$$\begin{bmatrix}
-\frac{\sqrt{21}i}{224} & 0 & \frac{3\sqrt{210}i}{1120} & 0 & \frac{3\sqrt{105}i}{1120} & 0 & 0 & \frac{5\sqrt{14}i}{112} & 0 & -\frac{\sqrt{70}i}{56} & 0 & -\frac{\sqrt{42}i}{112} & 0 & 0 \\
0 & \frac{\sqrt{35}i}{160} & 0 & -\frac{\sqrt{70}i}{1120} & 0 & \frac{3\sqrt{7}i}{224} & -\frac{\sqrt{6}i}{16} & 0 & 0 & 0 & -\frac{\sqrt{210}i}{112} & 0 & -\frac{\sqrt{42}i}{56} & 0 \\
-\frac{3\sqrt{7}i}{224} & 0 & \frac{\sqrt{70}i}{1120} & 0 & -\frac{\sqrt{35}i}{160} & 0 & 0 & -\frac{\sqrt{42}i}{56} & 0 & -\frac{\sqrt{210}i}{112} & 0 & 0 & 0 & -\frac{\sqrt{6}i}{16} \\
0 & -\frac{3\sqrt{105}i}{1120} & 0 & -\frac{3\sqrt{210}i}{1120} & 0 & \frac{\sqrt{21}i}{224} & 0 & 0 & -\frac{\sqrt{42}i}{112} & 0 & -\frac{\sqrt{70}i}{56} & 0 & \frac{5\sqrt{14}i}{112} & 0 \\
0 & -\frac{\sqrt{21}i}{28} & 0 & -\frac{\sqrt{42}i}{56} & 0 & 0 & \frac{\sqrt{10}i}{96} & 0 & -\frac{\sqrt{210}i}{336} & 0 & -\frac{\sqrt{14}i}{224} & 0 & 0 & 0 \\
-\frac{\sqrt{21}i}{28} & 0 & \frac{\sqrt{210}i}{280} & 0 & -\frac{\sqrt{105}i}{70} & 0 & 0 & -\frac{5\sqrt{14}i}{672} & 0 & -\frac{\sqrt{70}i}{336} & 0 & -\frac{\sqrt{42}i}{224} & 0 & 0 \\
0 & \frac{\sqrt{210}i}{280} & 0 & \frac{\sqrt{105}i}{70} & 0 & -\frac{\sqrt{42}i}{56} & \frac{i}{32} & 0 & -\frac{5\sqrt{21}i}{672} & 0 & \frac{\sqrt{35}i}{672} & 0 & -\frac{3\sqrt{7}i}{224} & 0 \\
-\frac{\sqrt{42}i}{56} & 0 & \frac{\sqrt{105}i}{70} & 0 & \frac{\sqrt{210}i}{280} & 0 & 0 & \frac{3\sqrt{7}i}{224} & 0 & -\frac{\sqrt{35}i}{672} & 0 & \frac{5\sqrt{21}i}{672} & 0 & -\frac{i}{32} \\
0 & -\frac{\sqrt{105}i}{70} & 0 & \frac{\sqrt{210}i}{280} & 0 & -\frac{\sqrt{21}i}{28} & 0 & 0 & \frac{\sqrt{42}i}{224} & 0 & \frac{\sqrt{70}i}{336} & 0 & \frac{5\sqrt{14}i}{672} & 0 \\
0 & 0 & -\frac{\sqrt{42}i}{56} & 0 & -\frac{\sqrt{21}i}{28} & 0 & 0 & 0 & 0 & \frac{\sqrt{14}i}{224} & 0 & \frac{\sqrt{210}i}{336} & 0 & -\frac{\sqrt{10}i}{96}
\end{bmatrix}$$

737	symmetry	$\dfrac{\sqrt{15}\,y(x-z)(x+z)}{2}$

$$\mathbb{T}_{3,2}^{(1,0;a)}(E,2):$$

$$\begin{bmatrix}
\frac{\sqrt{21}}{224} & 0 & \frac{3\sqrt{210}}{1120} & 0 & -\frac{3\sqrt{105}}{1120} & 0 & 0 & -\frac{5\sqrt{14}}{112} & 0 & -\frac{\sqrt{70}}{56} & 0 & \frac{\sqrt{42}}{112} & 0 & 0 \\
0 & -\frac{\sqrt{35}}{160} & 0 & -\frac{\sqrt{70}}{1120} & 0 & -\frac{3\sqrt{7}}{224} & -\frac{\sqrt{6}}{16} & 0 & 0 & 0 & -\frac{\sqrt{210}}{112} & 0 & \frac{\sqrt{42}}{56} & 0 \\
-\frac{3\sqrt{7}}{224} & 0 & -\frac{\sqrt{70}}{1120} & 0 & -\frac{\sqrt{35}}{160} & 0 & 0 & -\frac{\sqrt{42}}{56} & 0 & \frac{\sqrt{210}}{112} & 0 & 0 & 0 & \frac{\sqrt{6}}{16} \\
0 & -\frac{3\sqrt{105}}{1120} & 0 & \frac{3\sqrt{210}}{1120} & 0 & \frac{\sqrt{21}}{224} & 0 & 0 & -\frac{\sqrt{42}}{112} & 0 & \frac{\sqrt{70}}{56} & 0 & \frac{5\sqrt{14}}{112} & 0 \\
0 & -\frac{\sqrt{21}}{28} & 0 & \frac{\sqrt{42}}{56} & 0 & 0 & -\frac{\sqrt{10}}{96} & 0 & -\frac{\sqrt{210}}{336} & 0 & \frac{\sqrt{14}}{224} & 0 & 0 & 0 \\
\frac{\sqrt{21}}{28} & 0 & \frac{\sqrt{210}}{280} & 0 & \frac{\sqrt{105}}{70} & 0 & 0 & \frac{5\sqrt{14}}{672} & 0 & -\frac{\sqrt{70}}{336} & 0 & \frac{\sqrt{42}}{224} & 0 & 0 \\
0 & -\frac{\sqrt{210}}{280} & 0 & \frac{\sqrt{105}}{70} & 0 & \frac{\sqrt{42}}{56} & \frac{1}{32} & 0 & \frac{5\sqrt{21}}{672} & 0 & \frac{\sqrt{35}}{672} & 0 & \frac{3\sqrt{7}}{224} & 0 \\
-\frac{\sqrt{42}}{56} & 0 & -\frac{\sqrt{105}}{70} & 0 & \frac{\sqrt{210}}{280} & 0 & 0 & \frac{3\sqrt{7}}{224} & 0 & \frac{\sqrt{35}}{672} & 0 & \frac{5\sqrt{21}}{672} & 0 & \frac{1}{32} \\
0 & -\frac{\sqrt{105}}{70} & 0 & -\frac{\sqrt{210}}{280} & 0 & -\frac{\sqrt{21}}{28} & 0 & 0 & \frac{\sqrt{42}}{224} & 0 & -\frac{\sqrt{70}}{336} & 0 & \frac{5\sqrt{14}}{672} & 0 \\
0 & 0 & -\frac{\sqrt{42}}{56} & 0 & \frac{\sqrt{21}}{28} & 0 & 0 & 0 & 0 & \frac{\sqrt{14}}{224} & 0 & -\frac{\sqrt{210}}{336} & 0 & -\frac{\sqrt{10}}{96}
\end{bmatrix}$$

738	symmetry	$\dfrac{\sqrt{105}\,xyz\left(x^2+y^2-2z^2\right)}{2}$

continued ...

Table 9

No.	multipole	matrix

$\mathbb{T}_5^{(1,0;a)}(A_1)$

$$\begin{bmatrix}
0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}}{100} & 0 & 0 & 0 & \frac{\sqrt{14}}{20} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{210}}{100} & 0 & 0 & 0 & -\frac{3\sqrt{70}}{100} & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{70}}{100} & 0 & 0 & 0 & \frac{\sqrt{210}}{100} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{14}}{20} & 0 & 0 & 0 & -\frac{\sqrt{10}}{100} \\
0 & 0 & \frac{\sqrt{210}}{140} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{70}}{420} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & -\frac{\sqrt{42}}{28} & 0 & 0 & \frac{\sqrt{10}}{300} & 0 & 0 & 0 & -\frac{\sqrt{14}}{210} & 0 & 0 & 0 \\
-\frac{\sqrt{210}}{140} & 0 & 0 & 0 & \frac{\sqrt{42}}{28} & 0 & 0 & -\frac{2\sqrt{35}}{525} & 0 & 0 & 0 & -\frac{\sqrt{105}}{1050} & 0 & 0 \\
0 & \frac{\sqrt{42}}{28} & 0 & 0 & 0 & -\frac{\sqrt{210}}{140} & 0 & 0 & \frac{\sqrt{105}}{1050} & 0 & 0 & 0 & \frac{2\sqrt{35}}{525} & 0 \\
0 & 0 & -\frac{\sqrt{42}}{28} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{14}}{210} & 0 & 0 & 0 & -\frac{\sqrt{10}}{300} \\
0 & 0 & 0 & \frac{\sqrt{210}}{140} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}}{420} & 0 & 0 & 0
\end{bmatrix}$$

739	symmetry	$-\frac{\sqrt{105}z(x-y)(x+y)\left(x^2+y^2-2z^2\right)}{4}$

$\mathbb{T}_5^{(1,0;a)}(A_2)$

$$\begin{bmatrix}
0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}i}{100} & 0 & 0 & 0 & -\frac{\sqrt{14}i}{20} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{210}i}{100} & 0 & 0 & 0 & \frac{3\sqrt{70}i}{100} & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{70}i}{100} & 0 & 0 & 0 & -\frac{\sqrt{210}i}{100} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{14}i}{20} & 0 & 0 & 0 & \frac{\sqrt{10}i}{100} \\
0 & 0 & -\frac{\sqrt{210}i}{140} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}i}{420} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & \frac{\sqrt{42}i}{28} & 0 & 0 & \frac{\sqrt{10}i}{300} & 0 & 0 & 0 & \frac{\sqrt{14}i}{210} & 0 & 0 & 0 \\
-\frac{\sqrt{210}i}{140} & 0 & 0 & 0 & -\frac{\sqrt{42}i}{28} & 0 & 0 & -\frac{2\sqrt{35}i}{525} & 0 & 0 & 0 & \frac{\sqrt{105}i}{1050} & 0 & 0 \\
0 & \frac{\sqrt{42}i}{28} & 0 & 0 & 0 & \frac{\sqrt{210}i}{140} & 0 & 0 & \frac{\sqrt{105}i}{1050} & 0 & 0 & 0 & -\frac{2\sqrt{35}i}{525} & 0 \\
0 & 0 & -\frac{\sqrt{42}i}{28} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{14}i}{210} & 0 & 0 & 0 & \frac{\sqrt{10}i}{300} \\
0 & 0 & 0 & \frac{\sqrt{210}i}{140} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}i}{420} & 0 & 0 & 0
\end{bmatrix}$$

740	symmetry	$\frac{3\sqrt{35}xyz(x-y)(x+y)}{2}$

continued …

Table 9

No.	multipole	matrix

$\mathbb{T}_5^{(1,0;a)}(B_1)$

$$\begin{bmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{210}}{50} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{10}}{50} \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{10}}{50} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{210}}{50} & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & -\frac{3\sqrt{35}}{70} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{14}}{140} & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{35}}{70} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{210}}{2100} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{150} \\
0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{150} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
\frac{3\sqrt{35}}{70} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{210}}{2100} & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & -\frac{3\sqrt{35}}{70} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{14}}{140} & 0 & 0 & 0 & 0 & 0
\end{bmatrix}$$

741	symmetry	$\frac{z\left(15x^4+30x^2y^2-40x^2z^2+15y^4-40y^2z^2+8z^4\right)}{8}$

$\mathbb{T}_5^{(1,0;a)}(B_2,1)$

$$\begin{bmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}i}{10} & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}i}{10} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}i}{10} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2}i}{10} & 0 & 0 \\
-\frac{\sqrt{5}i}{70} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}i}{420} & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & \frac{\sqrt{5}i}{14} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{2}i}{140} & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & -\frac{\sqrt{5}i}{7} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{210} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & \frac{\sqrt{5}i}{7} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{210} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{14} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{2}i}{140} & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & \frac{\sqrt{5}i}{70} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}i}{420} & 0
\end{bmatrix}$$

742	symmetry	$\frac{3\sqrt{35}z\left(x^2-2xy-y^2\right)\left(x^2+2xy-y^2\right)}{8}$

Table 9

No.	multipole	matrix

$\mathbb{T}_5^{(1,0;a)}(B_2,2)$

$$\begin{pmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{210}i}{50} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{10}i}{50} \\
0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{10}i}{50} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{210}i}{50} & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & -\frac{3\sqrt{35}i}{70} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{14}i}{140} & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{35}i}{70} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{210}i}{2100} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{150} \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{150} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
-\frac{3\sqrt{35}i}{70} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{210}i}{2100} & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & \frac{3\sqrt{35}i}{70} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{14}i}{140} & 0 & 0 & 0 & 0 & 0
\end{pmatrix}$$

| 743 | symmetry | $\dfrac{x\left(8x^4-40x^2y^2-40x^2z^2+15y^4+30y^2z^2+15z^4\right)}{8}$ |

$\mathbb{T}_{5,1}^{(1,0;a)}(E,1)$

$$\begin{pmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}i}{80} & 0 & -\frac{\sqrt{30}i}{80} & 0 & \frac{7\sqrt{2}i}{80} & 0 & -\frac{3\sqrt{42}i}{80} \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{14}i}{80} & 0 & -\frac{3\sqrt{6}i}{80} & 0 & \frac{3\sqrt{10}i}{80} & 0 & -\frac{7\sqrt{2}i}{80} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{7\sqrt{2}i}{80} & 0 & \frac{3\sqrt{10}i}{80} & 0 & -\frac{3\sqrt{6}i}{80} & 0 & \frac{\sqrt{14}i}{80} \\
0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{42}i}{80} & 0 & \frac{7\sqrt{2}i}{80} & 0 & -\frac{\sqrt{30}i}{80} & 0 & \frac{\sqrt{6}i}{80} & 0 \\
0 & -\frac{3i}{112} & 0 & \frac{\sqrt{2}i}{16} & 0 & -\frac{9\sqrt{5}i}{80} & \frac{\sqrt{210}i}{6720} & 0 & -\frac{\sqrt{10}i}{448} & 0 & \frac{\sqrt{6}i}{192} & 0 & -\frac{\sqrt{30}i}{320} & 0 \\
-\frac{3i}{112} & 0 & \frac{3\sqrt{10}i}{112} & 0 & -\frac{\sqrt{5}i}{16} & 0 & 0 & -\frac{23\sqrt{6}i}{6720} & 0 & \frac{13\sqrt{30}i}{6720} & 0 & -\frac{\sqrt{2}i}{320} & 0 & -\frac{\sqrt{42}i}{320} \\
0 & \frac{3\sqrt{10}i}{112} & 0 & -\frac{3\sqrt{5}i}{56} & 0 & \frac{\sqrt{2}i}{16} & -\frac{\sqrt{21}i}{480} & 0 & \frac{11i}{1120} & 0 & -\frac{\sqrt{15}i}{3360} & 0 & -\frac{\sqrt{3}i}{160} & 0 \\
\frac{\sqrt{2}i}{16} & 0 & -\frac{3\sqrt{5}i}{56} & 0 & \frac{3\sqrt{10}i}{112} & 0 & 0 & \frac{\sqrt{3}i}{160} & 0 & \frac{\sqrt{15}i}{3360} & 0 & -\frac{11i}{1120} & 0 & \frac{\sqrt{21}i}{480} \\
0 & -\frac{\sqrt{5}i}{16} & 0 & \frac{3\sqrt{10}i}{112} & 0 & -\frac{3i}{112} & \frac{\sqrt{42}i}{320} & 0 & \frac{\sqrt{2}i}{320} & 0 & -\frac{13\sqrt{30}i}{6720} & 0 & \frac{23\sqrt{6}i}{6720} & 0 \\
-\frac{9\sqrt{5}i}{80} & 0 & \frac{\sqrt{2}i}{16} & 0 & -\frac{3i}{112} & 0 & 0 & \frac{\sqrt{30}i}{320} & 0 & -\frac{\sqrt{6}i}{192} & 0 & \frac{\sqrt{10}i}{448} & 0 & -\frac{\sqrt{210}i}{6720}
\end{pmatrix}$$

| 744 | symmetry | $\dfrac{y\left(15x^4-40x^2y^2+30x^2z^2+8y^4-40y^2z^2+15z^4\right)}{8}$ |

Table 9

No.	multipole	matrix

$\mathbb{T}_{5,2}^{(1,0;a)}(E,1)$

$$\begin{bmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}}{80} & 0 & -\frac{\sqrt{30}}{80} & 0 & -\frac{7\sqrt{2}}{80} & 0 & -\frac{3\sqrt{42}}{80} \\[4pt]
0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{14}}{80} & 0 & \frac{3\sqrt{6}}{80} & 0 & \frac{3\sqrt{10}}{80} & 0 & \frac{7\sqrt{2}}{80} & 0 \\[4pt]
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{7\sqrt{2}}{80} & 0 & -\frac{3\sqrt{10}}{80} & 0 & -\frac{3\sqrt{6}}{80} & 0 & -\frac{\sqrt{14}}{80} \\[4pt]
0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{42}}{80} & 0 & \frac{7\sqrt{2}}{80} & 0 & \frac{\sqrt{30}}{80} & 0 & \frac{\sqrt{6}}{80} & 0 \\[4pt]
0 & -\frac{3}{112} & 0 & -\frac{\sqrt{2}}{16} & 0 & -\frac{9\sqrt{5}}{80} & -\frac{\sqrt{210}}{6720} & 0 & -\frac{\sqrt{10}}{448} & 0 & -\frac{\sqrt{6}}{192} & 0 & -\frac{\sqrt{30}}{320} & 0 \\[4pt]
\frac{3}{112} & 0 & \frac{3\sqrt{10}}{112} & 0 & \frac{\sqrt{5}}{16} & 0 & 0 & \frac{23\sqrt{6}}{6720} & 0 & \frac{13\sqrt{30}}{6720} & 0 & \frac{\sqrt{2}}{320} & 0 & -\frac{\sqrt{42}}{320} \\[4pt]
0 & -\frac{3\sqrt{10}}{112} & 0 & -\frac{3\sqrt{5}}{56} & 0 & -\frac{\sqrt{2}}{16} & -\frac{\sqrt{21}}{480} & 0 & -\frac{11}{1120} & 0 & -\frac{\sqrt{15}}{3360} & 0 & \frac{\sqrt{3}}{160} & 0 \\[4pt]
\frac{\sqrt{2}}{16} & 0 & \frac{3\sqrt{5}}{56} & 0 & \frac{3\sqrt{10}}{112} & 0 & 0 & \frac{\sqrt{3}}{160} & 0 & -\frac{\sqrt{15}}{3360} & 0 & -\frac{11}{1120} & 0 & -\frac{\sqrt{21}}{480} \\[4pt]
0 & -\frac{\sqrt{5}}{16} & 0 & -\frac{3\sqrt{10}}{112} & 0 & -\frac{3}{112} & -\frac{\sqrt{42}}{320} & 0 & \frac{\sqrt{2}}{320} & 0 & \frac{13\sqrt{30}}{6720} & 0 & \frac{23\sqrt{6}}{6720} & 0 \\[4pt]
\frac{9\sqrt{5}}{80} & 0 & \frac{\sqrt{2}}{16} & 0 & \frac{3}{112} & 0 & 0 & -\frac{\sqrt{30}}{320} & 0 & -\frac{\sqrt{6}}{192} & 0 & -\frac{\sqrt{10}}{448} & 0 & -\frac{\sqrt{210}}{6720}
\end{bmatrix}$$

| 745 | symmetry | $\dfrac{3\sqrt{35}\,x\left(y^2-2yz-z^2\right)\left(y^2+2yz-z^2\right)}{8}$ |

$\mathbb{T}_{5,1}^{(1,0;a)}(E,2)$

$$\begin{bmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{210}i}{400} & 0 & -\frac{\sqrt{42}i}{80} & 0 & -\frac{9\sqrt{70}i}{400} & 0 & -\frac{\sqrt{30}i}{80} \\[4pt]
0 & 0 & 0 & 0 & 0 & 0 & -\frac{9\sqrt{10}i}{400} & 0 & -\frac{3\sqrt{210}i}{400} & 0 & \frac{3\sqrt{14}i}{80} & 0 & \frac{9\sqrt{70}i}{400} & 0 \\[4pt]
0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{9\sqrt{70}i}{400} & 0 & \frac{3\sqrt{14}i}{80} & 0 & -\frac{3\sqrt{210}i}{400} & 0 & -\frac{9\sqrt{10}i}{400} \\[4pt]
0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}i}{80} & 0 & -\frac{9\sqrt{70}i}{400} & 0 & -\frac{\sqrt{42}i}{80} & 0 & \frac{\sqrt{210}i}{400} & 0 \\[4pt]
0 & -\frac{3\sqrt{35}i}{560} & 0 & -\frac{9\sqrt{70}i}{560} & 0 & -\frac{3\sqrt{7}i}{112} & \frac{\sqrt{6}i}{960} & 0 & -\frac{\sqrt{14}i}{448} & 0 & -\frac{3\sqrt{210}i}{2240} & 0 & -\frac{\sqrt{42}i}{1344} & 0 \\[4pt]
-\frac{3\sqrt{35}i}{560} & 0 & \frac{3\sqrt{14}i}{112} & 0 & \frac{9\sqrt{7}i}{112} & 0 & 0 & -\frac{23\sqrt{210}i}{33600} & 0 & \frac{13\sqrt{42}i}{6720} & 0 & \frac{9\sqrt{70}i}{11200} & 0 & -\frac{\sqrt{30}i}{960} \\[4pt]
0 & \frac{3\sqrt{14}i}{112} & 0 & -\frac{3\sqrt{7}i}{56} & 0 & -\frac{9\sqrt{70}i}{560} & \frac{3\sqrt{15}i}{800} & 0 & \frac{11\sqrt{35}i}{5600} & 0 & -\frac{\sqrt{21}i}{3360} & 0 & \frac{9\sqrt{105}i}{5600} & 0 \\[4pt]
-\frac{9\sqrt{70}i}{560} & 0 & -\frac{3\sqrt{7}i}{56} & 0 & \frac{3\sqrt{14}i}{112} & 0 & 0 & -\frac{9\sqrt{105}i}{5600} & 0 & \frac{\sqrt{21}i}{3360} & 0 & -\frac{11\sqrt{35}i}{5600} & 0 & -\frac{3\sqrt{15}i}{800} \\[4pt]
0 & \frac{9\sqrt{7}i}{112} & 0 & \frac{3\sqrt{14}i}{112} & 0 & -\frac{3\sqrt{35}i}{560} & \frac{\sqrt{30}i}{960} & 0 & -\frac{9\sqrt{70}i}{11200} & 0 & -\frac{13\sqrt{42}i}{6720} & 0 & \frac{23\sqrt{210}i}{33600} & 0 \\[4pt]
-\frac{3\sqrt{7}i}{112} & 0 & -\frac{9\sqrt{70}i}{560} & 0 & -\frac{3\sqrt{35}i}{560} & 0 & 0 & \frac{\sqrt{42}i}{1344} & 0 & \frac{3\sqrt{210}i}{2240} & 0 & \frac{\sqrt{14}i}{448} & 0 & -\frac{\sqrt{6}i}{960}
\end{bmatrix}$$

| 746 | symmetry | $\dfrac{3\sqrt{35}\,y\left(x^2-2xz-z^2\right)\left(x^2+2xz-z^2\right)}{8}$ |

continued …

Table 9

No.	multipole	matrix

$$\mathbb{T}_{5,2}^{(1,0;a)}(E,2) = \begin{bmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{210}}{400} & 0 & -\frac{\sqrt{42}}{80} & 0 & \frac{9\sqrt{70}}{400} & 0 & -\frac{\sqrt{30}}{80} \\
0 & 0 & 0 & 0 & 0 & 0 & -\frac{9\sqrt{10}}{400} & 0 & \frac{3\sqrt{210}}{400} & 0 & \frac{3\sqrt{14}}{80} & 0 & -\frac{9\sqrt{70}}{400} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{9\sqrt{70}}{400} & 0 & -\frac{3\sqrt{14}}{80} & 0 & -\frac{3\sqrt{210}}{400} & 0 & \frac{9\sqrt{10}}{400} \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{80} & 0 & -\frac{9\sqrt{70}}{400} & 0 & \frac{\sqrt{42}}{80} & 0 & \frac{\sqrt{210}}{400} & 0 \\
0 & -\frac{3\sqrt{35}}{560} & 0 & \frac{9\sqrt{70}}{560} & 0 & -\frac{3\sqrt{7}}{112} & -\frac{\sqrt{6}}{960} & 0 & -\frac{\sqrt{14}}{448} & 0 & \frac{3\sqrt{210}}{2240} & 0 & -\frac{\sqrt{42}}{1344} & 0 \\
\frac{3\sqrt{35}}{560} & 0 & \frac{3\sqrt{14}}{112} & 0 & -\frac{9\sqrt{7}}{112} & 0 & 0 & \frac{23\sqrt{210}}{33600} & 0 & \frac{13\sqrt{42}}{6720} & 0 & -\frac{9\sqrt{70}}{11200} & 0 & -\frac{\sqrt{30}}{960} \\
0 & -\frac{3\sqrt{14}}{112} & 0 & -\frac{3\sqrt{7}}{56} & 0 & \frac{9\sqrt{70}}{560} & \frac{3\sqrt{15}}{800} & 0 & -\frac{11\sqrt{35}}{5600} & 0 & -\frac{\sqrt{21}}{3360} & 0 & -\frac{9\sqrt{105}}{5600} & 0 \\
-\frac{9\sqrt{70}}{560} & 0 & \frac{3\sqrt{7}}{56} & 0 & \frac{3\sqrt{14}}{112} & 0 & 0 & -\frac{9\sqrt{105}}{5600} & 0 & -\frac{\sqrt{21}}{3360} & 0 & -\frac{11\sqrt{35}}{5600} & 0 & \frac{3\sqrt{15}}{800} \\
0 & \frac{9\sqrt{7}}{112} & 0 & -\frac{3\sqrt{14}}{112} & 0 & -\frac{3\sqrt{35}}{560} & -\frac{\sqrt{30}}{960} & 0 & -\frac{9\sqrt{70}}{11200} & 0 & \frac{13\sqrt{42}}{6720} & 0 & \frac{23\sqrt{210}}{33600} & 0 \\
\frac{3\sqrt{7}}{112} & 0 & -\frac{9\sqrt{70}}{560} & 0 & \frac{3\sqrt{35}}{560} & 0 & 0 & -\frac{\sqrt{42}}{1344} & 0 & \frac{3\sqrt{210}}{2240} & 0 & -\frac{\sqrt{14}}{448} & 0 & -\frac{\sqrt{6}}{960}
\end{bmatrix}$$

747 symmetry

$$\frac{\sqrt{105}\,x(y-z)(y+z)\big(2x^2-y^2-z^2\big)}{4}$$

$$\mathbb{T}_{5,1}^{(1,0;a)}(E,3) = \begin{bmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{70}i}{200} & 0 & -\frac{\sqrt{14}i}{40} & 0 & \frac{\sqrt{210}i}{200} & 0 & \frac{3\sqrt{10}i}{40} \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}i}{200} & 0 & -\frac{3\sqrt{70}i}{200} & 0 & \frac{\sqrt{42}i}{40} & 0 & -\frac{\sqrt{210}i}{200} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{210}i}{200} & 0 & \frac{\sqrt{42}i}{40} & 0 & -\frac{3\sqrt{70}i}{200} & 0 & \frac{\sqrt{30}i}{200} \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{10}i}{40} & 0 & \frac{\sqrt{210}i}{200} & 0 & -\frac{\sqrt{14}i}{40} & 0 & \frac{\sqrt{70}i}{200} & 0 \\
0 & -\frac{\sqrt{105}i}{280} & 0 & \frac{\sqrt{210}i}{280} & 0 & \frac{3\sqrt{21}i}{56} & \frac{\sqrt{2}i}{480} & 0 & -\frac{\sqrt{42}i}{672} & 0 & \frac{\sqrt{70}i}{1120} & 0 & \frac{\sqrt{14}i}{224} & 0 \\
-\frac{\sqrt{105}i}{280} & 0 & \frac{\sqrt{42}i}{56} & 0 & -\frac{\sqrt{21}i}{56} & 0 & 0 & -\frac{23\sqrt{70}i}{16800} & 0 & \frac{13\sqrt{14}i}{3360} & 0 & -\frac{\sqrt{210}i}{5600} & 0 & \frac{\sqrt{10}i}{160} \\
0 & \frac{\sqrt{42}i}{56} & 0 & -\frac{\sqrt{21}i}{28} & 0 & \frac{\sqrt{210}i}{280} & -\frac{\sqrt{5}i}{400} & 0 & \frac{11\sqrt{105}i}{8400} & 0 & -\frac{\sqrt{7}i}{1680} & 0 & -\frac{3\sqrt{35}i}{2800} & 0 \\
\frac{\sqrt{210}i}{280} & 0 & -\frac{\sqrt{21}i}{28} & 0 & \frac{\sqrt{42}i}{56} & 0 & 0 & \frac{3\sqrt{35}i}{2800} & 0 & \frac{\sqrt{7}i}{1680} & 0 & -\frac{11\sqrt{105}i}{8400} & 0 & \frac{\sqrt{5}i}{400} \\
0 & -\frac{\sqrt{21}i}{56} & 0 & \frac{\sqrt{42}i}{56} & 0 & -\frac{\sqrt{105}i}{280} & -\frac{\sqrt{10}i}{160} & 0 & \frac{\sqrt{210}i}{5600} & 0 & -\frac{13\sqrt{14}i}{3360} & 0 & \frac{23\sqrt{70}i}{16800} & 0 \\
\frac{3\sqrt{21}i}{56} & 0 & \frac{\sqrt{210}i}{280} & 0 & -\frac{\sqrt{105}i}{280} & 0 & 0 & -\frac{\sqrt{14}i}{224} & 0 & -\frac{\sqrt{70}i}{1120} & 0 & \frac{\sqrt{42}i}{672} & 0 & -\frac{\sqrt{2}i}{480}
\end{bmatrix}$$

748 symmetry

$$-\frac{\sqrt{105}\,y(x-z)(x+z)\big(x^2-2y^2+z^2\big)}{4}$$

continued ...

Table 9

No.	multipole	matrix

$\mathbb{T}_{5,2}^{(1,0;a)}(E,3)$

$$\begin{bmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}}{200} & 0 & -\frac{\sqrt{14}}{40} & 0 & -\frac{\sqrt{210}}{200} & 0 & \frac{3\sqrt{10}}{40} \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{200} & 0 & \frac{3\sqrt{70}}{200} & 0 & \frac{\sqrt{42}}{40} & 0 & \frac{\sqrt{210}}{200} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{210}}{200} & 0 & -\frac{\sqrt{42}}{40} & 0 & -\frac{3\sqrt{70}}{200} & 0 & -\frac{\sqrt{30}}{200} \\
0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{10}}{40} & 0 & \frac{\sqrt{210}}{200} & 0 & \frac{\sqrt{14}}{40} & 0 & \frac{\sqrt{70}}{200} & 0 \\
0 & -\frac{\sqrt{105}}{280} & 0 & -\frac{\sqrt{210}}{280} & 0 & \frac{3\sqrt{21}}{56} & -\frac{\sqrt{2}}{480} & 0 & -\frac{\sqrt{42}}{672} & 0 & -\frac{\sqrt{70}}{1120} & 0 & \frac{\sqrt{14}}{224} & 0 \\
\frac{\sqrt{105}}{280} & 0 & \frac{\sqrt{42}}{56} & 0 & \frac{\sqrt{21}}{56} & 0 & 0 & \frac{23\sqrt{70}}{16800} & 0 & \frac{13\sqrt{14}}{3360} & 0 & \frac{\sqrt{210}}{5600} & 0 & \frac{\sqrt{10}}{160} \\
0 & -\frac{\sqrt{42}}{56} & 0 & -\frac{\sqrt{21}}{28} & 0 & -\frac{\sqrt{210}}{280} & -\frac{\sqrt{5}}{400} & 0 & -\frac{11\sqrt{105}}{8400} & 0 & -\frac{\sqrt{7}}{1680} & 0 & \frac{3\sqrt{35}}{2800} & 0 \\
\frac{\sqrt{210}}{280} & 0 & \frac{\sqrt{21}}{28} & 0 & \frac{\sqrt{42}}{56} & 0 & 0 & \frac{3\sqrt{35}}{2800} & 0 & -\frac{\sqrt{7}}{1680} & 0 & -\frac{11\sqrt{105}}{8400} & 0 & -\frac{\sqrt{5}}{400} \\
0 & -\frac{\sqrt{21}}{56} & 0 & -\frac{\sqrt{42}}{56} & 0 & -\frac{\sqrt{105}}{280} & \frac{\sqrt{10}}{160} & 0 & \frac{\sqrt{210}}{5600} & 0 & \frac{13\sqrt{14}}{3360} & 0 & \frac{23\sqrt{70}}{16800} & 0 \\
-\frac{3\sqrt{21}}{56} & 0 & \frac{\sqrt{210}}{280} & 0 & \frac{\sqrt{105}}{280} & 0 & 0 & \frac{\sqrt{14}}{224} & 0 & -\frac{\sqrt{70}}{1120} & 0 & -\frac{\sqrt{42}}{672} & 0 & -\frac{\sqrt{2}}{480}
\end{bmatrix}$$

749	symmetry	z

$\mathbb{T}_1^{(1,1;a)}(B_2)$

$$\begin{bmatrix}
0 & -\frac{i}{5} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & -\frac{\sqrt{6}i}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & -\frac{\sqrt{6}i}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & -\frac{i}{5} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
-\frac{2i}{7} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}i}{28} & 0 & 0 & 0 & 0 & 0 \\
0 & -\frac{6i}{35} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}i}{28} & 0 & 0 & 0 & 0 \\
0 & 0 & -\frac{2i}{35} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{14} & 0 & 0 & 0 \\
0 & 0 & 0 & \frac{2i}{35} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{14} & 0 & 0 \\
0 & 0 & 0 & 0 & \frac{6i}{35} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}i}{28} & 0 \\
0 & 0 & 0 & 0 & 0 & \frac{2i}{7} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}i}{28}
\end{bmatrix}$$

750	symmetry	x

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Table 9

No.	multipole	matrix

$$\mathbb{T}^{(1,1;a)}_{1,1}(E) = \begin{pmatrix}
\frac{\sqrt{5}i}{10} & 0 & -\frac{\sqrt{2}i}{20} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & \frac{\sqrt{3}i}{10} & 0 & -\frac{\sqrt{6}i}{20} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & \frac{\sqrt{6}i}{20} & 0 & -\frac{\sqrt{3}i}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & \frac{\sqrt{2}i}{20} & 0 & -\frac{\sqrt{5}i}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & -\frac{2\sqrt{5}i}{35} & 0 & 0 & 0 & 0 & -\frac{\sqrt{42}i}{56} & 0 & \frac{\sqrt{2}i}{56} & 0 & 0 & 0 & 0 & 0 \\
-\frac{2\sqrt{5}i}{35} & 0 & -\frac{4\sqrt{2}i}{35} & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}i}{56} & 0 & \frac{\sqrt{6}i}{56} & 0 & 0 & 0 & 0 \\
0 & -\frac{4\sqrt{2}i}{35} & 0 & -\frac{6i}{35} & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{28} & 0 & \frac{\sqrt{3}i}{28} & 0 & 0 & 0 \\
0 & 0 & -\frac{6i}{35} & 0 & -\frac{4\sqrt{2}i}{35} & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{28} & 0 & \frac{\sqrt{5}i}{28} & 0 & 0 \\
0 & 0 & 0 & -\frac{4\sqrt{2}i}{35} & 0 & -\frac{2\sqrt{5}i}{35} & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{56} & 0 & \frac{\sqrt{30}i}{56} & 0 \\
0 & 0 & 0 & 0 & -\frac{2\sqrt{5}i}{35} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}i}{56} & 0 & \frac{\sqrt{42}i}{56}
\end{pmatrix}$$

751	symmetry	y

$$\mathbb{T}^{(1,1;a)}_{1,2}(E) = \begin{pmatrix}
-\frac{\sqrt{5}}{10} & 0 & -\frac{\sqrt{2}}{20} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & -\frac{\sqrt{3}}{10} & 0 & -\frac{\sqrt{6}}{20} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & -\frac{\sqrt{6}}{20} & 0 & -\frac{\sqrt{3}}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & -\frac{\sqrt{2}}{20} & 0 & -\frac{\sqrt{5}}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & -\frac{2\sqrt{5}}{35} & 0 & 0 & 0 & 0 & \frac{\sqrt{42}}{56} & 0 & \frac{\sqrt{2}}{56} & 0 & 0 & 0 & 0 & 0 \\
\frac{2\sqrt{5}}{35} & 0 & -\frac{4\sqrt{2}}{35} & 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{56} & 0 & \frac{\sqrt{6}}{56} & 0 & 0 & 0 & 0 \\
0 & \frac{4\sqrt{2}}{35} & 0 & -\frac{6}{35} & 0 & 0 & 0 & 0 & \frac{\sqrt{5}}{28} & 0 & \frac{\sqrt{3}}{28} & 0 & 0 & 0 \\
0 & 0 & \frac{6}{35} & 0 & -\frac{4\sqrt{2}}{35} & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{28} & 0 & \frac{\sqrt{5}}{28} & 0 & 0 \\
0 & 0 & 0 & \frac{4\sqrt{2}}{35} & 0 & -\frac{2\sqrt{5}}{35} & 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{56} & 0 & \frac{\sqrt{30}}{56} & 0 \\
0 & 0 & 0 & 0 & \frac{2\sqrt{5}}{35} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2}}{56} & 0 & \frac{\sqrt{42}}{56}
\end{pmatrix}$$

752	symmetry	$\sqrt{15}xyz$

Table 9

No.	multipole	matrix

$\mathbb{T}_3^{(1,1;a)}(A_1)$

$$\begin{bmatrix}
0 & 0 & 0 & \frac{3\sqrt{30}}{56} & 0 & 0 & \frac{\sqrt{14}}{56} & 0 & 0 & 0 & -\frac{\sqrt{10}}{56} & 0 & 0 & 0 \\
\frac{15}{56} & 0 & 0 & 0 & \frac{3\sqrt{5}}{56} & 0 & 0 & -\frac{\sqrt{6}}{56} & 0 & 0 & 0 & -\frac{3\sqrt{2}}{56} & 0 & 0 \\
0 & -\frac{3\sqrt{5}}{56} & 0 & 0 & 0 & -\frac{15}{56} & 0 & 0 & -\frac{3\sqrt{2}}{56} & 0 & 0 & 0 & -\frac{\sqrt{6}}{56} & 0 \\
0 & 0 & -\frac{3\sqrt{30}}{56} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}}{56} & 0 & 0 & 0 & \frac{\sqrt{14}}{56} \\
0 & 0 & \frac{5\sqrt{6}}{84} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}}{28} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & \frac{\sqrt{30}}{84} & 0 & 0 & -\frac{\sqrt{14}}{56} & 0 & 0 & 0 & -\frac{\sqrt{10}}{56} & 0 & 0 & 0 \\
-\frac{5\sqrt{6}}{84} & 0 & 0 & 0 & -\frac{\sqrt{30}}{84} & 0 & 0 & -\frac{1}{56} & 0 & 0 & 0 & -\frac{\sqrt{3}}{56} & 0 & 0 \\
0 & -\frac{\sqrt{30}}{84} & 0 & 0 & 0 & -\frac{5\sqrt{6}}{84} & 0 & 0 & \frac{\sqrt{3}}{56} & 0 & 0 & 0 & \frac{1}{56} & 0 \\
0 & 0 & \frac{\sqrt{30}}{84} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}}{56} & 0 & 0 & 0 & \frac{\sqrt{14}}{56} \\
0 & 0 & 0 & \frac{5\sqrt{6}}{84} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2}}{28} & 0 & 0 & 0
\end{bmatrix}$$

753	symmetry	$\frac{\sqrt{15}z(x-y)(x+y)}{2}$

$\mathbb{T}_3^{(1,1;a)}(A_2)$

$$\begin{bmatrix}
0 & 0 & 0 & \frac{3\sqrt{30}i}{56} & 0 & 0 & -\frac{\sqrt{14}i}{56} & 0 & 0 & 0 & -\frac{\sqrt{10}i}{56} & 0 & 0 & 0 \\
-\frac{15i}{56} & 0 & 0 & 0 & \frac{3\sqrt{5}i}{56} & 0 & 0 & \frac{\sqrt{6}i}{56} & 0 & 0 & 0 & -\frac{3\sqrt{2}i}{56} & 0 & 0 \\
0 & \frac{3\sqrt{5}i}{56} & 0 & 0 & 0 & -\frac{15i}{56} & 0 & 0 & \frac{3\sqrt{2}i}{56} & 0 & 0 & 0 & -\frac{\sqrt{6}i}{56} & 0 \\
0 & 0 & \frac{3\sqrt{30}i}{56} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}i}{56} & 0 & 0 & 0 & \frac{\sqrt{14}i}{56} \\
0 & 0 & \frac{5\sqrt{6}i}{84} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}i}{28} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & \frac{\sqrt{30}i}{84} & 0 & 0 & \frac{\sqrt{14}i}{56} & 0 & 0 & 0 & -\frac{\sqrt{10}i}{56} & 0 & 0 & 0 \\
\frac{5\sqrt{6}i}{84} & 0 & 0 & 0 & -\frac{\sqrt{30}i}{84} & 0 & 0 & \frac{i}{56} & 0 & 0 & 0 & -\frac{\sqrt{3}i}{56} & 0 & 0 \\
0 & \frac{\sqrt{30}i}{84} & 0 & 0 & 0 & -\frac{5\sqrt{6}i}{84} & 0 & 0 & -\frac{\sqrt{3}i}{56} & 0 & 0 & 0 & \frac{i}{56} & 0 \\
0 & 0 & -\frac{\sqrt{30}i}{84} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}i}{56} & 0 & 0 & 0 & \frac{\sqrt{14}i}{56} \\
0 & 0 & 0 & -\frac{5\sqrt{6}i}{84} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}i}{28} & 0 & 0 & 0
\end{bmatrix}$$

754	symmetry	$-\frac{z\left(3x^2+3y^2-2z^2\right)}{2}$

continued ...

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Table 9

No.	multipole	matrix

$\mathbb{T}_3^{(1,1;a)}(B_2)$

$$\begin{bmatrix}
0 & \frac{9i}{28} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}i}{28} & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & -\frac{3\sqrt{6}i}{28} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}i}{28} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & -\frac{3\sqrt{6}i}{28} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2}i}{28} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & \frac{9i}{28} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}i}{28} & 0 & 0 \\
\frac{5i}{42} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{28} & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & -\frac{i}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & -\frac{2i}{21} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{28} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & \frac{2i}{21} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{28} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & \frac{i}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & -\frac{5i}{42} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{28} & 0
\end{bmatrix}$$

755	symmetry	$\dfrac{x\left(2x^2-3y^2-3z^2\right)}{2}$

$\mathbb{T}_{3,1}^{(1,1;a)}(E,1)$

$$\begin{bmatrix}
\frac{9\sqrt{5}i}{224} & 0 & -\frac{27\sqrt{2}i}{224} & 0 & \frac{45i}{224} & 0 & 0 & -\frac{\sqrt{30}i}{112} & 0 & \frac{\sqrt{6}i}{56} & 0 & -\frac{\sqrt{10}i}{112} & 0 & 0 \\
0 & -\frac{3\sqrt{3}i}{32} & 0 & \frac{3\sqrt{6}i}{224} & 0 & \frac{15\sqrt{15}i}{224} & -\frac{\sqrt{70}i}{112} & 0 & 0 & 0 & \frac{3\sqrt{2}i}{112} & 0 & -\frac{\sqrt{10}i}{56} & 0 \\
-\frac{15\sqrt{15}i}{224} & 0 & -\frac{3\sqrt{6}i}{224} & 0 & \frac{3\sqrt{3}i}{32} & 0 & 0 & -\frac{\sqrt{10}i}{56} & 0 & \frac{3\sqrt{2}i}{112} & 0 & 0 & 0 & -\frac{\sqrt{70}i}{112} \\
0 & -\frac{45i}{224} & 0 & \frac{27\sqrt{2}i}{224} & 0 & -\frac{9\sqrt{5}i}{224} & 0 & 0 & -\frac{\sqrt{10}i}{112} & 0 & \frac{\sqrt{6}i}{56} & 0 & -\frac{\sqrt{30}i}{112} & 0 \\
0 & -\frac{\sqrt{5}i}{28} & 0 & \frac{5\sqrt{10}i}{168} & 0 & 0 & -\frac{\sqrt{42}i}{224} & 0 & \frac{3\sqrt{2}i}{112} & 0 & -\frac{\sqrt{30}i}{224} & 0 & 0 & 0 \\
-\frac{\sqrt{5}i}{28} & 0 & \frac{\sqrt{2}i}{56} & 0 & \frac{5i}{42} & 0 & 0 & \frac{\sqrt{30}i}{224} & 0 & \frac{\sqrt{6}i}{112} & 0 & -\frac{3\sqrt{10}i}{224} & 0 & 0 \\
0 & \frac{\sqrt{2}i}{56} & 0 & \frac{i}{14} & 0 & \frac{5\sqrt{10}i}{168} & \frac{\sqrt{105}i}{224} & 0 & \frac{3\sqrt{5}i}{224} & 0 & -\frac{\sqrt{3}i}{224} & 0 & -\frac{3\sqrt{15}i}{224} & 0 \\
\frac{5\sqrt{10}i}{168} & 0 & \frac{i}{14} & 0 & \frac{\sqrt{2}i}{56} & 0 & 0 & \frac{3\sqrt{15}i}{224} & 0 & \frac{\sqrt{3}i}{224} & 0 & -\frac{3\sqrt{5}i}{224} & 0 & -\frac{\sqrt{105}i}{224} \\
0 & \frac{5i}{42} & 0 & \frac{\sqrt{2}i}{56} & 0 & -\frac{\sqrt{5}i}{28} & 0 & 0 & \frac{3\sqrt{10}i}{224} & 0 & -\frac{\sqrt{6}i}{112} & 0 & -\frac{\sqrt{30}i}{224} & 0 \\
0 & 0 & \frac{5\sqrt{10}i}{168} & 0 & -\frac{\sqrt{5}i}{28} & 0 & 0 & 0 & 0 & \frac{\sqrt{30}i}{224} & 0 & -\frac{3\sqrt{2}i}{112} & 0 & \frac{\sqrt{42}i}{224}
\end{bmatrix}$$

756	symmetry	$-\dfrac{y\left(3x^2-2y^2+3z^2\right)}{2}$

continued …

Table 9

No.	multipole	matrix
	$\mathbb{T}_{3,2}^{(1,1;a)}(E,1)$	(matrix below)

$$\begin{bmatrix}
-\frac{9\sqrt{5}}{224} & 0 & -\frac{27\sqrt{2}}{224} & 0 & -\frac{45}{224} & 0 & 0 & \frac{\sqrt{30}}{112} & 0 & \frac{\sqrt{6}}{56} & 0 & \frac{\sqrt{10}}{112} & 0 & 0 \\
0 & \frac{3\sqrt{3}}{32} & 0 & \frac{3\sqrt{6}}{224} & 0 & -\frac{15\sqrt{15}}{224} & -\frac{\sqrt{70}}{112} & 0 & 0 & 0 & \frac{3\sqrt{2}}{112} & 0 & \frac{\sqrt{10}}{56} & 0 \\
-\frac{15\sqrt{15}}{224} & 0 & \frac{3\sqrt{6}}{224} & 0 & \frac{3\sqrt{3}}{32} & 0 & 0 & -\frac{\sqrt{10}}{56} & 0 & -\frac{3\sqrt{2}}{112} & 0 & 0 & 0 & \frac{\sqrt{70}}{112} \\
0 & -\frac{45}{224} & 0 & -\frac{27\sqrt{2}}{224} & 0 & -\frac{9\sqrt{5}}{224} & 0 & 0 & -\frac{\sqrt{10}}{112} & 0 & -\frac{\sqrt{6}}{56} & 0 & -\frac{\sqrt{30}}{112} & 0 \\
0 & -\frac{\sqrt{5}}{28} & 0 & -\frac{5\sqrt{10}}{168} & 0 & 0 & \frac{\sqrt{42}}{224} & 0 & \frac{3\sqrt{2}}{112} & 0 & \frac{\sqrt{30}}{224} & 0 & 0 & 0 \\
\frac{\sqrt{5}}{28} & 0 & \frac{\sqrt{2}}{56} & 0 & -\frac{5}{42} & 0 & 0 & -\frac{\sqrt{30}}{224} & 0 & \frac{\sqrt{6}}{112} & 0 & \frac{3\sqrt{10}}{224} & 0 & 0 \\
0 & -\frac{\sqrt{2}}{56} & 0 & \frac{1}{14} & 0 & -\frac{5\sqrt{10}}{168} & \frac{\sqrt{105}}{224} & 0 & -\frac{3\sqrt{5}}{224} & 0 & -\frac{\sqrt{3}}{224} & 0 & \frac{3\sqrt{15}}{224} & 0 \\
\frac{5\sqrt{10}}{168} & 0 & -\frac{1}{14} & 0 & \frac{\sqrt{2}}{56} & 0 & 0 & \frac{3\sqrt{15}}{224} & 0 & -\frac{\sqrt{3}}{224} & 0 & -\frac{3\sqrt{5}}{224} & 0 & \frac{\sqrt{105}}{224} \\
0 & \frac{5}{42} & 0 & -\frac{\sqrt{2}}{56} & 0 & -\frac{\sqrt{5}}{28} & 0 & 0 & \frac{3\sqrt{10}}{224} & 0 & \frac{\sqrt{6}}{112} & 0 & -\frac{\sqrt{30}}{224} & 0 \\
0 & 0 & \frac{5\sqrt{10}}{168} & 0 & \frac{\sqrt{5}}{28} & 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{224} & 0 & \frac{3\sqrt{2}}{112} & 0 & \frac{\sqrt{42}}{224}
\end{bmatrix}$$

No.	multipole	matrix
757	symmetry	$\dfrac{\sqrt{15}x(y-z)(y+z)}{2}$
	$\mathbb{T}_{3,1}^{(1,1;a)}(E,2)$	(matrix below)

$$\begin{bmatrix}
\frac{15\sqrt{3}i}{224} & 0 & -\frac{9\sqrt{30}i}{224} & 0 & -\frac{9\sqrt{15}i}{224} & 0 & 0 & -\frac{5\sqrt{2}i}{112} & 0 & \frac{\sqrt{10}i}{56} & 0 & \frac{\sqrt{6}i}{112} & 0 & 0 \\
0 & -\frac{3\sqrt{5}i}{32} & 0 & \frac{3\sqrt{10}i}{224} & 0 & -\frac{45i}{224} & \frac{\sqrt{42}i}{112} & 0 & 0 & 0 & \frac{\sqrt{30}i}{112} & 0 & \frac{\sqrt{6}i}{56} & 0 \\
\frac{45i}{224} & 0 & -\frac{3\sqrt{10}i}{224} & 0 & \frac{3\sqrt{5}i}{32} & 0 & 0 & \frac{\sqrt{6}i}{56} & 0 & \frac{\sqrt{30}i}{112} & 0 & 0 & 0 & \frac{\sqrt{42}i}{112} \\
0 & \frac{9\sqrt{15}i}{224} & 0 & \frac{9\sqrt{30}i}{224} & 0 & -\frac{15\sqrt{3}i}{224} & 0 & 0 & \frac{\sqrt{6}i}{112} & 0 & \frac{\sqrt{10}i}{56} & 0 & -\frac{5\sqrt{2}i}{112} & 0 \\
0 & -\frac{5\sqrt{3}i}{84} & 0 & -\frac{5\sqrt{6}i}{168} & 0 & 0 & -\frac{\sqrt{70}i}{224} & 0 & \frac{\sqrt{30}i}{112} & 0 & \frac{3\sqrt{2}i}{224} & 0 & 0 & 0 \\
-\frac{5\sqrt{3}i}{84} & 0 & \frac{\sqrt{30}i}{168} & 0 & -\frac{\sqrt{15}i}{42} & 0 & 0 & \frac{5\sqrt{2}i}{224} & 0 & \frac{\sqrt{10}i}{112} & 0 & \frac{3\sqrt{6}i}{224} & 0 & 0 \\
0 & \frac{\sqrt{30}i}{168} & 0 & \frac{\sqrt{15}i}{42} & 0 & -\frac{5\sqrt{6}i}{168} & -\frac{3\sqrt{7}i}{224} & 0 & \frac{5\sqrt{3}i}{224} & 0 & -\frac{\sqrt{5}i}{224} & 0 & \frac{9i}{224} & 0 \\
-\frac{5\sqrt{6}i}{168} & 0 & \frac{\sqrt{15}i}{42} & 0 & \frac{\sqrt{30}i}{168} & 0 & 0 & -\frac{9i}{224} & 0 & \frac{\sqrt{5}i}{224} & 0 & -\frac{5\sqrt{3}i}{224} & 0 & \frac{3\sqrt{7}i}{224} \\
0 & -\frac{\sqrt{15}i}{42} & 0 & \frac{\sqrt{30}i}{168} & 0 & -\frac{5\sqrt{3}i}{84} & 0 & 0 & -\frac{3\sqrt{6}i}{224} & 0 & -\frac{\sqrt{10}i}{112} & 0 & -\frac{5\sqrt{2}i}{224} & 0 \\
0 & 0 & -\frac{5\sqrt{6}i}{168} & 0 & -\frac{5\sqrt{3}i}{84} & 0 & 0 & 0 & 0 & -\frac{3\sqrt{2}i}{224} & 0 & -\frac{\sqrt{30}i}{112} & 0 & \frac{\sqrt{70}i}{224}
\end{bmatrix}$$

No.	multipole	matrix
758	symmetry	$\dfrac{\sqrt{15}y(x-z)(x+z)}{2}$

continued …

Table 9

No.	multipole	matrix
	$\mathbb{T}_{3,2}^{(1,1;a)}(E,2)$	(matrix below)

$$
\begin{bmatrix}
-\frac{15\sqrt{3}}{224} & 0 & -\frac{9\sqrt{30}}{224} & 0 & \frac{9\sqrt{15}}{224} & 0 & 0 & \frac{5\sqrt{2}}{112} & 0 & \frac{\sqrt{10}}{56} & 0 & -\frac{\sqrt{6}}{112} & 0 & 0 \\
0 & \frac{3\sqrt{5}}{32} & 0 & \frac{3\sqrt{10}}{224} & 0 & \frac{45}{224} & \frac{\sqrt{42}}{112} & 0 & 0 & 0 & \frac{\sqrt{30}}{112} & 0 & -\frac{\sqrt{6}}{56} & 0 \\
\frac{45}{224} & 0 & \frac{3\sqrt{10}}{224} & 0 & \frac{3\sqrt{5}}{32} & 0 & 0 & \frac{\sqrt{6}}{56} & 0 & -\frac{\sqrt{30}}{112} & 0 & 0 & 0 & -\frac{\sqrt{42}}{112} \\
0 & \frac{9\sqrt{15}}{224} & 0 & -\frac{9\sqrt{30}}{224} & 0 & -\frac{15\sqrt{3}}{224} & 0 & 0 & \frac{\sqrt{6}}{112} & 0 & -\frac{\sqrt{10}}{56} & 0 & -\frac{5\sqrt{2}}{112} & 0 \\
0 & -\frac{5\sqrt{3}}{84} & 0 & \frac{5\sqrt{6}}{168} & 0 & 0 & \frac{\sqrt{70}}{224} & 0 & \frac{\sqrt{30}}{112} & 0 & -\frac{3\sqrt{2}}{224} & 0 & 0 & 0 \\
\frac{5\sqrt{3}}{84} & 0 & \frac{\sqrt{30}}{168} & 0 & \frac{\sqrt{15}}{42} & 0 & 0 & -\frac{5\sqrt{2}}{224} & 0 & \frac{\sqrt{10}}{112} & 0 & -\frac{3\sqrt{6}}{224} & 0 & 0 \\
0 & -\frac{\sqrt{30}}{168} & 0 & \frac{\sqrt{15}}{42} & 0 & \frac{5\sqrt{6}}{168} & -\frac{3\sqrt{7}}{224} & 0 & -\frac{5\sqrt{3}}{224} & 0 & -\frac{\sqrt{5}}{224} & 0 & -\frac{9}{224} & 0 \\
-\frac{5\sqrt{6}}{168} & 0 & -\frac{\sqrt{15}}{42} & 0 & \frac{\sqrt{30}}{168} & 0 & 0 & -\frac{9}{224} & 0 & -\frac{\sqrt{5}}{224} & 0 & -\frac{5\sqrt{3}}{224} & 0 & -\frac{3\sqrt{7}}{224} \\
0 & -\frac{\sqrt{15}}{42} & 0 & -\frac{\sqrt{30}}{168} & 0 & -\frac{5\sqrt{3}}{84} & 0 & 0 & -\frac{3\sqrt{6}}{224} & 0 & \frac{\sqrt{10}}{112} & 0 & -\frac{5\sqrt{2}}{224} & 0 \\
0 & 0 & -\frac{5\sqrt{6}}{168} & 0 & \frac{5\sqrt{3}}{84} & 0 & 0 & 0 & 0 & -\frac{3\sqrt{2}}{224} & 0 & \frac{\sqrt{30}}{112} & 0 & \frac{\sqrt{70}}{224}
\end{bmatrix}
$$

| 759 | symmetry | $\frac{\sqrt{3}(x-y)(x+y)}{2}$ |

| | $\mathbb{M}_2^{(a)}(A_1)$ | (matrix below) |

$$
\begin{bmatrix}
0 & 0 & 0 & \frac{\sqrt{15}}{35} & 0 & 0 & \frac{\sqrt{7}}{28} & 0 & 0 & 0 & \frac{\sqrt{5}}{140} & 0 & 0 & 0 \\
-\frac{\sqrt{2}}{7} & 0 & 0 & 0 & \frac{2\sqrt{10}}{35} & 0 & 0 & \frac{\sqrt{3}}{28} & 0 & 0 & 0 & \frac{1}{28} & 0 & 0 \\
0 & -\frac{2\sqrt{10}}{35} & 0 & 0 & 0 & \frac{\sqrt{2}}{7} & 0 & 0 & \frac{1}{28} & 0 & 0 & 0 & \frac{\sqrt{3}}{28} & 0 \\
0 & 0 & -\frac{\sqrt{15}}{35} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{5}}{140} & 0 & 0 & 0 & \frac{\sqrt{7}}{28} \\
0 & 0 & -\frac{\sqrt{3}}{28} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{1}{14} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & -\frac{3\sqrt{15}}{140} & 0 & 0 & -\frac{\sqrt{7}}{14} & 0 & 0 & 0 & \frac{2\sqrt{5}}{35} & 0 & 0 & 0 \\
-\frac{\sqrt{3}}{28} & 0 & 0 & 0 & -\frac{3\sqrt{15}}{140} & 0 & 0 & -\frac{\sqrt{2}}{7} & 0 & 0 & 0 & \frac{\sqrt{6}}{14} & 0 & 0 \\
0 & -\frac{3\sqrt{15}}{140} & 0 & 0 & 0 & -\frac{\sqrt{3}}{28} & 0 & 0 & -\frac{\sqrt{6}}{14} & 0 & 0 & 0 & \frac{\sqrt{2}}{7} & 0 \\
0 & 0 & -\frac{3\sqrt{15}}{140} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{2\sqrt{5}}{35} & 0 & 0 & 0 & \frac{\sqrt{7}}{14} \\
0 & 0 & 0 & -\frac{\sqrt{3}}{28} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{1}{14} & 0 & 0 & 0
\end{bmatrix}
$$

| 760 | symmetry | $\sqrt{3}xy$ |

Table 9

No.	multipole	matrix

$\mathbb{M}_2^{(a)}(A_2)$

$$\begin{bmatrix}
0 & 0 & 0 & -\frac{\sqrt{15}i}{35} & 0 & 0 & \frac{\sqrt{7}i}{28} & 0 & 0 & 0 & -\frac{\sqrt{5}i}{140} & 0 & 0 & 0 \\
-\frac{\sqrt{2}i}{7} & 0 & 0 & 0 & -\frac{2\sqrt{10}i}{35} & 0 & 0 & \frac{\sqrt{3}i}{28} & 0 & 0 & 0 & -\frac{i}{28} & 0 & 0 \\
0 & -\frac{2\sqrt{10}i}{35} & 0 & 0 & 0 & -\frac{\sqrt{2}i}{7} & 0 & 0 & \frac{i}{28} & 0 & 0 & 0 & -\frac{\sqrt{3}i}{28} & 0 \\
0 & 0 & -\frac{\sqrt{15}i}{35} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{5}i}{140} & 0 & 0 & 0 & -\frac{\sqrt{7}i}{28} \\
0 & 0 & \frac{\sqrt{3}i}{28} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{i}{14} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & \frac{3\sqrt{15}i}{140} & 0 & 0 & -\frac{\sqrt{7}i}{14} & 0 & 0 & 0 & -\frac{2\sqrt{5}i}{35} & 0 & 0 & 0 \\
-\frac{\sqrt{3}i}{28} & 0 & 0 & 0 & \frac{3\sqrt{15}i}{140} & 0 & 0 & -\frac{\sqrt{2}i}{7} & 0 & 0 & 0 & -\frac{\sqrt{6}i}{14} & 0 & 0 \\
0 & -\frac{3\sqrt{15}i}{140} & 0 & 0 & 0 & \frac{\sqrt{3}i}{28} & 0 & 0 & -\frac{\sqrt{6}i}{14} & 0 & 0 & 0 & -\frac{\sqrt{2}i}{7} & 0 \\
0 & 0 & -\frac{3\sqrt{15}i}{140} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{2\sqrt{5}i}{35} & 0 & 0 & 0 & -\frac{\sqrt{7}i}{14} \\
0 & 0 & 0 & -\frac{\sqrt{3}i}{28} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{i}{14} & 0 & 0 & 0
\end{bmatrix}$$

761	symmetry	$-\frac{x^2}{2} - \frac{y^2}{2} + z^2$

$\mathbb{M}_2^{(a)}(B_1)$

$$\begin{bmatrix}
0 & \frac{3\sqrt{10}}{35} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{1}{14} & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & \frac{\sqrt{15}}{35} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{5}}{70} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & -\frac{\sqrt{15}}{35} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{5}}{70} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & -\frac{3\sqrt{10}}{35} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{1}{14} & 0 & 0 \\
-\frac{\sqrt{10}}{28} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{14} & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & \frac{\sqrt{10}}{140} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3}{14} & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & \frac{\sqrt{10}}{35} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{70} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & \frac{\sqrt{10}}{35} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}}{70} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & \frac{\sqrt{10}}{140} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3}{14} & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}}{28} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{14} & 0
\end{bmatrix}$$

762	symmetry	$\sqrt{3}yz$

continued ...

Table 9

No.	multipole	matrix

$\mathbb{M}_{2,1}^{(a)}(E)$

$$\begin{pmatrix}
-\frac{\sqrt{6}i}{14} & 0 & -\frac{3\sqrt{15}i}{70} & 0 & 0 & 0 & 0 & -\frac{i}{14} & 0 & -\frac{\sqrt{5}i}{70} & 0 & 0 & 0 & 0 \\
0 & \frac{\sqrt{10}i}{70} & 0 & -\frac{\sqrt{5}i}{14} & 0 & 0 & 0 & 0 & -\frac{i}{14} & 0 & -\frac{\sqrt{15}i}{70} & 0 & 0 & 0 \\
0 & 0 & \frac{\sqrt{5}i}{14} & 0 & -\frac{\sqrt{10}i}{70} & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{70} & 0 & -\frac{i}{14} & 0 & 0 \\
0 & 0 & 0 & \frac{3\sqrt{15}i}{70} & 0 & \frac{\sqrt{6}i}{14} & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{70} & 0 & -\frac{i}{14} & 0 \\
0 & \frac{\sqrt{6}i}{28} & 0 & 0 & 0 & 0 & -\frac{\sqrt{35}i}{28} & 0 & -\frac{\sqrt{15}i}{28} & 0 & 0 & 0 & 0 & 0 \\
-\frac{\sqrt{6}i}{28} & 0 & \frac{\sqrt{15}i}{70} & 0 & 0 & 0 & 0 & -\frac{i}{28} & 0 & -\frac{11\sqrt{5}i}{140} & 0 & 0 & 0 & 0 \\
0 & -\frac{\sqrt{15}i}{70} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}i}{28} & 0 & -\frac{\sqrt{10}i}{20} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{70} & 0 & 0 & 0 & 0 & \frac{\sqrt{10}i}{20} & 0 & -\frac{\sqrt{6}i}{28} & 0 & 0 \\
0 & 0 & 0 & \frac{\sqrt{15}i}{70} & 0 & -\frac{\sqrt{6}i}{28} & 0 & 0 & 0 & 0 & \frac{11\sqrt{5}i}{140} & 0 & \frac{i}{28} & 0 \\
0 & 0 & 0 & 0 & \frac{\sqrt{6}i}{28} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{28} & 0 & \frac{\sqrt{35}i}{28}
\end{pmatrix}$$

| 763 | symmetry | $-\sqrt{3}xz$ |

$\mathbb{M}_{2,2}^{(a)}(E)$

$$\begin{bmatrix}
\frac{\sqrt{6}}{14} & 0 & -\frac{3\sqrt{15}}{70} & 0 & 0 & 0 & 0 & \frac{1}{14} & 0 & -\frac{\sqrt{5}}{70} & 0 & 0 & 0 & 0 \\
0 & -\frac{\sqrt{10}}{70} & 0 & -\frac{\sqrt{5}}{14} & 0 & 0 & 0 & 0 & \frac{1}{14} & 0 & -\frac{\sqrt{15}}{70} & 0 & 0 & 0 \\
0 & 0 & -\frac{\sqrt{5}}{14} & 0 & -\frac{\sqrt{10}}{70} & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{70} & 0 & -\frac{1}{14} & 0 & 0 \\
0 & 0 & 0 & -\frac{3\sqrt{15}}{70} & 0 & \frac{\sqrt{6}}{14} & 0 & 0 & 0 & 0 & \frac{\sqrt{5}}{70} & 0 & -\frac{1}{14} & 0 \\
0 & \frac{\sqrt{6}}{28} & 0 & 0 & 0 & 0 & \frac{\sqrt{35}}{28} & 0 & -\frac{\sqrt{15}}{28} & 0 & 0 & 0 & 0 & 0 \\
\frac{\sqrt{6}}{28} & 0 & \frac{\sqrt{15}}{70} & 0 & 0 & 0 & 0 & \frac{1}{28} & 0 & -\frac{11\sqrt{5}}{140} & 0 & 0 & 0 & 0 \\
0 & \frac{\sqrt{15}}{70} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}}{28} & 0 & -\frac{\sqrt{10}}{20} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{70} & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}}{20} & 0 & -\frac{\sqrt{6}}{28} & 0 & 0 \\
0 & 0 & 0 & -\frac{\sqrt{15}}{70} & 0 & -\frac{\sqrt{6}}{28} & 0 & 0 & 0 & 0 & -\frac{11\sqrt{5}}{140} & 0 & \frac{1}{28} & 0 \\
0 & 0 & 0 & 0 & -\frac{\sqrt{6}}{28} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{28} & 0 & \frac{\sqrt{35}}{28}
\end{bmatrix}$$

| 764 | symmetry | $\frac{\sqrt{5}(x-y)(x+y)\left(x^2+y^2-6z^2\right)}{4}$ |

continued …

Table 9

No.	multipole	matrix

$\mathbb{M}_4^{(a)}(A_1)$

0	0	0	$\frac{\sqrt{10}}{28}$	0	0	$\frac{3\sqrt{42}}{280}$	0	0	0	$\frac{9\sqrt{30}}{280}$	0	0	0
$-\frac{\sqrt{3}}{28}$	0	0	0	$-\frac{\sqrt{15}}{28}$	0	0	$-\frac{33\sqrt{2}}{280}$	0	0	0	$\frac{3\sqrt{6}}{280}$	0	0
0	$\frac{\sqrt{15}}{28}$	0	0	0	$\frac{\sqrt{3}}{28}$	0	0	$\frac{3\sqrt{6}}{280}$	0	0	0	$-\frac{33\sqrt{2}}{280}$	0
0	0	$-\frac{\sqrt{10}}{28}$	0	0	0	0	0	0	$\frac{9\sqrt{30}}{280}$	0	0	0	$\frac{3\sqrt{42}}{280}$
0	0	$-\frac{3\sqrt{2}}{28}$	0	0	0	0	0	0	$\frac{\sqrt{6}}{14}$	0	0	0	0
0	0	0	$\frac{\sqrt{10}}{28}$	0	0	$-\frac{3\sqrt{42}}{140}$	0	0	0	$\frac{\sqrt{30}}{140}$	0	0	0
$-\frac{3\sqrt{2}}{28}$	0	0	0	$\frac{\sqrt{10}}{28}$	0	0	$\frac{9\sqrt{3}}{140}$	0	0	0	$-\frac{17}{140}$	0	0
0	$\frac{\sqrt{10}}{28}$	0	0	0	$-\frac{3\sqrt{2}}{28}$	0	0	$\frac{17}{140}$	0	0	0	$-\frac{9\sqrt{3}}{140}$	0
0	0	$\frac{\sqrt{10}}{28}$	0	0	0	0	0	0	$-\frac{\sqrt{30}}{140}$	0	0	0	$\frac{3\sqrt{42}}{140}$
0	0	0	$-\frac{3\sqrt{2}}{28}$	0	0	0	0	0	0	$-\frac{\sqrt{6}}{14}$	0	0	0

765	symmetry	$-\frac{\sqrt{5}xy(x^2+y^2-6z^2)}{2}$

$\mathbb{M}_4^{(a)}(A_2)$

0	0	0	$\frac{\sqrt{10}i}{28}$	0	0	$-\frac{3\sqrt{42}i}{280}$	0	0	0	$\frac{9\sqrt{30}i}{280}$	0	0	0
$\frac{\sqrt{3}i}{28}$	0	0	0	$-\frac{\sqrt{15}i}{28}$	0	0	$\frac{33\sqrt{2}i}{280}$	0	0	0	$\frac{3\sqrt{6}i}{280}$	0	0
0	$-\frac{\sqrt{15}i}{28}$	0	0	0	$\frac{\sqrt{3}i}{28}$	0	0	$-\frac{3\sqrt{6}i}{280}$	0	0	0	$-\frac{33\sqrt{2}i}{280}$	0
0	0	$\frac{\sqrt{10}i}{28}$	0	0	0	0	0	0	$-\frac{9\sqrt{30}i}{280}$	0	0	0	$\frac{3\sqrt{42}i}{280}$
0	0	$-\frac{3\sqrt{2}i}{28}$	0	0	0	0	0	0	$\frac{\sqrt{6}i}{14}$	0	0	0	0
0	0	0	$\frac{\sqrt{10}i}{28}$	0	0	$\frac{3\sqrt{42}i}{140}$	0	0	0	$\frac{\sqrt{30}i}{140}$	0	0	0
$\frac{3\sqrt{2}i}{28}$	0	0	0	$\frac{\sqrt{10}i}{28}$	0	0	$-\frac{9\sqrt{3}i}{140}$	0	0	0	$-\frac{17i}{140}$	0	0
0	$-\frac{\sqrt{10}i}{28}$	0	0	0	$-\frac{3\sqrt{2}i}{28}$	0	0	$-\frac{17i}{140}$	0	0	0	$-\frac{9\sqrt{3}i}{140}$	0
0	0	$-\frac{\sqrt{10}i}{28}$	0	0	0	0	0	0	$\frac{\sqrt{30}i}{140}$	0	0	0	$\frac{3\sqrt{42}i}{140}$
0	0	0	$\frac{3\sqrt{2}i}{28}$	0	0	0	0	0	0	$\frac{\sqrt{6}i}{14}$	0	0	0

766	symmetry	$\frac{\sqrt{21}(x^4-3x^2y^2-3x^2z^2+y^4-3y^2z^2+z^4)}{6}$

continued …

255

Table 9

No.	multipole	matrix

$\mathbb{M}_4^{(a)}(B_1,1)$

$$\begin{bmatrix}
0 & -\frac{\sqrt{21}}{84} & 0 & 0 & 0 & -\frac{\sqrt{105}}{84} & 0 & 0 & -\frac{3\sqrt{210}}{280} & 0 & 0 & 0 & -\frac{3\sqrt{70}}{280} & 0 \\
0 & 0 & \frac{\sqrt{14}}{28} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{42}}{56} & 0 & 0 & 0 & -\frac{\sqrt{30}}{40} \\
0 & 0 & 0 & -\frac{\sqrt{14}}{28} & 0 & 0 & -\frac{\sqrt{30}}{40} & 0 & 0 & 0 & \frac{\sqrt{42}}{56} & 0 & 0 & 0 \\
\frac{\sqrt{105}}{84} & 0 & 0 & 0 & \frac{\sqrt{21}}{84} & 0 & 0 & -\frac{3\sqrt{70}}{280} & 0 & 0 & 0 & -\frac{3\sqrt{210}}{280} & 0 & 0 \\
\frac{\sqrt{21}}{84} & 0 & 0 & 0 & \frac{\sqrt{105}}{84} & 0 & 0 & -\frac{\sqrt{14}}{28} & 0 & 0 & 0 & -\frac{\sqrt{42}}{84} & 0 & 0 \\
0 & -\frac{\sqrt{21}}{28} & 0 & 0 & 0 & \frac{\sqrt{105}}{84} & 0 & 0 & \frac{\sqrt{210}}{105} & 0 & 0 & 0 & -\frac{\sqrt{70}}{70} & 0 \\
0 & 0 & \frac{\sqrt{21}}{42} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}}{28} & 0 & 0 & 0 & -\frac{\sqrt{5}}{20} \\
0 & 0 & 0 & \frac{\sqrt{21}}{42} & 0 & 0 & \frac{\sqrt{5}}{20} & 0 & 0 & 0 & -\frac{\sqrt{7}}{28} & 0 & 0 & 0 \\
\frac{\sqrt{105}}{84} & 0 & 0 & 0 & -\frac{\sqrt{21}}{28} & 0 & 0 & \frac{\sqrt{70}}{70} & 0 & 0 & 0 & -\frac{\sqrt{210}}{105} & 0 & 0 \\
0 & \frac{\sqrt{105}}{84} & 0 & 0 & 0 & \frac{\sqrt{21}}{84} & 0 & 0 & \frac{\sqrt{42}}{84} & 0 & 0 & 0 & \frac{\sqrt{14}}{28} & 0
\end{bmatrix}$$

767 symmetry

$$-\frac{\sqrt{15}\left(x^4-12x^2y^2+6x^2z^2+y^4+6y^2z^2-2z^4\right)}{12}$$

$\mathbb{M}_4^{(a)}(B_1,2)$

$$\begin{bmatrix}
0 & -\frac{\sqrt{15}}{84} & 0 & 0 & 0 & \frac{\sqrt{3}}{12} & 0 & 0 & -\frac{3\sqrt{6}}{56} & 0 & 0 & 0 & \frac{3\sqrt{2}}{40} & 0 \\
0 & 0 & \frac{\sqrt{10}}{28} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{56} & 0 & 0 & 0 & \frac{\sqrt{42}}{40} \\
0 & 0 & 0 & -\frac{\sqrt{10}}{28} & 0 & 0 & \frac{\sqrt{42}}{40} & 0 & 0 & 0 & \frac{\sqrt{30}}{56} & 0 & 0 & 0 \\
-\frac{\sqrt{3}}{12} & 0 & 0 & 0 & \frac{\sqrt{15}}{84} & 0 & 0 & \frac{3\sqrt{2}}{40} & 0 & 0 & 0 & -\frac{3\sqrt{6}}{56} & 0 & 0 \\
\frac{\sqrt{15}}{84} & 0 & 0 & 0 & -\frac{\sqrt{3}}{12} & 0 & 0 & -\frac{\sqrt{10}}{28} & 0 & 0 & 0 & \frac{\sqrt{30}}{60} & 0 & 0 \\
0 & -\frac{\sqrt{15}}{28} & 0 & 0 & 0 & -\frac{\sqrt{3}}{12} & 0 & 0 & \frac{\sqrt{6}}{21} & 0 & 0 & 0 & \frac{\sqrt{2}}{10} & 0 \\
0 & 0 & \frac{\sqrt{15}}{42} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{5}}{28} & 0 & 0 & 0 & \frac{\sqrt{7}}{20} \\
0 & 0 & 0 & \frac{\sqrt{15}}{42} & 0 & 0 & -\frac{\sqrt{7}}{20} & 0 & 0 & 0 & -\frac{\sqrt{5}}{28} & 0 & 0 & 0 \\
-\frac{\sqrt{3}}{12} & 0 & 0 & 0 & -\frac{\sqrt{15}}{28} & 0 & 0 & -\frac{\sqrt{2}}{10} & 0 & 0 & 0 & -\frac{\sqrt{6}}{21} & 0 & 0 \\
0 & -\frac{\sqrt{3}}{12} & 0 & 0 & 0 & \frac{\sqrt{15}}{84} & 0 & 0 & -\frac{\sqrt{30}}{60} & 0 & 0 & 0 & \frac{\sqrt{10}}{28} & 0
\end{bmatrix}$$

768 symmetry

$$\frac{\sqrt{35}xy(x-y)(x+y)}{2}$$

continued …

No.	multipole	matrix
	$\mathbb{M}_4^{(a)}(B_2)$	$$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}i}{14} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{42}i}{140} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{2}i}{20} \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{2}i}{20} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ \frac{\sqrt{7}i}{14} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{42}i}{140} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{7}i}{14} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{70}i}{70} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}i}{14} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{42}i}{35} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{10} \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ \frac{\sqrt{7}i}{14} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{42}i}{35} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{7}i}{14} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{70}i}{70} & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$$
769	symmetry	$\dfrac{\sqrt{35}yz(y-z)(y+z)}{2}$
	$\mathbb{M}_{4,1}^{(a)}(E,1)$	$$\begin{bmatrix} -\frac{\sqrt{7}i}{112} & 0 & -\frac{\sqrt{70}i}{112} & 0 & -\frac{\sqrt{35}i}{112} & 0 & 0 & -\frac{9\sqrt{42}i}{560} & 0 & -\frac{3\sqrt{210}i}{280} & 0 & -\frac{9\sqrt{14}i}{560} & 0 & 0 \\ 0 & \frac{\sqrt{105}i}{112} & 0 & \frac{\sqrt{210}i}{112} & 0 & \frac{\sqrt{21}i}{112} & \frac{3\sqrt{2}i}{80} & 0 & \frac{3\sqrt{42}i}{140} & 0 & \frac{3\sqrt{70}i}{560} & 0 & -\frac{3\sqrt{14}i}{280} & 0 \\ -\frac{\sqrt{21}i}{112} & 0 & -\frac{\sqrt{210}i}{112} & 0 & -\frac{\sqrt{105}i}{112} & 0 & 0 & -\frac{3\sqrt{14}i}{280} & 0 & \frac{3\sqrt{70}i}{560} & 0 & \frac{3\sqrt{42}i}{140} & 0 & \frac{3\sqrt{2}i}{80} \\ 0 & \frac{\sqrt{35}i}{112} & 0 & \frac{\sqrt{70}i}{112} & 0 & \frac{\sqrt{7}i}{112} & 0 & 0 & -\frac{9\sqrt{14}i}{560} & 0 & -\frac{3\sqrt{210}i}{280} & 0 & -\frac{9\sqrt{42}i}{560} & 0 \\ 0 & \frac{\sqrt{7}i}{28} & 0 & \frac{\sqrt{14}i}{56} & 0 & 0 & -\frac{\sqrt{30}i}{80} & 0 & -\frac{\sqrt{70}i}{56} & 0 & -\frac{\sqrt{42}i}{112} & 0 & 0 & 0 \\ -\frac{\sqrt{7}i}{28} & 0 & -\frac{\sqrt{70}i}{56} & 0 & 0 & 0 & 0 & \frac{13\sqrt{42}i}{560} & 0 & \frac{\sqrt{210}i}{280} & 0 & -\frac{\sqrt{14}i}{80} & 0 & 0 \\ 0 & \frac{\sqrt{70}i}{56} & 0 & 0 & 0 & -\frac{\sqrt{14}i}{56} & -\frac{3\sqrt{3}i}{80} & 0 & -\frac{\sqrt{7}i}{560} & 0 & \frac{\sqrt{105}i}{80} & 0 & \frac{\sqrt{21}i}{560} & 0 \\ -\frac{\sqrt{14}i}{56} & 0 & 0 & 0 & \frac{\sqrt{70}i}{56} & 0 & 0 & -\frac{\sqrt{21}i}{560} & 0 & -\frac{\sqrt{105}i}{80} & 0 & \frac{\sqrt{7}i}{560} & 0 & \frac{3\sqrt{3}i}{80} \\ 0 & 0 & 0 & -\frac{\sqrt{70}i}{56} & 0 & -\frac{\sqrt{7}i}{28} & 0 & 0 & \frac{\sqrt{14}i}{80} & 0 & -\frac{\sqrt{210}i}{280} & 0 & -\frac{13\sqrt{42}i}{560} & 0 \\ 0 & 0 & \frac{\sqrt{14}i}{56} & 0 & \frac{\sqrt{7}i}{28} & 0 & 0 & 0 & 0 & \frac{\sqrt{42}i}{112} & 0 & \frac{\sqrt{70}i}{56} & 0 & \frac{\sqrt{30}i}{80} \end{bmatrix}$$
770	symmetry	$-\dfrac{\sqrt{35}xz(x-z)(x+z)}{2}$

continued ...

Table 9

No.	multipole	matrix

$\mathbb{M}_{4,2}^{(a)}(E,1)$

$\frac{\sqrt{7}}{112}$	0	$-\frac{\sqrt{70}}{112}$	0	$\frac{\sqrt{35}}{112}$	0	0	$\frac{9\sqrt{42}}{560}$	0	$-\frac{3\sqrt{210}}{280}$	0	$\frac{9\sqrt{14}}{560}$	0	0
0	$-\frac{\sqrt{105}}{112}$	0	$\frac{\sqrt{210}}{112}$	0	$-\frac{\sqrt{21}}{112}$	$\frac{3\sqrt{2}}{80}$	0	$-\frac{3\sqrt{42}}{140}$	0	$\frac{3\sqrt{70}}{560}$	0	$\frac{3\sqrt{14}}{280}$	0
$-\frac{\sqrt{21}}{112}$	0	$\frac{\sqrt{210}}{112}$	0	$-\frac{\sqrt{105}}{112}$	0	0	$-\frac{3\sqrt{14}}{280}$	0	$-\frac{3\sqrt{70}}{560}$	0	$\frac{3\sqrt{42}}{140}$	0	$-\frac{3\sqrt{2}}{80}$
0	$\frac{\sqrt{35}}{112}$	0	$-\frac{\sqrt{70}}{112}$	0	$\frac{\sqrt{7}}{112}$	0	0	$-\frac{9\sqrt{14}}{560}$	0	$\frac{3\sqrt{210}}{280}$	0	$-\frac{9\sqrt{42}}{560}$	0
0	$\frac{\sqrt{7}}{28}$	0	$-\frac{\sqrt{14}}{56}$	0	0	$\frac{\sqrt{30}}{80}$	0	$-\frac{\sqrt{70}}{56}$	0	$\frac{\sqrt{42}}{112}$	0	0	0
$\frac{\sqrt{7}}{28}$	0	$-\frac{\sqrt{70}}{56}$	0	0	0	0	$-\frac{13\sqrt{42}}{560}$	0	$\frac{\sqrt{210}}{280}$	0	$\frac{\sqrt{14}}{80}$	0	0
0	$-\frac{\sqrt{70}}{56}$	0	0	0	$\frac{\sqrt{14}}{56}$	$-\frac{3\sqrt{3}}{80}$	0	$\frac{\sqrt{7}}{560}$	0	$\frac{\sqrt{105}}{80}$	0	$-\frac{\sqrt{21}}{560}$	0
$-\frac{\sqrt{14}}{56}$	0	0	0	$\frac{\sqrt{70}}{56}$	0	0	$-\frac{\sqrt{21}}{560}$	0	$\frac{\sqrt{105}}{80}$	0	$\frac{\sqrt{7}}{560}$	0	$-\frac{3\sqrt{3}}{80}$
0	0	0	$\frac{\sqrt{70}}{56}$	0	$-\frac{\sqrt{7}}{28}$	0	0	$\frac{\sqrt{14}}{80}$	0	$\frac{\sqrt{210}}{280}$	0	$-\frac{13\sqrt{42}}{560}$	0
0	0	$\frac{\sqrt{14}}{56}$	0	$-\frac{\sqrt{7}}{28}$	0	0	0	0	$\frac{\sqrt{42}}{112}$	0	$-\frac{\sqrt{70}}{56}$	0	$\frac{\sqrt{30}}{80}$

771	symmetry	$\frac{\sqrt{5}\,yz\left(6x^2-y^2-z^2\right)}{2}$

$\mathbb{M}_{4,1}^{(a)}(E,2)$

$-\frac{i}{112}$	0	$-\frac{\sqrt{10}i}{112}$	0	$\frac{\sqrt{5}i}{16}$	0	0	$-\frac{9\sqrt{6}i}{560}$	0	$-\frac{3\sqrt{30}i}{280}$	0	$\frac{9\sqrt{2}i}{80}$	0	0
0	$\frac{\sqrt{15}i}{112}$	0	$\frac{\sqrt{30}i}{112}$	0	$-\frac{\sqrt{3}i}{16}$	$-\frac{3\sqrt{14}i}{80}$	0	$\frac{3\sqrt{6}i}{140}$	0	$\frac{3\sqrt{10}i}{560}$	0	$\frac{3\sqrt{2}i}{40}$	0
$\frac{\sqrt{3}i}{16}$	0	$-\frac{\sqrt{30}i}{112}$	0	$-\frac{\sqrt{15}i}{112}$	0	0	$\frac{3\sqrt{2}i}{40}$	0	$\frac{3\sqrt{10}i}{560}$	0	$\frac{3\sqrt{6}i}{140}$	0	$-\frac{3\sqrt{14}i}{80}$
0	$-\frac{\sqrt{5}i}{16}$	0	$\frac{\sqrt{10}i}{112}$	0	$\frac{i}{112}$	0	0	$\frac{9\sqrt{2}i}{80}$	0	$-\frac{3\sqrt{30}i}{280}$	0	$-\frac{9\sqrt{6}i}{560}$	0
0	$\frac{i}{28}$	0	$-\frac{\sqrt{2}i}{8}$	0	0	$-\frac{\sqrt{210}i}{560}$	0	$-\frac{\sqrt{10}i}{56}$	0	$\frac{\sqrt{6}i}{16}$	0	0	0
$-\frac{i}{28}$	0	$-\frac{\sqrt{10}i}{56}$	0	0	0	0	$\frac{13\sqrt{6}i}{560}$	0	$\frac{\sqrt{30}i}{280}$	0	$\frac{7\sqrt{2}i}{80}$	0	0
0	$\frac{\sqrt{10}i}{56}$	0	0	0	$\frac{\sqrt{2}i}{8}$	$\frac{3\sqrt{21}i}{80}$	0	$-\frac{i}{560}$	0	$\frac{\sqrt{15}i}{80}$	0	$-\frac{\sqrt{3}i}{80}$	0
$\frac{\sqrt{2}i}{8}$	0	0	0	$\frac{\sqrt{10}i}{56}$	0	0	$\frac{\sqrt{3}i}{80}$	0	$-\frac{\sqrt{15}i}{80}$	0	$\frac{i}{560}$	0	$-\frac{3\sqrt{21}i}{80}$
0	0	0	$-\frac{\sqrt{10}i}{56}$	0	$-\frac{i}{28}$	0	0	$-\frac{7\sqrt{2}i}{80}$	0	$-\frac{\sqrt{30}i}{280}$	0	$-\frac{13\sqrt{6}i}{560}$	0
0	0	$-\frac{\sqrt{2}i}{8}$	0	$\frac{i}{28}$	0	0	0	0	$-\frac{\sqrt{6}i}{16}$	0	$\frac{\sqrt{10}i}{56}$	0	$\frac{\sqrt{210}i}{560}$

772	symmetry	$\frac{\sqrt{5}\,xz\left(x^2-6y^2+z^2\right)}{2}$

continued …

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Table 9

No.	multipole	matrix

$\mathbb{M}_{4,2}^{(a)}(E,2)$

$$\begin{bmatrix}
\frac{1}{112} & 0 & -\frac{\sqrt{10}}{112} & 0 & -\frac{\sqrt{5}}{16} & 0 & 0 & \frac{9\sqrt{6}}{560} & 0 & -\frac{3\sqrt{30}}{280} & 0 & -\frac{9\sqrt{2}}{80} & 0 & 0 \\
0 & -\frac{\sqrt{15}}{112} & 0 & \frac{\sqrt{30}}{112} & 0 & \frac{\sqrt{3}}{16} & -\frac{3\sqrt{14}}{80} & 0 & -\frac{3\sqrt{6}}{140} & 0 & \frac{3\sqrt{10}}{560} & 0 & -\frac{3\sqrt{2}}{40} & 0 \\
\frac{\sqrt{3}}{16} & 0 & \frac{\sqrt{30}}{112} & 0 & -\frac{\sqrt{15}}{112} & 0 & 0 & \frac{3\sqrt{2}}{40} & 0 & -\frac{3\sqrt{10}}{560} & 0 & \frac{3\sqrt{6}}{140} & 0 & \frac{3\sqrt{14}}{80} \\
0 & -\frac{\sqrt{5}}{16} & 0 & -\frac{\sqrt{10}}{112} & 0 & \frac{1}{112} & 0 & 0 & \frac{9\sqrt{2}}{80} & 0 & \frac{3\sqrt{30}}{280} & 0 & -\frac{9\sqrt{6}}{560} & 0 \\
0 & \frac{1}{28} & 0 & \frac{\sqrt{2}}{8} & 0 & 0 & \frac{\sqrt{210}}{560} & 0 & -\frac{\sqrt{10}}{56} & 0 & -\frac{\sqrt{6}}{16} & 0 & 0 & 0 \\
\frac{1}{28} & 0 & -\frac{\sqrt{10}}{56} & 0 & 0 & 0 & 0 & -\frac{13\sqrt{6}}{560} & 0 & \frac{\sqrt{30}}{280} & 0 & -\frac{7\sqrt{2}}{80} & 0 & 0 \\
0 & -\frac{\sqrt{10}}{56} & 0 & 0 & 0 & -\frac{\sqrt{2}}{8} & \frac{3\sqrt{21}}{80} & 0 & \frac{1}{560} & 0 & \frac{\sqrt{15}}{80} & 0 & \frac{\sqrt{3}}{80} & 0 \\
\frac{\sqrt{2}}{8} & 0 & 0 & 0 & \frac{\sqrt{10}}{56} & 0 & 0 & \frac{\sqrt{3}}{80} & 0 & \frac{\sqrt{15}}{80} & 0 & \frac{1}{560} & 0 & \frac{3\sqrt{21}}{80} \\
0 & 0 & 0 & \frac{\sqrt{10}}{56} & 0 & -\frac{1}{28} & 0 & 0 & -\frac{7\sqrt{2}}{80} & 0 & \frac{\sqrt{30}}{280} & 0 & -\frac{13\sqrt{6}}{560} & 0 \\
0 & 0 & -\frac{\sqrt{2}}{8} & 0 & -\frac{1}{28} & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}}{16} & 0 & -\frac{\sqrt{10}}{56} & 0 & \frac{\sqrt{210}}{560}
\end{bmatrix}$$

773   symmetry $\dfrac{\sqrt{3}(x-y)(x+y)}{2}$

$\mathbb{M}_2^{(1,-1;a)}(A_1)$

$$\begin{bmatrix}
0 & 0 & 0 & -\frac{3}{70} & 0 & 0 & -\frac{\sqrt{105}}{35} & 0 & 0 & 0 & -\frac{\sqrt{3}}{35} & 0 & 0 & 0 \\
\frac{\sqrt{30}}{70} & 0 & 0 & 0 & -\frac{\sqrt{6}}{35} & 0 & 0 & -\frac{3\sqrt{5}}{35} & 0 & 0 & 0 & -\frac{\sqrt{15}}{35} & 0 & 0 \\
0 & \frac{\sqrt{6}}{35} & 0 & 0 & 0 & -\frac{\sqrt{30}}{70} & 0 & 0 & -\frac{\sqrt{15}}{35} & 0 & 0 & 0 & -\frac{3\sqrt{5}}{35} & 0 \\
0 & 0 & \frac{3}{70} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{35} & 0 & 0 & 0 & -\frac{\sqrt{105}}{35} \\
0 & 0 & \frac{\sqrt{5}}{35} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{70} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & \frac{3}{35} & 0 & 0 & -\frac{\sqrt{105}}{70} & 0 & 0 & 0 & \frac{2\sqrt{3}}{35} & 0 & 0 & 0 \\
\frac{\sqrt{5}}{35} & 0 & 0 & 0 & \frac{3}{35} & 0 & 0 & -\frac{\sqrt{30}}{35} & 0 & 0 & 0 & \frac{3\sqrt{10}}{70} & 0 & 0 \\
0 & \frac{3}{35} & 0 & 0 & 0 & \frac{\sqrt{5}}{35} & 0 & 0 & -\frac{3\sqrt{10}}{70} & 0 & 0 & 0 & \frac{\sqrt{30}}{35} & 0 \\
0 & 0 & \frac{3}{35} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{2\sqrt{3}}{35} & 0 & 0 & 0 & \frac{\sqrt{105}}{70} \\
0 & 0 & 0 & \frac{\sqrt{5}}{35} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{70} & 0 & 0 & 0
\end{bmatrix}$$

774   symmetry $\sqrt{3}\,xy$

continued ...

Table 9

No.	multipole	matrix

$$\mathbb{M}_2^{(1,-1;a)}(A_2):\quad
\begin{pmatrix}
0 & 0 & 0 & \frac{3i}{70} & 0 & 0 & -\frac{\sqrt{105}i}{35} & 0 & 0 & 0 & \frac{\sqrt{3}i}{35} & 0 & 0 & 0 \\
\frac{\sqrt{30}i}{70} & 0 & 0 & 0 & \frac{\sqrt{6}i}{35} & 0 & 0 & -\frac{3\sqrt{5}i}{35} & 0 & 0 & 0 & \frac{\sqrt{15}i}{35} & 0 & 0 \\
0 & \frac{\sqrt{6}i}{35} & 0 & 0 & 0 & \frac{\sqrt{30}i}{70} & 0 & 0 & -\frac{\sqrt{15}i}{35} & 0 & 0 & 0 & \frac{3\sqrt{5}i}{35} & 0 \\
0 & 0 & \frac{3i}{70} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{35} & 0 & 0 & 0 & \frac{\sqrt{105}i}{35} \\
0 & 0 & -\frac{\sqrt{5}i}{35} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{70} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & -\frac{3i}{35} & 0 & 0 & -\frac{\sqrt{105}i}{70} & 0 & 0 & 0 & -\frac{2\sqrt{3}i}{35} & 0 & 0 & 0 \\
\frac{\sqrt{5}i}{35} & 0 & 0 & 0 & -\frac{3i}{35} & 0 & 0 & -\frac{\sqrt{30}i}{35} & 0 & 0 & 0 & -\frac{3\sqrt{10}i}{70} & 0 & 0 \\
0 & \frac{3i}{35} & 0 & 0 & 0 & -\frac{\sqrt{5}i}{35} & 0 & 0 & -\frac{3\sqrt{10}i}{70} & 0 & 0 & 0 & -\frac{\sqrt{30}i}{35} & 0 \\
0 & 0 & \frac{3i}{35} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{2\sqrt{3}i}{35} & 0 & 0 & 0 & -\frac{\sqrt{105}i}{70} \\
0 & 0 & 0 & \frac{\sqrt{5}i}{35} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{70} & 0 & 0 & 0
\end{pmatrix}$$

775	symmetry	$-\frac{x^2}{2}-\frac{y^2}{2}+z^2$

$$\mathbb{M}_2^{(1,-1;a)}(B_1):\quad
\begin{pmatrix}
0 & -\frac{3\sqrt{6}}{70} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{2\sqrt{15}}{35} & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & -\frac{3}{70} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{6\sqrt{3}}{35} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & \frac{3}{70} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{6\sqrt{3}}{35} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & \frac{3\sqrt{6}}{70} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{2\sqrt{15}}{35} & 0 & 0 \\
\frac{\sqrt{6}}{21} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3}{14} & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & -\frac{\sqrt{6}}{105} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{15}}{70} & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & -\frac{4\sqrt{6}}{105} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{2}}{70} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & -\frac{4\sqrt{6}}{105} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{2}}{70} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & -\frac{\sqrt{6}}{105} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{15}}{70} & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{21} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3}{14} & 0
\end{pmatrix}$$

776	symmetry	$\sqrt{3}yz$

Table 9

No.	multipole	matrix

$\mathbb{M}_{2,1}^{(1,-1;a)}(E)$

$$\begin{pmatrix}
\frac{3\sqrt{10}i}{140} & 0 & \frac{9i}{140} & 0 & 0 & 0 & 0 & \frac{2\sqrt{15}i}{35} & 0 & \frac{2\sqrt{3}i}{35} & 0 & 0 & 0 & 0 \\
0 & -\frac{\sqrt{6}i}{140} & 0 & \frac{\sqrt{3}i}{28} & 0 & 0 & 0 & 0 & \frac{2\sqrt{15}i}{35} & 0 & \frac{6i}{35} & 0 & 0 & 0 \\
0 & 0 & -\frac{\sqrt{3}i}{28} & 0 & \frac{\sqrt{6}i}{140} & 0 & 0 & 0 & 0 & \frac{6i}{35} & 0 & \frac{2\sqrt{15}i}{35} & 0 & 0 \\
0 & 0 & 0 & -\frac{9i}{140} & 0 & -\frac{3\sqrt{10}i}{140} & 0 & 0 & 0 & 0 & \frac{2\sqrt{3}i}{35} & 0 & \frac{2\sqrt{15}i}{35} & 0 \\
0 & -\frac{\sqrt{10}i}{35} & 0 & 0 & 0 & 0 & -\frac{\sqrt{21}i}{28} & 0 & -\frac{3i}{28} & 0 & 0 & 0 & 0 & 0 \\
\frac{\sqrt{10}i}{35} & 0 & -\frac{2i}{35} & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{140} & 0 & -\frac{11\sqrt{3}i}{140} & 0 & 0 & 0 & 0 \\
0 & \frac{2i}{35} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{10}i}{140} & 0 & -\frac{\sqrt{6}i}{20} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & \frac{2i}{35} & 0 & 0 & 0 & 0 & \frac{\sqrt{6}i}{20} & 0 & -\frac{3\sqrt{10}i}{140} & 0 & 0 \\
0 & 0 & 0 & -\frac{2i}{35} & 0 & \frac{\sqrt{10}i}{35} & 0 & 0 & 0 & 0 & \frac{11\sqrt{3}i}{140} & 0 & \frac{\sqrt{15}i}{140} & 0 \\
0 & 0 & 0 & 0 & -\frac{\sqrt{10}i}{35} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3i}{28} & 0 & \frac{\sqrt{21}i}{28}
\end{pmatrix}$$

777	symmetry	$-\sqrt{3}xz$

$\mathbb{M}_{2,2}^{(1,-1;a)}(E)$

$$\begin{pmatrix}
-\frac{3\sqrt{10}}{140} & 0 & \frac{9}{140} & 0 & 0 & 0 & 0 & -\frac{2\sqrt{15}}{35} & 0 & \frac{2\sqrt{3}}{35} & 0 & 0 & 0 & 0 \\
0 & \frac{\sqrt{6}}{140} & 0 & \frac{\sqrt{3}}{28} & 0 & 0 & 0 & 0 & -\frac{2\sqrt{15}}{35} & 0 & \frac{6}{35} & 0 & 0 & 0 \\
0 & 0 & \frac{\sqrt{3}}{28} & 0 & \frac{\sqrt{6}}{140} & 0 & 0 & 0 & 0 & -\frac{6}{35} & 0 & \frac{2\sqrt{15}}{35} & 0 & 0 \\
0 & 0 & 0 & \frac{9}{140} & 0 & -\frac{3\sqrt{10}}{140} & 0 & 0 & 0 & 0 & -\frac{2\sqrt{3}}{35} & 0 & \frac{2\sqrt{15}}{35} & 0 \\
0 & -\frac{\sqrt{10}}{35} & 0 & 0 & 0 & 0 & \frac{\sqrt{21}}{28} & 0 & -\frac{3}{28} & 0 & 0 & 0 & 0 & 0 \\
-\frac{\sqrt{10}}{35} & 0 & -\frac{2}{35} & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{140} & 0 & -\frac{11\sqrt{3}}{140} & 0 & 0 & 0 & 0 \\
0 & -\frac{2}{35} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{10}}{140} & 0 & -\frac{\sqrt{6}}{20} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & \frac{2}{35} & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}}{20} & 0 & -\frac{3\sqrt{10}}{140} & 0 & 0 \\
0 & 0 & 0 & \frac{2}{35} & 0 & \frac{\sqrt{10}}{35} & 0 & 0 & 0 & 0 & -\frac{11\sqrt{3}}{140} & 0 & \frac{\sqrt{15}}{140} & 0 \\
0 & 0 & 0 & 0 & \frac{\sqrt{10}}{35} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3}{28} & 0 & \frac{\sqrt{21}}{28}
\end{pmatrix}$$

778	symmetry	$\frac{\sqrt{5}(x-y)(x+y)\left(x^2+y^2-6z^2\right)}{4}$

Table 9

No.	multipole	matrix

$$\mathbb{M}_4^{(1,-1;a)}(A_1) = \begin{pmatrix}
0 & 0 & 0 & -\frac{\sqrt{30}}{168} & 0 & 0 & -\frac{\sqrt{14}}{56} & 0 & 0 & 0 & -\frac{3\sqrt{10}}{56} & 0 & 0 & 0 \\
\frac{1}{56} & 0 & 0 & 0 & \frac{\sqrt{5}}{56} & 0 & 0 & \frac{11\sqrt{6}}{168} & 0 & 0 & 0 & -\frac{\sqrt{2}}{56} & 0 & 0 \\
0 & -\frac{\sqrt{5}}{56} & 0 & 0 & 0 & -\frac{1}{56} & 0 & 0 & -\frac{\sqrt{2}}{56} & 0 & 0 & 0 & \frac{11\sqrt{6}}{168} & 0 \\
0 & 0 & \frac{\sqrt{30}}{168} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{10}}{56} & 0 & 0 & 0 & -\frac{\sqrt{14}}{56} \\
0 & 0 & \frac{\sqrt{6}}{28} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{5\sqrt{2}}{28} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & -\frac{\sqrt{30}}{84} & 0 & 0 & -\frac{3\sqrt{14}}{56} & 0 & 0 & 0 & \frac{\sqrt{10}}{56} & 0 & 0 & 0 \\
\frac{\sqrt{6}}{28} & 0 & 0 & 0 & -\frac{\sqrt{30}}{84} & 0 & 0 & \frac{9}{56} & 0 & 0 & 0 & -\frac{17\sqrt{3}}{168} & 0 & 0 \\
0 & -\frac{\sqrt{30}}{84} & 0 & 0 & 0 & \frac{\sqrt{6}}{28} & 0 & 0 & \frac{17\sqrt{3}}{168} & 0 & 0 & 0 & -\frac{9}{56} & 0 \\
0 & 0 & -\frac{\sqrt{30}}{84} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}}{56} & 0 & 0 & 0 & \frac{3\sqrt{14}}{56} \\
0 & 0 & 0 & \frac{\sqrt{6}}{28} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{5\sqrt{2}}{28} & 0 & 0 & 0
\end{pmatrix}$$

779	symmetry	$-\dfrac{\sqrt{5}xy\left(x^2+y^2-6z^2\right)}{2}$

$$\mathbb{M}_4^{(1,-1;a)}(A_2) = \begin{bmatrix}
0 & 0 & 0 & -\frac{\sqrt{30}i}{168} & 0 & 0 & \frac{\sqrt{14}i}{56} & 0 & 0 & 0 & -\frac{3\sqrt{10}i}{56} & 0 & 0 & 0 \\
-\frac{i}{56} & 0 & 0 & 0 & \frac{\sqrt{5}i}{56} & 0 & 0 & -\frac{11\sqrt{6}i}{168} & 0 & 0 & 0 & -\frac{\sqrt{2}i}{56} & 0 & 0 \\
0 & \frac{\sqrt{5}i}{56} & 0 & 0 & 0 & -\frac{i}{56} & 0 & 0 & \frac{\sqrt{2}i}{56} & 0 & 0 & 0 & \frac{11\sqrt{6}i}{168} & 0 \\
0 & 0 & -\frac{\sqrt{30}i}{168} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{10}i}{56} & 0 & 0 & 0 & -\frac{\sqrt{14}i}{56} \\
0 & 0 & \frac{\sqrt{6}i}{28} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{5\sqrt{2}i}{28} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & -\frac{\sqrt{30}i}{84} & 0 & 0 & \frac{3\sqrt{14}i}{56} & 0 & 0 & 0 & \frac{\sqrt{10}i}{56} & 0 & 0 & 0 \\
-\frac{\sqrt{6}i}{28} & 0 & 0 & 0 & -\frac{\sqrt{30}i}{84} & 0 & 0 & -\frac{9i}{56} & 0 & 0 & 0 & -\frac{17\sqrt{3}i}{168} & 0 & 0 \\
0 & \frac{\sqrt{30}i}{84} & 0 & 0 & 0 & \frac{\sqrt{6}i}{28} & 0 & 0 & -\frac{17\sqrt{3}i}{168} & 0 & 0 & 0 & -\frac{9i}{56} & 0 \\
0 & 0 & \frac{\sqrt{30}i}{84} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}i}{56} & 0 & 0 & 0 & \frac{3\sqrt{14}i}{56} \\
0 & 0 & 0 & -\frac{\sqrt{6}i}{28} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{5\sqrt{2}i}{28} & 0 & 0 & 0
\end{bmatrix}$$

780	symmetry	$\dfrac{\sqrt{21}\left(x^4-3x^2y^2-3x^2z^2+y^4-3y^2z^2+z^4\right)}{6}$

Table 9

No.	multipole	matrix

$\mathbb{M}_4^{(1,-1;a)}(B_1,1)$

$$\begin{bmatrix}
0 & \frac{\sqrt{7}}{168} & 0 & 0 & 0 & \frac{\sqrt{35}}{168} & 0 & 0 & \frac{\sqrt{70}}{56} & 0 & 0 & 0 & \frac{\sqrt{210}}{168} & 0 \\
0 & 0 & -\frac{\sqrt{42}}{168} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{5\sqrt{14}}{168} & 0 & 0 & 0 & \frac{\sqrt{10}}{24} \\
0 & 0 & 0 & \frac{\sqrt{42}}{168} & 0 & 0 & \frac{\sqrt{10}}{24} & 0 & 0 & 0 & -\frac{5\sqrt{14}}{168} & 0 & 0 & 0 \\
-\frac{\sqrt{35}}{168} & 0 & 0 & 0 & -\frac{\sqrt{7}}{168} & 0 & 0 & \frac{\sqrt{210}}{168} & 0 & 0 & 0 & \frac{\sqrt{70}}{56} & 0 & 0 \\
-\frac{\sqrt{7}}{84} & 0 & 0 & 0 & -\frac{\sqrt{35}}{84} & 0 & 0 & -\frac{5\sqrt{42}}{168} & 0 & 0 & 0 & -\frac{5\sqrt{14}}{168} & 0 & 0 \\
0 & \frac{\sqrt{7}}{28} & 0 & 0 & 0 & -\frac{\sqrt{35}}{84} & 0 & 0 & \frac{\sqrt{70}}{42} & 0 & 0 & 0 & -\frac{\sqrt{210}}{84} & 0 \\
0 & 0 & -\frac{\sqrt{7}}{42} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{5\sqrt{21}}{168} & 0 & 0 & 0 & -\frac{\sqrt{15}}{24} \\
0 & 0 & 0 & -\frac{\sqrt{7}}{42} & 0 & 0 & \frac{\sqrt{15}}{24} & 0 & 0 & 0 & -\frac{5\sqrt{21}}{168} & 0 & 0 & 0 \\
-\frac{\sqrt{35}}{84} & 0 & 0 & 0 & \frac{\sqrt{7}}{28} & 0 & 0 & \frac{\sqrt{210}}{168} & 0 & 0 & 0 & -\frac{\sqrt{70}}{42} & 0 & 0 \\
0 & -\frac{\sqrt{35}}{84} & 0 & 0 & 0 & -\frac{\sqrt{7}}{84} & 0 & 0 & \frac{5\sqrt{14}}{168} & 0 & 0 & 0 & \frac{5\sqrt{42}}{168} & 0
\end{bmatrix}$$

781	symmetry	$-\frac{\sqrt{15}\left(x^4-12x^2y^2+6x^2z^2+y^4+6y^2z^2-2z^4\right)}{12}$

$\mathbb{M}_4^{(1,-1;a)}(B_1,2)$

$$\begin{bmatrix}
0 & \frac{\sqrt{5}}{168} & 0 & 0 & 0 & -\frac{1}{24} & 0 & 0 & \frac{5\sqrt{2}}{56} & 0 & 0 & 0 & -\frac{\sqrt{6}}{24} & 0 \\
0 & 0 & -\frac{\sqrt{30}}{168} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{5\sqrt{10}}{168} & 0 & 0 & 0 & -\frac{\sqrt{14}}{24} \\
0 & 0 & 0 & \frac{\sqrt{30}}{168} & 0 & 0 & -\frac{\sqrt{14}}{24} & 0 & 0 & 0 & -\frac{5\sqrt{10}}{168} & 0 & 0 & 0 \\
\frac{1}{24} & 0 & 0 & 0 & -\frac{\sqrt{5}}{168} & 0 & 0 & -\frac{\sqrt{6}}{24} & 0 & 0 & 0 & \frac{5\sqrt{2}}{56} & 0 & 0 \\
-\frac{\sqrt{5}}{84} & 0 & 0 & 0 & \frac{1}{12} & 0 & 0 & -\frac{5\sqrt{30}}{168} & 0 & 0 & 0 & \frac{\sqrt{10}}{24} & 0 & 0 \\
0 & \frac{\sqrt{5}}{28} & 0 & 0 & 0 & \frac{1}{12} & 0 & 0 & \frac{5\sqrt{2}}{42} & 0 & 0 & 0 & \frac{\sqrt{6}}{12} & 0 \\
0 & 0 & -\frac{\sqrt{5}}{42} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{5\sqrt{15}}{168} & 0 & 0 & 0 & \frac{\sqrt{21}}{24} \\
0 & 0 & 0 & -\frac{\sqrt{5}}{42} & 0 & 0 & -\frac{\sqrt{21}}{24} & 0 & 0 & 0 & -\frac{5\sqrt{15}}{168} & 0 & 0 & 0 \\
\frac{1}{12} & 0 & 0 & 0 & \frac{\sqrt{5}}{28} & 0 & 0 & -\frac{\sqrt{6}}{12} & 0 & 0 & 0 & -\frac{5\sqrt{2}}{42} & 0 & 0 \\
0 & \frac{1}{12} & 0 & 0 & 0 & -\frac{\sqrt{5}}{84} & 0 & 0 & -\frac{\sqrt{10}}{24} & 0 & 0 & 0 & \frac{5\sqrt{30}}{168} & 0
\end{bmatrix}$$

782	symmetry	$\frac{\sqrt{35}xy(x-y)(x+y)}{2}$

continued ...

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Table 9

No.	multipole	matrix

$$\mathbb{M}_4^{(1,-1;a)}(B_2)$$

$$
\begin{bmatrix}
0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{21}i}{84} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{14}i}{28} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{12} \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}i}{12} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
-\frac{\sqrt{21}i}{84} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{14}i}{28} & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & \frac{\sqrt{21}i}{42} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{210}i}{84} & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & \frac{\sqrt{21}i}{42} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{14}i}{14} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{i}{4} \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{i}{4} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
-\frac{\sqrt{21}i}{42} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{14}i}{14} & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & -\frac{\sqrt{21}i}{42} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{210}i}{84} & 0 & 0 & 0 & 0 & 0
\end{bmatrix}
$$

783	symmetry	$\dfrac{\sqrt{35}\,yz(y-z)(y+z)}{2}$

$$\mathbb{M}_{4,1}^{(1,-1;a)}(E,1)$$

$$
\begin{bmatrix}
\frac{\sqrt{21}i}{672} & 0 & \frac{\sqrt{210}i}{672} & 0 & \frac{\sqrt{105}i}{672} & 0 & 0 & \frac{3\sqrt{14}i}{112} & 0 & \frac{\sqrt{70}i}{56} & 0 & \frac{\sqrt{42}i}{112} & 0 & 0 \\
0 & -\frac{\sqrt{35}i}{224} & 0 & -\frac{\sqrt{70}i}{224} & 0 & -\frac{\sqrt{7}i}{224} & -\frac{\sqrt{6}i}{48} & 0 & -\frac{\sqrt{14}i}{28} & 0 & -\frac{\sqrt{210}i}{336} & 0 & \frac{\sqrt{42}i}{168} & 0 \\
\frac{\sqrt{7}i}{224} & 0 & \frac{\sqrt{70}i}{224} & 0 & \frac{\sqrt{35}i}{224} & 0 & 0 & \frac{\sqrt{42}i}{168} & 0 & -\frac{\sqrt{210}i}{336} & 0 & -\frac{\sqrt{14}i}{28} & 0 & -\frac{\sqrt{6}i}{48} \\
0 & -\frac{\sqrt{105}i}{672} & 0 & -\frac{\sqrt{210}i}{672} & 0 & -\frac{\sqrt{21}i}{672} & 0 & 0 & \frac{\sqrt{42}i}{112} & 0 & \frac{\sqrt{70}i}{56} & 0 & \frac{3\sqrt{14}i}{112} & 0 \\
0 & -\frac{\sqrt{21}i}{84} & 0 & -\frac{\sqrt{42}i}{168} & 0 & 0 & -\frac{\sqrt{10}i}{32} & 0 & -\frac{5\sqrt{210}i}{336} & 0 & -\frac{5\sqrt{14}i}{224} & 0 & 0 & 0 \\
\frac{\sqrt{21}i}{84} & 0 & \frac{\sqrt{210}i}{168} & 0 & 0 & 0 & 0 & \frac{13\sqrt{14}i}{224} & 0 & \frac{\sqrt{70}i}{112} & 0 & -\frac{\sqrt{42}i}{96} & 0 & 0 \\
0 & -\frac{\sqrt{210}i}{168} & 0 & 0 & 0 & \frac{\sqrt{42}i}{168} & -\frac{3i}{32} & 0 & -\frac{\sqrt{21}i}{672} & 0 & \frac{\sqrt{35}i}{32} & 0 & \frac{\sqrt{7}i}{224} & 0 \\
\frac{\sqrt{42}i}{168} & 0 & 0 & 0 & -\frac{\sqrt{210}i}{168} & 0 & 0 & -\frac{\sqrt{7}i}{224} & 0 & -\frac{\sqrt{35}i}{32} & 0 & \frac{\sqrt{21}i}{672} & 0 & \frac{3i}{32} \\
0 & 0 & 0 & \frac{\sqrt{210}i}{168} & 0 & \frac{\sqrt{21}i}{84} & 0 & 0 & \frac{\sqrt{42}i}{96} & 0 & -\frac{\sqrt{70}i}{112} & 0 & -\frac{13\sqrt{14}i}{224} & 0 \\
0 & 0 & -\frac{\sqrt{42}i}{168} & 0 & -\frac{\sqrt{21}i}{84} & 0 & 0 & 0 & 0 & \frac{5\sqrt{14}i}{224} & 0 & \frac{5\sqrt{210}i}{336} & 0 & \frac{\sqrt{10}i}{32}
\end{bmatrix}
$$

784	symmetry	$-\dfrac{\sqrt{35}\,xz(x-z)(x+z)}{2}$

continued ...

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Table 9

No.	multipole	matrix

$\mathbb{M}_{4,2}^{(1,-1;a)}(E,1)$

$-\frac{\sqrt{21}}{672}$	0	$\frac{\sqrt{210}}{672}$	0	$-\frac{\sqrt{105}}{672}$	0	0	$-\frac{3\sqrt{14}}{112}$	0	$\frac{\sqrt{70}}{56}$	0	$-\frac{\sqrt{42}}{112}$	0	0
0	$\frac{\sqrt{35}}{224}$	0	$-\frac{\sqrt{70}}{224}$	0	$\frac{\sqrt{7}}{224}$	$-\frac{\sqrt{6}}{48}$	0	$\frac{\sqrt{14}}{28}$	0	$-\frac{\sqrt{210}}{336}$	0	$-\frac{\sqrt{42}}{168}$	0
$\frac{\sqrt{7}}{224}$	0	$-\frac{\sqrt{70}}{224}$	0	$\frac{\sqrt{35}}{224}$	0	0	$\frac{\sqrt{42}}{168}$	0	$\frac{\sqrt{210}}{336}$	0	$-\frac{\sqrt{14}}{28}$	0	$\frac{\sqrt{6}}{48}$
0	$-\frac{\sqrt{105}}{672}$	0	$\frac{\sqrt{210}}{672}$	0	$-\frac{\sqrt{21}}{672}$	0	0	$\frac{\sqrt{42}}{112}$	0	$-\frac{\sqrt{70}}{56}$	0	$\frac{3\sqrt{14}}{112}$	0
0	$-\frac{\sqrt{21}}{84}$	0	$\frac{\sqrt{42}}{168}$	0	0	$\frac{\sqrt{10}}{32}$	0	$-\frac{5\sqrt{210}}{336}$	0	$\frac{5\sqrt{14}}{224}$	0	0	0
$-\frac{\sqrt{21}}{84}$	0	$\frac{\sqrt{210}}{168}$	0	0	0	0	$-\frac{13\sqrt{14}}{224}$	0	$\frac{\sqrt{70}}{112}$	0	$\frac{\sqrt{42}}{96}$	0	0
0	$\frac{\sqrt{210}}{168}$	0	0	0	$-\frac{\sqrt{42}}{168}$	$-\frac{3}{32}$	0	$\frac{\sqrt{21}}{672}$	0	$\frac{\sqrt{35}}{32}$	0	$-\frac{\sqrt{7}}{224}$	0
$\frac{\sqrt{42}}{168}$	0	0	0	$-\frac{\sqrt{210}}{168}$	0	0	$-\frac{\sqrt{7}}{224}$	0	$\frac{\sqrt{35}}{32}$	0	$\frac{\sqrt{21}}{672}$	0	$-\frac{3}{32}$
0	0	0	$-\frac{\sqrt{210}}{168}$	0	$\frac{\sqrt{21}}{84}$	0	0	$\frac{\sqrt{42}}{96}$	0	$\frac{\sqrt{70}}{112}$	0	$-\frac{13\sqrt{14}}{224}$	0
0	0	$-\frac{\sqrt{42}}{168}$	0	$\frac{\sqrt{21}}{84}$	0	0	0	0	$\frac{5\sqrt{14}}{224}$	0	$-\frac{5\sqrt{210}}{336}$	0	$\frac{\sqrt{10}}{32}$

No.	symmetry	
785	symmetry	$\frac{\sqrt{5}yz\left(6x^2-y^2-z^2\right)}{2}$

$\mathbb{M}_{4,1}^{(1,-1;a)}(E,2)$

$\frac{\sqrt{3}i}{672}$	0	$\frac{\sqrt{30}i}{672}$	0	$-\frac{\sqrt{15}i}{96}$	0	0	$\frac{3\sqrt{2}i}{112}$	0	$\frac{\sqrt{10}i}{56}$	0	$-\frac{\sqrt{6}i}{16}$	0	0
0	$-\frac{\sqrt{5}i}{224}$	0	$-\frac{\sqrt{10}i}{224}$	0	$\frac{i}{32}$	$\frac{\sqrt{42}i}{48}$	0	$-\frac{\sqrt{2}i}{28}$	0	$-\frac{\sqrt{30}i}{336}$	0	$-\frac{\sqrt{6}i}{24}$	0
$-\frac{i}{32}$	0	$\frac{\sqrt{10}i}{224}$	0	$\frac{\sqrt{5}i}{224}$	0	0	$-\frac{\sqrt{6}i}{24}$	0	$-\frac{\sqrt{30}i}{336}$	0	$-\frac{\sqrt{2}i}{28}$	0	$\frac{\sqrt{42}i}{48}$
0	$\frac{\sqrt{15}i}{96}$	0	$-\frac{\sqrt{30}i}{672}$	0	$-\frac{\sqrt{3}i}{672}$	0	0	$-\frac{\sqrt{6}i}{16}$	0	$\frac{\sqrt{10}i}{56}$	0	$\frac{3\sqrt{2}i}{112}$	0
0	$-\frac{\sqrt{3}i}{84}$	0	$\frac{\sqrt{6}i}{24}$	0	0	$-\frac{\sqrt{70}i}{224}$	0	$-\frac{5\sqrt{30}i}{336}$	0	$\frac{5\sqrt{2}i}{32}$	0	0	0
$\frac{\sqrt{3}i}{84}$	0	$\frac{\sqrt{30}i}{168}$	0	0	0	0	$\frac{13\sqrt{2}i}{224}$	0	$\frac{\sqrt{10}i}{112}$	0	$\frac{7\sqrt{6}i}{96}$	0	0
0	$-\frac{\sqrt{30}i}{168}$	0	0	0	$-\frac{\sqrt{6}i}{24}$	$\frac{3\sqrt{7}i}{32}$	0	$-\frac{\sqrt{3}i}{672}$	0	$\frac{\sqrt{5}i}{32}$	0	$-\frac{i}{32}$	0
$-\frac{\sqrt{6}i}{24}$	0	0	0	$-\frac{\sqrt{30}i}{168}$	0	0	$\frac{i}{32}$	0	$-\frac{\sqrt{5}i}{32}$	0	$\frac{\sqrt{3}i}{672}$	0	$-\frac{3\sqrt{7}i}{32}$
0	0	0	$\frac{\sqrt{30}i}{168}$	0	$\frac{\sqrt{3}i}{84}$	0	0	$-\frac{7\sqrt{6}i}{96}$	0	$-\frac{\sqrt{10}i}{112}$	0	$-\frac{13\sqrt{2}i}{224}$	0
0	0	$\frac{\sqrt{6}i}{24}$	0	$-\frac{\sqrt{3}i}{84}$	0	0	0	0	$-\frac{5\sqrt{2}i}{32}$	0	$\frac{5\sqrt{30}i}{336}$	0	$\frac{\sqrt{70}i}{224}$

No.	symmetry	
786	symmetry	$\frac{\sqrt{5}xz\left(x^2-6y^2+z^2\right)}{2}$

continued …

Table 9

No.	multipole	matrix

$\mathbb{M}_{4,2}^{(1,-1;a)}(E,2)$

$$\begin{bmatrix}
-\frac{\sqrt{3}}{672} & 0 & \frac{\sqrt{30}}{672} & 0 & \frac{\sqrt{15}}{96} & 0 & 0 & -\frac{3\sqrt{2}}{112} & 0 & \frac{\sqrt{10}}{56} & 0 & \frac{\sqrt{6}}{16} & 0 & 0 \\
0 & \frac{\sqrt{5}}{224} & 0 & -\frac{\sqrt{10}}{224} & 0 & -\frac{1}{32} & \frac{\sqrt{42}}{48} & 0 & \frac{\sqrt{2}}{28} & 0 & -\frac{\sqrt{30}}{336} & 0 & \frac{\sqrt{6}}{24} & 0 \\
-\frac{1}{32} & 0 & -\frac{\sqrt{10}}{224} & 0 & \frac{\sqrt{5}}{224} & 0 & 0 & -\frac{\sqrt{6}}{24} & 0 & \frac{\sqrt{30}}{336} & 0 & -\frac{\sqrt{2}}{28} & 0 & -\frac{\sqrt{42}}{48} \\
0 & \frac{\sqrt{15}}{96} & 0 & \frac{\sqrt{30}}{672} & 0 & -\frac{\sqrt{3}}{672} & 0 & 0 & -\frac{\sqrt{6}}{16} & 0 & -\frac{\sqrt{10}}{56} & 0 & \frac{3\sqrt{2}}{112} & 0 \\
0 & -\frac{\sqrt{3}}{84} & 0 & -\frac{\sqrt{6}}{24} & 0 & 0 & \frac{\sqrt{70}}{224} & 0 & -\frac{5\sqrt{30}}{336} & 0 & -\frac{5\sqrt{2}}{32} & 0 & 0 & 0 \\
-\frac{\sqrt{3}}{84} & 0 & \frac{\sqrt{30}}{168} & 0 & 0 & 0 & 0 & -\frac{13\sqrt{2}}{224} & 0 & \frac{\sqrt{10}}{112} & 0 & -\frac{7\sqrt{6}}{96} & 0 & 0 \\
0 & \frac{\sqrt{30}}{168} & 0 & 0 & 0 & \frac{\sqrt{6}}{24} & \frac{3\sqrt{7}}{32} & 0 & \frac{\sqrt{3}}{672} & 0 & \frac{\sqrt{5}}{32} & 0 & \frac{1}{32} & 0 \\
-\frac{\sqrt{6}}{24} & 0 & 0 & 0 & -\frac{\sqrt{30}}{168} & 0 & 0 & \frac{1}{32} & 0 & \frac{\sqrt{5}}{32} & 0 & \frac{\sqrt{3}}{672} & 0 & \frac{3\sqrt{7}}{32} \\
0 & 0 & 0 & -\frac{\sqrt{30}}{168} & 0 & \frac{\sqrt{3}}{84} & 0 & 0 & -\frac{7\sqrt{6}}{96} & 0 & \frac{\sqrt{10}}{112} & 0 & -\frac{13\sqrt{2}}{224} & 0 \\
0 & 0 & \frac{\sqrt{6}}{24} & 0 & \frac{\sqrt{3}}{84} & 0 & 0 & 0 & 0 & -\frac{5\sqrt{2}}{32} & 0 & -\frac{5\sqrt{30}}{336} & 0 & \frac{\sqrt{70}}{224}
\end{bmatrix}$$

787   symmetry

$$-\frac{\sqrt{2310}(x-y)(x+y)(x-z)(x+z)(y-z)(y+z)}{8}$$

$\mathbb{M}_{6}^{(1,-1;a)}(A_1,1)$

$$\begin{bmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}}{24} & 0 & 0 & 0 & \frac{\sqrt{5}}{8} \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{1}{24} & 0 & 0 & 0 & \frac{\sqrt{35}}{24} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{14}}{24} & 0 & 0 & 0 & -\frac{\sqrt{42}}{24} & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{42}}{24} & 0 & 0 & 0 & \frac{\sqrt{14}}{24} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{35}}{24} & 0 & 0 & 0 & -\frac{1}{24} \\
0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}}{8} & 0 & 0 & 0 & \frac{\sqrt{7}}{24} & 0 & 0 & 0
\end{bmatrix}$$

788   symmetry

$$\frac{\sqrt{42}(x-y)(x+y)\left(x^4-9x^2y^2-5x^2z^2+y^4-5y^2z^2+5z^4\right)}{8}$$

Table 9

No.	multipole	matrix
	$\mathbb{M}_6^{(1,-1;a)}(A_1,2)$	$$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{385}}{264} & 0 & 0 & 0 & \frac{\sqrt{11}}{8} \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{55}}{264} & 0 & 0 & 0 & -\frac{5\sqrt{77}}{264} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{770}}{264} & 0 & 0 & 0 & \frac{\sqrt{2310}}{264} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2310}}{264} & 0 & 0 & 0 & -\frac{\sqrt{770}}{264} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{5\sqrt{77}}{264} & 0 & 0 & 0 & \frac{\sqrt{55}}{264} \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{11}}{8} & 0 & 0 & 0 & -\frac{\sqrt{385}}{264} & 0 & 0 & 0 \end{bmatrix}$$
789	symmetry	$\dfrac{\sqrt{462}\,xy\left(x^2-3y^2\right)\left(3x^2-y^2\right)}{16}$
	$\mathbb{M}_6^{(1,-1;a)}(A_2,1)$	$$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{i}{2} \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{i}{2} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$$
790	symmetry	$\dfrac{\sqrt{210}\,xy\left(x^4+2x^2y^2-16x^2z^2+y^4-16y^2z^2+16z^4\right)}{16}$

continued ...

Table 9

No.	multipole	matrix

$\mathbb{M}_6^{(1,-1;a)}(A_2,2)$

0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	$-\frac{\sqrt{77}i}{66}$	0	0	0
0	0	0	0	0	0	$-\frac{\sqrt{11}i}{66}$	0	0	0	$\frac{\sqrt{385}i}{66}$	0	0
0	0	0	0	0	0	0	$\frac{\sqrt{154}i}{66}$	0	0	0	$-\frac{\sqrt{462}i}{66}$	0
0	0	0	0	0	0	0	0	$-\frac{\sqrt{462}i}{66}$	0	0	0	$\frac{\sqrt{154}i}{66}$
0	0	0	0	0	0	0	0	0	$\frac{\sqrt{385}i}{66}$	0	0	$-\frac{\sqrt{11}i}{66}$
0	0	0	0	0	0	0	0	0	0	$-\frac{\sqrt{77}i}{66}$	0	0

791	symmetry	$\frac{\sqrt{2}\left(2x^6-15x^4y^2-15x^4z^2-15x^2y^4+180x^2y^2z^2-15x^2z^4+2y^6-15y^4z^2-15y^2z^4+2z^6\right)}{8}$

$\mathbb{M}_6^{(1,-1;a)}(B_1,1)$

0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	$\frac{\sqrt{33}}{264}$	0	0	0	$-\frac{7\sqrt{11}}{88}$	0
0	0	0	0	0	0	0	0	$-\frac{\sqrt{55}}{88}$	0	0	0	$\frac{7\sqrt{165}}{264}$
0	0	0	0	0	0	0	0	0	$\frac{5\sqrt{66}}{264}$	0	0	$-\frac{\sqrt{2310}}{264}$
0	0	0	0	0	0	$\frac{\sqrt{2310}}{264}$	0	0	0	$-\frac{5\sqrt{66}}{264}$	0	0
0	0	0	0	0	0	0	$-\frac{7\sqrt{165}}{264}$	0	0	0	$\frac{\sqrt{55}}{88}$	0
0	0	0	0	0	0	0	0	$\frac{7\sqrt{11}}{88}$	0	0	0	$-\frac{\sqrt{33}}{264}$

792	symmetry	$-\frac{\sqrt{14}\left(x^6-15x^4z^2+15x^2z^4+y^6-15y^4z^2+15y^2z^4-2z^6\right)}{8}$

Table 9

No.	multipole	matrix
	$\mathbb{M}_6^{(1,-1;a)}(B_1,2)$	$$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{231}}{264} & 0 & 0 & 0 & \frac{\sqrt{77}}{88} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{385}}{88} & 0 & 0 & 0 & -\frac{\sqrt{1155}}{264} \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{5\sqrt{462}}{264} & 0 & 0 & \frac{\sqrt{330}}{264} \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{330}}{264} & 0 & 0 & 0 & -\frac{5\sqrt{462}}{264} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{1155}}{264} & 0 & 0 & 0 & \frac{\sqrt{385}}{88} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{77}}{88} & 0 & 0 & 0 & -\frac{\sqrt{231}}{264} \end{bmatrix}$$
793	symmetry	$-\dfrac{3\sqrt{7}xy(x-y)(x+y)\left(x^2+y^2-10z^2\right)}{4}$
	$\mathbb{M}_6^{(1,-1;a)}(B_2)$	$$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{154}i}{44} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2310}i}{132} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{165}i}{66} \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{165}i}{66} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2310}i}{132} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{154}i}{44} & 0 & 0 & 0 \end{bmatrix}$$
794	symmetry	$\dfrac{3\sqrt{7}yz(y-z)(y+z)\left(10x^2-y^2-z^2\right)}{4}$

continued ...

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Table 9

No.	multipole	matrix

$\mathbb{M}_{6,1}^{(1,-1;a)}(E,1)$

$$\begin{bmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{66}i}{1056} & 0 & -\frac{\sqrt{154}i}{352} & 0 & \frac{\sqrt{2310}i}{352} & 0 & \frac{\sqrt{462}i}{96} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2310}i}{1056} & 0 & \frac{5\sqrt{462}i}{1056} & 0 & -\frac{3\sqrt{770}i}{352} & 0 & -\frac{\sqrt{330}i}{96} \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{165}i}{176} & 0 & -\frac{\sqrt{385}i}{176} & 0 & -\frac{5\sqrt{231}i}{528} & 0 & \frac{\sqrt{1155}i}{176} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{1155}i}{176} & 0 & \frac{5\sqrt{231}i}{528} & 0 & \frac{\sqrt{385}i}{176} & 0 & -\frac{\sqrt{165}i}{176} \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{330}i}{96} & 0 & \frac{3\sqrt{770}i}{352} & 0 & -\frac{5\sqrt{462}i}{1056} & 0 & -\frac{\sqrt{2310}i}{1056} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{462}i}{96} & 0 & -\frac{\sqrt{2310}i}{352} & 0 & \frac{\sqrt{154}i}{352} & 0 & \frac{\sqrt{66}i}{1056}
\end{bmatrix}$$

| 795 | symmetry | $\dfrac{3\sqrt{7}xz(x-z)(x+z)\left(x^2-10y^2+z^2\right)}{4}$ |

$\mathbb{M}_{6,2}^{(1,-1;a)}(E,1)$

$$\begin{bmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{66}}{1056} & 0 & -\frac{\sqrt{154}}{352} & 0 & -\frac{\sqrt{2310}}{352} & 0 & \frac{\sqrt{462}}{96} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2310}}{1056} & 0 & \frac{5\sqrt{462}}{1056} & 0 & \frac{3\sqrt{770}}{352} & 0 & -\frac{\sqrt{330}}{96} \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{165}}{176} & 0 & \frac{\sqrt{385}}{176} & 0 & -\frac{5\sqrt{231}}{528} & 0 & -\frac{\sqrt{1155}}{176} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{1155}}{176} & 0 & -\frac{5\sqrt{231}}{528} & 0 & \frac{\sqrt{385}}{176} & 0 & \frac{\sqrt{165}}{176} \\
0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{330}}{96} & 0 & \frac{3\sqrt{770}}{352} & 0 & \frac{5\sqrt{462}}{1056} & 0 & -\frac{\sqrt{2310}}{1056} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{462}}{96} & 0 & -\frac{\sqrt{2310}}{352} & 0 & -\frac{\sqrt{154}}{352} & 0 & \frac{\sqrt{66}}{1056}
\end{bmatrix}$$

| 796 | symmetry | $\dfrac{\sqrt{462}yz\left(y^2-3z^2\right)\left(3y^2-z^2\right)}{16}$ |

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Table 9

No.	multipole	matrix
	$\mathbb{M}_{6,1}^{(1,-1;a)}(E,2)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{i}{64} & 0 & -\frac{\sqrt{21}i}{64} & 0 & -\frac{\sqrt{35}i}{64} & 0 & -\frac{\sqrt{7}i}{64} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{35}i}{64} & 0 & \frac{5\sqrt{7}i}{64} & 0 & \frac{\sqrt{105}i}{64} & 0 & \frac{\sqrt{5}i}{64} \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}i}{64} & 0 & -\frac{\sqrt{210}i}{64} & 0 & -\frac{5\sqrt{14}i}{64} & 0 & -\frac{\sqrt{70}i}{64} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{70}i}{64} & 0 & \frac{5\sqrt{14}i}{64} & 0 & \frac{\sqrt{210}i}{64} & 0 & \frac{\sqrt{10}i}{64} \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{64} & 0 & -\frac{\sqrt{105}i}{64} & 0 & -\frac{5\sqrt{7}i}{64} & 0 & -\frac{\sqrt{35}i}{64} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}i}{64} & 0 & \frac{\sqrt{35}i}{64} & 0 & \frac{\sqrt{21}i}{64} & 0 & \frac{i}{64} \end{bmatrix}$
797	symmetry	$-\dfrac{\sqrt{462}\,xz\left(x^2-3z^2\right)\left(3x^2-z^2\right)}{16}$
	$\mathbb{M}_{6,2}^{(1,-1;a)}(E,2)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{1}{64} & 0 & -\frac{\sqrt{21}}{64} & 0 & \frac{\sqrt{35}}{64} & 0 & -\frac{\sqrt{7}}{64} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{35}}{64} & 0 & \frac{5\sqrt{7}}{64} & 0 & -\frac{\sqrt{105}}{64} & 0 & \frac{\sqrt{5}}{64} \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}}{64} & 0 & \frac{\sqrt{210}}{64} & 0 & -\frac{5\sqrt{14}}{64} & 0 & \frac{\sqrt{70}}{64} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{70}}{64} & 0 & -\frac{5\sqrt{14}}{64} & 0 & \frac{\sqrt{210}}{64} & 0 & -\frac{\sqrt{10}}{64} \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{5}}{64} & 0 & -\frac{\sqrt{105}}{64} & 0 & \frac{5\sqrt{7}}{64} & 0 & -\frac{\sqrt{35}}{64} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}}{64} & 0 & \frac{\sqrt{35}}{64} & 0 & -\frac{\sqrt{21}}{64} & 0 & \frac{1}{64} \end{bmatrix}$
798	symmetry	$\dfrac{\sqrt{210}\,yz\left(16x^4-16x^2y^2-16x^2z^2+y^4+2y^2z^2+z^4\right)}{16}$

continued …

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Table 9

No.	multipole	matrix

$\mathbb{M}_{6,1}^{(1,-1;a)}(E,3)$

$$\begin{bmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{55}i}{2112} & 0 & -\frac{\sqrt{1155}i}{2112} & 0 & \frac{9\sqrt{77}i}{704} & 0 & -\frac{\sqrt{385}i}{64} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{5\sqrt{77}i}{2112} & 0 & \frac{5\sqrt{385}i}{2112} & 0 & -\frac{9\sqrt{231}i}{704} & 0 & \frac{5\sqrt{11}i}{64} \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{9\sqrt{22}i}{704} & 0 & -\frac{5\sqrt{462}i}{2112} & 0 & -\frac{5\sqrt{770}i}{2112} & 0 & \frac{9\sqrt{154}i}{704} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{9\sqrt{154}i}{704} & 0 & \frac{5\sqrt{770}i}{2112} & 0 & \frac{5\sqrt{462}i}{2112} & 0 & -\frac{9\sqrt{22}i}{704} \\
0 & 0 & 0 & 0 & 0 & 0 & -\frac{5\sqrt{11}i}{64} & 0 & \frac{9\sqrt{231}i}{704} & 0 & -\frac{5\sqrt{385}i}{2112} & 0 & -\frac{5\sqrt{77}i}{2112} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{385}i}{64} & 0 & -\frac{9\sqrt{77}i}{704} & 0 & \frac{\sqrt{1155}i}{2112} & 0 & \frac{\sqrt{55}i}{2112}
\end{bmatrix}$$

| 799 | symmetry | $-\frac{\sqrt{210}xz\left(x^4-16x^2y^2+2x^2z^2+16y^4-16y^2z^2+z^4\right)}{16}$ |

$\mathbb{M}_{6,2}^{(1,-1;a)}(E,3)$

$$\begin{bmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{55}}{2112} & 0 & -\frac{\sqrt{1155}}{2112} & 0 & -\frac{9\sqrt{77}}{704} & 0 & -\frac{\sqrt{385}}{64} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{5\sqrt{77}}{2112} & 0 & \frac{5\sqrt{385}}{2112} & 0 & \frac{9\sqrt{231}}{704} & 0 & \frac{5\sqrt{11}}{64} \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{9\sqrt{22}}{704} & 0 & \frac{5\sqrt{462}}{2112} & 0 & -\frac{5\sqrt{770}}{2112} & 0 & -\frac{9\sqrt{154}}{704} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{9\sqrt{154}}{704} & 0 & -\frac{5\sqrt{770}}{2112} & 0 & \frac{5\sqrt{462}}{2112} & 0 & \frac{9\sqrt{22}}{704} \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{5\sqrt{11}}{64} & 0 & \frac{9\sqrt{231}}{704} & 0 & \frac{5\sqrt{385}}{2112} & 0 & -\frac{5\sqrt{77}}{2112} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{385}}{64} & 0 & -\frac{9\sqrt{77}}{704} & 0 & -\frac{\sqrt{1155}}{2112} & 0 & \frac{\sqrt{55}}{2112}
\end{bmatrix}$$

| 800 | symmetry | $\frac{\sqrt{3}(x-y)(x+y)}{2}$ |

No.	multipole	matrix

$$\mathbb{M}_2^{(1,0;a)}(A_1) = \begin{pmatrix}
0 & 0 & 0 & -\frac{\sqrt{10}}{70} & 0 & 0 & \frac{\sqrt{42}}{28} & 0 & 0 & 0 & \frac{\sqrt{30}}{140} & 0 & 0 & 0 \\
\frac{\sqrt{3}}{21} & 0 & 0 & 0 & -\frac{2\sqrt{15}}{105} & 0 & 0 & \frac{3\sqrt{2}}{28} & 0 & 0 & 0 & \frac{\sqrt{6}}{28} & 0 & 0 \\
0 & \frac{2\sqrt{15}}{105} & 0 & 0 & 0 & -\frac{\sqrt{3}}{21} & 0 & 0 & \frac{\sqrt{6}}{28} & 0 & 0 & 0 & \frac{3\sqrt{2}}{28} & 0 \\
0 & 0 & \frac{\sqrt{10}}{70} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{140} & 0 & 0 & 0 & \frac{\sqrt{42}}{28} \\
0 & 0 & \frac{3\sqrt{2}}{28} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{84} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & \frac{9\sqrt{10}}{140} & 0 & 0 & -\frac{\sqrt{42}}{84} & 0 & 0 & 0 & \frac{\sqrt{30}}{105} & 0 & 0 & 0 \\
\frac{3\sqrt{2}}{28} & 0 & 0 & 0 & \frac{9\sqrt{10}}{140} & 0 & 0 & -\frac{\sqrt{3}}{21} & 0 & 0 & 0 & \frac{1}{14} & 0 & 0 \\
0 & \frac{9\sqrt{10}}{140} & 0 & 0 & 0 & \frac{3\sqrt{2}}{28} & 0 & 0 & -\frac{1}{14} & 0 & 0 & 0 & \frac{\sqrt{3}}{21} & 0 \\
0 & 0 & \frac{9\sqrt{10}}{140} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}}{105} & 0 & 0 & 0 & \frac{\sqrt{42}}{84} \\
0 & 0 & 0 & \frac{3\sqrt{2}}{28} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}}{84} & 0 & 0 & 0
\end{pmatrix}$$

801	symmetry	$\sqrt{3}xy$

$$\mathbb{M}_2^{(1,0;a)}(A_2) = \begin{pmatrix}
0 & 0 & 0 & \frac{\sqrt{10}i}{70} & 0 & 0 & \frac{\sqrt{42}i}{28} & 0 & 0 & 0 & -\frac{\sqrt{30}i}{140} & 0 & 0 & 0 \\
\frac{\sqrt{3}i}{21} & 0 & 0 & 0 & \frac{2\sqrt{15}i}{105} & 0 & 0 & \frac{3\sqrt{2}i}{28} & 0 & 0 & 0 & -\frac{\sqrt{6}i}{28} & 0 & 0 \\
0 & \frac{2\sqrt{15}i}{105} & 0 & 0 & 0 & \frac{\sqrt{3}i}{21} & 0 & 0 & \frac{\sqrt{6}i}{28} & 0 & 0 & 0 & -\frac{3\sqrt{2}i}{28} & 0 \\
0 & 0 & \frac{\sqrt{10}i}{70} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}i}{140} & 0 & 0 & 0 & -\frac{\sqrt{42}i}{28} \\
0 & 0 & -\frac{3\sqrt{2}i}{28} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{84} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & -\frac{9\sqrt{10}i}{140} & 0 & 0 & -\frac{\sqrt{42}i}{84} & 0 & 0 & 0 & -\frac{\sqrt{30}i}{105} & 0 & 0 & 0 \\
\frac{3\sqrt{2}i}{28} & 0 & 0 & 0 & -\frac{9\sqrt{10}i}{140} & 0 & 0 & -\frac{\sqrt{3}i}{21} & 0 & 0 & 0 & -\frac{i}{14} & 0 & 0 \\
0 & \frac{9\sqrt{10}i}{140} & 0 & 0 & 0 & -\frac{3\sqrt{2}i}{28} & 0 & 0 & -\frac{i}{14} & 0 & 0 & 0 & -\frac{\sqrt{3}i}{21} & 0 \\
0 & 0 & \frac{9\sqrt{10}i}{140} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}i}{105} & 0 & 0 & 0 & -\frac{\sqrt{42}i}{84} \\
0 & 0 & 0 & \frac{3\sqrt{2}i}{28} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{84} & 0 & 0 & 0
\end{pmatrix}$$

802	symmetry	$-\frac{x^2}{2} - \frac{y^2}{2} + z^2$

continued ...

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Table 9

No.	multipole	matrix

$\mathbb{M}_2^{(1,0;a)}(B_1)$

$$\begin{bmatrix}
0 & -\frac{\sqrt{15}}{35} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{14} & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & -\frac{\sqrt{10}}{70} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{30}}{70} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & \frac{\sqrt{10}}{70} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{30}}{70} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & \frac{\sqrt{15}}{35} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{14} & 0 & 0 \\
\frac{\sqrt{15}}{14} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}}{28} & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & -\frac{\sqrt{15}}{70} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{28} & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & -\frac{2\sqrt{15}}{35} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{5}}{70} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & -\frac{2\sqrt{15}}{35} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}}{70} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{70} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}}{28} & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{14} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}}{28} & 0
\end{bmatrix}$$

803	symmetry	$\sqrt{3}yz$

$\mathbb{M}_{2,1}^{(1,0;a)}(E)$

$$\begin{bmatrix}
\frac{i}{14} & 0 & \frac{3\sqrt{10}i}{140} & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{14} & 0 & -\frac{\sqrt{30}i}{70} & 0 & 0 & 0 & 0 \\
0 & -\frac{\sqrt{15}i}{210} & 0 & \frac{\sqrt{30}i}{84} & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{14} & 0 & -\frac{3\sqrt{10}i}{70} & 0 & 0 & 0 \\
0 & 0 & -\frac{\sqrt{30}i}{84} & 0 & \frac{\sqrt{15}i}{210} & 0 & 0 & 0 & 0 & -\frac{3\sqrt{10}i}{70} & 0 & -\frac{\sqrt{6}i}{14} & 0 & 0 \\
0 & 0 & 0 & -\frac{3\sqrt{10}i}{140} & 0 & -\frac{i}{14} & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}i}{70} & 0 & -\frac{\sqrt{6}i}{14} & 0 \\
0 & -\frac{3i}{14} & 0 & 0 & 0 & 0 & -\frac{\sqrt{210}i}{168} & 0 & -\frac{\sqrt{10}i}{56} & 0 & 0 & 0 & 0 & 0 \\
\frac{3i}{14} & 0 & -\frac{3\sqrt{10}i}{70} & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{168} & 0 & -\frac{11\sqrt{30}i}{840} & 0 & 0 & 0 & 0 \\
0 & \frac{3\sqrt{10}i}{70} & 0 & 0 & 0 & 0 & 0 & \frac{i}{28} & 0 & -\frac{\sqrt{15}i}{60} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & \frac{3\sqrt{10}i}{70} & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{60} & 0 & -\frac{i}{28} & 0 & 0 \\
0 & 0 & 0 & -\frac{3\sqrt{10}i}{70} & 0 & \frac{3i}{14} & 0 & 0 & 0 & 0 & \frac{11\sqrt{30}i}{840} & 0 & \frac{\sqrt{6}i}{168} & 0 \\
0 & 0 & 0 & 0 & -\frac{3i}{14} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}i}{56} & 0 & \frac{\sqrt{210}i}{168}
\end{bmatrix}$$

804	symmetry	$-\sqrt{3}xz$

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Table 9

No.	multipole	matrix

$\mathbb{M}_{2,2}^{(1,0;a)}(E)$

$$\begin{bmatrix}
-\frac{1}{14} & 0 & \frac{3\sqrt{10}}{140} & 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{14} & 0 & -\frac{\sqrt{30}}{70} & 0 & 0 & 0 & 0 \\
0 & \frac{\sqrt{15}}{210} & 0 & \frac{\sqrt{30}}{84} & 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{14} & 0 & -\frac{3\sqrt{10}}{70} & 0 & 0 & 0 \\
0 & 0 & \frac{\sqrt{30}}{84} & 0 & \frac{\sqrt{15}}{210} & 0 & 0 & 0 & 0 & \frac{3\sqrt{10}}{70} & 0 & -\frac{\sqrt{6}}{14} & 0 & 0 \\
0 & 0 & 0 & \frac{3\sqrt{10}}{140} & 0 & -\frac{1}{14} & 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{70} & 0 & -\frac{\sqrt{6}}{14} & 0 \\
0 & -\frac{3}{14} & 0 & 0 & 0 & 0 & \frac{\sqrt{210}}{168} & 0 & -\frac{\sqrt{10}}{56} & 0 & 0 & 0 & 0 & 0 \\
-\frac{3}{14} & 0 & -\frac{3\sqrt{10}}{70} & 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{168} & 0 & -\frac{11\sqrt{30}}{840} & 0 & 0 & 0 & 0 \\
0 & -\frac{3\sqrt{10}}{70} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{1}{28} & 0 & -\frac{\sqrt{15}}{60} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & \frac{3\sqrt{10}}{70} & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{60} & 0 & -\frac{1}{28} & 0 & 0 \\
0 & 0 & 0 & \frac{3\sqrt{10}}{70} & 0 & \frac{3}{14} & 0 & 0 & 0 & 0 & -\frac{11\sqrt{30}}{840} & 0 & \frac{\sqrt{6}}{168} & 0 \\
0 & 0 & 0 & 0 & \frac{3}{14} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}}{56} & 0 & \frac{\sqrt{210}}{168}
\end{bmatrix}$$

805	symmetry	$\dfrac{\sqrt{5}(x-y)(x+y)\left(x^2+y^2-6z^2\right)}{4}$

$\mathbb{M}_{4}^{(1,0;a)}(A_1)$

$$\begin{bmatrix}
0 & 0 & 0 & -\frac{\sqrt{2}}{56} & 0 & 0 & \frac{9\sqrt{210}}{1400} & 0 & 0 & 0 & \frac{27\sqrt{6}}{280} & 0 & 0 & 0 \\
\frac{\sqrt{15}}{280} & 0 & 0 & 0 & \frac{\sqrt{3}}{56} & 0 & 0 & -\frac{99\sqrt{10}}{1400} & 0 & 0 & 0 & \frac{9\sqrt{30}}{1400} & 0 & 0 \\
0 & -\frac{\sqrt{3}}{56} & 0 & 0 & 0 & -\frac{\sqrt{15}}{280} & 0 & 0 & \frac{9\sqrt{30}}{1400} & 0 & 0 & 0 & -\frac{99\sqrt{10}}{1400} & 0 \\
0 & 0 & \frac{\sqrt{2}}{56} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{27\sqrt{6}}{280} & 0 & 0 & 0 & \frac{9\sqrt{210}}{1400} \\
0 & 0 & \frac{9\sqrt{10}}{140} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{140} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & -\frac{3\sqrt{2}}{28} & 0 & 0 & -\frac{3\sqrt{210}}{1400} & 0 & 0 & 0 & \frac{\sqrt{6}}{280} & 0 & 0 & 0 \\
\frac{9\sqrt{10}}{140} & 0 & 0 & 0 & -\frac{3\sqrt{2}}{28} & 0 & 0 & \frac{9\sqrt{15}}{1400} & 0 & 0 & 0 & -\frac{17\sqrt{5}}{1400} & 0 & 0 \\
0 & -\frac{3\sqrt{2}}{28} & 0 & 0 & 0 & \frac{9\sqrt{10}}{140} & 0 & 0 & \frac{17\sqrt{5}}{1400} & 0 & 0 & 0 & -\frac{9\sqrt{15}}{1400} & 0 \\
0 & 0 & -\frac{3\sqrt{2}}{28} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}}{280} & 0 & 0 & 0 & \frac{3\sqrt{210}}{1400} \\
0 & 0 & 0 & \frac{9\sqrt{10}}{140} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}}{140} & 0 & 0 & 0
\end{bmatrix}$$

806	symmetry	$-\dfrac{\sqrt{5}xy\left(x^2+y^2-6z^2\right)}{2}$

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Table 9

No.	multipole	matrix

$\mathbb{M}_4^{(1,0;a)}(A_2)$

$$\begin{bmatrix}
0 & 0 & 0 & -\frac{\sqrt{2}i}{56} & 0 & 0 & -\frac{9\sqrt{210}i}{1400} & 0 & 0 & 0 & \frac{27\sqrt{6}i}{280} & 0 & 0 & 0 \\
-\frac{\sqrt{15}i}{280} & 0 & 0 & 0 & \frac{\sqrt{3}i}{56} & 0 & 0 & \frac{99\sqrt{10}i}{1400} & 0 & 0 & 0 & \frac{9\sqrt{30}i}{1400} & 0 & 0 \\
0 & \frac{\sqrt{3}i}{56} & 0 & 0 & 0 & -\frac{\sqrt{15}i}{280} & 0 & 0 & -\frac{9\sqrt{30}i}{1400} & 0 & 0 & 0 & -\frac{99\sqrt{10}i}{1400} & 0 \\
0 & 0 & -\frac{\sqrt{2}i}{56} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{27\sqrt{6}i}{280} & 0 & 0 & 0 & \frac{9\sqrt{210}i}{1400} \\
0 & 0 & \frac{9\sqrt{10}i}{140} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}i}{140} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & -\frac{3\sqrt{2}i}{28} & 0 & 0 & \frac{3\sqrt{210}i}{1400} & 0 & 0 & 0 & \frac{\sqrt{6}i}{280} & 0 & 0 & 0 \\
-\frac{9\sqrt{10}i}{140} & 0 & 0 & 0 & -\frac{3\sqrt{2}i}{28} & 0 & 0 & -\frac{9\sqrt{15}i}{1400} & 0 & 0 & 0 & -\frac{17\sqrt{5}i}{1400} & 0 & 0 \\
0 & \frac{3\sqrt{2}i}{28} & 0 & 0 & 0 & \frac{9\sqrt{10}i}{140} & 0 & 0 & -\frac{17\sqrt{5}i}{1400} & 0 & 0 & 0 & -\frac{9\sqrt{15}i}{1400} & 0 \\
0 & 0 & \frac{3\sqrt{2}i}{28} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}i}{280} & 0 & 0 & 0 & \frac{3\sqrt{210}i}{1400} \\
0 & 0 & 0 & -\frac{9\sqrt{10}i}{140} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}i}{140} & 0 & 0 & 0
\end{bmatrix}$$

807   symmetry

$$\frac{\sqrt{21}(x^4-3x^2y^2-3x^2z^2+y^4-3y^2z^2+z^4)}{6}$$

$\mathbb{M}_4^{(1,0;a)}(B_1,1)$

$$\begin{bmatrix}
0 & \frac{\sqrt{105}}{840} & 0 & 0 & 0 & \frac{\sqrt{21}}{168} & 0 & 0 & -\frac{9\sqrt{42}}{280} & 0 & 0 & 0 & -\frac{9\sqrt{14}}{280} & 0 \\
0 & 0 & -\frac{\sqrt{70}}{280} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{210}}{280} & 0 & 0 & 0 & -\frac{3\sqrt{6}}{40} \\
0 & 0 & 0 & \frac{\sqrt{70}}{280} & 0 & 0 & -\frac{3\sqrt{6}}{40} & 0 & 0 & 0 & \frac{3\sqrt{210}}{280} & 0 & 0 & 0 \\
-\frac{\sqrt{21}}{168} & 0 & 0 & 0 & -\frac{\sqrt{105}}{840} & 0 & 0 & -\frac{9\sqrt{14}}{280} & 0 & 0 & 0 & -\frac{9\sqrt{42}}{280} & 0 & 0 \\
-\frac{\sqrt{105}}{140} & 0 & 0 & 0 & -\frac{\sqrt{21}}{28} & 0 & 0 & -\frac{\sqrt{70}}{280} & 0 & 0 & 0 & -\frac{\sqrt{210}}{840} & 0 & 0 \\
0 & \frac{3\sqrt{105}}{140} & 0 & 0 & 0 & -\frac{\sqrt{21}}{28} & 0 & 0 & \frac{\sqrt{42}}{210} & 0 & 0 & 0 & -\frac{\sqrt{14}}{140} & 0 \\
0 & 0 & -\frac{\sqrt{105}}{70} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{35}}{280} & 0 & 0 & 0 & -\frac{1}{40} \\
0 & 0 & 0 & -\frac{\sqrt{105}}{70} & 0 & 0 & \frac{1}{40} & 0 & 0 & 0 & -\frac{\sqrt{35}}{280} & 0 & 0 & 0 \\
-\frac{\sqrt{21}}{28} & 0 & 0 & 0 & \frac{3\sqrt{105}}{140} & 0 & 0 & \frac{\sqrt{14}}{140} & 0 & 0 & 0 & -\frac{\sqrt{42}}{210} & 0 & 0 \\
0 & -\frac{\sqrt{21}}{28} & 0 & 0 & 0 & -\frac{\sqrt{105}}{140} & 0 & 0 & \frac{\sqrt{210}}{840} & 0 & 0 & 0 & \frac{\sqrt{70}}{280} & 0
\end{bmatrix}$$

808   symmetry

$$-\frac{\sqrt{15}(x^4-12x^2y^2+6x^2z^2+y^4+6y^2z^2-2z^4)}{12}$$

continued ...

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Table 9

No.	multipole	matrix

$\mathbb{M}_4^{(1,0;a)}(B_1,2)$

$$\begin{bmatrix}
0 & \frac{\sqrt{3}}{168} & 0 & 0 & 0 & -\frac{\sqrt{15}}{120} & 0 & 0 & -\frac{9\sqrt{30}}{280} & 0 & 0 & 0 & \frac{9\sqrt{10}}{200} & 0 \\
0 & 0 & -\frac{\sqrt{2}}{56} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{6}}{56} & 0 & 0 & 0 & \frac{3\sqrt{210}}{200} \\
0 & 0 & 0 & \frac{\sqrt{2}}{56} & 0 & 0 & \frac{3\sqrt{210}}{200} & 0 & 0 & 0 & \frac{3\sqrt{6}}{56} & 0 & 0 & 0 \\
\frac{\sqrt{15}}{120} & 0 & 0 & 0 & -\frac{\sqrt{3}}{168} & 0 & 0 & \frac{9\sqrt{10}}{200} & 0 & 0 & 0 & -\frac{9\sqrt{30}}{280} & 0 & 0 \\
-\frac{\sqrt{3}}{28} & 0 & 0 & 0 & \frac{\sqrt{15}}{20} & 0 & 0 & -\frac{\sqrt{2}}{56} & 0 & 0 & 0 & \frac{\sqrt{6}}{120} & 0 & 0 \\
0 & \frac{3\sqrt{3}}{28} & 0 & 0 & 0 & \frac{\sqrt{15}}{20} & 0 & 0 & \frac{\sqrt{30}}{210} & 0 & 0 & 0 & \frac{\sqrt{10}}{100} & 0 \\
0 & 0 & -\frac{\sqrt{3}}{14} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{1}{56} & 0 & 0 & 0 & \frac{\sqrt{35}}{200} \\
0 & 0 & 0 & -\frac{\sqrt{3}}{14} & 0 & 0 & -\frac{\sqrt{35}}{200} & 0 & 0 & 0 & -\frac{1}{56} & 0 & 0 & 0 \\
\frac{\sqrt{15}}{20} & 0 & 0 & 0 & \frac{3\sqrt{3}}{28} & 0 & 0 & -\frac{\sqrt{10}}{100} & 0 & 0 & 0 & -\frac{\sqrt{30}}{210} & 0 & 0 \\
0 & \frac{\sqrt{15}}{20} & 0 & 0 & 0 & -\frac{\sqrt{3}}{28} & 0 & 0 & -\frac{\sqrt{6}}{120} & 0 & 0 & 0 & \frac{\sqrt{2}}{56} & 0
\end{bmatrix}$$

809	symmetry	$\dfrac{\sqrt{35}xy(x-y)(x+y)}{2}$

$\mathbb{M}_4^{(1,0;a)}(B_2)$

$$\begin{bmatrix}
0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{35}i}{140} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{9\sqrt{210}i}{700} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{9\sqrt{10}i}{100} \\
0 & 0 & 0 & 0 & 0 & 0 & -\frac{9\sqrt{10}i}{100} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
-\frac{\sqrt{35}i}{140} & 0 & 0 & 0 & 0 & 0 & -\frac{9\sqrt{210}i}{700} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & \frac{3\sqrt{35}i}{70} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{14}i}{140} & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{35}i}{70} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{210}i}{350} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{100} \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{100} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
-\frac{3\sqrt{35}i}{70} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{210}i}{350} & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & -\frac{3\sqrt{35}i}{70} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{14}i}{140} & 0 & 0 & 0 & 0 & 0
\end{bmatrix}$$

810	symmetry	$\dfrac{\sqrt{35}yz(y-z)(y+z)}{2}$

Table 9

No.	multipole	matrix

$\mathbb{M}^{(1,0;a)}_{4,1}(E,1)$

$$\begin{bmatrix}
\frac{\sqrt{35}i}{1120} & 0 & \frac{\sqrt{14}i}{224} & 0 & \frac{\sqrt{7}i}{224} & 0 & 0 & -\frac{27\sqrt{210}i}{2800} & 0 & -\frac{9\sqrt{42}i}{280} & 0 & -\frac{27\sqrt{70}i}{2800} & 0 & 0 \\
0 & -\frac{\sqrt{21}i}{224} & 0 & -\frac{\sqrt{42}i}{224} & 0 & -\frac{\sqrt{105}i}{1120} & \frac{9\sqrt{10}i}{400} & 0 & \frac{9\sqrt{210}i}{700} & 0 & \frac{9\sqrt{14}i}{560} & 0 & -\frac{9\sqrt{70}i}{1400} & 0 \\
\frac{\sqrt{105}i}{1120} & 0 & \frac{\sqrt{42}i}{224} & 0 & \frac{\sqrt{21}i}{224} & 0 & 0 & -\frac{9\sqrt{70}i}{1400} & 0 & \frac{9\sqrt{14}i}{560} & 0 & \frac{9\sqrt{210}i}{700} & 0 & \frac{9\sqrt{10}i}{400} \\
0 & -\frac{\sqrt{7}i}{224} & 0 & -\frac{\sqrt{14}i}{224} & 0 & -\frac{\sqrt{35}i}{1120} & 0 & 0 & -\frac{27\sqrt{70}i}{2800} & 0 & -\frac{9\sqrt{42}i}{280} & 0 & -\frac{27\sqrt{210}i}{2800} & 0 \\
0 & -\frac{3\sqrt{35}i}{140} & 0 & -\frac{3\sqrt{70}i}{280} & 0 & 0 & -\frac{\sqrt{6}i}{160} & 0 & -\frac{\sqrt{14}i}{112} & 0 & -\frac{\sqrt{210}i}{1120} & 0 & 0 & 0 \\
\frac{3\sqrt{35}i}{140} & 0 & \frac{3\sqrt{14}i}{56} & 0 & 0 & 0 & 0 & \frac{13\sqrt{210}i}{5600} & 0 & \frac{\sqrt{42}i}{560} & 0 & -\frac{\sqrt{70}i}{800} & 0 & 0 \\
0 & -\frac{3\sqrt{14}i}{56} & 0 & 0 & 0 & \frac{3\sqrt{70}i}{280} & -\frac{3\sqrt{15}i}{800} & 0 & -\frac{\sqrt{35}i}{5600} & 0 & \frac{\sqrt{21}i}{160} & 0 & \frac{\sqrt{105}i}{5600} & 0 \\
\frac{3\sqrt{70}i}{280} & 0 & 0 & 0 & -\frac{3\sqrt{14}i}{56} & 0 & 0 & -\frac{\sqrt{105}i}{5600} & 0 & -\frac{\sqrt{21}i}{160} & 0 & \frac{\sqrt{35}i}{5600} & 0 & \frac{3\sqrt{15}i}{800} \\
0 & 0 & 0 & \frac{3\sqrt{14}i}{56} & 0 & \frac{3\sqrt{35}i}{140} & 0 & 0 & \frac{\sqrt{70}i}{800} & 0 & -\frac{\sqrt{42}i}{560} & 0 & -\frac{13\sqrt{210}i}{5600} & 0 \\
0 & 0 & -\frac{3\sqrt{70}i}{280} & 0 & -\frac{3\sqrt{35}i}{140} & 0 & 0 & 0 & 0 & \frac{\sqrt{210}i}{1120} & 0 & \frac{\sqrt{14}i}{112} & 0 & \frac{\sqrt{6}i}{160}
\end{bmatrix}$$

811	symmetry	$-\frac{\sqrt{35}\,xz(x-z)(x+z)}{2}$

$\mathbb{M}^{(1,0;a)}_{4,2}(E,1)$

$$\begin{bmatrix}
-\frac{\sqrt{35}}{1120} & 0 & \frac{\sqrt{14}}{224} & 0 & -\frac{\sqrt{7}}{224} & 0 & 0 & \frac{27\sqrt{210}}{2800} & 0 & -\frac{9\sqrt{42}}{280} & 0 & \frac{27\sqrt{70}}{2800} & 0 & 0 \\
0 & \frac{\sqrt{21}}{224} & 0 & -\frac{\sqrt{42}}{224} & 0 & \frac{\sqrt{105}}{1120} & \frac{9\sqrt{10}}{400} & 0 & -\frac{9\sqrt{210}}{700} & 0 & \frac{9\sqrt{14}}{560} & 0 & \frac{9\sqrt{70}}{1400} & 0 \\
\frac{\sqrt{105}}{1120} & 0 & -\frac{\sqrt{42}}{224} & 0 & \frac{\sqrt{21}}{224} & 0 & 0 & -\frac{9\sqrt{70}}{1400} & 0 & -\frac{9\sqrt{14}}{560} & 0 & \frac{9\sqrt{210}}{700} & 0 & -\frac{9\sqrt{10}}{400} \\
0 & -\frac{\sqrt{7}}{224} & 0 & \frac{\sqrt{14}}{224} & 0 & -\frac{\sqrt{35}}{1120} & 0 & 0 & -\frac{27\sqrt{70}}{2800} & 0 & \frac{9\sqrt{42}}{280} & 0 & -\frac{27\sqrt{210}}{2800} & 0 \\
0 & -\frac{3\sqrt{35}}{140} & 0 & \frac{3\sqrt{70}}{280} & 0 & 0 & \frac{\sqrt{6}}{160} & 0 & -\frac{\sqrt{14}}{112} & 0 & \frac{\sqrt{210}}{1120} & 0 & 0 & 0 \\
-\frac{3\sqrt{35}}{140} & 0 & \frac{3\sqrt{14}}{56} & 0 & 0 & 0 & 0 & -\frac{13\sqrt{210}}{5600} & 0 & \frac{\sqrt{42}}{560} & 0 & \frac{\sqrt{70}}{800} & 0 & 0 \\
0 & \frac{3\sqrt{14}}{56} & 0 & 0 & 0 & -\frac{3\sqrt{70}}{280} & -\frac{3\sqrt{15}}{800} & 0 & \frac{\sqrt{35}}{5600} & 0 & \frac{\sqrt{21}}{160} & 0 & -\frac{\sqrt{105}}{5600} & 0 \\
\frac{3\sqrt{70}}{280} & 0 & 0 & 0 & -\frac{3\sqrt{14}}{56} & 0 & 0 & -\frac{\sqrt{105}}{5600} & 0 & \frac{\sqrt{21}}{160} & 0 & \frac{\sqrt{35}}{5600} & 0 & -\frac{3\sqrt{15}}{800} \\
0 & 0 & 0 & -\frac{3\sqrt{14}}{56} & 0 & \frac{3\sqrt{35}}{140} & 0 & 0 & \frac{\sqrt{70}}{800} & 0 & \frac{\sqrt{42}}{560} & 0 & -\frac{13\sqrt{210}}{5600} & 0 \\
0 & 0 & -\frac{3\sqrt{70}}{280} & 0 & \frac{3\sqrt{35}}{140} & 0 & 0 & 0 & 0 & \frac{\sqrt{210}}{1120} & 0 & -\frac{\sqrt{14}}{112} & 0 & \frac{\sqrt{6}}{160}
\end{bmatrix}$$

812	symmetry	$\frac{\sqrt{5}\,yz(6x^2-y^2-z^2)}{2}$

278

No.	multipole	matrix

$\mathbb{M}_{4,1}^{(1,0;a)}(E,2)$

$$\begin{pmatrix}
\frac{\sqrt{5}i}{1120} & 0 & \frac{\sqrt{2}i}{224} & 0 & -\frac{i}{32} & 0 & 0 & -\frac{27\sqrt{30}i}{2800} & 0 & -\frac{9\sqrt{6}i}{280} & 0 & \frac{27\sqrt{10}i}{400} & 0 & 0 \\
0 & -\frac{\sqrt{3}i}{224} & 0 & -\frac{\sqrt{6}i}{224} & 0 & \frac{\sqrt{15}i}{160} & -\frac{9\sqrt{70}i}{400} & 0 & \frac{9\sqrt{30}i}{700} & 0 & \frac{9\sqrt{2}i}{560} & 0 & \frac{9\sqrt{10}i}{200} & 0 \\
-\frac{\sqrt{15}i}{160} & 0 & \frac{\sqrt{6}i}{224} & 0 & \frac{\sqrt{3}i}{224} & 0 & 0 & \frac{9\sqrt{10}i}{200} & 0 & \frac{9\sqrt{2}i}{560} & 0 & \frac{9\sqrt{30}i}{700} & 0 & -\frac{9\sqrt{70}i}{400} \\
0 & \frac{i}{32} & 0 & -\frac{\sqrt{2}i}{224} & 0 & -\frac{\sqrt{5}i}{1120} & 0 & 0 & \frac{27\sqrt{10}i}{400} & 0 & -\frac{9\sqrt{6}i}{280} & 0 & -\frac{27\sqrt{30}i}{2800} & 0 \\
0 & -\frac{3\sqrt{5}i}{140} & 0 & \frac{3\sqrt{10}i}{40} & 0 & 0 & -\frac{\sqrt{42}i}{1120} & 0 & -\frac{\sqrt{2}i}{112} & 0 & \frac{\sqrt{30}i}{160} & 0 & 0 & 0 \\
\frac{3\sqrt{5}i}{140} & 0 & \frac{3\sqrt{2}i}{56} & 0 & 0 & 0 & 0 & \frac{13\sqrt{30}i}{5600} & 0 & \frac{\sqrt{6}i}{560} & 0 & \frac{7\sqrt{10}i}{800} & 0 & 0 \\
0 & -\frac{3\sqrt{2}i}{56} & 0 & 0 & 0 & -\frac{3\sqrt{10}i}{40} & \frac{3\sqrt{105}i}{800} & 0 & -\frac{\sqrt{5}i}{5600} & 0 & \frac{\sqrt{3}i}{160} & 0 & -\frac{\sqrt{15}i}{800} & 0 \\
-\frac{3\sqrt{10}i}{40} & 0 & 0 & 0 & -\frac{3\sqrt{2}i}{56} & 0 & 0 & \frac{\sqrt{15}i}{800} & 0 & -\frac{\sqrt{3}i}{160} & 0 & \frac{\sqrt{5}i}{5600} & 0 & -\frac{3\sqrt{105}i}{800} \\
0 & 0 & 0 & \frac{3\sqrt{2}i}{56} & 0 & \frac{3\sqrt{5}i}{140} & 0 & 0 & -\frac{7\sqrt{10}i}{800} & 0 & -\frac{\sqrt{6}i}{560} & 0 & -\frac{13\sqrt{30}i}{5600} & 0 \\
0 & 0 & \frac{3\sqrt{10}i}{40} & 0 & -\frac{3\sqrt{5}i}{140} & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}i}{160} & 0 & \frac{\sqrt{2}i}{112} & 0 & \frac{\sqrt{42}i}{1120}
\end{pmatrix}$$

| 813 | symmetry | $\dfrac{\sqrt{5}\,xz\left(x^2-6y^2+z^2\right)}{2}$ |

$\mathbb{M}_{4,2}^{(1,0;a)}(E,2)$

$$\begin{pmatrix}
-\frac{\sqrt{5}}{1120} & 0 & \frac{\sqrt{2}}{224} & 0 & \frac{1}{32} & 0 & 0 & \frac{27\sqrt{30}}{2800} & 0 & -\frac{9\sqrt{6}}{280} & 0 & -\frac{27\sqrt{10}}{400} & 0 & 0 \\
0 & \frac{\sqrt{3}}{224} & 0 & -\frac{\sqrt{6}}{224} & 0 & -\frac{\sqrt{15}}{160} & -\frac{9\sqrt{70}}{400} & 0 & -\frac{9\sqrt{30}}{700} & 0 & \frac{9\sqrt{2}}{560} & 0 & -\frac{9\sqrt{10}}{200} & 0 \\
-\frac{\sqrt{15}}{160} & 0 & -\frac{\sqrt{6}}{224} & 0 & \frac{\sqrt{3}}{224} & 0 & 0 & \frac{9\sqrt{10}}{200} & 0 & -\frac{9\sqrt{2}}{560} & 0 & \frac{9\sqrt{30}}{700} & 0 & \frac{9\sqrt{70}}{400} \\
0 & \frac{1}{32} & 0 & \frac{\sqrt{2}}{224} & 0 & -\frac{\sqrt{5}}{1120} & 0 & 0 & \frac{27\sqrt{10}}{400} & 0 & \frac{9\sqrt{6}}{280} & 0 & -\frac{27\sqrt{30}}{2800} & 0 \\
0 & -\frac{3\sqrt{5}}{140} & 0 & -\frac{3\sqrt{10}}{40} & 0 & 0 & \frac{\sqrt{42}}{1120} & 0 & -\frac{\sqrt{2}}{112} & 0 & -\frac{\sqrt{30}}{160} & 0 & 0 & 0 \\
-\frac{3\sqrt{5}}{140} & 0 & \frac{3\sqrt{2}}{56} & 0 & 0 & 0 & 0 & -\frac{13\sqrt{30}}{5600} & 0 & \frac{\sqrt{6}}{560} & 0 & -\frac{7\sqrt{10}}{800} & 0 & 0 \\
0 & \frac{3\sqrt{2}}{56} & 0 & 0 & 0 & \frac{3\sqrt{10}}{40} & \frac{3\sqrt{105}}{800} & 0 & \frac{\sqrt{5}}{5600} & 0 & \frac{\sqrt{3}}{160} & 0 & \frac{\sqrt{15}}{800} & 0 \\
-\frac{3\sqrt{10}}{40} & 0 & 0 & 0 & -\frac{3\sqrt{2}}{56} & 0 & 0 & \frac{\sqrt{15}}{800} & 0 & \frac{\sqrt{3}}{160} & 0 & \frac{\sqrt{5}}{5600} & 0 & \frac{3\sqrt{105}}{800} \\
0 & 0 & 0 & -\frac{3\sqrt{2}}{56} & 0 & \frac{3\sqrt{5}}{140} & 0 & 0 & -\frac{7\sqrt{10}}{800} & 0 & \frac{\sqrt{6}}{560} & 0 & -\frac{13\sqrt{30}}{5600} & 0 \\
0 & 0 & \frac{3\sqrt{10}}{40} & 0 & \frac{3\sqrt{5}}{140} & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}}{160} & 0 & -\frac{\sqrt{2}}{112} & 0 & \frac{\sqrt{42}}{1120}
\end{pmatrix}$$

| 814 | symmetry | 1 |

continued ...

Table 9

No.	multipole	matrix

$\mathbb{M}_0^{(1,1;a)}(B_1)$

$$\begin{bmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
-\frac{\sqrt{3}}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & -\frac{\sqrt{3}}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & -\frac{\sqrt{3}}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & -\frac{\sqrt{3}}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
\end{bmatrix}$$

| 815 | symmetry | $\frac{\sqrt{3}(x-y)(x+y)}{2}$ |

$\mathbb{M}_2^{(1,1;a)}(A_1)$

$$\begin{bmatrix}
0 & 0 & 0 & \frac{2\sqrt{6}}{35} & 0 & 0 & -\frac{3\sqrt{70}}{280} & 0 & 0 & 0 & -\frac{3\sqrt{2}}{280} & 0 & 0 & 0 \\
-\frac{4\sqrt{5}}{35} & 0 & 0 & 0 & \frac{8}{35} & 0 & 0 & -\frac{3\sqrt{30}}{280} & 0 & 0 & 0 & -\frac{3\sqrt{10}}{280} & 0 & 0 \\
0 & -\frac{8}{35} & 0 & 0 & 0 & \frac{4\sqrt{5}}{35} & 0 & 0 & -\frac{3\sqrt{10}}{280} & 0 & 0 & 0 & -\frac{3\sqrt{30}}{280} & 0 \\
0 & 0 & -\frac{2\sqrt{6}}{35} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{2}}{280} & 0 & 0 & 0 & -\frac{3\sqrt{70}}{280} \\
0 & 0 & \frac{3\sqrt{30}}{140} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}}{105} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & \frac{9\sqrt{6}}{140} & 0 & 0 & \frac{\sqrt{70}}{105} & 0 & 0 & 0 & -\frac{4\sqrt{2}}{105} & 0 & 0 & 0 \\
\frac{3\sqrt{30}}{140} & 0 & 0 & 0 & \frac{9\sqrt{6}}{140} & 0 & 0 & \frac{4\sqrt{5}}{105} & 0 & 0 & 0 & -\frac{2\sqrt{15}}{105} & 0 & 0 \\
0 & \frac{9\sqrt{6}}{140} & 0 & 0 & 0 & \frac{3\sqrt{30}}{140} & 0 & 0 & \frac{2\sqrt{15}}{105} & 0 & 0 & 0 & -\frac{4\sqrt{5}}{105} & 0 \\
0 & 0 & \frac{9\sqrt{6}}{140} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{4\sqrt{2}}{105} & 0 & 0 & 0 & -\frac{\sqrt{70}}{105} \\
0 & 0 & 0 & \frac{3\sqrt{30}}{140} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}}{105} & 0 & 0 & 0 \\
\end{bmatrix}$$

| 816 | symmetry | $\sqrt{3}xy$ |

Table 9

No.	multipole	matrix												

$\mathbb{M}_2^{(1,1;a)}(A_2)$

$$\begin{pmatrix}
0 & 0 & 0 & -\frac{2\sqrt{6}i}{35} & 0 & 0 & -\frac{3\sqrt{70}i}{280} & 0 & 0 & 0 & \frac{3\sqrt{2}i}{280} & 0 & 0 & 0 \\
-\frac{4\sqrt{5}i}{35} & 0 & 0 & 0 & -\frac{8i}{35} & 0 & 0 & -\frac{3\sqrt{30}i}{280} & 0 & 0 & 0 & \frac{3\sqrt{10}i}{280} & 0 & 0 \\
0 & -\frac{8i}{35} & 0 & 0 & 0 & -\frac{4\sqrt{5}i}{35} & 0 & 0 & -\frac{3\sqrt{10}i}{280} & 0 & 0 & 0 & \frac{3\sqrt{30}i}{280} & 0 \\
0 & 0 & -\frac{2\sqrt{6}i}{35} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{2}i}{280} & 0 & 0 & 0 & \frac{3\sqrt{70}i}{280} \\
0 & 0 & -\frac{3\sqrt{30}i}{140} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}i}{105} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & -\frac{9\sqrt{6}i}{140} & 0 & 0 & \frac{\sqrt{70}i}{105} & 0 & 0 & 0 & \frac{4\sqrt{2}i}{105} & 0 & 0 & 0 \\
\frac{3\sqrt{30}i}{140} & 0 & 0 & 0 & -\frac{9\sqrt{6}i}{140} & 0 & 0 & \frac{4\sqrt{5}i}{105} & 0 & 0 & 0 & \frac{2\sqrt{15}i}{105} & 0 & 0 \\
0 & \frac{9\sqrt{6}i}{140} & 0 & 0 & 0 & -\frac{3\sqrt{30}i}{140} & 0 & 0 & \frac{2\sqrt{15}i}{105} & 0 & 0 & 0 & \frac{4\sqrt{5}i}{105} & 0 \\
0 & 0 & \frac{9\sqrt{6}i}{140} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{4\sqrt{2}i}{105} & 0 & 0 & 0 & \frac{\sqrt{70}i}{105} \\
0 & 0 & 0 & \frac{3\sqrt{30}i}{140} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}i}{105} & 0 & 0 & 0
\end{pmatrix}$$

| 817 | symmetry | $-\frac{x^2}{2} - \frac{y^2}{2} + z^2$ |

$\mathbb{M}_2^{(1,1;a)}(B_1)$

$$\begin{pmatrix}
0 & \frac{12}{35} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{10}}{140} & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & \frac{2\sqrt{6}}{35} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{9\sqrt{2}}{140} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & -\frac{2\sqrt{6}}{35} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{9\sqrt{2}}{140} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & -\frac{12}{35} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{10}}{140} & 0 & 0 \\
\frac{3}{14} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}}{21} & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & -\frac{3}{70} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}}{35} & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & -\frac{6}{35} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{2\sqrt{3}}{105} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & -\frac{6}{35} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{2\sqrt{3}}{105} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & -\frac{3}{70} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}}{35} & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & \frac{3}{14} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{21} & 0
\end{pmatrix}$$

| 818 | symmetry | $\sqrt{3}yz$ |

281

Table 9

No.	multipole	matrix
	$\mathbb{M}_{2,1}^{(1,1;a)}(E)$	(see matrix below)

$$\mathbb{M}_{2,1}^{(1,1;a)}(E) = \begin{bmatrix} -\frac{2\sqrt{15}i}{35} & 0 & -\frac{3\sqrt{6}i}{35} & 0 & 0 & 0 & 0 & \frac{3\sqrt{10}i}{140} & 0 & \frac{3\sqrt{2}i}{140} & 0 & 0 & 0 & 0 \\ 0 & \frac{2i}{35} & 0 & -\frac{\sqrt{2}i}{7} & 0 & 0 & 0 & 0 & \frac{3\sqrt{10}i}{140} & 0 & \frac{3\sqrt{6}i}{140} & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{2}i}{7} & 0 & -\frac{2i}{35} & 0 & 0 & 0 & 0 & \frac{3\sqrt{6}i}{140} & 0 & \frac{3\sqrt{10}i}{140} & 0 & 0 \\ 0 & 0 & 0 & \frac{3\sqrt{6}i}{35} & 0 & \frac{2\sqrt{15}i}{35} & 0 & 0 & 0 & 0 & \frac{3\sqrt{2}i}{140} & 0 & \frac{3\sqrt{10}i}{140} & 0 \\ 0 & -\frac{3\sqrt{15}i}{70} & 0 & 0 & 0 & 0 & \frac{\sqrt{14}i}{42} & 0 & \frac{\sqrt{6}i}{42} & 0 & 0 & 0 & 0 & 0 \\ \frac{3\sqrt{15}i}{70} & 0 & -\frac{3\sqrt{6}i}{70} & 0 & 0 & 0 & 0 & \frac{\sqrt{10}i}{210} & 0 & \frac{11\sqrt{2}i}{210} & 0 & 0 & 0 & 0 \\ 0 & \frac{3\sqrt{6}i}{70} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{105} & 0 & \frac{i}{15} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{3\sqrt{6}i}{70} & 0 & 0 & 0 & 0 & -\frac{i}{15} & 0 & \frac{\sqrt{15}i}{105} & 0 & 0 \\ 0 & 0 & 0 & -\frac{3\sqrt{6}i}{70} & 0 & \frac{3\sqrt{15}i}{70} & 0 & 0 & 0 & 0 & -\frac{11\sqrt{2}i}{210} & 0 & -\frac{\sqrt{10}i}{210} & 0 \\ 0 & 0 & 0 & 0 & -\frac{3\sqrt{15}i}{70} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{42} & 0 & -\frac{\sqrt{14}i}{42} \end{bmatrix}$$

| 819 | symmetry | $-\sqrt{3}xz$ |

$$\mathbb{M}_{2,2}^{(1,1;a)}(E) = \begin{bmatrix} \frac{2\sqrt{15}}{35} & 0 & -\frac{3\sqrt{6}}{35} & 0 & 0 & 0 & 0 & -\frac{3\sqrt{10}}{140} & 0 & \frac{3\sqrt{2}}{140} & 0 & 0 & 0 & 0 \\ 0 & -\frac{2}{35} & 0 & -\frac{\sqrt{2}}{7} & 0 & 0 & 0 & 0 & -\frac{3\sqrt{10}}{140} & 0 & \frac{3\sqrt{6}}{140} & 0 & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{2}}{7} & 0 & -\frac{2}{35} & 0 & 0 & 0 & 0 & -\frac{3\sqrt{6}}{140} & 0 & \frac{3\sqrt{10}}{140} & 0 & 0 \\ 0 & 0 & 0 & -\frac{3\sqrt{6}}{35} & 0 & \frac{2\sqrt{15}}{35} & 0 & 0 & 0 & 0 & -\frac{3\sqrt{2}}{140} & 0 & \frac{3\sqrt{10}}{140} & 0 \\ 0 & -\frac{3\sqrt{15}}{70} & 0 & 0 & 0 & 0 & -\frac{\sqrt{14}}{42} & 0 & \frac{\sqrt{6}}{42} & 0 & 0 & 0 & 0 & 0 \\ -\frac{3\sqrt{15}}{70} & 0 & -\frac{3\sqrt{6}}{70} & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}}{210} & 0 & \frac{11\sqrt{2}}{210} & 0 & 0 & 0 & 0 \\ 0 & -\frac{3\sqrt{6}}{70} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{105} & 0 & \frac{1}{15} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{3\sqrt{6}}{70} & 0 & 0 & 0 & 0 & \frac{1}{15} & 0 & \frac{\sqrt{15}}{105} & 0 & 0 \\ 0 & 0 & 0 & \frac{3\sqrt{6}}{70} & 0 & \frac{3\sqrt{15}}{70} & 0 & 0 & 0 & 0 & \frac{11\sqrt{2}}{210} & 0 & -\frac{\sqrt{10}}{210} & 0 \\ 0 & 0 & 0 & 0 & \frac{3\sqrt{15}}{70} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{42} & 0 & -\frac{\sqrt{14}}{42} \end{bmatrix}$$

| 820 | symmetry | $\frac{\sqrt{5}(x-y)(x+y)\left(x^2+y^2-6z^2\right)}{4}$ |

continued ...

Table 9

No.	multipole	matrix

$$\mathbb{M}_4^{(1,1;a)}(A_1) = \begin{pmatrix}
0 & 0 & 0 & \frac{\sqrt{33}}{21} & 0 & 0 & -\frac{\sqrt{385}}{700} & 0 & 0 & 0 & -\frac{3\sqrt{11}}{140} & 0 & 0 & 0 \\[4pt]
-\frac{\sqrt{110}}{70} & 0 & 0 & 0 & -\frac{\sqrt{22}}{14} & 0 & 0 & \frac{11\sqrt{165}}{2100} & 0 & 0 & 0 & -\frac{\sqrt{55}}{700} & 0 & 0 \\[4pt]
0 & \frac{\sqrt{22}}{14} & 0 & 0 & 0 & \frac{\sqrt{110}}{70} & 0 & 0 & -\frac{\sqrt{55}}{700} & 0 & 0 & 0 & \frac{11\sqrt{165}}{2100} & 0 \\[4pt]
0 & 0 & -\frac{\sqrt{33}}{21} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{11}}{140} & 0 & 0 & 0 & -\frac{\sqrt{385}}{700} \\[4pt]
0 & 0 & \frac{\sqrt{165}}{140} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{2\sqrt{55}}{385} & 0 & 0 & 0 & 0 \\[4pt]
0 & 0 & 0 & -\frac{\sqrt{33}}{84} & 0 & 0 & \frac{3\sqrt{385}}{1925} & 0 & 0 & 0 & -\frac{\sqrt{11}}{385} & 0 & 0 & 0 \\[4pt]
\frac{\sqrt{165}}{140} & 0 & 0 & 0 & -\frac{\sqrt{33}}{84} & 0 & 0 & -\frac{9\sqrt{110}}{3850} & 0 & 0 & 0 & \frac{17\sqrt{330}}{11550} & 0 & 0 \\[4pt]
0 & -\frac{\sqrt{33}}{84} & 0 & 0 & 0 & \frac{\sqrt{165}}{140} & 0 & 0 & -\frac{17\sqrt{330}}{11550} & 0 & 0 & 0 & \frac{9\sqrt{110}}{3850} & 0 \\[4pt]
0 & 0 & -\frac{\sqrt{33}}{84} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{11}}{385} & 0 & 0 & 0 & -\frac{3\sqrt{385}}{1925} \\[4pt]
0 & 0 & 0 & \frac{\sqrt{165}}{140} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{2\sqrt{55}}{385} & 0 & 0 & 0
\end{pmatrix}$$

821 symmetry

$$-\frac{\sqrt{5}\,xy\left(x^2+y^2-6z^2\right)}{2}$$

$$\mathbb{M}_4^{(1,1;a)}(A_2) = \begin{bmatrix}
0 & 0 & 0 & \frac{\sqrt{33}i}{21} & 0 & 0 & \frac{\sqrt{385}i}{700} & 0 & 0 & 0 & -\frac{3\sqrt{11}i}{140} & 0 & 0 & 0 \\[4pt]
\frac{\sqrt{110}i}{70} & 0 & 0 & 0 & -\frac{\sqrt{22}i}{14} & 0 & 0 & -\frac{11\sqrt{165}i}{2100} & 0 & 0 & 0 & -\frac{\sqrt{55}i}{700} & 0 & 0 \\[4pt]
0 & -\frac{\sqrt{22}i}{14} & 0 & 0 & 0 & \frac{\sqrt{110}i}{70} & 0 & 0 & \frac{\sqrt{55}i}{700} & 0 & 0 & 0 & \frac{11\sqrt{165}i}{2100} & 0 \\[4pt]
0 & 0 & \frac{\sqrt{33}i}{21} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{11}i}{140} & 0 & 0 & 0 & -\frac{\sqrt{385}i}{700} \\[4pt]
0 & 0 & \frac{\sqrt{165}i}{140} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{2\sqrt{55}i}{385} & 0 & 0 & 0 & 0 \\[4pt]
0 & 0 & 0 & -\frac{\sqrt{33}i}{84} & 0 & 0 & -\frac{3\sqrt{385}i}{1925} & 0 & 0 & 0 & -\frac{\sqrt{11}i}{385} & 0 & 0 & 0 \\[4pt]
-\frac{\sqrt{165}i}{140} & 0 & 0 & 0 & -\frac{\sqrt{33}i}{84} & 0 & 0 & \frac{9\sqrt{110}i}{3850} & 0 & 0 & 0 & \frac{17\sqrt{330}i}{11550} & 0 & 0 \\[4pt]
0 & \frac{\sqrt{33}i}{84} & 0 & 0 & 0 & \frac{\sqrt{165}i}{140} & 0 & 0 & \frac{17\sqrt{330}i}{11550} & 0 & 0 & 0 & \frac{9\sqrt{110}i}{3850} & 0 \\[4pt]
0 & 0 & \frac{\sqrt{33}i}{84} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{11}i}{385} & 0 & 0 & 0 & -\frac{3\sqrt{385}i}{1925} \\[4pt]
0 & 0 & 0 & -\frac{\sqrt{165}i}{140} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{2\sqrt{55}i}{385} & 0 & 0 & 0
\end{bmatrix}$$

822 symmetry

$$\frac{\sqrt{21}\left(x^4-3x^2y^2-3x^2z^2+y^4-3y^2z^2+z^4\right)}{6}$$

continued …

Table 9

No.	multipole	matrix
	$\mathbb{M}_4^{(1,1;a)}(B_1,1)$	$$\begin{pmatrix} 0 & -\frac{\sqrt{770}}{210} & 0 & 0 & 0 & -\frac{\sqrt{154}}{42} & 0 & 0 & \frac{\sqrt{77}}{140} & 0 & 0 & 0 & \frac{\sqrt{231}}{420} & 0 \\ 0 & 0 & \frac{\sqrt{1155}}{105} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{385}}{420} & 0 & 0 & 0 & \frac{\sqrt{11}}{60} \\ 0 & 0 & 0 & -\frac{\sqrt{1155}}{105} & 0 & 0 & \frac{\sqrt{11}}{60} & 0 & 0 & 0 & -\frac{\sqrt{385}}{420} & 0 & 0 & 0 \\ \frac{\sqrt{154}}{42} & 0 & 0 & 0 & \frac{\sqrt{770}}{210} & 0 & 0 & \frac{\sqrt{231}}{420} & 0 & 0 & 0 & \frac{\sqrt{77}}{140} & 0 & 0 \\ -\frac{\sqrt{770}}{840} & 0 & 0 & 0 & -\frac{\sqrt{154}}{168} & 0 & 0 & \frac{\sqrt{1155}}{1155} & 0 & 0 & 0 & \frac{\sqrt{385}}{1155} & 0 & 0 \\ 0 & \frac{\sqrt{770}}{280} & 0 & 0 & 0 & -\frac{\sqrt{154}}{168} & 0 & 0 & -\frac{4\sqrt{77}}{1155} & 0 & 0 & 0 & \frac{2\sqrt{231}}{1155} & 0 \\ 0 & 0 & -\frac{\sqrt{770}}{420} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2310}}{2310} & 0 & 0 & 0 & \frac{\sqrt{66}}{330} \\ 0 & 0 & 0 & -\frac{\sqrt{770}}{420} & 0 & 0 & -\frac{\sqrt{66}}{330} & 0 & 0 & 0 & \frac{\sqrt{2310}}{2310} & 0 & 0 & 0 \\ -\frac{\sqrt{154}}{168} & 0 & 0 & 0 & \frac{\sqrt{770}}{280} & 0 & 0 & -\frac{2\sqrt{231}}{1155} & 0 & 0 & 0 & \frac{4\sqrt{77}}{1155} & 0 & 0 \\ 0 & -\frac{\sqrt{154}}{168} & 0 & 0 & 0 & -\frac{\sqrt{770}}{840} & 0 & 0 & -\frac{\sqrt{385}}{1155} & 0 & 0 & 0 & -\frac{\sqrt{1155}}{1155} & 0 \end{pmatrix}$$
823	symmetry	$$-\frac{\sqrt{15}\left(x^4-12x^2y^2+6x^2z^2+y^4+6y^2z^2-2z^4\right)}{12}$$
	$\mathbb{M}_4^{(1,1;a)}(B_1,2)$	$$\begin{pmatrix} 0 & -\frac{\sqrt{22}}{42} & 0 & 0 & 0 & \frac{\sqrt{110}}{30} & 0 & 0 & \frac{\sqrt{55}}{140} & 0 & 0 & 0 & -\frac{\sqrt{165}}{300} & 0 \\ 0 & 0 & \frac{\sqrt{33}}{21} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{11}}{84} & 0 & 0 & 0 & -\frac{\sqrt{385}}{300} \\ 0 & 0 & 0 & -\frac{\sqrt{33}}{21} & 0 & 0 & -\frac{\sqrt{385}}{300} & 0 & 0 & 0 & -\frac{\sqrt{11}}{84} & 0 & 0 & 0 \\ -\frac{\sqrt{110}}{30} & 0 & 0 & 0 & \frac{\sqrt{22}}{42} & 0 & 0 & -\frac{\sqrt{165}}{300} & 0 & 0 & 0 & \frac{\sqrt{55}}{140} & 0 & 0 \\ -\frac{\sqrt{22}}{168} & 0 & 0 & 0 & \frac{\sqrt{110}}{120} & 0 & 0 & \frac{\sqrt{33}}{231} & 0 & 0 & 0 & -\frac{\sqrt{11}}{165} & 0 & 0 \\ 0 & \frac{\sqrt{22}}{56} & 0 & 0 & 0 & \frac{\sqrt{110}}{120} & 0 & 0 & -\frac{4\sqrt{55}}{1155} & 0 & 0 & 0 & -\frac{2\sqrt{165}}{825} & 0 \\ 0 & 0 & -\frac{\sqrt{22}}{84} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{66}}{462} & 0 & 0 & 0 & -\frac{\sqrt{2310}}{1650} \\ 0 & 0 & 0 & -\frac{\sqrt{22}}{84} & 0 & 0 & \frac{\sqrt{2310}}{1650} & 0 & 0 & 0 & \frac{\sqrt{66}}{462} & 0 & 0 & 0 \\ \frac{\sqrt{110}}{120} & 0 & 0 & 0 & \frac{\sqrt{22}}{56} & 0 & 0 & \frac{2\sqrt{165}}{825} & 0 & 0 & 0 & \frac{4\sqrt{55}}{1155} & 0 & 0 \\ 0 & \frac{\sqrt{110}}{120} & 0 & 0 & 0 & -\frac{\sqrt{22}}{168} & 0 & 0 & \frac{\sqrt{11}}{165} & 0 & 0 & 0 & -\frac{\sqrt{33}}{231} & 0 \end{pmatrix}$$
824	symmetry	$$\frac{\sqrt{35}xy(x-y)(x+y)}{2}$$

continued ...

Table 9

No.	multipole	matrix

$$\mathbb{M}_4^{(1,1;a)}(B_2)=$$

$$\begin{pmatrix}
0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2310}i}{105} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{385}i}{350} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{165}i}{150} \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{165}i}{150} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
\frac{\sqrt{2310}i}{105} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{385}i}{350} & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & \frac{\sqrt{2310}i}{420} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{2\sqrt{231}i}{1155} & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2310}i}{420} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{4\sqrt{385}i}{1925} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{110}i}{275} \\
0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{110}i}{275} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
-\frac{\sqrt{2310}i}{420} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{4\sqrt{385}i}{1925} & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & -\frac{\sqrt{2310}i}{420} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{2\sqrt{231}i}{1155} & 0 & 0 & 0 & 0 & 0
\end{pmatrix}$$

825	symmetry	$\dfrac{\sqrt{35}\,yz(y-z)(y+z)}{2}$

$$\mathbb{M}_{4,1}^{(1,1;a)}(E,1)=$$

$$\begin{pmatrix}
-\frac{\sqrt{2310}i}{840} & 0 & -\frac{\sqrt{231}i}{84} & 0 & -\frac{\sqrt{462}i}{168} & 0 & 0 & \frac{3\sqrt{385}i}{1400} & 0 & \frac{\sqrt{77}i}{140} & 0 & \frac{\sqrt{1155}i}{1400} & 0 & 0 \\
0 & \frac{\sqrt{154}i}{56} & 0 & \frac{\sqrt{77}i}{28} & 0 & \frac{\sqrt{770}i}{280} & -\frac{\sqrt{165}i}{600} & 0 & -\frac{\sqrt{385}i}{350} & 0 & -\frac{\sqrt{231}i}{840} & 0 & \frac{\sqrt{1155}i}{2100} & 0 \\
-\frac{\sqrt{770}i}{280} & 0 & -\frac{\sqrt{77}i}{28} & 0 & -\frac{\sqrt{154}i}{56} & 0 & 0 & \frac{\sqrt{1155}i}{2100} & 0 & -\frac{\sqrt{231}i}{840} & 0 & -\frac{\sqrt{385}i}{350} & 0 & -\frac{\sqrt{165}i}{600} \\
0 & \frac{\sqrt{462}i}{168} & 0 & \frac{\sqrt{231}i}{84} & 0 & \frac{\sqrt{2310}i}{840} & 0 & 0 & \frac{\sqrt{1155}i}{1400} & 0 & \frac{\sqrt{77}i}{140} & 0 & \frac{3\sqrt{385}i}{1400} & 0 \\
0 & -\frac{\sqrt{2310}i}{840} & 0 & -\frac{\sqrt{1155}i}{840} & 0 & 0 & \frac{\sqrt{11}i}{220} & 0 & \frac{\sqrt{231}i}{462} & 0 & \frac{\sqrt{385}i}{1540} & 0 & 0 & 0 \\
\frac{\sqrt{2310}i}{840} & 0 & \frac{\sqrt{231}i}{168} & 0 & 0 & 0 & 0 & -\frac{13\sqrt{385}i}{7700} & 0 & -\frac{\sqrt{77}i}{770} & 0 & \frac{\sqrt{1155}i}{3300} & 0 & 0 \\
0 & -\frac{\sqrt{231}i}{168} & 0 & 0 & 0 & \frac{\sqrt{1155}i}{840} & \frac{3\sqrt{110}i}{2200} & 0 & \frac{\sqrt{2310}i}{46200} & 0 & -\frac{\sqrt{154}i}{440} & 0 & -\frac{\sqrt{770}i}{15400} & 0 \\
\frac{\sqrt{1155}i}{840} & 0 & 0 & 0 & -\frac{\sqrt{231}i}{168} & 0 & 0 & \frac{\sqrt{770}i}{15400} & 0 & \frac{\sqrt{154}i}{440} & 0 & -\frac{\sqrt{2310}i}{46200} & 0 & -\frac{3\sqrt{110}i}{2200} \\
0 & 0 & 0 & \frac{\sqrt{231}i}{168} & 0 & \frac{\sqrt{2310}i}{840} & 0 & 0 & -\frac{\sqrt{1155}i}{3300} & 0 & \frac{\sqrt{77}i}{770} & 0 & \frac{13\sqrt{385}i}{7700} & 0 \\
0 & 0 & -\frac{\sqrt{1155}i}{840} & 0 & -\frac{\sqrt{2310}i}{840} & 0 & 0 & 0 & 0 & -\frac{\sqrt{385}i}{1540} & 0 & -\frac{\sqrt{231}i}{462} & 0 & -\frac{\sqrt{11}i}{220}
\end{pmatrix}$$

826	symmetry	$-\dfrac{\sqrt{35}\,xz(x-z)(x+z)}{2}$

Table 9

No.	multipole	matrix
	$\mathbb{M}_{4,2}^{(1,1;a)}(E,1)$	$\begin{pmatrix} \frac{\sqrt{2310}}{840} & 0 & -\frac{\sqrt{231}}{84} & 0 & \frac{\sqrt{462}}{168} & 0 & 0 & -\frac{3\sqrt{385}}{1400} & 0 & \frac{\sqrt{77}}{140} & 0 & -\frac{\sqrt{1155}}{1400} & 0 & 0 \\ 0 & -\frac{\sqrt{154}}{56} & 0 & \frac{\sqrt{77}}{28} & 0 & -\frac{\sqrt{770}}{280} & -\frac{\sqrt{165}}{600} & 0 & \frac{\sqrt{385}}{350} & 0 & -\frac{\sqrt{231}}{840} & 0 & -\frac{\sqrt{1155}}{2100} & 0 \\ -\frac{\sqrt{770}}{280} & 0 & \frac{\sqrt{77}}{28} & 0 & -\frac{\sqrt{154}}{56} & 0 & 0 & \frac{\sqrt{1155}}{2100} & 0 & \frac{\sqrt{231}}{840} & 0 & -\frac{\sqrt{385}}{350} & 0 & \frac{\sqrt{165}}{600} \\ 0 & \frac{\sqrt{462}}{168} & 0 & -\frac{\sqrt{231}}{84} & 0 & \frac{\sqrt{2310}}{840} & 0 & 0 & \frac{\sqrt{1155}}{1400} & 0 & -\frac{\sqrt{77}}{140} & 0 & \frac{3\sqrt{385}}{1400} & 0 \\ 0 & -\frac{\sqrt{2310}}{840} & 0 & \frac{\sqrt{1155}}{840} & 0 & 0 & -\frac{\sqrt{11}}{220} & 0 & \frac{\sqrt{231}}{462} & 0 & -\frac{\sqrt{385}}{1540} & 0 & 0 & 0 \\ -\frac{\sqrt{2310}}{840} & 0 & \frac{\sqrt{231}}{168} & 0 & 0 & 0 & 0 & \frac{13\sqrt{385}}{7700} & 0 & -\frac{\sqrt{77}}{770} & 0 & -\frac{\sqrt{1155}}{3300} & 0 & 0 \\ 0 & \frac{\sqrt{231}}{168} & 0 & 0 & 0 & -\frac{\sqrt{1155}}{840} & \frac{3\sqrt{110}}{2200} & 0 & -\frac{\sqrt{2310}}{46200} & 0 & -\frac{\sqrt{154}}{440} & 0 & \frac{\sqrt{770}}{15400} & 0 \\ \frac{\sqrt{1155}}{840} & 0 & 0 & 0 & -\frac{\sqrt{231}}{168} & 0 & 0 & \frac{\sqrt{770}}{15400} & 0 & -\frac{\sqrt{154}}{440} & 0 & -\frac{\sqrt{2310}}{46200} & 0 & \frac{3\sqrt{110}}{2200} \\ 0 & 0 & 0 & -\frac{\sqrt{231}}{168} & 0 & \frac{\sqrt{2310}}{840} & 0 & 0 & -\frac{\sqrt{1155}}{3300} & 0 & -\frac{\sqrt{77}}{770} & 0 & \frac{13\sqrt{385}}{7700} & 0 \\ 0 & 0 & -\frac{\sqrt{1155}}{840} & 0 & \frac{\sqrt{2310}}{840} & 0 & 0 & 0 & 0 & -\frac{\sqrt{385}}{1540} & 0 & \frac{\sqrt{231}}{462} & 0 & -\frac{\sqrt{11}}{220} \end{pmatrix}$
827	symmetry	$\dfrac{\sqrt{5}\,yz\left(6x^2-y^2-z^2\right)}{2}$
	$\mathbb{M}_{4,1}^{(1,1;a)}(E,2)$	$\begin{pmatrix} -\frac{\sqrt{330}i}{840} & 0 & -\frac{\sqrt{33}i}{84} & 0 & \frac{\sqrt{66}i}{24} & 0 & 0 & \frac{3\sqrt{55}}{1400} & 0 & \frac{\sqrt{11}i}{140} & 0 & -\frac{\sqrt{165}i}{200} & 0 & 0 \\ 0 & \frac{\sqrt{22}i}{56} & 0 & \frac{\sqrt{11}i}{28} & 0 & -\frac{\sqrt{110}i}{40} & \frac{\sqrt{1155}i}{600} & 0 & -\frac{\sqrt{55}i}{350} & 0 & -\frac{\sqrt{33}i}{840} & 0 & -\frac{\sqrt{165}i}{300} & 0 \\ \frac{\sqrt{110}i}{40} & 0 & -\frac{\sqrt{11}i}{28} & 0 & -\frac{\sqrt{22}i}{56} & 0 & 0 & -\frac{\sqrt{165}i}{300} & 0 & -\frac{\sqrt{33}i}{840} & 0 & -\frac{\sqrt{55}i}{350} & 0 & \frac{\sqrt{1155}i}{600} \\ 0 & -\frac{\sqrt{66}i}{24} & 0 & \frac{\sqrt{33}i}{84} & 0 & \frac{\sqrt{330}i}{840} & 0 & 0 & -\frac{\sqrt{165}i}{200} & 0 & \frac{\sqrt{11}i}{140} & 0 & \frac{3\sqrt{55}}{1400} & 0 \\ 0 & -\frac{\sqrt{330}i}{840} & 0 & \frac{\sqrt{165}i}{120} & 0 & 0 & \frac{\sqrt{77}i}{1540} & 0 & \frac{\sqrt{33}i}{462} & 0 & -\frac{\sqrt{55}i}{220} & 0 & 0 & 0 \\ \frac{\sqrt{330}i}{840} & 0 & \frac{\sqrt{33}i}{168} & 0 & 0 & 0 & 0 & -\frac{13\sqrt{55}i}{7700} & 0 & -\frac{\sqrt{11}i}{770} & 0 & -\frac{7\sqrt{165}i}{3300} & 0 & 0 \\ 0 & -\frac{\sqrt{33}i}{168} & 0 & 0 & 0 & -\frac{\sqrt{165}i}{120} & -\frac{3\sqrt{770}i}{2200} & 0 & \frac{\sqrt{330}i}{46200} & 0 & -\frac{\sqrt{22}i}{440} & 0 & \frac{\sqrt{110}i}{2200} & 0 \\ -\frac{\sqrt{165}i}{120} & 0 & 0 & 0 & -\frac{\sqrt{33}i}{168} & 0 & 0 & -\frac{\sqrt{110}i}{2200} & 0 & \frac{\sqrt{22}i}{440} & 0 & -\frac{\sqrt{330}i}{46200} & 0 & \frac{3\sqrt{770}i}{2200} \\ 0 & 0 & 0 & \frac{\sqrt{33}i}{168} & 0 & \frac{\sqrt{330}i}{840} & 0 & 0 & \frac{7\sqrt{165}i}{3300} & 0 & \frac{\sqrt{11}i}{770} & 0 & \frac{13\sqrt{55}i}{7700} & 0 \\ 0 & 0 & \frac{\sqrt{165}i}{120} & 0 & -\frac{\sqrt{330}i}{840} & 0 & 0 & 0 & 0 & \frac{\sqrt{55}i}{220} & 0 & -\frac{\sqrt{33}i}{462} & 0 & -\frac{\sqrt{77}i}{1540} \end{pmatrix}$
828	symmetry	$\dfrac{\sqrt{5}\,xz\left(x^2-6y^2+z^2\right)}{2}$

Table 9

No.	multipole	matrix

$$\mathbb{M}_{4,2}^{(1,1;a)}(E,2)$$

$$
\begin{pmatrix}
\frac{\sqrt{330}}{840} & 0 & -\frac{\sqrt{33}}{84} & 0 & -\frac{\sqrt{66}}{24} & 0 & 0 & -\frac{3\sqrt{55}}{1400} & 0 & \frac{\sqrt{11}}{140} & 0 & \frac{\sqrt{165}}{200} & 0 & 0 \\
0 & -\frac{\sqrt{22}}{56} & 0 & \frac{\sqrt{11}}{28} & 0 & \frac{\sqrt{110}}{40} & \frac{\sqrt{1155}}{600} & 0 & \frac{\sqrt{55}}{350} & 0 & -\frac{\sqrt{33}}{840} & 0 & \frac{\sqrt{165}}{300} & 0 \\
\frac{\sqrt{110}}{40} & 0 & \frac{\sqrt{11}}{28} & 0 & -\frac{\sqrt{22}}{56} & 0 & 0 & -\frac{\sqrt{165}}{300} & 0 & \frac{\sqrt{33}}{840} & 0 & -\frac{\sqrt{55}}{350} & 0 & -\frac{\sqrt{1155}}{600} \\
0 & -\frac{\sqrt{66}}{24} & 0 & -\frac{\sqrt{33}}{84} & 0 & \frac{\sqrt{330}}{840} & 0 & 0 & -\frac{\sqrt{165}}{200} & 0 & -\frac{\sqrt{11}}{140} & 0 & \frac{3\sqrt{55}}{1400} & 0 \\
0 & -\frac{\sqrt{330}}{840} & 0 & -\frac{\sqrt{165}}{120} & 0 & 0 & -\frac{\sqrt{77}}{1540} & 0 & \frac{\sqrt{33}}{462} & 0 & \frac{\sqrt{55}}{220} & 0 & 0 & 0 \\
-\frac{\sqrt{330}}{840} & 0 & \frac{\sqrt{33}}{168} & 0 & 0 & 0 & 0 & \frac{13\sqrt{55}}{7700} & 0 & -\frac{\sqrt{11}}{770} & 0 & \frac{7\sqrt{165}}{3300} & 0 & 0 \\
0 & \frac{\sqrt{33}}{168} & 0 & 0 & 0 & \frac{\sqrt{165}}{120} & -\frac{3\sqrt{770}}{2200} & 0 & -\frac{\sqrt{330}}{46200} & 0 & -\frac{\sqrt{22}}{440} & 0 & -\frac{\sqrt{110}}{2200} & 0 \\
-\frac{\sqrt{165}}{120} & 0 & 0 & 0 & -\frac{\sqrt{33}}{168} & 0 & 0 & -\frac{\sqrt{110}}{2200} & 0 & -\frac{\sqrt{22}}{440} & 0 & -\frac{\sqrt{330}}{46200} & 0 & -\frac{3\sqrt{770}}{2200} \\
0 & 0 & 0 & -\frac{\sqrt{33}}{168} & 0 & \frac{\sqrt{330}}{840} & 0 & 0 & \frac{7\sqrt{165}}{3300} & 0 & -\frac{\sqrt{11}}{770} & 0 & \frac{13\sqrt{55}}{7700} & 0 \\
0 & 0 & \frac{\sqrt{165}}{120} & 0 & \frac{\sqrt{330}}{840} & 0 & 0 & 0 & 0 & \frac{\sqrt{55}}{220} & 0 & \frac{\sqrt{33}}{462} & 0 & -\frac{\sqrt{77}}{1540}
\end{pmatrix}
$$

bra: $= \langle\frac{5}{2},\frac{5}{2};f|, \langle\frac{5}{2},\frac{3}{2};f|, \langle\frac{5}{2},\frac{1}{2};f|, \langle\frac{5}{2},-\frac{1}{2};f|, \langle\frac{5}{2},-\frac{3}{2};f|, \langle\frac{5}{2},-\frac{5}{2};f|, \langle\frac{7}{2},\frac{7}{2};f|, \langle\frac{7}{2},\frac{5}{2};f|, \langle\frac{7}{2},\frac{3}{2};f|, \langle\frac{7}{2},\frac{1}{2};f|, \langle\frac{7}{2},-\frac{1}{2};f|, \langle\frac{7}{2},-\frac{3}{2};f|, \langle\frac{7}{2},-\frac{5}{2};f|, \langle\frac{7}{2},-\frac{7}{2};f|$

ket: $= |\frac{5}{2},\frac{5}{2};f\rangle, |\frac{5}{2},\frac{3}{2};f\rangle, |\frac{5}{2},\frac{1}{2};f\rangle, |\frac{5}{2},-\frac{1}{2};f\rangle, |\frac{5}{2},-\frac{3}{2};f\rangle, |\frac{5}{2},-\frac{5}{2};f\rangle, |\frac{7}{2},\frac{7}{2};f\rangle, |\frac{7}{2},\frac{5}{2};f\rangle, |\frac{7}{2},\frac{3}{2};f\rangle, |\frac{7}{2},\frac{1}{2};f\rangle, |\frac{7}{2},-\frac{1}{2};f\rangle, |\frac{7}{2},-\frac{3}{2};f\rangle, |\frac{7}{2},-\frac{5}{2};f\rangle, |\frac{7}{2},-\frac{7}{2};f\rangle$

Table 10: (f,f) block.

No.	multipole	matrix
829	symmetry	1

Table 10

No.	multipole	matrix

$$\mathbb{Q}_0^{(a)}(A_1)$$

$$
\begin{pmatrix}
\frac{\sqrt{14}}{14} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & \frac{\sqrt{14}}{14} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & \frac{\sqrt{14}}{14} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & \frac{\sqrt{14}}{14} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & \frac{\sqrt{14}}{14} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & \frac{\sqrt{14}}{14} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{14}}{14} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{14}}{14} & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{14}}{14} & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{14}}{14} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{14}}{14} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{14}}{14} & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{14}}{14} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{14}}{14}
\end{pmatrix}
$$

| 830 | symmetry | $-\frac{x^2}{2} - \frac{y^2}{2} + z^2$ |

continued ...

Table 10

No.	multipole	matrix													
	$\mathbb{Q}_2^{(a)}(A_1)$	$-\frac{5\sqrt{42}}{98}$	0	0	0	0	0	0	$-\frac{5\sqrt{7}}{98}$	0	0	0	0	0	0
		0	$\frac{\sqrt{42}}{98}$	0	0	0	0	0	0	$-\frac{\sqrt{105}}{98}$	0	0	0	0	0
		0	0	$\frac{2\sqrt{42}}{49}$	0	0	0	0	0	0	$-\frac{\sqrt{14}}{98}$	0	0	0	0
		0	0	0	$\frac{2\sqrt{42}}{49}$	0	0	0	0	0	0	$\frac{\sqrt{14}}{98}$	0	0	0
		0	0	0	0	$\frac{\sqrt{42}}{98}$	0	0	0	0	0	0	$\frac{\sqrt{105}}{98}$	0	0
		0	0	0	0	0	$-\frac{5\sqrt{42}}{98}$	0	0	0	0	0	0	$\frac{5\sqrt{7}}{98}$	0
		0	0	0	0	0	0	$-\frac{5\sqrt{42}}{84}$	0	0	0	0	0	0	0
		$-\frac{5\sqrt{7}}{98}$	0	0	0	0	0	0	$-\frac{5\sqrt{42}}{588}$	0	0	0	0	0	0
		0	$-\frac{\sqrt{105}}{98}$	0	0	0	0	0	0	$\frac{5\sqrt{42}}{196}$	0	0	0	0	0
		0	0	$-\frac{\sqrt{14}}{98}$	0	0	0	0	0	0	$\frac{25\sqrt{42}}{588}$	0	0	0	0
		0	0	0	$\frac{\sqrt{14}}{98}$	0	0	0	0	0	0	$\frac{25\sqrt{42}}{588}$	0	0	0
		0	0	0	0	$\frac{\sqrt{105}}{98}$	0	0	0	0	0	0	$\frac{5\sqrt{42}}{196}$	0	0
		0	0	0	0	0	$\frac{5\sqrt{7}}{98}$	0	0	0	0	0	0	$-\frac{5\sqrt{42}}{588}$	0
		0	0	0	0	0	0	0	0	0	0	0	0	0	$-\frac{5\sqrt{42}}{84}$
831	symmetry	$\frac{\sqrt{3}(x-y)(x+y)}{2}$													

continued …

Table 10

No.	multipole	matrix												
	$\mathbb{Q}_2^{(a)}(B_1)$	0	0	$-\frac{3\sqrt{35}}{98}$	0	0	0	0	0	0	$-\frac{\sqrt{105}}{294}$	0	0	0	0
		0	0	0	$-\frac{9\sqrt{7}}{98}$	0	0	$\frac{\sqrt{15}}{42}$	0	0	0	$-\frac{2\sqrt{21}}{147}$	0	0	0
		$-\frac{3\sqrt{35}}{98}$	0	0	0	$-\frac{9\sqrt{7}}{98}$	0	0	$\frac{\sqrt{210}}{147}$	0	0	0	$-\frac{\sqrt{70}}{98}$	0	0
		0	$-\frac{9\sqrt{7}}{98}$	0	0	0	$-\frac{3\sqrt{35}}{98}$	0	0	$\frac{\sqrt{70}}{98}$	0	0	0	$-\frac{\sqrt{210}}{147}$	0
		0	0	$-\frac{9\sqrt{7}}{98}$	0	0	0	0	0	0	$\frac{2\sqrt{21}}{147}$	0	0	0	$-\frac{\sqrt{15}}{42}$
		0	0	0	$-\frac{3\sqrt{35}}{98}$	0	0	0	0	0	0	$\frac{\sqrt{105}}{294}$	0	0	0
		0	$\frac{\sqrt{15}}{42}$	0	0	0	0	0	0	$-\frac{5\sqrt{6}}{84}$	0	0	0	0	0
		0	0	$\frac{\sqrt{210}}{147}$	0	0	0	0	0	0	$-\frac{5\sqrt{70}}{196}$	0	0	0	0
		0	0	0	$\frac{\sqrt{70}}{98}$	0	0	$-\frac{5\sqrt{6}}{84}$	0	0	0	$-\frac{5\sqrt{210}}{294}$	0	0	0
		$-\frac{\sqrt{105}}{294}$	0	0	0	$\frac{2\sqrt{21}}{147}$	0	0	$-\frac{5\sqrt{70}}{196}$	0	0	0	$-\frac{5\sqrt{210}}{294}$	0	0
		0	$-\frac{2\sqrt{21}}{147}$	0	0	0	$\frac{\sqrt{105}}{294}$	0	0	$-\frac{5\sqrt{210}}{294}$	0	0	0	$-\frac{5\sqrt{70}}{196}$	0
		0	0	$-\frac{\sqrt{70}}{98}$	0	0	0	0	0	0	$-\frac{5\sqrt{210}}{294}$	0	0	0	$-\frac{5\sqrt{6}}{84}$
		0	0	0	$-\frac{\sqrt{210}}{147}$	0	0	0	0	0	0	$-\frac{5\sqrt{70}}{196}$	0	0	0
		0	0	0	0	$-\frac{\sqrt{15}}{42}$	0	0	0	0	0	0	$-\frac{5\sqrt{6}}{84}$	0	0
832	symmetry	$\sqrt{3}xy$													

Table 10

No.	multipole	matrix												

$\mathbb{Q}_2^{(a)}(B_2)$

$$\begin{pmatrix}
0 & 0 & \frac{3\sqrt{35}i}{98} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{105}i}{294} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & \frac{9\sqrt{7}i}{98} & 0 & 0 & \frac{\sqrt{15}i}{42} & 0 & 0 & 0 & \frac{2\sqrt{21}i}{147} & 0 & 0 & 0 \\
-\frac{3\sqrt{35}i}{98} & 0 & 0 & 0 & \frac{9\sqrt{7}i}{98} & 0 & 0 & \frac{\sqrt{210}i}{147} & 0 & 0 & 0 & \frac{\sqrt{70}i}{98} & 0 & 0 \\
0 & -\frac{9\sqrt{7}i}{98} & 0 & 0 & 0 & \frac{3\sqrt{35}i}{98} & 0 & 0 & \frac{\sqrt{70}i}{98} & 0 & 0 & 0 & \frac{\sqrt{210}i}{147} & 0 \\
0 & 0 & -\frac{9\sqrt{7}i}{98} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{2\sqrt{21}i}{147} & 0 & 0 & 0 & \frac{\sqrt{15}i}{42} \\
0 & 0 & 0 & -\frac{3\sqrt{35}i}{98} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{105}i}{294} & 0 & 0 & 0 \\
0 & -\frac{\sqrt{15}i}{42} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{5\sqrt{6}i}{84} & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & -\frac{\sqrt{210}i}{147} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{5\sqrt{70}i}{196} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & -\frac{\sqrt{70}i}{98} & 0 & 0 & -\frac{5\sqrt{6}i}{84} & 0 & 0 & 0 & \frac{5\sqrt{210}i}{294} & 0 & 0 & 0 \\
-\frac{\sqrt{105}i}{294} & 0 & 0 & 0 & -\frac{2\sqrt{21}i}{147} & 0 & 0 & -\frac{5\sqrt{70}i}{196} & 0 & 0 & 0 & \frac{5\sqrt{210}i}{294} & 0 & 0 \\
0 & -\frac{2\sqrt{21}i}{147} & 0 & 0 & 0 & -\frac{\sqrt{105}i}{294} & 0 & 0 & -\frac{5\sqrt{210}i}{294} & 0 & 0 & 0 & \frac{5\sqrt{70}i}{196} & 0 \\
0 & 0 & -\frac{\sqrt{70}i}{98} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{5\sqrt{210}i}{294} & 0 & 0 & 0 & \frac{5\sqrt{6}i}{84} \\
0 & 0 & 0 & -\frac{\sqrt{210}i}{147} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{5\sqrt{70}i}{196} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{42} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{5\sqrt{6}i}{84} & 0 & 0 \\
\end{pmatrix}$$

833	symmetry	$\sqrt{3}yz$

continued …

Table 10

No.	multipole	matrix													
		0	$\frac{3\sqrt{70}i}{98}$	0	0	0	0	$\frac{5\sqrt{3}i}{84}$	0	$\frac{5\sqrt{7}i}{196}$	0	0	0	0	0
		$-\frac{3\sqrt{70}i}{98}$	0	$\frac{3\sqrt{7}i}{49}$	0	0	0	0	$\frac{\sqrt{105}i}{588}$	0	$\frac{11\sqrt{21}i}{588}$	0	0	0	0
		0	$-\frac{3\sqrt{7}i}{49}$	0	0	0	0	0	0	$-\frac{\sqrt{70}i}{196}$	0	$\frac{\sqrt{42}i}{84}$	0	0	0
		0	0	0	0	$-\frac{3\sqrt{7}i}{49}$	0	0	0	0	$-\frac{\sqrt{42}i}{84}$	0	$\frac{\sqrt{70}i}{196}$	0	0
		0	0	0	$\frac{3\sqrt{7}i}{49}$	0	$-\frac{3\sqrt{70}i}{98}$	0	0	0	0	$-\frac{11\sqrt{21}i}{588}$	0	$-\frac{\sqrt{105}i}{588}$	0
		0	0	0	0	$\frac{3\sqrt{70}i}{98}$	0	0	0	0	0	0	$-\frac{5\sqrt{7}i}{196}$	0	$-\frac{5\sqrt{3}i}{84}$
	$\mathbb{Q}_{2,1}^{(a)}(E)$	$-\frac{5\sqrt{3}i}{84}$	0	0	0	0	0	0	$\frac{5\sqrt{2}i}{28}$	0	0	0	0	0	0
		0	$-\frac{\sqrt{105}i}{588}$	0	0	0	0	$-\frac{5\sqrt{2}i}{28}$	0	$\frac{5\sqrt{42}i}{147}$	0	0	0	0	0
		$-\frac{5\sqrt{7}i}{196}$	0	$\frac{\sqrt{70}i}{196}$	0	0	0	0	$-\frac{5\sqrt{42}i}{147}$	0	$\frac{5\sqrt{210}i}{588}$	0	0	0	0
		0	$-\frac{11\sqrt{21}i}{588}$	0	$\frac{\sqrt{42}i}{84}$	0	0	0	0	$-\frac{5\sqrt{210}i}{588}$	0	0	0	0	0
		0	0	$-\frac{\sqrt{42}i}{84}$	0	$\frac{11\sqrt{21}i}{588}$	0	0	0	0	0	0	$-\frac{5\sqrt{210}i}{588}$	0	0
		0	0	0	$-\frac{\sqrt{70}i}{196}$	0	$\frac{5\sqrt{7}i}{196}$	0	0	0	0	$\frac{5\sqrt{210}i}{588}$	0	$-\frac{5\sqrt{42}i}{147}$	0
		0	0	0	0	$\frac{\sqrt{105}i}{588}$	0	0	0	0	0	0	$\frac{5\sqrt{42}i}{147}$	0	$-\frac{5\sqrt{2}i}{28}$
		0	0	0	0	0	$\frac{5\sqrt{3}i}{84}$	0	0	0	0	0	0	$\frac{5\sqrt{2}i}{28}$	0
834	symmetry	$\sqrt{3}xz$														

continued ...

Table 10

No.	multipole	matrix

$\mathbb{Q}_{2,2}^{(a)}(E)$

$$\begin{pmatrix}
0 & -\frac{3\sqrt{70}}{98} & 0 & 0 & 0 & 0 & \frac{5\sqrt{3}}{84} & 0 & -\frac{5\sqrt{7}}{196} & 0 & 0 & 0 & 0 & 0 \\
-\frac{3\sqrt{70}}{98} & 0 & -\frac{3\sqrt{7}}{49} & 0 & 0 & 0 & 0 & \frac{\sqrt{105}}{588} & 0 & -\frac{11\sqrt{21}}{588} & 0 & 0 & 0 & 0 \\
0 & -\frac{3\sqrt{7}}{49} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}}{196} & 0 & -\frac{\sqrt{42}}{84} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & \frac{3\sqrt{7}}{49} & 0 & 0 & 0 & 0 & -\frac{\sqrt{42}}{84} & 0 & -\frac{\sqrt{70}}{196} & 0 & 0 \\
0 & 0 & 0 & \frac{3\sqrt{7}}{49} & 0 & \frac{3\sqrt{70}}{98} & 0 & 0 & 0 & 0 & -\frac{11\sqrt{21}}{588} & 0 & \frac{\sqrt{105}}{588} & 0 \\
0 & 0 & 0 & 0 & \frac{3\sqrt{70}}{98} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{5\sqrt{7}}{196} & 0 & \frac{5\sqrt{3}}{84} \\
\frac{5\sqrt{3}}{84} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{5\sqrt{2}}{28} & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & \frac{\sqrt{105}}{588} & 0 & 0 & 0 & 0 & -\frac{5\sqrt{2}}{28} & 0 & -\frac{5\sqrt{42}}{147} & 0 & 0 & 0 & 0 & 0 \\
-\frac{5\sqrt{7}}{196} & 0 & -\frac{\sqrt{70}}{196} & 0 & 0 & 0 & 0 & -\frac{5\sqrt{42}}{147} & 0 & -\frac{5\sqrt{210}}{588} & 0 & 0 & 0 & 0 \\
0 & -\frac{11\sqrt{21}}{588} & 0 & -\frac{\sqrt{42}}{84} & 0 & 0 & 0 & 0 & -\frac{5\sqrt{210}}{588} & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & -\frac{\sqrt{42}}{84} & 0 & -\frac{11\sqrt{21}}{588} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{5\sqrt{210}}{588} & 0 & 0 \\
0 & 0 & 0 & -\frac{\sqrt{70}}{196} & 0 & -\frac{5\sqrt{7}}{196} & 0 & 0 & 0 & 0 & \frac{5\sqrt{210}}{588} & 0 & \frac{5\sqrt{42}}{147} & 0 \\
0 & 0 & 0 & 0 & \frac{\sqrt{105}}{588} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{5\sqrt{42}}{147} & 0 & \frac{5\sqrt{2}}{28} \\
0 & 0 & 0 & 0 & 0 & \frac{5\sqrt{3}}{84} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{5\sqrt{2}}{28} & 0
\end{pmatrix}$$

| 835 | symmetry | $\frac{\sqrt{21}\left(x^4-3x^2y^2-3x^2z^2+y^4-3y^2z^2+z^4\right)}{6}$ |

Table 10

No.	multipole	matrix													
		$\frac{\sqrt{33}}{84}$	0	0	0	$\frac{\sqrt{165}}{84}$	0	0	$\frac{5\sqrt{22}}{154}$	0	0	0	$\frac{5\sqrt{66}}{462}$	0	0
		0	$-\frac{\sqrt{33}}{28}$	0	0	0	$\frac{\sqrt{165}}{84}$	0	0	$-\frac{2\sqrt{330}}{231}$	0	0	0	$\frac{\sqrt{110}}{77}$	0
		0	0	$\frac{\sqrt{33}}{42}$	0	0	0	0	0	0	$-\frac{5\sqrt{11}}{154}$	0	0	0	$\frac{\sqrt{385}}{154}$
		0	0	0	$\frac{\sqrt{33}}{42}$	0	0	$-\frac{\sqrt{385}}{154}$	0	0	0	$\frac{5\sqrt{11}}{154}$	0	0	0
		$\frac{\sqrt{165}}{84}$	0	0	0	$-\frac{\sqrt{33}}{28}$	0	0	$-\frac{\sqrt{110}}{77}$	0	0	0	$\frac{2\sqrt{330}}{231}$	0	0
		0	$\frac{\sqrt{165}}{84}$	0	0	0	$\frac{\sqrt{33}}{84}$	0	0	$-\frac{5\sqrt{66}}{462}$	0	0	0	$-\frac{5\sqrt{22}}{154}$	0
	$\mathbb{Q}_4^{(a)}(A_1,1)$	0	0	0	$-\frac{\sqrt{385}}{154}$	0	0	$\frac{\sqrt{33}}{44}$	0	0	0	$\frac{\sqrt{1155}}{308}$	0	0	0
		$\frac{5\sqrt{22}}{154}$	0	0	0	$-\frac{\sqrt{110}}{77}$	0	0	$-\frac{13\sqrt{33}}{308}$	0	0	0	$\frac{15\sqrt{11}}{308}$	0	0
		0	$-\frac{2\sqrt{330}}{231}$	0	0	0	$-\frac{5\sqrt{66}}{462}$	0	0	$-\frac{3\sqrt{33}}{308}$	0	0	0	$\frac{15\sqrt{11}}{308}$	0
		0	0	$-\frac{5\sqrt{11}}{154}$	0	0	0	0	0	0	$\frac{9\sqrt{33}}{308}$	0	0	0	$\frac{\sqrt{1155}}{308}$
		0	0	0	$\frac{5\sqrt{11}}{154}$	0	0	$\frac{\sqrt{1155}}{308}$	0	0	0	$\frac{9\sqrt{33}}{308}$	0	0	0
		$\frac{5\sqrt{66}}{462}$	0	0	0	$\frac{2\sqrt{330}}{231}$	0	0	$\frac{15\sqrt{11}}{308}$	0	0	0	$-\frac{3\sqrt{33}}{308}$	0	0
		0	$\frac{\sqrt{110}}{77}$	0	0	0	$-\frac{5\sqrt{22}}{154}$	0	0	$\frac{15\sqrt{11}}{308}$	0	0	0	$-\frac{13\sqrt{33}}{308}$	0
		0	0	$\frac{\sqrt{385}}{154}$	0	0	0	0	0	0	$\frac{\sqrt{1155}}{308}$	0	0	0	$\frac{\sqrt{33}}{44}$
836	symmetry	$-\frac{\sqrt{15}\left(x^4-12x^2y^2+6x^2z^2+y^4+6y^2z^2-2z^4\right)}{12}$													

Table 10

No.	multipole	matrix

$$\mathbb{Q}_4^{(a)}(A_1,2)$$

$$
\begin{pmatrix}
\frac{\sqrt{1155}}{588} & 0 & 0 & 0 & -\frac{\sqrt{231}}{84} & 0 & 0 & \frac{5\sqrt{770}}{1078} & 0 & 0 & 0 & -\frac{\sqrt{2310}}{462} & 0 & 0 \\
0 & -\frac{\sqrt{1155}}{196} & 0 & 0 & 0 & -\frac{\sqrt{231}}{84} & 0 & 0 & -\frac{10\sqrt{462}}{1617} & 0 & 0 & 0 & -\frac{\sqrt{154}}{77} & 0 \\
0 & 0 & \frac{\sqrt{1155}}{294} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{5\sqrt{385}}{1078} & 0 & 0 & 0 & -\frac{\sqrt{11}}{22} \\
0 & 0 & 0 & \frac{\sqrt{1155}}{294} & 0 & 0 & \frac{\sqrt{11}}{22} & 0 & 0 & 0 & \frac{5\sqrt{385}}{1078} & 0 & 0 & 0 \\
-\frac{\sqrt{231}}{84} & 0 & 0 & 0 & -\frac{\sqrt{1155}}{196} & 0 & 0 & \frac{\sqrt{154}}{77} & 0 & 0 & 0 & \frac{10\sqrt{462}}{1617} & 0 & 0 \\
0 & -\frac{\sqrt{231}}{84} & 0 & 0 & 0 & \frac{\sqrt{1155}}{588} & 0 & 0 & \frac{\sqrt{2310}}{462} & 0 & 0 & 0 & -\frac{5\sqrt{770}}{1078} & 0 \\
0 & 0 & 0 & \frac{\sqrt{11}}{22} & 0 & 0 & \frac{\sqrt{1155}}{308} & 0 & 0 & 0 & -\frac{\sqrt{33}}{44} & 0 & 0 & 0 \\
\frac{5\sqrt{770}}{1078} & 0 & 0 & 0 & \frac{\sqrt{154}}{77} & 0 & 0 & -\frac{13\sqrt{1155}}{2156} & 0 & 0 & 0 & -\frac{3\sqrt{385}}{308} & 0 & 0 \\
0 & -\frac{10\sqrt{462}}{1617} & 0 & 0 & 0 & \frac{\sqrt{2310}}{462} & 0 & 0 & -\frac{3\sqrt{1155}}{2156} & 0 & 0 & 0 & -\frac{3\sqrt{385}}{308} & 0 \\
0 & 0 & -\frac{5\sqrt{385}}{1078} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{9\sqrt{1155}}{2156} & 0 & 0 & 0 & -\frac{\sqrt{33}}{44} \\
0 & 0 & 0 & \frac{5\sqrt{385}}{1078} & 0 & 0 & -\frac{\sqrt{33}}{44} & 0 & 0 & 0 & \frac{9\sqrt{1155}}{2156} & 0 & 0 & 0 \\
-\frac{\sqrt{2310}}{462} & 0 & 0 & 0 & \frac{10\sqrt{462}}{1617} & 0 & 0 & -\frac{3\sqrt{385}}{308} & 0 & 0 & 0 & -\frac{3\sqrt{1155}}{2156} & 0 & 0 \\
0 & -\frac{\sqrt{154}}{77} & 0 & 0 & 0 & -\frac{5\sqrt{770}}{1078} & 0 & 0 & -\frac{3\sqrt{385}}{308} & 0 & 0 & 0 & -\frac{13\sqrt{1155}}{2156} & 0 \\
0 & 0 & -\frac{\sqrt{11}}{22} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{33}}{44} & 0 & 0 & 0 & \frac{\sqrt{1155}}{308}
\end{pmatrix}
$$

837	symmetry	$\frac{\sqrt{35}xy(x-y)(x+y)}{2}$

continued ...

Table 10

No.	multipole	matrix												

$\mathbb{Q}_4^{(a)}(A_2)$

$$\begin{pmatrix}
0 & 0 & 0 & 0 & -\frac{\sqrt{11}i}{14} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{110}i}{77} & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{11}i}{14} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{2\sqrt{66}i}{77} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{231}i}{77} \\
0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{231}i}{77} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
\frac{\sqrt{11}i}{14} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{2\sqrt{66}i}{77} & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & \frac{\sqrt{11}i}{14} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{110}i}{77} & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & \frac{\sqrt{231}i}{77} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{77}i}{154} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & \frac{2\sqrt{66}i}{77} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{165}i}{154} & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & \frac{\sqrt{110}i}{77} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{165}i}{154} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{77}i}{154} \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{77}i}{154} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
\frac{\sqrt{110}i}{77} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{165}i}{154} & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & \frac{2\sqrt{66}i}{77} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{165}i}{154} & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & \frac{\sqrt{231}i}{77} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{77}i}{154} & 0 & 0 & 0 & 0
\end{pmatrix}$$

838	symmetry	$\frac{\sqrt{5}(x-y)(x+y)\left(x^2+y^2-6z^2\right)}{4}$

continued …

Table 10

No.	multipole	matrix

$\mathbb{Q}_4^{(a)}(B_1)$

$$\begin{pmatrix}
0 & 0 & -\frac{3\sqrt{154}}{196} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{5\sqrt{462}}{539} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & \frac{\sqrt{770}}{196} & 0 & 0 & \frac{3\sqrt{66}}{154} & 0 & 0 & 0 & -\frac{\sqrt{2310}}{1078} & 0 & 0 & 0 \\
-\frac{3\sqrt{154}}{196} & 0 & 0 & 0 & \frac{\sqrt{770}}{196} & 0 & 0 & -\frac{9\sqrt{231}}{1078} & 0 & 0 & 0 & \frac{17\sqrt{77}}{1078} & 0 & 0 \\
0 & \frac{\sqrt{770}}{196} & 0 & 0 & 0 & -\frac{3\sqrt{154}}{196} & 0 & 0 & -\frac{17\sqrt{77}}{1078} & 0 & 0 & 0 & \frac{9\sqrt{231}}{1078} & 0 \\
0 & 0 & \frac{\sqrt{770}}{196} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2310}}{1078} & 0 & 0 & 0 & -\frac{3\sqrt{66}}{154} \\
0 & 0 & 0 & -\frac{3\sqrt{154}}{196} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{5\sqrt{462}}{539} & 0 & 0 & 0 \\
0 & \frac{3\sqrt{66}}{154} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{165}}{154} & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & -\frac{9\sqrt{231}}{1078} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{77}}{1078} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & -\frac{17\sqrt{77}}{1078} & 0 & 0 & -\frac{3\sqrt{165}}{154} & 0 & 0 & 0 & \frac{6\sqrt{231}}{539} & 0 & 0 & 0 \\
-\frac{5\sqrt{462}}{539} & 0 & 0 & 0 & \frac{\sqrt{2310}}{1078} & 0 & 0 & -\frac{3\sqrt{77}}{1078} & 0 & 0 & 0 & \frac{6\sqrt{231}}{539} & 0 & 0 \\
0 & -\frac{\sqrt{2310}}{1078} & 0 & 0 & 0 & \frac{5\sqrt{462}}{539} & 0 & 0 & \frac{6\sqrt{231}}{539} & 0 & 0 & 0 & -\frac{3\sqrt{77}}{1078} & 0 \\
0 & 0 & \frac{17\sqrt{77}}{1078} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{6\sqrt{231}}{539} & 0 & 0 & 0 & -\frac{3\sqrt{165}}{154} \\
0 & 0 & 0 & \frac{9\sqrt{231}}{1078} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{77}}{1078} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & -\frac{3\sqrt{66}}{154} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{165}}{154} & 0 & 0
\end{pmatrix}$$

| 839 | symmetry | $-\frac{\sqrt{5}xy\left(x^2+y^2-6z^2\right)}{2}$ |

continued ...

Table 10

No.	multipole	matrix

$\mathbb{Q}_4^{(a)}(B_2)$

$$\begin{pmatrix}
0 & 0 & -\frac{3\sqrt{154}i}{196} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{5\sqrt{462}i}{539} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & \frac{\sqrt{770}i}{196} & 0 & 0 & -\frac{3\sqrt{66}i}{154} & 0 & 0 & 0 & -\frac{\sqrt{2310}i}{1078} & 0 & 0 & 0 \\
\frac{3\sqrt{154}i}{196} & 0 & 0 & 0 & \frac{\sqrt{770}i}{196} & 0 & 0 & \frac{9\sqrt{231}i}{1078} & 0 & 0 & 0 & \frac{17\sqrt{77}i}{1078} & 0 & 0 \\
0 & -\frac{\sqrt{770}i}{196} & 0 & 0 & 0 & -\frac{3\sqrt{154}i}{196} & 0 & 0 & \frac{17\sqrt{77}i}{1078} & 0 & 0 & 0 & \frac{9\sqrt{231}i}{1078} & 0 \\
0 & 0 & -\frac{\sqrt{770}i}{196} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2310}i}{1078} & 0 & 0 & 0 & -\frac{3\sqrt{66}i}{154} \\
0 & 0 & 0 & \frac{3\sqrt{154}i}{196} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{5\sqrt{462}i}{539} & 0 & 0 & 0 \\
0 & \frac{3\sqrt{66}i}{154} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{165}i}{154} & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & -\frac{9\sqrt{231}i}{1078} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{77}i}{1078} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & -\frac{17\sqrt{77}i}{1078} & 0 & 0 & \frac{3\sqrt{165}i}{154} & 0 & 0 & 0 & \frac{6\sqrt{231}i}{539} & 0 & 0 & 0 \\
\frac{5\sqrt{462}i}{539} & 0 & 0 & 0 & \frac{\sqrt{2310}i}{1078} & 0 & 0 & \frac{3\sqrt{77}i}{1078} & 0 & 0 & 0 & \frac{6\sqrt{231}i}{539} & 0 & 0 \\
0 & \frac{\sqrt{2310}i}{1078} & 0 & 0 & 0 & \frac{5\sqrt{462}i}{539} & 0 & 0 & -\frac{6\sqrt{231}i}{539} & 0 & 0 & 0 & -\frac{3\sqrt{77}i}{1078} & 0 \\
0 & 0 & -\frac{17\sqrt{77}i}{1078} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{6\sqrt{231}i}{539} & 0 & 0 & 0 & -\frac{3\sqrt{165}i}{154} \\
0 & 0 & 0 & -\frac{9\sqrt{231}i}{1078} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{77}i}{1078} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & \frac{3\sqrt{66}i}{154} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{165}i}{154} & 0 & 0
\end{pmatrix}$$

| 840 | symmetry | $\frac{\sqrt{35}yz(y-z)(y+z)}{2}$ |

continued ...

Table 10

No.	multipole	matrix

$\mathbb{Q}_{4,1}^{(a)}(E,1)$

$$
\begin{bmatrix}
0 & \frac{\sqrt{11}i}{28} & 0 & \frac{\sqrt{22}i}{56} & 0 & 0 & \frac{\sqrt{2310}i}{616} & 0 & \frac{5\sqrt{110}i}{308} & 0 & \frac{5\sqrt{66}i}{616} & 0 & 0 & 0 \\
-\frac{\sqrt{11}i}{28} & 0 & -\frac{\sqrt{110}i}{56} & 0 & 0 & 0 & 0 & -\frac{13\sqrt{66}i}{616} & 0 & -\frac{\sqrt{330}i}{308} & 0 & \frac{\sqrt{22}i}{88} & 0 & 0 \\
0 & \frac{\sqrt{110}i}{56} & 0 & 0 & 0 & -\frac{\sqrt{22}i}{56} & \frac{3\sqrt{231}i}{616} & 0 & \frac{\sqrt{11}i}{616} & 0 & -\frac{\sqrt{165}i}{88} & 0 & -\frac{\sqrt{33}i}{616} & 0 \\
-\frac{\sqrt{22}i}{56} & 0 & 0 & 0 & \frac{\sqrt{110}i}{56} & 0 & 0 & \frac{\sqrt{33}i}{616} & 0 & \frac{\sqrt{165}i}{88} & 0 & -\frac{\sqrt{11}i}{616} & 0 & -\frac{3\sqrt{231}i}{616} \\
0 & 0 & 0 & -\frac{\sqrt{110}i}{56} & 0 & -\frac{\sqrt{11}i}{28} & 0 & 0 & -\frac{\sqrt{22}i}{88} & 0 & \frac{\sqrt{330}i}{308} & 0 & \frac{13\sqrt{66}i}{616} & 0 \\
0 & 0 & \frac{\sqrt{22}i}{56} & 0 & \frac{\sqrt{11}i}{28} & 0 & 0 & 0 & 0 & -\frac{5\sqrt{66}i}{616} & 0 & -\frac{5\sqrt{110}i}{308} & 0 & -\frac{\sqrt{2310}i}{616} \\
-\frac{\sqrt{2310}i}{616} & 0 & -\frac{3\sqrt{231}i}{616} & 0 & 0 & 0 & 0 & \frac{3\sqrt{385}i}{308} & 0 & \frac{3\sqrt{77}i}{308} & 0 & 0 & 0 & 0 \\
0 & \frac{13\sqrt{66}i}{616} & 0 & -\frac{\sqrt{33}i}{616} & 0 & 0 & -\frac{3\sqrt{385}i}{308} & 0 & -\frac{3\sqrt{165}i}{308} & 0 & \frac{3\sqrt{11}i}{154} & 0 & 0 & 0 \\
-\frac{5\sqrt{110}i}{308} & 0 & -\frac{\sqrt{11}i}{616} & 0 & \frac{\sqrt{22}i}{88} & 0 & 0 & \frac{3\sqrt{165}i}{308} & 0 & -\frac{9\sqrt{33}i}{308} & 0 & 0 & 0 & 0 \\
0 & \frac{\sqrt{330}i}{308} & 0 & -\frac{\sqrt{165}i}{88} & 0 & \frac{5\sqrt{66}i}{616} & -\frac{3\sqrt{77}i}{308} & 0 & \frac{9\sqrt{33}i}{308} & 0 & 0 & 0 & -\frac{3\sqrt{11}i}{154} & 0 \\
-\frac{5\sqrt{66}i}{616} & 0 & \frac{\sqrt{165}i}{88} & 0 & -\frac{\sqrt{330}i}{308} & 0 & 0 & -\frac{3\sqrt{11}i}{154} & 0 & 0 & 0 & \frac{9\sqrt{33}i}{308} & 0 & -\frac{3\sqrt{77}i}{308} \\
0 & -\frac{\sqrt{22}i}{88} & 0 & \frac{\sqrt{11}i}{616} & 0 & \frac{5\sqrt{110}i}{308} & 0 & 0 & 0 & 0 & -\frac{9\sqrt{33}i}{308} & 0 & \frac{3\sqrt{165}i}{308} & 0 \\
0 & 0 & \frac{\sqrt{33}i}{616} & 0 & -\frac{13\sqrt{66}i}{616} & 0 & 0 & 0 & 0 & \frac{3\sqrt{11}i}{154} & 0 & -\frac{3\sqrt{165}i}{308} & 0 & -\frac{3\sqrt{385}i}{308} \\
0 & 0 & 0 & \frac{3\sqrt{231}i}{616} & 0 & \frac{\sqrt{2310}i}{616} & 0 & 0 & 0 & 0 & \frac{3\sqrt{77}i}{308} & 0 & \frac{3\sqrt{385}i}{308} & 0
\end{bmatrix}
$$

841	symmetry	$\frac{\sqrt{35}xz(x-z)(x+z)}{2}$

Table 10

No.	multipole	matrix													
	$\mathbb{Q}_{4,2}^{(a)}(E,1)$	0	$-\frac{\sqrt{11}}{28}$	0	$\frac{\sqrt{22}}{56}$	0	0	$\frac{\sqrt{2310}}{616}$	0	$-\frac{5\sqrt{110}}{308}$	0	$\frac{5\sqrt{66}}{616}$	0	0	0
		$-\frac{\sqrt{11}}{28}$	0	$\frac{\sqrt{110}}{56}$	0	0	0	0	$-\frac{13\sqrt{66}}{616}$	0	$\frac{\sqrt{330}}{308}$	0	$\frac{\sqrt{22}}{88}$	0	0
		0	$\frac{\sqrt{110}}{56}$	0	0	0	$-\frac{\sqrt{22}}{56}$	$-\frac{3\sqrt{231}}{616}$	0	$\frac{\sqrt{11}}{616}$	0	$\frac{\sqrt{165}}{88}$	0	$-\frac{\sqrt{33}}{616}$	0
		$\frac{\sqrt{22}}{56}$	0	0	0	$-\frac{\sqrt{110}}{56}$	0	0	$-\frac{\sqrt{33}}{616}$	0	$\frac{\sqrt{165}}{88}$	0	$\frac{\sqrt{11}}{616}$	0	$-\frac{3\sqrt{231}}{616}$
		0	0	0	$-\frac{\sqrt{110}}{56}$	0	$\frac{\sqrt{11}}{28}$	0	0	$\frac{\sqrt{22}}{88}$	0	$\frac{\sqrt{330}}{308}$	0	$-\frac{13\sqrt{66}}{616}$	0
		0	0	$-\frac{\sqrt{22}}{56}$	0	$\frac{\sqrt{11}}{28}$	0	0	0	0	$\frac{5\sqrt{66}}{616}$	0	$-\frac{5\sqrt{110}}{308}$	0	$\frac{\sqrt{2310}}{616}$
		$\frac{\sqrt{2310}}{616}$	0	$-\frac{3\sqrt{231}}{616}$	0	0	0	0	$-\frac{3\sqrt{385}}{308}$	0	$\frac{3\sqrt{77}}{308}$	0	0	0	0
		0	$-\frac{13\sqrt{66}}{616}$	0	$-\frac{\sqrt{33}}{616}$	0	0	$-\frac{3\sqrt{385}}{308}$	0	$\frac{3\sqrt{165}}{308}$	0	$\frac{3\sqrt{11}}{154}$	0	0	0
		$-\frac{5\sqrt{110}}{308}$	0	$\frac{\sqrt{11}}{616}$	0	$\frac{\sqrt{22}}{88}$	0	0	$\frac{3\sqrt{165}}{308}$	0	$\frac{9\sqrt{33}}{308}$	0	0	0	0
		0	$\frac{\sqrt{330}}{308}$	0	$\frac{\sqrt{165}}{88}$	0	$\frac{5\sqrt{66}}{616}$	$\frac{3\sqrt{77}}{308}$	0	$\frac{9\sqrt{33}}{308}$	0	0	0	$-\frac{3\sqrt{11}}{154}$	0
		$\frac{5\sqrt{66}}{616}$	0	$\frac{\sqrt{165}}{88}$	0	$\frac{\sqrt{330}}{308}$	0	0	$\frac{3\sqrt{11}}{154}$	0	0	0	$-\frac{9\sqrt{33}}{308}$	0	$-\frac{3\sqrt{77}}{308}$
		0	$\frac{\sqrt{22}}{88}$	0	$\frac{\sqrt{11}}{616}$	0	$-\frac{5\sqrt{110}}{308}$	0	0	0	0	$-\frac{9\sqrt{33}}{308}$	0	$-\frac{3\sqrt{165}}{308}$	0
		0	0	$-\frac{\sqrt{33}}{616}$	0	$-\frac{13\sqrt{66}}{616}$	0	0	0	0	$-\frac{3\sqrt{11}}{154}$	0	$-\frac{3\sqrt{165}}{308}$	0	$\frac{3\sqrt{385}}{308}$
		0	0	0	$-\frac{3\sqrt{231}}{616}$	0	$\frac{\sqrt{2310}}{616}$	0	0	0	0	$-\frac{3\sqrt{77}}{308}$	0	$\frac{3\sqrt{385}}{308}$	0

| 842 | symmetry | $\frac{\sqrt{5}yz\left(6x^2-y^2-z^2\right)}{2}$ |

continued ...

Table 10

No.	multipole	matrix

$\mathbb{Q}_{4,1}^{(a)}(E,2)$

$$\begin{pmatrix}
0 & \frac{\sqrt{77}i}{196} & 0 & -\frac{\sqrt{154}i}{56} & 0 & 0 & \frac{\sqrt{330}i}{616} & 0 & \frac{5\sqrt{770}i}{2156} & 0 & -\frac{5\sqrt{462}i}{616} & 0 & 0 & 0 \\
-\frac{\sqrt{77}i}{196} & 0 & -\frac{\sqrt{770}i}{392} & 0 & 0 & 0 & 0 & -\frac{13\sqrt{462}i}{4312} & 0 & -\frac{\sqrt{2310}i}{2156} & 0 & -\frac{\sqrt{154}i}{88} & 0 & 0 \\
0 & \frac{\sqrt{770}i}{392} & 0 & 0 & 0 & \frac{\sqrt{154}i}{56} & -\frac{3\sqrt{33}i}{88} & 0 & \frac{\sqrt{77}i}{4312} & 0 & -\frac{\sqrt{1155}i}{616} & 0 & \frac{\sqrt{231}i}{616} & 0 \\
\frac{\sqrt{154}i}{56} & 0 & 0 & 0 & \frac{\sqrt{770}i}{392} & 0 & 0 & -\frac{\sqrt{231}i}{616} & 0 & \frac{\sqrt{1155}i}{616} & 0 & -\frac{\sqrt{77}i}{4312} & 0 & \frac{3\sqrt{33}i}{88} \\
0 & 0 & 0 & -\frac{\sqrt{770}i}{392} & 0 & -\frac{\sqrt{77}i}{196} & 0 & 0 & \frac{\sqrt{154}i}{88} & 0 & \frac{\sqrt{2310}i}{2156} & 0 & \frac{13\sqrt{462}i}{4312} & 0 \\
0 & 0 & -\frac{\sqrt{154}i}{56} & 0 & \frac{\sqrt{77}i}{196} & 0 & 0 & 0 & 0 & \frac{5\sqrt{462}i}{616} & 0 & -\frac{5\sqrt{770}i}{2156} & 0 & -\frac{\sqrt{330}i}{616} \\
-\frac{\sqrt{330}i}{616} & 0 & \frac{3\sqrt{33}i}{88} & 0 & 0 & 0 & 0 & \frac{3\sqrt{55}i}{308} & 0 & -\frac{3\sqrt{11}i}{44} & 0 & 0 & 0 & 0 \\
0 & \frac{13\sqrt{462}i}{4312} & 0 & \frac{\sqrt{231}i}{616} & 0 & 0 & -\frac{3\sqrt{55}i}{308} & 0 & -\frac{3\sqrt{1155}i}{2156} & 0 & -\frac{3\sqrt{77}i}{154} & 0 & 0 & 0 \\
-\frac{5\sqrt{770}i}{2156} & 0 & -\frac{\sqrt{77}i}{4312} & 0 & -\frac{\sqrt{154}i}{88} & 0 & 0 & \frac{3\sqrt{1155}i}{2156} & 0 & -\frac{9\sqrt{231}i}{2156} & 0 & 0 & 0 & 0 \\
0 & \frac{\sqrt{2310}i}{2156} & 0 & -\frac{\sqrt{1155}i}{616} & 0 & -\frac{5\sqrt{462}i}{616} & \frac{3\sqrt{11}i}{44} & 0 & \frac{9\sqrt{231}i}{2156} & 0 & 0 & 0 & \frac{3\sqrt{77}i}{154} & 0 \\
\frac{5\sqrt{462}i}{616} & 0 & \frac{\sqrt{1155}i}{616} & 0 & -\frac{\sqrt{2310}i}{2156} & 0 & 0 & \frac{3\sqrt{77}i}{154} & 0 & 0 & 0 & \frac{9\sqrt{231}i}{2156} & 0 & \frac{3\sqrt{11}i}{44} \\
0 & \frac{\sqrt{154}i}{88} & 0 & \frac{\sqrt{77}i}{4312} & 0 & \frac{5\sqrt{770}i}{2156} & 0 & 0 & 0 & 0 & -\frac{9\sqrt{231}i}{2156} & 0 & \frac{3\sqrt{1155}i}{2156} & 0 \\
0 & 0 & -\frac{\sqrt{231}i}{616} & 0 & -\frac{13\sqrt{462}i}{4312} & 0 & 0 & 0 & 0 & -\frac{3\sqrt{77}i}{154} & 0 & -\frac{3\sqrt{1155}i}{2156} & 0 & -\frac{3\sqrt{55}i}{308} \\
0 & 0 & 0 & -\frac{3\sqrt{33}i}{88} & 0 & \frac{\sqrt{330}i}{616} & 0 & 0 & 0 & 0 & -\frac{3\sqrt{11}i}{44} & 0 & \frac{3\sqrt{55}i}{308} & 0
\end{pmatrix}$$

| 843 | symmetry | $-\frac{\sqrt{5}xz\left(x^2-6y^2+z^2\right)}{2}$ |

Table 10

No.	multipole	matrix													
	$\mathbb{Q}_{4,2}^{(a)}(E,2)$	0	$-\frac{\sqrt{77}}{196}$	0	$-\frac{\sqrt{154}}{56}$	0	0	$\frac{\sqrt{330}}{616}$	0	$-\frac{5\sqrt{770}}{2156}$	0	$-\frac{5\sqrt{462}}{616}$	0	0	0
		$-\frac{\sqrt{77}}{196}$	0	$\frac{\sqrt{770}}{392}$	0	0	0	0	$-\frac{13\sqrt{462}}{4312}$	0	$\frac{\sqrt{2310}}{2156}$	0	$-\frac{\sqrt{154}}{88}$	0	0
		0	$\frac{\sqrt{770}}{392}$	0	0	0	$\frac{\sqrt{154}}{56}$	$\frac{3\sqrt{33}}{88}$	0	$\frac{\sqrt{77}}{4312}$	0	$\frac{\sqrt{1155}}{616}$	0	$\frac{\sqrt{231}}{616}$	0
		$-\frac{\sqrt{154}}{56}$	0	0	0	$-\frac{\sqrt{770}}{392}$	0	0	$\frac{\sqrt{231}}{616}$	0	$\frac{\sqrt{1155}}{616}$	0	$\frac{\sqrt{77}}{4312}$	0	$\frac{3\sqrt{33}}{88}$
		0	0	0	$-\frac{\sqrt{770}}{392}$	0	$\frac{\sqrt{77}}{196}$	0	0	$-\frac{\sqrt{154}}{88}$	0	$\frac{\sqrt{2310}}{2156}$	0	$-\frac{13\sqrt{462}}{4312}$	0
		0	0	$\frac{\sqrt{154}}{56}$	0	$\frac{\sqrt{77}}{196}$	0	0	0	0	$-\frac{5\sqrt{462}}{616}$	0	$-\frac{5\sqrt{770}}{2156}$	0	$\frac{\sqrt{330}}{616}$
		$\frac{\sqrt{330}}{616}$	0	$\frac{3\sqrt{33}}{88}$	0	0	0	0	$-\frac{3\sqrt{55}}{308}$	0	$-\frac{3\sqrt{11}}{44}$	0	0	0	0
		0	$-\frac{13\sqrt{462}}{4312}$	0	$\frac{\sqrt{231}}{616}$	0	0	$-\frac{3\sqrt{55}}{308}$	0	$\frac{3\sqrt{1155}}{2156}$	0	$-\frac{3\sqrt{77}}{154}$	0	0	0
		$-\frac{5\sqrt{770}}{2156}$	0	$\frac{\sqrt{77}}{4312}$	0	$-\frac{\sqrt{154}}{88}$	0	0	$\frac{3\sqrt{1155}}{2156}$	0	$\frac{9\sqrt{231}}{2156}$	0	0	0	0
		0	$\frac{\sqrt{2310}}{2156}$	0	$\frac{\sqrt{1155}}{616}$	0	$-\frac{5\sqrt{462}}{616}$	$-\frac{3\sqrt{11}}{44}$	0	$\frac{9\sqrt{231}}{2156}$	0	0	0	$\frac{3\sqrt{77}}{154}$	0
		$-\frac{5\sqrt{462}}{616}$	0	$\frac{\sqrt{1155}}{616}$	0	$\frac{\sqrt{2310}}{2156}$	0	0	$-\frac{3\sqrt{77}}{154}$	0	0	0	$-\frac{9\sqrt{231}}{2156}$	0	$\frac{3\sqrt{11}}{44}$
		0	$-\frac{\sqrt{154}}{88}$	0	$\frac{\sqrt{77}}{4312}$	0	$-\frac{5\sqrt{770}}{2156}$	0	0	0	0	$-\frac{9\sqrt{231}}{2156}$	0	$-\frac{3\sqrt{1155}}{2156}$	0
		0	0	$\frac{\sqrt{231}}{616}$	0	$-\frac{13\sqrt{462}}{4312}$	0	0	0	0	$\frac{3\sqrt{77}}{154}$	0	$-\frac{3\sqrt{1155}}{2156}$	0	$\frac{3\sqrt{55}}{308}$
		0	0	0	$\frac{3\sqrt{33}}{88}$	0	$\frac{\sqrt{330}}{616}$	0	0	0	0	$\frac{3\sqrt{11}}{44}$	0	$\frac{3\sqrt{55}}{308}$	0
844	symmetry	$\frac{\sqrt{2}\left(2x^6-15x^4y^2-15x^4z^2-15x^2y^4+180x^2y^2z^2-15x^2z^4+2y^6-15y^4z^2-15y^2z^4+2z^6\right)}{8}$														

continued ...

Table 10

No.	multipole														
								matrix							
	$\mathbb{Q}_6^{(a)}(A_1,1)$	0	0	0	0	0	0	0	$-\frac{\sqrt{154}}{616}$	0	0	0	$\frac{\sqrt{462}}{88}$	0	0
		0	0	0	0	0	0	0	0	$\frac{\sqrt{2310}}{616}$	0	0	0	$-\frac{\sqrt{770}}{88}$	0
		0	0	0	0	0	0	0	0	0	$-\frac{5\sqrt{77}}{308}$	0	0	0	$\frac{\sqrt{55}}{44}$
		0	0	0	0	0	0	$-\frac{\sqrt{55}}{44}$	0	0	0	$\frac{5\sqrt{77}}{308}$	0	0	0
		0	0	0	0	0	0	0	$\frac{\sqrt{770}}{88}$	0	0	0	$-\frac{\sqrt{2310}}{616}$	0	0
		0	0	0	0	0	0	0	0	$-\frac{\sqrt{462}}{88}$	0	0	0	$\frac{\sqrt{154}}{616}$	0
		0	0	0	$-\frac{\sqrt{55}}{44}$	0	0	$-\frac{\sqrt{231}}{1848}$	0	0	0	$\frac{\sqrt{165}}{88}$	0	0	0
		$-\frac{\sqrt{154}}{616}$	0	0	0	$\frac{\sqrt{770}}{88}$	0	0	$\frac{5\sqrt{231}}{1848}$	0	0	0	$-\frac{\sqrt{77}}{88}$	0	0
		0	$\frac{\sqrt{2310}}{616}$	0	0	0	$-\frac{\sqrt{462}}{88}$	0	0	$-\frac{3\sqrt{231}}{616}$	0	0	0	$-\frac{\sqrt{77}}{88}$	0
		0	0	$-\frac{5\sqrt{77}}{308}$	0	0	0	0	0	$\frac{5\sqrt{231}}{1848}$	0	0	0	0	$\frac{\sqrt{165}}{88}$
		0	0	0	$\frac{5\sqrt{77}}{308}$	0	0	$\frac{\sqrt{165}}{88}$	0	0	0	$\frac{5\sqrt{231}}{1848}$	0	0	0
		$\frac{\sqrt{462}}{88}$	0	0	0	$-\frac{\sqrt{2310}}{616}$	0	0	$-\frac{\sqrt{77}}{88}$	0	0	0	$-\frac{3\sqrt{231}}{616}$	0	0
		0	$-\frac{\sqrt{770}}{88}$	0	0	0	$\frac{\sqrt{154}}{616}$	0	0	$-\frac{\sqrt{77}}{88}$	0	0	0	$\frac{5\sqrt{231}}{1848}$	0
		0	0	$\frac{\sqrt{55}}{44}$	0	0	0	0	0	0	$\frac{\sqrt{165}}{88}$	0	0	0	$-\frac{\sqrt{231}}{1848}$
845	symmetry	$-\frac{\sqrt{14}\left(x^6-15x^4z^2+15x^2z^4+y^6-15y^4z^2+15y^2z^4-2z^6\right)}{8}$														

Table 10

No.	multipole	matrix

$\mathbb{Q}_6^{(a)}(A_1,2)$

$$\begin{pmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{22}}{88} & 0 & 0 & 0 & -\frac{\sqrt{66}}{88} & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{330}}{88} & 0 & 0 & 0 & \frac{\sqrt{110}}{88} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{5\sqrt{11}}{44} & 0 & 0 & 0 & -\frac{\sqrt{385}}{308} \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{385}}{308} & 0 & 0 & 0 & \frac{5\sqrt{11}}{44} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{110}}{88} & 0 & 0 & 0 & -\frac{\sqrt{330}}{88} & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{66}}{88} & 0 & 0 & 0 & \frac{\sqrt{22}}{88} & 0 \\
0 & 0 & 0 & \frac{\sqrt{385}}{308} & 0 & 0 & -\frac{\sqrt{33}}{264} & 0 & 0 & 0 & -\frac{\sqrt{1155}}{616} & 0 & 0 & 0 \\
-\frac{\sqrt{22}}{88} & 0 & 0 & 0 & -\frac{\sqrt{110}}{88} & 0 & 0 & \frac{5\sqrt{33}}{264} & 0 & 0 & 0 & \frac{\sqrt{11}}{88} & 0 & 0 \\
0 & \frac{\sqrt{330}}{88} & 0 & 0 & 0 & \frac{\sqrt{66}}{88} & 0 & 0 & -\frac{3\sqrt{33}}{88} & 0 & 0 & 0 & \frac{\sqrt{11}}{88} & 0 \\
0 & 0 & -\frac{5\sqrt{11}}{44} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{5\sqrt{33}}{264} & 0 & 0 & 0 & -\frac{\sqrt{1155}}{616} \\
0 & 0 & 0 & \frac{5\sqrt{11}}{44} & 0 & 0 & -\frac{\sqrt{1155}}{616} & 0 & 0 & 0 & \frac{5\sqrt{33}}{264} & 0 & 0 & 0 \\
-\frac{\sqrt{66}}{88} & 0 & 0 & 0 & -\frac{\sqrt{330}}{88} & 0 & 0 & \frac{\sqrt{11}}{88} & 0 & 0 & 0 & -\frac{3\sqrt{33}}{88} & 0 & 0 \\
0 & \frac{\sqrt{110}}{88} & 0 & 0 & 0 & \frac{\sqrt{22}}{88} & 0 & 0 & \frac{\sqrt{11}}{88} & 0 & 0 & 0 & \frac{5\sqrt{33}}{264} & 0 \\
0 & 0 & -\frac{\sqrt{385}}{308} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{1155}}{616} & 0 & 0 & 0 & -\frac{\sqrt{33}}{264}
\end{pmatrix}$$

| 846 | symmetry | $-\frac{3\sqrt{7}xy(x-y)(x+y)\left(x^2+y^2-10z^2\right)}{4}$ |

continued …

Table 10

No.	multipole	matrix												

$\mathbb{Q}_6^{(a)}(A_2)$

0	0	0	0	0	0	0	0	0	0	0	$\frac{\sqrt{33}i}{22}$	0	0
0	0	0	0	0	0	0	0	0	0	0	0	$-\frac{\sqrt{55}i}{22}$	0
0	0	0	0	0	0	0	0	0	0	0	0	0	$\frac{\sqrt{770}i}{154}$
0	0	0	0	0	0	$\frac{\sqrt{770}i}{154}$	0	0	0	0	0	0	0
0	0	0	0	0	0	0	$-\frac{\sqrt{55}i}{22}$	0	0	0	0	0	0
0	0	0	0	0	0	0	0	$\frac{\sqrt{33}i}{22}$	0	0	0	0	0
0	0	0	$-\frac{\sqrt{770}i}{154}$	0	0	0	0	0	0	$\frac{\sqrt{2310}i}{308}$	0	0	0
0	0	0	0	$\frac{\sqrt{55}i}{22}$	0	0	0	0	0	0	$-\frac{\sqrt{22}i}{44}$	0	0
0	0	0	0	0	$-\frac{\sqrt{33}i}{22}$	0	0	0	0	0	0	$-\frac{\sqrt{22}i}{44}$	0
0	0	0	0	0	0	0	0	0	0	0	0	0	$\frac{\sqrt{2310}i}{308}$
0	0	0	0	0	0	$-\frac{\sqrt{2310}i}{308}$	0	0	0	0	0	0	0
$-\frac{\sqrt{33}i}{22}$	0	0	0	0	0	0	$\frac{\sqrt{22}i}{44}$	0	0	0	0	0	0
0	$\frac{\sqrt{55}i}{22}$	0	0	0	0	0	0	$\frac{\sqrt{22}i}{44}$	0	0	0	0	0
0	0	$-\frac{\sqrt{770}i}{154}$	0	0	0	0	0	0	$-\frac{\sqrt{2310}i}{308}$	0	0	0	0

847	symmetry	$-\frac{\sqrt{2310}(x-y)(x+y)(x-z)(x+z)(y-z)(y+z)}{8}$

continued ...

Table 10

No.	multipole	matrix												
	$\mathbb{Q}_6^{(a)}(B_1,1)$	0	0	0	0	0	0	0	0	0	$\frac{\sqrt{6}}{24}$	0	0	0	$-\frac{\sqrt{210}}{56}$
		0	0	0	0	0	0	$-\frac{\sqrt{42}}{168}$	0	0	0	$-\frac{\sqrt{30}}{24}$	0	0	0
		0	0	0	0	0	0	0	$\frac{\sqrt{3}}{12}$	0	0	0	$\frac{1}{4}$	0	0
		0	0	0	0	0	0	0	0	$-\frac{1}{4}$	0	0	0	$-\frac{\sqrt{3}}{12}$	0
		0	0	0	0	0	0	0	0	0	$\frac{\sqrt{30}}{24}$	0	0	0	$\frac{\sqrt{42}}{168}$
		0	0	0	0	0	0	$\frac{\sqrt{210}}{56}$	0	0	0	$-\frac{\sqrt{6}}{24}$	0	0	0
		0	$-\frac{\sqrt{42}}{168}$	0	0	0	$\frac{\sqrt{210}}{56}$	0	0	$\frac{\sqrt{105}}{168}$	0	0	0	$-\frac{\sqrt{35}}{56}$	0
		0	0	$\frac{\sqrt{3}}{12}$	0	0	0	0	0	0	$-\frac{1}{8}$	0	0	0	$-\frac{\sqrt{35}}{56}$
		0	0	0	$-\frac{1}{4}$	0	0	$\frac{\sqrt{105}}{168}$	0	0	0	$\frac{\sqrt{3}}{24}$	0	0	0
		$\frac{\sqrt{6}}{24}$	0	0	0	$\frac{\sqrt{30}}{24}$	0	0	$-\frac{1}{8}$	0	0	0	$\frac{\sqrt{3}}{24}$	0	0
		0	$-\frac{\sqrt{30}}{24}$	0	0	0	$-\frac{\sqrt{6}}{24}$	0	0	$\frac{\sqrt{3}}{24}$	0	0	0	$-\frac{1}{8}$	0
		0	0	$\frac{1}{4}$	0	0	0	0	0	0	$\frac{\sqrt{3}}{24}$	0	0	0	$\frac{\sqrt{105}}{168}$
		0	0	0	$-\frac{\sqrt{3}}{12}$	0	0	$-\frac{\sqrt{35}}{56}$	0	0	0	$-\frac{1}{8}$	0	0	0
		$-\frac{\sqrt{210}}{56}$	0	0	0	$\frac{\sqrt{42}}{168}$	0	0	$-\frac{\sqrt{35}}{56}$	0	0	0	$\frac{\sqrt{105}}{168}$	0	0

| 848 | symmetry | $\frac{\sqrt{42}(x-y)(x+y)\left(x^4-9x^2y^2-5x^2z^2+y^4-5y^2z^2+5z^4\right)}{8}$ |

Table 10

No.	multipole	matrix													
	$\mathbb{Q}_6^{(a)}(B_1,2)$	0	0	0	0	0	0	0	0	0	$-\frac{\sqrt{330}}{264}$	0	0	0	$-\frac{\sqrt{462}}{56}$
		0	0	0	0	0	0	$\frac{\sqrt{2310}}{1848}$	0	0	0	$\frac{5\sqrt{66}}{264}$	0	0	0
		0	0	0	0	0	0	0	$-\frac{\sqrt{165}}{132}$	0	0	0	$-\frac{\sqrt{55}}{44}$	0	0
		0	0	0	0	0	0	0	0	$\frac{\sqrt{55}}{44}$	0	0	0	$\frac{\sqrt{165}}{132}$	0
		0	0	0	0	0	0	0	0	0	$-\frac{5\sqrt{66}}{264}$	0	0	0	$-\frac{\sqrt{2310}}{1848}$
		0	0	0	0	0	0	$\frac{\sqrt{462}}{56}$	0	0	0	$\frac{\sqrt{330}}{264}$	0	0	0
		0	$\frac{\sqrt{2310}}{1848}$	0	0	0	$\frac{\sqrt{462}}{56}$	0	0	$-\frac{5\sqrt{231}}{1848}$	0	0	0	$-\frac{\sqrt{77}}{56}$	0
		0	0	$-\frac{\sqrt{165}}{132}$	0	0	0	0	0	0	$\frac{\sqrt{55}}{88}$	0	0	0	$-\frac{\sqrt{77}}{56}$
		0	0	0	$\frac{\sqrt{55}}{44}$	0	0	$-\frac{5\sqrt{231}}{1848}$	0	0	0	$-\frac{\sqrt{165}}{264}$	0	0	0
		$-\frac{\sqrt{330}}{264}$	0	0	0	$-\frac{5\sqrt{66}}{264}$	0	0	$\frac{\sqrt{55}}{88}$	0	0	0	$-\frac{\sqrt{165}}{264}$	0	0
		0	$\frac{5\sqrt{66}}{264}$	0	0	0	$\frac{\sqrt{330}}{264}$	0	0	$-\frac{\sqrt{165}}{264}$	0	0	0	$\frac{\sqrt{55}}{88}$	0
		0	0	$-\frac{\sqrt{55}}{44}$	0	0	0	0	0	0	$-\frac{\sqrt{165}}{264}$	0	0	0	$-\frac{5\sqrt{231}}{1848}$
		0	0	0	$\frac{\sqrt{165}}{132}$	0	0	$-\frac{\sqrt{77}}{56}$	0	0	0	$\frac{\sqrt{55}}{88}$	0	0	0
		$-\frac{\sqrt{462}}{56}$	0	0	0	$-\frac{\sqrt{2310}}{1848}$	0	0	$-\frac{\sqrt{77}}{56}$	0	0	0	$-\frac{5\sqrt{231}}{1848}$	0	0
849	symmetry	$\frac{\sqrt{462}xy(x^2-3y^2)(3x^2-y^2)}{16}$														

continued ...

Table 10

No.	multipole	matrix
	$\mathbb{Q}_6^{(a)}(B_2,1)$	$$\begin{pmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{42}i}{14} \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{42}i}{14} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{42}i}{14} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}i}{14} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}i}{14} \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}i}{14} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ -\frac{\sqrt{42}i}{14} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}i}{14} & 0 & 0 & 0 & 0 & 0 & 0 \end{pmatrix}$$
850	symmetry	$\dfrac{\sqrt{210}\,xy\left(x^4+2x^2y^2-16x^2z^2+y^4-16y^2z^2+16z^4\right)}{16}$

continued ...

Table 10

No.	multipole	matrix

$\mathbb{Q}_6^{(a)}(B_2,2)$

$$
\begin{pmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{66}i}{66} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{462}i}{462} & 0 & 0 & -\frac{\sqrt{330}i}{66} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{33}i}{33} & 0 & 0 & \frac{\sqrt{11}i}{11} & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{11}i}{11} & 0 & 0 & -\frac{\sqrt{33}i}{33} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{330}i}{66} & 0 & 0 & \frac{\sqrt{462}i}{462} \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{66}i}{66} & 0 & 0 \\
0 & -\frac{\sqrt{462}i}{462} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{1155}i}{462} & 0 & 0 & 0 & 0 \\
0 & 0 & \frac{\sqrt{33}i}{33} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{11}i}{22} & 0 & 0 & 0 \\
0 & 0 & 0 & -\frac{\sqrt{11}i}{11} & 0 & 0 & -\frac{\sqrt{1155}i}{462} & 0 & 0 & 0 & \frac{\sqrt{33}i}{66} & 0 & 0 \\
-\frac{\sqrt{66}i}{66} & 0 & 0 & 0 & \frac{\sqrt{330}i}{66} & 0 & 0 & \frac{\sqrt{11}i}{22} & 0 & 0 & 0 & \frac{\sqrt{33}i}{66} & 0 & 0 \\
0 & \frac{\sqrt{330}i}{66} & 0 & 0 & 0 & -\frac{\sqrt{66}i}{66} & 0 & 0 & -\frac{\sqrt{33}i}{66} & 0 & 0 & -\frac{\sqrt{11}i}{22} & 0 \\
0 & 0 & -\frac{\sqrt{11}i}{11} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{33}i}{66} & 0 & 0 & \frac{\sqrt{1155}i}{462} \\
0 & 0 & 0 & \frac{\sqrt{33}i}{33} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{11}i}{22} & 0 & 0 \\
0 & 0 & 0 & 0 & -\frac{\sqrt{462}i}{462} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{1155}i}{462} & 0 & 0
\end{pmatrix}
$$

| 851 | symmetry | $\frac{3\sqrt{7}\,yz(y-z)(y+z)\left(10x^2-y^2-z^2\right)}{4}$ |

continued …

Table 10

No.	multipole	matrix
	$\mathbb{Q}_{6,1}^{(a)}(E,1)$	$\begin{pmatrix} 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{77}i}{1232} & 0 & \frac{\sqrt{33}i}{176} & 0 & -\frac{3\sqrt{55}i}{176} & 0 & -\frac{\sqrt{11}i}{16} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{55}i}{176} & 0 & -\frac{5\sqrt{11}i}{176} & 0 & \frac{3\sqrt{165}i}{176} & 0 & \frac{\sqrt{385}i}{112} \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{770}i}{1232} & 0 & \frac{\sqrt{330}i}{176} & 0 & \frac{5\sqrt{22}i}{176} & 0 & -\frac{3\sqrt{110}i}{176} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{110}i}{176} & 0 & -\frac{5\sqrt{22}i}{176} & 0 & -\frac{\sqrt{330}i}{176} & 0 & \frac{3\sqrt{770}i}{1232} \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{385}i}{112} & 0 & -\frac{3\sqrt{165}i}{176} & 0 & \frac{5\sqrt{11}i}{176} & 0 & \frac{\sqrt{55}i}{176} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{11}i}{16} & 0 & \frac{3\sqrt{55}i}{176} & 0 & -\frac{\sqrt{33}i}{176} & 0 & -\frac{\sqrt{77}i}{1232} \\ -\frac{\sqrt{77}i}{1232} & 0 & \frac{3\sqrt{770}i}{1232} & 0 & \frac{\sqrt{385}i}{112} & 0 & 0 & \frac{\sqrt{462}i}{1232} & 0 & -\frac{\sqrt{2310}i}{616} & 0 & -\frac{\sqrt{154}i}{112} & 0 & 0 \\ 0 & \frac{\sqrt{55}i}{176} & 0 & -\frac{3\sqrt{110}i}{176} & 0 & -\frac{\sqrt{11}i}{16} & -\frac{\sqrt{462}i}{1232} & 0 & -\frac{\sqrt{22}i}{88} & 0 & \frac{\sqrt{330}i}{176} & 0 & 0 & 0 \\ -\frac{\sqrt{33}i}{176} & 0 & -\frac{\sqrt{330}i}{176} & 0 & \frac{3\sqrt{165}i}{176} & 0 & 0 & \frac{\sqrt{22}i}{88} & 0 & \frac{\sqrt{110}i}{176} & 0 & 0 & 0 & \frac{\sqrt{154}i}{112} \\ 0 & \frac{5\sqrt{11}i}{176} & 0 & \frac{5\sqrt{22}i}{176} & 0 & -\frac{3\sqrt{55}i}{176} & \frac{\sqrt{2310}i}{616} & 0 & -\frac{\sqrt{110}i}{176} & 0 & 0 & 0 & -\frac{\sqrt{330}i}{176} & 0 \\ \frac{3\sqrt{55}i}{176} & 0 & -\frac{5\sqrt{22}i}{176} & 0 & -\frac{5\sqrt{11}i}{176} & 0 & 0 & -\frac{\sqrt{330}i}{176} & 0 & 0 & 0 & -\frac{\sqrt{110}i}{176} & 0 & \frac{\sqrt{2310}i}{616} \\ 0 & -\frac{3\sqrt{165}i}{176} & 0 & \frac{\sqrt{330}i}{176} & 0 & \frac{\sqrt{33}i}{176} & \frac{\sqrt{154}i}{112} & 0 & 0 & 0 & \frac{\sqrt{110}i}{176} & 0 & \frac{\sqrt{22}i}{88} & 0 \\ \frac{\sqrt{11}i}{16} & 0 & \frac{3\sqrt{110}i}{176} & 0 & -\frac{\sqrt{55}i}{176} & 0 & 0 & 0 & 0 & \frac{\sqrt{330}i}{176} & 0 & -\frac{\sqrt{22}i}{88} & 0 & -\frac{\sqrt{462}i}{1232} \\ 0 & -\frac{\sqrt{385}i}{112} & 0 & -\frac{3\sqrt{770}i}{1232} & 0 & \frac{\sqrt{77}i}{1232} & 0 & 0 & -\frac{\sqrt{154}i}{112} & 0 & -\frac{\sqrt{2310}i}{616} & 0 & \frac{\sqrt{462}i}{1232} & 0 \end{pmatrix}$
852	symmetry	$-\frac{3\sqrt{7}xz(x-z)(x+z)\left(x^2-10y^2+z^2\right)}{4}$

continued ...

310

Table 10

No.	multipole	matrix													
	$\mathbb{Q}_{6,2}^{(a)}(E,1)$	0	0	0	0	0	0	$\frac{\sqrt{77}}{1232}$	0	$-\frac{\sqrt{33}}{176}$	0	$-\frac{3\sqrt{55}}{176}$	0	$\frac{\sqrt{11}}{16}$	0
		0	0	0	0	0	0	0	$-\frac{\sqrt{55}}{176}$	0	$\frac{5\sqrt{11}}{176}$	0	$\frac{3\sqrt{165}}{176}$	0	$-\frac{\sqrt{385}}{112}$
		0	0	0	0	0	0	$\frac{3\sqrt{770}}{1232}$	0	$\frac{\sqrt{330}}{176}$	0	$-\frac{5\sqrt{22}}{176}$	0	$-\frac{3\sqrt{110}}{176}$	0
		0	0	0	0	0	0	0	$-\frac{3\sqrt{110}}{176}$	0	$-\frac{5\sqrt{22}}{176}$	0	$\frac{\sqrt{330}}{176}$	0	$\frac{3\sqrt{770}}{1232}$
		0	0	0	0	0	0	$-\frac{\sqrt{385}}{112}$	0	$\frac{3\sqrt{165}}{176}$	0	$\frac{5\sqrt{11}}{176}$	0	$-\frac{\sqrt{55}}{176}$	0
		0	0	0	0	0	0	0	$\frac{\sqrt{11}}{16}$	0	$-\frac{3\sqrt{55}}{176}$	0	$-\frac{\sqrt{33}}{176}$	0	$\frac{\sqrt{77}}{1232}$
		$\frac{\sqrt{77}}{1232}$	0	$\frac{3\sqrt{770}}{1232}$	0	$-\frac{\sqrt{385}}{112}$	0	0	$-\frac{\sqrt{462}}{1232}$	0	$-\frac{\sqrt{2310}}{616}$	0	$\frac{\sqrt{154}}{112}$	0	0
		0	$-\frac{\sqrt{55}}{176}$	0	$-\frac{3\sqrt{110}}{176}$	0	$\frac{\sqrt{11}}{16}$	$-\frac{\sqrt{462}}{1232}$	0	$\frac{\sqrt{22}}{88}$	0	$\frac{\sqrt{330}}{176}$	0	0	0
		$-\frac{\sqrt{33}}{176}$	0	$\frac{\sqrt{330}}{176}$	0	$\frac{3\sqrt{165}}{176}$	0	0	$\frac{\sqrt{22}}{88}$	0	$-\frac{\sqrt{110}}{176}$	0	0	0	$-\frac{\sqrt{154}}{112}$
		0	$\frac{5\sqrt{11}}{176}$	0	$-\frac{5\sqrt{22}}{176}$	0	$-\frac{3\sqrt{55}}{176}$	$-\frac{\sqrt{2310}}{616}$	0	$-\frac{\sqrt{110}}{176}$	0	0	0	$-\frac{\sqrt{330}}{176}$	0
		$-\frac{3\sqrt{55}}{176}$	0	$-\frac{5\sqrt{22}}{176}$	0	$\frac{5\sqrt{11}}{176}$	0	0	$\frac{\sqrt{330}}{176}$	0	0	0	$\frac{\sqrt{110}}{176}$	0	$\frac{\sqrt{2310}}{616}$
		0	$\frac{3\sqrt{165}}{176}$	0	$\frac{\sqrt{330}}{176}$	0	$-\frac{\sqrt{33}}{176}$	$\frac{\sqrt{154}}{112}$	0	0	0	$\frac{\sqrt{110}}{176}$	0	$-\frac{\sqrt{22}}{88}$	0
		$\frac{\sqrt{11}}{16}$	0	$-\frac{3\sqrt{110}}{176}$	0	$-\frac{\sqrt{55}}{176}$	0	0	0	0	$-\frac{\sqrt{330}}{176}$	0	$-\frac{\sqrt{22}}{88}$	0	$\frac{\sqrt{462}}{1232}$
		0	$-\frac{\sqrt{385}}{112}$	0	$\frac{3\sqrt{770}}{1232}$	0	$\frac{\sqrt{77}}{1232}$	0	0	$-\frac{\sqrt{154}}{112}$	0	$\frac{\sqrt{2310}}{616}$	0	$\frac{\sqrt{462}}{1232}$	0
853	symmetry	$\frac{\sqrt{462}\,yz\left(y^2-3z^2\right)\left(3y^2-z^2\right)}{16}$													

continued ...

Table 10

No.	multipole	matrix

$$\mathbb{Q}_{6,1}^{(a)}(E,2)$$

$$\begin{pmatrix}
0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{42}i}{448} & 0 & \frac{3\sqrt{2}i}{64} & 0 & \frac{\sqrt{30}i}{64} & 0 & \frac{\sqrt{6}i}{64} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}i}{64} & 0 & -\frac{5\sqrt{6}i}{64} & 0 & -\frac{3\sqrt{10}i}{64} & 0 & -\frac{\sqrt{210}i}{448} \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{105}i}{224} & 0 & \frac{3\sqrt{5}i}{32} & 0 & \frac{5\sqrt{3}i}{32} & 0 & \frac{\sqrt{15}i}{32} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{32} & 0 & -\frac{5\sqrt{3}i}{32} & 0 & -\frac{3\sqrt{5}i}{32} & 0 & -\frac{\sqrt{105}i}{224} \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{210}i}{448} & 0 & \frac{3\sqrt{10}i}{64} & 0 & \frac{5\sqrt{6}i}{64} & 0 & \frac{\sqrt{30}i}{64} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{64} & 0 & -\frac{\sqrt{30}i}{64} & 0 & -\frac{3\sqrt{2}i}{64} & 0 & -\frac{\sqrt{42}i}{448} \\
-\frac{\sqrt{42}i}{448} & 0 & -\frac{\sqrt{105}i}{224} & 0 & -\frac{\sqrt{210}i}{448} & 0 & 0 & \frac{3\sqrt{7}i}{224} & 0 & \frac{\sqrt{35}i}{112} & 0 & \frac{\sqrt{21}i}{224} & 0 & 0 \\
0 & \frac{\sqrt{30}i}{64} & 0 & \frac{\sqrt{15}i}{32} & 0 & \frac{\sqrt{6}i}{64} & -\frac{3\sqrt{7}i}{224} & 0 & -\frac{\sqrt{3}i}{16} & 0 & -\frac{\sqrt{5}i}{32} & 0 & 0 & 0 \\
-\frac{3\sqrt{2}i}{64} & 0 & -\frac{3\sqrt{5}i}{32} & 0 & -\frac{3\sqrt{10}i}{64} & 0 & 0 & \frac{\sqrt{3}i}{16} & 0 & \frac{\sqrt{15}i}{32} & 0 & 0 & 0 & -\frac{\sqrt{21}i}{224} \\
0 & \frac{5\sqrt{6}i}{64} & 0 & \frac{5\sqrt{3}i}{32} & 0 & \frac{\sqrt{30}i}{64} & -\frac{\sqrt{35}i}{112} & 0 & -\frac{\sqrt{15}i}{32} & 0 & 0 & 0 & \frac{\sqrt{5}i}{32} & 0 \\
-\frac{\sqrt{30}i}{64} & 0 & -\frac{5\sqrt{3}i}{32} & 0 & -\frac{5\sqrt{6}i}{64} & 0 & 0 & \frac{\sqrt{5}i}{32} & 0 & 0 & 0 & -\frac{\sqrt{15}i}{32} & 0 & -\frac{\sqrt{35}i}{112} \\
0 & \frac{3\sqrt{10}i}{64} & 0 & \frac{3\sqrt{5}i}{32} & 0 & \frac{3\sqrt{2}i}{64} & -\frac{\sqrt{21}i}{224} & 0 & 0 & 0 & \frac{\sqrt{15}i}{32} & 0 & \frac{\sqrt{3}i}{16} & 0 \\
-\frac{\sqrt{6}i}{64} & 0 & -\frac{\sqrt{15}i}{32} & 0 & -\frac{\sqrt{30}i}{64} & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{32} & 0 & -\frac{\sqrt{3}i}{16} & 0 & -\frac{3\sqrt{7}i}{224} \\
0 & \frac{\sqrt{210}i}{448} & 0 & \frac{\sqrt{105}i}{224} & 0 & \frac{\sqrt{42}i}{448} & 0 & 0 & \frac{\sqrt{21}i}{224} & 0 & \frac{\sqrt{35}i}{112} & 0 & \frac{3\sqrt{7}i}{224} & 0
\end{pmatrix}$$

| 854 | symmetry | $\frac{\sqrt{462}\,xz\left(x^2-3z^2\right)\left(3x^2-z^2\right)}{16}$ |

Table 10

No.	multipole	matrix													
		0	0	0	0	0	0	$\frac{\sqrt{42}}{448}$	0	$-\frac{3\sqrt{2}}{64}$	0	$\frac{\sqrt{30}}{64}$	0	$-\frac{\sqrt{6}}{64}$	0
		0	0	0	0	0	0	0	$-\frac{\sqrt{30}}{64}$	0	$\frac{5\sqrt{6}}{64}$	0	$-\frac{3\sqrt{10}}{64}$	0	$\frac{\sqrt{210}}{448}$
		0	0	0	0	0	0	$-\frac{\sqrt{105}}{224}$	0	$\frac{3\sqrt{5}}{32}$	0	$-\frac{5\sqrt{3}}{32}$	0	$\frac{\sqrt{15}}{32}$	0
		0	0	0	0	0	0	0	$\frac{\sqrt{15}}{32}$	0	$-\frac{5\sqrt{3}}{32}$	0	$\frac{3\sqrt{5}}{32}$	0	$-\frac{\sqrt{105}}{224}$
		0	0	0	0	0	0	$\frac{\sqrt{210}}{448}$	0	$-\frac{3\sqrt{10}}{64}$	0	$\frac{5\sqrt{6}}{64}$	0	$-\frac{\sqrt{30}}{64}$	0
		0	0	0	0	0	0	0	$-\frac{\sqrt{6}}{64}$	0	$\frac{\sqrt{30}}{64}$	0	$-\frac{3\sqrt{2}}{64}$	0	$\frac{\sqrt{42}}{448}$
	$\mathbb{Q}_{6,2}^{(a)}(E,2)$	$\frac{\sqrt{42}}{448}$	0	$-\frac{\sqrt{105}}{224}$	0	$\frac{\sqrt{210}}{448}$	0	0	$-\frac{3\sqrt{7}}{224}$	0	$\frac{\sqrt{35}}{112}$	0	$-\frac{\sqrt{21}}{224}$	0	0
		0	$-\frac{\sqrt{30}}{64}$	0	$\frac{\sqrt{15}}{32}$	0	$-\frac{\sqrt{6}}{64}$	$-\frac{3\sqrt{7}}{224}$	0	$\frac{\sqrt{3}}{16}$	0	$-\frac{\sqrt{5}}{32}$	0	0	0
		$-\frac{3\sqrt{2}}{64}$	0	$\frac{3\sqrt{5}}{32}$	0	$-\frac{3\sqrt{10}}{64}$	0	0	$\frac{\sqrt{3}}{16}$	0	$-\frac{\sqrt{15}}{32}$	0	0	0	$\frac{\sqrt{21}}{224}$
		0	$\frac{5\sqrt{6}}{64}$	0	$-\frac{5\sqrt{3}}{32}$	0	$\frac{\sqrt{30}}{64}$	$\frac{\sqrt{35}}{112}$	0	$-\frac{\sqrt{15}}{32}$	0	0	0	$\frac{\sqrt{5}}{32}$	0
		$\frac{\sqrt{30}}{64}$	0	$-\frac{5\sqrt{3}}{32}$	0	$\frac{5\sqrt{6}}{64}$	0	0	$-\frac{\sqrt{5}}{32}$	0	0	0	$\frac{\sqrt{15}}{32}$	0	$-\frac{\sqrt{35}}{112}$
		0	$-\frac{3\sqrt{10}}{64}$	0	$\frac{3\sqrt{5}}{32}$	0	$-\frac{3\sqrt{2}}{64}$	$-\frac{\sqrt{21}}{224}$	0	0	0	$\frac{\sqrt{15}}{32}$	0	$-\frac{\sqrt{3}}{16}$	0
		$-\frac{\sqrt{6}}{64}$	0	$\frac{\sqrt{15}}{32}$	0	$-\frac{\sqrt{30}}{64}$	0	0	0	0	$\frac{\sqrt{5}}{32}$	0	$-\frac{\sqrt{3}}{16}$	0	$\frac{3\sqrt{7}}{224}$
		0	$\frac{\sqrt{210}}{448}$	0	$-\frac{\sqrt{105}}{224}$	0	$\frac{\sqrt{42}}{448}$	0	0	$\frac{\sqrt{21}}{224}$	0	$-\frac{\sqrt{35}}{112}$	0	$\frac{3\sqrt{7}}{224}$	0
855	symmetry	$\frac{\sqrt{210}\,yz\left(16x^4-16x^2y^2-16x^2z^2+y^4+2y^2z^2+z^4\right)}{16}$													

continued ...

Table 10

No.	multipole	matrix													
	$\mathbb{Q}_{6,1}^{(a)}(E,3)$	0	0	0	0	0	0	$\frac{\sqrt{2310}i}{14784}$	0	$\frac{\sqrt{110}i}{704}$	0	$-\frac{9\sqrt{66}i}{704}$	0	$\frac{\sqrt{330}i}{64}$	0
		0	0	0	0	0	0	0	$-\frac{5\sqrt{66}i}{2112}$	0	$-\frac{5\sqrt{330}i}{2112}$	0	$\frac{27\sqrt{22}i}{704}$	0	$-\frac{5\sqrt{462}i}{448}$
		0	0	0	0	0	0	$-\frac{9\sqrt{231}i}{2464}$	0	$\frac{5\sqrt{11}i}{352}$	0	$\frac{5\sqrt{165}i}{1056}$	0	$-\frac{9\sqrt{33}i}{352}$	0
		0	0	0	0	0	0	0	$\frac{9\sqrt{33}i}{352}$	0	$-\frac{5\sqrt{165}i}{1056}$	0	$-\frac{5\sqrt{11}i}{352}$	0	$\frac{9\sqrt{231}i}{2464}$
		0	0	0	0	0	0	$\frac{5\sqrt{462}i}{448}$	0	$-\frac{27\sqrt{22}i}{704}$	0	$\frac{5\sqrt{330}i}{2112}$	0	$\frac{5\sqrt{66}i}{2112}$	0
		0	0	0	0	0	0	0	$-\frac{\sqrt{330}i}{64}$	0	$\frac{9\sqrt{66}i}{704}$	0	$-\frac{\sqrt{110}i}{704}$	0	$-\frac{\sqrt{2310}i}{14784}$
		$-\frac{\sqrt{2310}i}{14784}$	0	$\frac{9\sqrt{231}i}{2464}$	0	$-\frac{5\sqrt{462}i}{448}$	0	0	$\frac{\sqrt{385}i}{2464}$	0	$-\frac{9\sqrt{77}i}{1232}$	0	$\frac{\sqrt{1155}i}{224}$	0	0
		0	$\frac{5\sqrt{66}i}{2112}$	0	$-\frac{9\sqrt{33}i}{352}$	0	$\frac{\sqrt{330}i}{64}$	$-\frac{\sqrt{385}i}{2464}$	0	$-\frac{\sqrt{165}i}{528}$	0	$\frac{9\sqrt{11}i}{352}$	0	0	0
		$-\frac{\sqrt{110}i}{704}$	0	$-\frac{5\sqrt{11}i}{352}$	0	$\frac{27\sqrt{22}i}{704}$	0	0	$\frac{\sqrt{165}i}{528}$	0	$\frac{5\sqrt{33}i}{1056}$	0	0	0	$-\frac{\sqrt{1155}i}{224}$
		0	$\frac{5\sqrt{330}i}{2112}$	0	$\frac{5\sqrt{165}i}{1056}$	0	$-\frac{9\sqrt{66}i}{704}$	$\frac{9\sqrt{77}i}{1232}$	0	$-\frac{5\sqrt{33}i}{1056}$	0	0	0	$-\frac{9\sqrt{11}i}{352}$	0
		$\frac{9\sqrt{66}i}{704}$	0	$-\frac{5\sqrt{165}i}{1056}$	0	$-\frac{5\sqrt{330}i}{2112}$	0	0	$-\frac{9\sqrt{11}i}{352}$	0	0	0	$-\frac{5\sqrt{33}i}{1056}$	0	$\frac{9\sqrt{77}i}{1232}$
		0	$-\frac{27\sqrt{22}i}{704}$	0	$\frac{5\sqrt{11}i}{352}$	0	$\frac{\sqrt{110}i}{704}$	$-\frac{\sqrt{1155}i}{224}$	0	0	0	$\frac{5\sqrt{33}i}{1056}$	0	$\frac{\sqrt{165}i}{528}$	0
		$-\frac{\sqrt{330}i}{64}$	0	$\frac{9\sqrt{33}i}{352}$	0	$-\frac{5\sqrt{66}i}{2112}$	0	0	0	0	$\frac{9\sqrt{11}i}{352}$	0	$-\frac{\sqrt{165}i}{528}$	0	$-\frac{\sqrt{385}i}{2464}$
		0	$\frac{5\sqrt{462}i}{448}$	0	$-\frac{9\sqrt{231}i}{2464}$	0	$\frac{\sqrt{2310}i}{14784}$	0	0	$\frac{\sqrt{1155}i}{224}$	0	$-\frac{9\sqrt{77}i}{1232}$	0	$\frac{\sqrt{385}i}{2464}$	0
856	symmetry	$\frac{\sqrt{210}xz\left(x^4-16x^2y^2+2x^2z^2+16y^4-16y^2z^2+z^4\right)}{16}$														

Table 10

No.	multipole	matrix

$$\mathbb{Q}_{6,2}^{(a)}(E,3)$$

$$\begin{pmatrix}
0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2310}}{14784} & 0 & -\frac{\sqrt{110}}{704} & 0 & -\frac{9\sqrt{66}}{704} & 0 & -\frac{\sqrt{330}}{64} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{5\sqrt{66}}{2112} & 0 & \frac{5\sqrt{330}}{2112} & 0 & \frac{27\sqrt{22}}{704} & 0 & \frac{5\sqrt{462}}{448} \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{9\sqrt{231}}{2464} & 0 & \frac{5\sqrt{11}}{352} & 0 & -\frac{5\sqrt{165}}{1056} & 0 & -\frac{9\sqrt{33}}{352} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{9\sqrt{33}}{352} & 0 & -\frac{5\sqrt{165}}{1056} & 0 & \frac{5\sqrt{11}}{352} & 0 & \frac{9\sqrt{231}}{2464} \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{5\sqrt{462}}{448} & 0 & \frac{27\sqrt{22}}{704} & 0 & \frac{5\sqrt{330}}{2112} & 0 & -\frac{5\sqrt{66}}{2112} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{330}}{64} & 0 & -\frac{9\sqrt{66}}{704} & 0 & -\frac{\sqrt{110}}{704} & 0 & \frac{\sqrt{2310}}{14784} \\
\frac{\sqrt{2310}}{14784} & 0 & \frac{9\sqrt{231}}{2464} & 0 & \frac{5\sqrt{462}}{448} & 0 & 0 & -\frac{\sqrt{385}}{2464} & 0 & -\frac{9\sqrt{77}}{1232} & 0 & -\frac{\sqrt{1155}}{224} & 0 & 0 \\
0 & -\frac{5\sqrt{66}}{2112} & 0 & -\frac{9\sqrt{33}}{352} & 0 & -\frac{\sqrt{330}}{64} & -\frac{\sqrt{385}}{2464} & 0 & \frac{\sqrt{165}}{528} & 0 & \frac{9\sqrt{11}}{352} & 0 & 0 & 0 \\
-\frac{\sqrt{110}}{704} & 0 & \frac{5\sqrt{11}}{352} & 0 & \frac{27\sqrt{22}}{704} & 0 & 0 & \frac{\sqrt{165}}{528} & 0 & -\frac{5\sqrt{33}}{1056} & 0 & 0 & 0 & \frac{\sqrt{1155}}{224} \\
0 & \frac{5\sqrt{330}}{2112} & 0 & -\frac{5\sqrt{165}}{1056} & 0 & -\frac{9\sqrt{66}}{704} & -\frac{9\sqrt{77}}{1232} & 0 & -\frac{5\sqrt{33}}{1056} & 0 & 0 & 0 & -\frac{9\sqrt{11}}{352} & 0 \\
-\frac{9\sqrt{66}}{704} & 0 & -\frac{5\sqrt{165}}{1056} & 0 & \frac{5\sqrt{330}}{2112} & 0 & 0 & \frac{9\sqrt{11}}{352} & 0 & 0 & 0 & \frac{5\sqrt{33}}{1056} & 0 & \frac{9\sqrt{77}}{1232} \\
0 & \frac{27\sqrt{22}}{704} & 0 & \frac{5\sqrt{11}}{352} & 0 & -\frac{\sqrt{110}}{704} & -\frac{\sqrt{1155}}{224} & 0 & 0 & 0 & \frac{5\sqrt{33}}{1056} & 0 & -\frac{\sqrt{165}}{528} & 0 \\
-\frac{\sqrt{330}}{64} & 0 & -\frac{9\sqrt{33}}{352} & 0 & -\frac{5\sqrt{66}}{2112} & 0 & 0 & 0 & 0 & -\frac{9\sqrt{11}}{352} & 0 & -\frac{\sqrt{165}}{528} & 0 & \frac{\sqrt{385}}{2464} \\
0 & \frac{5\sqrt{462}}{448} & 0 & \frac{9\sqrt{231}}{2464} & 0 & \frac{\sqrt{2310}}{14784} & 0 & 0 & \frac{\sqrt{1155}}{224} & 0 & \frac{9\sqrt{77}}{1232} & 0 & \frac{\sqrt{385}}{2464} & 0
\end{pmatrix}$$

No.		
857	symmetry	$-\frac{x^2}{2} - \frac{y^2}{2} + z^2$

Table 10

No.	multipole	matrix												

		$-\frac{5\sqrt{21}}{147}$	0	0	0	0	0	0	$-\frac{15\sqrt{14}}{196}$	0	0	0	0	0	0
		0	$\frac{\sqrt{21}}{147}$	0	0	0	0	0	0	$-\frac{3\sqrt{210}}{196}$	0	0	0	0	0
		0	0	$\frac{4\sqrt{21}}{147}$	0	0	0	0	0	0	$-\frac{3\sqrt{7}}{98}$	0	0	0	0
		0	0	0	$\frac{4\sqrt{21}}{147}$	0	0	0	0	0	0	$\frac{3\sqrt{7}}{98}$	0	0	0
		0	0	0	0	$\frac{\sqrt{21}}{147}$	0	0	0	0	0	0	$\frac{3\sqrt{210}}{196}$	0	0
	$\mathbb{Q}_2^{(1,-1;a)}(A_1)$	0	0	0	0	0	$-\frac{5\sqrt{21}}{147}$	0	0	0	0	0	0	$\frac{15\sqrt{14}}{196}$	0
		0	0	0	0	0	0	$\frac{\sqrt{21}}{14}$	0	0	0	0	0	0	0
		$-\frac{15\sqrt{14}}{196}$	0	0	0	0	0	0	$\frac{\sqrt{21}}{98}$	0	0	0	0	0	0
		0	$-\frac{3\sqrt{210}}{196}$	0	0	0	0	0	0	$-\frac{3\sqrt{21}}{98}$	0	0	0	0	0
		0	0	$-\frac{3\sqrt{7}}{98}$	0	0	0	0	0	0	$-\frac{5\sqrt{21}}{98}$	0	0	0	0
		0	0	0	$\frac{3\sqrt{7}}{98}$	0	0	0	0	0	0	$-\frac{5\sqrt{21}}{98}$	0	0	0
		0	0	0	0	$\frac{3\sqrt{210}}{196}$	0	0	0	0	0	0	$-\frac{3\sqrt{21}}{98}$	0	0
		0	0	0	0	0	$\frac{15\sqrt{14}}{196}$	0	0	0	0	0	0	$\frac{\sqrt{21}}{98}$	0
		0	0	0	0	0	0	0	0	0	0	0	0	0	$\frac{\sqrt{21}}{14}$

858	symmetry	$\frac{\sqrt{3}(x-y)(x+y)}{2}$

Table 10

No.	multipole	matrix

$$\mathbb{Q}_2^{(1,-1;a)}(B_1)$$

$$
\begin{pmatrix}
0 & 0 & -\frac{\sqrt{70}}{98} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{210}}{196} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & -\frac{3\sqrt{14}}{98} & 0 & 0 & \frac{\sqrt{30}}{28} & 0 & 0 & 0 & -\frac{\sqrt{42}}{49} & 0 & 0 & 0 \\
-\frac{\sqrt{70}}{98} & 0 & 0 & 0 & -\frac{3\sqrt{14}}{98} & 0 & 0 & \frac{\sqrt{105}}{49} & 0 & 0 & 0 & -\frac{3\sqrt{35}}{98} & 0 & 0 \\
0 & -\frac{3\sqrt{14}}{98} & 0 & 0 & 0 & -\frac{\sqrt{70}}{98} & 0 & 0 & \frac{3\sqrt{35}}{98} & 0 & 0 & 0 & -\frac{\sqrt{105}}{49} & 0 \\
0 & 0 & -\frac{3\sqrt{14}}{98} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{42}}{49} & 0 & 0 & 0 & -\frac{\sqrt{30}}{28} \\
0 & 0 & 0 & -\frac{\sqrt{70}}{98} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{210}}{196} & 0 & 0 & 0 \\
0 & \frac{\sqrt{30}}{28} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{14} & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & \frac{\sqrt{105}}{49} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{35}}{98} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & \frac{3\sqrt{35}}{98} & 0 & 0 & \frac{\sqrt{3}}{14} & 0 & 0 & 0 & \frac{\sqrt{105}}{49} & 0 & 0 & 0 \\
-\frac{\sqrt{210}}{196} & 0 & 0 & 0 & \frac{\sqrt{42}}{49} & 0 & 0 & \frac{3\sqrt{35}}{98} & 0 & 0 & 0 & \frac{\sqrt{105}}{49} & 0 & 0 \\
0 & -\frac{\sqrt{42}}{49} & 0 & 0 & 0 & \frac{\sqrt{210}}{196} & 0 & 0 & \frac{\sqrt{105}}{49} & 0 & 0 & 0 & \frac{3\sqrt{35}}{98} & 0 \\
0 & 0 & -\frac{3\sqrt{35}}{98} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{105}}{49} & 0 & 0 & 0 & \frac{\sqrt{3}}{14} \\
0 & 0 & 0 & -\frac{\sqrt{105}}{49} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{35}}{98} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & -\frac{\sqrt{30}}{28} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{14} & 0 & 0 \\
\end{pmatrix}
$$

859	symmetry	$\sqrt{3}xy$

continued ...

Table 10

No.	multipole	matrix

$\mathbb{Q}_2^{(1,-1;a)}(B_2)$

0	0	$\frac{\sqrt{70}i}{98}$	0	0	0	0	0	0	$\frac{\sqrt{210}i}{196}$	0	0	0	0
0	0	0	$\frac{3\sqrt{14}i}{98}$	0	0	$\frac{\sqrt{30}i}{28}$	0	0	0	$\frac{\sqrt{42}i}{49}$	0	0	0
$-\frac{\sqrt{70}i}{98}$	0	0	0	$\frac{3\sqrt{14}i}{98}$	0	0	$\frac{\sqrt{105}i}{49}$	0	0	0	$\frac{3\sqrt{35}i}{98}$	0	0
0	$-\frac{3\sqrt{14}i}{98}$	0	0	0	$\frac{\sqrt{70}i}{98}$	0	0	$\frac{3\sqrt{35}i}{98}$	0	0	0	$\frac{\sqrt{105}i}{49}$	0
0	0	$-\frac{3\sqrt{14}i}{98}$	0	0	0	0	0	0	$\frac{\sqrt{42}i}{49}$	0	0	0	$\frac{\sqrt{30}i}{28}$
0	0	0	$-\frac{\sqrt{70}i}{98}$	0	0	0	0	0	0	$\frac{\sqrt{210}i}{196}$	0	0	0
0	$-\frac{\sqrt{30}i}{28}$	0	0	0	0	0	0	$-\frac{\sqrt{3}i}{14}$	0	0	0	0	0
0	0	$-\frac{\sqrt{105}i}{49}$	0	0	0	0	0	0	$-\frac{3\sqrt{35}i}{98}$	0	0	0	0
0	0	0	$-\frac{3\sqrt{35}i}{98}$	0	0	$\frac{\sqrt{3}i}{14}$	0	0	0	$-\frac{\sqrt{105}i}{49}$	0	0	0
$-\frac{\sqrt{210}i}{196}$	0	0	0	$-\frac{\sqrt{42}i}{49}$	0	0	$\frac{3\sqrt{35}i}{98}$	0	0	0	$-\frac{\sqrt{105}i}{49}$	0	0
0	$-\frac{\sqrt{42}i}{49}$	0	0	0	$-\frac{\sqrt{210}i}{196}$	0	0	$\frac{\sqrt{105}i}{49}$	0	0	0	$-\frac{3\sqrt{35}i}{98}$	0
0	0	$-\frac{3\sqrt{35}i}{98}$	0	0	0	0	0	0	$\frac{\sqrt{105}i}{49}$	0	0	0	$-\frac{\sqrt{3}i}{14}$
0	0	0	$-\frac{\sqrt{105}i}{49}$	0	0	0	0	0	0	$\frac{3\sqrt{35}i}{98}$	0	0	0
0	0	0	0	$-\frac{\sqrt{30}i}{28}$	0	0	0	0	0	0	$\frac{\sqrt{3}i}{14}$	0	0

860	symmetry	$\sqrt{3}yz$

continued …

Table 10

No.	multipole	matrix

$\mathbb{Q}_{2,1}^{(1,-1;a)}(E)$

$$\begin{pmatrix}
0 & \frac{\sqrt{35}i}{49} & 0 & 0 & 0 & 0 & \frac{5\sqrt{6}i}{56} & 0 & \frac{15\sqrt{14}i}{392} & 0 & 0 & 0 & 0 \\
-\frac{\sqrt{35}i}{49} & 0 & \frac{\sqrt{14}i}{49} & 0 & 0 & 0 & 0 & \frac{\sqrt{210}i}{392} & 0 & \frac{11\sqrt{42}i}{392} & 0 & 0 & 0 \\
0 & -\frac{\sqrt{14}i}{49} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{35}i}{196} & 0 & \frac{\sqrt{21}i}{28} & 0 & 0 \\
0 & 0 & 0 & 0 & -\frac{\sqrt{14}i}{49} & 0 & 0 & 0 & 0 & -\frac{\sqrt{21}i}{28} & 0 & \frac{3\sqrt{35}i}{196} & 0 \\
0 & 0 & 0 & \frac{\sqrt{14}i}{49} & 0 & -\frac{\sqrt{35}i}{49} & 0 & 0 & 0 & 0 & -\frac{11\sqrt{42}i}{392} & 0 & -\frac{\sqrt{210}i}{392} \\
0 & 0 & 0 & 0 & \frac{\sqrt{35}i}{49} & 0 & 0 & 0 & 0 & 0 & -\frac{15\sqrt{14}i}{392} & 0 & -\frac{5\sqrt{6}i}{56} \\
-\frac{5\sqrt{6}i}{56} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3i}{14} & 0 & 0 & 0 & 0 & 0 \\
0 & -\frac{\sqrt{210}i}{392} & 0 & 0 & 0 & 0 & \frac{3i}{14} & 0 & -\frac{2\sqrt{21}i}{49} & 0 & 0 & 0 & 0 \\
-\frac{15\sqrt{14}i}{392} & 0 & \frac{3\sqrt{35}i}{196} & 0 & 0 & 0 & 0 & \frac{2\sqrt{21}i}{49} & 0 & -\frac{\sqrt{105}i}{98} & 0 & 0 & 0 \\
0 & -\frac{11\sqrt{42}i}{392} & 0 & \frac{\sqrt{21}i}{28} & 0 & 0 & 0 & 0 & \frac{\sqrt{105}i}{98} & 0 & 0 & 0 & 0 \\
0 & 0 & -\frac{\sqrt{21}i}{28} & 0 & \frac{11\sqrt{42}i}{392} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{105}i}{98} & 0 & 0 \\
0 & 0 & 0 & -\frac{3\sqrt{35}i}{196} & 0 & \frac{15\sqrt{14}i}{392} & 0 & 0 & 0 & 0 & -\frac{\sqrt{105}i}{98} & 0 & \frac{2\sqrt{21}i}{49} \\
0 & 0 & 0 & 0 & \frac{\sqrt{210}i}{392} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{2\sqrt{21}i}{49} & 0 \\
0 & 0 & 0 & 0 & 0 & \frac{5\sqrt{6}i}{56} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3i}{14}
\end{pmatrix}$$

No.	symmetry	
861	symmetry	$\sqrt{3}xz$

continued …

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Table 10

No.	multipole	matrix

$\mathbb{Q}_{2,2}^{(1,-1;a)}(E)$

$$\begin{pmatrix}
0 & -\frac{\sqrt{35}}{49} & 0 & 0 & 0 & 0 & \frac{5\sqrt{6}}{56} & 0 & -\frac{15\sqrt{14}}{392} & 0 & 0 & 0 & 0 & 0 \\
-\frac{\sqrt{35}}{49} & 0 & -\frac{\sqrt{14}}{49} & 0 & 0 & 0 & 0 & \frac{\sqrt{210}}{392} & 0 & -\frac{11\sqrt{42}}{392} & 0 & 0 & 0 & 0 \\
0 & -\frac{\sqrt{14}}{49} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{35}}{196} & 0 & -\frac{\sqrt{21}}{28} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & \frac{\sqrt{14}}{49} & 0 & 0 & 0 & 0 & -\frac{\sqrt{21}}{28} & 0 & -\frac{3\sqrt{35}}{196} & 0 & 0 \\
0 & 0 & 0 & \frac{\sqrt{14}}{49} & 0 & \frac{\sqrt{35}}{49} & 0 & 0 & 0 & 0 & -\frac{11\sqrt{42}}{392} & 0 & \frac{\sqrt{210}}{392} & 0 \\
0 & 0 & 0 & 0 & \frac{\sqrt{35}}{49} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{15\sqrt{14}}{392} & 0 & \frac{5\sqrt{6}}{56} \\
\frac{5\sqrt{6}}{56} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3}{14} & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & \frac{\sqrt{210}}{392} & 0 & 0 & 0 & 0 & \frac{3}{14} & 0 & \frac{2\sqrt{21}}{49} & 0 & 0 & 0 & 0 & 0 \\
-\frac{15\sqrt{14}}{392} & 0 & -\frac{3\sqrt{35}}{196} & 0 & 0 & 0 & 0 & \frac{2\sqrt{21}}{49} & 0 & \frac{\sqrt{105}}{98} & 0 & 0 & 0 & 0 \\
0 & -\frac{11\sqrt{42}}{392} & 0 & -\frac{\sqrt{21}}{28} & 0 & 0 & 0 & 0 & \frac{\sqrt{105}}{98} & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & -\frac{\sqrt{21}}{28} & 0 & -\frac{11\sqrt{42}}{392} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{105}}{98} & 0 & 0 \\
0 & 0 & 0 & -\frac{3\sqrt{35}}{196} & 0 & -\frac{15\sqrt{14}}{392} & 0 & 0 & 0 & 0 & -\frac{\sqrt{105}}{98} & 0 & -\frac{2\sqrt{21}}{49} & 0 \\
0 & 0 & 0 & 0 & \frac{\sqrt{210}}{392} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{2\sqrt{21}}{49} & 0 & -\frac{3}{14} \\
0 & 0 & 0 & 0 & 0 & \frac{5\sqrt{6}}{56} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3}{14} & 0
\end{pmatrix}$$

| 862 | symmetry | $\frac{\sqrt{21}\left(x^4-3x^2y^2-3x^2z^2+y^4-3y^2z^2+z^4\right)}{6}$ |

continued ...

Table 10

No.	multipole	matrix												

$\mathbb{Q}_4^{(1,-1;a)}(A_1,1)$													
$\frac{1}{42}$	0	0	0	$\frac{\sqrt{5}}{42}$	0	0	$\frac{5\sqrt{6}}{84}$	0	0	0	$\frac{5\sqrt{2}}{84}$	0	0
0	$-\frac{1}{14}$	0	0	0	$\frac{\sqrt{5}}{42}$	0	0	$-\frac{\sqrt{10}}{21}$	0	0	0	$\frac{\sqrt{30}}{42}$	0
0	0	$\frac{1}{21}$	0	0	0	0	0	0	$-\frac{5\sqrt{3}}{84}$	0	0	0	$\frac{\sqrt{105}}{84}$
0	0	0	$\frac{1}{21}$	0	0	$-\frac{\sqrt{105}}{84}$	0	0	0	$\frac{5\sqrt{3}}{84}$	0	0	0
$\frac{\sqrt{5}}{42}$	0	0	0	$-\frac{1}{14}$	0	0	$-\frac{\sqrt{30}}{42}$	0	0	0	$\frac{\sqrt{10}}{21}$	0	0
0	$\frac{\sqrt{5}}{42}$	0	0	0	$\frac{1}{42}$	0	0	$-\frac{5\sqrt{2}}{84}$	0	0	0	$-\frac{5\sqrt{6}}{84}$	0
0	0	0	$-\frac{\sqrt{105}}{84}$	0	0	$-\frac{1}{6}$	0	0	0	$-\frac{\sqrt{35}}{42}$	0	0	0
$\frac{5\sqrt{6}}{84}$	0	0	0	$-\frac{\sqrt{30}}{42}$	0	0	$\frac{13}{42}$	0	0	0	$-\frac{5\sqrt{3}}{42}$	0	0
0	$-\frac{\sqrt{10}}{21}$	0	0	0	$-\frac{5\sqrt{2}}{84}$	0	0	$\frac{1}{14}$	0	0	0	$-\frac{5\sqrt{3}}{42}$	0
0	0	$-\frac{5\sqrt{3}}{84}$	0	0	0	0	0	0	$-\frac{3}{14}$	0	0	0	$-\frac{\sqrt{35}}{42}$
0	0	0	$\frac{5\sqrt{3}}{84}$	0	0	$-\frac{\sqrt{35}}{42}$	0	0	0	$-\frac{3}{14}$	0	0	0
$\frac{5\sqrt{2}}{84}$	0	0	0	$\frac{\sqrt{10}}{21}$	0	0	$-\frac{5\sqrt{3}}{42}$	0	0	0	$\frac{1}{14}$	0	0
0	$\frac{\sqrt{30}}{42}$	0	0	0	$-\frac{5\sqrt{6}}{84}$	0	0	$-\frac{5\sqrt{3}}{42}$	0	0	0	$\frac{13}{42}$	0
0	0	$\frac{\sqrt{105}}{84}$	0	0	0	0	0	0	$-\frac{\sqrt{35}}{42}$	0	0	0	$-\frac{1}{6}$

863	symmetry	$-\frac{\sqrt{15}\left(x^4-12x^2y^2+6x^2z^2+y^4+6y^2z^2-2z^4\right)}{12}$

Table 10

No.	multipole	matrix													
	$\mathbb{Q}_4^{(1,-1;a)}(A_1,2)$	$\frac{\sqrt{35}}{294}$	0	0	0	$-\frac{\sqrt{7}}{42}$	0	0	$\frac{5\sqrt{210}}{588}$	0	0	0	$-\frac{\sqrt{70}}{84}$	0	0
		0	$-\frac{\sqrt{35}}{98}$	0	0	0	$-\frac{\sqrt{7}}{42}$	0	0	$-\frac{5\sqrt{14}}{147}$	0	0	0	$-\frac{\sqrt{42}}{42}$	0
		0	0	$\frac{\sqrt{35}}{147}$	0	0	0	0	0	0	$-\frac{5\sqrt{105}}{588}$	0	0	0	$-\frac{\sqrt{3}}{12}$
		0	0	0	$\frac{\sqrt{35}}{147}$	0	0	$\frac{\sqrt{3}}{12}$	0	0	0	$\frac{5\sqrt{105}}{588}$	0	0	0
		$-\frac{\sqrt{7}}{42}$	0	0	0	$-\frac{\sqrt{35}}{98}$	0	0	$\frac{\sqrt{42}}{42}$	0	0	0	$\frac{5\sqrt{14}}{147}$	0	0
		0	$-\frac{\sqrt{7}}{42}$	0	0	0	$\frac{\sqrt{35}}{294}$	0	0	$\frac{\sqrt{70}}{84}$	0	0	0	$-\frac{5\sqrt{210}}{588}$	0
		0	0	0	$\frac{\sqrt{3}}{12}$	0	0	$-\frac{\sqrt{35}}{42}$	0	0	0	$\frac{1}{6}$	0	0	0
		$\frac{5\sqrt{210}}{588}$	0	0	0	$\frac{\sqrt{42}}{42}$	0	0	$\frac{13\sqrt{35}}{294}$	0	0	0	$\frac{\sqrt{105}}{42}$	0	0
		0	$-\frac{5\sqrt{14}}{147}$	0	0	0	$\frac{\sqrt{70}}{84}$	0	0	$\frac{\sqrt{35}}{98}$	0	0	0	$\frac{\sqrt{105}}{42}$	0
		0	0	$-\frac{5\sqrt{105}}{588}$	0	0	0	0	0	0	$-\frac{3\sqrt{35}}{98}$	0	0	0	$\frac{1}{6}$
		0	0	0	$\frac{5\sqrt{105}}{588}$	0	0	$\frac{1}{6}$	0	0	0	$-\frac{3\sqrt{35}}{98}$	0	0	0
		$-\frac{\sqrt{70}}{84}$	0	0	0	$\frac{5\sqrt{14}}{147}$	0	0	$\frac{\sqrt{105}}{42}$	0	0	0	$\frac{\sqrt{35}}{98}$	0	0
		0	$-\frac{\sqrt{42}}{42}$	0	0	0	$-\frac{5\sqrt{210}}{588}$	0	0	$\frac{\sqrt{105}}{42}$	0	0	0	$\frac{13\sqrt{35}}{294}$	0
		0	0	$-\frac{\sqrt{3}}{12}$	0	0	0	0	0	0	$\frac{1}{6}$	0	0	0	$-\frac{\sqrt{35}}{42}$
864	symmetry	$\frac{\sqrt{35}xy(x-y)(x+y)}{2}$														

Table 10

No.	multipole	matrix

$$\mathbb{Q}_4^{(1,-1;a)}(A_2)$$

$$\begin{pmatrix}
0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{21} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}i}{42} & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{21} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}i}{7} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}i}{14} \\
0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}i}{14} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
\frac{\sqrt{3}i}{21} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}i}{7} & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & \frac{\sqrt{3}i}{21} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}i}{42} & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & \frac{\sqrt{7}i}{14} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{21}i}{21} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & \frac{\sqrt{2}i}{7} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{5}i}{7} & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}i}{42} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{5}i}{7} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{21}i}{21} \\
0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{21}i}{21} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
\frac{\sqrt{30}i}{42} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{7} & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & \frac{\sqrt{2}i}{7} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{7} & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & \frac{\sqrt{7}i}{14} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{21}i}{21} & 0 & 0 & 0 & 0
\end{pmatrix}$$

| 865 | symmetry | $\frac{\sqrt{5}(x-y)(x+y)\left(x^2+y^2-6z^2\right)}{4}$ |

continued ...

Table 10

No.	multipole	matrix													
	$\mathbb{Q}_4^{(1,-1;a)}(B_1)$	0	0	$-\frac{\sqrt{42}}{98}$	0	0	0	0	0	0	$-\frac{5\sqrt{14}}{98}$	0	0	0	0
		0	0	0	$\frac{\sqrt{210}}{294}$	0	0	$\frac{3\sqrt{2}}{28}$	0	0	0	$-\frac{\sqrt{70}}{196}$	0	0	0
		$-\frac{\sqrt{42}}{98}$	0	0	0	$\frac{\sqrt{210}}{294}$	0	0	$-\frac{9\sqrt{7}}{196}$	0	0	0	$\frac{17\sqrt{21}}{588}$	0	0
		0	$\frac{\sqrt{210}}{294}$	0	0	0	$-\frac{\sqrt{42}}{98}$	0	0	$-\frac{17\sqrt{21}}{588}$	0	0	0	$\frac{9\sqrt{7}}{196}$	0
		0	0	$\frac{\sqrt{210}}{294}$	0	0	0	0	0	0	$\frac{\sqrt{70}}{196}$	0	0	0	$-\frac{3\sqrt{2}}{28}$
		0	0	0	$-\frac{\sqrt{42}}{98}$	0	0	0	0	0	0	$\frac{5\sqrt{14}}{98}$	0	0	0
		0	$\frac{3\sqrt{2}}{28}$	0	0	0	0	0	0	$\frac{\sqrt{5}}{7}$	0	0	0	0	0
		0	0	$-\frac{9\sqrt{7}}{196}$	0	0	0	0	0	0	$\frac{\sqrt{21}}{147}$	0	0	0	0
		0	0	0	$-\frac{17\sqrt{21}}{588}$	0	0	$\frac{\sqrt{5}}{7}$	0	0	0	$-\frac{4\sqrt{7}}{49}$	0	0	0
		$-\frac{5\sqrt{14}}{98}$	0	0	0	$\frac{\sqrt{70}}{196}$	0	0	$\frac{\sqrt{21}}{147}$	0	0	0	$-\frac{4\sqrt{7}}{49}$	0	0
		0	$-\frac{\sqrt{70}}{196}$	0	0	0	$\frac{5\sqrt{14}}{98}$	0	0	$-\frac{4\sqrt{7}}{49}$	0	0	0	$\frac{\sqrt{21}}{147}$	0
		0	0	$\frac{17\sqrt{21}}{588}$	0	0	0	0	0	0	$-\frac{4\sqrt{7}}{49}$	0	0	0	$\frac{\sqrt{5}}{7}$
		0	0	0	$\frac{9\sqrt{7}}{196}$	0	0	0	0	0	0	$\frac{\sqrt{21}}{147}$	0	0	0
		0	0	0	0	$-\frac{3\sqrt{2}}{28}$	0	0	0	0	0	0	$\frac{\sqrt{5}}{7}$	0	0

| 866 | symmetry | $-\frac{\sqrt{5}xy\left(x^2+y^2-6z^2\right)}{2}$ |

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Table 10

No.	multipole	matrix

$$\mathbb{Q}_4^{(1,-1;a)}(B_2)$$

$$
\begin{pmatrix}
0 & 0 & -\frac{\sqrt{42}i}{98} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{5\sqrt{14}i}{98} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & \frac{\sqrt{210}i}{294} & 0 & 0 & -\frac{3\sqrt{2}i}{28} & 0 & 0 & 0 & -\frac{\sqrt{70}i}{196} & 0 & 0 & 0 \\
\frac{\sqrt{42}i}{98} & 0 & 0 & 0 & \frac{\sqrt{210}i}{294} & 0 & 0 & \frac{9\sqrt{7}i}{196} & 0 & 0 & 0 & \frac{17\sqrt{21}i}{588} & 0 & 0 \\
0 & -\frac{\sqrt{210}i}{294} & 0 & 0 & 0 & -\frac{\sqrt{42}i}{98} & 0 & 0 & \frac{17\sqrt{21}i}{588} & 0 & 0 & 0 & \frac{9\sqrt{7}i}{196} & 0 \\
0 & 0 & -\frac{\sqrt{210}i}{294} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}i}{196} & 0 & 0 & 0 & -\frac{3\sqrt{2}i}{28} \\
0 & 0 & 0 & \frac{\sqrt{42}i}{98} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{5\sqrt{14}i}{98} & 0 & 0 & 0 \\
0 & \frac{3\sqrt{2}i}{28} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{5}i}{7} & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & -\frac{9\sqrt{7}i}{196} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{21}i}{147} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & -\frac{17\sqrt{21}i}{588} & 0 & 0 & -\frac{\sqrt{5}i}{7} & 0 & 0 & 0 & -\frac{4\sqrt{7}i}{49} & 0 & 0 & 0 \\
\frac{5\sqrt{14}i}{98} & 0 & 0 & 0 & \frac{\sqrt{70}i}{196} & 0 & 0 & -\frac{\sqrt{21}i}{147} & 0 & 0 & 0 & -\frac{4\sqrt{7}i}{49} & 0 & 0 \\
0 & \frac{\sqrt{70}i}{196} & 0 & 0 & 0 & \frac{5\sqrt{14}i}{98} & 0 & 0 & \frac{4\sqrt{7}i}{49} & 0 & 0 & 0 & \frac{\sqrt{21}i}{147} & 0 \\
0 & 0 & -\frac{17\sqrt{21}i}{588} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{4\sqrt{7}i}{49} & 0 & 0 & 0 & \frac{\sqrt{5}i}{7} \\
0 & 0 & 0 & -\frac{9\sqrt{7}i}{196} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{21}i}{147} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & \frac{3\sqrt{2}i}{28} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{7} & 0 & 0 \\
\end{pmatrix}
$$

867	symmetry	$\frac{\sqrt{35}yz(y-z)(y+z)}{2}$

continued ...

Table 10

No.	multipole	matrix

$$\mathbb{Q}_{4,1}^{(1,-1;a)}(E,1)$$

$$
\begin{bmatrix}
0 & \frac{\sqrt{3}i}{42} & 0 & \frac{\sqrt{6}i}{84} & 0 & 0 & \frac{\sqrt{70}i}{112} & 0 & \frac{5\sqrt{30}i}{168} & 0 & \frac{5\sqrt{2}i}{112} & 0 & 0 & 0 \\
-\frac{\sqrt{3}i}{42} & 0 & -\frac{\sqrt{30}i}{84} & 0 & 0 & 0 & 0 & -\frac{13\sqrt{2}i}{112} & 0 & -\frac{\sqrt{10}i}{56} & 0 & \frac{\sqrt{6}i}{48} & 0 & 0 \\
0 & \frac{\sqrt{30}i}{84} & 0 & 0 & 0 & -\frac{\sqrt{6}i}{84} & \frac{3\sqrt{7}i}{112} & 0 & \frac{\sqrt{3}i}{336} & 0 & -\frac{\sqrt{5}i}{16} & 0 & -\frac{i}{112} & 0 \\
-\frac{\sqrt{6}i}{84} & 0 & 0 & 0 & \frac{\sqrt{30}i}{84} & 0 & 0 & \frac{i}{112} & 0 & \frac{\sqrt{5}i}{16} & 0 & -\frac{\sqrt{3}i}{336} & 0 & -\frac{3\sqrt{7}i}{112} \\
0 & 0 & 0 & -\frac{\sqrt{30}i}{84} & 0 & -\frac{\sqrt{3}i}{42} & 0 & 0 & -\frac{\sqrt{6}i}{48} & 0 & \frac{\sqrt{10}i}{56} & 0 & \frac{13\sqrt{2}i}{112} & 0 \\
0 & 0 & \frac{\sqrt{6}i}{84} & 0 & \frac{\sqrt{3}i}{42} & 0 & 0 & 0 & 0 & -\frac{5\sqrt{2}i}{112} & 0 & -\frac{5\sqrt{30}i}{168} & 0 & -\frac{\sqrt{70}i}{112} \\
-\frac{\sqrt{70}i}{112} & 0 & -\frac{3\sqrt{7}i}{112} & 0 & 0 & 0 & 0 & -\frac{\sqrt{105}i}{42} & 0 & -\frac{\sqrt{21}i}{42} & 0 & 0 & 0 & 0 \\
0 & \frac{13\sqrt{2}i}{112} & 0 & -\frac{i}{112} & 0 & 0 & \frac{\sqrt{105}i}{42} & 0 & \frac{\sqrt{5}i}{14} & 0 & -\frac{\sqrt{3}i}{21} & 0 & 0 & 0 \\
-\frac{5\sqrt{30}i}{168} & 0 & -\frac{\sqrt{3}i}{336} & 0 & \frac{\sqrt{6}i}{48} & 0 & 0 & -\frac{\sqrt{5}i}{14} & 0 & \frac{3i}{14} & 0 & 0 & 0 & 0 \\
0 & \frac{\sqrt{10}i}{56} & 0 & -\frac{\sqrt{5}i}{16} & 0 & \frac{5\sqrt{2}i}{112} & \frac{\sqrt{21}i}{42} & 0 & -\frac{3i}{14} & 0 & 0 & 0 & \frac{\sqrt{3}i}{21} & 0 \\
-\frac{5\sqrt{2}i}{112} & 0 & \frac{\sqrt{5}i}{16} & 0 & -\frac{\sqrt{10}i}{56} & 0 & 0 & \frac{\sqrt{3}i}{21} & 0 & 0 & 0 & -\frac{3i}{14} & 0 & \frac{\sqrt{21}i}{42} \\
0 & -\frac{\sqrt{6}i}{48} & 0 & \frac{\sqrt{3}i}{336} & 0 & \frac{5\sqrt{30}i}{168} & 0 & 0 & 0 & 0 & \frac{3i}{14} & 0 & -\frac{\sqrt{5}i}{14} & 0 \\
0 & 0 & \frac{i}{112} & 0 & -\frac{13\sqrt{2}i}{112} & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{21} & 0 & \frac{\sqrt{5}i}{14} & 0 & \frac{\sqrt{105}i}{42} \\
0 & 0 & 0 & \frac{3\sqrt{7}i}{112} & 0 & \frac{\sqrt{70}i}{112} & 0 & 0 & 0 & 0 & -\frac{\sqrt{21}i}{42} & 0 & -\frac{\sqrt{105}i}{42} & 0 \\
\end{bmatrix}
$$

868	symmetry	$\frac{\sqrt{35}xz(x-z)(x+z)}{2}$

Table 10

No.	multipole	matrix													
	$\mathbb{Q}_{4,2}^{(1,-1;a)}(E,1)$	0	$-\frac{\sqrt{3}}{42}$	0	$\frac{\sqrt{6}}{84}$	0	0	$\frac{\sqrt{70}}{112}$	0	$-\frac{5\sqrt{30}}{168}$	0	$\frac{5\sqrt{2}}{112}$	0	0	0
		$-\frac{\sqrt{3}}{42}$	0	$\frac{\sqrt{30}}{84}$	0	0	0	0	$-\frac{13\sqrt{2}}{112}$	0	$\frac{\sqrt{10}}{56}$	0	$\frac{\sqrt{6}}{48}$	0	0
		0	$\frac{\sqrt{30}}{84}$	0	0	0	$-\frac{\sqrt{6}}{84}$	$-\frac{3\sqrt{7}}{112}$	0	$\frac{\sqrt{3}}{336}$	0	$\frac{\sqrt{5}}{16}$	0	$-\frac{1}{112}$	0
		$\frac{\sqrt{6}}{84}$	0	0	0	$-\frac{\sqrt{30}}{84}$	0	0	$-\frac{1}{112}$	0	$\frac{\sqrt{5}}{16}$	0	$\frac{\sqrt{3}}{336}$	0	$-\frac{3\sqrt{7}}{112}$
		0	0	0	$-\frac{\sqrt{30}}{84}$	0	$\frac{\sqrt{3}}{42}$	0	0	$\frac{\sqrt{6}}{48}$	0	$\frac{\sqrt{10}}{56}$	0	$-\frac{13\sqrt{2}}{112}$	0
		0	0	$-\frac{\sqrt{6}}{84}$	0	$\frac{\sqrt{3}}{42}$	0	0	0	0	$\frac{5\sqrt{2}}{112}$	0	$-\frac{5\sqrt{30}}{168}$	0	$\frac{\sqrt{70}}{112}$
		$\frac{\sqrt{70}}{112}$	0	$-\frac{3\sqrt{7}}{112}$	0	0	0	0	$\frac{\sqrt{105}}{42}$	0	$-\frac{\sqrt{21}}{42}$	0	0	0	0
		0	$-\frac{13\sqrt{2}}{112}$	0	$-\frac{1}{112}$	0	0	$\frac{\sqrt{105}}{42}$	0	$-\frac{\sqrt{5}}{14}$	0	$-\frac{\sqrt{3}}{21}$	0	0	0
		$-\frac{5\sqrt{30}}{168}$	0	$\frac{\sqrt{3}}{336}$	0	$\frac{\sqrt{6}}{48}$	0	0	$-\frac{\sqrt{5}}{14}$	0	$-\frac{3}{14}$	0	0	0	0
		0	$\frac{\sqrt{10}}{56}$	0	$\frac{\sqrt{5}}{16}$	0	$\frac{5\sqrt{2}}{112}$	$-\frac{\sqrt{21}}{42}$	0	$-\frac{3}{14}$	0	0	0	$\frac{\sqrt{3}}{21}$	0
		$\frac{5\sqrt{2}}{112}$	0	$\frac{\sqrt{5}}{16}$	0	$\frac{\sqrt{10}}{56}$	0	0	$-\frac{\sqrt{3}}{21}$	0	0	0	$\frac{3}{14}$	0	$\frac{\sqrt{21}}{42}$
		0	$\frac{\sqrt{6}}{48}$	0	$\frac{\sqrt{3}}{336}$	0	$-\frac{5\sqrt{30}}{168}$	0	0	0	0	$\frac{3}{14}$	0	$\frac{\sqrt{5}}{14}$	0
		0	0	$-\frac{1}{112}$	0	$-\frac{13\sqrt{2}}{112}$	0	0	0	0	$\frac{\sqrt{3}}{21}$	0	$\frac{\sqrt{5}}{14}$	0	$-\frac{\sqrt{105}}{42}$
		0	0	0	$-\frac{3\sqrt{7}}{112}$	0	$\frac{\sqrt{70}}{112}$	0	0	0	0	$\frac{\sqrt{21}}{42}$	0	$-\frac{\sqrt{105}}{42}$	0
869	symmetry	$\frac{\sqrt{5}yz\left(6x^2-y^2-z^2\right)}{2}$														

continued …

Table 10

No.	multipole	matrix

<table>
<tr><td>0</td><td>$\frac{\sqrt{21}i}{294}$</td><td>0</td><td>$-\frac{\sqrt{42}i}{84}$</td><td>0</td><td>0</td><td>$\frac{\sqrt{10}i}{112}$</td><td>0</td><td>$\frac{5\sqrt{210}i}{1176}$</td><td>$0$</td><td>$-\frac{5\sqrt{14}i}{112}$</td><td>$0$</td><td>$0$</td><td>$0$</td></tr>
<tr><td>$-\frac{\sqrt{21}i}{294}$</td><td>0</td><td>$-\frac{\sqrt{210}i}{588}$</td><td>0</td><td>0</td><td>0</td><td>0</td><td>$-\frac{13\sqrt{14}i}{784}$</td><td>$0$</td><td>$-\frac{\sqrt{70}i}{392}$</td><td>$0$</td><td>$-\frac{\sqrt{42}i}{48}$</td><td>$0$</td><td>$0$</td></tr>
<tr><td>0</td><td>$\frac{\sqrt{210}i}{588}$</td><td>0</td><td>0</td><td>0</td><td>$\frac{\sqrt{42}i}{84}$</td><td>$-\frac{3i}{16}$</td><td>0</td><td>$\frac{\sqrt{21}i}{2352}$</td><td>0</td><td>$-\frac{\sqrt{35}i}{112}$</td><td>0</td><td>$\frac{\sqrt{7}i}{112}$</td><td>0</td></tr>
<tr><td>$\frac{\sqrt{42}i}{84}$</td><td>0</td><td>0</td><td>0</td><td>$\frac{\sqrt{210}i}{588}$</td><td>0</td><td>0</td><td>$-\frac{\sqrt{7}i}{112}$</td><td>0</td><td>$\frac{\sqrt{35}i}{112}$</td><td>0</td><td>$-\frac{\sqrt{21}i}{2352}$</td><td>0</td><td>$\frac{3i}{16}$</td></tr>
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<tr><td>$-\frac{\sqrt{10}i}{112}$</td><td>0</td><td>$\frac{3i}{16}$</td><td>0</td><td>0</td><td>0</td><td>0</td><td>$-\frac{\sqrt{15}i}{42}$</td><td>0</td><td>$\frac{\sqrt{3}i}{6}$</td><td>0</td><td>0</td><td>0</td><td>0</td></tr>
<tr><td>0</td><td>$\frac{13\sqrt{14}i}{784}$</td><td>0</td><td>$\frac{\sqrt{7}i}{112}$</td><td>0</td><td>0</td><td>$\frac{\sqrt{15}i}{42}$</td><td>0</td><td>$\frac{\sqrt{35}i}{98}$</td><td>0</td><td>$\frac{\sqrt{21}i}{21}$</td><td>0</td><td>0</td><td>0</td></tr>
<tr><td>$-\frac{5\sqrt{210}i}{1176}$</td><td>$0$</td><td>$-\frac{\sqrt{21}i}{2352}$</td><td>$0$</td><td>$-\frac{\sqrt{42}i}{48}$</td><td>$0$</td><td>$0$</td><td>$-\frac{\sqrt{35}i}{98}$</td><td>$0$</td><td>$\frac{3\sqrt{7}i}{98}$</td><td>$0$</td><td>$0$</td><td>$0$</td><td>$0$</td></tr>
<tr><td>0</td><td>$\frac{\sqrt{70}i}{392}$</td><td>0</td><td>$-\frac{\sqrt{35}i}{112}$</td><td>0</td><td>$-\frac{5\sqrt{14}i}{112}$</td><td>$-\frac{\sqrt{3}i}{6}$</td><td>0</td><td>$-\frac{3\sqrt{7}i}{98}$</td><td>0</td><td>0</td><td>0</td><td>$-\frac{\sqrt{21}i}{21}$</td><td>0</td></tr>
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<tr><td>0</td><td>$\frac{\sqrt{42}i}{48}$</td><td>0</td><td>$\frac{\sqrt{21}i}{2352}$</td><td>0</td><td>$\frac{5\sqrt{210}i}{1176}$</td><td>$0$</td><td>$0$</td><td>$0$</td><td>$0$</td><td>$\frac{3\sqrt{7}i}{98}$</td><td>$0$</td><td>$-\frac{\sqrt{35}i}{98}$</td><td>$0$</td></tr>
<tr><td>0</td><td>0</td><td>$-\frac{\sqrt{7}i}{112}$</td><td>0</td><td>$-\frac{13\sqrt{14}i}{784}$</td><td>$0$</td><td>$0$</td><td>$0$</td><td>$0$</td><td>$\frac{\sqrt{21}i}{21}$</td><td>$0$</td><td>$\frac{\sqrt{35}i}{98}$</td><td>$0$</td><td>$\frac{\sqrt{15}i}{42}$</td></tr>
<tr><td>0</td><td>0</td><td>0</td><td>$-\frac{3i}{16}$</td><td>0</td><td>$\frac{\sqrt{10}i}{112}$</td><td>0</td><td>0</td><td>0</td><td>0</td><td>$\frac{\sqrt{3}i}{6}$</td><td>0</td><td>$-\frac{\sqrt{15}i}{42}$</td><td>0</td></tr>
</table>

Multipole: $\mathbb{Q}_{4,1}^{(1,-1;a)}(E,2)$

870	symmetry	$-\frac{\sqrt{5}xz\left(x^2-6y^2+z^2\right)}{2}$

Table 10

No.	multipole	matrix													
	$\mathbb{Q}_{4,2}^{(1,-1;a)}(E,2)$	0	$-\frac{\sqrt{21}}{294}$	0	$-\frac{\sqrt{42}}{84}$	0	0	$\frac{\sqrt{10}}{112}$	0	$-\frac{5\sqrt{210}}{1176}$	0	$-\frac{5\sqrt{14}}{112}$	0	0	0
		$-\frac{\sqrt{21}}{294}$	0	$\frac{\sqrt{210}}{588}$	0	0	0	0	$-\frac{13\sqrt{14}}{784}$	0	$\frac{\sqrt{70}}{392}$	0	$-\frac{\sqrt{42}}{48}$	0	0
		0	$\frac{\sqrt{210}}{588}$	0	0	0	$\frac{\sqrt{42}}{84}$	$\frac{3}{16}$	0	$\frac{\sqrt{21}}{2352}$	0	$\frac{\sqrt{35}}{112}$	0	$\frac{\sqrt{7}}{112}$	0
		$-\frac{\sqrt{42}}{84}$	0	0	0	$-\frac{\sqrt{210}}{588}$	0	0	$\frac{\sqrt{7}}{112}$	0	$\frac{\sqrt{35}}{112}$	0	$\frac{\sqrt{21}}{2352}$	0	$\frac{3}{16}$
		0	0	0	$-\frac{\sqrt{210}}{588}$	0	$\frac{\sqrt{21}}{294}$	0	0	$-\frac{\sqrt{42}}{48}$	0	$\frac{\sqrt{70}}{392}$	0	$-\frac{13\sqrt{14}}{784}$	0
		0	0	$\frac{\sqrt{42}}{84}$	0	$\frac{\sqrt{21}}{294}$	0	0	0	0	$-\frac{5\sqrt{14}}{112}$	0	$-\frac{5\sqrt{210}}{1176}$	0	$\frac{\sqrt{10}}{112}$
		$\frac{\sqrt{10}}{112}$	0	$\frac{3}{16}$	0	0	0	0	$\frac{\sqrt{15}}{42}$	0	$\frac{\sqrt{3}}{6}$	0	0	0	0
		0	$-\frac{13\sqrt{14}}{784}$	0	$\frac{\sqrt{7}}{112}$	0	0	$\frac{\sqrt{15}}{42}$	0	$-\frac{\sqrt{35}}{98}$	0	$\frac{\sqrt{21}}{21}$	0	0	0
		$-\frac{5\sqrt{210}}{1176}$	0	$\frac{\sqrt{21}}{2352}$	0	$-\frac{\sqrt{42}}{48}$	0	0	$-\frac{\sqrt{35}}{98}$	0	$-\frac{3\sqrt{7}}{98}$	0	0	0	0
		0	$\frac{\sqrt{70}}{392}$	0	$\frac{\sqrt{35}}{112}$	0	$-\frac{5\sqrt{14}}{112}$	$\frac{\sqrt{3}}{6}$	0	$-\frac{3\sqrt{7}}{98}$	0	0	0	$-\frac{\sqrt{21}}{21}$	0
		$-\frac{5\sqrt{14}}{112}$	0	$\frac{\sqrt{35}}{112}$	0	$\frac{\sqrt{70}}{392}$	0	0	$\frac{\sqrt{21}}{21}$	0	0	0	$\frac{3\sqrt{7}}{98}$	0	$-\frac{\sqrt{3}}{6}$
		0	$-\frac{\sqrt{42}}{48}$	0	$\frac{\sqrt{21}}{2352}$	0	$-\frac{5\sqrt{210}}{1176}$	0	0	0	0	$\frac{3\sqrt{7}}{98}$	0	$\frac{\sqrt{35}}{98}$	0
		0	0	$\frac{\sqrt{7}}{112}$	0	$-\frac{13\sqrt{14}}{784}$	0	0	0	0	$-\frac{\sqrt{21}}{21}$	0	$\frac{\sqrt{35}}{98}$	0	$-\frac{\sqrt{15}}{42}$
		0	0	0	$\frac{3}{16}$	0	$\frac{\sqrt{10}}{112}$	0	0	0	0	$-\frac{\sqrt{3}}{6}$	0	$-\frac{\sqrt{15}}{42}$	0

| 871 | symmetry | $\frac{\sqrt{2}\left(2x^6-15x^4y^2-15x^4z^2-15x^2y^4+180x^2y^2z^2-15x^2z^4+2y^6-15y^4z^2-15y^2z^4+2z^6\right)}{8}$ |

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Table 10

No.	multipole	matrix													
	$\mathbb{Q}_6^{(1,-1;a)}(A_1,1)$	0	0	0	0	0	0	0	$-\frac{\sqrt{231}}{1848}$	0	0	0	$\frac{\sqrt{77}}{88}$	0	0
		0	0	0	0	0	0	0	0	$\frac{\sqrt{385}}{616}$	0	0	0	$-\frac{\sqrt{1155}}{264}$	0
		0	0	0	0	0	0	0	0	0	$-\frac{5\sqrt{462}}{1848}$	0	0	0	$\frac{\sqrt{330}}{264}$
		0	0	0	0	0	0	$-\frac{\sqrt{330}}{264}$	0	0	0	$\frac{5\sqrt{462}}{1848}$	0	0	0
		0	0	0	0	0	0	0	$\frac{\sqrt{1155}}{264}$	0	0	0	$-\frac{\sqrt{385}}{616}$	0	0
		0	0	0	0	0	0	0	0	$-\frac{\sqrt{77}}{88}$	0	0	0	$\frac{\sqrt{231}}{1848}$	0
		0	0	0	$-\frac{\sqrt{330}}{264}$	0	0	$\frac{\sqrt{154}}{616}$	0	0	0	$-\frac{3\sqrt{110}}{88}$	0	0	0
		$-\frac{\sqrt{231}}{1848}$	0	0	0	$\frac{\sqrt{1155}}{264}$	0	0	$-\frac{5\sqrt{154}}{616}$	0	0	0	$\frac{\sqrt{462}}{88}$	0	0
		0	$\frac{\sqrt{385}}{616}$	0	0	0	$-\frac{\sqrt{77}}{88}$	0	0	$\frac{9\sqrt{154}}{616}$	0	0	0	$\frac{\sqrt{462}}{88}$	0
		0	0	$-\frac{5\sqrt{462}}{1848}$	0	0	0	0	0	0	$-\frac{5\sqrt{154}}{616}$	0	0	0	$-\frac{3\sqrt{110}}{88}$
		0	0	0	$\frac{5\sqrt{462}}{1848}$	0	0	$-\frac{3\sqrt{110}}{88}$	0	0	0	$-\frac{5\sqrt{154}}{616}$	0	0	0
		$\frac{\sqrt{77}}{88}$	0	0	0	$-\frac{\sqrt{385}}{616}$	0	0	$\frac{\sqrt{462}}{88}$	0	0	0	$\frac{9\sqrt{154}}{616}$	0	0
		0	$-\frac{\sqrt{1155}}{264}$	0	0	0	$\frac{\sqrt{231}}{1848}$	0	0	$\frac{\sqrt{462}}{88}$	0	0	0	$-\frac{5\sqrt{154}}{616}$	0
		0	0	$\frac{\sqrt{330}}{264}$	0	0	0	0	0	0	$-\frac{3\sqrt{110}}{88}$	0	0	0	$\frac{\sqrt{154}}{616}$
872	symmetry	$-\frac{\sqrt{14}\left(x^6-15x^4z^2+15x^2z^4+y^6-15y^4z^2+15y^2z^4-2z^6\right)}{8}$														

continued …

Table 10

No.	multipole	matrix

0	0	0	0	0	0	0	$-\frac{\sqrt{33}}{264}$	0	0	0	$-\frac{\sqrt{11}}{88}$	0	0
0	0	0	0	0	0	0	0	$\frac{\sqrt{55}}{88}$	0	0	0	$\frac{\sqrt{165}}{264}$	0
0	0	0	0	0	0	0	0	0	$-\frac{5\sqrt{66}}{264}$	0	0	0	$-\frac{\sqrt{2310}}{1848}$
0	0	0	0	0	0	$\frac{\sqrt{2310}}{1848}$	0	0	0	$\frac{5\sqrt{66}}{264}$	0	0	0
0	0	0	0	0	0	0	$-\frac{\sqrt{165}}{264}$	0	0	0	$-\frac{\sqrt{55}}{88}$	0	0
0	0	0	0	0	0	0	0	$\frac{\sqrt{11}}{88}$	0	0	0	$\frac{\sqrt{33}}{264}$	0
0	0	0	$\frac{\sqrt{2310}}{1848}$	0	0	$\frac{\sqrt{22}}{88}$	0	0	0	$\frac{3\sqrt{770}}{616}$	0	0	0
$-\frac{\sqrt{33}}{264}$	0	0	0	$-\frac{\sqrt{165}}{264}$	0	0	$-\frac{5\sqrt{22}}{88}$	0	0	0	$-\frac{\sqrt{66}}{88}$	0	0
0	$\frac{\sqrt{55}}{88}$	0	0	0	$\frac{\sqrt{11}}{88}$	0	0	$\frac{9\sqrt{22}}{88}$	0	0	0	$-\frac{\sqrt{66}}{88}$	0
0	0	$-\frac{5\sqrt{66}}{264}$	0	0	0	0	0	$-\frac{5\sqrt{22}}{88}$	0	0	0	0	$\frac{3\sqrt{770}}{616}$
0	0	0	$\frac{5\sqrt{66}}{264}$	0	0	$\frac{3\sqrt{770}}{616}$	0	0	0	$-\frac{5\sqrt{22}}{88}$	0	0	0
$-\frac{\sqrt{11}}{88}$	0	0	0	$-\frac{\sqrt{55}}{88}$	0	0	$-\frac{\sqrt{66}}{88}$	0	0	0	$\frac{9\sqrt{22}}{88}$	0	0
0	$\frac{\sqrt{165}}{264}$	0	0	0	$\frac{\sqrt{33}}{264}$	0	0	$-\frac{\sqrt{66}}{88}$	0	0	0	$-\frac{5\sqrt{22}}{88}$	0
0	0	$-\frac{\sqrt{2310}}{1848}$	0	0	0	0	0	0	$\frac{3\sqrt{770}}{616}$	0	0	0	$\frac{\sqrt{22}}{88}$

multipole: $\mathbb{Q}_6^{(1,-1;a)}(A_1,2)$

873	symmetry	$-\frac{3\sqrt{7}xy(x-y)(x+y)\left(x^2+y^2-10z^2\right)}{4}$

Table 10

No.	multipole	matrix												
	$\mathbb{Q}_6^{(1,-1;a)}(A_2)$	0	0	0	0	0	0	0	0	0	0	0	$\frac{\sqrt{22}i}{44}$	0	0
		0	0	0	0	0	0	0	0	0	0	0	0	$-\frac{\sqrt{330}i}{132}$	0
		0	0	0	0	0	0	0	0	0	0	0	0	0	$\frac{\sqrt{1155}i}{462}$
		0	0	0	0	0	0	$\frac{\sqrt{1155}i}{462}$	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	$-\frac{\sqrt{330}i}{132}$	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	$\frac{\sqrt{22}i}{44}$	0	0	0	0	0
		0	0	0	$-\frac{\sqrt{1155}i}{462}$	0	0	0	0	0	0	$-\frac{3\sqrt{385}i}{154}$	0	0	0
		0	0	0	0	$\frac{\sqrt{330}i}{132}$	0	0	0	0	0	0	$\frac{\sqrt{33}i}{22}$	0	0
		0	0	0	0	0	$-\frac{\sqrt{22}i}{44}$	0	0	0	0	0	0	$\frac{\sqrt{33}i}{22}$	0
		0	0	0	0	0	0	0	0	0	0	0	0	0	$-\frac{3\sqrt{385}i}{154}$
		0	0	0	0	0	0	$\frac{3\sqrt{385}i}{154}$	0	0	0	0	0	0	0
		$-\frac{\sqrt{22}i}{44}$	0	0	0	0	0	0	$-\frac{\sqrt{33}i}{22}$	0	0	0	0	0	0
		0	$\frac{\sqrt{330}i}{132}$	0	0	0	0	0	0	$-\frac{\sqrt{33}i}{22}$	0	0	0	0	0
		0	0	$-\frac{\sqrt{1155}i}{462}$	0	0	0	0	0	0	$\frac{3\sqrt{385}i}{154}$	0	0	0	0

| 874 | symmetry | $-\frac{\sqrt{2310}(x-y)(x+y)(x-z)(x+z)(y-z)(y+z)}{8}$ |

continued ...

Table 10

No.	multipole	matrix

$\mathbb{Q}_6^{(1,-1;a)}(B_1,1)$

$$\begin{pmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{1}{24} & 0 & 0 & 0 & -\frac{\sqrt{35}}{56} \\
0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}}{168} & 0 & 0 & 0 & -\frac{\sqrt{5}}{24} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2}}{24} & 0 & 0 & 0 & \frac{\sqrt{6}}{24} & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}}{24} & 0 & 0 & 0 & -\frac{\sqrt{2}}{24} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{5}}{24} & 0 & 0 & 0 & \frac{\sqrt{7}}{168} \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{35}}{56} & 0 & 0 & 0 & -\frac{1}{24} & 0 & 0 & 0 \\
0 & -\frac{\sqrt{7}}{168} & 0 & 0 & 0 & \frac{\sqrt{35}}{56} & 0 & 0 & -\frac{\sqrt{70}}{56} & 0 & 0 & 0 & \frac{\sqrt{210}}{56} & 0 \\
0 & 0 & \frac{\sqrt{2}}{24} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{8} & 0 & 0 & 0 & \frac{\sqrt{210}}{56} \\
0 & 0 & 0 & -\frac{\sqrt{6}}{24} & 0 & 0 & -\frac{\sqrt{70}}{56} & 0 & 0 & 0 & -\frac{\sqrt{2}}{8} & 0 & 0 & 0 \\
\frac{1}{24} & 0 & 0 & 0 & \frac{\sqrt{5}}{24} & 0 & 0 & \frac{\sqrt{6}}{8} & 0 & 0 & 0 & -\frac{\sqrt{2}}{8} & 0 & 0 \\
0 & -\frac{\sqrt{5}}{24} & 0 & 0 & 0 & -\frac{1}{24} & 0 & 0 & -\frac{\sqrt{2}}{8} & 0 & 0 & 0 & \frac{\sqrt{6}}{8} & 0 \\
0 & 0 & \frac{\sqrt{6}}{24} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}}{8} & 0 & 0 & 0 & -\frac{\sqrt{70}}{56} \\
0 & 0 & 0 & -\frac{\sqrt{2}}{24} & 0 & 0 & \frac{\sqrt{210}}{56} & 0 & 0 & 0 & \frac{\sqrt{6}}{8} & 0 & 0 & 0 \\
-\frac{\sqrt{35}}{56} & 0 & 0 & 0 & \frac{\sqrt{7}}{168} & 0 & 0 & \frac{\sqrt{210}}{56} & 0 & 0 & 0 & -\frac{\sqrt{70}}{56} & 0 & 0
\end{pmatrix}$$

| 875 | symmetry | $\frac{\sqrt{42}(x-y)(x+y)\left(x^4-9x^2y^2-5x^2z^2+y^4-5y^2z^2+5z^4\right)}{8}$ |

continued ...

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Table 10

No.	multipole	matrix													
		0	0	0	0	0	0	0	0	0	$-\frac{\sqrt{55}}{264}$	0	0	0	$-\frac{\sqrt{77}}{56}$
		0	0	0	0	0	0	$\frac{\sqrt{385}}{1848}$	0	0	0	$\frac{5\sqrt{11}}{264}$	0	0	0
		0	0	0	0	0	0	0	$-\frac{\sqrt{110}}{264}$	0	0	0	$-\frac{\sqrt{330}}{264}$	0	0
		0	0	0	0	0	0	0	0	$\frac{\sqrt{330}}{264}$	0	0	0	$\frac{\sqrt{110}}{264}$	0
		0	0	0	0	0	0	0	0	0	$-\frac{5\sqrt{11}}{264}$	0	0	0	$-\frac{\sqrt{385}}{1848}$
		0	0	0	0	0	0	$\frac{\sqrt{77}}{56}$	0	0	0	$\frac{\sqrt{55}}{264}$	0	0	0
	$\mathbb{Q}_6^{(1,-1;a)}(B_1,2)$	0	$\frac{\sqrt{385}}{1848}$	0	0	0	$\frac{\sqrt{77}}{56}$	0	0	$\frac{5\sqrt{154}}{616}$	0	0	0	$\frac{\sqrt{462}}{56}$	0
		0	0	$-\frac{\sqrt{110}}{264}$	0	0	0	0	0	0	$-\frac{\sqrt{330}}{88}$	0	0	0	$\frac{\sqrt{462}}{56}$
		0	0	0	$\frac{\sqrt{330}}{264}$	0	0	$\frac{5\sqrt{154}}{616}$	0	0	0	$\frac{\sqrt{110}}{88}$	0	0	0
		$-\frac{\sqrt{55}}{264}$	0	0	0	$-\frac{5\sqrt{11}}{264}$	0	0	$-\frac{\sqrt{330}}{88}$	0	0	0	$\frac{\sqrt{110}}{88}$	0	0
		0	$\frac{5\sqrt{11}}{264}$	0	0	0	$\frac{\sqrt{55}}{264}$	0	0	$\frac{\sqrt{110}}{88}$	0	0	0	$-\frac{\sqrt{330}}{88}$	0
		0	0	$-\frac{\sqrt{330}}{264}$	0	0	0	0	0	0	$\frac{\sqrt{110}}{88}$	0	0	0	$\frac{5\sqrt{154}}{616}$
		0	0	0	$\frac{\sqrt{110}}{264}$	0	0	$\frac{\sqrt{462}}{56}$	0	0	0	$-\frac{\sqrt{330}}{88}$	0	0	0
		$-\frac{\sqrt{77}}{56}$	0	0	0	$-\frac{\sqrt{385}}{1848}$	0	0	$\frac{\sqrt{462}}{56}$	0	0	0	$\frac{5\sqrt{154}}{616}$	0	0

| 876 | symmetry | $\frac{\sqrt{462}xy\left(x^2-3y^2\right)\left(3x^2-y^2\right)}{16}$ |

continued ...

Table 10

No.	multipole	matrix

$\mathbb{Q}_6^{(1,-1;a)}(B_2,1)$

$$\begin{pmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}i}{14} \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}i}{14} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}i}{14} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{42}i}{14} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{42}i}{14} \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{42}i}{14} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
-\frac{\sqrt{7}i}{14} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{42}i}{14} & 0 & 0 & 0 & 0 & 0 & 0 \\
\end{pmatrix}$$

| 877 | symmetry | $\dfrac{\sqrt{210}\,xy\left(x^4+2x^2y^2-16x^2z^2+y^4-16y^2z^2+16z^4\right)}{16}$ |

continued …

Table 10

No.	multipole	matrix												
	$\mathbb{Q}_6^{(1,-1;a)}(B_2,2)$	0	0	0	0	0	0	0	0	0	$\frac{\sqrt{11}i}{66}$	0	0	0	0
		0	0	0	0	0	0	$\frac{\sqrt{77}i}{462}$	0	0	0	$-\frac{\sqrt{55}i}{66}$	0	0	0
		0	0	0	0	0	0	0	$-\frac{\sqrt{22}i}{66}$	0	0	0	$\frac{\sqrt{66}i}{66}$	0	0
		0	0	0	0	0	0	0	0	$\frac{\sqrt{66}i}{66}$	0	0	0	$-\frac{\sqrt{22}i}{66}$	0
		0	0	0	0	0	0	0	0	0	$-\frac{\sqrt{55}i}{66}$	0	0	0	$\frac{\sqrt{77}i}{462}$
		0	0	0	0	0	0	0	0	0	0	$\frac{\sqrt{11}i}{66}$	0	0	0
		0	$-\frac{\sqrt{77}i}{462}$	0	0	0	0	0	0	$-\frac{\sqrt{770}i}{154}$	0	0	0	0	0
		0	0	$\frac{\sqrt{22}i}{66}$	0	0	0	0	0	0	$\frac{\sqrt{66}i}{22}$	0	0	0	0
		0	0	0	$-\frac{\sqrt{66}i}{66}$	0	0	$\frac{\sqrt{770}i}{154}$	0	0	0	$-\frac{\sqrt{22}i}{22}$	0	0	0
		$-\frac{\sqrt{11}i}{66}$	0	0	0	$\frac{\sqrt{55}i}{66}$	0	0	$-\frac{\sqrt{66}i}{22}$	0	0	0	$-\frac{\sqrt{22}i}{22}$	0	0
		0	$\frac{\sqrt{55}i}{66}$	0	0	0	$-\frac{\sqrt{11}i}{66}$	0	0	$\frac{\sqrt{22}i}{22}$	0	0	0	$\frac{\sqrt{66}i}{22}$	0
		0	0	$-\frac{\sqrt{66}i}{66}$	0	0	0	0	0	0	$\frac{\sqrt{22}i}{22}$	0	0	0	$-\frac{\sqrt{770}i}{154}$
		0	0	0	$\frac{\sqrt{22}i}{66}$	0	0	0	0	0	0	$-\frac{\sqrt{66}i}{22}$	0	0	0
		0	0	0	0	$-\frac{\sqrt{77}i}{462}$	0	0	0	0	0	0	$\frac{\sqrt{770}i}{154}$	0	0

| 878 | symmetry | $\frac{3\sqrt{7}yz(y-z)(y+z)\left(10x^2-y^2-z^2\right)}{4}$ |

Table 10

No.	multipole	matrix

$\mathbb{Q}_{6,1}^{(1,-1;a)}(E,1)$													
0	0	0	0	0	0	$\frac{\sqrt{462}i}{7392}$	0	$\frac{\sqrt{22}i}{352}$	0	$-\frac{\sqrt{330}i}{352}$	0	$-\frac{\sqrt{66}i}{96}$	0
0	0	0	0	0	0	0	$-\frac{\sqrt{330}i}{1056}$	0	$-\frac{5\sqrt{66}i}{1056}$	0	$\frac{3\sqrt{110}i}{352}$	0	$\frac{\sqrt{2310}i}{672}$
0	0	0	0	0	0	$-\frac{\sqrt{1155}i}{1232}$	0	$\frac{\sqrt{55}i}{176}$	0	$\frac{5\sqrt{33}i}{528}$	0	$-\frac{\sqrt{165}i}{176}$	0
0	0	0	0	0	0	0	$\frac{\sqrt{165}i}{176}$	0	$-\frac{5\sqrt{33}i}{528}$	0	$-\frac{\sqrt{55}i}{176}$	0	$\frac{\sqrt{1155}i}{1232}$
0	0	0	0	0	0	$-\frac{\sqrt{2310}i}{672}$	0	$-\frac{3\sqrt{110}i}{352}$	0	$\frac{5\sqrt{66}i}{1056}$	0	$\frac{\sqrt{330}i}{1056}$	0
0	0	0	0	0	0	0	$\frac{\sqrt{66}i}{96}$	0	$\frac{\sqrt{330}i}{352}$	0	$-\frac{\sqrt{22}i}{352}$	0	$-\frac{\sqrt{462}i}{7392}$
$-\frac{\sqrt{462}i}{7392}$	0	$\frac{\sqrt{1155}i}{1232}$	0	$\frac{\sqrt{2310}i}{672}$	0	0	$-\frac{3\sqrt{77}i}{616}$	0	$\frac{3\sqrt{385}i}{308}$	0	$\frac{\sqrt{231}i}{56}$	0	0
0	$\frac{\sqrt{330}i}{1056}$	0	$-\frac{\sqrt{165}i}{176}$	0	$-\frac{\sqrt{66}i}{96}$	$\frac{3\sqrt{77}i}{616}$	0	$\frac{\sqrt{33}i}{44}$	0	$-\frac{3\sqrt{55}i}{88}$	0	0	0
$-\frac{\sqrt{22}i}{352}$	0	$-\frac{\sqrt{55}i}{176}$	0	$\frac{3\sqrt{110}i}{352}$	0	0	$-\frac{\sqrt{33}i}{44}$	0	$-\frac{\sqrt{165}i}{88}$	0	0	0	$-\frac{\sqrt{231}i}{56}$
0	$\frac{5\sqrt{66}i}{1056}$	0	$\frac{5\sqrt{33}i}{528}$	0	$-\frac{\sqrt{330}i}{352}$	$-\frac{3\sqrt{385}i}{308}$	0	$\frac{\sqrt{165}i}{88}$	0	0	0	$\frac{3\sqrt{55}i}{88}$	0
$\frac{\sqrt{330}i}{352}$	0	$-\frac{5\sqrt{33}i}{528}$	0	$-\frac{5\sqrt{66}i}{1056}$	0	0	$\frac{3\sqrt{55}i}{88}$	0	0	0	$\frac{\sqrt{165}i}{88}$	0	$-\frac{3\sqrt{385}i}{308}$
0	$-\frac{3\sqrt{110}i}{352}$	0	$\frac{\sqrt{55}i}{176}$	0	$\frac{\sqrt{22}i}{352}$	$-\frac{\sqrt{231}i}{56}$	0	0	0	$-\frac{\sqrt{165}i}{88}$	0	$-\frac{\sqrt{33}i}{44}$	0
$\frac{\sqrt{66}i}{96}$	0	$\frac{\sqrt{165}i}{176}$	0	$-\frac{\sqrt{330}i}{1056}$	0	0	0	0	$-\frac{3\sqrt{55}i}{88}$	0	$\frac{\sqrt{33}i}{44}$	0	$\frac{3\sqrt{77}i}{616}$
0	$-\frac{\sqrt{2310}i}{672}$	0	$-\frac{\sqrt{1155}i}{1232}$	0	$\frac{\sqrt{462}i}{7392}$	0	0	$\frac{\sqrt{231}i}{56}$	0	$\frac{3\sqrt{385}i}{308}$	0	$-\frac{3\sqrt{77}i}{616}$	0

879	symmetry	$-\frac{3\sqrt{7}xz(x-z)(x+z)\left(x^2-10y^2+z^2\right)}{4}$

Table 10

No.	multipole	matrix													
	$\mathbb{Q}_{6,2}^{(1,-1;a)}(E,1)$	0	0	0	0	0	0	$\frac{\sqrt{462}}{7392}$	0	$-\frac{\sqrt{22}}{352}$	0	$-\frac{\sqrt{330}}{352}$	0	$\frac{\sqrt{66}}{96}$	0
		0	0	0	0	0	0	0	$-\frac{\sqrt{330}}{1056}$	0	$\frac{5\sqrt{66}}{1056}$	0	$\frac{3\sqrt{110}}{352}$	0	$-\frac{\sqrt{2310}}{672}$
		0	0	0	0	0	0	$\frac{\sqrt{1155}}{1232}$	0	$\frac{\sqrt{55}}{176}$	0	$-\frac{5\sqrt{33}}{528}$	0	$-\frac{\sqrt{165}}{176}$	0
		0	0	0	0	0	0	0	$-\frac{\sqrt{165}}{176}$	0	$-\frac{5\sqrt{33}}{528}$	0	$\frac{\sqrt{55}}{176}$	0	$\frac{\sqrt{1155}}{1232}$
		0	0	0	0	0	0	$-\frac{\sqrt{2310}}{672}$	0	$\frac{3\sqrt{110}}{352}$	0	$\frac{5\sqrt{66}}{1056}$	0	$-\frac{\sqrt{330}}{1056}$	0
		0	0	0	0	0	0	0	$\frac{\sqrt{66}}{96}$	0	$-\frac{\sqrt{330}}{352}$	0	$-\frac{\sqrt{22}}{352}$	0	$\frac{\sqrt{462}}{7392}$
		$\frac{\sqrt{462}}{7392}$	0	$\frac{\sqrt{1155}}{1232}$	0	$-\frac{\sqrt{2310}}{672}$	0	0	$\frac{3\sqrt{77}}{616}$	0	$\frac{3\sqrt{385}}{308}$	0	$-\frac{\sqrt{231}}{56}$	0	0
		0	$-\frac{\sqrt{330}}{1056}$	0	$-\frac{\sqrt{165}}{176}$	0	$\frac{\sqrt{66}}{96}$	$\frac{3\sqrt{77}}{616}$	0	$-\frac{\sqrt{33}}{44}$	0	$-\frac{3\sqrt{55}}{88}$	0	0	0
		$-\frac{\sqrt{22}}{352}$	0	$\frac{\sqrt{55}}{176}$	0	$\frac{3\sqrt{110}}{352}$	0	0	$-\frac{\sqrt{33}}{44}$	0	$\frac{\sqrt{165}}{88}$	0	0	0	$\frac{\sqrt{231}}{56}$
		0	$\frac{5\sqrt{66}}{1056}$	0	$-\frac{5\sqrt{33}}{528}$	0	$-\frac{\sqrt{330}}{352}$	$\frac{3\sqrt{385}}{308}$	0	$\frac{\sqrt{165}}{88}$	0	0	0	$\frac{3\sqrt{55}}{88}$	0
		$-\frac{\sqrt{330}}{352}$	0	$-\frac{5\sqrt{33}}{528}$	0	$\frac{5\sqrt{66}}{1056}$	0	0	$-\frac{3\sqrt{55}}{88}$	0	0	0	$-\frac{\sqrt{165}}{88}$	0	$-\frac{3\sqrt{385}}{308}$
		0	$\frac{3\sqrt{110}}{352}$	0	$\frac{\sqrt{55}}{176}$	0	$-\frac{\sqrt{22}}{352}$	$-\frac{\sqrt{231}}{56}$	0	0	0	$-\frac{\sqrt{165}}{88}$	0	$\frac{\sqrt{33}}{44}$	0
		$\frac{\sqrt{66}}{96}$	0	$-\frac{\sqrt{165}}{176}$	0	$-\frac{\sqrt{330}}{1056}$	0	0	0	0	$\frac{3\sqrt{55}}{88}$	0	$\frac{\sqrt{33}}{44}$	0	$-\frac{3\sqrt{77}}{616}$
		0	$-\frac{\sqrt{2310}}{672}$	0	$\frac{\sqrt{1155}}{1232}$	0	$\frac{\sqrt{462}}{7392}$	0	0	$\frac{\sqrt{231}}{56}$	0	$-\frac{3\sqrt{385}}{308}$	0	$-\frac{3\sqrt{77}}{616}$	0

| 880 | symmetry | $\frac{\sqrt{462}\,yz\left(y^2-3z^2\right)\left(3y^2-z^2\right)}{16}$ |

Table 10

No.	multipole	matrix

$\mathbb{Q}_{6,1}^{(1,-1;a)}(E,2)$

$$\begin{bmatrix}
0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}i}{448} & 0 & \frac{\sqrt{3}i}{64} & 0 & \frac{\sqrt{5}i}{64} & 0 & \frac{i}{64} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{64} & 0 & -\frac{5i}{64} & 0 & -\frac{\sqrt{15}i}{64} & 0 & -\frac{\sqrt{35}i}{448} \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{70}i}{448} & 0 & \frac{\sqrt{30}i}{64} & 0 & \frac{5\sqrt{2}i}{64} & 0 & \frac{\sqrt{10}i}{64} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}i}{64} & 0 & -\frac{5\sqrt{2}i}{64} & 0 & -\frac{\sqrt{30}i}{64} & 0 & -\frac{\sqrt{70}i}{448} \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{35}i}{448} & 0 & \frac{\sqrt{15}i}{64} & 0 & \frac{5i}{64} & 0 & \frac{\sqrt{5}i}{64} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{i}{64} & 0 & -\frac{\sqrt{5}i}{64} & 0 & -\frac{\sqrt{3}i}{64} & 0 & -\frac{\sqrt{7}i}{448} \\
-\frac{\sqrt{7}i}{448} & 0 & -\frac{\sqrt{70}i}{448} & 0 & -\frac{\sqrt{35}i}{448} & 0 & 0 & -\frac{3\sqrt{42}i}{224} & 0 & -\frac{\sqrt{210}i}{112} & 0 & -\frac{3\sqrt{14}i}{224} & 0 & 0 \\
0 & \frac{\sqrt{5}i}{64} & 0 & \frac{\sqrt{10}i}{64} & 0 & \frac{i}{64} & \frac{3\sqrt{42}i}{224} & 0 & \frac{3\sqrt{2}i}{16} & 0 & \frac{\sqrt{30}i}{32} & 0 & 0 & 0 \\
-\frac{\sqrt{3}i}{64} & 0 & -\frac{\sqrt{30}i}{64} & 0 & -\frac{\sqrt{15}i}{64} & 0 & 0 & -\frac{3\sqrt{2}i}{16} & 0 & -\frac{3\sqrt{10}i}{32} & 0 & 0 & 0 & \frac{3\sqrt{14}i}{224} \\
0 & \frac{5i}{64} & 0 & \frac{5\sqrt{2}i}{64} & 0 & \frac{\sqrt{5}i}{64} & \frac{\sqrt{210}i}{112} & 0 & \frac{3\sqrt{10}i}{32} & 0 & 0 & 0 & -\frac{\sqrt{30}i}{32} & 0 \\
-\frac{\sqrt{5}i}{64} & 0 & -\frac{5\sqrt{2}i}{64} & 0 & -\frac{5i}{64} & 0 & 0 & -\frac{\sqrt{30}i}{32} & 0 & 0 & 0 & \frac{3\sqrt{10}i}{32} & 0 & \frac{\sqrt{210}i}{112} \\
0 & \frac{\sqrt{15}i}{64} & 0 & \frac{\sqrt{30}i}{64} & 0 & \frac{\sqrt{3}i}{64} & \frac{3\sqrt{14}i}{224} & 0 & 0 & 0 & -\frac{3\sqrt{10}i}{32} & 0 & -\frac{3\sqrt{2}i}{16} & 0 \\
-\frac{i}{64} & 0 & -\frac{\sqrt{10}i}{64} & 0 & -\frac{\sqrt{5}i}{64} & 0 & 0 & 0 & 0 & \frac{\sqrt{30}i}{32} & 0 & \frac{3\sqrt{2}i}{16} & 0 & \frac{3\sqrt{42}i}{224} \\
0 & \frac{\sqrt{35}i}{448} & 0 & \frac{\sqrt{70}i}{448} & 0 & \frac{\sqrt{7}i}{448} & 0 & 0 & -\frac{3\sqrt{14}i}{224} & 0 & -\frac{\sqrt{210}i}{112} & 0 & -\frac{3\sqrt{42}i}{224} & 0
\end{bmatrix}$$

| 881 | symmetry | $\dfrac{\sqrt{462}\,xz\left(x^2-3z^2\right)\left(3x^2-z^2\right)}{16}$ |

339

Table 10

No.	multipole	matrix

$\mathbb{Q}_{6,2}^{(1,-1;a)}(E,2)$

$$\begin{pmatrix}
0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}}{448} & 0 & -\frac{\sqrt{3}}{64} & 0 & \frac{\sqrt{5}}{64} & 0 & -\frac{1}{64} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}}{64} & 0 & \frac{5}{64} & 0 & -\frac{\sqrt{15}}{64} & 0 & \frac{\sqrt{35}}{448} \\
0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}}{448} & 0 & \frac{\sqrt{30}}{64} & 0 & -\frac{5\sqrt{2}}{64} & 0 & \frac{\sqrt{10}}{64} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}}{64} & 0 & -\frac{5\sqrt{2}}{64} & 0 & \frac{\sqrt{30}}{64} & 0 & -\frac{\sqrt{70}}{448} \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{35}}{448} & 0 & -\frac{\sqrt{15}}{64} & 0 & \frac{5}{64} & 0 & -\frac{\sqrt{5}}{64} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{1}{64} & 0 & \frac{\sqrt{5}}{64} & 0 & -\frac{\sqrt{3}}{64} & 0 & \frac{\sqrt{7}}{448} \\
\frac{\sqrt{7}}{448} & 0 & -\frac{\sqrt{70}}{448} & 0 & \frac{\sqrt{35}}{448} & 0 & 0 & \frac{3\sqrt{42}}{224} & 0 & -\frac{\sqrt{210}}{112} & 0 & \frac{3\sqrt{14}}{224} & 0 & 0 \\
0 & -\frac{\sqrt{5}}{64} & 0 & \frac{\sqrt{10}}{64} & 0 & -\frac{1}{64} & \frac{3\sqrt{42}}{224} & 0 & -\frac{3\sqrt{2}}{16} & 0 & \frac{\sqrt{30}}{32} & 0 & 0 & 0 \\
-\frac{\sqrt{3}}{64} & 0 & \frac{\sqrt{30}}{64} & 0 & -\frac{\sqrt{15}}{64} & 0 & 0 & -\frac{3\sqrt{2}}{16} & 0 & \frac{3\sqrt{10}}{32} & 0 & 0 & 0 & -\frac{3\sqrt{14}}{224} \\
0 & \frac{5}{64} & 0 & -\frac{5\sqrt{2}}{64} & 0 & \frac{\sqrt{5}}{64} & -\frac{\sqrt{210}}{112} & 0 & \frac{3\sqrt{10}}{32} & 0 & 0 & 0 & -\frac{\sqrt{30}}{32} & 0 \\
\frac{\sqrt{5}}{64} & 0 & -\frac{5\sqrt{2}}{64} & 0 & \frac{5}{64} & 0 & 0 & \frac{\sqrt{30}}{32} & 0 & 0 & 0 & -\frac{3\sqrt{10}}{32} & 0 & \frac{\sqrt{210}}{112} \\
0 & -\frac{\sqrt{15}}{64} & 0 & \frac{\sqrt{30}}{64} & 0 & -\frac{\sqrt{3}}{64} & \frac{3\sqrt{14}}{224} & 0 & 0 & 0 & -\frac{3\sqrt{10}}{32} & 0 & \frac{3\sqrt{2}}{16} & 0 \\
-\frac{1}{64} & 0 & \frac{\sqrt{10}}{64} & 0 & -\frac{\sqrt{5}}{64} & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}}{32} & 0 & \frac{3\sqrt{2}}{16} & 0 & -\frac{3\sqrt{42}}{224} \\
0 & \frac{\sqrt{35}}{448} & 0 & -\frac{\sqrt{70}}{448} & 0 & \frac{\sqrt{7}}{448} & 0 & 0 & -\frac{3\sqrt{14}}{224} & 0 & \frac{\sqrt{210}}{112} & 0 & -\frac{3\sqrt{42}}{224} & 0
\end{pmatrix}$$

| 882 | symmetry | $\frac{\sqrt{210}\,yz\left(16x^4-16x^2y^2-16x^2z^2+y^4+2y^2z^2+z^4\right)}{16}$ |

Table 10

No.	multipole	matrix													
		0	0	0	0	0	0	$\frac{\sqrt{385}i}{14784}$	0	$\frac{\sqrt{165}i}{2112}$	0	$-\frac{9\sqrt{11}i}{704}$	0	$\frac{\sqrt{55}i}{64}$	0
		0	0	0	0	0	0	0	$-\frac{5\sqrt{11}i}{2112}$	0	$-\frac{5\sqrt{55}i}{2112}$	0	$\frac{9\sqrt{33}i}{704}$	0	$-\frac{5\sqrt{77}i}{448}$
		0	0	0	0	0	0	$-\frac{9\sqrt{154}i}{4928}$	0	$\frac{5\sqrt{66}i}{2112}$	0	$\frac{5\sqrt{110}i}{2112}$	0	$-\frac{9\sqrt{22}i}{704}$	0
		0	0	0	0	0	0	0	$\frac{9\sqrt{22}i}{704}$	0	$-\frac{5\sqrt{110}i}{2112}$	0	$-\frac{5\sqrt{66}i}{2112}$	0	$\frac{9\sqrt{154}i}{4928}$
		0	0	0	0	0	0	$\frac{5\sqrt{77}i}{448}$	0	$-\frac{9\sqrt{33}i}{704}$	0	$\frac{5\sqrt{55}i}{2112}$	0	$\frac{5\sqrt{11}i}{2112}$	0
		0	0	0	0	0	0	0	$-\frac{\sqrt{55}i}{64}$	0	$\frac{9\sqrt{11}i}{704}$	0	$-\frac{\sqrt{165}i}{2112}$	0	$-\frac{\sqrt{385}i}{14784}$
	$\mathbb{Q}_{6,1}^{(1,-1;a)}(E,3)$	$-\frac{\sqrt{385}i}{14784}$	0	$\frac{9\sqrt{154}i}{4928}$	0	$-\frac{5\sqrt{77}i}{448}$	0	0	$-\frac{\sqrt{2310}i}{2464}$	0	$\frac{9\sqrt{462}i}{1232}$	0	$-\frac{3\sqrt{770}i}{224}$	0	0
		0	$\frac{5\sqrt{11}i}{2112}$	0	$-\frac{9\sqrt{22}i}{704}$	0	$\frac{\sqrt{55}i}{64}$	$\frac{\sqrt{2310}i}{2464}$	0	$\frac{\sqrt{110}i}{176}$	0	$-\frac{9\sqrt{66}i}{352}$	0	0	0
		$-\frac{\sqrt{165}i}{2112}$	0	$-\frac{5\sqrt{66}i}{2112}$	0	$\frac{9\sqrt{33}i}{704}$	0	0	$-\frac{\sqrt{110}i}{176}$	0	$-\frac{5\sqrt{22}i}{352}$	0	0	0	$\frac{3\sqrt{770}i}{224}$
		0	$\frac{5\sqrt{55}i}{2112}$	0	$\frac{5\sqrt{110}i}{2112}$	0	$-\frac{9\sqrt{11}i}{704}$	$-\frac{9\sqrt{462}i}{1232}$	0	$\frac{5\sqrt{22}i}{352}$	0	0	0	$\frac{9\sqrt{66}i}{352}$	0
		$\frac{9\sqrt{11}i}{704}$	0	$-\frac{5\sqrt{110}i}{2112}$	0	$-\frac{5\sqrt{55}i}{2112}$	0	0	$\frac{9\sqrt{66}i}{352}$	0	0	0	$\frac{5\sqrt{22}i}{352}$	0	$-\frac{9\sqrt{462}i}{1232}$
		0	$-\frac{9\sqrt{33}i}{704}$	0	$\frac{5\sqrt{66}i}{2112}$	0	$\frac{\sqrt{165}i}{2112}$	$\frac{3\sqrt{770}i}{224}$	0	0	0	$-\frac{5\sqrt{22}i}{352}$	0	$-\frac{\sqrt{110}i}{176}$	0
		$-\frac{\sqrt{55}i}{64}$	0	$\frac{9\sqrt{22}i}{704}$	0	$-\frac{5\sqrt{11}i}{2112}$	0	0	0	0	$-\frac{9\sqrt{66}i}{352}$	0	$\frac{\sqrt{110}i}{176}$	0	$\frac{\sqrt{2310}i}{2464}$
		0	$\frac{5\sqrt{77}i}{448}$	0	$-\frac{9\sqrt{154}i}{4928}$	0	$\frac{\sqrt{385}i}{14784}$	0	0	$-\frac{3\sqrt{770}i}{224}$	0	$\frac{9\sqrt{462}i}{1232}$	0	$-\frac{\sqrt{2310}i}{2464}$	0

No.		symmetry
883		$\frac{\sqrt{210}\,xz\left(x^4-16x^2y^2+2x^2z^2+16y^4-16y^2z^2+z^4\right)}{16}$

continued ...

Table 10

No.	multipole	matrix												

$\mathbb{Q}_{6,2}^{(1,-1;a)}(E,3)$

0	0	0	0	0	0	$\frac{\sqrt{385}}{14784}$	0	$-\frac{\sqrt{165}}{2112}$	0	$-\frac{9\sqrt{11}}{704}$	0	$-\frac{\sqrt{55}}{64}$	0
0	0	0	0	0	0	0	$-\frac{5\sqrt{11}}{2112}$	0	$\frac{5\sqrt{55}}{2112}$	0	$\frac{9\sqrt{33}}{704}$	0	$\frac{5\sqrt{77}}{448}$
0	0	0	0	0	0	$\frac{9\sqrt{154}}{4928}$	0	$\frac{5\sqrt{66}}{2112}$	0	$-\frac{5\sqrt{110}}{2112}$	0	$-\frac{9\sqrt{22}}{704}$	0
0	0	0	0	0	0	0	$-\frac{9\sqrt{22}}{704}$	0	$-\frac{5\sqrt{110}}{2112}$	0	$\frac{5\sqrt{66}}{2112}$	0	$\frac{9\sqrt{154}}{4928}$
0	0	0	0	0	0	$\frac{5\sqrt{77}}{448}$	0	$\frac{9\sqrt{33}}{704}$	0	$\frac{5\sqrt{55}}{2112}$	0	$-\frac{5\sqrt{11}}{2112}$	0
0	0	0	0	0	0	0	$-\frac{\sqrt{55}}{64}$	0	$-\frac{9\sqrt{11}}{704}$	0	$-\frac{\sqrt{165}}{2112}$	0	$\frac{\sqrt{385}}{14784}$
$\frac{\sqrt{385}}{14784}$	0	$\frac{9\sqrt{154}}{4928}$	0	$\frac{5\sqrt{77}}{448}$	0	0	$\frac{\sqrt{2310}}{2464}$	0	$\frac{9\sqrt{462}}{1232}$	0	$\frac{3\sqrt{770}}{224}$	0	0
0	$-\frac{5\sqrt{11}}{2112}$	0	$-\frac{9\sqrt{22}}{704}$	0	$-\frac{\sqrt{55}}{64}$	$\frac{\sqrt{2310}}{2464}$	0	$-\frac{\sqrt{110}}{176}$	0	$-\frac{9\sqrt{66}}{352}$	0	0	0
$-\frac{\sqrt{165}}{2112}$	0	$\frac{5\sqrt{66}}{2112}$	0	$\frac{9\sqrt{33}}{704}$	0	0	$-\frac{\sqrt{110}}{176}$	0	$\frac{5\sqrt{22}}{352}$	0	0	0	$-\frac{3\sqrt{770}}{224}$
0	$\frac{5\sqrt{55}}{2112}$	0	$-\frac{5\sqrt{110}}{2112}$	0	$-\frac{9\sqrt{11}}{704}$	$\frac{9\sqrt{462}}{1232}$	0	$\frac{5\sqrt{22}}{352}$	0	0	0	$\frac{9\sqrt{66}}{352}$	0
$-\frac{9\sqrt{11}}{704}$	0	$-\frac{5\sqrt{110}}{2112}$	0	$\frac{5\sqrt{55}}{2112}$	0	0	$-\frac{9\sqrt{66}}{352}$	0	0	0	$-\frac{5\sqrt{22}}{352}$	0	$-\frac{9\sqrt{462}}{1232}$
0	$\frac{9\sqrt{33}}{704}$	0	$\frac{5\sqrt{66}}{2112}$	0	$-\frac{\sqrt{165}}{2112}$	$\frac{3\sqrt{770}}{224}$	0	0	0	$-\frac{5\sqrt{22}}{352}$	0	$\frac{\sqrt{110}}{176}$	0
$-\frac{\sqrt{55}}{64}$	0	$-\frac{9\sqrt{22}}{704}$	0	$-\frac{5\sqrt{11}}{2112}$	0	0	0	0	$\frac{9\sqrt{66}}{352}$	0	$\frac{\sqrt{110}}{176}$	0	$-\frac{\sqrt{2310}}{2464}$
0	$\frac{5\sqrt{77}}{448}$	0	$\frac{9\sqrt{154}}{4928}$	0	$\frac{\sqrt{385}}{14784}$	0	0	$-\frac{3\sqrt{770}}{224}$	0	$-\frac{9\sqrt{462}}{1232}$	0	$-\frac{\sqrt{2310}}{2464}$	0

884	symmetry	1

continued ...

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Table 10

No.	multipole	matrix
	$\mathbb{Q}_0^{(1,1;a)}(A_1)$	$\begin{pmatrix} -\frac{\sqrt{42}}{21} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{42}}{21} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{42}}{21} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{42}}{21} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{42}}{21} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{42}}{21} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{42}}{28} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{42}}{28} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{42}}{28} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{42}}{28} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{42}}{28} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{42}}{28} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{42}}{28} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{42}}{28} \end{pmatrix}$
885	symmetry	$-\frac{x^2}{2} - \frac{y^2}{2} + z^2$

continued ...

Table 10

No.	multipole	matrix													
	$\mathbb{Q}_2^{(1,1;a)}(A_1)$	$\frac{15\sqrt{7}}{98}$	0	0	0	0	0	0	$-\frac{5\sqrt{42}}{147}$	0	0	0	0	0	0
		0	$-\frac{3\sqrt{7}}{98}$	0	0	0	0	0	0	$-\frac{\sqrt{70}}{49}$	0	0	0	0	0
		0	0	$-\frac{6\sqrt{7}}{49}$	0	0	0	0	0	0	$-\frac{2\sqrt{21}}{147}$	0	0	0	0
		0	0	0	$-\frac{6\sqrt{7}}{49}$	0	0	0	0	0	0	$\frac{2\sqrt{21}}{147}$	0	0	0
		0	0	0	0	$-\frac{3\sqrt{7}}{98}$	0	0	0	0	0	0	$\frac{\sqrt{70}}{49}$	0	0
		0	0	0	0	0	$\frac{15\sqrt{7}}{98}$	0	0	0	0	0	0	$\frac{5\sqrt{42}}{147}$	0
		0	0	0	0	0	0	$-\frac{\sqrt{7}}{14}$	0	0	0	0	0	0	0
		$-\frac{5\sqrt{42}}{147}$	0	0	0	0	0	0	$-\frac{\sqrt{7}}{98}$	0	0	0	0	0	0
		0	$-\frac{\sqrt{70}}{49}$	0	0	0	0	0	0	$\frac{3\sqrt{7}}{98}$	0	0	0	0	0
		0	0	$-\frac{2\sqrt{21}}{147}$	0	0	0	0	0	0	$\frac{5\sqrt{7}}{98}$	0	0	0	0
		0	0	0	$\frac{2\sqrt{21}}{147}$	0	0	0	0	0	0	$\frac{5\sqrt{7}}{98}$	0	0	0
		0	0	0	0	$\frac{\sqrt{70}}{49}$	0	0	0	0	0	0	$\frac{3\sqrt{7}}{98}$	0	0
		0	0	0	0	0	$\frac{5\sqrt{42}}{147}$	0	0	0	0	0	0	$-\frac{\sqrt{7}}{98}$	0
		0	0	0	0	0	0	0	0	0	0	0	0	0	$-\frac{\sqrt{7}}{14}$

886	symmetry	$\frac{\sqrt{3}(x-y)(x+y)}{2}$

continued …

Table 10

No.	multipole	matrix													
	$\mathbb{Q}_2^{(1,1;a)}(B_1)$	0	0	$\frac{3\sqrt{210}}{196}$	0	0	0	0	0	0	$-\frac{\sqrt{70}}{147}$	0	0	0	0
		0	0	0	$\frac{9\sqrt{42}}{196}$	0	0	$\frac{\sqrt{10}}{21}$	0	0	0	$-\frac{4\sqrt{14}}{147}$	0	0	0
		$\frac{3\sqrt{210}}{196}$	0	0	0	$\frac{9\sqrt{42}}{196}$	0	0	$\frac{4\sqrt{35}}{147}$	0	0	0	$-\frac{2\sqrt{105}}{147}$	0	0
		0	$\frac{9\sqrt{42}}{196}$	0	0	0	$\frac{3\sqrt{210}}{196}$	0	0	$\frac{2\sqrt{105}}{147}$	0	0	0	$-\frac{4\sqrt{35}}{147}$	0
		0	0	$\frac{9\sqrt{42}}{196}$	0	0	0	0	0	0	$\frac{4\sqrt{14}}{147}$	0	0	0	$-\frac{\sqrt{10}}{21}$
		0	0	0	$\frac{3\sqrt{210}}{196}$	0	0	0	0	0	0	$\frac{\sqrt{70}}{147}$	0	0	0
		0	$\frac{\sqrt{10}}{21}$	0	0	0	0	0	0	$-\frac{1}{14}$	0	0	0	0	0
		0	0	$\frac{4\sqrt{35}}{147}$	0	0	0	0	0	0	$-\frac{\sqrt{105}}{98}$	0	0	0	0
		0	0	0	$\frac{2\sqrt{105}}{147}$	0	0	$-\frac{1}{14}$	0	0	0	$-\frac{\sqrt{35}}{49}$	0	0	0
		$-\frac{\sqrt{70}}{147}$	0	0	0	$\frac{4\sqrt{14}}{147}$	0	0	$-\frac{\sqrt{105}}{98}$	0	0	0	$-\frac{\sqrt{35}}{49}$	0	0
		0	$-\frac{4\sqrt{14}}{147}$	0	0	0	$\frac{\sqrt{70}}{147}$	0	0	$-\frac{\sqrt{35}}{49}$	0	0	0	$-\frac{\sqrt{105}}{98}$	0
		0	0	$-\frac{2\sqrt{105}}{147}$	0	0	0	0	0	0	$-\frac{\sqrt{35}}{49}$	0	0	0	$-\frac{1}{14}$
		0	0	0	$-\frac{4\sqrt{35}}{147}$	0	0	0	0	0	0	$-\frac{\sqrt{105}}{98}$	0	0	0
		0	0	0	0	$-\frac{\sqrt{10}}{21}$	0	0	0	0	0	0	$-\frac{1}{14}$	0	0
887	symmetry	$\sqrt{3}xy$														

continued …

Table 10

No.	multipole	matrix													
	$\mathbb{Q}_2^{(1,1;a)}(B_2)$	0	0	$-\frac{3\sqrt{210}i}{196}$	0	0	0	0	0	0	$\frac{\sqrt{70}i}{147}$	0	0	0	0
		0	0	0	$-\frac{9\sqrt{42}i}{196}$	0	0	$\frac{\sqrt{10}i}{21}$	0	0	0	$\frac{4\sqrt{14}i}{147}$	0	0	0
		$\frac{3\sqrt{210}i}{196}$	0	0	0	$-\frac{9\sqrt{42}i}{196}$	0	0	$\frac{4\sqrt{35}i}{147}$	0	0	0	$\frac{2\sqrt{105}i}{147}$	0	0
		0	$\frac{9\sqrt{42}i}{196}$	0	0	0	$-\frac{3\sqrt{210}i}{196}$	0	0	$\frac{2\sqrt{105}i}{147}$	0	0	0	$\frac{4\sqrt{35}i}{147}$	0
		0	0	$\frac{9\sqrt{42}i}{196}$	0	0	0	0	0	0	$\frac{4\sqrt{14}i}{147}$	0	0	0	$\frac{\sqrt{10}i}{21}$
		0	0	0	$\frac{3\sqrt{210}i}{196}$	0	0	0	0	0	0	$\frac{\sqrt{70}i}{147}$	0	0	0
		0	$-\frac{\sqrt{10}i}{21}$	0	0	0	0	0	0	$\frac{i}{14}$	0	0	0	0	0
		0	0	$-\frac{4\sqrt{35}i}{147}$	0	0	0	0	0	0	$\frac{\sqrt{105}i}{98}$	0	0	0	0
		0	0	0	$-\frac{2\sqrt{105}i}{147}$	0	0	$-\frac{i}{14}$	0	0	0	$\frac{\sqrt{35}i}{49}$	0	0	0
		$-\frac{\sqrt{70}i}{147}$	0	0	0	$-\frac{4\sqrt{14}i}{147}$	0	0	$-\frac{\sqrt{105}i}{98}$	0	0	0	$\frac{\sqrt{35}i}{49}$	0	0
		0	$-\frac{4\sqrt{14}i}{147}$	0	0	0	$-\frac{\sqrt{70}i}{147}$	0	0	$-\frac{\sqrt{35}i}{49}$	0	0	0	$\frac{\sqrt{105}i}{98}$	0
		0	0	$-\frac{2\sqrt{105}i}{147}$	0	0	0	0	0	0	$-\frac{\sqrt{35}i}{49}$	0	0	0	$\frac{i}{14}$
		0	0	0	$-\frac{4\sqrt{35}i}{147}$	0	0	0	0	0	0	$-\frac{\sqrt{105}i}{98}$	0	0	0
		0	0	0	0	$-\frac{\sqrt{10}i}{21}$	0	0	0	0	0	0	$-\frac{i}{14}$	0	0

| 888 | symmetry | $\sqrt{3}yz$ |

continued ...

Table 10

No.	multipole	matrix

0	$-\frac{3\sqrt{105}i}{98}$	0	0	0	0	$\frac{5\sqrt{2}i}{42}$	0	$\frac{5\sqrt{42}i}{294}$	0	0	0	0	0
$\frac{3\sqrt{105}i}{98}$	0	$-\frac{3\sqrt{42}i}{98}$	0	0	0	0	$\frac{\sqrt{70}i}{294}$	0	$\frac{11\sqrt{14}i}{294}$	0	0	0	0
0	$\frac{3\sqrt{42}i}{98}$	0	0	0	0	0	0	$-\frac{\sqrt{105}i}{147}$	0	$\frac{\sqrt{7}i}{21}$	0	0	0
0	0	0	0	$\frac{3\sqrt{42}i}{98}$	0	0	0	0	$-\frac{\sqrt{7}i}{21}$	0	$\frac{\sqrt{105}i}{147}$	0	0
0	0	0	$-\frac{3\sqrt{42}i}{98}$	0	$\frac{3\sqrt{105}i}{98}$	0	0	0	0	$-\frac{11\sqrt{14}i}{294}$	0	$-\frac{\sqrt{70}i}{294}$	0
0	0	0	0	$-\frac{3\sqrt{105}i}{98}$	0	0	0	0	0	0	$-\frac{5\sqrt{42}i}{294}$	0	$-\frac{5\sqrt{2}i}{42}$
$-\frac{5\sqrt{2}i}{42}$	0	0	0	0	0	0	$\frac{\sqrt{3}i}{14}$	0	0	0	0	0	0
0	$-\frac{\sqrt{70}i}{294}$	0	0	0	0	$-\frac{\sqrt{3}i}{14}$	0	$\frac{2\sqrt{7}i}{49}$	0	0	0	0	0
$-\frac{5\sqrt{42}i}{294}$	0	$\frac{\sqrt{105}i}{147}$	0	0	0	0	$-\frac{2\sqrt{7}i}{49}$	0	$\frac{\sqrt{35}i}{98}$	0	0	0	0
0	$-\frac{11\sqrt{14}i}{294}$	0	$\frac{\sqrt{7}i}{21}$	0	0	0	0	$-\frac{\sqrt{35}i}{98}$	0	0	0	0	0
0	0	$-\frac{\sqrt{7}i}{21}$	0	$\frac{11\sqrt{14}i}{294}$	0	0	0	0	0	0	$-\frac{\sqrt{35}i}{98}$	0	0
0	0	0	$-\frac{\sqrt{105}i}{147}$	0	$\frac{5\sqrt{42}i}{294}$	0	0	0	0	$\frac{\sqrt{35}i}{98}$	0	$-\frac{2\sqrt{7}i}{49}$	0
0	0	0	0	$\frac{\sqrt{70}i}{294}$	0	0	0	0	0	0	$\frac{2\sqrt{7}i}{49}$	0	$-\frac{\sqrt{3}i}{14}$
0	0	0	0	0	$\frac{5\sqrt{2}i}{42}$	0	0	0	0	0	0	$\frac{\sqrt{3}i}{14}$	0

multipole: $\mathbb{Q}_{2,1}^{(1,1;a)}(E)$

889	symmetry	$\sqrt{3}xz$

continued …

Table 10

No.	multipole	matrix													
	$\mathbb{Q}_{2,2}^{(1,1;a)}(E)$	0	$\frac{3\sqrt{105}}{98}$	0	0	0	0	$\frac{5\sqrt{2}}{42}$	0	$-\frac{5\sqrt{42}}{294}$	0	0	0	0	0
		$\frac{3\sqrt{105}}{98}$	0	$\frac{3\sqrt{42}}{98}$	0	0	0	0	$\frac{\sqrt{70}}{294}$	0	$-\frac{11\sqrt{14}}{294}$	0	0	0	0
		0	$\frac{3\sqrt{42}}{98}$	0	0	0	0	0	0	$-\frac{\sqrt{105}}{147}$	0	$-\frac{\sqrt{7}}{21}$	0	0	0
		0	0	0	0	$-\frac{3\sqrt{42}}{98}$	0	0	0	0	$-\frac{\sqrt{7}}{21}$	0	$-\frac{\sqrt{105}}{147}$	0	0
		0	0	0	$-\frac{3\sqrt{42}}{98}$	0	$-\frac{3\sqrt{105}}{98}$	0	0	0	0	$-\frac{11\sqrt{14}}{294}$	0	$\frac{\sqrt{70}}{294}$	0
		0	0	0	0	$-\frac{3\sqrt{105}}{98}$	0	0	0	0	0	0	$-\frac{5\sqrt{42}}{294}$	0	$\frac{5\sqrt{2}}{42}$
		$\frac{5\sqrt{2}}{42}$	0	0	0	0	0	0	$-\frac{\sqrt{3}}{14}$	0	0	0	0	0	0
		0	$\frac{\sqrt{70}}{294}$	0	0	0	0	$-\frac{\sqrt{3}}{14}$	0	$-\frac{2\sqrt{7}}{49}$	0	0	0	0	0
		$-\frac{5\sqrt{42}}{294}$	0	$-\frac{\sqrt{105}}{147}$	0	0	0	0	$-\frac{2\sqrt{7}}{49}$	0	$-\frac{\sqrt{35}}{98}$	0	0	0	0
		0	$-\frac{11\sqrt{14}}{294}$	0	$-\frac{\sqrt{7}}{21}$	0	0	0	0	$-\frac{\sqrt{35}}{98}$	0	0	0	0	0
		0	0	$-\frac{\sqrt{7}}{21}$	0	$-\frac{11\sqrt{14}}{294}$	0	0	0	0	0	0	$\frac{\sqrt{35}}{98}$	0	0
		0	0	0	$-\frac{\sqrt{105}}{147}$	0	$-\frac{5\sqrt{42}}{294}$	0	0	0	0	$\frac{\sqrt{35}}{98}$	0	$\frac{2\sqrt{7}}{49}$	0
		0	0	0	0	$\frac{\sqrt{70}}{294}$	0	0	0	0	0	0	$\frac{2\sqrt{7}}{49}$	0	$\frac{\sqrt{3}}{14}$
		0	0	0	0	0	$\frac{5\sqrt{2}}{42}$	0	0	0	0	0	0	$\frac{\sqrt{3}}{14}$	0
890	symmetry	$\frac{\sqrt{21}\left(x^4-3x^2y^2-3x^2z^2+y^4-3y^2z^2+z^4\right)}{6}$														

continued ...

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Table 10

No.	multipole	matrix

$\mathbb{Q}_4^{(1,1;a)}(A_1,1)$

$$\begin{pmatrix}
-\frac{\sqrt{110}}{84} & 0 & 0 & 0 & -\frac{5\sqrt{22}}{84} & 0 & 0 & \frac{2\sqrt{165}}{231} & 0 & 0 & 0 & \frac{2\sqrt{55}}{231} & 0 & 0 \\
0 & \frac{\sqrt{110}}{28} & 0 & 0 & 0 & -\frac{5\sqrt{22}}{84} & 0 & 0 & -\frac{8\sqrt{11}}{231} & 0 & 0 & 0 & \frac{4\sqrt{33}}{231} & 0 \\
0 & 0 & -\frac{\sqrt{110}}{42} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{330}}{231} & 0 & 0 & 0 & \frac{\sqrt{462}}{231} \\
0 & 0 & 0 & -\frac{\sqrt{110}}{42} & 0 & 0 & -\frac{\sqrt{462}}{231} & 0 & 0 & 0 & \frac{\sqrt{330}}{231} & 0 & 0 & 0 \\
-\frac{5\sqrt{22}}{84} & 0 & 0 & 0 & \frac{\sqrt{110}}{28} & 0 & 0 & -\frac{4\sqrt{33}}{231} & 0 & 0 & 0 & \frac{8\sqrt{11}}{231} & 0 & 0 \\
0 & -\frac{5\sqrt{22}}{84} & 0 & 0 & 0 & -\frac{\sqrt{110}}{84} & 0 & 0 & -\frac{2\sqrt{55}}{231} & 0 & 0 & 0 & -\frac{2\sqrt{165}}{231} & 0 \\
0 & 0 & 0 & -\frac{\sqrt{462}}{231} & 0 & 0 & \frac{\sqrt{110}}{264} & 0 & 0 & 0 & \frac{5\sqrt{154}}{1848} & 0 & 0 & 0 \\
\frac{2\sqrt{165}}{231} & 0 & 0 & 0 & -\frac{4\sqrt{33}}{231} & 0 & 0 & -\frac{13\sqrt{110}}{1848} & 0 & 0 & 0 & \frac{5\sqrt{330}}{1848} & 0 & 0 \\
0 & -\frac{8\sqrt{11}}{231} & 0 & 0 & 0 & -\frac{2\sqrt{55}}{231} & 0 & 0 & -\frac{\sqrt{110}}{616} & 0 & 0 & 0 & \frac{5\sqrt{330}}{1848} & 0 \\
0 & 0 & -\frac{\sqrt{330}}{231} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{110}}{616} & 0 & 0 & 0 & \frac{5\sqrt{154}}{1848} \\
0 & 0 & 0 & \frac{\sqrt{330}}{231} & 0 & 0 & \frac{5\sqrt{154}}{1848} & 0 & 0 & 0 & \frac{3\sqrt{110}}{616} & 0 & 0 & 0 \\
\frac{2\sqrt{55}}{231} & 0 & 0 & 0 & \frac{8\sqrt{11}}{231} & 0 & 0 & \frac{5\sqrt{330}}{1848} & 0 & 0 & 0 & -\frac{\sqrt{110}}{616} & 0 & 0 \\
0 & \frac{4\sqrt{33}}{231} & 0 & 0 & 0 & -\frac{2\sqrt{165}}{231} & 0 & 0 & \frac{5\sqrt{330}}{1848} & 0 & 0 & 0 & -\frac{13\sqrt{110}}{1848} & 0 \\
0 & 0 & \frac{\sqrt{462}}{231} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{5\sqrt{154}}{1848} & 0 & 0 & 0 & \frac{\sqrt{110}}{264}
\end{pmatrix}$$

| 891 | symmetry | $-\frac{\sqrt{15}\left(x^4-12x^2y^2+6x^2z^2+y^4+6y^2z^2-2z^4\right)}{12}$ |

Table 10

No.	multipole	matrix
	$\mathbb{Q}_4^{(1,1;a)}(A_1,2)$	$$\begin{pmatrix} -\frac{5\sqrt{154}}{588} & 0 & 0 & 0 & \frac{\sqrt{770}}{84} & 0 & 0 & \frac{10\sqrt{231}}{1617} & 0 & 0 & 0 & -\frac{2\sqrt{77}}{231} & 0 & 0 \\ 0 & \frac{5\sqrt{154}}{196} & 0 & 0 & 0 & \frac{\sqrt{770}}{84} & 0 & 0 & -\frac{8\sqrt{385}}{1617} & 0 & 0 & 0 & -\frac{4\sqrt{1155}}{1155} & 0 \\ 0 & 0 & -\frac{5\sqrt{154}}{294} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{5\sqrt{462}}{1617} & 0 & 0 & 0 & -\frac{\sqrt{330}}{165} \\ 0 & 0 & 0 & -\frac{5\sqrt{154}}{294} & 0 & 0 & \frac{\sqrt{330}}{165} & 0 & 0 & 0 & \frac{5\sqrt{462}}{1617} & 0 & 0 & 0 \\ \frac{\sqrt{770}}{84} & 0 & 0 & 0 & \frac{5\sqrt{154}}{196} & 0 & 0 & \frac{4\sqrt{1155}}{1155} & 0 & 0 & 0 & \frac{8\sqrt{385}}{1617} & 0 & 0 \\ 0 & \frac{\sqrt{770}}{84} & 0 & 0 & 0 & -\frac{5\sqrt{154}}{588} & 0 & 0 & \frac{2\sqrt{77}}{231} & 0 & 0 & 0 & -\frac{10\sqrt{231}}{1617} & 0 \\ 0 & 0 & 0 & \frac{\sqrt{330}}{165} & 0 & 0 & \frac{5\sqrt{154}}{1848} & 0 & 0 & 0 & -\frac{\sqrt{110}}{264} & 0 & 0 & 0 \\ \frac{10\sqrt{231}}{1617} & 0 & 0 & 0 & \frac{4\sqrt{1155}}{1155} & 0 & 0 & -\frac{65\sqrt{154}}{12936} & 0 & 0 & 0 & -\frac{5\sqrt{462}}{1848} & 0 & 0 \\ 0 & -\frac{8\sqrt{385}}{1617} & 0 & 0 & 0 & \frac{2\sqrt{77}}{231} & 0 & 0 & -\frac{5\sqrt{154}}{4312} & 0 & 0 & 0 & -\frac{5\sqrt{462}}{1848} & 0 \\ 0 & 0 & -\frac{5\sqrt{462}}{1617} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{15\sqrt{154}}{4312} & 0 & 0 & 0 & -\frac{\sqrt{110}}{264} \\ 0 & 0 & 0 & \frac{5\sqrt{462}}{1617} & 0 & 0 & -\frac{\sqrt{110}}{264} & 0 & 0 & 0 & \frac{15\sqrt{154}}{4312} & 0 & 0 & 0 \\ -\frac{2\sqrt{77}}{231} & 0 & 0 & 0 & \frac{8\sqrt{385}}{1617} & 0 & 0 & -\frac{5\sqrt{462}}{1848} & 0 & 0 & 0 & -\frac{5\sqrt{154}}{4312} & 0 & 0 \\ 0 & -\frac{4\sqrt{1155}}{1155} & 0 & 0 & 0 & -\frac{10\sqrt{231}}{1617} & 0 & 0 & -\frac{5\sqrt{462}}{1848} & 0 & 0 & 0 & -\frac{65\sqrt{154}}{12936} & 0 \\ 0 & 0 & -\frac{\sqrt{330}}{165} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{110}}{264} & 0 & 0 & 0 & \frac{5\sqrt{154}}{1848} \end{pmatrix}$$
892	symmetry	$\frac{\sqrt{35}xy(x-y)(x+y)}{2}$

Table 10

No.	multipole	matrix													
	$\mathbb{Q}_4^{(1,1;a)}(A_2)$	0	0	0	0	$\frac{\sqrt{330}i}{42}$	0	0	0	0	0	0	$-\frac{4\sqrt{33}i}{231}$	0	0
		0	0	0	0	0	$\frac{\sqrt{330}i}{42}$	0	0	0	0	0	0	$-\frac{8\sqrt{55}i}{385}$	0
		0	0	0	0	0	0	0	0	0	0	0	0	0	$-\frac{2\sqrt{770}i}{385}$
		0	0	0	0	0	0	$-\frac{2\sqrt{770}i}{385}$	0	0	0	0	0	0	0
		$-\frac{\sqrt{330}i}{42}$	0	0	0	0	0	0	$-\frac{8\sqrt{55}i}{385}$	0	0	0	0	0	0
		0	$-\frac{\sqrt{330}i}{42}$	0	0	0	0	0	0	$-\frac{4\sqrt{33}i}{231}$	0	0	0	0	0
		0	0	0	$\frac{2\sqrt{770}i}{385}$	0	0	0	0	0	0	$-\frac{\sqrt{2310}i}{924}$	0	0	0
		0	0	0	0	$\frac{8\sqrt{55}i}{385}$	0	0	0	0	0	0	$-\frac{5\sqrt{22}i}{308}$	0	0
		0	0	0	0	0	$\frac{4\sqrt{33}i}{231}$	0	0	0	0	0	0	$-\frac{5\sqrt{22}i}{308}$	0
		0	0	0	0	0	0	0	0	0	0	0	0	0	$-\frac{\sqrt{2310}i}{924}$
		0	0	0	0	0	0	$\frac{\sqrt{2310}i}{924}$	0	0	0	0	0	0	0
		$\frac{4\sqrt{33}i}{231}$	0	0	0	0	0	0	$\frac{5\sqrt{22}i}{308}$	0	0	0	0	0	0
		0	$\frac{8\sqrt{55}i}{385}$	0	0	0	0	0	0	$\frac{5\sqrt{22}i}{308}$	0	0	0	0	0
		0	0	$\frac{2\sqrt{770}i}{385}$	0	0	0	0	0	0	$\frac{\sqrt{2310}i}{924}$	0	0	0	0

| 893 | symmetry | $\frac{\sqrt{5}(x-y)(x+y)\left(x^2+y^2-6z^2\right)}{4}$ |

continued ...

Table 10

No.	multipole	matrix

0	0	$\frac{\sqrt{1155}}{98}$	0	0	0	0	0	0	$-\frac{4\sqrt{385}}{539}$	0	0	0	0
0	0	0	$-\frac{5\sqrt{231}}{294}$	0	0	$\frac{6\sqrt{55}}{385}$	0	0	0	$-\frac{2\sqrt{77}}{539}$	0	0	0
$\frac{\sqrt{1155}}{98}$	0	0	0	$-\frac{5\sqrt{231}}{294}$	0	0	$-\frac{9\sqrt{770}}{2695}$	0	0	0	$\frac{17\sqrt{2310}}{8085}$	0	0
0	$-\frac{5\sqrt{231}}{294}$	0	0	0	$\frac{\sqrt{1155}}{98}$	0	0	$-\frac{17\sqrt{2310}}{8085}$	0	0	0	$\frac{9\sqrt{770}}{2695}$	0
0	0	$-\frac{5\sqrt{231}}{294}$	0	0	0	0	0	0	$\frac{2\sqrt{77}}{539}$	0	0	0	$-\frac{6\sqrt{55}}{385}$
0	0	0	$\frac{\sqrt{1155}}{98}$	0	0	0	0	0	0	$\frac{4\sqrt{385}}{539}$	0	0	0
0	$\frac{6\sqrt{55}}{385}$	0	0	0	0	0	0	$-\frac{5\sqrt{22}}{308}$	0	0	0	0	0
0	0	$-\frac{9\sqrt{770}}{2695}$	0	0	0	0	0	0	$-\frac{\sqrt{2310}}{6468}$	0	0	0	0
0	0	0	$-\frac{17\sqrt{2310}}{8085}$	0	0	$-\frac{5\sqrt{22}}{308}$	0	0	0	$\frac{\sqrt{770}}{539}$	0	0	0
$-\frac{4\sqrt{385}}{539}$	0	0	0	$\frac{2\sqrt{77}}{539}$	0	0	$-\frac{\sqrt{2310}}{6468}$	0	0	0	$\frac{\sqrt{770}}{539}$	0	0
0	$-\frac{2\sqrt{77}}{539}$	0	0	0	$\frac{4\sqrt{385}}{539}$	0	0	$\frac{\sqrt{770}}{539}$	0	0	0	$-\frac{\sqrt{2310}}{6468}$	0
0	0	$\frac{17\sqrt{2310}}{8085}$	0	0	0	0	0	0	$\frac{\sqrt{770}}{539}$	0	0	0	$-\frac{5\sqrt{22}}{308}$
0	0	0	$\frac{9\sqrt{770}}{2695}$	0	0	0	0	0	0	$-\frac{\sqrt{2310}}{6468}$	0	0	0
0	0	0	0	$-\frac{6\sqrt{55}}{385}$	0	0	0	0	0	0	$-\frac{5\sqrt{22}}{308}$	0	0

Multipole: $\mathbb{Q}_4^{(1,1;a)}(B_1)$

No.	symmetry
894	$-\frac{\sqrt{5}xy\left(x^2+y^2-6z^2\right)}{2}$

continued …

Table 10

No.	multipole	matrix

| $\mathbb{Q}_4^{(1,1;a)}(B_2)$ |

$$\begin{pmatrix}
0 & 0 & \frac{\sqrt{1155}i}{98} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{4\sqrt{385}i}{539} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & -\frac{5\sqrt{231}i}{294} & 0 & 0 & -\frac{6\sqrt{55}i}{385} & 0 & 0 & 0 & -\frac{2\sqrt{77}i}{539} & 0 & 0 & 0 \\
-\frac{\sqrt{1155}i}{98} & 0 & 0 & 0 & -\frac{5\sqrt{231}i}{294} & 0 & 0 & \frac{9\sqrt{770}i}{2695} & 0 & 0 & 0 & \frac{17\sqrt{2310}i}{8085} & 0 & 0 \\
0 & \frac{5\sqrt{231}i}{294} & 0 & 0 & 0 & \frac{\sqrt{1155}i}{98} & 0 & 0 & \frac{17\sqrt{2310}i}{8085} & 0 & 0 & 0 & \frac{9\sqrt{770}i}{2695} & 0 \\
0 & 0 & \frac{5\sqrt{231}i}{294} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{2\sqrt{77}i}{539} & 0 & 0 & 0 & -\frac{6\sqrt{55}i}{385} \\
0 & 0 & 0 & -\frac{\sqrt{1155}i}{98} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{4\sqrt{385}i}{539} & 0 & 0 & 0 \\
0 & \frac{6\sqrt{55}i}{385} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{5\sqrt{22}i}{308} & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & -\frac{9\sqrt{770}i}{2695} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2310}i}{6468} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & -\frac{17\sqrt{2310}i}{8085} & 0 & 0 & \frac{5\sqrt{22}i}{308} & 0 & 0 & 0 & \frac{\sqrt{770}i}{539} & 0 & 0 & 0 \\
\frac{4\sqrt{385}i}{539} & 0 & 0 & 0 & \frac{2\sqrt{77}i}{539} & 0 & 0 & \frac{\sqrt{2310}i}{6468} & 0 & 0 & 0 & \frac{\sqrt{770}i}{539} & 0 & 0 \\
0 & \frac{2\sqrt{77}i}{539} & 0 & 0 & 0 & \frac{4\sqrt{385}i}{539} & 0 & 0 & -\frac{\sqrt{770}i}{539} & 0 & 0 & 0 & -\frac{\sqrt{2310}i}{6468} & 0 \\
0 & 0 & -\frac{17\sqrt{2310}i}{8085} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{770}i}{539} & 0 & 0 & 0 & -\frac{5\sqrt{22}i}{308} \\
0 & 0 & 0 & -\frac{9\sqrt{770}i}{2695} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2310}i}{6468} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & \frac{6\sqrt{55}i}{385} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{5\sqrt{22}i}{308} & 0 & 0 \\
\end{pmatrix}$$

| 895 | symmetry | $\frac{\sqrt{35}yz(y-z)(y+z)}{2}$ |

continued …

Table 10

No.	multipole	matrix

$\mathbb{Q}_{4,1}^{(1,1;a)}(E,1)$

$$\begin{pmatrix}
0 & -\frac{\sqrt{330}i}{84} & 0 & -\frac{\sqrt{165}i}{84} & 0 & 0 & \frac{\sqrt{77}i}{154} & 0 & \frac{5\sqrt{33}i}{231} & 0 & \frac{\sqrt{55}i}{154} & 0 & 0 & 0 \\
\frac{\sqrt{330}i}{84} & 0 & \frac{5\sqrt{33}i}{84} & 0 & 0 & 0 & 0 & -\frac{13\sqrt{55}i}{770} & 0 & -\frac{\sqrt{11}i}{77} & 0 & \frac{\sqrt{165}i}{330} & 0 & 0 \\
0 & -\frac{5\sqrt{33}i}{84} & 0 & 0 & 0 & \frac{\sqrt{165}i}{84} & \frac{3\sqrt{770}i}{1540} & 0 & \frac{\sqrt{330}i}{4620} & 0 & -\frac{\sqrt{22}i}{44} & 0 & -\frac{\sqrt{110}i}{1540} & 0 \\
\frac{\sqrt{165}i}{84} & 0 & 0 & 0 & -\frac{5\sqrt{33}i}{84} & 0 & 0 & \frac{\sqrt{110}i}{1540} & 0 & \frac{\sqrt{22}i}{44} & 0 & -\frac{\sqrt{330}i}{4620} & 0 & -\frac{3\sqrt{770}i}{1540} \\
0 & 0 & 0 & \frac{5\sqrt{33}i}{84} & 0 & \frac{\sqrt{330}i}{84} & 0 & 0 & -\frac{\sqrt{165}i}{330} & 0 & \frac{\sqrt{11}i}{77} & 0 & \frac{13\sqrt{55}i}{770} & 0 \\
0 & 0 & -\frac{\sqrt{165}i}{84} & 0 & -\frac{\sqrt{330}i}{84} & 0 & 0 & 0 & 0 & -\frac{\sqrt{55}i}{154} & 0 & -\frac{5\sqrt{33}i}{231} & 0 & -\frac{\sqrt{77}i}{154} \\
-\frac{\sqrt{77}i}{154} & 0 & -\frac{3\sqrt{770}i}{1540} & 0 & 0 & 0 & 0 & \frac{5\sqrt{462}i}{1848} & 0 & \frac{\sqrt{2310}i}{1848} & 0 & 0 & 0 & 0 \\
0 & \frac{13\sqrt{55}i}{770} & 0 & -\frac{\sqrt{110}i}{1540} & 0 & 0 & -\frac{5\sqrt{462}i}{1848} & 0 & -\frac{5\sqrt{22}i}{616} & 0 & \frac{\sqrt{330}i}{924} & 0 & 0 & 0 \\
-\frac{5\sqrt{33}i}{231} & 0 & -\frac{\sqrt{330}i}{4620} & 0 & \frac{\sqrt{165}i}{330} & 0 & 0 & \frac{5\sqrt{22}i}{616} & 0 & -\frac{3\sqrt{110}i}{616} & 0 & 0 & 0 & 0 \\
0 & \frac{\sqrt{11}i}{77} & 0 & -\frac{\sqrt{22}i}{44} & 0 & \frac{\sqrt{55}i}{154} & -\frac{\sqrt{2310}i}{1848} & 0 & \frac{3\sqrt{110}i}{616} & 0 & 0 & 0 & -\frac{\sqrt{330}i}{924} & 0 \\
-\frac{\sqrt{55}i}{154} & 0 & \frac{\sqrt{22}i}{44} & 0 & -\frac{\sqrt{11}i}{77} & 0 & 0 & -\frac{\sqrt{330}i}{924} & 0 & 0 & 0 & \frac{3\sqrt{110}i}{616} & 0 & -\frac{\sqrt{2310}i}{1848} \\
0 & -\frac{\sqrt{165}i}{330} & 0 & \frac{\sqrt{330}i}{4620} & 0 & \frac{5\sqrt{33}i}{231} & 0 & 0 & 0 & 0 & -\frac{3\sqrt{110}i}{616} & 0 & \frac{5\sqrt{22}i}{616} & 0 \\
0 & 0 & \frac{\sqrt{110}i}{1540} & 0 & -\frac{13\sqrt{55}i}{770} & 0 & 0 & 0 & 0 & \frac{\sqrt{330}i}{924} & 0 & -\frac{5\sqrt{22}i}{616} & 0 & -\frac{5\sqrt{462}i}{1848} \\
0 & 0 & 0 & \frac{3\sqrt{770}i}{1540} & 0 & \frac{\sqrt{77}i}{154} & 0 & 0 & 0 & 0 & \frac{\sqrt{2310}i}{1848} & 0 & \frac{5\sqrt{462}i}{1848} & 0
\end{pmatrix}$$

896	symmetry	$\frac{\sqrt{35}xz(x-z)(x+z)}{2}$

Table 10

No.	multipole	matrix

$\mathbb{Q}_{4,2}^{(1,1;a)}(E,1)$

$$\begin{pmatrix}
0 & \frac{\sqrt{330}}{84} & 0 & -\frac{\sqrt{165}}{84} & 0 & 0 & \frac{\sqrt{77}}{154} & 0 & -\frac{5\sqrt{33}}{231} & 0 & \frac{\sqrt{55}}{154} & 0 & 0 & 0 \\
\frac{\sqrt{330}}{84} & 0 & -\frac{5\sqrt{33}}{84} & 0 & 0 & 0 & 0 & -\frac{13\sqrt{55}}{770} & 0 & \frac{\sqrt{11}}{77} & 0 & \frac{\sqrt{165}}{330} & 0 & 0 \\
0 & -\frac{5\sqrt{33}}{84} & 0 & 0 & 0 & \frac{\sqrt{165}}{84} & -\frac{3\sqrt{770}}{1540} & 0 & \frac{\sqrt{330}}{4620} & 0 & \frac{\sqrt{22}}{44} & 0 & -\frac{\sqrt{110}}{1540} & 0 \\
-\frac{\sqrt{165}}{84} & 0 & 0 & 0 & \frac{5\sqrt{33}}{84} & 0 & 0 & -\frac{\sqrt{110}}{1540} & 0 & \frac{\sqrt{22}}{44} & 0 & \frac{\sqrt{330}}{4620} & 0 & -\frac{3\sqrt{770}}{1540} \\
0 & 0 & 0 & \frac{5\sqrt{33}}{84} & 0 & -\frac{\sqrt{330}}{84} & 0 & 0 & \frac{\sqrt{165}}{330} & 0 & \frac{\sqrt{11}}{77} & 0 & -\frac{13\sqrt{55}}{770} & 0 \\
0 & 0 & \frac{\sqrt{165}}{84} & 0 & -\frac{\sqrt{330}}{84} & 0 & 0 & 0 & 0 & \frac{\sqrt{55}}{154} & 0 & -\frac{5\sqrt{33}}{231} & 0 & \frac{\sqrt{77}}{154} \\
\frac{\sqrt{77}}{154} & 0 & -\frac{3\sqrt{770}}{1540} & 0 & 0 & 0 & 0 & -\frac{5\sqrt{462}}{1848} & 0 & \frac{\sqrt{2310}}{1848} & 0 & 0 & 0 & 0 \\
0 & -\frac{13\sqrt{55}}{770} & 0 & -\frac{\sqrt{110}}{1540} & 0 & 0 & -\frac{5\sqrt{462}}{1848} & 0 & \frac{5\sqrt{22}}{616} & 0 & \frac{\sqrt{330}}{924} & 0 & 0 & 0 \\
-\frac{5\sqrt{33}}{231} & 0 & \frac{\sqrt{330}}{4620} & 0 & \frac{\sqrt{165}}{330} & 0 & 0 & \frac{5\sqrt{22}}{616} & 0 & \frac{3\sqrt{110}}{616} & 0 & 0 & 0 & 0 \\
0 & \frac{\sqrt{11}}{77} & 0 & \frac{\sqrt{22}}{44} & 0 & \frac{\sqrt{55}}{154} & \frac{\sqrt{2310}}{1848} & 0 & \frac{3\sqrt{110}}{616} & 0 & 0 & 0 & -\frac{\sqrt{330}}{924} & 0 \\
\frac{\sqrt{55}}{154} & 0 & \frac{\sqrt{22}}{44} & 0 & \frac{\sqrt{11}}{77} & 0 & 0 & \frac{\sqrt{330}}{924} & 0 & 0 & 0 & -\frac{3\sqrt{110}}{616} & 0 & -\frac{\sqrt{2310}}{1848} \\
0 & \frac{\sqrt{165}}{330} & 0 & \frac{\sqrt{330}}{4620} & 0 & -\frac{5\sqrt{33}}{231} & 0 & 0 & 0 & 0 & -\frac{3\sqrt{110}}{616} & 0 & -\frac{5\sqrt{22}}{616} & 0 \\
0 & 0 & -\frac{\sqrt{110}}{1540} & 0 & -\frac{13\sqrt{55}}{770} & 0 & 0 & 0 & 0 & -\frac{\sqrt{330}}{924} & 0 & -\frac{5\sqrt{22}}{616} & 0 & \frac{5\sqrt{462}}{1848} \\
0 & 0 & 0 & -\frac{3\sqrt{770}}{1540} & 0 & \frac{\sqrt{77}}{154} & 0 & 0 & 0 & 0 & -\frac{\sqrt{2310}}{1848} & 0 & \frac{5\sqrt{462}}{1848} & 0
\end{pmatrix}$$

| 897 | symmetry | $\frac{\sqrt{5}yz\left(6x^2-y^2-z^2\right)}{2}$ |

continued …

Table 10

No.	multipole	matrix													
	$\mathbb{Q}_{4,1}^{(1,1;a)}(E,2)$	0	$-\frac{\sqrt{2310}i}{588}$	0	$\frac{\sqrt{1155}i}{84}$	0	0	$\frac{\sqrt{11}i}{154}$	0	$\frac{5\sqrt{231}i}{1617}$	0	$-\frac{\sqrt{385}i}{154}$	0	0	0
		$\frac{\sqrt{2310}i}{588}$	0	$\frac{5\sqrt{231}i}{588}$	0	0	0	0	$-\frac{13\sqrt{385}i}{5390}$	0	$-\frac{\sqrt{77}i}{539}$	0	$-\frac{\sqrt{1155}i}{330}$	0	0
		0	$-\frac{5\sqrt{231}i}{588}$	0	0	0	$-\frac{\sqrt{1155}i}{84}$	$-\frac{3\sqrt{110}i}{220}$	0	$\frac{\sqrt{2310}i}{32340}$	0	$-\frac{\sqrt{154}i}{308}$	0	$\frac{\sqrt{770}i}{1540}$	0
		$-\frac{\sqrt{1155}i}{84}$	0	0	0	$-\frac{5\sqrt{231}i}{588}$	0	0	$-\frac{\sqrt{770}i}{1540}$	0	$\frac{\sqrt{154}i}{308}$	0	$-\frac{\sqrt{2310}i}{32340}$	0	$\frac{3\sqrt{110}i}{220}$
		0	0	0	$\frac{5\sqrt{231}i}{588}$	0	$\frac{\sqrt{2310}i}{588}$	0	0	$\frac{\sqrt{1155}i}{330}$	0	$\frac{\sqrt{77}i}{539}$	0	$\frac{13\sqrt{385}i}{5390}$	0
		0	0	$\frac{\sqrt{1155}i}{84}$	0	$-\frac{\sqrt{2310}i}{588}$	0	0	0	0	$\frac{\sqrt{385}i}{154}$	0	$-\frac{5\sqrt{231}i}{1617}$	0	$-\frac{\sqrt{11}i}{154}$
		$-\frac{\sqrt{11}i}{154}$	0	$\frac{3\sqrt{110}i}{220}$	0	0	0	0	$\frac{5\sqrt{66}i}{1848}$	0	$-\frac{\sqrt{330}i}{264}$	0	0	0	0
		0	$\frac{13\sqrt{385}i}{5390}$	0	$\frac{\sqrt{770}i}{1540}$	0	0	$-\frac{5\sqrt{66}i}{1848}$	0	$-\frac{5\sqrt{154}i}{4312}$	0	$-\frac{\sqrt{2310}i}{924}$	0	0	0
		$-\frac{5\sqrt{231}i}{1617}$	0	$-\frac{\sqrt{2310}i}{32340}$	0	$-\frac{\sqrt{1155}i}{330}$	0	0	$\frac{5\sqrt{154}i}{4312}$	0	$-\frac{3\sqrt{770}i}{4312}$	0	0	0	0
		0	$\frac{\sqrt{77}i}{539}$	0	$-\frac{\sqrt{154}i}{308}$	0	$-\frac{\sqrt{385}i}{154}$	$\frac{\sqrt{330}i}{264}$	0	$\frac{3\sqrt{770}i}{4312}$	0	0	0	$\frac{\sqrt{2310}i}{924}$	0
		$\frac{\sqrt{385}i}{154}$	0	$\frac{\sqrt{154}i}{308}$	0	$-\frac{\sqrt{77}i}{539}$	0	0	$\frac{\sqrt{2310}i}{924}$	0	0	0	$\frac{3\sqrt{770}i}{4312}$	0	$\frac{\sqrt{330}i}{264}$
		0	$\frac{\sqrt{1155}i}{330}$	0	$\frac{\sqrt{2310}i}{32340}$	0	$\frac{5\sqrt{231}i}{1617}$	0	0	0	0	$-\frac{3\sqrt{770}i}{4312}$	0	$\frac{5\sqrt{154}i}{4312}$	0
		0	0	$-\frac{\sqrt{770}i}{1540}$	0	$-\frac{13\sqrt{385}i}{5390}$	0	0	0	0	$-\frac{\sqrt{2310}i}{924}$	0	$-\frac{5\sqrt{154}i}{4312}$	0	$-\frac{5\sqrt{66}i}{1848}$
		0	0	0	$-\frac{3\sqrt{110}i}{220}$	0	$\frac{\sqrt{11}i}{154}$	0	0	0	0	$-\frac{\sqrt{330}i}{264}$	0	$\frac{5\sqrt{66}i}{1848}$	0
898	symmetry	$-\frac{\sqrt{5}xz\left(x^2-6y^2+z^2\right)}{2}$													

356

Table 10

No.	multipole	matrix

$\mathbb{Q}_{4,2}^{(1,1;a)}(E,2)$

$$
\begin{pmatrix}
0 & \frac{\sqrt{2310}}{588} & 0 & \frac{\sqrt{1155}}{84} & 0 & 0 & \frac{\sqrt{11}}{154} & 0 & -\frac{5\sqrt{231}}{1617} & 0 & -\frac{\sqrt{385}}{154} & 0 & 0 & 0 \\
\frac{\sqrt{2310}}{588} & 0 & -\frac{5\sqrt{231}}{588} & 0 & 0 & 0 & 0 & -\frac{13\sqrt{385}}{5390} & 0 & \frac{\sqrt{77}}{539} & 0 & -\frac{\sqrt{1155}}{330} & 0 & 0 \\
0 & -\frac{5\sqrt{231}}{588} & 0 & 0 & 0 & -\frac{\sqrt{1155}}{84} & \frac{3\sqrt{110}}{220} & 0 & \frac{\sqrt{2310}}{32340} & 0 & \frac{\sqrt{154}}{308} & 0 & \frac{\sqrt{770}}{1540} & 0 \\
\frac{\sqrt{1155}}{84} & 0 & 0 & 0 & \frac{5\sqrt{231}}{588} & 0 & 0 & \frac{\sqrt{770}}{1540} & 0 & \frac{\sqrt{154}}{308} & 0 & \frac{\sqrt{2310}}{32340} & 0 & \frac{3\sqrt{110}}{220} \\
0 & 0 & 0 & \frac{5\sqrt{231}}{588} & 0 & -\frac{\sqrt{2310}}{588} & 0 & 0 & -\frac{\sqrt{1155}}{330} & 0 & \frac{\sqrt{77}}{539} & 0 & -\frac{13\sqrt{385}}{5390} & 0 \\
0 & 0 & -\frac{\sqrt{1155}}{84} & 0 & -\frac{\sqrt{2310}}{588} & 0 & 0 & 0 & 0 & -\frac{\sqrt{385}}{154} & 0 & -\frac{5\sqrt{231}}{1617} & 0 & \frac{\sqrt{11}}{154} \\
\frac{\sqrt{11}}{154} & 0 & \frac{3\sqrt{110}}{220} & 0 & 0 & 0 & 0 & -\frac{5\sqrt{66}}{1848} & 0 & -\frac{\sqrt{330}}{264} & 0 & 0 & 0 & 0 \\
0 & -\frac{13\sqrt{385}}{5390} & 0 & \frac{\sqrt{770}}{1540} & 0 & 0 & -\frac{5\sqrt{66}}{1848} & 0 & \frac{5\sqrt{154}}{4312} & 0 & -\frac{\sqrt{2310}}{924} & 0 & 0 & 0 \\
-\frac{5\sqrt{231}}{1617} & 0 & \frac{\sqrt{2310}}{32340} & 0 & -\frac{\sqrt{1155}}{330} & 0 & 0 & \frac{5\sqrt{154}}{4312} & 0 & \frac{3\sqrt{770}}{4312} & 0 & 0 & 0 & 0 \\
0 & \frac{\sqrt{77}}{539} & 0 & \frac{\sqrt{154}}{308} & 0 & -\frac{\sqrt{385}}{154} & -\frac{\sqrt{330}}{264} & 0 & \frac{3\sqrt{770}}{4312} & 0 & 0 & 0 & \frac{\sqrt{2310}}{924} & 0 \\
-\frac{\sqrt{385}}{154} & 0 & \frac{\sqrt{154}}{308} & 0 & \frac{\sqrt{77}}{539} & 0 & 0 & -\frac{\sqrt{2310}}{924} & 0 & 0 & 0 & -\frac{3\sqrt{770}}{4312} & 0 & \frac{\sqrt{330}}{264} \\
0 & -\frac{\sqrt{1155}}{330} & 0 & \frac{\sqrt{2310}}{32340} & 0 & -\frac{5\sqrt{231}}{1617} & 0 & 0 & 0 & 0 & -\frac{3\sqrt{770}}{4312} & 0 & -\frac{5\sqrt{154}}{4312} & 0 \\
0 & 0 & \frac{\sqrt{770}}{1540} & 0 & -\frac{13\sqrt{385}}{5390} & 0 & 0 & 0 & 0 & \frac{\sqrt{2310}}{924} & 0 & -\frac{5\sqrt{154}}{4312} & 0 & \frac{5\sqrt{66}}{1848} \\
0 & 0 & 0 & \frac{3\sqrt{110}}{220} & 0 & \frac{\sqrt{11}}{154} & 0 & 0 & 0 & 0 & \frac{\sqrt{330}}{264} & 0 & \frac{5\sqrt{66}}{1848} & 0
\end{pmatrix}
$$

899	symmetry	z

continued ...

Table 10

No.	multipole	matrix												
	$\mathbb{G}_1^{(1,0;a)}(A_2)$	0	0	0	0	0	0	0	$-\frac{\sqrt{42}i}{28}$	0	0	0	0	0
		0	0	0	0	0	0	0	0	$-\frac{\sqrt{70}i}{28}$	0	0	0	0
		0	0	0	0	0	0	0	0	0	$-\frac{\sqrt{21}i}{14}$	0	0	0
		0	0	0	0	0	0	0	0	0	0	$-\frac{\sqrt{21}i}{14}$	0	0
		0	0	0	0	0	0	0	0	0	0	0	$-\frac{\sqrt{70}i}{28}$	0
		0	0	0	0	0	0	0	0	0	0	0	0	$-\frac{\sqrt{42}i}{28}$
		0	0	0	0	0	0	0	0	0	0	0	0	0
		$\frac{\sqrt{42}i}{28}$	0	0	0	0	0	0	0	0	0	0	0	0
		0	$\frac{\sqrt{70}i}{28}$	0	0	0	0	0	0	0	0	0	0	0
		0	0	$\frac{\sqrt{21}i}{14}$	0	0	0	0	0	0	0	0	0	0
		0	0	0	$\frac{\sqrt{21}i}{14}$	0	0	0	0	0	0	0	0	0
		0	0	0	0	$\frac{\sqrt{70}i}{28}$	0	0	0	0	0	0	0	0
		0	0	0	0	0	$\frac{\sqrt{42}i}{28}$	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0	0
900	symmetry	x												

continued ...

Table 10

No.	multipole	matrix													
		0	0	0	0	0	0	$\frac{\sqrt{6}i}{8}$	0	$-\frac{\sqrt{14}i}{56}$	0	0	0	0	0
		0	0	0	0	0	0	0	$\frac{\sqrt{210}i}{56}$	0	$-\frac{\sqrt{42}i}{56}$	0	0	0	0
		0	0	0	0	0	0	0	0	$\frac{\sqrt{35}i}{28}$	0	$-\frac{\sqrt{21}i}{28}$	0	0	0
		0	0	0	0	0	0	0	0	0	$\frac{\sqrt{21}i}{28}$	0	$-\frac{\sqrt{35}i}{28}$	0	0
		0	0	0	0	0	0	0	0	0	0	$\frac{\sqrt{42}i}{56}$	0	$-\frac{\sqrt{210}i}{56}$	0
	$\mathbb{G}_{1,1}^{(1,0;a)}(E)$	0	0	0	0	0	0	0	0	0	0	0	$\frac{\sqrt{14}i}{56}$	0	$-\frac{\sqrt{6}i}{8}$
		$-\frac{\sqrt{6}i}{8}$	0	0	0	0	0	0	0	0	0	0	0	0	0
		0	$-\frac{\sqrt{210}i}{56}$	0	0	0	0	0	0	0	0	0	0	0	0
		$\frac{\sqrt{14}i}{56}$	0	$-\frac{\sqrt{35}i}{28}$	0	0	0	0	0	0	0	0	0	0	0
		0	$\frac{\sqrt{42}i}{56}$	0	$-\frac{\sqrt{21}i}{28}$	0	0	0	0	0	0	0	0	0	0
		0	0	$\frac{\sqrt{21}i}{28}$	0	$-\frac{\sqrt{42}i}{56}$	0	0	0	0	0	0	0	0	0
		0	0	0	$\frac{\sqrt{35}i}{28}$	0	$-\frac{\sqrt{14}i}{56}$	0	0	0	0	0	0	0	0
		0	0	0	0	$\frac{\sqrt{210}i}{56}$	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	$\frac{\sqrt{6}i}{8}$	0	0	0	0	0	0	0	0

901	symmetry	$-y$

continued …

Table 10

No.	multipole	matrix

$$\mathbb{G}_{1,2}^{(1,0;a)}(E)$$

$$\begin{pmatrix}
0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{8} & 0 & \frac{\sqrt{14}}{56} & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{210}}{56} & 0 & \frac{\sqrt{42}}{56} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{35}}{28} & 0 & \frac{\sqrt{21}}{28} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{21}}{28} & 0 & \frac{\sqrt{35}}{28} & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{42}}{56} & 0 & \frac{\sqrt{210}}{56} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{14}}{56} & 0 & \frac{\sqrt{6}}{8} \\
\frac{\sqrt{6}}{8} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & \frac{\sqrt{210}}{56} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
\frac{\sqrt{14}}{56} & 0 & \frac{\sqrt{35}}{28} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & \frac{\sqrt{42}}{56} & 0 & \frac{\sqrt{21}}{28} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & \frac{\sqrt{21}}{28} & 0 & \frac{\sqrt{42}}{56} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & \frac{\sqrt{35}}{28} & 0 & \frac{\sqrt{14}}{56} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & \frac{\sqrt{210}}{56} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{8} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0
\end{pmatrix}$$

902	symmetry	$-\frac{z\left(3x^2+3y^2-2z^2\right)}{2}$

Table 10

No.	multipole	matrix

$\mathbb{G}_3^{(1,0;a)}(A_2)$

0	0	0	0	0	0	0	$\frac{\sqrt{6}i}{6}$	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	$-\frac{\sqrt{3}i}{6}$	0	0	0	0
0	0	0	0	0	0	0	0	0	0	$-\frac{\sqrt{3}i}{6}$	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	$\frac{\sqrt{6}i}{6}$	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0
$-\frac{\sqrt{6}i}{6}$	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	$\frac{\sqrt{3}i}{6}$	0	0	0	0	0	0	0	0	0	0	0
0	0	0	$\frac{\sqrt{3}i}{6}$	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	$-\frac{\sqrt{6}i}{6}$	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0

903	symmetry	$\sqrt{15}xyz$

Table 10

No.	multipole	matrix												

$$\mathbb{G}_3^{(1,0;a)}(B_1)$$

$$
\begin{pmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2}}{6} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{14}}{12} & 0 & 0 & 0 & \frac{\sqrt{10}}{12} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{1}{12} & 0 & 0 & 0 & \frac{\sqrt{3}}{12} & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{12} & 0 & 0 & 0 & -\frac{1}{12} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}}{12} & 0 & 0 & 0 & -\frac{\sqrt{14}}{12} \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}}{6} & 0 & 0 & 0 \\
0 & \frac{\sqrt{14}}{12} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & \frac{1}{12} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & -\frac{\sqrt{3}}{12} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
\frac{\sqrt{2}}{6} & 0 & 0 & 0 & -\frac{\sqrt{10}}{12} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & \frac{\sqrt{10}}{12} & 0 & 0 & 0 & -\frac{\sqrt{2}}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & \frac{\sqrt{3}}{12} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & -\frac{1}{12} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & -\frac{\sqrt{14}}{12} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
\end{pmatrix}
$$

904	symmetry	$\frac{\sqrt{15}z(x-y)(x+y)}{2}$

continued ...

Table 10

No.	multipole	matrix

$\mathbb{G}_3^{(1,0;a)}(B_2)$

$$\begin{pmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2}i}{6} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{14}i}{12} & 0 & 0 & 0 & \frac{\sqrt{10}i}{12} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{i}{12} & 0 & 0 & 0 & \frac{\sqrt{3}i}{12} & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{12} & 0 & 0 & 0 & -\frac{i}{12} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}i}{12} & 0 & 0 & 0 & -\frac{\sqrt{14}i}{12} \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2}i}{6} & 0 & 0 & 0 \\
0 & \frac{\sqrt{14}i}{12} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & \frac{i}{12} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & -\frac{\sqrt{3}i}{12} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
-\frac{\sqrt{2}i}{6} & 0 & 0 & 0 & -\frac{\sqrt{10}i}{12} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & -\frac{\sqrt{10}i}{12} & 0 & 0 & 0 & -\frac{\sqrt{2}i}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & -\frac{\sqrt{3}i}{12} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & \frac{i}{12} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & \frac{\sqrt{14}i}{12} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0
\end{pmatrix}$$

| 905 | symmetry | $\frac{x\left(2x^2-3y^2-3z^2\right)}{2}$ |

continued ...

Table 10

No.	multipole	matrix

$$\mathbb{G}_{3,1}^{(1,0;a)}(E,1)$$

$$
\begin{pmatrix}
0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{42}i}{48} & 0 & -\frac{\sqrt{2}i}{8} & 0 & \frac{\sqrt{30}i}{48} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}i}{48} & 0 & -\frac{\sqrt{6}i}{24} & 0 & \frac{\sqrt{10}i}{16} & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{105}i}{48} & 0 & -\frac{\sqrt{5}i}{16} & 0 & \frac{\sqrt{3}i}{48} & 0 & \frac{\sqrt{15}i}{16} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{16} & 0 & -\frac{\sqrt{3}i}{48} & 0 & \frac{\sqrt{5}i}{16} & 0 & \frac{\sqrt{105}i}{48} \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}i}{16} & 0 & \frac{\sqrt{6}i}{24} & 0 & \frac{\sqrt{30}i}{48} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}i}{48} & 0 & \frac{\sqrt{2}i}{8} & 0 & -\frac{\sqrt{42}i}{48} \\
-\frac{\sqrt{42}i}{48} & 0 & \frac{\sqrt{105}i}{48} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & \frac{\sqrt{30}i}{48} & 0 & \frac{\sqrt{15}i}{16} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
\frac{\sqrt{2}i}{8} & 0 & \frac{\sqrt{5}i}{16} & 0 & \frac{\sqrt{10}i}{16} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & \frac{\sqrt{6}i}{24} & 0 & \frac{\sqrt{3}i}{48} & 0 & \frac{\sqrt{30}i}{48} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
-\frac{\sqrt{30}i}{48} & 0 & -\frac{\sqrt{3}i}{48} & 0 & -\frac{\sqrt{6}i}{24} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & -\frac{\sqrt{10}i}{16} & 0 & -\frac{\sqrt{5}i}{16} & 0 & -\frac{\sqrt{2}i}{8} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & -\frac{\sqrt{15}i}{16} & 0 & -\frac{\sqrt{30}i}{48} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & -\frac{\sqrt{105}i}{48} & 0 & \frac{\sqrt{42}i}{48} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
\end{pmatrix}
$$

| 906 | symmetry | $\frac{y\left(3x^2-2y^2+3z^2\right)}{2}$ |

continued ...

Table 10

No.	multipole	matrix

$$\mathbb{G}_{3,2}^{(1,0;a)}(E,1)$$

$$\begin{pmatrix}
0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{42}}{48} & 0 & \frac{\sqrt{2}}{8} & 0 & \frac{\sqrt{30}}{48} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}}{48} & 0 & \frac{\sqrt{6}}{24} & 0 & \frac{\sqrt{10}}{16} & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{105}}{48} & 0 & -\frac{\sqrt{5}}{16} & 0 & -\frac{\sqrt{3}}{48} & 0 & \frac{\sqrt{15}}{16} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{16} & 0 & -\frac{\sqrt{3}}{48} & 0 & -\frac{\sqrt{5}}{16} & 0 & \frac{\sqrt{105}}{48} \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}}{16} & 0 & \frac{\sqrt{6}}{24} & 0 & -\frac{\sqrt{30}}{48} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{48} & 0 & \frac{\sqrt{2}}{8} & 0 & \frac{\sqrt{42}}{48} \\
\frac{\sqrt{42}}{48} & 0 & \frac{\sqrt{105}}{48} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & -\frac{\sqrt{30}}{48} & 0 & \frac{\sqrt{15}}{16} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
\frac{\sqrt{2}}{8} & 0 & -\frac{\sqrt{5}}{16} & 0 & \frac{\sqrt{10}}{16} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & \frac{\sqrt{6}}{24} & 0 & -\frac{\sqrt{3}}{48} & 0 & \frac{\sqrt{30}}{48} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
\frac{\sqrt{30}}{48} & 0 & -\frac{\sqrt{3}}{48} & 0 & \frac{\sqrt{6}}{24} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & \frac{\sqrt{10}}{16} & 0 & -\frac{\sqrt{5}}{16} & 0 & \frac{\sqrt{2}}{8} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & \frac{\sqrt{15}}{16} & 0 & -\frac{\sqrt{30}}{48} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & \frac{\sqrt{105}}{48} & 0 & \frac{\sqrt{42}}{48} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0
\end{pmatrix}$$

| 907 | symmetry | $\frac{\sqrt{15}\,x(y-z)(y+z)}{2}$ |

365

Table 10

No.	multipole	matrix													

$\mathbb{G}_{3,1}^{(1,0;a)}(E,2)$

$$
\begin{pmatrix}
0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{70}i}{48} & 0 & -\frac{\sqrt{30}i}{24} & 0 & -\frac{\sqrt{2}i}{16} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{5\sqrt{2}i}{48} & 0 & -\frac{\sqrt{10}i}{24} & 0 & -\frac{\sqrt{6}i}{16} & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}i}{16} & 0 & -\frac{5\sqrt{3}i}{48} & 0 & \frac{\sqrt{5}i}{48} & 0 & -\frac{3i}{16} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3i}{16} & 0 & -\frac{\sqrt{5}i}{48} & 0 & \frac{5\sqrt{3}i}{48} & 0 & -\frac{\sqrt{7}i}{16} \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}i}{16} & 0 & \frac{\sqrt{10}i}{24} & 0 & \frac{5\sqrt{2}i}{48} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2}i}{16} & 0 & \frac{\sqrt{30}i}{24} & 0 & -\frac{\sqrt{70}i}{48} \\
-\frac{\sqrt{70}i}{48} & 0 & -\frac{\sqrt{7}i}{16} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & \frac{5\sqrt{2}i}{48} & 0 & -\frac{3i}{16} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
\frac{\sqrt{30}i}{24} & 0 & \frac{5\sqrt{3}i}{48} & 0 & -\frac{\sqrt{6}i}{16} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & \frac{\sqrt{10}i}{24} & 0 & \frac{\sqrt{5}i}{48} & 0 & -\frac{\sqrt{2}i}{16} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
\frac{\sqrt{2}i}{16} & 0 & -\frac{\sqrt{5}i}{48} & 0 & -\frac{\sqrt{10}i}{24} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & \frac{\sqrt{6}i}{16} & 0 & -\frac{5\sqrt{3}i}{48} & 0 & -\frac{\sqrt{30}i}{24} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & \frac{3i}{16} & 0 & -\frac{5\sqrt{2}i}{48} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & \frac{\sqrt{7}i}{16} & 0 & \frac{\sqrt{70}i}{48} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0
\end{pmatrix}
$$

908	symmetry	$-\frac{\sqrt{15}y(x-z)(x+z)}{2}$

Table 10

No.	multipole	matrix

$\mathbb{G}_{3,2}^{(1,0;a)}(E,2)$

$$\begin{pmatrix}
0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{70}}{48} & 0 & \frac{\sqrt{30}}{24} & 0 & -\frac{\sqrt{2}}{16} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{5\sqrt{2}}{48} & 0 & \frac{\sqrt{10}}{24} & 0 & -\frac{\sqrt{6}}{16} & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}}{16} & 0 & -\frac{5\sqrt{3}}{48} & 0 & -\frac{\sqrt{5}}{48} & 0 & -\frac{3}{16} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3}{16} & 0 & -\frac{\sqrt{5}}{48} & 0 & -\frac{5\sqrt{3}}{48} & 0 & -\frac{\sqrt{7}}{16} \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}}{16} & 0 & \frac{\sqrt{10}}{24} & 0 & -\frac{5\sqrt{2}}{48} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}}{16} & 0 & \frac{\sqrt{30}}{24} & 0 & \frac{\sqrt{70}}{48} \\
\frac{\sqrt{70}}{48} & 0 & -\frac{\sqrt{7}}{16} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & -\frac{5\sqrt{2}}{48} & 0 & -\frac{3}{16} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
\frac{\sqrt{30}}{24} & 0 & -\frac{5\sqrt{3}}{48} & 0 & -\frac{\sqrt{6}}{16} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & \frac{\sqrt{10}}{24} & 0 & -\frac{\sqrt{5}}{48} & 0 & -\frac{\sqrt{2}}{16} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
-\frac{\sqrt{2}}{16} & 0 & -\frac{\sqrt{5}}{48} & 0 & \frac{\sqrt{10}}{24} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & -\frac{\sqrt{6}}{16} & 0 & -\frac{5\sqrt{3}}{48} & 0 & \frac{\sqrt{30}}{24} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & -\frac{3}{16} & 0 & -\frac{5\sqrt{2}}{48} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & -\frac{\sqrt{7}}{16} & 0 & \frac{\sqrt{70}}{48} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0
\end{pmatrix}$$

| 909 | symmetry | $\frac{3\sqrt{35}xyz(x-y)(x+y)}{2}$ |

continued ...

367

Table 10

No.	multipole	matrix

$$\mathbb{G}_5^{(1,0;a)}(A_1) = \begin{pmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}}{4} & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}}{60} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{105}}{30} \\
0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{105}}{30} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{60} & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2}}{4} & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & -\frac{\sqrt{105}}{30} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & \frac{\sqrt{30}}{60} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2}}{4} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
-\frac{\sqrt{2}}{4} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & -\frac{\sqrt{30}}{60} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & \frac{\sqrt{105}}{30} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0
\end{pmatrix}$$

| 910 | symmetry | $\dfrac{z\left(15x^4+30x^2y^2-40x^2z^2+15y^4-40y^2z^2+8z^4\right)}{8}$ |

Table 10

No.	multipole	matrix												

$\mathbb{G}_5^{(1,0;a)}(A_2,1)$

0	0	0	0	0	0	0	$-\frac{\sqrt{210}i}{84}$	0	0	0	0	0	0
0	0	0	0	0	0	0	0	$\frac{3\sqrt{14}i}{28}$	0	0	0	0	0
0	0	0	0	0	0	0	0	0	$-\frac{\sqrt{105}i}{42}$	0	0	0	0
0	0	0	0	0	0	0	0	0	0	$-\frac{\sqrt{105}i}{42}$	0	0	0
0	0	0	0	0	0	0	0	0	0	0	$\frac{3\sqrt{14}i}{28}$	0	0
0	0	0	0	0	0	0	0	0	0	0	0	$-\frac{\sqrt{210}i}{84}$	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0
$\frac{\sqrt{210}i}{84}$	0	0	0	0	0	0	0	0	0	0	0	0	0
0	$-\frac{3\sqrt{14}i}{28}$	0	0	0	0	0	0	0	0	0	0	0	0
0	0	$\frac{\sqrt{105}i}{42}$	0	0	0	0	0	0	0	0	0	0	0
0	0	0	$\frac{\sqrt{105}i}{42}$	0	0	0	0	0	0	0	0	0	0
0	0	0	0	$-\frac{3\sqrt{14}i}{28}$	0	0	0	0	0	0	0	0	0
0	0	0	0	0	$\frac{\sqrt{210}i}{84}$	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0

911	symmetry	$\frac{3\sqrt{35}z\left(x^2-2xy-y^2\right)\left(x^2+2xy-y^2\right)}{8}$

continued …

Table 10

No.	multipole	matrix

$$\mathbb{G}_5^{(1,0;a)}(A_2,2)$$

$$
\begin{bmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}i}{4} & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}i}{60} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{105}i}{30} \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{105}i}{30} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}i}{60} & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}i}{4} & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & -\frac{\sqrt{105}i}{30} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & \frac{\sqrt{30}i}{60} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2}i}{4} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
\frac{\sqrt{2}i}{4} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & \frac{\sqrt{30}i}{60} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & -\frac{\sqrt{105}i}{30} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0
\end{bmatrix}
$$

912	symmetry	$\frac{\sqrt{105}\,xyz\left(x^2+y^2-2z^2\right)}{2}$

continued ...

Table 10

No.	multipole	matrix

$$\mathbb{G}_5^{(1,0;a)}(B_1)$$

$$\begin{pmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}}{12} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{70}}{60} & 0 & 0 & 0 & -\frac{\sqrt{2}}{6} & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{2\sqrt{5}}{15} & 0 & 0 & 0 & -\frac{\sqrt{15}}{30} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{30} & 0 & 0 & 0 & \frac{2\sqrt{5}}{15} \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2}}{6} & 0 & 0 & -\frac{\sqrt{70}}{60} \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}}{12} & 0 & 0 & 0 \\
0 & \frac{\sqrt{70}}{60} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & -\frac{2\sqrt{5}}{15} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & \frac{\sqrt{15}}{30} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
\frac{\sqrt{10}}{12} & 0 & 0 & 0 & \frac{\sqrt{2}}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & -\frac{\sqrt{2}}{6} & 0 & 0 & 0 & -\frac{\sqrt{10}}{12} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & -\frac{\sqrt{15}}{30} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & \frac{2\sqrt{5}}{15} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & -\frac{\sqrt{70}}{60} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0
\end{pmatrix}$$

| 913 | symmetry | $-\dfrac{\sqrt{105}\,z(x-y)(x+y)\left(x^2+y^2-2z^2\right)}{4}$ |

continued ...

Table 10

<table>
<tr><th>No.</th><th>multipole</th><th colspan="14">matrix</th></tr>
<tr><td rowspan="15"></td><td rowspan="15">$\mathbb{G}_5^{(1,0;a)}(B_2)$</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>$-\frac{\sqrt{10}i}{12}$</td><td>0</td><td>0</td><td>0</td><td>0</td></tr>
<tr><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>$\frac{\sqrt{70}i}{60}$</td><td>0</td><td>0</td><td>0</td><td>$\frac{\sqrt{2}i}{6}$</td><td>0</td><td>0</td><td>0</td></tr>
<tr><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>$-\frac{2\sqrt{5}i}{15}$</td><td>0</td><td>0</td><td>0</td><td>$\frac{\sqrt{15}i}{30}$</td><td>0</td><td>0</td></tr>
<tr><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>$\frac{\sqrt{15}i}{30}$</td><td>0</td><td>0</td><td>0</td><td>$-\frac{2\sqrt{5}i}{15}$</td><td>0</td></tr>
<tr><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>$\frac{\sqrt{2}i}{6}$</td><td>0</td><td>0</td><td>0</td><td>$\frac{\sqrt{70}i}{60}$</td></tr>
<tr><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>$-\frac{\sqrt{10}i}{12}$</td><td>0</td><td>0</td><td>0</td></tr>
<tr><td>0</td><td>$-\frac{\sqrt{70}i}{60}$</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr>
<tr><td>0</td><td>0</td><td>$\frac{2\sqrt{5}i}{15}$</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr>
<tr><td>0</td><td>0</td><td>0</td><td>$-\frac{\sqrt{15}i}{30}$</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr>
<tr><td>$\frac{\sqrt{10}i}{12}$</td><td>0</td><td>0</td><td>0</td><td>$-\frac{\sqrt{2}i}{6}$</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr>
<tr><td>0</td><td>$-\frac{\sqrt{2}i}{6}$</td><td>0</td><td>0</td><td>0</td><td>$\frac{\sqrt{10}i}{12}$</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr>
<tr><td>0</td><td>0</td><td>$-\frac{\sqrt{15}i}{30}$</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr>
<tr><td>0</td><td>0</td><td>0</td><td>$\frac{2\sqrt{5}i}{15}$</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr>
<tr><td>0</td><td>0</td><td>0</td><td>0</td><td>$-\frac{\sqrt{70}i}{60}$</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr>
<tr><td>914</td><td>symmetry</td><td colspan="14">$\frac{x\left(8x^4-40x^2y^2-40x^2z^2+15y^4+30y^2z^2+15z^4\right)}{8}$</td></tr>
</table>

Table 10

No.	multipole	matrix

$\mathbb{G}_{5,1}^{(1,0;a)}(E,1)$

$$\begin{pmatrix}
0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}i}{192} & 0 & -\frac{5\sqrt{70}i}{448} & 0 & \frac{5\sqrt{42}i}{192} & 0 & -\frac{\sqrt{210}i}{64} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{23\sqrt{42}i}{1344} & 0 & \frac{13\sqrt{210}i}{1344} & 0 & -\frac{\sqrt{14}i}{64} & 0 & -\frac{7\sqrt{6}i}{64} \\
0 & 0 & 0 & 0 & 0 & 0 & -\frac{7\sqrt{3}i}{96} & 0 & \frac{11\sqrt{7}i}{224} & 0 & -\frac{\sqrt{105}i}{672} & 0 & -\frac{\sqrt{21}i}{32} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{21}i}{32} & 0 & \frac{\sqrt{105}i}{672} & 0 & -\frac{11\sqrt{7}i}{224} & 0 & \frac{7\sqrt{3}i}{96} \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{7\sqrt{6}i}{64} & 0 & \frac{\sqrt{14}i}{64} & 0 & -\frac{13\sqrt{210}i}{1344} & 0 & \frac{23\sqrt{42}i}{1344} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{210}i}{64} & 0 & -\frac{5\sqrt{42}i}{192} & 0 & \frac{5\sqrt{70}i}{448} & 0 & -\frac{\sqrt{30}i}{192} \\
-\frac{\sqrt{30}i}{192} & 0 & \frac{7\sqrt{3}i}{96} & 0 & -\frac{7\sqrt{6}i}{64} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & \frac{23\sqrt{42}i}{1344} & 0 & -\frac{\sqrt{21}i}{32} & 0 & -\frac{\sqrt{210}i}{64} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
\frac{5\sqrt{70}i}{448} & 0 & -\frac{11\sqrt{7}i}{224} & 0 & -\frac{\sqrt{14}i}{64} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & -\frac{13\sqrt{210}i}{1344} & 0 & -\frac{\sqrt{105}i}{672} & 0 & \frac{5\sqrt{42}i}{192} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
-\frac{5\sqrt{42}i}{192} & 0 & \frac{\sqrt{105}i}{672} & 0 & \frac{13\sqrt{210}i}{1344} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & \frac{\sqrt{14}i}{64} & 0 & \frac{11\sqrt{7}i}{224} & 0 & -\frac{5\sqrt{70}i}{448} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
\frac{\sqrt{210}i}{64} & 0 & \frac{\sqrt{21}i}{32} & 0 & -\frac{23\sqrt{42}i}{1344} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & \frac{7\sqrt{6}i}{64} & 0 & -\frac{7\sqrt{3}i}{96} & 0 & \frac{\sqrt{30}i}{192} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0
\end{pmatrix}$$

| 915 | symmetry | $-\frac{y\left(15x^4-40x^2y^2+30x^2z^2+8y^4-40y^2z^2+15z^4\right)}{8}$ |

Table 10

No.	multipole	matrix												

$\mathbb{G}_{5,2}^{(1,0;a)}(E,1)$

$$\begin{pmatrix}
0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{192} & 0 & \frac{5\sqrt{70}}{448} & 0 & \frac{5\sqrt{42}}{192} & 0 & \frac{\sqrt{210}}{64} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{23\sqrt{42}}{1344} & 0 & -\frac{13\sqrt{210}}{1344} & 0 & -\frac{\sqrt{14}}{64} & 0 & \frac{7\sqrt{6}}{64} \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{7\sqrt{3}}{96} & 0 & \frac{11\sqrt{7}}{224} & 0 & \frac{\sqrt{105}}{672} & 0 & -\frac{\sqrt{21}}{32} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{21}}{32} & 0 & \frac{\sqrt{105}}{672} & 0 & \frac{11\sqrt{7}}{224} & 0 & \frac{7\sqrt{3}}{96} \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{7\sqrt{6}}{64} & 0 & -\frac{\sqrt{14}}{64} & 0 & -\frac{13\sqrt{210}}{1344} & 0 & -\frac{23\sqrt{42}}{1344} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{210}}{64} & 0 & \frac{5\sqrt{42}}{192} & 0 & \frac{5\sqrt{70}}{448} & 0 & \frac{\sqrt{30}}{192} \\
\frac{\sqrt{30}}{192} & 0 & \frac{7\sqrt{3}}{96} & 0 & \frac{7\sqrt{6}}{64} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & -\frac{23\sqrt{42}}{1344} & 0 & -\frac{\sqrt{21}}{32} & 0 & \frac{\sqrt{210}}{64} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
\frac{5\sqrt{70}}{448} & 0 & \frac{11\sqrt{7}}{224} & 0 & -\frac{\sqrt{14}}{64} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & -\frac{13\sqrt{210}}{1344} & 0 & \frac{\sqrt{105}}{672} & 0 & \frac{5\sqrt{42}}{192} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
\frac{5\sqrt{42}}{192} & 0 & \frac{\sqrt{105}}{672} & 0 & -\frac{13\sqrt{210}}{1344} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & -\frac{\sqrt{14}}{64} & 0 & \frac{11\sqrt{7}}{224} & 0 & \frac{5\sqrt{70}}{448} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
\frac{\sqrt{210}}{64} & 0 & -\frac{\sqrt{21}}{32} & 0 & -\frac{23\sqrt{42}}{1344} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & \frac{7\sqrt{6}}{64} & 0 & \frac{7\sqrt{3}}{96} & 0 & \frac{\sqrt{30}}{192} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0
\end{pmatrix}$$

916	symmetry	$\dfrac{3\sqrt{35}\,x\left(y^2-2yz-z^2\right)\left(y^2+2yz-z^2\right)}{8}$

Table 10

No.	multipole	matrix

$\mathbb{G}_{5,1}^{(1,0;a)}(E,2)$

$$\begin{bmatrix}
0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{42}i}{192} & 0 & -\frac{5\sqrt{2}i}{64} & 0 & -\frac{3\sqrt{30}i}{64} & 0 & -\frac{5\sqrt{6}i}{192} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{23\sqrt{30}i}{960} & 0 & \frac{13\sqrt{6}i}{192} & 0 & \frac{9\sqrt{10}i}{320} & 0 & -\frac{\sqrt{210}i}{192} \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{105}i}{160} & 0 & \frac{11\sqrt{5}i}{160} & 0 & -\frac{\sqrt{3}i}{96} & 0 & \frac{9\sqrt{15}i}{160} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{9\sqrt{15}i}{160} & 0 & \frac{\sqrt{3}i}{96} & 0 & -\frac{11\sqrt{5}i}{160} & 0 & -\frac{3\sqrt{105}i}{160} \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{210}i}{192} & 0 & -\frac{9\sqrt{10}i}{320} & 0 & -\frac{13\sqrt{6}i}{192} & 0 & \frac{23\sqrt{30}i}{960} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{5\sqrt{6}i}{192} & 0 & \frac{3\sqrt{30}i}{64} & 0 & \frac{5\sqrt{2}i}{64} & 0 & -\frac{\sqrt{42}i}{192} \\
-\frac{\sqrt{42}i}{192} & 0 & -\frac{3\sqrt{105}i}{160} & 0 & -\frac{\sqrt{210}i}{192} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & \frac{23\sqrt{30}i}{960} & 0 & \frac{9\sqrt{15}i}{160} & 0 & -\frac{5\sqrt{6}i}{192} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
\frac{5\sqrt{2}i}{64} & 0 & -\frac{11\sqrt{5}i}{160} & 0 & \frac{9\sqrt{10}i}{320} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & -\frac{13\sqrt{6}i}{192} & 0 & -\frac{\sqrt{3}i}{96} & 0 & -\frac{3\sqrt{30}i}{64} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
\frac{3\sqrt{30}i}{64} & 0 & \frac{\sqrt{3}i}{96} & 0 & \frac{13\sqrt{6}i}{192} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & -\frac{9\sqrt{10}i}{320} & 0 & \frac{11\sqrt{5}i}{160} & 0 & -\frac{5\sqrt{2}i}{64} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
\frac{5\sqrt{6}i}{192} & 0 & -\frac{9\sqrt{15}i}{160} & 0 & -\frac{23\sqrt{30}i}{960} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & \frac{\sqrt{210}i}{192} & 0 & \frac{3\sqrt{105}i}{160} & 0 & \frac{\sqrt{42}i}{192} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0
\end{bmatrix}$$

| 917 | symmetry | $-\frac{3\sqrt{35}y\left(x^2-2xz-z^2\right)\left(x^2+2xz-z^2\right)}{8}$ |

continued …

Table 10

No.	multipole	matrix

$$\mathbb{G}_{5,2}^{(1,0;a)}(E,2)$$

$$
\begin{pmatrix}
0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{42}}{192} & 0 & \frac{5\sqrt{2}}{64} & 0 & -\frac{3\sqrt{30}}{64} & 0 & \frac{5\sqrt{6}}{192} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{23\sqrt{30}}{960} & 0 & -\frac{13\sqrt{6}}{192} & 0 & \frac{9\sqrt{10}}{320} & 0 & \frac{\sqrt{210}}{192} \\
0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{105}}{160} & 0 & \frac{11\sqrt{5}}{160} & 0 & \frac{\sqrt{3}}{96} & 0 & \frac{9\sqrt{15}}{160} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{9\sqrt{15}}{160} & 0 & \frac{\sqrt{3}}{96} & 0 & \frac{11\sqrt{5}}{160} & 0 & -\frac{3\sqrt{105}}{160} \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{210}}{192} & 0 & \frac{9\sqrt{10}}{320} & 0 & -\frac{13\sqrt{6}}{192} & 0 & -\frac{23\sqrt{30}}{960} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{5\sqrt{6}}{192} & 0 & -\frac{3\sqrt{30}}{64} & 0 & \frac{5\sqrt{2}}{64} & 0 & \frac{\sqrt{42}}{192} \\
\frac{\sqrt{42}}{192} & 0 & -\frac{3\sqrt{105}}{160} & 0 & \frac{\sqrt{210}}{192} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & -\frac{23\sqrt{30}}{960} & 0 & \frac{9\sqrt{15}}{160} & 0 & \frac{5\sqrt{6}}{192} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
\frac{5\sqrt{2}}{64} & 0 & \frac{11\sqrt{5}}{160} & 0 & \frac{9\sqrt{10}}{320} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & -\frac{13\sqrt{6}}{192} & 0 & \frac{\sqrt{3}}{96} & 0 & -\frac{3\sqrt{30}}{64} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
-\frac{3\sqrt{30}}{64} & 0 & \frac{\sqrt{3}}{96} & 0 & -\frac{13\sqrt{6}}{192} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & \frac{9\sqrt{10}}{320} & 0 & \frac{11\sqrt{5}}{160} & 0 & \frac{5\sqrt{2}}{64} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
\frac{5\sqrt{6}}{192} & 0 & \frac{9\sqrt{15}}{160} & 0 & -\frac{23\sqrt{30}}{960} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & \frac{\sqrt{210}}{192} & 0 & -\frac{3\sqrt{105}}{160} & 0 & \frac{\sqrt{42}}{192} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0
\end{pmatrix}
$$

| 918 | symmetry | $\frac{\sqrt{105}x(y-z)(y+z)\left(2x^2-y^2-z^2\right)}{4}$ |

Table 10

No.	multipole	matrix

$$\mathbb{G}_{5,1}^{(1,0;a)}(E,3)$$

$$
\begin{pmatrix}
0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{14}i}{96} & 0 & -\frac{5\sqrt{6}i}{96} & 0 & \frac{\sqrt{10}i}{32} & 0 & \frac{5\sqrt{2}i}{32} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{23\sqrt{10}i}{480} & 0 & \frac{13\sqrt{2}i}{96} & 0 & -\frac{\sqrt{30}i}{160} & 0 & \frac{\sqrt{70}i}{32} \\
0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{35}i}{80} & 0 & \frac{11\sqrt{15}i}{240} & 0 & -\frac{i}{48} & 0 & -\frac{3\sqrt{5}i}{80} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{5}i}{80} & 0 & \frac{i}{48} & 0 & -\frac{11\sqrt{15}i}{240} & 0 & \frac{\sqrt{35}i}{80} \\
0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}i}{32} & 0 & \frac{\sqrt{30}i}{160} & 0 & -\frac{13\sqrt{2}i}{96} & 0 & \frac{23\sqrt{10}i}{480} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{5\sqrt{2}i}{32} & 0 & -\frac{\sqrt{10}i}{32} & 0 & \frac{5\sqrt{6}i}{96} & 0 & -\frac{\sqrt{14}i}{96} \\
-\frac{\sqrt{14}i}{96} & 0 & \frac{\sqrt{35}i}{80} & 0 & \frac{\sqrt{70}i}{32} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & \frac{23\sqrt{10}i}{480} & 0 & -\frac{3\sqrt{5}i}{80} & 0 & \frac{5\sqrt{2}i}{32} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
\frac{5\sqrt{6}i}{96} & 0 & -\frac{11\sqrt{15}i}{240} & 0 & -\frac{\sqrt{30}i}{160} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & -\frac{13\sqrt{2}i}{96} & 0 & -\frac{i}{48} & 0 & \frac{\sqrt{10}i}{32} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
-\frac{\sqrt{10}i}{32} & 0 & \frac{i}{48} & 0 & \frac{13\sqrt{2}i}{96} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & \frac{\sqrt{30}i}{160} & 0 & \frac{11\sqrt{15}i}{240} & 0 & -\frac{5\sqrt{6}i}{96} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
-\frac{5\sqrt{2}i}{32} & 0 & \frac{3\sqrt{5}i}{80} & 0 & -\frac{23\sqrt{10}i}{480} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & -\frac{\sqrt{70}i}{32} & 0 & -\frac{\sqrt{35}i}{80} & 0 & \frac{\sqrt{14}i}{96} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
\end{pmatrix}
$$

| 919 | symmetry | $\dfrac{\sqrt{105}\,y(x-z)(x+z)\left(x^2-2y^2+z^2\right)}{4}$ |

continued ...

Table 10

No.	multipole	matrix													
		0	0	0	0	0	0	$\frac{\sqrt{14}}{96}$	0	$\frac{5\sqrt{6}}{96}$	0	$\frac{\sqrt{10}}{32}$	0	$-\frac{5\sqrt{2}}{32}$	0
		0	0	0	0	0	0	0	$-\frac{23\sqrt{10}}{480}$	0	$-\frac{13\sqrt{2}}{96}$	0	$-\frac{\sqrt{30}}{160}$	0	$-\frac{\sqrt{70}}{32}$
		0	0	0	0	0	0	$\frac{\sqrt{35}}{80}$	0	$\frac{11\sqrt{15}}{240}$	0	$\frac{1}{48}$	0	$-\frac{3\sqrt{5}}{80}$	0
		0	0	0	0	0	0	0	$-\frac{3\sqrt{5}}{80}$	0	$\frac{1}{48}$	0	$\frac{11\sqrt{15}}{240}$	0	$\frac{\sqrt{35}}{80}$
		0	0	0	0	0	0	$-\frac{\sqrt{70}}{32}$	0	$-\frac{\sqrt{30}}{160}$	0	$-\frac{13\sqrt{2}}{96}$	0	$-\frac{23\sqrt{10}}{480}$	0
		0	0	0	0	0	0	0	$-\frac{5\sqrt{2}}{32}$	0	$\frac{\sqrt{10}}{32}$	0	$\frac{5\sqrt{6}}{96}$	0	$\frac{\sqrt{14}}{96}$
	$\mathbb{G}_{5,2}^{(1,0;a)}(E,3)$	$\frac{\sqrt{14}}{96}$	0	$\frac{\sqrt{35}}{80}$	0	$-\frac{\sqrt{70}}{32}$	0	0	0	0	0	0	0	0	0
		0	$-\frac{23\sqrt{10}}{480}$	0	$-\frac{3\sqrt{5}}{80}$	0	$-\frac{5\sqrt{2}}{32}$	0	0	0	0	0	0	0	0
		$\frac{5\sqrt{6}}{96}$	0	$\frac{11\sqrt{15}}{240}$	0	$-\frac{\sqrt{30}}{160}$	0	0	0	0	0	0	0	0	0
		0	$-\frac{13\sqrt{2}}{96}$	0	$\frac{1}{48}$	0	$\frac{\sqrt{10}}{32}$	0	0	0	0	0	0	0	0
		$\frac{\sqrt{10}}{32}$	0	$\frac{1}{48}$	0	$-\frac{13\sqrt{2}}{96}$	0	0	0	0	0	0	0	0	0
		0	$-\frac{\sqrt{30}}{160}$	0	$\frac{11\sqrt{15}}{240}$	0	$\frac{5\sqrt{6}}{96}$	0	0	0	0	0	0	0	0
		$-\frac{5\sqrt{2}}{32}$	0	$-\frac{3\sqrt{5}}{80}$	0	$-\frac{23\sqrt{10}}{480}$	0	0	0	0	0	0	0	0	0
		0	$-\frac{\sqrt{70}}{32}$	0	$\frac{\sqrt{35}}{80}$	0	$\frac{\sqrt{14}}{96}$	0	0	0	0	0	0	0	0

| 920 | symmetry | $-\frac{x^2}{2} - \frac{y^2}{2} + z^2$ |

No.	multipole	matrix

$$\mathbb{T}_2^{(1,0;a)}(A_1)$$

$$
\begin{pmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{5\sqrt{42}i}{84} & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{70}i}{28} & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{21}i}{42} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{21}i}{42} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}i}{28} & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{5\sqrt{42}i}{84} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
-\frac{5\sqrt{42}i}{84} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & -\frac{\sqrt{70}i}{28} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & -\frac{\sqrt{21}i}{42} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & \frac{\sqrt{21}i}{42} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & \frac{\sqrt{70}i}{28} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & \frac{5\sqrt{42}i}{84} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
\end{pmatrix}
$$

| 921 | symmetry | $\frac{\sqrt{3}(x-y)(x+y)}{2}$ |

continued …

Table 10

No.	multipole	matrix

$$\mathbb{T}_2^{(1,0;a)}(B_1)$$

$$
\begin{pmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{70}i}{84} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}i}{12} & 0 & 0 & 0 & \frac{\sqrt{14}i}{21} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{35}i}{21} & 0 & 0 & 0 & \frac{\sqrt{105}i}{42} & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{105}i}{42} & 0 & 0 & 0 & \frac{\sqrt{35}i}{21} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{14}i}{21} & 0 & 0 & 0 & \frac{\sqrt{10}i}{12} \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}i}{84} & 0 & 0 & 0 \\
0 & \frac{\sqrt{10}i}{12} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & \frac{\sqrt{35}i}{21} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & \frac{\sqrt{105}i}{42} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
-\frac{\sqrt{70}i}{84} & 0 & 0 & 0 & \frac{\sqrt{14}i}{21} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & -\frac{\sqrt{14}i}{21} & 0 & 0 & 0 & \frac{\sqrt{70}i}{84} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & -\frac{\sqrt{105}i}{42} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & -\frac{\sqrt{35}i}{21} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & -\frac{\sqrt{10}i}{12} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
\end{pmatrix}
$$

922	symmetry	$\sqrt{3}xy$

continued …

Table 10

No.	multipole	matrix												
		0	0	0	0	0	0	0	0	0	$\frac{\sqrt{70}}{84}$	0	0	0	0
		0	0	0	0	0	0	$\frac{\sqrt{10}}{12}$	0	0	0	$\frac{\sqrt{14}}{21}$	0	0	0
		0	0	0	0	0	0	0	$\frac{\sqrt{35}}{21}$	0	0	0	$\frac{\sqrt{105}}{42}$	0	0
		0	0	0	0	0	0	0	0	$\frac{\sqrt{105}}{42}$	0	0	0	$\frac{\sqrt{35}}{21}$	0
		0	0	0	0	0	0	0	0	0	$\frac{\sqrt{14}}{21}$	0	0	0	$\frac{\sqrt{10}}{12}$
		0	0	0	0	0	0	0	0	0	0	$\frac{\sqrt{70}}{84}$	0	0	0
	$\mathbb{T}_2^{(1,0;a)}(B_2)$	0	$\frac{\sqrt{10}}{12}$	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	$\frac{\sqrt{35}}{21}$	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	$\frac{\sqrt{105}}{42}$	0	0	0	0	0	0	0	0	0	0
		$\frac{\sqrt{70}}{84}$	0	0	0	$\frac{\sqrt{14}}{21}$	0	0	0	0	0	0	0	0	0
		0	$\frac{\sqrt{14}}{21}$	0	0	0	$\frac{\sqrt{70}}{84}$	0	0	0	0	0	0	0	0
		0	0	$\frac{\sqrt{105}}{42}$	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	$\frac{\sqrt{35}}{21}$	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	$\frac{\sqrt{10}}{12}$	0	0	0	0	0	0	0	0	0

923	symmetry	$\sqrt{3}yz$

continued ...

Table 10

No.	multipole	matrix

$\mathbb{T}_{2,1}^{(1,0;a)}(E)$

0	0	0	0	0	0	$\frac{5\sqrt{2}}{24}$	0	$\frac{5\sqrt{42}}{168}$	0	0	0	0	0
0	0	0	0	0	0	0	$\frac{\sqrt{70}}{168}$	0	$\frac{11\sqrt{14}}{168}$	0	0	0	0
0	0	0	0	0	0	0	0	$-\frac{\sqrt{105}}{84}$	0	$\frac{\sqrt{7}}{12}$	0	0	0
0	0	0	0	0	0	0	0	0	$-\frac{\sqrt{7}}{12}$	0	$\frac{\sqrt{105}}{84}$	0	0
0	0	0	0	0	0	0	0	0	0	$-\frac{11\sqrt{14}}{168}$	0	$-\frac{\sqrt{70}}{168}$	0
0	0	0	0	0	0	0	0	0	0	0	$-\frac{5\sqrt{42}}{168}$	0	$-\frac{5\sqrt{2}}{24}$
$\frac{5\sqrt{2}}{24}$	0	0	0	0	0	0	0	0	0	0	0	0	0
0	$\frac{\sqrt{70}}{168}$	0	0	0	0	0	0	0	0	0	0	0	0
$\frac{5\sqrt{42}}{168}$	0	$-\frac{\sqrt{105}}{84}$	0	0	0	0	0	0	0	0	0	0	0
0	$\frac{11\sqrt{14}}{168}$	0	$-\frac{\sqrt{7}}{12}$	0	0	0	0	0	0	0	0	0	0
0	0	$\frac{\sqrt{7}}{12}$	0	$-\frac{11\sqrt{14}}{168}$	0	0	0	0	0	0	0	0	0
0	0	0	$\frac{\sqrt{105}}{84}$	0	$-\frac{5\sqrt{42}}{168}$	0	0	0	0	0	0	0	0
0	0	0	0	$-\frac{\sqrt{70}}{168}$	0	0	0	0	0	0	0	0	0
0	0	0	0	0	$-\frac{5\sqrt{2}}{24}$	0	0	0	0	0	0	0	0

924	symmetry	$\sqrt{3}xz$

continued ...

Table 10

No.	multipole	matrix														
	$\mathbb{T}_{2,2}^{(1,0;a)}(E)$	0	0	0	0	0	0	$-\frac{5\sqrt{2}i}{24}$	0	$\frac{5\sqrt{42}i}{168}$	0	0	0	0	0
		0	0	0	0	0	0	0	$-\frac{\sqrt{70}i}{168}$	0	$\frac{11\sqrt{14}i}{168}$	0	0	0	0
		0	0	0	0	0	0	0	0	$\frac{\sqrt{105}i}{84}$	0	$\frac{\sqrt{7}i}{12}$	0	0	0
		0	0	0	0	0	0	0	0	0	$\frac{\sqrt{7}i}{12}$	0	$\frac{\sqrt{105}i}{84}$	0	0
		0	0	0	0	0	0	0	0	0	0	$\frac{11\sqrt{14}i}{168}$	0	$-\frac{\sqrt{70}i}{168}$	0
		0	0	0	0	0	0	0	0	0	0	0	$\frac{5\sqrt{42}i}{168}$	0	$-\frac{5\sqrt{2}i}{24}$
		$\frac{5\sqrt{2}i}{24}$	0	0	0	0	0	0	0	0	0	0	0	0	0
		0	$\frac{\sqrt{70}i}{168}$	0	0	0	0	0	0	0	0	0	0	0	0
		$-\frac{5\sqrt{42}i}{168}$	0	$-\frac{\sqrt{105}i}{84}$	0	0	0	0	0	0	0	0	0	0	0
		0	$-\frac{11\sqrt{14}i}{168}$	0	$-\frac{\sqrt{7}i}{12}$	0	0	0	0	0	0	0	0	0	0
		0	0	$-\frac{\sqrt{7}i}{12}$	0	$-\frac{11\sqrt{14}i}{168}$	0	0	0	0	0	0	0	0	0
		0	0	0	$-\frac{\sqrt{105}i}{84}$	0	$-\frac{5\sqrt{42}i}{168}$	0	0	0	0	0	0	0	0
		0	0	0	0	$\frac{\sqrt{70}i}{168}$	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	$\frac{5\sqrt{2}i}{24}$	0	0	0	0	0	0	0	0
925	symmetry	$\frac{\sqrt{21}\left(x^4-3x^2y^2-3x^2z^2+y^4-3y^2z^2+z^4\right)}{6}$														

Table 10

No.	multipole	matrix													
	$\mathbb{T}_4^{(1,0;a)}(A_1,1)$	0	0	0	0	0	0	0	$-\frac{\sqrt{110}i}{44}$	0	0	0	$-\frac{\sqrt{330}i}{132}$	0	0
		0	0	0	0	0	0	0	0	$\frac{\sqrt{66}i}{33}$	0	0	0	$-\frac{\sqrt{22}i}{22}$	0
		0	0	0	0	0	0	0	0	0	$\frac{\sqrt{55}i}{44}$	0	0	0	$-\frac{\sqrt{77}i}{44}$
		0	0	0	0	0	0	$\frac{\sqrt{77}i}{44}$	0	0	0	$-\frac{\sqrt{55}i}{44}$	0	0	0
		0	0	0	0	0	0	0	$\frac{\sqrt{22}i}{22}$	0	0	0	$-\frac{\sqrt{66}i}{33}$	0	0
		0	0	0	0	0	0	0	0	$\frac{\sqrt{330}i}{132}$	0	0	0	$\frac{\sqrt{110}i}{44}$	0
		0	0	0	$-\frac{\sqrt{77}i}{44}$	0	0	0	0	0	0	0	0	0	0
		$\frac{\sqrt{110}i}{44}$	0	0	0	$-\frac{\sqrt{22}i}{22}$	0	0	0	0	0	0	0	0	0
		0	$-\frac{\sqrt{66}i}{33}$	0	0	0	$-\frac{\sqrt{330}i}{132}$	0	0	0	0	0	0	0	0
		0	0	$-\frac{\sqrt{55}i}{44}$	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	$\frac{\sqrt{55}i}{44}$	0	0	0	0	0	0	0	0	0	0
		$\frac{\sqrt{330}i}{132}$	0	0	0	$\frac{\sqrt{66}i}{33}$	0	0	0	0	0	0	0	0	0
		0	$\frac{\sqrt{22}i}{22}$	0	0	0	$-\frac{\sqrt{110}i}{44}$	0	0	0	0	0	0	0	0
		0	0	$\frac{\sqrt{77}i}{44}$	0	0	0	0	0	0	0	0	0	0	0

926	symmetry	$-\frac{\sqrt{15}\left(x^4-12x^2y^2+6x^2z^2+y^4+6y^2z^2-2z^4\right)}{12}$

384

Table 10

No.	multipole	matrix

$\mathbb{T}_4^{(1,0;a)}(A_1,2)$

0	0	0	0	0	0	0	$-\frac{5\sqrt{154}i}{308}$	0	0	0	$\frac{\sqrt{462}i}{132}$	0	0
0	0	0	0	0	0	0	0	$\frac{\sqrt{2310}i}{231}$	0	0	0	$\frac{\sqrt{770}i}{110}$	0
0	0	0	0	0	0	0	0	0	$\frac{5\sqrt{77}i}{308}$	0	0	0	$\frac{7\sqrt{55}i}{220}$
0	0	0	0	0	0	$-\frac{7\sqrt{55}i}{220}$	0	0	0	$-\frac{5\sqrt{77}i}{308}$	0	0	0
0	0	0	0	0	0	0	$-\frac{\sqrt{770}i}{110}$	0	0	0	$-\frac{\sqrt{2310}i}{231}$	0	0
0	0	0	0	0	0	0	0	$-\frac{\sqrt{462}i}{132}$	0	0	0	$\frac{5\sqrt{154}i}{308}$	0
0	0	0	$\frac{7\sqrt{55}i}{220}$	0	0	0	0	0	0	0	0	0	0
$\frac{5\sqrt{154}i}{308}$	0	0	0	$\frac{\sqrt{770}i}{110}$	0	0	0	0	0	0	0	0	0
0	$-\frac{\sqrt{2310}i}{231}$	0	0	0	$\frac{\sqrt{462}i}{132}$	0	0	0	0	0	0	0	0
0	0	$-\frac{5\sqrt{77}i}{308}$	0	0	0	0	0	0	0	0	0	0	0
0	0	0	$\frac{5\sqrt{77}i}{308}$	0	0	0	0	0	0	0	0	0	0
$-\frac{\sqrt{462}i}{132}$	0	0	0	$\frac{\sqrt{2310}i}{231}$	0	0	0	0	0	0	0	0	0
0	$-\frac{\sqrt{770}i}{110}$	0	0	0	$-\frac{5\sqrt{154}i}{308}$	0	0	0	0	0	0	0	0
0	0	$-\frac{7\sqrt{55}i}{220}$	0	0	0	0	0	0	0	0	0	0	0

No.		
927	symmetry	$\frac{\sqrt{35}xy(x-y)(x+y)}{2}$

Table 10

No.	multipole	matrix

$\mathbb{T}_4^{(1,0;a)}(A_2)$

$$\begin{pmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{22}}{22} & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{330}}{55} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{1155}}{110} \\
0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{1155}}{110} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{330}}{55} & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{22}}{22} & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & -\frac{\sqrt{1155}}{110} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & -\frac{\sqrt{330}}{55} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{22}}{22} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
-\frac{\sqrt{22}}{22} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & -\frac{\sqrt{330}}{55} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & -\frac{\sqrt{1155}}{110} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0
\end{pmatrix}$$

928	symmetry	$\dfrac{\sqrt{5}(x-y)(x+y)\left(x^2+y^2-6z^2\right)}{4}$

Table 10

No.	multipole	matrix

$\mathbb{T}_4^{(1,0;a)}(B_1)$

$$
\begin{pmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2310}i}{154} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{330}i}{220} & 0 & 0 & 0 & \frac{\sqrt{462}i}{308} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{9\sqrt{1155}i}{1540} & 0 & 0 & 0 & -\frac{17\sqrt{385}i}{1540} & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{17\sqrt{385}i}{1540} & 0 & 0 & 0 & -\frac{9\sqrt{1155}i}{1540} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{462}i}{308} & 0 & 0 & 0 & \frac{3\sqrt{330}i}{220} \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2310}i}{154} & 0 & 0 & 0 \\
0 & \frac{3\sqrt{330}i}{220} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & -\frac{9\sqrt{1155}i}{1540} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & -\frac{17\sqrt{385}i}{1540} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
-\frac{\sqrt{2310}i}{154} & 0 & 0 & 0 & \frac{\sqrt{462}i}{308} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & -\frac{\sqrt{462}i}{308} & 0 & 0 & 0 & \frac{\sqrt{2310}i}{154} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & \frac{17\sqrt{385}i}{1540} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & \frac{9\sqrt{1155}i}{1540} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & -\frac{3\sqrt{330}i}{220} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
\end{pmatrix}
$$

| 929 | symmetry | $-\dfrac{\sqrt{5}xy(x^2+y^2-6z^2)}{2}$ |

continued …

Table 10

No.	multipole	matrix

$$\mathbb{T}_4^{(1,0;a)}(B_2) = \begin{pmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2310}}{154} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{330}}{220} & 0 & 0 & 0 & -\frac{\sqrt{462}}{308} & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{9\sqrt{1155}}{1540} & 0 & 0 & 0 & \frac{17\sqrt{385}}{1540} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{17\sqrt{385}}{1540} & 0 & 0 & 0 & \frac{9\sqrt{1155}}{1540} \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{462}}{308} & 0 & 0 & -\frac{3\sqrt{330}}{220} \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2310}}{154} & 0 & 0 \\
0 & -\frac{3\sqrt{330}}{220} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & \frac{9\sqrt{1155}}{1540} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & \frac{17\sqrt{385}}{1540} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
-\frac{\sqrt{2310}}{154} & 0 & 0 & 0 & -\frac{\sqrt{462}}{308} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & -\frac{\sqrt{462}}{308} & 0 & 0 & 0 & -\frac{\sqrt{2310}}{154} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & \frac{17\sqrt{385}}{1540} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & \frac{9\sqrt{1155}}{1540} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & -\frac{3\sqrt{330}}{220} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0
\end{pmatrix}$$

930	symmetry	$\frac{\sqrt{35}yz(y-z)(y+z)}{2}$

continued ...

Table 10

No.	multipole	matrix

$$\mathbb{T}_{4,1}^{(1,0;a)}(E,1)$$

$$
\begin{pmatrix}
0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{462}}{176} & 0 & \frac{5\sqrt{22}}{88} & 0 & \frac{\sqrt{330}}{176} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{13\sqrt{330}}{880} & 0 & -\frac{\sqrt{66}}{88} & 0 & \frac{7\sqrt{110}}{880} & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{1155}}{880} & 0 & \frac{\sqrt{55}}{880} & 0 & -\frac{7\sqrt{33}}{176} & 0 & -\frac{\sqrt{165}}{880} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{165}}{880} & 0 & \frac{7\sqrt{33}}{176} & 0 & -\frac{\sqrt{55}}{880} & 0 & -\frac{3\sqrt{1155}}{880} \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{7\sqrt{110}}{880} & 0 & \frac{\sqrt{66}}{88} & 0 & \frac{13\sqrt{330}}{880} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{330}}{176} & 0 & -\frac{5\sqrt{22}}{88} & 0 & -\frac{\sqrt{462}}{176} \\
\frac{\sqrt{462}}{176} & 0 & \frac{3\sqrt{1155}}{880} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & -\frac{13\sqrt{330}}{880} & 0 & \frac{\sqrt{165}}{880} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
\frac{5\sqrt{22}}{88} & 0 & \frac{\sqrt{55}}{880} & 0 & -\frac{7\sqrt{110}}{880} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & -\frac{\sqrt{66}}{88} & 0 & \frac{7\sqrt{33}}{176} & 0 & -\frac{\sqrt{330}}{176} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
\frac{\sqrt{330}}{176} & 0 & -\frac{7\sqrt{33}}{176} & 0 & \frac{\sqrt{66}}{88} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & \frac{7\sqrt{110}}{880} & 0 & -\frac{\sqrt{55}}{880} & 0 & -\frac{5\sqrt{22}}{88} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & -\frac{\sqrt{165}}{880} & 0 & \frac{13\sqrt{330}}{880} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & -\frac{3\sqrt{1155}}{880} & 0 & -\frac{\sqrt{462}}{176} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
\end{pmatrix}
$$

| 931 | symmetry | $\frac{\sqrt{35}xz(x-z)(x+z)}{2}$ |

continued …

Table 10

No.	multipole	matrix

$\mathbb{T}_{4,2}^{(1,0;a)}(E,1)$

0	0	0	0	0	0	$-\frac{\sqrt{462}i}{176}$	0	$\frac{5\sqrt{22}i}{88}$	0	$-\frac{\sqrt{330}i}{176}$	0	0	0
0	0	0	0	0	0	0	$\frac{13\sqrt{330}i}{880}$	0	$-\frac{\sqrt{66}i}{88}$	0	$-\frac{7\sqrt{110}i}{880}$	0	0
0	0	0	0	0	0	$\frac{3\sqrt{1155}i}{880}$	0	$-\frac{\sqrt{55}i}{880}$	0	$-\frac{7\sqrt{33}i}{176}$	0	$\frac{\sqrt{165}i}{880}$	0
0	0	0	0	0	0	0	$\frac{\sqrt{165}i}{880}$	0	$-\frac{7\sqrt{33}i}{176}$	0	$-\frac{\sqrt{55}i}{880}$	0	$\frac{3\sqrt{1155}i}{880}$
0	0	0	0	0	0	0	0	$-\frac{7\sqrt{110}i}{880}$	0	$-\frac{\sqrt{66}i}{88}$	0	$\frac{13\sqrt{330}i}{880}$	0
0	0	0	0	0	0	0	0	0	$-\frac{\sqrt{330}i}{176}$	0	$\frac{5\sqrt{22}i}{88}$	0	$-\frac{\sqrt{462}i}{176}$
$\frac{\sqrt{462}i}{176}$	0	$-\frac{3\sqrt{1155}i}{880}$	0	0	0	0	0	0	0	0	0	0	0
0	$-\frac{13\sqrt{330}i}{880}$	0	$-\frac{\sqrt{165}i}{880}$	0	0	0	0	0	0	0	0	0	0
$-\frac{5\sqrt{22}i}{88}$	0	$\frac{\sqrt{55}i}{880}$	0	$\frac{7\sqrt{110}i}{880}$	0	0	0	0	0	0	0	0	0
0	$\frac{\sqrt{66}i}{88}$	0	$\frac{7\sqrt{33}i}{176}$	0	$\frac{\sqrt{330}i}{176}$	0	0	0	0	0	0	0	0
$\frac{\sqrt{330}i}{176}$	0	$\frac{7\sqrt{33}i}{176}$	0	$\frac{\sqrt{66}i}{88}$	0	0	0	0	0	0	0	0	0
0	$\frac{7\sqrt{110}i}{880}$	0	$\frac{\sqrt{55}i}{880}$	0	$-\frac{5\sqrt{22}i}{88}$	0	0	0	0	0	0	0	0
0	0	$-\frac{\sqrt{165}i}{880}$	0	$-\frac{13\sqrt{330}i}{880}$	0	0	0	0	0	0	0	0	0
0	0	0	$-\frac{3\sqrt{1155}i}{880}$	0	$\frac{\sqrt{462}i}{176}$	0	0	0	0	0	0	0	0

No.		
932	symmetry	$\frac{\sqrt{5}yz(6x^2-y^2-z^2)}{2}$

continued ...

Table 10

No.	multipole	matrix													
	$\mathbb{T}_{4,1}^{(1,0;a)}(E,2)$	0	0	0	0	0	0	$\frac{\sqrt{66}}{176}$	0	$\frac{5\sqrt{154}}{616}$	0	$-\frac{\sqrt{2310}}{176}$	0	0	0
		0	0	0	0	0	0	0	$-\frac{13\sqrt{2310}}{6160}$	0	$-\frac{\sqrt{462}}{616}$	0	$-\frac{7\sqrt{770}}{880}$	0	0
		0	0	0	0	0	0	$-\frac{21\sqrt{165}}{880}$	0	$\frac{\sqrt{385}}{6160}$	0	$-\frac{\sqrt{231}}{176}$	0	$\frac{\sqrt{1155}}{880}$	0
		0	0	0	0	0	0	0	$-\frac{\sqrt{1155}}{880}$	0	$\frac{\sqrt{231}}{176}$	0	$-\frac{\sqrt{385}}{6160}$	0	$\frac{21\sqrt{165}}{880}$
		0	0	0	0	0	0	0	0	$\frac{7\sqrt{770}}{880}$	0	$\frac{\sqrt{462}}{616}$	0	$\frac{13\sqrt{2310}}{6160}$	0
		0	0	0	0	0	0	0	0	0	$\frac{\sqrt{2310}}{176}$	0	$-\frac{5\sqrt{154}}{616}$	0	$-\frac{\sqrt{66}}{176}$
		$\frac{\sqrt{66}}{176}$	0	$-\frac{21\sqrt{165}}{880}$	0	0	0	0	0	0	0	0	0	0	0
		0	$-\frac{13\sqrt{2310}}{6160}$	0	$-\frac{\sqrt{1155}}{880}$	0	0	0	0	0	0	0	0	0	0
		$\frac{5\sqrt{154}}{616}$	0	$\frac{\sqrt{385}}{6160}$	0	$\frac{7\sqrt{770}}{880}$	0	0	0	0	0	0	0	0	0
		0	$-\frac{\sqrt{462}}{616}$	0	$\frac{\sqrt{231}}{176}$	0	$\frac{\sqrt{2310}}{176}$	0	0	0	0	0	0	0	0
		$-\frac{\sqrt{2310}}{176}$	0	$-\frac{\sqrt{231}}{176}$	0	$\frac{\sqrt{462}}{616}$	0	0	0	0	0	0	0	0	0
		0	$-\frac{7\sqrt{770}}{880}$	0	$-\frac{\sqrt{385}}{6160}$	0	$-\frac{5\sqrt{154}}{616}$	0	0	0	0	0	0	0	0
		0	0	$\frac{\sqrt{1155}}{880}$	0	$\frac{13\sqrt{2310}}{6160}$	0	0	0	0	0	0	0	0	0
		0	0	0	$\frac{21\sqrt{165}}{880}$	0	$-\frac{\sqrt{66}}{176}$	0	0	0	0	0	0	0	0
933	symmetry	$-\frac{\sqrt{5}xz(x^2-6y^2+z^2)}{2}$													

Table 10

No.	multipole	matrix

$$\mathbb{T}_{4,2}^{(1,0;a)}(E,2)=$$

$$\begin{pmatrix}
0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{66}\,i}{176} & 0 & \frac{5\sqrt{154}\,i}{616} & 0 & \frac{\sqrt{2310}\,i}{176} & 0 & 0 & 0 \\[4pt]
0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{13\sqrt{2310}\,i}{6160} & 0 & -\frac{\sqrt{462}\,i}{616} & 0 & \frac{7\sqrt{770}\,i}{880} & 0 & 0 \\[4pt]
0 & 0 & 0 & 0 & 0 & 0 & -\frac{21\sqrt{165}\,i}{880} & 0 & -\frac{\sqrt{385}\,i}{6160} & 0 & -\frac{\sqrt{231}\,i}{176} & 0 & -\frac{\sqrt{1155}\,i}{880} & 0 \\[4pt]
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{1155}\,i}{880} & 0 & -\frac{\sqrt{231}\,i}{176} & 0 & -\frac{\sqrt{385}\,i}{6160} & 0 & -\frac{21\sqrt{165}\,i}{880} \\[4pt]
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{7\sqrt{770}\,i}{880} & 0 & -\frac{\sqrt{462}\,i}{616} & 0 & \frac{13\sqrt{2310}\,i}{6160} & 0 \\[4pt]
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2310}\,i}{176} & 0 & \frac{5\sqrt{154}\,i}{616} & 0 & -\frac{\sqrt{66}\,i}{176} \\[4pt]
\frac{\sqrt{66}\,i}{176} & 0 & \frac{21\sqrt{165}\,i}{880} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\[4pt]
0 & -\frac{13\sqrt{2310}\,i}{6160} & 0 & \frac{\sqrt{1155}\,i}{880} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\[4pt]
-\frac{5\sqrt{154}\,i}{616} & 0 & \frac{\sqrt{385}\,i}{6160} & 0 & -\frac{7\sqrt{770}\,i}{880} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\[4pt]
0 & \frac{\sqrt{462}\,i}{616} & 0 & \frac{\sqrt{231}\,i}{176} & 0 & -\frac{\sqrt{2310}\,i}{176} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\[4pt]
-\frac{\sqrt{2310}\,i}{176} & 0 & \frac{\sqrt{231}\,i}{176} & 0 & \frac{\sqrt{462}\,i}{616} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\[4pt]
0 & -\frac{7\sqrt{770}\,i}{880} & 0 & \frac{\sqrt{385}\,i}{6160} & 0 & -\frac{5\sqrt{154}\,i}{616} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\[4pt]
0 & 0 & \frac{\sqrt{1155}\,i}{880} & 0 & -\frac{13\sqrt{2310}\,i}{6160} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\[4pt]
0 & 0 & 0 & \frac{21\sqrt{165}\,i}{880} & 0 & \frac{\sqrt{66}\,i}{176} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0
\end{pmatrix}$$

No.	symmetry
934	$\dfrac{\sqrt{2}\left(2x^6-15x^4y^2-15x^4z^2-15x^2y^4+180x^2y^2z^2-15x^2z^4+2y^6-15y^4z^2-15y^2z^4+2z^6\right)}{8}$

continued …

Table 10

No.	multipole	matrix

$$\mathbb{T}_6^{(1,0;a)}(A_1,1)$$

$$
\begin{pmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{33}i}{264} & 0 & 0 & 0 & -\frac{7\sqrt{11}i}{88} & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{55}i}{88} & 0 & 0 & 0 & \frac{7\sqrt{165}i}{264} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{5\sqrt{66}i}{264} & 0 & 0 & 0 & -\frac{\sqrt{2310}i}{264} \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2310}i}{264} & 0 & 0 & 0 & -\frac{5\sqrt{66}i}{264} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{7\sqrt{165}i}{264} & 0 & 0 & 0 & \frac{\sqrt{55}i}{88} & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{7\sqrt{11}i}{88} & 0 & 0 & 0 & -\frac{\sqrt{33}i}{264} & 0 \\
0 & 0 & 0 & -\frac{\sqrt{2310}i}{264} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
-\frac{\sqrt{33}i}{264} & 0 & 0 & 0 & \frac{7\sqrt{165}i}{264} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & \frac{\sqrt{55}i}{88} & 0 & 0 & 0 & -\frac{7\sqrt{11}i}{88} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & -\frac{5\sqrt{66}i}{264} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & \frac{5\sqrt{66}i}{264} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
\frac{7\sqrt{11}i}{88} & 0 & 0 & 0 & -\frac{\sqrt{55}i}{88} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & -\frac{7\sqrt{165}i}{264} & 0 & 0 & 0 & \frac{\sqrt{33}i}{264} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & \frac{\sqrt{2310}i}{264} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
\end{pmatrix}
$$

| 935 | symmetry | $-\frac{\sqrt{14}\left(x^6-15x^4z^2+15x^2z^4+y^6-15y^4z^2+15y^2z^4-2z^6\right)}{8}$ |

Table 10

No.	multipole	matrix
	$\mathbb{T}_6^{(1,0;a)}(A_1,2)$	(see matrix below)
936	symmetry	$-\dfrac{3\sqrt{7}\,xy(x-y)(x+y)\left(x^2+y^2-10z^2\right)}{4}$

$$
\begin{pmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{231}i}{264} & 0 & 0 & 0 & \frac{\sqrt{77}i}{88} & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{385}i}{88} & 0 & 0 & 0 & -\frac{\sqrt{1155}i}{264} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{5\sqrt{462}i}{264} & 0 & 0 & 0 & \frac{\sqrt{330}i}{264} \\
0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{330}i}{264} & 0 & 0 & 0 & -\frac{5\sqrt{462}i}{264} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{1155}i}{264} & 0 & 0 & 0 & \frac{\sqrt{385}i}{88} & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{77}i}{88} & 0 & 0 & 0 & -\frac{\sqrt{231}i}{264} & 0 \\
0 & 0 & 0 & \frac{\sqrt{330}i}{264} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
-\frac{\sqrt{231}i}{264} & 0 & 0 & 0 & -\frac{\sqrt{1155}i}{264} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & \frac{\sqrt{385}i}{88} & 0 & 0 & 0 & \frac{\sqrt{77}i}{88} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & -\frac{5\sqrt{462}i}{264} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & \frac{5\sqrt{462}i}{264} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
-\frac{\sqrt{77}i}{88} & 0 & 0 & 0 & -\frac{\sqrt{385}i}{88} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & \frac{\sqrt{1155}i}{264} & 0 & 0 & 0 & \frac{\sqrt{231}i}{264} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & -\frac{\sqrt{330}i}{264} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0
\end{pmatrix}
$$

Table 10

No.	multipole	matrix

$\mathbb{T}_6^{(1,0;a)}(A_2)$

$$\begin{pmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{154}}{44} & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2310}}{132} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{165}}{66} \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{165}}{66} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2310}}{132} & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{154}}{44} & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & \frac{\sqrt{165}}{66} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & -\frac{\sqrt{2310}}{132} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & \frac{\sqrt{154}}{44} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
\frac{\sqrt{154}}{44} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & -\frac{\sqrt{2310}}{132} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & \frac{\sqrt{165}}{66} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0
\end{pmatrix}$$

| 937 | symmetry | $-\frac{\sqrt{2310}(x-y)(x+y)(x-z)(x+z)(y-z)(y+z)}{8}$ |

Table 10

No.	multipole	matrix

$\mathbb{T}_6^{(1,0;a)}(B_1,1)$

$$\begin{pmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}i}{24} & 0 & 0 & 0 & \frac{\sqrt{5}i}{8} \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{i}{24} & 0 & 0 & 0 & \frac{\sqrt{35}i}{24} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{14}i}{24} & 0 & 0 & 0 & -\frac{\sqrt{42}i}{24} & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{42}i}{24} & 0 & 0 & 0 & \frac{\sqrt{14}i}{24} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{35}i}{24} & 0 & 0 & 0 & -\frac{i}{24} \\
0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{8} & 0 & 0 & 0 & \frac{\sqrt{7}i}{24} & 0 & 0 & 0 \\
0 & -\frac{i}{24} & 0 & 0 & 0 & \frac{\sqrt{5}i}{8} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & \frac{\sqrt{14}i}{24} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & -\frac{\sqrt{42}i}{24} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
\frac{\sqrt{7}i}{24} & 0 & 0 & 0 & \frac{\sqrt{35}i}{24} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & -\frac{\sqrt{35}i}{24} & 0 & 0 & 0 & -\frac{\sqrt{7}i}{24} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & \frac{\sqrt{42}i}{24} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & -\frac{\sqrt{14}i}{24} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
-\frac{\sqrt{5}i}{8} & 0 & 0 & 0 & \frac{i}{24} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0
\end{pmatrix}$$

| 938 | symmetry | $\frac{\sqrt{42}(x-y)(x+y)\left(x^4-9x^2y^2-5x^2z^2+y^4-5y^2z^2+5z^4\right)}{8}$ |

continued …

Table 10

No.	multipole	matrix

$\mathbb{T}_6^{(1,0;a)}(B_1,2)$

$$
\begin{bmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{385}i}{264} & 0 & 0 & 0 & \frac{\sqrt{11}i}{8} \\
0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{55}i}{264} & 0 & 0 & 0 & -\frac{5\sqrt{77}i}{264} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{770}i}{264} & 0 & 0 & 0 & \frac{\sqrt{2310}i}{264} & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2310}i}{264} & 0 & 0 & 0 & -\frac{\sqrt{770}i}{264} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{5\sqrt{77}i}{264} & 0 & 0 & 0 & \frac{\sqrt{55}i}{264} \\
0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{11}i}{8} & 0 & 0 & 0 & -\frac{\sqrt{385}i}{264} & 0 & 0 & 0 \\
0 & \frac{\sqrt{55}i}{264} & 0 & 0 & 0 & \frac{\sqrt{11}i}{8} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & -\frac{\sqrt{770}i}{264} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & \frac{\sqrt{2310}i}{264} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
-\frac{\sqrt{385}i}{264} & 0 & 0 & 0 & -\frac{5\sqrt{77}i}{264} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & \frac{5\sqrt{77}i}{264} & 0 & 0 & 0 & \frac{\sqrt{385}i}{264} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & -\frac{\sqrt{2310}i}{264} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & \frac{\sqrt{770}i}{264} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
-\frac{\sqrt{11}i}{8} & 0 & 0 & 0 & -\frac{\sqrt{55}i}{264} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
\end{bmatrix}
$$

| 939 | symmetry | $\dfrac{\sqrt{462}\,xy\left(x^2-3y^2\right)\left(3x^2-y^2\right)}{16}$ |

continued …

Table 10

No.	multipole	matrix
	$\mathbb{T}_6^{(1,0;a)}(B_2,1)$	$\begin{pmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{1}{2} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{1}{2} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ \frac{1}{2} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{pmatrix}$
940	symmetry	$\frac{\sqrt{210}xy\left(x^4+2x^2y^2-16x^2z^2+y^4-16y^2z^2+16z^4\right)}{16}$

continued ...

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Table 10

No.	multipole	matrix													
		0	0	0	0	0	0	0	0	0	$\frac{\sqrt{77}}{66}$	0	0	0	0
		0	0	0	0	0	0	$\frac{\sqrt{11}}{66}$	0	0	0	$-\frac{\sqrt{385}}{66}$	0	0	0
		0	0	0	0	0	0	0	$-\frac{\sqrt{154}}{66}$	0	0	0	$\frac{\sqrt{462}}{66}$	0	0
		0	0	0	0	0	0	0	0	$\frac{\sqrt{462}}{66}$	0	0	0	$-\frac{\sqrt{154}}{66}$	0
		0	0	0	0	0	0	0	0	0	$-\frac{\sqrt{385}}{66}$	0	0	0	$\frac{\sqrt{11}}{66}$
		0	0	0	0	0	0	0	0	0	0	$\frac{\sqrt{77}}{66}$	0	0	0
	$\mathbb{T}_6^{(1,0;a)}(B_2,2)$	0	$\frac{\sqrt{11}}{66}$	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	$-\frac{\sqrt{154}}{66}$	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	$\frac{\sqrt{462}}{66}$	0	0	0	0	0	0	0	0	0	0
		$\frac{\sqrt{77}}{66}$	0	0	0	$-\frac{\sqrt{385}}{66}$	0	0	0	0	0	0	0	0	0
		0	$-\frac{\sqrt{385}}{66}$	0	0	0	$\frac{\sqrt{77}}{66}$	0	0	0	0	0	0	0	0
		0	0	$\frac{\sqrt{462}}{66}$	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	$-\frac{\sqrt{154}}{66}$	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	$\frac{\sqrt{11}}{66}$	0	0	0	0	0	0	0	0	0
941	symmetry	$\frac{3\sqrt{7}yz(y-z)(y+z)\left(10x^2-y^2-z^2\right)}{4}$													

continued ...

Table 10

No.	multipole	matrix													
	$\mathbb{T}_{6,1}^{(1,0;a)}(E,1)$	0	0	0	0	0	0	$\frac{\sqrt{66}}{1056}$	0	$\frac{\sqrt{154}}{352}$	0	$-\frac{\sqrt{2310}}{352}$	0	$-\frac{\sqrt{462}}{96}$	0
		0	0	0	0	0	0	0	$-\frac{\sqrt{2310}}{1056}$	0	$-\frac{5\sqrt{462}}{1056}$	0	$\frac{3\sqrt{770}}{352}$	0	$\frac{\sqrt{330}}{96}$
		0	0	0	0	0	0	$-\frac{\sqrt{165}}{176}$	0	$\frac{\sqrt{385}}{176}$	0	$\frac{5\sqrt{231}}{528}$	0	$-\frac{\sqrt{1155}}{176}$	0
		0	0	0	0	0	0	0	$\frac{\sqrt{1155}}{176}$	0	$-\frac{5\sqrt{231}}{528}$	0	$-\frac{\sqrt{385}}{176}$	0	$\frac{\sqrt{165}}{176}$
		0	0	0	0	0	0	$-\frac{\sqrt{330}}{96}$	0	$-\frac{3\sqrt{770}}{352}$	0	$\frac{5\sqrt{462}}{1056}$	0	$\frac{\sqrt{2310}}{1056}$	0
		0	0	0	0	0	0	0	$\frac{\sqrt{462}}{96}$	0	$\frac{\sqrt{2310}}{352}$	0	$-\frac{\sqrt{154}}{352}$	0	$-\frac{\sqrt{66}}{1056}$
		$\frac{\sqrt{66}}{1056}$	0	$-\frac{\sqrt{165}}{176}$	0	$-\frac{\sqrt{330}}{96}$	0	0	0	0	0	0	0	0	0
		0	$-\frac{\sqrt{2310}}{1056}$	0	$\frac{\sqrt{1155}}{176}$	0	$\frac{\sqrt{462}}{96}$	0	0	0	0	0	0	0	0
		$\frac{\sqrt{154}}{352}$	0	$\frac{\sqrt{385}}{176}$	0	$-\frac{3\sqrt{770}}{352}$	0	0	0	0	0	0	0	0	0
		0	$-\frac{5\sqrt{462}}{1056}$	0	$-\frac{5\sqrt{231}}{528}$	0	$\frac{\sqrt{2310}}{352}$	0	0	0	0	0	0	0	0
		$-\frac{\sqrt{2310}}{352}$	0	$\frac{5\sqrt{231}}{528}$	0	$\frac{5\sqrt{462}}{1056}$	0	0	0	0	0	0	0	0	0
		0	$\frac{3\sqrt{770}}{352}$	0	$-\frac{\sqrt{385}}{176}$	0	$-\frac{\sqrt{154}}{352}$	0	0	0	0	0	0	0	0
		$-\frac{\sqrt{462}}{96}$	0	$-\frac{\sqrt{1155}}{176}$	0	$\frac{\sqrt{2310}}{1056}$	0	0	0	0	0	0	0	0	0
		0	$\frac{\sqrt{330}}{96}$	0	$\frac{\sqrt{165}}{176}$	0	$-\frac{\sqrt{66}}{1056}$	0	0	0	0	0	0	0	0

| 942 | symmetry | $-\frac{3\sqrt{7}xz(x-z)(x+z)\left(x^2-10y^2+z^2\right)}{4}$ |

continued ...

Table 10

No.	multipole	matrix

$\mathbb{T}_{6,2}^{(1,0;a)}(E,1)$

$$\begin{pmatrix}
0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{66}i}{1056} & 0 & \frac{\sqrt{154}i}{352} & 0 & \frac{\sqrt{2310}i}{352} & 0 & -\frac{\sqrt{462}i}{96} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2310}i}{1056} & 0 & -\frac{5\sqrt{462}i}{1056} & 0 & -\frac{3\sqrt{770}i}{352} & 0 & \frac{\sqrt{330}i}{96} \\
0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{165}i}{176} & 0 & -\frac{\sqrt{385}i}{176} & 0 & \frac{5\sqrt{231}i}{528} & 0 & \frac{\sqrt{1155}i}{176} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{1155}i}{176} & 0 & \frac{5\sqrt{231}i}{528} & 0 & -\frac{\sqrt{385}i}{176} & 0 & -\frac{\sqrt{165}i}{176} \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{330}i}{96} & 0 & -\frac{3\sqrt{770}i}{352} & 0 & -\frac{5\sqrt{462}i}{1056} & 0 & \frac{\sqrt{2310}i}{1056} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{462}i}{96} & 0 & \frac{\sqrt{2310}i}{352} & 0 & \frac{\sqrt{154}i}{352} & 0 & -\frac{\sqrt{66}i}{1056} \\
\frac{\sqrt{66}i}{1056} & 0 & \frac{\sqrt{165}i}{176} & 0 & -\frac{\sqrt{330}i}{96} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & -\frac{\sqrt{2310}i}{1056} & 0 & -\frac{\sqrt{1155}i}{176} & 0 & \frac{\sqrt{462}i}{96} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
-\frac{\sqrt{154}i}{352} & 0 & \frac{\sqrt{385}i}{176} & 0 & \frac{3\sqrt{770}i}{352} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & \frac{5\sqrt{462}i}{1056} & 0 & -\frac{5\sqrt{231}i}{528} & 0 & -\frac{\sqrt{2310}i}{352} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
-\frac{\sqrt{2310}i}{352} & 0 & -\frac{5\sqrt{231}i}{528} & 0 & \frac{5\sqrt{462}i}{1056} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & \frac{3\sqrt{770}i}{352} & 0 & \frac{\sqrt{385}i}{176} & 0 & -\frac{\sqrt{154}i}{352} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
\frac{\sqrt{462}i}{96} & 0 & -\frac{\sqrt{1155}i}{176} & 0 & -\frac{\sqrt{2310}i}{1056} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & -\frac{\sqrt{330}i}{96} & 0 & \frac{\sqrt{165}i}{176} & 0 & \frac{\sqrt{66}i}{1056} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0
\end{pmatrix}$$

943	symmetry	$\frac{\sqrt{462}yz(y^2-3z^2)(3y^2-z^2)}{16}$

continued ...

Table 10

No.	multipole	matrix

$$
\mathbb{T}_{6,1}^{(1,0;a)}(E,2)
$$

$$
\begin{pmatrix}
0 & 0 & 0 & 0 & 0 & 0 & \frac{1}{64} & 0 & \frac{\sqrt{21}}{64} & 0 & \frac{\sqrt{35}}{64} & 0 & \frac{\sqrt{7}}{64} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{35}}{64} & 0 & -\frac{5\sqrt{7}}{64} & 0 & -\frac{\sqrt{105}}{64} & 0 & -\frac{\sqrt{5}}{64} \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}}{64} & 0 & \frac{\sqrt{210}}{64} & 0 & \frac{5\sqrt{14}}{64} & 0 & \frac{\sqrt{70}}{64} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}}{64} & 0 & -\frac{5\sqrt{14}}{64} & 0 & -\frac{\sqrt{210}}{64} & 0 & -\frac{\sqrt{10}}{64} \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{5}}{64} & 0 & \frac{\sqrt{105}}{64} & 0 & \frac{5\sqrt{7}}{64} & 0 & \frac{\sqrt{35}}{64} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}}{64} & 0 & -\frac{\sqrt{35}}{64} & 0 & -\frac{\sqrt{21}}{64} & 0 & -\frac{1}{64} \\
\frac{1}{64} & 0 & \frac{\sqrt{10}}{64} & 0 & \frac{\sqrt{5}}{64} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & -\frac{\sqrt{35}}{64} & 0 & -\frac{\sqrt{70}}{64} & 0 & -\frac{\sqrt{7}}{64} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
\frac{\sqrt{21}}{64} & 0 & \frac{\sqrt{210}}{64} & 0 & \frac{\sqrt{105}}{64} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & -\frac{5\sqrt{7}}{64} & 0 & -\frac{5\sqrt{14}}{64} & 0 & -\frac{\sqrt{35}}{64} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
\frac{\sqrt{35}}{64} & 0 & \frac{5\sqrt{14}}{64} & 0 & \frac{5\sqrt{7}}{64} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & -\frac{\sqrt{105}}{64} & 0 & -\frac{\sqrt{210}}{64} & 0 & -\frac{\sqrt{21}}{64} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
\frac{\sqrt{7}}{64} & 0 & \frac{\sqrt{70}}{64} & 0 & \frac{\sqrt{35}}{64} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & -\frac{\sqrt{5}}{64} & 0 & -\frac{\sqrt{10}}{64} & 0 & -\frac{1}{64} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0
\end{pmatrix}
$$

| 944 | symmetry | $\dfrac{\sqrt{462}\,xz\left(x^2-3z^2\right)\left(3x^2-z^2\right)}{16}$ |

continued ...

Table 10

No.	multipole	matrix

$\mathbb{T}_{6,2}^{(1,0;a)}(E,2)$

$$\begin{pmatrix}
0 & 0 & 0 & 0 & 0 & 0 & -\frac{i}{64} & 0 & \frac{\sqrt{21}i}{64} & 0 & -\frac{\sqrt{35}i}{64} & 0 & \frac{\sqrt{7}i}{64} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{35}i}{64} & 0 & -\frac{5\sqrt{7}i}{64} & 0 & \frac{\sqrt{105}i}{64} & 0 & -\frac{\sqrt{5}i}{64} \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}i}{64} & 0 & -\frac{\sqrt{210}i}{64} & 0 & \frac{5\sqrt{14}i}{64} & 0 & -\frac{\sqrt{70}i}{64} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}i}{64} & 0 & \frac{5\sqrt{14}i}{64} & 0 & -\frac{\sqrt{210}i}{64} & 0 & \frac{\sqrt{10}i}{64} \\
0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{64} & 0 & \frac{\sqrt{105}i}{64} & 0 & -\frac{5\sqrt{7}i}{64} & 0 & \frac{\sqrt{35}i}{64} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}i}{64} & 0 & -\frac{\sqrt{35}i}{64} & 0 & \frac{\sqrt{21}i}{64} & 0 & -\frac{i}{64} \\
\frac{i}{64} & 0 & -\frac{\sqrt{10}i}{64} & 0 & \frac{\sqrt{5}i}{64} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & -\frac{\sqrt{35}i}{64} & 0 & \frac{\sqrt{70}i}{64} & 0 & -\frac{\sqrt{7}i}{64} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
-\frac{\sqrt{21}i}{64} & 0 & \frac{\sqrt{210}i}{64} & 0 & -\frac{\sqrt{105}i}{64} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & \frac{5\sqrt{7}i}{64} & 0 & -\frac{5\sqrt{14}i}{64} & 0 & \frac{\sqrt{35}i}{64} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
\frac{\sqrt{35}i}{64} & 0 & -\frac{5\sqrt{14}i}{64} & 0 & \frac{5\sqrt{7}i}{64} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & -\frac{\sqrt{105}i}{64} & 0 & \frac{\sqrt{210}i}{64} & 0 & -\frac{\sqrt{21}i}{64} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
-\frac{\sqrt{7}i}{64} & 0 & \frac{\sqrt{70}i}{64} & 0 & -\frac{\sqrt{35}i}{64} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & \frac{\sqrt{5}i}{64} & 0 & -\frac{\sqrt{10}i}{64} & 0 & \frac{i}{64} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0
\end{pmatrix}$$

| 945 | symmetry | $\dfrac{\sqrt{210}\,yz\left(16x^4-16x^2y^2-16x^2z^2+y^4+2y^2z^2+z^4\right)}{16}$ |

continued …

Table 10

No.	multipole	matrix													
	$\mathbb{T}_{6,1}^{(1,0;a)}(E,3)$	0	0	0	0	0	0	$\frac{\sqrt{55}}{2112}$	0	$\frac{\sqrt{1155}}{2112}$	0	$-\frac{9\sqrt{77}}{704}$	0	$\frac{\sqrt{385}}{64}$	0
		0	0	0	0	0	0	0	$-\frac{5\sqrt{77}}{2112}$	0	$-\frac{5\sqrt{385}}{2112}$	0	$\frac{9\sqrt{231}}{704}$	0	$-\frac{5\sqrt{11}}{64}$
		0	0	0	0	0	0	$-\frac{9\sqrt{22}}{704}$	0	$\frac{5\sqrt{462}}{2112}$	0	$\frac{5\sqrt{770}}{2112}$	0	$-\frac{9\sqrt{154}}{704}$	0
		0	0	0	0	0	0	0	$\frac{9\sqrt{154}}{704}$	0	$-\frac{5\sqrt{770}}{2112}$	0	$-\frac{5\sqrt{462}}{2112}$	0	$\frac{9\sqrt{22}}{704}$
		0	0	0	0	0	0	$\frac{5\sqrt{11}}{64}$	0	$-\frac{9\sqrt{231}}{704}$	0	$\frac{5\sqrt{385}}{2112}$	0	$\frac{5\sqrt{77}}{2112}$	0
		0	0	0	0	0	0	0	$-\frac{\sqrt{385}}{64}$	0	$\frac{9\sqrt{77}}{704}$	0	$-\frac{\sqrt{1155}}{2112}$	0	$-\frac{\sqrt{55}}{2112}$
		$\frac{\sqrt{55}}{2112}$	0	$-\frac{9\sqrt{22}}{704}$	0	$\frac{5\sqrt{11}}{64}$	0	0	0	0	0	0	0	0	0
		0	$-\frac{5\sqrt{77}}{2112}$	0	$\frac{9\sqrt{154}}{704}$	0	$-\frac{\sqrt{385}}{64}$	0	0	0	0	0	0	0	0
		$\frac{\sqrt{1155}}{2112}$	0	$\frac{5\sqrt{462}}{2112}$	0	$-\frac{9\sqrt{231}}{704}$	0	0	0	0	0	0	0	0	0
		0	$-\frac{5\sqrt{385}}{2112}$	0	$-\frac{5\sqrt{770}}{2112}$	0	$\frac{9\sqrt{77}}{704}$	0	0	0	0	0	0	0	0
		$-\frac{9\sqrt{77}}{704}$	0	$\frac{5\sqrt{770}}{2112}$	0	$\frac{5\sqrt{385}}{2112}$	0	0	0	0	0	0	0	0	0
		0	$\frac{9\sqrt{231}}{704}$	0	$-\frac{5\sqrt{462}}{2112}$	0	$-\frac{\sqrt{1155}}{2112}$	0	0	0	0	0	0	0	0
		$\frac{\sqrt{385}}{64}$	0	$-\frac{9\sqrt{154}}{704}$	0	$\frac{5\sqrt{77}}{2112}$	0	0	0	0	0	0	0	0	0
		0	$-\frac{5\sqrt{11}}{64}$	0	$\frac{9\sqrt{22}}{704}$	0	$-\frac{\sqrt{55}}{2112}$	0	0	0	0	0	0	0	0

| 946 | symmetry | $\frac{\sqrt{210}xz\left(x^4-16x^2y^2+2x^2z^2+16y^4-16y^2z^2+z^4\right)}{16}$ |

Table 10

No.	multipole	matrix														

$\mathbb{T}_{6,2}^{(1,0;a)}(E,3)$

$$\begin{pmatrix}
0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{55}i}{2112} & 0 & \frac{\sqrt{1155}i}{2112} & 0 & \frac{9\sqrt{77}i}{704} & 0 & \frac{\sqrt{385}i}{64} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{5\sqrt{77}i}{2112} & 0 & -\frac{5\sqrt{385}i}{2112} & 0 & -\frac{9\sqrt{231}i}{704} & 0 & -\frac{5\sqrt{11}i}{64} \\
0 & 0 & 0 & 0 & 0 & 0 & -\frac{9\sqrt{22}i}{704} & 0 & -\frac{5\sqrt{462}i}{2112} & 0 & \frac{5\sqrt{770}i}{2112} & 0 & \frac{9\sqrt{154}i}{704} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{9\sqrt{154}i}{704} & 0 & \frac{5\sqrt{770}i}{2112} & 0 & -\frac{5\sqrt{462}i}{2112} & 0 & -\frac{9\sqrt{22}i}{704} \\
0 & 0 & 0 & 0 & 0 & 0 & -\frac{5\sqrt{11}i}{64} & 0 & -\frac{9\sqrt{231}i}{704} & 0 & -\frac{5\sqrt{385}i}{2112} & 0 & \frac{5\sqrt{77}i}{2112} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{385}i}{64} & 0 & \frac{9\sqrt{77}i}{704} & 0 & \frac{\sqrt{1155}i}{2112} & 0 & -\frac{\sqrt{55}i}{2112} \\
\frac{\sqrt{55}i}{2112} & 0 & \frac{9\sqrt{22}i}{704} & 0 & \frac{5\sqrt{11}i}{64} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & -\frac{5\sqrt{77}i}{2112} & 0 & -\frac{9\sqrt{154}i}{704} & 0 & -\frac{\sqrt{385}i}{64} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
-\frac{\sqrt{1155}i}{2112} & 0 & \frac{5\sqrt{462}i}{2112} & 0 & \frac{9\sqrt{231}i}{704} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & \frac{5\sqrt{385}i}{2112} & 0 & -\frac{5\sqrt{770}i}{2112} & 0 & -\frac{9\sqrt{77}i}{704} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
-\frac{9\sqrt{77}i}{704} & 0 & -\frac{5\sqrt{770}i}{2112} & 0 & \frac{5\sqrt{385}i}{2112} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & \frac{9\sqrt{231}i}{704} & 0 & \frac{5\sqrt{462}i}{2112} & 0 & -\frac{\sqrt{1155}i}{2112} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
-\frac{\sqrt{385}i}{64} & 0 & -\frac{9\sqrt{154}i}{704} & 0 & -\frac{5\sqrt{77}i}{2112} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & \frac{5\sqrt{11}i}{64} & 0 & \frac{9\sqrt{22}i}{704} & 0 & \frac{\sqrt{55}i}{2112} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0
\end{pmatrix}$$

947	symmetry	z

Table 10

No.	multipole	matrix													
		$\frac{5\sqrt{14}}{49}$	0	0	0	0	0	0	$\frac{\sqrt{21}}{98}$	0	0	0	0	0	0
		0	$\frac{3\sqrt{14}}{49}$	0	0	0	0	0	0	$\frac{\sqrt{35}}{98}$	0	0	0	0	0
		0	0	$\frac{\sqrt{14}}{49}$	0	0	0	0	0	0	$\frac{\sqrt{42}}{98}$	0	0	0	0
		0	0	0	$-\frac{\sqrt{14}}{49}$	0	0	0	0	0	0	$\frac{\sqrt{42}}{98}$	0	0	0
		0	0	0	0	$-\frac{3\sqrt{14}}{49}$	0	0	0	0	0	0	$\frac{\sqrt{35}}{98}$	0	0
		0	0	0	0	0	$-\frac{5\sqrt{14}}{49}$	0	0	0	0	0	0	$\frac{\sqrt{21}}{98}$	0
	$\mathbb{M}_1^{(a)}(A_2)$	0	0	0	0	0	0	$\frac{3\sqrt{14}}{28}$	0	0	0	0	0	0	0
		$\frac{\sqrt{21}}{98}$	0	0	0	0	0	0	$\frac{15\sqrt{14}}{196}$	0	0	0	0	0	0
		0	$\frac{\sqrt{35}}{98}$	0	0	0	0	0	0	$\frac{9\sqrt{14}}{196}$	0	0	0	0	0
		0	0	$\frac{\sqrt{42}}{98}$	0	0	0	0	0	0	$\frac{3\sqrt{14}}{196}$	0	0	0	0
		0	0	0	$\frac{\sqrt{42}}{98}$	0	0	0	0	0	0	$-\frac{3\sqrt{14}}{196}$	0	0	0
		0	0	0	0	$\frac{\sqrt{35}}{98}$	0	0	0	0	0	0	$-\frac{9\sqrt{14}}{196}$	0	0
		0	0	0	0	0	$\frac{\sqrt{21}}{98}$	0	0	0	0	0	0	$-\frac{15\sqrt{14}}{196}$	0
		0	0	0	0	0	0	0	0	0	0	0	0	0	$-\frac{3\sqrt{14}}{28}$

| 948 | symmetry | x |

continued ...

Table 10

No.	multipole	matrix

$$\mathbb{M}_{1,1}^{(a)}(E)$$

$$
\begin{pmatrix}
0 & \frac{\sqrt{70}}{49} & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{28} & 0 & \frac{\sqrt{7}}{196} & 0 & 0 & 0 & 0 & 0 \\
\frac{\sqrt{70}}{49} & 0 & \frac{4\sqrt{7}}{49} & 0 & 0 & 0 & 0 & -\frac{\sqrt{105}}{196} & 0 & \frac{\sqrt{21}}{196} & 0 & 0 & 0 & 0 \\
0 & \frac{4\sqrt{7}}{49} & 0 & \frac{3\sqrt{14}}{49} & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}}{196} & 0 & \frac{\sqrt{42}}{196} & 0 & 0 & 0 \\
0 & 0 & \frac{3\sqrt{14}}{49} & 0 & \frac{4\sqrt{7}}{49} & 0 & 0 & 0 & 0 & -\frac{\sqrt{42}}{196} & 0 & \frac{\sqrt{70}}{196} & 0 & 0 \\
0 & 0 & 0 & \frac{4\sqrt{7}}{49} & 0 & \frac{\sqrt{70}}{49} & 0 & 0 & 0 & 0 & -\frac{\sqrt{21}}{196} & 0 & \frac{\sqrt{105}}{196} & 0 \\
0 & 0 & 0 & 0 & \frac{\sqrt{70}}{49} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}}{196} & 0 & \frac{\sqrt{3}}{28} \\
-\frac{\sqrt{3}}{28} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{2}}{28} & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & -\frac{\sqrt{105}}{196} & 0 & 0 & 0 & 0 & \frac{3\sqrt{2}}{28} & 0 & \frac{3\sqrt{42}}{98} & 0 & 0 & 0 & 0 & 0 \\
\frac{\sqrt{7}}{196} & 0 & -\frac{\sqrt{70}}{196} & 0 & 0 & 0 & 0 & \frac{3\sqrt{42}}{98} & 0 & \frac{3\sqrt{210}}{196} & 0 & 0 & 0 & 0 \\
0 & \frac{\sqrt{21}}{196} & 0 & -\frac{\sqrt{42}}{196} & 0 & 0 & 0 & 0 & \frac{3\sqrt{210}}{196} & 0 & \frac{3\sqrt{14}}{49} & 0 & 0 & 0 \\
0 & 0 & \frac{\sqrt{42}}{196} & 0 & -\frac{\sqrt{21}}{196} & 0 & 0 & 0 & 0 & \frac{3\sqrt{14}}{49} & 0 & \frac{3\sqrt{210}}{196} & 0 & 0 \\
0 & 0 & 0 & \frac{\sqrt{70}}{196} & 0 & -\frac{\sqrt{7}}{196} & 0 & 0 & 0 & 0 & \frac{3\sqrt{210}}{196} & 0 & \frac{3\sqrt{42}}{98} & 0 \\
0 & 0 & 0 & 0 & \frac{\sqrt{105}}{196} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{42}}{98} & 0 & \frac{3\sqrt{2}}{28} \\
0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{28} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{2}}{28} & 0 \\
\end{pmatrix}
$$

| 949 | symmetry | $-y$ |

continued ...

Table 10

No.	multipole	matrix

$\mathbb{M}_{1,2}^{(a)}(E)$

$$\begin{pmatrix}
0 & \frac{\sqrt{70}i}{49} & 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{28} & 0 & \frac{\sqrt{7}i}{196} & 0 & 0 & 0 & 0 & 0 \\
-\frac{\sqrt{70}i}{49} & 0 & \frac{4\sqrt{7}i}{49} & 0 & 0 & 0 & 0 & \frac{\sqrt{105}i}{196} & 0 & \frac{\sqrt{21}i}{196} & 0 & 0 & 0 & 0 \\
0 & -\frac{4\sqrt{7}i}{49} & 0 & \frac{3\sqrt{14}i}{49} & 0 & 0 & 0 & 0 & \frac{\sqrt{70}i}{196} & 0 & \frac{\sqrt{42}i}{196} & 0 & 0 & 0 \\
0 & 0 & -\frac{3\sqrt{14}i}{49} & 0 & \frac{4\sqrt{7}i}{49} & 0 & 0 & 0 & 0 & \frac{\sqrt{42}i}{196} & 0 & \frac{\sqrt{70}i}{196} & 0 & 0 \\
0 & 0 & 0 & -\frac{4\sqrt{7}i}{49} & 0 & \frac{\sqrt{70}i}{49} & 0 & 0 & 0 & 0 & \frac{\sqrt{21}i}{196} & 0 & \frac{\sqrt{105}i}{196} & 0 \\
0 & 0 & 0 & 0 & -\frac{\sqrt{70}i}{49} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}i}{196} & 0 & \frac{\sqrt{3}i}{28} \\
-\frac{\sqrt{3}i}{28} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{2}i}{28} & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & -\frac{\sqrt{105}i}{196} & 0 & 0 & 0 & 0 & -\frac{3\sqrt{2}i}{28} & 0 & \frac{3\sqrt{42}i}{98} & 0 & 0 & 0 & 0 & 0 \\
-\frac{\sqrt{7}i}{196} & 0 & -\frac{\sqrt{70}i}{196} & 0 & 0 & 0 & 0 & -\frac{3\sqrt{42}i}{98} & 0 & \frac{3\sqrt{210}i}{196} & 0 & 0 & 0 & 0 \\
0 & -\frac{\sqrt{21}i}{196} & 0 & -\frac{\sqrt{42}i}{196} & 0 & 0 & 0 & 0 & -\frac{3\sqrt{210}i}{196} & 0 & \frac{3\sqrt{14}i}{49} & 0 & 0 & 0 \\
0 & 0 & -\frac{\sqrt{42}i}{196} & 0 & -\frac{\sqrt{21}i}{196} & 0 & 0 & 0 & 0 & -\frac{3\sqrt{14}i}{49} & 0 & \frac{3\sqrt{210}i}{196} & 0 & 0 \\
0 & 0 & 0 & -\frac{\sqrt{70}i}{196} & 0 & -\frac{\sqrt{7}i}{196} & 0 & 0 & 0 & 0 & -\frac{3\sqrt{210}i}{196} & 0 & \frac{3\sqrt{42}i}{98} & 0 \\
0 & 0 & 0 & 0 & -\frac{\sqrt{105}i}{196} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{42}i}{98} & 0 & \frac{3\sqrt{2}i}{28} \\
0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{28} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{2}i}{28} & 0
\end{pmatrix}$$

| 950 | symmetry | $-\frac{z\left(3x^2+3y^2-2z^2\right)}{2}$ |

continued ...

Table 10

No.	multipole	matrix													
	$\mathbb{M}_3^{(a)}(A_2)$	$-\frac{5\sqrt{3}}{42}$	0	0	0	0	0	0	$-\frac{\sqrt{2}}{7}$	0	0	0	0	0	0
		0	$\frac{\sqrt{3}}{6}$	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	$\frac{2\sqrt{3}}{21}$	0	0	0	0	0	0	$\frac{1}{7}$	0	0	0	0
		0	0	0	$-\frac{2\sqrt{3}}{21}$	0	0	0	0	0	0	$\frac{1}{7}$	0	0	0
		0	0	0	0	$-\frac{\sqrt{3}}{6}$	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	$\frac{5\sqrt{3}}{42}$	0	0	0	0	0	0	$-\frac{\sqrt{2}}{7}$	0
		0	0	0	0	0	0	$-\frac{\sqrt{3}}{6}$	0	0	0	0	0	0	0
		$-\frac{\sqrt{2}}{7}$	0	0	0	0	0	0	$\frac{5\sqrt{3}}{42}$	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	$\frac{\sqrt{3}}{6}$	0	0	0	0	0
		0	0	$\frac{1}{7}$	0	0	0	0	0	0	$\frac{\sqrt{3}}{14}$	0	0	0	0
		0	0	0	$\frac{1}{7}$	0	0	0	0	0	0	$-\frac{\sqrt{3}}{14}$	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	$-\frac{\sqrt{3}}{6}$	0	0
		0	0	0	0	0	$-\frac{\sqrt{2}}{7}$	0	0	0	0	0	0	$-\frac{5\sqrt{3}}{42}$	0
		0	0	0	0	0	0	0	0	0	0	0	0	0	$\frac{\sqrt{3}}{6}$
951	symmetry	$\sqrt{15}xyz$													

continued ...

Table 10

No.	multipole	matrix														

$\mathbb{M}_3^{(a)}(B_1)$

$$\begin{pmatrix}
0 & 0 & \frac{5\sqrt{2}i}{28} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}i}{21} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & \frac{\sqrt{10}i}{28} & 0 & 0 & \frac{\sqrt{42}i}{42} & 0 & 0 & 0 & \frac{\sqrt{30}i}{42} & 0 & 0 & 0 \\
-\frac{5\sqrt{2}i}{28} & 0 & 0 & 0 & -\frac{\sqrt{10}i}{28} & 0 & 0 & \frac{\sqrt{3}i}{42} & 0 & 0 & 0 & \frac{i}{14} & 0 & 0 \\
0 & -\frac{\sqrt{10}i}{28} & 0 & 0 & 0 & -\frac{5\sqrt{2}i}{28} & 0 & 0 & -\frac{i}{14} & 0 & 0 & 0 & -\frac{\sqrt{3}i}{42} & 0 \\
0 & 0 & \frac{\sqrt{10}i}{28} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}i}{42} & 0 & 0 & 0 & -\frac{\sqrt{42}i}{42} \\
0 & 0 & 0 & \frac{5\sqrt{2}i}{28} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{21} & 0 & 0 & 0 \\
0 & -\frac{\sqrt{42}i}{42} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{105}i}{42} & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & -\frac{\sqrt{3}i}{42} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3i}{14} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & \frac{i}{14} & 0 & 0 & -\frac{\sqrt{105}i}{42} & 0 & 0 & 0 & \frac{\sqrt{3}i}{21} & 0 & 0 & 0 \\
-\frac{\sqrt{6}i}{21} & 0 & 0 & 0 & \frac{\sqrt{30}i}{42} & 0 & 0 & -\frac{3i}{14} & 0 & 0 & 0 & -\frac{\sqrt{3}i}{21} & 0 & 0 \\
0 & -\frac{\sqrt{30}i}{42} & 0 & 0 & 0 & \frac{\sqrt{6}i}{21} & 0 & 0 & -\frac{\sqrt{3}i}{21} & 0 & 0 & 0 & -\frac{3i}{14} & 0 \\
0 & 0 & -\frac{i}{14} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{21} & 0 & 0 & 0 & -\frac{\sqrt{105}i}{42} \\
0 & 0 & 0 & \frac{\sqrt{3}i}{42} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3i}{14} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & \frac{\sqrt{42}i}{42} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{105}i}{42} & 0 & 0
\end{pmatrix}$$

952	symmetry	$\frac{\sqrt{15}z(x-y)(x+y)}{2}$

410

Table 10

No.	multipole	matrix

$$\mathbb{M}_3^{(a)}(B_2)$$

$$\begin{pmatrix}
0 & 0 & -\frac{5\sqrt{2}}{28} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}}{21} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & -\frac{\sqrt{10}}{28} & 0 & 0 & \frac{\sqrt{42}}{42} & 0 & 0 & 0 & -\frac{\sqrt{30}}{42} & 0 & 0 & 0 \\
-\frac{5\sqrt{2}}{28} & 0 & 0 & 0 & \frac{\sqrt{10}}{28} & 0 & 0 & \frac{\sqrt{3}}{42} & 0 & 0 & 0 & -\frac{1}{14} & 0 & 0 \\
0 & -\frac{\sqrt{10}}{28} & 0 & 0 & 0 & \frac{5\sqrt{2}}{28} & 0 & 0 & -\frac{1}{14} & 0 & 0 & 0 & \frac{\sqrt{3}}{42} & 0 \\
0 & 0 & \frac{\sqrt{10}}{28} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}}{42} & 0 & 0 & 0 & \frac{\sqrt{42}}{42} \\
0 & 0 & 0 & \frac{5\sqrt{2}}{28} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}}{21} & 0 & 0 & 0 \\
0 & \frac{\sqrt{42}}{42} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{105}}{42} & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & \frac{\sqrt{3}}{42} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3}{14} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & -\frac{1}{14} & 0 & 0 & -\frac{\sqrt{105}}{42} & 0 & 0 & 0 & -\frac{\sqrt{3}}{21} & 0 & 0 & 0 \\
-\frac{\sqrt{6}}{21} & 0 & 0 & 0 & -\frac{\sqrt{30}}{42} & 0 & 0 & -\frac{3}{14} & 0 & 0 & 0 & \frac{\sqrt{3}}{21} & 0 & 0 \\
0 & -\frac{\sqrt{30}}{42} & 0 & 0 & 0 & -\frac{\sqrt{6}}{21} & 0 & 0 & -\frac{\sqrt{3}}{21} & 0 & 0 & 0 & \frac{3}{14} & 0 \\
0 & 0 & -\frac{1}{14} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{21} & 0 & 0 & 0 & \frac{\sqrt{105}}{42} \\
0 & 0 & 0 & \frac{\sqrt{3}}{42} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3}{14} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & \frac{\sqrt{42}}{42} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{105}}{42} & 0 & 0
\end{pmatrix}$$

953	symmetry	$\frac{x\left(2x^2-3y^2-3z^2\right)}{2}$

continued ...

Table 10

No.	multipole	matrix													
	$\mathbb{M}_{3,1}^{(a)}(E,1)$	0	$\frac{\sqrt{15}}{28}$	0	$-\frac{5\sqrt{30}}{168}$	0	0	$-\frac{\sqrt{14}}{56}$	0	$\frac{\sqrt{6}}{28}$	0	$-\frac{\sqrt{10}}{56}$	0	0	0
		$\frac{\sqrt{15}}{28}$	0	$-\frac{\sqrt{6}}{56}$	0	$-\frac{5\sqrt{3}}{42}$	0	0	$\frac{\sqrt{10}}{56}$	0	$\frac{\sqrt{2}}{28}$	0	$-\frac{\sqrt{30}}{56}$	0	0
		0	$-\frac{\sqrt{6}}{56}$	0	$-\frac{\sqrt{3}}{14}$	0	$-\frac{5\sqrt{30}}{168}$	$\frac{\sqrt{35}}{56}$	0	$\frac{\sqrt{15}}{56}$	0	$-\frac{1}{56}$	0	$-\frac{3\sqrt{5}}{56}$	0
		$-\frac{5\sqrt{30}}{168}$	0	$-\frac{\sqrt{3}}{14}$	0	$-\frac{\sqrt{6}}{56}$	0	0	$\frac{3\sqrt{5}}{56}$	0	$\frac{1}{56}$	0	$-\frac{\sqrt{15}}{56}$	0	$-\frac{\sqrt{35}}{56}$
		0	$-\frac{5\sqrt{3}}{42}$	0	$-\frac{\sqrt{6}}{56}$	0	$\frac{\sqrt{15}}{28}$	0	0	$\frac{\sqrt{30}}{56}$	0	$-\frac{\sqrt{2}}{28}$	0	$-\frac{\sqrt{10}}{56}$	0
		0	0	$-\frac{5\sqrt{30}}{168}$	0	$\frac{\sqrt{15}}{28}$	0	0	0	0	$\frac{\sqrt{10}}{56}$	0	$-\frac{\sqrt{6}}{28}$	0	$\frac{\sqrt{14}}{56}$
		$-\frac{\sqrt{14}}{56}$	0	$\frac{\sqrt{35}}{56}$	0	0	0	0	$\frac{\sqrt{21}}{28}$	0	$-\frac{\sqrt{105}}{84}$	0	0	0	0
		0	$\frac{\sqrt{10}}{56}$	0	$\frac{3\sqrt{5}}{56}$	0	0	$\frac{\sqrt{21}}{28}$	0	$\frac{1}{28}$	0	$-\frac{\sqrt{15}}{21}$	0	0	0
		$\frac{\sqrt{6}}{28}$	0	$\frac{\sqrt{15}}{56}$	0	$\frac{\sqrt{30}}{56}$	0	0	$\frac{1}{28}$	0	$-\frac{\sqrt{5}}{28}$	0	$-\frac{5\sqrt{3}}{42}$	0	0
		0	$\frac{\sqrt{2}}{28}$	0	$\frac{1}{56}$	0	$\frac{\sqrt{10}}{56}$	$-\frac{\sqrt{105}}{84}$	0	$-\frac{\sqrt{5}}{28}$	0	$-\frac{\sqrt{3}}{14}$	0	$-\frac{\sqrt{15}}{21}$	0
		$-\frac{\sqrt{10}}{56}$	0	$-\frac{1}{56}$	0	$-\frac{\sqrt{2}}{28}$	0	0	$-\frac{\sqrt{15}}{21}$	0	$-\frac{\sqrt{3}}{14}$	0	$-\frac{\sqrt{5}}{28}$	0	$-\frac{\sqrt{105}}{84}$
		0	$-\frac{\sqrt{30}}{56}$	0	$-\frac{\sqrt{15}}{56}$	0	$-\frac{\sqrt{6}}{28}$	0	0	$-\frac{5\sqrt{3}}{42}$	0	$-\frac{\sqrt{5}}{28}$	0	$\frac{1}{28}$	0
		0	0	$-\frac{3\sqrt{5}}{56}$	0	$-\frac{\sqrt{10}}{56}$	0	0	0	0	$-\frac{\sqrt{15}}{21}$	0	$\frac{1}{28}$	0	$\frac{\sqrt{21}}{28}$
		0	0	0	$-\frac{\sqrt{35}}{56}$	0	$\frac{\sqrt{14}}{56}$	0	0	0	0	$-\frac{\sqrt{105}}{84}$	0	$\frac{\sqrt{21}}{28}$	0
954	symmetry	$\frac{y\left(3x^2-2y^2+3z^2\right)}{2}$													

Table 10

No.	multipole	matrix

$\mathbb{M}_{3,2}^{(a)}(E,1)$

$$\begin{pmatrix}
0 & \frac{\sqrt{15}i}{28} & 0 & \frac{5\sqrt{30}i}{168} & 0 & 0 & \frac{\sqrt{14}i}{56} & 0 & \frac{\sqrt{6}i}{28} & 0 & \frac{\sqrt{10}i}{56} & 0 & 0 & 0 \\
-\frac{\sqrt{15}i}{28} & 0 & -\frac{\sqrt{6}i}{56} & 0 & \frac{5\sqrt{3}i}{42} & 0 & 0 & -\frac{\sqrt{10}i}{56} & 0 & \frac{\sqrt{2}i}{28} & 0 & \frac{\sqrt{30}i}{56} & 0 & 0 \\
0 & \frac{\sqrt{6}i}{56} & 0 & -\frac{\sqrt{3}i}{14} & 0 & \frac{5\sqrt{30}i}{168} & \frac{\sqrt{35}i}{56} & 0 & -\frac{\sqrt{15}i}{56} & 0 & -\frac{i}{56} & 0 & \frac{3\sqrt{5}i}{56} & 0 \\
-\frac{5\sqrt{30}i}{168} & 0 & \frac{\sqrt{3}i}{14} & 0 & -\frac{\sqrt{6}i}{56} & 0 & 0 & \frac{3\sqrt{5}i}{56} & 0 & -\frac{i}{56} & 0 & -\frac{\sqrt{15}i}{56} & 0 & \frac{\sqrt{35}i}{56} \\
0 & -\frac{5\sqrt{3}i}{42} & 0 & \frac{\sqrt{6}i}{56} & 0 & \frac{\sqrt{15}i}{28} & 0 & 0 & \frac{\sqrt{30}i}{56} & 0 & \frac{\sqrt{2}i}{28} & 0 & -\frac{\sqrt{10}i}{56} & 0 \\
0 & 0 & -\frac{5\sqrt{30}i}{168} & 0 & -\frac{\sqrt{15}i}{28} & 0 & 0 & 0 & 0 & \frac{\sqrt{10}i}{56} & 0 & \frac{\sqrt{6}i}{28} & 0 & \frac{\sqrt{14}i}{56} \\
-\frac{\sqrt{14}i}{56} & 0 & -\frac{\sqrt{35}i}{56} & 0 & 0 & 0 & 0 & \frac{\sqrt{21}i}{28} & 0 & \frac{\sqrt{105}i}{84} & 0 & 0 & 0 & 0 \\
0 & \frac{\sqrt{10}i}{56} & 0 & -\frac{3\sqrt{5}i}{56} & 0 & 0 & -\frac{\sqrt{21}i}{28} & 0 & \frac{i}{28} & 0 & \frac{\sqrt{15}i}{21} & 0 & 0 & 0 \\
-\frac{\sqrt{6}i}{28} & 0 & \frac{\sqrt{15}i}{56} & 0 & -\frac{\sqrt{30}i}{56} & 0 & 0 & -\frac{i}{28} & 0 & -\frac{\sqrt{5}i}{28} & 0 & \frac{5\sqrt{3}i}{42} & 0 & 0 \\
0 & -\frac{\sqrt{2}i}{28} & 0 & \frac{i}{56} & 0 & -\frac{\sqrt{10}i}{56} & -\frac{\sqrt{105}i}{84} & 0 & \frac{\sqrt{5}i}{28} & 0 & -\frac{\sqrt{3}i}{14} & 0 & \frac{\sqrt{15}i}{21} & 0 \\
-\frac{\sqrt{10}i}{56} & 0 & \frac{i}{56} & 0 & -\frac{\sqrt{2}i}{28} & 0 & 0 & -\frac{\sqrt{15}i}{21} & 0 & \frac{\sqrt{3}i}{14} & 0 & -\frac{\sqrt{5}i}{28} & 0 & \frac{\sqrt{105}i}{84} \\
0 & -\frac{\sqrt{30}i}{56} & 0 & \frac{\sqrt{15}i}{56} & 0 & -\frac{\sqrt{6}i}{28} & 0 & 0 & -\frac{5\sqrt{3}i}{42} & 0 & \frac{\sqrt{5}i}{28} & 0 & \frac{i}{28} & 0 \\
0 & 0 & -\frac{3\sqrt{5}i}{56} & 0 & \frac{\sqrt{10}i}{56} & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{21} & 0 & -\frac{i}{28} & 0 & \frac{\sqrt{21}i}{28} \\
0 & 0 & 0 & -\frac{\sqrt{35}i}{56} & 0 & -\frac{\sqrt{14}i}{56} & 0 & 0 & 0 & 0 & -\frac{\sqrt{105}i}{84} & 0 & -\frac{\sqrt{21}i}{28} & 0
\end{pmatrix}$$

| 955 | symmetry | $\frac{\sqrt{15}\,x(y-z)(y+z)}{2}$ |

continued ...

Table 10

No.	multipole	matrix

$$\mathbb{M}_{3,1}^{(a)}(E,2) = \begin{pmatrix}
0 & \frac{5}{28} & 0 & \frac{5\sqrt{2}}{56} & 0 & 0 & -\frac{\sqrt{210}}{168} & 0 & \frac{\sqrt{10}}{28} & 0 & \frac{\sqrt{6}}{56} & 0 & 0 & 0 \\
\frac{5}{28} & 0 & -\frac{\sqrt{10}}{56} & 0 & \frac{\sqrt{5}}{14} & 0 & 0 & \frac{5\sqrt{6}}{168} & 0 & \frac{\sqrt{30}}{84} & 0 & \frac{3\sqrt{2}}{56} & 0 & 0 \\
0 & -\frac{\sqrt{10}}{56} & 0 & -\frac{\sqrt{5}}{14} & 0 & \frac{5\sqrt{2}}{56} & -\frac{\sqrt{21}}{56} & 0 & \frac{5}{56} & 0 & -\frac{\sqrt{15}}{168} & 0 & \frac{3\sqrt{3}}{56} & 0 \\
\frac{5\sqrt{2}}{56} & 0 & -\frac{\sqrt{5}}{14} & 0 & -\frac{\sqrt{10}}{56} & 0 & 0 & -\frac{3\sqrt{3}}{56} & 0 & \frac{\sqrt{15}}{168} & 0 & -\frac{5}{56} & 0 & \frac{\sqrt{21}}{56} \\
0 & \frac{\sqrt{5}}{14} & 0 & -\frac{\sqrt{10}}{56} & 0 & \frac{5}{28} & 0 & 0 & -\frac{3\sqrt{2}}{56} & 0 & -\frac{\sqrt{30}}{84} & 0 & -\frac{5\sqrt{6}}{168} & 0 \\
0 & 0 & \frac{5\sqrt{2}}{56} & 0 & \frac{5}{28} & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}}{56} & 0 & -\frac{\sqrt{10}}{28} & 0 & \frac{\sqrt{210}}{168} \\
-\frac{\sqrt{210}}{168} & 0 & -\frac{\sqrt{21}}{56} & 0 & 0 & 0 & 0 & \frac{\sqrt{35}}{28} & 0 & \frac{\sqrt{7}}{28} & 0 & 0 & 0 & 0 \\
0 & \frac{5\sqrt{6}}{168} & 0 & -\frac{3\sqrt{3}}{56} & 0 & 0 & \frac{\sqrt{35}}{28} & 0 & \frac{\sqrt{15}}{84} & 0 & \frac{1}{7} & 0 & 0 & 0 \\
\frac{\sqrt{10}}{28} & 0 & \frac{5}{56} & 0 & -\frac{3\sqrt{2}}{56} & 0 & 0 & \frac{\sqrt{15}}{84} & 0 & -\frac{5\sqrt{3}}{84} & 0 & \frac{\sqrt{5}}{14} & 0 & 0 \\
0 & \frac{\sqrt{30}}{84} & 0 & \frac{\sqrt{15}}{168} & 0 & -\frac{\sqrt{6}}{56} & \frac{\sqrt{7}}{28} & 0 & -\frac{5\sqrt{3}}{84} & 0 & -\frac{\sqrt{5}}{14} & 0 & \frac{1}{7} & 0 \\
\frac{\sqrt{6}}{56} & 0 & -\frac{\sqrt{15}}{168} & 0 & -\frac{\sqrt{30}}{84} & 0 & 0 & \frac{1}{7} & 0 & -\frac{\sqrt{5}}{14} & 0 & -\frac{5\sqrt{3}}{84} & 0 & \frac{\sqrt{7}}{28} \\
0 & \frac{3\sqrt{2}}{56} & 0 & -\frac{5}{56} & 0 & -\frac{\sqrt{10}}{28} & 0 & 0 & \frac{\sqrt{5}}{14} & 0 & -\frac{5\sqrt{3}}{84} & 0 & \frac{\sqrt{15}}{84} & 0 \\
0 & 0 & \frac{3\sqrt{3}}{56} & 0 & -\frac{5\sqrt{6}}{168} & 0 & 0 & 0 & 0 & \frac{1}{7} & 0 & \frac{\sqrt{15}}{84} & 0 & \frac{\sqrt{35}}{28} \\
0 & 0 & 0 & \frac{\sqrt{21}}{56} & 0 & \frac{\sqrt{210}}{168} & 0 & 0 & 0 & 0 & \frac{\sqrt{7}}{28} & 0 & \frac{\sqrt{35}}{28} & 0
\end{pmatrix}$$

| 956 | symmetry | $-\frac{\sqrt{15}\,y(x-z)(x+z)}{2}$ |

Table 10

Table 10

No.	multipole	matrix												
		0	$\frac{5i}{28}$	0	$-\frac{5\sqrt{2}i}{56}$	0	0	$\frac{\sqrt{210}i}{168}$	0	$\frac{\sqrt{10}i}{28}$	0	$-\frac{\sqrt{6}i}{56}$	0	0	0
		$-\frac{5i}{28}$	0	$-\frac{\sqrt{10}i}{56}$	0	$-\frac{\sqrt{5}i}{14}$	0	0	$-\frac{5\sqrt{6}i}{168}$	0	$\frac{\sqrt{30}i}{84}$	0	$-\frac{3\sqrt{2}i}{56}$	0	0
		0	$\frac{\sqrt{10}i}{56}$	0	$-\frac{\sqrt{5}i}{14}$	0	$-\frac{5\sqrt{2}i}{56}$	$-\frac{\sqrt{21}i}{56}$	0	$-\frac{5i}{56}$	0	$-\frac{\sqrt{15}i}{168}$	0	$-\frac{3\sqrt{3}i}{56}$	0
		$\frac{5\sqrt{2}i}{56}$	0	$\frac{\sqrt{5}i}{14}$	0	$-\frac{\sqrt{10}i}{56}$	0	0	$-\frac{3\sqrt{3}i}{56}$	0	$-\frac{\sqrt{15}i}{168}$	0	$-\frac{5i}{56}$	0	$-\frac{\sqrt{21}i}{56}$
		0	$\frac{\sqrt{5}i}{14}$	0	$\frac{\sqrt{10}i}{56}$	0	$\frac{5i}{28}$	0	0	$-\frac{3\sqrt{2}i}{56}$	0	$\frac{\sqrt{30}i}{84}$	0	$-\frac{5\sqrt{6}i}{168}$	0
	$\mathbb{M}_{3,2}^{(a)}(E,2)$	0	0	$\frac{5\sqrt{2}i}{56}$	0	$-\frac{5i}{28}$	0	0	0	0	$-\frac{\sqrt{6}i}{56}$	0	$\frac{\sqrt{10}i}{28}$	0	$\frac{\sqrt{210}i}{168}$
		$-\frac{\sqrt{210}i}{168}$	0	$\frac{\sqrt{21}i}{56}$	0	0	0	0	$\frac{\sqrt{35}i}{28}$	0	$-\frac{\sqrt{7}i}{28}$	0	0	0	0
		0	$\frac{5\sqrt{6}i}{168}$	0	$\frac{3\sqrt{3}i}{56}$	0	0	$-\frac{\sqrt{35}i}{28}$	0	$\frac{\sqrt{15}i}{84}$	0	$-\frac{i}{7}$	0	0	0
		$-\frac{\sqrt{10}i}{28}$	0	$\frac{5i}{56}$	0	$\frac{3\sqrt{2}i}{56}$	0	0	$-\frac{\sqrt{15}i}{84}$	0	$-\frac{5\sqrt{3}i}{84}$	0	$-\frac{\sqrt{5}i}{14}$	0	0
		0	$-\frac{\sqrt{30}i}{84}$	0	$\frac{\sqrt{15}i}{168}$	0	$\frac{\sqrt{6}i}{56}$	$\frac{\sqrt{7}i}{28}$	0	$\frac{5\sqrt{3}i}{84}$	0	$-\frac{\sqrt{5}i}{14}$	0	$-\frac{i}{7}$	0
		$\frac{\sqrt{6}i}{56}$	0	$\frac{\sqrt{15}i}{168}$	0	$-\frac{\sqrt{30}i}{84}$	0	0	$\frac{i}{7}$	0	$\frac{\sqrt{5}i}{14}$	0	$-\frac{5\sqrt{3}i}{84}$	0	$-\frac{\sqrt{7}i}{28}$
		0	$\frac{3\sqrt{2}i}{56}$	0	$\frac{5i}{56}$	0	$-\frac{\sqrt{10}i}{28}$	0	0	$\frac{\sqrt{5}i}{14}$	0	$\frac{5\sqrt{3}i}{84}$	0	$\frac{\sqrt{15}i}{84}$	0
		0	0	$\frac{3\sqrt{3}i}{56}$	0	$\frac{5\sqrt{6}i}{168}$	0	0	0	0	$\frac{i}{7}$	0	$-\frac{\sqrt{15}i}{84}$	0	$\frac{\sqrt{35}i}{28}$
		0	0	0	$\frac{\sqrt{21}i}{56}$	0	$-\frac{\sqrt{210}i}{168}$	0	0	0	0	$\frac{\sqrt{7}i}{28}$	0	$-\frac{\sqrt{35}i}{28}$	0

| 957 | symmetry | $\frac{3\sqrt{35}xyz(x-y)(x+y)}{2}$ |

continued ...

Table 10

No.	multipole	matrix												

$$\mathbb{M}_5^{(a)}(A_1)$$

$$
\begin{pmatrix}
0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{14} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{14} & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}i}{14} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{i}{14} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{14}i}{14} \\
0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{14}i}{14} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
\frac{\sqrt{6}i}{14} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{i}{14} & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & -\frac{\sqrt{6}i}{14} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{14} & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & \frac{\sqrt{14}i}{14} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{42}i}{28} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & -\frac{i}{14} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}i}{28} & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{14} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}i}{28} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{42}i}{28} \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{42}i}{28} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
\frac{\sqrt{15}i}{14} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}i}{28} & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & \frac{i}{14} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}i}{28} & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & -\frac{\sqrt{14}i}{14} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{42}i}{28} & 0 & 0 & 0 & 0 \\
\end{pmatrix}
$$

| 958 | symmetry | $\frac{z\left(15x^4+30x^2y^2-40x^2z^2+15y^4-40y^2z^2+8z^4\right)}{8}$ |

continued …

No.	multipole	matrix

$\mathbb{M}_5^{(a)}(A_2,1)$

$$\begin{pmatrix}
\frac{\sqrt{42}}{294} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{5\sqrt{7}}{98} & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & -\frac{5\sqrt{42}}{294} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{105}}{98} & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & \frac{5\sqrt{42}}{147} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{5\sqrt{14}}{98} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & -\frac{5\sqrt{42}}{147} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{5\sqrt{14}}{98} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & \frac{5\sqrt{42}}{294} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{105}}{98} & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{42}}{294} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{5\sqrt{7}}{98} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{42}}{84} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
\frac{5\sqrt{7}}{98} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{23\sqrt{42}}{588} & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & -\frac{3\sqrt{105}}{98} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{17\sqrt{42}}{588} & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & \frac{5\sqrt{14}}{98} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{5\sqrt{42}}{196} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & \frac{5\sqrt{14}}{98} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{5\sqrt{42}}{196} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & -\frac{3\sqrt{105}}{98} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{17\sqrt{42}}{588} & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & \frac{5\sqrt{7}}{98} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{23\sqrt{42}}{588} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{42}}{84}
\end{pmatrix}$$

| 959 | symmetry | $\dfrac{3\sqrt{35}\,z\left(x^2-2xy-y^2\right)\left(x^2+2xy-y^2\right)}{8}$ |

417

Table 10

No.	multipole	matrix

$$\mathbb{M}_5^{(a)}(A_2,2)$$

$$\begin{pmatrix}
0 & 0 & 0 & 0 & \frac{\sqrt{6}}{14} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{14} & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}}{14} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{1}{14} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{14}}{14} \\
0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{14}}{14} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
\frac{\sqrt{6}}{14} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{1}{14} & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & -\frac{\sqrt{6}}{14} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{14} & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & -\frac{\sqrt{14}}{14} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{42}}{28} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & \frac{1}{14} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}}{28} & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{14} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}}{28} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{42}}{28} \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{42}}{28} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
\frac{\sqrt{15}}{14} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}}{28} & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & \frac{1}{14} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}}{28} & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & -\frac{\sqrt{14}}{14} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{42}}{28} & 0 & 0 & 0 & 0
\end{pmatrix}$$

960	symmetry	$\frac{\sqrt{105}\,xyz(x^2+y^2-2z^2)}{2}$

continued ...

Table 10

No.	multipole	matrix												
	$\mathbb{M}_5^{(a)}(B_1)$	0	0	$\frac{i}{14}$	0	0	0	0	0	0	$\frac{5\sqrt{3}i}{42}$	0	0	0	0
		0	0	0	$-\frac{\sqrt{5}i}{14}$	0	0	$\frac{\sqrt{21}i}{42}$	0	0	0	$-\frac{\sqrt{15}i}{21}$	0	0	0
		$-\frac{i}{14}$	0	0	0	$\frac{\sqrt{5}i}{14}$	0	0	$-\frac{2\sqrt{6}i}{21}$	0	0	0	$-\frac{\sqrt{2}i}{14}$	0	0
		0	$\frac{\sqrt{5}i}{14}$	0	0	0	$-\frac{i}{14}$	0	0	$\frac{\sqrt{2}i}{14}$	0	0	0	$\frac{2\sqrt{6}i}{21}$	0
		0	0	$-\frac{\sqrt{5}i}{14}$	0	0	0	0	0	0	$\frac{\sqrt{15}i}{21}$	0	0	0	$-\frac{\sqrt{21}i}{42}$
		0	0	0	$\frac{i}{14}$	0	0	0	0	0	0	$-\frac{5\sqrt{3}i}{42}$	0	0	0
		0	$-\frac{\sqrt{21}i}{42}$	0	0	0	0	0	0	$\frac{\sqrt{210}i}{84}$	0	0	0	0	0
		0	0	$\frac{2\sqrt{6}i}{21}$	0	0	0	0	0	0	$-\frac{3\sqrt{2}i}{28}$	0	0	0	0
		0	0	0	$-\frac{\sqrt{2}i}{14}$	0	0	$-\frac{\sqrt{210}i}{84}$	0	0	0	$-\frac{\sqrt{6}i}{21}$	0	0	0
		$-\frac{5\sqrt{3}i}{42}$	0	0	0	$-\frac{\sqrt{15}i}{21}$	0	0	$\frac{3\sqrt{2}i}{28}$	0	0	0	$\frac{\sqrt{6}i}{21}$	0	0
		0	$\frac{\sqrt{15}i}{21}$	0	0	0	$\frac{5\sqrt{3}i}{42}$	0	0	$\frac{\sqrt{6}i}{21}$	0	0	0	$\frac{3\sqrt{2}i}{28}$	0
		0	0	$\frac{\sqrt{2}i}{14}$	0	0	0	0	0	0	$-\frac{\sqrt{6}i}{21}$	0	0	0	$-\frac{\sqrt{210}i}{84}$
		0	0	0	$-\frac{2\sqrt{6}i}{21}$	0	0	0	0	0	0	$-\frac{3\sqrt{2}i}{28}$	0	0	0
		0	0	0	0	$\frac{\sqrt{21}i}{42}$	0	0	0	0	0	0	$\frac{\sqrt{210}i}{84}$	0	0
961	symmetry	$-\frac{\sqrt{105}z(x-y)(x+y)\left(x^2+y^2-2z^2\right)}{4}$													

continued ...

Table 10

No.	multipole	matrix

$\mathbb{M}_5^{(a)}(B_2)$

$$\begin{pmatrix}
0 & 0 & \frac{1}{14} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{5\sqrt{3}}{42} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & -\frac{\sqrt{5}}{14} & 0 & 0 & -\frac{\sqrt{21}}{42} & 0 & 0 & 0 & -\frac{\sqrt{15}}{21} & 0 & 0 & 0 \\
\frac{1}{14} & 0 & 0 & 0 & \frac{\sqrt{5}}{14} & 0 & 0 & \frac{2\sqrt{6}}{21} & 0 & 0 & 0 & -\frac{\sqrt{2}}{14} & 0 & 0 \\
0 & -\frac{\sqrt{5}}{14} & 0 & 0 & 0 & -\frac{1}{14} & 0 & 0 & -\frac{\sqrt{2}}{14} & 0 & 0 & 0 & \frac{2\sqrt{6}}{21} & 0 \\
0 & 0 & \frac{\sqrt{5}}{14} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{21} & 0 & 0 & 0 & -\frac{\sqrt{21}}{42} \\
0 & 0 & 0 & -\frac{1}{14} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{5\sqrt{3}}{42} & 0 & 0 & 0 \\
0 & -\frac{\sqrt{21}}{42} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{210}}{84} & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & \frac{2\sqrt{6}}{21} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{2}}{28} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & -\frac{\sqrt{2}}{14} & 0 & 0 & \frac{\sqrt{210}}{84} & 0 & 0 & 0 & -\frac{\sqrt{6}}{21} & 0 & 0 & 0 \\
\frac{5\sqrt{3}}{42} & 0 & 0 & 0 & -\frac{\sqrt{15}}{21} & 0 & 0 & -\frac{3\sqrt{2}}{28} & 0 & 0 & 0 & \frac{\sqrt{6}}{21} & 0 & 0 \\
0 & -\frac{\sqrt{15}}{21} & 0 & 0 & 0 & \frac{5\sqrt{3}}{42} & 0 & 0 & -\frac{\sqrt{6}}{21} & 0 & 0 & 0 & \frac{3\sqrt{2}}{28} & 0 \\
0 & 0 & -\frac{\sqrt{2}}{14} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{21} & 0 & 0 & 0 & -\frac{\sqrt{210}}{84} \\
0 & 0 & 0 & \frac{2\sqrt{6}}{21} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{2}}{28} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & -\frac{\sqrt{21}}{42} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{210}}{84} & 0 & 0
\end{pmatrix}$$

| 962 | symmetry | $\dfrac{x\left(8x^4-40x^2y^2-40x^2z^2+15y^4+30y^2z^2+15z^4\right)}{8}$ |

Table 10

No.	multipole	matrix

$\mathbb{M}_{5,1}^{(a)}(E,1)$

$$\begin{pmatrix}
0 & \frac{\sqrt{210}}{784} & 0 & -\frac{\sqrt{105}}{168} & 0 & \frac{3\sqrt{42}}{112} & -\frac{5}{224} & 0 & \frac{25\sqrt{21}}{1568} & 0 & -\frac{5\sqrt{35}}{224} & 0 & \frac{15\sqrt{7}}{224} & 0 \\
\frac{\sqrt{210}}{784} & 0 & -\frac{5\sqrt{21}}{392} & 0 & \frac{5\sqrt{42}}{336} & 0 & 0 & \frac{23\sqrt{35}}{1568} & 0 & -\frac{65\sqrt{7}}{1568} & 0 & \frac{\sqrt{105}}{224} & 0 & \frac{3\sqrt{5}}{32} \\
0 & -\frac{5\sqrt{21}}{392} & 0 & \frac{5\sqrt{42}}{392} & 0 & -\frac{\sqrt{105}}{168} & \frac{\sqrt{10}}{32} & 0 & -\frac{11\sqrt{210}}{1568} & 0 & \frac{5\sqrt{14}}{1568} & 0 & \frac{3\sqrt{70}}{224} & 0 \\
-\frac{\sqrt{105}}{168} & 0 & \frac{5\sqrt{42}}{392} & 0 & -\frac{5\sqrt{21}}{392} & 0 & 0 & -\frac{3\sqrt{70}}{224} & 0 & -\frac{5\sqrt{14}}{1568} & 0 & \frac{11\sqrt{210}}{1568} & 0 & -\frac{\sqrt{10}}{32} \\
0 & \frac{5\sqrt{42}}{336} & 0 & -\frac{5\sqrt{21}}{392} & 0 & \frac{\sqrt{210}}{784} & -\frac{3\sqrt{5}}{32} & 0 & -\frac{\sqrt{105}}{224} & 0 & \frac{65\sqrt{7}}{1568} & 0 & -\frac{23\sqrt{35}}{1568} & 0 \\
\frac{3\sqrt{42}}{112} & 0 & -\frac{\sqrt{105}}{168} & 0 & \frac{\sqrt{210}}{784} & 0 & 0 & -\frac{15\sqrt{7}}{224} & 0 & \frac{5\sqrt{35}}{224} & 0 & -\frac{25\sqrt{21}}{1568} & 0 & \frac{5}{224} \\
-\frac{5}{224} & 0 & \frac{\sqrt{10}}{32} & 0 & -\frac{3\sqrt{5}}{32} & 0 & 0 & \frac{5\sqrt{6}}{224} & 0 & -\frac{\sqrt{30}}{48} & 0 & \frac{3\sqrt{2}}{32} & 0 & 0 \\
0 & \frac{23\sqrt{35}}{1568} & 0 & -\frac{3\sqrt{70}}{224} & 0 & -\frac{15\sqrt{7}}{224} & \frac{5\sqrt{6}}{224} & 0 & -\frac{5\sqrt{14}}{196} & 0 & \frac{\sqrt{210}}{672} & 0 & \frac{3\sqrt{42}}{112} & 0 \\
\frac{25\sqrt{21}}{1568} & 0 & -\frac{11\sqrt{210}}{1568} & 0 & -\frac{\sqrt{105}}{224} & 0 & 0 & -\frac{5\sqrt{14}}{196} & 0 & \frac{\sqrt{70}}{1568} & 0 & \frac{5\sqrt{42}}{336} & 0 & \frac{3\sqrt{2}}{32} \\
0 & -\frac{65\sqrt{7}}{1568} & 0 & -\frac{5\sqrt{14}}{1568} & 0 & \frac{5\sqrt{35}}{224} & -\frac{\sqrt{30}}{48} & 0 & \frac{\sqrt{70}}{1568} & 0 & \frac{5\sqrt{42}}{392} & 0 & \frac{\sqrt{210}}{672} & 0 \\
-\frac{5\sqrt{35}}{224} & 0 & \frac{5\sqrt{14}}{1568} & 0 & \frac{65\sqrt{7}}{1568} & 0 & 0 & \frac{\sqrt{210}}{672} & 0 & \frac{5\sqrt{42}}{392} & 0 & \frac{\sqrt{70}}{1568} & 0 & -\frac{\sqrt{30}}{48} \\
0 & \frac{\sqrt{105}}{224} & 0 & \frac{11\sqrt{210}}{1568} & 0 & -\frac{25\sqrt{21}}{1568} & \frac{3\sqrt{2}}{32} & 0 & \frac{5\sqrt{42}}{336} & 0 & \frac{\sqrt{70}}{1568} & 0 & -\frac{5\sqrt{14}}{196} & 0 \\
\frac{15\sqrt{7}}{224} & 0 & \frac{3\sqrt{70}}{224} & 0 & -\frac{23\sqrt{35}}{1568} & 0 & 0 & \frac{3\sqrt{42}}{112} & 0 & \frac{\sqrt{210}}{672} & 0 & -\frac{5\sqrt{14}}{196} & 0 & \frac{5\sqrt{6}}{224} \\
0 & \frac{3\sqrt{5}}{32} & 0 & -\frac{\sqrt{10}}{32} & 0 & \frac{5}{224} & 0 & 0 & \frac{3\sqrt{2}}{32} & 0 & -\frac{\sqrt{30}}{48} & 0 & \frac{5\sqrt{6}}{224} & 0
\end{pmatrix}$$

| 963 | symmetry | $-\dfrac{y\left(15x^4 - 40x^2y^2 + 30x^2z^2 + 8y^4 - 40y^2z^2 + 15z^4\right)}{8}$ |

continued ...

Table 10

No.	multipole	matrix

$\mathbb{M}^{(a)}_{5,2}(E,1)$

$$\begin{pmatrix}
0 & \frac{\sqrt{210}i}{784} & 0 & \frac{\sqrt{105}i}{168} & 0 & \frac{3\sqrt{42}i}{112} & \frac{5i}{224} & 0 & \frac{25\sqrt{21}i}{1568} & 0 & \frac{5\sqrt{35}i}{224} & 0 & \frac{15\sqrt{7}i}{224} & 0 \\
-\frac{\sqrt{210}i}{784} & 0 & -\frac{5\sqrt{21}i}{392} & 0 & -\frac{5\sqrt{42}i}{336} & 0 & 0 & -\frac{23\sqrt{35}i}{1568} & 0 & -\frac{65\sqrt{7}i}{1568} & 0 & -\frac{\sqrt{105}i}{224} & 0 & \frac{3\sqrt{5}i}{32} \\
0 & \frac{5\sqrt{21}i}{392} & 0 & \frac{5\sqrt{42}i}{392} & 0 & \frac{\sqrt{105}i}{168} & \frac{\sqrt{10}i}{32} & 0 & \frac{11\sqrt{210}i}{1568} & 0 & \frac{5\sqrt{14}i}{1568} & 0 & -\frac{3\sqrt{70}i}{224} & 0 \\
-\frac{\sqrt{105}i}{168} & 0 & -\frac{5\sqrt{42}i}{392} & 0 & -\frac{5\sqrt{21}i}{392} & 0 & 0 & -\frac{3\sqrt{70}i}{224} & 0 & \frac{5\sqrt{14}i}{1568} & 0 & \frac{11\sqrt{210}i}{1568} & 0 & \frac{\sqrt{10}i}{32} \\
0 & \frac{5\sqrt{42}i}{336} & 0 & \frac{5\sqrt{21}i}{392} & 0 & \frac{\sqrt{210}i}{784} & \frac{3\sqrt{5}i}{32} & 0 & -\frac{\sqrt{105}i}{224} & 0 & -\frac{65\sqrt{7}i}{1568} & 0 & -\frac{23\sqrt{35}i}{1568} & 0 \\
-\frac{3\sqrt{42}i}{112} & 0 & -\frac{\sqrt{105}i}{168} & 0 & -\frac{\sqrt{210}i}{784} & 0 & 0 & \frac{15\sqrt{7}i}{224} & 0 & \frac{5\sqrt{35}i}{224} & 0 & \frac{25\sqrt{21}i}{1568} & 0 & \frac{5i}{224} \\
-\frac{5i}{224} & 0 & -\frac{\sqrt{10}i}{32} & 0 & -\frac{3\sqrt{5}i}{32} & 0 & 0 & \frac{5\sqrt{6}i}{224} & 0 & \frac{\sqrt{30}i}{48} & 0 & \frac{3\sqrt{2}i}{32} & 0 & 0 \\
0 & \frac{23\sqrt{35}i}{1568} & 0 & \frac{3\sqrt{70}i}{224} & 0 & -\frac{15\sqrt{7}i}{224} & -\frac{5\sqrt{6}i}{224} & 0 & -\frac{5\sqrt{14}i}{196} & 0 & -\frac{\sqrt{210}i}{672} & 0 & \frac{3\sqrt{42}i}{112} & 0 \\
-\frac{25\sqrt{21}i}{1568} & 0 & -\frac{11\sqrt{210}i}{1568} & 0 & \frac{\sqrt{105}i}{224} & 0 & 0 & \frac{5\sqrt{14}i}{196} & 0 & \frac{\sqrt{70}i}{1568} & 0 & -\frac{5\sqrt{42}i}{336} & 0 & \frac{3\sqrt{2}i}{32} \\
0 & \frac{65\sqrt{7}i}{1568} & 0 & -\frac{5\sqrt{14}i}{1568} & 0 & -\frac{5\sqrt{35}i}{224} & -\frac{\sqrt{30}i}{48} & 0 & -\frac{\sqrt{70}i}{1568} & 0 & \frac{5\sqrt{42}i}{392} & 0 & -\frac{\sqrt{210}i}{672} & 0 \\
-\frac{5\sqrt{35}i}{224} & 0 & -\frac{5\sqrt{14}i}{1568} & 0 & \frac{65\sqrt{7}i}{1568} & 0 & 0 & \frac{\sqrt{210}i}{672} & 0 & -\frac{5\sqrt{42}i}{392} & 0 & \frac{\sqrt{70}i}{1568} & 0 & \frac{\sqrt{30}i}{48} \\
0 & \frac{\sqrt{105}i}{224} & 0 & -\frac{11\sqrt{210}i}{1568} & 0 & -\frac{25\sqrt{21}i}{1568} & -\frac{3\sqrt{2}i}{32} & 0 & \frac{5\sqrt{42}i}{336} & 0 & -\frac{\sqrt{70}i}{1568} & 0 & -\frac{5\sqrt{14}i}{196} & 0 \\
-\frac{15\sqrt{7}i}{224} & 0 & \frac{3\sqrt{70}i}{224} & 0 & \frac{23\sqrt{35}i}{1568} & 0 & 0 & -\frac{3\sqrt{42}i}{112} & 0 & \frac{\sqrt{210}i}{672} & 0 & \frac{5\sqrt{14}i}{196} & 0 & \frac{5\sqrt{6}i}{224} \\
0 & -\frac{3\sqrt{5}i}{32} & 0 & -\frac{\sqrt{10}i}{32} & 0 & -\frac{5i}{224} & 0 & 0 & -\frac{3\sqrt{2}i}{32} & 0 & -\frac{\sqrt{30}i}{48} & 0 & -\frac{5\sqrt{6}i}{224} & 0
\end{pmatrix}$$

| 964 | symmetry | $\dfrac{3\sqrt{35}x\left(y^2-2yz-z^2\right)\left(y^2+2yz-z^2\right)}{8}$ |

continued ...

Table 10

No.	multipole	matrix													
	$\mathbb{M}_{5,1}^{(a)}(E,2)$	0	$\frac{\sqrt{6}}{112}$	0	$\frac{3\sqrt{3}}{56}$	0	$\frac{\sqrt{30}}{112}$	$-\frac{\sqrt{35}}{224}$	0	$\frac{5\sqrt{15}}{224}$	0	$\frac{45}{224}$	0	$\frac{5\sqrt{5}}{224}$	0
		$\frac{\sqrt{6}}{112}$	0	$-\frac{\sqrt{15}}{56}$	0	$-\frac{3\sqrt{30}}{112}$	0	0	$\frac{23}{224}$	0	$-\frac{13\sqrt{5}}{224}$	0	$-\frac{9\sqrt{3}}{224}$	0	$\frac{5\sqrt{7}}{224}$
		0	$-\frac{\sqrt{15}}{56}$	0	$\frac{\sqrt{30}}{56}$	0	$\frac{3\sqrt{3}}{56}$	$-\frac{9\sqrt{14}}{224}$	0	$-\frac{11\sqrt{6}}{224}$	0	$\frac{\sqrt{10}}{224}$	0	$-\frac{27\sqrt{2}}{224}$	0
		$\frac{3\sqrt{3}}{56}$	0	$\frac{\sqrt{30}}{56}$	0	$-\frac{\sqrt{15}}{56}$	0	0	$\frac{27\sqrt{2}}{224}$	0	$-\frac{\sqrt{10}}{224}$	0	$\frac{11\sqrt{6}}{224}$	0	$\frac{9\sqrt{14}}{224}$
		0	$-\frac{3\sqrt{30}}{112}$	0	$-\frac{\sqrt{15}}{56}$	0	$\frac{\sqrt{6}}{112}$	$-\frac{5\sqrt{7}}{224}$	0	$\frac{9\sqrt{3}}{224}$	0	$\frac{13\sqrt{5}}{224}$	0	$-\frac{23}{224}$	0
		$\frac{\sqrt{30}}{112}$	0	$\frac{3\sqrt{3}}{56}$	0	$\frac{\sqrt{6}}{112}$	0	0	$-\frac{5\sqrt{5}}{224}$	0	$-\frac{45}{224}$	0	$-\frac{5\sqrt{15}}{224}$	0	$\frac{\sqrt{35}}{224}$
		$-\frac{\sqrt{35}}{224}$	0	$-\frac{9\sqrt{14}}{224}$	0	$-\frac{5\sqrt{7}}{224}$	0	0	$\frac{\sqrt{210}}{224}$	0	$\frac{3\sqrt{42}}{112}$	0	$\frac{\sqrt{70}}{224}$	0	0
		0	$\frac{23}{224}$	0	$\frac{27\sqrt{2}}{224}$	0	$-\frac{5\sqrt{5}}{224}$	$\frac{\sqrt{210}}{224}$	0	$-\frac{\sqrt{10}}{28}$	0	$-\frac{3\sqrt{6}}{224}$	0	$\frac{\sqrt{30}}{112}$	0
		$\frac{5\sqrt{15}}{224}$	0	$-\frac{11\sqrt{6}}{224}$	0	$\frac{9\sqrt{3}}{224}$	0	0	$-\frac{\sqrt{10}}{28}$	0	$\frac{\sqrt{2}}{224}$	0	$-\frac{3\sqrt{30}}{112}$	0	$\frac{\sqrt{70}}{224}$
		0	$-\frac{13\sqrt{5}}{224}$	0	$-\frac{\sqrt{10}}{224}$	0	$-\frac{45}{224}$	$\frac{3\sqrt{42}}{112}$	0	$\frac{\sqrt{2}}{224}$	0	$\frac{\sqrt{30}}{56}$	0	$-\frac{3\sqrt{6}}{224}$	0
		$\frac{45}{224}$	0	$\frac{\sqrt{10}}{224}$	0	$\frac{13\sqrt{5}}{224}$	0	0	$-\frac{3\sqrt{6}}{224}$	0	$\frac{\sqrt{30}}{56}$	0	$\frac{\sqrt{2}}{224}$	0	$\frac{3\sqrt{42}}{112}$
		0	$-\frac{9\sqrt{3}}{224}$	0	$\frac{11\sqrt{6}}{224}$	0	$-\frac{5\sqrt{15}}{224}$	$\frac{\sqrt{70}}{224}$	0	$-\frac{3\sqrt{30}}{112}$	0	$\frac{\sqrt{2}}{224}$	0	$-\frac{\sqrt{10}}{28}$	0
		$\frac{5\sqrt{5}}{224}$	0	$-\frac{27\sqrt{2}}{224}$	0	$-\frac{23}{224}$	0	0	$\frac{\sqrt{30}}{112}$	0	$-\frac{3\sqrt{6}}{224}$	0	$-\frac{\sqrt{10}}{28}$	0	$\frac{\sqrt{210}}{224}$
		0	$\frac{5\sqrt{7}}{224}$	0	$\frac{9\sqrt{14}}{224}$	0	$\frac{\sqrt{35}}{224}$	0	0	$\frac{\sqrt{70}}{224}$	0	$\frac{3\sqrt{42}}{112}$	0	$\frac{\sqrt{210}}{224}$	0

| 965 | symmetry | $-\frac{3\sqrt{35}y\left(x^2-2xz-z^2\right)\left(x^2+2xz-z^2\right)}{8}$ |

Table 10

No.	multipole	matrix

$\mathbb{M}_{5,2}^{(a)}(E,2)$

$$\begin{array}{cccccccccccccc}
0 & \frac{\sqrt{6}i}{112} & 0 & -\frac{3\sqrt{3}i}{56} & 0 & \frac{\sqrt{30}i}{112} & \frac{\sqrt{35}i}{224} & 0 & \frac{5\sqrt{15}i}{224} & 0 & -\frac{45i}{224} & 0 & \frac{5\sqrt{5}i}{224} & 0 \\
-\frac{\sqrt{6}i}{112} & 0 & -\frac{\sqrt{15}i}{56} & 0 & \frac{3\sqrt{30}i}{112} & 0 & 0 & -\frac{23i}{224} & 0 & -\frac{13\sqrt{5}i}{224} & 0 & \frac{9\sqrt{3}i}{224} & 0 & \frac{5\sqrt{7}i}{224} \\
0 & \frac{\sqrt{15}i}{56} & 0 & \frac{\sqrt{30}i}{56} & 0 & -\frac{3\sqrt{3}i}{56} & -\frac{9\sqrt{14}i}{224} & 0 & \frac{11\sqrt{6}i}{224} & 0 & \frac{\sqrt{10}i}{224} & 0 & \frac{27\sqrt{2}i}{224} & 0 \\
\frac{3\sqrt{3}i}{56} & 0 & -\frac{\sqrt{30}i}{56} & 0 & -\frac{\sqrt{15}i}{56} & 0 & 0 & \frac{27\sqrt{2}i}{224} & 0 & \frac{\sqrt{10}i}{224} & 0 & \frac{11\sqrt{6}i}{224} & 0 & -\frac{9\sqrt{14}i}{224} \\
0 & -\frac{3\sqrt{30}i}{112} & 0 & \frac{\sqrt{15}i}{56} & 0 & \frac{\sqrt{6}i}{112} & \frac{5\sqrt{7}i}{224} & 0 & \frac{9\sqrt{3}i}{224} & 0 & -\frac{13\sqrt{5}i}{224} & 0 & -\frac{23i}{224} & 0 \\
-\frac{\sqrt{30}i}{112} & 0 & \frac{3\sqrt{3}i}{56} & 0 & -\frac{\sqrt{6}i}{112} & 0 & 0 & \frac{5\sqrt{5}i}{224} & 0 & -\frac{45i}{224} & 0 & \frac{5\sqrt{15}i}{224} & 0 & \frac{\sqrt{35}i}{224} \\
-\frac{\sqrt{35}i}{224} & 0 & \frac{9\sqrt{14}i}{224} & 0 & -\frac{5\sqrt{7}i}{224} & 0 & 0 & \frac{\sqrt{210}i}{224} & 0 & -\frac{3\sqrt{42}i}{112} & 0 & \frac{\sqrt{70}i}{224} & 0 & 0 \\
0 & \frac{23i}{224} & 0 & -\frac{27\sqrt{2}i}{224} & 0 & -\frac{5\sqrt{5}i}{224} & -\frac{\sqrt{210}i}{224} & 0 & -\frac{\sqrt{10}i}{28} & 0 & \frac{3\sqrt{6}i}{224} & 0 & \frac{\sqrt{30}i}{112} & 0 \\
-\frac{5\sqrt{15}i}{224} & 0 & -\frac{11\sqrt{6}i}{224} & 0 & -\frac{9\sqrt{3}i}{224} & 0 & 0 & \frac{\sqrt{10}i}{28} & 0 & \frac{\sqrt{2}i}{224} & 0 & \frac{3\sqrt{30}i}{112} & 0 & \frac{\sqrt{70}i}{224} \\
0 & \frac{13\sqrt{5}i}{224} & 0 & -\frac{\sqrt{10}i}{224} & 0 & \frac{45i}{224} & \frac{3\sqrt{42}i}{112} & 0 & -\frac{\sqrt{2}i}{224} & 0 & \frac{\sqrt{30}i}{56} & 0 & \frac{3\sqrt{6}i}{224} & 0 \\
\frac{45i}{224} & 0 & -\frac{\sqrt{10}i}{224} & 0 & \frac{13\sqrt{5}i}{224} & 0 & 0 & -\frac{3\sqrt{6}i}{224} & 0 & -\frac{\sqrt{30}i}{56} & 0 & \frac{\sqrt{2}i}{224} & 0 & -\frac{3\sqrt{42}i}{112} \\
0 & -\frac{9\sqrt{3}i}{224} & 0 & -\frac{11\sqrt{6}i}{224} & 0 & -\frac{5\sqrt{15}i}{224} & -\frac{\sqrt{70}i}{224} & 0 & -\frac{3\sqrt{30}i}{112} & 0 & -\frac{\sqrt{2}i}{224} & 0 & -\frac{\sqrt{10}i}{28} & 0 \\
-\frac{5\sqrt{5}i}{224} & 0 & -\frac{27\sqrt{2}i}{224} & 0 & \frac{23i}{224} & 0 & 0 & -\frac{\sqrt{30}i}{112} & 0 & -\frac{3\sqrt{6}i}{224} & 0 & \frac{\sqrt{10}i}{28} & 0 & \frac{\sqrt{210}i}{224} \\
0 & -\frac{5\sqrt{7}i}{224} & 0 & \frac{9\sqrt{14}i}{224} & 0 & -\frac{\sqrt{35}i}{224} & 0 & 0 & -\frac{\sqrt{70}i}{224} & 0 & \frac{3\sqrt{42}i}{112} & 0 & -\frac{\sqrt{210}i}{224} & 0
\end{array}$$

966	symmetry	$\frac{\sqrt{105}x(y-z)(y+z)\left(2x^2-y^2-z^2\right)}{4}$

Table 10

No.	multipole	matrix

$$\mathbb{M}_{5,1}^{(a)}(E,3)$$

$$
\begin{pmatrix}
0 & \frac{\sqrt{2}}{56} & 0 & -\frac{1}{28} & 0 & -\frac{3\sqrt{10}}{56} & -\frac{\sqrt{105}}{336} & 0 & \frac{5\sqrt{5}}{112} & 0 & -\frac{5\sqrt{3}}{112} & 0 & -\frac{5\sqrt{15}}{112} & 0 \\
\frac{\sqrt{2}}{56} & 0 & -\frac{\sqrt{5}}{28} & 0 & \frac{\sqrt{10}}{56} & 0 & 0 & \frac{23\sqrt{3}}{336} & 0 & -\frac{13\sqrt{15}}{336} & 0 & \frac{3}{112} & 0 & -\frac{5\sqrt{21}}{112} \\
0 & -\frac{\sqrt{5}}{28} & 0 & \frac{\sqrt{10}}{28} & 0 & -\frac{1}{28} & \frac{\sqrt{42}}{112} & 0 & -\frac{11\sqrt{2}}{112} & 0 & \frac{\sqrt{30}}{336} & 0 & \frac{3\sqrt{6}}{112} & 0 \\
-\frac{1}{28} & 0 & \frac{\sqrt{10}}{28} & 0 & -\frac{\sqrt{5}}{28} & 0 & 0 & -\frac{3\sqrt{6}}{112} & 0 & -\frac{\sqrt{30}}{336} & 0 & \frac{11\sqrt{2}}{112} & 0 & -\frac{\sqrt{42}}{112} \\
0 & \frac{\sqrt{10}}{56} & 0 & -\frac{\sqrt{5}}{28} & 0 & \frac{\sqrt{2}}{56} & \frac{5\sqrt{21}}{112} & 0 & -\frac{3}{112} & 0 & \frac{13\sqrt{15}}{336} & 0 & -\frac{23\sqrt{3}}{336} & 0 \\
-\frac{3\sqrt{10}}{56} & 0 & -\frac{1}{28} & 0 & \frac{\sqrt{2}}{56} & 0 & 0 & \frac{5\sqrt{15}}{112} & 0 & \frac{5\sqrt{3}}{112} & 0 & -\frac{5\sqrt{5}}{112} & 0 & \frac{\sqrt{105}}{336} \\
-\frac{\sqrt{105}}{336} & 0 & \frac{\sqrt{42}}{112} & 0 & \frac{5\sqrt{21}}{112} & 0 & 0 & \frac{\sqrt{70}}{112} & 0 & -\frac{\sqrt{14}}{56} & 0 & -\frac{\sqrt{210}}{112} & 0 & 0 \\
0 & \frac{23\sqrt{3}}{336} & 0 & -\frac{3\sqrt{6}}{112} & 0 & \frac{5\sqrt{15}}{112} & \frac{\sqrt{70}}{112} & 0 & -\frac{\sqrt{30}}{42} & 0 & \frac{\sqrt{2}}{112} & 0 & -\frac{3\sqrt{10}}{56} & 0 \\
\frac{5\sqrt{5}}{112} & 0 & -\frac{11\sqrt{2}}{112} & 0 & -\frac{3}{112} & 0 & 0 & -\frac{\sqrt{30}}{42} & 0 & \frac{\sqrt{6}}{336} & 0 & \frac{\sqrt{10}}{56} & 0 & -\frac{\sqrt{210}}{112} \\
0 & -\frac{13\sqrt{15}}{336} & 0 & -\frac{\sqrt{30}}{336} & 0 & \frac{5\sqrt{3}}{112} & -\frac{\sqrt{14}}{56} & 0 & \frac{\sqrt{6}}{336} & 0 & \frac{\sqrt{10}}{28} & 0 & \frac{\sqrt{2}}{112} & 0 \\
-\frac{5\sqrt{3}}{112} & 0 & \frac{\sqrt{30}}{336} & 0 & \frac{13\sqrt{15}}{336} & 0 & 0 & \frac{\sqrt{2}}{112} & 0 & \frac{\sqrt{10}}{28} & 0 & \frac{\sqrt{6}}{336} & 0 & -\frac{\sqrt{14}}{56} \\
0 & \frac{3}{112} & 0 & \frac{11\sqrt{2}}{112} & 0 & -\frac{5\sqrt{5}}{112} & -\frac{\sqrt{210}}{112} & 0 & \frac{\sqrt{10}}{56} & 0 & \frac{\sqrt{6}}{336} & 0 & -\frac{\sqrt{30}}{42} & 0 \\
-\frac{5\sqrt{15}}{112} & 0 & \frac{3\sqrt{6}}{112} & 0 & -\frac{23\sqrt{3}}{336} & 0 & 0 & -\frac{3\sqrt{10}}{56} & 0 & \frac{\sqrt{2}}{112} & 0 & -\frac{\sqrt{30}}{42} & 0 & \frac{\sqrt{70}}{112} \\
0 & -\frac{5\sqrt{21}}{112} & 0 & -\frac{\sqrt{42}}{112} & 0 & \frac{\sqrt{105}}{336} & 0 & 0 & -\frac{\sqrt{210}}{112} & 0 & -\frac{\sqrt{14}}{56} & 0 & \frac{\sqrt{70}}{112} & 0
\end{pmatrix}
$$

| 967 | symmetry | $\frac{\sqrt{105}\,y(x-z)(x+z)\left(x^2-2y^2+z^2\right)}{4}$ |

Table 10

No.	multipole	matrix

$$\mathbb{M}_{5,2}^{(a)}(E,3) = \begin{pmatrix}
0 & \frac{\sqrt{2}i}{56} & 0 & \frac{i}{28} & 0 & -\frac{3\sqrt{10}i}{56} & \frac{\sqrt{105}i}{336} & 0 & \frac{5\sqrt{5}i}{112} & 0 & \frac{5\sqrt{3}i}{112} & 0 & -\frac{5\sqrt{15}i}{112} & 0 \\
-\frac{\sqrt{2}i}{56} & 0 & -\frac{\sqrt{5}i}{28} & 0 & -\frac{\sqrt{10}i}{56} & 0 & 0 & -\frac{23\sqrt{3}i}{336} & 0 & -\frac{13\sqrt{15}i}{336} & 0 & -\frac{3i}{112} & 0 & -\frac{5\sqrt{21}i}{112} \\
0 & \frac{\sqrt{5}i}{28} & 0 & \frac{\sqrt{10}i}{28} & 0 & \frac{i}{28} & \frac{\sqrt{42}i}{112} & 0 & \frac{11\sqrt{2}i}{112} & 0 & \frac{\sqrt{30}i}{336} & 0 & -\frac{3\sqrt{6}i}{112} & 0 \\
-\frac{i}{28} & 0 & -\frac{\sqrt{10}i}{28} & 0 & -\frac{\sqrt{5}i}{28} & 0 & 0 & -\frac{3\sqrt{6}i}{112} & 0 & \frac{\sqrt{30}i}{336} & 0 & \frac{11\sqrt{2}i}{112} & 0 & \frac{\sqrt{42}i}{112} \\
0 & \frac{\sqrt{10}i}{56} & 0 & \frac{\sqrt{5}i}{28} & 0 & \frac{\sqrt{2}i}{56} & -\frac{5\sqrt{21}i}{112} & 0 & -\frac{3i}{112} & 0 & -\frac{13\sqrt{15}i}{336} & 0 & -\frac{23\sqrt{3}i}{336} & 0 \\
\frac{3\sqrt{10}i}{56} & 0 & -\frac{i}{28} & 0 & -\frac{\sqrt{2}i}{56} & 0 & 0 & -\frac{5\sqrt{15}i}{112} & 0 & \frac{5\sqrt{3}i}{112} & 0 & \frac{5\sqrt{5}i}{112} & 0 & \frac{\sqrt{105}i}{336} \\
-\frac{\sqrt{105}i}{336} & 0 & -\frac{\sqrt{42}i}{112} & 0 & \frac{5\sqrt{21}i}{112} & 0 & 0 & \frac{\sqrt{70}i}{112} & 0 & \frac{\sqrt{14}i}{56} & 0 & -\frac{\sqrt{210}i}{112} & 0 & 0 \\
0 & \frac{23\sqrt{3}i}{336} & 0 & \frac{3\sqrt{6}i}{112} & 0 & \frac{5\sqrt{15}i}{112} & -\frac{\sqrt{70}i}{112} & 0 & -\frac{\sqrt{30}i}{42} & 0 & -\frac{\sqrt{2}i}{112} & 0 & -\frac{3\sqrt{10}i}{56} & 0 \\
-\frac{5\sqrt{5}i}{112} & 0 & -\frac{11\sqrt{2}i}{112} & 0 & \frac{3i}{112} & 0 & 0 & \frac{\sqrt{30}i}{42} & 0 & \frac{\sqrt{6}i}{336} & 0 & -\frac{\sqrt{10}i}{56} & 0 & -\frac{\sqrt{210}i}{112} \\
0 & \frac{13\sqrt{15}i}{336} & 0 & -\frac{\sqrt{30}i}{336} & 0 & -\frac{5\sqrt{3}i}{112} & -\frac{\sqrt{14}i}{56} & 0 & -\frac{\sqrt{6}i}{336} & 0 & \frac{\sqrt{10}i}{28} & 0 & -\frac{\sqrt{2}i}{112} & 0 \\
-\frac{5\sqrt{3}i}{112} & 0 & -\frac{\sqrt{30}i}{336} & 0 & \frac{13\sqrt{15}i}{336} & 0 & 0 & \frac{\sqrt{2}i}{112} & 0 & -\frac{\sqrt{10}i}{28} & 0 & \frac{\sqrt{6}i}{336} & 0 & \frac{\sqrt{14}i}{56} \\
0 & \frac{3i}{112} & 0 & -\frac{11\sqrt{2}i}{112} & 0 & -\frac{5\sqrt{5}i}{112} & \frac{\sqrt{210}i}{112} & 0 & \frac{\sqrt{10}i}{56} & 0 & -\frac{\sqrt{6}i}{336} & 0 & -\frac{\sqrt{30}i}{42} & 0 \\
\frac{5\sqrt{15}i}{112} & 0 & \frac{3\sqrt{6}i}{112} & 0 & \frac{23\sqrt{3}i}{336} & 0 & 0 & \frac{3\sqrt{10}i}{56} & 0 & \frac{\sqrt{2}i}{112} & 0 & \frac{\sqrt{30}i}{42} & 0 & \frac{\sqrt{70}i}{112} \\
0 & \frac{5\sqrt{21}i}{112} & 0 & -\frac{\sqrt{42}i}{112} & 0 & -\frac{\sqrt{105}i}{336} & 0 & 0 & \frac{\sqrt{210}i}{112} & 0 & -\frac{\sqrt{14}i}{56} & 0 & -\frac{\sqrt{70}i}{112} & 0
\end{pmatrix}$$

No.		
968	symmetry	z

426

Table 10

No.	multipole	matrix													
	$\mathbb{M}_1^{(1,-1;a)}(A_2)$	$-\frac{5\sqrt{14}}{98}$	0	0	0	0	0	0	$-\frac{2\sqrt{21}}{49}$	0	0	0	0	0	0
		0	$-\frac{3\sqrt{14}}{98}$	0	0	0	0	0	0	$-\frac{2\sqrt{35}}{49}$	0	0	0	0	0
		0	0	$-\frac{\sqrt{14}}{98}$	0	0	0	0	0	0	$-\frac{2\sqrt{42}}{49}$	0	0	0	0
		0	0	0	$\frac{\sqrt{14}}{98}$	0	0	0	0	0	0	$-\frac{2\sqrt{42}}{49}$	0	0	0
		0	0	0	0	$\frac{3\sqrt{14}}{98}$	0	0	0	0	0	0	$-\frac{2\sqrt{35}}{49}$	0	0
		0	0	0	0	0	$\frac{5\sqrt{14}}{98}$	0	0	0	0	0	0	$-\frac{2\sqrt{21}}{49}$	0
		0	0	0	0	0	0	$\frac{\sqrt{14}}{14}$	0	0	0	0	0	0	0
		$-\frac{2\sqrt{21}}{49}$	0	0	0	0	0	0	$\frac{5\sqrt{14}}{98}$	0	0	0	0	0	0
		0	$-\frac{2\sqrt{35}}{49}$	0	0	0	0	0	0	$\frac{3\sqrt{14}}{98}$	0	0	0	0	0
		0	0	$-\frac{2\sqrt{42}}{49}$	0	0	0	0	0	0	$\frac{\sqrt{14}}{98}$	0	0	0	0
		0	0	0	$-\frac{2\sqrt{42}}{49}$	0	0	0	0	0	0	$-\frac{\sqrt{14}}{98}$	0	0	0
		0	0	0	0	$-\frac{2\sqrt{35}}{49}$	0	0	0	0	0	0	$-\frac{3\sqrt{14}}{98}$	0	0
		0	0	0	0	0	$-\frac{2\sqrt{21}}{49}$	0	0	0	0	0	0	$-\frac{5\sqrt{14}}{98}$	0
		0	0	0	0	0	0	0	0	0	0	0	0	0	$-\frac{\sqrt{14}}{14}$

| 969 | symmetry | x |

427

Table 10

No.	multipole	matrix														
	$\mathbb{M}_{1,1}^{(1,-1;a)}(E)$	0	$-\frac{\sqrt{70}}{98}$	0	0	0	0	$\frac{\sqrt{3}}{7}$	0	$-\frac{\sqrt{7}}{49}$	0	0	0	0	0
		$-\frac{\sqrt{70}}{98}$	0	$-\frac{2\sqrt{7}}{49}$	0	0	0	0	$\frac{\sqrt{105}}{49}$	0	$-\frac{\sqrt{21}}{49}$	0	0	0	0
		0	$-\frac{2\sqrt{7}}{49}$	0	$-\frac{3\sqrt{14}}{98}$	0	0	0	0	$\frac{\sqrt{70}}{49}$	0	$-\frac{\sqrt{42}}{49}$	0	0	0
		0	0	$-\frac{3\sqrt{14}}{98}$	0	$-\frac{2\sqrt{7}}{49}$	0	0	0	0	$\frac{\sqrt{42}}{49}$	0	$-\frac{\sqrt{70}}{49}$	0	0
		0	0	0	$-\frac{2\sqrt{7}}{49}$	0	$-\frac{\sqrt{70}}{98}$	0	0	0	0	$\frac{\sqrt{21}}{49}$	0	$-\frac{\sqrt{105}}{49}$	0
		0	0	0	0	$-\frac{\sqrt{70}}{98}$	0	0	0	0	0	0	$\frac{\sqrt{7}}{49}$	0	$-\frac{\sqrt{3}}{7}$
		$\frac{\sqrt{3}}{7}$	0	0	0	0	0	0	$\frac{\sqrt{2}}{14}$	0	0	0	0	0	0
		0	$\frac{\sqrt{105}}{49}$	0	0	0	0	$\frac{\sqrt{2}}{14}$	0	$\frac{\sqrt{42}}{49}$	0	0	0	0	0
		$-\frac{\sqrt{7}}{49}$	0	$\frac{\sqrt{70}}{49}$	0	0	0	0	$\frac{\sqrt{42}}{49}$	0	$\frac{\sqrt{210}}{98}$	0	0	0	0
		0	$-\frac{\sqrt{21}}{49}$	0	$\frac{\sqrt{42}}{49}$	0	0	0	0	$\frac{\sqrt{210}}{98}$	0	$\frac{2\sqrt{14}}{49}$	0	0	0
		0	0	$-\frac{\sqrt{42}}{49}$	0	$\frac{\sqrt{21}}{49}$	0	0	0	0	$\frac{2\sqrt{14}}{49}$	0	$\frac{\sqrt{210}}{98}$	0	0
		0	0	0	$-\frac{\sqrt{70}}{49}$	0	$\frac{\sqrt{7}}{49}$	0	0	0	0	$\frac{\sqrt{210}}{98}$	0	$\frac{\sqrt{42}}{49}$	0
		0	0	0	0	$-\frac{\sqrt{105}}{49}$	0	0	0	0	0	0	$\frac{\sqrt{42}}{49}$	0	$\frac{\sqrt{2}}{14}$
		0	0	0	0	0	$-\frac{\sqrt{3}}{7}$	0	0	0	0	0	0	$\frac{\sqrt{2}}{14}$	0

970	symmetry	$-y$

Table 10

No.	multipole	matrix

$$\mathbb{M}_{1,2}^{(1,-1;a)}(E)$$

0	$-\frac{\sqrt{70}i}{98}$	0	0	0	0	$-\frac{\sqrt{3}i}{7}$	0	$-\frac{\sqrt{7}i}{49}$	0	0	0	0	0
$\frac{\sqrt{70}i}{98}$	0	$-\frac{2\sqrt{7}i}{49}$	0	0	0	0	$-\frac{\sqrt{105}i}{49}$	0	$-\frac{\sqrt{21}i}{49}$	0	0	0	0
0	$\frac{2\sqrt{7}i}{49}$	0	$-\frac{3\sqrt{14}i}{98}$	0	0	0	0	$-\frac{\sqrt{70}i}{49}$	0	$-\frac{\sqrt{42}i}{49}$	0	0	0
0	0	$\frac{3\sqrt{14}i}{98}$	0	$-\frac{2\sqrt{7}i}{49}$	0	0	0	0	$-\frac{\sqrt{42}i}{49}$	0	$-\frac{\sqrt{70}i}{49}$	0	0
0	0	0	$\frac{2\sqrt{7}i}{49}$	0	$-\frac{\sqrt{70}i}{98}$	0	0	0	0	$-\frac{\sqrt{21}i}{49}$	0	$-\frac{\sqrt{105}i}{49}$	0
0	0	0	0	$\frac{\sqrt{70}i}{98}$	0	0	0	0	0	0	$-\frac{\sqrt{7}i}{49}$	0	$-\frac{\sqrt{3}i}{7}$
$\frac{\sqrt{3}i}{7}$	0	0	0	0	0	0	$\frac{\sqrt{2}i}{14}$	0	0	0	0	0	0
0	$\frac{\sqrt{105}i}{49}$	0	0	0	0	$-\frac{\sqrt{2}i}{14}$	0	$\frac{\sqrt{42}i}{49}$	0	0	0	0	0
$\frac{\sqrt{7}i}{49}$	0	$\frac{\sqrt{70}i}{49}$	0	0	0	0	$-\frac{\sqrt{42}i}{49}$	0	$\frac{\sqrt{210}i}{98}$	0	0	0	0
0	$\frac{\sqrt{21}i}{49}$	0	$\frac{\sqrt{42}i}{49}$	0	0	0	0	$-\frac{\sqrt{210}i}{98}$	0	$\frac{2\sqrt{14}i}{49}$	0	0	0
0	0	$\frac{\sqrt{42}i}{49}$	0	$\frac{\sqrt{21}i}{49}$	0	0	0	0	$-\frac{2\sqrt{14}i}{49}$	0	$\frac{\sqrt{210}i}{98}$	0	0
0	0	0	$\frac{\sqrt{70}i}{49}$	0	$\frac{\sqrt{7}i}{49}$	0	0	0	0	$-\frac{\sqrt{210}i}{98}$	0	$\frac{\sqrt{42}i}{49}$	0
0	0	0	0	$\frac{\sqrt{105}i}{49}$	0	0	0	0	0	0	$-\frac{\sqrt{42}i}{49}$	0	$\frac{\sqrt{2}i}{14}$
0	0	0	0	0	$\frac{\sqrt{3}i}{7}$	0	0	0	0	0	0	$-\frac{\sqrt{2}i}{14}$	0

971	symmetry	$-\frac{z\left(3x^2+3y^2-2z^2\right)}{2}$

continued ...

Table 10

No.	multipole	matrix

$$\mathbb{M}_3^{(1,-1;a)}(A_2)$$

$$\begin{pmatrix}
\frac{\sqrt{70}}{98} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{4\sqrt{105}}{147} & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & -\frac{\sqrt{70}}{70} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & -\frac{2\sqrt{70}}{245} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{2\sqrt{210}}{147} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & \frac{2\sqrt{70}}{245} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{2\sqrt{210}}{147} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & \frac{\sqrt{70}}{70} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}}{98} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{4\sqrt{105}}{147} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}}{28} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
\frac{4\sqrt{105}}{147} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{5\sqrt{70}}{196} & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{70}}{28} & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & -\frac{2\sqrt{210}}{147} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{70}}{196} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & -\frac{2\sqrt{210}}{147} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{70}}{196} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}}{28} & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & \frac{4\sqrt{105}}{147} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{5\sqrt{70}}{196} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{70}}{28}
\end{pmatrix}$$

972	symmetry	$\sqrt{15}xyz$

continued ...

Table 10

No.	multipole	matrix													
	$\mathbb{M}_3^{(1,-1;a)}(B_1)$	0	0	$-\frac{\sqrt{105}i}{98}$	0	0	0	0	0	0	$-\frac{4\sqrt{35}i}{147}$	0	0	0	0
		0	0	0	$-\frac{\sqrt{21}i}{98}$	0	0	$-\frac{2\sqrt{5}i}{21}$	0	0	0	$-\frac{10\sqrt{7}i}{147}$	0	0	0
		$\frac{\sqrt{105}i}{98}$	0	0	0	$\frac{\sqrt{21}i}{98}$	0	0	$-\frac{\sqrt{70}i}{147}$	0	0	0	$-\frac{\sqrt{210}i}{147}$	0	0
		0	$\frac{\sqrt{21}i}{98}$	0	0	0	$\frac{\sqrt{105}i}{98}$	0	0	$\frac{\sqrt{210}i}{147}$	0	0	0	$\frac{\sqrt{70}i}{147}$	0
		0	0	$-\frac{\sqrt{21}i}{98}$	0	0	0	0	0	0	$\frac{10\sqrt{7}i}{147}$	0	0	0	$\frac{2\sqrt{5}i}{21}$
		0	0	0	$-\frac{\sqrt{105}i}{98}$	0	0	0	0	0	0	$\frac{4\sqrt{35}i}{147}$	0	0	0
		0	$\frac{2\sqrt{5}i}{21}$	0	0	0	0	0	0	$\frac{5\sqrt{2}i}{28}$	0	0	0	0	0
		0	0	$\frac{\sqrt{70}i}{147}$	0	0	0	0	0	0	$\frac{3\sqrt{210}i}{196}$	0	0	0	0
		0	0	0	$-\frac{\sqrt{210}i}{147}$	0	0	$-\frac{5\sqrt{2}i}{28}$	0	0	0	$\frac{\sqrt{70}i}{98}$	0	0	0
		$\frac{4\sqrt{35}i}{147}$	0	0	0	$-\frac{10\sqrt{7}i}{147}$	0	0	$-\frac{3\sqrt{210}i}{196}$	0	0	0	$-\frac{\sqrt{70}i}{98}$	0	0
		0	$\frac{10\sqrt{7}i}{147}$	0	0	0	$-\frac{4\sqrt{35}i}{147}$	0	0	$-\frac{\sqrt{70}i}{98}$	0	0	0	$-\frac{3\sqrt{210}i}{196}$	0
		0	0	$\frac{\sqrt{210}i}{147}$	0	0	0	0	0	0	$\frac{\sqrt{70}i}{98}$	0	0	0	$-\frac{5\sqrt{2}i}{28}$
		0	0	0	$-\frac{\sqrt{70}i}{147}$	0	0	0	0	0	0	$\frac{3\sqrt{210}i}{196}$	0	0	0
		0	0	0	0	$-\frac{2\sqrt{5}i}{21}$	0	0	0	0	0	0	$\frac{5\sqrt{2}i}{28}$	0	0

| 973 | symmetry | $\frac{\sqrt{15}z(x-y)(x+y)}{2}$ |

Table 10

No.	multipole	matrix												

$\mathbb{M}_3^{(1,-1;a)}(B_2)$

$$\begin{pmatrix}
0 & 0 & \frac{\sqrt{105}}{98} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{4\sqrt{35}}{147} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & \frac{\sqrt{21}}{98} & 0 & 0 & -\frac{2\sqrt{5}}{21} & 0 & 0 & 0 & \frac{10\sqrt{7}}{147} & 0 & 0 & 0 \\
\frac{\sqrt{105}}{98} & 0 & 0 & 0 & -\frac{\sqrt{21}}{98} & 0 & 0 & -\frac{\sqrt{70}}{147} & 0 & 0 & 0 & \frac{\sqrt{210}}{147} & 0 & 0 \\
0 & \frac{\sqrt{21}}{98} & 0 & 0 & 0 & -\frac{\sqrt{105}}{98} & 0 & 0 & \frac{\sqrt{210}}{147} & 0 & 0 & 0 & -\frac{\sqrt{70}}{147} & 0 \\
0 & 0 & -\frac{\sqrt{21}}{98} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{10\sqrt{7}}{147} & 0 & 0 & 0 & -\frac{2\sqrt{5}}{21} \\
0 & 0 & 0 & -\frac{\sqrt{105}}{98} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{4\sqrt{35}}{147} & 0 & 0 & 0 \\
0 & -\frac{2\sqrt{5}}{21} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{5\sqrt{2}}{28} & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & -\frac{\sqrt{70}}{147} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{210}}{196} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & \frac{\sqrt{210}}{147} & 0 & 0 & -\frac{5\sqrt{2}}{28} & 0 & 0 & 0 & -\frac{\sqrt{70}}{98} & 0 & 0 & 0 \\
\frac{4\sqrt{35}}{147} & 0 & 0 & 0 & \frac{10\sqrt{7}}{147} & 0 & 0 & -\frac{3\sqrt{210}}{196} & 0 & 0 & 0 & \frac{\sqrt{70}}{98} & 0 & 0 \\
0 & \frac{10\sqrt{7}}{147} & 0 & 0 & 0 & \frac{4\sqrt{35}}{147} & 0 & 0 & -\frac{\sqrt{70}}{98} & 0 & 0 & 0 & \frac{3\sqrt{210}}{196} & 0 \\
0 & 0 & \frac{\sqrt{210}}{147} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{70}}{98} & 0 & 0 & 0 & \frac{5\sqrt{2}}{28} \\
0 & 0 & 0 & -\frac{\sqrt{70}}{147} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{210}}{196} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & -\frac{2\sqrt{5}}{21} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{5\sqrt{2}}{28} & 0 & 0 \\
\end{pmatrix}$$

974	symmetry	$\frac{x\left(2x^2-3y^2-3z^2\right)}{2}$

continued ...

Table 10

No.	multipole	matrix													
	$\mathbb{M}_{3,1}^{(1,-1;a)}(E,1)$	0	$-\frac{3\sqrt{14}}{196}$	0	$\frac{5\sqrt{7}}{196}$	0	0	$\frac{\sqrt{15}}{42}$	0	$-\frac{\sqrt{35}}{49}$	0	$\frac{5\sqrt{21}}{294}$	0	0	0
		$-\frac{3\sqrt{14}}{196}$	0	$\frac{3\sqrt{35}}{980}$	0	$\frac{\sqrt{70}}{98}$	0	0	$-\frac{5\sqrt{21}}{294}$	0	$-\frac{\sqrt{105}}{147}$	0	$\frac{5\sqrt{7}}{98}$	0	0
		0	$\frac{3\sqrt{35}}{980}$	0	$\frac{3\sqrt{70}}{490}$	0	$\frac{5\sqrt{7}}{196}$	$-\frac{5\sqrt{6}}{84}$	0	$-\frac{5\sqrt{14}}{196}$	0	$\frac{\sqrt{210}}{588}$	0	$\frac{5\sqrt{42}}{196}$	0
		$\frac{5\sqrt{7}}{196}$	0	$\frac{3\sqrt{70}}{490}$	0	$\frac{3\sqrt{35}}{980}$	0	0	$-\frac{5\sqrt{42}}{196}$	0	$-\frac{\sqrt{210}}{588}$	0	$\frac{5\sqrt{14}}{196}$	0	$\frac{5\sqrt{6}}{84}$
		0	$\frac{\sqrt{70}}{98}$	0	$\frac{3\sqrt{35}}{980}$	0	$-\frac{3\sqrt{14}}{196}$	0	0	$-\frac{5\sqrt{7}}{98}$	0	$\frac{\sqrt{105}}{147}$	0	$\frac{5\sqrt{21}}{294}$	0
		0	0	$\frac{5\sqrt{7}}{196}$	0	$-\frac{3\sqrt{14}}{196}$	0	0	0	0	$-\frac{5\sqrt{21}}{294}$	0	$\frac{\sqrt{35}}{49}$	0	$-\frac{\sqrt{15}}{42}$
		$\frac{\sqrt{15}}{42}$	0	$-\frac{5\sqrt{6}}{84}$	0	0	0	0	$\frac{3\sqrt{10}}{56}$	0	$-\frac{5\sqrt{2}}{56}$	0	0	0	0
		0	$-\frac{5\sqrt{21}}{294}$	0	$-\frac{5\sqrt{42}}{196}$	0	0	$\frac{3\sqrt{10}}{56}$	0	$\frac{\sqrt{210}}{392}$	0	$-\frac{5\sqrt{14}}{98}$	0	0	0
		$-\frac{\sqrt{35}}{49}$	0	$-\frac{5\sqrt{14}}{196}$	0	$-\frac{5\sqrt{7}}{98}$	0	0	$\frac{\sqrt{210}}{392}$	0	$-\frac{5\sqrt{42}}{392}$	0	$-\frac{5\sqrt{70}}{196}$	0	0
		0	$-\frac{\sqrt{105}}{147}$	0	$-\frac{\sqrt{210}}{588}$	0	$-\frac{5\sqrt{21}}{294}$	$-\frac{5\sqrt{2}}{56}$	0	$-\frac{5\sqrt{42}}{392}$	0	$-\frac{3\sqrt{70}}{196}$	0	$-\frac{5\sqrt{14}}{98}$	0
		$\frac{5\sqrt{21}}{294}$	0	$\frac{\sqrt{210}}{588}$	0	$\frac{\sqrt{105}}{147}$	0	0	$-\frac{5\sqrt{14}}{98}$	0	$-\frac{3\sqrt{70}}{196}$	0	$-\frac{5\sqrt{42}}{392}$	0	$-\frac{5\sqrt{2}}{56}$
		0	$\frac{5\sqrt{7}}{98}$	0	$\frac{5\sqrt{14}}{196}$	0	$\frac{\sqrt{35}}{49}$	0	0	$-\frac{5\sqrt{70}}{196}$	0	$-\frac{5\sqrt{42}}{392}$	0	$\frac{\sqrt{210}}{392}$	0
		0	0	$\frac{5\sqrt{42}}{196}$	0	$\frac{5\sqrt{21}}{294}$	0	0	0	0	$-\frac{5\sqrt{14}}{98}$	0	$\frac{\sqrt{210}}{392}$	0	$\frac{3\sqrt{10}}{56}$
		0	0	0	$\frac{5\sqrt{6}}{84}$	0	$-\frac{\sqrt{15}}{42}$	0	0	0	0	$-\frac{5\sqrt{2}}{56}$	0	$\frac{3\sqrt{10}}{56}$	0

| 975 | symmetry | $\frac{y\left(3x^2-2y^2+3z^2\right)}{2}$ |

continued ...

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Table 10

No.	multipole	matrix

$$\mathbb{M}_{3,2}^{(1,-1;a)}(E,1)$$

$$
\begin{bmatrix}
0 & -\frac{3\sqrt{14}i}{196} & 0 & -\frac{5\sqrt{7}i}{196} & 0 & 0 & -\frac{\sqrt{15}i}{42} & 0 & -\frac{\sqrt{35}i}{49} & 0 & -\frac{5\sqrt{21}i}{294} & 0 & 0 & 0 \\
\frac{3\sqrt{14}i}{196} & 0 & \frac{3\sqrt{35}i}{980} & 0 & -\frac{\sqrt{70}i}{98} & 0 & 0 & \frac{5\sqrt{21}i}{294} & 0 & -\frac{\sqrt{105}i}{147} & 0 & -\frac{5\sqrt{7}i}{98} & 0 & 0 \\
0 & -\frac{3\sqrt{35}i}{980} & 0 & \frac{3\sqrt{70}i}{490} & 0 & -\frac{5\sqrt{7}i}{196} & -\frac{5\sqrt{6}i}{84} & 0 & \frac{5\sqrt{14}i}{196} & 0 & \frac{\sqrt{210}i}{588} & 0 & -\frac{5\sqrt{42}i}{196} & 0 \\
\frac{5\sqrt{7}i}{196} & 0 & -\frac{3\sqrt{70}i}{490} & 0 & \frac{3\sqrt{35}i}{980} & 0 & 0 & -\frac{5\sqrt{42}i}{196} & 0 & \frac{\sqrt{210}i}{588} & 0 & \frac{5\sqrt{14}i}{196} & 0 & -\frac{5\sqrt{6}i}{84} \\
0 & \frac{\sqrt{70}i}{98} & 0 & -\frac{3\sqrt{35}i}{980} & 0 & -\frac{3\sqrt{14}i}{196} & 0 & 0 & -\frac{5\sqrt{7}i}{98} & 0 & -\frac{\sqrt{105}i}{147} & 0 & \frac{5\sqrt{21}i}{294} & 0 \\
0 & 0 & \frac{5\sqrt{7}i}{196} & 0 & \frac{3\sqrt{14}i}{196} & 0 & 0 & 0 & 0 & -\frac{5\sqrt{21}i}{294} & 0 & -\frac{\sqrt{35}i}{49} & 0 & -\frac{\sqrt{15}i}{42} \\
\frac{\sqrt{15}i}{42} & 0 & \frac{5\sqrt{6}i}{84} & 0 & 0 & 0 & 0 & \frac{3\sqrt{10}i}{56} & 0 & \frac{5\sqrt{2}i}{56} & 0 & 0 & 0 & 0 \\
0 & -\frac{5\sqrt{21}i}{294} & 0 & \frac{5\sqrt{42}i}{196} & 0 & 0 & -\frac{3\sqrt{10}i}{56} & 0 & \frac{\sqrt{210}i}{392} & 0 & \frac{5\sqrt{14}i}{98} & 0 & 0 & 0 \\
\frac{\sqrt{35}i}{49} & 0 & -\frac{5\sqrt{14}i}{196} & 0 & \frac{5\sqrt{7}i}{98} & 0 & 0 & -\frac{\sqrt{210}i}{392} & 0 & -\frac{5\sqrt{42}i}{392} & 0 & \frac{5\sqrt{70}i}{196} & 0 & 0 \\
0 & \frac{\sqrt{105}i}{147} & 0 & -\frac{\sqrt{210}i}{588} & 0 & \frac{5\sqrt{21}i}{294} & -\frac{5\sqrt{2}i}{56} & 0 & \frac{5\sqrt{42}i}{392} & 0 & -\frac{3\sqrt{70}i}{196} & 0 & \frac{5\sqrt{14}i}{98} & 0 \\
\frac{5\sqrt{21}i}{294} & 0 & -\frac{\sqrt{210}i}{588} & 0 & \frac{\sqrt{105}i}{147} & 0 & 0 & -\frac{5\sqrt{14}i}{98} & 0 & \frac{3\sqrt{70}i}{196} & 0 & -\frac{5\sqrt{42}i}{392} & 0 & \frac{5\sqrt{2}i}{56} \\
0 & \frac{5\sqrt{7}i}{98} & 0 & -\frac{5\sqrt{14}i}{196} & 0 & \frac{\sqrt{35}i}{49} & 0 & 0 & -\frac{5\sqrt{70}i}{196} & 0 & \frac{5\sqrt{42}i}{392} & 0 & \frac{\sqrt{210}i}{392} & 0 \\
0 & 0 & \frac{5\sqrt{42}i}{196} & 0 & -\frac{5\sqrt{21}i}{294} & 0 & 0 & 0 & 0 & -\frac{5\sqrt{14}i}{98} & 0 & -\frac{\sqrt{210}i}{392} & 0 & \frac{3\sqrt{10}i}{56} \\
0 & 0 & 0 & \frac{5\sqrt{6}i}{84} & 0 & \frac{\sqrt{15}i}{42} & 0 & 0 & 0 & 0 & -\frac{5\sqrt{2}i}{56} & 0 & -\frac{3\sqrt{10}i}{56} & 0
\end{bmatrix}
$$

976	symmetry	$\frac{\sqrt{15}x(y-z)(y+z)}{2}$

Table 10

No.	multipole	matrix													
	$\mathbb{M}_{3,1}^{(1,-1;a)}(E,2)$	0	$-\frac{\sqrt{210}}{196}$	0	$-\frac{\sqrt{105}}{196}$	0	0	$\frac{5}{42}$	0	$-\frac{5\sqrt{21}}{147}$	0	$-\frac{\sqrt{35}}{98}$	0	0	0
		$-\frac{\sqrt{210}}{196}$	0	$\frac{\sqrt{21}}{196}$	0	$-\frac{\sqrt{42}}{98}$	0	0	$-\frac{5\sqrt{35}}{294}$	0	$-\frac{5\sqrt{7}}{147}$	0	$-\frac{\sqrt{105}}{98}$	0	0
		0	$\frac{\sqrt{21}}{196}$	0	$\frac{\sqrt{42}}{98}$	0	$-\frac{\sqrt{105}}{196}$	$\frac{\sqrt{10}}{28}$	0	$-\frac{5\sqrt{210}}{588}$	0	$\frac{5\sqrt{14}}{588}$	0	$-\frac{3\sqrt{70}}{196}$	0
		$-\frac{\sqrt{105}}{196}$	0	$\frac{\sqrt{42}}{98}$	0	$\frac{\sqrt{21}}{196}$	0	0	$\frac{3\sqrt{70}}{196}$	0	$-\frac{5\sqrt{14}}{588}$	0	$\frac{5\sqrt{210}}{588}$	0	$-\frac{\sqrt{10}}{28}$
		0	$-\frac{\sqrt{42}}{98}$	0	$\frac{\sqrt{21}}{196}$	0	$-\frac{\sqrt{210}}{196}$	0	0	$\frac{\sqrt{105}}{98}$	0	$\frac{5\sqrt{7}}{147}$	0	$\frac{5\sqrt{35}}{294}$	0
		0	0	$-\frac{\sqrt{105}}{196}$	0	$-\frac{\sqrt{210}}{196}$	0	0	0	0	$\frac{\sqrt{35}}{98}$	0	$\frac{5\sqrt{21}}{147}$	0	$-\frac{5}{42}$
		$\frac{5}{42}$	0	$\frac{\sqrt{10}}{28}$	0	0	0	0	$\frac{5\sqrt{6}}{56}$	0	$\frac{\sqrt{30}}{56}$	0	0	0	0
		0	$-\frac{5\sqrt{35}}{294}$	0	$\frac{3\sqrt{70}}{196}$	0	0	$\frac{5\sqrt{6}}{56}$	0	$\frac{5\sqrt{14}}{392}$	0	$\frac{\sqrt{210}}{98}$	0	0	0
		$-\frac{5\sqrt{21}}{147}$	0	$-\frac{5\sqrt{210}}{588}$	0	$\frac{\sqrt{105}}{98}$	0	0	$\frac{5\sqrt{14}}{392}$	0	$-\frac{5\sqrt{70}}{392}$	0	$\frac{5\sqrt{42}}{196}$	0	0
		0	$-\frac{5\sqrt{7}}{147}$	0	$-\frac{5\sqrt{14}}{588}$	0	$\frac{\sqrt{35}}{98}$	$\frac{\sqrt{30}}{56}$	0	$-\frac{5\sqrt{70}}{392}$	0	$-\frac{5\sqrt{42}}{196}$	0	$\frac{\sqrt{210}}{98}$	0
		$-\frac{\sqrt{35}}{98}$	0	$\frac{5\sqrt{14}}{588}$	0	$\frac{5\sqrt{7}}{147}$	0	0	$\frac{\sqrt{210}}{98}$	0	$-\frac{5\sqrt{42}}{196}$	0	$-\frac{5\sqrt{70}}{392}$	0	$\frac{\sqrt{30}}{56}$
		0	$-\frac{\sqrt{105}}{98}$	0	$\frac{5\sqrt{210}}{588}$	0	$\frac{5\sqrt{21}}{147}$	0	0	$\frac{5\sqrt{42}}{196}$	0	$-\frac{5\sqrt{70}}{392}$	0	$\frac{5\sqrt{14}}{392}$	0
		0	0	$-\frac{3\sqrt{70}}{196}$	0	$\frac{5\sqrt{35}}{294}$	0	0	0	0	$\frac{\sqrt{210}}{98}$	0	$\frac{5\sqrt{14}}{392}$	0	$\frac{5\sqrt{6}}{56}$
		0	0	0	$-\frac{\sqrt{10}}{28}$	0	$-\frac{5}{42}$	0	0	0	0	$\frac{\sqrt{30}}{56}$	0	$\frac{5\sqrt{6}}{56}$	0
977	symmetry	$-\frac{\sqrt{15}y(x-z)(x+z)}{2}$													

continued ...

Table 10

No.	multipole	matrix													
	$\mathbb{M}_{3,2}^{(1,-1;a)}(E,2)$	0	$-\frac{\sqrt{210}i}{196}$	0	$\frac{\sqrt{105}i}{196}$	0	0	$-\frac{5i}{42}$	0	$-\frac{5\sqrt{21}i}{147}$	0	$\frac{\sqrt{35}i}{98}$	0	0	0
		$\frac{\sqrt{210}i}{196}$	0	$\frac{\sqrt{21}i}{196}$	0	$\frac{\sqrt{42}i}{98}$	0	0	$\frac{5\sqrt{35}i}{294}$	0	$-\frac{5\sqrt{7}i}{147}$	0	$\frac{\sqrt{105}i}{98}$	0	0
		0	$-\frac{\sqrt{21}i}{196}$	0	$\frac{\sqrt{42}i}{98}$	0	$\frac{\sqrt{105}i}{196}$	$\frac{\sqrt{10}i}{28}$	0	$\frac{5\sqrt{210}i}{588}$	0	$\frac{5\sqrt{14}i}{588}$	0	$\frac{3\sqrt{70}i}{196}$	0
		$-\frac{\sqrt{105}i}{196}$	0	$-\frac{\sqrt{42}i}{98}$	0	$\frac{\sqrt{21}i}{196}$	0	0	$\frac{3\sqrt{70}i}{196}$	0	$\frac{5\sqrt{14}i}{588}$	0	$\frac{5\sqrt{210}i}{588}$	0	$\frac{\sqrt{10}i}{28}$
		0	$-\frac{\sqrt{42}i}{98}$	0	$-\frac{\sqrt{21}i}{196}$	0	$-\frac{\sqrt{210}i}{196}$	0	0	$\frac{\sqrt{105}i}{98}$	0	$-\frac{5\sqrt{7}i}{147}$	0	$\frac{5\sqrt{35}i}{294}$	0
		0	0	$-\frac{\sqrt{105}i}{196}$	0	$\frac{\sqrt{210}i}{196}$	0	0	0	0	$\frac{\sqrt{35}i}{98}$	0	$-\frac{5\sqrt{21}i}{147}$	0	$-\frac{5i}{42}$
		$\frac{5i}{42}$	0	$-\frac{\sqrt{10}i}{28}$	0	0	0	0	$\frac{5\sqrt{6}i}{56}$	0	$-\frac{\sqrt{30}i}{56}$	0	0	0	0
		0	$-\frac{5\sqrt{35}i}{294}$	0	$-\frac{3\sqrt{70}i}{196}$	0	0	$-\frac{5\sqrt{6}i}{56}$	0	$\frac{5\sqrt{14}i}{392}$	0	$-\frac{\sqrt{210}i}{98}$	0	0	0
		$\frac{5\sqrt{21}i}{147}$	0	$-\frac{5\sqrt{210}i}{588}$	0	$-\frac{\sqrt{105}i}{98}$	0	0	$-\frac{5\sqrt{14}i}{392}$	0	$-\frac{5\sqrt{70}i}{392}$	0	$-\frac{5\sqrt{42}i}{196}$	0	0
		0	$\frac{5\sqrt{7}i}{147}$	0	$-\frac{5\sqrt{14}i}{588}$	0	$-\frac{\sqrt{35}i}{98}$	$\frac{\sqrt{30}i}{56}$	0	$\frac{5\sqrt{70}i}{392}$	0	$-\frac{5\sqrt{42}i}{196}$	0	$-\frac{\sqrt{210}i}{98}$	0
		$-\frac{\sqrt{35}i}{98}$	0	$-\frac{5\sqrt{14}i}{588}$	0	$\frac{5\sqrt{7}i}{147}$	0	0	$\frac{\sqrt{210}i}{98}$	0	$\frac{5\sqrt{42}i}{196}$	0	$-\frac{5\sqrt{70}i}{392}$	0	$-\frac{\sqrt{30}i}{56}$
		0	$-\frac{\sqrt{105}i}{98}$	0	$-\frac{5\sqrt{210}i}{588}$	0	$\frac{5\sqrt{21}i}{147}$	0	0	$\frac{5\sqrt{42}i}{196}$	0	$\frac{5\sqrt{70}i}{392}$	0	$\frac{5\sqrt{14}i}{392}$	0
		0	0	$-\frac{3\sqrt{70}i}{196}$	0	$-\frac{5\sqrt{35}i}{294}$	0	0	0	0	$\frac{\sqrt{210}i}{98}$	0	$-\frac{5\sqrt{14}i}{392}$	0	$\frac{5\sqrt{6}i}{56}$
		0	0	0	$-\frac{\sqrt{10}i}{28}$	0	$\frac{5i}{42}$	0	0	0	0	$\frac{\sqrt{30}i}{56}$	0	$-\frac{5\sqrt{6}i}{56}$	0
978	symmetry	$\frac{3\sqrt{35}xyz(x-y)(x+y)}{2}$														

Table 10

No.	multipole	matrix													
		0	0	0	0	$\frac{\sqrt{55}i}{154}$	0	0	0	0	0	0	$\frac{3\sqrt{22}i}{77}$	0	0
		0	0	0	0	0	$-\frac{\sqrt{55}i}{154}$	0	0	0	0	0	0	$\frac{\sqrt{330}i}{385}$	0
		0	0	0	0	0	0	0	0	0	0	0	0	0	$-\frac{2\sqrt{1155}i}{385}$
		0	0	0	0	0	0	$\frac{2\sqrt{1155}i}{385}$	0	0	0	0	0	0	0
		$-\frac{\sqrt{55}i}{154}$	0	0	0	0	0	0	$-\frac{\sqrt{330}i}{385}$	0	0	0	0	0	0
	$\mathbb{M}_5^{(1,-1;a)}(A_1)$	0	$\frac{\sqrt{55}i}{154}$	0	0	0	0	0	0	$-\frac{3\sqrt{22}i}{77}$	0	0	0	0	0
		0	0	0	$-\frac{2\sqrt{1155}i}{385}$	0	0	0	0	0	0	$-\frac{3\sqrt{385}i}{154}$	0	0	0
		0	0	0	0	$\frac{\sqrt{330}i}{385}$	0	0	0	0	0	0	$-\frac{5\sqrt{33}i}{154}$	0	0
		0	0	0	0	0	$\frac{3\sqrt{22}i}{77}$	0	0	0	0	0	0	$\frac{5\sqrt{33}i}{154}$	0
		0	0	0	0	0	0	0	0	0	0	0	0	0	$\frac{3\sqrt{385}i}{154}$
		0	0	0	0	0	0	$\frac{3\sqrt{385}i}{154}$	0	0	0	0	0	0	0
		$-\frac{3\sqrt{22}i}{77}$	0	0	0	0	0	0	$\frac{5\sqrt{33}i}{154}$	0	0	0	0	0	0
		0	$-\frac{\sqrt{330}i}{385}$	0	0	0	0	0	0	$-\frac{5\sqrt{33}i}{154}$	0	0	0	0	0
		0	0	$\frac{2\sqrt{1155}i}{385}$	0	0	0	0	0	0	$-\frac{3\sqrt{385}i}{154}$	0	0	0	0

| 979 | symmetry | $\frac{z\left(15x^4+30x^2y^2-40x^2z^2+15y^4-40y^2z^2+8z^4\right)}{8}$ |

continued ...

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Table 10

No.	multipole	matrix

$$\mathbb{M}_5^{(1,-1;a)}(A_2,1)$$

$$\begin{pmatrix}
-\frac{\sqrt{385}}{3234} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2310}}{539} & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & \frac{5\sqrt{385}}{3234} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{9\sqrt{154}}{539} & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & -\frac{5\sqrt{385}}{1617} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{2\sqrt{1155}}{539} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & \frac{5\sqrt{385}}{1617} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{2\sqrt{1155}}{539} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & -\frac{5\sqrt{385}}{3234} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{9\sqrt{154}}{539} & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & \frac{\sqrt{385}}{3234} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2310}}{539} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{385}}{154} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
-\frac{\sqrt{2310}}{539} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{23\sqrt{385}}{1078} & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & \frac{9\sqrt{154}}{539} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{17\sqrt{385}}{1078} & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & -\frac{2\sqrt{1155}}{539} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{15\sqrt{385}}{1078} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & -\frac{2\sqrt{1155}}{539} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{15\sqrt{385}}{1078} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & \frac{9\sqrt{154}}{539} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{17\sqrt{385}}{1078} & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2310}}{539} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{23\sqrt{385}}{1078} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{385}}{154}
\end{pmatrix}$$

| 980 | symmetry | $\frac{3\sqrt{35}z\left(x^2-2xy-y^2\right)\left(x^2+2xy-y^2\right)}{8}$ |

Table 10

No.	multipole	matrix													
	$\mathbb{M}_5^{(1,-1;a)}(A_2,2)$	0	0	0	0	$-\frac{\sqrt{55}}{154}$	0	0	0	0	0	0	$-\frac{3\sqrt{22}}{77}$	0	0
		0	0	0	0	0	$\frac{\sqrt{55}}{154}$	0	0	0	0	0	0	$-\frac{\sqrt{330}}{385}$	0
		0	0	0	0	0	0	0	0	0	0	0	0	0	$\frac{2\sqrt{1155}}{385}$
		0	0	0	0	0	0	$\frac{2\sqrt{1155}}{385}$	0	0	0	0	0	0	0
		$-\frac{\sqrt{55}}{154}$	0	0	0	0	0	0	$-\frac{\sqrt{330}}{385}$	0	0	0	0	0	0
		0	$\frac{\sqrt{55}}{154}$	0	0	0	0	0	0	$-\frac{3\sqrt{22}}{77}$	0	0	0	0	0
		0	0	0	$\frac{2\sqrt{1155}}{385}$	0	0	0	0	0	0	$\frac{3\sqrt{385}}{154}$	0	0	0
		0	0	0	0	$-\frac{\sqrt{330}}{385}$	0	0	0	0	0	0	$\frac{5\sqrt{33}}{154}$	0	0
		0	0	0	0	0	$-\frac{3\sqrt{22}}{77}$	0	0	0	0	0	0	$-\frac{5\sqrt{33}}{154}$	0
		0	0	0	0	0	0	0	0	0	0	0	0	0	$-\frac{3\sqrt{385}}{154}$
		0	0	0	0	0	0	$\frac{3\sqrt{385}}{154}$	0	0	0	0	0	0	0
		$-\frac{3\sqrt{22}}{77}$	0	0	0	0	0	0	$\frac{5\sqrt{33}}{154}$	0	0	0	0	0	0
		0	$-\frac{\sqrt{330}}{385}$	0	0	0	0	0	0	$-\frac{5\sqrt{33}}{154}$	0	0	0	0	0
		0	0	$\frac{2\sqrt{1155}}{385}$	0	0	0	0	0	0	$-\frac{3\sqrt{385}}{154}$	0	0	0	0

| 981 | symmetry | $\frac{\sqrt{105}xyz\left(x^2+y^2-2z^2\right)}{2}$ |

Table 10

No.	multipole	matrix												

$\mathbb{M}_5^{(1,-1;a)}(B_1)$

0	0	$-\frac{\sqrt{330}i}{924}$	0	0	0	0	0	0	$-\frac{\sqrt{110}i}{77}$	0	0	0	0
0	0	0	$\frac{5\sqrt{66}i}{924}$	0	0	$-\frac{\sqrt{770}i}{385}$	0	0	0	$\frac{2\sqrt{22}i}{77}$	0	0	0
$\frac{\sqrt{330}i}{924}$	0	0	0	$-\frac{5\sqrt{66}i}{924}$	0	0	$\frac{8\sqrt{55}i}{385}$	0	0	0	$\frac{2\sqrt{165}i}{385}$	0	0
0	$-\frac{5\sqrt{66}i}{924}$	0	0	0	$\frac{\sqrt{330}i}{924}$	0	0	$-\frac{2\sqrt{165}i}{385}$	0	0	0	$-\frac{8\sqrt{55}i}{385}$	0
0	0	$\frac{5\sqrt{66}i}{924}$	0	0	0	0	0	0	$-\frac{2\sqrt{22}i}{77}$	0	0	0	$\frac{\sqrt{770}i}{385}$
0	0	0	$-\frac{\sqrt{330}i}{924}$	0	0	0	0	0	0	$\frac{\sqrt{110}i}{77}$	0	0	0
0	$\frac{\sqrt{770}i}{385}$	0	0	0	0	0	0	$\frac{5\sqrt{77}i}{154}$	0	0	0	0	0
0	0	$-\frac{8\sqrt{55}i}{385}$	0	0	0	0	0	0	$-\frac{3\sqrt{165}i}{154}$	0	0	0	0
0	0	0	$\frac{2\sqrt{165}i}{385}$	0	0	$-\frac{5\sqrt{77}i}{154}$	0	0	0	$-\frac{2\sqrt{55}i}{77}$	0	0	0
$\frac{\sqrt{110}i}{77}$	0	0	0	$\frac{2\sqrt{22}i}{77}$	0	0	$\frac{3\sqrt{165}i}{154}$	0	0	0	$\frac{2\sqrt{55}i}{77}$	0	0
0	$-\frac{2\sqrt{22}i}{77}$	0	0	0	$-\frac{\sqrt{110}i}{77}$	0	0	$\frac{2\sqrt{55}i}{77}$	0	0	0	$\frac{3\sqrt{165}i}{154}$	0
0	0	$-\frac{2\sqrt{165}i}{385}$	0	0	0	0	0	0	$-\frac{2\sqrt{55}i}{77}$	0	0	0	$-\frac{5\sqrt{77}i}{154}$
0	0	0	$\frac{8\sqrt{55}i}{385}$	0	0	0	0	0	0	$-\frac{3\sqrt{165}i}{154}$	0	0	0
0	0	0	0	$-\frac{\sqrt{770}i}{385}$	0	0	0	0	0	0	$\frac{5\sqrt{77}i}{154}$	0	0

No.	
982	symmetry

$$-\frac{\sqrt{105}z(x-y)(x+y)\left(x^2+y^2-2z^2\right)}{4}$$

Table 10

No.	multipole	matrix

$\mathbb{M}_5^{(1,-1;a)}(B_2)$

$$\begin{pmatrix}
0 & 0 & -\frac{\sqrt{330}}{924} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{110}}{77} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & \frac{5\sqrt{66}}{924} & 0 & 0 & \frac{\sqrt{770}}{385} & 0 & 0 & 0 & \frac{2\sqrt{22}}{77} & 0 & 0 & 0 \\
-\frac{\sqrt{330}}{924} & 0 & 0 & 0 & -\frac{5\sqrt{66}}{924} & 0 & 0 & -\frac{8\sqrt{55}}{385} & 0 & 0 & 0 & \frac{2\sqrt{165}}{385} & 0 & 0 \\
0 & \frac{5\sqrt{66}}{924} & 0 & 0 & 0 & \frac{\sqrt{330}}{924} & 0 & 0 & \frac{2\sqrt{165}}{385} & 0 & 0 & 0 & -\frac{8\sqrt{55}}{385} & 0 \\
0 & 0 & -\frac{5\sqrt{66}}{924} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{2\sqrt{22}}{77} & 0 & 0 & 0 & \frac{\sqrt{770}}{385} \\
0 & 0 & 0 & \frac{\sqrt{330}}{924} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{110}}{77} & 0 & 0 & 0 \\
0 & \frac{\sqrt{770}}{385} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{5\sqrt{77}}{154} & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & -\frac{8\sqrt{55}}{385} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{165}}{154} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & \frac{2\sqrt{165}}{385} & 0 & 0 & \frac{5\sqrt{77}}{154} & 0 & 0 & 0 & -\frac{2\sqrt{55}}{77} & 0 & 0 & 0 \\
-\frac{\sqrt{110}}{77} & 0 & 0 & 0 & \frac{2\sqrt{22}}{77} & 0 & 0 & -\frac{3\sqrt{165}}{154} & 0 & 0 & 0 & \frac{2\sqrt{55}}{77} & 0 & 0 \\
0 & \frac{2\sqrt{22}}{77} & 0 & 0 & 0 & -\frac{\sqrt{110}}{77} & 0 & 0 & -\frac{2\sqrt{55}}{77} & 0 & 0 & 0 & \frac{3\sqrt{165}}{154} & 0 \\
0 & 0 & \frac{2\sqrt{165}}{385} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{2\sqrt{55}}{77} & 0 & 0 & 0 & -\frac{5\sqrt{77}}{154} \\
0 & 0 & 0 & -\frac{8\sqrt{55}}{385} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{165}}{154} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & \frac{\sqrt{770}}{385} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{5\sqrt{77}}{154} & 0 & 0
\end{pmatrix}$$

| 983 | symmetry | $\dfrac{x\left(8x^4-40x^2y^2-40x^2z^2+15y^4+30y^2z^2+15z^4\right)}{8}$ |

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Table 10

No.	multipole	matrix

$\mathbb{M}_{5,1}^{(1,-1;a)}(E,1)$

0	$-\frac{5\sqrt{77}}{8624}$	0	$\frac{5\sqrt{154}}{3696}$	0	$-\frac{3\sqrt{385}}{1232}$	$\frac{\sqrt{330}}{1232}$	0	$-\frac{15\sqrt{770}}{8624}$	0	$\frac{5\sqrt{462}}{1232}$	0	$-\frac{3\sqrt{2310}}{1232}$	0
$-\frac{5\sqrt{77}}{8624}$	0	$\frac{5\sqrt{770}}{8624}$	0	$-\frac{5\sqrt{385}}{3696}$	0	0	$-\frac{23\sqrt{462}}{8624}$	0	$\frac{13\sqrt{2310}}{8624}$	0	$-\frac{3\sqrt{154}}{1232}$	0	$-\frac{3\sqrt{66}}{176}$
0	$\frac{5\sqrt{770}}{8624}$	0	$-\frac{5\sqrt{385}}{4312}$	0	$\frac{5\sqrt{154}}{3696}$	$-\frac{\sqrt{33}}{88}$	0	$\frac{3\sqrt{77}}{392}$	0	$-\frac{\sqrt{1155}}{4312}$	0	$-\frac{3\sqrt{231}}{616}$	0
$\frac{5\sqrt{154}}{3696}$	0	$-\frac{5\sqrt{385}}{4312}$	0	$\frac{5\sqrt{770}}{8624}$	0	0	$\frac{3\sqrt{231}}{616}$	0	$\frac{\sqrt{1155}}{4312}$	0	$-\frac{3\sqrt{77}}{392}$	0	$\frac{\sqrt{33}}{88}$
0	$-\frac{5\sqrt{385}}{3696}$	0	$\frac{5\sqrt{770}}{8624}$	0	$-\frac{5\sqrt{77}}{8624}$	$\frac{3\sqrt{66}}{176}$	0	$\frac{3\sqrt{154}}{1232}$	0	$-\frac{13\sqrt{2310}}{8624}$	0	$\frac{23\sqrt{462}}{8624}$	0
$-\frac{3\sqrt{385}}{1232}$	0	$\frac{5\sqrt{154}}{3696}$	0	$-\frac{5\sqrt{77}}{8624}$	0	0	$\frac{3\sqrt{2310}}{1232}$	0	$-\frac{5\sqrt{462}}{1232}$	0	$\frac{15\sqrt{770}}{8624}$	0	$-\frac{\sqrt{330}}{1232}$
$\frac{\sqrt{330}}{1232}$	0	$-\frac{\sqrt{33}}{88}$	0	$\frac{3\sqrt{66}}{176}$	0	0	$\frac{15\sqrt{55}}{1232}$	0	$-\frac{5\sqrt{11}}{88}$	0	$\frac{3\sqrt{165}}{176}$	0	0
0	$-\frac{23\sqrt{462}}{8624}$	0	$\frac{3\sqrt{231}}{616}$	0	$\frac{3\sqrt{2310}}{1232}$	$\frac{15\sqrt{55}}{1232}$	0	$-\frac{5\sqrt{1155}}{1078}$	0	$\frac{5\sqrt{77}}{1232}$	0	$\frac{9\sqrt{385}}{616}$	0
$-\frac{15\sqrt{770}}{8624}$	0	$\frac{3\sqrt{77}}{392}$	0	$\frac{3\sqrt{154}}{1232}$	0	0	$-\frac{5\sqrt{1155}}{1078}$	0	$\frac{5\sqrt{231}}{8624}$	0	$\frac{5\sqrt{385}}{616}$	0	$\frac{3\sqrt{165}}{176}$
0	$\frac{13\sqrt{2310}}{8624}$	0	$\frac{\sqrt{1155}}{4312}$	0	$-\frac{5\sqrt{462}}{1232}$	$-\frac{5\sqrt{11}}{88}$	0	$\frac{5\sqrt{231}}{8624}$	0	$\frac{15\sqrt{385}}{2156}$	0	$\frac{5\sqrt{77}}{1232}$	0
$\frac{5\sqrt{462}}{1232}$	0	$-\frac{\sqrt{1155}}{4312}$	0	$-\frac{13\sqrt{2310}}{8624}$	0	0	$\frac{5\sqrt{77}}{1232}$	0	$\frac{15\sqrt{385}}{2156}$	0	$\frac{5\sqrt{231}}{8624}$	0	$-\frac{5\sqrt{11}}{88}$
0	$-\frac{3\sqrt{154}}{1232}$	0	$-\frac{3\sqrt{77}}{392}$	0	$\frac{15\sqrt{770}}{8624}$	$\frac{3\sqrt{165}}{176}$	0	$\frac{5\sqrt{385}}{616}$	0	$\frac{5\sqrt{231}}{8624}$	0	$-\frac{5\sqrt{1155}}{1078}$	0
$-\frac{3\sqrt{2310}}{1232}$	0	$-\frac{3\sqrt{231}}{616}$	0	$\frac{23\sqrt{462}}{8624}$	0	0	$\frac{9\sqrt{385}}{616}$	0	$\frac{5\sqrt{77}}{1232}$	0	$-\frac{5\sqrt{1155}}{1078}$	0	$\frac{15\sqrt{55}}{1232}$
0	$-\frac{3\sqrt{66}}{176}$	0	$\frac{\sqrt{33}}{88}$	0	$-\frac{\sqrt{330}}{1232}$	0	0	$\frac{3\sqrt{165}}{176}$	0	$-\frac{5\sqrt{11}}{88}$	0	$\frac{15\sqrt{55}}{1232}$	0

No.	symmetry	
984		$-\frac{y\left(15x^4-40x^2y^2+30x^2z^2+8y^4-40y^2z^2+15z^4\right)}{8}$

continued ...

Table 10

<table>
<tr><td>No.</td><td>multipole</td><td colspan="14" align="center">matrix</td></tr>
<tr>
<td></td>
<td rowspan="14">$\mathbb{M}_{5,2}^{(1,-1;a)}(E,1)$</td>
<td>0</td><td>$-\frac{5\sqrt{77}i}{8624}$</td><td>$0$</td><td>$-\frac{5\sqrt{154}i}{3696}$</td><td>$0$</td><td>$-\frac{3\sqrt{385}i}{1232}$</td><td>$-\frac{\sqrt{330}i}{1232}$</td><td>$0$</td><td>$-\frac{15\sqrt{770}i}{8624}$</td><td>$0$</td><td>$-\frac{5\sqrt{462}i}{1232}$</td><td>$0$</td><td>$-\frac{3\sqrt{2310}i}{1232}$</td><td>$0$</td>
</tr>
<tr>
<td>$\frac{5\sqrt{77}i}{8624}$</td><td>0</td><td>$\frac{5\sqrt{770}i}{8624}$</td><td>$0$</td><td>$\frac{5\sqrt{385}i}{3696}$</td><td>$0$</td><td>$0$</td><td>$\frac{23\sqrt{462}i}{8624}$</td><td>$0$</td><td>$\frac{13\sqrt{2310}i}{8624}$</td><td>$0$</td><td>$\frac{3\sqrt{154}i}{1232}$</td><td>$0$</td><td>$-\frac{3\sqrt{66}i}{176}$</td>
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</tr>
<tr>
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</tr>
<tr>
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<tr>
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</tr>
<tr>
<td>0</td><td>$\frac{3\sqrt{66}i}{176}$</td><td>0</td><td>$\frac{\sqrt{33}i}{88}$</td><td>0</td><td>$\frac{\sqrt{330}i}{1232}$</td><td>0</td><td>0</td><td>$-\frac{3\sqrt{165}i}{176}$</td><td>$0$</td><td>$-\frac{5\sqrt{11}i}{88}$</td><td>$0$</td><td>$-\frac{15\sqrt{55}i}{1232}$</td><td>$0$</td>
</tr>
<tr>
<td>985</td><td>symmetry</td><td colspan="14" align="center">$\frac{3\sqrt{35}x\left(y^2-2yz-z^2\right)\left(y^2+2yz-z^2\right)}{8}$</td>
</tr>
</table>

continued …

Table 10

No.	multipole	matrix

$\mathbb{M}_{5,1}^{(1,-1;a)}(E,2)$

0	$-\frac{\sqrt{55}}{1232}$	0	$-\frac{3\sqrt{110}}{1232}$	0	$-\frac{5\sqrt{11}}{1232}$	$\frac{\sqrt{462}}{1232}$	0	$-\frac{15\sqrt{22}}{1232}$	0	$-\frac{9\sqrt{330}}{1232}$	0	$-\frac{5\sqrt{66}}{1232}$	0
$-\frac{\sqrt{55}}{1232}$	0	$\frac{5\sqrt{22}}{1232}$	0	$\frac{15\sqrt{11}}{1232}$	0	0	$-\frac{23\sqrt{330}}{6160}$	0	$\frac{13\sqrt{66}}{1232}$	0	$\frac{27\sqrt{110}}{6160}$	0	$-\frac{\sqrt{2310}}{1232}$
0	$\frac{5\sqrt{22}}{1232}$	0	$-\frac{5\sqrt{11}}{616}$	0	$-\frac{3\sqrt{110}}{1232}$	$\frac{9\sqrt{1155}}{3080}$	0	$\frac{3\sqrt{55}}{280}$	0	$-\frac{\sqrt{33}}{616}$	0	$\frac{27\sqrt{165}}{3080}$	0
$-\frac{3\sqrt{110}}{1232}$	0	$-\frac{5\sqrt{11}}{616}$	0	$\frac{5\sqrt{22}}{1232}$	0	0	$-\frac{27\sqrt{165}}{3080}$	0	$\frac{\sqrt{33}}{616}$	0	$-\frac{3\sqrt{55}}{280}$	0	$-\frac{9\sqrt{1155}}{3080}$
0	$\frac{15\sqrt{11}}{1232}$	0	$\frac{5\sqrt{22}}{1232}$	0	$-\frac{\sqrt{55}}{1232}$	$\frac{\sqrt{2310}}{1232}$	0	$-\frac{27\sqrt{110}}{6160}$	0	$-\frac{13\sqrt{66}}{1232}$	0	$\frac{23\sqrt{330}}{6160}$	0
$-\frac{5\sqrt{11}}{1232}$	0	$-\frac{3\sqrt{110}}{1232}$	0	$-\frac{\sqrt{55}}{1232}$	0	0	$\frac{5\sqrt{66}}{1232}$	0	$\frac{9\sqrt{330}}{1232}$	0	$\frac{15\sqrt{22}}{1232}$	0	$-\frac{\sqrt{462}}{1232}$
$\frac{\sqrt{462}}{1232}$	0	$\frac{9\sqrt{1155}}{3080}$	0	$\frac{\sqrt{2310}}{1232}$	0	0	$\frac{15\sqrt{77}}{1232}$	0	$\frac{9\sqrt{385}}{616}$	0	$\frac{5\sqrt{231}}{1232}$	0	0
0	$-\frac{23\sqrt{330}}{6160}$	0	$-\frac{27\sqrt{165}}{3080}$	0	$\frac{5\sqrt{66}}{1232}$	$\frac{15\sqrt{77}}{1232}$	0	$-\frac{5\sqrt{33}}{154}$	0	$-\frac{9\sqrt{55}}{1232}$	0	$\frac{15\sqrt{11}}{616}$	0
$-\frac{15\sqrt{22}}{1232}$	0	$\frac{3\sqrt{55}}{280}$	0	$-\frac{27\sqrt{110}}{6160}$	0	0	$-\frac{5\sqrt{33}}{154}$	0	$\frac{\sqrt{165}}{1232}$	0	$-\frac{45\sqrt{11}}{616}$	0	$\frac{5\sqrt{231}}{1232}$
0	$\frac{13\sqrt{66}}{1232}$	0	$\frac{\sqrt{33}}{616}$	0	$\frac{9\sqrt{330}}{1232}$	$\frac{9\sqrt{385}}{616}$	0	$\frac{\sqrt{165}}{1232}$	0	$\frac{15\sqrt{11}}{308}$	0	$-\frac{9\sqrt{55}}{1232}$	0
$-\frac{9\sqrt{330}}{1232}$	0	$-\frac{\sqrt{33}}{616}$	0	$-\frac{13\sqrt{66}}{1232}$	0	0	$-\frac{9\sqrt{55}}{1232}$	0	$\frac{15\sqrt{11}}{308}$	0	$\frac{\sqrt{165}}{1232}$	0	$\frac{9\sqrt{385}}{616}$
0	$\frac{27\sqrt{110}}{6160}$	0	$-\frac{3\sqrt{55}}{280}$	0	$\frac{15\sqrt{22}}{1232}$	$\frac{5\sqrt{231}}{1232}$	0	$-\frac{45\sqrt{11}}{616}$	0	$\frac{\sqrt{165}}{1232}$	0	$-\frac{5\sqrt{33}}{154}$	0
$-\frac{5\sqrt{66}}{1232}$	0	$\frac{27\sqrt{165}}{3080}$	0	$\frac{23\sqrt{330}}{6160}$	0	0	$\frac{15\sqrt{11}}{616}$	0	$-\frac{9\sqrt{55}}{1232}$	0	$-\frac{5\sqrt{33}}{154}$	0	$\frac{15\sqrt{77}}{1232}$
0	$-\frac{\sqrt{2310}}{1232}$	0	$-\frac{9\sqrt{1155}}{3080}$	0	$-\frac{\sqrt{462}}{1232}$	0	0	$\frac{5\sqrt{231}}{1232}$	0	$\frac{9\sqrt{385}}{616}$	0	$\frac{15\sqrt{77}}{1232}$	0

986	symmetry	$-\frac{3\sqrt{35}\,y\left(x^2-2xz-z^2\right)\left(x^2+2xz-z^2\right)}{8}$

continued ...

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Table 10

No.	multipole	matrix

$\mathbb{M}_{5,2}^{(1,-1;a)}(E,2)$

0	$-\frac{\sqrt{55}i}{1232}$	0	$\frac{3\sqrt{110}i}{1232}$	0	$-\frac{5\sqrt{11}i}{1232}$	$-\frac{\sqrt{462}i}{1232}$	0	$-\frac{15\sqrt{22}i}{1232}$	0	$\frac{9\sqrt{330}i}{1232}$	0	$-\frac{5\sqrt{66}i}{1232}$	0
$\frac{\sqrt{55}i}{1232}$	0	$\frac{5\sqrt{22}i}{1232}$	0	$-\frac{15\sqrt{11}i}{1232}$	0	0	$\frac{23\sqrt{330}i}{6160}$	0	$\frac{13\sqrt{66}i}{1232}$	0	$-\frac{27\sqrt{110}i}{6160}$	0	$-\frac{\sqrt{2310}i}{1232}$
0	$-\frac{5\sqrt{22}i}{1232}$	0	$-\frac{5\sqrt{11}i}{616}$	0	$\frac{3\sqrt{110}i}{1232}$	$\frac{9\sqrt{1155}i}{3080}$	0	$-\frac{3\sqrt{55}i}{280}$	0	$-\frac{\sqrt{33}i}{616}$	0	$-\frac{27\sqrt{165}i}{3080}$	0
$-\frac{3\sqrt{110}i}{1232}$	0	$\frac{5\sqrt{11}i}{616}$	0	$\frac{5\sqrt{22}i}{1232}$	0	0	$-\frac{27\sqrt{165}i}{3080}$	0	$-\frac{\sqrt{33}i}{616}$	0	$-\frac{3\sqrt{55}i}{280}$	0	$\frac{9\sqrt{1155}i}{3080}$
0	$\frac{15\sqrt{11}i}{1232}$	0	$-\frac{5\sqrt{22}i}{1232}$	0	$-\frac{\sqrt{55}i}{1232}$	$-\frac{\sqrt{2310}i}{1232}$	0	$-\frac{27\sqrt{110}i}{6160}$	0	$\frac{13\sqrt{66}i}{1232}$	0	$\frac{23\sqrt{330}i}{6160}$	0
$\frac{5\sqrt{11}i}{1232}$	0	$-\frac{3\sqrt{110}i}{1232}$	0	$\frac{\sqrt{55}i}{1232}$	0	0	$-\frac{5\sqrt{66}i}{1232}$	0	$\frac{9\sqrt{330}i}{1232}$	0	$-\frac{15\sqrt{22}i}{1232}$	0	$-\frac{\sqrt{462}i}{1232}$
$\frac{\sqrt{462}i}{1232}$	0	$-\frac{9\sqrt{1155}i}{3080}$	0	$\frac{\sqrt{2310}i}{1232}$	0	0	$\frac{15\sqrt{77}i}{1232}$	0	$-\frac{9\sqrt{385}i}{616}$	0	$\frac{5\sqrt{231}i}{1232}$	0	0
0	$-\frac{23\sqrt{330}i}{6160}$	0	$\frac{27\sqrt{165}i}{3080}$	0	$\frac{5\sqrt{66}i}{1232}$	$-\frac{15\sqrt{77}i}{1232}$	0	$-\frac{5\sqrt{33}i}{154}$	0	$\frac{9\sqrt{55}i}{1232}$	0	$\frac{15\sqrt{11}i}{616}$	0
$\frac{15\sqrt{22}i}{1232}$	0	$\frac{3\sqrt{55}i}{280}$	0	$\frac{27\sqrt{110}i}{6160}$	0	0	$\frac{5\sqrt{33}i}{154}$	0	$\frac{\sqrt{165}i}{1232}$	0	$\frac{45\sqrt{11}i}{616}$	0	$\frac{5\sqrt{231}i}{1232}$
0	$-\frac{13\sqrt{66}i}{1232}$	0	$\frac{\sqrt{33}i}{616}$	0	$-\frac{9\sqrt{330}i}{1232}$	$\frac{9\sqrt{385}i}{616}$	0	$-\frac{\sqrt{165}i}{1232}$	0	$\frac{15\sqrt{11}i}{308}$	0	$\frac{9\sqrt{55}i}{1232}$	0
$-\frac{9\sqrt{330}i}{1232}$	0	$\frac{\sqrt{33}i}{616}$	0	$-\frac{13\sqrt{66}i}{1232}$	0	0	$-\frac{9\sqrt{55}i}{1232}$	0	$-\frac{15\sqrt{11}i}{308}$	0	$\frac{\sqrt{165}i}{1232}$	0	$-\frac{9\sqrt{385}i}{616}$
0	$\frac{27\sqrt{110}i}{6160}$	0	$\frac{3\sqrt{55}i}{280}$	0	$\frac{15\sqrt{22}i}{1232}$	$-\frac{5\sqrt{231}i}{1232}$	0	$-\frac{45\sqrt{11}i}{616}$	0	$-\frac{\sqrt{165}i}{1232}$	0	$-\frac{5\sqrt{33}i}{154}$	0
$\frac{5\sqrt{66}i}{1232}$	0	$\frac{27\sqrt{165}i}{3080}$	0	$-\frac{23\sqrt{330}i}{6160}$	0	0	$-\frac{15\sqrt{11}i}{616}$	0	$-\frac{9\sqrt{55}i}{1232}$	0	$\frac{5\sqrt{33}i}{154}$	0	$\frac{15\sqrt{77}i}{1232}$
0	$\frac{\sqrt{2310}i}{1232}$	0	$-\frac{9\sqrt{1155}i}{3080}$	0	$\frac{\sqrt{462}i}{1232}$	0	0	$-\frac{5\sqrt{231}i}{1232}$	0	$\frac{9\sqrt{385}i}{616}$	0	$-\frac{15\sqrt{77}i}{1232}$	0

987	symmetry	$\frac{\sqrt{105}x(y-z)(y+z)\left(2x^2-y^2-z^2\right)}{4}$

continued ...

Table 10

Table 10

No.	multipole	matrix

$\mathbb{M}_{5,1}^{(1,-1;a)}(E,3)$

$$\begin{pmatrix}
0 & -\frac{\sqrt{165}}{1848} & 0 & \frac{\sqrt{330}}{1848} & 0 & \frac{5\sqrt{33}}{616} & \frac{\sqrt{154}}{616} & 0 & -\frac{5\sqrt{66}}{616} & 0 & \frac{3\sqrt{110}}{616} & 0 & \frac{15\sqrt{22}}{616} & 0 \\
-\frac{\sqrt{165}}{1848} & 0 & \frac{5\sqrt{66}}{1848} & 0 & -\frac{5\sqrt{33}}{1848} & 0 & 0 & -\frac{23\sqrt{110}}{3080} & 0 & \frac{13\sqrt{22}}{616} & 0 & -\frac{3\sqrt{330}}{3080} & 0 & \frac{3\sqrt{770}}{616} \\
0 & \frac{5\sqrt{66}}{1848} & 0 & -\frac{5\sqrt{33}}{924} & 0 & \frac{\sqrt{330}}{1848} & -\frac{3\sqrt{385}}{1540} & 0 & \frac{\sqrt{165}}{140} & 0 & -\frac{\sqrt{11}}{308} & 0 & -\frac{9\sqrt{55}}{1540} & 0 \\
\frac{\sqrt{330}}{1848} & 0 & -\frac{5\sqrt{33}}{924} & 0 & \frac{5\sqrt{66}}{1848} & 0 & 0 & \frac{9\sqrt{55}}{1540} & 0 & \frac{\sqrt{11}}{308} & 0 & -\frac{\sqrt{165}}{140} & 0 & \frac{3\sqrt{385}}{1540} \\
0 & -\frac{5\sqrt{33}}{1848} & 0 & \frac{5\sqrt{66}}{1848} & 0 & -\frac{\sqrt{165}}{1848} & -\frac{3\sqrt{770}}{616} & 0 & \frac{3\sqrt{330}}{3080} & 0 & -\frac{13\sqrt{22}}{616} & 0 & \frac{23\sqrt{110}}{3080} & 0 \\
\frac{5\sqrt{33}}{616} & 0 & \frac{\sqrt{330}}{1848} & 0 & -\frac{\sqrt{165}}{1848} & 0 & 0 & -\frac{15\sqrt{22}}{616} & 0 & -\frac{3\sqrt{110}}{616} & 0 & \frac{5\sqrt{66}}{616} & 0 & -\frac{\sqrt{154}}{616} \\
\frac{\sqrt{154}}{616} & 0 & -\frac{3\sqrt{385}}{1540} & 0 & -\frac{3\sqrt{770}}{616} & 0 & 0 & \frac{5\sqrt{231}}{616} & 0 & -\frac{\sqrt{1155}}{308} & 0 & -\frac{15\sqrt{77}}{616} & 0 & 0 \\
0 & -\frac{23\sqrt{110}}{3080} & 0 & \frac{9\sqrt{55}}{1540} & 0 & -\frac{15\sqrt{22}}{616} & \frac{5\sqrt{231}}{616} & 0 & -\frac{5\sqrt{11}}{77} & 0 & \frac{\sqrt{165}}{616} & 0 & -\frac{15\sqrt{33}}{308} & 0 \\
-\frac{5\sqrt{66}}{616} & 0 & \frac{\sqrt{165}}{140} & 0 & \frac{3\sqrt{330}}{3080} & 0 & 0 & -\frac{5\sqrt{11}}{77} & 0 & \frac{\sqrt{55}}{616} & 0 & \frac{5\sqrt{33}}{308} & 0 & -\frac{15\sqrt{77}}{616} \\
0 & \frac{13\sqrt{22}}{616} & 0 & \frac{\sqrt{11}}{308} & 0 & -\frac{3\sqrt{110}}{616} & -\frac{\sqrt{1155}}{308} & 0 & \frac{\sqrt{55}}{616} & 0 & \frac{5\sqrt{33}}{154} & 0 & \frac{\sqrt{165}}{616} & 0 \\
\frac{3\sqrt{110}}{616} & 0 & -\frac{\sqrt{11}}{308} & 0 & -\frac{13\sqrt{22}}{616} & 0 & 0 & \frac{\sqrt{165}}{616} & 0 & \frac{5\sqrt{33}}{154} & 0 & \frac{\sqrt{55}}{616} & 0 & -\frac{\sqrt{1155}}{308} \\
0 & -\frac{3\sqrt{330}}{3080} & 0 & -\frac{\sqrt{165}}{140} & 0 & \frac{5\sqrt{66}}{616} & -\frac{15\sqrt{77}}{616} & 0 & \frac{5\sqrt{33}}{308} & 0 & \frac{\sqrt{55}}{616} & 0 & -\frac{5\sqrt{11}}{77} & 0 \\
\frac{15\sqrt{22}}{616} & 0 & -\frac{9\sqrt{55}}{1540} & 0 & \frac{23\sqrt{110}}{3080} & 0 & 0 & -\frac{15\sqrt{33}}{308} & 0 & \frac{\sqrt{165}}{616} & 0 & -\frac{5\sqrt{11}}{77} & 0 & \frac{5\sqrt{231}}{616} \\
0 & \frac{3\sqrt{770}}{616} & 0 & \frac{3\sqrt{385}}{1540} & 0 & -\frac{\sqrt{154}}{616} & 0 & 0 & -\frac{15\sqrt{77}}{616} & 0 & -\frac{\sqrt{1155}}{308} & 0 & \frac{5\sqrt{231}}{616} & 0
\end{pmatrix}$$

988	symmetry	$\dfrac{\sqrt{105}\,y(x-z)(x+z)\left(x^2-2y^2+z^2\right)}{4}$

Table 10

No.	multipole	matrix

$\mathbb{M}_{5,2}^{(1,-1;a)}(E,3)$

$$
\begin{bmatrix}
0 & -\frac{\sqrt{165}i}{1848} & 0 & -\frac{\sqrt{330}i}{1848} & 0 & \frac{5\sqrt{33}i}{616} & -\frac{\sqrt{154}i}{616} & 0 & -\frac{5\sqrt{66}i}{616} & 0 & -\frac{3\sqrt{110}i}{616} & 0 & \frac{15\sqrt{22}i}{616} & 0 \\
\frac{\sqrt{165}i}{1848} & 0 & \frac{5\sqrt{66}i}{1848} & 0 & \frac{5\sqrt{33}i}{1848} & 0 & 0 & \frac{23\sqrt{110}i}{3080} & 0 & \frac{13\sqrt{22}i}{616} & 0 & \frac{3\sqrt{330}i}{3080} & 0 & \frac{3\sqrt{770}i}{616} \\
0 & -\frac{5\sqrt{66}i}{1848} & 0 & -\frac{5\sqrt{33}i}{924} & 0 & -\frac{\sqrt{330}i}{1848} & -\frac{3\sqrt{385}i}{1540} & 0 & -\frac{\sqrt{165}i}{140} & 0 & -\frac{\sqrt{11}i}{308} & 0 & \frac{9\sqrt{55}i}{1540} & 0 \\
\frac{\sqrt{330}i}{1848} & 0 & \frac{5\sqrt{33}i}{924} & 0 & \frac{5\sqrt{66}i}{1848} & 0 & 0 & \frac{9\sqrt{55}i}{1540} & 0 & -\frac{\sqrt{11}i}{308} & 0 & -\frac{\sqrt{165}i}{140} & 0 & -\frac{3\sqrt{385}i}{1540} \\
0 & -\frac{5\sqrt{33}i}{1848} & 0 & -\frac{5\sqrt{66}i}{1848} & 0 & -\frac{\sqrt{165}i}{1848} & \frac{3\sqrt{770}i}{616} & 0 & \frac{3\sqrt{330}i}{3080} & 0 & \frac{13\sqrt{22}i}{616} & 0 & \frac{23\sqrt{110}i}{3080} & 0 \\
-\frac{5\sqrt{33}i}{616} & 0 & \frac{\sqrt{330}i}{1848} & 0 & \frac{\sqrt{165}i}{1848} & 0 & 0 & \frac{15\sqrt{22}i}{616} & 0 & -\frac{3\sqrt{110}i}{616} & 0 & -\frac{5\sqrt{66}i}{616} & 0 & -\frac{\sqrt{154}i}{616} \\
\frac{\sqrt{154}i}{616} & 0 & \frac{3\sqrt{385}i}{1540} & 0 & -\frac{3\sqrt{770}i}{616} & 0 & 0 & \frac{5\sqrt{231}i}{616} & 0 & \frac{\sqrt{1155}i}{308} & 0 & -\frac{15\sqrt{77}i}{616} & 0 & 0 \\
0 & -\frac{23\sqrt{110}i}{3080} & 0 & -\frac{9\sqrt{55}i}{1540} & 0 & -\frac{15\sqrt{22}i}{616} & -\frac{5\sqrt{231}i}{616} & 0 & -\frac{5\sqrt{11}i}{77} & 0 & -\frac{\sqrt{165}i}{616} & 0 & -\frac{15\sqrt{33}i}{308} & 0 \\
\frac{5\sqrt{66}i}{616} & 0 & \frac{\sqrt{165}i}{140} & 0 & -\frac{3\sqrt{330}i}{3080} & 0 & 0 & \frac{5\sqrt{11}i}{77} & 0 & \frac{\sqrt{55}i}{616} & 0 & -\frac{5\sqrt{33}i}{308} & 0 & -\frac{15\sqrt{77}i}{616} \\
0 & -\frac{13\sqrt{22}i}{616} & 0 & \frac{\sqrt{11}i}{308} & 0 & \frac{3\sqrt{110}i}{616} & -\frac{\sqrt{1155}i}{308} & 0 & -\frac{\sqrt{55}i}{616} & 0 & \frac{5\sqrt{33}i}{154} & 0 & -\frac{\sqrt{165}i}{616} & 0 \\
\frac{3\sqrt{110}i}{616} & 0 & \frac{\sqrt{11}i}{308} & 0 & -\frac{13\sqrt{22}i}{616} & 0 & 0 & \frac{\sqrt{165}i}{616} & 0 & -\frac{5\sqrt{33}i}{154} & 0 & \frac{\sqrt{55}i}{616} & 0 & \frac{\sqrt{1155}i}{308} \\
0 & -\frac{3\sqrt{330}i}{3080} & 0 & \frac{\sqrt{165}i}{140} & 0 & \frac{5\sqrt{66}i}{616} & \frac{15\sqrt{77}i}{616} & 0 & \frac{5\sqrt{33}i}{308} & 0 & -\frac{\sqrt{55}i}{616} & 0 & -\frac{5\sqrt{11}i}{77} & 0 \\
-\frac{15\sqrt{22}i}{616} & 0 & -\frac{9\sqrt{55}i}{1540} & 0 & -\frac{23\sqrt{110}i}{3080} & 0 & 0 & \frac{15\sqrt{33}i}{308} & 0 & \frac{\sqrt{165}i}{616} & 0 & \frac{5\sqrt{11}i}{77} & 0 & \frac{5\sqrt{231}i}{616} \\
0 & -\frac{3\sqrt{770}i}{616} & 0 & \frac{3\sqrt{385}i}{1540} & 0 & \frac{\sqrt{154}i}{616} & 0 & 0 & \frac{15\sqrt{77}i}{616} & 0 & -\frac{\sqrt{1155}i}{308} & 0 & -\frac{5\sqrt{231}i}{616} & 0
\end{bmatrix}
$$

No.	symmetry	
989		$-\frac{\sqrt{231}xyz(x-y)(x+y)\left(3x^2+3y^2-10z^2\right)}{4}$

Table 10

No.	multipole	matrix
	$\mathbb{M}_7^{(1,-1;a)}(A_1)$	$\begin{pmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{130}i}{52} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{546}i}{52} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{546}i}{52} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{130}i}{52} \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{130}i}{52} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{546}i}{52} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{546}i}{52} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{130}i}{52} & 0 & 0 & 0 & 0 \end{pmatrix}$
990	symmetry	$-\frac{z\left(35x^6+105x^4y^2-210x^4z^2+105x^2y^4-420x^2y^2z^2+168x^2z^4+35y^6-210y^4z^2+168y^2z^4-16z^6\right)}{16}$

Table 10

No.	multipole	matrix

$$\mathbb{M}_7^{(1,-1;a)}(A_2,1)$$

$$\begin{bmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{858}}{1716} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{7\sqrt{858}}{1716} & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{7\sqrt{858}}{572} & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{35\sqrt{858}}{1716} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{35\sqrt{858}}{1716} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{7\sqrt{858}}{572} & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{7\sqrt{858}}{1716} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{858}}{1716}
\end{bmatrix}$$

| 991 | symmetry | $-\frac{\sqrt{231}z\left(x^2-2xy-y^2\right)\left(x^2+2xy-y^2\right)\left(3x^2+3y^2-10z^2\right)}{16}$ |

continued ...

Table 10

No.	multipole	matrix

$\mathbb{M}_7^{(1,-1;a)}(A_2,2)$

$$\begin{pmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{130}}{52} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{546}}{52} & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{546}}{52} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{130}}{52} \\
0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{130}}{52} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{546}}{52} & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{546}}{52} & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{130}}{52} & 0 & 0 & 0 & 0
\end{pmatrix}$$

| 992 | symmetry | $\dfrac{\sqrt{91}xyz\left(3x^4-5x^2y^2-5x^2z^2+3y^4-5y^2z^2+3z^4\right)}{2}$ |

continued ...

Table 10

No.	multipole	matrix

$$\mathbb{M}_7^{(1,-1;a)}(B_1,1)$$

$$
\begin{pmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{22}i}{88} & 0 & 0 & 0 & \frac{\sqrt{66}i}{24} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2310}i}{264} & 0 & 0 & 0 & -\frac{\sqrt{66}i}{24} \\
0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{22}i}{88} & 0 & 0 & 0 & \frac{\sqrt{770}i}{88} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2310}i}{264} & 0 & 0 & 0 & -\frac{\sqrt{770}i}{88} & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{770}i}{88} & 0 & 0 & 0 & \frac{\sqrt{2310}i}{264} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{770}i}{88} & 0 & 0 & 0 & -\frac{\sqrt{22}i}{88} \\
0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{66}i}{24} & 0 & 0 & 0 & -\frac{\sqrt{2310}i}{264} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{66}i}{24} & 0 & 0 & 0 & \frac{\sqrt{22}i}{88} & 0 & 0 \\
\end{pmatrix}
$$

| 993 | symmetry | $-\frac{\sqrt{77}xyz\left(3x^4-20x^2y^2+10x^2z^2+3y^4+10y^2z^2-6z^4\right)}{4}$ |

continued ...

Table 10

No.	multipole	matrix

$$\mathbb{M}_7^{(1,-1;a)}(B_1,2)$$

$$\begin{pmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{26}i}{104} & 0 & 0 & 0 & -\frac{\sqrt{78}i}{24} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2730}i}{312} & 0 & 0 & 0 & \frac{\sqrt{78}i}{24} \\
0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{26}i}{104} & 0 & 0 & 0 & \frac{\sqrt{910}i}{104} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2730}i}{312} & 0 & 0 & 0 & -\frac{\sqrt{910}i}{104} & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{910}i}{104} & 0 & 0 & 0 & \frac{\sqrt{2730}i}{312} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{910}i}{104} & 0 & 0 & 0 & -\frac{\sqrt{26}i}{104} \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{78}i}{24} & 0 & 0 & 0 & -\frac{\sqrt{2730}i}{312} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{78}i}{24} & 0 & 0 & 0 & \frac{\sqrt{26}i}{104} & 0 & 0
\end{pmatrix}$$

| 994 | symmetry | $\frac{\sqrt{6006}z(x-y)(x+y)\left(x^2-4xy+y^2\right)\left(x^2+4xy+y^2\right)}{32}$ |

continued ...

452

Table 10

No.	multipole	matrix
	$\mathbb{M}_7^{(1,-1;a)}(B_2,1)$	$\begin{pmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{1}{2} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{1}{2} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{1}{2} & 0 & 0 & 0 & 0 & 0 & 0 \end{pmatrix}$
995	symmetry	$\frac{\sqrt{42}z(x-y)(x+y)\left(15x^4+30x^2y^2-80x^2z^2+15y^4-80y^2z^2+48z^4\right)}{32}$

continued ...

Table 10

No.	multipole	matrix

$\mathbb{M}_7^{(1,-1;a)}(B_2,2)$

$$\begin{pmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{429}}{286} & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{5005}}{286} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{429}}{286} & 0 & 0 & 0 & -\frac{\sqrt{15015}}{286} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{5005}}{286} & 0 & 0 & 0 & \frac{\sqrt{15015}}{286} & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15015}}{286} & 0 & 0 & 0 & -\frac{\sqrt{5005}}{286} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15015}}{286} & 0 & 0 & 0 & \frac{\sqrt{429}}{286} \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5005}}{286} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{429}}{286} & 0 & 0 \\
\end{pmatrix}$$

| 996 | symmetry | $\dfrac{x\left(16x^6 - 168x^4 y^2 - 168x^4 z^2 + 210 x^2 y^4 + 420 x^2 y^2 z^2 + 210 x^2 z^4 - 35 y^6 - 105 y^4 z^2 - 105 y^2 z^4 - 35 z^6\right)}{16}$ |

continued ...

Table 10

No.	multipole	matrix

$$\mathbb{M}_{7,1}^{(1,-1;a)}(E,1) = \begin{pmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{5\sqrt{6006}}{27456} & 0 & -\frac{3\sqrt{30030}}{9152} & 0 & \frac{3\sqrt{2002}}{832} & 0 & -\frac{\sqrt{858}}{64} \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{5\sqrt{6006}}{27456} & 0 & -\frac{35\sqrt{286}}{9152} & 0 & \frac{21\sqrt{4290}}{9152} & 0 & -\frac{7\sqrt{858}}{832} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{35\sqrt{286}}{9152} & 0 & \frac{35\sqrt{1430}}{9152} & 0 & -\frac{63\sqrt{858}}{9152} & 0 & \frac{3\sqrt{2002}}{832} \\
0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{30030}}{9152} & 0 & \frac{35\sqrt{1430}}{9152} & 0 & -\frac{175\sqrt{858}}{27456} & 0 & \frac{21\sqrt{4290}}{9152} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{21\sqrt{4290}}{9152} & 0 & -\frac{175\sqrt{858}}{27456} & 0 & \frac{35\sqrt{1430}}{9152} & 0 & -\frac{3\sqrt{30030}}{9152} \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{2002}}{832} & 0 & -\frac{63\sqrt{858}}{9152} & 0 & \frac{35\sqrt{1430}}{9152} & 0 & -\frac{35\sqrt{286}}{9152} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{7\sqrt{858}}{832} & 0 & \frac{21\sqrt{4290}}{9152} & 0 & -\frac{35\sqrt{286}}{9152} & 0 & \frac{5\sqrt{6006}}{27456} \\
0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{858}}{64} & 0 & \frac{3\sqrt{2002}}{832} & 0 & -\frac{3\sqrt{30030}}{9152} & 0 & \frac{5\sqrt{6006}}{27456} & 0
\end{pmatrix}$$

| 997 | symmetry | $\dfrac{y\left(35x^6-210x^4y^2+105x^4z^2+168x^2y^4-420x^2y^2z^2+105x^2z^4-16y^6+168y^4z^2-210y^2z^4+35z^6\right)}{16}$ |

Table 10

No.	multipole	matrix													

$\mathbb{M}_{7,2}^{(1,-1;a)}(E,1)$

$$\begin{pmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{5\sqrt{6006}i}{27456} & 0 & \frac{3\sqrt{30030}i}{9152} & 0 & \frac{3\sqrt{2002}i}{832} & 0 & \frac{\sqrt{858}i}{64} \\
0 & 0 & 0 & 0 & 0 & 0 & -\frac{5\sqrt{6006}i}{27456} & 0 & -\frac{35\sqrt{286}i}{9152} & 0 & -\frac{21\sqrt{4290}i}{9152} & 0 & -\frac{7\sqrt{858}i}{832} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{35\sqrt{286}i}{9152} & 0 & \frac{35\sqrt{1430}i}{9152} & 0 & \frac{63\sqrt{858}i}{9152} & 0 & \frac{3\sqrt{2002}i}{832} \\
0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{30030}i}{9152} & 0 & -\frac{35\sqrt{1430}i}{9152} & 0 & -\frac{175\sqrt{858}i}{27456} & 0 & -\frac{21\sqrt{4290}i}{9152} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{21\sqrt{4290}i}{9152} & 0 & \frac{175\sqrt{858}i}{27456} & 0 & \frac{35\sqrt{1430}i}{9152} & 0 & \frac{3\sqrt{30030}i}{9152} \\
0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{2002}i}{832} & 0 & -\frac{63\sqrt{858}i}{9152} & 0 & -\frac{35\sqrt{1430}i}{9152} & 0 & -\frac{35\sqrt{286}i}{9152} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{7\sqrt{858}i}{832} & 0 & \frac{21\sqrt{4290}i}{9152} & 0 & \frac{35\sqrt{286}i}{9152} & 0 & \frac{5\sqrt{6006}i}{27456} \\
0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{858}i}{64} & 0 & -\frac{3\sqrt{2002}i}{832} & 0 & -\frac{3\sqrt{30030}i}{9152} & 0 & -\frac{5\sqrt{6006}i}{27456} & 0
\end{pmatrix}$$

| 998 | symmetry | $\frac{\sqrt{231}x\left(10x^2-3y^2-3z^2\right)\left(y^2-2yz-z^2\right)\left(y^2+2yz-z^2\right)}{16}$ |

Table 10

No.	multipole	matrix

$\mathbb{M}_{7,1}^{(1,-1;a)}(E,2)$

$$\begin{pmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{26}}{832} & 0 & \frac{\sqrt{130}}{832} & 0 & -\frac{25\sqrt{78}}{832} & 0 & -\frac{\sqrt{182}}{64} \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{26}}{832} & 0 & -\frac{3\sqrt{546}}{832} & 0 & -\frac{\sqrt{910}}{832} & 0 & \frac{25\sqrt{182}}{832} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{546}}{832} & 0 & \frac{3\sqrt{2730}}{832} & 0 & \frac{3\sqrt{182}}{832} & 0 & -\frac{25\sqrt{78}}{832} \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{130}}{832} & 0 & \frac{3\sqrt{2730}}{832} & 0 & -\frac{15\sqrt{182}}{832} & 0 & -\frac{\sqrt{910}}{832} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{910}}{832} & 0 & -\frac{15\sqrt{182}}{832} & 0 & \frac{3\sqrt{2730}}{832} & 0 & \frac{\sqrt{130}}{832} \\
0 & 0 & 0 & 0 & 0 & 0 & -\frac{25\sqrt{78}}{832} & 0 & \frac{3\sqrt{182}}{832} & 0 & \frac{3\sqrt{2730}}{832} & 0 & -\frac{3\sqrt{546}}{832} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{25\sqrt{182}}{832} & 0 & -\frac{\sqrt{910}}{832} & 0 & -\frac{3\sqrt{546}}{832} & 0 & \frac{3\sqrt{26}}{832} \\
0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{182}}{64} & 0 & -\frac{25\sqrt{78}}{832} & 0 & \frac{\sqrt{130}}{832} & 0 & \frac{3\sqrt{26}}{832} & 0
\end{pmatrix}$$

| 999 | symmetry | $\dfrac{\sqrt{231}\,y\left(x^2-2xz-z^2\right)\left(x^2+2xz-z^2\right)\left(3x^2-10y^2+3z^2\right)}{16}$ |

continued ...

Table 10

No.	multipole	matrix												
	$\mathbb{M}_{7,2}^{(1,-1;a)}(E,2)$	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	$\frac{3\sqrt{26}i}{832}$	0	$-\frac{\sqrt{130}i}{832}$	0	$-\frac{25\sqrt{78}i}{832}$	0	$\frac{\sqrt{182}i}{64}$
		0	0	0	0	0	0	$-\frac{3\sqrt{26}i}{832}$	0	$-\frac{3\sqrt{546}i}{832}$	0	$\frac{\sqrt{910}i}{832}$	0	$\frac{25\sqrt{182}i}{832}$	0
		0	0	0	0	0	0	0	$\frac{3\sqrt{546}i}{832}$	0	$\frac{3\sqrt{2730}i}{832}$	0	$-\frac{3\sqrt{182}i}{832}$	0	$-\frac{25\sqrt{78}i}{832}$
		0	0	0	0	0	0	$\frac{\sqrt{130}i}{832}$	0	$-\frac{3\sqrt{2730}i}{832}$	0	$-\frac{15\sqrt{182}i}{832}$	0	$\frac{\sqrt{910}i}{832}$	0
		0	0	0	0	0	0	0	$-\frac{\sqrt{910}i}{832}$	0	$\frac{15\sqrt{182}i}{832}$	0	$\frac{3\sqrt{2730}i}{832}$	0	$-\frac{\sqrt{130}i}{832}$
		0	0	0	0	0	0	$\frac{25\sqrt{78}i}{832}$	0	$\frac{3\sqrt{182}i}{832}$	0	$-\frac{3\sqrt{2730}i}{832}$	0	$-\frac{3\sqrt{546}i}{832}$	0
		0	0	0	0	0	0	0	$-\frac{25\sqrt{182}i}{832}$	0	$-\frac{\sqrt{910}i}{832}$	0	$\frac{3\sqrt{546}i}{832}$	0	$\frac{3\sqrt{26}i}{832}$
		0	0	0	0	0	0	$-\frac{\sqrt{182}i}{64}$	0	$\frac{25\sqrt{78}i}{832}$	0	$\frac{\sqrt{130}i}{832}$	0	$-\frac{3\sqrt{26}i}{832}$	0
1000	symmetry	$\frac{\sqrt{6006}x(y-z)(y+z)\left(y^2-4yz+z^2\right)\left(y^2+4yz+z^2\right)}{32}$													

Table 10

No.	multipole	matrix													

$$\mathbb{M}_{7,1}^{(1,-1;a)}(E,3)$$

$$\begin{pmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{1}{64} & 0 & \frac{3\sqrt{5}}{64} & 0 & \frac{5\sqrt{3}}{64} & 0 & \frac{\sqrt{7}}{64} \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{1}{64} & 0 & -\frac{\sqrt{21}}{64} & 0 & -\frac{3\sqrt{35}}{64} & 0 & -\frac{5\sqrt{7}}{64} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{21}}{64} & 0 & \frac{\sqrt{105}}{64} & 0 & \frac{9\sqrt{7}}{64} & 0 & \frac{5\sqrt{3}}{64} \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{5}}{64} & 0 & \frac{\sqrt{105}}{64} & 0 & -\frac{5\sqrt{7}}{64} & 0 & -\frac{3\sqrt{35}}{64} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{35}}{64} & 0 & -\frac{5\sqrt{7}}{64} & 0 & \frac{\sqrt{105}}{64} & 0 & \frac{3\sqrt{5}}{64} \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{5\sqrt{3}}{64} & 0 & \frac{9\sqrt{7}}{64} & 0 & \frac{\sqrt{105}}{64} & 0 & -\frac{\sqrt{21}}{64} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{5\sqrt{7}}{64} & 0 & -\frac{3\sqrt{35}}{64} & 0 & -\frac{\sqrt{21}}{64} & 0 & \frac{1}{64} \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}}{64} & 0 & \frac{5\sqrt{3}}{64} & 0 & \frac{3\sqrt{5}}{64} & 0 & \frac{1}{64} & 0
\end{pmatrix}$$

| 1001 | symmetry | $-\frac{\sqrt{6006}\,y(x-z)(x+z)\left(x^2-4xz+z^2\right)\left(x^2+4xz+z^2\right)}{32}$ |

continued ...

Table 10

No.	multipole	matrix

$$\mathbb{M}_{7,2}^{(1,-1;a)}(E,3)$$

$$\left[\begin{array}{cccccccccccccc}
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{i}{64} & 0 & -\frac{3\sqrt{5}i}{64} & 0 & \frac{5\sqrt{3}i}{64} & 0 & -\frac{\sqrt{7}i}{64} \\
0 & 0 & 0 & 0 & 0 & 0 & -\frac{i}{64} & 0 & -\frac{\sqrt{21}i}{64} & 0 & \frac{3\sqrt{35}i}{64} & 0 & -\frac{5\sqrt{7}i}{64} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{21}i}{64} & 0 & \frac{\sqrt{105}i}{64} & 0 & -\frac{9\sqrt{7}i}{64} & 0 & \frac{5\sqrt{3}i}{64} \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{5}i}{64} & 0 & -\frac{\sqrt{105}i}{64} & 0 & -\frac{5\sqrt{7}i}{64} & 0 & \frac{3\sqrt{35}i}{64} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{35}i}{64} & 0 & \frac{5\sqrt{7}i}{64} & 0 & \frac{\sqrt{105}i}{64} & 0 & -\frac{3\sqrt{5}i}{64} \\
0 & 0 & 0 & 0 & 0 & 0 & -\frac{5\sqrt{3}i}{64} & 0 & \frac{9\sqrt{7}i}{64} & 0 & -\frac{\sqrt{105}i}{64} & 0 & -\frac{\sqrt{21}i}{64} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{5\sqrt{7}i}{64} & 0 & -\frac{3\sqrt{35}i}{64} & 0 & \frac{\sqrt{21}i}{64} & 0 & \frac{i}{64} \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}i}{64} & 0 & -\frac{5\sqrt{3}i}{64} & 0 & \frac{3\sqrt{5}i}{64} & 0 & -\frac{i}{64} & 0
\end{array}\right]$$

| 1002 | symmetry | $\dfrac{\sqrt{42}x(y-z)(y+z)\left(48x^4-80x^2y^2-80x^2z^2+15y^4+30y^2z^2+15z^4\right)}{32}$ |

continued ...

Table 10

No.	multipole	matrix

$\mathbb{M}_{7,1}^{(1,-1;a)}(E,4)$

$$\begin{pmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{15\sqrt{143}}{9152} & 0 & -\frac{19\sqrt{715}}{9152} & 0 & \frac{\sqrt{429}}{832} & 0 & \frac{\sqrt{1001}}{64} \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{15\sqrt{143}}{9152} & 0 & -\frac{15\sqrt{3003}}{9152} & 0 & \frac{19\sqrt{5005}}{9152} & 0 & -\frac{\sqrt{1001}}{832} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{15\sqrt{3003}}{9152} & 0 & \frac{15\sqrt{15015}}{9152} & 0 & -\frac{57\sqrt{1001}}{9152} & 0 & \frac{\sqrt{429}}{832} \\
0 & 0 & 0 & 0 & 0 & 0 & -\frac{19\sqrt{715}}{9152} & 0 & \frac{15\sqrt{15015}}{9152} & 0 & -\frac{75\sqrt{1001}}{9152} & 0 & \frac{19\sqrt{5005}}{9152} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{19\sqrt{5005}}{9152} & 0 & -\frac{75\sqrt{1001}}{9152} & 0 & \frac{15\sqrt{15015}}{9152} & 0 & -\frac{19\sqrt{715}}{9152} \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{429}}{832} & 0 & -\frac{57\sqrt{1001}}{9152} & 0 & \frac{15\sqrt{15015}}{9152} & 0 & -\frac{15\sqrt{3003}}{9152} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{1001}}{832} & 0 & \frac{19\sqrt{5005}}{9152} & 0 & -\frac{15\sqrt{3003}}{9152} & 0 & \frac{15\sqrt{143}}{9152} \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{1001}}{64} & 0 & \frac{\sqrt{429}}{832} & 0 & -\frac{19\sqrt{715}}{9152} & 0 & \frac{15\sqrt{143}}{9152} & 0
\end{pmatrix}$$

| 1003 | symmetry | $-\frac{\sqrt{42}\,y(x-z)(x+z)\left(15x^4-80x^2y^2+30x^2z^2+48y^4-80y^2z^2+15z^4\right)}{32}$ |

continued ...

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Table 10

No.	multipole	matrix

$$\mathbb{M}_{7,2}^{(1,-1;a)}(E,4)$$

$$
\begin{pmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{15\sqrt{143}i}{9152} & 0 & \frac{19\sqrt{715}i}{9152} & 0 & \frac{\sqrt{429}i}{832} & 0 & -\frac{\sqrt{1001}i}{64} \\
0 & 0 & 0 & 0 & 0 & 0 & -\frac{15\sqrt{143}i}{9152} & 0 & -\frac{15\sqrt{3003}i}{9152} & 0 & -\frac{19\sqrt{5005}i}{9152} & 0 & -\frac{\sqrt{1001}i}{832} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{15\sqrt{3003}i}{9152} & 0 & \frac{15\sqrt{15015}i}{9152} & 0 & \frac{57\sqrt{1001}i}{9152} & 0 & \frac{\sqrt{429}i}{832} \\
0 & 0 & 0 & 0 & 0 & 0 & -\frac{19\sqrt{715}i}{9152} & 0 & -\frac{15\sqrt{15015}i}{9152} & 0 & -\frac{75\sqrt{1001}i}{9152} & 0 & -\frac{19\sqrt{5005}i}{9152} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{19\sqrt{5005}i}{9152} & 0 & \frac{75\sqrt{1001}i}{9152} & 0 & \frac{15\sqrt{15015}i}{9152} & 0 & \frac{19\sqrt{715}i}{9152} \\
0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{429}i}{832} & 0 & -\frac{57\sqrt{1001}i}{9152} & 0 & -\frac{15\sqrt{15015}i}{9152} & 0 & -\frac{15\sqrt{3003}i}{9152} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{1001}i}{832} & 0 & \frac{19\sqrt{5005}i}{9152} & 0 & \frac{15\sqrt{3003}i}{9152} & 0 & \frac{15\sqrt{143}i}{9152} \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{1001}i}{64} & 0 & -\frac{\sqrt{429}i}{832} & 0 & -\frac{19\sqrt{715}i}{9152} & 0 & -\frac{15\sqrt{143}i}{9152} & 0
\end{pmatrix}
$$

1004	symmetry	z

continued ...

Table 10

No.	multipole	matrix

$$\mathbb{M}_1^{(1,1;a)}(A_2)$$

$$
\begin{pmatrix}
\frac{2\sqrt{105}}{49} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{70}}{196} & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & \frac{6\sqrt{105}}{245} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{5\sqrt{42}}{196} & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & \frac{2\sqrt{105}}{245} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{35}}{98} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & -\frac{2\sqrt{105}}{245} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{35}}{98} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & -\frac{6\sqrt{105}}{245} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{5\sqrt{42}}{196} & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & -\frac{2\sqrt{105}}{49} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{70}}{196} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{105}}{42} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
-\frac{3\sqrt{70}}{196} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{5\sqrt{105}}{294} & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & -\frac{5\sqrt{42}}{196} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{105}}{98} & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & -\frac{3\sqrt{35}}{98} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{105}}{294} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & -\frac{3\sqrt{35}}{98} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{105}}{294} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & -\frac{5\sqrt{42}}{196} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{105}}{98} & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{70}}{196} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{5\sqrt{105}}{294} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{105}}{42}
\end{pmatrix}
$$

1005	symmetry	x

Table 10

No.	multipole	matrix													
	$\mathbb{M}_{1,1}^{(1,1;a)}(E)$	0	$\frac{2\sqrt{21}}{49}$	0	0	0	0	$\frac{3\sqrt{10}}{56}$	0	$-\frac{\sqrt{210}}{392}$	0	0	0	0	0
		$\frac{2\sqrt{21}}{49}$	0	$\frac{4\sqrt{210}}{245}$	0	0	0	0	$\frac{15\sqrt{14}}{392}$	0	$-\frac{3\sqrt{70}}{392}$	0	0	0	0
		0	$\frac{4\sqrt{210}}{245}$	0	$\frac{6\sqrt{105}}{245}$	0	0	0	0	$\frac{5\sqrt{21}}{196}$	0	$-\frac{3\sqrt{35}}{196}$	0	0	0
		0	0	$\frac{6\sqrt{105}}{245}$	0	$\frac{4\sqrt{210}}{245}$	0	0	0	0	$\frac{3\sqrt{35}}{196}$	0	$-\frac{5\sqrt{21}}{196}$	0	0
		0	0	0	$\frac{4\sqrt{210}}{245}$	0	$\frac{2\sqrt{21}}{49}$	0	0	0	0	$\frac{3\sqrt{70}}{392}$	0	$-\frac{15\sqrt{14}}{392}$	0
		0	0	0	0	$\frac{2\sqrt{21}}{49}$	0	0	0	0	0	0	$\frac{\sqrt{210}}{392}$	0	$-\frac{3\sqrt{10}}{56}$
		$\frac{3\sqrt{10}}{56}$	0	0	0	0	0	0	$-\frac{\sqrt{15}}{42}$	0	0	0	0	0	0
		0	$\frac{15\sqrt{14}}{392}$	0	0	0	0	$-\frac{\sqrt{15}}{42}$	0	$-\frac{\sqrt{35}}{49}$	0	0	0	0	0
		$-\frac{\sqrt{210}}{392}$	0	$\frac{5\sqrt{21}}{196}$	0	0	0	0	$-\frac{\sqrt{35}}{49}$	0	$-\frac{5\sqrt{7}}{98}$	0	0	0	0
		0	$-\frac{3\sqrt{70}}{392}$	0	$\frac{3\sqrt{35}}{196}$	0	0	0	0	$-\frac{5\sqrt{7}}{98}$	0	$-\frac{2\sqrt{105}}{147}$	0	0	0
		0	0	$-\frac{3\sqrt{35}}{196}$	0	$\frac{3\sqrt{70}}{392}$	0	0	0	0	$-\frac{2\sqrt{105}}{147}$	0	$-\frac{5\sqrt{7}}{98}$	0	0
		0	0	0	$-\frac{5\sqrt{21}}{196}$	0	$\frac{\sqrt{210}}{392}$	0	0	0	0	$-\frac{5\sqrt{7}}{98}$	0	$-\frac{\sqrt{35}}{49}$	0
		0	0	0	0	$-\frac{15\sqrt{14}}{392}$	0	0	0	0	0	0	$-\frac{\sqrt{35}}{49}$	0	$-\frac{\sqrt{15}}{42}$
		0	0	0	0	0	$-\frac{3\sqrt{10}}{56}$	0	0	0	0	0	0	$-\frac{\sqrt{15}}{42}$	0

1006	symmetry	$-y$

continued …

Table 10

No.	multipole	matrix

$$\mathbb{M}_{1,2}^{(1,1;a)}(E)$$

$$
\begin{pmatrix}
0 & \frac{2\sqrt{21}i}{49} & 0 & 0 & 0 & 0 & -\frac{3\sqrt{10}i}{56} & 0 & -\frac{\sqrt{210}i}{392} & 0 & 0 & 0 & 0 & 0 \\[4pt]
-\frac{2\sqrt{21}i}{49} & 0 & \frac{4\sqrt{210}i}{245} & 0 & 0 & 0 & 0 & -\frac{15\sqrt{14}i}{392} & 0 & -\frac{3\sqrt{70}i}{392} & 0 & 0 & 0 & 0 \\[4pt]
0 & -\frac{4\sqrt{210}i}{245} & 0 & \frac{6\sqrt{105}i}{245} & 0 & 0 & 0 & 0 & -\frac{5\sqrt{21}i}{196} & 0 & -\frac{3\sqrt{35}i}{196} & 0 & 0 & 0 \\[4pt]
0 & 0 & -\frac{6\sqrt{105}i}{245} & 0 & \frac{4\sqrt{210}i}{245} & 0 & 0 & 0 & 0 & -\frac{3\sqrt{35}i}{196} & 0 & -\frac{5\sqrt{21}i}{196} & 0 & 0 \\[4pt]
0 & 0 & 0 & -\frac{4\sqrt{210}i}{245} & 0 & \frac{2\sqrt{21}i}{49} & 0 & 0 & 0 & 0 & -\frac{3\sqrt{70}i}{392} & 0 & -\frac{15\sqrt{14}i}{392} & 0 \\[4pt]
0 & 0 & 0 & 0 & -\frac{2\sqrt{21}i}{49} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{210}i}{392} & 0 & -\frac{3\sqrt{10}i}{56} \\[4pt]
\frac{3\sqrt{10}i}{56} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{42} & 0 & 0 & 0 & 0 & 0 & 0 \\[4pt]
0 & \frac{15\sqrt{14}i}{392} & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{42} & 0 & -\frac{\sqrt{35}i}{49} & 0 & 0 & 0 & 0 & 0 \\[4pt]
\frac{\sqrt{210}i}{392} & 0 & \frac{5\sqrt{21}i}{196} & 0 & 0 & 0 & 0 & \frac{\sqrt{35}i}{49} & 0 & -\frac{5\sqrt{7}i}{98} & 0 & 0 & 0 & 0 \\[4pt]
0 & \frac{3\sqrt{70}i}{392} & 0 & \frac{3\sqrt{35}i}{196} & 0 & 0 & 0 & 0 & \frac{5\sqrt{7}i}{98} & 0 & -\frac{2\sqrt{105}i}{147} & 0 & 0 & 0 \\[4pt]
0 & 0 & \frac{3\sqrt{35}i}{196} & 0 & \frac{3\sqrt{70}i}{392} & 0 & 0 & 0 & 0 & \frac{2\sqrt{105}i}{147} & 0 & -\frac{5\sqrt{7}i}{98} & 0 & 0 \\[4pt]
0 & 0 & 0 & \frac{5\sqrt{21}i}{196} & 0 & \frac{\sqrt{210}i}{392} & 0 & 0 & 0 & 0 & \frac{5\sqrt{7}i}{98} & 0 & -\frac{\sqrt{35}i}{49} & 0 \\[4pt]
0 & 0 & 0 & 0 & \frac{15\sqrt{14}i}{392} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{35}i}{49} & 0 & -\frac{\sqrt{15}i}{42} \\[4pt]
0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{10}i}{56} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{42} & 0
\end{pmatrix}
$$

No.	symmetry	
1007	symmetry	$-\frac{z\left(3x^2+3y^2-2z^2\right)}{2}$

continued ...

Table 10

No.	multipole	matrix

$$\mathbb{M}_3^{(1,1;a)}(A_2)$$

$$
\begin{pmatrix}
-\frac{5\sqrt{77}}{147} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{462}}{98} & 0 & 0 & 0 & 0 & 0 \\
0 & \frac{\sqrt{77}}{21} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & \frac{4\sqrt{77}}{147} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{231}}{98} & 0 & 0 & 0 \\
0 & 0 & 0 & -\frac{4\sqrt{77}}{147} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{231}}{98} & 0 & 0 \\
0 & 0 & 0 & 0 & -\frac{\sqrt{77}}{21} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & \frac{5\sqrt{77}}{147} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{462}}{98} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{77}}{77} & 0 & 0 & 0 & 0 & 0 & 0 \\
\frac{\sqrt{462}}{98} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{5\sqrt{77}}{539} & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{77}}{77} & 0 & 0 & 0 & 0 \\
0 & 0 & -\frac{\sqrt{231}}{98} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{77}}{539} & 0 & 0 & 0 \\
0 & 0 & 0 & -\frac{\sqrt{231}}{98} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{77}}{539} & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{77}}{77} & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & \frac{\sqrt{462}}{98} & 0 & 0 & 0 & 0 & 0 & \frac{5\sqrt{77}}{539} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{77}}{77}
\end{pmatrix}
$$

1008	symmetry	$\sqrt{15}\,xyz$

continued ...

Table 10

No.	multipole	matrix

$\mathbb{M}_3^{(1,1;a)}(B_1)$

$$\begin{pmatrix}
0 & 0 & \frac{5\sqrt{462}i}{294} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{154}i}{98} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & \frac{\sqrt{2310}i}{294} & 0 & 0 & -\frac{\sqrt{22}i}{28} & 0 & 0 & 0 & -\frac{\sqrt{770}i}{196} & 0 & 0 & 0 \\
-\frac{5\sqrt{462}i}{294} & 0 & 0 & 0 & -\frac{\sqrt{2310}i}{294} & 0 & 0 & -\frac{\sqrt{77}i}{196} & 0 & 0 & 0 & -\frac{\sqrt{231}i}{196} & 0 & 0 \\
0 & -\frac{\sqrt{2310}i}{294} & 0 & 0 & 0 & -\frac{5\sqrt{462}i}{294} & 0 & 0 & \frac{\sqrt{231}i}{196} & 0 & 0 & 0 & \frac{\sqrt{77}i}{196} & 0 \\
0 & 0 & \frac{\sqrt{2310}i}{294} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{770}i}{196} & 0 & 0 & 0 & \frac{\sqrt{22}i}{28} \\
0 & 0 & 0 & \frac{5\sqrt{462}i}{294} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{154}i}{98} & 0 & 0 & 0 \\
0 & \frac{\sqrt{22}i}{28} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{55}i}{77} & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & \frac{\sqrt{77}i}{196} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{231}i}{539} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & -\frac{\sqrt{231}i}{196} & 0 & 0 & \frac{\sqrt{55}i}{77} & 0 & 0 & 0 & -\frac{2\sqrt{77}i}{539} & 0 & 0 & 0 \\
\frac{\sqrt{154}i}{98} & 0 & 0 & 0 & -\frac{\sqrt{770}i}{196} & 0 & 0 & \frac{3\sqrt{231}i}{539} & 0 & 0 & 0 & \frac{2\sqrt{77}i}{539} & 0 & 0 \\
0 & \frac{\sqrt{770}i}{196} & 0 & 0 & 0 & -\frac{\sqrt{154}i}{98} & 0 & 0 & \frac{2\sqrt{77}i}{539} & 0 & 0 & 0 & \frac{3\sqrt{231}i}{539} & 0 \\
0 & 0 & \frac{\sqrt{231}i}{196} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{2\sqrt{77}i}{539} & 0 & 0 & 0 & \frac{\sqrt{55}i}{77} \\
0 & 0 & 0 & -\frac{\sqrt{77}i}{196} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{231}i}{539} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & -\frac{\sqrt{22}i}{28} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{55}i}{77} & 0 & 0
\end{pmatrix}$$

| 1009 | symmetry | $\frac{\sqrt{15}z(x-y)(x+y)}{2}$ |

continued ...

Table 10

No.	multipole	matrix													
	$\mathbb{M}_3^{(1,1;a)}(B_2)$	0	0	$-\frac{5\sqrt{462}}{294}$	0	0	0	0	0	0	$\frac{\sqrt{154}}{98}$	0	0	0	0
		0	0	0	$-\frac{\sqrt{2310}}{294}$	0	0	$-\frac{\sqrt{22}}{28}$	0	0	0	$\frac{\sqrt{770}}{196}$	0	0	0
		$-\frac{5\sqrt{462}}{294}$	0	0	0	$\frac{\sqrt{2310}}{294}$	0	0	$-\frac{\sqrt{77}}{196}$	0	0	0	$\frac{\sqrt{231}}{196}$	0	0
		0	$-\frac{\sqrt{2310}}{294}$	0	0	0	$\frac{5\sqrt{462}}{294}$	0	0	$\frac{\sqrt{231}}{196}$	0	0	0	$-\frac{\sqrt{77}}{196}$	0
		0	0	$\frac{\sqrt{2310}}{294}$	0	0	0	0	0	0	$\frac{\sqrt{770}}{196}$	0	0	0	$-\frac{\sqrt{22}}{28}$
		0	0	0	$\frac{5\sqrt{462}}{294}$	0	0	0	0	0	0	$\frac{\sqrt{154}}{98}$	0	0	0
		0	$-\frac{\sqrt{22}}{28}$	0	0	0	0	0	0	$\frac{\sqrt{55}}{77}$	0	0	0	0	0
		0	0	$-\frac{\sqrt{77}}{196}$	0	0	0	0	0	0	$\frac{3\sqrt{231}}{539}$	0	0	0	0
		0	0	0	$\frac{\sqrt{231}}{196}$	0	0	$\frac{\sqrt{55}}{77}$	0	0	0	$\frac{2\sqrt{77}}{539}$	0	0	0
		$\frac{\sqrt{154}}{98}$	0	0	0	$\frac{\sqrt{770}}{196}$	0	0	$\frac{3\sqrt{231}}{539}$	0	0	0	$-\frac{2\sqrt{77}}{539}$	0	0
		0	$\frac{\sqrt{770}}{196}$	0	0	0	$\frac{\sqrt{154}}{98}$	0	0	$\frac{2\sqrt{77}}{539}$	0	0	0	$-\frac{3\sqrt{231}}{539}$	0
		0	0	$\frac{\sqrt{231}}{196}$	0	0	0	0	0	0	$-\frac{2\sqrt{77}}{539}$	0	0	0	$-\frac{\sqrt{55}}{77}$
		0	0	0	$-\frac{\sqrt{77}}{196}$	0	0	0	0	0	0	$-\frac{3\sqrt{231}}{539}$	0	0	0
		0	0	0	0	$-\frac{\sqrt{22}}{28}$	0	0	0	0	0	0	$-\frac{\sqrt{55}}{77}$	0	0

| 1010 | symmetry | $\frac{x\left(2x^2-3y^2-3z^2\right)}{2}$ |

continued ...

Table 10

No.	multipole	matrix													
	$\mathbb{M}_{3,1}^{(1,1;a)}(E,1)$	0	$\frac{\sqrt{385}}{98}$	0	$-\frac{5\sqrt{770}}{588}$	0	0	$\frac{\sqrt{66}}{112}$	0	$-\frac{3\sqrt{154}}{392}$	0	$\frac{\sqrt{2310}}{784}$	0	0	0
		$\frac{\sqrt{385}}{98}$	0	$-\frac{\sqrt{154}}{196}$	0	$-\frac{5\sqrt{77}}{147}$	0	0	$-\frac{\sqrt{2310}}{784}$	0	$-\frac{\sqrt{462}}{392}$	0	$\frac{3\sqrt{770}}{784}$	0	0
		0	$-\frac{\sqrt{154}}{196}$	0	$-\frac{\sqrt{77}}{49}$	0	$-\frac{5\sqrt{770}}{588}$	$-\frac{\sqrt{165}}{112}$	0	$-\frac{3\sqrt{385}}{784}$	0	$\frac{\sqrt{231}}{784}$	0	$\frac{3\sqrt{1155}}{784}$	0
		$-\frac{5\sqrt{770}}{588}$	0	$-\frac{\sqrt{77}}{49}$	0	$-\frac{\sqrt{154}}{196}$	0	0	$-\frac{3\sqrt{1155}}{784}$	0	$-\frac{\sqrt{231}}{784}$	0	$\frac{3\sqrt{385}}{784}$	0	$\frac{\sqrt{165}}{112}$
		0	$-\frac{5\sqrt{77}}{147}$	0	$-\frac{\sqrt{154}}{196}$	0	$\frac{\sqrt{385}}{98}$	0	0	$-\frac{3\sqrt{770}}{784}$	0	$\frac{\sqrt{462}}{392}$	0	$\frac{\sqrt{2310}}{784}$	0
		0	0	$-\frac{5\sqrt{770}}{588}$	0	$\frac{\sqrt{385}}{98}$	0	0	0	0	$-\frac{\sqrt{2310}}{784}$	0	$\frac{3\sqrt{154}}{392}$	0	$-\frac{\sqrt{66}}{112}$
		$\frac{\sqrt{66}}{112}$	0	$-\frac{\sqrt{165}}{112}$	0	0	0	0	$-\frac{3\sqrt{11}}{154}$	0	$\frac{\sqrt{55}}{154}$	0	0	0	0
		0	$-\frac{\sqrt{2310}}{784}$	0	$-\frac{3\sqrt{1155}}{784}$	0	0	$-\frac{3\sqrt{11}}{154}$	0	$-\frac{\sqrt{231}}{1078}$	0	$\frac{2\sqrt{385}}{539}$	0	0	0
		$-\frac{3\sqrt{154}}{392}$	0	$-\frac{3\sqrt{385}}{784}$	0	$-\frac{3\sqrt{770}}{784}$	0	0	$-\frac{\sqrt{231}}{1078}$	0	$\frac{\sqrt{1155}}{1078}$	0	$\frac{5\sqrt{77}}{539}$	0	0
		0	$-\frac{\sqrt{462}}{392}$	0	$-\frac{\sqrt{231}}{784}$	0	$-\frac{\sqrt{2310}}{784}$	$\frac{\sqrt{55}}{154}$	0	$\frac{\sqrt{1155}}{1078}$	0	$\frac{3\sqrt{77}}{539}$	0	$\frac{2\sqrt{385}}{539}$	0
		$\frac{\sqrt{2310}}{784}$	0	$\frac{\sqrt{231}}{784}$	0	$\frac{\sqrt{462}}{392}$	0	0	$\frac{2\sqrt{385}}{539}$	0	$\frac{3\sqrt{77}}{539}$	0	$\frac{\sqrt{1155}}{1078}$	0	$\frac{\sqrt{55}}{154}$
		0	$\frac{3\sqrt{770}}{784}$	0	$\frac{3\sqrt{385}}{784}$	0	$\frac{3\sqrt{154}}{392}$	0	0	$\frac{5\sqrt{77}}{539}$	0	$\frac{\sqrt{1155}}{1078}$	0	$-\frac{\sqrt{231}}{1078}$	0
		0	0	$\frac{3\sqrt{1155}}{784}$	0	$\frac{\sqrt{2310}}{784}$	0	0	0	0	$\frac{2\sqrt{385}}{539}$	0	$-\frac{\sqrt{231}}{1078}$	0	$-\frac{3\sqrt{11}}{154}$
		0	0	0	$\frac{\sqrt{165}}{112}$	0	$-\frac{\sqrt{66}}{112}$	0	0	0	0	$\frac{\sqrt{55}}{154}$	0	$-\frac{3\sqrt{11}}{154}$	0
1011	symmetry	$\frac{y\left(3x^2-2y^2+3z^2\right)}{2}$													

continued ...

Table 10

No.	multipole	matrix													
	$\mathbb{M}_{3,2}^{(1,1;a)}(E,1)$	0	$\frac{\sqrt{385}i}{98}$	0	$\frac{5\sqrt{770}i}{588}$	0	0	$-\frac{\sqrt{66}i}{112}$	0	$-\frac{3\sqrt{154}i}{392}$	0	$-\frac{\sqrt{2310}i}{784}$	0	0	0
		$-\frac{\sqrt{385}i}{98}$	0	$-\frac{\sqrt{154}i}{196}$	0	$\frac{5\sqrt{77}i}{147}$	0	0	$\frac{\sqrt{2310}i}{784}$	0	$-\frac{\sqrt{462}i}{392}$	0	$-\frac{3\sqrt{770}i}{784}$	0	0
		0	$\frac{\sqrt{154}i}{196}$	0	$-\frac{\sqrt{77}i}{49}$	0	$\frac{5\sqrt{770}i}{588}$	$-\frac{\sqrt{165}i}{112}$	0	$\frac{3\sqrt{385}i}{784}$	0	$\frac{\sqrt{231}i}{784}$	0	$-\frac{3\sqrt{1155}i}{784}$	0
		$-\frac{5\sqrt{770}i}{588}$	0	$\frac{\sqrt{77}i}{49}$	0	$-\frac{\sqrt{154}i}{196}$	0	0	$-\frac{3\sqrt{1155}i}{784}$	0	$\frac{\sqrt{231}i}{784}$	0	$\frac{3\sqrt{385}i}{784}$	0	$-\frac{\sqrt{165}i}{112}$
		0	$-\frac{5\sqrt{77}i}{147}$	0	$\frac{\sqrt{154}i}{196}$	0	$\frac{\sqrt{385}i}{98}$	0	0	$-\frac{3\sqrt{770}i}{784}$	0	$-\frac{\sqrt{462}i}{392}$	0	$\frac{\sqrt{2310}i}{784}$	0
		0	0	$-\frac{5\sqrt{770}i}{588}$	0	$-\frac{\sqrt{385}i}{98}$	0	0	0	0	$-\frac{\sqrt{2310}i}{784}$	0	$-\frac{3\sqrt{154}i}{392}$	0	$-\frac{\sqrt{66}i}{112}$
		$\frac{\sqrt{66}i}{112}$	0	$\frac{\sqrt{165}i}{112}$	0	0	0	0	$-\frac{3\sqrt{11}i}{154}$	0	$-\frac{\sqrt{55}i}{154}$	0	0	0	0
		0	$-\frac{\sqrt{2310}i}{784}$	0	$\frac{3\sqrt{1155}i}{784}$	0	0	$\frac{3\sqrt{11}i}{154}$	0	$-\frac{\sqrt{231}i}{1078}$	0	$-\frac{2\sqrt{385}i}{539}$	0	0	0
		$\frac{3\sqrt{154}i}{392}$	0	$-\frac{3\sqrt{385}i}{784}$	0	$\frac{3\sqrt{770}i}{784}$	0	0	$\frac{\sqrt{231}i}{1078}$	0	$\frac{\sqrt{1155}i}{1078}$	0	$-\frac{5\sqrt{77}i}{539}$	0	0
		0	$\frac{\sqrt{462}i}{392}$	0	$-\frac{\sqrt{231}i}{784}$	0	$\frac{\sqrt{2310}i}{784}$	$\frac{\sqrt{55}i}{154}$	0	$-\frac{\sqrt{1155}i}{1078}$	0	$\frac{3\sqrt{77}i}{539}$	0	$-\frac{2\sqrt{385}i}{539}$	0
		$\frac{\sqrt{2310}i}{784}$	0	$-\frac{\sqrt{231}i}{784}$	0	$\frac{\sqrt{462}i}{392}$	0	0	$\frac{2\sqrt{385}i}{539}$	0	$-\frac{3\sqrt{77}i}{539}$	0	$\frac{\sqrt{1155}i}{1078}$	0	$-\frac{\sqrt{55}i}{154}$
		0	$\frac{3\sqrt{770}i}{784}$	0	$-\frac{3\sqrt{385}i}{784}$	0	$\frac{3\sqrt{154}i}{392}$	0	0	$\frac{5\sqrt{77}i}{539}$	0	$-\frac{\sqrt{1155}i}{1078}$	0	$-\frac{\sqrt{231}i}{1078}$	0
		0	0	$\frac{3\sqrt{1155}i}{784}$	0	$-\frac{\sqrt{2310}i}{784}$	0	0	0	0	$\frac{2\sqrt{385}i}{539}$	0	$\frac{\sqrt{231}i}{1078}$	0	$-\frac{3\sqrt{11}i}{154}$
		0	0	0	$\frac{\sqrt{165}i}{112}$	0	$\frac{\sqrt{66}i}{112}$	0	0	0	0	$\frac{\sqrt{55}i}{154}$	0	$\frac{3\sqrt{11}i}{154}$	0

| 1012 | symmetry | $\frac{\sqrt{15}x(y-z)(y+z)}{2}$ |

470

Table 10

No.	multipole	matrix													
	$\mathbb{M}_{3,1}^{(1,1;a)}(E,2)$	0	$\frac{5\sqrt{231}}{294}$	0	$\frac{5\sqrt{462}}{588}$	0	0	$\frac{\sqrt{110}}{112}$	0	$-\frac{\sqrt{2310}}{392}$	0	$-\frac{3\sqrt{154}}{784}$	0	0	0
		$\frac{5\sqrt{231}}{294}$	0	$-\frac{\sqrt{2310}}{588}$	0	$\frac{\sqrt{1155}}{147}$	0	0	$-\frac{5\sqrt{154}}{784}$	0	$-\frac{\sqrt{770}}{392}$	0	$-\frac{3\sqrt{462}}{784}$	0	0
		0	$-\frac{\sqrt{2310}}{588}$	0	$-\frac{\sqrt{1155}}{147}$	0	$\frac{5\sqrt{462}}{588}$	$\frac{3\sqrt{11}}{112}$	0	$-\frac{5\sqrt{231}}{784}$	0	$\frac{\sqrt{385}}{784}$	0	$-\frac{9\sqrt{77}}{784}$	0
		$\frac{5\sqrt{462}}{588}$	0	$-\frac{\sqrt{1155}}{147}$	0	$-\frac{\sqrt{2310}}{588}$	0	0	$\frac{9\sqrt{77}}{784}$	0	$-\frac{\sqrt{385}}{784}$	0	$\frac{5\sqrt{231}}{784}$	0	$-\frac{3\sqrt{11}}{112}$
		0	$\frac{\sqrt{1155}}{147}$	0	$-\frac{\sqrt{2310}}{588}$	0	$\frac{5\sqrt{231}}{294}$	0	0	$\frac{3\sqrt{462}}{784}$	0	$\frac{\sqrt{770}}{392}$	0	$\frac{5\sqrt{154}}{784}$	0
		0	0	$\frac{5\sqrt{462}}{588}$	0	$\frac{5\sqrt{231}}{294}$	0	0	0	0	$\frac{3\sqrt{154}}{784}$	0	$\frac{\sqrt{2310}}{392}$	0	$-\frac{\sqrt{110}}{112}$
		$\frac{\sqrt{110}}{112}$	0	$\frac{3\sqrt{11}}{112}$	0	0	0	0	$-\frac{\sqrt{165}}{154}$	0	$-\frac{\sqrt{33}}{154}$	0	0	0	0
		0	$-\frac{5\sqrt{154}}{784}$	0	$\frac{9\sqrt{77}}{784}$	0	0	$-\frac{\sqrt{165}}{154}$	0	$-\frac{\sqrt{385}}{1078}$	0	$-\frac{2\sqrt{231}}{539}$	0	0	0
		$-\frac{\sqrt{2310}}{392}$	0	$-\frac{5\sqrt{231}}{784}$	0	$\frac{3\sqrt{462}}{784}$	0	0	$-\frac{\sqrt{385}}{1078}$	0	$\frac{5\sqrt{77}}{1078}$	0	$-\frac{\sqrt{1155}}{539}$	0	0
		0	$-\frac{\sqrt{770}}{392}$	0	$-\frac{\sqrt{385}}{784}$	0	$\frac{3\sqrt{154}}{784}$	$-\frac{\sqrt{33}}{154}$	0	$\frac{5\sqrt{77}}{1078}$	0	$\frac{\sqrt{1155}}{539}$	0	$-\frac{2\sqrt{231}}{539}$	0
		$-\frac{3\sqrt{154}}{784}$	0	$\frac{\sqrt{385}}{784}$	0	$\frac{\sqrt{770}}{392}$	0	0	$-\frac{2\sqrt{231}}{539}$	0	$\frac{\sqrt{1155}}{539}$	0	$\frac{5\sqrt{77}}{1078}$	0	$-\frac{\sqrt{33}}{154}$
		0	$-\frac{3\sqrt{462}}{784}$	0	$\frac{5\sqrt{231}}{784}$	0	$\frac{\sqrt{2310}}{392}$	0	0	$-\frac{\sqrt{1155}}{539}$	0	$\frac{5\sqrt{77}}{1078}$	0	$-\frac{\sqrt{385}}{1078}$	0
		0	0	$-\frac{9\sqrt{77}}{784}$	0	$\frac{5\sqrt{154}}{784}$	0	0	0	0	$-\frac{2\sqrt{231}}{539}$	0	$-\frac{\sqrt{385}}{1078}$	0	$-\frac{\sqrt{165}}{154}$
		0	0	0	$-\frac{3\sqrt{11}}{112}$	0	$-\frac{\sqrt{110}}{112}$	0	0	0	0	$-\frac{\sqrt{33}}{154}$	0	$-\frac{\sqrt{165}}{154}$	0

| 1013 | symmetry | $-\frac{\sqrt{15}y(x-z)(x+z)}{2}$ |

Table 10

No.	multipole	matrix

$$\mathbb{M}_{3,2}^{(1,1;a)}(E,2)$$

$$
\begin{pmatrix}
0 & \frac{5\sqrt{231}i}{294} & 0 & -\frac{5\sqrt{462}i}{588} & 0 & 0 & -\frac{\sqrt{110}i}{112} & 0 & -\frac{\sqrt{2310}i}{392} & 0 & \frac{3\sqrt{154}i}{784} & 0 & 0 & 0 \\[4pt]
-\frac{5\sqrt{231}i}{294} & 0 & -\frac{\sqrt{2310}i}{588} & 0 & -\frac{\sqrt{1155}i}{147} & 0 & 0 & \frac{5\sqrt{154}i}{784} & 0 & -\frac{\sqrt{770}i}{392} & 0 & \frac{3\sqrt{462}i}{784} & 0 & 0 \\[4pt]
0 & \frac{\sqrt{2310}i}{588} & 0 & -\frac{\sqrt{1155}i}{147} & 0 & -\frac{5\sqrt{462}i}{588} & \frac{3\sqrt{11}i}{112} & 0 & \frac{5\sqrt{231}i}{784} & 0 & \frac{\sqrt{385}i}{784} & 0 & \frac{9\sqrt{77}i}{784} & 0 \\[4pt]
\frac{5\sqrt{462}i}{588} & 0 & \frac{\sqrt{1155}i}{147} & 0 & -\frac{\sqrt{2310}i}{588} & 0 & 0 & \frac{9\sqrt{77}i}{784} & 0 & \frac{\sqrt{385}i}{784} & 0 & \frac{5\sqrt{231}i}{784} & 0 & \frac{3\sqrt{11}i}{112} \\[4pt]
0 & \frac{\sqrt{1155}i}{147} & 0 & \frac{\sqrt{2310}i}{588} & 0 & \frac{5\sqrt{231}i}{294} & 0 & 0 & \frac{3\sqrt{462}i}{784} & 0 & -\frac{\sqrt{770}i}{392} & 0 & \frac{5\sqrt{154}i}{784} & 0 \\[4pt]
0 & 0 & \frac{5\sqrt{462}i}{588} & 0 & -\frac{5\sqrt{231}i}{294} & 0 & 0 & 0 & 0 & \frac{3\sqrt{154}i}{784} & 0 & -\frac{\sqrt{2310}i}{392} & 0 & -\frac{\sqrt{110}i}{112} \\[4pt]
\frac{\sqrt{110}i}{112} & 0 & -\frac{3\sqrt{11}i}{112} & 0 & 0 & 0 & 0 & -\frac{\sqrt{165}i}{154} & 0 & \frac{\sqrt{33}i}{154} & 0 & 0 & 0 & 0 \\[4pt]
0 & -\frac{5\sqrt{154}i}{784} & 0 & -\frac{9\sqrt{77}i}{784} & 0 & 0 & \frac{\sqrt{165}i}{154} & 0 & -\frac{\sqrt{385}i}{1078} & 0 & \frac{2\sqrt{231}i}{539} & 0 & 0 & 0 \\[4pt]
\frac{\sqrt{2310}i}{392} & 0 & -\frac{5\sqrt{231}i}{784} & 0 & -\frac{3\sqrt{462}i}{784} & 0 & 0 & \frac{\sqrt{385}i}{1078} & 0 & \frac{5\sqrt{77}i}{1078} & 0 & \frac{\sqrt{1155}i}{539} & 0 & 0 \\[4pt]
0 & \frac{\sqrt{770}i}{392} & 0 & -\frac{\sqrt{385}i}{784} & 0 & -\frac{3\sqrt{154}i}{784} & -\frac{\sqrt{33}i}{154} & 0 & -\frac{5\sqrt{77}i}{1078} & 0 & \frac{\sqrt{1155}i}{539} & 0 & \frac{2\sqrt{231}i}{539} & 0 \\[4pt]
-\frac{3\sqrt{154}i}{784} & 0 & -\frac{\sqrt{385}i}{784} & 0 & \frac{\sqrt{770}i}{392} & 0 & 0 & -\frac{2\sqrt{231}i}{539} & 0 & -\frac{\sqrt{1155}i}{539} & 0 & \frac{5\sqrt{77}i}{1078} & 0 & \frac{\sqrt{33}i}{154} \\[4pt]
0 & -\frac{3\sqrt{462}i}{784} & 0 & -\frac{5\sqrt{231}i}{784} & 0 & \frac{\sqrt{2310}i}{392} & 0 & 0 & -\frac{\sqrt{1155}i}{539} & 0 & -\frac{5\sqrt{77}i}{1078} & 0 & -\frac{\sqrt{385}i}{1078} & 0 \\[4pt]
0 & 0 & -\frac{9\sqrt{77}i}{784} & 0 & -\frac{5\sqrt{154}i}{784} & 0 & 0 & 0 & 0 & -\frac{2\sqrt{231}i}{539} & 0 & \frac{\sqrt{385}i}{1078} & 0 & -\frac{\sqrt{165}i}{154} \\[4pt]
0 & 0 & 0 & -\frac{3\sqrt{11}i}{112} & 0 & \frac{\sqrt{110}i}{112} & 0 & 0 & 0 & 0 & -\frac{\sqrt{33}i}{154} & 0 & \frac{\sqrt{165}i}{154} & 0
\end{pmatrix}
$$

| 1014 | symmetry | $\frac{3\sqrt{35}\,xyz(x-y)(x+y)}{2}$ |

continued ...

Table 10

No.	multipole	matrix

$$\mathbb{M}_5^{(1,1;a)}(A_1)$$

$$
\begin{pmatrix}
0 & 0 & 0 & 0 & -\frac{3\sqrt{143}i}{77} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{1430}i}{308} & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{143}i}{77} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{858}i}{924} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3003}i}{462} \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3003}i}{462} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
\frac{3\sqrt{143}i}{77} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{858}i}{924} & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & -\frac{3\sqrt{143}i}{77} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{1430}i}{308} & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & -\frac{\sqrt{3003}i}{462} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{1001}i}{2002} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & \frac{\sqrt{858}i}{924} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2145}i}{2002} & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & \frac{\sqrt{1430}i}{308} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2145}i}{2002} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{1001}i}{2002} \\
0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{1001}i}{2002} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
-\frac{\sqrt{1430}i}{308} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2145}i}{2002} & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & -\frac{\sqrt{858}i}{924} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2145}i}{2002} & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & \frac{\sqrt{3003}i}{462} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{1001}i}{2002} & 0 & 0 & 0 & 0 \\
\end{pmatrix}
$$

| 1015 | symmetry | $\dfrac{z\left(15x^4+30x^2y^2-40x^2z^2+15y^4-40y^2z^2+8z^4\right)}{8}$ |

Table 10

No.	multipole	matrix

$\mathbb{M}_5^{(1,1;a)}(A_2,1)$

$$\begin{pmatrix}
\frac{\sqrt{1001}}{539} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{5\sqrt{6006}}{6468} & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & -\frac{5\sqrt{1001}}{539} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{10010}}{2156} & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & \frac{10\sqrt{1001}}{539} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{5\sqrt{3003}}{3234} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & -\frac{10\sqrt{1001}}{539} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{5\sqrt{3003}}{3234} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & \frac{5\sqrt{1001}}{539} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{10010}}{2156} & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{1001}}{539} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{5\sqrt{6006}}{6468} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{1001}}{2002} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
-\frac{5\sqrt{6006}}{6468} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{23\sqrt{1001}}{14014} & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & \frac{3\sqrt{10010}}{2156} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{17\sqrt{1001}}{14014} & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & -\frac{5\sqrt{3003}}{3234} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{15\sqrt{1001}}{14014} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & -\frac{5\sqrt{3003}}{3234} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{15\sqrt{1001}}{14014} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & \frac{3\sqrt{10010}}{2156} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{17\sqrt{1001}}{14014} & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & -\frac{5\sqrt{6006}}{6468} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{23\sqrt{1001}}{14014} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{1001}}{2002}
\end{pmatrix}$$

1016	symmetry	$\dfrac{3\sqrt{35}z(x^2-2xy-y^2)(x^2+2xy-y^2)}{8}$

Table 10

No.	multipole	matrix													
		0	0	0	0	$\frac{3\sqrt{143}}{77}$	0	0	0	0	0	0	$-\frac{\sqrt{1430}}{308}$	0	0
		0	0	0	0	0	$-\frac{3\sqrt{143}}{77}$	0	0	0	0	0	0	$-\frac{\sqrt{858}}{924}$	0
		0	0	0	0	0	0	0	0	0	0	0	0	0	$\frac{\sqrt{3003}}{462}$
		0	0	0	0	0	0	$\frac{\sqrt{3003}}{462}$	0	0	0	0	0	0	0
	$\mathbb{M}_5^{(1,1;a)}(A_2,2)$	$\frac{3\sqrt{143}}{77}$	0	0	0	0	0	0	$-\frac{\sqrt{858}}{924}$	0	0	0	0	0	0
		0	$-\frac{3\sqrt{143}}{77}$	0	0	0	0	0	0	$-\frac{\sqrt{1430}}{308}$	0	0	0	0	0
		0	0	0	$\frac{\sqrt{3003}}{462}$	0	0	0	0	0	0	$-\frac{3\sqrt{1001}}{2002}$	0	0	0
		0	0	0	0	$-\frac{\sqrt{858}}{924}$	0	0	0	0	0	0	$-\frac{\sqrt{2145}}{2002}$	0	0
		0	0	0	0	0	$-\frac{\sqrt{1430}}{308}$	0	0	0	0	0	0	$\frac{\sqrt{2145}}{2002}$	0
		0	0	0	0	0	0	0	0	0	0	0	0	0	$\frac{3\sqrt{1001}}{2002}$
		0	0	0	0	0	0	$-\frac{3\sqrt{1001}}{2002}$	0	0	0	0	0	0	0
		$-\frac{\sqrt{1430}}{308}$	0	0	0	0	0	0	$-\frac{\sqrt{2145}}{2002}$	0	0	0	0	0	0
		0	$-\frac{\sqrt{858}}{924}$	0	0	0	0	0	0	$\frac{\sqrt{2145}}{2002}$	0	0	0	0	0
		0	0	$\frac{\sqrt{3003}}{462}$	0	0	0	0	0	0	$\frac{3\sqrt{1001}}{2002}$	0	0	0	0

| 1017 | symmetry | $\frac{\sqrt{105}xyz\left(x^2+y^2-2z^2\right)}{2}$ |

Table 10

No.	multipole	matrix												

$\mathbb{M}_5^{(1,1;a)}(B_1)$

$$
\begin{pmatrix}
0 & 0 & \frac{\sqrt{858}i}{154} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{5\sqrt{286}i}{924} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & -\frac{\sqrt{4290}i}{154} & 0 & 0 & -\frac{\sqrt{2002}i}{924} & 0 & 0 & 0 & \frac{\sqrt{1430}i}{462} & 0 & 0 & 0 \\
-\frac{\sqrt{858}i}{154} & 0 & 0 & 0 & \frac{\sqrt{4290}i}{154} & 0 & 0 & \frac{2\sqrt{143}i}{231} & 0 & 0 & 0 & \frac{\sqrt{429}i}{462} & 0 & 0 \\
0 & \frac{\sqrt{4290}i}{154} & 0 & 0 & 0 & -\frac{\sqrt{858}i}{154} & 0 & 0 & -\frac{\sqrt{429}i}{462} & 0 & 0 & 0 & -\frac{2\sqrt{143}i}{231} & 0 \\
0 & 0 & -\frac{\sqrt{4290}i}{154} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{1430}i}{462} & 0 & 0 & 0 & \frac{\sqrt{2002}i}{924} \\
0 & 0 & 0 & \frac{\sqrt{858}i}{154} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{5\sqrt{286}i}{924} & 0 & 0 & 0 \\
0 & \frac{\sqrt{2002}i}{924} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5005}i}{2002} & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & -\frac{2\sqrt{143}i}{231} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{429}i}{2002} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & \frac{\sqrt{429}i}{462} & 0 & 0 & \frac{\sqrt{5005}i}{2002} & 0 & 0 & 0 & \frac{2\sqrt{143}i}{1001} & 0 & 0 & 0 \\
\frac{5\sqrt{286}i}{924} & 0 & 0 & 0 & \frac{\sqrt{1430}i}{462} & 0 & 0 & -\frac{3\sqrt{429}i}{2002} & 0 & 0 & 0 & -\frac{2\sqrt{143}i}{1001} & 0 & 0 \\
0 & -\frac{\sqrt{1430}i}{462} & 0 & 0 & 0 & -\frac{5\sqrt{286}i}{924} & 0 & 0 & -\frac{2\sqrt{143}i}{1001} & 0 & 0 & 0 & -\frac{3\sqrt{429}i}{2002} & 0 \\
0 & 0 & -\frac{\sqrt{429}i}{462} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{2\sqrt{143}i}{1001} & 0 & 0 & 0 & \frac{\sqrt{5005}i}{2002} \\
0 & 0 & 0 & \frac{2\sqrt{143}i}{231} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{429}i}{2002} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & -\frac{\sqrt{2002}i}{924} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5005}i}{2002} & 0 & 0 \\
\end{pmatrix}
$$

1018	symmetry	$-\frac{\sqrt{105}z(x-y)(x+y)\left(x^2+y^2-2z^2\right)}{4}$

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Table 10

No.	multipole	matrix

$$\mathbb{M}_5^{(1,1;a)}(B_2)$$

$$\begin{pmatrix}
0 & 0 & \frac{\sqrt{858}}{154} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{5\sqrt{286}}{924} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & -\frac{\sqrt{4290}}{154} & 0 & 0 & \frac{\sqrt{2002}}{924} & 0 & 0 & 0 & \frac{\sqrt{1430}}{462} & 0 & 0 & 0 \\
\frac{\sqrt{858}}{154} & 0 & 0 & 0 & \frac{\sqrt{4290}}{154} & 0 & 0 & -\frac{2\sqrt{143}}{231} & 0 & 0 & 0 & \frac{\sqrt{429}}{462} & 0 & 0 \\
0 & -\frac{\sqrt{4290}}{154} & 0 & 0 & 0 & -\frac{\sqrt{858}}{154} & 0 & 0 & \frac{\sqrt{429}}{462} & 0 & 0 & 0 & -\frac{2\sqrt{143}}{231} & 0 \\
0 & 0 & \frac{\sqrt{4290}}{154} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{1430}}{462} & 0 & 0 & 0 & \frac{\sqrt{2002}}{924} \\
0 & 0 & 0 & -\frac{\sqrt{858}}{154} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{5\sqrt{286}}{924} & 0 & 0 & 0 \\
0 & \frac{\sqrt{2002}}{924} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5005}}{2002} & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & -\frac{2\sqrt{143}}{231} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{429}}{2002} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & \frac{\sqrt{429}}{462} & 0 & 0 & -\frac{\sqrt{5005}}{2002} & 0 & 0 & 0 & \frac{2\sqrt{143}}{1001} & 0 & 0 & 0 \\
-\frac{5\sqrt{286}}{924} & 0 & 0 & 0 & \frac{\sqrt{1430}}{462} & 0 & 0 & \frac{3\sqrt{429}}{2002} & 0 & 0 & 0 & -\frac{2\sqrt{143}}{1001} & 0 & 0 \\
0 & \frac{\sqrt{1430}}{462} & 0 & 0 & 0 & -\frac{5\sqrt{286}}{924} & 0 & 0 & \frac{2\sqrt{143}}{1001} & 0 & 0 & 0 & -\frac{3\sqrt{429}}{2002} & 0 \\
0 & 0 & \frac{\sqrt{429}}{462} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{2\sqrt{143}}{1001} & 0 & 0 & 0 & \frac{\sqrt{5005}}{2002} \\
0 & 0 & 0 & -\frac{2\sqrt{143}}{231} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{429}}{2002} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & \frac{\sqrt{2002}}{924} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{5005}}{2002} & 0 & 0
\end{pmatrix}$$

| 1019 | symmetry | $\dfrac{x\left(8x^4-40x^2y^2-40x^2z^2+15y^4+30y^2z^2+15z^4\right)}{8}$ |

continued ...

Table 10

No.	multipole	matrix													
	$\mathbb{M}_{5,1}^{(1,1;a)}(E,1)$	0	$\frac{3\sqrt{5005}}{4312}$	0	$-\frac{\sqrt{10010}}{616}$	0	$\frac{9\sqrt{1001}}{616}$	$\frac{5\sqrt{858}}{14784}$	0	$-\frac{25\sqrt{2002}}{34496}$	0	$\frac{5\sqrt{30030}}{14784}$	0	$-\frac{5\sqrt{6006}}{4928}$	0
		$\frac{3\sqrt{5005}}{4312}$	0	$-\frac{15\sqrt{2002}}{4312}$	0	$\frac{5\sqrt{1001}}{616}$	0	0	$-\frac{23\sqrt{30030}}{103488}$	0	$\frac{65\sqrt{6006}}{103488}$	0	$-\frac{\sqrt{10010}}{4928}$	0	$-\frac{\sqrt{4290}}{704}$
		0	$-\frac{15\sqrt{2002}}{4312}$	0	$\frac{15\sqrt{1001}}{2156}$	0	$-\frac{\sqrt{10010}}{616}$	$-\frac{\sqrt{2145}}{1056}$	0	$\frac{\sqrt{5005}}{1568}$	0	$-\frac{5\sqrt{3003}}{51744}$	0	$-\frac{\sqrt{15015}}{2464}$	0
		$-\frac{\sqrt{10010}}{616}$	0	$\frac{15\sqrt{1001}}{2156}$	0	$-\frac{15\sqrt{2002}}{4312}$	0	0	$\frac{\sqrt{15015}}{2464}$	0	$\frac{5\sqrt{3003}}{51744}$	0	$-\frac{\sqrt{5005}}{1568}$	0	$\frac{\sqrt{2145}}{1056}$
		0	$\frac{5\sqrt{1001}}{616}$	0	$-\frac{15\sqrt{2002}}{4312}$	0	$\frac{3\sqrt{5005}}{4312}$	$\frac{\sqrt{4290}}{704}$	0	$\frac{\sqrt{10010}}{4928}$	0	$-\frac{65\sqrt{6006}}{103488}$	0	$\frac{23\sqrt{30030}}{103488}$	0
		$\frac{9\sqrt{1001}}{616}$	0	$-\frac{\sqrt{10010}}{616}$	0	$\frac{3\sqrt{5005}}{4312}$	0	0	$\frac{5\sqrt{6006}}{4928}$	0	$-\frac{5\sqrt{30030}}{14784}$	0	$\frac{25\sqrt{2002}}{34496}$	0	$-\frac{5\sqrt{858}}{14784}$
		$\frac{5\sqrt{858}}{14784}$	0	$-\frac{\sqrt{2145}}{1056}$	0	$\frac{\sqrt{4290}}{704}$	0	0	$-\frac{15\sqrt{143}}{16016}$	0	$\frac{\sqrt{715}}{1144}$	0	$-\frac{3\sqrt{429}}{2288}$	0	0
		0	$-\frac{23\sqrt{30030}}{103488}$	0	$\frac{\sqrt{15015}}{2464}$	0	$\frac{5\sqrt{6006}}{4928}$	$-\frac{15\sqrt{143}}{16016}$	0	$\frac{5\sqrt{3003}}{14014}$	0	$-\frac{\sqrt{5005}}{16016}$	0	$-\frac{9\sqrt{1001}}{8008}$	0
		$-\frac{25\sqrt{2002}}{34496}$	0	$\frac{\sqrt{5005}}{1568}$	0	$\frac{\sqrt{10010}}{4928}$	0	0	$\frac{5\sqrt{3003}}{14014}$	0	$-\frac{\sqrt{15015}}{112112}$	0	$-\frac{5\sqrt{1001}}{8008}$	0	$-\frac{3\sqrt{429}}{2288}$
		0	$\frac{65\sqrt{6006}}{103488}$	0	$\frac{5\sqrt{3003}}{51744}$	0	$-\frac{5\sqrt{30030}}{14784}$	$\frac{\sqrt{715}}{1144}$	0	$-\frac{\sqrt{15015}}{112112}$	0	$-\frac{15\sqrt{1001}}{28028}$	0	$-\frac{\sqrt{5005}}{16016}$	0
		$\frac{5\sqrt{30030}}{14784}$	0	$-\frac{5\sqrt{3003}}{51744}$	0	$-\frac{65\sqrt{6006}}{103488}$	0	0	$-\frac{\sqrt{5005}}{16016}$	0	$-\frac{15\sqrt{1001}}{28028}$	0	$-\frac{\sqrt{15015}}{112112}$	0	$\frac{\sqrt{715}}{1144}$
		0	$-\frac{\sqrt{10010}}{4928}$	0	$-\frac{\sqrt{5005}}{1568}$	0	$\frac{25\sqrt{2002}}{34496}$	$-\frac{3\sqrt{429}}{2288}$	0	$-\frac{5\sqrt{1001}}{8008}$	0	$-\frac{\sqrt{15015}}{112112}$	0	$\frac{5\sqrt{3003}}{14014}$	0
		$-\frac{5\sqrt{6006}}{4928}$	0	$-\frac{\sqrt{15015}}{2464}$	0	$\frac{23\sqrt{30030}}{103488}$	0	0	$-\frac{9\sqrt{1001}}{8008}$	0	$-\frac{\sqrt{5005}}{16016}$	0	$\frac{5\sqrt{3003}}{14014}$	0	$-\frac{15\sqrt{143}}{16016}$
		0	$-\frac{\sqrt{4290}}{704}$	0	$\frac{\sqrt{2145}}{1056}$	0	$-\frac{5\sqrt{858}}{14784}$	0	0	$-\frac{3\sqrt{429}}{2288}$	0	$\frac{\sqrt{715}}{1144}$	0	$-\frac{15\sqrt{143}}{16016}$	0
1020	symmetry	$-\frac{y\left(15x^4-40x^2y^2+30x^2z^2+8y^4-40y^2z^2+15z^4\right)}{8}$													

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Table 10

No.	multipole	matrix

$\mathbb{M}_{5,2}^{(1,1;a)}(E,1)$

0	$\frac{3\sqrt{5005}i}{4312}$	0	$\frac{\sqrt{10010}i}{616}$	0	$\frac{9\sqrt{1001}i}{616}$	$-\frac{5\sqrt{858}i}{14784}$	0	$-\frac{25\sqrt{2002}i}{34496}$	0	$-\frac{5\sqrt{30030}i}{14784}$	0	$-\frac{5\sqrt{6006}i}{4928}$	0
$-\frac{3\sqrt{5005}i}{4312}$	0	$-\frac{15\sqrt{2002}i}{4312}$	0	$-\frac{5\sqrt{1001}i}{616}$	0	0	$\frac{23\sqrt{30030}i}{103488}$	0	$\frac{65\sqrt{6006}i}{103488}$	0	$\frac{\sqrt{10010}i}{4928}$	0	$-\frac{\sqrt{4290}i}{704}$
0	$\frac{15\sqrt{2002}i}{4312}$	0	$\frac{15\sqrt{1001}i}{2156}$	0	$\frac{\sqrt{10010}i}{616}$	$-\frac{\sqrt{2145}i}{1056}$	0	$-\frac{\sqrt{5005}i}{1568}$	0	$-\frac{5\sqrt{3003}i}{51744}$	0	$\frac{\sqrt{15015}i}{2464}$	0
$-\frac{\sqrt{10010}i}{616}$	0	$-\frac{15\sqrt{1001}i}{2156}$	0	$-\frac{15\sqrt{2002}i}{4312}$	0	0	$\frac{\sqrt{15015}i}{2464}$	0	$-\frac{5\sqrt{3003}i}{51744}$	0	$-\frac{\sqrt{5005}i}{1568}$	0	$-\frac{\sqrt{2145}i}{1056}$
0	$\frac{5\sqrt{1001}i}{616}$	0	$\frac{15\sqrt{2002}i}{4312}$	0	$\frac{3\sqrt{5005}i}{4312}$	$-\frac{\sqrt{4290}i}{704}$	0	$\frac{\sqrt{10010}i}{4928}$	0	$\frac{65\sqrt{6006}i}{103488}$	0	$\frac{23\sqrt{30030}i}{103488}$	0
$-\frac{9\sqrt{1001}i}{616}$	0	$-\frac{\sqrt{10010}i}{616}$	0	$-\frac{3\sqrt{5005}i}{4312}$	0	0	$-\frac{5\sqrt{6006}i}{4928}$	0	$-\frac{5\sqrt{30030}i}{14784}$	0	$\frac{25\sqrt{2002}i}{34496}$	0	$-\frac{5\sqrt{858}i}{14784}$
$\frac{5\sqrt{858}i}{14784}$	0	$\frac{\sqrt{2145}i}{1056}$	0	$\frac{\sqrt{4290}i}{704}$	0	0	$-\frac{15\sqrt{143}i}{16016}$	0	$-\frac{\sqrt{715}i}{1144}$	0	$-\frac{3\sqrt{429}i}{2288}$	0	0
0	$-\frac{23\sqrt{30030}i}{103488}$	0	$-\frac{\sqrt{15015}i}{2464}$	0	$\frac{5\sqrt{6006}i}{4928}$	$\frac{15\sqrt{143}i}{16016}$	0	$\frac{5\sqrt{3003}i}{14014}$	0	$\frac{\sqrt{5005}i}{16016}$	0	$-\frac{9\sqrt{1001}i}{8008}$	0
$\frac{25\sqrt{2002}i}{34496}$	0	$\frac{\sqrt{5005}i}{1568}$	0	$-\frac{\sqrt{10010}i}{4928}$	0	0	$-\frac{5\sqrt{3003}i}{14014}$	0	$-\frac{\sqrt{15015}i}{112112}$	0	$\frac{5\sqrt{1001}i}{8008}$	0	$-\frac{3\sqrt{429}i}{2288}$
0	$-\frac{65\sqrt{6006}i}{103488}$	0	$\frac{5\sqrt{3003}i}{51744}$	0	$\frac{5\sqrt{30030}i}{14784}$	$\frac{\sqrt{715}i}{1144}$	0	$\frac{\sqrt{15015}i}{112112}$	0	$-\frac{15\sqrt{1001}i}{28028}$	0	$\frac{\sqrt{5005}i}{16016}$	0
$\frac{5\sqrt{30030}i}{14784}$	0	$\frac{5\sqrt{3003}i}{51744}$	0	$-\frac{65\sqrt{6006}i}{103488}$	0	0	$-\frac{\sqrt{5005}i}{16016}$	0	$\frac{15\sqrt{1001}i}{28028}$	0	$-\frac{\sqrt{15015}i}{112112}$	0	$-\frac{\sqrt{715}i}{1144}$
0	$-\frac{\sqrt{10010}i}{4928}$	0	$\frac{\sqrt{5005}i}{1568}$	0	$\frac{25\sqrt{2002}i}{34496}$	$\frac{3\sqrt{429}i}{2288}$	0	$-\frac{5\sqrt{1001}i}{8008}$	0	$\frac{\sqrt{15015}i}{112112}$	0	$\frac{5\sqrt{3003}i}{14014}$	0
$\frac{5\sqrt{6006}i}{4928}$	0	$-\frac{\sqrt{15015}i}{2464}$	0	$-\frac{23\sqrt{30030}i}{103488}$	0	0	$\frac{9\sqrt{1001}i}{8008}$	0	$-\frac{\sqrt{5005}i}{16016}$	0	$-\frac{5\sqrt{3003}i}{14014}$	0	$-\frac{15\sqrt{143}i}{16016}$
0	$\frac{\sqrt{4290}i}{704}$	0	$\frac{\sqrt{2145}i}{1056}$	0	$\frac{5\sqrt{858}i}{14784}$	0	0	$\frac{3\sqrt{429}i}{2288}$	0	$\frac{\sqrt{715}i}{1144}$	0	$\frac{15\sqrt{143}i}{16016}$	0

No.		
1021	symmetry	$\frac{3\sqrt{35}\,x\left(y^2-2yz-z^2\right)\left(y^2+2yz-z^2\right)}{8}$

Table 10

No.	multipole	matrix													
	$\mathbb{M}_{5,1}^{(1,1;a)}(E,2)$	0	$\frac{3\sqrt{143}}{616}$	0	$\frac{9\sqrt{286}}{616}$	0	$\frac{3\sqrt{715}}{616}$	$\frac{\sqrt{30030}}{14784}$	0	$-\frac{5\sqrt{1430}}{4928}$	0	$-\frac{15\sqrt{858}}{4928}$	0	$-\frac{5\sqrt{4290}}{14784}$	0
		$\frac{3\sqrt{143}}{616}$	0	$-\frac{3\sqrt{1430}}{616}$	0	$-\frac{9\sqrt{715}}{616}$	0	0	$-\frac{23\sqrt{858}}{14784}$	0	$\frac{13\sqrt{4290}}{14784}$	0	$\frac{9\sqrt{286}}{4928}$	0	$-\frac{5\sqrt{6006}}{14784}$
		0	$-\frac{3\sqrt{1430}}{616}$	0	$\frac{3\sqrt{715}}{308}$	0	$\frac{9\sqrt{286}}{616}$	$\frac{3\sqrt{3003}}{2464}$	0	$\frac{\sqrt{143}}{224}$	0	$-\frac{\sqrt{2145}}{7392}$	0	$\frac{9\sqrt{429}}{2464}$	0
		$\frac{9\sqrt{286}}{616}$	0	$\frac{3\sqrt{715}}{308}$	0	$-\frac{3\sqrt{1430}}{616}$	0	0	$-\frac{9\sqrt{429}}{2464}$	0	$\frac{\sqrt{2145}}{7392}$	0	$-\frac{\sqrt{143}}{224}$	0	$-\frac{3\sqrt{3003}}{2464}$
		0	$-\frac{9\sqrt{715}}{616}$	0	$-\frac{3\sqrt{1430}}{616}$	0	$\frac{3\sqrt{143}}{616}$	$\frac{5\sqrt{6006}}{14784}$	0	$-\frac{9\sqrt{286}}{4928}$	0	$-\frac{13\sqrt{4290}}{14784}$	0	$\frac{23\sqrt{858}}{14784}$	0
		$\frac{3\sqrt{715}}{616}$	0	$\frac{9\sqrt{286}}{616}$	0	$\frac{3\sqrt{143}}{616}$	0	0	$\frac{5\sqrt{4290}}{14784}$	0	$\frac{15\sqrt{858}}{4928}$	0	$\frac{5\sqrt{1430}}{4928}$	0	$-\frac{\sqrt{30030}}{14784}$
		$\frac{\sqrt{30030}}{14784}$	0	$\frac{3\sqrt{3003}}{2464}$	0	$\frac{5\sqrt{6006}}{14784}$	0	0	$-\frac{3\sqrt{5005}}{16016}$	0	$-\frac{9\sqrt{1001}}{8008}$	0	$-\frac{\sqrt{15015}}{16016}$	0	0
		0	$-\frac{23\sqrt{858}}{14784}$	0	$-\frac{9\sqrt{429}}{2464}$	0	$\frac{5\sqrt{4290}}{14784}$	$-\frac{3\sqrt{5005}}{16016}$	0	$\frac{\sqrt{2145}}{2002}$	0	$\frac{9\sqrt{143}}{16016}$	0	$-\frac{3\sqrt{715}}{8008}$	0
		$-\frac{5\sqrt{1430}}{4928}$	0	$\frac{\sqrt{143}}{224}$	0	$-\frac{9\sqrt{286}}{4928}$	0	0	$\frac{\sqrt{2145}}{2002}$	0	$-\frac{\sqrt{429}}{16016}$	0	$\frac{9\sqrt{715}}{8008}$	0	$-\frac{\sqrt{15015}}{16016}$
		0	$\frac{13\sqrt{4290}}{14784}$	0	$\frac{\sqrt{2145}}{7392}$	0	$\frac{15\sqrt{858}}{4928}$	$-\frac{9\sqrt{1001}}{8008}$	0	$-\frac{\sqrt{429}}{16016}$	0	$-\frac{3\sqrt{715}}{4004}$	0	$\frac{9\sqrt{143}}{16016}$	0
		$-\frac{15\sqrt{858}}{4928}$	0	$-\frac{\sqrt{2145}}{7392}$	0	$-\frac{13\sqrt{4290}}{14784}$	0	0	$\frac{9\sqrt{143}}{16016}$	0	$-\frac{3\sqrt{715}}{4004}$	0	$-\frac{\sqrt{429}}{16016}$	0	$-\frac{9\sqrt{1001}}{8008}$
		0	$\frac{9\sqrt{286}}{4928}$	0	$-\frac{\sqrt{143}}{224}$	0	$\frac{5\sqrt{1430}}{4928}$	$-\frac{\sqrt{15015}}{16016}$	0	$\frac{9\sqrt{715}}{8008}$	0	$-\frac{\sqrt{429}}{16016}$	0	$\frac{\sqrt{2145}}{2002}$	0
		$-\frac{5\sqrt{4290}}{14784}$	0	$\frac{9\sqrt{429}}{2464}$	0	$\frac{23\sqrt{858}}{14784}$	0	0	$-\frac{3\sqrt{715}}{8008}$	0	$\frac{9\sqrt{143}}{16016}$	0	$\frac{\sqrt{2145}}{2002}$	0	$-\frac{3\sqrt{5005}}{16016}$
		0	$-\frac{5\sqrt{6006}}{14784}$	0	$-\frac{3\sqrt{3003}}{2464}$	0	$-\frac{\sqrt{30030}}{14784}$	0	0	$-\frac{\sqrt{15015}}{16016}$	0	$-\frac{9\sqrt{1001}}{8008}$	0	$-\frac{3\sqrt{5005}}{16016}$	0
1022	symmetry	$-\frac{3\sqrt{35}\,y\left(x^2-2xz-z^2\right)\left(x^2+2xz-z^2\right)}{8}$													

continued …

Table 10

No.	multipole	matrix

$$\mathbb{M}_{5,2}^{(1,1;a)}(E,2)$$

$$\begin{pmatrix}
0 & \frac{3\sqrt{143}i}{616} & 0 & -\frac{9\sqrt{286}i}{616} & 0 & \frac{3\sqrt{715}i}{616} & -\frac{\sqrt{30030}i}{14784} & 0 & -\frac{5\sqrt{1430}i}{4928} & 0 & \frac{15\sqrt{858}i}{4928} & 0 & -\frac{5\sqrt{4290}i}{14784} & 0 \\[4pt]
-\frac{3\sqrt{143}i}{616} & 0 & -\frac{3\sqrt{1430}i}{616} & 0 & \frac{9\sqrt{715}i}{616} & 0 & 0 & \frac{23\sqrt{858}i}{14784} & 0 & \frac{13\sqrt{4290}i}{14784} & 0 & -\frac{9\sqrt{286}i}{4928} & 0 & -\frac{5\sqrt{6006}i}{14784} \\[4pt]
0 & \frac{3\sqrt{1430}i}{616} & 0 & \frac{3\sqrt{715}i}{308} & 0 & -\frac{9\sqrt{286}i}{616} & \frac{3\sqrt{3003}i}{2464} & 0 & -\frac{\sqrt{143}i}{224} & 0 & -\frac{\sqrt{2145}i}{7392} & 0 & -\frac{9\sqrt{429}i}{2464} & 0 \\[4pt]
\frac{9\sqrt{286}i}{616} & 0 & -\frac{3\sqrt{715}i}{308} & 0 & -\frac{3\sqrt{1430}i}{616} & 0 & 0 & -\frac{9\sqrt{429}i}{2464} & 0 & -\frac{\sqrt{2145}i}{7392} & 0 & -\frac{\sqrt{143}i}{224} & 0 & \frac{3\sqrt{3003}i}{2464} \\[4pt]
0 & -\frac{9\sqrt{715}i}{616} & 0 & \frac{3\sqrt{1430}i}{616} & 0 & \frac{3\sqrt{143}i}{616} & -\frac{5\sqrt{6006}i}{14784} & 0 & -\frac{9\sqrt{286}i}{4928} & 0 & \frac{13\sqrt{4290}i}{14784} & 0 & \frac{23\sqrt{858}i}{14784} & 0 \\[4pt]
-\frac{3\sqrt{715}i}{616} & 0 & \frac{9\sqrt{286}i}{616} & 0 & -\frac{3\sqrt{143}i}{616} & 0 & 0 & -\frac{5\sqrt{4290}i}{14784} & 0 & \frac{15\sqrt{858}i}{4928} & 0 & -\frac{5\sqrt{1430}i}{4928} & 0 & -\frac{\sqrt{30030}i}{14784} \\[4pt]
\frac{\sqrt{30030}i}{14784} & 0 & -\frac{3\sqrt{3003}i}{2464} & 0 & \frac{5\sqrt{6006}i}{14784} & 0 & 0 & -\frac{3\sqrt{5005}i}{16016} & 0 & \frac{9\sqrt{1001}i}{8008} & 0 & -\frac{\sqrt{15015}i}{16016} & 0 & 0 \\[4pt]
0 & -\frac{23\sqrt{858}i}{14784} & 0 & \frac{9\sqrt{429}i}{2464} & 0 & \frac{5\sqrt{4290}i}{14784} & \frac{3\sqrt{5005}i}{16016} & 0 & \frac{\sqrt{2145}i}{2002} & 0 & -\frac{9\sqrt{143}i}{16016} & 0 & -\frac{3\sqrt{715}i}{8008} & 0 \\[4pt]
\frac{5\sqrt{1430}i}{4928} & 0 & \frac{\sqrt{143}i}{224} & 0 & \frac{9\sqrt{286}i}{4928} & 0 & 0 & -\frac{\sqrt{2145}i}{2002} & 0 & -\frac{\sqrt{429}i}{16016} & 0 & -\frac{9\sqrt{715}i}{8008} & 0 & -\frac{\sqrt{15015}i}{16016} \\[4pt]
0 & -\frac{13\sqrt{4290}i}{14784} & 0 & \frac{\sqrt{2145}i}{7392} & 0 & -\frac{15\sqrt{858}i}{4928} & -\frac{9\sqrt{1001}i}{8008} & 0 & \frac{\sqrt{429}i}{16016} & 0 & -\frac{3\sqrt{715}i}{4004} & 0 & -\frac{9\sqrt{143}i}{16016} & 0 \\[4pt]
-\frac{15\sqrt{858}i}{4928} & 0 & \frac{\sqrt{2145}i}{7392} & 0 & -\frac{13\sqrt{4290}i}{14784} & 0 & 0 & \frac{9\sqrt{143}i}{16016} & 0 & \frac{3\sqrt{715}i}{4004} & 0 & -\frac{\sqrt{429}i}{16016} & 0 & \frac{9\sqrt{1001}i}{8008} \\[4pt]
0 & \frac{9\sqrt{286}i}{4928} & 0 & \frac{\sqrt{143}i}{224} & 0 & \frac{5\sqrt{1430}i}{4928} & \frac{\sqrt{15015}i}{16016} & 0 & \frac{9\sqrt{715}i}{8008} & 0 & \frac{\sqrt{429}i}{16016} & 0 & \frac{\sqrt{2145}i}{2002} & 0 \\[4pt]
\frac{5\sqrt{4290}i}{14784} & 0 & \frac{9\sqrt{429}i}{2464} & 0 & -\frac{23\sqrt{858}i}{14784} & 0 & 0 & \frac{3\sqrt{715}i}{8008} & 0 & \frac{9\sqrt{143}i}{16016} & 0 & -\frac{\sqrt{2145}i}{2002} & 0 & -\frac{3\sqrt{5005}i}{16016} \\[4pt]
0 & \frac{5\sqrt{6006}i}{14784} & 0 & -\frac{3\sqrt{3003}i}{2464} & 0 & \frac{\sqrt{30030}i}{14784} & 0 & 0 & \frac{\sqrt{15015}i}{16016} & 0 & -\frac{9\sqrt{1001}i}{8008} & 0 & \frac{3\sqrt{5005}i}{16016} & 0
\end{pmatrix}$$

| 1023 | symmetry | $\dfrac{\sqrt{105}x(y-z)(y+z)\left(2x^2-y^2-z^2\right)}{4}$ |

Table 10

No.	multipole	matrix												
	$\mathbb{M}_{5,1}^{(1,1;a)}(E,3)$	0	$\frac{\sqrt{429}}{308}$	0	$-\frac{\sqrt{858}}{308}$	0	$-\frac{3\sqrt{2145}}{308}$	$\frac{\sqrt{10010}}{7392}$	0	$-\frac{5\sqrt{4290}}{7392}$	0	$\frac{5\sqrt{286}}{2464}$	0	$\frac{5\sqrt{1430}}{2464}$	0
		$\frac{\sqrt{429}}{308}$	0	$-\frac{\sqrt{4290}}{308}$	0	$\frac{\sqrt{2145}}{308}$	0	0	$-\frac{23\sqrt{286}}{7392}$	0	$\frac{13\sqrt{1430}}{7392}$	0	$-\frac{\sqrt{858}}{2464}$	0	$\frac{5\sqrt{2002}}{2464}$
		0	$-\frac{\sqrt{4290}}{308}$	0	$\frac{\sqrt{2145}}{154}$	0	$-\frac{\sqrt{858}}{308}$	$-\frac{\sqrt{1001}}{1232}$	0	$\frac{\sqrt{429}}{336}$	0	$-\frac{\sqrt{715}}{3696}$	0	$-\frac{3\sqrt{143}}{1232}$	0
		$-\frac{\sqrt{858}}{308}$	0	$\frac{\sqrt{2145}}{154}$	0	$-\frac{\sqrt{4290}}{308}$	0	0	$\frac{3\sqrt{143}}{1232}$	0	$\frac{\sqrt{715}}{3696}$	0	$-\frac{\sqrt{429}}{336}$	0	$\frac{\sqrt{1001}}{1232}$
		0	$\frac{\sqrt{2145}}{308}$	0	$-\frac{\sqrt{4290}}{308}$	0	$\frac{\sqrt{429}}{308}$	$-\frac{5\sqrt{2002}}{2464}$	0	$\frac{\sqrt{858}}{2464}$	0	$-\frac{13\sqrt{1430}}{7392}$	0	$\frac{23\sqrt{286}}{7392}$	0
		$-\frac{3\sqrt{2145}}{308}$	0	$-\frac{\sqrt{858}}{308}$	0	$\frac{\sqrt{429}}{308}$	0	0	$-\frac{5\sqrt{1430}}{2464}$	0	$-\frac{5\sqrt{286}}{2464}$	0	$\frac{5\sqrt{4290}}{7392}$	0	$-\frac{\sqrt{10010}}{7392}$
		$\frac{\sqrt{10010}}{7392}$	0	$-\frac{\sqrt{1001}}{1232}$	0	$-\frac{5\sqrt{2002}}{2464}$	0	0	$-\frac{\sqrt{15015}}{8008}$	0	$\frac{\sqrt{3003}}{4004}$	0	$\frac{3\sqrt{5005}}{8008}$	0	0
		0	$-\frac{23\sqrt{286}}{7392}$	0	$\frac{3\sqrt{143}}{1232}$	0	$-\frac{5\sqrt{1430}}{2464}$	$-\frac{\sqrt{15015}}{8008}$	0	$\frac{\sqrt{715}}{1001}$	0	$-\frac{\sqrt{429}}{8008}$	0	$\frac{3\sqrt{2145}}{4004}$	0
		$-\frac{5\sqrt{4290}}{7392}$	0	$\frac{\sqrt{429}}{336}$	0	$\frac{\sqrt{858}}{2464}$	0	0	$\frac{\sqrt{715}}{1001}$	0	$-\frac{\sqrt{143}}{8008}$	0	$-\frac{\sqrt{2145}}{4004}$	0	$\frac{3\sqrt{5005}}{8008}$
		0	$\frac{13\sqrt{1430}}{7392}$	0	$\frac{\sqrt{715}}{3696}$	0	$-\frac{5\sqrt{286}}{2464}$	$\frac{\sqrt{3003}}{4004}$	0	$-\frac{\sqrt{143}}{8008}$	0	$-\frac{\sqrt{2145}}{2002}$	0	$-\frac{\sqrt{429}}{8008}$	0
		$\frac{5\sqrt{286}}{2464}$	0	$-\frac{\sqrt{715}}{3696}$	0	$-\frac{13\sqrt{1430}}{7392}$	0	0	$-\frac{\sqrt{429}}{8008}$	0	$-\frac{\sqrt{2145}}{2002}$	0	$-\frac{\sqrt{143}}{8008}$	0	$\frac{\sqrt{3003}}{4004}$
		0	$-\frac{\sqrt{858}}{2464}$	0	$-\frac{\sqrt{429}}{336}$	0	$\frac{5\sqrt{4290}}{7392}$	$\frac{3\sqrt{5005}}{8008}$	0	$-\frac{\sqrt{2145}}{4004}$	0	$-\frac{\sqrt{143}}{8008}$	0	$\frac{\sqrt{715}}{1001}$	0
		$\frac{5\sqrt{1430}}{2464}$	0	$-\frac{3\sqrt{143}}{1232}$	0	$\frac{23\sqrt{286}}{7392}$	0	0	$\frac{3\sqrt{2145}}{4004}$	0	$-\frac{\sqrt{429}}{8008}$	0	$\frac{\sqrt{715}}{1001}$	0	$-\frac{\sqrt{15015}}{8008}$
		0	$\frac{5\sqrt{2002}}{2464}$	0	$\frac{\sqrt{1001}}{1232}$	0	$-\frac{\sqrt{10010}}{7392}$	0	0	$\frac{3\sqrt{5005}}{8008}$	0	$\frac{\sqrt{3003}}{4004}$	0	$-\frac{\sqrt{15015}}{8008}$	0

| 1024 | symmetry | $\frac{\sqrt{105}\,y(x-z)(x+z)\left(x^2-2y^2+z^2\right)}{4}$ |

continued …

Table 10

No.	multipole	matrix

$$\mathbb{M}_{5,2}^{(1,1;a)}(E,3) =$$

$$\scriptsize\begin{pmatrix}
0 & \frac{\sqrt{429}i}{308} & 0 & \frac{\sqrt{858}i}{308} & 0 & -\frac{3\sqrt{2145}i}{308} & -\frac{\sqrt{10010}i}{7392} & 0 & -\frac{5\sqrt{4290}i}{7392} & 0 & -\frac{5\sqrt{286}i}{2464} & 0 & \frac{5\sqrt{1430}i}{2464} & 0 \\[4pt]
-\frac{\sqrt{429}i}{308} & 0 & -\frac{\sqrt{4290}i}{308} & 0 & -\frac{\sqrt{2145}i}{308} & 0 & 0 & \frac{23\sqrt{286}i}{7392} & 0 & \frac{13\sqrt{1430}i}{7392} & 0 & \frac{\sqrt{858}i}{2464} & 0 & \frac{5\sqrt{2002}i}{2464} \\[4pt]
0 & \frac{\sqrt{4290}i}{308} & 0 & \frac{\sqrt{2145}i}{154} & 0 & \frac{\sqrt{858}i}{308} & -\frac{\sqrt{1001}i}{1232} & 0 & -\frac{\sqrt{429}i}{336} & 0 & -\frac{\sqrt{715}i}{3696} & 0 & \frac{3\sqrt{143}i}{1232} & 0 \\[4pt]
-\frac{\sqrt{858}i}{308} & 0 & -\frac{\sqrt{2145}i}{154} & 0 & -\frac{\sqrt{4290}i}{308} & 0 & 0 & \frac{3\sqrt{143}i}{1232} & 0 & -\frac{\sqrt{715}i}{3696} & 0 & -\frac{\sqrt{429}i}{336} & 0 & -\frac{\sqrt{1001}i}{1232} \\[4pt]
0 & \frac{\sqrt{2145}i}{308} & 0 & \frac{\sqrt{4290}i}{308} & 0 & \frac{\sqrt{429}i}{308} & \frac{5\sqrt{2002}i}{2464} & 0 & \frac{\sqrt{858}i}{2464} & 0 & \frac{13\sqrt{1430}i}{7392} & 0 & \frac{23\sqrt{286}i}{7392} & 0 \\[4pt]
\frac{3\sqrt{2145}i}{308} & 0 & -\frac{\sqrt{858}i}{308} & 0 & -\frac{\sqrt{429}i}{308} & 0 & 0 & \frac{5\sqrt{1430}i}{2464} & 0 & -\frac{5\sqrt{286}i}{2464} & 0 & -\frac{5\sqrt{4290}i}{7392} & 0 & -\frac{\sqrt{10010}i}{7392} \\[4pt]
\frac{\sqrt{10010}i}{7392} & 0 & \frac{\sqrt{1001}i}{1232} & 0 & -\frac{5\sqrt{2002}i}{2464} & 0 & 0 & -\frac{\sqrt{15015}i}{8008} & 0 & -\frac{\sqrt{3003}i}{4004} & 0 & \frac{3\sqrt{5005}i}{8008} & 0 & 0 \\[4pt]
0 & -\frac{23\sqrt{286}i}{7392} & 0 & -\frac{3\sqrt{143}i}{1232} & 0 & -\frac{5\sqrt{1430}i}{2464} & \frac{\sqrt{15015}i}{8008} & 0 & \frac{\sqrt{715}i}{1001} & 0 & \frac{\sqrt{429}i}{8008} & 0 & \frac{3\sqrt{2145}i}{4004} & 0 \\[4pt]
\frac{5\sqrt{4290}i}{7392} & 0 & \frac{\sqrt{429}i}{336} & 0 & -\frac{\sqrt{858}i}{2464} & 0 & 0 & -\frac{\sqrt{715}i}{1001} & 0 & -\frac{\sqrt{143}i}{8008} & 0 & \frac{\sqrt{2145}i}{4004} & 0 & \frac{3\sqrt{5005}i}{8008} \\[4pt]
0 & -\frac{13\sqrt{1430}i}{7392} & 0 & \frac{\sqrt{715}i}{3696} & 0 & \frac{5\sqrt{286}i}{2464} & \frac{\sqrt{3003}i}{4004} & 0 & \frac{\sqrt{143}i}{8008} & 0 & -\frac{\sqrt{2145}i}{2002} & 0 & \frac{\sqrt{429}i}{8008} & 0 \\[4pt]
\frac{5\sqrt{286}i}{2464} & 0 & \frac{\sqrt{715}i}{3696} & 0 & -\frac{13\sqrt{1430}i}{7392} & 0 & 0 & -\frac{\sqrt{429}i}{8008} & 0 & \frac{\sqrt{2145}i}{2002} & 0 & -\frac{\sqrt{143}i}{8008} & 0 & -\frac{\sqrt{3003}i}{4004} \\[4pt]
0 & -\frac{\sqrt{858}i}{2464} & 0 & \frac{\sqrt{429}i}{336} & 0 & \frac{5\sqrt{4290}i}{7392} & -\frac{3\sqrt{5005}i}{8008} & 0 & -\frac{\sqrt{2145}i}{4004} & 0 & \frac{\sqrt{143}i}{8008} & 0 & \frac{\sqrt{715}i}{1001} & 0 \\[4pt]
-\frac{5\sqrt{1430}i}{2464} & 0 & -\frac{3\sqrt{143}i}{1232} & 0 & -\frac{23\sqrt{286}i}{7392} & 0 & 0 & -\frac{3\sqrt{2145}i}{4004} & 0 & -\frac{\sqrt{429}i}{8008} & 0 & -\frac{\sqrt{715}i}{1001} & 0 & -\frac{\sqrt{15015}i}{8008} \\[4pt]
0 & -\frac{5\sqrt{2002}i}{2464} & 0 & \frac{\sqrt{1001}i}{1232} & 0 & \frac{\sqrt{10010}i}{7392} & 0 & 0 & -\frac{3\sqrt{5005}i}{8008} & 0 & \frac{\sqrt{3003}i}{4004} & 0 & \frac{\sqrt{15015}i}{8008} & 0
\end{pmatrix}$$