

PG No. 29 T_h $m\bar{3}$ [cubic] (jml basis)

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
	$\mathbb{Q}_0^{(a)}(A_g)$	$\begin{bmatrix} \frac{\sqrt{2}}{2} & 0 \\ 0 & \frac{\sqrt{2}}{2} \end{bmatrix}$
2	symmetry	x
	$\mathbb{M}_{1,0}^{(1,-1;a)}(T_g)$	$\begin{bmatrix} 0 & \frac{\sqrt{2}}{2} \\ \frac{\sqrt{2}}{2} & 0 \end{bmatrix}$
3	symmetry	y
	$\mathbb{M}_{1,1}^{(1,-1;a)}(T_g)$	$\begin{bmatrix} 0 & -\frac{\sqrt{2}i}{2} \\ \frac{\sqrt{2}i}{2} & 0 \end{bmatrix}$
4	symmetry	z
	$\mathbb{M}_{1,2}^{(1,-1;a)}(T_g)$	$\begin{bmatrix} \frac{\sqrt{2}}{2} & 0 \\ 0 & -\frac{\sqrt{2}}{2} \end{bmatrix}$

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

continued ...

Table 2

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

continued ...

Table 2

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

continued ...

Table 2

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

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	$-\frac{x^2}{2} - \frac{y^2}{2} + z^2$
	$\mathbb{Q}_{2,0}^{(a)}(E_g)$	$\begin{bmatrix} 0 & -\frac{\sqrt{10}}{10} & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{10} & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{10}}{10} & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{10} & 0 & 0 \end{bmatrix}$
30	symmetry	$\frac{\sqrt{3}(x-y)(x+y)}{2}$
	$\mathbb{Q}_{2,1}^{(a)}(E_g)$	$\begin{bmatrix} 0 & 0 & 0 & -\frac{\sqrt{10}}{10} & \frac{\sqrt{2}}{4} & 0 & 0 & 0 & \frac{\sqrt{10}}{20} & 0 \\ \frac{\sqrt{10}}{10} & 0 & 0 & 0 & 0 & \frac{\sqrt{10}}{20} & 0 & 0 & 0 & \frac{\sqrt{2}}{4} \end{bmatrix}$
31	symmetry	$\sqrt{3}yz$
	$\mathbb{Q}_{2,0}^{(a)}(T_g)$	$\begin{bmatrix} \frac{\sqrt{10}i}{20} & 0 & \frac{\sqrt{30}i}{20} & 0 & 0 & -\frac{\sqrt{10}i}{10} & 0 & -\frac{\sqrt{5}i}{10} & 0 & 0 \\ 0 & -\frac{\sqrt{30}i}{20} & 0 & -\frac{\sqrt{10}i}{20} & 0 & 0 & -\frac{\sqrt{5}i}{10} & 0 & -\frac{\sqrt{10}i}{10} & 0 \end{bmatrix}$
32	symmetry	$\sqrt{3}xz$

continued ...

Table 3

No.	multipole	matrix
	$\mathbb{Q}_{2,1}^{(a)}(T_g)$	$\begin{bmatrix} \frac{\sqrt{10}}{20} & 0 & -\frac{\sqrt{30}}{20} & 0 & 0 & -\frac{\sqrt{10}}{10} & 0 & \frac{\sqrt{5}}{10} & 0 & 0 \\ 0 & -\frac{\sqrt{30}}{20} & 0 & \frac{\sqrt{10}}{20} & 0 & 0 & -\frac{\sqrt{5}}{10} & 0 & \frac{\sqrt{10}}{10} & 0 \end{bmatrix}$
33	symmetry	$\sqrt{3}xy$
	$\mathbb{Q}_{2,2}^{(a)}(T_g)$	$\begin{bmatrix} 0 & 0 & 0 & \frac{\sqrt{10}i}{10} & \frac{\sqrt{2}i}{4} & 0 & 0 & 0 & -\frac{\sqrt{10}i}{20} & 0 \\ \frac{\sqrt{10}i}{10} & 0 & 0 & 0 & 0 & \frac{\sqrt{10}i}{20} & 0 & 0 & 0 & -\frac{\sqrt{2}i}{4} \end{bmatrix}$
34	symmetry	$-\frac{x^2}{2} - \frac{y^2}{2} + z^2$
	$\mathbb{Q}_{2,0}^{(1,0;a)}(E_g)$	$\begin{bmatrix} 0 & \frac{\sqrt{15}}{10} & 0 & 0 & 0 & 0 & \frac{\sqrt{10}}{10} & 0 & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{15}}{10} & 0 & 0 & 0 & 0 & \frac{\sqrt{10}}{10} & 0 & 0 \end{bmatrix}$
35	symmetry	$\frac{\sqrt{3}(x-y)(x+y)}{2}$
	$\mathbb{Q}_{2,1}^{(1,0;a)}(E_g)$	$\begin{bmatrix} 0 & 0 & 0 & \frac{\sqrt{15}}{10} & \frac{\sqrt{3}}{6} & 0 & 0 & 0 & \frac{\sqrt{15}}{30} & 0 \\ -\frac{\sqrt{15}}{10} & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{30} & 0 & 0 & 0 & \frac{\sqrt{3}}{6} \end{bmatrix}$
36	symmetry	$\sqrt{3}yz$
	$\mathbb{Q}_{2,0}^{(1,0;a)}(T_g)$	$\begin{bmatrix} -\frac{\sqrt{15}i}{20} & 0 & -\frac{3\sqrt{5}i}{20} & 0 & 0 & -\frac{\sqrt{15}i}{15} & 0 & -\frac{\sqrt{30}i}{30} & 0 & 0 \\ 0 & \frac{3\sqrt{5}i}{20} & 0 & \frac{\sqrt{15}i}{20} & 0 & 0 & -\frac{\sqrt{30}i}{30} & 0 & -\frac{\sqrt{15}i}{15} & 0 \end{bmatrix}$
37	symmetry	$\sqrt{3}xz$
	$\mathbb{Q}_{2,1}^{(1,0;a)}(T_g)$	$\begin{bmatrix} -\frac{\sqrt{15}}{20} & 0 & \frac{3\sqrt{5}}{20} & 0 & 0 & -\frac{\sqrt{15}}{15} & 0 & \frac{\sqrt{30}}{30} & 0 & 0 \\ 0 & \frac{3\sqrt{5}}{20} & 0 & -\frac{\sqrt{15}}{20} & 0 & 0 & -\frac{\sqrt{30}}{30} & 0 & \frac{\sqrt{15}}{15} & 0 \end{bmatrix}$
38	symmetry	$\sqrt{3}xy$
	$\mathbb{Q}_{2,2}^{(1,0;a)}(T_g)$	$\begin{bmatrix} 0 & 0 & 0 & -\frac{\sqrt{15}i}{10} & \frac{\sqrt{3}i}{6} & 0 & 0 & 0 & -\frac{\sqrt{15}i}{30} & 0 \\ -\frac{\sqrt{15}i}{10} & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{30} & 0 & 0 & 0 & -\frac{\sqrt{3}i}{6} \end{bmatrix}$
39	symmetry	$\sqrt{15}xyz$
	$\mathbb{G}_3^{(1,-1;a)}(A_g)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & -\frac{\sqrt{6}}{12} & 0 & 0 & 0 & \frac{\sqrt{30}}{12} & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{12} & 0 & 0 & 0 & -\frac{\sqrt{6}}{12} \end{bmatrix}$
40	symmetry	$\frac{x(2x^2-3y^2-3z^2)}{2}$
	$\mathbb{G}_{3,0}^{(1,-1;a)}(T_g, 1)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2}i}{8} & 0 & -\frac{i}{4} & 0 & \frac{\sqrt{10}i}{8} \\ 0 & 0 & 0 & 0 & \frac{\sqrt{10}i}{8} & 0 & -\frac{i}{4} & 0 & \frac{\sqrt{2}i}{8} & 0 \end{bmatrix}$
41	symmetry ...	$-\frac{y(3x^2-2y^2+3z^2)}{2}$

continued ...

Table 3

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

continued ...

Table 3

No.	multipole	matrix
	$\mathbb{T}_{2,1}^{(a)}(E_g)$	$\begin{bmatrix} 0 & 0 & 0 & -\frac{\sqrt{10}i}{10} & \frac{\sqrt{2}i}{4} & 0 & 0 & 0 & \frac{\sqrt{10}i}{20} & 0 \\ \frac{\sqrt{10}i}{10} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}i}{20} & 0 & 0 & \frac{\sqrt{2}i}{4} \end{bmatrix}$
51	symmetry	$\sqrt{3}yz$
	$\mathbb{T}_{2,0}^{(a)}(T_g)$	$\begin{bmatrix} -\frac{\sqrt{10}}{20} & 0 & -\frac{\sqrt{30}}{20} & 0 & 0 & \frac{\sqrt{10}}{10} & 0 & \frac{\sqrt{5}}{10} & 0 & 0 \\ 0 & \frac{\sqrt{30}}{20} & 0 & \frac{\sqrt{10}}{20} & 0 & 0 & \frac{\sqrt{5}}{10} & 0 & \frac{\sqrt{10}}{10} & 0 \end{bmatrix}$
52	symmetry	$\sqrt{3}xz$
	$\mathbb{T}_{2,1}^{(a)}(T_g)$	$\begin{bmatrix} \frac{\sqrt{10}i}{20} & 0 & -\frac{\sqrt{30}i}{20} & 0 & 0 & -\frac{\sqrt{10}i}{10} & 0 & \frac{\sqrt{5}i}{10} & 0 & 0 \\ 0 & -\frac{\sqrt{30}i}{20} & 0 & \frac{\sqrt{10}i}{20} & 0 & 0 & -\frac{\sqrt{5}i}{10} & 0 & \frac{\sqrt{10}i}{10} & 0 \end{bmatrix}$
53	symmetry	$\sqrt{3}xy$
	$\mathbb{T}_{2,2}^{(a)}(T_g)$	$\begin{bmatrix} 0 & 0 & 0 & -\frac{\sqrt{10}}{10} & -\frac{\sqrt{2}}{4} & 0 & 0 & 0 & \frac{\sqrt{10}}{20} & 0 \\ -\frac{\sqrt{10}}{10} & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}}{20} & 0 & 0 & 0 & \frac{\sqrt{2}}{4} \end{bmatrix}$
54	symmetry	$-\frac{x^2}{2} - \frac{y^2}{2} + z^2$
	$\mathbb{T}_{2,0}^{(1,0;a)}(E_g)$	$\begin{bmatrix} 0 & -\frac{\sqrt{15}i}{10} & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}i}{10} & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{15}i}{10} & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}i}{10} & 0 & 0 \end{bmatrix}$
55	symmetry	$\frac{\sqrt{3}(x-y)(x+y)}{2}$
	$\mathbb{T}_{2,1}^{(1,0;a)}(E_g)$	$\begin{bmatrix} 0 & 0 & 0 & -\frac{\sqrt{15}i}{10} & -\frac{\sqrt{3}i}{6} & 0 & 0 & 0 & -\frac{\sqrt{15}i}{30} & 0 \\ \frac{\sqrt{15}i}{10} & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{30} & 0 & 0 & 0 & -\frac{\sqrt{3}i}{6} \end{bmatrix}$
56	symmetry	$\sqrt{3}yz$
	$\mathbb{T}_{2,0}^{(1,0;a)}(T_g)$	$\begin{bmatrix} -\frac{\sqrt{15}}{20} & 0 & -\frac{3\sqrt{5}}{20} & 0 & 0 & -\frac{\sqrt{15}}{15} & 0 & -\frac{\sqrt{30}}{30} & 0 & 0 \\ 0 & \frac{3\sqrt{5}}{20} & 0 & \frac{\sqrt{15}}{20} & 0 & 0 & -\frac{\sqrt{30}}{30} & 0 & -\frac{\sqrt{15}}{15} & 0 \end{bmatrix}$
57	symmetry	$\sqrt{3}xz$
	$\mathbb{T}_{2,1}^{(1,0;a)}(T_g)$	$\begin{bmatrix} \frac{\sqrt{15}i}{20} & 0 & -\frac{3\sqrt{5}i}{20} & 0 & 0 & \frac{\sqrt{15}i}{15} & 0 & -\frac{\sqrt{30}i}{30} & 0 & 0 \\ 0 & -\frac{3\sqrt{5}i}{20} & 0 & \frac{\sqrt{15}i}{20} & 0 & 0 & \frac{\sqrt{30}i}{30} & 0 & -\frac{\sqrt{15}i}{15} & 0 \end{bmatrix}$
58	symmetry	$\sqrt{3}xy$
	$\mathbb{T}_{2,2}^{(1,0;a)}(T_g)$	$\begin{bmatrix} 0 & 0 & 0 & -\frac{\sqrt{15}}{10} & \frac{\sqrt{3}}{6} & 0 & 0 & 0 & -\frac{\sqrt{15}}{30} & 0 \\ -\frac{\sqrt{15}}{10} & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{30} & 0 & 0 & 0 & -\frac{\sqrt{3}}{6} \end{bmatrix}$
59	symmetry	$\sqrt{15}xyz$

continued ...

Table 3

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

continued ...

Table 3

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

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	$\sqrt{15}xyz$
	$\mathbb{Q}_3^{(a)}(A_u)$	$\begin{bmatrix} -\frac{\sqrt{14}i}{28} & 0 & 0 & 0 & \frac{\sqrt{70}i}{28} & 0 & 0 & \frac{\sqrt{21}i}{14} & 0 & 0 & 0 & -\frac{\sqrt{7}i}{14} & 0 & 0 \\ 0 & \frac{\sqrt{70}i}{28} & 0 & 0 & 0 & -\frac{\sqrt{14}i}{28} & 0 & 0 & \frac{\sqrt{7}i}{14} & 0 & 0 & 0 & -\frac{\sqrt{21}i}{14} & 0 \end{bmatrix}$
70	symmetry	$\frac{x(2x^2-3y^2-3z^2)}{2}$
	$\mathbb{Q}_{3,0}^{(a)}(T_u, 1)$	$\begin{bmatrix} 0 & -\frac{\sqrt{42}}{56} & 0 & \frac{\sqrt{21}}{28} & 0 & -\frac{\sqrt{210}}{56} & -\frac{\sqrt{5}}{8} & 0 & \frac{\sqrt{105}}{56} & 0 & -\frac{3\sqrt{7}}{56} & 0 & \frac{\sqrt{35}}{56} & 0 \\ -\frac{\sqrt{210}}{56} & 0 & \frac{\sqrt{21}}{28} & 0 & -\frac{\sqrt{42}}{56} & 0 & 0 & -\frac{\sqrt{35}}{56} & 0 & \frac{3\sqrt{7}}{56} & 0 & -\frac{\sqrt{105}}{56} & 0 & \frac{\sqrt{5}}{8} \end{bmatrix}$
71	symmetry	$-\frac{y(3x^2-2y^2+3z^2)}{2}$
	$\mathbb{Q}_{3,1}^{(a)}(T_u, 1)$	$\begin{bmatrix} 0 & -\frac{\sqrt{42}i}{56} & 0 & -\frac{\sqrt{21}i}{28} & 0 & -\frac{\sqrt{210}i}{56} & \frac{\sqrt{5}i}{8} & 0 & \frac{\sqrt{105}i}{56} & 0 & \frac{3\sqrt{7}i}{56} & 0 & \frac{\sqrt{35}i}{56} & 0 \\ \frac{\sqrt{210}i}{56} & 0 & \frac{\sqrt{21}i}{28} & 0 & \frac{\sqrt{42}i}{56} & 0 & 0 & \frac{\sqrt{35}i}{56} & 0 & \frac{3\sqrt{7}i}{56} & 0 & \frac{\sqrt{105}i}{56} & 0 & \frac{\sqrt{5}i}{8} \end{bmatrix}$
72	symmetry	$-\frac{z(3x^2+3y^2-2z^2)}{2}$
	$\mathbb{Q}_{3,2}^{(a)}(T_u, 1)$	$\begin{bmatrix} 0 & 0 & -\frac{\sqrt{21}}{14} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}}{7} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{21}}{14} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}}{7} & 0 & 0 & 0 & 0 \end{bmatrix}$
73	symmetry	$\frac{\sqrt{15}x(y-z)(y+z)}{2}$
	$\mathbb{Q}_{3,0}^{(a)}(T_u, 2)$	$\begin{bmatrix} 0 & -\frac{\sqrt{70}}{56} & 0 & \frac{\sqrt{35}}{28} & 0 & \frac{3\sqrt{14}}{56} & \frac{\sqrt{3}}{8} & 0 & \frac{5\sqrt{7}}{56} & 0 & -\frac{\sqrt{105}}{56} & 0 & -\frac{\sqrt{21}}{56} & 0 \\ \frac{3\sqrt{14}}{56} & 0 & \frac{\sqrt{35}}{28} & 0 & -\frac{\sqrt{70}}{56} & 0 & 0 & \frac{\sqrt{21}}{56} & 0 & \frac{\sqrt{105}}{56} & 0 & -\frac{5\sqrt{7}}{56} & 0 & -\frac{\sqrt{3}}{8} \end{bmatrix}$
74	symmetry	$-\frac{\sqrt{15}y(x-z)(x+z)}{2}$
	$\mathbb{Q}_{3,1}^{(a)}(T_u, 2)$	$\begin{bmatrix} 0 & \frac{\sqrt{70}i}{56} & 0 & \frac{\sqrt{35}i}{28} & 0 & -\frac{3\sqrt{14}i}{56} & \frac{\sqrt{3}i}{8} & 0 & -\frac{5\sqrt{7}i}{56} & 0 & -\frac{\sqrt{105}i}{56} & 0 & \frac{\sqrt{21}i}{56} & 0 \\ \frac{3\sqrt{14}i}{56} & 0 & -\frac{\sqrt{35}i}{28} & 0 & -\frac{\sqrt{70}i}{56} & 0 & 0 & \frac{\sqrt{21}i}{56} & 0 & -\frac{\sqrt{105}i}{56} & 0 & -\frac{5\sqrt{7}i}{56} & 0 & \frac{\sqrt{3}i}{8} \end{bmatrix}$
75	symmetry	$\frac{\sqrt{15}z(x-y)(x+y)}{2}$

continued ...

Table 4

No.	multipole	matrix
	$\mathbb{Q}_{3,2}^{(a)}(T_u, 2)$	$\begin{bmatrix} -\frac{\sqrt{14}}{28} & 0 & 0 & 0 & -\frac{\sqrt{70}}{28} & 0 & 0 & \frac{\sqrt{21}}{14} & 0 & 0 & 0 & \frac{\sqrt{7}}{14} & 0 & 0 \\ 0 & \frac{\sqrt{70}}{28} & 0 & 0 & 0 & \frac{\sqrt{14}}{28} & 0 & 0 & \frac{\sqrt{7}}{14} & 0 & 0 & 0 & \frac{\sqrt{21}}{14} & 0 \end{bmatrix}$
76	symmetry	$\sqrt{15}xyz$
	$\mathbb{Q}_3^{(1,0;a)}(A_u)$	$\begin{bmatrix} \frac{\sqrt{42}i}{42} & 0 & 0 & 0 & -\frac{\sqrt{210}i}{42} & 0 & 0 & \frac{3\sqrt{7}i}{28} & 0 & 0 & 0 & -\frac{\sqrt{21}i}{28} & 0 & 0 \\ 0 & -\frac{\sqrt{210}i}{42} & 0 & 0 & 0 & \frac{\sqrt{42}i}{42} & 0 & 0 & \frac{\sqrt{21}i}{28} & 0 & 0 & 0 & -\frac{3\sqrt{7}i}{28} & 0 \end{bmatrix}$
77	symmetry	$\frac{x(2x^2-3y^2-3z^2)}{2}$
	$\mathbb{Q}_{3,0}^{(1,0;a)}(T_u, 1)$	$\begin{bmatrix} 0 & \frac{\sqrt{14}}{28} & 0 & -\frac{\sqrt{7}}{14} & 0 & \frac{\sqrt{70}}{28} & -\frac{\sqrt{15}}{16} & 0 & \frac{3\sqrt{35}}{112} & 0 & -\frac{3\sqrt{21}}{112} & 0 & \frac{\sqrt{105}}{112} & 0 \\ \frac{\sqrt{70}}{28} & 0 & -\frac{\sqrt{7}}{14} & 0 & \frac{\sqrt{14}}{28} & 0 & 0 & -\frac{\sqrt{105}}{112} & 0 & \frac{3\sqrt{21}}{112} & 0 & -\frac{3\sqrt{35}}{112} & 0 & \frac{\sqrt{15}}{16} \end{bmatrix}$
78	symmetry	$-\frac{y(3x^2-2y^2+3z^2)}{2}$
	$\mathbb{Q}_{3,1}^{(1,0;a)}(T_u, 1)$	$\begin{bmatrix} 0 & \frac{\sqrt{14}i}{28} & 0 & \frac{\sqrt{7}i}{14} & 0 & \frac{\sqrt{70}i}{28} & \frac{\sqrt{15}i}{16} & 0 & \frac{3\sqrt{35}i}{112} & 0 & \frac{3\sqrt{21}i}{112} & 0 & \frac{\sqrt{105}i}{112} & 0 \\ -\frac{\sqrt{70}i}{28} & 0 & -\frac{\sqrt{7}i}{14} & 0 & -\frac{\sqrt{14}i}{28} & 0 & 0 & \frac{\sqrt{105}i}{112} & 0 & \frac{3\sqrt{21}i}{112} & 0 & \frac{3\sqrt{35}i}{112} & 0 & \frac{\sqrt{15}i}{16} \end{bmatrix}$
79	symmetry	$-\frac{z(3x^2+3y^2-2z^2)}{2}$
	$\mathbb{Q}_{3,2}^{(1,0;a)}(T_u, 1)$	$\begin{bmatrix} 0 & 0 & \frac{\sqrt{7}}{7} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{21}}{14} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{7}}{7} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{21}}{14} & 0 & 0 & 0 \end{bmatrix}$
80	symmetry	$\frac{\sqrt{15}x(y-z)(y+z)}{2}$
	$\mathbb{Q}_{3,0}^{(1,0;a)}(T_u, 2)$	$\begin{bmatrix} 0 & \frac{\sqrt{210}}{84} & 0 & -\frac{\sqrt{105}}{42} & 0 & -\frac{\sqrt{42}}{28} & \frac{3}{16} & 0 & \frac{5\sqrt{21}}{112} & 0 & -\frac{3\sqrt{35}}{112} & 0 & -\frac{3\sqrt{7}}{112} & 0 \\ -\frac{\sqrt{42}}{28} & 0 & -\frac{\sqrt{105}}{42} & 0 & \frac{\sqrt{210}}{84} & 0 & 0 & \frac{3\sqrt{7}}{112} & 0 & \frac{3\sqrt{35}}{112} & 0 & -\frac{5\sqrt{21}}{112} & 0 & -\frac{3}{16} \end{bmatrix}$
81	symmetry	$-\frac{\sqrt{15}y(x-z)(x+z)}{2}$
	$\mathbb{Q}_{3,1}^{(1,0;a)}(T_u, 2)$	$\begin{bmatrix} 0 & -\frac{\sqrt{210}i}{84} & 0 & -\frac{\sqrt{105}i}{42} & 0 & \frac{\sqrt{42}i}{28} & \frac{3i}{16} & 0 & -\frac{5\sqrt{21}i}{112} & 0 & -\frac{3\sqrt{35}i}{112} & 0 & \frac{3\sqrt{7}i}{112} & 0 \\ -\frac{\sqrt{42}i}{28} & 0 & \frac{\sqrt{105}i}{42} & 0 & \frac{\sqrt{210}i}{84} & 0 & 0 & \frac{3\sqrt{7}i}{112} & 0 & -\frac{3\sqrt{35}i}{112} & 0 & -\frac{5\sqrt{21}i}{112} & 0 & \frac{3i}{16} \end{bmatrix}$
82	symmetry	$\frac{\sqrt{15}z(x-y)(x+y)}{2}$
	$\mathbb{Q}_{3,2}^{(1,0;a)}(T_u, 2)$	$\begin{bmatrix} \frac{\sqrt{42}}{42} & 0 & 0 & 0 & \frac{\sqrt{210}}{42} & 0 & 0 & \frac{3\sqrt{7}}{28} & 0 & 0 & 0 & \frac{\sqrt{21}}{28} & 0 & 0 \\ 0 & -\frac{\sqrt{210}}{42} & 0 & 0 & 0 & -\frac{\sqrt{42}}{42} & 0 & 0 & \frac{\sqrt{21}}{28} & 0 & 0 & 0 & \frac{3\sqrt{7}}{28} & 0 \end{bmatrix}$
83	symmetry	$\frac{\sqrt{21}(x^4-3x^2y^2-3x^2z^2+y^4-3y^2z^2+z^4)}{6}$
	$\mathbb{G}_4^{(1,-1;a)}(A_u)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{21}i}{12} & 0 & 0 & 0 & \frac{\sqrt{15}i}{12} \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{12} & 0 & 0 & 0 & -\frac{\sqrt{21}i}{12} & 0 & 0 & 0 \end{bmatrix}$
84	symmetry	$-\frac{\sqrt{15}(x^4-12x^2y^2+6x^2z^2+y^4+6y^2z^2-2z^4)}{12}$

continued ...

Table 4

No.	multipole	matrix
	$\mathbb{G}_{4,0}^{(1,-1;a)}(E_u)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{12} & 0 & 0 & 0 & -\frac{\sqrt{21}i}{12} \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{21}i}{12} & 0 & 0 & 0 & -\frac{\sqrt{15}i}{12} & 0 & 0 \end{bmatrix}$
85	symmetry	$\frac{\sqrt{5}(x-y)(x+y)(x^2+y^2-6z^2)}{4}$
	$\mathbb{G}_{4,1}^{(1,-1;a)}(E_u)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{i}{4} & 0 & 0 & 0 & -\frac{\sqrt{3}i}{4} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{4} & 0 & 0 & 0 & \frac{i}{4} & 0 \end{bmatrix}$
86	symmetry	$\frac{\sqrt{35}yz(y-z)(y+z)}{2}$
	$\mathbb{G}_{4,0}^{(1,-1;a)}(T_u, 1)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & -\frac{1}{16} & 0 & -\frac{\sqrt{21}}{16} & 0 & -\frac{\sqrt{35}}{16} & 0 & -\frac{\sqrt{7}}{16} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}}{16} & 0 & \frac{\sqrt{35}}{16} & 0 & \frac{\sqrt{21}}{16} & 0 & \frac{1}{16} \end{bmatrix}$
87	symmetry	$-\frac{\sqrt{35}xz(x-z)(x+z)}{2}$
	$\mathbb{G}_{4,1}^{(1,-1;a)}(T_u, 1)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & \frac{i}{16} & 0 & -\frac{\sqrt{21}i}{16} & 0 & \frac{\sqrt{35}i}{16} & 0 & -\frac{\sqrt{7}i}{16} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}i}{16} & 0 & \frac{\sqrt{35}i}{16} & 0 & -\frac{\sqrt{21}i}{16} & 0 & \frac{i}{16} \end{bmatrix}$
88	symmetry	$\frac{\sqrt{35}xy(x-y)(x+y)}{2}$
	$\mathbb{G}_{4,2}^{(1,-1;a)}(T_u, 1)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{1}{2} & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
89	symmetry	$\frac{\sqrt{5}yz(6x^2-y^2-z^2)}{2}$
	$\mathbb{G}_{4,0}^{(1,-1;a)}(T_u, 2)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}}{16} & 0 & -\frac{\sqrt{3}}{16} & 0 & -\frac{\sqrt{5}}{16} & 0 & \frac{7}{16} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{7}{16} & 0 & \frac{\sqrt{5}}{16} & 0 & \frac{\sqrt{3}}{16} & 0 & -\frac{\sqrt{7}}{16} \end{bmatrix}$
90	symmetry	$-\frac{\sqrt{5}xz(x^2-6y^2+z^2)}{2}$
	$\mathbb{G}_{4,1}^{(1,-1;a)}(T_u, 2)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}i}{16} & 0 & \frac{\sqrt{3}i}{16} & 0 & -\frac{\sqrt{5}i}{16} & 0 & -\frac{7i}{16} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{7i}{16} & 0 & -\frac{\sqrt{5}i}{16} & 0 & \frac{\sqrt{3}i}{16} & 0 & \frac{\sqrt{7}i}{16} \end{bmatrix}$
91	symmetry	$-\frac{\sqrt{5}xy(x^2+y^2-6z^2)}{2}$
	$\mathbb{G}_{4,2}^{(1,-1;a)}(T_u, 2)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{1}{4} & 0 & 0 & 0 & \frac{\sqrt{3}}{4} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{4} & 0 & 0 & 0 & -\frac{1}{4} & 0 \end{bmatrix}$
92	symmetry	$-\frac{x^2}{2} - \frac{y^2}{2} + z^2$
	$\mathbb{G}_{2,0}^{(1,1;a)}(E_u)$	$\begin{bmatrix} 0 & 0 & -\frac{i}{2} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{i}{2} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
93	symmetry	$\frac{\sqrt{3}(x-y)(x+y)}{2}$

continued ...

Table 4

No.	multipole	matrix
	$\mathbb{G}_{2,1}^{(1,1;a)}(E_u)$	$\begin{bmatrix} -\frac{\sqrt{30}i}{12} & 0 & 0 & 0 & -\frac{\sqrt{6}i}{12} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{6}i}{12} & 0 & 0 & 0 & -\frac{\sqrt{30}i}{12} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
94	symmetry	$\sqrt{3}yz$ $\begin{bmatrix} 0 & -\frac{\sqrt{6}}{6} & 0 & -\frac{\sqrt{3}}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{3}}{6} & 0 & -\frac{\sqrt{6}}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
95	symmetry	$\sqrt{3}xz$ $\begin{bmatrix} 0 & \frac{\sqrt{6}i}{6} & 0 & -\frac{\sqrt{3}i}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{3}i}{6} & 0 & -\frac{\sqrt{6}i}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
96	symmetry	$\sqrt{3}xy$ $\begin{bmatrix} \frac{\sqrt{30}}{12} & 0 & 0 & 0 & -\frac{\sqrt{6}}{12} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{6}}{12} & 0 & 0 & 0 & -\frac{\sqrt{30}}{12} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
97	symmetry	$\sqrt{15}xyz$ $\begin{bmatrix} \frac{\sqrt{14}}{28} & 0 & 0 & 0 & -\frac{\sqrt{70}}{28} & 0 & 0 & -\frac{\sqrt{21}}{14} & 0 & 0 & 0 & \frac{\sqrt{7}}{14} & 0 & 0 \\ 0 & -\frac{\sqrt{70}}{28} & 0 & 0 & 0 & \frac{\sqrt{14}}{28} & 0 & 0 & -\frac{\sqrt{7}}{14} & 0 & 0 & 0 & \frac{\sqrt{21}}{14} & 0 \end{bmatrix}$
98	symmetry	$\frac{x(2x^2-3y^2-3z^2)}{2}$ $\begin{bmatrix} 0 & -\frac{\sqrt{42}i}{56} & 0 & \frac{\sqrt{21}i}{28} & 0 & -\frac{\sqrt{210}i}{56} & -\frac{\sqrt{5}i}{8} & 0 & \frac{\sqrt{105}i}{56} & 0 & -\frac{3\sqrt{7}i}{56} & 0 & \frac{\sqrt{35}i}{56} & 0 \\ -\frac{\sqrt{210}i}{56} & 0 & \frac{\sqrt{21}i}{28} & 0 & -\frac{\sqrt{42}i}{56} & 0 & 0 & -\frac{\sqrt{35}i}{56} & 0 & \frac{3\sqrt{7}i}{56} & 0 & -\frac{\sqrt{105}i}{56} & 0 & \frac{\sqrt{5}i}{8} \end{bmatrix}$
99	symmetry	$-\frac{y(3x^2-2y^2+3z^2)}{2}$ $\begin{bmatrix} 0 & \frac{\sqrt{42}}{56} & 0 & \frac{\sqrt{21}}{28} & 0 & \frac{\sqrt{210}}{56} & -\frac{\sqrt{5}}{8} & 0 & -\frac{\sqrt{105}}{56} & 0 & -\frac{3\sqrt{7}}{56} & 0 & -\frac{\sqrt{35}}{56} & 0 \\ -\frac{\sqrt{210}}{56} & 0 & -\frac{\sqrt{21}}{28} & 0 & -\frac{\sqrt{42}}{56} & 0 & 0 & -\frac{\sqrt{35}}{56} & 0 & -\frac{3\sqrt{7}}{56} & 0 & -\frac{\sqrt{105}}{56} & 0 & -\frac{\sqrt{5}}{8} \end{bmatrix}$
100	symmetry	$-\frac{z(3x^2+3y^2-2z^2)}{2}$ $\begin{bmatrix} 0 & 0 & -\frac{\sqrt{21}i}{14} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}i}{7} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{21}i}{14} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}i}{7} & 0 & 0 & 0 & 0 \end{bmatrix}$
101	symmetry	$\frac{\sqrt{15}x(y-z)(y+z)}{2}$ $\begin{bmatrix} 0 & -\frac{\sqrt{70}i}{56} & 0 & \frac{\sqrt{35}i}{28} & 0 & \frac{3\sqrt{14}i}{56} & \frac{\sqrt{3}i}{8} & 0 & \frac{5\sqrt{7}i}{56} & 0 & -\frac{\sqrt{105}i}{56} & 0 & -\frac{\sqrt{21}i}{56} & 0 \\ \frac{3\sqrt{14}i}{56} & 0 & \frac{\sqrt{35}i}{28} & 0 & -\frac{\sqrt{70}i}{56} & 0 & 0 & \frac{\sqrt{21}i}{56} & 0 & \frac{\sqrt{105}i}{56} & 0 & -\frac{5\sqrt{7}i}{56} & 0 & -\frac{\sqrt{3}i}{8} \end{bmatrix}$
102	symmetry	$-\frac{\sqrt{15}y(x-z)(x+z)}{2}$

continued ...

Table 4

No.	multipole	matrix
	$\mathbb{T}_{3,1}^{(a)}(T_u, 2)$	$\begin{bmatrix} 0 & -\frac{\sqrt{70}}{56} & 0 & -\frac{\sqrt{35}}{28} & 0 & \frac{3\sqrt{14}}{56} & -\frac{\sqrt{3}}{8} & 0 & \frac{5\sqrt{7}}{56} & 0 & \frac{\sqrt{105}}{56} & 0 & -\frac{\sqrt{21}}{56} & 0 \\ -\frac{3\sqrt{14}}{56} & 0 & \frac{\sqrt{35}}{28} & 0 & \frac{\sqrt{70}}{56} & 0 & 0 & -\frac{\sqrt{21}}{56} & 0 & \frac{\sqrt{105}}{56} & 0 & \frac{5\sqrt{7}}{56} & 0 & -\frac{\sqrt{3}}{8} \end{bmatrix}$
103	symmetry	$\frac{\sqrt{15}z(x-y)(x+y)}{2}$
	$\mathbb{T}_{3,2}^{(a)}(T_u, 2)$	$\begin{bmatrix} -\frac{\sqrt{14}i}{28} & 0 & 0 & 0 & -\frac{\sqrt{70}i}{28} & 0 & 0 & \frac{\sqrt{21}i}{14} & 0 & 0 & 0 & \frac{\sqrt{7}i}{14} & 0 & 0 \\ 0 & \frac{\sqrt{70}i}{28} & 0 & 0 & 0 & \frac{\sqrt{14}i}{28} & 0 & 0 & \frac{\sqrt{7}i}{14} & 0 & 0 & 0 & \frac{\sqrt{21}i}{14} & 0 \end{bmatrix}$
104	symmetry	$\sqrt{15}xyz$
	$\mathbb{T}_3^{(1,0;a)}(A_u)$	$\begin{bmatrix} \frac{\sqrt{42}}{42} & 0 & 0 & 0 & -\frac{\sqrt{210}}{42} & 0 & 0 & \frac{3\sqrt{7}}{28} & 0 & 0 & 0 & -\frac{\sqrt{21}}{28} & 0 & 0 \\ 0 & -\frac{\sqrt{210}}{42} & 0 & 0 & 0 & \frac{\sqrt{42}}{42} & 0 & 0 & \frac{\sqrt{21}}{28} & 0 & 0 & 0 & -\frac{3\sqrt{7}}{28} & 0 \end{bmatrix}$
105	symmetry	$\frac{x(2x^2-3y^2-3z^2)}{2}$
	$\mathbb{T}_{3,0}^{(1,0;a)}(T_u, 1)$	$\begin{bmatrix} 0 & -\frac{\sqrt{14}i}{28} & 0 & \frac{\sqrt{7}i}{14} & 0 & -\frac{\sqrt{70}i}{28} & \frac{\sqrt{15}i}{16} & 0 & -\frac{3\sqrt{35}i}{112} & 0 & \frac{3\sqrt{21}i}{112} & 0 & -\frac{\sqrt{105}i}{112} & 0 \\ -\frac{\sqrt{70}i}{28} & 0 & \frac{\sqrt{7}i}{14} & 0 & -\frac{\sqrt{14}i}{28} & 0 & 0 & \frac{\sqrt{105}i}{112} & 0 & -\frac{3\sqrt{21}i}{112} & 0 & \frac{3\sqrt{35}i}{112} & 0 & -\frac{\sqrt{15}i}{16} \end{bmatrix}$
106	symmetry	$-\frac{y(3x^2-2y^2+3z^2)}{2}$
	$\mathbb{T}_{3,1}^{(1,0;a)}(T_u, 1)$	$\begin{bmatrix} 0 & \frac{\sqrt{14}}{28} & 0 & \frac{\sqrt{7}}{14} & 0 & \frac{\sqrt{70}}{28} & \frac{\sqrt{15}}{16} & 0 & \frac{3\sqrt{35}}{112} & 0 & \frac{3\sqrt{21}}{112} & 0 & \frac{\sqrt{105}}{112} & 0 \\ -\frac{\sqrt{70}}{28} & 0 & -\frac{\sqrt{7}}{14} & 0 & -\frac{\sqrt{14}}{28} & 0 & 0 & \frac{\sqrt{105}}{112} & 0 & \frac{3\sqrt{21}}{112} & 0 & \frac{3\sqrt{35}}{112} & 0 & \frac{\sqrt{15}}{16} \end{bmatrix}$
107	symmetry	$-\frac{z(3x^2+3y^2-2z^2)}{2}$
	$\mathbb{T}_{3,2}^{(1,0;a)}(T_u, 1)$	$\begin{bmatrix} 0 & 0 & -\frac{\sqrt{7}i}{7} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{21}i}{14} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{7}i}{7} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{21}i}{14} & 0 & 0 & 0 & 0 \end{bmatrix}$
108	symmetry	$\frac{\sqrt{15}x(y-z)(y+z)}{2}$
	$\mathbb{T}_{3,0}^{(1,0;a)}(T_u, 2)$	$\begin{bmatrix} 0 & -\frac{\sqrt{210}i}{84} & 0 & \frac{\sqrt{105}i}{42} & 0 & \frac{\sqrt{42}i}{28} & -\frac{3i}{16} & 0 & -\frac{5\sqrt{21}i}{112} & 0 & \frac{3\sqrt{35}i}{112} & 0 & \frac{3\sqrt{7}i}{112} & 0 \\ \frac{\sqrt{42}i}{28} & 0 & \frac{\sqrt{105}i}{42} & 0 & -\frac{\sqrt{210}i}{84} & 0 & 0 & -\frac{3\sqrt{7}i}{112} & 0 & -\frac{3\sqrt{35}i}{112} & 0 & \frac{5\sqrt{21}i}{112} & 0 & \frac{3i}{16} \end{bmatrix}$
109	symmetry	$-\frac{\sqrt{15}y(x-z)(x+z)}{2}$
	$\mathbb{T}_{3,1}^{(1,0;a)}(T_u, 2)$	$\begin{bmatrix} 0 & -\frac{\sqrt{210}}{84} & 0 & -\frac{\sqrt{105}}{42} & 0 & \frac{\sqrt{42}}{28} & \frac{3}{16} & 0 & -\frac{5\sqrt{21}}{112} & 0 & -\frac{3\sqrt{35}}{112} & 0 & \frac{3\sqrt{7}}{112} & 0 \\ -\frac{\sqrt{42}}{28} & 0 & \frac{\sqrt{105}}{42} & 0 & \frac{\sqrt{210}}{84} & 0 & 0 & \frac{3\sqrt{7}}{112} & 0 & -\frac{3\sqrt{35}}{112} & 0 & -\frac{5\sqrt{21}}{112} & 0 & \frac{3}{16} \end{bmatrix}$
110	symmetry	$\frac{\sqrt{15}z(x-y)(x+y)}{2}$
	$\mathbb{T}_{3,2}^{(1,0;a)}(T_u, 2)$	$\begin{bmatrix} -\frac{\sqrt{42}i}{42} & 0 & 0 & 0 & -\frac{\sqrt{210}i}{42} & 0 & 0 & -\frac{3\sqrt{7}i}{28} & 0 & 0 & 0 & -\frac{\sqrt{21}i}{28} & 0 & 0 \\ 0 & \frac{\sqrt{210}i}{42} & 0 & 0 & 0 & \frac{\sqrt{42}i}{42} & 0 & 0 & -\frac{\sqrt{21}i}{28} & 0 & 0 & 0 & -\frac{3\sqrt{7}i}{28} & 0 \end{bmatrix}$
111	symmetry	$\frac{\sqrt{21}(x^4-3x^2y^2-3x^2z^2+y^4-3y^2z^2+z^4)}{6}$

continued ...

Table 4

No.	multipole	matrix
	$\mathbb{M}_4^{(1,-1;a)}(A_u)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{21}}{12} & 0 & 0 & 0 & \frac{\sqrt{15}}{12} \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{12} & 0 & 0 & 0 & -\frac{\sqrt{21}}{12} & 0 & 0 & 0 \end{bmatrix}$
112	symmetry	$-\frac{\sqrt{15}(x^4-12x^2y^2+6x^2z^2+y^4+6y^2z^2-2z^4)}{12}$
	$\mathbb{M}_{4,0}^{(1,-1;a)}(E_u)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{12} & 0 & 0 & 0 & -\frac{\sqrt{21}}{12} \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{21}}{12} & 0 & 0 & 0 & -\frac{\sqrt{15}}{12} & 0 & 0 & 0 \end{bmatrix}$
113	symmetry	$\frac{\sqrt{5}(x-y)(x+y)(x^2+y^2-6z^2)}{4}$
	$\mathbb{M}_{4,1}^{(1,-1;a)}(E_u)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & -\frac{1}{4} & 0 & 0 & 0 & -\frac{\sqrt{3}}{4} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{4} & 0 & 0 & 0 & \frac{1}{4} & 0 \end{bmatrix}$
114	symmetry	$\frac{\sqrt{35}yz(y-z)(y+z)}{2}$
	$\mathbb{M}_{4,0}^{(1,-1;a)}(T_u, 1)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & \frac{i}{16} & 0 & \frac{\sqrt{21}i}{16} & 0 & \frac{\sqrt{35}i}{16} & 0 & \frac{\sqrt{7}i}{16} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}i}{16} & 0 & -\frac{\sqrt{35}i}{16} & 0 & -\frac{\sqrt{21}i}{16} & 0 & -\frac{i}{16} \end{bmatrix}$
115	symmetry	$-\frac{\sqrt{35}xz(x-z)(x+z)}{2}$
	$\mathbb{M}_{4,1}^{(1,-1;a)}(T_u, 1)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & \frac{1}{16} & 0 & -\frac{\sqrt{21}}{16} & 0 & \frac{\sqrt{35}}{16} & 0 & -\frac{\sqrt{7}}{16} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}}{16} & 0 & \frac{\sqrt{35}}{16} & 0 & -\frac{\sqrt{21}}{16} & 0 & \frac{1}{16} \end{bmatrix}$
116	symmetry	$\frac{\sqrt{35}xy(x-y)(x+y)}{2}$
	$\mathbb{M}_{4,2}^{(1,-1;a)}(T_u, 1)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{i}{2} \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{i}{2} & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
117	symmetry	$\frac{\sqrt{5}yz(6x^2-y^2-z^2)}{2}$
	$\mathbb{M}_{4,0}^{(1,-1;a)}(T_u, 2)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}i}{16} & 0 & \frac{\sqrt{3}i}{16} & 0 & \frac{\sqrt{5}i}{16} & 0 & -\frac{7i}{16} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{7i}{16} & 0 & -\frac{\sqrt{5}i}{16} & 0 & -\frac{\sqrt{3}i}{16} & 0 & \frac{\sqrt{7}i}{16} \end{bmatrix}$
118	symmetry	$-\frac{\sqrt{5}xz(x^2-6y^2+z^2)}{2}$
	$\mathbb{M}_{4,1}^{(1,-1;a)}(T_u, 2)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}}{16} & 0 & \frac{\sqrt{3}}{16} & 0 & -\frac{\sqrt{5}}{16} & 0 & -\frac{7}{16} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{7}{16} & 0 & -\frac{\sqrt{5}}{16} & 0 & \frac{\sqrt{3}}{16} & 0 & \frac{\sqrt{7}}{16} \end{bmatrix}$
119	symmetry	$-\frac{\sqrt{5}xy(x^2+y^2-6z^2)}{2}$
	$\mathbb{M}_{4,2}^{(1,-1;a)}(T_u, 2)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{i}{4} & 0 & 0 & 0 & -\frac{\sqrt{3}i}{4} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{4} & 0 & 0 & 0 & \frac{i}{4} & 0 \end{bmatrix}$
120	symmetry	$-\frac{x^2}{2} - \frac{y^2}{2} + z^2$

continued ...

Table 4

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

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
	$\mathbb{Q}_0^{(a)}(A_g)$	$\begin{bmatrix} \frac{\sqrt{6}}{6} & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{6}}{6} & 0 & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{6}}{6} & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{6}}{6} & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{6} & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{6} \end{bmatrix}$

continued ...

Table 5

No.	multipole	matrix
126	symmetry	$-\frac{x^2}{2} - \frac{y^2}{2} + z^2$ $\begin{bmatrix} 0 & 0 & 0 & -\frac{\sqrt{6}}{6} & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{6} & 0 \\ 0 & 0 & -\frac{\sqrt{3}}{6} & 0 & 0 & 0 \\ -\frac{\sqrt{6}}{6} & 0 & 0 & \frac{\sqrt{3}}{6} & 0 & 0 \\ 0 & \frac{\sqrt{6}}{6} & 0 & 0 & \frac{\sqrt{3}}{6} & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{6} \end{bmatrix}$
127	symmetry	$\frac{\sqrt{3}(x-y)(x+y)}{2}$ $\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}}{6} \\ 0 & 0 & \frac{\sqrt{6}}{6} & 0 & 0 & 0 \\ 0 & \frac{\sqrt{6}}{6} & 0 & 0 & -\frac{\sqrt{3}}{6} & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{6} \\ 0 & 0 & -\frac{\sqrt{3}}{6} & 0 & 0 & 0 \\ -\frac{\sqrt{6}}{6} & 0 & 0 & -\frac{\sqrt{3}}{6} & 0 & 0 \end{bmatrix}$
128	symmetry	$\sqrt{3}yz$ $\begin{bmatrix} 0 & 0 & \frac{\sqrt{6}i}{12} & 0 & \frac{\sqrt{2}i}{4} & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{2}i}{4} & 0 & -\frac{\sqrt{6}i}{12} \\ -\frac{\sqrt{6}i}{12} & 0 & 0 & \frac{\sqrt{3}i}{6} & 0 & 0 \\ 0 & \frac{\sqrt{2}i}{4} & -\frac{\sqrt{3}i}{6} & 0 & 0 & 0 \\ -\frac{\sqrt{2}i}{4} & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{6} \\ 0 & \frac{\sqrt{6}i}{12} & 0 & 0 & \frac{\sqrt{3}i}{6} & 0 \end{bmatrix}$
129	symmetry	$\sqrt{3}xz$ $\begin{bmatrix} 0 & 0 & \frac{\sqrt{6}}{12} & 0 & -\frac{\sqrt{2}}{4} & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{2}}{4} & 0 & \frac{\sqrt{6}}{12} \\ \frac{\sqrt{6}}{12} & 0 & 0 & -\frac{\sqrt{3}}{6} & 0 & 0 \\ 0 & -\frac{\sqrt{2}}{4} & -\frac{\sqrt{3}}{6} & 0 & 0 & 0 \\ -\frac{\sqrt{2}}{4} & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{6} \\ 0 & \frac{\sqrt{6}}{12} & 0 & 0 & \frac{\sqrt{3}}{6} & 0 \end{bmatrix}$
130	symmetry	$\sqrt{3}xy$

continued ...

Table 5

No.	multipole	matrix
		$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}i}{6} \\ 0 & 0 & \frac{\sqrt{6}i}{6} & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{6}i}{6} & 0 & 0 & \frac{\sqrt{3}i}{6} & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{6} \\ 0 & 0 & -\frac{\sqrt{3}i}{6} & 0 & 0 & 0 \\ -\frac{\sqrt{6}i}{6} & 0 & 0 & -\frac{\sqrt{3}i}{6} & 0 & 0 \end{bmatrix}$
131	symmetry	$-\frac{x^2}{2} - \frac{y^2}{2} + z^2$ $\begin{bmatrix} 0 & 0 & 0 & -\frac{\sqrt{3}}{6} & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{6} & 0 \\ 0 & 0 & \frac{\sqrt{6}}{6} & 0 & 0 & 0 \\ -\frac{\sqrt{3}}{6} & 0 & 0 & -\frac{\sqrt{6}}{6} & 0 & 0 \\ 0 & \frac{\sqrt{3}}{6} & 0 & 0 & -\frac{\sqrt{6}}{6} & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{6} \end{bmatrix}$
132	symmetry	$\frac{\sqrt{3}(x-y)(x+y)}{2}$ $\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{6} \\ 0 & 0 & \frac{\sqrt{3}}{6} & 0 & 0 & 0 \\ 0 & \frac{\sqrt{3}}{6} & 0 & 0 & \frac{\sqrt{6}}{6} & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{6} \\ 0 & 0 & \frac{\sqrt{6}}{6} & 0 & 0 & 0 \\ -\frac{\sqrt{3}}{6} & 0 & 0 & \frac{\sqrt{6}}{6} & 0 & 0 \end{bmatrix}$
133	symmetry	$\sqrt{3}yz$ $\begin{bmatrix} 0 & 0 & \frac{\sqrt{3}i}{12} & 0 & \frac{i}{4} & 0 \\ 0 & 0 & 0 & -\frac{i}{4} & 0 & -\frac{\sqrt{3}i}{12} \\ -\frac{\sqrt{3}i}{12} & 0 & 0 & -\frac{\sqrt{6}i}{6} & 0 & 0 \\ 0 & \frac{i}{4} & \frac{\sqrt{6}i}{6} & 0 & 0 & 0 \\ -\frac{i}{4} & 0 & 0 & 0 & 0 & \frac{\sqrt{6}i}{6} \\ 0 & \frac{\sqrt{3}i}{12} & 0 & 0 & -\frac{\sqrt{6}i}{6} & 0 \end{bmatrix}$
134	symmetry	$\sqrt{3}xz$

continued ...

Table 5

No.	multipole	matrix
		$\begin{bmatrix} 0 & 0 & \frac{\sqrt{3}}{12} & 0 & -\frac{1}{4} & 0 \\ 0 & 0 & 0 & -\frac{1}{4} & 0 & \frac{\sqrt{3}}{12} \\ \frac{\sqrt{3}}{12} & 0 & 0 & \frac{\sqrt{6}}{6} & 0 & 0 \\ 0 & -\frac{1}{4} & \frac{\sqrt{6}}{6} & 0 & 0 & 0 \\ -\frac{1}{4} & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}}{6} \\ 0 & \frac{\sqrt{3}}{12} & 0 & 0 & -\frac{\sqrt{6}}{6} & 0 \end{bmatrix}$
135	symmetry	$\sqrt{3}xy$
		$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{6} \\ 0 & 0 & \frac{\sqrt{3}i}{6} & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{3}i}{6} & 0 & 0 & -\frac{\sqrt{6}i}{6} & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{6} \\ 0 & 0 & \frac{\sqrt{6}i}{6} & 0 & 0 & 0 \\ -\frac{\sqrt{3}i}{6} & 0 & 0 & \frac{\sqrt{6}i}{6} & 0 & 0 \end{bmatrix}$
136	symmetry	1
		$\begin{bmatrix} -\frac{\sqrt{3}}{3} & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{3}}{3} & 0 & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{3}}{6} & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{3}}{6} & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{6} & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{6} \end{bmatrix}$
137	symmetry	x
		$\begin{bmatrix} 0 & 0 & \frac{\sqrt{3}i}{4} & 0 & -\frac{i}{4} & 0 \\ 0 & 0 & 0 & \frac{i}{4} & 0 & -\frac{\sqrt{3}i}{4} \\ -\frac{\sqrt{3}i}{4} & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{i}{4} & 0 & 0 & 0 & 0 \\ \frac{i}{4} & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{3}i}{4} & 0 & 0 & 0 & 0 \end{bmatrix}$
138	symmetry	y

continued ...

Table 5

No.	multipole	matrix
		$\begin{bmatrix} 0 & 0 & -\frac{\sqrt{3}}{4} & 0 & -\frac{1}{4} & 0 \\ 0 & 0 & 0 & -\frac{1}{4} & 0 & -\frac{\sqrt{3}}{4} \\ -\frac{\sqrt{3}}{4} & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{1}{4} & 0 & 0 & 0 & 0 \\ -\frac{1}{4} & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{3}}{4} & 0 & 0 & 0 & 0 \end{bmatrix}$
139	symmetry	$\begin{bmatrix} 0 & 0 & 0 & -\frac{i}{2} & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{i}{2} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 \\ \frac{i}{2} & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{i}{2} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
140	symmetry	$\begin{bmatrix} 0 & 0 & 0 & \frac{i}{2} & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{i}{2} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 \\ -\frac{i}{2} & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{i}{2} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
141	symmetry	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & \frac{i}{2} \\ 0 & 0 & -\frac{i}{2} & 0 & 0 & 0 \\ 0 & \frac{i}{2} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 \\ -\frac{i}{2} & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
142	symmetry	$\begin{bmatrix} \frac{\sqrt{3}(x-y)(x+y)}{2} & & & & & \\ & & & & & \\ & & & & & \\ & & & & & \\ & & & & & \\ & & & & & \end{bmatrix}$

continued ...

Table 5

No.	multipole	matrix
		$\begin{bmatrix} 0 & 0 & \frac{1}{4} & 0 & \frac{\sqrt{3}}{4} & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{3}}{4} & 0 & -\frac{1}{4} \\ \frac{1}{4} & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{3}}{4} & 0 & 0 & 0 & 0 \\ \frac{\sqrt{3}}{4} & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{1}{4} & 0 & 0 & 0 & 0 \end{bmatrix}$
143	symmetry	$\sqrt{3}xz$
		$\begin{bmatrix} 0 & 0 & -\frac{i}{4} & 0 & \frac{\sqrt{3}i}{4} & 0 \\ 0 & 0 & 0 & \frac{\sqrt{3}i}{4} & 0 & -\frac{i}{4} \\ \frac{i}{4} & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{3}i}{4} & 0 & 0 & 0 & 0 \\ -\frac{\sqrt{3}i}{4} & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{i}{4} & 0 & 0 & 0 & 0 \end{bmatrix}$
144	symmetry	$\sqrt{3}xy$
		$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & \frac{1}{2} & 0 & 0 & 0 \\ 0 & \frac{1}{2} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 \\ \frac{1}{2} & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
145	symmetry	x
		$\begin{bmatrix} 0 & \frac{1}{3} & -\frac{\sqrt{6}}{12} & 0 & \frac{\sqrt{2}}{12} & 0 \\ \frac{1}{3} & 0 & 0 & -\frac{\sqrt{2}}{12} & 0 & \frac{\sqrt{6}}{12} \\ -\frac{\sqrt{6}}{12} & 0 & 0 & \frac{\sqrt{3}}{6} & 0 & 0 \\ 0 & -\frac{\sqrt{2}}{12} & \frac{\sqrt{3}}{6} & 0 & \frac{1}{3} & 0 \\ \frac{\sqrt{2}}{12} & 0 & 0 & \frac{1}{3} & 0 & \frac{\sqrt{3}}{6} \\ 0 & \frac{\sqrt{6}}{12} & 0 & 0 & \frac{\sqrt{3}}{6} & 0 \end{bmatrix}$
146	symmetry	y

continued ...

Table 5

No.	multipole	matrix
		$\begin{bmatrix} 0 & -\frac{i}{3} & -\frac{\sqrt{6}i}{12} & 0 & -\frac{\sqrt{2}i}{12} & 0 \\ \frac{i}{3} & 0 & 0 & -\frac{\sqrt{2}i}{12} & 0 & -\frac{\sqrt{6}i}{12} \\ \frac{\sqrt{6}i}{12} & 0 & 0 & -\frac{\sqrt{3}i}{6} & 0 & 0 \\ 0 & \frac{\sqrt{2}i}{12} & \frac{\sqrt{3}i}{6} & 0 & -\frac{i}{3} & 0 \\ \frac{\sqrt{2}i}{12} & 0 & 0 & \frac{i}{3} & 0 & -\frac{\sqrt{3}i}{6} \\ 0 & \frac{\sqrt{6}i}{12} & 0 & 0 & \frac{\sqrt{3}i}{6} & 0 \end{bmatrix}$
147	symmetry	$\begin{bmatrix} z \\ \frac{1}{3} & 0 & 0 & \frac{\sqrt{2}}{6} & 0 & 0 \\ 0 & -\frac{1}{3} & 0 & 0 & \frac{\sqrt{2}}{6} & 0 \\ 0 & 0 & \frac{1}{2} & 0 & 0 & 0 \\ \frac{\sqrt{2}}{6} & 0 & 0 & \frac{1}{6} & 0 & 0 \\ 0 & \frac{\sqrt{2}}{6} & 0 & 0 & -\frac{1}{6} & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{1}{2} \end{bmatrix}$
148	symmetry	$\begin{bmatrix} x \\ 0 & -\frac{\sqrt{6}}{18} & \frac{1}{3} & 0 & -\frac{\sqrt{3}}{9} & 0 \\ -\frac{\sqrt{6}}{18} & 0 & 0 & \frac{\sqrt{3}}{9} & 0 & -\frac{1}{3} \\ \frac{1}{3} & 0 & 0 & \frac{\sqrt{2}}{6} & 0 & 0 \\ 0 & \frac{\sqrt{3}}{9} & \frac{\sqrt{2}}{6} & 0 & \frac{\sqrt{6}}{9} & 0 \\ -\frac{\sqrt{3}}{9} & 0 & 0 & \frac{\sqrt{6}}{9} & 0 & \frac{\sqrt{2}}{6} \\ 0 & -\frac{1}{3} & 0 & 0 & \frac{\sqrt{2}}{6} & 0 \end{bmatrix}$
149	symmetry	$\begin{bmatrix} y \\ 0 & \frac{\sqrt{6}i}{18} & \frac{i}{3} & 0 & \frac{\sqrt{3}i}{9} & 0 \\ -\frac{\sqrt{6}i}{18} & 0 & 0 & \frac{\sqrt{3}i}{9} & 0 & \frac{i}{3} \\ -\frac{i}{3} & 0 & 0 & -\frac{\sqrt{2}i}{6} & 0 & 0 \\ 0 & -\frac{\sqrt{3}i}{9} & \frac{\sqrt{2}i}{6} & 0 & -\frac{\sqrt{6}i}{9} & 0 \\ -\frac{\sqrt{3}i}{9} & 0 & 0 & \frac{\sqrt{6}i}{9} & 0 & -\frac{\sqrt{2}i}{6} \\ 0 & -\frac{i}{3} & 0 & 0 & \frac{\sqrt{2}i}{6} & 0 \end{bmatrix}$
150	symmetry	$\begin{bmatrix} z \\ \end{bmatrix}$

continued ...

Table 5

No.	multipole	matrix
		$\begin{bmatrix} -\frac{\sqrt{6}}{18} & 0 & 0 & -\frac{2\sqrt{3}}{9} & 0 & 0 \\ 0 & \frac{\sqrt{6}}{18} & 0 & 0 & -\frac{2\sqrt{3}}{9} & 0 \\ 0 & 0 & \frac{\sqrt{6}}{6} & 0 & 0 & 0 \\ -\frac{2\sqrt{3}}{9} & 0 & 0 & \frac{\sqrt{6}}{18} & 0 & 0 \\ 0 & -\frac{2\sqrt{3}}{9} & 0 & 0 & -\frac{\sqrt{6}}{18} & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}}{6} \end{bmatrix}$
151	symmetry	$\sqrt{15}xyz$ $\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{i}{2} & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{i}{2} \\ 0 & 0 & -\frac{i}{2} & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{i}{2} & 0 & 0 \end{bmatrix}$
152	symmetry	$\frac{x(2x^2-3y^2-3z^2)}{2}$ $\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{15}}{20} & 0 & -\frac{\sqrt{5}}{4} \\ 0 & 0 & \frac{\sqrt{15}}{20} & 0 & -\frac{3\sqrt{5}}{20} & 0 \\ 0 & 0 & 0 & -\frac{3\sqrt{5}}{20} & 0 & \frac{\sqrt{15}}{20} \\ 0 & 0 & -\frac{\sqrt{5}}{4} & 0 & \frac{\sqrt{15}}{20} & 0 \end{bmatrix}$
153	symmetry	$-\frac{y(3x^2-2y^2+3z^2)}{2}$ $\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{15}i}{20} & 0 & -\frac{\sqrt{5}i}{4} \\ 0 & 0 & \frac{\sqrt{15}i}{20} & 0 & \frac{3\sqrt{5}i}{20} & 0 \\ 0 & 0 & 0 & -\frac{3\sqrt{5}i}{20} & 0 & -\frac{\sqrt{15}i}{20} \\ 0 & 0 & \frac{\sqrt{5}i}{4} & 0 & \frac{\sqrt{15}i}{20} & 0 \end{bmatrix}$
154	symmetry	$-\frac{z(3x^2+3y^2-2z^2)}{2}$

continued ...

Table 5

No.	multipole	matrix
		$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{5}}{10} & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{3\sqrt{5}}{10} & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{3\sqrt{5}}{10} & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{5}}{10} \end{bmatrix}$
155	symmetry	$\frac{\sqrt{15}x(y-z)(y+z)}{2}$
		$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{1}{4} & 0 & \frac{\sqrt{3}}{4} \\ 0 & 0 & \frac{1}{4} & 0 & -\frac{\sqrt{3}}{4} & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{3}}{4} & 0 & \frac{1}{4} \\ 0 & 0 & \frac{\sqrt{3}}{4} & 0 & \frac{1}{4} & 0 \end{bmatrix}$
156	symmetry	$-\frac{\sqrt{15}y(x-z)(x+z)}{2}$
		$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{i}{4} & 0 & -\frac{\sqrt{3}i}{4} \\ 0 & 0 & -\frac{i}{4} & 0 & -\frac{\sqrt{3}i}{4} & 0 \\ 0 & 0 & 0 & \frac{\sqrt{3}i}{4} & 0 & \frac{i}{4} \\ 0 & 0 & \frac{\sqrt{3}i}{4} & 0 & -\frac{i}{4} & 0 \end{bmatrix}$
157	symmetry	$\frac{\sqrt{15}z(x-y)(x+y)}{2}$
		$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{1}{2} & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & -\frac{1}{2} & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{1}{2} & 0 & 0 \end{bmatrix}$
158	symmetry	x

continued ...

Table 5

No.	multipole	matrix
		$\begin{bmatrix} 0 & \frac{\sqrt{30}}{9} & \frac{\sqrt{5}}{12} & 0 & -\frac{\sqrt{15}}{36} & 0 \\ \frac{\sqrt{30}}{9} & 0 & 0 & \frac{\sqrt{15}}{36} & 0 & -\frac{\sqrt{5}}{12} \\ \frac{\sqrt{5}}{12} & 0 & 0 & -\frac{\sqrt{10}}{30} & 0 & 0 \\ 0 & \frac{\sqrt{15}}{36} & -\frac{\sqrt{10}}{30} & 0 & -\frac{\sqrt{30}}{45} & 0 \\ -\frac{\sqrt{15}}{36} & 0 & 0 & -\frac{\sqrt{30}}{45} & 0 & -\frac{\sqrt{10}}{30} \\ 0 & -\frac{\sqrt{5}}{12} & 0 & 0 & -\frac{\sqrt{10}}{30} & 0 \end{bmatrix}$
159	symmetry	y $\begin{bmatrix} 0 & -\frac{\sqrt{30}i}{9} & \frac{\sqrt{5}i}{12} & 0 & \frac{\sqrt{15}i}{36} & 0 \\ \frac{\sqrt{30}i}{9} & 0 & 0 & \frac{\sqrt{15}i}{36} & 0 & \frac{\sqrt{5}i}{12} \\ -\frac{\sqrt{5}i}{12} & 0 & 0 & \frac{\sqrt{10}i}{30} & 0 & 0 \\ 0 & -\frac{\sqrt{15}i}{36} & -\frac{\sqrt{10}i}{30} & 0 & \frac{\sqrt{30}i}{45} & 0 \\ -\frac{\sqrt{15}i}{36} & 0 & 0 & -\frac{\sqrt{30}i}{45} & 0 & \frac{\sqrt{10}i}{30} \\ 0 & -\frac{\sqrt{5}i}{12} & 0 & 0 & -\frac{\sqrt{10}i}{30} & 0 \end{bmatrix}$
160	symmetry	z $\begin{bmatrix} \frac{\sqrt{30}}{9} & 0 & 0 & -\frac{\sqrt{15}}{18} & 0 & 0 \\ 0 & -\frac{\sqrt{30}}{9} & 0 & 0 & -\frac{\sqrt{15}}{18} & 0 \\ 0 & 0 & -\frac{\sqrt{30}}{30} & 0 & 0 & 0 \\ -\frac{\sqrt{15}}{18} & 0 & 0 & -\frac{\sqrt{30}}{90} & 0 & 0 \\ 0 & -\frac{\sqrt{15}}{18} & 0 & 0 & \frac{\sqrt{30}}{90} & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{30} \end{bmatrix}$

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	x

continued ...

Table 6

No.	multipole	matrix
	$\mathbb{Q}_{1,0}^{(a)}(T_u)$	$\begin{bmatrix} -\frac{1}{4} & 0 & \frac{\sqrt{3}}{12} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{3}}{12} & 0 & \frac{1}{4} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{2}}{20} & 0 & 0 & -\frac{\sqrt{30}}{20} & 0 & \frac{\sqrt{3}}{20} & 0 & 0 & 0 \\ -\frac{\sqrt{2}}{20} & 0 & -\frac{\sqrt{6}}{30} & 0 & 0 & -\frac{3\sqrt{2}}{20} & 0 & \frac{3}{20} & 0 & 0 \\ 0 & -\frac{\sqrt{6}}{30} & 0 & -\frac{\sqrt{2}}{20} & 0 & 0 & -\frac{3}{20} & 0 & \frac{3\sqrt{2}}{20} & 0 \\ 0 & 0 & -\frac{\sqrt{2}}{20} & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{20} & 0 & \frac{\sqrt{30}}{20} \end{bmatrix}$
162	symmetry	$\begin{bmatrix} -\frac{i}{4} & 0 & -\frac{\sqrt{3}i}{12} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{3}i}{12} & 0 & -\frac{i}{4} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{2}i}{20} & 0 & 0 & -\frac{\sqrt{30}i}{20} & 0 & -\frac{\sqrt{3}i}{20} & 0 & 0 & 0 \\ -\frac{\sqrt{2}i}{20} & 0 & \frac{\sqrt{6}i}{30} & 0 & 0 & -\frac{3\sqrt{2}i}{20} & 0 & -\frac{3i}{20} & 0 & 0 \\ 0 & -\frac{\sqrt{6}i}{30} & 0 & \frac{\sqrt{2}i}{20} & 0 & 0 & -\frac{3i}{20} & 0 & -\frac{3\sqrt{2}i}{20} & 0 \\ 0 & 0 & -\frac{\sqrt{2}i}{20} & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{20} & 0 & -\frac{\sqrt{30}i}{20} \end{bmatrix}$
163	symmetry	$\begin{bmatrix} 0 & \frac{\sqrt{3}}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{3}}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ -\frac{\sqrt{6}}{20} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{10} & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{6}}{60} & 0 & 0 & 0 & 0 & 0 & \frac{3}{10} & 0 & 0 \\ 0 & 0 & \frac{\sqrt{6}}{60} & 0 & 0 & 0 & 0 & 0 & \frac{3}{10} & 0 \\ 0 & 0 & 0 & \frac{\sqrt{6}}{20} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{10} \end{bmatrix}$
164	symmetry	$\begin{bmatrix} 0 & 0 & 0 & 0 & -\frac{\sqrt{2}i}{12} & 0 & 0 & 0 & \frac{\sqrt{10}i}{12} & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}i}{12} & 0 & 0 & 0 & -\frac{\sqrt{2}i}{12} \\ 0 & 0 & -\frac{\sqrt{5}i}{10} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}i}{30} & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{5}i}{10} & \frac{i}{6} & 0 & 0 & 0 & 0 & \frac{\sqrt{5}i}{30} & 0 \\ \frac{\sqrt{5}i}{10} & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{30} & 0 & 0 & 0 & -\frac{i}{6} & 0 \\ 0 & -\frac{\sqrt{5}i}{10} & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}i}{30} & 0 & 0 & 0 & 0 \end{bmatrix}$
165	symmetry	$\frac{x(2x^2-3y^2-3z^2)}{2}$

continued ...

Table 6

No.	multipole	matrix
		$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}}{24} & 0 & \frac{\sqrt{3}}{12} & 0 & -\frac{\sqrt{30}}{24} \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{30}}{24} & 0 & \frac{\sqrt{3}}{12} & 0 & -\frac{\sqrt{6}}{24} & 0 \\ 0 & -\frac{\sqrt{3}}{20} & 0 & \frac{1}{4} & -\frac{\sqrt{5}}{40} & 0 & \frac{3\sqrt{2}}{40} & 0 & -\frac{1}{8} & 0 \\ -\frac{\sqrt{3}}{20} & 0 & \frac{3}{20} & 0 & 0 & \frac{7\sqrt{3}}{120} & 0 & -\frac{\sqrt{6}}{120} & 0 & -\frac{\sqrt{15}}{24} \\ 0 & \frac{3}{20} & 0 & -\frac{\sqrt{3}}{20} & \frac{\sqrt{15}}{24} & 0 & \frac{\sqrt{6}}{120} & 0 & -\frac{7\sqrt{3}}{120} & 0 \\ \frac{1}{4} & 0 & -\frac{\sqrt{3}}{20} & 0 & 0 & \frac{1}{8} & 0 & -\frac{3\sqrt{2}}{40} & 0 & \frac{\sqrt{5}}{40} \end{bmatrix}$
166	symmetry	$-\frac{y(3x^2-2y^2+3z^2)}{2}$
		$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{24} & 0 & -\frac{\sqrt{3}i}{12} & 0 & -\frac{\sqrt{30}i}{24} \\ 0 & 0 & 0 & 0 & \frac{\sqrt{30}i}{24} & 0 & \frac{\sqrt{3}i}{12} & 0 & \frac{\sqrt{6}i}{24} & 0 \\ 0 & \frac{\sqrt{3}i}{20} & 0 & \frac{i}{4} & -\frac{\sqrt{5}i}{40} & 0 & -\frac{3\sqrt{2}i}{40} & 0 & -\frac{i}{8} & 0 \\ -\frac{\sqrt{3}i}{20} & 0 & -\frac{3i}{20} & 0 & 0 & \frac{7\sqrt{3}i}{120} & 0 & \frac{\sqrt{6}i}{120} & 0 & -\frac{\sqrt{15}i}{24} \\ 0 & \frac{3i}{20} & 0 & \frac{\sqrt{3}i}{20} & -\frac{\sqrt{15}i}{24} & 0 & \frac{\sqrt{6}i}{120} & 0 & \frac{7\sqrt{3}i}{120} & 0 \\ -\frac{i}{4} & 0 & -\frac{\sqrt{3}i}{20} & 0 & 0 & -\frac{i}{8} & 0 & -\frac{3\sqrt{2}i}{40} & 0 & -\frac{\sqrt{5}i}{40} \end{bmatrix}$
167	symmetry	$-\frac{z(3x^2+3y^2-2z^2)}{2}$
		$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{6} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{6} & 0 & 0 \\ \frac{1}{10} & 0 & 0 & 0 & 0 & 0 & -\frac{1}{5} & 0 & 0 & 0 \\ 0 & -\frac{3}{10} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{15} & 0 & 0 \\ 0 & 0 & \frac{3}{10} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{15} & 0 \\ 0 & 0 & 0 & -\frac{1}{10} & 0 & 0 & 0 & 0 & 0 & -\frac{1}{5} \end{bmatrix}$
168	symmetry	$\frac{\sqrt{15}x(y-z)(y+z)}{2}$
		$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}}{24} & 0 & \frac{\sqrt{5}}{12} & 0 & \frac{\sqrt{2}}{8} \\ 0 & 0 & 0 & 0 & \frac{\sqrt{2}}{8} & 0 & \frac{\sqrt{5}}{12} & 0 & -\frac{\sqrt{10}}{24} & 0 \\ 0 & -\frac{\sqrt{5}}{20} & 0 & -\frac{\sqrt{15}}{20} & -\frac{\sqrt{3}}{24} & 0 & \frac{\sqrt{30}}{40} & 0 & \frac{\sqrt{15}}{40} & 0 \\ -\frac{\sqrt{5}}{20} & 0 & \frac{\sqrt{15}}{20} & 0 & 0 & \frac{7\sqrt{5}}{120} & 0 & -\frac{\sqrt{10}}{120} & 0 & \frac{1}{8} \\ 0 & \frac{\sqrt{15}}{20} & 0 & -\frac{\sqrt{5}}{20} & -\frac{1}{8} & 0 & \frac{\sqrt{10}}{120} & 0 & -\frac{7\sqrt{5}}{120} & 0 \\ -\frac{\sqrt{15}}{20} & 0 & -\frac{\sqrt{5}}{20} & 0 & 0 & -\frac{\sqrt{15}}{40} & 0 & -\frac{\sqrt{30}}{40} & 0 & \frac{\sqrt{3}}{24} \end{bmatrix}$
169	symmetry	$-\frac{\sqrt{15}y(x-z)(x+z)}{2}$

continued ...

Table 6

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

continued ...

Table 6

No.	multipole	matrix
		$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & -\frac{i}{12} & 0 & -\frac{\sqrt{2}i}{12} & 0 & -\frac{\sqrt{5}i}{12} \\ 0 & 0 & 0 & 0 & \frac{\sqrt{5}i}{12} & 0 & \frac{\sqrt{2}i}{12} & 0 & \frac{i}{12} & 0 \\ 0 & \frac{\sqrt{2}i}{40} & 0 & \frac{\sqrt{6}i}{24} & \frac{\sqrt{30}i}{60} & 0 & \frac{\sqrt{3}i}{10} & 0 & \frac{\sqrt{6}i}{12} & 0 \\ -\frac{\sqrt{2}i}{40} & 0 & -\frac{\sqrt{6}i}{40} & 0 & 0 & -\frac{7\sqrt{2}i}{60} & 0 & -\frac{i}{30} & 0 & \frac{\sqrt{10}i}{12} \\ 0 & \frac{\sqrt{6}i}{40} & 0 & \frac{\sqrt{2}i}{40} & \frac{\sqrt{10}i}{12} & 0 & -\frac{i}{30} & 0 & -\frac{7\sqrt{2}i}{60} & 0 \\ -\frac{\sqrt{6}i}{24} & 0 & -\frac{\sqrt{2}i}{40} & 0 & 0 & \frac{\sqrt{6}i}{12} & 0 & \frac{\sqrt{3}i}{10} & 0 & \frac{\sqrt{30}i}{60} \end{bmatrix}$
174	symmetry	$-\frac{z(3x^2+3y^2-2z^2)}{2}$
		$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}}{6} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2}}{6} & 0 & 0 \\ \frac{\sqrt{6}}{60} & 0 & 0 & 0 & 0 & 0 & \frac{2\sqrt{6}}{15} & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{6}}{20} & 0 & 0 & 0 & 0 & -\frac{4}{15} & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{6}}{20} & 0 & 0 & 0 & 0 & -\frac{4}{15} & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{6}}{60} & 0 & 0 & 0 & 0 & \frac{2\sqrt{6}}{15} & 0 \end{bmatrix}$
175	symmetry	$\frac{\sqrt{15}x(y-z)(y+z)}{2}$
		$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{36} & 0 & \frac{\sqrt{30}}{36} & 0 & \frac{\sqrt{3}}{12} \\ 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{12} & 0 & \frac{\sqrt{30}}{36} & 0 & -\frac{\sqrt{15}}{36} & 0 \\ 0 & -\frac{\sqrt{30}}{120} & 0 & -\frac{\sqrt{10}}{40} & \frac{\sqrt{2}}{12} & 0 & -\frac{\sqrt{5}}{10} & 0 & -\frac{\sqrt{10}}{20} & 0 \\ -\frac{\sqrt{30}}{120} & 0 & \frac{\sqrt{10}}{40} & 0 & 0 & -\frac{7\sqrt{30}}{180} & 0 & \frac{\sqrt{15}}{90} & 0 & -\frac{\sqrt{6}}{12} \\ 0 & \frac{\sqrt{10}}{40} & 0 & -\frac{\sqrt{30}}{120} & \frac{\sqrt{6}}{12} & 0 & -\frac{\sqrt{15}}{90} & 0 & \frac{7\sqrt{30}}{180} & 0 \\ -\frac{\sqrt{10}}{40} & 0 & -\frac{\sqrt{30}}{120} & 0 & 0 & \frac{\sqrt{10}}{20} & 0 & \frac{\sqrt{5}}{10} & 0 & -\frac{\sqrt{2}}{12} \end{bmatrix}$
176	symmetry	$-\frac{\sqrt{15}y(x-z)(x+z)}{2}$
		$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{36} & 0 & \frac{\sqrt{30}i}{36} & 0 & -\frac{\sqrt{3}i}{12} \\ 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{12} & 0 & -\frac{\sqrt{30}i}{36} & 0 & -\frac{\sqrt{15}i}{36} & 0 \\ 0 & -\frac{\sqrt{30}i}{120} & 0 & \frac{\sqrt{10}i}{40} & -\frac{\sqrt{2}i}{12} & 0 & -\frac{\sqrt{5}i}{10} & 0 & \frac{\sqrt{10}i}{20} & 0 \\ \frac{\sqrt{30}i}{120} & 0 & \frac{\sqrt{10}i}{40} & 0 & 0 & \frac{7\sqrt{30}i}{180} & 0 & \frac{\sqrt{15}i}{90} & 0 & \frac{\sqrt{6}i}{12} \\ 0 & -\frac{\sqrt{10}i}{40} & 0 & -\frac{\sqrt{30}i}{120} & \frac{\sqrt{6}i}{12} & 0 & \frac{\sqrt{15}i}{90} & 0 & \frac{7\sqrt{30}i}{180} & 0 \\ -\frac{\sqrt{10}i}{40} & 0 & \frac{\sqrt{30}i}{120} & 0 & 0 & \frac{\sqrt{10}i}{20} & 0 & -\frac{\sqrt{5}i}{10} & 0 & -\frac{\sqrt{2}i}{12} \end{bmatrix}$
177	symmetry	$\frac{\sqrt{15}z(x-y)(x+y)}{2}$

continued ...

Table 6

No.	multipole	matrix
	$\mathbb{Q}_{3,2}^{(1,-1;a)}(T_u, 2)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{18} & 0 & 0 & 0 & -\frac{\sqrt{15}}{18} & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{18} & 0 & 0 & 0 & \frac{\sqrt{3}}{18} \\ 0 & 0 & \frac{\sqrt{30}}{60} & 0 & 0 & 0 & 0 & 0 & \frac{2\sqrt{5}}{15} & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{30}}{60} & -\frac{\sqrt{6}}{9} & 0 & 0 & 0 & \frac{\sqrt{30}}{45} & 0 \\ \frac{\sqrt{30}}{60} & 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{45} & 0 & 0 & 0 & -\frac{\sqrt{6}}{9} \\ 0 & -\frac{\sqrt{30}}{60} & 0 & 0 & 0 & 0 & \frac{2\sqrt{5}}{15} & 0 & 0 & 0 \end{bmatrix}$
178	symmetry	$\begin{bmatrix} x \\ \frac{\sqrt{2}}{8} & 0 & -\frac{\sqrt{6}}{24} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{6}}{24} & 0 & -\frac{\sqrt{2}}{8} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{1}{5} & 0 & 0 & -\frac{\sqrt{15}}{20} & 0 & \frac{\sqrt{6}}{40} & 0 & 0 & 0 \\ \frac{1}{5} & 0 & \frac{2\sqrt{3}}{15} & 0 & 0 & -\frac{3}{20} & 0 & \frac{3\sqrt{2}}{40} & 0 & 0 \\ 0 & \frac{2\sqrt{3}}{15} & 0 & \frac{1}{5} & 0 & 0 & -\frac{3\sqrt{2}}{40} & 0 & \frac{3}{20} & 0 \\ 0 & 0 & \frac{1}{5} & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}}{40} & 0 & \frac{\sqrt{15}}{20} \end{bmatrix}$
179	symmetry	$\begin{bmatrix} y \\ \frac{\sqrt{2}i}{8} & 0 & \frac{\sqrt{6}i}{24} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{6}i}{24} & 0 & \frac{\sqrt{2}i}{8} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{i}{5} & 0 & 0 & -\frac{\sqrt{15}i}{20} & 0 & -\frac{\sqrt{6}i}{40} & 0 & 0 & 0 \\ \frac{i}{5} & 0 & -\frac{2\sqrt{3}i}{15} & 0 & 0 & -\frac{3i}{20} & 0 & -\frac{3\sqrt{2}i}{40} & 0 & 0 \\ 0 & \frac{2\sqrt{3}i}{15} & 0 & -\frac{i}{5} & 0 & 0 & -\frac{3\sqrt{2}i}{40} & 0 & -\frac{3i}{20} & 0 \\ 0 & 0 & \frac{i}{5} & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{40} & 0 & -\frac{\sqrt{15}i}{20} \end{bmatrix}$
180	symmetry	$\begin{bmatrix} z \\ 0 & -\frac{\sqrt{6}}{12} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{6}}{12} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ \frac{\sqrt{3}}{5} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{10} & 0 & 0 & 0 \\ 0 & \frac{\sqrt{3}}{15} & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{2}}{20} & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{3}}{15} & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{2}}{20} & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{3}}{5} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{10} \end{bmatrix}$
181	symmetry	$\sqrt{15}xyz$

continued ...

Table 6

No.	multipole	matrix
	$\mathbb{Q}_3^{(1,0;a)}(A_u)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{18} & 0 & 0 & 0 & \frac{\sqrt{30}i}{18} & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}i}{18} & 0 & 0 & 0 & -\frac{\sqrt{6}i}{18} \\ 0 & 0 & \frac{\sqrt{15}i}{15} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}i}{60} & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{15}i}{15} & \frac{\sqrt{3}i}{36} & 0 & 0 & 0 & \frac{\sqrt{15}i}{180} & 0 \\ -\frac{\sqrt{15}i}{15} & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{180} & 0 & 0 & 0 & -\frac{\sqrt{3}i}{36} \\ 0 & \frac{\sqrt{15}i}{15} & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}i}{60} & 0 & 0 & 0 \end{bmatrix}$
182	symmetry	$\frac{x(2x^2-3y^2-3z^2)}{2}$ $\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}}{12} & 0 & \frac{1}{6} & 0 & -\frac{\sqrt{10}}{12} \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{10}}{12} & 0 & \frac{1}{6} & 0 & -\frac{\sqrt{2}}{12} & 0 \\ 0 & \frac{1}{10} & 0 & -\frac{\sqrt{3}}{6} & -\frac{\sqrt{15}}{240} & 0 & \frac{\sqrt{6}}{80} & 0 & -\frac{\sqrt{3}}{48} & 0 \\ \frac{1}{10} & 0 & -\frac{\sqrt{3}}{10} & 0 & 0 & \frac{7}{240} & 0 & -\frac{\sqrt{2}}{240} & 0 & -\frac{\sqrt{5}}{48} \\ 0 & -\frac{\sqrt{3}}{10} & 0 & \frac{1}{10} & \frac{\sqrt{5}}{48} & 0 & \frac{\sqrt{2}}{240} & 0 & -\frac{7}{240} & 0 \\ -\frac{\sqrt{3}}{6} & 0 & \frac{1}{10} & 0 & 0 & \frac{\sqrt{3}}{48} & 0 & -\frac{\sqrt{6}}{80} & 0 & \frac{\sqrt{15}}{240} \end{bmatrix}$
183	symmetry	$-\frac{y(3x^2-2y^2+3z^2)}{2}$ $\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}i}{12} & 0 & -\frac{i}{6} & 0 & -\frac{\sqrt{10}i}{12} \\ 0 & 0 & 0 & 0 & \frac{\sqrt{10}i}{12} & 0 & \frac{i}{6} & 0 & \frac{\sqrt{2}i}{12} & 0 \\ 0 & -\frac{i}{10} & 0 & -\frac{\sqrt{3}i}{6} & -\frac{\sqrt{15}i}{240} & 0 & -\frac{\sqrt{6}i}{80} & 0 & -\frac{\sqrt{3}i}{48} & 0 \\ \frac{i}{10} & 0 & \frac{\sqrt{3}i}{10} & 0 & 0 & \frac{7i}{240} & 0 & \frac{\sqrt{2}i}{240} & 0 & -\frac{\sqrt{5}i}{48} \\ 0 & -\frac{\sqrt{3}i}{10} & 0 & -\frac{i}{10} & -\frac{\sqrt{5}i}{48} & 0 & \frac{\sqrt{2}i}{240} & 0 & \frac{7i}{240} & 0 \\ \frac{\sqrt{3}i}{6} & 0 & \frac{i}{10} & 0 & 0 & -\frac{\sqrt{3}i}{48} & 0 & -\frac{\sqrt{6}i}{80} & 0 & -\frac{\sqrt{15}i}{240} \end{bmatrix}$
184	symmetry	$-\frac{z(3x^2+3y^2-2z^2)}{2}$ $\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & -\frac{1}{3} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{1}{3} & 0 & 0 \\ -\frac{\sqrt{3}}{15} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{30} & 0 & 0 & 0 \\ 0 & \frac{\sqrt{3}}{5} & 0 & 0 & 0 & 0 & \frac{\sqrt{2}}{30} & 0 & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{3}}{5} & 0 & 0 & 0 & 0 & \frac{\sqrt{2}}{30} & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{3}}{15} & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{30} & 0 \end{bmatrix}$
185	symmetry	$\frac{\sqrt{15}x(y-z)(y+z)}{2}$

continued ...

Table 6

No.	multipole	matrix
	$\mathbb{Q}_{3,0}^{(1,0;a)}(T_u, 2)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}}{36} & 0 & \frac{\sqrt{15}}{18} & 0 & \frac{\sqrt{6}}{12} \\ 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{12} & 0 & \frac{\sqrt{15}}{18} & 0 & -\frac{\sqrt{30}}{36} & 0 \\ 0 & \frac{\sqrt{15}}{30} & 0 & \frac{\sqrt{5}}{10} & -\frac{1}{48} & 0 & \frac{\sqrt{10}}{80} & 0 & \frac{\sqrt{5}}{80} & 0 \\ \frac{\sqrt{15}}{30} & 0 & -\frac{\sqrt{5}}{10} & 0 & 0 & \frac{7\sqrt{15}}{720} & 0 & -\frac{\sqrt{30}}{720} & 0 & \frac{\sqrt{3}}{48} \\ 0 & -\frac{\sqrt{5}}{10} & 0 & \frac{\sqrt{15}}{30} & -\frac{\sqrt{3}}{48} & 0 & \frac{\sqrt{30}}{720} & 0 & -\frac{7\sqrt{15}}{720} & 0 \\ \frac{\sqrt{5}}{10} & 0 & \frac{\sqrt{15}}{30} & 0 & 0 & -\frac{\sqrt{5}}{80} & 0 & -\frac{\sqrt{10}}{80} & 0 & \frac{1}{48} \end{bmatrix}$
186	symmetry	$-\frac{\sqrt{15}y(x-z)(x+z)}{2}$
	$\mathbb{Q}_{3,1}^{(1,0;a)}(T_u, 2)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}i}{36} & 0 & \frac{\sqrt{15}i}{18} & 0 & -\frac{\sqrt{6}i}{12} \\ 0 & 0 & 0 & 0 & \frac{\sqrt{6}i}{12} & 0 & -\frac{\sqrt{15}i}{18} & 0 & -\frac{\sqrt{30}i}{36} & 0 \\ 0 & \frac{\sqrt{15}i}{30} & 0 & -\frac{\sqrt{5}i}{10} & \frac{i}{48} & 0 & \frac{\sqrt{10}i}{80} & 0 & -\frac{\sqrt{5}i}{80} & 0 \\ -\frac{\sqrt{15}i}{30} & 0 & -\frac{\sqrt{5}i}{10} & 0 & 0 & -\frac{7\sqrt{15}i}{720} & 0 & -\frac{\sqrt{30}i}{720} & 0 & -\frac{\sqrt{3}i}{48} \\ 0 & \frac{\sqrt{5}i}{10} & 0 & \frac{\sqrt{15}i}{30} & -\frac{\sqrt{3}i}{48} & 0 & -\frac{\sqrt{30}i}{720} & 0 & -\frac{7\sqrt{15}i}{720} & 0 \\ \frac{\sqrt{5}i}{10} & 0 & -\frac{\sqrt{15}i}{30} & 0 & 0 & -\frac{\sqrt{5}i}{80} & 0 & \frac{\sqrt{10}i}{80} & 0 & \frac{i}{48} \end{bmatrix}$
187	symmetry	$\frac{\sqrt{15}z(x-y)(x+y)}{2}$
	$\mathbb{Q}_{3,2}^{(1,0;a)}(T_u, 2)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & -\frac{\sqrt{6}}{18} & 0 & 0 & 0 & -\frac{\sqrt{30}}{18} & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{18} & 0 & 0 & 0 & \frac{\sqrt{6}}{18} \\ 0 & 0 & -\frac{\sqrt{15}}{15} & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}}{60} & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{15}}{15} & \frac{\sqrt{3}}{36} & 0 & 0 & 0 & -\frac{\sqrt{15}}{180} & 0 \\ -\frac{\sqrt{15}}{15} & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{180} & 0 & 0 & 0 & \frac{\sqrt{3}}{36} \\ 0 & \frac{\sqrt{15}}{15} & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}}{60} & 0 & 0 & 0 \end{bmatrix}$
188	symmetry	x
	$\mathbb{Q}_{1,0}^{(1,1;a)}(T_u)$	$\begin{bmatrix} \frac{\sqrt{6}}{8} & 0 & -\frac{\sqrt{2}}{8} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{2}}{8} & 0 & -\frac{\sqrt{6}}{8} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{3}}{10} & 0 & 0 & -\frac{\sqrt{5}}{20} & 0 & \frac{\sqrt{2}}{40} & 0 & 0 & 0 \\ -\frac{\sqrt{3}}{10} & 0 & -\frac{1}{5} & 0 & 0 & -\frac{\sqrt{3}}{20} & 0 & \frac{\sqrt{6}}{40} & 0 & 0 \\ 0 & -\frac{1}{5} & 0 & -\frac{\sqrt{3}}{10} & 0 & 0 & -\frac{\sqrt{6}}{40} & 0 & \frac{\sqrt{3}}{20} & 0 \\ 0 & 0 & -\frac{\sqrt{3}}{10} & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}}{40} & 0 & \frac{\sqrt{5}}{20} \end{bmatrix}$
189	symmetry	y

continued ...

Table 6

No.	multipole	matrix
		$\begin{bmatrix} \frac{\sqrt{6}i}{8} & 0 & \frac{\sqrt{2}i}{8} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{2}i}{8} & 0 & \frac{\sqrt{6}i}{8} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{3}i}{10} & 0 & 0 & -\frac{\sqrt{5}i}{20} & 0 & -\frac{\sqrt{2}i}{40} & 0 & 0 & 0 \\ -\frac{\sqrt{3}i}{10} & 0 & \frac{i}{5} & 0 & 0 & -\frac{\sqrt{3}i}{20} & 0 & -\frac{\sqrt{6}i}{40} & 0 & 0 \\ 0 & -\frac{i}{5} & 0 & \frac{\sqrt{3}i}{10} & 0 & 0 & -\frac{\sqrt{6}i}{40} & 0 & -\frac{\sqrt{3}i}{20} & 0 \\ 0 & 0 & -\frac{\sqrt{3}i}{10} & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}i}{40} & 0 & -\frac{\sqrt{5}i}{20} \end{bmatrix}$
190	symmetry	$\begin{bmatrix} 0 & -\frac{\sqrt{2}}{4} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{2}}{4} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ -\frac{3}{10} & 0 & 0 & 0 & 0 & 0 & \frac{1}{10} & 0 & 0 & 0 \\ 0 & -\frac{1}{10} & 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{20} & 0 & 0 & 0 \\ 0 & 0 & \frac{1}{10} & 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{20} & 0 & 0 \\ 0 & 0 & 0 & \frac{3}{10} & 0 & 0 & 0 & 0 & \frac{1}{10} & 0 \end{bmatrix}$
191	symmetry	$\begin{bmatrix} 0 & \frac{\sqrt{5}i}{10} & 0 & 0 & 0 & 0 & \frac{\sqrt{30}i}{30} & 0 & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{5}i}{10} & 0 & 0 & 0 & 0 & \frac{\sqrt{30}i}{30} & 0 & 0 \\ -\frac{\sqrt{10}i}{20} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}i}{10} & 0 & 0 & 0 \\ 0 & \frac{\sqrt{10}i}{20} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{30} & 0 & 0 \\ 0 & 0 & \frac{\sqrt{10}i}{20} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{30} & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{10}i}{20} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}i}{10} \end{bmatrix}$
192	symmetry	$\begin{bmatrix} 0 & 0 & 0 & \frac{\sqrt{5}i}{10} & \frac{i}{6} & 0 & 0 & 0 & \frac{\sqrt{5}i}{30} & 0 \\ -\frac{\sqrt{5}i}{10} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{5}i}{30} & 0 & 0 & \frac{i}{6} \\ 0 & 0 & -\frac{\sqrt{10}i}{20} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{30} & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{10}i}{20} & -\frac{\sqrt{2}i}{6} & 0 & 0 & 0 & \frac{\sqrt{10}i}{15} & 0 \\ -\frac{\sqrt{10}i}{20} & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}i}{15} & 0 & 0 & 0 & \frac{\sqrt{2}i}{6} \\ 0 & -\frac{\sqrt{10}i}{20} & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{30} & 0 & 0 & 0 \end{bmatrix}$
193	symmetry	$\sqrt{3}yz$

continued ...

Table 6

No.	multipole	matrix
	$\mathbb{G}_{2,0}^{(a)}(T_u)$	$\begin{bmatrix} \frac{\sqrt{5}}{20} & 0 & \frac{\sqrt{15}}{20} & 0 & 0 & \frac{\sqrt{5}}{15} & 0 & \frac{\sqrt{10}}{30} & 0 & 0 \\ 0 & -\frac{\sqrt{15}}{20} & 0 & -\frac{\sqrt{5}}{20} & 0 & 0 & \frac{\sqrt{10}}{30} & 0 & \frac{\sqrt{5}}{15} & 0 \\ 0 & -\frac{\sqrt{10}}{20} & 0 & 0 & \frac{\sqrt{6}}{12} & 0 & \frac{\sqrt{15}}{20} & 0 & 0 & 0 \\ \frac{\sqrt{10}}{20} & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}}{60} & 0 & \frac{\sqrt{5}}{12} & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{10}}{20} & 0 & 0 & -\frac{\sqrt{5}}{12} & 0 & \frac{\sqrt{10}}{60} & 0 \\ 0 & 0 & -\frac{\sqrt{10}}{20} & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{20} & 0 & -\frac{\sqrt{6}}{12} \end{bmatrix}$
194	symmetry	$\sqrt{3}xz$
	$\mathbb{G}_{2,1}^{(a)}(T_u)$	$\begin{bmatrix} -\frac{\sqrt{5}i}{20} & 0 & \frac{\sqrt{15}i}{20} & 0 & 0 & -\frac{\sqrt{5}i}{15} & 0 & \frac{\sqrt{10}i}{30} & 0 & 0 \\ 0 & \frac{\sqrt{15}i}{20} & 0 & -\frac{\sqrt{5}i}{20} & 0 & 0 & -\frac{\sqrt{10}i}{30} & 0 & \frac{\sqrt{5}i}{15} & 0 \\ 0 & -\frac{\sqrt{10}i}{20} & 0 & 0 & -\frac{\sqrt{6}i}{12} & 0 & \frac{\sqrt{15}i}{20} & 0 & 0 & 0 \\ -\frac{\sqrt{10}i}{20} & 0 & 0 & 0 & 0 & \frac{\sqrt{10}i}{60} & 0 & \frac{\sqrt{5}i}{12} & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{10}i}{20} & 0 & 0 & \frac{\sqrt{5}i}{12} & 0 & \frac{\sqrt{10}i}{60} & 0 \\ 0 & 0 & \frac{\sqrt{10}i}{20} & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{20} & 0 & -\frac{\sqrt{6}i}{12} \end{bmatrix}$
195	symmetry	$\sqrt{3}xy$
	$\mathbb{G}_{2,2}^{(a)}(T_u)$	$\begin{bmatrix} 0 & 0 & 0 & \frac{\sqrt{5}}{10} & -\frac{1}{6} & 0 & 0 & 0 & \frac{\sqrt{5}}{30} & 0 \\ \frac{\sqrt{5}}{10} & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}}{30} & 0 & 0 & 0 & \frac{1}{6} \\ 0 & 0 & -\frac{\sqrt{10}}{20} & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{30} & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{10}}{20} & \frac{\sqrt{2}}{6} & 0 & 0 & 0 & \frac{\sqrt{10}}{15} & 0 \\ \frac{\sqrt{10}}{20} & 0 & 0 & 0 & 0 & \frac{\sqrt{10}}{15} & 0 & 0 & 0 & \frac{\sqrt{2}}{6} \\ 0 & \frac{\sqrt{10}}{20} & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{30} & 0 & 0 & 0 \end{bmatrix}$
196	symmetry	$-\frac{x^2}{2} - \frac{y^2}{2} + z^2$
	$\mathbb{G}_{2,0}^{(1,-1;a)}(E_u)$	$\begin{bmatrix} 0 & -\frac{\sqrt{2}i}{20} & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{5} & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{2}i}{20} & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{5} & 0 & 0 \\ \frac{i}{10} & 0 & 0 & 0 & 0 & 0 & \frac{3i}{10} & 0 & 0 & 0 \\ 0 & -\frac{i}{10} & 0 & 0 & 0 & 0 & \frac{\sqrt{6}i}{20} & 0 & 0 & 0 \\ 0 & 0 & -\frac{i}{10} & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{20} & 0 & 0 \\ 0 & 0 & 0 & \frac{i}{10} & 0 & 0 & 0 & 0 & -\frac{3i}{10} & 0 \end{bmatrix}$
197	symmetry	$\frac{\sqrt{3}(x-y)(x+y)}{2}$

continued ...

Table 6

No.	multipole	matrix
	$\mathbb{G}_{2,1}^{(1,-1;a)}(E_u)$	$\begin{bmatrix} 0 & 0 & 0 & -\frac{\sqrt{2}i}{20} & -\frac{\sqrt{10}i}{10} & 0 & 0 & 0 & -\frac{\sqrt{2}i}{10} & 0 \\ \frac{\sqrt{2}i}{20} & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}i}{10} & 0 & 0 & 0 & -\frac{\sqrt{10}i}{10} \\ 0 & 0 & \frac{i}{10} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}i}{20} & 0 \\ 0 & 0 & 0 & \frac{i}{10} & -\frac{\sqrt{5}i}{10} & 0 & 0 & 0 & 0 & \frac{i}{5} \\ \frac{i}{10} & 0 & 0 & 0 & 0 & -\frac{i}{5} & 0 & 0 & 0 & \frac{\sqrt{5}i}{10} \\ 0 & \frac{i}{10} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{20} & 0 & 0 \end{bmatrix}$
198	symmetry	$\sqrt{3}yz$ $\begin{bmatrix} -\frac{\sqrt{2}}{40} & 0 & -\frac{\sqrt{6}}{40} & 0 & 0 & -\frac{\sqrt{2}}{5} & 0 & -\frac{1}{5} & 0 & 0 \\ 0 & \frac{\sqrt{6}}{40} & 0 & \frac{\sqrt{2}}{40} & 0 & 0 & -\frac{1}{5} & 0 & -\frac{\sqrt{2}}{5} & 0 \\ 0 & \frac{1}{10} & 0 & 0 & \frac{\sqrt{15}}{20} & 0 & \frac{3\sqrt{6}}{40} & 0 & 0 & 0 \\ -\frac{1}{10} & 0 & 0 & 0 & 0 & -\frac{1}{20} & 0 & \frac{\sqrt{2}}{8} & 0 & 0 \\ 0 & 0 & 0 & -\frac{1}{10} & 0 & 0 & -\frac{\sqrt{2}}{8} & 0 & \frac{1}{20} & 0 \\ 0 & 0 & \frac{1}{10} & 0 & 0 & 0 & 0 & -\frac{3\sqrt{6}}{40} & 0 & -\frac{\sqrt{15}}{20} \end{bmatrix}$
199	symmetry	$\sqrt{3}xz$ $\begin{bmatrix} \frac{\sqrt{2}i}{40} & 0 & -\frac{\sqrt{6}i}{40} & 0 & 0 & \frac{\sqrt{2}i}{5} & 0 & -\frac{i}{5} & 0 & 0 \\ 0 & -\frac{\sqrt{6}i}{40} & 0 & \frac{\sqrt{2}i}{40} & 0 & 0 & \frac{i}{5} & 0 & -\frac{\sqrt{2}i}{5} & 0 \\ 0 & \frac{i}{10} & 0 & 0 & -\frac{\sqrt{15}i}{20} & 0 & \frac{3\sqrt{6}i}{40} & 0 & 0 & 0 \\ \frac{i}{10} & 0 & 0 & 0 & 0 & \frac{i}{20} & 0 & \frac{\sqrt{2}i}{8} & 0 & 0 \\ 0 & 0 & 0 & -\frac{i}{10} & 0 & 0 & \frac{\sqrt{2}i}{8} & 0 & \frac{i}{20} & 0 \\ 0 & 0 & -\frac{i}{10} & 0 & 0 & 0 & 0 & \frac{3\sqrt{6}i}{40} & 0 & -\frac{\sqrt{15}i}{20} \end{bmatrix}$
200	symmetry	$\sqrt{3}xy$ $\begin{bmatrix} 0 & 0 & 0 & -\frac{\sqrt{2}}{20} & \frac{\sqrt{10}}{10} & 0 & 0 & 0 & -\frac{\sqrt{2}}{10} & 0 \\ -\frac{\sqrt{2}}{20} & 0 & 0 & 0 & 0 & \frac{\sqrt{2}}{10} & 0 & 0 & 0 & -\frac{\sqrt{10}}{10} \\ 0 & 0 & \frac{1}{10} & 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{20} & 0 & 0 \\ 0 & 0 & 0 & \frac{1}{10} & \frac{\sqrt{5}}{10} & 0 & 0 & 0 & \frac{1}{5} & 0 \\ -\frac{1}{10} & 0 & 0 & 0 & 0 & \frac{1}{5} & 0 & 0 & 0 & \frac{\sqrt{5}}{10} \\ 0 & -\frac{1}{10} & 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{20} & 0 & 0 & 0 \end{bmatrix}$
201	symmetry	$\frac{\sqrt{21}(x^4 - 3x^2y^2 - 3x^2z^2 + y^4 - 3y^2z^2 + z^4)}{6}$

continued ...

Table 6

No.	multipole	matrix
	$\mathbb{G}_4^{(1,-1;a)}(A_u)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{12} & 0 & 0 & 0 & -\frac{\sqrt{15}i}{12} \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2}i}{4} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}i}{4} & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{12} & 0 & 0 & 0 & \frac{\sqrt{3}i}{12} & 0 \end{bmatrix}$
202	symmetry	$-\frac{\sqrt{15}(x^4 - 12x^2y^2 + 6x^2z^2 + y^4 + 6y^2z^2 - 2z^4)}{12}$
	$\mathbb{G}_{4,0}^{(1,-1;a)}(E_u)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{105}i}{84} & 0 & 0 & 0 & \frac{\sqrt{21}i}{12} \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{70}i}{28} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}i}{28} & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{21}i}{12} & 0 & 0 & 0 & \frac{\sqrt{105}i}{84} & 0 \end{bmatrix}$
203	symmetry	$\frac{\sqrt{5}(x-y)(x+y)(x^2+y^2-6z^2)}{4}$
	$\mathbb{G}_{4,1}^{(1,-1;a)}(E_u)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{70}i}{28} & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{21}i}{28} & 0 & 0 & 0 & -\frac{\sqrt{105}i}{28} & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{105}i}{28} & 0 & 0 & 0 & \frac{\sqrt{21}i}{28} \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}i}{28} & 0 & 0 & 0 \end{bmatrix}$
204	symmetry	$\frac{\sqrt{35}yz(y-z)(y+z)}{2}$
	$\mathbb{G}_{4,0}^{(1,-1;a)}(T_u, 1)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{1}{16} & 0 & \frac{\sqrt{10}}{16} & 0 & \frac{\sqrt{5}}{16} & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{16} & 0 & -\frac{\sqrt{30}}{16} & 0 & -\frac{\sqrt{3}}{16} \\ 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{16} & 0 & \frac{\sqrt{30}}{16} & 0 & \frac{\sqrt{15}}{16} & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}}{16} & 0 & -\frac{\sqrt{10}}{16} & 0 & -\frac{1}{16} \end{bmatrix}$
205	symmetry	$-\frac{\sqrt{35}xz(x-z)(x+z)}{2}$

continued ...

Table 6

No.	multipole	matrix
	$\mathbb{G}_{4,1}^{(1,-1;a)}(T_u, 1)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{i}{16} & 0 & -\frac{\sqrt{10}i}{16} & 0 & \frac{\sqrt{5}i}{16} & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{16} & 0 & \frac{\sqrt{30}i}{16} & 0 & -\frac{\sqrt{3}i}{16} \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{16} & 0 & \frac{\sqrt{30}i}{16} & 0 & -\frac{\sqrt{15}i}{16} & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{5}i}{16} & 0 & -\frac{\sqrt{10}i}{16} & 0 & \frac{i}{16} \end{bmatrix}$
206	symmetry	$\frac{\sqrt{35}xy(x-y)(x+y)}{2}$
	$\mathbb{G}_{4,2}^{(1,-1;a)}(T_u, 1)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{1}{2} \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{1}{2} & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
207	symmetry	$\frac{\sqrt{5}yz(6x^2-y^2-z^2)}{2}$
	$\mathbb{G}_{4,0}^{(1,-1;a)}(T_u, 2)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{7}}{112} & 0 & \frac{\sqrt{70}}{112} & 0 & -\frac{\sqrt{35}}{16} & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{105}}{112} & 0 & -\frac{\sqrt{210}}{112} & 0 & \frac{\sqrt{21}}{16} \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{21}}{16} & 0 & \frac{\sqrt{210}}{112} & 0 & \frac{\sqrt{105}}{112} & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{35}}{16} & 0 & -\frac{\sqrt{70}}{112} & 0 & -\frac{\sqrt{7}}{112} \end{bmatrix}$
208	symmetry	$-\frac{\sqrt{5}xz(x^2-6y^2+z^2)}{2}$
	$\mathbb{G}_{4,1}^{(1,-1;a)}(T_u, 2)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{7}i}{112} & 0 & \frac{\sqrt{70}i}{112} & 0 & \frac{\sqrt{35}i}{16} & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{105}i}{112} & 0 & -\frac{\sqrt{210}i}{112} & 0 & -\frac{\sqrt{21}i}{16} \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{21}i}{16} & 0 & -\frac{\sqrt{210}i}{112} & 0 & \frac{\sqrt{105}i}{112} & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{35}i}{16} & 0 & \frac{\sqrt{70}i}{112} & 0 & -\frac{\sqrt{7}i}{112} \end{bmatrix}$
209	symmetry	$-\frac{\sqrt{5}xy(x^2+y^2-6z^2)}{2}$

continued ...

Table 6

No.	multipole	matrix
		$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}}{28} & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{21}}{28} & 0 & 0 & 0 & \frac{\sqrt{105}}{28} & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{105}}{28} & 0 & 0 & 0 & -\frac{\sqrt{21}}{28} \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}}{28} & 0 & 0 & 0 \end{bmatrix}$
210	symmetry	$-\frac{x^2}{2} - \frac{y^2}{2} + z^2$ $\begin{bmatrix} 0 & \frac{\sqrt{30}i}{60} & 0 & 0 & 0 & 0 & -\frac{2\sqrt{5}i}{15} & 0 & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{30}i}{60} & 0 & 0 & 0 & 0 & -\frac{2\sqrt{5}i}{15} & 0 & 0 \\ -\frac{\sqrt{15}i}{15} & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{30} & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{15}i}{15} & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}i}{60} & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{15}i}{15} & 0 & 0 & 0 & 0 & \frac{\sqrt{10}i}{60} & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{15}i}{15} & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{30} & 0 \end{bmatrix}$
211	symmetry	$\frac{\sqrt{3}(x-y)(x+y)}{2}$ $\begin{bmatrix} 0 & 0 & 0 & \frac{\sqrt{30}i}{60} & -\frac{\sqrt{6}i}{9} & 0 & 0 & 0 & -\frac{\sqrt{30}i}{45} & 0 \\ -\frac{\sqrt{30}i}{60} & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}i}{45} & 0 & 0 & 0 & -\frac{\sqrt{6}i}{9} \\ 0 & 0 & -\frac{\sqrt{15}i}{15} & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}i}{60} & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{15}i}{15} & \frac{\sqrt{3}i}{18} & 0 & 0 & 0 & -\frac{\sqrt{15}i}{45} & 0 \\ -\frac{\sqrt{15}i}{15} & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{45} & 0 & 0 & 0 & -\frac{\sqrt{3}i}{18} \\ 0 & -\frac{\sqrt{15}i}{15} & 0 & 0 & 0 & 0 & \frac{\sqrt{10}i}{60} & 0 & 0 & 0 \end{bmatrix}$
212	symmetry	$\sqrt{3}yz$ $\begin{bmatrix} \frac{\sqrt{30}}{120} & 0 & \frac{\sqrt{10}}{40} & 0 & 0 & -\frac{2\sqrt{30}}{45} & 0 & -\frac{2\sqrt{15}}{45} & 0 & 0 \\ 0 & -\frac{\sqrt{10}}{40} & 0 & -\frac{\sqrt{30}}{120} & 0 & 0 & -\frac{2\sqrt{15}}{45} & 0 & -\frac{2\sqrt{30}}{45} & 0 \\ 0 & -\frac{\sqrt{15}}{15} & 0 & 0 & -\frac{1}{12} & 0 & -\frac{\sqrt{10}}{40} & 0 & 0 & 0 \\ \frac{\sqrt{15}}{15} & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{180} & 0 & -\frac{\sqrt{30}}{72} & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{15}}{15} & 0 & 0 & \frac{\sqrt{30}}{72} & 0 & -\frac{\sqrt{15}}{180} & 0 \\ 0 & 0 & -\frac{\sqrt{15}}{15} & 0 & 0 & 0 & 0 & \frac{\sqrt{10}}{40} & 0 & \frac{1}{12} \end{bmatrix}$
213	symmetry	$\sqrt{3}xz$

continued ...

Table 6

No.	multipole	matrix
	$\mathbb{G}_{2,1}^{(1,0;a)}(T_u)$	$\begin{bmatrix} -\frac{\sqrt{30}i}{120} & 0 & \frac{\sqrt{10}i}{40} & 0 & 0 & \frac{2\sqrt{30}i}{45} & 0 & -\frac{2\sqrt{15}i}{45} & 0 & 0 \\ 0 & \frac{\sqrt{10}i}{40} & 0 & -\frac{\sqrt{30}i}{120} & 0 & 0 & \frac{2\sqrt{15}i}{45} & 0 & -\frac{2\sqrt{30}i}{45} & 0 \\ 0 & -\frac{\sqrt{15}i}{15} & 0 & 0 & \frac{i}{12} & 0 & -\frac{\sqrt{10}i}{40} & 0 & 0 & 0 \\ -\frac{\sqrt{15}i}{15} & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{180} & 0 & -\frac{\sqrt{30}i}{72} & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{15}i}{15} & 0 & 0 & -\frac{\sqrt{30}i}{72} & 0 & -\frac{\sqrt{15}i}{180} & 0 \\ 0 & 0 & \frac{\sqrt{15}i}{15} & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}i}{40} & 0 & \frac{i}{12} \end{bmatrix}$
214	symmetry	$\sqrt{3}xy$
	$\mathbb{G}_{2,2}^{(1,0;a)}(T_u)$	$\begin{bmatrix} 0 & 0 & 0 & \frac{\sqrt{30}}{60} & \frac{\sqrt{6}}{9} & 0 & 0 & 0 & -\frac{\sqrt{30}}{45} & 0 \\ \frac{\sqrt{30}}{60} & 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{45} & 0 & 0 & 0 & -\frac{\sqrt{6}}{9} \\ 0 & 0 & -\frac{\sqrt{15}}{15} & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}}{60} & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{15}}{15} & -\frac{\sqrt{3}}{18} & 0 & 0 & 0 & -\frac{\sqrt{15}}{45} & 0 \\ \frac{\sqrt{15}}{15} & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{45} & 0 & 0 & 0 & -\frac{\sqrt{3}}{18} \\ 0 & \frac{\sqrt{15}}{15} & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}}{60} & 0 & 0 & 0 \end{bmatrix}$
215	symmetry	1
	$\mathbb{G}_0^{(1,1;a)}(A_u)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ -\frac{\sqrt{2}i}{4} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{2}i}{4} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{2}i}{4} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{2}i}{4} & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
216	symmetry	$-\frac{x^2}{2} - \frac{y^2}{2} + z^2$
	$\mathbb{G}_{2,0}^{(1,1;a)}(E_u)$	$\begin{bmatrix} 0 & \frac{\sqrt{42}i}{15} & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}i}{30} & 0 & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{42}i}{15} & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}i}{30} & 0 & 0 \\ \frac{\sqrt{21}i}{30} & 0 & 0 & 0 & 0 & -\frac{2\sqrt{21}i}{105} & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{21}i}{30} & 0 & 0 & 0 & 0 & -\frac{\sqrt{14}i}{105} & 0 & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{21}i}{30} & 0 & 0 & 0 & 0 & \frac{\sqrt{14}i}{105} & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{21}i}{30} & 0 & 0 & 0 & 0 & \frac{2\sqrt{21}i}{105} & 0 \end{bmatrix}$
217	symmetry	$\frac{\sqrt{3}(x-y)(x+y)}{2}$

continued ...

Table 6

No.	multipole	matrix
	$\mathbb{G}_{2,1}^{(1,1;a)}(E_u)$	$\begin{bmatrix} 0 & 0 & 0 & \frac{\sqrt{42}i}{15} & -\frac{\sqrt{210}i}{180} & 0 & 0 & 0 & -\frac{\sqrt{42}i}{180} & 0 \\ -\frac{\sqrt{42}i}{15} & 0 & 0 & 0 & 0 & -\frac{\sqrt{42}i}{180} & 0 & 0 & 0 & -\frac{\sqrt{210}i}{180} \\ 0 & 0 & \frac{\sqrt{21}i}{30} & 0 & 0 & 0 & 0 & -\frac{\sqrt{14}i}{105} & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{21}i}{30} & \frac{2\sqrt{105}i}{315} & 0 & 0 & 0 & -\frac{4\sqrt{21}i}{315} & 0 \\ \frac{\sqrt{21}i}{30} & 0 & 0 & 0 & 0 & \frac{4\sqrt{21}i}{315} & 0 & 0 & 0 & -\frac{2\sqrt{105}i}{315} \\ 0 & \frac{\sqrt{21}i}{30} & 0 & 0 & 0 & 0 & \frac{\sqrt{14}i}{105} & 0 & 0 & 0 \end{bmatrix}$
218	symmetry	$\sqrt{3}yz$
	$\mathbb{G}_{2,0}^{(1,1;a)}(T_u)$	$\begin{bmatrix} \frac{\sqrt{42}}{30} & 0 & \frac{\sqrt{14}}{10} & 0 & 0 & -\frac{\sqrt{42}}{90} & 0 & -\frac{\sqrt{21}}{90} & 0 & 0 \\ 0 & -\frac{\sqrt{14}}{10} & 0 & -\frac{\sqrt{42}}{30} & 0 & 0 & -\frac{\sqrt{21}}{90} & 0 & -\frac{\sqrt{42}}{90} & 0 \\ 0 & \frac{\sqrt{21}}{30} & 0 & 0 & -\frac{\sqrt{35}}{105} & 0 & -\frac{\sqrt{14}}{70} & 0 & 0 & 0 \\ -\frac{\sqrt{21}}{30} & 0 & 0 & 0 & 0 & \frac{\sqrt{21}}{315} & 0 & -\frac{\sqrt{42}}{126} & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{21}}{30} & 0 & 0 & \frac{\sqrt{42}}{126} & 0 & -\frac{\sqrt{21}}{315} & 0 \\ 0 & 0 & \frac{\sqrt{21}}{30} & 0 & 0 & 0 & 0 & \frac{\sqrt{14}}{70} & 0 & \frac{\sqrt{35}}{105} \end{bmatrix}$
219	symmetry	$\sqrt{3}xz$
	$\mathbb{G}_{2,1}^{(1,1;a)}(T_u)$	$\begin{bmatrix} -\frac{\sqrt{42}i}{30} & 0 & \frac{\sqrt{14}i}{10} & 0 & 0 & \frac{\sqrt{42}i}{90} & 0 & -\frac{\sqrt{21}i}{90} & 0 & 0 \\ 0 & \frac{\sqrt{14}i}{10} & 0 & -\frac{\sqrt{42}i}{30} & 0 & 0 & \frac{\sqrt{21}i}{90} & 0 & -\frac{\sqrt{42}i}{90} & 0 \\ 0 & \frac{\sqrt{21}i}{30} & 0 & 0 & \frac{\sqrt{35}i}{105} & 0 & -\frac{\sqrt{14}i}{70} & 0 & 0 & 0 \\ \frac{\sqrt{21}i}{30} & 0 & 0 & 0 & 0 & -\frac{\sqrt{21}i}{315} & 0 & -\frac{\sqrt{42}i}{126} & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{21}i}{30} & 0 & 0 & -\frac{\sqrt{42}i}{126} & 0 & -\frac{\sqrt{21}i}{315} & 0 \\ 0 & 0 & -\frac{\sqrt{21}i}{30} & 0 & 0 & 0 & 0 & -\frac{\sqrt{14}i}{70} & 0 & \frac{\sqrt{35}i}{105} \end{bmatrix}$
220	symmetry	$\sqrt{3}xy$
	$\mathbb{G}_{2,2}^{(1,1;a)}(T_u)$	$\begin{bmatrix} 0 & 0 & 0 & \frac{\sqrt{42}}{15} & \frac{\sqrt{210}}{180} & 0 & 0 & 0 & -\frac{\sqrt{42}}{180} & 0 \\ \frac{\sqrt{42}}{15} & 0 & 0 & 0 & 0 & \frac{\sqrt{42}}{180} & 0 & 0 & 0 & -\frac{\sqrt{210}}{180} \\ 0 & 0 & \frac{\sqrt{21}}{30} & 0 & 0 & 0 & 0 & -\frac{\sqrt{14}}{105} & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{21}}{30} & -\frac{2\sqrt{105}}{315} & 0 & 0 & 0 & -\frac{4\sqrt{21}}{315} & 0 \\ -\frac{\sqrt{21}}{30} & 0 & 0 & 0 & 0 & -\frac{4\sqrt{21}}{315} & 0 & 0 & 0 & -\frac{2\sqrt{105}}{315} \\ 0 & -\frac{\sqrt{21}}{30} & 0 & 0 & 0 & 0 & -\frac{\sqrt{14}}{105} & 0 & 0 & 0 \end{bmatrix}$
221	symmetry	x

continued ...

Table 6

No.	multipole	matrix
	$\mathbb{T}_{1,0}^{(a)}(T_u)$	$\begin{bmatrix} -\frac{i}{4} & 0 & \frac{\sqrt{3}i}{12} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{3}i}{12} & 0 & \frac{i}{4} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{2}i}{20} & 0 & 0 & -\frac{\sqrt{30}i}{20} & 0 & \frac{\sqrt{3}i}{20} & 0 & 0 & 0 \\ -\frac{\sqrt{2}i}{20} & 0 & -\frac{\sqrt{6}i}{30} & 0 & 0 & -\frac{3\sqrt{2}i}{20} & 0 & \frac{3i}{20} & 0 & 0 \\ 0 & -\frac{\sqrt{6}i}{30} & 0 & -\frac{\sqrt{2}i}{20} & 0 & 0 & -\frac{3i}{20} & 0 & \frac{3\sqrt{2}i}{20} & 0 \\ 0 & 0 & -\frac{\sqrt{2}i}{20} & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{20} & 0 & \frac{\sqrt{30}i}{20} \end{bmatrix}$
222	symmetry	$\begin{bmatrix} \frac{1}{4} & 0 & \frac{\sqrt{3}}{12} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{3}}{12} & 0 & \frac{1}{4} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{2}}{20} & 0 & 0 & \frac{\sqrt{30}}{20} & 0 & \frac{\sqrt{3}}{20} & 0 & 0 & 0 \\ \frac{\sqrt{2}}{20} & 0 & -\frac{\sqrt{6}}{30} & 0 & 0 & \frac{3\sqrt{2}}{20} & 0 & \frac{3}{20} & 0 & 0 \\ 0 & \frac{\sqrt{6}}{30} & 0 & -\frac{\sqrt{2}}{20} & 0 & 0 & \frac{3}{20} & 0 & \frac{3\sqrt{2}}{20} & 0 \\ 0 & 0 & \frac{\sqrt{2}}{20} & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{20} & 0 & \frac{\sqrt{30}}{20} \end{bmatrix}$
223	symmetry	$\begin{bmatrix} 0 & \frac{\sqrt{3}i}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{3}i}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ -\frac{\sqrt{6}i}{20} & 0 & 0 & 0 & 0 & \frac{\sqrt{6}i}{10} & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{6}i}{60} & 0 & 0 & 0 & 0 & \frac{3i}{10} & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{6}i}{60} & 0 & 0 & 0 & 0 & \frac{3i}{10} & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{6}i}{20} & 0 & 0 & 0 & 0 & \frac{\sqrt{6}i}{10} & 0 \end{bmatrix}$
224	symmetry	$\begin{bmatrix} 0 & 0 & 0 & 0 & \frac{\sqrt{2}}{12} & 0 & 0 & 0 & -\frac{\sqrt{10}}{12} & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}}{12} & 0 & 0 & 0 & \frac{\sqrt{2}}{12} \\ 0 & 0 & \frac{\sqrt{5}}{10} & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}}{30} & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{5}}{10} & -\frac{1}{6} & 0 & 0 & 0 & -\frac{\sqrt{5}}{30} & 0 \\ -\frac{\sqrt{5}}{10} & 0 & 0 & 0 & 0 & \frac{\sqrt{5}}{30} & 0 & 0 & 0 & \frac{1}{6} \\ 0 & \frac{\sqrt{5}}{10} & 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{30} & 0 & 0 & 0 \end{bmatrix}$
225	symmetry	$\frac{x(2x^2-3y^2-3z^2)}{2}$

continued ...

Table 6

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

continued ...

Table 6

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

continued ...

Table 6

No.	multipole	matrix
		$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & \frac{1}{12} & 0 & \frac{\sqrt{2}}{12} & 0 & \frac{\sqrt{5}}{12} \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{5}}{12} & 0 & -\frac{\sqrt{2}}{12} & 0 & -\frac{1}{12} & 0 \\ 0 & -\frac{\sqrt{2}}{40} & 0 & -\frac{\sqrt{6}}{24} & -\frac{\sqrt{30}}{60} & 0 & -\frac{\sqrt{3}}{10} & 0 & -\frac{\sqrt{6}}{12} & 0 \\ \frac{\sqrt{2}}{40} & 0 & \frac{\sqrt{6}}{40} & 0 & 0 & \frac{7\sqrt{2}}{60} & 0 & \frac{1}{30} & 0 & -\frac{\sqrt{10}}{12} \\ 0 & -\frac{\sqrt{6}}{40} & 0 & -\frac{\sqrt{2}}{40} & -\frac{\sqrt{10}}{12} & 0 & \frac{1}{30} & 0 & \frac{7\sqrt{2}}{60} & 0 \\ \frac{\sqrt{6}}{24} & 0 & \frac{\sqrt{2}}{40} & 0 & 0 & -\frac{\sqrt{6}}{12} & 0 & -\frac{\sqrt{3}}{10} & 0 & -\frac{\sqrt{30}}{60} \end{bmatrix}$
234	symmetry	$-\frac{z(3x^2+3y^2-2z^2)}{2}$
		$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}i}{6} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2}i}{6} & 0 & 0 \\ \frac{\sqrt{6}i}{60} & 0 & 0 & 0 & 0 & 0 & \frac{2\sqrt{6}i}{15} & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{6}i}{20} & 0 & 0 & 0 & 0 & -\frac{4i}{15} & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{6}i}{20} & 0 & 0 & 0 & 0 & -\frac{4i}{15} & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{6}i}{60} & 0 & 0 & 0 & 0 & \frac{2\sqrt{6}i}{15} & 0 \end{bmatrix}$
235	symmetry	$\frac{\sqrt{15}x(y-z)(y+z)}{2}$
		$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{36} & 0 & \frac{\sqrt{30}i}{36} & 0 & \frac{\sqrt{3}i}{12} \\ 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{12} & 0 & \frac{\sqrt{30}i}{36} & 0 & -\frac{\sqrt{15}i}{36} & 0 \\ 0 & -\frac{\sqrt{30}i}{120} & 0 & -\frac{\sqrt{10}i}{40} & \frac{\sqrt{2}i}{12} & 0 & -\frac{\sqrt{5}i}{10} & 0 & -\frac{\sqrt{10}i}{20} & 0 \\ -\frac{\sqrt{30}i}{120} & 0 & \frac{\sqrt{10}i}{40} & 0 & 0 & -\frac{7\sqrt{30}i}{180} & 0 & \frac{\sqrt{15}i}{90} & 0 & -\frac{\sqrt{6}i}{12} \\ 0 & \frac{\sqrt{10}i}{40} & 0 & -\frac{\sqrt{30}i}{120} & \frac{\sqrt{6}i}{12} & 0 & -\frac{\sqrt{15}i}{90} & 0 & \frac{7\sqrt{30}i}{180} & 0 \\ -\frac{\sqrt{10}i}{40} & 0 & -\frac{\sqrt{30}i}{120} & 0 & 0 & \frac{\sqrt{10}i}{20} & 0 & \frac{\sqrt{5}i}{10} & 0 & -\frac{\sqrt{2}i}{12} \end{bmatrix}$
236	symmetry	$-\frac{\sqrt{15}y(x-z)(x+z)}{2}$
		$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{36} & 0 & -\frac{\sqrt{30}}{36} & 0 & \frac{\sqrt{3}}{12} \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{12} & 0 & \frac{\sqrt{30}}{36} & 0 & \frac{\sqrt{15}}{36} & 0 \\ 0 & \frac{\sqrt{30}}{120} & 0 & -\frac{\sqrt{10}}{40} & \frac{\sqrt{2}}{12} & 0 & \frac{\sqrt{5}}{10} & 0 & -\frac{\sqrt{10}}{20} & 0 \\ -\frac{\sqrt{30}}{120} & 0 & -\frac{\sqrt{10}}{40} & 0 & 0 & -\frac{7\sqrt{30}}{180} & 0 & -\frac{\sqrt{15}}{90} & 0 & -\frac{\sqrt{6}}{12} \\ 0 & \frac{\sqrt{10}}{40} & 0 & \frac{\sqrt{30}}{120} & -\frac{\sqrt{6}}{12} & 0 & -\frac{\sqrt{15}}{90} & 0 & -\frac{7\sqrt{30}}{180} & 0 \\ \frac{\sqrt{10}}{40} & 0 & -\frac{\sqrt{30}}{120} & 0 & 0 & -\frac{\sqrt{10}}{20} & 0 & \frac{\sqrt{5}}{10} & 0 & \frac{\sqrt{2}}{12} \end{bmatrix}$
237	symmetry	$\frac{\sqrt{15}z(x-y)(x+y)}{2}$

continued ...

Table 6

No.	multipole	matrix
	$\mathbb{T}_{3,2}^{(1,-1;a)}(T_u, 2)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{18} & 0 & 0 & 0 & -\frac{\sqrt{15}i}{18} & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{18} & 0 & 0 & 0 & \frac{\sqrt{3}i}{18} \\ 0 & 0 & \frac{\sqrt{30}i}{60} & 0 & 0 & 0 & 0 & \frac{2\sqrt{5}i}{15} & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{30}i}{60} & -\frac{\sqrt{6}i}{9} & 0 & 0 & 0 & \frac{\sqrt{30}i}{45} & 0 \\ \frac{\sqrt{30}i}{60} & 0 & 0 & 0 & 0 & \frac{\sqrt{30}i}{45} & 0 & 0 & 0 & -\frac{\sqrt{6}i}{9} \\ 0 & -\frac{\sqrt{30}i}{60} & 0 & 0 & 0 & 0 & \frac{2\sqrt{5}i}{15} & 0 & 0 & 0 \end{bmatrix}$
238	symmetry	x $\begin{bmatrix} -\frac{\sqrt{2}i}{8} & 0 & \frac{\sqrt{6}i}{24} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{6}i}{24} & 0 & \frac{\sqrt{2}i}{8} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{i}{5} & 0 & 0 & \frac{\sqrt{15}i}{20} & 0 & -\frac{\sqrt{6}i}{40} & 0 & 0 & 0 \\ -\frac{i}{5} & 0 & -\frac{2\sqrt{3}i}{15} & 0 & 0 & \frac{3i}{20} & 0 & -\frac{3\sqrt{2}i}{40} & 0 & 0 \\ 0 & -\frac{2\sqrt{3}i}{15} & 0 & -\frac{i}{5} & 0 & 0 & \frac{3\sqrt{2}i}{40} & 0 & -\frac{3i}{20} & 0 \\ 0 & 0 & -\frac{i}{5} & 0 & 0 & 0 & 0 & \frac{\sqrt{6}i}{40} & 0 & -\frac{\sqrt{15}i}{20} \end{bmatrix}$
239	symmetry	y $\begin{bmatrix} \frac{\sqrt{2}}{8} & 0 & \frac{\sqrt{6}}{24} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{6}}{24} & 0 & \frac{\sqrt{2}}{8} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{1}{5} & 0 & 0 & -\frac{\sqrt{15}}{20} & 0 & -\frac{\sqrt{6}}{40} & 0 & 0 & 0 \\ \frac{1}{5} & 0 & -\frac{2\sqrt{3}}{15} & 0 & 0 & -\frac{3}{20} & 0 & -\frac{3\sqrt{2}}{40} & 0 & 0 \\ 0 & \frac{2\sqrt{3}}{15} & 0 & -\frac{1}{5} & 0 & 0 & -\frac{3\sqrt{2}}{40} & 0 & -\frac{3}{20} & 0 \\ 0 & 0 & \frac{1}{5} & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}}{40} & 0 & -\frac{\sqrt{15}}{20} \end{bmatrix}$
240	symmetry	z $\begin{bmatrix} 0 & \frac{\sqrt{6}i}{12} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{6}i}{12} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ -\frac{\sqrt{3}i}{5} & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{10} & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{3}i}{15} & 0 & 0 & 0 & 0 & -\frac{3\sqrt{2}i}{20} & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{3}i}{15} & 0 & 0 & 0 & 0 & -\frac{3\sqrt{2}i}{20} & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{3}i}{5} & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{10} & 0 \end{bmatrix}$
241	symmetry	$\sqrt{15}xyz$

continued ...

Table 6

No.	multipole	matrix
		$\begin{bmatrix} 0 & 0 & 0 & 0 & -\frac{\sqrt{6}}{18} & 0 & 0 & 0 & \frac{\sqrt{30}}{18} & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{18} & 0 & 0 & 0 & -\frac{\sqrt{6}}{18} \\ 0 & 0 & \frac{\sqrt{15}}{15} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}}{60} & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{15}}{15} & \frac{\sqrt{3}}{36} & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{180} \\ -\frac{\sqrt{15}}{15} & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{180} & 0 & 0 & 0 & -\frac{\sqrt{3}}{36} \\ 0 & \frac{\sqrt{15}}{15} & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}}{60} & 0 & 0 & 0 \end{bmatrix}$
242	symmetry	$\frac{x(2x^2-3y^2-3z^2)}{2}$
		$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2}i}{12} & 0 & -\frac{i}{6} & 0 & \frac{\sqrt{10}i}{12} \\ 0 & 0 & 0 & 0 & \frac{\sqrt{10}i}{12} & 0 & -\frac{i}{6} & 0 & \frac{\sqrt{2}i}{12} & 0 \\ 0 & -\frac{i}{10} & 0 & \frac{\sqrt{3}i}{6} & \frac{\sqrt{15}i}{240} & 0 & -\frac{\sqrt{6}i}{80} & 0 & \frac{\sqrt{3}i}{48} & 0 \\ -\frac{i}{10} & 0 & \frac{\sqrt{3}i}{10} & 0 & 0 & -\frac{7i}{240} & 0 & \frac{\sqrt{2}i}{240} & 0 & \frac{\sqrt{5}i}{48} \\ 0 & \frac{\sqrt{3}i}{10} & 0 & -\frac{i}{10} & -\frac{\sqrt{5}i}{48} & 0 & -\frac{\sqrt{2}i}{240} & 0 & \frac{7i}{240} & 0 \\ \frac{\sqrt{3}i}{6} & 0 & -\frac{i}{10} & 0 & 0 & -\frac{\sqrt{3}i}{48} & 0 & \frac{\sqrt{6}i}{80} & 0 & -\frac{\sqrt{15}i}{240} \end{bmatrix}$
243	symmetry	$-\frac{y(3x^2-2y^2+3z^2)}{2}$
		$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}}{12} & 0 & -\frac{1}{6} & 0 & -\frac{\sqrt{10}}{12} \\ 0 & 0 & 0 & 0 & \frac{\sqrt{10}}{12} & 0 & \frac{1}{6} & 0 & \frac{\sqrt{2}}{12} & 0 \\ 0 & -\frac{1}{10} & 0 & -\frac{\sqrt{3}}{6} & -\frac{\sqrt{15}}{240} & 0 & -\frac{\sqrt{6}}{80} & 0 & -\frac{\sqrt{3}}{48} & 0 \\ \frac{1}{10} & 0 & \frac{\sqrt{3}}{10} & 0 & 0 & \frac{7}{240} & 0 & \frac{\sqrt{2}}{240} & 0 & -\frac{\sqrt{5}}{48} \\ 0 & -\frac{\sqrt{3}}{10} & 0 & -\frac{1}{10} & -\frac{\sqrt{5}}{48} & 0 & \frac{\sqrt{2}}{240} & 0 & \frac{7}{240} & 0 \\ \frac{\sqrt{3}}{6} & 0 & \frac{1}{10} & 0 & 0 & -\frac{\sqrt{3}}{48} & 0 & -\frac{\sqrt{6}}{80} & 0 & -\frac{\sqrt{15}}{240} \end{bmatrix}$
244	symmetry	$-\frac{z(3x^2+3y^2-2z^2)}{2}$
		$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & \frac{i}{3} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{i}{3} & 0 & 0 \\ \frac{\sqrt{3}i}{15} & 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{30} & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{3}i}{5} & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}i}{30} & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{3}i}{5} & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}i}{30} & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{3}i}{15} & 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{30} & 0 \end{bmatrix}$
245	symmetry	$\frac{\sqrt{15}x(y-z)(y+z)}{2}$

continued ...

Table 6

No.	multipole	matrix
	$\mathbb{T}_{3,0}^{(1,0;a)}(T_u, 2)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}i}{36} & 0 & -\frac{\sqrt{15}i}{18} & 0 & -\frac{\sqrt{6}i}{12} \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{12} & 0 & -\frac{\sqrt{15}i}{18} & 0 & \frac{\sqrt{30}i}{36} & 0 \\ 0 & -\frac{\sqrt{15}i}{30} & 0 & -\frac{\sqrt{5}i}{10} & \frac{i}{48} & 0 & -\frac{\sqrt{10}i}{80} & 0 & -\frac{\sqrt{5}i}{80} & 0 \\ -\frac{\sqrt{15}i}{30} & 0 & \frac{\sqrt{5}i}{10} & 0 & 0 & -\frac{7\sqrt{15}i}{720} & 0 & \frac{\sqrt{30}i}{720} & 0 & -\frac{\sqrt{3}i}{48} \\ 0 & \frac{\sqrt{5}i}{10} & 0 & -\frac{\sqrt{15}i}{30} & \frac{\sqrt{3}i}{48} & 0 & -\frac{\sqrt{30}i}{720} & 0 & \frac{7\sqrt{15}i}{720} & 0 \\ -\frac{\sqrt{5}i}{10} & 0 & -\frac{\sqrt{15}i}{30} & 0 & 0 & \frac{\sqrt{5}i}{80} & 0 & \frac{\sqrt{10}i}{80} & 0 & -\frac{i}{48} \end{bmatrix}$
246	symmetry	$-\frac{\sqrt{15}y(x-z)(x+z)}{2}$
	$\mathbb{T}_{3,1}^{(1,0;a)}(T_u, 2)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{36} & 0 & \frac{\sqrt{15}}{18} & 0 & -\frac{\sqrt{6}}{12} \\ 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{12} & 0 & -\frac{\sqrt{15}}{18} & 0 & -\frac{\sqrt{30}}{36} & 0 \\ 0 & \frac{\sqrt{15}}{30} & 0 & -\frac{\sqrt{5}}{10} & \frac{1}{48} & 0 & \frac{\sqrt{10}}{80} & 0 & -\frac{\sqrt{5}}{80} & 0 \\ -\frac{\sqrt{15}}{30} & 0 & -\frac{\sqrt{5}}{10} & 0 & 0 & -\frac{7\sqrt{15}}{720} & 0 & -\frac{\sqrt{30}}{720} & 0 & -\frac{\sqrt{3}}{48} \\ 0 & \frac{\sqrt{5}}{10} & 0 & \frac{\sqrt{15}}{30} & -\frac{\sqrt{3}}{48} & 0 & -\frac{\sqrt{30}}{720} & 0 & -\frac{7\sqrt{15}}{720} & 0 \\ \frac{\sqrt{5}}{10} & 0 & -\frac{\sqrt{15}}{30} & 0 & 0 & -\frac{\sqrt{5}}{80} & 0 & \frac{\sqrt{10}}{80} & 0 & \frac{1}{48} \end{bmatrix}$
247	symmetry	$\frac{\sqrt{15}z(x-y)(x+y)}{2}$
	$\mathbb{T}_{3,2}^{(1,0;a)}(T_u, 2)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & \frac{\sqrt{6}i}{18} & 0 & 0 & 0 & \frac{\sqrt{30}i}{18} & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}i}{18} & 0 & 0 & 0 & -\frac{\sqrt{6}i}{18} \\ 0 & 0 & \frac{\sqrt{15}i}{15} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}i}{60} & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{15}i}{15} & -\frac{\sqrt{3}i}{36} & 0 & 0 & 0 & \frac{\sqrt{15}i}{180} & 0 \\ \frac{\sqrt{15}i}{15} & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{180} & 0 & 0 & 0 & -\frac{\sqrt{3}i}{36} \\ 0 & -\frac{\sqrt{15}i}{15} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}i}{60} & 0 & 0 & 0 \end{bmatrix}$
248	symmetry	x
	$\mathbb{T}_{1,0}^{(1,1;a)}(T_u)$	$\begin{bmatrix} \frac{\sqrt{6}i}{8} & 0 & -\frac{\sqrt{2}i}{8} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{2}i}{8} & 0 & -\frac{\sqrt{6}i}{8} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{3}i}{10} & 0 & 0 & -\frac{\sqrt{5}i}{20} & 0 & \frac{\sqrt{2}i}{40} & 0 & 0 & 0 \\ -\frac{\sqrt{3}i}{10} & 0 & -\frac{i}{5} & 0 & 0 & -\frac{\sqrt{3}i}{20} & 0 & \frac{\sqrt{6}i}{40} & 0 & 0 \\ 0 & -\frac{i}{5} & 0 & -\frac{\sqrt{3}i}{10} & 0 & 0 & -\frac{\sqrt{6}i}{40} & 0 & \frac{\sqrt{3}i}{20} & 0 \\ 0 & 0 & -\frac{\sqrt{3}i}{10} & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}i}{40} & 0 & \frac{\sqrt{5}i}{20} \end{bmatrix}$
249	symmetry	y

continued ...

Table 6

No.	multipole	matrix
	$\mathbb{T}_{1,1}^{(1,1;a)}(T_u)$	$\begin{bmatrix} -\frac{\sqrt{6}}{8} & 0 & -\frac{\sqrt{2}}{8} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{2}}{8} & 0 & -\frac{\sqrt{6}}{8} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{3}}{10} & 0 & 0 & \frac{\sqrt{5}}{20} & 0 & \frac{\sqrt{2}}{40} & 0 & 0 & 0 \\ \frac{\sqrt{3}}{10} & 0 & -\frac{1}{5} & 0 & 0 & \frac{\sqrt{3}}{20} & 0 & \frac{\sqrt{6}}{40} & 0 & 0 \\ 0 & \frac{1}{5} & 0 & -\frac{\sqrt{3}}{10} & 0 & 0 & \frac{\sqrt{6}}{40} & 0 & \frac{\sqrt{3}}{20} & 0 \\ 0 & 0 & \frac{\sqrt{3}}{10} & 0 & 0 & 0 & 0 & \frac{\sqrt{2}}{40} & 0 & \frac{\sqrt{5}}{20} \end{bmatrix}$
250	symmetry	$\begin{bmatrix} 0 & -\frac{\sqrt{2}i}{4} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{2}i}{4} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ -\frac{3i}{10} & 0 & 0 & 0 & 0 & 0 & \frac{i}{10} & 0 & 0 & 0 \\ 0 & -\frac{i}{10} & 0 & 0 & 0 & 0 & \frac{\sqrt{6}i}{20} & 0 & 0 & 0 \\ 0 & 0 & \frac{i}{10} & 0 & 0 & 0 & 0 & \frac{\sqrt{6}i}{20} & 0 & 0 \\ 0 & 0 & 0 & \frac{3i}{10} & 0 & 0 & 0 & 0 & \frac{i}{10} & 0 \end{bmatrix}$
251	symmetry	$\begin{bmatrix} 0 & \frac{\sqrt{5}}{10} & 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{30} & 0 & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{5}}{10} & 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{30} & 0 & 0 \\ -\frac{\sqrt{10}}{20} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}}{10} & 0 & 0 & 0 \\ 0 & \frac{\sqrt{10}}{20} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{30} & 0 & 0 \\ 0 & 0 & \frac{\sqrt{10}}{20} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{30} & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{10}}{20} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}}{10} \end{bmatrix}$
252	symmetry	$\begin{bmatrix} 0 & 0 & 0 & \frac{\sqrt{5}}{10} & \frac{1}{6} & 0 & 0 & 0 & \frac{\sqrt{5}}{30} & 0 \\ -\frac{\sqrt{5}}{10} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{5}}{30} & 0 & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{10}}{20} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{30} & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{10}}{20} & -\frac{\sqrt{2}}{6} & 0 & 0 & 0 & \frac{\sqrt{10}}{15} & 0 \\ -\frac{\sqrt{10}}{20} & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}}{15} & 0 & 0 & 0 & \frac{\sqrt{2}}{6} \\ 0 & -\frac{\sqrt{10}}{20} & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{30} & 0 & 0 & 0 \end{bmatrix}$
253	symmetry	$\sqrt{3}yz$

continued ...

Table 6

No.	multipole	matrix
		$\begin{bmatrix} -\frac{\sqrt{5}i}{20} & 0 & -\frac{\sqrt{15}i}{20} & 0 & 0 & -\frac{\sqrt{5}i}{15} & 0 & -\frac{\sqrt{10}i}{30} & 0 & 0 \\ 0 & \frac{\sqrt{15}i}{20} & 0 & \frac{\sqrt{5}i}{20} & 0 & 0 & -\frac{\sqrt{10}i}{30} & 0 & -\frac{\sqrt{5}i}{15} & 0 \\ 0 & \frac{\sqrt{10}i}{20} & 0 & 0 & -\frac{\sqrt{6}i}{12} & 0 & -\frac{\sqrt{15}i}{20} & 0 & 0 & 0 \\ -\frac{\sqrt{10}i}{20} & 0 & 0 & 0 & 0 & \frac{\sqrt{10}i}{60} & 0 & -\frac{\sqrt{5}i}{12} & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{10}i}{20} & 0 & 0 & \frac{\sqrt{5}i}{12} & 0 & -\frac{\sqrt{10}i}{60} & 0 \\ 0 & 0 & \frac{\sqrt{10}i}{20} & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{20} & 0 & \frac{\sqrt{6}i}{12} \end{bmatrix}$
254	symmetry	$\sqrt{3}xz$
		$\begin{bmatrix} -\frac{\sqrt{5}}{20} & 0 & \frac{\sqrt{15}}{20} & 0 & 0 & -\frac{\sqrt{5}}{15} & 0 & \frac{\sqrt{10}}{30} & 0 & 0 \\ 0 & \frac{\sqrt{15}}{20} & 0 & -\frac{\sqrt{5}}{20} & 0 & 0 & -\frac{\sqrt{10}}{30} & 0 & \frac{\sqrt{5}}{15} & 0 \\ 0 & -\frac{\sqrt{10}}{20} & 0 & 0 & -\frac{\sqrt{6}}{12} & 0 & \frac{\sqrt{15}}{20} & 0 & 0 & 0 \\ -\frac{\sqrt{10}}{20} & 0 & 0 & 0 & 0 & \frac{\sqrt{10}}{60} & 0 & \frac{\sqrt{5}}{12} & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{10}}{20} & 0 & 0 & \frac{\sqrt{5}}{12} & 0 & \frac{\sqrt{10}}{60} & 0 \\ 0 & 0 & \frac{\sqrt{10}}{20} & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{20} & 0 & -\frac{\sqrt{6}}{12} \end{bmatrix}$
255	symmetry	$\sqrt{3}xy$
		$\begin{bmatrix} 0 & 0 & 0 & -\frac{\sqrt{5}i}{10} & \frac{i}{6} & 0 & 0 & 0 & -\frac{\sqrt{5}i}{30} & 0 \\ -\frac{\sqrt{5}i}{10} & 0 & 0 & 0 & 0 & \frac{\sqrt{5}i}{30} & 0 & 0 & 0 & -\frac{i}{6} \\ 0 & 0 & \frac{\sqrt{10}i}{20} & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{30} & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{10}i}{20} & -\frac{\sqrt{2}i}{6} & 0 & 0 & 0 & -\frac{\sqrt{10}i}{15} & 0 \\ -\frac{\sqrt{10}i}{20} & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}i}{15} & 0 & 0 & 0 & -\frac{\sqrt{2}i}{6} \\ 0 & -\frac{\sqrt{10}i}{20} & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{30} & 0 & 0 & 0 \end{bmatrix}$
256	symmetry	$-\frac{x^2}{2} - \frac{y^2}{2} + z^2$
		$\begin{bmatrix} 0 & -\frac{\sqrt{2}}{20} & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{5} & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{2}}{20} & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{5} & 0 & 0 \\ \frac{1}{10} & 0 & 0 & 0 & 0 & \frac{3}{10} & 0 & 0 & 0 & 0 \\ 0 & -\frac{1}{10} & 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{20} & 0 & 0 & 0 \\ 0 & 0 & -\frac{1}{10} & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}}{20} & 0 & 0 \\ 0 & 0 & 0 & \frac{1}{10} & 0 & 0 & 0 & 0 & -\frac{3}{10} & 0 \end{bmatrix}$
257	symmetry	$\frac{\sqrt{3}(x-y)(x+y)}{2}$

continued ...

Table 6

No.	multipole	matrix
		$\begin{bmatrix} 0 & 0 & 0 & -\frac{\sqrt{2}}{20} & -\frac{\sqrt{10}}{10} & 0 & 0 & 0 & -\frac{\sqrt{2}}{10} & 0 \\ \frac{\sqrt{2}}{20} & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}}{10} & 0 & 0 & 0 & -\frac{\sqrt{10}}{10} \\ 0 & 0 & \frac{1}{10} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{20} & 0 & 0 \\ 0 & 0 & 0 & \frac{1}{10} & -\frac{\sqrt{5}}{10} & 0 & 0 & 0 & 0 & \frac{1}{5} & 0 \\ \frac{1}{10} & 0 & 0 & 0 & 0 & -\frac{1}{5} & 0 & 0 & 0 & 0 & \frac{\sqrt{5}}{10} \\ 0 & \frac{1}{10} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}}{20} & 0 & 0 & 0 \end{bmatrix}$
258	symmetry	$\sqrt{3}yz$ $\begin{bmatrix} \frac{\sqrt{2}i}{40} & 0 & \frac{\sqrt{6}i}{40} & 0 & 0 & \frac{\sqrt{2}i}{5} & 0 & \frac{i}{5} & 0 & 0 \\ 0 & -\frac{\sqrt{6}i}{40} & 0 & -\frac{\sqrt{2}i}{40} & 0 & 0 & \frac{i}{5} & 0 & \frac{\sqrt{2}i}{5} & 0 \\ 0 & -\frac{i}{10} & 0 & 0 & -\frac{\sqrt{15}i}{20} & 0 & -\frac{3\sqrt{6}i}{40} & 0 & 0 & 0 \\ \frac{i}{10} & 0 & 0 & 0 & 0 & 0 & \frac{i}{20} & 0 & -\frac{\sqrt{2}i}{8} & 0 & 0 \\ 0 & 0 & 0 & \frac{i}{10} & 0 & 0 & 0 & \frac{\sqrt{2}i}{8} & 0 & -\frac{i}{20} & 0 \\ 0 & 0 & -\frac{i}{10} & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{6}i}{40} & 0 & \frac{\sqrt{15}i}{20} \end{bmatrix}$
259	symmetry	$\sqrt{3}xz$ $\begin{bmatrix} \frac{\sqrt{2}}{40} & 0 & -\frac{\sqrt{6}}{40} & 0 & 0 & \frac{\sqrt{2}}{5} & 0 & -\frac{1}{5} & 0 & 0 \\ 0 & -\frac{\sqrt{6}}{40} & 0 & \frac{\sqrt{2}}{40} & 0 & 0 & \frac{1}{5} & 0 & -\frac{\sqrt{2}}{5} & 0 \\ 0 & \frac{1}{10} & 0 & 0 & -\frac{\sqrt{15}}{20} & 0 & \frac{3\sqrt{6}}{40} & 0 & 0 & 0 \\ \frac{1}{10} & 0 & 0 & 0 & 0 & 0 & \frac{1}{20} & 0 & \frac{\sqrt{2}}{8} & 0 & 0 \\ 0 & 0 & 0 & -\frac{1}{10} & 0 & 0 & \frac{\sqrt{2}}{8} & 0 & \frac{1}{20} & 0 & 0 \\ 0 & 0 & -\frac{1}{10} & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{6}}{40} & 0 & -\frac{\sqrt{15}}{20} \end{bmatrix}$
260	symmetry	$\sqrt{3}xy$ $\begin{bmatrix} 0 & 0 & 0 & \frac{\sqrt{2}i}{20} & -\frac{\sqrt{10}i}{10} & 0 & 0 & 0 & \frac{\sqrt{2}i}{10} & 0 \\ \frac{\sqrt{2}i}{20} & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}i}{10} & 0 & 0 & 0 & \frac{\sqrt{10}i}{10} \\ 0 & 0 & -\frac{i}{10} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{20} & 0 & 0 \\ 0 & 0 & 0 & -\frac{i}{10} & -\frac{\sqrt{5}i}{10} & 0 & 0 & 0 & 0 & -\frac{i}{5} & 0 \\ \frac{i}{10} & 0 & 0 & 0 & 0 & -\frac{i}{5} & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{10} \\ 0 & \frac{i}{10} & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{20} & 0 & 0 & 0 & 0 \end{bmatrix}$
261	symmetry	$\frac{\sqrt{21}(x^4 - 3x^2y^2 - 3x^2z^2 + y^4 - 3y^2z^2 + z^4)}{6}$

continued ...

Table 6

No.	multipole	matrix
		$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{12} & 0 & 0 & 0 & -\frac{\sqrt{15}}{12} \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2}}{4} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}}{4} & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{12} & 0 & 0 & 0 & \frac{\sqrt{3}}{12} & 0 \end{bmatrix}$
262	symmetry	$-\frac{\sqrt{15}(x^4 - 12x^2y^2 + 6x^2z^2 + y^4 + 6y^2z^2 - 2z^4)}{12}$
		$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{105}}{84} & 0 & 0 & 0 & \frac{\sqrt{21}}{12} \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{70}}{28} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}}{28} & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{21}}{12} & 0 & 0 & 0 & \frac{\sqrt{105}}{84} & 0 \end{bmatrix}$
263	symmetry	$\frac{\sqrt{5}(x-y)(x+y)(x^2+y^2-6z^2)}{4}$
		$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{70}}{28} & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{21}}{28} & 0 & 0 & 0 & -\frac{\sqrt{105}}{28} & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{105}}{28} & 0 & 0 & 0 & \frac{\sqrt{21}}{28} \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}}{28} & 0 & 0 & 0 \end{bmatrix}$
264	symmetry	$\frac{\sqrt{35}yz(y-z)(y+z)}{2}$
		$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{i}{16} & 0 & -\frac{\sqrt{10}i}{16} & 0 & -\frac{\sqrt{5}i}{16} & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{16} & 0 & \frac{\sqrt{30}i}{16} & 0 & \frac{\sqrt{3}i}{16} \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{16} & 0 & -\frac{\sqrt{30}i}{16} & 0 & -\frac{\sqrt{15}i}{16} & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{5}i}{16} & 0 & \frac{\sqrt{10}i}{16} & 0 & \frac{i}{16} \end{bmatrix}$
265	symmetry	$-\frac{\sqrt{35}xz(x-z)(x+z)}{2}$

continued ...

Table 6

No.	multipole	matrix
		$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{1}{16} & 0 & -\frac{\sqrt{10}}{16} & 0 & \frac{\sqrt{5}}{16} & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{16} & 0 & \frac{\sqrt{30}}{16} & 0 & -\frac{\sqrt{3}}{16} \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{16} & 0 & \frac{\sqrt{30}}{16} & 0 & -\frac{\sqrt{15}}{16} & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{5}}{16} & 0 & -\frac{\sqrt{10}}{16} & 0 & \frac{1}{16} \end{bmatrix}$
266	symmetry	$\frac{\sqrt{35}xy(x-y)(x+y)}{2}$ $\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{i}{2} \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{i}{2} & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
267	symmetry	$\frac{\sqrt{5}yz(6x^2-y^2-z^2)}{2}$ $\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{7}i}{112} & 0 & -\frac{\sqrt{70}i}{112} & 0 & \frac{\sqrt{35}i}{16} & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{105}i}{112} & 0 & \frac{\sqrt{210}i}{112} & 0 & -\frac{\sqrt{21}i}{16} \\ 0 & 0 & 0 & 0 & \frac{\sqrt{21}i}{16} & 0 & -\frac{\sqrt{210}i}{112} & 0 & -\frac{\sqrt{105}i}{112} & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{35}i}{16} & 0 & \frac{\sqrt{70}i}{112} & 0 & \frac{\sqrt{7}i}{112} \end{bmatrix}$
268	symmetry	$-\frac{\sqrt{5}xz(x^2-6y^2+z^2)}{2}$ $\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{7}}{112} & 0 & \frac{\sqrt{70}}{112} & 0 & \frac{\sqrt{35}}{16} & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{105}}{112} & 0 & -\frac{\sqrt{210}}{112} & 0 & -\frac{\sqrt{21}}{16} \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{21}}{16} & 0 & -\frac{\sqrt{210}}{112} & 0 & \frac{\sqrt{105}}{112} & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{35}}{16} & 0 & \frac{\sqrt{70}}{112} & 0 & -\frac{\sqrt{7}}{112} \end{bmatrix}$
269	symmetry	$-\frac{\sqrt{5}xy(x^2+y^2-6z^2)}{2}$

continued ...

Table 6

No.	multipole	matrix
	$\mathbb{M}_{4,2}^{(1,-1;a)}(T_u, 2)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{70}i}{28} & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{21}i}{28} & 0 & 0 & 0 & -\frac{\sqrt{105}i}{28} & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{105}i}{28} & 0 & 0 & 0 & \frac{\sqrt{21}i}{28} \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{70}i}{28} & 0 & 0 & 0 \end{bmatrix}$
270	symmetry	$-\frac{x^2}{2} - \frac{y^2}{2} + z^2$
	$\mathbb{M}_{2,0}^{(1,0;a)}(E_u)$	$\begin{bmatrix} 0 & -\frac{\sqrt{30}}{60} & 0 & 0 & 0 & 0 & \frac{2\sqrt{5}}{15} & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{30}}{60} & 0 & 0 & 0 & 0 & \frac{2\sqrt{5}}{15} & 0 & 0 \\ \frac{\sqrt{15}}{15} & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{30} & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{15}}{15} & 0 & 0 & 0 & 0 & \frac{\sqrt{10}}{60} & 0 & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{15}}{15} & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}}{60} & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{15}}{15} & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{30} & 0 \end{bmatrix}$
271	symmetry	$\frac{\sqrt{3}(x-y)(x+y)}{2}$
	$\mathbb{M}_{2,1}^{(1,0;a)}(E_u)$	$\begin{bmatrix} 0 & 0 & 0 & -\frac{\sqrt{30}}{60} & \frac{\sqrt{6}}{9} & 0 & 0 & 0 & \frac{\sqrt{30}}{45} & 0 \\ \frac{\sqrt{30}}{60} & 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{45} & 0 & 0 & 0 & \frac{\sqrt{6}}{9} \\ 0 & 0 & \frac{\sqrt{15}}{15} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}}{60} & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{15}}{15} & -\frac{\sqrt{3}}{18} & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{45} & 0 \\ \frac{\sqrt{15}}{15} & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{45} & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{18} \\ 0 & \frac{\sqrt{15}}{15} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}}{60} & 0 & 0 & 0 \end{bmatrix}$
272	symmetry	$\sqrt{3}yz$
	$\mathbb{M}_{2,0}^{(1,0;a)}(T_u)$	$\begin{bmatrix} \frac{\sqrt{30}i}{120} & 0 & \frac{\sqrt{10}i}{40} & 0 & 0 & -\frac{2\sqrt{30}i}{45} & 0 & -\frac{2\sqrt{15}i}{45} & 0 & 0 \\ 0 & -\frac{\sqrt{10}i}{40} & 0 & -\frac{\sqrt{30}i}{120} & 0 & 0 & -\frac{2\sqrt{15}i}{45} & 0 & -\frac{2\sqrt{30}i}{45} & 0 \\ 0 & -\frac{\sqrt{15}i}{15} & 0 & 0 & -\frac{i}{12} & 0 & -\frac{\sqrt{10}i}{40} & 0 & 0 & 0 \\ \frac{\sqrt{15}i}{15} & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{180} & 0 & -\frac{\sqrt{30}i}{72} & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{15}i}{15} & 0 & 0 & \frac{\sqrt{30}i}{72} & 0 & -\frac{\sqrt{15}i}{180} & 0 \\ 0 & 0 & -\frac{\sqrt{15}i}{15} & 0 & 0 & 0 & 0 & \frac{\sqrt{10}i}{40} & 0 & \frac{i}{12} \end{bmatrix}$
273	symmetry	$\sqrt{3}xz$

continued ...

Table 6

No.	multipole	matrix
	$\mathbb{M}_{2,1}^{(1,0;a)}(T_u)$	$\begin{bmatrix} \frac{\sqrt{30}}{120} & 0 & -\frac{\sqrt{10}}{40} & 0 & 0 & -\frac{2\sqrt{30}}{45} & 0 & \frac{2\sqrt{15}}{45} & 0 & 0 \\ 0 & -\frac{\sqrt{10}}{40} & 0 & \frac{\sqrt{30}}{120} & 0 & 0 & -\frac{2\sqrt{15}}{45} & 0 & \frac{2\sqrt{30}}{45} & 0 \\ 0 & \frac{\sqrt{15}}{15} & 0 & 0 & -\frac{1}{12} & 0 & \frac{\sqrt{10}}{40} & 0 & 0 & 0 \\ \frac{\sqrt{15}}{15} & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{180} & 0 & \frac{\sqrt{30}}{72} & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{15}}{15} & 0 & 0 & \frac{\sqrt{30}}{72} & 0 & \frac{\sqrt{15}}{180} & 0 \\ 0 & 0 & -\frac{\sqrt{15}}{15} & 0 & 0 & 0 & 0 & \frac{\sqrt{10}}{40} & 0 & -\frac{1}{12} \end{bmatrix}$
274	symmetry	$\sqrt{3}xy$
	$\mathbb{M}_{2,2}^{(1,0;a)}(T_u)$	$\begin{bmatrix} 0 & 0 & 0 & \frac{\sqrt{30}i}{60} & \frac{\sqrt{6}i}{9} & 0 & 0 & 0 & -\frac{\sqrt{30}i}{45} & 0 \\ \frac{\sqrt{30}i}{60} & 0 & 0 & 0 & 0 & \frac{\sqrt{30}i}{45} & 0 & 0 & 0 & -\frac{\sqrt{6}i}{9} \\ 0 & 0 & -\frac{\sqrt{15}i}{15} & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}i}{60} & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{15}i}{15} & -\frac{\sqrt{3}i}{18} & 0 & 0 & 0 & -\frac{\sqrt{15}i}{45} & 0 \\ \frac{\sqrt{15}i}{15} & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{45} & 0 & 0 & 0 & -\frac{\sqrt{3}i}{18} \\ 0 & \frac{\sqrt{15}i}{15} & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}i}{60} & 0 & 0 & 0 \end{bmatrix}$
275	symmetry	1
	$\mathbb{M}_0^{(1,1;a)}(A_u)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ -\frac{\sqrt{2}}{4} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{2}}{4} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{2}}{4} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{2}}{4} & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
276	symmetry	$-\frac{x^2}{2} - \frac{y^2}{2} + z^2$
	$\mathbb{M}_{2,0}^{(1,1;a)}(E_u)$	$\begin{bmatrix} 0 & \frac{\sqrt{42}}{15} & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}}{30} & 0 & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{42}}{15} & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}}{30} & 0 & 0 \\ \frac{\sqrt{21}}{30} & 0 & 0 & 0 & 0 & -\frac{2\sqrt{21}}{105} & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{21}}{30} & 0 & 0 & 0 & 0 & -\frac{\sqrt{14}}{105} & 0 & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{21}}{30} & 0 & 0 & 0 & 0 & \frac{\sqrt{14}}{105} & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{21}}{30} & 0 & 0 & 0 & 0 & \frac{2\sqrt{21}}{105} & 0 \end{bmatrix}$
277	symmetry	$\frac{\sqrt{3}(x-y)(x+y)}{2}$

continued ...

Table 6

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

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	$-\frac{x^2}{2} - \frac{y^2}{2} + z^2$ $\begin{bmatrix} 0 & 0 & \frac{\sqrt{3}}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{3}}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{1}{7} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}}{14} & 0 & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{6}}{42} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{2}}{14} & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{6}}{42} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{2}}{14} & 0 \\ 0 & 0 & 0 & 0 & \frac{1}{7} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}}{14} \\ \end{bmatrix}$
282	symmetry	$\frac{\sqrt{3}(x-y)(x+y)}{2}$ $\begin{bmatrix} \frac{\sqrt{10}}{12} & 0 & 0 & 0 & \frac{\sqrt{2}}{12} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{2}}{12} & 0 & 0 & 0 & \frac{\sqrt{10}}{12} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{6}}{42} & 0 & 0 & \frac{\sqrt{70}}{28} & 0 & 0 & 0 & \frac{\sqrt{2}}{28} & 0 \\ \frac{\sqrt{5}}{21} & 0 & 0 & 0 & -\frac{2}{21} & 0 & 0 & \frac{\sqrt{30}}{28} & 0 & 0 & 0 & \frac{\sqrt{10}}{28} \\ 0 & \frac{2}{21} & 0 & 0 & 0 & -\frac{\sqrt{5}}{21} & 0 & 0 & \frac{\sqrt{10}}{28} & 0 & 0 & \frac{\sqrt{30}}{28} \\ 0 & 0 & \frac{\sqrt{6}}{42} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2}}{28} & 0 & 0 & \frac{\sqrt{70}}{28} \\ \end{bmatrix}$
283	symmetry	$\sqrt{3}yz$ $\begin{bmatrix} 0 & -\frac{\sqrt{2}i}{6} & 0 & -\frac{i}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{i}{6} & 0 & -\frac{\sqrt{2}i}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ \frac{\sqrt{15}i}{42} & 0 & \frac{\sqrt{6}i}{28} & 0 & 0 & 0 & -\frac{\sqrt{10}i}{14} & 0 & -\frac{\sqrt{2}i}{14} & 0 & 0 & 0 \\ 0 & -\frac{i}{42} & 0 & \frac{5\sqrt{2}i}{84} & 0 & 0 & 0 & -\frac{\sqrt{10}i}{14} & 0 & -\frac{\sqrt{6}i}{14} & 0 & 0 \\ 0 & 0 & -\frac{5\sqrt{2}i}{84} & 0 & \frac{i}{42} & 0 & 0 & 0 & -\frac{\sqrt{6}i}{14} & 0 & -\frac{\sqrt{10}i}{14} & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{6}i}{28} & 0 & -\frac{\sqrt{15}i}{42} & 0 & 0 & 0 & -\frac{\sqrt{2}i}{14} & 0 & -\frac{\sqrt{10}i}{14} \\ \end{bmatrix}$
284	symmetry	$\sqrt{3}xz$

continued ...

Table 7

No.	multipole	matrix
	$\mathbb{Q}_{2,1}^{(a)}(T_g)$	$\begin{bmatrix} 0 & -\frac{\sqrt{2}}{6} & 0 & \frac{1}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{1}{6} & 0 & \frac{\sqrt{2}}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ \frac{\sqrt{15}}{42} & 0 & -\frac{\sqrt{6}}{28} & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}}{14} & 0 & \frac{\sqrt{2}}{14} & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{1}{42} & 0 & -\frac{5\sqrt{2}}{84} & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}}{14} & 0 & \frac{\sqrt{6}}{14} & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{5\sqrt{2}}{84} & 0 & -\frac{1}{42} & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}}{14} & 0 & \frac{\sqrt{10}}{14} & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{6}}{28} & 0 & \frac{\sqrt{15}}{42} & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}}{14} & 0 & \frac{\sqrt{10}}{14} & 0 & 0 \end{bmatrix}$
285	symmetry	$\sqrt{3}xy$ $\begin{bmatrix} \frac{\sqrt{10}i}{12} & 0 & 0 & 0 & -\frac{\sqrt{2}i}{12} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{2}i}{12} & 0 & 0 & 0 & -\frac{\sqrt{10}i}{12} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{6}i}{42} & 0 & 0 & \frac{\sqrt{70}i}{28} & 0 & 0 & 0 & -\frac{\sqrt{2}i}{28} & 0 & 0 & 0 & 0 \\ \frac{\sqrt{5}i}{21} & 0 & 0 & 0 & \frac{2i}{21} & 0 & 0 & \frac{\sqrt{30}i}{28} & 0 & 0 & 0 & -\frac{\sqrt{10}i}{28} & 0 & 0 & 0 \\ 0 & \frac{2i}{21} & 0 & 0 & 0 & \frac{\sqrt{5}i}{21} & 0 & 0 & \frac{\sqrt{10}i}{28} & 0 & 0 & 0 & -\frac{\sqrt{30}i}{28} & 0 & 0 \\ 0 & 0 & \frac{\sqrt{6}i}{42} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2}i}{28} & 0 & 0 & 0 & -\frac{\sqrt{70}i}{28} & 0 \end{bmatrix}$
286	symmetry	$\frac{\sqrt{21}(x^4 - 3x^2y^2 - 3x^2z^2 + y^4 - 3y^2z^2 + z^4)}{6}$ $\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}}{12} & 0 & 0 & 0 & -\frac{\sqrt{5}}{12} \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{5}}{12} & 0 & 0 & 0 & \frac{\sqrt{7}}{12} & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{7}}{28} & 0 & 0 & 0 & \frac{\sqrt{35}}{28} & 0 & 0 & 0 & -\frac{\sqrt{70}}{56} & 0 & 0 & 0 & -\frac{\sqrt{210}}{168} & 0 \\ 0 & 0 & -\frac{\sqrt{42}}{28} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{5\sqrt{14}}{168} & 0 & 0 & 0 & -\frac{\sqrt{10}}{24} \\ 0 & 0 & 0 & \frac{\sqrt{42}}{28} & 0 & 0 & -\frac{\sqrt{10}}{24} & 0 & 0 & 0 & \frac{5\sqrt{14}}{168} & 0 & 0 & 0 & 0 \\ -\frac{\sqrt{35}}{28} & 0 & 0 & 0 & -\frac{\sqrt{7}}{28} & 0 & 0 & -\frac{\sqrt{210}}{168} & 0 & 0 & 0 & -\frac{\sqrt{70}}{56} & 0 & 0 & 0 \end{bmatrix}$
287	symmetry	$-\frac{\sqrt{15}(x^4 - 12x^2y^2 + 6x^2z^2 + y^4 + 6y^2z^2 - 2z^4)}{12}$ $\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}}{12} & 0 & 0 & 0 & \frac{\sqrt{7}}{12} \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}}{12} & 0 & 0 & 0 & \frac{\sqrt{5}}{12} & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{5}}{28} & 0 & 0 & 0 & -\frac{1}{4} & 0 & 0 & -\frac{5\sqrt{2}}{56} & 0 & 0 & 0 & \frac{\sqrt{6}}{24} & 0 \\ 0 & 0 & -\frac{\sqrt{30}}{28} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{5\sqrt{10}}{168} & 0 & 0 & 0 & \frac{\sqrt{14}}{24} \\ 0 & 0 & 0 & \frac{\sqrt{30}}{28} & 0 & 0 & \frac{\sqrt{14}}{24} & 0 & 0 & 0 & \frac{5\sqrt{10}}{168} & 0 & 0 & 0 & 0 \\ \frac{1}{4} & 0 & 0 & 0 & -\frac{\sqrt{5}}{28} & 0 & 0 & \frac{\sqrt{6}}{24} & 0 & 0 & 0 & -\frac{5\sqrt{2}}{56} & 0 & 0 & 0 \end{bmatrix}$
288	symmetry	$\frac{\sqrt{5}(x-y)(x+y)(x^2 + y^2 - 6z^2)}{4}$

continued ...

Table 7

No.	multipole	matrix
	$\mathbb{Q}_{4,1}^{(a)}(E_g)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{12} & 0 & 0 & 0 & \frac{1}{4} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{1}{4} & 0 & 0 & 0 & -\frac{\sqrt{3}}{12} & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{30}}{28} & 0 & 0 & \frac{\sqrt{14}}{56} & 0 & 0 & 0 & \frac{3\sqrt{10}}{56} & 0 & 0 & 0 \\ \frac{3}{28} & 0 & 0 & 0 & \frac{3\sqrt{5}}{28} & 0 & 0 & -\frac{11\sqrt{6}}{168} & 0 & 0 & 0 & \frac{\sqrt{2}}{56} & 0 & 0 \\ 0 & -\frac{3\sqrt{5}}{28} & 0 & 0 & 0 & -\frac{3}{28} & 0 & 0 & \frac{\sqrt{2}}{56} & 0 & 0 & 0 & -\frac{11\sqrt{6}}{168} & 0 \\ 0 & 0 & \frac{\sqrt{30}}{28} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{10}}{56} & 0 & 0 & 0 & \frac{\sqrt{14}}{56} \end{bmatrix}$
289	symmetry	$\frac{\sqrt{35}yz(y-z)(y+z)}{2}$ $\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{48} & 0 & -\frac{\sqrt{7}i}{16} & 0 & -\frac{\sqrt{105}i}{48} & 0 & -\frac{\sqrt{21}i}{48} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{21}i}{48} & 0 & \frac{\sqrt{105}i}{48} & 0 & \frac{\sqrt{7}i}{16} & 0 & \frac{\sqrt{3}i}{48} \\ \frac{\sqrt{21}i}{112} & 0 & \frac{\sqrt{210}i}{112} & 0 & \frac{\sqrt{105}i}{112} & 0 & 0 & -\frac{3\sqrt{14}i}{112} & 0 & -\frac{\sqrt{70}i}{56} & 0 & -\frac{\sqrt{42}i}{112} & 0 & 0 \\ 0 & -\frac{3\sqrt{35}i}{112} & 0 & -\frac{3\sqrt{70}i}{112} & 0 & -\frac{3\sqrt{7}i}{112} & \frac{\sqrt{6}i}{48} & 0 & \frac{\sqrt{14}i}{28} & 0 & \frac{\sqrt{210}i}{336} & 0 & -\frac{\sqrt{42}i}{168} & 0 \\ \frac{3\sqrt{7}i}{112} & 0 & \frac{3\sqrt{70}i}{112} & 0 & \frac{3\sqrt{35}i}{112} & 0 & 0 & -\frac{\sqrt{42}i}{168} & 0 & \frac{\sqrt{210}i}{336} & 0 & \frac{\sqrt{14}i}{28} & 0 & \frac{\sqrt{6}i}{48} \\ 0 & -\frac{\sqrt{105}i}{112} & 0 & -\frac{\sqrt{210}i}{112} & 0 & -\frac{\sqrt{21}i}{112} & 0 & 0 & -\frac{\sqrt{42}i}{112} & 0 & -\frac{\sqrt{70}i}{56} & 0 & -\frac{3\sqrt{14}i}{112} & 0 \end{bmatrix}$
290	symmetry	$\frac{-\sqrt{35}xz(x-z)(x+z)}{2}$ $\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{48} & 0 & \frac{\sqrt{7}}{16} & 0 & -\frac{\sqrt{105}}{48} & 0 & \frac{\sqrt{21}}{48} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{21}}{48} & 0 & -\frac{\sqrt{105}}{48} & 0 & \frac{\sqrt{7}}{16} & 0 & -\frac{\sqrt{3}}{48} \\ -\frac{\sqrt{21}}{112} & 0 & \frac{\sqrt{210}}{112} & 0 & -\frac{\sqrt{105}}{112} & 0 & 0 & 0 & \frac{3\sqrt{14}}{112} & 0 & -\frac{\sqrt{70}}{56} & 0 & \frac{\sqrt{42}}{112} & 0 & 0 \\ 0 & \frac{3\sqrt{35}}{112} & 0 & -\frac{3\sqrt{70}}{112} & 0 & \frac{3\sqrt{7}}{112} & \frac{\sqrt{6}}{48} & 0 & -\frac{\sqrt{14}}{28} & 0 & \frac{\sqrt{210}}{336} & 0 & \frac{\sqrt{42}}{168} & 0 & 0 \\ \frac{3\sqrt{7}}{112} & 0 & -\frac{3\sqrt{70}}{112} & 0 & \frac{3\sqrt{35}}{112} & 0 & 0 & -\frac{\sqrt{42}}{168} & 0 & -\frac{\sqrt{210}}{336} & 0 & \frac{\sqrt{14}}{28} & 0 & -\frac{\sqrt{6}}{48} \\ 0 & -\frac{\sqrt{105}}{112} & 0 & \frac{\sqrt{210}}{112} & 0 & -\frac{\sqrt{21}}{112} & 0 & 0 & -\frac{\sqrt{42}}{112} & 0 & \frac{\sqrt{70}}{56} & 0 & -\frac{3\sqrt{14}}{112} & 0 \end{bmatrix}$
291	symmetry	$\frac{\sqrt{35}xy(x-y)(x+y)}{2}$ $\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{6} \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{21}i}{14} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{14}i}{28} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}i}{12} \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{12} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ -\frac{\sqrt{21}i}{14} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{14}i}{28} & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
292	symmetry	$\frac{\sqrt{5}yz(6x^2-y^2-z^2)}{2}$

continued ...

Table 7

No.	multipole	matrix
	$\mathbb{Q}_{4,0}^{(a)}(T_g, 2)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{21}i}{48} & 0 & -\frac{i}{16} & 0 & -\frac{\sqrt{15}i}{48} & 0 & \frac{7\sqrt{3}i}{48} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{7\sqrt{3}i}{48} & 0 & \frac{\sqrt{15}i}{48} & 0 & \frac{i}{16} & 0 & -\frac{\sqrt{21}i}{48} \\ \frac{\sqrt{3}i}{112} & 0 & \frac{\sqrt{30}i}{112} & 0 & -\frac{\sqrt{15}i}{16} & 0 & 0 & -\frac{3\sqrt{2}i}{112} & 0 & -\frac{\sqrt{10}i}{56} & 0 & \frac{\sqrt{6}i}{16} & 0 & 0 \\ 0 & -\frac{3\sqrt{5}i}{112} & 0 & -\frac{3\sqrt{10}i}{112} & 0 & \frac{3i}{16} & -\frac{\sqrt{42}i}{48} & 0 & \frac{\sqrt{2}i}{28} & 0 & \frac{\sqrt{30}i}{336} & 0 & \frac{\sqrt{6}i}{24} & 0 \\ -\frac{3i}{16} & 0 & \frac{3\sqrt{10}i}{112} & 0 & \frac{3\sqrt{5}i}{112} & 0 & 0 & \frac{\sqrt{6}i}{24} & 0 & \frac{\sqrt{30}i}{336} & 0 & \frac{\sqrt{2}i}{28} & 0 & -\frac{\sqrt{42}i}{48} \\ 0 & \frac{\sqrt{15}i}{16} & 0 & -\frac{\sqrt{30}i}{112} & 0 & -\frac{\sqrt{3}i}{112} & 0 & 0 & \frac{\sqrt{6}i}{16} & 0 & -\frac{\sqrt{10}i}{56} & 0 & -\frac{3\sqrt{2}i}{112} & 0 \end{bmatrix}$
293	symmetry	$-\frac{\sqrt{5}xz(x^2-6y^2+z^2)}{2}$
	$\mathbb{Q}_{4,1}^{(a)}(T_g, 2)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{21}}{48} & 0 & -\frac{1}{16} & 0 & \frac{\sqrt{15}}{48} & 0 & \frac{7\sqrt{3}}{48} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{7\sqrt{3}}{48} & 0 & \frac{\sqrt{15}}{48} & 0 & -\frac{1}{16} & 0 & -\frac{\sqrt{21}}{48} \\ \frac{\sqrt{3}}{112} & 0 & -\frac{\sqrt{30}}{112} & 0 & -\frac{\sqrt{15}}{16} & 0 & 0 & -\frac{3\sqrt{2}}{112} & 0 & \frac{\sqrt{10}}{56} & 0 & \frac{\sqrt{6}}{16} & 0 & 0 \\ 0 & -\frac{3\sqrt{5}}{112} & 0 & \frac{3\sqrt{10}}{112} & 0 & \frac{3}{16} & \frac{\sqrt{42}}{48} & 0 & \frac{\sqrt{2}}{28} & 0 & -\frac{\sqrt{30}}{336} & 0 & \frac{\sqrt{6}}{24} & 0 \\ \frac{3}{16} & 0 & \frac{3\sqrt{10}}{112} & 0 & -\frac{3\sqrt{5}}{112} & 0 & 0 & -\frac{\sqrt{6}}{24} & 0 & \frac{\sqrt{30}}{336} & 0 & -\frac{\sqrt{2}}{28} & 0 & -\frac{\sqrt{42}}{48} \\ 0 & -\frac{\sqrt{15}}{16} & 0 & -\frac{\sqrt{30}}{112} & 0 & \frac{\sqrt{3}}{112} & 0 & 0 & -\frac{\sqrt{6}}{16} & 0 & -\frac{\sqrt{10}}{56} & 0 & \frac{3\sqrt{2}}{112} & 0 \end{bmatrix}$
294	symmetry	$-\frac{\sqrt{5}xy(x^2+y^2-6z^2)}{2}$
	$\mathbb{Q}_{4,2}^{(a)}(T_g, 2)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{12} & 0 & 0 & 0 & \frac{i}{4} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{i}{4} & 0 & 0 & 0 & -\frac{\sqrt{3}i}{12} & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{30}i}{28} & 0 & 0 & -\frac{\sqrt{14}i}{56} & 0 & 0 & 0 & \frac{3\sqrt{10}i}{56} & 0 & 0 & 0 \\ -\frac{3i}{28} & 0 & 0 & 0 & \frac{3\sqrt{5}i}{28} & 0 & 0 & \frac{11\sqrt{6}i}{168} & 0 & 0 & 0 & \frac{\sqrt{2}i}{56} & 0 & 0 \\ 0 & \frac{3\sqrt{5}i}{28} & 0 & 0 & 0 & -\frac{3i}{28} & 0 & 0 & -\frac{\sqrt{2}i}{56} & 0 & 0 & 0 & -\frac{11\sqrt{6}i}{168} & 0 \\ 0 & 0 & -\frac{\sqrt{30}i}{28} & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{10}i}{56} & 0 & 0 & 0 & \frac{\sqrt{14}i}{56} & 0 \end{bmatrix}$
295	symmetry	$\frac{\sqrt{21}(x^4-3x^2y^2-3x^2z^2+y^4-3y^2z^2+z^4)}{6}$
	$\mathbb{Q}_4^{(1,-1;a)}(A_g)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{21}}{24} & 0 & 0 & 0 & -\frac{\sqrt{15}}{24} \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{24} & 0 & 0 & 0 & \frac{\sqrt{21}}{24} & 0 & 0 & 0 \\ 0 & \frac{\sqrt{21}}{168} & 0 & 0 & 0 & \frac{\sqrt{105}}{168} & 0 & 0 & \frac{\sqrt{210}}{56} & 0 & 0 & 0 & \frac{\sqrt{70}}{56} & 0 \\ 0 & 0 & -\frac{\sqrt{14}}{56} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{5\sqrt{42}}{168} & 0 & 0 & 0 & \frac{\sqrt{30}}{24} \\ 0 & 0 & 0 & \frac{\sqrt{14}}{56} & 0 & 0 & \frac{\sqrt{30}}{24} & 0 & 0 & 0 & -\frac{5\sqrt{42}}{168} & 0 & 0 & 0 \\ -\frac{\sqrt{105}}{168} & 0 & 0 & 0 & -\frac{\sqrt{21}}{168} & 0 & 0 & \frac{\sqrt{70}}{56} & 0 & 0 & 0 & \frac{\sqrt{210}}{56} & 0 & 0 \end{bmatrix}$
296	symmetry	$-\frac{\sqrt{15}(x^4-12x^2y^2+6x^2z^2+y^4+6y^2z^2-2z^4)}{12}$

continued ...

Table 7

No.	multipole	matrix
	$\mathbb{Q}_{4,0}^{(1,-1;a)}(E_g)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{24} & 0 & 0 & 0 & \frac{\sqrt{21}}{24} \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{21}}{24} & 0 & 0 & 0 & \frac{\sqrt{15}}{24} & 0 & 0 & 0 \\ 0 & \frac{\sqrt{15}}{168} & 0 & 0 & 0 & -\frac{\sqrt{3}}{24} & 0 & 0 & \frac{5\sqrt{6}}{56} & 0 & 0 & 0 & -\frac{\sqrt{2}}{8} & 0 \\ 0 & 0 & -\frac{\sqrt{10}}{56} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{5\sqrt{30}}{168} & 0 & 0 & 0 & -\frac{\sqrt{42}}{24} \\ 0 & 0 & 0 & \frac{\sqrt{10}}{56} & 0 & 0 & -\frac{\sqrt{42}}{24} & 0 & 0 & 0 & -\frac{5\sqrt{30}}{168} & 0 & 0 & 0 \\ \frac{\sqrt{3}}{24} & 0 & 0 & 0 & -\frac{\sqrt{15}}{168} & 0 & 0 & -\frac{\sqrt{2}}{8} & 0 & 0 & 0 & \frac{5\sqrt{6}}{56} & 0 & 0 \end{bmatrix}$
297	symmetry	$\frac{\sqrt{5}(x-y)(x+y)(x^2+y^2-6z^2)}{4}$ $\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{1}{8} & 0 & 0 & 0 & \frac{\sqrt{3}}{8} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{8} & 0 & 0 & 0 & -\frac{1}{8} & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{10}}{56} & 0 & 0 & -\frac{\sqrt{42}}{56} & 0 & 0 & 0 & -\frac{3\sqrt{30}}{56} & 0 & 0 & 0 \\ \frac{\sqrt{3}}{56} & 0 & 0 & 0 & \frac{\sqrt{15}}{56} & 0 & 0 & \frac{11\sqrt{2}}{56} & 0 & 0 & 0 & -\frac{\sqrt{6}}{56} & 0 & 0 \\ 0 & -\frac{\sqrt{15}}{56} & 0 & 0 & 0 & -\frac{\sqrt{3}}{56} & 0 & 0 & -\frac{\sqrt{6}}{56} & 0 & 0 & 0 & \frac{11\sqrt{2}}{56} & 0 \\ 0 & 0 & \frac{\sqrt{10}}{56} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{30}}{56} & 0 & 0 & 0 & -\frac{\sqrt{42}}{56} \end{bmatrix}$
298	symmetry	$\frac{\sqrt{35}yz(y-z)(y+z)}{2}$ $\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & -\frac{i}{32} & 0 & -\frac{\sqrt{21}i}{32} & 0 & -\frac{\sqrt{35}i}{32} & 0 & -\frac{\sqrt{7}i}{32} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}i}{32} & 0 & \frac{\sqrt{35}i}{32} & 0 & \frac{\sqrt{21}i}{32} & 0 & \frac{i}{32} \\ \frac{\sqrt{7}i}{224} & 0 & \frac{\sqrt{70}i}{224} & 0 & \frac{\sqrt{35}i}{224} & 0 & 0 & \frac{3\sqrt{42}i}{112} & 0 & \frac{\sqrt{210}i}{56} & 0 & \frac{3\sqrt{14}i}{112} & 0 & 0 \\ 0 & -\frac{\sqrt{105}i}{224} & 0 & -\frac{\sqrt{210}i}{224} & 0 & -\frac{\sqrt{21}i}{224} & -\frac{\sqrt{2}i}{16} & 0 & -\frac{\sqrt{42}i}{28} & 0 & -\frac{\sqrt{70}i}{112} & 0 & \frac{\sqrt{14}i}{56} & 0 \\ \frac{\sqrt{21}i}{224} & 0 & \frac{\sqrt{210}i}{224} & 0 & \frac{\sqrt{105}i}{224} & 0 & 0 & \frac{\sqrt{14}i}{56} & 0 & -\frac{\sqrt{70}i}{112} & 0 & -\frac{\sqrt{42}i}{28} & 0 & -\frac{\sqrt{2}i}{16} \\ 0 & -\frac{\sqrt{35}i}{224} & 0 & -\frac{\sqrt{70}i}{224} & 0 & -\frac{\sqrt{7}i}{224} & 0 & 0 & \frac{3\sqrt{14}i}{112} & 0 & \frac{\sqrt{210}i}{56} & 0 & \frac{3\sqrt{42}i}{112} & 0 \end{bmatrix}$
299	symmetry	$-\frac{\sqrt{35}xz(x-z)(x+z)}{2}$ $\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & -\frac{1}{32} & 0 & \frac{\sqrt{21}}{32} & 0 & -\frac{\sqrt{35}}{32} & 0 & \frac{\sqrt{7}}{32} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}}{32} & 0 & -\frac{\sqrt{35}}{32} & 0 & \frac{\sqrt{21}}{32} & 0 & -\frac{1}{32} \\ -\frac{\sqrt{7}}{224} & 0 & \frac{\sqrt{70}}{224} & 0 & -\frac{\sqrt{35}}{224} & 0 & 0 & -\frac{3\sqrt{42}}{112} & 0 & \frac{\sqrt{210}}{56} & 0 & -\frac{3\sqrt{14}}{112} & 0 & 0 \\ 0 & \frac{\sqrt{105}}{224} & 0 & -\frac{\sqrt{210}}{224} & 0 & \frac{\sqrt{21}}{224} & -\frac{\sqrt{2}}{16} & 0 & \frac{\sqrt{42}}{28} & 0 & -\frac{\sqrt{70}}{112} & 0 & -\frac{\sqrt{14}}{56} & 0 \\ \frac{\sqrt{21}}{224} & 0 & -\frac{\sqrt{210}}{224} & 0 & \frac{\sqrt{105}}{224} & 0 & 0 & \frac{\sqrt{14}}{56} & 0 & \frac{\sqrt{70}}{112} & 0 & -\frac{\sqrt{42}}{28} & 0 & \frac{\sqrt{2}}{16} \\ 0 & -\frac{\sqrt{35}}{224} & 0 & \frac{\sqrt{70}}{224} & 0 & -\frac{\sqrt{7}}{224} & 0 & 0 & \frac{3\sqrt{14}}{112} & 0 & -\frac{\sqrt{210}}{56} & 0 & \frac{3\sqrt{42}}{112} & 0 \end{bmatrix}$
300	symmetry	$\frac{\sqrt{35}xy(x-y)(x+y)}{2}$

continued ...

Table 7

No.	multipole	matrix
	$\mathbb{Q}_{4,2}^{(1,-1;a)}(T_g, 1)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{i}{4} \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{i}{4} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}i}{28} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{42}i}{28} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}i}{4} \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2}i}{4} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ -\frac{\sqrt{7}i}{28} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{42}i}{28} & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
301	symmetry	$\frac{\sqrt{5}yz(6x^2-y^2-z^2)}{2}$ $\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}i}{32} & 0 & -\frac{\sqrt{3}i}{32} & 0 & -\frac{\sqrt{5}i}{32} & 0 & \frac{7i}{32} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{7i}{32} & 0 & \frac{\sqrt{5}i}{32} & 0 & \frac{\sqrt{3}i}{32} & 0 & -\frac{\sqrt{7}i}{32} \\ \frac{i}{224} & 0 & \frac{\sqrt{10}i}{224} & 0 & -\frac{\sqrt{5}i}{32} & 0 & 0 & \frac{3\sqrt{6}i}{112} & 0 & \frac{\sqrt{30}i}{56} & 0 & -\frac{3\sqrt{2}i}{16} & 0 & 0 \\ 0 & -\frac{\sqrt{15}i}{224} & 0 & -\frac{\sqrt{30}i}{224} & 0 & \frac{\sqrt{3}i}{32} & \frac{\sqrt{14}i}{16} & 0 & -\frac{\sqrt{6}i}{28} & 0 & -\frac{\sqrt{10}i}{112} & 0 & -\frac{\sqrt{2}i}{8} & 0 \\ -\frac{\sqrt{3}i}{32} & 0 & \frac{\sqrt{30}i}{224} & 0 & \frac{\sqrt{15}i}{224} & 0 & 0 & -\frac{\sqrt{2}i}{8} & 0 & -\frac{\sqrt{10}i}{112} & 0 & -\frac{\sqrt{6}i}{28} & 0 & \frac{\sqrt{14}i}{16} \\ 0 & \frac{\sqrt{5}i}{32} & 0 & -\frac{\sqrt{10}i}{224} & 0 & -\frac{i}{224} & 0 & 0 & -\frac{3\sqrt{2}i}{16} & 0 & \frac{\sqrt{30}i}{56} & 0 & \frac{3\sqrt{6}i}{112} & 0 \end{bmatrix}$
302	symmetry	$-\frac{\sqrt{5}xz(x^2-6y^2+z^2)}{2}$ $\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}}{32} & 0 & -\frac{\sqrt{3}}{32} & 0 & \frac{\sqrt{5}}{32} & 0 & \frac{7}{32} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{7}{32} & 0 & \frac{\sqrt{5}}{32} & 0 & -\frac{\sqrt{3}}{32} & 0 & -\frac{\sqrt{7}}{32} \\ \frac{1}{224} & 0 & -\frac{\sqrt{10}}{224} & 0 & -\frac{\sqrt{5}}{32} & 0 & 0 & \frac{3\sqrt{6}}{112} & 0 & -\frac{\sqrt{30}}{56} & 0 & -\frac{3\sqrt{2}}{16} & 0 & 0 \\ 0 & -\frac{\sqrt{15}}{224} & 0 & \frac{\sqrt{30}}{224} & 0 & \frac{\sqrt{3}}{32} & -\frac{\sqrt{14}}{16} & 0 & -\frac{\sqrt{6}}{28} & 0 & \frac{\sqrt{10}}{112} & 0 & -\frac{\sqrt{2}}{8} & 0 \\ \frac{\sqrt{3}}{32} & 0 & \frac{\sqrt{30}}{224} & 0 & -\frac{\sqrt{15}}{224} & 0 & 0 & \frac{\sqrt{2}}{8} & 0 & -\frac{\sqrt{10}}{112} & 0 & \frac{\sqrt{6}}{28} & 0 & \frac{\sqrt{14}}{16} \\ 0 & -\frac{\sqrt{5}}{32} & 0 & -\frac{\sqrt{10}}{224} & 0 & \frac{1}{224} & 0 & 0 & \frac{3\sqrt{2}}{16} & 0 & \frac{\sqrt{30}}{56} & 0 & -\frac{3\sqrt{6}}{112} & 0 \end{bmatrix}$
303	symmetry	$-\frac{\sqrt{5}xy(x^2+y^2-6z^2)}{2}$ $\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{i}{8} & 0 & 0 & 0 & \frac{\sqrt{3}i}{8} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{8} & 0 & 0 & 0 & -\frac{i}{8} & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{10}i}{56} & 0 & 0 & \frac{\sqrt{42}i}{56} & 0 & 0 & 0 & -\frac{3\sqrt{30}i}{56} & 0 & 0 & 0 \\ -\frac{\sqrt{3}i}{56} & 0 & 0 & 0 & \frac{\sqrt{15}i}{56} & 0 & 0 & -\frac{11\sqrt{2}i}{56} & 0 & 0 & 0 & -\frac{\sqrt{6}i}{56} & 0 & 0 \\ 0 & \frac{\sqrt{15}i}{56} & 0 & 0 & 0 & -\frac{\sqrt{3}i}{56} & 0 & 0 & \frac{\sqrt{6}i}{56} & 0 & 0 & 0 & \frac{11\sqrt{2}i}{56} & 0 \\ 0 & 0 & -\frac{\sqrt{10}i}{56} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{30}i}{56} & 0 & 0 & 0 & -\frac{\sqrt{42}i}{56} \end{bmatrix}$
304	symmetry	$-\frac{x^2}{2} - \frac{y^2}{2} + z^2$

continued ...

Table 7

No.	multipole	matrix
	$\mathbb{Q}_{2,0}^{(1,0;a)}(E_g)$	$\begin{bmatrix} 0 & 0 & -\frac{\sqrt{2}}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{2}}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{5\sqrt{6}}{42} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{21} & 0 & 0 & 0 & 0 \\ 0 & 0 & \frac{5}{42} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{7} & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{5}{42} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{7} & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{5\sqrt{6}}{42} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{21} & 0 & 0 \end{bmatrix}$
305	symmetry	$\frac{\sqrt{3}(x-y)(x+y)}{2}$ $\begin{bmatrix} -\frac{\sqrt{15}}{18} & 0 & 0 & 0 & -\frac{\sqrt{3}}{18} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{3}}{18} & 0 & 0 & 0 & -\frac{\sqrt{15}}{18} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{5}{42} & 0 & 0 & \frac{\sqrt{105}}{42} & 0 & 0 & 0 & \frac{\sqrt{3}}{42} & 0 & 0 \\ -\frac{5\sqrt{30}}{126} & 0 & 0 & 0 & \frac{5\sqrt{6}}{63} & 0 & 0 & \frac{\sqrt{5}}{14} & 0 & 0 & 0 & \frac{\sqrt{15}}{42} & 0 & 0 \\ 0 & -\frac{5\sqrt{6}}{63} & 0 & 0 & 0 & \frac{5\sqrt{30}}{126} & 0 & 0 & \frac{\sqrt{15}}{42} & 0 & 0 & 0 & \frac{\sqrt{5}}{14} & 0 \\ 0 & 0 & -\frac{5}{42} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{42} & 0 & 0 & 0 & \frac{\sqrt{105}}{42} & 0 \end{bmatrix}$
306	symmetry	$\sqrt{3}yz$ $\begin{bmatrix} 0 & \frac{\sqrt{3}i}{9} & 0 & \frac{\sqrt{6}i}{18} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{6}i}{18} & 0 & \frac{\sqrt{3}i}{9} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ -\frac{5\sqrt{10}i}{84} & 0 & -\frac{5i}{28} & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{21} & 0 & -\frac{\sqrt{3}i}{21} & 0 & 0 & 0 \\ 0 & \frac{5\sqrt{6}i}{252} & 0 & -\frac{25\sqrt{3}i}{252} & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{21} & 0 & -\frac{i}{7} & 0 & 0 \\ 0 & 0 & \frac{25\sqrt{3}i}{252} & 0 & -\frac{5\sqrt{6}i}{252} & 0 & 0 & 0 & 0 & -\frac{i}{7} & 0 & -\frac{\sqrt{15}i}{21} & 0 \\ 0 & 0 & 0 & \frac{5i}{28} & 0 & \frac{5\sqrt{10}i}{84} & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{21} & 0 & -\frac{\sqrt{15}i}{21} & 0 \end{bmatrix}$
307	symmetry	$\sqrt{3}xz$ $\begin{bmatrix} 0 & \frac{\sqrt{3}}{9} & 0 & -\frac{\sqrt{6}}{18} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{6}}{18} & 0 & -\frac{\sqrt{3}}{9} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ -\frac{5\sqrt{10}}{84} & 0 & \frac{5}{28} & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{21} & 0 & \frac{\sqrt{3}}{21} & 0 & 0 & 0 \\ 0 & \frac{5\sqrt{6}}{252} & 0 & \frac{25\sqrt{3}}{252} & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{21} & 0 & \frac{1}{7} & 0 & 0 \\ 0 & 0 & \frac{25\sqrt{3}}{252} & 0 & \frac{5\sqrt{6}}{252} & 0 & 0 & 0 & 0 & -\frac{1}{7} & 0 & \frac{\sqrt{15}}{21} & 0 \\ 0 & 0 & 0 & \frac{5}{28} & 0 & -\frac{5\sqrt{10}}{84} & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{21} & 0 & \frac{\sqrt{15}}{21} & 0 \end{bmatrix}$
308	symmetry	$\sqrt{3}xy$

continued ...

Table 7

No.	multipole	matrix
		$\begin{bmatrix} -\frac{\sqrt{15}i}{18} & 0 & 0 & 0 & \frac{\sqrt{3}i}{18} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{3}i}{18} & 0 & 0 & 0 & \frac{\sqrt{15}i}{18} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{5i}{42} & 0 & 0 & \frac{\sqrt{105}i}{42} & 0 & 0 & 0 & -\frac{\sqrt{3}i}{42} & 0 & 0 & 0 & 0 \\ -\frac{5\sqrt{30}i}{126} & 0 & 0 & 0 & -\frac{5\sqrt{6}i}{63} & 0 & 0 & \frac{\sqrt{5}i}{14} & 0 & 0 & 0 & -\frac{\sqrt{15}i}{42} & 0 & 0 & 0 \\ 0 & -\frac{5\sqrt{6}i}{63} & 0 & 0 & 0 & -\frac{5\sqrt{30}i}{126} & 0 & 0 & \frac{\sqrt{15}i}{42} & 0 & 0 & 0 & -\frac{\sqrt{5}i}{14} & 0 & 0 \\ 0 & 0 & -\frac{5i}{42} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{42} & 0 & 0 & 0 & 0 & -\frac{\sqrt{105}i}{42} \end{bmatrix}$
309	symmetry	$\frac{\sqrt{21}(x^4 - 3x^2y^2 - 3x^2z^2 + y^4 - 3y^2z^2 + z^4)}{6}$
		$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{35}}{24} & 0 & 0 & 0 & 0 & -\frac{5}{24} \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{5}{24} & 0 & 0 & 0 & \frac{\sqrt{35}}{24} & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{35}}{56} & 0 & 0 & 0 & -\frac{5\sqrt{7}}{56} & 0 & 0 & -\frac{\sqrt{14}}{56} & 0 & 0 & 0 & -\frac{\sqrt{42}}{168} & 0 & 0 \\ 0 & 0 & \frac{\sqrt{210}}{56} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{70}}{168} & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}}{24} \\ 0 & 0 & 0 & -\frac{\sqrt{210}}{56} & 0 & 0 & -\frac{\sqrt{2}}{24} & 0 & 0 & 0 & \frac{\sqrt{70}}{168} & 0 & 0 & 0 & 0 \\ \frac{5\sqrt{7}}{56} & 0 & 0 & 0 & \frac{\sqrt{35}}{56} & 0 & 0 & -\frac{\sqrt{42}}{168} & 0 & 0 & 0 & -\frac{\sqrt{14}}{56} & 0 & 0 & 0 \end{bmatrix}$
310	symmetry	$-\frac{\sqrt{15}(x^4 - 12x^2y^2 + 6x^2z^2 + y^4 + 6y^2z^2 - 2z^4)}{12}$
		$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{5}{24} & 0 & 0 & 0 & 0 & \frac{\sqrt{35}}{24} \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{35}}{24} & 0 & 0 & 0 & \frac{5}{24} & 0 & 0 & 0 & 0 \\ 0 & -\frac{5}{56} & 0 & 0 & 0 & \frac{\sqrt{5}}{8} & 0 & 0 & -\frac{\sqrt{10}}{56} & 0 & 0 & 0 & \frac{\sqrt{30}}{120} & 0 & 0 \\ 0 & 0 & \frac{5\sqrt{6}}{56} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{5\sqrt{2}}{168} & 0 & 0 & 0 & 0 & \frac{\sqrt{70}}{120} \\ 0 & 0 & 0 & -\frac{5\sqrt{6}}{56} & 0 & 0 & \frac{\sqrt{70}}{120} & 0 & 0 & 0 & \frac{5\sqrt{2}}{168} & 0 & 0 & 0 & 0 \\ -\frac{\sqrt{5}}{8} & 0 & 0 & 0 & \frac{5}{56} & 0 & 0 & \frac{\sqrt{30}}{120} & 0 & 0 & 0 & -\frac{\sqrt{10}}{56} & 0 & 0 & 0 \end{bmatrix}$
311	symmetry	$\frac{\sqrt{5}(x-y)(x+y)(x^2+y^2-6z^2)}{4}$
		$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{24} & 0 & 0 & 0 & \frac{\sqrt{5}}{8} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}}{8} & 0 & 0 & 0 & -\frac{\sqrt{15}}{24} & 0 & 0 \\ 0 & 0 & 0 & \frac{5\sqrt{6}}{56} & 0 & 0 & \frac{\sqrt{70}}{280} & 0 & 0 & 0 & \frac{3\sqrt{2}}{56} & 0 & 0 & 0 & 0 \\ -\frac{3\sqrt{5}}{56} & 0 & 0 & 0 & -\frac{15}{56} & 0 & 0 & -\frac{11\sqrt{30}}{840} & 0 & 0 & 0 & \frac{\sqrt{10}}{280} & 0 & 0 & 0 \\ 0 & \frac{15}{56} & 0 & 0 & 0 & \frac{3\sqrt{5}}{56} & 0 & 0 & \frac{\sqrt{10}}{280} & 0 & 0 & 0 & -\frac{11\sqrt{30}}{840} & 0 & 0 \\ 0 & 0 & -\frac{5\sqrt{6}}{56} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{2}}{56} & 0 & 0 & 0 & 0 & \frac{\sqrt{70}}{280} \end{bmatrix}$
312	symmetry	$\frac{\sqrt{35}yz(y-z)(y+z)}{2}$

continued ...

Table 7

No.	multipole	matrix
	$\mathbb{Q}_{4,0}^{(1,0;a)}(T_g, 1)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{96} & 0 & -\frac{\sqrt{35}i}{32} & 0 & -\frac{5\sqrt{21}i}{96} & 0 & -\frac{\sqrt{105}i}{96} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{105}i}{96} & 0 & \frac{5\sqrt{21}i}{96} & 0 & \frac{\sqrt{35}i}{32} & 0 & \frac{\sqrt{15}i}{96} \\ -\frac{\sqrt{105}i}{224} & 0 & -\frac{5\sqrt{42}i}{224} & 0 & -\frac{5\sqrt{21}i}{224} & 0 & 0 & -\frac{3\sqrt{70}i}{560} & 0 & -\frac{\sqrt{14}i}{56} & 0 & -\frac{\sqrt{210}i}{560} & 0 & 0 \\ 0 & \frac{15\sqrt{7}i}{224} & 0 & \frac{15\sqrt{14}i}{224} & 0 & \frac{3\sqrt{35}i}{224} & \frac{\sqrt{30}i}{240} & 0 & \frac{\sqrt{70}i}{140} & 0 & \frac{\sqrt{42}i}{336} & 0 & -\frac{\sqrt{210}i}{840} & 0 \\ -\frac{3\sqrt{35}i}{224} & 0 & -\frac{15\sqrt{14}i}{224} & 0 & -\frac{15\sqrt{7}i}{224} & 0 & 0 & -\frac{\sqrt{210}i}{840} & 0 & \frac{\sqrt{42}i}{336} & 0 & \frac{\sqrt{70}i}{140} & 0 & \frac{\sqrt{30}i}{240} \\ 0 & \frac{5\sqrt{21}i}{224} & 0 & \frac{5\sqrt{42}i}{224} & 0 & \frac{\sqrt{105}i}{224} & 0 & 0 & -\frac{\sqrt{210}i}{560} & 0 & -\frac{\sqrt{14}i}{56} & 0 & -\frac{3\sqrt{70}i}{560} & 0 \end{bmatrix}$
313	symmetry	$-\frac{\sqrt{35}xz(x-z)(x+z)}{2}$ $\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{96} & 0 & \frac{\sqrt{35}}{32} & 0 & -\frac{5\sqrt{21}}{96} & 0 & \frac{\sqrt{105}}{96} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{105}}{96} & 0 & -\frac{5\sqrt{21}}{96} & 0 & \frac{\sqrt{35}}{32} & 0 & -\frac{\sqrt{15}}{96} \\ \frac{\sqrt{105}}{224} & 0 & -\frac{5\sqrt{42}}{224} & 0 & \frac{5\sqrt{21}}{224} & 0 & 0 & \frac{3\sqrt{70}}{560} & 0 & -\frac{\sqrt{14}}{56} & 0 & \frac{\sqrt{210}}{560} & 0 & 0 \\ 0 & -\frac{15\sqrt{7}}{224} & 0 & \frac{15\sqrt{14}}{224} & 0 & -\frac{3\sqrt{35}}{224} & \frac{\sqrt{30}}{240} & 0 & -\frac{\sqrt{70}}{140} & 0 & \frac{\sqrt{42}}{336} & 0 & \frac{\sqrt{210}}{840} & 0 \\ -\frac{3\sqrt{35}}{224} & 0 & \frac{15\sqrt{14}}{224} & 0 & -\frac{15\sqrt{7}}{224} & 0 & 0 & -\frac{\sqrt{210}}{840} & 0 & -\frac{\sqrt{42}}{336} & 0 & \frac{\sqrt{70}}{140} & 0 & -\frac{\sqrt{30}}{240} \\ 0 & \frac{5\sqrt{21}}{224} & 0 & -\frac{5\sqrt{42}}{224} & 0 & \frac{\sqrt{105}}{224} & 0 & 0 & -\frac{\sqrt{210}}{560} & 0 & \frac{\sqrt{14}}{56} & 0 & -\frac{3\sqrt{70}}{560} & 0 \end{bmatrix}$
314	symmetry	$\frac{\sqrt{35}xy(x-y)(x+y)}{2}$ $\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{12} \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{12} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{105}i}{28} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{70}i}{140} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}i}{60} \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}i}{60} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ \frac{\sqrt{105}i}{28} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}i}{140} & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
315	symmetry	$\frac{\sqrt{5}yz(6x^2-y^2-z^2)}{2}$ $\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{105}i}{96} & 0 & -\frac{\sqrt{5}i}{32} & 0 & -\frac{5\sqrt{3}i}{96} & 0 & \frac{7\sqrt{15}i}{96} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{7\sqrt{15}i}{96} & 0 & \frac{5\sqrt{3}i}{96} & 0 & \frac{\sqrt{5}i}{32} & 0 & -\frac{\sqrt{105}i}{96} \\ -\frac{\sqrt{15}i}{224} & 0 & -\frac{5\sqrt{6}i}{224} & 0 & \frac{5\sqrt{3}i}{32} & 0 & 0 & -\frac{3\sqrt{10}i}{560} & 0 & -\frac{\sqrt{2}i}{56} & 0 & \frac{\sqrt{30}i}{80} & 0 & 0 \\ 0 & \frac{15i}{224} & 0 & \frac{15\sqrt{2}i}{224} & 0 & -\frac{3\sqrt{5}i}{32} & -\frac{\sqrt{210}i}{240} & 0 & \frac{\sqrt{10}i}{140} & 0 & \frac{\sqrt{6}i}{336} & 0 & \frac{\sqrt{30}i}{120} & 0 \\ \frac{3\sqrt{5}i}{32} & 0 & -\frac{15\sqrt{2}i}{224} & 0 & -\frac{15i}{224} & 0 & 0 & \frac{\sqrt{30}i}{120} & 0 & \frac{\sqrt{6}i}{336} & 0 & \frac{\sqrt{10}i}{140} & 0 & -\frac{\sqrt{210}i}{240} \\ 0 & -\frac{5\sqrt{3}i}{32} & 0 & \frac{5\sqrt{6}i}{224} & 0 & \frac{\sqrt{15}i}{224} & 0 & 0 & \frac{\sqrt{30}i}{80} & 0 & -\frac{\sqrt{2}i}{56} & 0 & -\frac{3\sqrt{10}i}{560} & 0 \end{bmatrix}$
316	symmetry	$-\frac{\sqrt{5}xz(x^2-6y^2+z^2)}{2}$

continued ...

Table 7

No.	multipole	matrix
	$\mathbb{Q}_{4,1}^{(1,0;a)}(T_g, 2)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{105}}{96} & 0 & -\frac{\sqrt{5}}{32} & 0 & \frac{5\sqrt{3}}{96} & 0 & \frac{7\sqrt{15}}{96} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{7\sqrt{15}}{96} & 0 & \frac{5\sqrt{3}}{96} & 0 & -\frac{\sqrt{5}}{32} & 0 & -\frac{\sqrt{105}}{96} \\ -\frac{\sqrt{15}}{224} & 0 & \frac{5\sqrt{6}}{224} & 0 & \frac{5\sqrt{3}}{32} & 0 & 0 & -\frac{3\sqrt{10}}{560} & 0 & \frac{\sqrt{2}}{56} & 0 & \frac{\sqrt{30}}{80} & 0 & 0 \\ 0 & \frac{15}{224} & 0 & -\frac{15\sqrt{2}}{224} & 0 & -\frac{3\sqrt{5}}{32} & \frac{\sqrt{210}}{240} & 0 & \frac{\sqrt{10}}{140} & 0 & -\frac{\sqrt{6}}{336} & 0 & \frac{\sqrt{30}}{120} & 0 \\ -\frac{3\sqrt{5}}{32} & 0 & -\frac{15\sqrt{2}}{224} & 0 & \frac{15}{224} & 0 & 0 & -\frac{\sqrt{30}}{120} & 0 & \frac{\sqrt{6}}{336} & 0 & -\frac{\sqrt{10}}{140} & 0 & -\frac{\sqrt{210}}{240} \\ 0 & \frac{5\sqrt{3}}{32} & 0 & \frac{5\sqrt{6}}{224} & 0 & -\frac{\sqrt{15}}{224} & 0 & 0 & -\frac{\sqrt{30}}{80} & 0 & -\frac{\sqrt{2}}{56} & 0 & \frac{3\sqrt{10}}{560} & 0 \end{bmatrix}$
317	symmetry	$-\frac{\sqrt{5}xy(x^2+y^2-6z^2)}{2}$ $\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{24} & 0 & 0 & 0 & \frac{\sqrt{5}i}{8} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{5}i}{8} & 0 & 0 & 0 & -\frac{\sqrt{15}i}{24} & 0 \\ 0 & 0 & 0 & \frac{5\sqrt{6}i}{56} & 0 & 0 & -\frac{\sqrt{70}i}{280} & 0 & 0 & 0 & \frac{3\sqrt{2}i}{56} & 0 & 0 & 0 \\ \frac{3\sqrt{5}i}{56} & 0 & 0 & 0 & -\frac{15i}{56} & 0 & 0 & \frac{11\sqrt{30}i}{840} & 0 & 0 & 0 & \frac{\sqrt{10}i}{280} & 0 & 0 \\ 0 & -\frac{15i}{56} & 0 & 0 & 0 & \frac{3\sqrt{5}i}{56} & 0 & 0 & -\frac{\sqrt{10}i}{280} & 0 & 0 & 0 & -\frac{11\sqrt{30}i}{840} & 0 \\ 0 & 0 & \frac{5\sqrt{6}i}{56} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{2}i}{56} & 0 & 0 & 0 & \frac{\sqrt{70}i}{280} & 0 \end{bmatrix}$
318	symmetry	$-\frac{x^2}{2} - \frac{y^2}{2} + z^2$ $\begin{bmatrix} 0 & 0 & -\frac{1}{3} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{1}{3} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{4\sqrt{3}}{21} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{84} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{2\sqrt{2}}{21} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{28} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{2\sqrt{2}}{21} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{28} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{4\sqrt{3}}{21} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{84} & 0 & 0 \end{bmatrix}$
319	symmetry	$\frac{\sqrt{3}(x-y)(x+y)}{2}$ $\begin{bmatrix} -\frac{\sqrt{30}}{18} & 0 & 0 & 0 & -\frac{\sqrt{6}}{18} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{6}}{18} & 0 & 0 & 0 & -\frac{\sqrt{30}}{18} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{2\sqrt{2}}{21} & 0 & 0 & \frac{\sqrt{210}}{168} & 0 & 0 & 0 & \frac{\sqrt{6}}{168} & 0 & 0 & 0 \\ \frac{4\sqrt{15}}{63} & 0 & 0 & 0 & -\frac{8\sqrt{3}}{63} & 0 & 0 & \frac{\sqrt{10}}{56} & 0 & 0 & 0 & \frac{\sqrt{30}}{168} & 0 & 0 \\ 0 & \frac{8\sqrt{3}}{63} & 0 & 0 & 0 & -\frac{4\sqrt{15}}{63} & 0 & 0 & \frac{\sqrt{30}}{168} & 0 & 0 & 0 & \frac{\sqrt{10}}{56} & 0 \\ 0 & 0 & \frac{2\sqrt{2}}{21} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{168} & 0 & 0 & 0 & \frac{\sqrt{210}}{168} \end{bmatrix}$
320	symmetry	$\sqrt{3}yz$

continued ...

Table 7

No.	multipole	matrix
	$\mathbb{Q}_{2,0}^{(1,1;a)}(T_g)$	$\begin{bmatrix} 0 & \frac{\sqrt{6}i}{9} & 0 & \frac{\sqrt{3}i}{9} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{3}i}{9} & 0 & \frac{\sqrt{6}i}{9} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ \frac{2\sqrt{5}i}{21} & 0 & \frac{\sqrt{2}i}{7} & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}i}{84} & 0 & -\frac{\sqrt{6}i}{84} & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{2\sqrt{3}i}{63} & 0 & \frac{5\sqrt{6}i}{63} & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}i}{84} & 0 & -\frac{\sqrt{2}i}{28} & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{5\sqrt{6}i}{63} & 0 & \frac{2\sqrt{3}i}{63} & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}i}{28} & 0 & -\frac{\sqrt{30}i}{84} & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{2}i}{7} & 0 & -\frac{2\sqrt{5}i}{21} & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{84} & 0 & -\frac{\sqrt{30}i}{84} & 0 & 0 \end{bmatrix}$
321	symmetry	$\sqrt{3}xz$ $\begin{bmatrix} 0 & \frac{\sqrt{6}}{9} & 0 & -\frac{\sqrt{3}}{9} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{3}}{9} & 0 & -\frac{\sqrt{6}}{9} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ \frac{2\sqrt{5}}{21} & 0 & -\frac{\sqrt{2}}{7} & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}}{84} & 0 & \frac{\sqrt{6}}{84} & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{2\sqrt{3}}{63} & 0 & -\frac{5\sqrt{6}}{63} & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}}{84} & 0 & \frac{\sqrt{2}}{28} & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{5\sqrt{6}}{63} & 0 & -\frac{2\sqrt{3}}{63} & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}}{28} & 0 & \frac{\sqrt{30}}{84} & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{2}}{7} & 0 & \frac{2\sqrt{5}}{21} & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}}{84} & 0 & \frac{\sqrt{30}}{84} & 0 & 0 \end{bmatrix}$
322	symmetry	$\sqrt{3}xy$ $\begin{bmatrix} -\frac{\sqrt{30}i}{18} & 0 & 0 & 0 & \frac{\sqrt{6}i}{18} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{6}i}{18} & 0 & 0 & 0 & \frac{\sqrt{30}i}{18} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{2\sqrt{2}i}{21} & 0 & 0 & \frac{\sqrt{210}i}{168} & 0 & 0 & 0 & -\frac{\sqrt{6}i}{168} & 0 & 0 & 0 & 0 \\ \frac{4\sqrt{15}i}{63} & 0 & 0 & 0 & \frac{8\sqrt{3}i}{63} & 0 & 0 & \frac{\sqrt{10}i}{56} & 0 & 0 & 0 & -\frac{\sqrt{30}i}{168} & 0 & 0 & 0 \\ 0 & \frac{8\sqrt{3}i}{63} & 0 & 0 & 0 & \frac{4\sqrt{15}i}{63} & 0 & 0 & \frac{\sqrt{30}i}{168} & 0 & 0 & 0 & -\frac{\sqrt{10}i}{56} & 0 & 0 \\ 0 & 0 & \frac{2\sqrt{2}i}{21} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}i}{168} & 0 & 0 & 0 & -\frac{\sqrt{210}i}{168} & 0 \end{bmatrix}$
323	symmetry	$\sqrt{15}xyz$ $\begin{bmatrix} -\frac{\sqrt{14}}{42} & 0 & 0 & 0 & \frac{\sqrt{70}}{42} & 0 & 0 & -\frac{\sqrt{21}}{28} & 0 & 0 & 0 & \frac{\sqrt{7}}{28} & 0 & 0 \\ 0 & \frac{\sqrt{70}}{42} & 0 & 0 & 0 & -\frac{\sqrt{14}}{42} & 0 & 0 & -\frac{\sqrt{7}}{28} & 0 & 0 & 0 & \frac{\sqrt{21}}{28} & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{210}}{84} & 0 & 0 & -\frac{\sqrt{2}}{8} & 0 & 0 & 0 & \frac{\sqrt{70}}{56} & 0 & 0 & 0 & 0 \\ -\frac{5\sqrt{7}}{84} & 0 & 0 & 0 & -\frac{\sqrt{35}}{84} & 0 & 0 & \frac{\sqrt{42}}{56} & 0 & 0 & 0 & \frac{3\sqrt{14}}{56} & 0 & 0 & 0 \\ 0 & \frac{\sqrt{35}}{84} & 0 & 0 & 0 & \frac{5\sqrt{7}}{84} & 0 & 0 & \frac{3\sqrt{14}}{56} & 0 & 0 & 0 & \frac{\sqrt{42}}{56} & 0 & 0 \\ 0 & 0 & \frac{\sqrt{210}}{84} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{70}}{56} & 0 & 0 & 0 & -\frac{\sqrt{2}}{8} & 0 \end{bmatrix}$
324	symmetry	$\frac{x(2x^2-3y^2-3z^2)}{2}$

continued ...

Table 7

No.	multipole	matrix
	$\mathbb{G}_{3,0}^{(a)}(T_g, 1)$	$\begin{bmatrix} 0 & \frac{\sqrt{42}i}{84} & 0 & -\frac{\sqrt{21}i}{42} & 0 & \frac{\sqrt{210}i}{84} & -\frac{\sqrt{5}i}{16} & 0 & \frac{\sqrt{105}i}{112} & 0 & -\frac{3\sqrt{7}i}{112} & 0 & \frac{\sqrt{35}i}{112} & 0 \\ \frac{\sqrt{210}i}{84} & 0 & -\frac{\sqrt{21}i}{42} & 0 & \frac{\sqrt{42}i}{84} & 0 & 0 & -\frac{\sqrt{35}i}{112} & 0 & \frac{3\sqrt{7}i}{112} & 0 & -\frac{\sqrt{105}i}{112} & 0 & \frac{\sqrt{5}i}{16} \\ -\frac{\sqrt{35}i}{112} & 0 & \frac{3\sqrt{14}i}{112} & 0 & -\frac{5\sqrt{7}i}{112} & 0 & 0 & \frac{\sqrt{210}i}{112} & 0 & -\frac{\sqrt{42}i}{56} & 0 & \frac{\sqrt{70}i}{112} & 0 & 0 \\ 0 & \frac{\sqrt{21}i}{48} & 0 & -\frac{\sqrt{42}i}{336} & 0 & -\frac{5\sqrt{105}i}{336} & \frac{\sqrt{10}i}{16} & 0 & 0 & 0 & -\frac{3\sqrt{14}i}{112} & 0 & \frac{\sqrt{70}i}{56} & 0 \\ \frac{5\sqrt{105}i}{336} & 0 & \frac{\sqrt{42}i}{336} & 0 & -\frac{\sqrt{21}i}{48} & 0 & 0 & \frac{\sqrt{70}i}{56} & 0 & -\frac{3\sqrt{14}i}{112} & 0 & 0 & 0 & \frac{\sqrt{10}i}{16} \\ 0 & \frac{5\sqrt{7}i}{112} & 0 & -\frac{3\sqrt{14}i}{112} & 0 & \frac{\sqrt{35}i}{112} & 0 & 0 & \frac{\sqrt{70}i}{112} & 0 & -\frac{\sqrt{42}i}{56} & 0 & \frac{\sqrt{210}i}{112} & 0 \end{bmatrix}$
325	symmetry	$-\frac{y(3x^2 - 2y^2 + 3z^2)}{2}$ $\begin{bmatrix} 0 & -\frac{\sqrt{42}}{84} & 0 & -\frac{\sqrt{21}}{42} & 0 & -\frac{\sqrt{210}}{84} & -\frac{\sqrt{5}}{16} & 0 & -\frac{\sqrt{105}}{112} & 0 & -\frac{3\sqrt{7}}{112} & 0 & -\frac{\sqrt{35}}{112} & 0 \\ \frac{\sqrt{210}}{84} & 0 & \frac{\sqrt{21}}{42} & 0 & \frac{\sqrt{42}}{84} & 0 & 0 & -\frac{\sqrt{35}}{112} & 0 & -\frac{3\sqrt{7}}{112} & 0 & -\frac{\sqrt{105}}{112} & 0 & -\frac{\sqrt{5}}{16} \\ \frac{\sqrt{35}}{112} & 0 & \frac{3\sqrt{14}}{112} & 0 & \frac{5\sqrt{7}}{112} & 0 & 0 & -\frac{\sqrt{210}}{112} & 0 & -\frac{\sqrt{42}}{56} & 0 & -\frac{\sqrt{70}}{112} & 0 & 0 \\ 0 & -\frac{\sqrt{21}}{48} & 0 & -\frac{\sqrt{42}}{336} & 0 & \frac{5\sqrt{105}}{336} & \frac{\sqrt{10}}{16} & 0 & 0 & 0 & -\frac{3\sqrt{14}}{112} & 0 & -\frac{\sqrt{70}}{56} & 0 \\ \frac{5\sqrt{105}}{336} & 0 & -\frac{\sqrt{42}}{336} & 0 & -\frac{\sqrt{21}}{48} & 0 & 0 & \frac{\sqrt{70}}{56} & 0 & \frac{3\sqrt{14}}{112} & 0 & 0 & 0 & -\frac{\sqrt{10}}{16} \\ 0 & \frac{5\sqrt{7}}{112} & 0 & \frac{3\sqrt{14}}{112} & 0 & \frac{\sqrt{35}}{112} & 0 & 0 & \frac{\sqrt{70}}{112} & 0 & \frac{\sqrt{42}}{56} & 0 & \frac{\sqrt{210}}{112} & 0 \end{bmatrix}$
326	symmetry	$-\frac{z(3x^2 + 3y^2 - 2z^2)}{2}$ $\begin{bmatrix} 0 & 0 & \frac{\sqrt{21}i}{21} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}i}{14} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{21}i}{21} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}i}{14} & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{7}i}{14} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{70}i}{28} & 0 & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{42}i}{42} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{14}i}{28} & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{42}i}{42} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{14}i}{28} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{7}i}{14} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}i}{28} & 0 & 0 \end{bmatrix}$
327	symmetry	$\frac{\sqrt{15}x(y-z)(y+z)}{2}$ $\begin{bmatrix} 0 & \frac{\sqrt{70}i}{84} & 0 & -\frac{\sqrt{35}i}{42} & 0 & -\frac{\sqrt{14}i}{28} & \frac{\sqrt{3}i}{16} & 0 & \frac{5\sqrt{7}i}{112} & 0 & -\frac{\sqrt{105}i}{112} & 0 & -\frac{\sqrt{21}i}{112} & 0 \\ -\frac{\sqrt{14}i}{28} & 0 & -\frac{\sqrt{35}i}{42} & 0 & \frac{\sqrt{70}i}{84} & 0 & 0 & \frac{\sqrt{21}i}{112} & 0 & \frac{\sqrt{105}i}{112} & 0 & -\frac{5\sqrt{7}i}{112} & 0 & -\frac{\sqrt{3}i}{16} \\ -\frac{5\sqrt{21}i}{336} & 0 & \frac{\sqrt{210}i}{112} & 0 & \frac{\sqrt{105}i}{112} & 0 & 0 & \frac{5\sqrt{14}i}{112} & 0 & -\frac{\sqrt{70}i}{56} & 0 & -\frac{\sqrt{42}i}{112} & 0 & 0 \\ 0 & \frac{\sqrt{35}i}{48} & 0 & -\frac{\sqrt{70}i}{336} & 0 & \frac{5\sqrt{7}i}{112} & -\frac{\sqrt{6}i}{16} & 0 & 0 & 0 & -\frac{\sqrt{210}i}{112} & 0 & -\frac{\sqrt{42}i}{56} & 0 \\ -\frac{5\sqrt{7}i}{112} & 0 & \frac{\sqrt{70}i}{336} & 0 & -\frac{\sqrt{35}i}{48} & 0 & 0 & -\frac{\sqrt{42}i}{56} & 0 & -\frac{\sqrt{210}i}{112} & 0 & 0 & 0 & -\frac{\sqrt{6}i}{16} \\ 0 & -\frac{\sqrt{105}i}{112} & 0 & -\frac{\sqrt{210}i}{112} & 0 & \frac{5\sqrt{21}i}{336} & 0 & 0 & -\frac{\sqrt{42}i}{112} & 0 & -\frac{\sqrt{70}i}{56} & 0 & \frac{5\sqrt{14}i}{112} & 0 \end{bmatrix}$
328	symmetry	$-\frac{\sqrt{15}y(x-z)(x+z)}{2}$

continued ...

Table 7

No.	multipole	matrix
		$\begin{bmatrix} 0 & \frac{\sqrt{70}}{84} & 0 & \frac{\sqrt{35}}{42} & 0 & -\frac{\sqrt{14}}{28} & -\frac{\sqrt{3}}{16} & 0 & \frac{5\sqrt{7}}{112} & 0 & \frac{\sqrt{105}}{112} & 0 & -\frac{\sqrt{21}}{112} & 0 \\ \frac{\sqrt{14}}{28} & 0 & -\frac{\sqrt{35}}{42} & 0 & -\frac{\sqrt{70}}{84} & 0 & 0 & -\frac{\sqrt{21}}{112} & 0 & \frac{\sqrt{105}}{112} & 0 & \frac{5\sqrt{7}}{112} & 0 & -\frac{\sqrt{3}}{16} \\ -\frac{5\sqrt{21}}{336} & 0 & -\frac{\sqrt{210}}{112} & 0 & \frac{\sqrt{105}}{112} & 0 & 0 & \frac{5\sqrt{14}}{112} & 0 & \frac{\sqrt{70}}{56} & 0 & -\frac{\sqrt{42}}{112} & 0 & 0 \\ 0 & \frac{\sqrt{35}}{48} & 0 & \frac{\sqrt{70}}{336} & 0 & \frac{5\sqrt{7}}{112} & \frac{\sqrt{6}}{16} & 0 & 0 & 0 & \frac{\sqrt{210}}{112} & 0 & -\frac{\sqrt{42}}{56} & 0 \\ \frac{5\sqrt{7}}{112} & 0 & \frac{\sqrt{70}}{336} & 0 & \frac{\sqrt{35}}{48} & 0 & 0 & \frac{\sqrt{42}}{56} & 0 & -\frac{\sqrt{210}}{112} & 0 & 0 & 0 & -\frac{\sqrt{6}}{16} \\ 0 & \frac{\sqrt{105}}{112} & 0 & -\frac{\sqrt{210}}{112} & 0 & -\frac{5\sqrt{21}}{336} & 0 & 0 & \frac{\sqrt{42}}{112} & 0 & -\frac{\sqrt{70}}{56} & 0 & -\frac{5\sqrt{14}}{112} & 0 \end{bmatrix}$
329	symmetry	$\frac{\sqrt{15}z(x-y)(x+y)}{2}$ $\begin{bmatrix} \frac{\sqrt{14}i}{42} & 0 & 0 & 0 & \frac{\sqrt{70}i}{42} & 0 & 0 & \frac{\sqrt{21}i}{28} & 0 & 0 & 0 & \frac{\sqrt{7}i}{28} & 0 & 0 \\ 0 & -\frac{\sqrt{70}i}{42} & 0 & 0 & 0 & -\frac{\sqrt{14}i}{42} & 0 & 0 & \frac{\sqrt{7}i}{28} & 0 & 0 & 0 & \frac{\sqrt{21}i}{28} & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{210}i}{84} & 0 & 0 & \frac{\sqrt{2}i}{8} & 0 & 0 & 0 & \frac{\sqrt{70}i}{56} & 0 & 0 & 0 \\ \frac{5\sqrt{7}i}{84} & 0 & 0 & 0 & -\frac{\sqrt{35}i}{84} & 0 & 0 & -\frac{\sqrt{42}i}{56} & 0 & 0 & 0 & \frac{3\sqrt{14}i}{56} & 0 & 0 \\ 0 & -\frac{\sqrt{35}i}{84} & 0 & 0 & 0 & \frac{5\sqrt{7}i}{84} & 0 & 0 & -\frac{3\sqrt{14}i}{56} & 0 & 0 & 0 & \frac{\sqrt{42}i}{56} & 0 \\ 0 & 0 & -\frac{\sqrt{210}i}{84} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}i}{56} & 0 & 0 & 0 & -\frac{\sqrt{2}i}{8} \end{bmatrix}$
330	symmetry	$\sqrt{15}xyz$ $\begin{bmatrix} \frac{\sqrt{30}}{252} & 0 & 0 & 0 & -\frac{5\sqrt{6}}{252} & 0 & 0 & \frac{\sqrt{5}}{7} & 0 & 0 & 0 & -\frac{\sqrt{15}}{21} & 0 & 0 \\ 0 & -\frac{5\sqrt{6}}{252} & 0 & 0 & 0 & \frac{\sqrt{30}}{252} & 0 & 0 & \frac{\sqrt{15}}{21} & 0 & 0 & 0 & -\frac{\sqrt{5}}{7} & 0 \\ 0 & 0 & 0 & \frac{\sqrt{2}}{21} & 0 & 0 & 0 & -\frac{\sqrt{210}}{84} & 0 & 0 & 0 & \frac{5\sqrt{6}}{84} & 0 & 0 \\ \frac{\sqrt{15}}{63} & 0 & 0 & 0 & \frac{\sqrt{3}}{63} & 0 & 0 & \frac{\sqrt{10}}{28} & 0 & 0 & 0 & \frac{\sqrt{30}}{28} & 0 & 0 \\ 0 & -\frac{\sqrt{3}}{63} & 0 & 0 & 0 & -\frac{\sqrt{15}}{63} & 0 & 0 & \frac{\sqrt{30}}{28} & 0 & 0 & 0 & \frac{\sqrt{10}}{28} & 0 \\ 0 & 0 & -\frac{\sqrt{2}}{21} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{5\sqrt{6}}{84} & 0 & 0 & 0 & -\frac{\sqrt{210}}{84} \end{bmatrix}$
331	symmetry	$\frac{x(2x^2-3y^2-3z^2)}{2}$ $\begin{bmatrix} 0 & -\frac{\sqrt{10}i}{168} & 0 & \frac{\sqrt{5}i}{84} & 0 & -\frac{5\sqrt{2}i}{168} & \frac{5\sqrt{21}i}{84} & 0 & -\frac{5i}{28} & 0 & \frac{\sqrt{15}i}{28} & 0 & -\frac{5\sqrt{3}i}{84} & 0 \\ -\frac{5\sqrt{2}i}{168} & 0 & \frac{\sqrt{5}i}{84} & 0 & -\frac{\sqrt{10}i}{168} & 0 & 0 & \frac{5\sqrt{3}i}{84} & 0 & -\frac{\sqrt{15}i}{28} & 0 & \frac{5i}{28} & 0 & -\frac{5\sqrt{21}i}{84} \\ \frac{\sqrt{3}i}{84} & 0 & -\frac{\sqrt{30}i}{140} & 0 & \frac{\sqrt{15}i}{84} & 0 & 0 & \frac{5\sqrt{2}i}{56} & 0 & -\frac{\sqrt{10}i}{28} & 0 & \frac{5\sqrt{6}i}{168} & 0 & 0 \\ 0 & -\frac{\sqrt{5}i}{60} & 0 & \frac{\sqrt{10}i}{420} & 0 & \frac{5i}{84} & \frac{5\sqrt{42}i}{168} & 0 & 0 & 0 & -\frac{\sqrt{30}i}{56} & 0 & \frac{5\sqrt{6}i}{84} & 0 \\ -\frac{5i}{84} & 0 & -\frac{\sqrt{10}i}{420} & 0 & \frac{\sqrt{5}i}{60} & 0 & 0 & \frac{5\sqrt{6}i}{84} & 0 & -\frac{\sqrt{30}i}{56} & 0 & 0 & 0 & \frac{5\sqrt{42}i}{168} \\ 0 & -\frac{\sqrt{15}i}{84} & 0 & \frac{\sqrt{30}i}{140} & 0 & -\frac{\sqrt{3}i}{84} & 0 & 0 & \frac{5\sqrt{6}i}{168} & 0 & -\frac{\sqrt{10}i}{28} & 0 & \frac{5\sqrt{2}i}{56} & 0 \end{bmatrix}$
332	symmetry	$-\frac{y(3x^2-2y^2+3z^2)}{2}$

continued ...

Table 7

No.	multipole	matrix
	$\mathbb{G}_{3,1}^{(1,-1;a)}(T_g, 1)$	$\begin{bmatrix} 0 & \frac{\sqrt{10}}{168} & 0 & \frac{\sqrt{5}}{84} & 0 & \frac{5\sqrt{2}}{168} & \frac{5\sqrt{21}}{84} & 0 & \frac{5}{28} & 0 & \frac{\sqrt{15}}{28} & 0 & \frac{5\sqrt{3}}{84} & 0 \\ -\frac{5\sqrt{2}}{168} & 0 & -\frac{\sqrt{5}}{84} & 0 & -\frac{\sqrt{10}}{168} & 0 & 0 & \frac{5\sqrt{3}}{84} & 0 & \frac{\sqrt{15}}{28} & 0 & \frac{5}{28} & 0 & \frac{5\sqrt{21}}{84} \\ -\frac{\sqrt{3}}{84} & 0 & -\frac{\sqrt{30}}{140} & 0 & -\frac{\sqrt{15}}{84} & 0 & 0 & -\frac{5\sqrt{2}}{56} & 0 & -\frac{\sqrt{10}}{28} & 0 & -\frac{5\sqrt{6}}{168} & 0 & 0 \\ 0 & \frac{\sqrt{5}}{60} & 0 & \frac{\sqrt{10}}{420} & 0 & -\frac{5}{84} & \frac{5\sqrt{42}}{168} & 0 & 0 & 0 & -\frac{\sqrt{30}}{56} & 0 & -\frac{5\sqrt{6}}{84} & 0 & 0 \\ -\frac{5}{84} & 0 & \frac{\sqrt{10}}{420} & 0 & \frac{\sqrt{5}}{60} & 0 & 0 & \frac{5\sqrt{6}}{84} & 0 & \frac{\sqrt{30}}{56} & 0 & 0 & 0 & -\frac{5\sqrt{42}}{168} & 0 \\ 0 & -\frac{\sqrt{15}}{84} & 0 & -\frac{\sqrt{30}}{140} & 0 & -\frac{\sqrt{3}}{84} & 0 & 0 & \frac{5\sqrt{6}}{168} & 0 & \frac{\sqrt{10}}{28} & 0 & \frac{5\sqrt{2}}{56} & 0 & 0 \end{bmatrix}$
333	symmetry	$-\frac{z(3x^2+3y^2-2z^2)}{2}$ $\begin{bmatrix} 0 & 0 & -\frac{\sqrt{5}i}{42} & 0 & 0 & 0 & 0 & 0 & -\frac{2\sqrt{15}i}{21} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{5}i}{42} & 0 & 0 & 0 & 0 & 0 & -\frac{2\sqrt{15}i}{21} & 0 & 0 & 0 & 0 \\ 0 & \frac{2\sqrt{15}i}{105} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{5\sqrt{6}i}{42} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{2\sqrt{10}i}{105} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}i}{42} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{2\sqrt{10}i}{105} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}i}{42} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{2\sqrt{15}i}{105} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{5\sqrt{6}i}{42} & 0 & 0 \end{bmatrix}$
334	symmetry	$\frac{\sqrt{15}x(y-z)(y+z)}{2}$ $\begin{bmatrix} 0 & -\frac{5\sqrt{6}i}{504} & 0 & \frac{5\sqrt{3}i}{252} & 0 & \frac{\sqrt{30}i}{168} & -\frac{\sqrt{35}i}{28} & 0 & -\frac{5\sqrt{15}i}{84} & 0 & \frac{5i}{28} & 0 & \frac{\sqrt{5}i}{28} & 0 \\ \frac{\sqrt{30}i}{168} & 0 & \frac{5\sqrt{3}i}{252} & 0 & -\frac{5\sqrt{6}i}{504} & 0 & 0 & -\frac{\sqrt{5}i}{28} & 0 & -\frac{5i}{28} & 0 & \frac{5\sqrt{15}i}{84} & 0 & \frac{\sqrt{35}i}{28} \\ \frac{\sqrt{5}i}{84} & 0 & -\frac{\sqrt{2}i}{28} & 0 & -\frac{i}{28} & 0 & 0 & \frac{5\sqrt{30}i}{168} & 0 & -\frac{5\sqrt{6}i}{84} & 0 & -\frac{\sqrt{10}i}{56} & 0 & 0 \\ 0 & -\frac{\sqrt{3}i}{36} & 0 & \frac{\sqrt{6}i}{252} & 0 & -\frac{\sqrt{15}i}{84} & -\frac{\sqrt{70}i}{56} & 0 & 0 & 0 & -\frac{5\sqrt{2}i}{56} & 0 & -\frac{\sqrt{10}i}{28} & 0 \\ \frac{\sqrt{15}i}{84} & 0 & -\frac{\sqrt{6}i}{252} & 0 & \frac{\sqrt{3}i}{36} & 0 & 0 & -\frac{\sqrt{10}i}{28} & 0 & -\frac{5\sqrt{2}i}{56} & 0 & 0 & 0 & -\frac{\sqrt{70}i}{56} \\ 0 & \frac{i}{28} & 0 & \frac{\sqrt{2}i}{28} & 0 & -\frac{\sqrt{5}i}{84} & 0 & 0 & -\frac{\sqrt{10}i}{56} & 0 & -\frac{5\sqrt{6}i}{84} & 0 & \frac{5\sqrt{30}i}{168} & 0 \end{bmatrix}$
335	symmetry	$-\frac{\sqrt{15}y(x-z)(x+z)}{2}$ $\begin{bmatrix} 0 & -\frac{5\sqrt{6}}{504} & 0 & -\frac{5\sqrt{3}}{252} & 0 & \frac{\sqrt{30}}{168} & \frac{\sqrt{35}}{28} & 0 & -\frac{5\sqrt{15}}{84} & 0 & -\frac{5}{28} & 0 & \frac{\sqrt{5}}{28} & 0 \\ -\frac{\sqrt{30}}{168} & 0 & \frac{5\sqrt{3}}{252} & 0 & \frac{5\sqrt{6}}{504} & 0 & 0 & \frac{\sqrt{5}}{28} & 0 & -\frac{5}{28} & 0 & -\frac{5\sqrt{15}}{84} & 0 & \frac{\sqrt{35}}{28} \\ \frac{\sqrt{5}}{84} & 0 & \frac{\sqrt{2}}{28} & 0 & -\frac{1}{28} & 0 & 0 & \frac{5\sqrt{30}}{168} & 0 & \frac{5\sqrt{6}}{84} & 0 & -\frac{\sqrt{10}}{56} & 0 & 0 \\ 0 & -\frac{\sqrt{3}}{36} & 0 & -\frac{\sqrt{6}}{252} & 0 & -\frac{\sqrt{15}}{84} & \frac{\sqrt{70}}{56} & 0 & 0 & 0 & \frac{5\sqrt{2}}{56} & 0 & -\frac{\sqrt{10}}{28} & 0 \\ -\frac{\sqrt{15}}{84} & 0 & -\frac{\sqrt{6}}{252} & 0 & -\frac{\sqrt{3}}{36} & 0 & 0 & -\frac{\sqrt{10}}{28} & 0 & -\frac{5\sqrt{2}}{56} & 0 & 0 & 0 & -\frac{\sqrt{70}}{56} \\ 0 & -\frac{1}{28} & 0 & \frac{\sqrt{2}}{28} & 0 & \frac{\sqrt{5}}{84} & 0 & 0 & \frac{\sqrt{10}}{56} & 0 & -\frac{5\sqrt{6}}{84} & 0 & -\frac{5\sqrt{30}}{168} & 0 \end{bmatrix}$
336	symmetry	$\frac{\sqrt{15}z(x-y)(x+y)}{2}$

continued ...

Table 7

No.	multipole	matrix
	$\mathbb{G}_{3,2}^{(1,-1;a)}(T_g, 2)$	$\begin{bmatrix} -\frac{\sqrt{30}i}{252} & 0 & 0 & 0 & -\frac{5\sqrt{6}i}{252} & 0 & 0 & -\frac{\sqrt{5}i}{7} & 0 & 0 & 0 & -\frac{\sqrt{15}i}{21} & 0 & 0 \\ 0 & \frac{5\sqrt{6}i}{252} & 0 & 0 & 0 & \frac{\sqrt{30}i}{252} & 0 & 0 & -\frac{\sqrt{15}i}{21} & 0 & 0 & 0 & -\frac{\sqrt{5}i}{7} & 0 \\ 0 & 0 & 0 & \frac{\sqrt{2}i}{21} & 0 & 0 & \frac{\sqrt{210}i}{84} & 0 & 0 & 0 & \frac{5\sqrt{6}i}{84} & 0 & 0 & 0 \\ -\frac{\sqrt{15}i}{63} & 0 & 0 & 0 & \frac{\sqrt{3}i}{63} & 0 & 0 & -\frac{\sqrt{10}i}{28} & 0 & 0 & 0 & \frac{\sqrt{30}i}{28} & 0 & 0 \\ 0 & \frac{\sqrt{3}i}{63} & 0 & 0 & 0 & -\frac{\sqrt{15}i}{63} & 0 & 0 & -\frac{\sqrt{30}i}{28} & 0 & 0 & 0 & \frac{\sqrt{10}i}{28} & 0 \\ 0 & 0 & \frac{\sqrt{2}i}{21} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{5\sqrt{6}i}{84} & 0 & 0 & 0 & -\frac{\sqrt{210}i}{84} \end{bmatrix}$
337	symmetry	$\frac{3\sqrt{35}xyz(x-y)(x+y)}{2}$ $\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}}{20} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{20} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{20} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}}{20} & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
338	symmetry	$\frac{\sqrt{105}xyz(x^2+y^2-2z^2)}{2}$ $\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}}{120} & 0 & 0 & 0 & \frac{\sqrt{42}}{24} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{70}}{40} & 0 & 0 & 0 & -\frac{\sqrt{210}}{40} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{210}}{40} & 0 & 0 & 0 & \frac{\sqrt{70}}{40} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{42}}{24} & 0 & 0 & 0 & -\frac{\sqrt{30}}{120} \end{bmatrix}$
339	symmetry	$\frac{x(8x^4-40x^2y^2-40x^2z^2+15y^4+30y^2z^2+15z^4)}{8}$ $\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2}i}{32} & 0 & -\frac{\sqrt{10}i}{32} & 0 & \frac{7\sqrt{6}i}{96} & 0 & -\frac{3\sqrt{14}i}{32} \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{42}i}{96} & 0 & -\frac{3\sqrt{2}i}{32} & 0 & \frac{\sqrt{30}i}{32} & 0 & -\frac{7\sqrt{6}i}{96} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{7\sqrt{6}i}{96} & 0 & \frac{\sqrt{30}i}{32} & 0 & -\frac{3\sqrt{2}i}{32} & 0 & \frac{\sqrt{42}i}{96} \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{14}i}{32} & 0 & \frac{7\sqrt{6}i}{96} & 0 & -\frac{\sqrt{10}i}{32} & 0 & \frac{\sqrt{2}i}{32} & 0 \end{bmatrix}$
340	symmetry	$\frac{y(15x^4-40x^2y^2+30x^2z^2+8y^4-40y^2z^2+15z^4)}{8}$

continued ...

Table 7

No.	multipole	matrix
	$\mathbb{G}_{5,1}^{(1,-1;a)}(T_g, 1)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}}{32} & 0 & -\frac{\sqrt{10}}{32} & 0 & -\frac{7\sqrt{6}}{96} & 0 & -\frac{3\sqrt{14}}{32} \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{42}}{96} & 0 & \frac{3\sqrt{2}}{32} & 0 & \frac{\sqrt{30}}{32} & 0 & \frac{7\sqrt{6}}{96} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{7\sqrt{6}}{96} & 0 & -\frac{\sqrt{30}}{32} & 0 & -\frac{3\sqrt{2}}{32} & 0 & -\frac{\sqrt{42}}{96} \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{14}}{32} & 0 & \frac{7\sqrt{6}}{96} & 0 & \frac{\sqrt{10}}{32} & 0 & \frac{\sqrt{2}}{32} & 0 \end{bmatrix}$
341	symmetry	$\frac{z(15x^4 + 30x^2y^2 - 40x^2z^2 + 15y^4 - 40y^2z^2 + 8z^4)}{8}$ $\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{12} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}i}{12} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}i}{12} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}i}{12} & 0 & 0 \end{bmatrix}$
342	symmetry	$\frac{3\sqrt{35}x(y^2 - 2yz - z^2)(y^2 + 2yz - z^2)}{8}$ $\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{70}i}{160} & 0 & -\frac{\sqrt{14}i}{32} & 0 & -\frac{3\sqrt{210}i}{160} & 0 & -\frac{\sqrt{10}i}{32} \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{30}i}{160} & 0 & -\frac{3\sqrt{70}i}{160} & 0 & \frac{\sqrt{42}i}{32} & 0 & \frac{3\sqrt{210}i}{160} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{210}i}{160} & 0 & \frac{\sqrt{42}i}{32} & 0 & -\frac{3\sqrt{70}i}{160} & 0 & -\frac{3\sqrt{30}i}{160} \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}i}{32} & 0 & -\frac{3\sqrt{210}i}{160} & 0 & -\frac{\sqrt{14}i}{32} & 0 & \frac{\sqrt{70}i}{160} & 0 \end{bmatrix}$
343	symmetry	$\frac{3\sqrt{35}y(x^2 - 2xz - z^2)(x^2 + 2xz - z^2)}{8}$ $\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}}{160} & 0 & -\frac{\sqrt{14}}{32} & 0 & \frac{3\sqrt{210}}{160} & 0 & -\frac{\sqrt{10}}{32} \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{30}}{160} & 0 & \frac{3\sqrt{70}}{160} & 0 & \frac{\sqrt{42}}{32} & 0 & -\frac{3\sqrt{210}}{160} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{210}}{160} & 0 & -\frac{\sqrt{42}}{32} & 0 & -\frac{3\sqrt{70}}{160} & 0 & \frac{3\sqrt{30}}{160} \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}}{32} & 0 & -\frac{3\sqrt{210}}{160} & 0 & \frac{\sqrt{14}}{32} & 0 & \frac{\sqrt{70}}{160} & 0 \end{bmatrix}$
344	symmetry	$\frac{3\sqrt{35}z(x^2 - 2xy - y^2)(x^2 + 2xy - y^2)}{8}$

continued ...

Table 7

No.	multipole	matrix
	$\mathbb{G}_{5,2}^{(1,-1;a)}(T_g, 2)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}i}{20} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}i}{20} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}i}{20} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{70}i}{20} & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
345	symmetry	$\frac{\sqrt{105}x(y-z)(y+z)(2x^2-y^2-z^2)}{4}$ $\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{210}i}{240} & 0 & -\frac{\sqrt{42}i}{48} & 0 & \frac{\sqrt{70}i}{80} & 0 & \frac{\sqrt{30}i}{16} \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}i}{80} & 0 & -\frac{\sqrt{210}i}{80} & 0 & \frac{\sqrt{14}i}{16} & 0 & -\frac{\sqrt{70}i}{80} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}i}{80} & 0 & \frac{\sqrt{14}i}{16} & 0 & -\frac{\sqrt{210}i}{80} & 0 & \frac{\sqrt{10}i}{80} \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}i}{16} & 0 & \frac{\sqrt{70}i}{80} & 0 & -\frac{\sqrt{42}i}{48} & 0 & \frac{\sqrt{210}i}{240} & 0 \end{bmatrix}$
346	symmetry	$\frac{\sqrt{105}y(x-z)(x+z)(x^2-2y^2+z^2)}{4}$ $\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{210}}{240} & 0 & \frac{\sqrt{42}}{48} & 0 & \frac{\sqrt{70}}{80} & 0 & -\frac{\sqrt{30}}{16} \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}}{80} & 0 & -\frac{\sqrt{210}}{80} & 0 & -\frac{\sqrt{14}}{16} & 0 & -\frac{\sqrt{70}}{80} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{70}}{80} & 0 & \frac{\sqrt{14}}{16} & 0 & \frac{\sqrt{210}}{80} & 0 & \frac{\sqrt{10}}{80} \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{16} & 0 & -\frac{\sqrt{70}}{80} & 0 & -\frac{\sqrt{42}}{48} & 0 & -\frac{\sqrt{210}}{240} & 0 \end{bmatrix}$
347	symmetry	$-\frac{\sqrt{105}z(x-y)(x+y)(x^2+y^2-2z^2)}{4}$ $\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}i}{120} & 0 & 0 & 0 & -\frac{\sqrt{42}i}{24} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{70}i}{40} & 0 & 0 & 0 & \frac{\sqrt{210}i}{40} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{210}i}{40} & 0 & 0 & 0 & -\frac{\sqrt{70}i}{40} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{42}i}{24} & 0 & 0 & 0 & \frac{\sqrt{30}i}{120} \end{bmatrix}$
348	symmetry	$\sqrt{15}xyz$

continued ...

Table 7

No.	multipole	matrix
	$\mathbb{G}_3^{(1,0;a)}(A_g)$	$\begin{bmatrix} -\frac{\sqrt{42}}{126} & 0 & 0 & 0 & \frac{\sqrt{210}}{126} & 0 & 0 & \frac{5\sqrt{7}}{56} & 0 & 0 & 0 & -\frac{5\sqrt{21}}{168} & 0 & 0 \\ 0 & \frac{\sqrt{210}}{126} & 0 & 0 & 0 & -\frac{\sqrt{42}}{126} & 0 & 0 & \frac{5\sqrt{21}}{168} & 0 & 0 & 0 & -\frac{5\sqrt{7}}{56} & 0 \\ 0 & 0 & 0 & -\frac{5\sqrt{70}}{168} & 0 & 0 & \frac{\sqrt{6}}{24} & 0 & 0 & 0 & -\frac{\sqrt{210}}{168} & 0 & 0 & 0 \\ -\frac{25\sqrt{21}}{504} & 0 & 0 & 0 & -\frac{5\sqrt{105}}{504} & 0 & 0 & -\frac{\sqrt{14}}{56} & 0 & 0 & 0 & -\frac{\sqrt{42}}{56} & 0 & 0 \\ 0 & \frac{5\sqrt{105}}{504} & 0 & 0 & 0 & \frac{25\sqrt{21}}{504} & 0 & 0 & -\frac{\sqrt{42}}{56} & 0 & 0 & 0 & -\frac{\sqrt{14}}{56} & 0 \\ 0 & 0 & \frac{5\sqrt{70}}{168} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{210}}{168} & 0 & 0 & 0 & \frac{\sqrt{6}}{24} \end{bmatrix}$
349	symmetry	$\frac{x(2x^2-3y^2-3z^2)}{2}$ $\begin{bmatrix} 0 & \frac{\sqrt{14}i}{84} & 0 & -\frac{\sqrt{7}i}{42} & 0 & \frac{\sqrt{70}i}{84} & \frac{5\sqrt{15}i}{96} & 0 & -\frac{5\sqrt{35}i}{224} & 0 & \frac{5\sqrt{21}i}{224} & 0 & -\frac{5\sqrt{105}i}{672} & 0 \\ \frac{\sqrt{70}i}{84} & 0 & -\frac{\sqrt{7}i}{42} & 0 & \frac{\sqrt{14}i}{84} & 0 & 0 & \frac{5\sqrt{105}i}{672} & 0 & -\frac{5\sqrt{21}i}{224} & 0 & \frac{5\sqrt{35}i}{224} & 0 & -\frac{5\sqrt{15}i}{96} \\ -\frac{5\sqrt{105}i}{672} & 0 & \frac{5\sqrt{42}i}{224} & 0 & -\frac{25\sqrt{21}i}{672} & 0 & 0 & -\frac{\sqrt{70}i}{112} & 0 & \frac{\sqrt{14}i}{56} & 0 & -\frac{\sqrt{210}i}{336} & 0 & 0 \\ 0 & \frac{5\sqrt{7}i}{96} & 0 & -\frac{5\sqrt{14}i}{672} & 0 & -\frac{25\sqrt{35}i}{672} & -\frac{\sqrt{30}i}{48} & 0 & 0 & 0 & \frac{\sqrt{42}i}{112} & 0 & -\frac{\sqrt{210}i}{168} & 0 \\ \frac{25\sqrt{35}i}{672} & 0 & \frac{5\sqrt{14}i}{672} & 0 & -\frac{5\sqrt{7}i}{96} & 0 & 0 & -\frac{\sqrt{210}i}{168} & 0 & \frac{\sqrt{42}i}{112} & 0 & 0 & 0 & -\frac{\sqrt{30}i}{48} \\ 0 & \frac{25\sqrt{21}i}{672} & 0 & -\frac{5\sqrt{42}i}{224} & 0 & \frac{5\sqrt{105}i}{672} & 0 & 0 & -\frac{\sqrt{210}i}{336} & 0 & \frac{\sqrt{14}i}{56} & 0 & -\frac{\sqrt{70}i}{112} & 0 \end{bmatrix}$
350	symmetry	$-\frac{y(3x^2-2y^2+3z^2)}{2}$ $\begin{bmatrix} 0 & -\frac{\sqrt{14}}{84} & 0 & -\frac{\sqrt{7}}{42} & 0 & -\frac{\sqrt{70}}{84} & \frac{5\sqrt{15}}{96} & 0 & \frac{5\sqrt{35}}{224} & 0 & \frac{5\sqrt{21}}{224} & 0 & \frac{5\sqrt{105}}{672} & 0 \\ \frac{\sqrt{70}}{84} & 0 & \frac{\sqrt{7}}{42} & 0 & \frac{\sqrt{14}}{84} & 0 & 0 & \frac{5\sqrt{105}}{672} & 0 & \frac{5\sqrt{21}}{224} & 0 & \frac{5\sqrt{35}}{224} & 0 & \frac{5\sqrt{15}}{96} \\ \frac{5\sqrt{105}}{672} & 0 & \frac{5\sqrt{42}}{224} & 0 & \frac{25\sqrt{21}}{672} & 0 & 0 & \frac{\sqrt{70}}{112} & 0 & \frac{\sqrt{14}}{56} & 0 & \frac{\sqrt{210}}{336} & 0 & 0 \\ 0 & -\frac{5\sqrt{7}}{96} & 0 & -\frac{5\sqrt{14}}{672} & 0 & \frac{25\sqrt{35}}{672} & -\frac{\sqrt{30}}{48} & 0 & 0 & 0 & \frac{\sqrt{42}i}{112} & 0 & \frac{\sqrt{210}}{168} & 0 \\ \frac{25\sqrt{35}}{672} & 0 & -\frac{5\sqrt{14}}{672} & 0 & -\frac{5\sqrt{7}}{96} & 0 & 0 & -\frac{\sqrt{210}}{168} & 0 & -\frac{\sqrt{42}i}{112} & 0 & 0 & 0 & \frac{\sqrt{30}}{48} \\ 0 & \frac{25\sqrt{21}}{672} & 0 & \frac{5\sqrt{42}}{224} & 0 & \frac{5\sqrt{105}}{672} & 0 & 0 & -\frac{\sqrt{210}}{336} & 0 & -\frac{\sqrt{14}}{56} & 0 & -\frac{\sqrt{70}}{112} & 0 \end{bmatrix}$
351	symmetry	$-\frac{z(3x^2+3y^2-2z^2)}{2}$ $\begin{bmatrix} 0 & 0 & \frac{\sqrt{7}i}{21} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{5\sqrt{21}i}{84} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{7}i}{21} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{5\sqrt{21}i}{84} & 0 & 0 & 0 \\ 0 & -\frac{5\sqrt{21}i}{84} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{210}i}{84} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & \frac{5\sqrt{14}i}{84} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{42}i}{84} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{5\sqrt{14}i}{84} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{42}i}{84} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{5\sqrt{21}i}{84} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{210}i}{84} & 0 & 0 \end{bmatrix}$
352	symmetry	$\frac{\sqrt{15}x(y-z)(y+z)}{2}$

continued ...

Table 7

No.	multipole	matrix
$\mathbb{G}_{3,0}^{(1,0;a)}(T_g, 2)$	$0 \quad \frac{\sqrt{210}i}{252} \quad 0 \quad -\frac{\sqrt{105}i}{126} \quad 0 \quad -\frac{\sqrt{42}i}{84} \quad -\frac{5i}{32} \quad 0 \quad -\frac{25\sqrt{21}i}{672} \quad 0 \quad \frac{5\sqrt{35}i}{224} \quad 0 \quad \frac{5\sqrt{7}i}{224} \quad 0$	
	$-\frac{\sqrt{42}i}{84} \quad 0 \quad -\frac{\sqrt{105}i}{126} \quad 0 \quad \frac{\sqrt{210}i}{252} \quad 0 \quad 0 \quad -\frac{5\sqrt{7}i}{224} \quad 0 \quad -\frac{5\sqrt{35}i}{224} \quad 0 \quad \frac{25\sqrt{21}i}{672} \quad 0 \quad \frac{5i}{32}$	
	$-\frac{25\sqrt{7}i}{672} \quad 0 \quad \frac{5\sqrt{70}i}{224} \quad 0 \quad \frac{5\sqrt{35}i}{224} \quad 0 \quad 0 \quad -\frac{5\sqrt{42}i}{336} \quad 0 \quad \frac{\sqrt{210}i}{168} \quad 0 \quad \frac{\sqrt{14}i}{112} \quad 0 \quad 0$	
	$0 \quad \frac{5\sqrt{105}i}{288} \quad 0 \quad -\frac{5\sqrt{210}i}{2016} \quad 0 \quad \frac{25\sqrt{21}i}{672} \quad \frac{\sqrt{2}i}{16} \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{70}i}{112} \quad 0 \quad \frac{\sqrt{14}i}{56} \quad 0$	
	$-\frac{25\sqrt{21}i}{672} \quad 0 \quad \frac{5\sqrt{210}i}{2016} \quad 0 \quad -\frac{5\sqrt{105}i}{288} \quad 0 \quad 0 \quad \frac{\sqrt{14}i}{56} \quad 0 \quad \frac{\sqrt{70}i}{112} \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{2}i}{16}$	
	$0 \quad -\frac{5\sqrt{35}i}{224} \quad 0 \quad -\frac{5\sqrt{70}i}{224} \quad 0 \quad \frac{25\sqrt{7}i}{672} \quad 0 \quad 0 \quad \frac{\sqrt{14}i}{112} \quad 0 \quad \frac{\sqrt{210}i}{168} \quad 0 \quad -\frac{5\sqrt{42}i}{336} \quad 0$	
353	symmetry	$-\frac{\sqrt{15}y(x-z)(x+z)}{2}$
$\mathbb{G}_{3,1}^{(1,0;a)}(T_g, 2)$	$0 \quad \frac{\sqrt{210}}{252} \quad 0 \quad \frac{\sqrt{105}}{126} \quad 0 \quad -\frac{\sqrt{42}}{84} \quad \frac{5}{32} \quad 0 \quad -\frac{25\sqrt{21}}{672} \quad 0 \quad -\frac{5\sqrt{35}}{224} \quad 0 \quad \frac{5\sqrt{7}}{224} \quad 0$	
	$\frac{\sqrt{42}}{84} \quad 0 \quad -\frac{\sqrt{105}}{126} \quad 0 \quad -\frac{\sqrt{210}}{252} \quad 0 \quad 0 \quad \frac{5\sqrt{7}}{224} \quad 0 \quad -\frac{5\sqrt{35}}{224} \quad 0 \quad -\frac{25\sqrt{21}}{672} \quad 0 \quad \frac{5}{32}$	
	$-\frac{25\sqrt{7}}{672} \quad 0 \quad -\frac{5\sqrt{70}}{224} \quad 0 \quad \frac{5\sqrt{35}}{224} \quad 0 \quad 0 \quad -\frac{5\sqrt{42}}{336} \quad 0 \quad -\frac{\sqrt{210}}{168} \quad 0 \quad \frac{\sqrt{14}}{112} \quad 0 \quad 0$	
	$0 \quad \frac{5\sqrt{105}}{288} \quad 0 \quad \frac{5\sqrt{210}}{2016} \quad 0 \quad \frac{25\sqrt{21}}{672} \quad -\frac{\sqrt{2}}{16} \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{70}}{112} \quad 0 \quad \frac{\sqrt{14}}{56} \quad 0$	
	$\frac{25\sqrt{21}}{672} \quad 0 \quad \frac{5\sqrt{210}}{2016} \quad 0 \quad \frac{5\sqrt{105}}{288} \quad 0 \quad 0 \quad -\frac{\sqrt{14}}{56} \quad 0 \quad \frac{\sqrt{70}}{112} \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{2}}{16}$	
	$0 \quad \frac{5\sqrt{35}}{224} \quad 0 \quad -\frac{5\sqrt{70}}{224} \quad 0 \quad -\frac{25\sqrt{7}}{672} \quad 0 \quad 0 \quad -\frac{\sqrt{14}}{112} \quad 0 \quad \frac{\sqrt{210}}{168} \quad 0 \quad \frac{5\sqrt{42}}{336} \quad 0$	
354	symmetry	$\frac{\sqrt{15}z(x-y)(x+y)}{2}$
$\mathbb{G}_{3,2}^{(1,0;a)}(T_g, 2)$	$\frac{\sqrt{42}i}{126} \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{210}i}{126} \quad 0 \quad 0 \quad -\frac{5\sqrt{7}i}{56} \quad 0 \quad 0 \quad 0 \quad -\frac{5\sqrt{21}i}{168} \quad 0 \quad 0$	
	$0 \quad -\frac{\sqrt{210}i}{126} \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{42}i}{126} \quad 0 \quad 0 \quad -\frac{5\sqrt{21}i}{168} \quad 0 \quad 0 \quad 0 \quad -\frac{5\sqrt{7}i}{56} \quad 0$	
	$0 \quad 0 \quad 0 \quad -\frac{5\sqrt{70}i}{168} \quad 0 \quad 0 \quad -\frac{\sqrt{6}i}{24} \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{210}i}{168} \quad 0 \quad 0 \quad 0 \quad 0$	
	$\frac{25\sqrt{21}i}{504} \quad 0 \quad 0 \quad 0 \quad -\frac{5\sqrt{105}i}{504} \quad 0 \quad 0 \quad \frac{\sqrt{14}i}{56} \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{42}i}{56} \quad 0 \quad 0 \quad 0$	
	$0 \quad -\frac{5\sqrt{105}i}{504} \quad 0 \quad 0 \quad 0 \quad \frac{25\sqrt{21}i}{504} \quad 0 \quad 0 \quad \frac{\sqrt{42}i}{56} \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{14}i}{56} \quad 0$	
	$0 \quad 0 \quad -\frac{5\sqrt{70}i}{168} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{210}i}{168} \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{6}i}{24} \quad 0$	
355	symmetry	x
$\mathbb{G}_{1,0}^{(1,1;a)}(T_g)$	$0 \quad 0 \quad 0$	
	$0 \quad 0 \quad 0$	
	$\frac{\sqrt{2}i}{4} \quad 0 \quad -\frac{\sqrt{5}i}{20} \quad 0 \quad 0$	
	$0 \quad \frac{\sqrt{30}i}{20} \quad 0 \quad -\frac{\sqrt{15}i}{20} \quad 0 \quad 0$	
	$0 \quad 0 \quad \frac{\sqrt{15}i}{20} \quad 0 \quad -\frac{\sqrt{30}i}{20} \quad 0 \quad 0$	
	$0 \quad 0 \quad 0 \quad \frac{\sqrt{5}i}{20} \quad 0 \quad -\frac{\sqrt{2}i}{4} \quad 0 \quad 0$	
356	symmetry	y

continued ...

Table 7

No.	multipole	matrix
	$\mathbb{G}_{1,1}^{(1,1;a)}(T_g)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ -\frac{\sqrt{2}}{4} & 0 & -\frac{\sqrt{5}}{20} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{30}}{20} & 0 & -\frac{\sqrt{15}}{20} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{15}}{20} & 0 & -\frac{\sqrt{30}}{20} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{5}}{20} & 0 & -\frac{\sqrt{2}}{4} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
357	symmetry	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{10}i}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{15}i}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{15}i}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{10}i}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
358	symmetry	$\begin{bmatrix} -\frac{\sqrt{6}}{14} & 0 & 0 & 0 & \frac{\sqrt{30}}{14} & 0 & 0 & \frac{3}{56} & 0 & 0 & 0 & -\frac{\sqrt{3}}{56} & 0 & 0 \\ 0 & \frac{\sqrt{30}}{14} & 0 & 0 & 0 & -\frac{\sqrt{6}}{14} & 0 & 0 & \frac{\sqrt{3}}{56} & 0 & 0 & 0 & -\frac{3}{56} & 0 \\ 0 & 0 & 0 & \frac{3\sqrt{10}}{56} & 0 & 0 & \frac{\sqrt{42}}{168} & 0 & 0 & 0 & -\frac{\sqrt{30}}{168} & 0 & 0 & 0 \\ \frac{5\sqrt{3}}{56} & 0 & 0 & 0 & \frac{\sqrt{15}}{56} & 0 & 0 & -\frac{\sqrt{2}}{56} & 0 & 0 & 0 & -\frac{\sqrt{6}}{56} & 0 & 0 \\ 0 & -\frac{\sqrt{15}}{56} & 0 & 0 & 0 & -\frac{5\sqrt{3}}{56} & 0 & 0 & -\frac{\sqrt{6}}{56} & 0 & 0 & 0 & -\frac{\sqrt{2}}{56} & 0 \\ 0 & 0 & -\frac{3\sqrt{10}}{56} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}}{168} & 0 & 0 & 0 & \frac{\sqrt{42}}{168} \end{bmatrix}$
359	symmetry	$\begin{bmatrix} 0 & \frac{3\sqrt{2}i}{28} & 0 & -\frac{3i}{14} & 0 & \frac{3\sqrt{10}i}{28} & \frac{\sqrt{105}i}{224} & 0 & -\frac{3\sqrt{5}i}{224} & 0 & \frac{3\sqrt{3}i}{224} & 0 & -\frac{\sqrt{15}i}{224} & 0 \\ \frac{3\sqrt{10}i}{28} & 0 & -\frac{3i}{14} & 0 & \frac{3\sqrt{2}i}{28} & 0 & 0 & \frac{\sqrt{15}i}{224} & 0 & -\frac{3\sqrt{3}i}{224} & 0 & \frac{3\sqrt{5}i}{224} & 0 & -\frac{\sqrt{105}i}{224} \\ \frac{3\sqrt{15}i}{224} & 0 & -\frac{9\sqrt{6}i}{224} & 0 & \frac{15\sqrt{3}i}{224} & 0 & 0 & -\frac{\sqrt{10}i}{112} & 0 & \frac{\sqrt{2}i}{56} & 0 & -\frac{\sqrt{30}i}{336} & 0 & 0 \\ 0 & -\frac{3i}{32} & 0 & \frac{3\sqrt{2}i}{224} & 0 & \frac{15\sqrt{5}i}{224} & -\frac{\sqrt{210}i}{336} & 0 & 0 & 0 & \frac{\sqrt{6}i}{112} & 0 & -\frac{\sqrt{30}i}{168} & 0 \\ -\frac{15\sqrt{5}i}{224} & 0 & -\frac{3\sqrt{2}i}{224} & 0 & \frac{3i}{32} & 0 & 0 & -\frac{\sqrt{30}i}{168} & 0 & \frac{\sqrt{6}i}{112} & 0 & 0 & 0 & -\frac{\sqrt{210}i}{336} \\ 0 & -\frac{15\sqrt{3}i}{224} & 0 & \frac{9\sqrt{6}i}{224} & 0 & -\frac{3\sqrt{15}i}{224} & 0 & 0 & -\frac{\sqrt{30}i}{336} & 0 & \frac{\sqrt{2}i}{56} & 0 & -\frac{\sqrt{10}i}{112} & 0 \end{bmatrix}$
360	symmetry	$\begin{bmatrix} -\frac{y(3x^2-2y^2+3z^2)}{2} \end{bmatrix}$

continued ...

Table 7

No.	multipole	matrix
	$\mathbb{G}_{3,1}^{(1,1;a)}(T_g, 1)$	$\begin{bmatrix} 0 & -\frac{3\sqrt{2}}{28} & 0 & -\frac{3}{14} & 0 & -\frac{3\sqrt{10}}{28} & \frac{\sqrt{105}}{224} & 0 & \frac{3\sqrt{5}}{224} & 0 & \frac{3\sqrt{3}}{224} & 0 & \frac{\sqrt{15}}{224} & 0 \\ \frac{3\sqrt{10}}{28} & 0 & \frac{3}{14} & 0 & \frac{3\sqrt{2}}{28} & 0 & 0 & \frac{\sqrt{15}}{224} & 0 & \frac{3\sqrt{3}}{224} & 0 & \frac{3\sqrt{5}}{224} & 0 & \frac{\sqrt{105}}{224} \\ -\frac{3\sqrt{15}}{224} & 0 & -\frac{9\sqrt{6}}{224} & 0 & -\frac{15\sqrt{3}}{224} & 0 & 0 & \frac{\sqrt{10}}{112} & 0 & \frac{\sqrt{2}}{56} & 0 & \frac{\sqrt{30}}{336} & 0 & 0 \\ 0 & \frac{3}{32} & 0 & \frac{3\sqrt{2}}{224} & 0 & -\frac{15\sqrt{5}}{224} & -\frac{\sqrt{210}}{336} & 0 & 0 & 0 & \frac{\sqrt{6}}{112} & 0 & \frac{\sqrt{30}}{168} & 0 \\ -\frac{15\sqrt{5}}{224} & 0 & \frac{3\sqrt{2}}{224} & 0 & \frac{3}{32} & 0 & 0 & -\frac{\sqrt{30}}{168} & 0 & -\frac{\sqrt{6}}{112} & 0 & 0 & 0 & \frac{\sqrt{210}}{336} \\ 0 & -\frac{15\sqrt{3}}{224} & 0 & -\frac{9\sqrt{6}}{224} & 0 & -\frac{3\sqrt{15}}{224} & 0 & 0 & -\frac{\sqrt{30}}{336} & 0 & -\frac{\sqrt{2}}{56} & 0 & -\frac{\sqrt{10}}{112} & 0 \end{bmatrix}$
361	symmetry	$-\frac{z(3x^2+3y^2-2z^2)}{2}$ $\begin{bmatrix} 0 & 0 & \frac{3i}{7} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{28} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{3i}{7} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{28} & 0 & 0 & 0 \\ 0 & \frac{3\sqrt{3}i}{28} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}i}{84} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{3\sqrt{2}i}{28} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{84} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{3\sqrt{2}i}{28} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}i}{84} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{3\sqrt{3}i}{28} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}i}{84} & 0 & 0 \end{bmatrix}$
362	symmetry	$\frac{\sqrt{15}x(y-z)(y+z)}{2}$ $\begin{bmatrix} 0 & \frac{\sqrt{30}i}{28} & 0 & -\frac{\sqrt{15}i}{14} & 0 & -\frac{3\sqrt{6}i}{28} & -\frac{3\sqrt{7}i}{224} & 0 & -\frac{5\sqrt{3}i}{224} & 0 & \frac{3\sqrt{5}i}{224} & 0 & \frac{3i}{224} & 0 \\ -\frac{3\sqrt{6}i}{28} & 0 & -\frac{\sqrt{15}i}{14} & 0 & \frac{\sqrt{30}i}{28} & 0 & 0 & -\frac{3i}{224} & 0 & -\frac{3\sqrt{5}i}{224} & 0 & \frac{5\sqrt{3}i}{224} & 0 & \frac{3\sqrt{7}i}{224} \\ \frac{15i}{224} & 0 & -\frac{9\sqrt{10}i}{224} & 0 & -\frac{9\sqrt{5}i}{224} & 0 & 0 & -\frac{5\sqrt{6}i}{336} & 0 & \frac{\sqrt{30}i}{168} & 0 & \frac{\sqrt{2}i}{112} & 0 & 0 \\ 0 & -\frac{\sqrt{15}i}{32} & 0 & \frac{\sqrt{30}i}{224} & 0 & -\frac{15\sqrt{3}i}{224} & \frac{\sqrt{14}i}{112} & 0 & 0 & 0 & \frac{\sqrt{10}i}{112} & 0 & \frac{\sqrt{2}i}{56} & 0 \\ \frac{15\sqrt{3}i}{224} & 0 & -\frac{\sqrt{30}i}{224} & 0 & \frac{\sqrt{15}i}{32} & 0 & 0 & \frac{\sqrt{2}i}{56} & 0 & \frac{\sqrt{10}i}{112} & 0 & 0 & 0 & \frac{\sqrt{14}i}{112} \\ 0 & \frac{9\sqrt{5}i}{224} & 0 & \frac{9\sqrt{10}i}{224} & 0 & -\frac{15i}{224} & 0 & 0 & \frac{\sqrt{2}i}{112} & 0 & \frac{\sqrt{30}i}{168} & 0 & -\frac{5\sqrt{6}i}{336} & 0 \end{bmatrix}$
363	symmetry	$-\frac{\sqrt{15}y(x-z)(x+z)}{2}$ $\begin{bmatrix} 0 & \frac{\sqrt{30}}{28} & 0 & \frac{\sqrt{15}}{14} & 0 & -\frac{3\sqrt{6}}{28} & \frac{3\sqrt{7}}{224} & 0 & -\frac{5\sqrt{3}}{224} & 0 & -\frac{3\sqrt{5}}{224} & 0 & \frac{3}{224} & 0 \\ \frac{3\sqrt{6}}{28} & 0 & -\frac{\sqrt{15}}{14} & 0 & -\frac{\sqrt{30}}{28} & 0 & 0 & \frac{3}{224} & 0 & -\frac{3\sqrt{5}}{224} & 0 & -\frac{5\sqrt{3}}{224} & 0 & \frac{3\sqrt{7}}{224} \\ \frac{15}{224} & 0 & \frac{9\sqrt{10}}{224} & 0 & -\frac{9\sqrt{5}}{224} & 0 & 0 & -\frac{5\sqrt{6}}{336} & 0 & -\frac{\sqrt{30}}{168} & 0 & \frac{\sqrt{2}}{112} & 0 & 0 \\ 0 & -\frac{\sqrt{15}}{32} & 0 & -\frac{\sqrt{30}}{224} & 0 & -\frac{15\sqrt{3}}{224} & -\frac{\sqrt{14}}{112} & 0 & 0 & 0 & -\frac{\sqrt{10}}{112} & 0 & \frac{\sqrt{2}}{56} & 0 \\ -\frac{15\sqrt{3}}{224} & 0 & -\frac{\sqrt{30}}{224} & 0 & -\frac{\sqrt{15}}{32} & 0 & 0 & -\frac{\sqrt{2}}{56} & 0 & \frac{\sqrt{10}}{112} & 0 & 0 & 0 & \frac{\sqrt{14}}{112} \\ 0 & -\frac{9\sqrt{5}}{224} & 0 & \frac{9\sqrt{10}}{224} & 0 & \frac{15}{224} & 0 & 0 & -\frac{\sqrt{2}}{112} & 0 & \frac{\sqrt{30}}{168} & 0 & \frac{5\sqrt{6}}{336} & 0 \end{bmatrix}$
364	symmetry	$\frac{\sqrt{15}z(x-y)(x+y)}{2}$

continued ...

Table 7

No.	multipole	matrix
	$\mathbb{G}_{3,2}^{(1,1;a)}(T_g, 2)$	$\begin{bmatrix} \frac{\sqrt{6}i}{14} & 0 & 0 & 0 & \frac{\sqrt{30}i}{14} & 0 & 0 & -\frac{3i}{56} & 0 & 0 & 0 & -\frac{\sqrt{3}i}{56} & 0 & 0 \\ 0 & -\frac{\sqrt{30}i}{14} & 0 & 0 & 0 & -\frac{\sqrt{6}i}{14} & 0 & 0 & -\frac{\sqrt{3}i}{56} & 0 & 0 & 0 & -\frac{3i}{56} & 0 \\ 0 & 0 & 0 & \frac{3\sqrt{10}i}{56} & 0 & 0 & -\frac{\sqrt{42}i}{168} & 0 & 0 & 0 & -\frac{\sqrt{30}i}{168} & 0 & 0 & 0 \\ -\frac{5\sqrt{3}i}{56} & 0 & 0 & 0 & \frac{\sqrt{15}i}{56} & 0 & 0 & \frac{\sqrt{2}i}{56} & 0 & 0 & 0 & -\frac{\sqrt{6}i}{56} & 0 & 0 \\ 0 & \frac{\sqrt{15}i}{56} & 0 & 0 & 0 & -\frac{5\sqrt{3}i}{56} & 0 & 0 & \frac{\sqrt{6}i}{56} & 0 & 0 & 0 & -\frac{\sqrt{2}i}{56} & 0 \\ 0 & 0 & \frac{3\sqrt{10}i}{56} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}i}{168} & 0 & 0 & 0 & \frac{\sqrt{42}i}{168} \end{bmatrix}$
365	symmetry	$-\frac{x^2}{2} - \frac{y^2}{2} + z^2$
	$\mathbb{T}_{2,0}^{(a)}(E_g)$	$\begin{bmatrix} 0 & 0 & \frac{\sqrt{3}i}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{3}i}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{i}{7} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}i}{14} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{6}i}{42} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{2}i}{14} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{6}i}{42} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{2}i}{14} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{i}{7} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}i}{14} & 0 & 0 \end{bmatrix}$
366	symmetry	$\frac{\sqrt{3}(x-y)(x+y)}{2}$
	$\mathbb{T}_{2,1}^{(a)}(E_g)$	$\begin{bmatrix} \frac{\sqrt{10}i}{12} & 0 & 0 & 0 & \frac{\sqrt{2}i}{12} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{2}i}{12} & 0 & 0 & 0 & \frac{\sqrt{10}i}{12} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{6}i}{42} & 0 & 0 & \frac{\sqrt{70}i}{28} & 0 & 0 & 0 & \frac{\sqrt{2}i}{28} & 0 & 0 & 0 \\ \frac{\sqrt{5}i}{21} & 0 & 0 & 0 & -\frac{2i}{21} & 0 & 0 & \frac{\sqrt{30}i}{28} & 0 & 0 & 0 & \frac{\sqrt{10}i}{28} & 0 & 0 \\ 0 & \frac{2i}{21} & 0 & 0 & 0 & -\frac{\sqrt{5}i}{21} & 0 & 0 & \frac{\sqrt{10}i}{28} & 0 & 0 & 0 & \frac{\sqrt{30}i}{28} & 0 \\ 0 & 0 & \frac{\sqrt{6}i}{42} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2}i}{28} & 0 & 0 & 0 & \frac{\sqrt{70}i}{28} \end{bmatrix}$
367	symmetry	$\sqrt{3}yz$
	$\mathbb{T}_{2,0}^{(a)}(T_g)$	$\begin{bmatrix} 0 & \frac{\sqrt{2}}{6} & 0 & \frac{1}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & \frac{1}{6} & 0 & \frac{\sqrt{2}}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ -\frac{\sqrt{15}}{42} & 0 & -\frac{\sqrt{6}}{28} & 0 & 0 & 0 & 0 & \frac{\sqrt{10}}{14} & 0 & \frac{\sqrt{2}}{14} & 0 & 0 & 0 & 0 \\ 0 & \frac{1}{42} & 0 & -\frac{5\sqrt{2}}{84} & 0 & 0 & 0 & 0 & \frac{\sqrt{10}}{14} & 0 & \frac{\sqrt{6}}{14} & 0 & 0 & 0 \\ 0 & 0 & \frac{5\sqrt{2}}{84} & 0 & -\frac{1}{42} & 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{14} & 0 & \frac{\sqrt{10}}{14} & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{6}}{28} & 0 & \frac{\sqrt{15}}{42} & 0 & 0 & 0 & 0 & \frac{\sqrt{2}}{14} & 0 & \frac{\sqrt{10}}{14} & 0 \end{bmatrix}$
368	symmetry	$\sqrt{3}xz$

continued ...

Table 7

No.	multipole	matrix
	$\mathbb{T}_{2,1}^{(a)}(T_g)$	$\begin{bmatrix} 0 & -\frac{\sqrt{2}i}{6} & 0 & \frac{i}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{i}{6} & 0 & \frac{\sqrt{2}i}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ \frac{\sqrt{15}i}{42} & 0 & -\frac{\sqrt{6}i}{28} & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}i}{14} & 0 & \frac{\sqrt{2}i}{14} & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{i}{42} & 0 & -\frac{5\sqrt{2}i}{84} & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}i}{14} & 0 & \frac{\sqrt{6}i}{14} & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{5\sqrt{2}i}{84} & 0 & -\frac{i}{42} & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{14} & 0 & \frac{\sqrt{10}i}{14} & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{6}i}{28} & 0 & \frac{\sqrt{15}i}{42} & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}i}{14} & 0 & \frac{\sqrt{10}i}{14} & 0 \end{bmatrix}$
369	symmetry	$\sqrt{3}xy$ $\begin{bmatrix} -\frac{\sqrt{10}}{12} & 0 & 0 & 0 & \frac{\sqrt{2}}{12} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{2}}{12} & 0 & 0 & 0 & \frac{\sqrt{10}}{12} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{6}}{42} & 0 & 0 & -\frac{\sqrt{70}}{28} & 0 & 0 & 0 & \frac{\sqrt{2}}{28} & 0 & 0 & 0 & 0 \\ -\frac{\sqrt{5}}{21} & 0 & 0 & 0 & -\frac{2}{21} & 0 & 0 & -\frac{\sqrt{30}}{28} & 0 & 0 & 0 & \frac{\sqrt{10}}{28} & 0 & 0 & 0 \\ 0 & -\frac{2}{21} & 0 & 0 & 0 & -\frac{\sqrt{5}}{21} & 0 & 0 & -\frac{\sqrt{10}}{28} & 0 & 0 & 0 & \frac{\sqrt{30}}{28} & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{6}}{42} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}}{28} & 0 & 0 & 0 & \frac{\sqrt{70}}{28} & 0 \end{bmatrix}$
370	symmetry	$\frac{\sqrt{21}(x^4 - 3x^2y^2 - 3x^2z^2 + y^4 - 3y^2z^2 + z^4)}{6}$ $\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}i}{12} & 0 & 0 & 0 & -\frac{\sqrt{5}i}{12} \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{5}i}{12} & 0 & 0 & 0 & \frac{\sqrt{7}i}{12} & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{7}i}{28} & 0 & 0 & 0 & \frac{\sqrt{35}i}{28} & 0 & 0 & -\frac{\sqrt{70}i}{56} & 0 & 0 & 0 & -\frac{\sqrt{210}i}{168} & 0 \\ 0 & 0 & -\frac{\sqrt{42}i}{28} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{5\sqrt{14}i}{168} & 0 & 0 & 0 & -\frac{\sqrt{10}i}{24} \\ 0 & 0 & 0 & \frac{\sqrt{42}i}{28} & 0 & 0 & -\frac{\sqrt{10}i}{24} & 0 & 0 & 0 & \frac{5\sqrt{14}i}{168} & 0 & 0 & 0 \\ -\frac{\sqrt{35}i}{28} & 0 & 0 & 0 & -\frac{\sqrt{7}i}{28} & 0 & 0 & -\frac{\sqrt{210}i}{168} & 0 & 0 & 0 & -\frac{\sqrt{70}i}{56} & 0 & 0 \end{bmatrix}$
371	symmetry	$-\frac{\sqrt{15}(x^4 - 12x^2y^2 + 6x^2z^2 + y^4 + 6y^2z^2 - 2z^4)}{12}$ $\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{12} & 0 & 0 & 0 & \frac{\sqrt{7}i}{12} \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}i}{12} & 0 & 0 & 0 & \frac{\sqrt{5}i}{12} & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{5}i}{28} & 0 & 0 & 0 & -\frac{i}{4} & 0 & 0 & -\frac{5\sqrt{2}i}{56} & 0 & 0 & 0 & \frac{\sqrt{6}i}{24} & 0 \\ 0 & 0 & -\frac{\sqrt{30}i}{28} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{5\sqrt{10}i}{168} & 0 & 0 & 0 & \frac{\sqrt{14}i}{24} \\ 0 & 0 & 0 & \frac{\sqrt{30}i}{28} & 0 & 0 & \frac{\sqrt{14}i}{24} & 0 & 0 & 0 & \frac{5\sqrt{10}i}{168} & 0 & 0 & 0 \\ \frac{i}{4} & 0 & 0 & 0 & -\frac{\sqrt{5}i}{28} & 0 & 0 & \frac{\sqrt{6}i}{24} & 0 & 0 & 0 & -\frac{5\sqrt{2}i}{56} & 0 & 0 \end{bmatrix}$
372	symmetry	$\frac{\sqrt{5}(x-y)(x+y)(x^2 + y^2 - 6z^2)}{4}$

continued ...

Table 7

No.	multipole	matrix
	$\mathbb{T}_{4,1}^{(a)}(E_g)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{12} & 0 & 0 & 0 & \frac{i}{4} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{i}{4} & 0 & 0 & 0 & -\frac{\sqrt{3}i}{12} & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{30}i}{28} & 0 & 0 & \frac{\sqrt{14}i}{56} & 0 & 0 & 0 & \frac{3\sqrt{10}i}{56} & 0 & 0 & 0 \\ \frac{3i}{28} & 0 & 0 & 0 & \frac{3\sqrt{5}i}{28} & 0 & 0 & -\frac{11\sqrt{6}i}{168} & 0 & 0 & 0 & \frac{\sqrt{2}i}{56} & 0 & 0 \\ 0 & -\frac{3\sqrt{5}i}{28} & 0 & 0 & 0 & -\frac{3i}{28} & 0 & 0 & \frac{\sqrt{2}i}{56} & 0 & 0 & 0 & -\frac{11\sqrt{6}i}{168} & 0 \\ 0 & 0 & \frac{\sqrt{30}i}{28} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{10}i}{56} & 0 & 0 & 0 & \frac{\sqrt{14}i}{56} \end{bmatrix}$
373	symmetry	$\frac{\sqrt{35}yz(y-z)(y+z)}{2}$ $\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{48} & 0 & \frac{\sqrt{7}}{16} & 0 & \frac{\sqrt{105}}{48} & 0 & \frac{\sqrt{21}}{48} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{21}}{48} & 0 & -\frac{\sqrt{105}}{48} & 0 & -\frac{\sqrt{7}}{16} & 0 & -\frac{\sqrt{3}}{48} \\ -\frac{\sqrt{21}}{112} & 0 & -\frac{\sqrt{210}}{112} & 0 & -\frac{\sqrt{105}}{112} & 0 & 0 & \frac{3\sqrt{14}}{112} & 0 & \frac{\sqrt{70}}{56} & 0 & \frac{\sqrt{42}}{112} & 0 & 0 \\ 0 & \frac{3\sqrt{35}}{112} & 0 & \frac{3\sqrt{70}}{112} & 0 & \frac{3\sqrt{7}}{112} & -\frac{\sqrt{6}}{48} & 0 & -\frac{\sqrt{14}}{28} & 0 & -\frac{\sqrt{210}}{336} & 0 & \frac{\sqrt{42}}{168} & 0 \\ -\frac{3\sqrt{7}}{112} & 0 & -\frac{3\sqrt{70}}{112} & 0 & -\frac{3\sqrt{35}}{112} & 0 & 0 & \frac{\sqrt{42}}{168} & 0 & -\frac{\sqrt{210}}{336} & 0 & -\frac{\sqrt{14}}{28} & 0 & -\frac{\sqrt{6}}{48} \\ 0 & \frac{\sqrt{105}}{112} & 0 & \frac{\sqrt{210}}{112} & 0 & \frac{\sqrt{21}}{112} & 0 & 0 & \frac{\sqrt{42}}{112} & 0 & \frac{\sqrt{70}}{56} & 0 & \frac{3\sqrt{14}}{112} & 0 \end{bmatrix}$
374	symmetry	$-\frac{\sqrt{35}xz(x-z)(x+z)}{2}$ $\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{48} & 0 & \frac{\sqrt{7}i}{16} & 0 & -\frac{\sqrt{105}i}{48} & 0 & \frac{\sqrt{21}i}{48} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{21}i}{48} & 0 & -\frac{\sqrt{105}i}{48} & 0 & \frac{\sqrt{7}i}{16} & 0 & -\frac{\sqrt{3}i}{48} \\ -\frac{\sqrt{21}i}{112} & 0 & \frac{\sqrt{210}i}{112} & 0 & -\frac{\sqrt{105}i}{112} & 0 & 0 & \frac{3\sqrt{14}i}{112} & 0 & -\frac{\sqrt{70}i}{56} & 0 & \frac{\sqrt{42}i}{112} & 0 & 0 \\ 0 & \frac{3\sqrt{35}i}{112} & 0 & -\frac{3\sqrt{70}i}{112} & 0 & \frac{3\sqrt{7}i}{112} & \frac{\sqrt{6}i}{48} & 0 & -\frac{\sqrt{14}i}{28} & 0 & \frac{\sqrt{210}i}{336} & 0 & \frac{\sqrt{42}i}{168} & 0 \\ \frac{3\sqrt{7}i}{112} & 0 & -\frac{3\sqrt{70}i}{112} & 0 & \frac{3\sqrt{35}i}{112} & 0 & 0 & -\frac{\sqrt{42}i}{168} & 0 & -\frac{\sqrt{210}i}{336} & 0 & \frac{\sqrt{14}i}{28} & 0 & -\frac{\sqrt{6}i}{48} \\ 0 & -\frac{\sqrt{105}i}{112} & 0 & \frac{\sqrt{210}i}{112} & 0 & -\frac{\sqrt{21}i}{112} & 0 & 0 & -\frac{\sqrt{42}i}{112} & 0 & \frac{\sqrt{70}i}{56} & 0 & -\frac{3\sqrt{14}i}{112} & 0 \end{bmatrix}$
375	symmetry	$\frac{\sqrt{35}xy(x-y)(x+y)}{2}$ $\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{6} \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{6} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{21}}{14} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{14}}{28} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}}{12} \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{12} & 0 & 0 & 0 & 0 & 0 & 0 \\ \frac{\sqrt{21}}{14} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{14}}{28} & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
376	symmetry	$\frac{\sqrt{5}yz(6x^2-y^2-z^2)}{2}$

continued ...

Table 7

No.	multipole	matrix
	$\mathbb{T}_{4,0}^{(a)}(T_g, 2)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{21}}{48} & 0 & \frac{1}{16} & 0 & \frac{\sqrt{15}}{48} & 0 & -\frac{7\sqrt{3}}{48} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{7\sqrt{3}}{48} & 0 & -\frac{\sqrt{15}}{48} & 0 & -\frac{1}{16} & 0 & \frac{\sqrt{21}}{48} \\ -\frac{\sqrt{3}}{112} & 0 & -\frac{\sqrt{30}}{112} & 0 & \frac{\sqrt{15}}{16} & 0 & 0 & \frac{3\sqrt{2}}{112} & 0 & \frac{\sqrt{10}}{56} & 0 & -\frac{\sqrt{6}}{16} & 0 & 0 \\ 0 & \frac{3\sqrt{5}}{112} & 0 & \frac{3\sqrt{10}}{112} & 0 & -\frac{3}{16} & \frac{\sqrt{42}}{48} & 0 & -\frac{\sqrt{2}}{28} & 0 & -\frac{\sqrt{30}}{336} & 0 & -\frac{\sqrt{6}}{24} & 0 \\ \frac{3}{16} & 0 & -\frac{3\sqrt{10}}{112} & 0 & -\frac{3\sqrt{5}}{112} & 0 & 0 & -\frac{\sqrt{6}}{24} & 0 & -\frac{\sqrt{30}}{336} & 0 & -\frac{\sqrt{2}}{28} & 0 & \frac{\sqrt{42}}{48} \\ 0 & -\frac{\sqrt{15}}{16} & 0 & \frac{\sqrt{30}}{112} & 0 & \frac{\sqrt{3}}{112} & 0 & 0 & -\frac{\sqrt{6}}{16} & 0 & \frac{\sqrt{10}}{56} & 0 & \frac{3\sqrt{2}}{112} & 0 \end{bmatrix}$
377	symmetry	$-\frac{\sqrt{5}xz(x^2-6y^2+z^2)}{2}$
	$\mathbb{T}_{4,1}^{(a)}(T_g, 2)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{21}i}{48} & 0 & -\frac{i}{16} & 0 & \frac{\sqrt{15}i}{48} & 0 & \frac{7\sqrt{3}i}{48} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{7\sqrt{3}i}{48} & 0 & \frac{\sqrt{15}i}{48} & 0 & -\frac{i}{16} & 0 & -\frac{\sqrt{21}i}{48} \\ \frac{\sqrt{3}i}{112} & 0 & -\frac{\sqrt{30}i}{112} & 0 & -\frac{\sqrt{15}i}{16} & 0 & 0 & -\frac{3\sqrt{2}i}{112} & 0 & \frac{\sqrt{10}i}{56} & 0 & \frac{\sqrt{6}i}{16} & 0 & 0 \\ 0 & -\frac{3\sqrt{5}i}{112} & 0 & \frac{3\sqrt{10}i}{112} & 0 & \frac{3i}{16} & \frac{\sqrt{42}i}{48} & 0 & \frac{\sqrt{2}i}{28} & 0 & -\frac{\sqrt{30}i}{336} & 0 & \frac{\sqrt{6}i}{24} & 0 \\ \frac{3i}{16} & 0 & \frac{3\sqrt{10}i}{112} & 0 & -\frac{3\sqrt{5}i}{112} & 0 & 0 & -\frac{\sqrt{6}i}{24} & 0 & \frac{\sqrt{30}i}{336} & 0 & -\frac{\sqrt{2}i}{28} & 0 & -\frac{\sqrt{42}i}{48} \\ 0 & -\frac{\sqrt{15}i}{16} & 0 & -\frac{\sqrt{30}i}{112} & 0 & \frac{\sqrt{3}i}{112} & 0 & 0 & -\frac{\sqrt{6}i}{16} & 0 & -\frac{\sqrt{10}i}{56} & 0 & \frac{3\sqrt{2}i}{112} & 0 \end{bmatrix}$
378	symmetry	$-\frac{\sqrt{5}xy(x^2+y^2-6z^2)}{2}$
	$\mathbb{T}_{4,2}^{(a)}(T_g, 2)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{12} & 0 & 0 & 0 & -\frac{1}{4} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{1}{4} & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{12} & 0 \\ 0 & 0 & 0 & \frac{\sqrt{30}}{28} & 0 & 0 & \frac{\sqrt{14}}{56} & 0 & 0 & 0 & -\frac{3\sqrt{10}}{56} & 0 & 0 & 0 & 0 \\ \frac{3}{28} & 0 & 0 & 0 & -\frac{3\sqrt{5}}{28} & 0 & 0 & -\frac{11\sqrt{6}}{168} & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}}{56} & 0 & 0 \\ 0 & -\frac{3\sqrt{5}}{28} & 0 & 0 & 0 & \frac{3}{28} & 0 & 0 & \frac{\sqrt{2}}{56} & 0 & 0 & 0 & 0 & \frac{11\sqrt{6}}{168} & 0 \\ 0 & 0 & \frac{\sqrt{30}}{28} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{10}}{56} & 0 & 0 & 0 & 0 & -\frac{\sqrt{14}}{56} \end{bmatrix}$
379	symmetry	$\frac{\sqrt{21}(x^4-3x^2y^2-3x^2z^2+y^4-3y^2z^2+z^4)}{6}$
	$\mathbb{T}_4^{(1,-1;a)}(A_g)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{21}i}{24} & 0 & 0 & 0 & -\frac{\sqrt{15}i}{24} \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{24} & 0 & 0 & 0 & \frac{\sqrt{21}i}{24} & 0 & 0 & 0 \\ 0 & \frac{\sqrt{21}i}{168} & 0 & 0 & 0 & \frac{\sqrt{105}i}{168} & 0 & 0 & \frac{\sqrt{210}i}{56} & 0 & 0 & 0 & \frac{\sqrt{70}i}{56} & 0 \\ 0 & 0 & -\frac{\sqrt{14}i}{56} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{5\sqrt{42}i}{168} & 0 & 0 & 0 & \frac{\sqrt{30}i}{24} \\ 0 & 0 & 0 & \frac{\sqrt{14}i}{56} & 0 & 0 & \frac{\sqrt{30}i}{24} & 0 & 0 & 0 & -\frac{5\sqrt{42}i}{168} & 0 & 0 & 0 \\ -\frac{\sqrt{105}i}{168} & 0 & 0 & 0 & -\frac{\sqrt{21}i}{168} & 0 & 0 & \frac{\sqrt{70}i}{56} & 0 & 0 & 0 & \frac{\sqrt{210}i}{56} & 0 & 0 \end{bmatrix}$
380	symmetry	$-\frac{\sqrt{15}(x^4-12x^2y^2+6x^2z^2+y^4+6y^2z^2-2z^4)}{12}$

continued ...

Table 7

No.	multipole	matrix
	$\mathbb{T}_{4,0}^{(1,-1;a)}(E_g)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{24} & 0 & 0 & 0 & \frac{\sqrt{21}i}{24} \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{21}i}{24} & 0 & 0 & 0 & \frac{\sqrt{15}i}{24} & 0 & 0 & 0 \\ 0 & \frac{\sqrt{15}i}{168} & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{24} & 0 & 0 & \frac{5\sqrt{6}i}{56} & 0 & 0 & 0 & -\frac{\sqrt{2}i}{8} \\ 0 & 0 & -\frac{\sqrt{10}i}{56} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{5\sqrt{30}i}{168} & 0 & 0 & 0 & -\frac{\sqrt{42}i}{24} \\ 0 & 0 & 0 & \frac{\sqrt{10}i}{56} & 0 & 0 & -\frac{\sqrt{42}i}{24} & 0 & 0 & 0 & -\frac{5\sqrt{30}i}{168} & 0 & 0 & 0 \\ \frac{\sqrt{3}i}{24} & 0 & 0 & 0 & -\frac{\sqrt{15}i}{168} & 0 & 0 & -\frac{\sqrt{2}i}{8} & 0 & 0 & 0 & \frac{5\sqrt{6}i}{56} & 0 & 0 \end{bmatrix}$
381	symmetry	$\frac{\sqrt{5}(x-y)(x+y)(x^2+y^2-6z^2)}{4}$ $\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{i}{8} & 0 & 0 & 0 & \frac{\sqrt{3}i}{8} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{8} & 0 & 0 & 0 & -\frac{i}{8} & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{10}i}{56} & 0 & 0 & -\frac{\sqrt{42}i}{56} & 0 & 0 & 0 & -\frac{3\sqrt{30}i}{56} & 0 & 0 & 0 \\ \frac{\sqrt{3}i}{56} & 0 & 0 & 0 & \frac{\sqrt{15}i}{56} & 0 & 0 & \frac{11\sqrt{2}i}{56} & 0 & 0 & 0 & -\frac{\sqrt{6}i}{56} & 0 & 0 \\ 0 & -\frac{\sqrt{15}i}{56} & 0 & 0 & 0 & -\frac{\sqrt{3}i}{56} & 0 & 0 & -\frac{\sqrt{6}i}{56} & 0 & 0 & 0 & \frac{11\sqrt{2}i}{56} & 0 \\ 0 & 0 & \frac{\sqrt{10}i}{56} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{30}i}{56} & 0 & 0 & 0 & -\frac{\sqrt{42}i}{56} \end{bmatrix}$
382	symmetry	$\frac{\sqrt{35}yz(y-z)(y+z)}{2}$ $\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & \frac{1}{32} & 0 & \frac{\sqrt{21}}{32} & 0 & \frac{\sqrt{35}}{32} & 0 & \frac{\sqrt{7}}{32} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}}{32} & 0 & -\frac{\sqrt{35}}{32} & 0 & -\frac{\sqrt{21}}{32} & 0 & -\frac{1}{32} \\ -\frac{\sqrt{7}}{224} & 0 & -\frac{\sqrt{70}}{224} & 0 & -\frac{\sqrt{35}}{224} & 0 & 0 & -\frac{3\sqrt{42}}{112} & 0 & -\frac{\sqrt{210}}{56} & 0 & -\frac{3\sqrt{14}}{112} & 0 & 0 & 0 \\ 0 & \frac{\sqrt{105}}{224} & 0 & \frac{\sqrt{210}}{224} & 0 & \frac{\sqrt{21}}{224} & \frac{\sqrt{2}}{16} & 0 & \frac{\sqrt{42}}{28} & 0 & \frac{\sqrt{70}}{112} & 0 & -\frac{\sqrt{14}}{56} & 0 & 0 \\ -\frac{\sqrt{21}}{224} & 0 & -\frac{\sqrt{210}}{224} & 0 & -\frac{\sqrt{105}}{224} & 0 & 0 & -\frac{\sqrt{14}}{56} & 0 & \frac{\sqrt{70}}{112} & 0 & \frac{\sqrt{42}}{28} & 0 & \frac{\sqrt{2}}{16} \\ 0 & \frac{\sqrt{35}}{224} & 0 & \frac{\sqrt{70}}{224} & 0 & \frac{\sqrt{7}}{224} & 0 & 0 & -\frac{3\sqrt{14}}{112} & 0 & -\frac{\sqrt{210}}{56} & 0 & -\frac{3\sqrt{42}}{112} & 0 & 0 \end{bmatrix}$
383	symmetry	$-\frac{\sqrt{35}xz(x-z)(x+z)}{2}$ $\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & -\frac{i}{32} & 0 & \frac{\sqrt{21}i}{32} & 0 & -\frac{\sqrt{35}i}{32} & 0 & \frac{\sqrt{7}i}{32} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}i}{32} & 0 & -\frac{\sqrt{35}i}{32} & 0 & \frac{\sqrt{21}i}{32} & 0 & -\frac{i}{32} \\ -\frac{\sqrt{7}i}{224} & 0 & \frac{\sqrt{70}i}{224} & 0 & -\frac{\sqrt{35}i}{224} & 0 & 0 & -\frac{3\sqrt{42}i}{112} & 0 & \frac{\sqrt{210}i}{56} & 0 & -\frac{3\sqrt{14}i}{112} & 0 & 0 \\ 0 & \frac{\sqrt{105}i}{224} & 0 & -\frac{\sqrt{210}i}{224} & 0 & \frac{\sqrt{21}i}{224} & -\frac{\sqrt{2}i}{16} & 0 & \frac{\sqrt{42}i}{28} & 0 & -\frac{\sqrt{70}i}{112} & 0 & -\frac{\sqrt{14}i}{56} & 0 \\ \frac{\sqrt{21}i}{224} & 0 & -\frac{\sqrt{210}i}{224} & 0 & \frac{\sqrt{105}i}{224} & 0 & 0 & \frac{\sqrt{14}i}{56} & 0 & \frac{\sqrt{70}i}{112} & 0 & -\frac{\sqrt{42}i}{28} & 0 & \frac{\sqrt{2}i}{16} \\ 0 & -\frac{\sqrt{35}i}{224} & 0 & \frac{\sqrt{70}i}{224} & 0 & -\frac{\sqrt{7}i}{224} & 0 & 0 & \frac{3\sqrt{14}i}{112} & 0 & -\frac{\sqrt{210}i}{56} & 0 & \frac{3\sqrt{42}i}{112} & 0 \end{bmatrix}$
384	symmetry	$\frac{\sqrt{35}xy(x-y)(x+y)}{2}$

continued ...

Table 7

No.	multipole	matrix
	$T_{4,2}^{(1,-1;a)}(T_g, 1)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{1}{4} \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{1}{4} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}}{28} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{42}}{28} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2}}{4} \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}}{4} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ \frac{\sqrt{7}}{28} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{42}}{28} & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
385	symmetry	$\frac{\sqrt{5}yz(6x^2-y^2-z^2)}{2}$ $\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}}{32} & 0 & \frac{\sqrt{3}}{32} & 0 & \frac{\sqrt{5}}{32} & 0 & -\frac{7}{32} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{7}{32} & 0 & -\frac{\sqrt{5}}{32} & 0 & -\frac{\sqrt{3}}{32} & 0 & \frac{\sqrt{7}}{32} \\ -\frac{1}{224} & 0 & -\frac{\sqrt{10}}{224} & 0 & \frac{\sqrt{5}}{32} & 0 & 0 & -\frac{3\sqrt{6}}{112} & 0 & -\frac{\sqrt{30}}{56} & 0 & \frac{3\sqrt{2}}{16} & 0 & 0 \\ 0 & \frac{\sqrt{15}}{224} & 0 & \frac{\sqrt{30}}{224} & 0 & -\frac{\sqrt{3}}{32} & -\frac{\sqrt{14}}{16} & 0 & \frac{\sqrt{6}}{28} & 0 & \frac{\sqrt{10}}{112} & 0 & \frac{\sqrt{2}}{8} & 0 \\ \frac{\sqrt{3}}{32} & 0 & -\frac{\sqrt{30}}{224} & 0 & -\frac{\sqrt{15}}{224} & 0 & 0 & \frac{\sqrt{2}}{8} & 0 & \frac{\sqrt{10}}{112} & 0 & \frac{\sqrt{6}}{28} & 0 & -\frac{\sqrt{14}}{16} \\ 0 & -\frac{\sqrt{5}}{32} & 0 & \frac{\sqrt{10}}{224} & 0 & \frac{1}{224} & 0 & 0 & \frac{3\sqrt{2}}{16} & 0 & -\frac{\sqrt{30}}{56} & 0 & -\frac{3\sqrt{6}}{112} & 0 \end{bmatrix}$
386	symmetry	$-\frac{\sqrt{5}xz(x^2-6y^2+z^2)}{2}$ $\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}i}{32} & 0 & -\frac{\sqrt{3}i}{32} & 0 & \frac{\sqrt{5}i}{32} & 0 & \frac{7i}{32} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{7i}{32} & 0 & \frac{\sqrt{5}i}{32} & 0 & -\frac{\sqrt{3}i}{32} & 0 & -\frac{\sqrt{7}i}{32} \\ \frac{i}{224} & 0 & -\frac{\sqrt{10}i}{224} & 0 & -\frac{\sqrt{5}i}{32} & 0 & 0 & \frac{3\sqrt{6}i}{112} & 0 & -\frac{\sqrt{30}i}{56} & 0 & -\frac{3\sqrt{2}i}{16} & 0 & 0 \\ 0 & -\frac{\sqrt{15}i}{224} & 0 & \frac{\sqrt{30}i}{224} & 0 & \frac{\sqrt{3}i}{32} & -\frac{\sqrt{14}i}{16} & 0 & -\frac{\sqrt{6}i}{28} & 0 & \frac{\sqrt{10}i}{112} & 0 & -\frac{\sqrt{2}i}{8} & 0 \\ \frac{\sqrt{3}i}{32} & 0 & \frac{\sqrt{30}i}{224} & 0 & -\frac{\sqrt{15}i}{224} & 0 & 0 & \frac{\sqrt{2}i}{8} & 0 & -\frac{\sqrt{10}i}{112} & 0 & \frac{\sqrt{6}i}{28} & 0 & \frac{\sqrt{14}i}{16} \\ 0 & -\frac{\sqrt{5}i}{32} & 0 & -\frac{\sqrt{10}i}{224} & 0 & \frac{i}{224} & 0 & 0 & \frac{3\sqrt{2}i}{16} & 0 & \frac{\sqrt{30}i}{56} & 0 & -\frac{3\sqrt{6}i}{112} & 0 \end{bmatrix}$
387	symmetry	$-\frac{\sqrt{5}xy(x^2+y^2-6z^2)}{2}$ $\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{1}{8} & 0 & 0 & 0 & -\frac{\sqrt{3}}{8} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{8} & 0 & 0 & 0 & \frac{1}{8} & 0 \\ 0 & 0 & 0 & \frac{\sqrt{10}}{56} & 0 & 0 & -\frac{\sqrt{42}}{56} & 0 & 0 & 0 & \frac{3\sqrt{30}}{56} & 0 & 0 & 0 \\ \frac{\sqrt{3}}{56} & 0 & 0 & 0 & -\frac{\sqrt{15}}{56} & 0 & 0 & \frac{11\sqrt{2}}{56} & 0 & 0 & 0 & \frac{\sqrt{6}}{56} & 0 & 0 \\ 0 & -\frac{\sqrt{15}}{56} & 0 & 0 & 0 & \frac{\sqrt{3}}{56} & 0 & 0 & -\frac{\sqrt{6}}{56} & 0 & 0 & 0 & -\frac{11\sqrt{2}}{56} & 0 \\ 0 & 0 & \frac{\sqrt{10}}{56} & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{30}}{56} & 0 & 0 & 0 & 0 & \frac{\sqrt{42}}{56} \end{bmatrix}$
388	symmetry	$-\frac{x^2}{2} - \frac{y^2}{2} + z^2$

continued ...

Table 7

No.	multipole	matrix
	$\mathbb{T}_{2,0}^{(1,0;a)}(E_g)$	$\begin{bmatrix} 0 & 0 & \frac{\sqrt{2}i}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{2}i}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{5\sqrt{6}i}{42} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{21} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{5i}{42} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{7} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{5i}{42} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{7} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{5\sqrt{6}i}{42} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{21} & 0 & 0 \end{bmatrix}$
389	symmetry	$\frac{\sqrt{3}(x-y)(x+y)}{2}$ $\begin{bmatrix} \frac{\sqrt{15}i}{18} & 0 & 0 & 0 & \frac{\sqrt{3}i}{18} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{3}i}{18} & 0 & 0 & 0 & \frac{\sqrt{15}i}{18} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{5i}{42} & 0 & 0 & -\frac{\sqrt{105}i}{42} & 0 & 0 & 0 & -\frac{\sqrt{3}i}{42} & 0 & 0 & 0 \\ \frac{5\sqrt{30}i}{126} & 0 & 0 & 0 & -\frac{5\sqrt{6}i}{63} & 0 & 0 & -\frac{\sqrt{5}i}{14} & 0 & 0 & 0 & -\frac{\sqrt{15}i}{42} & 0 & 0 \\ 0 & \frac{5\sqrt{6}i}{63} & 0 & 0 & 0 & -\frac{5\sqrt{30}i}{126} & 0 & 0 & -\frac{\sqrt{15}i}{42} & 0 & 0 & 0 & -\frac{\sqrt{5}i}{14} & 0 \\ 0 & 0 & \frac{5i}{42} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{42} & 0 & 0 & 0 & -\frac{\sqrt{105}i}{42} \end{bmatrix}$
390	symmetry	$\sqrt{3}yz$ $\begin{bmatrix} 0 & \frac{\sqrt{3}}{9} & 0 & \frac{\sqrt{6}}{18} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{6}}{18} & 0 & \frac{\sqrt{3}}{9} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ -\frac{5\sqrt{10}}{84} & 0 & -\frac{5}{28} & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{21} & 0 & -\frac{\sqrt{3}}{21} & 0 & 0 & 0 & 0 \\ 0 & \frac{5\sqrt{6}}{252} & 0 & -\frac{25\sqrt{3}}{252} & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{21} & 0 & -\frac{1}{7} & 0 & 0 & 0 \\ 0 & 0 & \frac{25\sqrt{3}}{252} & 0 & -\frac{5\sqrt{6}}{252} & 0 & 0 & 0 & 0 & -\frac{1}{7} & 0 & -\frac{\sqrt{15}}{21} & 0 & 0 \\ 0 & 0 & 0 & \frac{5}{28} & 0 & \frac{5\sqrt{10}}{84} & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{21} & 0 & -\frac{\sqrt{15}}{21} & 0 \end{bmatrix}$
391	symmetry	$\sqrt{3}xz$ $\begin{bmatrix} 0 & -\frac{\sqrt{3}i}{9} & 0 & \frac{\sqrt{6}i}{18} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{6}i}{18} & 0 & \frac{\sqrt{3}i}{9} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ \frac{5\sqrt{10}i}{84} & 0 & -\frac{5i}{28} & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{21} & 0 & -\frac{\sqrt{3}i}{21} & 0 & 0 & 0 & 0 \\ 0 & -\frac{5\sqrt{6}i}{252} & 0 & -\frac{25\sqrt{3}i}{252} & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{21} & 0 & -\frac{i}{7} & 0 & 0 & 0 \\ 0 & 0 & -\frac{25\sqrt{3}i}{252} & 0 & -\frac{5\sqrt{6}i}{252} & 0 & 0 & 0 & 0 & \frac{i}{7} & 0 & -\frac{\sqrt{15}i}{21} & 0 & 0 \\ 0 & 0 & 0 & -\frac{5i}{28} & 0 & \frac{5\sqrt{10}i}{84} & 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{21} & 0 & -\frac{\sqrt{15}i}{21} & 0 \end{bmatrix}$
392	symmetry	$\sqrt{3}xy$

continued ...

Table 7

No.	multipole	matrix
	$\mathbb{T}_{2,2}^{(1,0;a)}(T_g)$	$\begin{bmatrix} -\frac{\sqrt{15}}{18} & 0 & 0 & 0 & \frac{\sqrt{3}}{18} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{3}}{18} & 0 & 0 & 0 & \frac{\sqrt{15}}{18} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{5}{42} & 0 & 0 & \frac{\sqrt{105}}{42} & 0 & 0 & 0 & -\frac{\sqrt{3}}{42} & 0 & 0 & 0 & 0 \\ -\frac{5\sqrt{30}}{126} & 0 & 0 & 0 & -\frac{5\sqrt{6}}{63} & 0 & 0 & \frac{\sqrt{5}}{14} & 0 & 0 & 0 & -\frac{\sqrt{15}}{42} & 0 & 0 & 0 \\ 0 & -\frac{5\sqrt{6}}{63} & 0 & 0 & 0 & -\frac{5\sqrt{30}}{126} & 0 & 0 & \frac{\sqrt{15}}{42} & 0 & 0 & 0 & -\frac{\sqrt{5}}{14} & 0 & 0 \\ 0 & 0 & -\frac{5}{42} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{42} & 0 & 0 & 0 & 0 & -\frac{\sqrt{105}}{42} \end{bmatrix}$
393	symmetry	$\frac{\sqrt{21}(x^4 - 3x^2y^2 - 3x^2z^2 + y^4 - 3y^2z^2 + z^4)}{6}$ $\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{35}i}{24} & 0 & 0 & 0 & 0 & \frac{5i}{24} \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{5i}{24} & 0 & 0 & 0 & -\frac{\sqrt{35}i}{24} & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{35}i}{56} & 0 & 0 & 0 & \frac{5\sqrt{7}i}{56} & 0 & 0 & \frac{\sqrt{14}i}{56} & 0 & 0 & 0 & 0 & \frac{\sqrt{42}i}{168} & 0 \\ 0 & 0 & -\frac{\sqrt{210}i}{56} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}i}{168} & 0 & 0 & 0 & 0 & \frac{\sqrt{2}i}{24} \\ 0 & 0 & 0 & \frac{\sqrt{210}i}{56} & 0 & 0 & \frac{\sqrt{2}i}{24} & 0 & 0 & 0 & -\frac{\sqrt{70}i}{168} & 0 & 0 & 0 & 0 \\ -\frac{5\sqrt{7}i}{56} & 0 & 0 & 0 & -\frac{\sqrt{35}i}{56} & 0 & 0 & \frac{\sqrt{42}i}{168} & 0 & 0 & 0 & 0 & \frac{\sqrt{14}i}{56} & 0 & 0 \end{bmatrix}$
394	symmetry	$-\frac{\sqrt{15}(x^4 - 12x^2y^2 + 6x^2z^2 + y^4 + 6y^2z^2 - 2z^4)}{12}$ $\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{5i}{24} & 0 & 0 & 0 & 0 & -\frac{\sqrt{35}i}{24} \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{35}i}{24} & 0 & 0 & 0 & -\frac{5i}{24} & 0 & 0 & 0 & 0 \\ 0 & \frac{5i}{56} & 0 & 0 & 0 & -\frac{\sqrt{5}i}{8} & 0 & 0 & \frac{\sqrt{10}i}{56} & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}i}{120} & 0 \\ 0 & 0 & -\frac{5\sqrt{6}i}{56} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{5\sqrt{2}i}{168} & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}i}{120} \\ 0 & 0 & 0 & \frac{5\sqrt{6}i}{56} & 0 & 0 & -\frac{\sqrt{70}i}{120} & 0 & 0 & 0 & -\frac{5\sqrt{2}i}{168} & 0 & 0 & 0 & 0 \\ \frac{\sqrt{5}i}{8} & 0 & 0 & 0 & -\frac{5i}{56} & 0 & 0 & -\frac{\sqrt{30}i}{120} & 0 & 0 & 0 & \frac{\sqrt{10}i}{56} & 0 & 0 & 0 \end{bmatrix}$
395	symmetry	$\frac{\sqrt{5}(x-y)(x+y)(x^2+y^2-6z^2)}{4}$ $\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{24} & 0 & 0 & 0 & -\frac{\sqrt{5}i}{8} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{5}i}{8} & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{24} & 0 \\ 0 & 0 & 0 & -\frac{5\sqrt{6}i}{56} & 0 & 0 & -\frac{\sqrt{70}i}{280} & 0 & 0 & 0 & -\frac{3\sqrt{2}i}{56} & 0 & 0 & 0 & 0 \\ \frac{3\sqrt{5}i}{56} & 0 & 0 & 0 & \frac{15i}{56} & 0 & 0 & \frac{11\sqrt{30}i}{840} & 0 & 0 & 0 & -\frac{\sqrt{10}i}{280} & 0 & 0 & 0 \\ 0 & -\frac{15i}{56} & 0 & 0 & 0 & -\frac{3\sqrt{5}i}{56} & 0 & 0 & -\frac{\sqrt{10}i}{280} & 0 & 0 & 0 & \frac{11\sqrt{30}i}{840} & 0 & 0 \\ 0 & 0 & \frac{5\sqrt{6}i}{56} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{2}i}{56} & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}i}{280} \end{bmatrix}$
396	symmetry	$\frac{\sqrt{35}yz(y-z)(y+z)}{2}$

continued ...

Table 7

No.	multipole	matrix
	$\mathbb{T}_{4,0}^{(1,0;a)}(T_g, 1)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{96} & 0 & -\frac{\sqrt{35}}{32} & 0 & -\frac{5\sqrt{21}}{96} & 0 & -\frac{\sqrt{105}}{96} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{105}}{96} & 0 & \frac{5\sqrt{21}}{96} & 0 & \frac{\sqrt{35}}{32} & 0 & \frac{\sqrt{15}}{96} \\ -\frac{\sqrt{105}}{224} & 0 & -\frac{5\sqrt{42}}{224} & 0 & -\frac{5\sqrt{21}}{224} & 0 & 0 & -\frac{3\sqrt{70}}{560} & 0 & -\frac{\sqrt{14}}{56} & 0 & -\frac{\sqrt{210}}{560} & 0 & 0 \\ 0 & \frac{15\sqrt{7}}{224} & 0 & \frac{15\sqrt{14}}{224} & 0 & \frac{3\sqrt{35}}{224} & \frac{\sqrt{30}}{240} & 0 & \frac{\sqrt{70}}{140} & 0 & \frac{\sqrt{42}}{336} & 0 & -\frac{\sqrt{210}}{840} & 0 \\ -\frac{3\sqrt{35}}{224} & 0 & -\frac{15\sqrt{14}}{224} & 0 & -\frac{15\sqrt{7}}{224} & 0 & 0 & -\frac{\sqrt{210}}{840} & 0 & \frac{\sqrt{42}}{336} & 0 & \frac{\sqrt{70}}{140} & 0 & \frac{\sqrt{30}}{240} \\ 0 & \frac{5\sqrt{21}}{224} & 0 & \frac{5\sqrt{42}}{224} & 0 & \frac{\sqrt{105}}{224} & 0 & 0 & -\frac{\sqrt{210}}{560} & 0 & -\frac{\sqrt{14}}{56} & 0 & -\frac{3\sqrt{70}}{560} & 0 \end{bmatrix}$
397	symmetry	$-\frac{\sqrt{35}xz(x-z)(x+z)}{2}$ $\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{96} & 0 & -\frac{\sqrt{35}i}{32} & 0 & \frac{5\sqrt{21}i}{96} & 0 & -\frac{\sqrt{105}i}{96} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{105}i}{96} & 0 & \frac{5\sqrt{21}i}{96} & 0 & -\frac{\sqrt{35}i}{32} & 0 & \frac{\sqrt{15}i}{96} \\ -\frac{\sqrt{105}i}{224} & 0 & \frac{5\sqrt{42}i}{224} & 0 & -\frac{5\sqrt{21}i}{224} & 0 & 0 & -\frac{3\sqrt{70}i}{560} & 0 & \frac{\sqrt{14}i}{56} & 0 & -\frac{\sqrt{210}i}{560} & 0 & 0 \\ 0 & \frac{15\sqrt{7}i}{224} & 0 & -\frac{15\sqrt{14}i}{224} & 0 & \frac{3\sqrt{35}i}{224} & -\frac{\sqrt{30}i}{240} & 0 & \frac{\sqrt{70}i}{140} & 0 & -\frac{\sqrt{42}i}{336} & 0 & -\frac{\sqrt{210}i}{840} & 0 \\ \frac{3\sqrt{35}i}{224} & 0 & -\frac{15\sqrt{14}i}{224} & 0 & \frac{15\sqrt{7}i}{224} & 0 & 0 & \frac{\sqrt{210}i}{840} & 0 & \frac{\sqrt{42}i}{336} & 0 & -\frac{\sqrt{70}i}{140} & 0 & \frac{\sqrt{30}i}{240} \\ 0 & -\frac{5\sqrt{21}i}{224} & 0 & \frac{5\sqrt{42}i}{224} & 0 & -\frac{\sqrt{105}i}{224} & 0 & 0 & \frac{\sqrt{210}i}{560} & 0 & -\frac{\sqrt{14}i}{56} & 0 & \frac{3\sqrt{70}i}{560} & 0 \end{bmatrix}$
398	symmetry	$\frac{\sqrt{35}xy(x-y)(x+y)}{2}$ $\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{12} \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{12} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{105}}{28} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{70}}{140} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{60} \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}}{60} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ \frac{\sqrt{105}}{28} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}}{140} & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
399	symmetry	$\frac{\sqrt{5}yz(6x^2-y^2-z^2)}{2}$ $\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{105}}{96} & 0 & -\frac{\sqrt{5}}{32} & 0 & -\frac{5\sqrt{3}}{96} & 0 & \frac{7\sqrt{15}}{96} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{7\sqrt{15}}{96} & 0 & \frac{5\sqrt{3}}{96} & 0 & \frac{\sqrt{5}}{32} & 0 & -\frac{\sqrt{105}}{96} \\ -\frac{\sqrt{15}}{224} & 0 & -\frac{5\sqrt{6}}{224} & 0 & \frac{5\sqrt{3}}{32} & 0 & 0 & -\frac{3\sqrt{10}}{560} & 0 & -\frac{\sqrt{2}}{56} & 0 & \frac{\sqrt{30}}{80} & 0 & 0 \\ 0 & \frac{15}{224} & 0 & \frac{15\sqrt{2}}{224} & 0 & -\frac{3\sqrt{5}}{32} & -\frac{\sqrt{210}}{240} & 0 & \frac{\sqrt{10}}{140} & 0 & \frac{\sqrt{6}}{336} & 0 & \frac{\sqrt{30}}{120} & 0 \\ \frac{3\sqrt{5}}{32} & 0 & -\frac{15\sqrt{2}}{224} & 0 & -\frac{15}{224} & 0 & 0 & \frac{\sqrt{30}}{120} & 0 & \frac{\sqrt{6}}{336} & 0 & \frac{\sqrt{10}}{140} & 0 & -\frac{\sqrt{210}}{240} \\ 0 & -\frac{5\sqrt{3}}{32} & 0 & \frac{5\sqrt{6}}{224} & 0 & \frac{\sqrt{15}}{224} & 0 & 0 & \frac{\sqrt{30}}{80} & 0 & -\frac{\sqrt{2}}{56} & 0 & -\frac{3\sqrt{10}}{560} & 0 \end{bmatrix}$
400	symmetry	$-\frac{\sqrt{5}xz(x^2-6y^2+z^2)}{2}$

continued ...

Table 7

No.	multipole	matrix
	$\mathbb{T}_{4,1}^{(1,0;a)}(T_g, 2)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{105}i}{96} & 0 & \frac{\sqrt{5}i}{32} & 0 & -\frac{5\sqrt{3}i}{96} & 0 & -\frac{7\sqrt{15}i}{96} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{7\sqrt{15}i}{96} & 0 & -\frac{5\sqrt{3}i}{96} & 0 & \frac{\sqrt{5}i}{32} & 0 & \frac{\sqrt{105}i}{96} \\ \frac{\sqrt{15}i}{224} & 0 & -\frac{5\sqrt{6}i}{224} & 0 & -\frac{5\sqrt{3}i}{32} & 0 & 0 & \frac{3\sqrt{10}i}{560} & 0 & -\frac{\sqrt{2}i}{56} & 0 & -\frac{\sqrt{30}i}{80} & 0 & 0 \\ 0 & -\frac{15i}{224} & 0 & \frac{15\sqrt{2}i}{224} & 0 & \frac{3\sqrt{5}i}{32} & -\frac{\sqrt{210}i}{240} & 0 & -\frac{\sqrt{10}i}{140} & 0 & \frac{\sqrt{6}i}{336} & 0 & -\frac{\sqrt{30}i}{120} & 0 \\ \frac{3\sqrt{5}i}{32} & 0 & \frac{15\sqrt{2}i}{224} & 0 & -\frac{15i}{224} & 0 & 0 & \frac{\sqrt{30}i}{120} & 0 & -\frac{\sqrt{6}i}{336} & 0 & \frac{\sqrt{10}i}{140} & 0 & \frac{\sqrt{210}i}{240} \\ 0 & -\frac{5\sqrt{3}i}{32} & 0 & -\frac{5\sqrt{6}i}{224} & 0 & \frac{\sqrt{15}i}{224} & 0 & 0 & \frac{\sqrt{30}i}{80} & 0 & \frac{\sqrt{2}i}{56} & 0 & -\frac{3\sqrt{10}i}{560} & 0 \end{bmatrix}$
401	symmetry	$-\frac{\sqrt{5}xy(x^2+y^2-6z^2)}{2}$ $\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{24} & 0 & 0 & 0 & \frac{\sqrt{5}}{8} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{5}}{8} & 0 & 0 & 0 & -\frac{\sqrt{15}}{24} & 0 \\ 0 & 0 & 0 & \frac{5\sqrt{6}}{56} & 0 & 0 & -\frac{\sqrt{70}}{280} & 0 & 0 & 0 & \frac{3\sqrt{2}}{56} & 0 & 0 & 0 \\ \frac{3\sqrt{5}}{56} & 0 & 0 & 0 & -\frac{15}{56} & 0 & 0 & \frac{11\sqrt{30}}{840} & 0 & 0 & 0 & \frac{\sqrt{10}}{280} & 0 & 0 \\ 0 & -\frac{15}{56} & 0 & 0 & 0 & \frac{3\sqrt{5}}{56} & 0 & 0 & -\frac{\sqrt{10}}{280} & 0 & 0 & 0 & -\frac{11\sqrt{30}}{840} & 0 \\ 0 & 0 & \frac{5\sqrt{6}}{56} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{2}}{56} & 0 & 0 & 0 & \frac{\sqrt{70}}{280} \end{bmatrix}$
402	symmetry	$-\frac{x^2}{2} - \frac{y^2}{2} + z^2$ $\begin{bmatrix} 0 & 0 & -\frac{i}{3} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{i}{3} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{4\sqrt{3}i}{21} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}i}{84} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{2\sqrt{2}i}{21} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}i}{28} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{2\sqrt{2}i}{21} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}i}{28} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{4\sqrt{3}i}{21} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}i}{84} & 0 & 0 \end{bmatrix}$
403	symmetry	$\frac{\sqrt{3}(x-y)(x+y)}{2}$ $\begin{bmatrix} -\frac{\sqrt{30}i}{18} & 0 & 0 & 0 & -\frac{\sqrt{6}i}{18} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{6}i}{18} & 0 & 0 & 0 & -\frac{\sqrt{30}i}{18} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{2\sqrt{2}i}{21} & 0 & 0 & \frac{\sqrt{210}i}{168} & 0 & 0 & 0 & \frac{\sqrt{6}i}{168} & 0 & 0 & 0 \\ \frac{4\sqrt{15}i}{63} & 0 & 0 & 0 & -\frac{8\sqrt{3}i}{63} & 0 & 0 & \frac{\sqrt{10}i}{56} & 0 & 0 & 0 & \frac{\sqrt{30}i}{168} & 0 & 0 \\ 0 & \frac{8\sqrt{3}i}{63} & 0 & 0 & 0 & -\frac{4\sqrt{15}i}{63} & 0 & 0 & \frac{\sqrt{30}i}{168} & 0 & 0 & 0 & \frac{\sqrt{10}i}{56} & 0 \\ 0 & 0 & \frac{2\sqrt{2}i}{21} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}i}{168} & 0 & 0 & 0 & \frac{\sqrt{210}i}{168} \end{bmatrix}$
404	symmetry	$\sqrt{3}yz$

continued ...

Table 7

No.	multipole	matrix
		$\begin{bmatrix} 0 & -\frac{\sqrt{6}}{9} & 0 & -\frac{\sqrt{3}}{9} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{3}}{9} & 0 & -\frac{\sqrt{6}}{9} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ -\frac{2\sqrt{5}}{21} & 0 & -\frac{\sqrt{2}}{7} & 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{84} & 0 & \frac{\sqrt{6}}{84} & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{2\sqrt{3}}{63} & 0 & -\frac{5\sqrt{6}}{63} & 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{84} & 0 & \frac{\sqrt{2}}{28} & 0 & 0 & 0 & 0 \\ 0 & 0 & \frac{5\sqrt{6}}{63} & 0 & -\frac{2\sqrt{3}}{63} & 0 & 0 & 0 & 0 & \frac{\sqrt{2}}{28} & 0 & \frac{\sqrt{30}}{84} & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{2}}{7} & 0 & \frac{2\sqrt{5}}{21} & 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{84} & 0 & \frac{\sqrt{30}}{84} & 0 & 0 \end{bmatrix}$
405	symmetry	$\sqrt{3}xz$ $\begin{bmatrix} 0 & \frac{\sqrt{6}i}{9} & 0 & -\frac{\sqrt{3}i}{9} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{3}i}{9} & 0 & -\frac{\sqrt{6}i}{9} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ \frac{2\sqrt{5}i}{21} & 0 & -\frac{\sqrt{2}i}{7} & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}i}{84} & 0 & \frac{\sqrt{6}i}{84} & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{2\sqrt{3}i}{63} & 0 & -\frac{5\sqrt{6}i}{63} & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}i}{84} & 0 & \frac{\sqrt{2}i}{28} & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{5\sqrt{6}i}{63} & 0 & -\frac{2\sqrt{3}i}{63} & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}i}{28} & 0 & \frac{\sqrt{30}i}{84} & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{2}i}{7} & 0 & \frac{2\sqrt{5}i}{21} & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{84} & 0 & \frac{\sqrt{30}i}{84} & 0 & 0 \end{bmatrix}$
406	symmetry	$\sqrt{3}xy$ $\begin{bmatrix} \frac{\sqrt{30}}{18} & 0 & 0 & 0 & -\frac{\sqrt{6}}{18} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{6}}{18} & 0 & 0 & 0 & -\frac{\sqrt{30}}{18} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{2\sqrt{2}}{21} & 0 & 0 & -\frac{\sqrt{210}}{168} & 0 & 0 & 0 & \frac{\sqrt{6}}{168} & 0 & 0 & 0 & 0 \\ -\frac{4\sqrt{15}}{63} & 0 & 0 & 0 & -\frac{8\sqrt{3}}{63} & 0 & 0 & 0 & -\frac{\sqrt{10}}{56} & 0 & 0 & 0 & \frac{\sqrt{30}}{168} & 0 & 0 \\ 0 & -\frac{8\sqrt{3}}{63} & 0 & 0 & 0 & -\frac{4\sqrt{15}}{63} & 0 & 0 & -\frac{\sqrt{30}}{168} & 0 & 0 & 0 & \frac{\sqrt{10}}{56} & 0 & 0 \\ 0 & 0 & -\frac{2\sqrt{2}}{21} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}}{168} & 0 & 0 & 0 & \frac{\sqrt{210}}{168} & 0 & 0 \end{bmatrix}$
407	symmetry	$\sqrt{15}xyz$ $\begin{bmatrix} \frac{\sqrt{14}i}{42} & 0 & 0 & 0 & -\frac{\sqrt{70}i}{42} & 0 & 0 & \frac{\sqrt{21}i}{28} & 0 & 0 & 0 & -\frac{\sqrt{7}i}{28} & 0 & 0 \\ 0 & -\frac{\sqrt{70}i}{42} & 0 & 0 & 0 & \frac{\sqrt{14}i}{42} & 0 & 0 & \frac{\sqrt{7}i}{28} & 0 & 0 & 0 & -\frac{\sqrt{21}i}{28} & 0 \\ 0 & 0 & 0 & \frac{\sqrt{210}i}{84} & 0 & 0 & \frac{\sqrt{2}i}{8} & 0 & 0 & 0 & -\frac{\sqrt{70}i}{56} & 0 & 0 & 0 & 0 \\ \frac{5\sqrt{7}i}{84} & 0 & 0 & 0 & \frac{\sqrt{35}i}{84} & 0 & 0 & -\frac{\sqrt{42}i}{56} & 0 & 0 & 0 & -\frac{3\sqrt{14}i}{56} & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{35}i}{84} & 0 & 0 & 0 & -\frac{5\sqrt{7}i}{84} & 0 & 0 & -\frac{3\sqrt{14}i}{56} & 0 & 0 & 0 & -\frac{\sqrt{42}i}{56} & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{210}i}{84} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}i}{56} & 0 & 0 & 0 & \frac{\sqrt{2}i}{8} & 0 & 0 \end{bmatrix}$
408	symmetry	$\frac{x(2x^2-3y^2-3z^2)}{2}$

continued ...

Table 7

No.	multipole	matrix
		$\begin{bmatrix} 0 & \frac{\sqrt{42}}{84} & 0 & -\frac{\sqrt{21}}{42} & 0 & \frac{\sqrt{210}}{84} & -\frac{\sqrt{5}}{16} & 0 & \frac{\sqrt{105}}{112} & 0 & -\frac{3\sqrt{7}}{112} & 0 & \frac{\sqrt{35}}{112} & 0 \\ \frac{\sqrt{210}}{84} & 0 & -\frac{\sqrt{21}}{42} & 0 & \frac{\sqrt{42}}{84} & 0 & 0 & -\frac{\sqrt{35}}{112} & 0 & \frac{3\sqrt{7}}{112} & 0 & -\frac{\sqrt{105}}{112} & 0 & \frac{\sqrt{5}}{16} \\ -\frac{\sqrt{35}}{112} & 0 & \frac{3\sqrt{14}}{112} & 0 & -\frac{5\sqrt{7}}{112} & 0 & 0 & \frac{\sqrt{210}}{112} & 0 & -\frac{\sqrt{42}}{56} & 0 & \frac{\sqrt{70}}{112} & 0 & 0 \\ 0 & \frac{\sqrt{21}}{48} & 0 & -\frac{\sqrt{42}}{336} & 0 & -\frac{5\sqrt{105}}{336} & \frac{\sqrt{10}}{16} & 0 & 0 & 0 & -\frac{3\sqrt{14}}{112} & 0 & \frac{\sqrt{70}}{56} & 0 \\ \frac{5\sqrt{105}}{336} & 0 & \frac{\sqrt{42}}{336} & 0 & -\frac{\sqrt{21}}{48} & 0 & 0 & \frac{\sqrt{70}}{56} & 0 & -\frac{3\sqrt{14}}{112} & 0 & 0 & 0 & \frac{\sqrt{10}}{16} \\ 0 & \frac{5\sqrt{7}}{112} & 0 & -\frac{3\sqrt{14}}{112} & 0 & \frac{\sqrt{35}}{112} & 0 & 0 & \frac{\sqrt{70}}{112} & 0 & -\frac{\sqrt{42}}{56} & 0 & \frac{\sqrt{210}}{112} & 0 \end{bmatrix}$
409	symmetry	$-\frac{y(3x^2 - 2y^2 + 3z^2)}{2}$ $\begin{bmatrix} 0 & \frac{\sqrt{42}i}{84} & 0 & \frac{\sqrt{21}i}{42} & 0 & \frac{\sqrt{210}i}{84} & \frac{\sqrt{5}i}{16} & 0 & \frac{\sqrt{105}i}{112} & 0 & \frac{3\sqrt{7}i}{112} & 0 & \frac{\sqrt{35}i}{112} & 0 \\ -\frac{\sqrt{210}i}{84} & 0 & -\frac{\sqrt{21}i}{42} & 0 & -\frac{\sqrt{42}i}{84} & 0 & 0 & \frac{\sqrt{35}i}{112} & 0 & \frac{3\sqrt{7}i}{112} & 0 & \frac{\sqrt{105}i}{112} & 0 & \frac{\sqrt{5}i}{16} \\ -\frac{\sqrt{35}i}{112} & 0 & -\frac{3\sqrt{14}i}{112} & 0 & -\frac{5\sqrt{7}i}{112} & 0 & 0 & \frac{\sqrt{210}i}{112} & 0 & \frac{\sqrt{42}i}{56} & 0 & \frac{\sqrt{70}i}{112} & 0 & 0 \\ 0 & \frac{\sqrt{21}i}{48} & 0 & \frac{\sqrt{42}i}{336} & 0 & -\frac{5\sqrt{105}i}{336} & -\frac{\sqrt{10}i}{16} & 0 & 0 & 0 & \frac{3\sqrt{14}i}{112} & 0 & \frac{\sqrt{70}i}{56} & 0 \\ -\frac{5\sqrt{105}i}{336} & 0 & \frac{\sqrt{42}i}{336} & 0 & \frac{\sqrt{21}i}{48} & 0 & 0 & -\frac{\sqrt{70}i}{56} & 0 & -\frac{3\sqrt{14}i}{112} & 0 & 0 & 0 & \frac{\sqrt{10}i}{16} \\ 0 & -\frac{5\sqrt{7}i}{112} & 0 & -\frac{3\sqrt{14}i}{112} & 0 & -\frac{\sqrt{35}i}{112} & 0 & 0 & -\frac{\sqrt{70}i}{112} & 0 & -\frac{\sqrt{42}i}{56} & 0 & -\frac{\sqrt{210}i}{112} & 0 \end{bmatrix}$
410	symmetry	$-\frac{z(3x^2 + 3y^2 - 2z^2)}{2}$ $\begin{bmatrix} 0 & 0 & \frac{\sqrt{21}}{21} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}}{14} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{21}}{21} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}}{14} & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{7}}{14} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{70}}{28} & 0 & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{42}}{42} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{14}}{28} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{42}}{42} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{14}}{28} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{7}}{14} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}}{28} & 0 & 0 \end{bmatrix}$
411	symmetry	$\frac{\sqrt{15}x(y-z)(y+z)}{2}$ $\begin{bmatrix} 0 & \frac{\sqrt{70}}{84} & 0 & -\frac{\sqrt{35}}{42} & 0 & -\frac{\sqrt{14}}{28} & \frac{\sqrt{3}}{16} & 0 & \frac{5\sqrt{7}}{112} & 0 & -\frac{\sqrt{105}}{112} & 0 & -\frac{\sqrt{21}}{112} & 0 \\ -\frac{\sqrt{14}}{28} & 0 & -\frac{\sqrt{35}}{42} & 0 & \frac{\sqrt{70}}{84} & 0 & 0 & \frac{\sqrt{21}}{112} & 0 & \frac{\sqrt{105}}{112} & 0 & -\frac{5\sqrt{7}}{112} & 0 & -\frac{\sqrt{3}}{16} \\ -\frac{5\sqrt{21}}{336} & 0 & \frac{\sqrt{210}}{112} & 0 & \frac{\sqrt{105}}{112} & 0 & 0 & \frac{5\sqrt{14}}{112} & 0 & -\frac{\sqrt{70}}{56} & 0 & -\frac{\sqrt{42}}{112} & 0 & 0 \\ 0 & \frac{\sqrt{35}}{48} & 0 & -\frac{\sqrt{70}}{336} & 0 & \frac{5\sqrt{7}}{112} & -\frac{\sqrt{6}}{16} & 0 & 0 & 0 & -\frac{\sqrt{210}}{112} & 0 & -\frac{\sqrt{42}}{56} & 0 \\ -\frac{5\sqrt{7}}{112} & 0 & \frac{\sqrt{70}}{336} & 0 & -\frac{\sqrt{35}}{48} & 0 & 0 & -\frac{\sqrt{42}}{56} & 0 & -\frac{\sqrt{210}}{112} & 0 & 0 & 0 & -\frac{\sqrt{6}}{16} \\ 0 & -\frac{\sqrt{105}}{112} & 0 & -\frac{\sqrt{210}}{112} & 0 & \frac{5\sqrt{21}}{336} & 0 & 0 & -\frac{\sqrt{42}}{112} & 0 & -\frac{\sqrt{70}}{56} & 0 & \frac{5\sqrt{14}}{112} & 0 \end{bmatrix}$
412	symmetry	$-\frac{\sqrt{15}y(x-z)(x+z)}{2}$

continued ...

Table 7

No.	multipole	matrix
	$\mathbb{M}_{3,1}^{(a)}(T_g, 2)$	$\begin{bmatrix} 0 & -\frac{\sqrt{70}i}{84} & 0 & -\frac{\sqrt{35}i}{42} & 0 & \frac{\sqrt{14}i}{28} & \frac{\sqrt{3}i}{16} & 0 & -\frac{5\sqrt{7}i}{112} & 0 & -\frac{\sqrt{105}i}{112} & 0 & \frac{\sqrt{21}i}{112} & 0 \\ -\frac{\sqrt{14}i}{28} & 0 & \frac{\sqrt{35}i}{42} & 0 & \frac{\sqrt{70}i}{84} & 0 & 0 & \frac{\sqrt{21}i}{112} & 0 & -\frac{\sqrt{105}i}{112} & 0 & -\frac{5\sqrt{7}i}{112} & 0 & \frac{\sqrt{3}i}{16} \\ \frac{5\sqrt{21}i}{336} & 0 & \frac{\sqrt{210}i}{112} & 0 & -\frac{\sqrt{105}i}{112} & 0 & 0 & -\frac{5\sqrt{14}i}{112} & 0 & -\frac{\sqrt{70}i}{56} & 0 & \frac{\sqrt{42}i}{112} & 0 & 0 \\ 0 & -\frac{\sqrt{35}i}{48} & 0 & -\frac{\sqrt{70}i}{336} & 0 & -\frac{5\sqrt{7}i}{112} & -\frac{\sqrt{6}i}{16} & 0 & 0 & 0 & -\frac{\sqrt{210}i}{112} & 0 & \frac{\sqrt{42}i}{56} & 0 \\ -\frac{5\sqrt{7}i}{112} & 0 & -\frac{\sqrt{70}i}{336} & 0 & -\frac{\sqrt{35}i}{48} & 0 & 0 & -\frac{\sqrt{42}i}{56} & 0 & \frac{\sqrt{210}i}{112} & 0 & 0 & 0 & \frac{\sqrt{6}i}{16} \\ 0 & -\frac{\sqrt{105}i}{112} & 0 & \frac{\sqrt{210}i}{112} & 0 & \frac{5\sqrt{21}i}{336} & 0 & 0 & -\frac{\sqrt{42}i}{112} & 0 & \frac{\sqrt{70}i}{56} & 0 & \frac{5\sqrt{14}i}{112} & 0 \end{bmatrix}$
413	symmetry	$\frac{\sqrt{15}z(x-y)(x+y)}{2}$ $\begin{bmatrix} \frac{\sqrt{14}}{42} & 0 & 0 & 0 & \frac{\sqrt{70}}{42} & 0 & 0 & \frac{\sqrt{21}}{28} & 0 & 0 & 0 & \frac{\sqrt{7}}{28} & 0 & 0 \\ 0 & -\frac{\sqrt{70}}{42} & 0 & 0 & 0 & -\frac{\sqrt{14}}{42} & 0 & 0 & \frac{\sqrt{7}}{28} & 0 & 0 & 0 & \frac{\sqrt{21}}{28} & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{210}}{84} & 0 & 0 & \frac{\sqrt{2}}{8} & 0 & 0 & 0 & \frac{\sqrt{70}}{56} & 0 & 0 & 0 \\ \frac{5\sqrt{7}}{84} & 0 & 0 & 0 & -\frac{\sqrt{35}}{84} & 0 & 0 & -\frac{\sqrt{42}}{56} & 0 & 0 & 0 & \frac{3\sqrt{14}}{56} & 0 & 0 \\ 0 & -\frac{\sqrt{35}}{84} & 0 & 0 & 0 & \frac{5\sqrt{7}}{84} & 0 & 0 & -\frac{3\sqrt{14}}{56} & 0 & 0 & 0 & \frac{\sqrt{42}}{56} & 0 \\ 0 & 0 & -\frac{\sqrt{210}}{84} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}}{56} & 0 & 0 & 0 & -\frac{\sqrt{2}}{8} \end{bmatrix}$
414	symmetry	$\sqrt{15}xyz$ $\begin{bmatrix} -\frac{\sqrt{30}i}{252} & 0 & 0 & 0 & \frac{5\sqrt{6}i}{252} & 0 & 0 & -\frac{\sqrt{5}i}{7} & 0 & 0 & 0 & \frac{\sqrt{15}i}{21} & 0 & 0 \\ 0 & \frac{5\sqrt{6}i}{252} & 0 & 0 & 0 & -\frac{\sqrt{30}i}{252} & 0 & 0 & -\frac{\sqrt{15}i}{21} & 0 & 0 & 0 & \frac{\sqrt{5}i}{7} & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{2}i}{21} & 0 & 0 & \frac{\sqrt{210}i}{84} & 0 & 0 & 0 & -\frac{5\sqrt{6}i}{84} & 0 & 0 & 0 \\ -\frac{\sqrt{15}i}{63} & 0 & 0 & 0 & -\frac{\sqrt{3}i}{63} & 0 & 0 & -\frac{\sqrt{10}i}{28} & 0 & 0 & 0 & -\frac{\sqrt{30}i}{28} & 0 & 0 \\ 0 & \frac{\sqrt{3}i}{63} & 0 & 0 & 0 & \frac{\sqrt{15}i}{63} & 0 & 0 & -\frac{\sqrt{30}i}{28} & 0 & 0 & 0 & -\frac{\sqrt{10}i}{28} & 0 \\ 0 & 0 & \frac{\sqrt{2}i}{21} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{5\sqrt{6}i}{84} & 0 & 0 & 0 & \frac{\sqrt{210}i}{84} \end{bmatrix}$
415	symmetry	$\frac{x(2x^2-3y^2-3z^2)}{2}$ $\begin{bmatrix} 0 & -\frac{\sqrt{10}}{168} & 0 & \frac{\sqrt{5}}{84} & 0 & -\frac{5\sqrt{2}}{168} & \frac{5\sqrt{21}}{84} & 0 & -\frac{5}{28} & 0 & \frac{\sqrt{15}}{28} & 0 & -\frac{5\sqrt{3}}{84} & 0 \\ -\frac{5\sqrt{2}}{168} & 0 & \frac{\sqrt{5}}{84} & 0 & -\frac{\sqrt{10}}{168} & 0 & 0 & \frac{5\sqrt{3}}{84} & 0 & -\frac{\sqrt{15}}{28} & 0 & \frac{5}{28} & 0 & -\frac{5\sqrt{21}}{84} \\ \frac{\sqrt{3}}{84} & 0 & -\frac{\sqrt{30}}{140} & 0 & \frac{\sqrt{15}}{84} & 0 & 0 & \frac{5\sqrt{2}}{56} & 0 & -\frac{\sqrt{10}}{28} & 0 & \frac{5\sqrt{6}}{168} & 0 & 0 \\ 0 & -\frac{\sqrt{5}}{60} & 0 & \frac{\sqrt{10}}{420} & 0 & \frac{5}{84} & \frac{5\sqrt{42}}{168} & 0 & 0 & 0 & -\frac{\sqrt{30}}{56} & 0 & \frac{5\sqrt{6}}{84} & 0 \\ -\frac{5}{84} & 0 & -\frac{\sqrt{10}}{420} & 0 & \frac{\sqrt{5}}{60} & 0 & 0 & \frac{5\sqrt{6}}{84} & 0 & -\frac{\sqrt{30}}{56} & 0 & 0 & 0 & \frac{5\sqrt{42}}{168} \\ 0 & -\frac{\sqrt{15}}{84} & 0 & \frac{\sqrt{30}}{140} & 0 & -\frac{\sqrt{3}}{84} & 0 & 0 & \frac{5\sqrt{6}}{168} & 0 & -\frac{\sqrt{10}}{28} & 0 & \frac{5\sqrt{2}}{56} & 0 \end{bmatrix}$
416	symmetry	$-\frac{y(3x^2-2y^2+3z^2)}{2}$

continued ...

Table 7

No.	multipole	matrix
	$\mathbb{M}_{3,1}^{(1,-1;a)}(T_g, 1)$	$\begin{bmatrix} 0 & -\frac{\sqrt{10}i}{168} & 0 & -\frac{\sqrt{5}i}{84} & 0 & -\frac{5\sqrt{2}i}{168} & -\frac{5\sqrt{21}i}{84} & 0 & -\frac{5i}{28} & 0 & -\frac{\sqrt{15}i}{28} & 0 & -\frac{5\sqrt{3}i}{84} & 0 \\ \frac{5\sqrt{2}i}{168} & 0 & \frac{\sqrt{5}i}{84} & 0 & \frac{\sqrt{10}i}{168} & 0 & 0 & -\frac{5\sqrt{3}i}{84} & 0 & -\frac{\sqrt{15}i}{28} & 0 & -\frac{5i}{28} & 0 & -\frac{5\sqrt{21}i}{84} \\ \frac{\sqrt{3}i}{84} & 0 & \frac{\sqrt{30}i}{140} & 0 & \frac{\sqrt{15}i}{84} & 0 & 0 & \frac{5\sqrt{2}i}{56} & 0 & \frac{\sqrt{10}i}{28} & 0 & \frac{5\sqrt{6}i}{168} & 0 & 0 \\ 0 & -\frac{\sqrt{5}i}{60} & 0 & -\frac{\sqrt{10}i}{420} & 0 & \frac{5i}{84} & -\frac{5\sqrt{42}i}{168} & 0 & 0 & 0 & \frac{\sqrt{30}i}{56} & 0 & \frac{5\sqrt{6}i}{84} & 0 \\ \frac{5i}{84} & 0 & -\frac{\sqrt{10}i}{420} & 0 & -\frac{\sqrt{5}i}{60} & 0 & 0 & -\frac{5\sqrt{6}i}{84} & 0 & -\frac{\sqrt{30}i}{56} & 0 & 0 & 0 & \frac{5\sqrt{42}i}{168} \\ 0 & \frac{\sqrt{15}i}{84} & 0 & \frac{\sqrt{30}i}{140} & 0 & \frac{\sqrt{3}i}{84} & 0 & 0 & -\frac{5\sqrt{6}i}{168} & 0 & -\frac{\sqrt{10}i}{28} & 0 & -\frac{5\sqrt{2}i}{56} & 0 \end{bmatrix}$
417	symmetry	$-\frac{z(3x^2+3y^2-2z^2)}{2}$
	$\mathbb{M}_{3,2}^{(1,-1;a)}(T_g, 1)$	$\begin{bmatrix} 0 & 0 & -\frac{\sqrt{5}}{42} & 0 & 0 & 0 & 0 & 0 & -\frac{2\sqrt{15}}{21} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{5}}{42} & 0 & 0 & 0 & 0 & 0 & -\frac{2\sqrt{15}}{21} & 0 & 0 & 0 \\ 0 & \frac{2\sqrt{15}}{105} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{5\sqrt{6}}{42} & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{2\sqrt{10}}{105} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{42} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{2\sqrt{10}}{105} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}}{42} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{2\sqrt{15}}{105} & 0 & 0 & 0 & 0 & 0 & -\frac{5\sqrt{6}}{42} & 0 & 0 \end{bmatrix}$
418	symmetry	$\frac{\sqrt{15}x(y-z)(y+z)}{2}$
	$\mathbb{M}_{3,0}^{(1,-1;a)}(T_g, 2)$	$\begin{bmatrix} 0 & -\frac{5\sqrt{6}}{504} & 0 & \frac{5\sqrt{3}}{252} & 0 & \frac{\sqrt{30}}{168} & -\frac{\sqrt{35}}{28} & 0 & -\frac{5\sqrt{15}}{84} & 0 & \frac{5}{28} & 0 & \frac{\sqrt{5}}{28} & 0 \\ \frac{\sqrt{30}}{168} & 0 & \frac{5\sqrt{3}}{252} & 0 & -\frac{5\sqrt{6}}{504} & 0 & 0 & -\frac{\sqrt{5}}{28} & 0 & -\frac{5}{28} & 0 & \frac{5\sqrt{15}}{84} & 0 & \frac{\sqrt{35}}{28} \\ \frac{\sqrt{5}}{84} & 0 & -\frac{\sqrt{2}}{28} & 0 & -\frac{1}{28} & 0 & 0 & \frac{5\sqrt{30}}{168} & 0 & -\frac{5\sqrt{6}}{84} & 0 & -\frac{\sqrt{10}}{56} & 0 & 0 \\ 0 & -\frac{\sqrt{3}}{36} & 0 & \frac{\sqrt{6}}{252} & 0 & -\frac{\sqrt{15}}{84} & -\frac{\sqrt{70}}{56} & 0 & 0 & 0 & -\frac{5\sqrt{2}}{56} & 0 & -\frac{\sqrt{10}}{28} & 0 \\ \frac{\sqrt{15}}{84} & 0 & -\frac{\sqrt{6}}{252} & 0 & \frac{\sqrt{3}}{36} & 0 & 0 & -\frac{\sqrt{10}}{28} & 0 & -\frac{5\sqrt{2}}{56} & 0 & 0 & 0 & -\frac{\sqrt{70}}{56} \\ 0 & \frac{1}{28} & 0 & \frac{\sqrt{2}}{28} & 0 & -\frac{\sqrt{5}}{84} & 0 & 0 & -\frac{\sqrt{10}}{56} & 0 & -\frac{5\sqrt{6}}{84} & 0 & \frac{5\sqrt{30}}{168} & 0 \end{bmatrix}$
419	symmetry	$-\frac{\sqrt{15}y(x-z)(x+z)}{2}$
	$\mathbb{M}_{3,1}^{(1,-1;a)}(T_g, 2)$	$\begin{bmatrix} 0 & \frac{5\sqrt{6}i}{504} & 0 & \frac{5\sqrt{3}i}{252} & 0 & -\frac{\sqrt{30}i}{168} & -\frac{\sqrt{35}i}{28} & 0 & \frac{5\sqrt{15}i}{84} & 0 & \frac{5i}{28} & 0 & -\frac{\sqrt{5}i}{28} & 0 \\ \frac{\sqrt{30}i}{168} & 0 & -\frac{5\sqrt{3}i}{252} & 0 & -\frac{5\sqrt{6}i}{504} & 0 & 0 & -\frac{\sqrt{5}i}{28} & 0 & \frac{5i}{28} & 0 & \frac{5\sqrt{15}i}{84} & 0 & -\frac{\sqrt{35}i}{28} \\ -\frac{\sqrt{5}i}{84} & 0 & -\frac{\sqrt{2}i}{28} & 0 & \frac{i}{28} & 0 & 0 & -\frac{5\sqrt{30}i}{168} & 0 & -\frac{5\sqrt{6}i}{84} & 0 & \frac{\sqrt{10}i}{56} & 0 & 0 \\ 0 & \frac{\sqrt{3}i}{36} & 0 & \frac{\sqrt{6}i}{252} & 0 & \frac{\sqrt{15}i}{84} & -\frac{\sqrt{70}i}{56} & 0 & 0 & 0 & -\frac{5\sqrt{2}i}{56} & 0 & \frac{\sqrt{10}i}{28} & 0 \\ \frac{\sqrt{15}i}{84} & 0 & \frac{\sqrt{6}i}{252} & 0 & \frac{\sqrt{3}i}{36} & 0 & 0 & -\frac{\sqrt{10}i}{28} & 0 & \frac{5\sqrt{2}i}{56} & 0 & 0 & 0 & \frac{\sqrt{70}i}{56} \\ 0 & \frac{i}{28} & 0 & -\frac{\sqrt{2}i}{28} & 0 & -\frac{\sqrt{5}i}{84} & 0 & 0 & -\frac{\sqrt{10}i}{56} & 0 & \frac{5\sqrt{6}i}{84} & 0 & \frac{5\sqrt{30}i}{168} & 0 \end{bmatrix}$
420	symmetry	$\frac{\sqrt{15}z(x-y)(x+y)}{2}$

continued ...

Table 7

No.	multipole	matrix
	$\mathbb{M}_{3,2}^{(1,-1;a)}(T_g, 2)$	$\begin{bmatrix} -\frac{\sqrt{30}}{252} & 0 & 0 & 0 & -\frac{5\sqrt{6}}{252} & 0 & 0 & -\frac{\sqrt{5}}{7} & 0 & 0 & 0 & -\frac{\sqrt{15}}{21} & 0 & 0 \\ 0 & \frac{5\sqrt{6}}{252} & 0 & 0 & 0 & \frac{\sqrt{30}}{252} & 0 & 0 & -\frac{\sqrt{15}}{21} & 0 & 0 & 0 & -\frac{\sqrt{5}}{7} & 0 \\ 0 & 0 & 0 & \frac{\sqrt{2}}{21} & 0 & 0 & \frac{\sqrt{210}}{84} & 0 & 0 & 0 & \frac{5\sqrt{6}}{84} & 0 & 0 & 0 \\ -\frac{\sqrt{15}}{63} & 0 & 0 & 0 & \frac{\sqrt{3}}{63} & 0 & 0 & -\frac{\sqrt{10}}{28} & 0 & 0 & 0 & \frac{\sqrt{30}}{28} & 0 & 0 \\ 0 & \frac{\sqrt{3}}{63} & 0 & 0 & 0 & -\frac{\sqrt{15}}{63} & 0 & 0 & -\frac{\sqrt{30}}{28} & 0 & 0 & 0 & \frac{\sqrt{10}}{28} & 0 \\ 0 & 0 & \frac{\sqrt{2}}{21} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{5\sqrt{6}}{84} & 0 & 0 & 0 & -\frac{\sqrt{210}}{84} \end{bmatrix}$
421	symmetry	$\frac{3\sqrt{35}xyz(x-y)(x+y)}{2}$ $\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{70}i}{20} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}i}{20} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}i}{20} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{70}i}{20} & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
422	symmetry	$\frac{\sqrt{105}xyz(x^2+y^2-2z^2)}{2}$ $\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}i}{120} & 0 & 0 & 0 & -\frac{\sqrt{42}i}{24} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}i}{40} & 0 & 0 & 0 & \frac{\sqrt{210}i}{40} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{210}i}{40} & 0 & 0 & 0 & -\frac{\sqrt{70}i}{40} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{42}i}{24} & 0 & 0 & 0 & \frac{\sqrt{30}i}{120} \end{bmatrix}$
423	symmetry	$\frac{x(8x^4-40x^2y^2-40x^2z^2+15y^4+30y^2z^2+15z^4)}{8}$ $\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2}}{32} & 0 & -\frac{\sqrt{10}}{32} & 0 & \frac{7\sqrt{6}}{96} & 0 & -\frac{3\sqrt{14}}{32} \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{42}}{96} & 0 & -\frac{3\sqrt{2}}{32} & 0 & \frac{\sqrt{30}}{32} & 0 & -\frac{7\sqrt{6}}{96} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{7\sqrt{6}}{96} & 0 & \frac{\sqrt{30}}{32} & 0 & -\frac{3\sqrt{2}}{32} & 0 & \frac{\sqrt{42}}{96} \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{14}}{32} & 0 & \frac{7\sqrt{6}}{96} & 0 & -\frac{\sqrt{10}}{32} & 0 & \frac{\sqrt{2}}{32} & 0 \end{bmatrix}$
424	symmetry	$\frac{y(15x^4-40x^2y^2+30x^2z^2+8y^4-40y^2z^2+15z^4)}{8}$

continued ...

Table 7

No.	multipole	matrix
	$\mathbb{M}_{5,1}^{(1,-1;a)}(T_g, 1)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2}i}{32} & 0 & \frac{\sqrt{10}i}{32} & 0 & \frac{7\sqrt{6}i}{96} & 0 & \frac{3\sqrt{14}i}{32} \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{42}i}{96} & 0 & -\frac{3\sqrt{2}i}{32} & 0 & -\frac{\sqrt{30}i}{32} & 0 & -\frac{7\sqrt{6}i}{96} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{7\sqrt{6}i}{96} & 0 & \frac{\sqrt{30}i}{32} & 0 & \frac{3\sqrt{2}i}{32} & 0 & \frac{\sqrt{42}i}{96} \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{14}i}{32} & 0 & -\frac{7\sqrt{6}i}{96} & 0 & -\frac{\sqrt{10}i}{32} & 0 & -\frac{\sqrt{2}i}{32} & 0 \end{bmatrix}$
425	symmetry	$\frac{z(15x^4 + 30x^2y^2 - 40x^2z^2 + 15y^4 - 40y^2z^2 + 8z^4)}{8}$ $\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}}{12} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{12} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}}{12} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{12} & 0 & 0 \end{bmatrix}$
426	symmetry	$\frac{3\sqrt{35}x(y^2 - 2yz - z^2)(y^2 + 2yz - z^2)}{8}$ $\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{70}}{160} & 0 & -\frac{\sqrt{14}}{32} & 0 & -\frac{3\sqrt{210}}{160} & 0 & -\frac{\sqrt{10}}{32} \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{30}}{160} & 0 & -\frac{3\sqrt{70}}{160} & 0 & \frac{\sqrt{42}}{32} & 0 & \frac{3\sqrt{210}}{160} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{210}}{160} & 0 & \frac{\sqrt{42}}{32} & 0 & -\frac{3\sqrt{70}}{160} & 0 & -\frac{3\sqrt{30}}{160} \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}}{32} & 0 & -\frac{3\sqrt{210}}{160} & 0 & -\frac{\sqrt{14}}{32} & 0 & \frac{\sqrt{70}}{160} & 0 \end{bmatrix}$
427	symmetry	$\frac{3\sqrt{35}y(x^2 - 2xz - z^2)(x^2 + 2xz - z^2)}{8}$ $\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{70}i}{160} & 0 & \frac{\sqrt{14}i}{32} & 0 & -\frac{3\sqrt{210}i}{160} & 0 & \frac{\sqrt{10}i}{32} \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{30}i}{160} & 0 & -\frac{3\sqrt{70}i}{160} & 0 & -\frac{\sqrt{42}i}{32} & 0 & \frac{3\sqrt{210}i}{160} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{210}i}{160} & 0 & \frac{\sqrt{42}i}{32} & 0 & \frac{3\sqrt{70}i}{160} & 0 & -\frac{3\sqrt{30}i}{160} \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}i}{32} & 0 & \frac{3\sqrt{210}i}{160} & 0 & -\frac{\sqrt{14}i}{32} & 0 & -\frac{\sqrt{70}i}{160} & 0 \end{bmatrix}$
428	symmetry	$\frac{3\sqrt{35}z(x^2 - 2xy - y^2)(x^2 + 2xy - y^2)}{8}$

continued ...

Table 7

No.	multipole	matrix
	$\mathbb{M}_{5,2}^{(1,-1;a)}(T_g, 2)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}}{20} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{20} \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}}{20} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{70}}{20} & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
429	symmetry	$\frac{\sqrt{105}x(y-z)(y+z)(2x^2-y^2-z^2)}{4}$ $\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{210}}{240} & 0 & -\frac{\sqrt{42}}{48} & 0 & \frac{\sqrt{70}}{80} & 0 & \frac{\sqrt{30}}{16} \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}}{80} & 0 & -\frac{\sqrt{210}}{80} & 0 & \frac{\sqrt{14}}{16} & 0 & -\frac{\sqrt{70}}{80} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}}{80} & 0 & \frac{\sqrt{14}}{16} & 0 & -\frac{\sqrt{210}}{80} & 0 & \frac{\sqrt{10}}{80} \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{16} & 0 & \frac{\sqrt{70}}{80} & 0 & -\frac{\sqrt{42}}{48} & 0 & \frac{\sqrt{210}}{240} & 0 \end{bmatrix}$
430	symmetry	$\frac{\sqrt{105}y(x-z)(x+z)(x^2-2y^2+z^2)}{4}$ $\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{210}i}{240} & 0 & -\frac{\sqrt{42}i}{48} & 0 & -\frac{\sqrt{70}i}{80} & 0 & \frac{\sqrt{30}i}{16} \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}i}{80} & 0 & \frac{\sqrt{210}i}{80} & 0 & \frac{\sqrt{14}i}{16} & 0 & \frac{\sqrt{70}i}{80} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}i}{80} & 0 & -\frac{\sqrt{14}i}{16} & 0 & -\frac{\sqrt{210}i}{80} & 0 & -\frac{\sqrt{10}i}{80} \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}i}{16} & 0 & \frac{\sqrt{70}i}{80} & 0 & \frac{\sqrt{42}i}{48} & 0 & \frac{\sqrt{210}i}{240} & 0 \end{bmatrix}$
431	symmetry	$-\frac{\sqrt{105}z(x-y)(x+y)(x^2+y^2-2z^2)}{4}$ $\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}}{120} & 0 & 0 & 0 & -\frac{\sqrt{42}}{24} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{70}}{40} & 0 & 0 & 0 & \frac{\sqrt{210}}{40} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{210}}{40} & 0 & 0 & 0 & -\frac{\sqrt{70}}{40} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{42}}{24} & 0 & 0 & 0 & \frac{\sqrt{30}}{120} \end{bmatrix}$
432	symmetry	$\sqrt{15}xyz$

continued ...

Table 7

No.	multipole	matrix
	$\mathbb{M}_3^{(1,0;a)}(A_g)$	$\begin{bmatrix} -\frac{\sqrt{42}i}{126} & 0 & 0 & 0 & \frac{\sqrt{210}i}{126} & 0 & 0 & \frac{5\sqrt{7}i}{56} & 0 & 0 & 0 & -\frac{5\sqrt{21}i}{168} & 0 & 0 \\ 0 & \frac{\sqrt{210}i}{126} & 0 & 0 & 0 & -\frac{\sqrt{42}i}{126} & 0 & 0 & \frac{5\sqrt{21}i}{168} & 0 & 0 & 0 & -\frac{5\sqrt{7}i}{56} & 0 \\ 0 & 0 & 0 & -\frac{5\sqrt{70}i}{168} & 0 & 0 & \frac{\sqrt{6}i}{24} & 0 & 0 & 0 & -\frac{\sqrt{210}i}{168} & 0 & 0 & 0 \\ -\frac{25\sqrt{21}i}{504} & 0 & 0 & 0 & -\frac{5\sqrt{105}i}{504} & 0 & 0 & -\frac{\sqrt{14}i}{56} & 0 & 0 & 0 & -\frac{\sqrt{42}i}{56} & 0 & 0 \\ 0 & \frac{5\sqrt{105}i}{504} & 0 & 0 & 0 & \frac{25\sqrt{21}i}{504} & 0 & 0 & -\frac{\sqrt{42}i}{56} & 0 & 0 & 0 & -\frac{\sqrt{14}i}{56} & 0 \\ 0 & 0 & \frac{5\sqrt{70}i}{168} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{210}i}{168} & 0 & 0 & 0 & \frac{\sqrt{6}i}{24} \end{bmatrix}$
433	symmetry	$\frac{x(2x^2-3y^2-3z^2)}{2}$ $\begin{bmatrix} 0 & -\frac{\sqrt{14}}{84} & 0 & \frac{\sqrt{7}}{42} & 0 & -\frac{\sqrt{70}}{84} & -\frac{5\sqrt{15}}{96} & 0 & \frac{5\sqrt{35}}{224} & 0 & -\frac{5\sqrt{21}}{224} & 0 & \frac{5\sqrt{105}}{672} & 0 \\ -\frac{\sqrt{70}}{84} & 0 & \frac{\sqrt{7}}{42} & 0 & -\frac{\sqrt{14}}{84} & 0 & 0 & -\frac{5\sqrt{105}}{672} & 0 & \frac{5\sqrt{21}}{224} & 0 & -\frac{5\sqrt{35}}{224} & 0 & \frac{5\sqrt{15}}{96} \\ \frac{5\sqrt{105}}{672} & 0 & -\frac{5\sqrt{42}}{224} & 0 & \frac{25\sqrt{21}}{672} & 0 & 0 & \frac{\sqrt{70}}{112} & 0 & -\frac{\sqrt{14}}{56} & 0 & \frac{\sqrt{210}}{336} & 0 & 0 \\ 0 & -\frac{5\sqrt{7}}{96} & 0 & \frac{5\sqrt{14}}{672} & 0 & \frac{25\sqrt{35}}{672} & \frac{\sqrt{30}}{48} & 0 & 0 & 0 & -\frac{\sqrt{42}}{112} & 0 & \frac{\sqrt{210}}{168} & 0 \\ -\frac{25\sqrt{35}}{672} & 0 & -\frac{5\sqrt{14}}{672} & 0 & \frac{5\sqrt{7}}{96} & 0 & 0 & \frac{\sqrt{210}}{168} & 0 & -\frac{\sqrt{42}}{112} & 0 & 0 & 0 & \frac{\sqrt{30}}{48} \\ 0 & -\frac{25\sqrt{21}}{672} & 0 & \frac{5\sqrt{42}}{224} & 0 & -\frac{5\sqrt{105}}{672} & 0 & 0 & \frac{\sqrt{210}}{336} & 0 & -\frac{\sqrt{14}}{56} & 0 & \frac{\sqrt{70}}{112} & 0 \end{bmatrix}$
434	symmetry	$-\frac{y(3x^2-2y^2+3z^2)}{2}$ $\begin{bmatrix} 0 & -\frac{\sqrt{14}i}{84} & 0 & -\frac{\sqrt{7}i}{42} & 0 & -\frac{\sqrt{70}i}{84} & \frac{5\sqrt{15}i}{96} & 0 & \frac{5\sqrt{35}i}{224} & 0 & \frac{5\sqrt{21}i}{224} & 0 & \frac{5\sqrt{105}i}{672} & 0 \\ \frac{\sqrt{70}i}{84} & 0 & \frac{\sqrt{7}i}{42} & 0 & \frac{\sqrt{14}i}{84} & 0 & 0 & \frac{5\sqrt{105}i}{672} & 0 & \frac{5\sqrt{21}i}{224} & 0 & \frac{5\sqrt{35}i}{224} & 0 & \frac{5\sqrt{15}i}{96} \\ \frac{5\sqrt{105}i}{672} & 0 & \frac{5\sqrt{42}i}{224} & 0 & \frac{25\sqrt{21}i}{672} & 0 & 0 & \frac{\sqrt{70}i}{112} & 0 & \frac{\sqrt{14}i}{56} & 0 & \frac{\sqrt{210}i}{336} & 0 & 0 \\ 0 & -\frac{5\sqrt{7}i}{96} & 0 & -\frac{5\sqrt{14}i}{672} & 0 & \frac{25\sqrt{35}i}{672} & -\frac{\sqrt{30}i}{48} & 0 & 0 & 0 & \frac{\sqrt{42}i}{112} & 0 & \frac{\sqrt{210}i}{168} & 0 \\ \frac{25\sqrt{35}i}{672} & 0 & -\frac{5\sqrt{14}i}{672} & 0 & -\frac{5\sqrt{7}i}{96} & 0 & 0 & -\frac{\sqrt{210}i}{168} & 0 & -\frac{\sqrt{42}i}{112} & 0 & 0 & 0 & \frac{\sqrt{30}i}{48} \\ 0 & \frac{25\sqrt{21}i}{672} & 0 & \frac{5\sqrt{42}i}{224} & 0 & \frac{5\sqrt{105}i}{672} & 0 & 0 & -\frac{\sqrt{210}i}{336} & 0 & -\frac{\sqrt{14}i}{56} & 0 & -\frac{\sqrt{70}i}{112} & 0 \end{bmatrix}$
435	symmetry	$-\frac{z(3x^2+3y^2-2z^2)}{2}$ $\begin{bmatrix} 0 & 0 & -\frac{\sqrt{7}}{21} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{5\sqrt{21}}{84} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{7}}{21} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{5\sqrt{21}}{84} & 0 & 0 & 0 \\ 0 & \frac{5\sqrt{21}}{84} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{210}}{84} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{5\sqrt{14}}{84} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{42}}{84} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{5\sqrt{14}}{84} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{42}}{84} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{5\sqrt{21}}{84} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{210}}{84} & 0 & 0 \end{bmatrix}$
436	symmetry	$\frac{\sqrt{15}x(y-z)(y+z)}{2}$

continued ...

Table 7

No.	multipole	matrix
	$\mathbb{M}_{3,0}^{(1,0;a)}(T_g, 2)$	$\begin{bmatrix} 0 & -\frac{\sqrt{210}}{252} & 0 & \frac{\sqrt{105}}{126} & 0 & \frac{\sqrt{42}}{84} & \frac{5}{32} & 0 & \frac{25\sqrt{21}}{672} & 0 & -\frac{5\sqrt{35}}{224} & 0 & 0 & -\frac{5\sqrt{7}}{224} & 0 \\ \frac{\sqrt{42}}{84} & 0 & \frac{\sqrt{105}}{126} & 0 & -\frac{\sqrt{210}}{252} & 0 & 0 & \frac{5\sqrt{7}}{224} & 0 & \frac{5\sqrt{35}}{224} & 0 & -\frac{25\sqrt{21}}{672} & 0 & 0 & -\frac{5}{32} \\ \frac{25\sqrt{7}}{672} & 0 & -\frac{5\sqrt{70}}{224} & 0 & -\frac{5\sqrt{35}}{224} & 0 & 0 & \frac{5\sqrt{42}}{336} & 0 & -\frac{\sqrt{210}}{168} & 0 & -\frac{\sqrt{14}}{112} & 0 & 0 & 0 \\ 0 & -\frac{5\sqrt{105}}{288} & 0 & \frac{5\sqrt{210}}{2016} & 0 & -\frac{25\sqrt{21}}{672} & -\frac{\sqrt{2}}{16} & 0 & 0 & 0 & -\frac{\sqrt{70}}{112} & 0 & -\frac{\sqrt{14}}{56} & 0 & 0 \\ \frac{25\sqrt{21}}{672} & 0 & -\frac{5\sqrt{210}}{2016} & 0 & \frac{5\sqrt{105}}{288} & 0 & 0 & -\frac{\sqrt{14}}{56} & 0 & -\frac{\sqrt{70}}{112} & 0 & 0 & 0 & -\frac{\sqrt{2}}{16} & 0 \\ 0 & \frac{5\sqrt{35}}{224} & 0 & \frac{5\sqrt{70}}{224} & 0 & -\frac{25\sqrt{7}}{672} & 0 & 0 & -\frac{\sqrt{14}}{112} & 0 & -\frac{\sqrt{210}}{168} & 0 & \frac{5\sqrt{42}}{336} & 0 & 0 \end{bmatrix}$
437	symmetry	$\begin{bmatrix} 0 & \frac{\sqrt{210}i}{252} & 0 & \frac{\sqrt{105}i}{126} & 0 & -\frac{\sqrt{42}i}{84} & \frac{5i}{32} & 0 & -\frac{25\sqrt{21}i}{672} & 0 & -\frac{5\sqrt{35}i}{224} & 0 & \frac{5\sqrt{7}i}{224} & 0 \\ \frac{\sqrt{42}i}{84} & 0 & -\frac{\sqrt{105}i}{126} & 0 & -\frac{\sqrt{210}i}{252} & 0 & 0 & \frac{5\sqrt{7}i}{224} & 0 & -\frac{5\sqrt{35}i}{224} & 0 & -\frac{25\sqrt{21}i}{672} & 0 & \frac{5i}{32} \\ -\frac{25\sqrt{7}i}{672} & 0 & -\frac{5\sqrt{70}i}{224} & 0 & \frac{5\sqrt{35}i}{224} & 0 & 0 & -\frac{5\sqrt{42}i}{336} & 0 & -\frac{\sqrt{210}i}{168} & 0 & \frac{\sqrt{14}i}{112} & 0 & 0 \\ 0 & \frac{5\sqrt{105}i}{288} & 0 & \frac{5\sqrt{210}i}{2016} & 0 & \frac{25\sqrt{21}i}{672} & -\frac{\sqrt{2}i}{16} & 0 & 0 & 0 & -\frac{\sqrt{70}i}{112} & 0 & \frac{\sqrt{14}i}{56} & 0 & 0 \\ \frac{25\sqrt{21}i}{672} & 0 & \frac{5\sqrt{210}i}{2016} & 0 & \frac{5\sqrt{105}i}{288} & 0 & 0 & -\frac{\sqrt{14}i}{56} & 0 & \frac{\sqrt{70}i}{112} & 0 & 0 & 0 & \frac{\sqrt{2}i}{16} & 0 \\ 0 & \frac{5\sqrt{35}i}{224} & 0 & -\frac{5\sqrt{70}i}{224} & 0 & -\frac{25\sqrt{7}i}{672} & 0 & 0 & -\frac{\sqrt{14}i}{112} & 0 & \frac{\sqrt{210}i}{168} & 0 & \frac{5\sqrt{42}i}{336} & 0 & 0 \end{bmatrix}$
438	symmetry	$\begin{bmatrix} -\frac{\sqrt{42}}{126} & 0 & 0 & 0 & -\frac{\sqrt{210}}{126} & 0 & 0 & \frac{5\sqrt{7}}{56} & 0 & 0 & 0 & \frac{5\sqrt{21}}{168} & 0 & 0 \\ 0 & \frac{\sqrt{210}}{126} & 0 & 0 & 0 & \frac{\sqrt{42}}{126} & 0 & 0 & \frac{5\sqrt{21}}{168} & 0 & 0 & 0 & \frac{5\sqrt{7}}{56} & 0 \\ 0 & 0 & 0 & \frac{5\sqrt{70}}{168} & 0 & 0 & \frac{\sqrt{6}}{24} & 0 & 0 & 0 & \frac{\sqrt{210}}{168} & 0 & 0 & 0 & 0 \\ -\frac{25\sqrt{21}}{504} & 0 & 0 & 0 & \frac{5\sqrt{105}}{504} & 0 & 0 & -\frac{\sqrt{14}}{56} & 0 & 0 & 0 & \frac{\sqrt{42}}{56} & 0 & 0 & 0 \\ 0 & \frac{5\sqrt{105}}{504} & 0 & 0 & 0 & -\frac{25\sqrt{21}}{504} & 0 & 0 & -\frac{\sqrt{42}}{56} & 0 & 0 & 0 & \frac{\sqrt{14}}{56} & 0 & 0 \\ 0 & 0 & \frac{5\sqrt{70}}{168} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{210}}{168} & 0 & 0 & 0 & -\frac{\sqrt{6}}{24} & 0 \end{bmatrix}$
439	symmetry	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ \frac{\sqrt{2}}{4} & 0 & -\frac{\sqrt{5}}{20} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{30}}{20} & 0 & -\frac{\sqrt{15}}{20} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{15}}{20} & 0 & -\frac{\sqrt{30}}{20} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{5}}{20} & 0 & -\frac{\sqrt{2}}{4} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
440	symmetry	$\begin{bmatrix} & & & & & & & y & & & & & & & & \end{bmatrix}$

continued ...

Table 7

No.	multipole	matrix
	$\mathbb{M}_{1,1}^{(1,1;a)}(T_g)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ \frac{\sqrt{2}i}{4} & 0 & \frac{\sqrt{5}i}{20} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{30}i}{20} & 0 & \frac{\sqrt{15}i}{20} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{15}i}{20} & 0 & \frac{\sqrt{30}i}{20} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{5}i}{20} & 0 & \frac{\sqrt{2}i}{4} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
441	symmetry	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{10}}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{15}}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{15}}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{10}}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
442	symmetry	$\begin{bmatrix} \frac{\sqrt{6}i}{14} & 0 & 0 & 0 & -\frac{\sqrt{30}i}{14} & 0 & 0 & -\frac{3i}{56} & 0 & 0 & 0 & \frac{\sqrt{3}i}{56} & 0 & 0 \\ 0 & -\frac{\sqrt{30}i}{14} & 0 & 0 & 0 & \frac{\sqrt{6}i}{14} & 0 & 0 & -\frac{\sqrt{3}i}{56} & 0 & 0 & 0 & \frac{3i}{56} & 0 \\ 0 & 0 & 0 & -\frac{3\sqrt{10}i}{56} & 0 & 0 & -\frac{\sqrt{42}i}{168} & 0 & 0 & 0 & \frac{\sqrt{30}i}{168} & 0 & 0 & 0 \\ -\frac{5\sqrt{3}i}{56} & 0 & 0 & 0 & -\frac{\sqrt{15}i}{56} & 0 & 0 & \frac{\sqrt{2}i}{56} & 0 & 0 & 0 & \frac{\sqrt{6}i}{56} & 0 & 0 \\ 0 & \frac{\sqrt{15}i}{56} & 0 & 0 & 0 & \frac{5\sqrt{3}i}{56} & 0 & 0 & \frac{\sqrt{6}i}{56} & 0 & 0 & 0 & \frac{\sqrt{2}i}{56} & 0 \\ 0 & 0 & \frac{3\sqrt{10}i}{56} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}i}{168} & 0 & 0 & 0 & -\frac{\sqrt{42}i}{168} \end{bmatrix}$
443	symmetry	$\begin{bmatrix} 0 & \frac{3\sqrt{2}}{28} & 0 & -\frac{3}{14} & 0 & \frac{3\sqrt{10}}{28} & \frac{\sqrt{105}}{224} & 0 & -\frac{3\sqrt{5}}{224} & 0 & \frac{3\sqrt{3}}{224} & 0 & -\frac{\sqrt{15}}{224} & 0 \\ \frac{3\sqrt{10}}{28} & 0 & -\frac{3}{14} & 0 & \frac{3\sqrt{2}}{28} & 0 & 0 & \frac{\sqrt{15}}{224} & 0 & -\frac{3\sqrt{3}}{224} & 0 & \frac{3\sqrt{5}}{224} & 0 & -\frac{\sqrt{105}}{224} \\ \frac{3\sqrt{15}}{224} & 0 & -\frac{9\sqrt{6}}{224} & 0 & \frac{15\sqrt{3}}{224} & 0 & 0 & -\frac{\sqrt{10}}{112} & 0 & \frac{\sqrt{2}}{56} & 0 & -\frac{\sqrt{30}}{336} & 0 & 0 \\ 0 & -\frac{3}{32} & 0 & \frac{3\sqrt{2}}{224} & 0 & \frac{15\sqrt{5}}{224} & -\frac{\sqrt{210}}{336} & 0 & 0 & 0 & \frac{\sqrt{6}}{112} & 0 & -\frac{\sqrt{30}}{168} & 0 \\ -\frac{15\sqrt{5}}{224} & 0 & -\frac{3\sqrt{2}}{224} & 0 & \frac{3}{32} & 0 & 0 & -\frac{\sqrt{30}}{168} & 0 & \frac{\sqrt{6}}{112} & 0 & 0 & 0 & -\frac{\sqrt{210}}{336} \\ 0 & -\frac{15\sqrt{3}}{224} & 0 & \frac{9\sqrt{6}}{224} & 0 & -\frac{3\sqrt{15}}{224} & 0 & 0 & -\frac{\sqrt{30}}{336} & 0 & \frac{\sqrt{2}}{56} & 0 & -\frac{\sqrt{10}}{112} & 0 \end{bmatrix}$
444	symmetry	$-\frac{y(3x^2 - 2y^2 + 3z^2)}{2}$

continued ...

Table 7

No.	multipole	matrix
	$\mathbb{M}_{3,1}^{(1,1;a)}(T_g, 1)$	$\begin{bmatrix} 0 & \frac{3\sqrt{2}i}{28} & 0 & \frac{3i}{14} & 0 & \frac{3\sqrt{10}i}{28} & -\frac{\sqrt{105}i}{224} & 0 & -\frac{3\sqrt{5}i}{224} & 0 & -\frac{3\sqrt{3}i}{224} & 0 & -\frac{\sqrt{15}i}{224} & 0 \\ -\frac{3\sqrt{10}i}{28} & 0 & -\frac{3i}{14} & 0 & -\frac{3\sqrt{2}i}{28} & 0 & 0 & -\frac{\sqrt{15}i}{224} & 0 & -\frac{3\sqrt{3}i}{224} & 0 & -\frac{3\sqrt{5}i}{224} & 0 & -\frac{\sqrt{105}i}{224} \\ \frac{3\sqrt{15}i}{224} & 0 & \frac{9\sqrt{6}i}{224} & 0 & \frac{15\sqrt{3}i}{224} & 0 & 0 & -\frac{\sqrt{10}i}{112} & 0 & -\frac{\sqrt{2}i}{56} & 0 & -\frac{\sqrt{30}i}{336} & 0 & 0 \\ 0 & -\frac{3i}{32} & 0 & -\frac{3\sqrt{2}i}{224} & 0 & \frac{15\sqrt{5}i}{224} & \frac{\sqrt{210}i}{336} & 0 & 0 & 0 & -\frac{\sqrt{6}i}{112} & 0 & -\frac{\sqrt{30}i}{168} & 0 \\ \frac{15\sqrt{5}i}{224} & 0 & -\frac{3\sqrt{2}i}{224} & 0 & -\frac{3i}{32} & 0 & 0 & \frac{\sqrt{30}i}{168} & 0 & \frac{\sqrt{6}i}{112} & 0 & 0 & 0 & -\frac{\sqrt{210}i}{336} \\ 0 & \frac{15\sqrt{3}i}{224} & 0 & \frac{9\sqrt{6}i}{224} & 0 & \frac{3\sqrt{15}i}{224} & 0 & 0 & \frac{\sqrt{30}i}{336} & 0 & \frac{\sqrt{2}i}{56} & 0 & \frac{\sqrt{10}i}{112} & 0 \end{bmatrix}$
445	symmetry	$-\frac{z(3x^2+3y^2-2z^2)}{2}$ $\begin{bmatrix} 0 & 0 & \frac{3}{7} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{28} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{3}{7} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{28} & 0 & 0 & 0 \\ 0 & \frac{3\sqrt{3}}{28} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}}{84} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{3\sqrt{2}}{28} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}}{84} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{3\sqrt{2}}{28} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{84} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{3\sqrt{3}}{28} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{84} & 0 & 0 \end{bmatrix}$
446	symmetry	$\frac{\sqrt{15}x(y-z)(y+z)}{2}$ $\begin{bmatrix} 0 & \frac{\sqrt{30}}{28} & 0 & -\frac{\sqrt{15}}{14} & 0 & -\frac{3\sqrt{6}}{28} & -\frac{3\sqrt{7}}{224} & 0 & -\frac{5\sqrt{3}}{224} & 0 & \frac{3\sqrt{5}}{224} & 0 & \frac{3}{224} & 0 \\ -\frac{3\sqrt{6}}{28} & 0 & -\frac{\sqrt{15}}{14} & 0 & \frac{\sqrt{30}}{28} & 0 & 0 & -\frac{3}{224} & 0 & -\frac{3\sqrt{5}}{224} & 0 & \frac{5\sqrt{3}}{224} & 0 & \frac{3\sqrt{7}}{224} \\ \frac{15}{224} & 0 & -\frac{9\sqrt{10}}{224} & 0 & -\frac{9\sqrt{5}}{224} & 0 & 0 & -\frac{5\sqrt{6}}{336} & 0 & \frac{\sqrt{30}}{168} & 0 & \frac{\sqrt{2}}{112} & 0 & 0 \\ 0 & -\frac{\sqrt{15}}{32} & 0 & \frac{\sqrt{30}}{224} & 0 & -\frac{15\sqrt{3}}{224} & \frac{\sqrt{14}}{112} & 0 & 0 & 0 & \frac{\sqrt{10}}{112} & 0 & \frac{\sqrt{2}}{56} & 0 \\ \frac{15\sqrt{3}}{224} & 0 & -\frac{\sqrt{30}}{224} & 0 & \frac{\sqrt{15}}{32} & 0 & 0 & \frac{\sqrt{2}}{56} & 0 & \frac{\sqrt{10}}{112} & 0 & 0 & 0 & \frac{\sqrt{14}}{112} \\ 0 & \frac{9\sqrt{5}}{224} & 0 & \frac{9\sqrt{10}}{224} & 0 & -\frac{15}{224} & 0 & 0 & \frac{\sqrt{2}}{112} & 0 & \frac{\sqrt{30}}{168} & 0 & -\frac{5\sqrt{6}}{336} & 0 \end{bmatrix}$
447	symmetry	$-\frac{\sqrt{15}y(x-z)(x+z)}{2}$ $\begin{bmatrix} 0 & -\frac{\sqrt{30}i}{28} & 0 & -\frac{\sqrt{15}i}{14} & 0 & \frac{3\sqrt{6}i}{28} & -\frac{3\sqrt{7}i}{224} & 0 & \frac{5\sqrt{3}i}{224} & 0 & \frac{3\sqrt{5}i}{224} & 0 & -\frac{3i}{224} & 0 \\ -\frac{3\sqrt{6}i}{28} & 0 & \frac{\sqrt{15}i}{14} & 0 & \frac{\sqrt{30}i}{28} & 0 & 0 & -\frac{3i}{224} & 0 & \frac{3\sqrt{5}i}{224} & 0 & \frac{5\sqrt{3}i}{224} & 0 & -\frac{3\sqrt{7}i}{224} \\ -\frac{15i}{224} & 0 & -\frac{9\sqrt{10}i}{224} & 0 & \frac{9\sqrt{5}i}{224} & 0 & 0 & \frac{5\sqrt{6}i}{336} & 0 & \frac{\sqrt{30}i}{168} & 0 & -\frac{\sqrt{2}i}{112} & 0 & 0 \\ 0 & \frac{\sqrt{15}i}{32} & 0 & \frac{\sqrt{30}i}{224} & 0 & \frac{15\sqrt{3}i}{224} & \frac{\sqrt{14}i}{112} & 0 & 0 & 0 & \frac{\sqrt{10}i}{112} & 0 & -\frac{\sqrt{2}i}{56} & 0 \\ \frac{15\sqrt{3}i}{224} & 0 & \frac{\sqrt{30}i}{224} & 0 & \frac{\sqrt{15}i}{32} & 0 & 0 & \frac{\sqrt{2}i}{56} & 0 & -\frac{\sqrt{10}i}{112} & 0 & 0 & 0 & -\frac{\sqrt{14}i}{112} \\ 0 & \frac{9\sqrt{5}i}{224} & 0 & -\frac{9\sqrt{10}i}{224} & 0 & -\frac{15i}{224} & 0 & 0 & \frac{\sqrt{2}i}{112} & 0 & -\frac{\sqrt{30}i}{168} & 0 & -\frac{5\sqrt{6}i}{336} & 0 \end{bmatrix}$
448	symmetry	$\frac{\sqrt{15}z(x-y)(x+y)}{2}$

continued ...

Table 7

No.	multipole	matrix
	$\mathbb{M}_{3,2}^{(1,1;a)}(T_g, 2)$	$\begin{bmatrix} \frac{\sqrt{6}}{14} & 0 & 0 & 0 & \frac{\sqrt{30}}{14} & 0 & 0 & -\frac{3}{56} & 0 & 0 & 0 & -\frac{\sqrt{3}}{56} & 0 & 0 \\ 0 & -\frac{\sqrt{30}}{14} & 0 & 0 & 0 & -\frac{\sqrt{6}}{14} & 0 & 0 & -\frac{\sqrt{3}}{56} & 0 & 0 & 0 & -\frac{3}{56} & 0 \\ 0 & 0 & 0 & \frac{3\sqrt{10}}{56} & 0 & 0 & -\frac{\sqrt{42}}{168} & 0 & 0 & 0 & -\frac{\sqrt{30}}{168} & 0 & 0 & 0 \\ -\frac{5\sqrt{3}}{56} & 0 & 0 & 0 & \frac{\sqrt{15}}{56} & 0 & 0 & \frac{\sqrt{2}}{56} & 0 & 0 & 0 & -\frac{\sqrt{6}}{56} & 0 & 0 \\ 0 & \frac{\sqrt{15}}{56} & 0 & 0 & 0 & -\frac{5\sqrt{3}}{56} & 0 & 0 & \frac{\sqrt{6}}{56} & 0 & 0 & 0 & -\frac{\sqrt{2}}{56} & 0 \\ 0 & 0 & \frac{3\sqrt{10}}{56} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{168} & 0 & 0 & 0 & \frac{\sqrt{42}}{168} \end{bmatrix}$

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	$\begin{bmatrix} 1 & & & & & & & & & & & & & & & \\ & \frac{\sqrt{10}}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ & 0 & \frac{\sqrt{10}}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ & 0 & 0 & \frac{\sqrt{10}}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ & 0 & 0 & 0 & \frac{\sqrt{10}}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ & 0 & 0 & 0 & 0 & \frac{\sqrt{10}}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}}{10} & 0 & 0 & 0 & 0 & 0 & 0 \\ & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}}{10} & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
450	symmetry	$-\frac{x^2}{2} - \frac{y^2}{2} + z^2$

continued ...

Table 8

No.	multipole	matrix
$\mathbb{Q}_{2,0}^{(a)}(E_g)$		$\begin{bmatrix} -\frac{\sqrt{7}}{10} & 0 & 0 & 0 & 0 & -\frac{3\sqrt{7}}{35} & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{7}}{10} & 0 & 0 & 0 & 0 & -\frac{\sqrt{42}}{70} & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{7}}{10} & 0 & 0 & 0 & 0 & \frac{\sqrt{42}}{70} & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{7}}{10} & 0 & 0 & 0 & 0 & \frac{3\sqrt{7}}{35} & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{7}}{7} & 0 & 0 & 0 & 0 & 0 \\ -\frac{3\sqrt{7}}{35} & 0 & 0 & 0 & 0 & \frac{\sqrt{7}}{35} & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{42}}{70} & 0 & 0 & 0 & 0 & \frac{4\sqrt{7}}{35} & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{42}}{70} & 0 & 0 & 0 & 0 & \frac{4\sqrt{7}}{35} & 0 & 0 \\ 0 & 0 & 0 & \frac{3\sqrt{7}}{35} & 0 & 0 & 0 & 0 & \frac{\sqrt{7}}{35} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}}{7} \end{bmatrix}$
$\mathbb{Q}_{2,1}^{(a)}(E_g)$		$\begin{bmatrix} 0 & 0 & -\frac{\sqrt{7}}{10} & 0 & 0 & 0 & 0 & -\frac{\sqrt{42}}{70} & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{7}}{10} & \frac{\sqrt{35}}{35} & 0 & 0 & 0 & -\frac{2\sqrt{7}}{35} & 0 \\ -\frac{\sqrt{7}}{10} & 0 & 0 & 0 & 0 & \frac{2\sqrt{7}}{35} & 0 & 0 & 0 & -\frac{\sqrt{35}}{35} \\ 0 & -\frac{\sqrt{7}}{10} & 0 & 0 & 0 & 0 & \frac{\sqrt{42}}{70} & 0 & 0 & 0 \\ 0 & \frac{\sqrt{35}}{35} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{210}}{70} & 0 & 0 \\ 0 & 0 & \frac{2\sqrt{7}}{35} & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{42}}{70} & 0 \\ 0 & 0 & 0 & \frac{\sqrt{42}}{70} & -\frac{\sqrt{210}}{70} & 0 & 0 & 0 & -\frac{3\sqrt{42}}{70} & 0 \\ -\frac{\sqrt{42}}{70} & 0 & 0 & 0 & 0 & -\frac{3\sqrt{42}}{70} & 0 & 0 & 0 & -\frac{\sqrt{210}}{70} \\ 0 & -\frac{2\sqrt{7}}{35} & 0 & 0 & 0 & 0 & -\frac{3\sqrt{42}}{70} & 0 & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{35}}{35} & 0 & 0 & 0 & 0 & -\frac{\sqrt{210}}{70} & 0 & 0 \end{bmatrix}$
452	symmetry	$\sqrt{3}(x-y)(x+y)$
		$\sqrt{3}yz$

continued ...

Table 8

No.	multipole	matrix
$\mathbb{Q}_{2,0}^{(a)}(T_g)$	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 0 $-\frac{\sqrt{7}i}{10}$ 0 0 $-\frac{\sqrt{14}i}{28}$ 0 $\frac{\sqrt{7}i}{70}$ 0
	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 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 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 0 $-\frac{\sqrt{7}i}{70}$ 0 0 0 0 $\frac{\sqrt{42}i}{35}$ 0 $-\frac{\sqrt{105}i}{35}$
	0	0 0 0 $\frac{\sqrt{105}i}{70}$ 0 0 0 0 $\frac{\sqrt{105}i}{35}$ 0
453 symmetry	$\sqrt{3}xz$	
	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 0 $-\frac{\sqrt{7}}{70}$ 0 $-\frac{\sqrt{14}}{28}$ 0 0
	0	0 0 0 $\frac{\sqrt{7}}{10}$ 0 0 $-\frac{\sqrt{14}}{28}$ 0 $-\frac{\sqrt{7}}{70}$ 0
	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 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 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 0 $-\frac{\sqrt{7}}{70}$ 0 0 0 0 $\frac{\sqrt{42}}{35}$ 0 $\frac{\sqrt{105}}{35}$
454 symmetry	$\sqrt{3}xy$	
	<i>continued ...</i>	

Table 8

No.	multipole	matrix
$\mathbb{Q}_{2,2}^{(a)}(T_g)$	0	0 0 $\frac{\sqrt{7}i}{10}$ 0 0 0 0 $\frac{\sqrt{42}i}{70}$ 0 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 0 $\frac{2\sqrt{7}i}{35}$ 0 0 0 $\frac{\sqrt{35}i}{35}$
	0	0 $-\frac{\sqrt{7}i}{10}$ 0 0 0 0 $\frac{\sqrt{42}i}{70}$ 0 0 0
	0	0 $-\frac{\sqrt{35}i}{35}$ 0 0 0 0 $\frac{\sqrt{210}i}{70}$ 0 0 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 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 0 $-\frac{3\sqrt{42}i}{70}$ 0 0 0 $\frac{\sqrt{210}i}{70}$
	0	0 $-\frac{2\sqrt{7}i}{35}$ 0 0 0 0 $-\frac{3\sqrt{42}i}{70}$ 0 0 0
	0	0 0 $-\frac{\sqrt{35}i}{35}$ 0 0 0 0 $-\frac{\sqrt{210}i}{70}$ 0 0
455	symmetry	$\frac{\sqrt{21}(x^4 - 3x^2y^2 - 3x^2z^2 + y^4 - 3y^2z^2 + z^4)}{6}$
$\mathbb{Q}_4^{(a)}(A_g)$	0	0 0 0 0 0 $\frac{\sqrt{15}}{30}$ 0 0 0 $\frac{\sqrt{3}}{6}$
	0	0 0 0 0 0 0 $-\frac{\sqrt{10}}{10}$ 0 0 0
	0	0 0 0 0 0 0 0 $\frac{\sqrt{10}}{10}$ 0 0
	0	0 0 0 0 $-\frac{\sqrt{3}}{6}$ 0 0 0 $-\frac{\sqrt{15}}{30}$ 0
	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 0 $-\frac{\sqrt{15}}{20}$ 0 0 0 $\frac{\sqrt{3}}{12}$
	0	$-\frac{\sqrt{10}}{10}$ 0 0 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 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 0 $\frac{\sqrt{3}}{12}$ 0 0 0 $\frac{\sqrt{15}}{60}$
456	symmetry	$-\frac{\sqrt{15}(x^4 - 12x^2y^2 + 6x^2z^2 + y^4 + 6y^2z^2 - 2z^4)}{12}$

continued ...

Table 8

No.	multipole	matrix
$\mathbb{Q}_{4,0}^{(a)}(E_g)$	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 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 $\frac{\sqrt{21}}{84}$	
457	symmetry	$\frac{\sqrt{5}(x-y)(x+y)(x^2+y^2-6z^2)}{4}$
$\mathbb{Q}_{4,1}^{(a)}(E_g)$	0 0 0 0 0 0 0 $-\frac{\sqrt{14}}{14}$ 0 0	
	0 0 0 0 $\frac{\sqrt{105}}{70}$ 0 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	
458	symmetry	$\frac{\sqrt{35}yz(y-z)(y+z)}{2}$

continued ...

Table 8

No.	multipole	matrix
$\mathbb{Q}_{4,0}^{(a)}(T_g, 1)$	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	
459	symmetry	$-\frac{\sqrt{35}xz(x-z)(x+z)}{2}$
$\mathbb{Q}_{4,1}^{(a)}(T_g, 1)$	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	
460	symmetry	$\frac{\sqrt{35}xy(x-y)(x+y)}{2}$

continued ...

Table 8

No.	multipole	matrix
		$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{5} \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{5} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{5}i}{5} & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{10} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{10} \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{5}i}{10} & 0 & 0 & 0 & 0 & 0 \\ \frac{\sqrt{5}i}{5} & 0 & 0 & 0 & 0 & \frac{\sqrt{5}i}{10} & 0 & 0 & 0 & 0 \end{bmatrix}$
461	symmetry	$\frac{\sqrt{5}yz(6x^2-y^2-z^2)}{2}$ $\begin{bmatrix} 0 & 0 & 0 & 0 & \frac{\sqrt{35}i}{280} & 0 & \frac{\sqrt{14}i}{56} & 0 & -\frac{\sqrt{7}i}{8} & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{21}i}{56} & 0 & -\frac{\sqrt{42}i}{56} & 0 & \frac{\sqrt{105}i}{40} \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{105}i}{40} & 0 & \frac{\sqrt{42}i}{56} & 0 & \frac{\sqrt{21}i}{56} & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}i}{8} & 0 & -\frac{\sqrt{14}i}{56} & 0 & -\frac{\sqrt{35}i}{280} \\ -\frac{\sqrt{35}i}{280} & 0 & \frac{\sqrt{105}i}{40} & 0 & 0 & \frac{\sqrt{35}i}{140} & 0 & -\frac{\sqrt{70}i}{40} & 0 & 0 \\ 0 & \frac{\sqrt{21}i}{56} & 0 & -\frac{\sqrt{7}i}{8} & -\frac{\sqrt{35}i}{140} & 0 & -\frac{\sqrt{14}i}{56} & 0 & 0 & 0 \\ -\frac{\sqrt{14}i}{56} & 0 & -\frac{\sqrt{42}i}{56} & 0 & 0 & \frac{\sqrt{14}i}{56} & 0 & 0 & 0 & \frac{\sqrt{70}i}{40} \\ 0 & \frac{\sqrt{42}i}{56} & 0 & \frac{\sqrt{14}i}{56} & \frac{\sqrt{70}i}{40} & 0 & 0 & 0 & \frac{\sqrt{14}i}{56} & 0 \\ \frac{\sqrt{7}i}{8} & 0 & -\frac{\sqrt{21}i}{56} & 0 & 0 & 0 & 0 & -\frac{\sqrt{14}i}{56} & 0 & -\frac{\sqrt{35}i}{140} \\ 0 & -\frac{\sqrt{105}i}{40} & 0 & \frac{\sqrt{35}i}{280} & 0 & 0 & -\frac{\sqrt{70}i}{40} & 0 & \frac{\sqrt{35}i}{140} & 0 \end{bmatrix}$
462	symmetry	$-\frac{\sqrt{5}xz(x^2-6y^2+z^2)}{2}$

continued ...

Table 8

No.	multipole	matrix
$\mathbb{Q}_{4,1}^{(a)}(T_g, 2)$		$\begin{bmatrix} 0 & 0 & 0 & 0 & \frac{\sqrt{35}}{280} & 0 & -\frac{\sqrt{14}}{56} & 0 & -\frac{\sqrt{7}}{8} & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{21}}{56} & 0 & \frac{\sqrt{42}}{56} & 0 & \frac{\sqrt{105}}{40} \\ 0 & 0 & 0 & 0 & \frac{\sqrt{105}}{40} & 0 & \frac{\sqrt{42}}{56} & 0 & -\frac{\sqrt{21}}{56} & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}}{8} & 0 & -\frac{\sqrt{14}}{56} & 0 & \frac{\sqrt{35}}{280} \\ \frac{\sqrt{35}}{280} & 0 & \frac{\sqrt{105}}{40} & 0 & 0 & -\frac{\sqrt{35}}{140} & 0 & -\frac{\sqrt{70}}{40} & 0 & 0 \\ 0 & -\frac{\sqrt{21}}{56} & 0 & -\frac{\sqrt{7}}{8} & -\frac{\sqrt{35}}{140} & 0 & \frac{\sqrt{14}}{56} & 0 & 0 & 0 \\ -\frac{\sqrt{14}}{56} & 0 & \frac{\sqrt{42}}{56} & 0 & 0 & \frac{\sqrt{14}}{56} & 0 & 0 & 0 & \frac{\sqrt{70}}{40} \\ 0 & \frac{\sqrt{42}}{56} & 0 & -\frac{\sqrt{14}}{56} & -\frac{\sqrt{70}}{40} & 0 & 0 & 0 & -\frac{\sqrt{14}}{56} & 0 \\ -\frac{\sqrt{7}}{8} & 0 & -\frac{\sqrt{21}}{56} & 0 & 0 & 0 & 0 & -\frac{\sqrt{14}}{56} & 0 & \frac{\sqrt{35}}{140} \\ 0 & \frac{\sqrt{105}}{40} & 0 & \frac{\sqrt{35}}{280} & 0 & 0 & \frac{\sqrt{70}}{40} & 0 & \frac{\sqrt{35}}{140} & 0 \end{bmatrix}$
		$-\frac{\sqrt{5}xy(x^2+y^2-6z^2)}{2}$
$\mathbb{Q}_{4,2}^{(a)}(T_g, 2)$		$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{14}i}{14} & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{105}i}{70} & 0 & 0 & 0 & \frac{\sqrt{21}i}{14} & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{21}i}{14} & 0 & 0 & 0 & -\frac{\sqrt{105}i}{70} \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{14}i}{14} & 0 & 0 & 0 \\ 0 & \frac{\sqrt{105}i}{70} & 0 & 0 & 0 & 0 & -\frac{3\sqrt{70}i}{140} & 0 & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{21}i}{14} & 0 & 0 & 0 & 0 & \frac{\sqrt{14}i}{28} & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{14}i}{14} & \frac{3\sqrt{70}i}{140} & 0 & 0 & 0 & \frac{\sqrt{14}i}{28} & 0 \\ \frac{\sqrt{14}i}{14} & 0 & 0 & 0 & 0 & -\frac{\sqrt{14}i}{28} & 0 & 0 & 0 & -\frac{3\sqrt{70}i}{140} \\ 0 & -\frac{\sqrt{21}i}{14} & 0 & 0 & 0 & 0 & -\frac{\sqrt{14}i}{28} & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{105}i}{70} & 0 & 0 & 0 & 0 & \frac{3\sqrt{70}i}{140} & 0 & 0 \end{bmatrix}$
		$-\frac{x^2}{2} - \frac{y^2}{2} + z^2$

continued ...

Table 8

No.	multipole	matrix
	$\mathbb{Q}_{2,0}^{(1,-1;a)}(E_g)$	$\begin{bmatrix} -\frac{\sqrt{30}}{50} & 0 & 0 & 0 & 0 & -\frac{3\sqrt{30}}{50} & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{30}}{50} & 0 & 0 & 0 & 0 & -\frac{3\sqrt{5}}{50} & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{30}}{50} & 0 & 0 & 0 & 0 & \frac{3\sqrt{5}}{50} & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{30}}{50} & 0 & 0 & 0 & 0 & \frac{3\sqrt{30}}{50} & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{15} & 0 & 0 & 0 & 0 & 0 \\ -\frac{3\sqrt{30}}{50} & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}}{75} & 0 & 0 & 0 & 0 \\ 0 & -\frac{3\sqrt{5}}{50} & 0 & 0 & 0 & 0 & -\frac{4\sqrt{30}}{75} & 0 & 0 & 0 \\ 0 & 0 & \frac{3\sqrt{5}}{50} & 0 & 0 & 0 & 0 & -\frac{4\sqrt{30}}{75} & 0 & 0 \\ 0 & 0 & 0 & \frac{3\sqrt{30}}{50} & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}}{75} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{15} \end{bmatrix}$
465	symmetry	$\frac{\sqrt{3}(x-y)(x+y)}{2}$
	$\mathbb{Q}_{2,1}^{(1,-1;a)}(E_g)$	$\begin{bmatrix} 0 & 0 & -\frac{\sqrt{30}}{50} & 0 & 0 & 0 & 0 & -\frac{3\sqrt{5}}{50} & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{30}}{50} & \frac{\sqrt{6}}{10} & 0 & 0 & 0 & -\frac{\sqrt{30}}{25} & 0 \\ -\frac{\sqrt{30}}{50} & 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{25} & 0 & 0 & 0 & -\frac{\sqrt{6}}{10} \\ 0 & -\frac{\sqrt{30}}{50} & 0 & 0 & 0 & 0 & \frac{3\sqrt{5}}{50} & 0 & 0 & 0 \\ 0 & \frac{\sqrt{6}}{10} & 0 & 0 & 0 & 0 & 0 & \frac{1}{5} & 0 & 0 \\ 0 & 0 & \frac{\sqrt{30}}{25} & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{5}}{25} & 0 \\ 0 & 0 & 0 & \frac{3\sqrt{5}}{50} & \frac{1}{5} & 0 & 0 & 0 & 0 & \frac{3\sqrt{5}}{25} \\ -\frac{3\sqrt{5}}{50} & 0 & 0 & 0 & 0 & \frac{3\sqrt{5}}{25} & 0 & 0 & 0 & \frac{1}{5} \\ 0 & -\frac{\sqrt{30}}{25} & 0 & 0 & 0 & 0 & \frac{3\sqrt{5}}{25} & 0 & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{6}}{10} & 0 & 0 & 0 & 0 & 0 & \frac{1}{5} & 0 & 0 \end{bmatrix}$
466	symmetry	$\sqrt{3}yz$

continued ...

Table 8

No.	multipole	matrix
$\mathbb{Q}_{2,0}^{(1,-1;a)}(T_g)$	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 0 $-\frac{\sqrt{30}i}{100}$ 0 $\frac{\sqrt{15}i}{20}$ 0 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 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 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 0
	$-\frac{9\sqrt{5}i}{100}$	0 $\frac{\sqrt{15}i}{20}$ 0 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	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 0 $\frac{3\sqrt{2}i}{20}$ 0 0 0 0 $-\frac{\sqrt{2}i}{5}$ 0
467	symmetry	$\sqrt{3}xz$
$\mathbb{Q}_{2,1}^{(1,-1;a)}(T_g)$	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 0 $-\frac{\sqrt{30}}{100}$ 0 $-\frac{\sqrt{15}}{20}$ 0 0
	0	0 0 0 $\frac{\sqrt{30}}{50}$ 0 0 $-\frac{\sqrt{15}}{20}$ 0 $-\frac{\sqrt{30}}{100}$ 0
	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 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 0
	$-\frac{9\sqrt{5}}{100}$	0 $-\frac{\sqrt{15}}{20}$ 0 $-\frac{9\sqrt{5}}{100}$ 0 0 0 0 $-\frac{2\sqrt{5}}{25}$ 0
	0	0 0 $-\frac{\sqrt{30}}{100}$ 0 0 0 0 $-\frac{2\sqrt{5}}{25}$ 0 $-\frac{\sqrt{2}}{5}$
	0	0 0 0 $\frac{3\sqrt{2}}{20}$ 0 0 0 0 $-\frac{\sqrt{2}}{5}$ 0
	0	0 0 0 $\frac{3\sqrt{2}}{20}$ 0 0 0 0 $-\frac{\sqrt{2}}{5}$ 0
468	symmetry	$\sqrt{3}xy$

continued ...

Table 8

No.	multipole	matrix
$\mathbb{Q}_{2,2}^{(1,-1;a)}(T_g)$		$\begin{bmatrix} 0 & 0 & \frac{\sqrt{30}i}{50} & 0 & 0 & 0 & 0 & \frac{3\sqrt{5}i}{50} & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{30}i}{50} & \frac{\sqrt{6}i}{10} & 0 & 0 & 0 & \frac{\sqrt{30}i}{25} & 0 \\ -\frac{\sqrt{30}i}{50} & 0 & 0 & 0 & 0 & \frac{\sqrt{30}i}{25} & 0 & 0 & 0 & \frac{\sqrt{6}i}{10} \\ 0 & -\frac{\sqrt{30}i}{50} & 0 & 0 & 0 & 0 & \frac{3\sqrt{5}i}{50} & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{6}i}{10} & 0 & 0 & 0 & 0 & -\frac{i}{5} & 0 & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{30}i}{25} & 0 & 0 & 0 & 0 & -\frac{3\sqrt{5}i}{25} & 0 & 0 \\ 0 & 0 & 0 & -\frac{3\sqrt{5}i}{50} & \frac{i}{5} & 0 & 0 & 0 & -\frac{3\sqrt{5}i}{25} & 0 \\ -\frac{3\sqrt{5}i}{50} & 0 & 0 & 0 & 0 & \frac{3\sqrt{5}i}{25} & 0 & 0 & 0 & -\frac{i}{5} \\ 0 & -\frac{\sqrt{30}i}{25} & 0 & 0 & 0 & 0 & \frac{3\sqrt{5}i}{25} & 0 & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{6}i}{10} & 0 & 0 & 0 & 0 & \frac{i}{5} & 0 & 0 \end{bmatrix}$
		$\frac{\sqrt{21}(x^4 - 3x^2y^2 - 3x^2z^2 + y^4 - 3y^2z^2 + z^4)}{6}$
		$\mathbb{Q}_4^{(1,-1;a)}(A_g)$
469	symmetry	$\frac{\sqrt{21}(x^4 - 3x^2y^2 - 3x^2z^2 + y^4 - 3y^2z^2 + z^4)}{6}$
470	symmetry	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{60} & 0 & 0 & 0 & \frac{\sqrt{3}}{12} \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}}{20} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}}{20} & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{12} & 0 & 0 & 0 & -\frac{\sqrt{15}}{60} & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{3}}{12} & -\frac{\sqrt{15}}{30} & 0 & 0 & 0 & -\frac{\sqrt{3}}{6} & 0 \\ \frac{\sqrt{15}}{60} & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{10} & 0 & 0 & 0 & -\frac{\sqrt{3}}{6} \\ 0 & -\frac{\sqrt{10}}{20} & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{15} & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{10}}{20} & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{15} & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{15}}{60} & -\frac{\sqrt{3}}{6} & 0 & 0 & 0 & \frac{\sqrt{15}}{10} & 0 \\ \frac{\sqrt{3}}{12} & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{6} & 0 & 0 & 0 & -\frac{\sqrt{15}}{30} \end{bmatrix}$
		$-\frac{\sqrt{15}(x^4 - 12x^2y^2 + 6x^2z^2 + y^4 + 6y^2z^2 - 2z^4)}{12}$

continued ...

Table 8

No.	multipole	matrix
$\mathbb{Q}_{4,0}^{(1,-1;a)}(E_g)$	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 $-\frac{\sqrt{21}}{42}$	
471	symmetry	$\frac{\sqrt{5}(x-y)(x+y)(x^2+y^2-6z^2)}{4}$
$\mathbb{Q}_{4,1}^{(1,-1;a)}(E_g)$	0 0 0 0 0 0 0 0 $-\frac{\sqrt{14}}{28}$ 0 0	
	0 0 0 0 $\frac{\sqrt{105}}{140}$ 0 0 0 0 $\frac{\sqrt{21}}{28}$ 0	
	0 0 0 0 0 0 $-\frac{\sqrt{21}}{28}$ 0 0 0 $-\frac{\sqrt{105}}{140}$	
	0 0 0 0 0 0 0 $\frac{\sqrt{14}}{28}$ 0 0 0	
	0 $\frac{\sqrt{105}}{140}$ 0 0 0 0 0 $\frac{3\sqrt{70}}{70}$ 0 0 0	
	0 0 $-\frac{\sqrt{21}}{28}$ 0 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 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 0 $-\frac{\sqrt{14}}{14}$ 0 0 0	
	0 0 $-\frac{\sqrt{105}}{140}$ 0 0 0 0 0 $\frac{3\sqrt{70}}{70}$ 0 0	
472	symmetry	$\frac{\sqrt{35}yz(y-z)(y+z)}{2}$

continued ...

Table 8

No.	multipole	matrix
$\mathbb{Q}_{4,0}^{(1,-1;a)}(T_g, 1)$	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	
473	symmetry	$-\frac{\sqrt{35}xz(x-z)(x+z)}{2}$
$\mathbb{Q}_{4,1}^{(1,-1;a)}(T_g, 1)$	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 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	
474	symmetry	$\frac{\sqrt{35}xy(x-y)(x+y)}{2}$

continued ...

Table 8

No.	multipole	matrix
	$\mathbb{Q}_{4,2}^{(1,-1;a)}(T_g, 1)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{10} \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{10} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{5}i}{10} & 0 & 0 & 0 & 0 & \frac{\sqrt{5}i}{5} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{5}i}{5} \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{5} & 0 & 0 & 0 & 0 & 0 \\ \frac{\sqrt{5}i}{10} & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{5} & 0 & 0 & 0 & 0 \end{bmatrix}$
475	symmetry	$\frac{\sqrt{5}yz(6x^2-y^2-z^2)}{2}$ $\begin{bmatrix} 0 & 0 & 0 & 0 & \frac{\sqrt{35}i}{560} & 0 & \frac{\sqrt{14}i}{112} & 0 & -\frac{\sqrt{7}i}{16} & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{21}i}{112} & 0 & -\frac{\sqrt{42}i}{112} & 0 & \frac{\sqrt{105}i}{80} \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{105}i}{80} & 0 & \frac{\sqrt{42}i}{112} & 0 & \frac{\sqrt{21}i}{112} & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}i}{16} & 0 & -\frac{\sqrt{14}i}{112} & 0 & -\frac{\sqrt{35}i}{560} \\ -\frac{\sqrt{35}i}{560} & 0 & \frac{\sqrt{105}i}{80} & 0 & 0 & -\frac{\sqrt{35}i}{70} & 0 & \frac{\sqrt{70}i}{20} & 0 & 0 \\ 0 & \frac{\sqrt{21}i}{112} & 0 & -\frac{\sqrt{7}i}{16} & \frac{\sqrt{35}i}{70} & 0 & \frac{\sqrt{14}i}{28} & 0 & 0 & 0 \\ -\frac{\sqrt{14}i}{112} & 0 & -\frac{\sqrt{42}i}{112} & 0 & 0 & -\frac{\sqrt{14}i}{28} & 0 & 0 & 0 & -\frac{\sqrt{70}i}{20} \\ 0 & \frac{\sqrt{42}i}{112} & 0 & \frac{\sqrt{14}i}{112} & -\frac{\sqrt{70}i}{20} & 0 & 0 & 0 & -\frac{\sqrt{14}i}{28} & 0 \\ \frac{\sqrt{7}i}{16} & 0 & -\frac{\sqrt{21}i}{112} & 0 & 0 & 0 & 0 & \frac{\sqrt{14}i}{28} & 0 & \frac{\sqrt{35}i}{70} \\ 0 & -\frac{\sqrt{105}i}{80} & 0 & \frac{\sqrt{35}i}{560} & 0 & 0 & \frac{\sqrt{70}i}{20} & 0 & -\frac{\sqrt{35}i}{70} & 0 \end{bmatrix}$
476	symmetry	$-\frac{\sqrt{5}xz(x^2-6y^2+z^2)}{2}$

continued ...

Table 8

No.	multipole	matrix
$\mathbb{Q}_{4,1}^{(1,-1;a)}(T_g, 2)$	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	
477	symmetry	$-\frac{\sqrt{5}xy(x^2+y^2-6z^2)}{2}$
$\mathbb{Q}_{4,2}^{(1,-1;a)}(T_g, 2)$	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 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 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 0	
478	symmetry	1

continued ...

Table 8

No.	multipole	matrix
$\mathbb{Q}_0^{(1,1;a)}(A_g)$		$\begin{bmatrix} -\frac{\sqrt{15}}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{15}}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{15}}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{15}}{10} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{15} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{15} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{15} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{15} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{15} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{15} \end{bmatrix}$
		$-\frac{x^2}{2} - \frac{y^2}{2} + z^2$
		$\begin{bmatrix} \frac{\sqrt{105}}{25} & 0 & 0 & 0 & 0 & -\frac{4\sqrt{105}}{175} & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{105}}{25} & 0 & 0 & 0 & 0 & -\frac{2\sqrt{70}}{175} & 0 & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{105}}{25} & 0 & 0 & 0 & 0 & \frac{2\sqrt{70}}{175} & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{105}}{25} & 0 & 0 & 0 & 0 & \frac{4\sqrt{105}}{175} & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{105}}{70} & 0 & 0 & 0 & 0 & 0 \\ -\frac{4\sqrt{105}}{175} & 0 & 0 & 0 & 0 & \frac{\sqrt{105}}{350} & 0 & 0 & 0 & 0 \\ 0 & -\frac{2\sqrt{70}}{175} & 0 & 0 & 0 & 0 & \frac{2\sqrt{105}}{175} & 0 & 0 & 0 \\ 0 & 0 & \frac{2\sqrt{70}}{175} & 0 & 0 & 0 & 0 & \frac{2\sqrt{105}}{175} & 0 & 0 \\ 0 & 0 & 0 & \frac{4\sqrt{105}}{175} & 0 & 0 & 0 & 0 & \frac{\sqrt{105}}{350} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{105}}{70} \end{bmatrix}$
		$\sqrt{3}(x-y)(x+y)$
		$\frac{\sqrt{3}(x-y)(x+y)}{2}$
479	symmetry	$-\frac{x^2}{2} - \frac{y^2}{2} + z^2$
480	symmetry	$\frac{\sqrt{3}(x-y)(x+y)}{2}$

continued ...

Table 8

No.	multipole	matrix
$\mathbb{Q}_{2,1}^{(1,1;a)}(E_g)$	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	
481	symmetry	$\sqrt{3}yz$
$\mathbb{Q}_{2,0}^{(1,1;a)}(T_g)$	0 $-\frac{\sqrt{105}i}{25}$ 0 0 $\frac{2\sqrt{7}i}{35}$ 0 $\frac{3\sqrt{70}i}{175}$ 0 0 0	
	$\frac{\sqrt{105}i}{25}$ 0 0 0 0 $-\frac{2\sqrt{105}i}{525}$ 0 $\frac{\sqrt{210}i}{105}$ 0 0	
	0 0 0 $\frac{\sqrt{105}i}{25}$ 0 0 $-\frac{\sqrt{210}i}{105}$ 0 $\frac{2\sqrt{105}i}{525}$ 0	
	0 0 $-\frac{\sqrt{105}i}{25}$ 0 0 0 0 $-\frac{3\sqrt{70}i}{175}$ 0 $-\frac{2\sqrt{7}i}{35}$	
	$-\frac{2\sqrt{7}i}{35}$ 0 0 0 0 $\frac{3\sqrt{7}i}{70}$ 0 0 0 0	
	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	
	$-\frac{3\sqrt{70}i}{175}$ 0 $\frac{\sqrt{210}i}{105}$ 0 0 $-\frac{3\sqrt{70}i}{350}$ 0 0 0 0	
	0 $-\frac{\sqrt{210}i}{105}$ 0 $\frac{3\sqrt{70}i}{175}$ 0 0 0 0 $-\frac{3\sqrt{70}i}{350}$ 0	
	0 0 $-\frac{2\sqrt{105}i}{525}$ 0 0 0 0 $\frac{3\sqrt{70}i}{350}$ 0 $-\frac{3\sqrt{7}i}{70}$	
	0 0 0 $\frac{2\sqrt{7}i}{35}$ 0 0 0 0 $\frac{3\sqrt{7}i}{70}$ 0	
482	symmetry	$\sqrt{3}xz$

continued ...

Table 8

No.	multipole	matrix
$\mathbb{Q}_{2,1}^{(1,1;a)}(T_g)$	0	$\frac{\sqrt{105}}{25}$ 0 0 $\frac{2\sqrt{7}}{35}$ 0 $-\frac{3\sqrt{70}}{175}$ 0 0 0
	$\frac{\sqrt{105}}{25}$	0 0 0 0 0 $-\frac{2\sqrt{105}}{525}$ 0 $-\frac{\sqrt{210}}{105}$ 0 0
	0	0 0 0 $-\frac{\sqrt{105}}{25}$ 0 0 $-\frac{\sqrt{210}}{105}$ 0 $-\frac{2\sqrt{105}}{525}$ 0
	0	0 0 $-\frac{\sqrt{105}}{25}$ 0 0 0 0 $-\frac{3\sqrt{70}}{175}$ 0 $\frac{2\sqrt{7}}{35}$
	$\frac{2\sqrt{7}}{35}$	0 0 0 0 0 $-\frac{3\sqrt{7}}{70}$ 0 0 0 0
	0	$-\frac{2\sqrt{105}}{525}$ 0 0 $-\frac{3\sqrt{7}}{70}$ 0 $-\frac{3\sqrt{70}}{350}$ 0 0 0
	$-\frac{3\sqrt{70}}{175}$	0 $-\frac{\sqrt{210}}{105}$ 0 0 0 $-\frac{3\sqrt{70}}{350}$ 0 0 0 0
	0	$-\frac{\sqrt{210}}{105}$ 0 $-\frac{3\sqrt{70}}{175}$ 0 0 0 0 $\frac{3\sqrt{70}}{350}$ 0
	0	0 $-\frac{2\sqrt{105}}{525}$ 0 0 0 0 $\frac{3\sqrt{70}}{350}$ 0 $\frac{3\sqrt{7}}{70}$
	0	0 0 0 $\frac{2\sqrt{7}}{35}$ 0 0 0 0 $\frac{3\sqrt{7}}{70}$ 0
483	symmetry	$\sqrt{3}xy$
$\mathbb{Q}_{2,2}^{(1,1;a)}(T_g)$	0	0 0 $-\frac{\sqrt{105}i}{25}$ 0 0 0 0 $\frac{2\sqrt{70}i}{175}$ 0 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 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 0 $\frac{2\sqrt{70}i}{175}$ 0 0 0
	0	$-\frac{4\sqrt{21}i}{105}$ 0 0 0 0 0 $\frac{3\sqrt{14}i}{140}$ 0 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 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 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 0 $-\frac{9\sqrt{70}i}{700}$ 0 0 0
	0	0 0 $-\frac{4\sqrt{21}i}{105}$ 0 0 0 0 $-\frac{3\sqrt{14}i}{140}$ 0 0
484	symmetry	x

continued ...

Table 8

No.	multipole	matrix
$\mathbb{G}_{1,0}^{(1,0;a)}(T_g)$	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	
485	symmetry	y
$\mathbb{G}_{1,1}^{(1,0;a)}(T_g)$	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	
486	symmetry	z

continued ...

Table 8

No.	multipole	matrix
$\mathbb{G}_{1,2}^{(1,0;a)}(T_g)$	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	
487	symmetry	$\sqrt{15}xyz$
$\mathbb{G}_3^{(1,0;a)}(A_g)$	0 0 0 0 0 0 0 $\frac{\sqrt{2}}{4}$ 0 0	
	0 0 0 0 $\frac{\sqrt{15}}{12}$ 0 0 0 0 $\frac{\sqrt{3}}{12}$ 0	
	0 0 0 0 0 0 $-\frac{\sqrt{3}}{12}$ 0 0 0 $-\frac{\sqrt{15}}{12}$	
	0 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	
488	symmetry	$\frac{x(2x^2-3y^2-3z^2)}{2}$

continued ...

Table 8

No.	multipole	matrix
$\mathbb{G}_{3,0}^{(1,0;a)}(T_g, 1)$	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	
489	symmetry	$-\frac{y(3x^2 - 2y^2 + 3z^2)}{2}$
$\mathbb{G}_{3,1}^{(1,0;a)}(T_g, 1)$	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	
490	symmetry	$-\frac{z(3x^2 + 3y^2 - 2z^2)}{2}$

continued ...

Table 8

No.	multipole	matrix
	$\mathbb{G}_{3,2}^{(1,0;a)}(T_g, 1)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{10} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}i}{10} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}i}{10} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{10} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ -\frac{\sqrt{15}i}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{10}i}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{10}i}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{15}i}{10} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
491	symmetry	$\frac{\sqrt{15}x(y-z)(y+z)}{2}$ $\begin{bmatrix} 0 & 0 & 0 & 0 & \frac{\sqrt{5}i}{16} & 0 & -\frac{3\sqrt{2}i}{16} & 0 & -\frac{3i}{16} & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{7\sqrt{3}i}{48} & 0 & \frac{\sqrt{6}i}{48} & 0 & -\frac{\sqrt{15}i}{16} \\ 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{16} & 0 & -\frac{\sqrt{6}i}{48} & 0 & \frac{7\sqrt{3}i}{48} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{3i}{16} & 0 & \frac{3\sqrt{2}i}{16} & 0 & -\frac{\sqrt{5}i}{16} \\ -\frac{\sqrt{5}i}{16} & 0 & -\frac{\sqrt{15}i}{16} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{7\sqrt{3}i}{48} & 0 & -\frac{3i}{16} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ \frac{3\sqrt{2}i}{16} & 0 & \frac{\sqrt{6}i}{48} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{6}i}{48} & 0 & -\frac{3\sqrt{2}i}{16} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ \frac{3i}{16} & 0 & -\frac{7\sqrt{3}i}{48} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{15}i}{16} & 0 & \frac{\sqrt{5}i}{16} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
492	symmetry	$-\frac{\sqrt{15}y(x-z)(x+z)}{2}$

continued ...

Table 8

No.	multipole	matrix
$\mathbb{G}_{3,1}^{(1,0;a)}(T_g, 2)$	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	
493	symmetry	$\frac{\sqrt{15}z(x-y)(x+y)}{2}$
$\mathbb{G}_{3,2}^{(1,0;a)}(T_g, 2)$	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	
494	symmetry	$-\frac{x^2}{2} - \frac{y^2}{2} + z^2$

continued ...

Table 8

No.	multipole	matrix
	$\mathbb{T}_{2,0}^{(1,0;a)}(E_g)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{42}i}{14} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}i}{14} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}i}{14} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{42}i}{14} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ -\frac{\sqrt{42}i}{14} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{7}i}{14} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{7}i}{14} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{42}i}{14} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
495	symmetry	$\frac{\sqrt{3}(x-y)(x+y)}{2}$
	$\mathbb{T}_{2,1}^{(1,0;a)}(E_g)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}i}{14} & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{210}i}{42} & 0 & 0 & 0 & \frac{\sqrt{42}i}{21} & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{42}i}{21} & 0 & 0 & 0 & \frac{\sqrt{210}i}{42} \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}i}{14} & 0 & 0 \\ 0 & \frac{\sqrt{210}i}{42} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{42}i}{21} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{7}i}{14} & 0 & 0 & 0 & 0 & 0 & 0 \\ -\frac{\sqrt{7}i}{14} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{42}i}{21} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{210}i}{42} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
496	symmetry	$\sqrt{3}yz$

continued ...

Table 8

No.	multipole	matrix
$\mathbb{T}_{2,0}^{(1,0;a)}(T_g)$	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	
497	symmetry	$\sqrt{3}xz$
$\mathbb{T}_{2,1}^{(1,0;a)}(T_g)$	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	
498	symmetry	$\sqrt{3}xy$

continued ...

Table 8

No.	multipole	matrix
		$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}}{14} & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{210}}{42} & 0 & 0 & 0 & \frac{\sqrt{42}}{21} & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{42}}{21} & 0 & 0 & 0 & \frac{\sqrt{210}}{42} \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}}{14} & 0 & 0 & 0 \\ 0 & \frac{\sqrt{210}}{42} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{42}}{21} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{7}}{14} & 0 & 0 & 0 & 0 & 0 & 0 \\ \frac{\sqrt{7}}{14} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{42}}{21} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{210}}{42} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
499	$\mathbb{T}_{2,2}^{(1,0;a)}(T_g)$	$\frac{\sqrt{21}(x^4 - 3x^2y^2 - 3x^2z^2 + y^4 - 3y^2z^2 + z^4)}{6}$
		$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{12} & 0 & 0 & 0 & -\frac{\sqrt{15}i}{12} \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2}i}{4} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}i}{4} & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{12} & 0 & 0 & 0 & \frac{\sqrt{3}i}{12} & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{15}i}{12} & 0 & 0 & 0 & 0 & 0 & 0 \\ \frac{\sqrt{3}i}{12} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{2}i}{4} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{2}i}{4} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{3}i}{12} & 0 & 0 & 0 & 0 & 0 & 0 \\ \frac{\sqrt{15}i}{12} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
500	$\mathbb{T}_4^{(1,0;a)}(A_g)$	$-\frac{\sqrt{15}(x^4 - 12x^2y^2 + 6x^2z^2 + y^4 + 6y^2z^2 - 2z^4)}{12}$

continued ...

Table 8

No.	multipole	matrix
$\mathbb{T}_{4,0}^{(1,0;a)}(E_g)$	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 0 $\frac{\sqrt{70}i}{28}$ 0 0 0
	0	0 0 0 0 0 0 0 $-\frac{\sqrt{70}i}{28}$ 0 0
	0	0 0 0 0 $-\frac{\sqrt{21}i}{12}$ 0 0 0 $\frac{\sqrt{105}i}{84}$ 0
	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
	0	$-\frac{\sqrt{70}i}{28}$ 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 $-\frac{\sqrt{105}i}{84}$ 0 0 0 0 0 0
	$-\frac{\sqrt{21}i}{12}$	0 0 0 0 0 0 0 0 0 0
501	symmetry	$\frac{\sqrt{5}(x-y)(x+y)(x^2+y^2-6z^2)}{4}$
$\mathbb{T}_{4,1}^{(1,0;a)}(E_g)$	0	0 0 0 0 0 0 0 $\frac{\sqrt{70}i}{28}$ 0 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 0 $\frac{\sqrt{105}i}{28}$ 0 0 0 $\frac{\sqrt{21}i}{28}$
	0	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	0 $-\frac{\sqrt{105}i}{28}$ 0 0 0 0 0 0 0 0
	0	0 0 0 $\frac{\sqrt{70}i}{28}$ 0 0 0 0 0 0
	$-\frac{\sqrt{70}i}{28}$	0 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	0 0 $-\frac{\sqrt{21}i}{28}$ 0 0 0 0 0 0 0
502	symmetry	$\frac{\sqrt{35}yz(y-z)(y+z)}{2}$

continued ...

Table 8

No.	multipole	matrix
	$\mathbb{T}_{4,0}^{(1,0;a)}(T_g, 1)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & \frac{1}{16} & 0 & \frac{\sqrt{10}}{16} & 0 & \frac{\sqrt{5}}{16} & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{16} & 0 & -\frac{\sqrt{30}}{16} & 0 & -\frac{\sqrt{3}}{16} \\ 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{16} & 0 & \frac{\sqrt{30}}{16} & 0 & \frac{\sqrt{15}}{16} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}}{16} & 0 & -\frac{\sqrt{10}}{16} & 0 & -\frac{1}{16} \\ \frac{1}{16} & 0 & \frac{\sqrt{3}}{16} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{15}}{16} & 0 & -\frac{\sqrt{5}}{16} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ \frac{\sqrt{10}}{16} & 0 & \frac{\sqrt{30}}{16} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{30}}{16} & 0 & -\frac{\sqrt{10}}{16} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ \frac{\sqrt{5}}{16} & 0 & \frac{\sqrt{15}}{16} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{3}}{16} & 0 & -\frac{1}{16} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
503	symmetry	$-\frac{\sqrt{35}xz(x-z)(x+z)}{2}$
	$\mathbb{T}_{4,1}^{(1,0;a)}(T_g, 1)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & \frac{i}{16} & 0 & -\frac{\sqrt{10}i}{16} & 0 & \frac{\sqrt{5}i}{16} & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{16} & 0 & \frac{\sqrt{30}i}{16} & 0 & -\frac{\sqrt{3}i}{16} \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{16} & 0 & \frac{\sqrt{30}i}{16} & 0 & -\frac{\sqrt{15}i}{16} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{5}i}{16} & 0 & -\frac{\sqrt{10}i}{16} & 0 & \frac{i}{16} \\ -\frac{i}{16} & 0 & \frac{\sqrt{3}i}{16} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{15}i}{16} & 0 & -\frac{\sqrt{5}i}{16} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ \frac{\sqrt{10}i}{16} & 0 & -\frac{\sqrt{30}i}{16} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{30}i}{16} & 0 & \frac{\sqrt{10}i}{16} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ -\frac{\sqrt{5}i}{16} & 0 & \frac{\sqrt{15}i}{16} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{3}i}{16} & 0 & -\frac{i}{16} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
504	symmetry	$\frac{\sqrt{35}xy(x-y)(x+y)}{2}$

continued ...

Table 8

No.	multipole	matrix
	$\mathbb{T}_{4,2}^{(1,0;a)}(T_g, 1)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{1}{2} \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{1}{2} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{1}{2} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ -\frac{1}{2} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
505	symmetry	$\frac{\sqrt{5}yz(6x^2-y^2-z^2)}{2}$ $\begin{bmatrix} 0 & 0 & 0 & 0 & \frac{\sqrt{7}}{112} & 0 & \frac{\sqrt{70}}{112} & 0 & -\frac{\sqrt{35}}{16} & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{105}}{112} & 0 & -\frac{\sqrt{210}}{112} & 0 & \frac{\sqrt{21}}{16} \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{21}}{16} & 0 & \frac{\sqrt{210}}{112} & 0 & \frac{\sqrt{105}}{112} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{35}}{16} & 0 & -\frac{\sqrt{70}}{112} & 0 & -\frac{\sqrt{7}}{112} \\ \frac{\sqrt{7}}{112} & 0 & -\frac{\sqrt{21}}{16} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{105}}{112} & 0 & \frac{\sqrt{35}}{16} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ \frac{\sqrt{70}}{112} & 0 & \frac{\sqrt{210}}{112} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{210}}{112} & 0 & -\frac{\sqrt{70}}{112} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ -\frac{\sqrt{35}}{16} & 0 & \frac{\sqrt{105}}{112} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{21}}{16} & 0 & -\frac{\sqrt{7}}{112} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
506	symmetry	$-\frac{\sqrt{5}xz(x^2-6y^2+z^2)}{2}$

continued ...

Table 8

No.	multipole	matrix
$\mathbb{T}_{4,1}^{(1,0;a)}(T_g, 2)$	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 0 $\frac{\sqrt{105}i}{112}$ 0 $-\frac{\sqrt{210}i}{112}$ 0 $-\frac{\sqrt{21}i}{16}$
	0	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 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
	0	$-\frac{\sqrt{105}i}{112}$ 0 $-\frac{\sqrt{35}i}{16}$ 0 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
	0	$\frac{\sqrt{210}i}{112}$ 0 $-\frac{\sqrt{70}i}{112}$ 0 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
	0	$\frac{\sqrt{21}i}{16}$ 0 $\frac{\sqrt{7}i}{112}$ 0 0 0 0 0 0 0
507	symmetry	$-\frac{\sqrt{5}xy(x^2+y^2-6z^2)}{2}$
$\mathbb{T}_{4,2}^{(1,0;a)}(T_g, 2)$	0	0 0 0 0 0 0 0 $-\frac{\sqrt{70}}{28}$ 0 0
	0	0 0 0 0 $-\frac{\sqrt{21}}{28}$ 0 0 0 $\frac{\sqrt{105}}{28}$ 0
	0	0 0 0 0 0 $\frac{\sqrt{105}}{28}$ 0 0 0 $-\frac{\sqrt{21}}{28}$
	0	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	0 $\frac{\sqrt{105}}{28}$ 0 0 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
	0	$\frac{\sqrt{105}}{28}$ 0 0 0 0 0 0 0 0 0
	0	0 0 $-\frac{\sqrt{21}}{28}$ 0 0 0 0 0 0 0
508	symmetry	x

continued ...

Table 8

No.	multipole	matrix
$\mathbb{M}_{1,0}^{(a)}(T_g)$	0	$\frac{3\sqrt{15}}{50}$ 0 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 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 0 $-\frac{\sqrt{30}}{100}$ 0 $\frac{\sqrt{15}}{50}$ 0
	0	0 $\frac{3\sqrt{15}}{50}$ 0 0 0 0 0 $-\frac{\sqrt{10}}{100}$ 0 $\frac{1}{10}$
	$-\frac{1}{10}$	0 0 0 0 0 0 $\frac{1}{5}$ 0 0 0
	0	$-\frac{\sqrt{15}}{50}$ 0 0 $\frac{1}{5}$ 0 $\frac{2\sqrt{10}}{25}$ 0 0 0 0
	$\frac{\sqrt{10}}{100}$	0 $-\frac{\sqrt{30}}{100}$ 0 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 0 $\frac{3\sqrt{5}}{25}$ 0 $\frac{2\sqrt{10}}{25}$ 0
	0	0 $\frac{\sqrt{15}}{50}$ 0 0 0 0 0 $\frac{2\sqrt{10}}{25}$ 0 $\frac{1}{5}$
	0	0 0 0 $\frac{1}{10}$ 0 0 0 0 0 $\frac{1}{5}$ 0
509	symmetry	y
$\mathbb{M}_{1,1}^{(a)}(T_g)$	0	$-\frac{3\sqrt{15}i}{50}$ 0 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 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 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 0 $-\frac{\sqrt{10}i}{100}$ 0 $-\frac{i}{10}$
	$\frac{i}{10}$	0 0 0 0 0 0 $-\frac{i}{5}$ 0 0 0
	0	$\frac{\sqrt{15}i}{50}$ 0 0 $\frac{i}{5}$ 0 $-\frac{2\sqrt{10}i}{25}$ 0 0 0 0
	$\frac{\sqrt{10}i}{100}$	0 $\frac{\sqrt{30}i}{100}$ 0 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 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 0 $\frac{2\sqrt{10}i}{25}$ 0 $-\frac{i}{5}$
	0	0 0 0 $\frac{i}{10}$ 0 0 0 0 0 $\frac{i}{5}$ 0
510	symmetry	z

continued ...

Table 8

No.	multipole	matrix
$\mathbb{M}_{1,2}^{(a)}(T_g)$	$\frac{9\sqrt{5}}{50}$	0 0 0 0 0 $\frac{\sqrt{5}}{25}$ 0 0 0 0
	0	$\frac{3\sqrt{5}}{50}$ 0 0 0 0 0 $\frac{\sqrt{30}}{50}$ 0 0 0
	0	0 0 $-\frac{3\sqrt{5}}{50}$ 0 0 0 0 $\frac{\sqrt{30}}{50}$ 0 0
	0	0 0 0 $-\frac{9\sqrt{5}}{50}$ 0 0 0 0 $\frac{\sqrt{5}}{25}$ 0
	0	0 0 0 0 $\frac{\sqrt{5}}{5}$ 0 0 0 0 0
	$\frac{\sqrt{5}}{25}$	0 0 0 0 0 $\frac{3\sqrt{5}}{25}$ 0 0 0 0
	0	$\frac{\sqrt{30}}{50}$ 0 0 0 0 0 $\frac{\sqrt{5}}{25}$ 0 0 0
	0	0 0 $\frac{\sqrt{30}}{50}$ 0 0 0 0 $-\frac{\sqrt{5}}{25}$ 0 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 0 $-\frac{\sqrt{5}}{5}$
511	symmetry	$\sqrt{15}xyz$
$\mathbb{M}_3^{(a)}(A_g)$	0	0 0 $\frac{i}{5}$ 0 0 0 0 $\frac{\sqrt{6}i}{10}$ 0 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 0 $-\frac{i}{10}$ 0 0 0 $-\frac{\sqrt{5}i}{10}$
	0	$\frac{i}{5}$ 0 0 0 0 0 $-\frac{\sqrt{6}i}{10}$ 0 0 0
	0	$-\frac{\sqrt{5}i}{10}$ 0 0 0 0 0 $\frac{\sqrt{30}i}{20}$ 0 0 0
	0	0 0 $\frac{i}{10}$ 0 0 0 0 $\frac{\sqrt{6}i}{20}$ 0 0
	0	0 0 0 $\frac{\sqrt{6}i}{10}$ $-\frac{\sqrt{30}i}{20}$ 0 0 0 $-\frac{\sqrt{6}i}{20}$
	$-\frac{\sqrt{6}i}{10}$	0 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 0 $\frac{\sqrt{6}i}{20}$ 0 0 0
	0	0 0 $\frac{\sqrt{5}i}{10}$ 0 0 0 0 $\frac{\sqrt{30}i}{20}$ 0 0
512	symmetry	$\frac{x(2x^2-3y^2-3z^2)}{2}$

continued ...

Table 8

No.	multipole	matrix
$\mathbb{M}_{3,0}^{(a)}(T_g, 1)$	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 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 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 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 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 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
513 symmetry	$-\frac{y(3x^2 - 2y^2 + 3z^2)}{2}$	
	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 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 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 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 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 0 $\frac{\sqrt{5}i}{10}$ 0 $-\frac{3\sqrt{10}i}{200}$ 0 $-\frac{3i}{20}$
514 symmetry	$-\frac{z(3x^2 + 3y^2 - 2z^2)}{2}$	
	<i>continued ...</i>	

Table 8

No.	multipole	matrix
	$\mathbb{M}_{3,2}^{(a)}(T_g, 1)$	$\begin{bmatrix} -\frac{\sqrt{5}}{25} & 0 & 0 & 0 & 0 & -\frac{3\sqrt{5}}{25} & 0 & 0 & 0 & 0 \\ 0 & \frac{3\sqrt{5}}{25} & 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{25} & 0 & 0 & 0 \\ 0 & 0 & -\frac{3\sqrt{5}}{25} & 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{25} & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{5}}{25} & 0 & 0 & 0 & 0 & -\frac{3\sqrt{5}}{25} & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{5}}{10} & 0 & 0 & 0 & 0 & 0 \\ -\frac{3\sqrt{5}}{25} & 0 & 0 & 0 & 0 & \frac{7\sqrt{5}}{50} & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{30}}{25} & 0 & 0 & 0 & 0 & \frac{2\sqrt{5}}{25} & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{30}}{25} & 0 & 0 & 0 & 0 & -\frac{2\sqrt{5}}{25} & 0 & 0 \\ 0 & 0 & 0 & -\frac{3\sqrt{5}}{25} & 0 & 0 & 0 & 0 & -\frac{7\sqrt{5}}{50} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{5}}{10} \end{bmatrix}$
515	symmetry	$\frac{\sqrt{15}x(y-z)(y+z)}{2}$ $\begin{bmatrix} 0 & \frac{1}{10} & 0 & \frac{\sqrt{3}}{10} & -\frac{\sqrt{15}}{40} & 0 & \frac{3\sqrt{6}}{40} & 0 & \frac{3\sqrt{3}}{40} & 0 \\ \frac{1}{10} & 0 & -\frac{\sqrt{3}}{10} & 0 & 0 & \frac{7}{40} & 0 & -\frac{\sqrt{2}}{40} & 0 & \frac{3\sqrt{5}}{40} \\ 0 & -\frac{\sqrt{3}}{10} & 0 & \frac{1}{10} & -\frac{3\sqrt{5}}{40} & 0 & \frac{\sqrt{2}}{40} & 0 & -\frac{7}{40} & 0 \\ \frac{\sqrt{3}}{10} & 0 & \frac{1}{10} & 0 & 0 & -\frac{3\sqrt{3}}{40} & 0 & -\frac{3\sqrt{6}}{40} & 0 & \frac{\sqrt{15}}{40} \\ -\frac{\sqrt{15}}{40} & 0 & -\frac{3\sqrt{5}}{40} & 0 & 0 & \frac{\sqrt{15}}{20} & 0 & \frac{\sqrt{30}}{40} & 0 & 0 \\ 0 & \frac{7}{40} & 0 & -\frac{3\sqrt{3}}{40} & \frac{\sqrt{15}}{20} & 0 & -\frac{\sqrt{6}}{40} & 0 & \frac{\sqrt{3}}{10} & 0 \\ \frac{3\sqrt{6}}{40} & 0 & \frac{\sqrt{2}}{40} & 0 & 0 & -\frac{\sqrt{6}}{40} & 0 & -\frac{\sqrt{3}}{10} & 0 & \frac{\sqrt{30}}{40} \\ 0 & -\frac{\sqrt{2}}{40} & 0 & -\frac{3\sqrt{6}}{40} & \frac{\sqrt{30}}{40} & 0 & -\frac{\sqrt{3}}{10} & 0 & -\frac{\sqrt{6}}{40} & 0 \\ \frac{3\sqrt{3}}{40} & 0 & -\frac{7}{40} & 0 & 0 & \frac{\sqrt{3}}{10} & 0 & -\frac{\sqrt{6}}{40} & 0 & \frac{\sqrt{15}}{20} \\ 0 & \frac{3\sqrt{5}}{40} & 0 & \frac{\sqrt{15}}{40} & 0 & 0 & \frac{\sqrt{30}}{40} & 0 & \frac{\sqrt{15}}{20} & 0 \end{bmatrix}$
516	symmetry	$-\frac{\sqrt{15}y(x-z)(x+z)}{2}$

continued ...

Table 8

No.	multipole	matrix
$\mathbb{M}_{3,1}^{(a)}(T_g, 2)$	0	$\frac{i}{10} \quad 0 \quad -\frac{\sqrt{3}i}{10} \quad \frac{\sqrt{15}i}{40} \quad 0 \quad \frac{3\sqrt{6}i}{40} \quad 0 \quad -\frac{3\sqrt{3}i}{40} \quad 0$
	$-\frac{i}{10}$	$0 \quad -\frac{\sqrt{3}i}{10} \quad 0 \quad 0 \quad -\frac{7i}{40} \quad 0 \quad -\frac{\sqrt{2}i}{40} \quad 0 \quad -\frac{3\sqrt{5}i}{40}$
	0	$\frac{\sqrt{3}i}{10} \quad 0 \quad \frac{i}{10} \quad -\frac{3\sqrt{5}i}{40} \quad 0 \quad -\frac{\sqrt{2}i}{40} \quad 0 \quad -\frac{7i}{40} \quad 0$
	$\frac{\sqrt{3}i}{10}$	$0 \quad -\frac{i}{10} \quad 0 \quad 0 \quad -\frac{3\sqrt{3}i}{40} \quad 0 \quad \frac{3\sqrt{6}i}{40} \quad 0 \quad \frac{\sqrt{15}i}{40}$
	$-\frac{\sqrt{15}i}{40}$	$0 \quad \frac{3\sqrt{5}i}{40} \quad 0 \quad 0 \quad \frac{\sqrt{15}i}{20} \quad 0 \quad -\frac{\sqrt{30}i}{40} \quad 0 \quad 0$
	0	$\frac{7i}{40} \quad 0 \quad \frac{3\sqrt{3}i}{40} \quad -\frac{\sqrt{15}i}{20} \quad 0 \quad -\frac{\sqrt{6}i}{40} \quad 0 \quad -\frac{\sqrt{3}i}{10} \quad 0$
	$-\frac{3\sqrt{6}i}{40}$	$0 \quad \frac{\sqrt{2}i}{40} \quad 0 \quad 0 \quad \frac{\sqrt{6}i}{40} \quad 0 \quad -\frac{\sqrt{3}i}{10} \quad 0 \quad -\frac{\sqrt{30}i}{40}$
	0	$\frac{\sqrt{2}i}{40} \quad 0 \quad -\frac{3\sqrt{6}i}{40} \quad \frac{\sqrt{30}i}{40} \quad 0 \quad \frac{\sqrt{3}i}{10} \quad 0 \quad -\frac{\sqrt{6}i}{40} \quad 0$
	$\frac{3\sqrt{3}i}{40}$	$0 \quad \frac{7i}{40} \quad 0 \quad 0 \quad \frac{\sqrt{3}i}{10} \quad 0 \quad \frac{\sqrt{6}i}{40} \quad 0 \quad \frac{\sqrt{15}i}{20}$
	0	$\frac{3\sqrt{5}i}{40} \quad 0 \quad -\frac{\sqrt{15}i}{40} \quad 0 \quad 0 \quad \frac{\sqrt{30}i}{40} \quad 0 \quad -\frac{\sqrt{15}i}{20} \quad 0$
517	symmetry	$\frac{\sqrt{15}z(x-y)(x+y)}{2}$
$\mathbb{M}_{3,2}^{(a)}(T_g, 2)$	0	$0 \quad 0 \quad -\frac{1}{5} \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{6}}{10} \quad 0 \quad 0$
	0	$0 \quad 0 \quad 0 \quad \frac{1}{5} \quad \frac{\sqrt{5}}{10} \quad 0 \quad 0 \quad 0 \quad -\frac{1}{10} \quad 0$
	$-\frac{1}{5}$	$0 \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{1}{10} \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{5}}{10}$
	0	$\frac{1}{5} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{6}}{10} \quad 0 \quad 0 \quad 0$
	0	$\frac{\sqrt{5}}{10} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{30}}{20} \quad 0 \quad 0 \quad 0$
	0	$0 \quad 0 \quad -\frac{1}{10} \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{6}}{20} \quad 0 \quad 0$
	0	$0 \quad 0 \quad 0 \quad -\frac{\sqrt{6}}{10} \quad -\frac{\sqrt{30}}{20} \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{6}}{20} \quad 0$
	$-\frac{\sqrt{6}}{10}$	$0 \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{6}}{20} \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{30}}{20}$
	0	$-\frac{1}{10} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{6}}{20} \quad 0 \quad 0 \quad 0$
	0	$0 \quad 0 \quad \frac{\sqrt{5}}{10} \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{30}}{20} \quad 0 \quad 0$
518	symmetry	x

continued ...

Table 8

No.	multipole	matrix
$\mathbb{M}_{1,0}^{(1,-1;a)}(T_g)$	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 0 $\frac{\sqrt{30}}{25}$ 0 $-\frac{\sqrt{15}}{25}$ 0 0
	0	$-\frac{\sqrt{10}}{25}$ 0 $-\frac{\sqrt{30}}{50}$ 0 0 0 $\frac{\sqrt{15}}{25}$ 0 $-\frac{\sqrt{30}}{25}$ 0
	0	0 $-\frac{\sqrt{30}}{50}$ 0 0 0 0 0 $\frac{\sqrt{5}}{25}$ 0 $-\frac{\sqrt{2}}{5}$
	$\frac{\sqrt{2}}{5}$	0 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 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 0 $-\frac{\sqrt{2}}{5}$ 0 0 0 0 $\frac{\sqrt{2}}{10}$ 0
$\mathbb{M}_{1,1}^{(1,-1;a)}(T_g)$	519	symmetry
520	symmetry	

continued ...

Table 8

No.	multipole	matrix
$\mathbb{M}_{1,2}^{(1,-1;a)}(T_g)$	$\sqrt{15}xyz$	$\begin{bmatrix} -\frac{3\sqrt{10}}{50} & 0 & 0 & 0 & 0 & -\frac{2\sqrt{10}}{25} & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{10}}{50} & 0 & 0 & 0 & 0 & -\frac{2\sqrt{15}}{25} & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{10}}{50} & 0 & 0 & 0 & 0 & -\frac{2\sqrt{15}}{25} & 0 & 0 \\ 0 & 0 & 0 & \frac{3\sqrt{10}}{50} & 0 & 0 & 0 & 0 & -\frac{2\sqrt{10}}{25} & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{10}}{10} & 0 & 0 & 0 & 0 & 0 \\ -\frac{2\sqrt{10}}{25} & 0 & 0 & 0 & 0 & \frac{3\sqrt{10}}{50} & 0 & 0 & 0 & 0 \\ 0 & -\frac{2\sqrt{15}}{25} & 0 & 0 & 0 & 0 & \frac{\sqrt{10}}{50} & 0 & 0 & 0 \\ 0 & 0 & -\frac{2\sqrt{15}}{25} & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}}{50} & 0 & 0 \\ 0 & 0 & 0 & -\frac{2\sqrt{10}}{25} & 0 & 0 & 0 & 0 & -\frac{3\sqrt{10}}{50} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}}{10} \end{bmatrix}$
	521 symmetry	$\sqrt{15}xyz$
	$\mathbb{M}_3^{(1,-1;a)}(A_g)$	$\begin{bmatrix} 0 & 0 & -\frac{\sqrt{21}i}{70} & 0 & 0 & 0 & 0 & -\frac{2\sqrt{14}i}{35} & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{21}i}{70} & -\frac{2\sqrt{105}i}{105} & 0 & 0 & 0 & -\frac{2\sqrt{21}i}{105} & 0 \\ \frac{\sqrt{21}i}{70} & 0 & 0 & 0 & 0 & \frac{2\sqrt{21}i}{105} & 0 & 0 & 0 & \frac{2\sqrt{105}i}{105} \\ 0 & -\frac{\sqrt{21}i}{70} & 0 & 0 & 0 & 0 & \frac{2\sqrt{14}i}{35} & 0 & 0 & 0 \\ 0 & \frac{2\sqrt{105}i}{105} & 0 & 0 & 0 & 0 & \frac{3\sqrt{70}i}{70} & 0 & 0 & 0 \\ 0 & 0 & -\frac{2\sqrt{21}i}{105} & 0 & 0 & 0 & 0 & \frac{3\sqrt{14}i}{70} & 0 & 0 \\ 0 & 0 & 0 & -\frac{2\sqrt{14}i}{35} & -\frac{3\sqrt{70}i}{70} & 0 & 0 & 0 & -\frac{3\sqrt{14}i}{70} & 0 \\ \frac{2\sqrt{14}i}{35} & 0 & 0 & 0 & 0 & -\frac{3\sqrt{14}i}{70} & 0 & 0 & 0 & -\frac{3\sqrt{70}i}{70} \\ 0 & \frac{2\sqrt{21}i}{105} & 0 & 0 & 0 & 0 & \frac{3\sqrt{14}i}{70} & 0 & 0 & 0 \\ 0 & 0 & -\frac{2\sqrt{105}i}{105} & 0 & 0 & 0 & 0 & \frac{3\sqrt{70}i}{70} & 0 & 0 \end{bmatrix}$
		$\frac{x(2x^2-3y^2-3z^2)}{2}$

continued ...

Table 8

No.	multipole	matrix
$\mathbb{M}_{3,0}^{(1,-1;a)}(T_g, 1)$	0	$-\frac{3\sqrt{35}}{700}, \frac{\sqrt{105}}{140}, \frac{\sqrt{21}}{70}, 0, -\frac{3\sqrt{210}}{350}, 0, \frac{\sqrt{105}}{70}, 0$
	$-\frac{3\sqrt{35}}{700}$	$0, \frac{3\sqrt{105}}{700}, 0, 0, -\frac{\sqrt{35}}{50}, 0, \frac{\sqrt{70}}{350}, 0, \frac{\sqrt{7}}{14}$
	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	$\frac{\sqrt{7}}{14}, 0, -\frac{\sqrt{21}}{70}, 0, 0, -\frac{\sqrt{42}}{28}, 0, \frac{3\sqrt{21}}{70}, 0$
523	symmetry	$-\frac{y(3x^2 - 2y^2 + 3z^2)}{2}$
$\mathbb{M}_{3,1}^{(1,-1;a)}(T_g, 1)$	0	$-\frac{3\sqrt{35}i}{700}, \frac{\sqrt{105}i}{140}, \frac{\sqrt{21}i}{70}, 0, \frac{3\sqrt{210}i}{350}, 0, \frac{\sqrt{105}i}{70}, 0$
	$-\frac{3\sqrt{35}i}{700}$	$0, -\frac{3\sqrt{105}i}{700}, 0, 0, -\frac{\sqrt{35}i}{50}, 0, -\frac{\sqrt{70}i}{350}, 0, \frac{\sqrt{7}i}{14}$
	0	$\frac{3\sqrt{105}i}{700}, 0, \frac{3\sqrt{35}i}{700}, \frac{\sqrt{7}i}{14}, 0, -\frac{\sqrt{70}i}{350}, 0, -\frac{\sqrt{35}i}{50}, 0$
	$-\frac{\sqrt{105}i}{140}$	$0, -\frac{3\sqrt{35}i}{700}, 0, 0, \frac{\sqrt{105}i}{70}, 0, \frac{3\sqrt{210}i}{350}, 0, \frac{\sqrt{21}i}{70}$
	$-\frac{\sqrt{21}i}{70}$	$0, -\frac{\sqrt{7}i}{14}, 0, 0, -\frac{\sqrt{21}i}{70}, 0, -\frac{\sqrt{42}i}{28}, 0, 0$
	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	$-\frac{\sqrt{7}i}{14}, 0, -\frac{\sqrt{21}i}{70}, 0, 0, \frac{\sqrt{42}i}{28}, 0, \frac{3\sqrt{21}i}{70}, 0$
524	symmetry	$-\frac{z(3x^2 + 3y^2 - 2z^2)}{2}$

continued ...

Table 8

No.	multipole	matrix
$\mathbb{M}_{3,2}^{(1,-1;a)}(T_g, 1)$	$\frac{\sqrt{105}}{350}$	$0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{4\sqrt{105}}{175} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0$
	0	$- \frac{3\sqrt{105}}{350} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad - \frac{4\sqrt{70}}{175} \quad 0 \quad 0 \quad 0 \quad 0$
	0	$0 \quad 0 \quad \frac{3\sqrt{105}}{350} \quad 0 \quad 0 \quad 0 \quad 0 \quad - \frac{4\sqrt{70}}{175} \quad 0 \quad 0 \quad 0$
	0	$0 \quad 0 \quad 0 \quad - \frac{\sqrt{105}}{350} \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{4\sqrt{105}}{175} \quad 0 \quad 0$
	0	$0 \quad 0 \quad 0 \quad 0 \quad - \frac{\sqrt{105}}{35} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0$
	$\frac{4\sqrt{105}}{175}$	$0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{105}}{25} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0$
	0	$- \frac{4\sqrt{70}}{175} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{4\sqrt{105}}{175} \quad 0 \quad 0 \quad 0 \quad 0$
	0	$0 \quad 0 \quad - \frac{4\sqrt{70}}{175} \quad 0 \quad 0 \quad 0 \quad 0 \quad - \frac{4\sqrt{105}}{175} \quad 0 \quad 0 \quad 0$
	0	$0 \quad 0 \quad 0 \quad \frac{4\sqrt{105}}{175} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad - \frac{\sqrt{105}}{25} \quad 0$
	0	$0 \quad 0 \quad \frac{\sqrt{105}}{35}$
525	symmetry	$\frac{\sqrt{15}x(y-z)(y+z)}{2}$
$\mathbb{M}_{3,0}^{(1,-1;a)}(T_g, 2)$	$0 \quad - \frac{\sqrt{21}}{140} \quad 0 \quad - \frac{3\sqrt{7}}{140} \quad \frac{\sqrt{35}}{70} \quad 0 \quad - \frac{3\sqrt{14}}{70} \quad 0 \quad - \frac{3\sqrt{7}}{70} \quad 0$	
	$- \frac{\sqrt{21}}{140} \quad 0 \quad \frac{3\sqrt{7}}{140} \quad 0 \quad 0 \quad - \frac{\sqrt{21}}{30} \quad 0 \quad \frac{\sqrt{42}}{210} \quad 0 \quad - \frac{\sqrt{105}}{70}$	
	$0 \quad \frac{3\sqrt{7}}{140} \quad 0 \quad - \frac{\sqrt{21}}{140} \quad \frac{\sqrt{105}}{70} \quad 0 \quad - \frac{\sqrt{42}}{210} \quad 0 \quad \frac{\sqrt{21}}{30} \quad 0$	
	$- \frac{3\sqrt{7}}{140} \quad 0 \quad - \frac{\sqrt{21}}{140} \quad 0 \quad 0 \quad \frac{3\sqrt{7}}{70} \quad 0 \quad \frac{3\sqrt{14}}{70} \quad 0 \quad - \frac{\sqrt{35}}{70}$	
	$\frac{\sqrt{35}}{70} \quad 0 \quad \frac{\sqrt{105}}{70} \quad 0 \quad 0 \quad \frac{3\sqrt{35}}{70} \quad 0 \quad \frac{3\sqrt{70}}{140} \quad 0 \quad 0$	
	$0 \quad - \frac{\sqrt{21}}{30} \quad 0 \quad \frac{3\sqrt{7}}{70} \quad \frac{3\sqrt{35}}{70} \quad 0 \quad - \frac{3\sqrt{14}}{140} \quad 0 \quad \frac{3\sqrt{7}}{35} \quad 0$	
	$- \frac{3\sqrt{14}}{70} \quad 0 \quad - \frac{\sqrt{42}}{210} \quad 0 \quad 0 \quad - \frac{3\sqrt{14}}{140} \quad 0 \quad - \frac{3\sqrt{7}}{35} \quad 0 \quad \frac{3\sqrt{70}}{140}$	
	$0 \quad \frac{\sqrt{42}}{210} \quad 0 \quad \frac{3\sqrt{14}}{70} \quad \frac{3\sqrt{70}}{140} \quad 0 \quad - \frac{3\sqrt{7}}{35} \quad 0 \quad - \frac{3\sqrt{14}}{140} \quad 0$	
	$- \frac{3\sqrt{7}}{70} \quad 0 \quad \frac{\sqrt{21}}{30} \quad 0 \quad 0 \quad \frac{3\sqrt{7}}{35} \quad 0 \quad - \frac{3\sqrt{14}}{140} \quad 0 \quad \frac{3\sqrt{35}}{70}$	
	$0 \quad - \frac{\sqrt{105}}{70} \quad 0 \quad - \frac{\sqrt{35}}{70} \quad 0 \quad 0 \quad \frac{3\sqrt{70}}{140} \quad 0 \quad \frac{3\sqrt{35}}{70} \quad 0$	
526	symmetry	$-\frac{\sqrt{15}y(x-z)(x+z)}{2}$

continued ...

Table 8

No.	multipole	matrix
$\mathbb{M}_{3,1}^{(1,-1;a)}(T_g, 2)$	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
	$\frac{\sqrt{21}i}{140}$	0 $\frac{3\sqrt{7}i}{140}$ 0 0 $\frac{\sqrt{21}i}{30}$ 0 $\frac{\sqrt{42}i}{210}$ 0 $\frac{\sqrt{105}i}{70}$
	0	$-\frac{3\sqrt{7}i}{140}$ 0 $-\frac{\sqrt{21}i}{140}$ $\frac{\sqrt{105}i}{70}$ 0 0 $\frac{\sqrt{42}i}{210}$ 0 $\frac{\sqrt{21}i}{30}$ 0
	$-\frac{3\sqrt{7}i}{140}$	0 $\frac{\sqrt{21}i}{140}$ 0 0 0 $\frac{3\sqrt{7}i}{70}$ 0 $-\frac{3\sqrt{14}i}{70}$ 0 $-\frac{\sqrt{35}i}{70}$
	$\frac{\sqrt{35}i}{70}$	0 0 $-\frac{\sqrt{105}i}{70}$ 0 0 0 $-\frac{3\sqrt{70}i}{140}$ 0 0 0
	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
	$\frac{3\sqrt{14}i}{70}$	0 0 $-\frac{\sqrt{42}i}{210}$ 0 0 $\frac{3\sqrt{14}i}{140}$ 0 $-\frac{3\sqrt{7}i}{35}$ 0 $-\frac{3\sqrt{70}i}{140}$
	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
	$-\frac{3\sqrt{7}i}{70}$	0 $-\frac{\sqrt{21}i}{30}$ 0 0 0 $\frac{3\sqrt{7}i}{35}$ 0 $\frac{3\sqrt{14}i}{140}$ 0 $\frac{3\sqrt{35}i}{70}$
	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
527	symmetry	$\frac{\sqrt{15}z(x-y)(x+y)}{2}$
$\mathbb{M}_{3,2}^{(1,-1;a)}(T_g, 2)$	0	0 0 $\frac{\sqrt{21}}{70}$ 0 0 0 0 $\frac{2\sqrt{14}}{35}$ 0 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 0 $\frac{2\sqrt{21}}{105}$ 0 0 0 $-\frac{2\sqrt{105}}{105}$
	0	$-\frac{\sqrt{21}}{70}$ 0 0 0 0 0 $\frac{2\sqrt{14}}{35}$ 0 0 0
	0	$-\frac{2\sqrt{105}}{105}$ 0 0 0 0 0 $-\frac{3\sqrt{70}}{70}$ 0 0 0
	0	0 0 $\frac{2\sqrt{21}}{105}$ 0 0 0 0 $-\frac{3\sqrt{14}}{70}$ 0 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 0 $-\frac{3\sqrt{14}}{70}$ 0 0 0 $\frac{3\sqrt{70}}{70}$
	0	$\frac{2\sqrt{21}}{105}$ 0 0 0 0 0 $\frac{3\sqrt{14}}{70}$ 0 0 0
	0	0 0 $-\frac{2\sqrt{105}}{105}$ 0 0 0 0 $\frac{3\sqrt{70}}{70}$ 0 0
528	symmetry	$\frac{3\sqrt{35}xyz(x-y)(x+y)}{2}$

continued ...

Table 8

No.	multipole	matrix
	$\mathbb{M}_{5,0}^{(1,-1;a)}(E_g)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{i}{2} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{i}{2} \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{i}{2} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{i}{2} & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
529	symmetry	$\frac{\sqrt{105}xyz(x^2+y^2-2z^2)}{2}$ $\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}i}{12} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}i}{12} & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{12} & 0 & 0 & 0 & \frac{\sqrt{30}i}{12} & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}i}{12} & 0 & 0 & 0 & -\frac{\sqrt{6}i}{12} \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}i}{12} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}i}{12} & 0 & 0 \end{bmatrix}$
530	symmetry	$\frac{x(8x^4-40x^2y^2-40x^2z^2+15y^4+30y^2z^2+15z^4)}{8}$

continued ...

Table 8

No.	multipole	matrix
$\mathbb{M}_{5,0}^{(1,-1;a)}(T_g, 1)$	0 0 0 0 0 0 0 0 0 0	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{35}}{112} & 0 & -\frac{\sqrt{70}}{48} & 0 & \frac{3\sqrt{7}}{16} \\ 0 & 0 & 0 & 0 & \frac{\sqrt{35}}{112} & 0 & -\frac{5\sqrt{14}}{112} & 0 & \frac{5\sqrt{7}}{48} & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{5\sqrt{14}}{112} & 0 & \frac{5\sqrt{7}}{56} & 0 & -\frac{\sqrt{70}}{48} \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{70}}{48} & 0 & \frac{5\sqrt{7}}{56} & 0 & -\frac{5\sqrt{14}}{112} & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{5\sqrt{7}}{48} & 0 & -\frac{5\sqrt{14}}{112} & 0 & \frac{\sqrt{35}}{112} \\ 0 & 0 & 0 & 0 & \frac{3\sqrt{7}}{16} & 0 & -\frac{\sqrt{70}}{48} & 0 & \frac{\sqrt{35}}{112} & 0 \end{bmatrix}$
	0 0 0 0 0 0 0 0 0 0	
	0 0 0 0 0 0 0 0 0 0	
	0 0 0 0 0 0 0 0 0 0	
	0 0 0 0 0 0 0 0 0 0	
	0 0 0 0 0 0 0 0 0 0	
	0 0 0 0 0 0 0 0 0 0	
	0 0 0 0 0 0 0 0 0 0	
	0 0 0 0 0 0 0 0 0 0	
	0 0 0 0 0 0 0 0 0 0	
531	symmetry	$\frac{y(15x^4 - 40x^2y^2 + 30x^2z^2 + 8y^4 - 40y^2z^2 + 15z^4)}{8}$
$\mathbb{M}_{5,1}^{(1,-1;a)}(T_g, 1)$	0 0 0 0 0 0 0 0 0 0	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{35}i}{112} & 0 & -\frac{\sqrt{70}i}{48} & 0 & -\frac{3\sqrt{7}i}{16} \\ 0 & 0 & 0 & 0 & \frac{\sqrt{35}i}{112} & 0 & \frac{5\sqrt{14}i}{112} & 0 & \frac{5\sqrt{7}i}{48} & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{5\sqrt{14}i}{112} & 0 & -\frac{5\sqrt{7}i}{56} & 0 & -\frac{\sqrt{70}i}{48} \\ 0 & 0 & 0 & 0 & \frac{\sqrt{70}i}{48} & 0 & \frac{5\sqrt{7}i}{56} & 0 & \frac{5\sqrt{14}i}{112} & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{5\sqrt{7}i}{48} & 0 & -\frac{5\sqrt{14}i}{112} & 0 & -\frac{\sqrt{35}i}{112} \\ 0 & 0 & 0 & 0 & \frac{3\sqrt{7}i}{16} & 0 & \frac{\sqrt{70}i}{48} & 0 & \frac{\sqrt{35}i}{112} & 0 \end{bmatrix}$
	0 0 0 0 0 0 0 0 0 0	
	0 0 0 0 0 0 0 0 0 0	
	0 0 0 0 0 0 0 0 0 0	
	0 0 0 0 0 0 0 0 0 0	
	0 0 0 0 0 0 0 0 0 0	
	0 0 0 0 0 0 0 0 0 0	
	0 0 0 0 0 0 0 0 0 0	
	0 0 0 0 0 0 0 0 0 0	
	0 0 0 0 0 0 0 0 0 0	
532	symmetry	$\frac{z(15x^4 + 30x^2y^2 - 40x^2z^2 + 15y^4 - 40y^2z^2 + 8z^4)}{8}$

continued ...

Table 8

No.	multipole	matrix
		$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{7}}{42} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{5\sqrt{7}}{42} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{5\sqrt{7}}{21} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{5\sqrt{7}}{21} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{5\sqrt{7}}{42} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}}{42} \end{bmatrix}$
533	symmetry	$\frac{3\sqrt{35}x(y^2-2yz-z^2)(y^2+2yz-z^2)}{8}$ $\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{1}{16} & 0 & \frac{3\sqrt{2}}{16} & 0 & \frac{\sqrt{5}}{16} \\ 0 & 0 & 0 & 0 & \frac{1}{16} & 0 & -\frac{\sqrt{10}}{16} & 0 & -\frac{3\sqrt{5}}{16} & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}}{16} & 0 & \frac{\sqrt{5}}{8} & 0 & \frac{3\sqrt{2}}{16} \\ 0 & 0 & 0 & 0 & \frac{3\sqrt{2}}{16} & 0 & \frac{\sqrt{5}}{8} & 0 & -\frac{\sqrt{10}}{16} & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{5}}{16} & 0 & -\frac{\sqrt{10}}{16} & 0 & \frac{1}{16} \\ 0 & 0 & 0 & 0 & \frac{\sqrt{5}}{16} & 0 & \frac{3\sqrt{2}}{16} & 0 & \frac{1}{16} & 0 \end{bmatrix}$
534	symmetry	$\frac{3\sqrt{35}y(x^2-2xz-z^2)(x^2+2xz-z^2)}{8}$

continued ...

Table 8

No.	multipole	matrix
$\mathbb{M}_{5,1}^{(1,-1;a)}(T_g, 2)$	0 0 0 0 0 0 0 0 0 0	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{i}{16} & 0 & \frac{3\sqrt{2}i}{16} & 0 & -\frac{\sqrt{5}i}{16} \\ 0 & 0 & 0 & 0 & \frac{i}{16} & 0 & \frac{\sqrt{10}i}{16} & 0 & -\frac{3\sqrt{5}i}{16} & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}i}{16} & 0 & -\frac{\sqrt{5}i}{8} & 0 & \frac{3\sqrt{2}i}{16} \\ 0 & 0 & 0 & 0 & -\frac{3\sqrt{2}i}{16} & 0 & \frac{\sqrt{5}i}{8} & 0 & \frac{\sqrt{10}i}{16} & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{5}i}{16} & 0 & -\frac{\sqrt{10}i}{16} & 0 & -\frac{i}{16} \\ 0 & 0 & 0 & 0 & \frac{\sqrt{5}i}{16} & 0 & -\frac{3\sqrt{2}i}{16} & 0 & \frac{i}{16} & 0 \end{bmatrix}$
	535 symmetry	$\frac{3\sqrt{35}z(x^2-2xy-y^2)(x^2+2xy-y^2)}{8}$
$\mathbb{M}_{5,2}^{(1,-1;a)}(T_g, 2)$	0 0 0 0 0 0 0 0 0 0	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{1}{2} \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{1}{2} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{1}{2} & 0 & 0 & 0 & 0 \end{bmatrix}$
	536 symmetry	$\frac{\sqrt{105}x(y-z)(y+z)(2x^2-y^2-z^2)}{4}$

continued ...

Table 8

No.	multipole	matrix
$\mathbb{M}_{5,0}^{(1,-1;a)}(T_g, 3)$	0 0 0 0 0 0 0 0 0 0	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{24} & 0 & -\frac{\sqrt{6}}{24} & 0 & -\frac{\sqrt{15}}{8} \\ 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{24} & 0 & -\frac{\sqrt{30}}{24} & 0 & \frac{\sqrt{15}}{24} & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}}{24} & 0 & \frac{\sqrt{15}}{12} & 0 & -\frac{\sqrt{6}}{24} \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{6}}{24} & 0 & \frac{\sqrt{15}}{12} & 0 & -\frac{\sqrt{30}}{24} & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{24} & 0 & -\frac{\sqrt{30}}{24} & 0 & \frac{\sqrt{3}}{24} \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{8} & 0 & -\frac{\sqrt{6}}{24} & 0 & \frac{\sqrt{3}}{24} & 0 \end{bmatrix}$
	537 symmetry	$\frac{\sqrt{105}y(x-z)(x+z)(x^2-2y^2+z^2)}{4}$
$\mathbb{M}_{5,1}^{(1,-1;a)}(T_g, 3)$	0 0 0 0 0 0 0 0 0 0	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{24} & 0 & \frac{\sqrt{6}i}{24} & 0 & -\frac{\sqrt{15}i}{8} \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{24} & 0 & -\frac{\sqrt{30}i}{24} & 0 & -\frac{\sqrt{15}i}{24} & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}i}{24} & 0 & \frac{\sqrt{15}i}{12} & 0 & \frac{\sqrt{6}i}{24} \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{24} & 0 & -\frac{\sqrt{15}i}{12} & 0 & -\frac{\sqrt{30}i}{24} & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{24} & 0 & \frac{\sqrt{30}i}{24} & 0 & \frac{\sqrt{3}i}{24} \\ 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{8} & 0 & -\frac{\sqrt{6}i}{24} & 0 & -\frac{\sqrt{3}i}{24} & 0 \end{bmatrix}$
	538 symmetry	$-\frac{\sqrt{105}z(x-y)(x+y)(x^2+y^2-2z^2)}{4}$

continued ...

Table 8

No.	multipole	matrix
		$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{12} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}}{12} & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{12} & 0 & 0 & 0 & \frac{\sqrt{30}}{12} & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}}{12} & 0 & 0 & 0 & -\frac{\sqrt{6}}{12} \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{12} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}}{12} & 0 & 0 \end{bmatrix}$
539	symmetry	x $\begin{bmatrix} 0 & \frac{\sqrt{210}}{50} & 0 & 0 & \frac{\sqrt{14}}{20} & 0 & -\frac{\sqrt{35}}{100} & 0 & 0 & 0 \\ \frac{\sqrt{210}}{50} & 0 & \frac{\sqrt{70}}{25} & 0 & 0 & \frac{\sqrt{210}}{100} & 0 & -\frac{\sqrt{105}}{100} & 0 & 0 \\ 0 & \frac{\sqrt{70}}{25} & 0 & \frac{\sqrt{210}}{50} & 0 & 0 & \frac{\sqrt{105}}{100} & 0 & -\frac{\sqrt{210}}{100} & 0 \\ 0 & 0 & \frac{\sqrt{210}}{50} & 0 & 0 & 0 & 0 & \frac{\sqrt{35}}{100} & 0 & -\frac{\sqrt{14}}{20} \\ \frac{\sqrt{14}}{20} & 0 & 0 & 0 & 0 & -\frac{\sqrt{14}}{35} & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{210}}{100} & 0 & 0 & -\frac{\sqrt{14}}{35} & 0 & -\frac{4\sqrt{35}}{175} & 0 & 0 & 0 \\ -\frac{\sqrt{35}}{100} & 0 & \frac{\sqrt{105}}{100} & 0 & 0 & -\frac{4\sqrt{35}}{175} & 0 & -\frac{3\sqrt{70}}{175} & 0 & 0 \\ 0 & -\frac{\sqrt{105}}{100} & 0 & \frac{\sqrt{35}}{100} & 0 & 0 & -\frac{3\sqrt{70}}{175} & 0 & -\frac{4\sqrt{35}}{175} & 0 \\ 0 & 0 & -\frac{\sqrt{210}}{100} & 0 & 0 & 0 & 0 & -\frac{4\sqrt{35}}{175} & 0 & -\frac{\sqrt{14}}{35} \\ 0 & 0 & 0 & -\frac{\sqrt{14}}{20} & 0 & 0 & 0 & 0 & -\frac{\sqrt{14}}{35} & 0 \end{bmatrix}$
540	symmetry	y

continued ...

Table 8

No.	multipole	matrix
$\mathbb{M}_{1,1}^{(1,1;a)}(T_g)$	0	$-\frac{\sqrt{210}i}{50}$ 0 0 $\frac{\sqrt{14}i}{20}$ 0 $\frac{\sqrt{35}i}{100}$ 0 0 0
	$\frac{\sqrt{210}i}{50}$	0 $-\frac{\sqrt{70}i}{25}$ 0 0 $\frac{\sqrt{210}i}{100}$ 0 $\frac{\sqrt{105}i}{100}$ 0 0 0
	0	$\frac{\sqrt{70}i}{25}$ 0 $-\frac{\sqrt{210}i}{50}$ 0 0 0 $\frac{\sqrt{105}i}{100}$ 0 $\frac{\sqrt{210}i}{100}$ 0
	0	0 $\frac{\sqrt{210}i}{50}$ 0 0 0 0 0 $\frac{\sqrt{35}i}{100}$ 0 $\frac{\sqrt{14}i}{20}$
	$-\frac{\sqrt{14}i}{20}$	0 0 0 0 0 $\frac{\sqrt{14}i}{35}$ 0 0 0 0
	0	$-\frac{\sqrt{210}i}{100}$ 0 0 $-\frac{\sqrt{14}i}{35}$ 0 $\frac{4\sqrt{35}i}{175}$ 0 0 0
	$-\frac{\sqrt{35}i}{100}$	0 $-\frac{\sqrt{105}i}{100}$ 0 0 0 $-\frac{4\sqrt{35}i}{175}$ 0 $\frac{3\sqrt{70}i}{175}$ 0 0
	0	$-\frac{\sqrt{105}i}{100}$ 0 $-\frac{\sqrt{35}i}{100}$ 0 0 0 $-\frac{3\sqrt{70}i}{175}$ 0 $\frac{4\sqrt{35}i}{175}$ 0
	0	0 $-\frac{\sqrt{210}i}{100}$ 0 0 0 0 0 $-\frac{4\sqrt{35}i}{175}$ 0 $\frac{\sqrt{14}i}{35}$
	0	0 0 0 $-\frac{\sqrt{14}i}{20}$ 0 0 0 0 $-\frac{\sqrt{14}i}{35}$ 0
541	symmetry	z
$\mathbb{M}_{1,2}^{(1,1;a)}(T_g)$	$\frac{3\sqrt{70}}{50}$	0 0 0 0 0 $-\frac{\sqrt{70}}{50}$ 0 0 0 0
	0	$\frac{\sqrt{70}}{50}$ 0 0 0 0 0 $-\frac{\sqrt{105}}{50}$ 0 0 0
	0	0 $-\frac{\sqrt{70}}{50}$ 0 0 0 0 0 $-\frac{\sqrt{105}}{50}$ 0 0
	0	0 0 $-\frac{3\sqrt{70}}{50}$ 0 0 0 0 0 $-\frac{\sqrt{70}}{50}$ 0
	0	0 0 0 0 $-\frac{\sqrt{70}}{35}$ 0 0 0 0 0
	$-\frac{\sqrt{70}}{50}$	0 0 0 0 0 $-\frac{3\sqrt{70}}{175}$ 0 0 0 0
	0	$-\frac{\sqrt{105}}{50}$ 0 0 0 0 0 $-\frac{\sqrt{70}}{175}$ 0 0 0
	0	0 $-\frac{\sqrt{105}}{50}$ 0 0 0 0 0 $\frac{\sqrt{70}}{175}$ 0 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 0 $\frac{\sqrt{70}}{35}$
542	symmetry	$\sqrt{15}xyz$

continued ...

Table 8

No.	multipole	matrix
$\mathbb{M}_3^{(1,1;a)}(A_g)$	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	
543	symmetry	$\frac{x(2x^2-3y^2-3z^2)}{2}$
$\mathbb{M}_{3,0}^{(1,1;a)}(T_g, 1)$	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	
544	symmetry	$-\frac{y(3x^2-2y^2+3z^2)}{2}$

continued ...

Table 8

No.	multipole	matrix
$\mathbb{M}_{3,1}^{(1,1;a)}(T_g, 1)$	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 $\frac{\sqrt{7}i}{70}$
$\mathbb{M}_{3,2}^{(1,1;a)}(T_g, 1)$	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
	545	symmetry $-\frac{z(3x^2+3y^2-2z^2)}{2}$
$\mathbb{M}_{3,2}^{(1,1;a)}(T_g, 1)$	0	$-\frac{6\sqrt{35}}{175}$ 0 0 0 0 $\frac{9\sqrt{35}}{350}$ 0 0 0 0
	0	$\frac{18\sqrt{35}}{175}$ 0 0 0 0 0 $-\frac{3\sqrt{210}}{350}$ 0 0 0
	0	0 $-\frac{18\sqrt{35}}{175}$ 0 0 0 0 0 $-\frac{3\sqrt{210}}{350}$ 0 0
	0	0 0 $\frac{6\sqrt{35}}{175}$ 0 0 0 0 0 $\frac{9\sqrt{35}}{350}$ 0
	0	0 0 0 0 $\frac{\sqrt{35}}{105}$ 0 0 0 0 0
	$\frac{9\sqrt{35}}{350}$	0 0 0 0 0 $-\frac{\sqrt{35}}{75}$ 0 0 0 0
	0	$-\frac{3\sqrt{210}}{350}$ 0 0 0 0 0 $-\frac{4\sqrt{35}}{525}$ 0 0 0
	0	0 $-\frac{3\sqrt{210}}{350}$ 0 0 0 0 0 $\frac{4\sqrt{35}}{525}$ 0 0
	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 0 0 0 $-\frac{\sqrt{35}}{105}$
546	symmetry $\frac{\sqrt{15}x(y-z)(y+z)}{2}$	

continued ...

Table 8

No.	multipole	matrix
$\mathbb{M}_{3,0}^{(1,1;a)}(T_g, 2)$	0	$\begin{bmatrix} 0 & \frac{3\sqrt{7}}{35} & 0 & \frac{3\sqrt{21}}{35} & \frac{3\sqrt{105}}{560} & 0 & -\frac{9\sqrt{42}}{560} & 0 & -\frac{9\sqrt{21}}{560} & 0 \\ \frac{3\sqrt{7}}{35} & 0 & -\frac{3\sqrt{21}}{35} & 0 & 0 & -\frac{3\sqrt{7}}{80} & 0 & \frac{3\sqrt{14}}{560} & 0 & -\frac{9\sqrt{35}}{560} \\ 0 & -\frac{3\sqrt{21}}{35} & 0 & \frac{3\sqrt{7}}{35} & \frac{9\sqrt{35}}{560} & 0 & -\frac{3\sqrt{14}}{560} & 0 & \frac{3\sqrt{7}}{80} & 0 \\ \frac{3\sqrt{21}}{35} & 0 & \frac{3\sqrt{7}}{35} & 0 & 0 & \frac{9\sqrt{21}}{560} & 0 & \frac{9\sqrt{42}}{560} & 0 & -\frac{3\sqrt{105}}{560} \\ \frac{3\sqrt{105}}{560} & 0 & \frac{9\sqrt{35}}{560} & 0 & 0 & -\frac{\sqrt{105}}{210} & 0 & -\frac{\sqrt{210}}{420} & 0 & 0 \\ 0 & -\frac{3\sqrt{7}}{80} & 0 & \frac{9\sqrt{21}}{560} & -\frac{\sqrt{105}}{210} & 0 & \frac{\sqrt{42}}{420} & 0 & -\frac{\sqrt{21}}{105} & 0 \\ -\frac{9\sqrt{42}}{560} & 0 & -\frac{3\sqrt{14}}{560} & 0 & 0 & \frac{\sqrt{42}}{420} & 0 & \frac{\sqrt{21}}{105} & 0 & -\frac{\sqrt{210}}{420} \\ 0 & \frac{3\sqrt{14}}{560} & 0 & \frac{9\sqrt{42}}{560} & -\frac{\sqrt{210}}{420} & 0 & \frac{\sqrt{21}}{105} & 0 & \frac{\sqrt{42}}{420} & 0 \\ -\frac{9\sqrt{21}}{560} & 0 & \frac{3\sqrt{7}}{80} & 0 & 0 & -\frac{\sqrt{21}}{105} & 0 & \frac{\sqrt{42}}{420} & 0 & -\frac{\sqrt{105}}{210} \\ 0 & -\frac{9\sqrt{35}}{560} & 0 & -\frac{3\sqrt{105}}{560} & 0 & 0 & -\frac{\sqrt{210}}{420} & 0 & -\frac{\sqrt{105}}{210} & 0 \end{bmatrix}$
	547	symmetry $-\frac{\sqrt{15}y(x-z)(x+z)}{2}$
	$\mathbb{M}_{3,1}^{(1,1;a)}(T_g, 2)$	$\begin{bmatrix} 0 & \frac{3\sqrt{7}i}{35} & 0 & -\frac{3\sqrt{21}i}{35} & -\frac{3\sqrt{105}i}{560} & 0 & -\frac{9\sqrt{42}i}{560} & 0 & \frac{9\sqrt{21}i}{560} & 0 \\ -\frac{3\sqrt{7}i}{35} & 0 & -\frac{3\sqrt{21}i}{35} & 0 & 0 & \frac{3\sqrt{7}i}{80} & 0 & \frac{3\sqrt{14}i}{560} & 0 & \frac{9\sqrt{35}i}{560} \\ 0 & \frac{3\sqrt{21}i}{35} & 0 & \frac{3\sqrt{7}i}{35} & \frac{9\sqrt{35}i}{560} & 0 & \frac{3\sqrt{14}i}{560} & 0 & \frac{3\sqrt{7}i}{80} & 0 \\ \frac{3\sqrt{21}i}{35} & 0 & -\frac{3\sqrt{7}i}{35} & 0 & 0 & \frac{9\sqrt{21}i}{560} & 0 & -\frac{9\sqrt{42}i}{560} & 0 & -\frac{3\sqrt{105}i}{560} \\ \frac{3\sqrt{105}i}{560} & 0 & -\frac{9\sqrt{35}i}{560} & 0 & 0 & -\frac{\sqrt{105}i}{210} & 0 & \frac{\sqrt{210}i}{420} & 0 & 0 \\ 0 & -\frac{3\sqrt{7}i}{80} & 0 & -\frac{9\sqrt{21}i}{560} & \frac{\sqrt{105}i}{210} & 0 & \frac{\sqrt{42}i}{420} & 0 & \frac{\sqrt{21}i}{105} & 0 \\ \frac{9\sqrt{42}i}{560} & 0 & -\frac{3\sqrt{14}i}{560} & 0 & 0 & -\frac{\sqrt{42}i}{420} & 0 & \frac{\sqrt{21}i}{105} & 0 & \frac{\sqrt{210}i}{420} \\ 0 & -\frac{3\sqrt{14}i}{560} & 0 & \frac{9\sqrt{42}i}{560} & -\frac{\sqrt{210}i}{420} & 0 & -\frac{\sqrt{21}i}{105} & 0 & \frac{\sqrt{42}i}{420} & 0 \\ -\frac{9\sqrt{21}i}{560} & 0 & -\frac{3\sqrt{7}i}{80} & 0 & 0 & -\frac{\sqrt{21}i}{105} & 0 & -\frac{\sqrt{42}i}{420} & 0 & -\frac{\sqrt{105}i}{210} \\ 0 & -\frac{9\sqrt{35}i}{560} & 0 & \frac{3\sqrt{105}i}{560} & 0 & 0 & -\frac{\sqrt{210}i}{420} & 0 & \frac{\sqrt{105}i}{210} & 0 \end{bmatrix}$
	548	symmetry $\frac{\sqrt{15}z(x-y)(x+y)}{2}$

continued ...

Table 8

No.	multipole	matrix
$\mathbb{M}_{3,2}^{(1,1;a)}(T_g, 2)$	0	0 $-\frac{6\sqrt{7}}{35}$ 0 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 0 $\frac{3\sqrt{7}}{140}$ 0
	$-\frac{6\sqrt{7}}{35}$	0 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 0 $\frac{3\sqrt{42}}{140}$ 0 0 0
	0	$-\frac{3\sqrt{35}}{140}$ 0 0 0 0 0 $\frac{\sqrt{210}}{210}$ 0 0 0
	0	0 $\frac{3\sqrt{7}}{140}$ 0 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 0 $\frac{\sqrt{42}}{210}$ 0 0 0 $-\frac{\sqrt{210}}{210}$
	0	$\frac{3\sqrt{7}}{140}$ 0 0 0 0 0 $-\frac{\sqrt{42}}{210}$ 0 0 0
	0	0 0 $-\frac{3\sqrt{35}}{140}$ 0 0 0 0 0 $-\frac{\sqrt{210}}{210}$ 0 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: $| \frac{5}{2}, \frac{5}{2}; f \rangle, | \frac{5}{2}, \frac{3}{2}; f \rangle, | \frac{5}{2}, \frac{1}{2}; f \rangle, | \frac{5}{2}, -\frac{1}{2}; f \rangle, | \frac{5}{2}, -\frac{3}{2}; f \rangle, | \frac{5}{2}, -\frac{5}{2}; f \rangle, | \frac{7}{2}, \frac{5}{2}; f \rangle, | \frac{7}{2}, \frac{3}{2}; f \rangle, | \frac{7}{2}, \frac{1}{2}; f \rangle, | \frac{7}{2}, -\frac{1}{2}; f \rangle, | \frac{7}{2}, -\frac{3}{2}; f \rangle, | \frac{7}{2}, -\frac{5}{2}; f \rangle, | \frac{7}{2}, -\frac{7}{2}; f \rangle$

Table 9: (d,f) block.

No.	multipole	matrix
549	symmetry	x
$\mathbb{Q}_{1,0}^{(a)}(T_u)$	$-\frac{\sqrt{5}}{10}$	0 $\frac{\sqrt{2}}{20}$ 0 0 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
	0	0 0 $-\frac{\sqrt{6}}{20}$ 0 $\frac{\sqrt{3}}{10}$ 0 0 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
	0	$-\frac{\sqrt{5}}{70}$ 0 0 0 0 0 $-\frac{\sqrt{42}}{28}$ 0 $\frac{\sqrt{2}}{28}$ 0 0 0 0 0 0
	$-\frac{\sqrt{5}}{70}$	0 0 $-\frac{\sqrt{2}}{35}$ 0 0 0 0 $-\frac{\sqrt{30}}{28}$ 0 $\frac{\sqrt{6}}{28}$ 0 0 0 0 0
	0	$-\frac{\sqrt{2}}{35}$ 0 $-\frac{3}{70}$ 0 0 0 0 0 $-\frac{\sqrt{5}}{14}$ 0 $\frac{\sqrt{3}}{14}$ 0 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 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 0 $-\frac{\sqrt{5}}{70}$ 0 0 0 0 0 0 $-\frac{\sqrt{2}}{28}$ 0 $\frac{\sqrt{42}}{28}$

continued ...

Table 9

No.	multipole	matrix
550	symmetry $\mathbb{Q}_{1,1}^{(a)}(T_u)$	y $\begin{bmatrix} -\frac{\sqrt{5}i}{10} & 0 & -\frac{\sqrt{2}i}{20} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{3}i}{10} & 0 & -\frac{\sqrt{6}i}{20} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{6}i}{20} & 0 & -\frac{\sqrt{3}i}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{2}i}{20} & 0 & -\frac{\sqrt{5}i}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{5}i}{70} & 0 & 0 & 0 & 0 & -\frac{\sqrt{42}i}{28} & 0 & -\frac{\sqrt{2}i}{28} & 0 & 0 & 0 & 0 & 0 & 0 \\ -\frac{\sqrt{5}i}{70} & 0 & \frac{\sqrt{2}i}{35} & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}i}{28} & 0 & -\frac{\sqrt{6}i}{28} & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{2}i}{35} & 0 & \frac{3i}{70} & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{14} & 0 & -\frac{\sqrt{3}i}{14} & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{3i}{70} & 0 & \frac{\sqrt{2}i}{35} & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{14} & 0 & -\frac{\sqrt{5}i}{14} & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{2}i}{35} & 0 & \frac{\sqrt{5}i}{70} & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{28} & 0 & -\frac{\sqrt{30}i}{28} & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{70} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}i}{28} & 0 & -\frac{\sqrt{42}i}{28} & 0 \end{bmatrix}$
551	symmetry $\mathbb{Q}_{1,2}^{(a)}(T_u)$	z $\begin{bmatrix} 0 & \frac{1}{5} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{6}}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{6}}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{1}{5} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ -\frac{1}{14} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{14} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{3}{70} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}}{14} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{1}{70} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{7} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{1}{70} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{7} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{3}{70} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}}{14} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{1}{14} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{14} & 0 & 0 \end{bmatrix}$
552	symmetry	$\sqrt{15}xyz$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{Q}_3^{(a)}(A_u)$	$0 \quad 0 \quad 0 \quad \frac{3\sqrt{70}i}{140} \quad 0 \quad 0 \quad -\frac{\sqrt{6}i}{24} \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{210}i}{168} \quad 0 \quad 0 \quad 0$	
	$\frac{\sqrt{21}i}{28} \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{105}i}{140} \quad 0 \quad 0 \quad \frac{\sqrt{14}i}{56} \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{42}i}{56} \quad 0 \quad 0 \quad 0$	
	$0 \quad -\frac{\sqrt{105}i}{140} \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{21}i}{28} \quad 0 \quad 0 \quad \frac{\sqrt{42}i}{56} \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{14}i}{56} \quad 0 \quad 0$	
	$0 \quad 0 \quad -\frac{3\sqrt{70}i}{140} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{210}i}{168} \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{6}i}{24}$	
	$0 \quad 0 \quad -\frac{\sqrt{14}i}{28} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{42}i}{42} \quad 0 \quad 0 \quad 0 \quad 0$	
	$0 \quad 0 \quad 0 \quad -\frac{\sqrt{70}i}{140} \quad 0 \quad 0 \quad \frac{\sqrt{6}i}{12} \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{210}i}{84} \quad 0 \quad 0 \quad 0$	
	$\frac{\sqrt{14}i}{28} \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{70}i}{140} \quad 0 \quad 0 \quad \frac{\sqrt{21}i}{84} \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{7}i}{28} \quad 0 \quad 0$	
	$0 \quad \frac{\sqrt{70}i}{140} \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{14}i}{28} \quad 0 \quad 0 \quad -\frac{\sqrt{7}i}{28} \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{21}i}{84} \quad 0$	
	$0 \quad 0 \quad -\frac{\sqrt{70}i}{140} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{210}i}{84} \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{6}i}{12}$	
	$0 \quad 0 \quad 0 \quad -\frac{\sqrt{14}i}{28} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{42}i}{42} \quad 0 \quad 0 \quad 0$	
553	symmetry	$\frac{x(2x^2-3y^2-3z^2)}{2}$
$\mathbb{Q}_{3,0}^{(a)}(T_u, 1)$	$-\frac{3\sqrt{105}}{560} \quad 0 \quad \frac{9\sqrt{42}}{560} \quad 0 \quad -\frac{3\sqrt{21}}{112} \quad 0 \quad 0 \quad -\frac{\sqrt{70}}{112} \quad 0 \quad \frac{\sqrt{14}}{56} \quad 0 \quad -\frac{\sqrt{210}}{336} \quad 0 \quad 0$	
	$0 \quad \frac{3\sqrt{7}}{80} \quad 0 \quad -\frac{3\sqrt{14}}{560} \quad 0 \quad -\frac{3\sqrt{35}}{112} \quad -\frac{\sqrt{30}}{48} \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{42}}{112} \quad 0 \quad -\frac{\sqrt{210}}{168} \quad 0$	
	$\frac{3\sqrt{35}}{112} \quad 0 \quad \frac{3\sqrt{14}}{560} \quad 0 \quad -\frac{3\sqrt{7}}{80} \quad 0 \quad 0 \quad -\frac{\sqrt{210}}{168} \quad 0 \quad \frac{\sqrt{42}}{112} \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{30}}{48}$	
	$0 \quad \frac{3\sqrt{21}}{112} \quad 0 \quad -\frac{9\sqrt{42}}{560} \quad 0 \quad \frac{3\sqrt{105}}{560} \quad 0 \quad 0 \quad -\frac{\sqrt{210}}{336} \quad 0 \quad \frac{\sqrt{14}}{56} \quad 0 \quad -\frac{\sqrt{70}}{112} \quad 0$	
	$0 \quad -\frac{\sqrt{105}}{140} \quad 0 \quad \frac{\sqrt{210}}{168} \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{2}}{16} \quad 0 \quad \frac{\sqrt{42}}{56} \quad 0 \quad -\frac{\sqrt{70}}{112} \quad 0 \quad 0 \quad 0$	
	$-\frac{\sqrt{105}}{140} \quad 0 \quad \frac{\sqrt{42}}{280} \quad 0 \quad \frac{\sqrt{21}}{42} \quad 0 \quad 0 \quad \frac{\sqrt{70}}{112} \quad 0 \quad \frac{\sqrt{14}}{56} \quad 0 \quad -\frac{\sqrt{210}}{112} \quad 0 \quad 0 \quad 0$	
	$0 \quad \frac{\sqrt{42}}{280} \quad 0 \quad \frac{\sqrt{21}}{70} \quad 0 \quad \frac{\sqrt{210}}{168} \quad \frac{\sqrt{5}}{16} \quad 0 \quad \frac{\sqrt{105}}{112} \quad 0 \quad -\frac{\sqrt{7}}{112} \quad 0 \quad -\frac{3\sqrt{35}}{112} \quad 0$	
	$\frac{\sqrt{210}}{168} \quad 0 \quad \frac{\sqrt{21}}{70} \quad 0 \quad \frac{\sqrt{42}}{280} \quad 0 \quad 0 \quad \frac{3\sqrt{35}}{112} \quad 0 \quad \frac{\sqrt{7}}{112} \quad 0 \quad -\frac{\sqrt{105}}{112} \quad 0 \quad -\frac{\sqrt{5}}{16}$	
	$0 \quad \frac{\sqrt{21}}{42} \quad 0 \quad \frac{\sqrt{42}}{280} \quad 0 \quad -\frac{\sqrt{105}}{140} \quad 0 \quad 0 \quad \frac{\sqrt{210}}{112} \quad 0 \quad -\frac{\sqrt{14}}{56} \quad 0 \quad -\frac{\sqrt{70}}{112} \quad 0$	
	$0 \quad 0 \quad \frac{\sqrt{210}}{168} \quad 0 \quad -\frac{\sqrt{105}}{140} \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{70}}{112} \quad 0 \quad -\frac{\sqrt{42}}{56} \quad 0 \quad \frac{\sqrt{2}}{16}$	
554	symmetry	$-\frac{y(3x^2-2y^2+3z^2)}{2}$

continued ...

Table 9

No.	multipole	matrix												
$\mathbb{Q}_{3,1}^{(a)}(T_u, 1)$	$-\frac{3\sqrt{105}i}{560}$	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	$-\frac{\sqrt{2}i}{16}$
555	symmetry	$-\frac{z(3x^2+3y^2-2z^2)}{2}$												
$\mathbb{Q}_{3,2}^{(a)}(T_u, 1)$	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	$\frac{\sqrt{42}}{84}$	0	0	0	0
	0	0	0	0	$-\frac{3\sqrt{21}}{70}$	0	0	0	0	0	$\frac{\sqrt{210}}{84}$	0	0	0
	$\frac{\sqrt{21}}{42}$	0	0	0	0	0	0	$-\frac{\sqrt{14}}{14}$	0	0	0	0	0	0
	0	$-\frac{\sqrt{21}}{30}$	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	$-\frac{2\sqrt{21}}{105}$	0	0	0	0	0	$\frac{\sqrt{7}}{14}$	0	0	0	0	0
	0	0	0	$\frac{2\sqrt{21}}{105}$	0	0	0	0	0	$\frac{\sqrt{7}}{14}$	0	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	$-\frac{\sqrt{14}}{14}$	0	0
556	symmetry	$\frac{\sqrt{15}x(y-z)(y+z)}{2}$												

continued ..

Table 9

No.	multipole	matrix
$\mathbb{Q}_{3,0}^{(a)}(T_u, 2)$	$-\frac{3\sqrt{7}}{112}, 0, \frac{9\sqrt{70}}{560}, 0, \frac{9\sqrt{35}}{560}, 0, 0, -\frac{5\sqrt{42}}{336}, 0, \frac{\sqrt{210}}{168}, 0, \frac{\sqrt{14}}{112}, 0, 0$	
	$0, \frac{\sqrt{105}}{80}, 0, -\frac{\sqrt{210}}{560}, 0, \frac{3\sqrt{21}}{112}, \frac{\sqrt{2}}{16}, 0, 0, 0, \frac{\sqrt{70}}{112}, 0, \frac{\sqrt{14}}{56}, 0$	
	$-\frac{3\sqrt{21}}{112}, 0, \frac{\sqrt{210}}{560}, 0, -\frac{\sqrt{105}}{80}, 0, 0, \frac{\sqrt{14}}{56}, 0, \frac{\sqrt{70}}{112}, 0, 0, 0, \frac{\sqrt{2}}{16}$	
	$0, -\frac{9\sqrt{35}}{560}, 0, -\frac{9\sqrt{70}}{560}, 0, \frac{3\sqrt{7}}{112}, 0, 0, \frac{\sqrt{14}}{112}, 0, \frac{\sqrt{210}}{168}, 0, -\frac{5\sqrt{42}}{336}, 0$	
	$0, -\frac{\sqrt{7}}{28}, 0, -\frac{\sqrt{14}}{56}, 0, 0, -\frac{\sqrt{30}}{48}, 0, \frac{\sqrt{70}}{56}, 0, \frac{\sqrt{42}}{112}, 0, 0, 0$	
	$-\frac{\sqrt{7}}{28}, 0, \frac{\sqrt{70}}{280}, 0, -\frac{\sqrt{35}}{70}, 0, 0, \frac{5\sqrt{42}}{336}, 0, \frac{\sqrt{210}}{168}, 0, \frac{3\sqrt{14}}{112}, 0, 0$	
	$0, \frac{\sqrt{70}}{280}, 0, \frac{\sqrt{35}}{70}, 0, -\frac{\sqrt{14}}{56}, -\frac{\sqrt{3}}{16}, 0, \frac{5\sqrt{7}}{112}, 0, -\frac{\sqrt{105}}{336}, 0, \frac{3\sqrt{21}}{112}, 0$	
	$-\frac{\sqrt{14}}{56}, 0, \frac{\sqrt{35}}{70}, 0, \frac{\sqrt{70}}{280}, 0, 0, -\frac{3\sqrt{21}}{112}, 0, \frac{\sqrt{105}}{336}, 0, -\frac{5\sqrt{7}}{112}, 0, \frac{\sqrt{3}}{16}$	
	$0, -\frac{\sqrt{35}}{70}, 0, \frac{\sqrt{70}}{280}, 0, -\frac{\sqrt{7}}{28}, 0, 0, -\frac{3\sqrt{14}}{112}, 0, -\frac{\sqrt{210}}{168}, 0, -\frac{5\sqrt{42}}{336}, 0$	
	$0, 0, -\frac{\sqrt{14}}{56}, 0, -\frac{\sqrt{7}}{28}, 0, 0, 0, -\frac{\sqrt{42}}{112}, 0, -\frac{\sqrt{70}}{56}, 0, \frac{\sqrt{30}}{48}$	
557	symmetry	$-\frac{\sqrt{15}y(x-z)(x+z)}{2}$
$\mathbb{Q}_{3,1}^{(a)}(T_u, 2)$	$\frac{3\sqrt{7}i}{112}, 0, \frac{9\sqrt{70}i}{560}, 0, -\frac{9\sqrt{35}i}{560}, 0, 0, \frac{5\sqrt{42}i}{336}, 0, \frac{\sqrt{210}i}{168}, 0, -\frac{\sqrt{14}i}{112}, 0, 0$	
	$0, -\frac{\sqrt{105}i}{80}, 0, -\frac{\sqrt{210}i}{560}, 0, -\frac{3\sqrt{21}i}{112}, \frac{\sqrt{2}i}{16}, 0, 0, 0, \frac{\sqrt{70}i}{112}, 0, -\frac{\sqrt{14}i}{56}, 0$	
	$-\frac{3\sqrt{21}i}{112}, 0, -\frac{\sqrt{210}i}{560}, 0, -\frac{\sqrt{105}i}{80}, 0, 0, \frac{\sqrt{14}i}{56}, 0, -\frac{\sqrt{70}i}{112}, 0, 0, 0, -\frac{\sqrt{2}i}{16}$	
	$0, -\frac{9\sqrt{35}i}{560}, 0, \frac{9\sqrt{70}i}{560}, 0, \frac{3\sqrt{7}i}{112}, 0, 0, \frac{\sqrt{14}i}{112}, 0, -\frac{\sqrt{210}i}{168}, 0, -\frac{5\sqrt{42}i}{336}, 0$	
	$0, -\frac{\sqrt{7}i}{28}, 0, \frac{\sqrt{14}i}{56}, 0, 0, \frac{\sqrt{30}i}{48}, 0, \frac{\sqrt{70}i}{56}, 0, -\frac{\sqrt{42}i}{112}, 0, 0, 0$	
	$\frac{\sqrt{7}i}{28}, 0, \frac{\sqrt{70}i}{280}, 0, \frac{\sqrt{35}i}{70}, 0, 0, -\frac{5\sqrt{42}i}{336}, 0, \frac{\sqrt{210}i}{168}, 0, -\frac{3\sqrt{14}i}{112}, 0, 0$	
	$0, -\frac{\sqrt{70}i}{280}, 0, \frac{\sqrt{35}i}{70}, 0, \frac{\sqrt{14}i}{56}, -\frac{\sqrt{3}i}{16}, 0, -\frac{5\sqrt{7}i}{112}, 0, -\frac{\sqrt{105}i}{336}, 0, -\frac{3\sqrt{21}i}{112}, 0$	
	$-\frac{\sqrt{14}i}{56}, 0, -\frac{\sqrt{35}i}{70}, 0, \frac{\sqrt{70}i}{280}, 0, 0, -\frac{3\sqrt{21}i}{112}, 0, -\frac{\sqrt{105}i}{336}, 0, -\frac{5\sqrt{7}i}{112}, 0, -\frac{\sqrt{3}i}{16}$	
	$0, -\frac{\sqrt{35}i}{70}, 0, -\frac{\sqrt{70}i}{280}, 0, -\frac{\sqrt{7}i}{28}, 0, 0, -\frac{3\sqrt{14}i}{112}, 0, \frac{\sqrt{210}i}{168}, 0, -\frac{5\sqrt{42}i}{336}, 0$	
	$0, 0, -\frac{\sqrt{14}i}{56}, 0, \frac{\sqrt{7}i}{28}, 0, 0, 0, -\frac{\sqrt{42}i}{112}, 0, \frac{\sqrt{70}i}{56}, 0, \frac{\sqrt{30}i}{48}$	
558	symmetry	$\frac{\sqrt{15}z(x-y)(x+y)}{2}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{Q}_{3,2}^{(a)}(T_u, 2)$	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	
	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 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	
559	symmetry	$\frac{3\sqrt{35}xyz(x-y)(x+y)}{2}$
$\mathbb{Q}_{5,0}^{(a)}(E_u)$	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 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 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 0	
	$-\frac{\sqrt{42}i}{28}$ 0 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 0 $\frac{\sqrt{105}i}{70}$ 0 0 0 0 0 0	
560	symmetry	$\frac{\sqrt{105}xyz(x^2+y^2-2z^2)}{2}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{Q}_{5,1}^{(a)}(E_u)$	$0 \ 0 \ 0 \ 0 \ 0 \ 0 \ -\frac{\sqrt{3}i}{60} \ 0 \ 0 \ 0 \ \frac{\sqrt{105}i}{60} \ 0 \ 0 \ 0$	
	$0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ \frac{\sqrt{7}i}{20} \ 0 \ 0 \ 0 \ -\frac{\sqrt{21}i}{20} \ 0 \ 0 \ 0$	
	$0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ -\frac{\sqrt{21}i}{20} \ 0 \ 0 \ 0 \ 0 \ \frac{\sqrt{7}i}{20} \ 0$	
	$0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ \frac{\sqrt{105}i}{60} \ 0 \ 0 \ 0 \ -\frac{\sqrt{3}i}{60}$	
	$0 \ 0 \ -\frac{\sqrt{7}i}{28} \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ \frac{\sqrt{21}i}{42} \ 0 \ 0 \ 0 \ 0 \ 0$	
	$0 \ 0 \ 0 \ \frac{\sqrt{35}i}{28} \ 0 \ 0 \ \frac{\sqrt{3}i}{30} \ 0 \ 0 \ 0 \ -\frac{\sqrt{105}i}{105} \ 0 \ 0 \ 0$	
	$\frac{\sqrt{7}i}{28} \ 0 \ 0 \ 0 \ -\frac{\sqrt{35}i}{28} \ 0 \ 0 \ -\frac{2\sqrt{42}i}{105} \ 0 \ 0 \ 0 \ -\frac{\sqrt{14}i}{70} \ 0 \ 0 \ 0$	
	$0 \ -\frac{\sqrt{35}i}{28} \ 0 \ 0 \ 0 \ \frac{\sqrt{7}i}{28} \ 0 \ 0 \ \frac{\sqrt{14}i}{70} \ 0 \ 0 \ 0 \ \frac{2\sqrt{42}i}{105} \ 0$	
	$0 \ 0 \ \frac{\sqrt{35}i}{28} \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ \frac{\sqrt{105}i}{105} \ 0 \ 0 \ 0 \ -\frac{\sqrt{3}i}{30}$	
	$0 \ 0 \ 0 \ -\frac{\sqrt{7}i}{28} \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ -\frac{\sqrt{21}i}{42} \ 0 \ 0 \ 0$	
561	symmetry	$\frac{x(8x^4 - 40x^2y^2 - 40x^2z^2 + 15y^4 + 30y^2z^2 + 15z^4)}{8}$
$\mathbb{Q}_{5,0}^{(a)}(T_u, 1)$	$0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ -\frac{\sqrt{5}}{80} \ 0 \ \frac{1}{16} \ 0 \ -\frac{7\sqrt{15}}{240} \ 0 \ \frac{3\sqrt{35}}{80}$	
	$0 \ 0 \ 0 \ 0 \ 0 \ 0 \ -\frac{\sqrt{105}}{240} \ 0 \ \frac{3\sqrt{5}}{80} \ 0 \ -\frac{\sqrt{3}}{16} \ 0 \ \frac{7\sqrt{15}}{240} \ 0$	
	$0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ \frac{7\sqrt{15}}{240} \ 0 \ -\frac{\sqrt{3}}{16} \ 0 \ \frac{3\sqrt{5}}{80} \ 0 \ -\frac{\sqrt{105}}{240}$	
	$0 \ 0 \ 0 \ 0 \ 0 \ 0 \ \frac{3\sqrt{35}}{80} \ 0 \ -\frac{7\sqrt{15}}{240} \ 0 \ \frac{1}{16} \ 0 \ -\frac{\sqrt{5}}{80} \ 0$	
	$0 \ -\frac{\sqrt{30}}{224} \ 0 \ \frac{\sqrt{15}}{48} \ 0 \ -\frac{3\sqrt{6}}{32} \ -\frac{\sqrt{7}}{224} \ 0 \ \frac{5\sqrt{3}}{224} \ 0 \ -\frac{\sqrt{5}}{32} \ 0 \ \frac{3}{32} \ 0$	
	$-\frac{\sqrt{30}}{224} \ 0 \ \frac{5\sqrt{3}}{112} \ 0 \ -\frac{5\sqrt{6}}{96} \ 0 \ 0 \ \frac{23\sqrt{5}}{1120} \ 0 \ -\frac{13}{224} \ 0 \ \frac{\sqrt{15}}{160} \ 0 \ \frac{3\sqrt{35}}{160}$	
	$0 \ \frac{5\sqrt{3}}{112} \ 0 \ -\frac{5\sqrt{6}}{112} \ 0 \ \frac{\sqrt{15}}{48} \ \frac{\sqrt{70}}{160} \ 0 \ -\frac{11\sqrt{30}}{1120} \ 0 \ \frac{\sqrt{2}}{224} \ 0 \ \frac{3\sqrt{10}}{160} \ 0$	
	$\frac{\sqrt{15}}{48} \ 0 \ -\frac{5\sqrt{6}}{112} \ 0 \ \frac{5\sqrt{3}}{112} \ 0 \ 0 \ -\frac{3\sqrt{10}}{160} \ 0 \ -\frac{\sqrt{2}}{224} \ 0 \ \frac{11\sqrt{30}}{1120} \ 0 \ -\frac{\sqrt{70}}{160}$	
	$0 \ -\frac{5\sqrt{6}}{96} \ 0 \ \frac{5\sqrt{3}}{112} \ 0 \ -\frac{\sqrt{30}}{224} \ -\frac{3\sqrt{35}}{160} \ 0 \ -\frac{\sqrt{15}}{160} \ 0 \ \frac{13}{224} \ 0 \ -\frac{23\sqrt{5}}{1120} \ 0$	
	$-\frac{3\sqrt{6}}{32} \ 0 \ \frac{\sqrt{15}}{48} \ 0 \ -\frac{\sqrt{30}}{224} \ 0 \ 0 \ -\frac{3}{32} \ 0 \ \frac{\sqrt{5}}{32} \ 0 \ -\frac{5\sqrt{3}}{224} \ 0 \ \frac{\sqrt{7}}{224}$	
562	symmetry	$\frac{y(15x^4 - 40x^2y^2 + 30x^2z^2 + 8y^4 - 40y^2z^2 + 15z^4)}{8}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{Q}_{5,1}^{(a)}(T_u, 1)$	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 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 $-\frac{\sqrt{7}i}{224}$	
563	symmetry	$\frac{z(15x^4+30x^2y^2-40x^2z^2+15y^4-40y^2z^2+8z^4)}{8}$
$\mathbb{Q}_{5,2}^{(a)}(T_u, 1)$	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 0 $\frac{\sqrt{3}}{6}$ 0 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 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 0 $-\frac{5\sqrt{6}}{42}$ 0 0 0 0 0 0 $\frac{\sqrt{2}}{14}$ 0 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 0 $-\frac{5\sqrt{6}}{84}$ 0 0 0 0 0 0 0 $-\frac{3\sqrt{15}}{70}$ 0 0	
564	symmetry	$\frac{3\sqrt{35}x(y^2-2yz-z^2)(y^2+2yz-z^2)}{8}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{Q}_{5,0}^{(a)}(T_u, 2)$		$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}}{80} & 0 & \frac{\sqrt{35}}{80} & 0 & \frac{3\sqrt{21}}{80} & 0 & \frac{1}{16} \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{3}}{80} & 0 & \frac{3\sqrt{7}}{80} & 0 & -\frac{\sqrt{105}}{80} & 0 & -\frac{3\sqrt{21}}{80} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{21}}{80} & 0 & -\frac{\sqrt{105}}{80} & 0 & \frac{3\sqrt{7}}{80} & 0 & \frac{3\sqrt{3}}{80} \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{1}{16} & 0 & \frac{3\sqrt{21}}{80} & 0 & \frac{\sqrt{35}}{80} & 0 & -\frac{\sqrt{7}}{80} & 0 \\ 0 & -\frac{\sqrt{42}}{224} & 0 & -\frac{3\sqrt{21}}{112} & 0 & -\frac{\sqrt{210}}{224} & -\frac{\sqrt{5}}{160} & 0 & \frac{\sqrt{105}}{224} & 0 & \frac{9\sqrt{7}}{224} & 0 & \frac{\sqrt{35}}{224} & 0 \\ -\frac{\sqrt{42}}{224} & 0 & \frac{\sqrt{105}}{112} & 0 & \frac{3\sqrt{210}}{224} & 0 & 0 & \frac{23\sqrt{7}}{1120} & 0 & -\frac{13\sqrt{35}}{1120} & 0 & -\frac{9\sqrt{21}}{1120} & 0 & \frac{1}{32} \\ 0 & \frac{\sqrt{105}}{112} & 0 & -\frac{\sqrt{210}}{112} & 0 & -\frac{3\sqrt{21}}{112} & -\frac{9\sqrt{2}}{160} & 0 & -\frac{11\sqrt{42}}{1120} & 0 & \frac{\sqrt{70}}{1120} & 0 & -\frac{27\sqrt{14}}{1120} & 0 \\ -\frac{3\sqrt{21}}{112} & 0 & -\frac{\sqrt{210}}{112} & 0 & \frac{\sqrt{105}}{112} & 0 & 0 & \frac{27\sqrt{14}}{1120} & 0 & -\frac{\sqrt{70}}{1120} & 0 & \frac{11\sqrt{42}}{1120} & 0 & \frac{9\sqrt{2}}{160} \\ 0 & \frac{3\sqrt{210}}{224} & 0 & \frac{\sqrt{105}}{112} & 0 & -\frac{\sqrt{42}}{224} & -\frac{1}{32} & 0 & \frac{9\sqrt{21}}{1120} & 0 & \frac{13\sqrt{35}}{1120} & 0 & -\frac{23\sqrt{7}}{1120} & 0 \\ -\frac{\sqrt{210}}{224} & 0 & -\frac{3\sqrt{21}}{112} & 0 & -\frac{\sqrt{42}}{224} & 0 & 0 & -\frac{\sqrt{35}}{224} & 0 & -\frac{9\sqrt{7}}{224} & 0 & -\frac{\sqrt{105}}{224} & 0 & \frac{\sqrt{5}}{160} \end{bmatrix}$
		$\frac{3\sqrt{35}y(x^2 - 2xz - z^2)(x^2 + 2xz - z^2)}{8}$
$\mathbb{Q}_{5,1}^{(a)}(T_u, 2)$		$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}i}{80} & 0 & -\frac{\sqrt{35}i}{80} & 0 & \frac{3\sqrt{21}i}{80} & 0 & -\frac{i}{16} \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{3}i}{80} & 0 & \frac{3\sqrt{7}i}{80} & 0 & \frac{\sqrt{105}i}{80} & 0 & -\frac{3\sqrt{21}i}{80} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{21}i}{80} & 0 & -\frac{\sqrt{105}i}{80} & 0 & -\frac{3\sqrt{7}i}{80} & 0 & \frac{3\sqrt{3}i}{80} \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{i}{16} & 0 & -\frac{3\sqrt{21}i}{80} & 0 & \frac{\sqrt{35}i}{80} & 0 & \frac{\sqrt{7}i}{80} & 0 \\ 0 & \frac{\sqrt{42}i}{224} & 0 & -\frac{3\sqrt{21}i}{112} & 0 & \frac{\sqrt{210}i}{224} & -\frac{\sqrt{5}i}{160} & 0 & -\frac{\sqrt{105}i}{224} & 0 & \frac{9\sqrt{7}i}{224} & 0 & -\frac{\sqrt{35}i}{224} & 0 \\ -\frac{\sqrt{42}i}{224} & 0 & -\frac{\sqrt{105}i}{112} & 0 & \frac{3\sqrt{210}i}{224} & 0 & 0 & \frac{23\sqrt{7}i}{1120} & 0 & \frac{13\sqrt{35}i}{1120} & 0 & -\frac{9\sqrt{21}i}{1120} & 0 & -\frac{i}{32} \\ 0 & \frac{\sqrt{105}i}{112} & 0 & \frac{\sqrt{210}i}{112} & 0 & -\frac{3\sqrt{21}i}{112} & \frac{9\sqrt{2}i}{160} & 0 & -\frac{11\sqrt{42}i}{1120} & 0 & -\frac{\sqrt{70}i}{1120} & 0 & -\frac{27\sqrt{14}i}{1120} & 0 \\ \frac{3\sqrt{21}i}{112} & 0 & -\frac{\sqrt{210}i}{112} & 0 & -\frac{\sqrt{105}i}{112} & 0 & 0 & -\frac{27\sqrt{14}i}{1120} & 0 & -\frac{\sqrt{70}i}{1120} & 0 & -\frac{11\sqrt{42}i}{1120} & 0 & \frac{9\sqrt{2}i}{160} \\ 0 & -\frac{3\sqrt{210}i}{224} & 0 & \frac{\sqrt{105}i}{112} & 0 & \frac{\sqrt{42}i}{224} & -\frac{i}{32} & 0 & -\frac{9\sqrt{21}i}{1120} & 0 & \frac{13\sqrt{35}i}{1120} & 0 & \frac{23\sqrt{7}i}{1120} & 0 \\ -\frac{\sqrt{210}i}{224} & 0 & \frac{3\sqrt{21}i}{112} & 0 & -\frac{\sqrt{42}i}{224} & 0 & 0 & -\frac{\sqrt{35}i}{224} & 0 & \frac{9\sqrt{7}i}{224} & 0 & -\frac{\sqrt{105}i}{224} & 0 & -\frac{\sqrt{5}i}{160} \end{bmatrix}$
		$\frac{3\sqrt{35}y(x^2 - 2xy - y^2)(x^2 + 2xy - y^2)}{8}$
566	symmetry	$\frac{3\sqrt{35}z(x^2 - 2xy - y^2)(x^2 + 2xy - y^2)}{8}$

continued ...

Table 9

No.	multipole	matrix
	$\mathbb{Q}_{5,2}^{(a)}(T_u, 2)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}}{10} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{10} \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{10} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}}{10} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{42}}{28} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{105}}{70} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{42}}{28} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}}{70} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}}{10} \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ -\frac{\sqrt{42}}{28} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}}{70} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{42}}{28} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{105}}{70} & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
567	symmetry	$\frac{\sqrt{105}x(y-z)(y+z)(2x^2-y^2-z^2)}{4}$
	$\mathbb{Q}_{5,0}^{(a)}(T_u, 3)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{21}}{120} & 0 & \frac{\sqrt{105}}{120} & 0 & -\frac{\sqrt{7}}{40} & 0 & -\frac{\sqrt{3}}{8} \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{1}{40} & 0 & \frac{\sqrt{21}}{40} & 0 & -\frac{\sqrt{35}}{40} & 0 & \frac{\sqrt{7}}{40} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}}{40} & 0 & -\frac{\sqrt{35}}{40} & 0 & \frac{\sqrt{21}}{40} & 0 & -\frac{1}{40} \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{8} & 0 & -\frac{\sqrt{7}}{40} & 0 & \frac{\sqrt{105}}{120} & 0 & -\frac{\sqrt{21}}{120} & 0 \\ 0 & -\frac{\sqrt{14}}{112} & 0 & \frac{\sqrt{7}}{56} & 0 & \frac{3\sqrt{70}}{112} & -\frac{\sqrt{15}}{240} & 0 & \frac{\sqrt{35}}{112} & 0 & -\frac{\sqrt{21}}{112} & 0 & -\frac{\sqrt{105}}{112} & 0 \\ -\frac{\sqrt{14}}{112} & 0 & \frac{\sqrt{35}}{56} & 0 & -\frac{\sqrt{70}}{112} & 0 & 0 & \frac{23\sqrt{21}}{1680} & 0 & -\frac{13\sqrt{105}}{1680} & 0 & \frac{3\sqrt{7}}{560} & 0 & -\frac{\sqrt{3}}{16} \\ 0 & \frac{\sqrt{35}}{56} & 0 & -\frac{\sqrt{70}}{56} & 0 & \frac{\sqrt{7}}{56} & \frac{\sqrt{6}}{80} & 0 & -\frac{11\sqrt{14}}{560} & 0 & \frac{\sqrt{210}}{1680} & 0 & \frac{3\sqrt{42}}{560} & 0 \\ \frac{\sqrt{7}}{56} & 0 & -\frac{\sqrt{70}}{56} & 0 & \frac{\sqrt{35}}{56} & 0 & 0 & -\frac{3\sqrt{42}}{560} & 0 & -\frac{\sqrt{210}}{1680} & 0 & \frac{11\sqrt{14}}{560} & 0 & -\frac{\sqrt{6}}{80} \\ 0 & -\frac{\sqrt{70}}{112} & 0 & \frac{\sqrt{35}}{56} & 0 & -\frac{\sqrt{14}}{112} & \frac{\sqrt{3}}{16} & 0 & -\frac{3\sqrt{7}}{560} & 0 & \frac{13\sqrt{105}}{1680} & 0 & -\frac{23\sqrt{21}}{1680} & 0 \\ \frac{3\sqrt{70}}{112} & 0 & \frac{\sqrt{7}}{56} & 0 & -\frac{\sqrt{14}}{112} & 0 & 0 & \frac{\sqrt{105}}{112} & 0 & \frac{\sqrt{21}}{112} & 0 & -\frac{\sqrt{35}}{112} & 0 & \frac{\sqrt{15}}{240} \end{bmatrix}$
568	symmetry	$\frac{\sqrt{105}y(x-z)(x+z)(x^2-2y^2+z^2)}{4}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{Q}_{5,1}^{(a)}(T_u, 3)$	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 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 $\frac{\sqrt{15}i}{240}$	
569	symmetry	$-\frac{\sqrt{105}z(x-y)(x+y)(x^2+y^2-2z^2)}{4}$
$\mathbb{Q}_{5,2}^{(a)}(T_u, 3)$	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 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 0 $\frac{\sqrt{35}}{28}$ 0 0 0 $-\frac{\sqrt{3}}{30}$ 0 0 0 $-\frac{\sqrt{105}}{105}$ 0 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 0	
570	symmetry	$\sqrt{15}xyz$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{Q}_3^{(1,-1;a)}(A_u)$	$x\left(\frac{2x^2-3y^2-3z^2}{2}\right)$	$\begin{bmatrix} 0 & 0 & 0 & \frac{\sqrt{5}i}{35} & 0 & 0 & -\frac{\sqrt{21}i}{28} & 0 & 0 & 0 & \frac{\sqrt{15}i}{28} & 0 & 0 & 0 \\ \frac{\sqrt{6}i}{42} & 0 & 0 & 0 & \frac{\sqrt{30}i}{210} & 0 & 0 & \frac{3i}{28} & 0 & 0 & 0 & \frac{3\sqrt{3}i}{28} & 0 & 0 \\ 0 & -\frac{\sqrt{30}i}{210} & 0 & 0 & 0 & -\frac{\sqrt{6}i}{42} & 0 & 0 & \frac{3\sqrt{3}i}{28} & 0 & 0 & 0 & \frac{3i}{28} & 0 \\ 0 & 0 & -\frac{\sqrt{5}i}{35} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{28} & 0 & 0 & 0 & -\frac{\sqrt{21}i}{28} \\ 0 & 0 & -\frac{3i}{28} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{2\sqrt{3}i}{21} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{3\sqrt{5}i}{140} & 0 & 0 & -\frac{\sqrt{21}i}{21} & 0 & 0 & 0 & -\frac{\sqrt{15}i}{21} & 0 & 0 & 0 \\ \frac{3i}{28} & 0 & 0 & 0 & \frac{3\sqrt{5}i}{140} & 0 & 0 & -\frac{\sqrt{6}i}{42} & 0 & 0 & 0 & -\frac{\sqrt{2}i}{14} & 0 & 0 \\ 0 & \frac{3\sqrt{5}i}{140} & 0 & 0 & 0 & \frac{3i}{28} & 0 & 0 & \frac{\sqrt{2}i}{14} & 0 & 0 & 0 & \frac{\sqrt{6}i}{42} & 0 \\ 0 & 0 & -\frac{3\sqrt{5}i}{140} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{21} & 0 & 0 & 0 & \frac{\sqrt{21}i}{21} & 0 \\ 0 & 0 & 0 & -\frac{3i}{28} & 0 & 0 & 0 & 0 & 0 & \frac{2\sqrt{3}i}{21} & 0 & 0 & 0 & 0 \end{bmatrix}$
	$y\left(\frac{3x^2-2y^2+3z^2}{2}\right)$	
	571 symmetry	
		$\begin{bmatrix} -\frac{\sqrt{30}}{280} & 0 & \frac{3\sqrt{3}}{140} & 0 & -\frac{\sqrt{6}}{56} & 0 & 0 & -\frac{3\sqrt{5}}{56} & 0 & \frac{3}{28} & 0 & -\frac{\sqrt{15}}{56} & 0 & 0 \\ 0 & \frac{\sqrt{2}}{40} & 0 & -\frac{1}{140} & 0 & -\frac{\sqrt{10}}{56} & -\frac{\sqrt{105}}{56} & 0 & 0 & 0 & \frac{3\sqrt{3}}{56} & 0 & -\frac{\sqrt{15}}{28} & 0 \\ \frac{\sqrt{10}}{56} & 0 & \frac{1}{140} & 0 & -\frac{\sqrt{2}}{40} & 0 & 0 & -\frac{\sqrt{15}}{28} & 0 & 0 & \frac{3\sqrt{3}}{56} & 0 & 0 & -\frac{\sqrt{105}}{56} \\ 0 & \frac{\sqrt{6}}{56} & 0 & -\frac{3\sqrt{3}}{140} & 0 & \frac{\sqrt{30}}{280} & 0 & 0 & -\frac{\sqrt{15}}{56} & 0 & \frac{3}{28} & 0 & -\frac{3\sqrt{5}}{56} & 0 \\ 0 & -\frac{3\sqrt{30}}{280} & 0 & \frac{\sqrt{15}}{56} & 0 & 0 & \frac{\sqrt{7}}{28} & 0 & -\frac{\sqrt{3}}{14} & 0 & \frac{\sqrt{5}}{28} & 0 & 0 & 0 \\ -\frac{3\sqrt{30}}{280} & 0 & \frac{3\sqrt{3}}{280} & 0 & \frac{\sqrt{6}}{28} & 0 & 0 & -\frac{\sqrt{5}}{28} & 0 & -\frac{1}{14} & 0 & \frac{\sqrt{15}}{28} & 0 & 0 \\ 0 & \frac{3\sqrt{3}}{280} & 0 & \frac{3\sqrt{6}}{140} & 0 & \frac{\sqrt{15}}{56} & -\frac{\sqrt{70}}{56} & 0 & -\frac{\sqrt{30}}{56} & 0 & \frac{\sqrt{2}}{56} & 0 & \frac{3\sqrt{10}}{56} & 0 \\ \frac{\sqrt{15}}{56} & 0 & \frac{3\sqrt{6}}{140} & 0 & \frac{3\sqrt{3}}{280} & 0 & 0 & -\frac{3\sqrt{10}}{56} & 0 & -\frac{\sqrt{2}}{56} & 0 & \frac{\sqrt{30}}{56} & 0 & \frac{\sqrt{70}}{56} \\ 0 & \frac{\sqrt{6}}{28} & 0 & \frac{3\sqrt{3}}{280} & 0 & -\frac{3\sqrt{30}}{280} & 0 & 0 & -\frac{\sqrt{15}}{28} & 0 & \frac{1}{14} & 0 & \frac{\sqrt{5}}{28} & 0 \\ 0 & 0 & \frac{\sqrt{15}}{56} & 0 & -\frac{3\sqrt{30}}{280} & 0 & 0 & 0 & -\frac{\sqrt{5}}{28} & 0 & \frac{\sqrt{3}}{14} & 0 & -\frac{\sqrt{7}}{28} & 0 \end{bmatrix}$
572	symmetry	

continued ...

Table 9

No.	multipole	matrix
$\mathbb{Q}_{3,1}^{(1,-1;a)}(T_u, 1)$	$-\frac{\sqrt{30}i}{280}$	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 $\frac{\sqrt{7}i}{28}$
573	symmetry	$-\frac{z(3x^2+3y^2-2z^2)}{2}$
$\mathbb{Q}_{3,2}^{(1,-1;a)}(T_u, 1)$	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 0 $-\frac{\sqrt{3}}{14}$ 0 0 0 0
	0	0 0 $\frac{2}{35}$ 0 0 0 0 0 0 0 $\frac{\sqrt{3}}{14}$ 0 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 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	0 $-\frac{\sqrt{6}}{35}$ 0 0 0 0 0 0 $-\frac{\sqrt{2}}{7}$ 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 0 $\frac{\sqrt{6}}{20}$ 0 0 0 0 0 0 0 0 0
	0	0 0 0 0 0 $-\frac{\sqrt{6}}{28}$ 0 0 0 0 0 0 0 $\frac{2}{7}$ 0
574	symmetry	$\frac{\sqrt{15}x(y-z)(y+z)}{2}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{Q}_{3,0}^{(1,-1;a)}(T_u, 2)$	$\begin{bmatrix} -\frac{\sqrt{2}}{56} & 0 & \frac{3\sqrt{5}}{140} & 0 & \frac{3\sqrt{10}}{280} & 0 & 0 & -\frac{5\sqrt{3}}{56} & 0 & \frac{\sqrt{15}}{28} & 0 & \frac{3}{56} & 0 & 0 \\ 0 & \frac{\sqrt{30}}{120} & 0 & -\frac{\sqrt{15}}{420} & 0 & \frac{\sqrt{6}}{56} & \frac{3\sqrt{7}}{56} & 0 & 0 & 0 & \frac{3\sqrt{5}}{56} & 0 & \frac{3}{28} & 0 \\ -\frac{\sqrt{6}}{56} & 0 & \frac{\sqrt{15}}{420} & 0 & -\frac{\sqrt{30}}{120} & 0 & 0 & \frac{3}{28} & 0 & \frac{3\sqrt{5}}{56} & 0 & 0 & 0 & \frac{3\sqrt{7}}{56} \\ 0 & -\frac{3\sqrt{10}}{280} & 0 & -\frac{3\sqrt{5}}{140} & 0 & \frac{\sqrt{2}}{56} & 0 & 0 & \frac{3}{56} & 0 & \frac{\sqrt{15}}{28} & 0 & -\frac{5\sqrt{3}}{56} & 0 \\ 0 & -\frac{3\sqrt{2}}{56} & 0 & -\frac{3}{56} & 0 & 0 & \frac{\sqrt{105}}{84} & 0 & -\frac{\sqrt{5}}{14} & 0 & -\frac{\sqrt{3}}{28} & 0 & 0 & 0 \\ -\frac{3\sqrt{2}}{56} & 0 & \frac{3\sqrt{5}}{280} & 0 & -\frac{3\sqrt{10}}{140} & 0 & 0 & -\frac{5\sqrt{3}}{84} & 0 & -\frac{\sqrt{15}}{42} & 0 & -\frac{3}{28} & 0 & 0 \\ 0 & \frac{3\sqrt{5}}{280} & 0 & \frac{3\sqrt{10}}{140} & 0 & -\frac{3}{56} & \frac{\sqrt{42}}{56} & 0 & -\frac{5\sqrt{2}}{56} & 0 & \frac{\sqrt{30}}{168} & 0 & -\frac{3\sqrt{6}}{56} & 0 \\ -\frac{3}{56} & 0 & \frac{3\sqrt{10}}{140} & 0 & \frac{3\sqrt{5}}{280} & 0 & 0 & \frac{3\sqrt{6}}{56} & 0 & -\frac{\sqrt{30}}{168} & 0 & \frac{5\sqrt{2}}{56} & 0 & -\frac{\sqrt{42}}{56} \\ 0 & -\frac{3\sqrt{10}}{140} & 0 & \frac{3\sqrt{5}}{280} & 0 & -\frac{3\sqrt{2}}{56} & 0 & 0 & \frac{3}{28} & 0 & \frac{\sqrt{15}}{42} & 0 & \frac{5\sqrt{3}}{84} & 0 \\ 0 & 0 & -\frac{3}{56} & 0 & -\frac{3\sqrt{2}}{56} & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{28} & 0 & \frac{\sqrt{5}}{14} & 0 & -\frac{\sqrt{105}}{84} \end{bmatrix}$	
		$-\frac{\sqrt{15}y(x-z)(x+z)}{2}$
$\mathbb{Q}_{3,1}^{(1,-1;a)}(T_u, 2)$	$\begin{bmatrix} \frac{\sqrt{2}i}{56} & 0 & \frac{3\sqrt{5}i}{140} & 0 & -\frac{3\sqrt{10}i}{280} & 0 & 0 & \frac{5\sqrt{3}i}{56} & 0 & \frac{\sqrt{15}i}{28} & 0 & -\frac{3i}{56} & 0 & 0 \\ 0 & -\frac{\sqrt{30}i}{120} & 0 & -\frac{\sqrt{15}i}{420} & 0 & -\frac{\sqrt{6}i}{56} & \frac{3\sqrt{7}i}{56} & 0 & 0 & 0 & \frac{3\sqrt{5}i}{56} & 0 & -\frac{3i}{28} & 0 \\ -\frac{\sqrt{6}i}{56} & 0 & -\frac{\sqrt{15}i}{420} & 0 & -\frac{\sqrt{30}i}{120} & 0 & 0 & \frac{3i}{28} & 0 & -\frac{3\sqrt{5}i}{56} & 0 & 0 & 0 & -\frac{3\sqrt{7}i}{56} \\ 0 & -\frac{3\sqrt{10}i}{280} & 0 & \frac{3\sqrt{5}i}{140} & 0 & \frac{\sqrt{2}i}{56} & 0 & 0 & \frac{3i}{56} & 0 & -\frac{\sqrt{15}i}{28} & 0 & -\frac{5\sqrt{3}i}{56} & 0 \\ 0 & -\frac{3\sqrt{2}i}{56} & 0 & \frac{3i}{56} & 0 & 0 & -\frac{\sqrt{105}i}{84} & 0 & -\frac{\sqrt{5}i}{14} & 0 & \frac{\sqrt{3}i}{28} & 0 & 0 & 0 \\ \frac{3\sqrt{2}i}{56} & 0 & \frac{3\sqrt{5}i}{280} & 0 & \frac{3\sqrt{10}i}{140} & 0 & 0 & \frac{5\sqrt{3}i}{84} & 0 & -\frac{\sqrt{15}i}{42} & 0 & \frac{3i}{28} & 0 & 0 \\ 0 & -\frac{3\sqrt{5}i}{280} & 0 & \frac{3\sqrt{10}i}{140} & 0 & \frac{3i}{56} & \frac{\sqrt{42}i}{56} & 0 & \frac{5\sqrt{2}i}{56} & 0 & \frac{\sqrt{30}i}{168} & 0 & \frac{3\sqrt{6}i}{56} & 0 \\ -\frac{3i}{56} & 0 & -\frac{3\sqrt{10}i}{140} & 0 & \frac{3\sqrt{5}i}{280} & 0 & 0 & \frac{3\sqrt{6}i}{56} & 0 & \frac{\sqrt{30}i}{168} & 0 & \frac{5\sqrt{2}i}{56} & 0 & \frac{\sqrt{42}i}{56} \\ 0 & -\frac{3\sqrt{10}i}{140} & 0 & -\frac{3\sqrt{5}i}{280} & 0 & -\frac{3\sqrt{2}i}{56} & 0 & 0 & \frac{3i}{28} & 0 & -\frac{\sqrt{15}i}{42} & 0 & \frac{5\sqrt{3}i}{84} & 0 \\ 0 & 0 & -\frac{3i}{56} & 0 & \frac{3\sqrt{2}i}{56} & 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{28} & 0 & -\frac{\sqrt{5}i}{14} & 0 & -\frac{\sqrt{105}i}{84} \end{bmatrix}$	$-\frac{\sqrt{15}y(x-z)(x+z)}{2}$
		$\frac{\sqrt{15}z(x-y)(x+y)}{2}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{Q}_{3,2}^{(1,-1;a)}(T_u, 2)$	$0 \quad 0 \quad 0 \quad -\frac{\sqrt{5}}{35} \quad 0 \quad 0 \quad -\frac{\sqrt{21}}{28} \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{15}}{28} \quad 0 \quad 0 \quad 0$	
	$\frac{\sqrt{6}}{42} \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{30}}{210} \quad 0 \quad 0 \quad \frac{3}{28} \quad 0 \quad 0 \quad 0 \quad -\frac{3\sqrt{3}}{28} \quad 0 \quad 0$	
	$0 \quad -\frac{\sqrt{30}}{210} \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{6}}{42} \quad 0 \quad 0 \quad \frac{3\sqrt{3}}{28} \quad 0 \quad 0 \quad 0 \quad -\frac{3}{28} \quad 0$	
	$0 \quad 0 \quad -\frac{\sqrt{5}}{35} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{15}}{28} \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{21}}{28}$	
	$0 \quad 0 \quad \frac{3}{28} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{2\sqrt{3}}{21} \quad 0 \quad 0 \quad 0 \quad 0$	
	$0 \quad 0 \quad 0 \quad \frac{3\sqrt{5}}{140} \quad 0 \quad 0 \quad -\frac{\sqrt{21}}{21} \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{15}}{21} \quad 0 \quad 0 \quad 0$	
	$\frac{3}{28} \quad 0 \quad 0 \quad 0 \quad -\frac{3\sqrt{5}}{140} \quad 0 \quad 0 \quad -\frac{\sqrt{6}}{42} \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{2}}{14} \quad 0 \quad 0$	
	$0 \quad \frac{3\sqrt{5}}{140} \quad 0 \quad 0 \quad 0 \quad -\frac{3}{28} \quad 0 \quad 0 \quad \frac{\sqrt{2}}{14} \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{6}}{42} \quad 0$	
	$0 \quad 0 \quad -\frac{3\sqrt{5}}{140} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{15}}{21} \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{21}}{21}$	
	$0 \quad 0 \quad 0 \quad -\frac{3}{28} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{2\sqrt{3}}{21} \quad 0 \quad 0 \quad 0$	
577	symmetry	$\frac{3\sqrt{35}xyz(x-y)(x+y)}{2}$
$\mathbb{Q}_{5,0}^{(1,-1;a)}(E_u)$	$0 \quad 0 \quad -\frac{\sqrt{210}i}{100} \quad 0$	
	$0 \quad 0 \quad \frac{3\sqrt{10}i}{100}$	
	$0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{3\sqrt{10}i}{100} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0$	
	$0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{210}i}{100} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0$	
	$0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{35}i}{70} \quad 0 \quad \frac{3\sqrt{14}i}{35} \quad 0 \quad 0$	
	$0 \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{35}i}{70} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{210}i}{175} \quad 0$	
	$0 \quad 0 \quad -\frac{2\sqrt{15}i}{25}$	
	$0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{2\sqrt{15}i}{25} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0$	
	$-\frac{\sqrt{35}i}{70} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{210}i}{175} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0$	
	$0 \quad \frac{\sqrt{35}i}{70} \quad 0 \quad -\frac{3\sqrt{14}i}{35} \quad 0 \quad 0 \quad 0 \quad 0$	
578	symmetry	$\frac{\sqrt{105}xyz(x^2+y^2-2z^2)}{2}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{Q}_{5,1}^{(1,-1;a)}(E_u)$	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 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 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 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	
579	symmetry	$\frac{x(8x^4 - 40x^2y^2 - 40x^2z^2 + 15y^4 + 30y^2z^2 + 15z^4)}{8}$
$\mathbb{Q}_{5,0}^{(1,-1;a)}(T_u, 1)$	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 $-\frac{\sqrt{210}}{560}$	
580	symmetry	$\frac{y(15x^4 - 40x^2y^2 + 30x^2z^2 + 8y^4 - 40y^2z^2 + 15z^4)}{8}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{Q}_{5,1}^{(1,-1;a)}(T_u, 1)$	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 $\frac{\sqrt{210}i}{560}$	
581	symmetry	$\frac{z(15x^4+30x^2y^2-40x^2z^2+15y^4-40y^2z^2+8z^4)}{8}$
$\mathbb{Q}_{5,2}^{(1,-1;a)}(T_u, 1)$	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 0 $-\frac{\sqrt{10}}{20}$ 0 0 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 0 0 $-\frac{\sqrt{2}}{20}$ 0 0 0	
	$-\frac{\sqrt{5}}{210}$ 0 0 0 0 0 0 0 $-\frac{\sqrt{30}}{35}$ 0 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	
	0 0 $-\frac{\sqrt{5}}{21}$ 0 0 0 0 0 0 $-\frac{2\sqrt{15}}{35}$ 0 0 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 0 0 $-\frac{\sqrt{5}}{42}$ 0 0 0 0 0 0 0 $\frac{9\sqrt{2}}{35}$ 0 0 0	
582	symmetry	$\frac{3\sqrt{35}x(y^2-2yz-z^2)(y^2+2yz-z^2)}{8}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{Q}_{5,0}^{(1,-1;a)}(T_u, 2)$	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 $-\frac{\sqrt{6}}{80}$	
583	symmetry	$\frac{3\sqrt{35}y(x^2 - 2xz - z^2)(x^2 + 2xz - z^2)}{8}$
$\mathbb{Q}_{5,1}^{(1,-1;a)}(T_u, 2)$	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 $\frac{\sqrt{6}i}{80}$	
584	symmetry	$\frac{3\sqrt{35}z(x^2 - 2xy - y^2)(x^2 + 2xy - y^2)}{8}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{Q}_{5,2}^{(1,-1;a)}(T_u, 2)$	0 0 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 0 0 0 0 0 0 0	0 $-\frac{3\sqrt{10}}{100}$
	0 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 0 0 0 0 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 0 0 0 0 0 0 0 0 0 0 0 0 0
	0 0 0 0 $-\frac{\sqrt{35}}{70}$ 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 $-\frac{3\sqrt{14}}{35}$ 0 0 0 0 0 0 0 0 0 0 0
	0 0 0 0 0 0 $\frac{\sqrt{35}}{70}$ 0 0 0 0 0 0 0 0 0 0	0 0 0 0 $-\frac{\sqrt{210}}{175}$ 0 0 0 0 0 0 0 0 0 0 0
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 $\frac{2\sqrt{15}}{25}$
	0 0 0 0 0 0 0 0 $\frac{2\sqrt{15}}{25}$ 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
	$-\frac{\sqrt{35}}{70}$ 0 0 0 0 0 0 0 $-\frac{\sqrt{210}}{175}$ 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
	0 $\frac{\sqrt{35}}{70}$ 0 0 0 0 0 0 0 0 $-\frac{3\sqrt{14}}{35}$ 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
585	symmetry	$\frac{\sqrt{105}x(y-z)(y+z)(2x^2-y^2-z^2)}{4}$
$\mathbb{Q}_{5,0}^{(1,-1;a)}(T_u, 3)$	0 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 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 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 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 $-\frac{\sqrt{2}}{40}$	
586	symmetry	$\frac{\sqrt{105}y(x-z)(x+z)(x^2-2y^2+z^2)}{4}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{Q}_{5,1}^{(1,-1;a)}(T_u, 3)$	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 $-\frac{11\sqrt{105}i}{700}$ 0 $-\frac{3\sqrt{5}i}{100}$	
	$\frac{\sqrt{210}i}{840}$ 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 $-\frac{\sqrt{2}i}{40}$	
587	symmetry	$-\frac{\sqrt{105}z(x-y)(x+y)(x^2+y^2-2z^2)}{4}$
$\mathbb{Q}_{5,2}^{(1,-1;a)}(T_u, 3)$	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 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 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	
588	symmetry	x

continued ...

Table 9

No.	multipole	matrix
$\mathbb{Q}_{1,0}^{(1,0;a)}(T_u)$	$\frac{\sqrt{10}}{20} 0 -\frac{1}{20} 0 0 0 0 0 0 0 0 0 0 0 0 0 0$	
	$0 \frac{\sqrt{6}}{20} 0 -\frac{\sqrt{3}}{20} 0 0 0 0 0 0 0 0 0 0 0 0 0$	
	$0 0 \frac{\sqrt{3}}{20} 0 -\frac{\sqrt{6}}{20} 0 0 0 0 0 0 0 0 0 0 0 0$	
	$0 0 0 \frac{1}{20} 0 -\frac{\sqrt{10}}{20} 0 0 0 0 0 0 0 0 0 0 0$	
	$0 0 \frac{3\sqrt{10}}{70} 0 0 0 0 -\frac{\sqrt{21}}{28} 0 \frac{1}{28} 0 0 0 0 0 0 0$	
	$\frac{3\sqrt{10}}{70} 0 \frac{6}{35} 0 0 0 0 0 -\frac{\sqrt{15}}{28} 0 \frac{\sqrt{3}}{28} 0 0 0 0 0 0$	
	$0 \frac{6}{35} 0 \frac{9\sqrt{2}}{70} 0 0 0 0 0 -\frac{\sqrt{10}}{28} 0 \frac{\sqrt{6}}{28} 0 0 0 0 0$	
	$0 0 \frac{9\sqrt{2}}{70} 0 \frac{6}{35} 0 0 0 0 0 -\frac{\sqrt{6}}{28} 0 \frac{\sqrt{10}}{28} 0 0 0$	
	$0 0 0 \frac{6}{35} 0 \frac{3\sqrt{10}}{70} 0 0 0 0 0 -\frac{\sqrt{3}}{28} 0 \frac{\sqrt{15}}{28} 0$	
	$0 0 0 0 \frac{3\sqrt{10}}{70} 0 0 0 0 0 0 0 -\frac{1}{28} 0 \frac{\sqrt{21}}{28}$	
589	symmetry	y
$\mathbb{Q}_{1,1}^{(1,0;a)}(T_u)$	$\frac{\sqrt{10}i}{20} 0 \frac{i}{20} 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0$	
	$0 \frac{\sqrt{6}i}{20} 0 \frac{\sqrt{3}i}{20} 0 0 0 0 0 0 0 0 0 0 0 0 0$	
	$0 0 \frac{\sqrt{3}i}{20} 0 \frac{\sqrt{6}i}{20} 0 0 0 0 0 0 0 0 0 0 0 0$	
	$0 0 0 \frac{i}{20} 0 \frac{\sqrt{10}i}{20} 0 0 0 0 0 0 0 0 0 0 0$	
	$0 -\frac{3\sqrt{10}i}{70} 0 0 0 0 -\frac{\sqrt{21}i}{28} 0 -\frac{i}{28} 0 0 0 0 0 0 0 0$	
	$\frac{3\sqrt{10}i}{70} 0 -\frac{6i}{35} 0 0 0 0 -\frac{\sqrt{15}i}{28} 0 -\frac{\sqrt{3}i}{28} 0 0 0 0 0 0 0$	
	$0 \frac{6i}{35} 0 -\frac{9\sqrt{2}i}{70} 0 0 0 0 0 -\frac{\sqrt{10}i}{28} 0 -\frac{\sqrt{6}i}{28} 0 0 0 0$	
	$0 0 \frac{9\sqrt{2}i}{70} 0 -\frac{6i}{35} 0 0 0 0 0 -\frac{\sqrt{6}i}{28} 0 -\frac{\sqrt{10}i}{28} 0 0 0$	
	$0 0 0 \frac{6i}{35} 0 -\frac{3\sqrt{10}i}{70} 0 0 0 0 0 -\frac{\sqrt{3}i}{28} 0 -\frac{\sqrt{15}i}{28} 0$	
	$0 0 0 0 \frac{3\sqrt{10}i}{70} 0 0 0 0 0 0 0 -\frac{i}{28} 0 -\frac{\sqrt{21}i}{28}$	
590	symmetry	z

continued ...

Table 9

No.	multipole	matrix
	$\mathbb{Q}_{1,2}^{(1,0;a)}(T_u)$	$\begin{bmatrix} 0 & -\frac{\sqrt{2}}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{3}}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{3}}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{2}}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ \frac{3\sqrt{2}}{14} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{14} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{9\sqrt{2}}{70} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{5}}{14} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & \frac{3\sqrt{2}}{70} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{14} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{3\sqrt{2}}{70} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{14} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{9\sqrt{2}}{70} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{5}}{14} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{2}}{14} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{14} & 0 \end{bmatrix}$
591	symmetry	$\sqrt{15}xyz$
	$\mathbb{Q}_3^{(1,0;a)}(A_u)$	$\begin{bmatrix} 0 & 0 & 0 & -\frac{\sqrt{210}i}{280} & 0 & 0 & -\frac{\sqrt{2}i}{8} & 0 & 0 & 0 & \frac{\sqrt{70}i}{56} & 0 & 0 & 0 \\ -\frac{\sqrt{7}i}{56} & 0 & 0 & 0 & -\frac{\sqrt{35}i}{280} & 0 & 0 & \frac{\sqrt{42}i}{56} & 0 & 0 & 0 & \frac{3\sqrt{14}i}{56} & 0 & 0 \\ 0 & \frac{\sqrt{35}i}{280} & 0 & 0 & 0 & \frac{\sqrt{7}i}{56} & 0 & 0 & \frac{3\sqrt{14}i}{56} & 0 & 0 & 0 & \frac{\sqrt{42}i}{56} & 0 \\ 0 & 0 & \frac{\sqrt{210}i}{280} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{70}i}{56} & 0 & 0 & 0 & -\frac{\sqrt{2}i}{8} \\ 0 & 0 & \frac{\sqrt{42}i}{28} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{14}i}{84} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{210}i}{140} & 0 & 0 & \frac{\sqrt{2}i}{24} & 0 & 0 & 0 & \frac{\sqrt{70}i}{168} & 0 & 0 & 0 \\ -\frac{\sqrt{42}i}{28} & 0 & 0 & 0 & -\frac{\sqrt{210}i}{140} & 0 & 0 & \frac{\sqrt{7}i}{168} & 0 & 0 & 0 & \frac{\sqrt{21}i}{168} & 0 & 0 \\ 0 & -\frac{\sqrt{210}i}{140} & 0 & 0 & 0 & -\frac{\sqrt{42}i}{28} & 0 & 0 & -\frac{\sqrt{21}i}{168} & 0 & 0 & 0 & -\frac{\sqrt{7}i}{168} & 0 \\ 0 & 0 & \frac{\sqrt{210}i}{140} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}i}{168} & 0 & 0 & 0 & -\frac{\sqrt{2}i}{24} \\ 0 & 0 & 0 & \frac{\sqrt{42}i}{28} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{14}i}{84} & 0 & 0 & 0 & 0 \end{bmatrix}$
592	symmetry	$\frac{x(2x^2-3y^2-3z^2)}{2}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{Q}_{3,0}^{(1,0;a)}(T_u, 1)$	$\begin{bmatrix} \frac{3\sqrt{35}}{1120} & 0 & -\frac{9\sqrt{14}}{1120} & 0 & \frac{3\sqrt{7}}{224} & 0 & 0 & -\frac{\sqrt{210}}{112} & 0 & \frac{\sqrt{42}}{56} & 0 & -\frac{\sqrt{70}}{112} & 0 & 0 \\ 0 & -\frac{\sqrt{21}}{160} & 0 & \frac{\sqrt{42}}{1120} & 0 & \frac{\sqrt{105}}{224} & -\frac{\sqrt{10}}{16} & 0 & 0 & 0 & \frac{3\sqrt{14}}{112} & 0 & -\frac{\sqrt{70}}{56} & 0 \\ -\frac{\sqrt{105}}{224} & 0 & -\frac{\sqrt{42}}{1120} & 0 & \frac{\sqrt{21}}{160} & 0 & 0 & -\frac{\sqrt{70}}{56} & 0 & 0 & \frac{3\sqrt{14}}{112} & 0 & 0 & -\frac{\sqrt{10}}{16} \\ 0 & -\frac{3\sqrt{7}}{224} & 0 & \frac{9\sqrt{14}}{1120} & 0 & -\frac{3\sqrt{35}}{1120} & 0 & 0 & -\frac{\sqrt{70}}{112} & 0 & \frac{\sqrt{42}}{56} & 0 & -\frac{\sqrt{210}}{112} & 0 \\ 0 & \frac{3\sqrt{35}}{140} & 0 & -\frac{\sqrt{70}}{56} & 0 & 0 & -\frac{\sqrt{6}}{96} & 0 & \frac{\sqrt{14}}{112} & 0 & -\frac{\sqrt{210}}{672} & 0 & 0 & 0 \\ \frac{3\sqrt{35}}{140} & 0 & -\frac{3\sqrt{14}}{280} & 0 & -\frac{\sqrt{7}}{14} & 0 & 0 & \frac{\sqrt{210}}{672} & 0 & \frac{\sqrt{42}}{336} & 0 & -\frac{\sqrt{70}}{224} & 0 & 0 \\ 0 & -\frac{3\sqrt{14}}{280} & 0 & -\frac{3\sqrt{7}}{70} & 0 & -\frac{\sqrt{70}}{56} & \frac{\sqrt{15}}{96} & 0 & \frac{\sqrt{35}}{224} & 0 & -\frac{\sqrt{21}}{672} & 0 & -\frac{\sqrt{105}}{224} & 0 \\ -\frac{\sqrt{70}}{56} & 0 & -\frac{3\sqrt{7}}{70} & 0 & -\frac{3\sqrt{14}}{280} & 0 & 0 & \frac{\sqrt{105}}{224} & 0 & \frac{\sqrt{21}}{672} & 0 & -\frac{\sqrt{35}}{224} & 0 & -\frac{\sqrt{15}}{96} \\ 0 & -\frac{\sqrt{7}}{14} & 0 & -\frac{3\sqrt{14}}{280} & 0 & \frac{3\sqrt{35}}{140} & 0 & 0 & \frac{\sqrt{70}}{224} & 0 & -\frac{\sqrt{42}}{336} & 0 & -\frac{\sqrt{210}}{672} & 0 \\ 0 & 0 & -\frac{\sqrt{70}}{56} & 0 & \frac{3\sqrt{35}}{140} & 0 & 0 & 0 & \frac{\sqrt{210}}{672} & 0 & -\frac{\sqrt{14}}{112} & 0 & \frac{\sqrt{6}}{96} \end{bmatrix}$	
	$-\frac{y(3x^2-2y^2+3z^2)}{2}$	
	593	symmetry
	$\begin{bmatrix} \frac{3\sqrt{35}i}{1120} & 0 & \frac{9\sqrt{14}i}{1120} & 0 & \frac{3\sqrt{7}i}{224} & 0 & 0 & -\frac{\sqrt{210}i}{112} & 0 & -\frac{\sqrt{42}i}{56} & 0 & -\frac{\sqrt{70}i}{112} & 0 & 0 \\ 0 & -\frac{\sqrt{21}i}{160} & 0 & -\frac{\sqrt{42}i}{1120} & 0 & \frac{\sqrt{105}i}{224} & \frac{\sqrt{10}i}{16} & 0 & 0 & 0 & -\frac{3\sqrt{14}i}{112} & 0 & -\frac{\sqrt{70}i}{56} & 0 \\ \frac{\sqrt{105}i}{224} & 0 & -\frac{\sqrt{42}i}{1120} & 0 & -\frac{\sqrt{21}i}{160} & 0 & 0 & \frac{\sqrt{70}i}{56} & 0 & \frac{3\sqrt{14}i}{112} & 0 & 0 & 0 & -\frac{\sqrt{10}i}{16} \\ 0 & \frac{3\sqrt{7}i}{224} & 0 & \frac{9\sqrt{14}i}{1120} & 0 & \frac{3\sqrt{35}i}{1120} & 0 & 0 & \frac{\sqrt{70}i}{112} & 0 & \frac{\sqrt{42}i}{56} & 0 & \frac{\sqrt{210}i}{112} & 0 \\ 0 & -\frac{3\sqrt{35}i}{140} & 0 & -\frac{\sqrt{70}i}{56} & 0 & 0 & -\frac{\sqrt{6}i}{96} & 0 & -\frac{\sqrt{14}i}{112} & 0 & -\frac{\sqrt{210}i}{672} & 0 & 0 & 0 \\ \frac{3\sqrt{35}i}{140} & 0 & \frac{3\sqrt{14}i}{280} & 0 & -\frac{\sqrt{7}i}{14} & 0 & 0 & \frac{\sqrt{210}i}{672} & 0 & -\frac{\sqrt{42}i}{336} & 0 & -\frac{\sqrt{70}i}{224} & 0 & 0 \\ 0 & -\frac{3\sqrt{14}i}{280} & 0 & \frac{3\sqrt{7}i}{70} & 0 & -\frac{\sqrt{70}i}{56} & -\frac{\sqrt{15}i}{96} & 0 & \frac{\sqrt{35}i}{224} & 0 & \frac{\sqrt{21}i}{672} & 0 & -\frac{\sqrt{105}i}{224} & 0 \\ \frac{\sqrt{70}i}{56} & 0 & -\frac{3\sqrt{7}i}{70} & 0 & \frac{3\sqrt{14}i}{280} & 0 & 0 & -\frac{\sqrt{105}i}{224} & 0 & \frac{\sqrt{21}i}{672} & 0 & \frac{\sqrt{35}i}{224} & 0 & -\frac{\sqrt{15}i}{96} \\ 0 & \frac{\sqrt{7}i}{14} & 0 & -\frac{3\sqrt{14}i}{280} & 0 & -\frac{3\sqrt{35}i}{140} & 0 & 0 & -\frac{\sqrt{70}i}{224} & 0 & -\frac{\sqrt{42}i}{336} & 0 & \frac{\sqrt{210}i}{672} & 0 \\ 0 & 0 & \frac{\sqrt{70}i}{56} & 0 & \frac{3\sqrt{35}i}{140} & 0 & 0 & 0 & -\frac{\sqrt{210}i}{672} & 0 & -\frac{\sqrt{14}i}{112} & 0 & -\frac{\sqrt{6}i}{96} \end{bmatrix}$	
	$-\frac{y(3x^2-2y^2+3z^2)}{2}$	
	594	symmetry
	$-\frac{z(3x^2+3y^2-2z^2)}{2}$	

continued ...

Table 9

No.	multipole	matrix
$\mathbb{Q}_{3,2}^{(1,0;a)}(T_u, 1)$	0	$\frac{3\sqrt{7}}{140} \quad 0 \quad -\frac{\sqrt{70}}{28} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0$
	0	$0 \quad 0 \quad -\frac{\sqrt{42}}{140} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{14}}{28} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0$
	0	$0 \quad 0 \quad 0 \quad -\frac{\sqrt{42}}{140} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{14}}{28} \quad 0 \quad 0 \quad 0 \quad 0$
	0	$0 \quad 0 \quad 0 \quad 0 \quad \frac{3\sqrt{7}}{140} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{70}}{28} \quad 0 \quad 0 \quad 0$
	$-\frac{\sqrt{7}}{14}$	$0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{42}}{84} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0$
	0	$\frac{\sqrt{7}}{10} \quad 0 \quad 0$
	0	$0 \quad 0 \quad \frac{2\sqrt{7}}{35} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{21}}{84} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0$
	0	$0 \quad 0 \quad 0 \quad -\frac{2\sqrt{7}}{35} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{21}}{84} \quad 0 \quad 0 \quad 0 \quad 0$
	0	$0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{7}}{10} \quad 0 \quad 0$
	0	$0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{7}}{14} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{42}}{84} \quad 0$
595	symmetry	$\frac{\sqrt{15}x(y-z)(y+z)}{2}$
$\mathbb{Q}_{3,0}^{(1,0;a)}(T_u, 2)$	$\frac{\sqrt{21}}{224} \quad 0 \quad -\frac{3\sqrt{210}}{1120} \quad 0 \quad -\frac{3\sqrt{105}}{1120} \quad 0 \quad 0 \quad -\frac{5\sqrt{14}}{112} \quad 0 \quad \frac{\sqrt{70}}{56} \quad 0 \quad \frac{\sqrt{42}}{112} \quad 0 \quad 0$	
	0	$-\frac{\sqrt{35}}{160} \quad 0 \quad \frac{\sqrt{70}}{1120} \quad 0 \quad -\frac{3\sqrt{7}}{224} \quad \frac{\sqrt{6}}{16} \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{210}}{112} \quad 0 \quad \frac{\sqrt{42}}{56} \quad 0$
	$\frac{3\sqrt{7}}{224} \quad 0 \quad -\frac{\sqrt{70}}{1120} \quad 0 \quad \frac{\sqrt{35}}{160} \quad 0 \quad 0 \quad \frac{\sqrt{42}}{56} \quad 0 \quad \frac{\sqrt{210}}{112} \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{6}}{16}$	
	0	$\frac{3\sqrt{105}}{1120} \quad 0 \quad \frac{3\sqrt{210}}{1120} \quad 0 \quad -\frac{\sqrt{21}}{224} \quad 0 \quad 0 \quad \frac{\sqrt{42}}{112} \quad 0 \quad \frac{\sqrt{70}}{56} \quad 0 \quad -\frac{5\sqrt{14}}{112} \quad 0$
	0	$\frac{\sqrt{21}}{28} \quad 0 \quad \frac{\sqrt{42}}{56} \quad 0 \quad 0 \quad -\frac{\sqrt{10}}{96} \quad 0 \quad \frac{\sqrt{210}}{336} \quad 0 \quad \frac{\sqrt{14}}{224} \quad 0 \quad 0 \quad 0$
	$\frac{\sqrt{21}}{28} \quad 0 \quad -\frac{\sqrt{210}}{280} \quad 0 \quad \frac{\sqrt{105}}{70} \quad 0 \quad 0 \quad \frac{5\sqrt{14}}{672} \quad 0 \quad \frac{\sqrt{70}}{336} \quad 0 \quad \frac{\sqrt{42}}{224} \quad 0 \quad 0$	
	0	$-\frac{\sqrt{210}}{280} \quad 0 \quad -\frac{\sqrt{105}}{70} \quad 0 \quad \frac{\sqrt{42}}{56} \quad -\frac{1}{32} \quad 0 \quad \frac{5\sqrt{21}}{672} \quad 0 \quad -\frac{\sqrt{35}}{672} \quad 0 \quad \frac{3\sqrt{7}}{224} \quad 0$
	$\frac{\sqrt{42}}{56} \quad 0 \quad -\frac{\sqrt{105}}{70} \quad 0 \quad -\frac{\sqrt{210}}{280} \quad 0 \quad 0 \quad -\frac{3\sqrt{7}}{224} \quad 0 \quad \frac{\sqrt{35}}{672} \quad 0 \quad -\frac{5\sqrt{21}}{672} \quad 0 \quad \frac{1}{32}$	
	0	$\frac{\sqrt{105}}{70} \quad 0 \quad -\frac{\sqrt{210}}{280} \quad 0 \quad \frac{\sqrt{21}}{28} \quad 0 \quad 0 \quad -\frac{\sqrt{42}}{224} \quad 0 \quad -\frac{\sqrt{70}}{336} \quad 0 \quad -\frac{5\sqrt{14}}{672} \quad 0$
	0	$0 \quad 0 \quad \frac{\sqrt{42}}{56} \quad 0 \quad \frac{\sqrt{21}}{28} \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{14}}{224} \quad 0 \quad -\frac{\sqrt{210}}{336} \quad 0 \quad \frac{\sqrt{10}}{96}$
596	symmetry	$-\frac{\sqrt{15}y(x-z)(x+z)}{2}$

continued ...

Table 9

No.	multipole	matrix												
$\mathbb{Q}_{3,1}^{(1,0;a)}(T_u, 2)$	$-\frac{\sqrt{21}i}{224}$	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	$-\frac{\sqrt{14}i}{224}$	0	$\frac{\sqrt{210}i}{336}$	0	$\frac{\sqrt{10}i}{96}$	
597	symmetry	$\frac{\sqrt{15}z(x-y)(x+y)}{2}$												
$\mathbb{Q}_{3,2}^{(1,0;a)}(T_u, 2)$	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	$\frac{\sqrt{70}}{56}$	0	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	$-\frac{\sqrt{70}}{168}$	0	0	0	$\frac{\sqrt{2}}{24}$	
	0	0	0	$\frac{\sqrt{42}}{28}$	0	0	0	0	0	$-\frac{\sqrt{14}}{84}$	0	0	0	0
598	symmetry	$\frac{3\sqrt{35}xyz(x-y)(x+y)}{2}$												

continued ...

Table 9

No.	multipole	matrix
$\mathbb{Q}_{5,0}^{(1,0;a)}(E_u)$		$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{210}i}{50} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{10}i}{50} \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{10}i}{50} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{210}i}{50} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{3\sqrt{35}i}{70} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{14}i}{140} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{35}i}{70} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{210}i}{2100} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{150} \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{150} & 0 & 0 & 0 & 0 & 0 & 0 \\ \frac{3\sqrt{35}i}{70} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{210}i}{2100} & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{3\sqrt{35}i}{70} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{14}i}{140} & 0 & 0 & 0 & 0 \end{bmatrix}$
		$\frac{\sqrt{105}xyz(x^2+y^2-2z^2)}{2}$
599	symmetry	$\frac{x(8x^4-40x^2y^2-40x^2z^2+15y^4+30y^2z^2+15z^4)}{8}$
$\mathbb{Q}_{5,1}^{(1,0;a)}(E_u)$		$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}i}{100} & 0 & 0 & 0 & \frac{\sqrt{14}i}{20} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{210}i}{100} & 0 & 0 & 0 & -\frac{3\sqrt{70}i}{100} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{70}i}{100} & 0 & 0 & 0 & \frac{\sqrt{210}i}{100} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{14}i}{20} & 0 & 0 & 0 & -\frac{\sqrt{10}i}{100} \\ 0 & 0 & \frac{\sqrt{210}i}{140} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{70}i}{420} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{42}i}{28} & 0 & 0 & \frac{\sqrt{10}i}{300} & 0 & 0 & 0 & -\frac{\sqrt{14}i}{210} & 0 & 0 & 0 \\ -\frac{\sqrt{210}i}{140} & 0 & 0 & 0 & \frac{\sqrt{42}i}{28} & 0 & 0 & -\frac{2\sqrt{35}i}{525} & 0 & 0 & 0 & -\frac{\sqrt{105}i}{1050} & 0 & 0 \\ 0 & \frac{\sqrt{42}i}{28} & 0 & 0 & 0 & -\frac{\sqrt{210}i}{140} & 0 & 0 & \frac{\sqrt{105}i}{1050} & 0 & 0 & 0 & \frac{2\sqrt{35}i}{525} & 0 \\ 0 & 0 & -\frac{\sqrt{42}i}{28} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{14}i}{210} & 0 & 0 & 0 & -\frac{\sqrt{10}i}{300} \\ 0 & 0 & 0 & \frac{\sqrt{210}i}{140} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}i}{420} & 0 & 0 & 0 \end{bmatrix}$
600	symmetry	$\frac{x(8x^4-40x^2y^2-40x^2z^2+15y^4+30y^2z^2+15z^4)}{8}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{Q}_{5,0}^{(1,0;a)}(T_u, 1)$	$0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ -\frac{\sqrt{6}}{80} \ 0 \ \frac{\sqrt{30}}{80} \ 0 \ -\frac{7\sqrt{2}}{80} \ 0 \ \frac{3\sqrt{42}}{80}$	
	$0 \ 0 \ 0 \ 0 \ 0 \ 0 \ -\frac{\sqrt{14}}{80} \ 0 \ \frac{3\sqrt{6}}{80} \ 0 \ -\frac{3\sqrt{10}}{80} \ 0 \ \frac{7\sqrt{2}}{80} \ 0$	
	$0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ \frac{7\sqrt{2}}{80} \ 0 \ -\frac{3\sqrt{10}}{80} \ 0 \ \frac{3\sqrt{6}}{80} \ 0 \ -\frac{\sqrt{14}}{80}$	
	$0 \ 0 \ 0 \ 0 \ 0 \ 0 \ \frac{3\sqrt{42}}{80} \ 0 \ -\frac{7\sqrt{2}}{80} \ 0 \ \frac{\sqrt{30}}{80} \ 0 \ -\frac{\sqrt{6}}{80} \ 0$	
	$0 \ \frac{3}{112} \ 0 \ -\frac{\sqrt{2}}{16} \ 0 \ \frac{9\sqrt{5}}{80} \ -\frac{\sqrt{210}}{6720} \ 0 \ \frac{\sqrt{10}}{448} \ 0 \ -\frac{\sqrt{6}}{192} \ 0 \ \frac{\sqrt{30}}{320} \ 0$	
	$\frac{3}{112} \ 0 \ -\frac{3\sqrt{10}}{112} \ 0 \ \frac{\sqrt{5}}{16} \ 0 \ 0 \ \frac{23\sqrt{6}}{6720} \ 0 \ -\frac{13\sqrt{30}}{6720} \ 0 \ \frac{\sqrt{2}}{320} \ 0 \ \frac{\sqrt{42}}{320}$	
	$0 \ -\frac{3\sqrt{10}}{112} \ 0 \ \frac{3\sqrt{5}}{56} \ 0 \ -\frac{\sqrt{2}}{16} \ \frac{\sqrt{21}}{480} \ 0 \ -\frac{11}{1120} \ 0 \ \frac{\sqrt{15}}{3360} \ 0 \ \frac{\sqrt{3}}{160} \ 0$	
	$-\frac{\sqrt{2}}{16} \ 0 \ \frac{3\sqrt{5}}{56} \ 0 \ -\frac{3\sqrt{10}}{112} \ 0 \ 0 \ -\frac{\sqrt{3}}{160} \ 0 \ -\frac{\sqrt{15}}{3360} \ 0 \ \frac{11}{1120} \ 0 \ -\frac{\sqrt{21}}{480}$	
	$0 \ \frac{\sqrt{5}}{16} \ 0 \ -\frac{3\sqrt{10}}{112} \ 0 \ \frac{3}{112} \ -\frac{\sqrt{42}}{320} \ 0 \ -\frac{\sqrt{2}}{320} \ 0 \ \frac{13\sqrt{30}}{6720} \ 0 \ -\frac{23\sqrt{6}}{6720} \ 0$	
	$\frac{9\sqrt{5}}{80} \ 0 \ -\frac{\sqrt{2}}{16} \ 0 \ \frac{3}{112} \ 0 \ 0 \ -\frac{\sqrt{30}}{320} \ 0 \ \frac{\sqrt{6}}{192} \ 0 \ -\frac{\sqrt{10}}{448} \ 0 \ \frac{\sqrt{210}}{6720}$	
601	symmetry	$\frac{y(15x^4 - 40x^2y^2 + 30x^2z^2 + 8y^4 - 40y^2z^2 + 15z^4)}{8}$
$\mathbb{Q}_{5,1}^{(1,0;a)}(T_u, 1)$	$0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ -\frac{\sqrt{6}i}{80} \ 0 \ -\frac{\sqrt{30}i}{80} \ 0 \ -\frac{7\sqrt{2}i}{80} \ 0 \ -\frac{3\sqrt{42}i}{80}$	
	$0 \ 0 \ 0 \ 0 \ 0 \ 0 \ \frac{\sqrt{14}i}{80} \ 0 \ \frac{3\sqrt{6}i}{80} \ 0 \ \frac{3\sqrt{10}i}{80} \ 0 \ \frac{7\sqrt{2}i}{80} \ 0$	
	$0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ -\frac{7\sqrt{2}i}{80} \ 0 \ -\frac{3\sqrt{10}i}{80} \ 0 \ -\frac{3\sqrt{6}i}{80} \ 0 \ -\frac{\sqrt{14}i}{80}$	
	$0 \ 0 \ 0 \ 0 \ 0 \ 0 \ \frac{3\sqrt{42}i}{80} \ 0 \ \frac{7\sqrt{2}i}{80} \ 0 \ \frac{\sqrt{30}i}{80} \ 0 \ \frac{\sqrt{6}i}{80} \ 0$	
	$0 \ -\frac{3i}{112} \ 0 \ -\frac{\sqrt{2}i}{16} \ 0 \ -\frac{9\sqrt{5}i}{80} \ -\frac{\sqrt{210}i}{6720} \ 0 \ -\frac{\sqrt{10}i}{448} \ 0 \ -\frac{\sqrt{6}i}{192} \ 0 \ -\frac{\sqrt{30}i}{320} \ 0$	
	$\frac{3i}{112} \ 0 \ \frac{3\sqrt{10}i}{112} \ 0 \ \frac{\sqrt{5}i}{16} \ 0 \ 0 \ \frac{23\sqrt{6}i}{6720} \ 0 \ \frac{13\sqrt{30}i}{6720} \ 0 \ \frac{\sqrt{2}i}{320} \ 0 \ -\frac{\sqrt{42}i}{320}$	
	$0 \ -\frac{3\sqrt{10}i}{112} \ 0 \ -\frac{3\sqrt{5}i}{56} \ 0 \ -\frac{\sqrt{2}i}{16} \ -\frac{\sqrt{21}i}{480} \ 0 \ -\frac{11i}{1120} \ 0 \ -\frac{\sqrt{15}i}{3360} \ 0 \ \frac{\sqrt{3}i}{160} \ 0$	
	$\frac{\sqrt{2}i}{16} \ 0 \ \frac{3\sqrt{5}i}{56} \ 0 \ \frac{3\sqrt{10}i}{112} \ 0 \ 0 \ \frac{\sqrt{3}i}{160} \ 0 \ -\frac{\sqrt{15}i}{3360} \ 0 \ -\frac{11i}{1120} \ 0 \ -\frac{\sqrt{21}i}{480}$	
	$0 \ -\frac{\sqrt{5}i}{16} \ 0 \ -\frac{3\sqrt{10}i}{112} \ 0 \ -\frac{3i}{112} \ -\frac{\sqrt{42}i}{320} \ 0 \ \frac{\sqrt{2}i}{320} \ 0 \ \frac{13\sqrt{30}i}{6720} \ 0 \ \frac{23\sqrt{6}i}{6720} \ 0$	
	$\frac{9\sqrt{5}i}{80} \ 0 \ \frac{\sqrt{2}i}{16} \ 0 \ \frac{3i}{112} \ 0 \ 0 \ -\frac{\sqrt{30}i}{320} \ 0 \ -\frac{\sqrt{6}i}{192} \ 0 \ -\frac{\sqrt{10}i}{448} \ 0 \ -\frac{\sqrt{210}i}{6720}$	
602	symmetry	$\frac{z(15x^4 + 30x^2y^2 - 40x^2z^2 + 15y^4 - 40y^2z^2 + 8z^4)}{8}$

continued ...

Table 9

No.	multipole	matrix
	$\mathbb{Q}_{5,2}^{(1,0;a)}(T_u, 1)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2}}{10} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}}{10} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}}{10} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}}{10} & 0 & 0 & 0 \\ \frac{\sqrt{5}}{70} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{420} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{5}}{14} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{2}}{140} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{5}}{7} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{210} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{5}}{7} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{210} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{5}}{14} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{2}}{140} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{5}}{70} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{420} & 0 & 0 \end{bmatrix}$
603	symmetry	$\frac{3\sqrt{35}x(y^2-2yz-z^2)(y^2+2yz-z^2)}{8}$ $\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{210}}{400} & 0 & \frac{\sqrt{42}}{80} & 0 & \frac{9\sqrt{70}}{400} & 0 & \frac{\sqrt{30}}{80} \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{9\sqrt{10}}{400} & 0 & \frac{3\sqrt{210}}{400} & 0 & -\frac{3\sqrt{14}}{80} & 0 & -\frac{9\sqrt{70}}{400} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{9\sqrt{70}}{400} & 0 & -\frac{3\sqrt{14}}{80} & 0 & \frac{3\sqrt{210}}{400} & 0 & \frac{9\sqrt{10}}{400} \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{80} & 0 & \frac{9\sqrt{70}}{400} & 0 & \frac{\sqrt{42}}{80} & 0 & -\frac{\sqrt{210}}{400} & 0 \\ 0 & \frac{3\sqrt{35}}{560} & 0 & \frac{9\sqrt{70}}{560} & 0 & \frac{3\sqrt{7}}{112} & -\frac{\sqrt{6}}{960} & 0 & \frac{\sqrt{14}}{448} & 0 & \frac{3\sqrt{210}}{2240} & 0 & \frac{\sqrt{42}}{1344} & 0 \\ \frac{3\sqrt{35}}{560} & 0 & -\frac{3\sqrt{14}}{112} & 0 & -\frac{9\sqrt{7}}{112} & 0 & 0 & \frac{23\sqrt{210}}{33600} & 0 & -\frac{13\sqrt{42}}{6720} & 0 & -\frac{9\sqrt{70}}{11200} & 0 & \frac{\sqrt{30}}{960} \\ 0 & -\frac{3\sqrt{14}}{112} & 0 & \frac{3\sqrt{7}}{56} & 0 & \frac{9\sqrt{70}}{560} & -\frac{3\sqrt{15}}{800} & 0 & -\frac{11\sqrt{35}}{5600} & 0 & \frac{\sqrt{21}}{3360} & 0 & -\frac{9\sqrt{105}}{5600} & 0 \\ \frac{9\sqrt{70}}{560} & 0 & \frac{3\sqrt{7}}{56} & 0 & -\frac{3\sqrt{14}}{112} & 0 & 0 & \frac{9\sqrt{105}}{5600} & 0 & -\frac{\sqrt{21}}{3360} & 0 & \frac{11\sqrt{35}}{5600} & 0 & \frac{3\sqrt{15}}{800} \\ 0 & -\frac{9\sqrt{7}}{112} & 0 & -\frac{3\sqrt{14}}{112} & 0 & \frac{3\sqrt{35}}{560} & -\frac{\sqrt{30}}{960} & 0 & \frac{9\sqrt{70}}{11200} & 0 & \frac{13\sqrt{42}}{6720} & 0 & -\frac{23\sqrt{210}}{33600} & 0 \\ \frac{3\sqrt{7}}{112} & 0 & \frac{9\sqrt{70}}{560} & 0 & \frac{3\sqrt{35}}{560} & 0 & 0 & -\frac{\sqrt{42}}{1344} & 0 & -\frac{3\sqrt{210}}{2240} & 0 & -\frac{\sqrt{14}}{448} & 0 & \frac{\sqrt{6}}{960} \end{bmatrix}$
604	symmetry	$\frac{3\sqrt{35}y(x^2-2xz-z^2)(x^2+2xz-z^2)}{8}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{Q}_{5,1}^{(1,0;a)}(T_u, 2)$	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 $-\frac{\sqrt{6}i}{960}$	
605	symmetry	$\frac{3\sqrt{35}z(x^2 - 2xy - y^2)(x^2 + 2xy - y^2)}{8}$
$\mathbb{Q}_{5,2}^{(1,0;a)}(T_u, 2)$	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 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 0	
	$\frac{3\sqrt{35}}{70}$ 0 0 0 0 0 0 0 $\frac{\sqrt{210}}{2100}$ 0 0 0 0 0 0	
606	symmetry	$\frac{\sqrt{105}x(y-z)(y+z)(2x^2 - y^2 - z^2)}{4}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{Q}_{5,0}^{(1,0;a)}(T_u, 3)$	$0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ -\frac{\sqrt{70}}{200} \ 0 \ \frac{\sqrt{14}}{40} \ 0 \ -\frac{\sqrt{210}}{200} \ 0 \ -\frac{3\sqrt{10}}{40}$	
	$0 \ 0 \ 0 \ 0 \ 0 \ 0 \ -\frac{\sqrt{30}}{200} \ 0 \ \frac{3\sqrt{70}}{200} \ 0 \ -\frac{\sqrt{42}}{40} \ 0 \ \frac{\sqrt{210}}{200} \ 0$	
	$0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ \frac{\sqrt{210}}{200} \ 0 \ -\frac{\sqrt{42}}{40} \ 0 \ \frac{3\sqrt{70}}{200} \ 0 \ -\frac{\sqrt{30}}{200}$	
	$0 \ 0 \ 0 \ 0 \ 0 \ 0 \ -\frac{3\sqrt{10}}{40} \ 0 \ -\frac{\sqrt{210}}{200} \ 0 \ \frac{\sqrt{14}}{40} \ 0 \ -\frac{\sqrt{70}}{200} \ 0$	
	$0 \ \frac{\sqrt{105}}{280} \ 0 \ -\frac{\sqrt{210}}{280} \ 0 \ -\frac{3\sqrt{21}}{56} \ -\frac{\sqrt{2}}{480} \ 0 \ \frac{\sqrt{42}}{672} \ 0 \ -\frac{\sqrt{70}}{1120} \ 0 \ -\frac{\sqrt{14}}{224} \ 0$	
	$\frac{\sqrt{105}}{280} \ 0 \ -\frac{\sqrt{42}}{56} \ 0 \ \frac{\sqrt{21}}{56} \ 0 \ 0 \ \frac{23\sqrt{70}}{16800} \ 0 \ -\frac{13\sqrt{14}}{3360} \ 0 \ \frac{\sqrt{210}}{5600} \ 0 \ -\frac{\sqrt{10}}{160}$	
	$0 \ -\frac{\sqrt{42}}{56} \ 0 \ \frac{\sqrt{21}}{28} \ 0 \ -\frac{\sqrt{210}}{280} \ \frac{\sqrt{5}}{400} \ 0 \ -\frac{11\sqrt{105}}{8400} \ 0 \ \frac{\sqrt{7}}{1680} \ 0 \ \frac{3\sqrt{35}}{2800} \ 0$	
	$-\frac{\sqrt{210}}{280} \ 0 \ \frac{\sqrt{21}}{28} \ 0 \ -\frac{\sqrt{42}}{56} \ 0 \ 0 \ -\frac{3\sqrt{35}}{2800} \ 0 \ -\frac{\sqrt{7}}{1680} \ 0 \ \frac{11\sqrt{105}}{8400} \ 0 \ -\frac{\sqrt{5}}{400}$	
	$0 \ \frac{\sqrt{21}}{56} \ 0 \ -\frac{\sqrt{42}}{56} \ 0 \ \frac{\sqrt{105}}{280} \ \frac{\sqrt{10}}{160} \ 0 \ -\frac{\sqrt{210}}{5600} \ 0 \ \frac{13\sqrt{14}}{3360} \ 0 \ -\frac{23\sqrt{70}}{16800} \ 0$	
	$-\frac{3\sqrt{21}}{56} \ 0 \ -\frac{\sqrt{210}}{280} \ 0 \ \frac{\sqrt{105}}{280} \ 0 \ 0 \ \frac{\sqrt{14}}{224} \ 0 \ \frac{\sqrt{70}}{1120} \ 0 \ -\frac{\sqrt{42}}{672} \ 0 \ \frac{\sqrt{2}}{480}$	
607	symmetry	$\frac{\sqrt{105}y(x-z)(x+z)(x^2-2y^2+z^2)}{4}$
$\mathbb{Q}_{5,1}^{(1,0;a)}(T_u, 3)$	$0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ \frac{\sqrt{70}i}{200} \ 0 \ \frac{\sqrt{14}i}{40} \ 0 \ \frac{\sqrt{210}i}{200} \ 0 \ -\frac{3\sqrt{10}i}{40}$	
	$0 \ 0 \ 0 \ 0 \ 0 \ 0 \ -\frac{\sqrt{30}i}{200} \ 0 \ -\frac{3\sqrt{70}i}{200} \ 0 \ -\frac{\sqrt{42}i}{40} \ 0 \ -\frac{\sqrt{210}i}{200} \ 0$	
	$0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ \frac{\sqrt{210}i}{200} \ 0 \ \frac{\sqrt{42}i}{40} \ 0 \ \frac{3\sqrt{70}i}{200} \ 0 \ \frac{\sqrt{30}i}{200}$	
	$0 \ 0 \ 0 \ 0 \ 0 \ 0 \ \frac{3\sqrt{10}i}{40} \ 0 \ -\frac{\sqrt{210}i}{200} \ 0 \ -\frac{\sqrt{14}i}{40} \ 0 \ -\frac{\sqrt{70}i}{200} \ 0$	
	$0 \ \frac{\sqrt{105}i}{280} \ 0 \ \frac{\sqrt{210}i}{280} \ 0 \ -\frac{3\sqrt{21}i}{56} \ \frac{\sqrt{2}i}{480} \ 0 \ \frac{\sqrt{42}i}{672} \ 0 \ \frac{\sqrt{70}i}{1120} \ 0 \ -\frac{\sqrt{14}i}{224} \ 0$	
	$-\frac{\sqrt{105}i}{280} \ 0 \ -\frac{\sqrt{42}i}{56} \ 0 \ -\frac{\sqrt{21}i}{56} \ 0 \ 0 \ -\frac{23\sqrt{70}i}{16800} \ 0 \ -\frac{13\sqrt{14}i}{3360} \ 0 \ -\frac{\sqrt{210}i}{5600} \ 0 \ -\frac{\sqrt{10}i}{160}$	
	$0 \ \frac{\sqrt{42}i}{56} \ 0 \ \frac{\sqrt{21}i}{28} \ 0 \ \frac{\sqrt{210}i}{280} \ \frac{\sqrt{5}i}{400} \ 0 \ \frac{11\sqrt{105}i}{8400} \ 0 \ \frac{\sqrt{7}i}{1680} \ 0 \ -\frac{3\sqrt{35}i}{2800} \ 0$	
	$-\frac{\sqrt{210}i}{280} \ 0 \ -\frac{\sqrt{21}i}{28} \ 0 \ -\frac{\sqrt{42}i}{56} \ 0 \ 0 \ -\frac{3\sqrt{35}i}{2800} \ 0 \ \frac{\sqrt{7}i}{1680} \ 0 \ \frac{11\sqrt{105}i}{8400} \ 0 \ \frac{\sqrt{5}i}{400}$	
	$0 \ \frac{\sqrt{21}i}{56} \ 0 \ \frac{\sqrt{42}i}{56} \ 0 \ \frac{\sqrt{105}i}{280} \ -\frac{\sqrt{10}i}{160} \ 0 \ -\frac{\sqrt{210}i}{5600} \ 0 \ -\frac{13\sqrt{14}i}{3360} \ 0 \ -\frac{23\sqrt{70}i}{16800} \ 0$	
	$\frac{3\sqrt{21}i}{56} \ 0 \ -\frac{\sqrt{210}i}{280} \ 0 \ -\frac{\sqrt{105}i}{280} \ 0 \ 0 \ -\frac{\sqrt{14}i}{224} \ 0 \ \frac{\sqrt{70}i}{1120} \ 0 \ \frac{\sqrt{42}i}{672} \ 0 \ \frac{\sqrt{2}i}{480}$	
608	symmetry	$-\frac{\sqrt{105}z(x-y)(x+y)(x^2+y^2-2z^2)}{4}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{Q}_{5,2}^{(1,0;a)}(T_u, 3)$	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 0 $\frac{3\sqrt{70}}{100}$ 0 0 0 $\frac{\sqrt{210}}{100}$ 0 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 0 $-\frac{\sqrt{42}}{28}$ 0 0 $-\frac{\sqrt{10}}{300}$ 0 0 0 $-\frac{\sqrt{14}}{210}$ 0 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 0	
609	symmetry	x
$\mathbb{Q}_{1,0}^{(1,1;a)}(T_u)$	$\frac{\sqrt{5}}{10}$ 0 $-\frac{\sqrt{2}}{20}$ 0 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	
	0 0 $\frac{\sqrt{6}}{20}$ 0 $-\frac{\sqrt{3}}{10}$ 0 0 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 0	
	0 $-\frac{2\sqrt{5}}{35}$ 0 0 0 0 0 $-\frac{\sqrt{42}}{56}$ 0 $\frac{\sqrt{2}}{56}$ 0 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	
	0 $-\frac{4\sqrt{2}}{35}$ 0 $-\frac{6}{35}$ 0 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 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 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 0 $-\frac{\sqrt{2}}{56}$ 0 $\frac{\sqrt{42}}{56}$	
610	symmetry	y

continued ...

Table 9

No.	multipole	matrix
$\mathbb{Q}_{1,1}^{(1,1;a)}(T_u)$	$\frac{\sqrt{5}i}{10}$	0 $\frac{\sqrt{2}i}{20}$ 0 0 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
	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 0 0 $\frac{\sqrt{2}i}{20}$ 0 $\frac{\sqrt{5}i}{10}$ 0 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 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 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
	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 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 0 $-\frac{2\sqrt{5}i}{35}$ 0 0 0 0 0 0 $-\frac{\sqrt{2}i}{56}$ 0 $-\frac{\sqrt{42}i}{56}$ 0
611	symmetry	z
$\mathbb{Q}_{1,2}^{(1,1;a)}(T_u)$	0	$-\frac{1}{5}$ 0 0 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	0 0 0 $-\frac{\sqrt{6}}{10}$ 0 0 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 0 0
	$-\frac{2}{7}$	0 0 0 0 0 0 0 $\frac{\sqrt{6}}{28}$ 0 0 0 0 0 0 0
	0	$-\frac{6}{35}$ 0 0 0 0 0 0 0 $\frac{\sqrt{10}}{28}$ 0 0 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 0 0 $\frac{2}{35}$ 0 0 0 0 0 0 $\frac{\sqrt{3}}{14}$ 0 0 0 0
	0	0 0 0 0 $\frac{6}{35}$ 0 0 0 0 0 0 0 $\frac{\sqrt{10}}{28}$ 0 0
612	symmetry	$\sqrt{15}xyz$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{Q}_3^{(1,1;a)}(A_u)$	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	
	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 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	
613	symmetry	$\frac{x(2x^2-3y^2-3z^2)}{2}$
$\mathbb{Q}_{3,0}^{(1,1;a)}(T_u, 1)$	$\frac{9\sqrt{5}}{224}$ 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 $\frac{\sqrt{42}}{224}$	
614	symmetry	$-\frac{y(3x^2-2y^2+3z^2)}{2}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{Q}_{3,1}^{(1,1;a)}(T_u, 1)$	$\frac{9\sqrt{5}i}{224}$	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 $-\frac{\sqrt{42}i}{224}$
615	symmetry	$-\frac{z(3x^2+3y^2-2z^2)}{2}$
$\mathbb{Q}_{3,2}^{(1,1;a)}(T_u, 1)$	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 0 $-\frac{3\sqrt{6}}{28}$ 0 0 0 0 0 0 $\frac{\sqrt{2}}{28}$ 0 0 0 0
	0	0 0 0 0 $\frac{9}{28}$ 0 0 0 0 0 0 $\frac{\sqrt{10}}{28}$ 0 0 0
	$\frac{5}{42}$	0 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	0 0 $-\frac{2}{21}$ 0 0 0 0 0 0 $\frac{\sqrt{3}}{28}$ 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 0 $\frac{1}{6}$ 0 0 0 0 0 0 0 0 0
616	symmetry	$\frac{\sqrt{15}x(y-z)(y+z)}{2}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{Q}_{3,0}^{(1,1;a)}(T_u, 2)$	$\begin{bmatrix} \frac{15\sqrt{3}}{224} & 0 & -\frac{9\sqrt{30}}{224} & 0 & -\frac{9\sqrt{15}}{224} & 0 & 0 & -\frac{5\sqrt{2}}{112} & 0 & \frac{\sqrt{10}}{56} & 0 & \frac{\sqrt{6}}{112} & 0 & 0 \\ 0 & -\frac{3\sqrt{5}}{32} & 0 & \frac{3\sqrt{10}}{224} & 0 & -\frac{45}{224} & \frac{\sqrt{42}}{112} & 0 & 0 & 0 & \frac{\sqrt{30}}{112} & 0 & \frac{\sqrt{6}}{56} & 0 \\ \frac{45}{224} & 0 & -\frac{3\sqrt{10}}{224} & 0 & \frac{3\sqrt{5}}{32} & 0 & 0 & \frac{\sqrt{6}}{56} & 0 & \frac{\sqrt{30}}{112} & 0 & 0 & 0 & \frac{\sqrt{42}}{112} \\ 0 & \frac{9\sqrt{15}}{224} & 0 & \frac{9\sqrt{30}}{224} & 0 & -\frac{15\sqrt{3}}{224} & 0 & 0 & \frac{\sqrt{6}}{112} & 0 & \frac{\sqrt{10}}{56} & 0 & -\frac{5\sqrt{2}}{112} & 0 \\ 0 & -\frac{5\sqrt{3}}{84} & 0 & -\frac{5\sqrt{6}}{168} & 0 & 0 & -\frac{\sqrt{70}}{224} & 0 & \frac{\sqrt{30}}{112} & 0 & \frac{3\sqrt{2}}{224} & 0 & 0 & 0 \\ -\frac{5\sqrt{3}}{84} & 0 & \frac{\sqrt{30}}{168} & 0 & -\frac{\sqrt{15}}{42} & 0 & 0 & \frac{5\sqrt{2}}{224} & 0 & \frac{\sqrt{10}}{112} & 0 & \frac{3\sqrt{6}}{224} & 0 & 0 \\ 0 & \frac{\sqrt{30}}{168} & 0 & \frac{\sqrt{15}}{42} & 0 & -\frac{5\sqrt{6}}{168} & -\frac{3\sqrt{7}}{224} & 0 & \frac{5\sqrt{3}}{224} & 0 & -\frac{\sqrt{5}}{224} & 0 & \frac{9}{224} & 0 \\ -\frac{5\sqrt{6}}{168} & 0 & \frac{\sqrt{15}}{42} & 0 & \frac{\sqrt{30}}{168} & 0 & 0 & -\frac{9}{224} & 0 & \frac{\sqrt{5}}{224} & 0 & -\frac{5\sqrt{3}}{224} & 0 & \frac{3\sqrt{7}}{224} \\ 0 & -\frac{\sqrt{15}}{42} & 0 & \frac{\sqrt{30}}{168} & 0 & -\frac{5\sqrt{3}}{84} & 0 & 0 & -\frac{3\sqrt{6}}{224} & 0 & -\frac{\sqrt{10}}{112} & 0 & -\frac{5\sqrt{2}}{224} & 0 \\ 0 & 0 & -\frac{5\sqrt{6}}{168} & 0 & -\frac{5\sqrt{3}}{84} & 0 & 0 & 0 & 0 & -\frac{3\sqrt{2}}{224} & 0 & -\frac{\sqrt{30}}{112} & 0 & \frac{\sqrt{70}}{224} \end{bmatrix}$	
	$\begin{array}{c} 617 \quad \text{symmetry} \\ \hline \end{array}$	$-\frac{\sqrt{15}y(x-z)(x+z)}{2}$
	$\begin{bmatrix} -\frac{15\sqrt{3}i}{224} & 0 & -\frac{9\sqrt{30}i}{224} & 0 & \frac{9\sqrt{15}i}{224} & 0 & 0 & \frac{5\sqrt{2}i}{112} & 0 & \frac{\sqrt{10}i}{56} & 0 & -\frac{\sqrt{6}i}{112} & 0 & 0 \\ 0 & \frac{3\sqrt{5}i}{32} & 0 & \frac{3\sqrt{10}i}{224} & 0 & \frac{45i}{224} & \frac{\sqrt{42}i}{112} & 0 & 0 & 0 & \frac{\sqrt{30}i}{112} & 0 & -\frac{\sqrt{6}i}{56} & 0 \\ \frac{45i}{224} & 0 & \frac{3\sqrt{10}i}{224} & 0 & \frac{3\sqrt{5}i}{32} & 0 & 0 & \frac{\sqrt{6}i}{56} & 0 & -\frac{\sqrt{30}i}{112} & 0 & 0 & 0 & -\frac{\sqrt{42}i}{112} \\ 0 & \frac{9\sqrt{15}i}{224} & 0 & -\frac{9\sqrt{30}i}{224} & 0 & -\frac{15\sqrt{3}i}{224} & 0 & 0 & \frac{\sqrt{6}i}{112} & 0 & -\frac{\sqrt{10}i}{56} & 0 & -\frac{5\sqrt{2}i}{112} & 0 \\ 0 & -\frac{5\sqrt{3}i}{84} & 0 & \frac{5\sqrt{6}i}{168} & 0 & 0 & \frac{\sqrt{70}i}{224} & 0 & \frac{\sqrt{30}i}{112} & 0 & -\frac{3\sqrt{2}i}{224} & 0 & 0 & 0 \\ \frac{5\sqrt{3}i}{84} & 0 & \frac{\sqrt{30}i}{168} & 0 & \frac{\sqrt{15}i}{42} & 0 & 0 & -\frac{5\sqrt{2}i}{224} & 0 & \frac{\sqrt{10}i}{112} & 0 & -\frac{3\sqrt{6}i}{224} & 0 & 0 \\ 0 & -\frac{\sqrt{30}i}{168} & 0 & \frac{\sqrt{15}i}{42} & 0 & \frac{5\sqrt{6}i}{168} & -\frac{3\sqrt{7}i}{224} & 0 & -\frac{5\sqrt{3}i}{224} & 0 & -\frac{\sqrt{5}i}{224} & 0 & -\frac{9i}{224} & 0 \\ -\frac{5\sqrt{6}i}{168} & 0 & -\frac{\sqrt{15}i}{42} & 0 & \frac{\sqrt{30}i}{168} & 0 & 0 & -\frac{9i}{224} & 0 & -\frac{\sqrt{5}i}{224} & 0 & -\frac{5\sqrt{3}i}{224} & 0 & -\frac{3\sqrt{7}i}{224} \\ 0 & -\frac{\sqrt{15}i}{42} & 0 & -\frac{\sqrt{30}i}{168} & 0 & -\frac{5\sqrt{3}i}{84} & 0 & 0 & -\frac{3\sqrt{6}i}{224} & 0 & \frac{\sqrt{10}i}{112} & 0 & -\frac{5\sqrt{2}i}{224} & 0 \\ 0 & 0 & -\frac{5\sqrt{6}i}{168} & 0 & \frac{5\sqrt{3}i}{84} & 0 & 0 & 0 & 0 & -\frac{3\sqrt{2}i}{224} & 0 & \frac{\sqrt{30}i}{112} & 0 & \frac{\sqrt{70}i}{224} \end{bmatrix}$	
	$\begin{array}{c} 618 \quad \text{symmetry} \\ \hline \end{array}$	$\frac{\sqrt{15}z(x-y)(x+y)}{2}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{Q}_{3,2}^{(1,1;a)}(T_u, 2)$	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	
619	symmetry	$-\frac{x^2}{2} - \frac{y^2}{2} + z^2$
$\mathbb{G}_{2,0}^{(a)}(E_u)$	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 $\frac{\sqrt{10}i}{140}$ 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	
620	symmetry	$\frac{\sqrt{3}(x-y)(x+y)}{2}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{G}_{2,1}^{(a)}(E_u)$	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	$\begin{bmatrix} 0 & 0 & 0 & \frac{\sqrt{15}i}{35} & 0 & 0 & \frac{\sqrt{7}i}{28} & 0 & 0 & 0 & \frac{\sqrt{5}i}{140} & 0 & 0 & 0 \\ -\frac{\sqrt{2}i}{7} & 0 & 0 & 0 & 0 & \frac{2\sqrt{10}i}{35} & 0 & 0 & \frac{\sqrt{3}i}{28} & 0 & 0 & 0 & \frac{i}{28} & 0 & 0 \\ 0 & -\frac{2\sqrt{10}i}{35} & 0 & 0 & 0 & 0 & \frac{\sqrt{2}i}{7} & 0 & 0 & \frac{i}{28} & 0 & 0 & 0 & \frac{\sqrt{3}i}{28} & 0 \\ 0 & 0 & -\frac{\sqrt{15}i}{35} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{5}i}{140} & 0 & 0 & 0 & \frac{\sqrt{7}i}{28} \\ 0 & 0 & -\frac{\sqrt{3}i}{28} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{i}{14} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{3\sqrt{15}i}{140} & 0 & 0 & -\frac{\sqrt{7}i}{14} & 0 & 0 & 0 & \frac{2\sqrt{5}i}{35} & 0 & 0 & 0 & 0 \\ -\frac{\sqrt{3}i}{28} & 0 & 0 & 0 & -\frac{3\sqrt{15}i}{140} & 0 & 0 & -\frac{\sqrt{2}i}{7} & 0 & 0 & 0 & 0 & \frac{\sqrt{6}i}{14} & 0 & 0 \\ 0 & -\frac{3\sqrt{15}i}{140} & 0 & 0 & 0 & -\frac{\sqrt{3}i}{28} & 0 & 0 & -\frac{\sqrt{6}i}{14} & 0 & 0 & 0 & 0 & \frac{\sqrt{2}i}{7} & 0 \\ 0 & 0 & -\frac{3\sqrt{15}i}{140} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{2\sqrt{5}i}{35} & 0 & 0 & 0 & 0 & \frac{\sqrt{7}i}{14} \\ 0 & 0 & 0 & -\frac{\sqrt{3}i}{28} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{i}{14} & 0 & 0 & 0 & 0 \end{bmatrix}$
	621 symmetry	$\sqrt{3}yz$
	$\mathbb{G}_{2,0}^{(a)}(T_u)$	$\begin{bmatrix} \frac{\sqrt{6}}{14} & 0 & \frac{3\sqrt{15}}{70} & 0 & 0 & 0 & 0 & \frac{1}{14} & 0 & \frac{\sqrt{5}}{70} & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{10}}{70} & 0 & \frac{\sqrt{5}}{14} & 0 & 0 & 0 & 0 & \frac{1}{14} & 0 & \frac{\sqrt{15}}{70} & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{5}}{14} & 0 & \frac{\sqrt{10}}{70} & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{70} & 0 & \frac{1}{14} & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{3\sqrt{15}}{70} & 0 & -\frac{\sqrt{6}}{14} & 0 & 0 & 0 & 0 & \frac{\sqrt{5}}{70} & 0 & \frac{1}{14} & 0 & 0 \\ 0 & -\frac{\sqrt{6}}{28} & 0 & 0 & 0 & 0 & \frac{\sqrt{35}}{28} & 0 & \frac{\sqrt{15}}{28} & 0 & 0 & 0 & 0 & 0 & 0 \\ \frac{\sqrt{6}}{28} & 0 & -\frac{\sqrt{15}}{70} & 0 & 0 & 0 & 0 & \frac{1}{28} & 0 & \frac{11\sqrt{5}}{140} & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{15}}{70} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}}{28} & 0 & \frac{\sqrt{10}}{20} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{70} & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}}{20} & 0 & \frac{\sqrt{6}}{28} & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{15}}{70} & 0 & \frac{\sqrt{6}}{28} & 0 & 0 & 0 & 0 & -\frac{11\sqrt{5}}{140} & 0 & -\frac{1}{28} & 0 & 0 \end{bmatrix}$
	622 symmetry	$\sqrt{3}xz$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{G}_{2,1}^{(a)}(T_u)$	$\sqrt{3}xy$	$\begin{bmatrix} -\frac{\sqrt{6}i}{14} & 0 & \frac{3\sqrt{15}i}{70} & 0 & 0 & 0 & 0 & -\frac{i}{14} & 0 & \frac{\sqrt{5}i}{70} & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{10}i}{70} & 0 & \frac{\sqrt{5}i}{14} & 0 & 0 & 0 & 0 & -\frac{i}{14} & 0 & \frac{\sqrt{15}i}{70} & 0 & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{5}i}{14} & 0 & \frac{\sqrt{10}i}{70} & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{70} & 0 & \frac{i}{14} & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{3\sqrt{15}i}{70} & 0 & -\frac{\sqrt{6}i}{14} & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{70} & 0 & \frac{i}{14} & 0 & 0 \\ 0 & -\frac{\sqrt{6}i}{28} & 0 & 0 & 0 & 0 & -\frac{\sqrt{35}i}{28} & 0 & \frac{\sqrt{15}i}{28} & 0 & 0 & 0 & 0 & 0 & 0 \\ -\frac{\sqrt{6}i}{28} & 0 & -\frac{\sqrt{15}i}{70} & 0 & 0 & 0 & 0 & -\frac{i}{28} & 0 & \frac{11\sqrt{5}i}{140} & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{15}i}{70} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}i}{28} & 0 & \frac{\sqrt{10}i}{20} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{70} & 0 & 0 & 0 & 0 & \frac{\sqrt{10}i}{20} & 0 & \frac{\sqrt{6}i}{28} & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{15}i}{70} & 0 & \frac{\sqrt{6}i}{28} & 0 & 0 & 0 & 0 & \frac{11\sqrt{5}i}{140} & 0 & -\frac{i}{28} & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{6}i}{28} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{28} & 0 & -\frac{\sqrt{35}i}{28} & 0 & 0 \end{bmatrix}$
	623 symmetry	$\sqrt{3}xy$
	$\mathbb{G}_{2,2}^{(a)}(T_u)$	$\begin{bmatrix} 0 & 0 & 0 & \frac{\sqrt{15}}{35} & 0 & 0 & -\frac{\sqrt{7}}{28} & 0 & 0 & 0 & \frac{\sqrt{5}}{140} & 0 & 0 & 0 \\ \frac{\sqrt{2}}{7} & 0 & 0 & 0 & \frac{2\sqrt{10}}{35} & 0 & 0 & -\frac{\sqrt{3}}{28} & 0 & 0 & 0 & \frac{1}{28} & 0 & 0 \\ 0 & \frac{2\sqrt{10}}{35} & 0 & 0 & 0 & \frac{\sqrt{2}}{7} & 0 & 0 & -\frac{1}{28} & 0 & 0 & 0 & \frac{\sqrt{3}}{28} & 0 \\ 0 & 0 & \frac{\sqrt{15}}{35} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}}{140} & 0 & 0 & 0 & \frac{\sqrt{7}}{28} \\ 0 & 0 & -\frac{\sqrt{3}}{28} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{1}{14} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{3\sqrt{15}}{140} & 0 & 0 & \frac{\sqrt{7}}{14} & 0 & 0 & 0 & \frac{2\sqrt{5}}{35} & 0 & 0 & 0 & 0 \\ \frac{\sqrt{3}}{28} & 0 & 0 & 0 & -\frac{3\sqrt{15}}{140} & 0 & 0 & \frac{\sqrt{2}}{7} & 0 & 0 & 0 & \frac{\sqrt{6}}{14} & 0 & 0 & 0 \\ 0 & \frac{3\sqrt{15}}{140} & 0 & 0 & 0 & -\frac{\sqrt{3}}{28} & 0 & 0 & \frac{\sqrt{6}}{14} & 0 & 0 & 0 & \frac{\sqrt{2}}{7} & 0 & 0 \\ 0 & 0 & \frac{3\sqrt{15}}{140} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{2\sqrt{5}}{35} & 0 & 0 & 0 & \frac{\sqrt{7}}{14} & 0 \\ 0 & 0 & 0 & \frac{\sqrt{3}}{28} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{1}{14} & 0 & 0 & 0 & 0 \end{bmatrix}$
		$\sqrt{21}(x^4 - 3x^2y^2 - 3x^2z^2 + y^4 - 3y^2z^2 + z^4)$
		6
		$\sqrt{21}(x^4 - 3x^2y^2 - 3x^2z^2 + y^4 - 3y^2z^2 + z^4)$
		6
		$\sqrt{21}(x^4 - 3x^2y^2 - 3x^2z^2 + y^4 - 3y^2z^2 + z^4)$
		6
		$\sqrt{21}(x^4 - 3x^2y^2 - 3x^2z^2 + y^4 - 3y^2z^2 + z^4)$
		6
		$\sqrt{21}(x^4 - 3x^2y^2 - 3x^2z^2 + y^4 - 3y^2z^2 + z^4)$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{G}_4^{(a)}(A_u)$	$0 \quad -\frac{\sqrt{21}i}{84} \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{105}i}{84} \quad 0 \quad 0 \quad -\frac{3\sqrt{210}i}{280} \quad 0 \quad 0 \quad 0 \quad -\frac{3\sqrt{70}i}{280} \quad 0$	
	$0 \quad 0 \quad \frac{\sqrt{14}i}{28} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{42}i}{56} \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{30}i}{40}$	
	$0 \quad 0 \quad 0 \quad -\frac{\sqrt{14}i}{28} \quad 0 \quad 0 \quad -\frac{\sqrt{30}i}{40} \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{42}i}{56} \quad 0 \quad 0 \quad 0$	
	$\frac{\sqrt{105}i}{84} \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{21}i}{84} \quad 0 \quad 0 \quad -\frac{3\sqrt{70}i}{280} \quad 0 \quad 0 \quad 0 \quad -\frac{3\sqrt{210}i}{280} \quad 0 \quad 0$	
	$\frac{\sqrt{21}i}{84} \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{105}i}{84} \quad 0 \quad 0 \quad -\frac{\sqrt{14}i}{28} \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{42}i}{84} \quad 0 \quad 0$	
	$0 \quad -\frac{\sqrt{21}i}{28} \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{105}i}{84} \quad 0 \quad 0 \quad \frac{\sqrt{210}i}{105} \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{70}i}{70} \quad 0$	
	$0 \quad 0 \quad \frac{\sqrt{21}i}{42} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{7}i}{28} \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{5}i}{20}$	
	$0 \quad 0 \quad 0 \quad \frac{\sqrt{21}i}{42} \quad 0 \quad 0 \quad \frac{\sqrt{5}i}{20} \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{7}i}{28} \quad 0 \quad 0 \quad 0$	
	$\frac{\sqrt{105}i}{84} \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{21}i}{28} \quad 0 \quad 0 \quad \frac{\sqrt{70}i}{70} \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{210}i}{105} \quad 0 \quad 0$	
625 symmetry	$0 \quad \frac{\sqrt{105}i}{84} \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{21}i}{84} \quad 0 \quad 0 \quad \frac{\sqrt{42}i}{84} \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{14}i}{28} \quad 0$	$-\frac{\sqrt{15}(x^4 - 12x^2y^2 + 6x^2z^2 + y^4 + 6y^2z^2 - 2z^4)}{12}$
	$0 \quad -\frac{\sqrt{15}i}{84} \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{3}i}{12} \quad 0 \quad 0 \quad -\frac{3\sqrt{6}i}{56} \quad 0 \quad 0 \quad 0 \quad \frac{3\sqrt{2}i}{40} \quad 0$	
	$0 \quad 0 \quad \frac{\sqrt{10}i}{28} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{30}i}{56} \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{42}i}{40}$	
	$0 \quad 0 \quad 0 \quad -\frac{\sqrt{10}i}{28} \quad 0 \quad 0 \quad \frac{\sqrt{42}i}{40} \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{30}i}{56} \quad 0 \quad 0 \quad 0$	
	$-\frac{\sqrt{3}i}{12} \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{15}i}{84} \quad 0 \quad 0 \quad \frac{3\sqrt{2}i}{40} \quad 0 \quad 0 \quad 0 \quad -\frac{3\sqrt{6}i}{56} \quad 0 \quad 0$	
	$\frac{\sqrt{15}i}{84} \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{3}i}{12} \quad 0 \quad 0 \quad -\frac{\sqrt{10}i}{28} \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{30}i}{60} \quad 0 \quad 0$	
	$0 \quad -\frac{\sqrt{15}i}{28} \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{3}i}{12} \quad 0 \quad 0 \quad \frac{\sqrt{6}i}{21} \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{2}i}{10} \quad 0$	
	$0 \quad 0 \quad \frac{\sqrt{15}i}{42} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{5}i}{28} \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{7}i}{20}$	
	$0 \quad 0 \quad 0 \quad \frac{\sqrt{15}i}{42} \quad 0 \quad 0 \quad -\frac{\sqrt{7}i}{20} \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{5}i}{28} \quad 0 \quad 0 \quad 0$	
626 symmetry	$0 \quad -\frac{\sqrt{3}i}{12} \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{15}i}{84} \quad 0 \quad 0 \quad -\frac{\sqrt{30}i}{60} \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{10}i}{28} \quad 0$	$\frac{\sqrt{5}(x-y)(x+y)(x^2+y^2-6z^2)}{4}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{G}_{4,1}^{(a)}(E_u)$	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	
	0 $\frac{\sqrt{15}i}{28}$ 0 0 0 $\frac{\sqrt{3}i}{28}$ 0 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	
	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	
627	symmetry	$\frac{\sqrt{35}yz(y-z)(y+z)}{2}$
$\mathbb{G}_{4,0}^{(a)}(T_u, 1)$	$\frac{\sqrt{7}}{112}$ 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 $-\frac{\sqrt{42}}{112}$ 0 $-\frac{\sqrt{70}}{56}$ 0 $-\frac{\sqrt{30}}{80}$	
628	symmetry	$-\frac{\sqrt{35}xz(x-z)(x+z)}{2}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{G}_{4,1}^{(a)}(T_u, 1)$	$\frac{\sqrt{7}i}{112}$	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 $-\frac{13\sqrt{42}i}{560}$ 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 $-\frac{\sqrt{21}i}{560}$ 0 $-\frac{\sqrt{105}i}{80}$ 0 $\frac{\sqrt{7}i}{560}$ 0 $-\frac{3\sqrt{3}i}{80}$
	0	0 0 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 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 $\frac{\sqrt{30}i}{80}$
629	symmetry	$\frac{\sqrt{35}xy(x-y)(x+y)}{2}$
$\mathbb{G}_{4,2}^{(a)}(T_u, 1)$	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 0 0 0 0 0 $-\frac{3\sqrt{2}}{20}$
	0	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 0 $\frac{3\sqrt{42}}{140}$ 0 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 0 $\frac{\sqrt{7}}{14}$ 0 0 0 0 0 0 0 $-\frac{\sqrt{42}}{35}$ 0
	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 $-\frac{\sqrt{3}}{10}$ 0 0 0 0 0 0 0
	$-\frac{\sqrt{7}}{14}$	0 0 0 0 0 0 0 $-\frac{\sqrt{42}}{35}$ 0 0 0 0 0 0
630	symmetry	$\frac{\sqrt{5}yz(6x^2-y^2-z^2)}{2}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{G}_{4,0}^{(a)}(T_u, 2)$	$\frac{1}{112} 0 \frac{\sqrt{10}}{112} 0 -\frac{\sqrt{5}}{16} 0 0 \frac{9\sqrt{6}}{560} 0 \frac{3\sqrt{30}}{280} 0 -\frac{9\sqrt{2}}{80} 0 0$	
	$0 -\frac{\sqrt{15}}{112} 0 -\frac{\sqrt{30}}{112} 0 \frac{\sqrt{3}}{16} \frac{3\sqrt{14}}{80} 0 -\frac{3\sqrt{6}}{140} 0 -\frac{3\sqrt{10}}{560} 0 -\frac{3\sqrt{2}}{40} 0 0$	
	$-\frac{\sqrt{3}}{16} 0 \frac{\sqrt{30}}{112} 0 \frac{\sqrt{15}}{112} 0 0 0 -\frac{3\sqrt{2}}{40} 0 -\frac{3\sqrt{10}}{560} 0 -\frac{3\sqrt{6}}{140} 0 \frac{3\sqrt{14}}{80}$	
	$0 \frac{\sqrt{5}}{16} 0 -\frac{\sqrt{10}}{112} 0 -\frac{1}{112} 0 0 0 -\frac{9\sqrt{2}}{80} 0 \frac{3\sqrt{30}}{280} 0 \frac{9\sqrt{6}}{560} 0$	
	$0 -\frac{1}{28} 0 \frac{\sqrt{2}}{8} 0 0 \frac{\sqrt{210}}{560} 0 \frac{\sqrt{10}}{56} 0 -\frac{\sqrt{6}}{16} 0 0 0$	
	$\frac{1}{28} 0 \frac{\sqrt{10}}{56} 0 0 0 0 -\frac{13\sqrt{6}}{560} 0 -\frac{\sqrt{30}}{280} 0 -\frac{7\sqrt{2}}{80} 0 0$	
	$0 -\frac{\sqrt{10}}{56} 0 0 0 -\frac{\sqrt{2}}{8} -\frac{3\sqrt{21}}{80} 0 \frac{1}{560} 0 -\frac{\sqrt{15}}{80} 0 \frac{\sqrt{3}}{80} 0$	
	$-\frac{\sqrt{2}}{8} 0 0 0 -\frac{\sqrt{10}}{56} 0 0 0 -\frac{\sqrt{3}}{80} 0 \frac{\sqrt{15}}{80} 0 -\frac{1}{560} 0 \frac{3\sqrt{21}}{80}$	
	$0 0 0 \frac{\sqrt{10}}{56} 0 \frac{1}{28} 0 0 0 \frac{7\sqrt{2}}{80} 0 \frac{\sqrt{30}}{280} 0 \frac{13\sqrt{6}}{560} 0$	
	$0 0 \frac{\sqrt{2}}{8} 0 -\frac{1}{28} 0 0 0 0 \frac{\sqrt{6}}{16} 0 -\frac{\sqrt{10}}{56} 0 -\frac{\sqrt{210}}{560}$	
631	symmetry	$-\frac{\sqrt{5}xz(x^2-6y^2+z^2)}{2}$
$\mathbb{G}_{4,1}^{(a)}(T_u, 2)$	$-\frac{i}{112} 0 \frac{\sqrt{10}i}{112} 0 \frac{\sqrt{5}i}{16} 0 0 0 -\frac{9\sqrt{6}i}{560} 0 \frac{3\sqrt{30}i}{280} 0 \frac{9\sqrt{2}i}{80} 0 0$	
	$0 \frac{\sqrt{15}i}{112} 0 -\frac{\sqrt{30}i}{112} 0 -\frac{\sqrt{3}i}{16} \frac{3\sqrt{14}i}{80} 0 \frac{3\sqrt{6}i}{140} 0 -\frac{3\sqrt{10}i}{560} 0 \frac{3\sqrt{2}i}{40} 0$	
	$-\frac{\sqrt{3}i}{16} 0 -\frac{\sqrt{30}i}{112} 0 \frac{\sqrt{15}i}{112} 0 0 0 -\frac{3\sqrt{2}i}{40} 0 \frac{3\sqrt{10}i}{560} 0 -\frac{3\sqrt{6}i}{140} 0 -\frac{3\sqrt{14}i}{80}$	
	$0 \frac{\sqrt{5}i}{16} 0 \frac{\sqrt{10}i}{112} 0 -\frac{i}{112} 0 0 0 -\frac{9\sqrt{2}i}{80} 0 -\frac{3\sqrt{30}i}{280} 0 \frac{9\sqrt{6}i}{560} 0$	
	$0 -\frac{i}{28} 0 -\frac{\sqrt{2}i}{8} 0 0 0 -\frac{\sqrt{210}i}{560} 0 \frac{\sqrt{10}i}{56} 0 \frac{\sqrt{6}i}{16} 0 0 0$	
	$-\frac{i}{28} 0 \frac{\sqrt{10}i}{56} 0 0 0 0 \frac{13\sqrt{6}i}{560} 0 -\frac{\sqrt{30}i}{280} 0 \frac{7\sqrt{2}i}{80} 0 0 0$	
	$0 \frac{\sqrt{10}i}{56} 0 0 0 \frac{\sqrt{2}i}{8} -\frac{3\sqrt{21}i}{80} 0 -\frac{i}{560} 0 -\frac{\sqrt{15}i}{80} 0 -\frac{\sqrt{3}i}{80} 0$	
	$-\frac{\sqrt{2}i}{8} 0 0 0 -\frac{\sqrt{10}i}{56} 0 0 0 -\frac{\sqrt{3}i}{80} 0 -\frac{\sqrt{15}i}{80} 0 -\frac{i}{560} 0 -\frac{3\sqrt{21}i}{80}$	
	$0 0 0 -\frac{\sqrt{10}i}{56} 0 \frac{i}{28} 0 0 0 \frac{7\sqrt{2}i}{80} 0 -\frac{\sqrt{30}i}{280} 0 \frac{13\sqrt{6}i}{560} 0$	
	$0 0 \frac{\sqrt{2}i}{8} 0 \frac{i}{28} 0 0 0 0 \frac{\sqrt{6}i}{16} 0 \frac{\sqrt{10}i}{56} 0 -\frac{\sqrt{210}i}{560}$	
632	symmetry	$-\frac{\sqrt{5}xy(x^2+y^2-6z^2)}{2}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{G}_{4,2}^{(a)}(T_u, 2)$	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	
	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	
	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 0	
	0 0 $\frac{3\sqrt{2}}{28}$ 0 0 0 0 0 0 $-\frac{\sqrt{6}}{14}$ 0 0 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 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	
	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	
	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	
	0 0 0 $-\frac{3\sqrt{2}}{28}$ 0 0 0 0 0 0 0 $-\frac{\sqrt{6}}{14}$ 0 0 0 0	
633	symmetry	$-\frac{x^2}{2} - \frac{y^2}{2} + z^2$
$\mathbb{G}_{2,0}^{(1,-1;a)}(E_u)$	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 0 $-\frac{3i}{70}$ 0 0 0 0 0 0 $-\frac{6\sqrt{3}i}{35}$ 0 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 0 $-\frac{3\sqrt{15}i}{70}$ 0 0	
634	symmetry	$\frac{\sqrt{3}(x-y)(x+y)}{2}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{G}_{2,1}^{(1,-1;a)}(E_u)$	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	
	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	
	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 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	
	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	
	0 0 $\frac{3i}{35}$ 0 0 0 0 0 0 $-\frac{2\sqrt{3}i}{35}$ 0 0 0 $-\frac{\sqrt{15}i}{70}$ 0 0 0	
	0 0 0 $\frac{\sqrt{5}i}{35}$ 0 0 0 0 0 0 $-\frac{\sqrt{15}i}{70}$ 0 0 0 0 0	
635 symmetry	$\sqrt{3}yz$	
	$-\frac{3\sqrt{10}}{140}$ 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 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 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 0	
	0 $\frac{\sqrt{10}}{35}$ 0 0 0 0 $\frac{\sqrt{21}}{28}$ 0 $\frac{3}{28}$ 0 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	
	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 0 $-\frac{2}{35}$ 0 0 0 0 0 $-\frac{\sqrt{6}}{20}$ 0 $\frac{3\sqrt{10}}{140}$ 0 0 0	
	0 0 0 $\frac{2}{35}$ 0 $-\frac{\sqrt{10}}{35}$ 0 0 0 0 0 $-\frac{11\sqrt{3}}{140}$ 0 $-\frac{\sqrt{15}}{140}$ 0 0	
636 symmetry	$\sqrt{3}xz$	
	continued ...	

Table 9

No.	multipole	matrix
$\mathbb{G}_{2,1}^{(1,-1;a)}(T_u)$	$\frac{3\sqrt{10}i}{140}$	0 $-\frac{9i}{140}$ 0 0 0 0 0 $\frac{2\sqrt{15}i}{35}$ 0 $-\frac{2\sqrt{3}i}{35}$ 0 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
	0	0 $-\frac{\sqrt{3}i}{28}$ 0 $-\frac{\sqrt{6}i}{140}$ 0 0 0 0 0 $\frac{6i}{35}$ 0 $-\frac{2\sqrt{15}i}{35}$ 0 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
	0	$\frac{\sqrt{10}i}{35}$ 0 0 0 0 $-\frac{\sqrt{21}i}{28}$ 0 $\frac{3i}{28}$ 0 0 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 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 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 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 0 $-\frac{\sqrt{10}i}{35}$ 0 0 0 0 0 0 $\frac{3i}{28}$ 0 $-\frac{\sqrt{21}i}{28}$ 0
637	symmetry	$\sqrt{3}xy$
$\mathbb{G}_{2,2}^{(1,-1;a)}(T_u)$	0	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
	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 0 $-\frac{\sqrt{105}}{35}$
	0	0 0 $\frac{\sqrt{5}}{35}$ 0 0 0 0 0 0 $\frac{\sqrt{15}}{70}$ 0 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 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 0 $\frac{\sqrt{5}}{35}$ 0 0 $\frac{3\sqrt{10}}{70}$ 0 0 0 $\frac{\sqrt{30}}{35}$ 0
	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 0 $-\frac{\sqrt{5}}{35}$ 0 0 0 0 0 0 $\frac{\sqrt{15}}{70}$ 0 0 0
638	symmetry	$\frac{\sqrt{21}(x^4 - 3x^2y^2 - 3x^2z^2 + y^4 - 3y^2z^2 + z^4)}{6}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{G}_4^{(1,-1;a)}(A_u)$	0	$\begin{bmatrix} 0 & \frac{\sqrt{7}i}{168} & 0 & 0 & 0 & \frac{\sqrt{35}i}{168} & 0 & 0 & \frac{\sqrt{70}i}{56} & 0 & 0 & 0 & 0 & \frac{\sqrt{210}i}{168} & 0 \\ 0 & 0 & -\frac{\sqrt{42}i}{168} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{5\sqrt{14}i}{168} & 0 & 0 & 0 & 0 & \frac{\sqrt{10}i}{24} \\ 0 & 0 & 0 & \frac{\sqrt{42}i}{168} & 0 & 0 & \frac{\sqrt{10}i}{24} & 0 & 0 & 0 & -\frac{5\sqrt{14}i}{168} & 0 & 0 & 0 & 0 \\ -\frac{\sqrt{35}i}{168} & 0 & 0 & 0 & -\frac{\sqrt{7}i}{168} & 0 & 0 & \frac{\sqrt{210}i}{168} & 0 & 0 & 0 & \frac{\sqrt{70}i}{56} & 0 & 0 & 0 & 0 \\ -\frac{\sqrt{7}i}{84} & 0 & 0 & 0 & -\frac{\sqrt{35}i}{84} & 0 & 0 & -\frac{5\sqrt{42}i}{168} & 0 & 0 & 0 & -\frac{5\sqrt{14}i}{168} & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{7}i}{28} & 0 & 0 & 0 & -\frac{\sqrt{35}i}{84} & 0 & 0 & \frac{\sqrt{70}i}{42} & 0 & 0 & 0 & 0 & -\frac{\sqrt{210}i}{84} & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{7}i}{42} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{5\sqrt{21}i}{168} & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{24} & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{7}i}{42} & 0 & 0 & \frac{\sqrt{15}i}{24} & 0 & 0 & 0 & -\frac{5\sqrt{21}i}{168} & 0 & 0 & 0 & 0 & 0 \\ -\frac{\sqrt{35}i}{84} & 0 & 0 & 0 & \frac{\sqrt{7}i}{28} & 0 & 0 & \frac{\sqrt{210}i}{84} & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}i}{42} & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{35}i}{84} & 0 & 0 & 0 & -\frac{\sqrt{7}i}{84} & 0 & 0 & \frac{5\sqrt{14}i}{168} & 0 & 0 & 0 & 0 & \frac{5\sqrt{42}i}{168} & 0 & 0 \end{bmatrix}$
	639	symmetry
		$-\frac{\sqrt{15}(x^4 - 12x^2y^2 + 6x^2z^2 + y^4 + 6y^2z^2 - 2z^4)}{12}$
	$\mathbb{G}_{4,0}^{(1,-1;a)}(E_u)$	$\begin{bmatrix} 0 & \frac{\sqrt{5}i}{168} & 0 & 0 & 0 & -\frac{i}{24} & 0 & 0 & \frac{5\sqrt{2}i}{56} & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{24} & 0 \\ 0 & 0 & -\frac{\sqrt{30}i}{168} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{5\sqrt{10}i}{168} & 0 & 0 & 0 & 0 & -\frac{\sqrt{14}i}{24} \\ 0 & 0 & 0 & \frac{\sqrt{30}i}{168} & 0 & 0 & -\frac{\sqrt{14}i}{24} & 0 & 0 & 0 & -\frac{5\sqrt{10}i}{168} & 0 & 0 & 0 & 0 \\ \frac{i}{24} & 0 & 0 & 0 & -\frac{\sqrt{5}i}{168} & 0 & 0 & -\frac{\sqrt{6}i}{24} & 0 & 0 & 0 & \frac{5\sqrt{2}i}{56} & 0 & 0 & 0 & 0 \\ -\frac{\sqrt{5}i}{84} & 0 & 0 & 0 & \frac{i}{12} & 0 & 0 & -\frac{5\sqrt{30}i}{168} & 0 & 0 & 0 & \frac{\sqrt{10}i}{24} & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{5}i}{28} & 0 & 0 & 0 & \frac{i}{12} & 0 & 0 & \frac{5\sqrt{2}i}{42} & 0 & 0 & 0 & 0 & \frac{\sqrt{6}i}{12} & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{5}i}{42} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{5\sqrt{15}i}{168} & 0 & 0 & 0 & 0 & \frac{\sqrt{21}i}{24} & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{5}i}{42} & 0 & 0 & -\frac{\sqrt{21}i}{24} & 0 & 0 & 0 & -\frac{5\sqrt{15}i}{168} & 0 & 0 & 0 & 0 & 0 \\ \frac{i}{12} & 0 & 0 & 0 & \frac{\sqrt{5}i}{28} & 0 & 0 & -\frac{\sqrt{6}i}{12} & 0 & 0 & 0 & -\frac{5\sqrt{2}i}{42} & 0 & 0 & 0 & 0 \\ 0 & \frac{i}{12} & 0 & 0 & 0 & -\frac{\sqrt{5}i}{84} & 0 & 0 & -\frac{\sqrt{10}i}{24} & 0 & 0 & 0 & 0 & \frac{5\sqrt{30}i}{168} & 0 & 0 \end{bmatrix}$
		$\frac{\sqrt{5}(x-y)(x+y)(x^2+y^2-6z^2)}{4}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{G}_{4,1}^{(1,-1;a)}(E_u)$	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	
	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 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	
	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	
641	symmetry	$\frac{\sqrt{35}yz(y-z)(y+z)}{2}$
$\mathbb{G}_{4,0}^{(1,-1;a)}(T_u, 1)$	$-\frac{\sqrt{21}}{672}$ 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 $-\frac{\sqrt{10}}{32}$	
642	symmetry	$-\frac{\sqrt{35}xz(x-z)(x+z)}{2}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{G}_{4,1}^{(1,-1;a)}(T_u, 1)$	$\begin{bmatrix} -\frac{\sqrt{21}i}{672} & 0 & \frac{\sqrt{210}i}{672} & 0 & -\frac{\sqrt{105}i}{672} & 0 & 0 & -\frac{3\sqrt{14}i}{112} & 0 & \frac{\sqrt{70}i}{56} & 0 & -\frac{\sqrt{42}i}{112} & 0 & 0 \\ 0 & \frac{\sqrt{35}i}{224} & 0 & -\frac{\sqrt{70}i}{224} & 0 & \frac{\sqrt{7}i}{224} & -\frac{\sqrt{6}i}{48} & 0 & \frac{\sqrt{14}i}{28} & 0 & -\frac{\sqrt{210}i}{336} & 0 & -\frac{\sqrt{42}i}{168} & 0 \\ \frac{\sqrt{7}i}{224} & 0 & -\frac{\sqrt{70}i}{224} & 0 & \frac{\sqrt{35}i}{224} & 0 & 0 & \frac{\sqrt{42}i}{168} & 0 & \frac{\sqrt{210}i}{336} & 0 & -\frac{\sqrt{14}i}{28} & 0 & \frac{\sqrt{6}i}{48} \\ 0 & -\frac{\sqrt{105}i}{672} & 0 & \frac{\sqrt{210}i}{672} & 0 & -\frac{\sqrt{21}i}{672} & 0 & 0 & \frac{\sqrt{42}i}{112} & 0 & -\frac{\sqrt{70}i}{56} & 0 & \frac{3\sqrt{14}i}{112} & 0 \\ 0 & -\frac{\sqrt{21}i}{84} & 0 & \frac{\sqrt{42}i}{168} & 0 & 0 & \frac{\sqrt{10}i}{32} & 0 & -\frac{5\sqrt{210}i}{336} & 0 & \frac{5\sqrt{14}i}{224} & 0 & 0 & 0 \\ -\frac{\sqrt{21}i}{84} & 0 & \frac{\sqrt{210}i}{168} & 0 & 0 & 0 & 0 & -\frac{13\sqrt{14}i}{224} & 0 & \frac{\sqrt{70}i}{112} & 0 & \frac{\sqrt{42}i}{96} & 0 & 0 \\ 0 & \frac{\sqrt{210}i}{168} & 0 & 0 & 0 & -\frac{\sqrt{42}i}{168} & -\frac{3i}{32} & 0 & \frac{\sqrt{21}i}{672} & 0 & \frac{\sqrt{35}i}{32} & 0 & -\frac{\sqrt{7}i}{224} & 0 \\ \frac{\sqrt{42}i}{168} & 0 & 0 & 0 & -\frac{\sqrt{210}i}{168} & 0 & 0 & -\frac{\sqrt{7}i}{224} & 0 & \frac{\sqrt{35}i}{32} & 0 & \frac{\sqrt{21}i}{672} & 0 & -\frac{3i}{32} \\ 0 & 0 & 0 & -\frac{\sqrt{210}i}{168} & 0 & \frac{\sqrt{21}i}{84} & 0 & 0 & \frac{\sqrt{42}i}{96} & 0 & \frac{\sqrt{70}i}{112} & 0 & -\frac{13\sqrt{14}i}{224} & 0 \\ 0 & 0 & -\frac{\sqrt{42}i}{168} & 0 & \frac{\sqrt{21}i}{84} & 0 & 0 & 0 & 0 & \frac{5\sqrt{14}i}{224} & 0 & -\frac{5\sqrt{210}i}{336} & 0 & \frac{\sqrt{10}i}{32} \end{bmatrix}$	
	643 symmetry	$\frac{\sqrt{35}xy(x-y)(x+y)}{2}$
	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{21}}{84} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{14}}{28} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{12} \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}}{12} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ \frac{\sqrt{21}}{84} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{14}}{28} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{21}}{42} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{210}}{84} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{21}}{42} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{14}}{14} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{1}{4} \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{1}{4} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ \frac{\sqrt{21}}{42} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{14}}{14} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{21}}{42} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{210}}{84} & 0 & 0 & 0 & 0 \end{bmatrix}$	
	644 symmetry	$\frac{\sqrt{5}yz(6x^2-y^2-z^2)}{2}$
	<i>continued ...</i>	

Table 9

No.	multipole	matrix
$\mathbb{G}_{4,0}^{(1,-1;a)}(T_u, 2)$	$\begin{bmatrix} -\frac{\sqrt{3}}{672} & 0 & -\frac{\sqrt{30}}{672} & 0 & \frac{\sqrt{15}}{96} & 0 & 0 & -\frac{3\sqrt{2}}{112} & 0 & -\frac{\sqrt{10}}{56} & 0 & \frac{\sqrt{6}}{16} & 0 & 0 \\ 0 & \frac{\sqrt{5}}{224} & 0 & \frac{\sqrt{10}}{224} & 0 & -\frac{1}{32} & -\frac{\sqrt{42}}{48} & 0 & \frac{\sqrt{2}}{28} & 0 & \frac{\sqrt{30}}{336} & 0 & \frac{\sqrt{6}}{24} & 0 \\ \frac{1}{32} & 0 & -\frac{\sqrt{10}}{224} & 0 & -\frac{\sqrt{5}}{224} & 0 & 0 & \frac{\sqrt{6}}{24} & 0 & \frac{\sqrt{30}}{336} & 0 & \frac{\sqrt{2}}{28} & 0 & -\frac{\sqrt{42}}{48} \\ 0 & -\frac{\sqrt{15}}{96} & 0 & \frac{\sqrt{30}}{672} & 0 & \frac{\sqrt{3}}{672} & 0 & 0 & \frac{\sqrt{6}}{16} & 0 & -\frac{\sqrt{10}}{56} & 0 & -\frac{3\sqrt{2}}{112} & 0 \\ 0 & \frac{\sqrt{3}}{84} & 0 & -\frac{\sqrt{6}}{24} & 0 & 0 & \frac{\sqrt{70}}{224} & 0 & \frac{5\sqrt{30}}{336} & 0 & -\frac{5\sqrt{2}}{32} & 0 & 0 & 0 \\ -\frac{\sqrt{3}}{84} & 0 & -\frac{\sqrt{30}}{168} & 0 & 0 & 0 & 0 & -\frac{13\sqrt{2}}{224} & 0 & -\frac{\sqrt{10}}{112} & 0 & -\frac{7\sqrt{6}}{96} & 0 & 0 \\ 0 & \frac{\sqrt{30}}{168} & 0 & 0 & 0 & \frac{\sqrt{6}}{24} & -\frac{3\sqrt{7}}{32} & 0 & \frac{\sqrt{3}}{672} & 0 & -\frac{\sqrt{5}}{32} & 0 & \frac{1}{32} & 0 \\ \frac{\sqrt{6}}{24} & 0 & 0 & 0 & \frac{\sqrt{30}}{168} & 0 & 0 & -\frac{1}{32} & 0 & \frac{\sqrt{5}}{32} & 0 & -\frac{\sqrt{3}}{672} & 0 & \frac{3\sqrt{7}}{32} \\ 0 & 0 & 0 & -\frac{\sqrt{30}}{168} & 0 & -\frac{\sqrt{3}}{84} & 0 & 0 & \frac{7\sqrt{6}}{96} & 0 & \frac{\sqrt{10}}{112} & 0 & \frac{13\sqrt{2}}{224} & 0 \\ 0 & 0 & -\frac{\sqrt{6}}{24} & 0 & \frac{\sqrt{3}}{84} & 0 & 0 & 0 & 0 & \frac{5\sqrt{2}}{32} & 0 & -\frac{5\sqrt{30}}{336} & 0 & -\frac{\sqrt{70}}{224} \end{bmatrix}$	
	645	symmetry
	$-\frac{\sqrt{5}xz(x^2-6y^2+z^2)}{2}$	
	$\begin{bmatrix} \frac{\sqrt{3}i}{672} & 0 & -\frac{\sqrt{30}i}{672} & 0 & -\frac{\sqrt{15}i}{96} & 0 & 0 & \frac{3\sqrt{2}i}{112} & 0 & -\frac{\sqrt{10}i}{56} & 0 & -\frac{\sqrt{6}i}{16} & 0 & 0 \\ 0 & -\frac{\sqrt{5}i}{224} & 0 & \frac{\sqrt{10}i}{224} & 0 & \frac{i}{32} & -\frac{\sqrt{42}i}{48} & 0 & -\frac{\sqrt{2}i}{28} & 0 & \frac{\sqrt{30}i}{336} & 0 & -\frac{\sqrt{6}i}{24} & 0 \\ \frac{i}{32} & 0 & \frac{\sqrt{10}i}{224} & 0 & -\frac{\sqrt{5}i}{224} & 0 & 0 & \frac{\sqrt{6}i}{24} & 0 & -\frac{\sqrt{30}i}{336} & 0 & \frac{\sqrt{2}i}{28} & 0 & \frac{\sqrt{42}i}{48} \\ 0 & -\frac{\sqrt{15}i}{96} & 0 & -\frac{\sqrt{30}i}{672} & 0 & \frac{\sqrt{3}i}{672} & 0 & 0 & \frac{\sqrt{6}i}{16} & 0 & \frac{\sqrt{10}i}{56} & 0 & -\frac{3\sqrt{2}i}{112} & 0 \\ 0 & \frac{\sqrt{3}i}{84} & 0 & \frac{\sqrt{6}i}{24} & 0 & 0 & -\frac{\sqrt{70}i}{224} & 0 & \frac{5\sqrt{30}i}{336} & 0 & \frac{5\sqrt{2}i}{32} & 0 & 0 & 0 \\ \frac{\sqrt{3}i}{84} & 0 & -\frac{\sqrt{30}i}{168} & 0 & 0 & 0 & 0 & \frac{13\sqrt{2}i}{224} & 0 & -\frac{\sqrt{10}i}{112} & 0 & \frac{7\sqrt{6}i}{96} & 0 & 0 \\ 0 & -\frac{\sqrt{30}i}{168} & 0 & 0 & 0 & -\frac{\sqrt{6}i}{24} & -\frac{3\sqrt{7}i}{32} & 0 & -\frac{\sqrt{3}i}{672} & 0 & -\frac{\sqrt{5}i}{32} & 0 & -\frac{i}{32} & 0 \\ \frac{\sqrt{6}i}{24} & 0 & 0 & 0 & \frac{\sqrt{30}i}{168} & 0 & 0 & -\frac{i}{32} & 0 & -\frac{\sqrt{5}i}{32} & 0 & -\frac{\sqrt{3}i}{672} & 0 & -\frac{3\sqrt{7}i}{32} \\ 0 & 0 & 0 & \frac{\sqrt{30}i}{168} & 0 & -\frac{\sqrt{3}i}{84} & 0 & 0 & \frac{7\sqrt{6}i}{96} & 0 & -\frac{\sqrt{10}i}{112} & 0 & \frac{13\sqrt{2}i}{224} & 0 \\ 0 & 0 & -\frac{\sqrt{6}i}{24} & 0 & -\frac{\sqrt{3}i}{84} & 0 & 0 & 0 & 0 & \frac{5\sqrt{2}i}{32} & 0 & \frac{5\sqrt{30}i}{336} & 0 & -\frac{\sqrt{70}i}{224} \end{bmatrix}$	
	646	symmetry
	$-\frac{\sqrt{5}xy(x^2+y^2-6z^2)}{2}$	

continued ...

Table 9

No.	multipole	matrix
	$\mathbb{G}_{4,2}^{(1,-1;a)}(T_u, 2)$	$\begin{bmatrix} 0 & 0 & 0 & \frac{\sqrt{30}}{168} & 0 & 0 & -\frac{\sqrt{14}}{56} & 0 & 0 & 0 & \frac{3\sqrt{10}}{56} & 0 & 0 & 0 & 0 \\ \frac{1}{56} & 0 & 0 & 0 & -\frac{\sqrt{5}}{56} & 0 & 0 & \frac{11\sqrt{6}}{168} & 0 & 0 & 0 & \frac{\sqrt{2}}{56} & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{5}}{56} & 0 & 0 & 0 & \frac{1}{56} & 0 & 0 & -\frac{\sqrt{2}}{56} & 0 & 0 & 0 & -\frac{11\sqrt{6}}{168} & 0 & 0 \\ 0 & 0 & \frac{\sqrt{30}}{168} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{10}}{56} & 0 & 0 & 0 & 0 & \frac{\sqrt{14}}{56} \\ 0 & 0 & -\frac{\sqrt{6}}{28} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{5\sqrt{2}}{28} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{30}}{84} & 0 & 0 & -\frac{3\sqrt{14}}{56} & 0 & 0 & 0 & -\frac{\sqrt{10}}{56} & 0 & 0 & 0 & 0 \\ \frac{\sqrt{6}}{28} & 0 & 0 & 0 & \frac{\sqrt{30}}{84} & 0 & 0 & \frac{9}{56} & 0 & 0 & 0 & \frac{17\sqrt{3}}{168} & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{30}}{84} & 0 & 0 & 0 & -\frac{\sqrt{6}}{28} & 0 & 0 & \frac{17\sqrt{3}}{168} & 0 & 0 & 0 & \frac{9}{56} & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{30}}{84} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}}{56} & 0 & 0 & 0 & 0 & -\frac{3\sqrt{14}}{56} \\ 0 & 0 & 0 & \frac{\sqrt{6}}{28} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{5\sqrt{2}}{28} & 0 & 0 & 0 & 0 \end{bmatrix}$
647	symmetry	$\frac{\sqrt{2}(2x^6 - 15x^4y^2 - 15x^4z^2 - 15x^2y^4 + 180x^2y^2z^2 - 15x^2z^4 + 2y^6 - 15y^4z^2 - 15y^2z^4 + 2z^6)}{8}$
	$\mathbb{G}_6^{(1,-1;a)}(A_u, 1)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{33}i}{264} & 0 & 0 & 0 & -\frac{7\sqrt{11}i}{88} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{55}i}{88} & 0 & 0 & 0 & \frac{7\sqrt{165}i}{264} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{5\sqrt{66}i}{264} & 0 & 0 & 0 & 0 & -\frac{\sqrt{2310}i}{264} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2310}i}{264} & 0 & 0 & 0 & -\frac{5\sqrt{66}i}{264} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{7\sqrt{165}i}{264} & 0 & 0 & 0 & \frac{\sqrt{55}i}{88} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{7\sqrt{11}i}{88} & 0 & 0 & 0 & -\frac{\sqrt{33}i}{264} & 0 & 0 & 0 \end{bmatrix}$
648	symmetry	$-\frac{\sqrt{2310}(x-y)(x+y)(x-z)(x+z)(y-z)(y+z)}{8}$

continued ...

Table 9

No.	multipole	matrix
	$\mathbb{G}_6^{(1,-1;a)}(A_u, 2)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}i}{24} & 0 & 0 & 0 & \frac{\sqrt{5}i}{8} \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{i}{24} & 0 & 0 & 0 & \frac{\sqrt{35}i}{24} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{14}i}{24} & 0 & 0 & 0 & -\frac{\sqrt{42}i}{24} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{42}i}{24} & 0 & 0 & 0 & \frac{\sqrt{14}i}{24} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{35}i}{24} & 0 & 0 & 0 & 0 & -\frac{i}{24} \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{8} & 0 & 0 & 0 & \frac{\sqrt{7}i}{24} & 0 & 0 & 0 & 0 \end{bmatrix}$
649	symmetry	$-\frac{\sqrt{14}(x^6 - 15x^4z^2 + 15x^2z^4 + y^6 - 15y^4z^2 + 15y^2z^4 - 2z^6)}{8}$
	$\mathbb{G}_{6,0}^{(1,-1;a)}(E_u)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{231}i}{264} & 0 & 0 & 0 & \frac{\sqrt{77}i}{88} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{385}i}{88} & 0 & 0 & 0 & -\frac{\sqrt{1155}i}{264} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{5\sqrt{462}i}{264} & 0 & 0 & 0 & \frac{\sqrt{330}i}{264} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{330}i}{264} & 0 & 0 & 0 & -\frac{5\sqrt{462}i}{264} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{1155}i}{264} & 0 & 0 & 0 & \frac{\sqrt{385}i}{88} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{77}i}{88} & 0 & 0 & 0 & -\frac{\sqrt{231}i}{264} & 0 & 0 \end{bmatrix}$
650	symmetry	$\frac{\sqrt{42}(x-y)(x+y)(x^4 - 9x^2y^2 - 5x^2z^2 + y^4 - 5y^2z^2 + 5z^4)}{8}$

continued ...

Table 9

No.	multipole	matrix
	$\mathbb{G}_{6,1}^{(1,-1;a)}(E_u)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{385}i}{264} & 0 & 0 & 0 & \frac{\sqrt{11}i}{8} \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{55}i}{264} & 0 & 0 & 0 & -\frac{5\sqrt{77}i}{264} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{770}i}{264} & 0 & 0 & 0 & \frac{\sqrt{2310}i}{264} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2310}i}{264} & 0 & 0 & 0 & -\frac{\sqrt{770}i}{264} \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{55}i}{264} \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{11}i}{8} & 0 & 0 & 0 & -\frac{\sqrt{385}i}{264} & 0 & 0 \end{bmatrix}$
651	symmetry	$\frac{3\sqrt{7}yz(y-z)(y+z)(10x^2-y^2-z^2)}{4}$
	$\mathbb{G}_{6,0}^{(1,-1;a)}(T_u, 1)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{66}}{1056} & 0 & \frac{\sqrt{154}}{352} & 0 & -\frac{\sqrt{2310}}{352} & 0 & -\frac{\sqrt{462}}{96} \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2310}}{1056} & 0 & -\frac{5\sqrt{462}}{1056} & 0 & \frac{3\sqrt{770}}{352} & 0 & \frac{\sqrt{330}}{96} \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{165}}{176} & 0 & \frac{\sqrt{385}}{176} & 0 & \frac{5\sqrt{231}}{528} & 0 & -\frac{\sqrt{1155}}{176} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{1155}}{176} & 0 & -\frac{5\sqrt{231}}{528} & 0 & -\frac{\sqrt{385}}{176} & 0 & \frac{\sqrt{165}}{176} \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{330}}{96} & 0 & -\frac{3\sqrt{770}}{352} & 0 & \frac{5\sqrt{462}}{1056} & 0 & \frac{\sqrt{2310}}{1056} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{462}}{96} & 0 & \frac{\sqrt{2310}}{352} & 0 & -\frac{\sqrt{154}}{352} & 0 & -\frac{\sqrt{66}}{1056} \end{bmatrix}$
652	symmetry	$\frac{3\sqrt{7}xz(x-z)(x+z)(x^2-10y^2+z^2)}{4}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{G}_{6,1}^{(1,-1;a)}(T_u, 1)$	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{66}i}{1056} & 0 & -\frac{\sqrt{154}i}{352} & 0 & -\frac{\sqrt{2310}i}{352} & 0 & \frac{\sqrt{462}i}{96} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2310}i}{1056} & 0 & \frac{5\sqrt{462}i}{1056} & 0 & \frac{3\sqrt{770}i}{352} & 0 & -\frac{\sqrt{330}i}{96} \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{165}i}{176} & 0 & \frac{\sqrt{385}i}{176} & 0 & -\frac{5\sqrt{231}i}{528} & 0 & -\frac{\sqrt{1155}i}{176} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{1155}i}{176} & 0 & -\frac{5\sqrt{231}i}{528} & 0 & \frac{\sqrt{385}i}{176} & 0 & \frac{\sqrt{165}i}{176} \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{330}i}{96} & 0 & \frac{3\sqrt{770}i}{352} & 0 & \frac{5\sqrt{462}i}{1056} & 0 & -\frac{\sqrt{2310}i}{1056} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{462}i}{96} & 0 & -\frac{\sqrt{2310}i}{352} & 0 & -\frac{\sqrt{154}i}{352} & 0 & \frac{\sqrt{66}i}{1056} \end{bmatrix}$
	653 symmetry	$-\frac{3\sqrt{7}xy(x-y)(x+y)(x^2+y^2-10z^2)}{4}$
$\mathbb{G}_{6,2}^{(1,-1;a)}(T_u, 1)$	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{154}}{44} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2310}}{132} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{165}}{66} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{165}}{66} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2310}}{132} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{154}}{44} & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
	654 symmetry	$\frac{\sqrt{462}yz(y^2-3z^2)(3y^2-z^2)}{16}$

continued ...

Table 9

No.	multipole	matrix
	$\mathbb{G}_{6,0}^{(1,-1;a)}(T_u, 2)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{1}{64} & 0 & \frac{\sqrt{21}}{64} & 0 & \frac{\sqrt{35}}{64} & 0 & \frac{\sqrt{7}}{64} \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{35}}{64} & 0 & -\frac{5\sqrt{7}}{64} & 0 & -\frac{\sqrt{105}}{64} & 0 & -\frac{\sqrt{5}}{64} \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}}{64} & 0 & \frac{\sqrt{210}}{64} & 0 & \frac{5\sqrt{14}}{64} & 0 & \frac{\sqrt{70}}{64} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}}{64} & 0 & -\frac{5\sqrt{14}}{64} & 0 & -\frac{\sqrt{210}}{64} & 0 & -\frac{\sqrt{10}}{64} \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{5}}{64} & 0 & \frac{\sqrt{105}}{64} & 0 & \frac{5\sqrt{7}}{64} & 0 & \frac{\sqrt{35}}{64} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}}{64} & 0 & -\frac{\sqrt{35}}{64} & 0 & -\frac{\sqrt{21}}{64} & 0 & -\frac{1}{64} & \end{bmatrix}$
655	symmetry	$\frac{\sqrt{462}xz(x^2-3z^2)(3x^2-z^2)}{16}$
	$\mathbb{G}_{6,1}^{(1,-1;a)}(T_u, 2)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{i}{64} & 0 & \frac{\sqrt{21}i}{64} & 0 & -\frac{\sqrt{35}i}{64} & 0 & \frac{\sqrt{7}i}{64} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{35}i}{64} & 0 & -\frac{5\sqrt{7}i}{64} & 0 & \frac{\sqrt{105}i}{64} & 0 & -\frac{\sqrt{5}i}{64} \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}i}{64} & 0 & -\frac{\sqrt{210}i}{64} & 0 & \frac{5\sqrt{14}i}{64} & 0 & -\frac{\sqrt{70}i}{64} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}i}{64} & 0 & \frac{5\sqrt{14}i}{64} & 0 & -\frac{\sqrt{210}i}{64} & 0 & \frac{\sqrt{10}i}{64} \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{64} & 0 & \frac{\sqrt{105}i}{64} & 0 & -\frac{5\sqrt{7}i}{64} & 0 & \frac{\sqrt{35}i}{64} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}i}{64} & 0 & -\frac{\sqrt{35}i}{64} & 0 & \frac{\sqrt{21}i}{64} & 0 & -\frac{i}{64} & \end{bmatrix}$
656	symmetry	$\frac{\sqrt{462}xy(x^2-3y^2)(3x^2-y^2)}{16}$

continued ...

Table 9

continued ..

Table 9

No.	multipole	matrix
$\mathbb{G}_{6,1}^{(1,-1;a)}(T_u, 3)$	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{55}i}{2112} & 0 & \frac{\sqrt{1155}i}{2112} & 0 & \frac{9\sqrt{77}i}{704} & 0 & \frac{\sqrt{385}i}{64} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{5\sqrt{77}i}{2112} & 0 & -\frac{5\sqrt{385}i}{2112} & 0 & -\frac{9\sqrt{231}i}{704} & 0 & -\frac{5\sqrt{11}i}{64} \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{9\sqrt{22}i}{704} & 0 & -\frac{5\sqrt{462}i}{2112} & 0 & \frac{5\sqrt{770}i}{2112} & 0 & \frac{9\sqrt{154}i}{704} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{9\sqrt{154}i}{704} & 0 & \frac{5\sqrt{770}i}{2112} & 0 & -\frac{5\sqrt{462}i}{2112} & 0 & -\frac{9\sqrt{22}i}{704} \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{5\sqrt{11}i}{64} & 0 & -\frac{9\sqrt{231}i}{704} & 0 & -\frac{5\sqrt{385}i}{2112} & 0 & \frac{5\sqrt{77}i}{2112} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{385}i}{64} & 0 & \frac{9\sqrt{77}i}{704} & 0 & \frac{\sqrt{1155}i}{2112} & 0 & -\frac{\sqrt{55}i}{2112} \end{bmatrix}$
	659 symmetry	$\frac{\sqrt{210}xy(x^4+2x^2y^2-16x^2z^2+y^4-16y^2z^2+16z^4)}{16}$
$\mathbb{G}_{6,2}^{(1,-1;a)}(T_u, 3)$	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{77}}{66} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{11}}{66} & 0 & 0 & 0 & -\frac{\sqrt{385}}{66} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{154}}{66} & 0 & 0 & 0 & \frac{\sqrt{462}}{66} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{462}}{66} & 0 & 0 & 0 & 0 & -\frac{\sqrt{154}}{66} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{385}}{66} & 0 & 0 & 0 & 0 & \frac{\sqrt{11}}{66} & 0 \end{bmatrix}$
	660 symmetry	$-\frac{x^2}{2} - \frac{y^2}{2} + z^2$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{G}_{2,0}^{(1,0;a)}(E_u)$	0	$\frac{\sqrt{15}i}{35}$ 0 0 0 0 0 0 0 $-\frac{\sqrt{6}i}{14}$ 0 0 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 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 0 0 0 $-\frac{\sqrt{15}i}{35}$ 0 0 0 0 0 0 0 $-\frac{\sqrt{6}i}{14}$ 0 0 0
	$-\frac{\sqrt{15}i}{14}$	0 0 0 0 0 0 0 $-\frac{\sqrt{10}i}{28}$ 0 0 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 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	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 0 0 0 $\frac{\sqrt{15}i}{70}$ 0 0 0 0 0 0 0 $\frac{\sqrt{6}i}{28}$ 0 0 0
	0	0 0 0 0 0 0 $-\frac{\sqrt{15}i}{14}$ 0 0 0 0 0 0 $\frac{\sqrt{10}i}{28}$ 0
661	symmetry	$\frac{\sqrt{3}(x-y)(x+y)}{2}$
$\mathbb{G}_{2,1}^{(1,0;a)}(E_u)$	0	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 0
	$-\frac{\sqrt{3}i}{21}$	0 0 0 0 $\frac{2\sqrt{15}i}{105}$ 0 0 $-\frac{3\sqrt{2}i}{28}$ 0 0 0 0 $-\frac{\sqrt{6}i}{28}$ 0 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 0 $-\frac{3\sqrt{2}i}{28}$ 0
	0	0 0 $-\frac{\sqrt{10}i}{70}$ 0 0 0 0 0 0 $-\frac{\sqrt{30}i}{140}$ 0 0 0 0 $-\frac{\sqrt{42}i}{28}$
	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 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 0
	$-\frac{3\sqrt{2}i}{28}$	0 0 0 0 $-\frac{9\sqrt{10}i}{140}$ 0 0 $\frac{\sqrt{3}i}{21}$ 0 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 0 $-\frac{\sqrt{3}i}{21}$ 0
	0	0 0 $-\frac{9\sqrt{10}i}{140}$ 0 0 0 0 0 0 $\frac{\sqrt{30}i}{105}$ 0 0 0 0 $-\frac{\sqrt{42}i}{84}$
	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
662	symmetry	$\sqrt{3}yz$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{G}_{2,0}^{(1,0;a)}(T_u)$		$\begin{bmatrix} \frac{1}{14} & 0 & \frac{3\sqrt{10}}{140} & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}}{14} & 0 & -\frac{\sqrt{30}}{70} & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{15}}{210} & 0 & \frac{\sqrt{30}}{84} & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}}{14} & 0 & -\frac{3\sqrt{10}}{70} & 0 & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{30}}{84} & 0 & \frac{\sqrt{15}}{210} & 0 & 0 & 0 & 0 & -\frac{3\sqrt{10}}{70} & 0 & -\frac{\sqrt{6}}{14} & 0 & 0 \\ 0 & 0 & 0 & -\frac{3\sqrt{10}}{140} & 0 & -\frac{1}{14} & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}}{70} & 0 & -\frac{\sqrt{6}}{14} & 0 \\ 0 & -\frac{3}{14} & 0 & 0 & 0 & 0 & -\frac{\sqrt{210}}{168} & 0 & 0 & -\frac{\sqrt{10}}{56} & 0 & 0 & 0 & 0 \\ \frac{3}{14} & 0 & -\frac{3\sqrt{10}}{70} & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}}{168} & 0 & -\frac{11\sqrt{30}}{840} & 0 & 0 & 0 & 0 \\ 0 & \frac{3\sqrt{10}}{70} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{1}{28} & 0 & -\frac{\sqrt{15}}{60} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{3\sqrt{10}}{70} & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{60} & 0 & -\frac{1}{28} & 0 & 0 \\ 0 & 0 & 0 & -\frac{3\sqrt{10}}{70} & 0 & \frac{3}{14} & 0 & 0 & 0 & 0 & \frac{11\sqrt{30}}{840} & 0 & \frac{\sqrt{6}}{168} & 0 \\ 0 & 0 & 0 & 0 & -\frac{3}{14} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}}{56} & 0 & \frac{\sqrt{210}}{168} \end{bmatrix}$
		663 symmetry
		$\sqrt{3}xz$
		$\begin{bmatrix} -\frac{i}{14} & 0 & \frac{3\sqrt{10}i}{140} & 0 & 0 & 0 & 0 & \frac{\sqrt{6}i}{14} & 0 & -\frac{\sqrt{30}i}{70} & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{15}i}{210} & 0 & \frac{\sqrt{30}i}{84} & 0 & 0 & 0 & 0 & \frac{\sqrt{6}i}{14} & 0 & -\frac{3\sqrt{10}i}{70} & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{30}i}{84} & 0 & \frac{\sqrt{15}i}{210} & 0 & 0 & 0 & 0 & \frac{3\sqrt{10}i}{70} & 0 & -\frac{\sqrt{6}i}{14} & 0 & 0 \\ 0 & 0 & 0 & \frac{3\sqrt{10}i}{140} & 0 & -\frac{i}{14} & 0 & 0 & 0 & 0 & \frac{\sqrt{30}i}{70} & 0 & -\frac{\sqrt{6}i}{14} & 0 \\ 0 & -\frac{3i}{14} & 0 & 0 & 0 & 0 & \frac{\sqrt{210}i}{168} & 0 & -\frac{\sqrt{10}i}{56} & 0 & 0 & 0 & 0 & 0 \\ -\frac{3i}{14} & 0 & -\frac{3\sqrt{10}i}{70} & 0 & 0 & 0 & 0 & \frac{\sqrt{6}i}{168} & 0 & -\frac{11\sqrt{30}i}{840} & 0 & 0 & 0 & 0 \\ 0 & -\frac{3\sqrt{10}i}{70} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{i}{28} & 0 & -\frac{\sqrt{15}i}{60} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{3\sqrt{10}i}{70} & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{60} & 0 & -\frac{i}{28} & 0 & 0 \\ 0 & 0 & 0 & \frac{3\sqrt{10}i}{70} & 0 & \frac{3i}{14} & 0 & 0 & 0 & 0 & -\frac{11\sqrt{30}i}{840} & 0 & \frac{\sqrt{6}i}{168} & 0 \\ 0 & 0 & 0 & 0 & \frac{3i}{14} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}i}{56} & 0 & \frac{\sqrt{210}i}{168} \end{bmatrix}$
		664 symmetry
		$\sqrt{3}xy$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{G}_{2,2}^{(1,0;a)}(T_u)$	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	
665	symmetry	$\frac{\sqrt{21}(x^4 - 3x^2y^2 - 3x^2z^2 + y^4 - 3y^2z^2 + z^4)}{6}$
$\mathbb{G}_4^{(1,0;a)}(A_u)$	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	
666	symmetry	$-\frac{\sqrt{15}(x^4 - 12x^2y^2 + 6x^2z^2 + y^4 + 6y^2z^2 - 2z^4)}{12}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{G}_{4,0}^{(1,0;a)}(E_u)$	$-\frac{\sqrt{3}i}{168}$	$0 \quad -\frac{\sqrt{3}i}{168} \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{15}i}{120} \quad 0 \quad 0 \quad 0 \quad \frac{9\sqrt{30}i}{280} \quad 0 \quad 0 \quad 0 \quad -\frac{9\sqrt{10}i}{200} \quad 0$
	$\frac{\sqrt{2}i}{56}$	$0 \quad 0 \quad \frac{\sqrt{2}i}{56} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{3\sqrt{6}i}{56} \quad 0 \quad 0 \quad 0 \quad -\frac{3\sqrt{210}i}{200}$
	$-\frac{\sqrt{2}i}{56}$	$0 \quad 0 \quad 0 \quad -\frac{\sqrt{2}i}{56} \quad 0 \quad 0 \quad -\frac{3\sqrt{210}i}{200} \quad 0 \quad 0 \quad 0 \quad -\frac{3\sqrt{6}i}{56} \quad 0 \quad 0 \quad 0 \quad 0$
	$-\frac{\sqrt{15}i}{120}$	$-\frac{\sqrt{15}i}{120} \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{3}i}{168} \quad 0 \quad 0 \quad -\frac{9\sqrt{10}i}{200} \quad 0 \quad 0 \quad 0 \quad \frac{9\sqrt{30}i}{280} \quad 0 \quad 0 \quad 0$
	$\frac{\sqrt{3}i}{28}$	$0 \quad 0 \quad 0 \quad -\frac{\sqrt{15}i}{20} \quad 0 \quad 0 \quad \frac{\sqrt{2}i}{56} \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{6}i}{120} \quad 0 \quad 0 \quad 0$
	$-\frac{3\sqrt{3}i}{28}$	$0 \quad -\frac{3\sqrt{3}i}{28} \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{15}i}{20} \quad 0 \quad 0 \quad -\frac{\sqrt{30}i}{210} \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{10}i}{100} \quad 0$
	$\frac{\sqrt{3}i}{14}$	$0 \quad 0 \quad \frac{\sqrt{3}i}{14} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{i}{56} \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{35}i}{200}$
	$-\frac{\sqrt{15}i}{20}$	$0 \quad 0 \quad 0 \quad \frac{\sqrt{3}i}{14} \quad 0 \quad 0 \quad \frac{\sqrt{35}i}{200} \quad 0 \quad 0 \quad 0 \quad \frac{i}{56} \quad 0 \quad 0 \quad 0$
	$-\frac{3\sqrt{3}i}{28}$	$-\frac{\sqrt{15}i}{20} \quad 0 \quad 0 \quad -\frac{3\sqrt{3}i}{28} \quad 0 \quad 0 \quad \frac{\sqrt{10}i}{100} \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{30}i}{210} \quad 0 \quad 0 \quad 0$
	$-\frac{\sqrt{15}i}{20}$	$0 \quad -\frac{\sqrt{15}i}{20} \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{3}i}{28} \quad 0 \quad 0 \quad \frac{\sqrt{6}i}{120} \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{2}i}{56} \quad 0$
667	symmetry	$\frac{\sqrt{5}(x-y)(x+y)(x^2+y^2-6z^2)}{4}$
$\mathbb{G}_{4,1}^{(1,0;a)}(E_u)$	$\frac{\sqrt{2}i}{56}$	$0 \quad 0 \quad 0 \quad \frac{\sqrt{2}i}{56} \quad 0 \quad 0 \quad -\frac{9\sqrt{210}i}{1400} \quad 0 \quad 0 \quad 0 \quad -\frac{27\sqrt{6}i}{280} \quad 0 \quad 0 \quad 0$
	$-\frac{\sqrt{15}i}{280}$	$-\frac{\sqrt{15}i}{280} \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{3}i}{56} \quad 0 \quad 0 \quad \frac{99\sqrt{10}i}{1400} \quad 0 \quad 0 \quad 0 \quad -\frac{9\sqrt{30}i}{1400} \quad 0 \quad 0 \quad 0$
	$\frac{\sqrt{3}i}{56}$	$0 \quad \frac{\sqrt{3}i}{56} \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{15}i}{280} \quad 0 \quad 0 \quad -\frac{9\sqrt{30}i}{1400} \quad 0 \quad 0 \quad 0 \quad \frac{99\sqrt{10}i}{1400} \quad 0$
	$-\frac{\sqrt{2}i}{56}$	$0 \quad 0 \quad -\frac{\sqrt{2}i}{56} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{27\sqrt{6}i}{280} \quad 0 \quad 0 \quad 0 \quad -\frac{9\sqrt{210}i}{1400}$
	$-\frac{9\sqrt{10}i}{140}$	$0 \quad 0 \quad -\frac{9\sqrt{10}i}{140} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{30}i}{140} \quad 0 \quad 0 \quad 0 \quad 0$
	$\frac{3\sqrt{2}i}{28}$	$0 \quad 0 \quad 0 \quad \frac{3\sqrt{2}i}{28} \quad 0 \quad 0 \quad \frac{3\sqrt{210}i}{1400} \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{6}i}{280} \quad 0 \quad 0 \quad 0$
	$-\frac{9\sqrt{10}i}{140}$	$-\frac{9\sqrt{10}i}{140} \quad 0 \quad 0 \quad 0 \quad \frac{3\sqrt{2}i}{28} \quad 0 \quad 0 \quad -\frac{9\sqrt{15}i}{1400} \quad 0 \quad 0 \quad 0 \quad \frac{17\sqrt{5}i}{1400} \quad 0 \quad 0 \quad 0$
	$\frac{3\sqrt{2}i}{28}$	$0 \quad \frac{3\sqrt{2}i}{28} \quad 0 \quad 0 \quad 0 \quad -\frac{9\sqrt{10}i}{140} \quad 0 \quad 0 \quad -\frac{17\sqrt{5}i}{1400} \quad 0 \quad 0 \quad 0 \quad \frac{9\sqrt{15}i}{1400} \quad 0$
	$\frac{3\sqrt{2}i}{28}$	$0 \quad 0 \quad \frac{3\sqrt{2}i}{28} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{6}i}{280} \quad 0 \quad 0 \quad 0 \quad -\frac{3\sqrt{210}i}{1400}$
	$-\frac{9\sqrt{10}i}{140}$	$0 \quad 0 \quad 0 \quad -\frac{9\sqrt{10}i}{140} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{30}i}{140} \quad 0 \quad 0 \quad 0$
668	symmetry	$\frac{\sqrt{35}yz(y-z)(y+z)}{2}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{G}_{4,0}^{(1,0;a)}(T_u, 1)$	$\begin{bmatrix} \frac{\sqrt{35}}{1120} & 0 & \frac{\sqrt{14}}{224} & 0 & \frac{\sqrt{7}}{224} & 0 & 0 & -\frac{27\sqrt{210}}{2800} & 0 & -\frac{9\sqrt{42}}{280} & 0 & -\frac{27\sqrt{70}}{2800} & 0 & 0 \\ 0 & -\frac{\sqrt{21}}{224} & 0 & -\frac{\sqrt{42}}{224} & 0 & -\frac{\sqrt{105}}{1120} & \frac{9\sqrt{10}}{400} & 0 & \frac{9\sqrt{210}}{700} & 0 & \frac{9\sqrt{14}}{560} & 0 & -\frac{9\sqrt{70}}{1400} & 0 \\ \frac{\sqrt{105}}{1120} & 0 & \frac{\sqrt{42}}{224} & 0 & \frac{\sqrt{21}}{224} & 0 & 0 & -\frac{9\sqrt{70}}{1400} & 0 & \frac{9\sqrt{14}}{560} & 0 & \frac{9\sqrt{210}}{700} & 0 & \frac{9\sqrt{10}}{400} \\ 0 & -\frac{\sqrt{7}}{224} & 0 & -\frac{\sqrt{14}}{224} & 0 & -\frac{\sqrt{35}}{1120} & 0 & 0 & -\frac{27\sqrt{70}}{2800} & 0 & -\frac{9\sqrt{42}}{280} & 0 & -\frac{27\sqrt{210}}{2800} & 0 \\ 0 & -\frac{3\sqrt{35}}{140} & 0 & -\frac{3\sqrt{70}}{280} & 0 & 0 & -\frac{\sqrt{6}}{160} & 0 & -\frac{\sqrt{14}}{112} & 0 & -\frac{\sqrt{210}}{1120} & 0 & 0 & 0 \\ \frac{3\sqrt{35}}{140} & 0 & \frac{3\sqrt{14}}{56} & 0 & 0 & 0 & 0 & \frac{13\sqrt{210}}{5600} & 0 & \frac{\sqrt{42}}{560} & 0 & -\frac{\sqrt{70}}{800} & 0 & 0 \\ 0 & -\frac{3\sqrt{14}}{56} & 0 & 0 & 0 & \frac{3\sqrt{70}}{280} & -\frac{3\sqrt{15}}{800} & 0 & -\frac{\sqrt{35}}{5600} & 0 & \frac{\sqrt{21}}{160} & 0 & \frac{\sqrt{105}}{5600} & 0 \\ \frac{3\sqrt{70}}{280} & 0 & 0 & 0 & -\frac{3\sqrt{14}}{56} & 0 & 0 & -\frac{\sqrt{105}}{5600} & 0 & -\frac{\sqrt{21}}{160} & 0 & \frac{\sqrt{35}}{5600} & 0 & \frac{3\sqrt{15}}{800} \\ 0 & 0 & 0 & \frac{3\sqrt{14}}{56} & 0 & \frac{3\sqrt{35}}{140} & 0 & 0 & \frac{\sqrt{70}}{800} & 0 & -\frac{\sqrt{42}}{560} & 0 & -\frac{13\sqrt{210}}{5600} & 0 \\ 0 & 0 & -\frac{3\sqrt{70}}{280} & 0 & -\frac{3\sqrt{35}}{140} & 0 & 0 & 0 & 0 & \frac{\sqrt{210}}{1120} & 0 & \frac{\sqrt{14}}{112} & 0 & \frac{\sqrt{6}}{160} \end{bmatrix}$	
	669	symmetry
	$-\frac{\sqrt{35}xz(x-z)(x+z)}{2}$	
	$\begin{bmatrix} \frac{\sqrt{35}i}{1120} & 0 & -\frac{\sqrt{14}i}{224} & 0 & \frac{\sqrt{7}i}{224} & 0 & 0 & -\frac{27\sqrt{210}i}{2800} & 0 & \frac{9\sqrt{42}i}{280} & 0 & -\frac{27\sqrt{70}i}{2800} & 0 & 0 \\ 0 & -\frac{\sqrt{21}i}{224} & 0 & \frac{\sqrt{42}i}{224} & 0 & -\frac{\sqrt{105}i}{1120} & -\frac{9\sqrt{10}i}{400} & 0 & \frac{9\sqrt{210}i}{700} & 0 & -\frac{9\sqrt{14}i}{560} & 0 & -\frac{9\sqrt{70}i}{1400} & 0 \\ -\frac{\sqrt{105}i}{1120} & 0 & \frac{\sqrt{42}i}{224} & 0 & -\frac{\sqrt{21}i}{224} & 0 & 0 & \frac{9\sqrt{70}i}{1400} & 0 & \frac{9\sqrt{14}i}{560} & 0 & -\frac{9\sqrt{210}i}{700} & 0 & \frac{9\sqrt{10}i}{400} \\ 0 & \frac{\sqrt{7}i}{224} & 0 & -\frac{\sqrt{14}i}{224} & 0 & \frac{\sqrt{35}i}{1120} & 0 & 0 & \frac{27\sqrt{70}i}{2800} & 0 & -\frac{9\sqrt{42}i}{280} & 0 & \frac{27\sqrt{210}i}{2800} & 0 \\ 0 & \frac{3\sqrt{35}i}{140} & 0 & -\frac{3\sqrt{70}i}{280} & 0 & 0 & -\frac{\sqrt{6}i}{160} & 0 & \frac{\sqrt{14}i}{112} & 0 & -\frac{\sqrt{210}i}{1120} & 0 & 0 & 0 \\ \frac{3\sqrt{35}i}{140} & 0 & -\frac{3\sqrt{14}i}{56} & 0 & 0 & 0 & 0 & \frac{13\sqrt{210}i}{5600} & 0 & -\frac{\sqrt{42}i}{560} & 0 & -\frac{\sqrt{70}i}{800} & 0 & 0 \\ 0 & -\frac{3\sqrt{14}i}{56} & 0 & 0 & 0 & \frac{3\sqrt{70}i}{280} & \frac{3\sqrt{15}i}{800} & 0 & -\frac{\sqrt{35}i}{5600} & 0 & -\frac{\sqrt{21}i}{160} & 0 & \frac{\sqrt{105}i}{5600} & 0 \\ -\frac{3\sqrt{70}i}{280} & 0 & 0 & 0 & \frac{3\sqrt{14}i}{56} & 0 & 0 & \frac{\sqrt{105}i}{5600} & 0 & -\frac{\sqrt{21}i}{160} & 0 & -\frac{\sqrt{35}i}{5600} & 0 & \frac{3\sqrt{15}i}{800} \\ 0 & 0 & 0 & \frac{3\sqrt{14}i}{56} & 0 & -\frac{3\sqrt{35}i}{140} & 0 & 0 & -\frac{\sqrt{70}i}{800} & 0 & -\frac{\sqrt{42}i}{560} & 0 & \frac{13\sqrt{210}i}{5600} & 0 \\ 0 & 0 & \frac{3\sqrt{70}i}{280} & 0 & -\frac{3\sqrt{35}i}{140} & 0 & 0 & 0 & 0 & -\frac{\sqrt{210}i}{1120} & 0 & \frac{\sqrt{14}i}{112} & 0 & -\frac{\sqrt{6}i}{160} \end{bmatrix}$	
	670	symmetry
	$\frac{\sqrt{35}xy(x-y)(x+y)}{2}$	

continued ...

Table 9

No.	multipole	matrix
	$\mathbb{G}_{4,2}^{(1,0;a)}(T_u, 1)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{35}}{140} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{9\sqrt{210}}{700} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{9\sqrt{10}}{100} \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{9\sqrt{10}}{100} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ -\frac{\sqrt{35}}{140} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{9\sqrt{210}}{700} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{3\sqrt{35}}{70} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{14}}{140} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{35}}{70} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{210}}{350} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{100} \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{100} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ -\frac{3\sqrt{35}}{70} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{210}}{350} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{3\sqrt{35}}{70} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{14}}{140} & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
671	symmetry	$\frac{\sqrt{5}yz(6x^2-y^2-z^2)}{2}$
	$\mathbb{G}_{4,0}^{(1,0;a)}(T_u, 2)$	$\begin{bmatrix} \frac{\sqrt{5}}{1120} & 0 & \frac{\sqrt{2}}{224} & 0 & -\frac{1}{32} & 0 & 0 & -\frac{27\sqrt{30}}{2800} & 0 & -\frac{9\sqrt{6}}{280} & 0 & \frac{27\sqrt{10}}{400} & 0 & 0 \\ 0 & -\frac{\sqrt{3}}{224} & 0 & -\frac{\sqrt{6}}{224} & 0 & \frac{\sqrt{15}}{160} & -\frac{9\sqrt{70}}{400} & 0 & \frac{9\sqrt{30}}{700} & 0 & \frac{9\sqrt{2}}{560} & 0 & \frac{9\sqrt{10}}{200} & 0 \\ -\frac{\sqrt{15}}{160} & 0 & \frac{\sqrt{6}}{224} & 0 & \frac{\sqrt{3}}{224} & 0 & 0 & \frac{9\sqrt{10}}{200} & 0 & \frac{9\sqrt{2}}{560} & 0 & \frac{9\sqrt{30}}{700} & 0 & -\frac{9\sqrt{70}}{400} \\ 0 & \frac{1}{32} & 0 & -\frac{\sqrt{2}}{224} & 0 & -\frac{\sqrt{5}}{1120} & 0 & 0 & \frac{27\sqrt{10}}{400} & 0 & -\frac{9\sqrt{6}}{280} & 0 & -\frac{27\sqrt{30}}{2800} & 0 \\ 0 & -\frac{3\sqrt{5}}{140} & 0 & \frac{3\sqrt{10}}{40} & 0 & 0 & -\frac{\sqrt{42}}{1120} & 0 & -\frac{\sqrt{2}}{112} & 0 & \frac{\sqrt{30}}{160} & 0 & 0 & 0 \\ \frac{3\sqrt{5}}{140} & 0 & \frac{3\sqrt{2}}{56} & 0 & 0 & 0 & 0 & \frac{13\sqrt{30}}{5600} & 0 & \frac{\sqrt{6}}{560} & 0 & \frac{7\sqrt{10}}{800} & 0 & 0 \\ 0 & -\frac{3\sqrt{2}}{56} & 0 & 0 & 0 & -\frac{3\sqrt{10}}{40} & \frac{3\sqrt{105}}{800} & 0 & -\frac{\sqrt{5}}{5600} & 0 & \frac{\sqrt{3}}{160} & 0 & -\frac{\sqrt{15}}{800} & 0 \\ -\frac{3\sqrt{10}}{40} & 0 & 0 & 0 & -\frac{3\sqrt{2}}{56} & 0 & 0 & \frac{\sqrt{15}}{800} & 0 & -\frac{\sqrt{3}}{160} & 0 & \frac{\sqrt{5}}{5600} & 0 & -\frac{3\sqrt{105}}{800} \\ 0 & 0 & 0 & \frac{3\sqrt{2}}{56} & 0 & \frac{3\sqrt{5}}{140} & 0 & 0 & -\frac{7\sqrt{10}}{800} & 0 & -\frac{\sqrt{6}}{560} & 0 & -\frac{13\sqrt{30}}{5600} & 0 \\ 0 & 0 & \frac{3\sqrt{10}}{40} & 0 & -\frac{3\sqrt{5}}{140} & 0 & 0 & 0 & -\frac{\sqrt{30}}{160} & 0 & \frac{\sqrt{2}}{112} & 0 & \frac{\sqrt{42}}{1120} & 0 \end{bmatrix}$
672	symmetry	$-\frac{\sqrt{5}xz(x^2-6y^2+z^2)}{2}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{G}_{4,1}^{(1,0;a)}(T_u, 2)$	$-\frac{\sqrt{5}i}{1120} \quad 0 \quad \frac{\sqrt{2}i}{224} \quad 0 \quad \frac{i}{32} \quad 0 \quad 0 \quad \frac{27\sqrt{30}i}{2800} \quad 0 \quad -\frac{9\sqrt{6}i}{280} \quad 0 \quad -\frac{27\sqrt{10}i}{400} \quad 0 \quad 0$	
	$0 \quad \frac{\sqrt{3}i}{224} \quad 0 \quad -\frac{\sqrt{6}i}{224} \quad 0 \quad -\frac{\sqrt{15}i}{160} \quad -\frac{9\sqrt{70}i}{400} \quad 0 \quad -\frac{9\sqrt{30}i}{700} \quad 0 \quad \frac{9\sqrt{2}i}{560} \quad 0 \quad -\frac{9\sqrt{10}i}{200} \quad 0$	
	$-\frac{\sqrt{15}i}{160} \quad 0 \quad -\frac{\sqrt{6}i}{224} \quad 0 \quad \frac{\sqrt{3}i}{224} \quad 0 \quad 0 \quad \frac{9\sqrt{10}i}{200} \quad 0 \quad -\frac{9\sqrt{2}i}{560} \quad 0 \quad \frac{9\sqrt{30}i}{700} \quad 0 \quad \frac{9\sqrt{70}i}{400}$	
	$0 \quad \frac{i}{32} \quad 0 \quad \frac{\sqrt{2}i}{224} \quad 0 \quad -\frac{\sqrt{5}i}{1120} \quad 0 \quad 0 \quad \frac{27\sqrt{10}i}{400} \quad 0 \quad \frac{9\sqrt{6}i}{280} \quad 0 \quad -\frac{27\sqrt{30}i}{2800} \quad 0$	
	$0 \quad -\frac{3\sqrt{5}i}{140} \quad 0 \quad -\frac{3\sqrt{10}i}{40} \quad 0 \quad 0 \quad \frac{\sqrt{42}i}{1120} \quad 0 \quad -\frac{\sqrt{2}i}{112} \quad 0 \quad -\frac{\sqrt{30}i}{160} \quad 0 \quad 0 \quad 0$	
	$-\frac{3\sqrt{5}i}{140} \quad 0 \quad \frac{3\sqrt{2}i}{56} \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{13\sqrt{30}i}{5600} \quad 0 \quad \frac{\sqrt{6}i}{560} \quad 0 \quad -\frac{7\sqrt{10}i}{800} \quad 0 \quad 0$	
	$0 \quad \frac{3\sqrt{2}i}{56} \quad 0 \quad 0 \quad 0 \quad \frac{3\sqrt{10}i}{40} \quad \frac{3\sqrt{105}i}{800} \quad 0 \quad \frac{\sqrt{5}i}{5600} \quad 0 \quad \frac{\sqrt{3}i}{160} \quad 0 \quad \frac{\sqrt{15}i}{800} \quad 0$	
	$-\frac{3\sqrt{10}i}{40} \quad 0 \quad 0 \quad 0 \quad -\frac{3\sqrt{2}i}{56} \quad 0 \quad 0 \quad \frac{\sqrt{15}i}{800} \quad 0 \quad \frac{\sqrt{3}i}{160} \quad 0 \quad \frac{\sqrt{5}i}{5600} \quad 0 \quad \frac{3\sqrt{105}i}{800}$	
	$0 \quad 0 \quad 0 \quad -\frac{3\sqrt{2}i}{56} \quad 0 \quad \frac{3\sqrt{5}i}{140} \quad 0 \quad 0 \quad -\frac{7\sqrt{10}i}{800} \quad 0 \quad \frac{\sqrt{6}i}{560} \quad 0 \quad -\frac{13\sqrt{30}i}{5600} \quad 0$	
	$0 \quad 0 \quad \frac{3\sqrt{10}i}{40} \quad 0 \quad \frac{3\sqrt{5}i}{140} \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{30}i}{160} \quad 0 \quad -\frac{\sqrt{2}i}{112} \quad 0 \quad \frac{\sqrt{42}i}{1120}$	
673	symmetry	$-\frac{\sqrt{5}xy(x^2+y^2-6z^2)}{2}$
$\mathbb{G}_{4,2}^{(1,0;a)}(T_u, 2)$	$0 \quad 0 \quad 0 \quad -\frac{\sqrt{2}}{56} \quad 0 \quad 0 \quad -\frac{9\sqrt{210}}{1400} \quad 0 \quad 0 \quad 0 \quad \frac{27\sqrt{6}}{280} \quad 0 \quad 0 \quad 0$	
	$-\frac{\sqrt{15}}{280} \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{3}}{56} \quad 0 \quad 0 \quad \frac{99\sqrt{10}}{1400} \quad 0 \quad 0 \quad 0 \quad \frac{9\sqrt{30}}{1400} \quad 0 \quad 0$	
	$0 \quad \frac{\sqrt{3}}{56} \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{15}}{280} \quad 0 \quad 0 \quad -\frac{9\sqrt{30}}{1400} \quad 0 \quad 0 \quad 0 \quad -\frac{99\sqrt{10}}{1400} \quad 0$	
	$0 \quad 0 \quad -\frac{\sqrt{2}}{56} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{27\sqrt{6}}{280} \quad 0 \quad 0 \quad 0 \quad \frac{9\sqrt{210}}{1400}$	
	$0 \quad 0 \quad \frac{9\sqrt{10}}{140} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{30}}{140} \quad 0 \quad 0 \quad 0 \quad 0$	
	$0 \quad 0 \quad 0 \quad -\frac{3\sqrt{2}}{28} \quad 0 \quad 0 \quad \frac{3\sqrt{210}}{1400} \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{6}}{280} \quad 0 \quad 0 \quad 0$	
	$-\frac{9\sqrt{10}}{140} \quad 0 \quad 0 \quad 0 \quad -\frac{3\sqrt{2}}{28} \quad 0 \quad 0 \quad -\frac{9\sqrt{15}}{1400} \quad 0 \quad 0 \quad 0 \quad -\frac{17\sqrt{5}}{1400} \quad 0 \quad 0$	
	$0 \quad \frac{3\sqrt{2}}{28} \quad 0 \quad 0 \quad 0 \quad \frac{9\sqrt{10}}{140} \quad 0 \quad 0 \quad -\frac{17\sqrt{5}}{1400} \quad 0 \quad 0 \quad 0 \quad -\frac{9\sqrt{15}}{1400} \quad 0$	
	$0 \quad 0 \quad \frac{3\sqrt{2}}{28} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{6}}{280} \quad 0 \quad 0 \quad 0 \quad \frac{3\sqrt{210}}{1400}$	
	$0 \quad 0 \quad 0 \quad -\frac{9\sqrt{10}}{140} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{30}}{140} \quad 0 \quad 0 \quad 0 \quad 0$	

674 symmetry

1

continued ...

Table 9

No.	multipole	matrix
	$\mathbb{G}_0^{(1,1;a)}(A_u)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ -\frac{\sqrt{3}i}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{3}i}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{3}i}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{3}i}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
675	symmetry	$-\frac{x^2}{2} - \frac{y^2}{2} + z^2$ $\begin{bmatrix} 0 & \frac{12i}{35} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{10}i}{140} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & \frac{2\sqrt{6}i}{35} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{9\sqrt{2}i}{140} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{2\sqrt{6}i}{35} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{9\sqrt{2}i}{140} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{12i}{35} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{10}i}{140} & 0 & 0 \\ \frac{3i}{14} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{21} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{3i}{70} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}i}{35} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{6i}{35} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{2\sqrt{3}i}{105} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{6i}{35} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{2\sqrt{3}i}{105} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{3i}{70} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}i}{35} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{3i}{14} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}i}{21} & 0 \end{bmatrix}$
676	symmetry	$\frac{\sqrt{3}(x-y)(x+y)}{2}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{G}_{2,1}^{(1,1;a)}(E_u)$	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	
	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	
	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 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 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	
	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	
	0 0 0 $\frac{9\sqrt{6}i}{140}$ 0 0 0 0 0 $\frac{4\sqrt{2}i}{105}$ 0 0 0 $-\frac{\sqrt{70}i}{105}$ 0 0 0	
677 symmetry	$\sqrt{3}yz$	
	$\frac{2\sqrt{15}}{35}$ 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 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 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	
	0 $\frac{3\sqrt{15}}{70}$ 0 0 0 0 $-\frac{\sqrt{14}}{42}$ 0 $-\frac{\sqrt{6}}{42}$ 0 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	
	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 0 $-\frac{3\sqrt{6}}{70}$ 0 0 0 0 0 $\frac{1}{15}$ 0 $-\frac{\sqrt{15}}{105}$ 0 0 0	
678 symmetry	$\sqrt{3}xz$	
	continued ...	

Table 9

No.	multipole	matrix
$\mathbb{G}_{2,1}^{(1,1;a)}(T_u)$	$\begin{bmatrix} -\frac{2\sqrt{15}i}{35} & 0 & \frac{3\sqrt{6}i}{35} & 0 & 0 & 0 & 0 & \frac{3\sqrt{10}i}{140} & 0 & -\frac{3\sqrt{2}i}{140} & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{2i}{35} & 0 & \frac{\sqrt{2}i}{7} & 0 & 0 & 0 & 0 & \frac{3\sqrt{10}i}{140} & 0 & -\frac{3\sqrt{6}i}{140} & 0 & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{2}i}{7} & 0 & \frac{2i}{35} & 0 & 0 & 0 & 0 & \frac{3\sqrt{6}i}{140} & 0 & -\frac{3\sqrt{10}i}{140} & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{3\sqrt{6}i}{35} & 0 & -\frac{2\sqrt{15}i}{35} & 0 & 0 & 0 & 0 & \frac{3\sqrt{2}i}{140} & 0 & -\frac{3\sqrt{10}i}{140} & 0 & 0 \\ 0 & \frac{3\sqrt{15}i}{70} & 0 & 0 & 0 & 0 & \frac{\sqrt{14}i}{42} & 0 & -\frac{\sqrt{6}i}{42} & 0 & 0 & 0 & 0 & 0 & 0 \\ \frac{3\sqrt{15}i}{70} & 0 & \frac{3\sqrt{6}i}{70} & 0 & 0 & 0 & 0 & \frac{\sqrt{10}i}{210} & 0 & -\frac{11\sqrt{2}i}{210} & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{3\sqrt{6}i}{70} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{105} & 0 & -\frac{i}{15} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{3\sqrt{6}i}{70} & 0 & 0 & 0 & 0 & -\frac{i}{15} & 0 & -\frac{\sqrt{15}i}{105} & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{3\sqrt{6}i}{70} & 0 & -\frac{3\sqrt{15}i}{70} & 0 & 0 & 0 & 0 & -\frac{11\sqrt{2}i}{210} & 0 & \frac{\sqrt{10}i}{210} & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{3\sqrt{15}i}{70} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{42} & 0 & \frac{\sqrt{14}i}{42} & 0 \end{bmatrix}$	
	679 symmetry	$\sqrt{3}xy$
	$\mathbb{G}_{2,2}^{(1,1;a)}(T_u)$	$\begin{bmatrix} 0 & 0 & 0 & \frac{2\sqrt{6}}{35} & 0 & 0 & \frac{3\sqrt{70}}{280} & 0 & 0 & 0 & -\frac{3\sqrt{2}}{280} & 0 & 0 & 0 & 0 \\ \frac{4\sqrt{5}}{35} & 0 & 0 & 0 & \frac{8}{35} & 0 & 0 & \frac{3\sqrt{30}}{280} & 0 & 0 & 0 & -\frac{3\sqrt{10}}{280} & 0 & 0 & 0 & 0 \\ 0 & \frac{8}{35} & 0 & 0 & 0 & \frac{4\sqrt{5}}{35} & 0 & 0 & \frac{3\sqrt{10}}{280} & 0 & 0 & 0 & -\frac{3\sqrt{30}}{280} & 0 & 0 & 0 \\ 0 & 0 & \frac{2\sqrt{6}}{35} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{2}}{280} & 0 & 0 & 0 & 0 & -\frac{3\sqrt{70}}{280} & 0 \\ 0 & 0 & \frac{3\sqrt{30}}{140} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}}{105} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{9\sqrt{6}}{140} & 0 & 0 & -\frac{\sqrt{70}}{105} & 0 & 0 & 0 & -\frac{4\sqrt{2}}{105} & 0 & 0 & 0 & 0 & 0 \\ -\frac{3\sqrt{30}}{140} & 0 & 0 & 0 & \frac{9\sqrt{6}}{140} & 0 & 0 & -\frac{4\sqrt{5}}{105} & 0 & 0 & 0 & -\frac{2\sqrt{15}}{105} & 0 & 0 & 0 & 0 \\ 0 & -\frac{9\sqrt{6}}{140} & 0 & 0 & 0 & \frac{3\sqrt{30}}{140} & 0 & 0 & -\frac{2\sqrt{15}}{105} & 0 & 0 & 0 & -\frac{4\sqrt{5}}{105} & 0 & 0 & 0 \\ 0 & 0 & -\frac{9\sqrt{6}}{140} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{4\sqrt{2}}{105} & 0 & 0 & 0 & -\frac{\sqrt{70}}{105} & 0 & 0 \\ 0 & 0 & 0 & -\frac{3\sqrt{30}}{140} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}}{105} & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
		$\frac{\sqrt{21}(x^4 - 3x^2y^2 - 3x^2z^2 + y^4 - 3y^2z^2 + z^4)}{6}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{G}_4^{(1,1;a)}(A_u)$	$0 \quad -\frac{\sqrt{770}i}{210} \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{154}i}{42} \quad 0 \quad 0 \quad \frac{\sqrt{77}i}{140} \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{231}i}{420} \quad 0$	
	$0 \quad 0 \quad \frac{\sqrt{1155}i}{105} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{385}i}{420} \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{11}i}{60}$	
	$0 \quad 0 \quad 0 \quad -\frac{\sqrt{1155}i}{105} \quad 0 \quad 0 \quad \frac{\sqrt{11}i}{60} \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{385}i}{420} \quad 0 \quad 0 \quad 0 \quad 0$	
	$\frac{\sqrt{154}i}{42} \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{770}i}{210} \quad 0 \quad 0 \quad \frac{\sqrt{231}i}{420} \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{77}i}{140} \quad 0 \quad 0$	
	$-\frac{\sqrt{770}i}{840} \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{154}i}{168} \quad 0 \quad 0 \quad \frac{\sqrt{1155}i}{1155} \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{385}i}{1155} \quad 0 \quad 0$	
	$0 \quad \frac{\sqrt{770}i}{280} \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{154}i}{168} \quad 0 \quad 0 \quad -\frac{4\sqrt{77}i}{1155} \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{2\sqrt{231}i}{1155} \quad 0$	
	$0 \quad 0 \quad -\frac{\sqrt{770}i}{420} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{231}i}{2310} \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{66}i}{330}$	
	$0 \quad 0 \quad 0 \quad -\frac{\sqrt{770}i}{420} \quad 0 \quad 0 \quad -\frac{\sqrt{66}i}{330} \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{231}i}{2310} \quad 0 \quad 0 \quad 0 \quad 0$	
	$-\frac{\sqrt{154}i}{168} \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{770}i}{280} \quad 0 \quad 0 \quad -\frac{2\sqrt{231}i}{1155} \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{4\sqrt{77}i}{1155} \quad 0 \quad 0$	
	$0 \quad -\frac{\sqrt{154}i}{168} \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{770}i}{840} \quad 0 \quad 0 \quad -\frac{\sqrt{385}i}{1155} \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{1155}i}{1155} \quad 0$	
681	symmetry	$-\frac{\sqrt{15}(x^4 - 12x^2y^2 + 6x^2z^2 + y^4 + 6y^2z^2 - 2z^4)}{12}$
$\mathbb{G}_{4,0}^{(1,1;a)}(E_u)$	$0 \quad -\frac{\sqrt{22}i}{42} \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{110}i}{30} \quad 0 \quad 0 \quad \frac{\sqrt{55}i}{140} \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{165}i}{300} \quad 0$	
	$0 \quad 0 \quad \frac{\sqrt{33}i}{21} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{11}i}{84} \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{385}i}{300}$	
	$0 \quad 0 \quad 0 \quad -\frac{\sqrt{33}i}{21} \quad 0 \quad 0 \quad -\frac{\sqrt{385}i}{300} \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{11}i}{84} \quad 0 \quad 0 \quad 0 \quad 0$	
	$-\frac{\sqrt{110}i}{30} \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{22}i}{42} \quad 0 \quad 0 \quad -\frac{\sqrt{165}i}{300} \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{55}i}{140} \quad 0 \quad 0 \quad 0$	
	$-\frac{\sqrt{22}i}{168} \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{110}i}{120} \quad 0 \quad 0 \quad \frac{\sqrt{33}i}{231} \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{11}i}{165} \quad 0 \quad 0 \quad 0$	
	$0 \quad \frac{\sqrt{22}i}{56} \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{110}i}{120} \quad 0 \quad 0 \quad -\frac{4\sqrt{55}i}{1155} \quad 0 \quad 0 \quad 0 \quad -\frac{2\sqrt{165}i}{825} \quad 0$	
	$0 \quad 0 \quad -\frac{\sqrt{22}i}{84} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{66}i}{462} \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{231}i}{1650} \quad 0$	
	$0 \quad 0 \quad 0 \quad -\frac{\sqrt{22}i}{84} \quad 0 \quad 0 \quad \frac{\sqrt{231}i}{1650} \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{66}i}{462} \quad 0 \quad 0 \quad 0 \quad 0$	
	$\frac{\sqrt{110}i}{120} \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{22}i}{56} \quad 0 \quad 0 \quad \frac{2\sqrt{165}i}{825} \quad 0 \quad 0 \quad 0 \quad \frac{4\sqrt{55}i}{1155} \quad 0 \quad 0 \quad 0$	
	$0 \quad \frac{\sqrt{110}i}{120} \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{22}i}{168} \quad 0 \quad 0 \quad \frac{\sqrt{11}i}{165} \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{33}i}{231} \quad 0 \quad 0$	
682	symmetry	$\frac{\sqrt{5}(x-y)(x+y)(x^2+y^2-6z^2)}{4}$

continued ...

Table 9

No.	multipole	matrix										
$\mathbb{G}_{4,1}^{(1,1;a)}(E_u)$	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											
	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 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 $-\frac{3\sqrt{385}i}{1925}$											
683 symmetry	0 0 0 $\frac{\sqrt{165}i}{140}$ 0 0 0 0 0 0 $\frac{2\sqrt{55}i}{385}$ 0 0 0											
	$\frac{\sqrt{35}yz(y-z)(y+z)}{2}$											
	$\frac{\sqrt{2310}}{840}$ 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 $\frac{3\sqrt{110}}{2200}$											
684 symmetry	0 0 0 $-\frac{\sqrt{231}}{168}$ 0 $-\frac{\sqrt{2310}}{840}$ 0 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 $\frac{\sqrt{11}}{220}$											

continued ...

Table 9

No.	multipole	matrix
$\mathbb{G}_{4,1}^{(1,1;a)}(T_u, 1)$	$\frac{\sqrt{2310}i}{840}$	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 $-\frac{\sqrt{770}i}{280}$ 0 $-\frac{\sqrt{165}i}{600}$ 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 $\frac{\sqrt{2310}i}{840}$ 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 $-\frac{\sqrt{11}i}{220}$
685	symmetry	$\frac{\sqrt{35}xy(x-y)(x+y)}{2}$
$\mathbb{G}_{4,2}^{(1,1;a)}(T_u, 1)$	0	0 0 0 0 0 $-\frac{\sqrt{2310}}{105}$ 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 0 $-\frac{\sqrt{165}}{150}$ 0 0 0 0 0 0
	$-\frac{\sqrt{2310}}{105}$	0 0 0 0 0 0 0 $-\frac{\sqrt{385}}{350}$ 0 0 0 0 0 0
	0	0 0 0 0 $-\frac{\sqrt{2310}}{420}$ 0 0 0 0 0 $\frac{2\sqrt{231}}{1155}$ 0 0
	0	0 0 0 0 0 $-\frac{\sqrt{2310}}{420}$ 0 0 0 0 0 $\frac{4\sqrt{385}}{1925}$ 0
	0	0 0 0 0 0 0 0 0 0 0 0 0 $\frac{\sqrt{110}}{275}$
	$\frac{\sqrt{2310}}{420}$	0 0 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 0 0 $\frac{2\sqrt{231}}{1155}$ 0 0 0 0 0
686	symmetry	$\frac{\sqrt{5}yz(6x^2-y^2-z^2)}{2}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{G}_{4,0}^{(1,1;a)}(T_u, 2)$	$\frac{\sqrt{330}}{840} 0 \frac{\sqrt{33}}{84} 0 -\frac{\sqrt{66}}{24} 0 0 -\frac{3\sqrt{55}}{1400} 0 -\frac{\sqrt{11}}{140} 0 \frac{\sqrt{165}}{200} 0 0 0$	
	$0 -\frac{\sqrt{22}}{56} 0 -\frac{\sqrt{11}}{28} 0 \frac{\sqrt{110}}{40} -\frac{\sqrt{1155}}{600} 0 \frac{\sqrt{55}}{350} 0 \frac{\sqrt{33}}{840} 0 \frac{\sqrt{165}}{300} 0 \frac{\sqrt{165}}{300} 0$	
	$-\frac{\sqrt{110}}{40} 0 \frac{\sqrt{11}}{28} 0 \frac{\sqrt{22}}{56} 0 0 0 \frac{\sqrt{165}}{300} 0 \frac{\sqrt{33}}{840} 0 \frac{\sqrt{55}}{350} 0 -\frac{\sqrt{1155}}{600} 0$	
	$0 \frac{\sqrt{66}}{24} 0 -\frac{\sqrt{33}}{84} 0 -\frac{\sqrt{330}}{840} 0 0 \frac{\sqrt{165}}{200} 0 -\frac{\sqrt{11}}{140} 0 -\frac{3\sqrt{55}}{1400} 0 0$	
	$0 \frac{\sqrt{330}}{840} 0 -\frac{\sqrt{165}}{120} 0 0 0 -\frac{\sqrt{77}}{1540} 0 -\frac{\sqrt{33}}{462} 0 \frac{\sqrt{55}}{220} 0 0 0$	
	$-\frac{\sqrt{330}}{840} 0 -\frac{\sqrt{33}}{168} 0 0 0 0 \frac{13\sqrt{55}}{7700} 0 \frac{\sqrt{11}}{770} 0 \frac{7\sqrt{165}}{3300} 0 0 0$	
	$0 \frac{\sqrt{33}}{168} 0 0 0 \frac{\sqrt{165}}{120} \frac{3\sqrt{770}}{2200} 0 -\frac{\sqrt{330}}{46200} 0 \frac{\sqrt{22}}{440} 0 -\frac{\sqrt{110}}{2200} 0 0$	
	$\frac{\sqrt{165}}{120} 0 0 0 \frac{\sqrt{33}}{168} 0 0 \frac{\sqrt{110}}{2200} 0 -\frac{\sqrt{22}}{440} 0 \frac{\sqrt{330}}{46200} 0 -\frac{3\sqrt{770}}{2200} 0$	
	$0 0 0 -\frac{\sqrt{33}}{168} 0 -\frac{\sqrt{330}}{840} 0 0 0 -\frac{7\sqrt{165}}{3300} 0 -\frac{\sqrt{11}}{770} 0 -\frac{13\sqrt{55}}{7700} 0 0$	
	$0 0 -\frac{\sqrt{165}}{120} 0 \frac{\sqrt{330}}{840} 0 0 0 0 -\frac{\sqrt{55}}{220} 0 \frac{\sqrt{33}}{462} 0 \frac{\sqrt{77}}{1540} 0$	
687	symmetry	$-\frac{\sqrt{5}xz(x^2-6y^2+z^2)}{2}$
$\mathbb{G}_{4,1}^{(1,1;a)}(T_u, 2)$	$-\frac{\sqrt{330i}}{840} 0 \frac{\sqrt{33i}}{84} 0 \frac{\sqrt{66i}}{24} 0 0 \frac{3\sqrt{55i}}{1400} 0 -\frac{\sqrt{11i}}{140} 0 -\frac{\sqrt{165i}}{200} 0 0 0$	
	$0 \frac{\sqrt{22i}}{56} 0 -\frac{\sqrt{11i}}{28} 0 -\frac{\sqrt{110i}}{40} -\frac{\sqrt{1155i}}{600} 0 -\frac{\sqrt{55i}}{350} 0 \frac{\sqrt{33i}}{840} 0 -\frac{\sqrt{165i}}{300} 0 0$	
	$-\frac{\sqrt{110i}}{40} 0 -\frac{\sqrt{11i}}{28} 0 \frac{\sqrt{22i}}{56} 0 0 0 \frac{\sqrt{165i}}{300} 0 -\frac{\sqrt{33i}}{840} 0 \frac{\sqrt{55i}}{350} 0 \frac{\sqrt{1155i}}{600} 0$	
	$0 \frac{\sqrt{66i}}{24} 0 \frac{\sqrt{33i}}{84} 0 -\frac{\sqrt{330i}}{840} 0 0 0 \frac{\sqrt{165i}}{200} 0 \frac{\sqrt{11i}}{140} 0 -\frac{3\sqrt{55i}}{1400} 0 0$	
	$0 \frac{\sqrt{330i}}{840} 0 \frac{\sqrt{165i}}{120} 0 0 0 \frac{\sqrt{77i}}{1540} 0 -\frac{\sqrt{33i}}{462} 0 -\frac{\sqrt{55i}}{220} 0 0 0$	
	$\frac{\sqrt{330i}}{840} 0 -\frac{\sqrt{33i}}{168} 0 0 0 0 -\frac{13\sqrt{55i}}{7700} 0 \frac{\sqrt{11i}}{770} 0 -\frac{7\sqrt{165i}}{3300} 0 0 0$	
	$0 -\frac{\sqrt{33i}}{168} 0 0 0 -\frac{\sqrt{165i}}{120} \frac{3\sqrt{770i}}{2200} 0 \frac{\sqrt{330i}}{46200} 0 \frac{\sqrt{22i}}{440} 0 \frac{\sqrt{110i}}{2200} 0 0$	
	$\frac{\sqrt{165i}}{120} 0 0 0 \frac{\sqrt{33i}}{168} 0 0 \frac{\sqrt{110i}}{2200} 0 \frac{\sqrt{22i}}{440} 0 \frac{\sqrt{330i}}{46200} 0 \frac{3\sqrt{770i}}{2200} 0$	
	$0 0 0 \frac{\sqrt{33i}}{168} 0 -\frac{\sqrt{330i}}{840} 0 0 0 -\frac{7\sqrt{165i}}{3300} 0 \frac{\sqrt{11i}}{770} 0 -\frac{13\sqrt{55i}}{7700} 0 0$	
	$0 0 -\frac{\sqrt{165i}}{120} 0 -\frac{\sqrt{330i}}{840} 0 0 0 0 -\frac{\sqrt{55i}}{220} 0 -\frac{\sqrt{33i}}{462} 0 \frac{\sqrt{77i}}{1540} 0$	
688	symmetry	$-\frac{\sqrt{5}xy(x^2+y^2-6z^2)}{2}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{G}_{4,2}^{(1,1;a)}(T_u, 2)$	$\begin{bmatrix} 0 & 0 & 0 & -\frac{\sqrt{33}}{21} & 0 & 0 & -\frac{\sqrt{385}}{700} & 0 & 0 & 0 & \frac{3\sqrt{11}}{140} & 0 & 0 & 0 \\ -\frac{\sqrt{110}}{70} & 0 & 0 & 0 & \frac{\sqrt{22}}{14} & 0 & 0 & \frac{11\sqrt{165}}{2100} & 0 & 0 & 0 & \frac{\sqrt{55}}{700} & 0 & 0 \\ 0 & \frac{\sqrt{22}}{14} & 0 & 0 & 0 & -\frac{\sqrt{110}}{70} & 0 & 0 & -\frac{\sqrt{55}}{700} & 0 & 0 & 0 & -\frac{11\sqrt{165}}{2100} & 0 \\ 0 & 0 & -\frac{\sqrt{33}}{21} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{11}}{140} & 0 & 0 & 0 & \frac{\sqrt{385}}{700} \\ 0 & 0 & -\frac{\sqrt{165}}{140} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{2\sqrt{55}}{385} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{33}}{84} & 0 & 0 & \frac{3\sqrt{385}}{1925} & 0 & 0 & 0 & \frac{\sqrt{11}}{385} & 0 & 0 & 0 \\ \frac{\sqrt{165}}{140} & 0 & 0 & 0 & \frac{\sqrt{33}}{84} & 0 & 0 & -\frac{9\sqrt{110}}{3850} & 0 & 0 & 0 & -\frac{17\sqrt{330}}{11550} & 0 & 0 \\ 0 & -\frac{\sqrt{33}}{84} & 0 & 0 & 0 & -\frac{\sqrt{165}}{140} & 0 & 0 & -\frac{17\sqrt{330}}{11550} & 0 & 0 & 0 & -\frac{9\sqrt{110}}{3850} & 0 \\ 0 & 0 & -\frac{\sqrt{33}}{84} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{11}}{385} & 0 & 0 & 0 & \frac{3\sqrt{385}}{1925} \\ 0 & 0 & 0 & \frac{\sqrt{165}}{140} & 0 & 0 & 0 & 0 & 0 & \frac{2\sqrt{55}}{385} & 0 & 0 & 0 & 0 \end{bmatrix}$	
	689 symmetry	x
	$\mathbb{T}_{1,0}^{(a)}(T_u)$	$\begin{bmatrix} -\frac{\sqrt{5}i}{10} & 0 & \frac{\sqrt{2}i}{20} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{3}i}{10} & 0 & \frac{\sqrt{6}i}{20} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{6}i}{20} & 0 & \frac{\sqrt{3}i}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{2}i}{20} & 0 & \frac{\sqrt{5}i}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{5}i}{70} & 0 & 0 & 0 & 0 & -\frac{\sqrt{42}i}{28} & 0 & \frac{\sqrt{2}i}{28} & 0 & 0 & 0 & 0 & 0 & 0 \\ -\frac{\sqrt{5}i}{70} & 0 & -\frac{\sqrt{2}i}{35} & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}i}{28} & 0 & \frac{\sqrt{6}i}{28} & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{2}i}{35} & 0 & -\frac{3i}{70} & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{14} & 0 & \frac{\sqrt{3}i}{14} & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{3i}{70} & 0 & -\frac{\sqrt{2}i}{35} & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{14} & 0 & \frac{\sqrt{5}i}{14} & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{2}i}{35} & 0 & -\frac{\sqrt{5}i}{70} & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{28} & 0 & \frac{\sqrt{30}i}{28} & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{70} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}i}{28} & 0 & \frac{\sqrt{42}i}{28} & 0 \end{bmatrix}$
	690 symmetry	y

continued ...

Table 9

No.	multipole	matrix
$\mathbb{T}_{1,1}^{(a)}(T_u)$	$\frac{\sqrt{5}}{10} 0 \frac{\sqrt{2}}{20} 0 0 0 0 0 0 0 0 0 0 0 0 0$	
	$0 \frac{\sqrt{3}}{10} 0 \frac{\sqrt{6}}{20} 0 0 0 0 0 0 0 0 0 0 0 0$	
	$0 0 \frac{\sqrt{6}}{20} 0 \frac{\sqrt{3}}{10} 0 0 0 0 0 0 0 0 0 0 0 0$	
	$0 0 0 \frac{\sqrt{2}}{20} 0 \frac{\sqrt{5}}{10} 0 0 0 0 0 0 0 0 0 0 0$	
	$0 -\frac{\sqrt{5}}{70} 0 0 0 0 \frac{\sqrt{42}}{28} 0 \frac{\sqrt{2}}{28} 0 0 0 0 0 0 0 0$	
	$\frac{\sqrt{5}}{70} 0 -\frac{\sqrt{2}}{35} 0 0 0 0 \frac{\sqrt{30}}{28} 0 \frac{\sqrt{6}}{28} 0 0 0 0 0 0 0$	
	$0 \frac{\sqrt{2}}{35} 0 -\frac{3}{70} 0 0 0 0 \frac{\sqrt{5}}{14} 0 \frac{\sqrt{3}}{14} 0 0 0 0 0 0$	
	$0 0 \frac{3}{70} 0 -\frac{\sqrt{2}}{35} 0 0 0 0 \frac{\sqrt{3}}{14} 0 \frac{\sqrt{5}}{14} 0 0 0 0 0$	
	$0 0 0 \frac{\sqrt{2}}{35} 0 -\frac{\sqrt{5}}{70} 0 0 0 0 \frac{\sqrt{6}}{28} 0 \frac{\sqrt{30}}{28} 0 0 0 0$	
	$0 0 0 0 \frac{\sqrt{5}}{70} 0 0 0 0 0 0 0 \frac{\sqrt{2}}{28} 0 \frac{\sqrt{42}}{28} 0$	
691	symmetry	z
$\mathbb{T}_{1,2}^{(a)}(T_u)$	$0 \frac{i}{5} 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0$	
	$0 0 \frac{\sqrt{6}i}{10} 0 0 0 0 0 0 0 0 0 0 0 0 0 0$	
	$0 0 0 \frac{\sqrt{6}i}{10} 0 0 0 0 0 0 0 0 0 0 0 0 0$	
	$0 0 0 0 \frac{i}{5} 0 0 0 0 0 0 0 0 0 0 0 0 0$	
	$-\frac{i}{14} 0 0 0 0 0 0 0 \frac{\sqrt{6}i}{14} 0 0 0 0 0 0 0 0$	
	$0 -\frac{3i}{70} 0 0 0 0 0 0 0 \frac{\sqrt{10}i}{14} 0 0 0 0 0 0 0$	
	$0 0 -\frac{i}{70} 0 0 0 0 0 0 0 \frac{\sqrt{3}i}{7} 0 0 0 0 0 0$	
	$0 0 0 \frac{i}{70} 0 0 0 0 0 0 0 \frac{\sqrt{3}i}{7} 0 0 0 0 0$	
	$0 0 0 0 \frac{3i}{70} 0 0 0 0 0 0 0 0 0 \frac{\sqrt{10}i}{14} 0 0$	
	$0 0 0 0 0 0 \frac{i}{14} 0 0 0 0 0 0 0 0 \frac{\sqrt{6}i}{14} 0$	
692	symmetry	$\sqrt{15}xyz$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{T}_3^{(a)}(A_u)$	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	
	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 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 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	
	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 0	
693	symmetry	$\frac{x(2x^2-3y^2-3z^2)}{2}$
$\mathbb{T}_{3,0}^{(a)}(T_u, 1)$	$-\frac{3\sqrt{105}i}{560}$ 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 $\frac{\sqrt{2}i}{16}$	
694	symmetry	$-\frac{y(3x^2-2y^2+3z^2)}{2}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{T}_{3,1}^{(a)}(T_u, 1)$	$\frac{3\sqrt{105}}{560} \quad 0 \quad \frac{9\sqrt{42}}{560} \quad 0 \quad \frac{3\sqrt{21}}{112} \quad 0 \quad 0 \quad \frac{\sqrt{70}}{112} \quad 0 \quad \frac{\sqrt{14}}{56} \quad 0 \quad \frac{\sqrt{210}}{336} \quad 0 \quad 0$	
	$0 \quad -\frac{3\sqrt{7}}{80} \quad 0 \quad -\frac{3\sqrt{14}}{560} \quad 0 \quad \frac{3\sqrt{35}}{112} \quad -\frac{\sqrt{30}}{48} \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{42}}{112} \quad 0 \quad \frac{\sqrt{210}}{168} \quad 0$	
	$\frac{3\sqrt{35}}{112} \quad 0 \quad -\frac{3\sqrt{14}}{560} \quad 0 \quad -\frac{3\sqrt{7}}{80} \quad 0 \quad 0 \quad -\frac{\sqrt{210}}{168} \quad 0 \quad -\frac{\sqrt{42}}{112} \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{30}}{48}$	
	$0 \quad \frac{3\sqrt{21}}{112} \quad 0 \quad \frac{9\sqrt{42}}{560} \quad 0 \quad \frac{3\sqrt{105}}{560} \quad 0 \quad 0 \quad -\frac{\sqrt{210}}{336} \quad 0 \quad -\frac{\sqrt{14}}{56} \quad 0 \quad -\frac{\sqrt{70}}{112} \quad 0$	
	$0 \quad -\frac{\sqrt{105}}{140} \quad 0 \quad -\frac{\sqrt{210}}{168} \quad 0 \quad 0 \quad \frac{\sqrt{2}}{16} \quad 0 \quad \frac{\sqrt{42}}{56} \quad 0 \quad \frac{\sqrt{70}}{112} \quad 0 \quad 0 \quad 0$	
	$\frac{\sqrt{105}}{140} \quad 0 \quad \frac{\sqrt{42}}{280} \quad 0 \quad -\frac{\sqrt{21}}{42} \quad 0 \quad 0 \quad -\frac{\sqrt{70}}{112} \quad 0 \quad \frac{\sqrt{14}}{56} \quad 0 \quad \frac{\sqrt{210}}{112} \quad 0 \quad 0$	
	$0 \quad -\frac{\sqrt{42}}{280} \quad 0 \quad \frac{\sqrt{21}}{70} \quad 0 \quad -\frac{\sqrt{210}}{168} \quad \frac{\sqrt{5}}{16} \quad 0 \quad -\frac{\sqrt{105}}{112} \quad 0 \quad -\frac{\sqrt{7}}{112} \quad 0 \quad \frac{3\sqrt{35}}{112} \quad 0$	
	$\frac{\sqrt{210}}{168} \quad 0 \quad -\frac{\sqrt{21}}{70} \quad 0 \quad \frac{\sqrt{42}}{280} \quad 0 \quad 0 \quad \frac{3\sqrt{35}}{112} \quad 0 \quad -\frac{\sqrt{7}}{112} \quad 0 \quad -\frac{\sqrt{105}}{112} \quad 0 \quad \frac{\sqrt{5}}{16}$	
	$0 \quad \frac{\sqrt{21}}{42} \quad 0 \quad -\frac{\sqrt{42}}{280} \quad 0 \quad -\frac{\sqrt{105}}{140} \quad 0 \quad 0 \quad \frac{\sqrt{210}}{112} \quad 0 \quad \frac{\sqrt{14}}{56} \quad 0 \quad -\frac{\sqrt{70}}{112} \quad 0$	
	$0 \quad 0 \quad \frac{\sqrt{210}}{168} \quad 0 \quad \frac{\sqrt{105}}{140} \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{70}}{112} \quad 0 \quad \frac{\sqrt{42}}{56} \quad 0 \quad \frac{\sqrt{2}}{16}$	
695	symmetry	$-\frac{z(3x^2+3y^2-2z^2)}{2}$
$\mathbb{T}_{3,2}^{(a)}(T_u, 1)$	$0 \quad -\frac{3\sqrt{21}i}{70} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{210}i}{84} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0$	
	$0 \quad 0 \quad \frac{3\sqrt{14}i}{70} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{42}i}{84} \quad 0 \quad 0 \quad 0 \quad 0$	
	$0 \quad 0 \quad 0 \quad \frac{3\sqrt{14}i}{70} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{42}i}{84} \quad 0 \quad 0 \quad 0$	
	$0 \quad 0 \quad 0 \quad 0 \quad -\frac{3\sqrt{21}i}{70} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{210}i}{84} \quad 0 \quad 0$	
	$\frac{\sqrt{21}i}{42} \quad 0 \quad -\frac{\sqrt{14}i}{14} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0$	
	$0 \quad -\frac{\sqrt{21}i}{30} \quad 0 \quad 0$	
	$0 \quad 0 \quad -\frac{2\sqrt{21}i}{105} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{7}i}{14} \quad 0 \quad 0 \quad 0 \quad 0$	
	$0 \quad 0 \quad 0 \quad \frac{2\sqrt{21}i}{105} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{7}i}{14} \quad 0 \quad 0 \quad 0$	
	$0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{21}i}{30} \quad 0 \quad 0$	
	$0 \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{21}i}{42} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{14}i}{14} \quad 0$	
696	symmetry	$\frac{\sqrt{15}x(y-z)(y+z)}{2}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{T}_{3,0}^{(a)}(T_u, 2)$	$-\frac{3\sqrt{7}i}{112}$	$0 \quad \frac{9\sqrt{70}i}{560} \quad 0 \quad \frac{9\sqrt{35}i}{560} \quad 0 \quad 0 \quad -\frac{5\sqrt{42}i}{336} \quad 0 \quad \frac{\sqrt{210}i}{168} \quad 0 \quad \frac{\sqrt{14}i}{112} \quad 0 \quad 0$
	$0 \quad \frac{\sqrt{105}i}{80}$	$0 \quad -\frac{\sqrt{210}i}{560} \quad 0 \quad \frac{3\sqrt{21}i}{112} \quad \frac{\sqrt{2}i}{16} \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{70}i}{112} \quad 0 \quad \frac{\sqrt{14}i}{56} \quad 0$
	$-\frac{3\sqrt{21}i}{112}$	$0 \quad \frac{\sqrt{210}i}{560} \quad 0 \quad -\frac{\sqrt{105}i}{80} \quad 0 \quad 0 \quad \frac{\sqrt{14}i}{56} \quad 0 \quad \frac{\sqrt{70}i}{112} \quad 0 \quad 0 \quad \frac{\sqrt{2}i}{16}$
	$0 \quad -\frac{9\sqrt{35}i}{560}$	$0 \quad -\frac{9\sqrt{70}i}{560} \quad 0 \quad \frac{3\sqrt{7}i}{112} \quad 0 \quad 0 \quad \frac{\sqrt{14}i}{112} \quad 0 \quad \frac{\sqrt{210}i}{168} \quad 0 \quad -\frac{5\sqrt{42}i}{336} \quad 0$
	$0 \quad -\frac{\sqrt{7}i}{28}$	$0 \quad -\frac{\sqrt{14}i}{56} \quad 0 \quad 0 \quad -\frac{\sqrt{30}i}{48} \quad 0 \quad \frac{\sqrt{70}i}{56} \quad 0 \quad \frac{\sqrt{42}i}{112} \quad 0 \quad 0 \quad 0$
	$-\frac{\sqrt{7}i}{28}$	$0 \quad \frac{\sqrt{70}i}{280} \quad 0 \quad -\frac{\sqrt{35}i}{70} \quad 0 \quad 0 \quad \frac{5\sqrt{42}i}{336} \quad 0 \quad \frac{\sqrt{210}i}{168} \quad 0 \quad \frac{3\sqrt{14}i}{112} \quad 0$
	$0 \quad \frac{\sqrt{70}i}{280}$	$0 \quad \frac{\sqrt{35}i}{70} \quad 0 \quad -\frac{\sqrt{14}i}{56} \quad -\frac{\sqrt{3}i}{16} \quad 0 \quad \frac{5\sqrt{7}i}{112} \quad 0 \quad -\frac{\sqrt{105}i}{336} \quad 0 \quad \frac{3\sqrt{21}i}{112} \quad 0$
	$-\frac{\sqrt{14}i}{56}$	$0 \quad \frac{\sqrt{35}i}{70} \quad 0 \quad \frac{\sqrt{70}i}{280} \quad 0 \quad 0 \quad -\frac{3\sqrt{21}i}{112} \quad 0 \quad \frac{\sqrt{105}i}{336} \quad 0 \quad -\frac{5\sqrt{7}i}{112} \quad 0 \quad \frac{\sqrt{3}i}{16}$
	$0 \quad -\frac{\sqrt{35}i}{70}$	$0 \quad \frac{\sqrt{70}i}{280} \quad 0 \quad -\frac{\sqrt{7}i}{28} \quad 0 \quad 0 \quad -\frac{3\sqrt{14}i}{112} \quad 0 \quad -\frac{\sqrt{210}i}{168} \quad 0 \quad -\frac{5\sqrt{42}i}{336} \quad 0$
	$0 \quad 0 \quad -\frac{\sqrt{14}i}{56}$	$0 \quad -\frac{\sqrt{7}i}{28} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{42}i}{112} \quad 0 \quad -\frac{\sqrt{70}i}{56} \quad 0 \quad \frac{\sqrt{30}i}{48}$
697	symmetry	$-\frac{\sqrt{15}y(x-z)(x+z)}{2}$
$\mathbb{T}_{3,1}^{(a)}(T_u, 2)$	$-\frac{3\sqrt{7}}{112}$	$0 \quad -\frac{9\sqrt{70}}{560} \quad 0 \quad \frac{9\sqrt{35}}{560} \quad 0 \quad 0 \quad -\frac{5\sqrt{42}}{336} \quad 0 \quad -\frac{\sqrt{210}}{168} \quad 0 \quad \frac{\sqrt{14}}{112} \quad 0 \quad 0$
	$0 \quad \frac{\sqrt{105}}{80}$	$0 \quad \frac{\sqrt{210}}{560} \quad 0 \quad \frac{3\sqrt{21}}{112} \quad -\frac{\sqrt{2}}{16} \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{70}}{112} \quad 0 \quad \frac{\sqrt{14}}{56} \quad 0$
	$\frac{3\sqrt{21}}{112}$	$0 \quad \frac{\sqrt{210}}{560} \quad 0 \quad \frac{\sqrt{105}}{80} \quad 0 \quad 0 \quad -\frac{\sqrt{14}}{56} \quad 0 \quad \frac{\sqrt{70}}{112} \quad 0 \quad 0 \quad \frac{\sqrt{2}}{16}$
	$0 \quad \frac{9\sqrt{35}}{560}$	$0 \quad -\frac{9\sqrt{70}}{560} \quad 0 \quad -\frac{3\sqrt{7}}{112} \quad 0 \quad 0 \quad -\frac{\sqrt{14}}{112} \quad 0 \quad \frac{\sqrt{210}}{168} \quad 0 \quad \frac{5\sqrt{42}}{336} \quad 0$
	$0 \quad \frac{\sqrt{7}}{28}$	$0 \quad -\frac{\sqrt{14}}{56} \quad 0 \quad 0 \quad -\frac{\sqrt{30}}{48} \quad 0 \quad -\frac{\sqrt{70}}{56} \quad 0 \quad \frac{\sqrt{42}}{112} \quad 0 \quad 0 \quad 0$
	$-\frac{\sqrt{7}}{28}$	$0 \quad -\frac{\sqrt{70}}{280} \quad 0 \quad -\frac{\sqrt{35}}{70} \quad 0 \quad 0 \quad \frac{5\sqrt{42}}{336} \quad 0 \quad -\frac{\sqrt{210}}{168} \quad 0 \quad \frac{3\sqrt{14}}{112} \quad 0$
	$0 \quad \frac{\sqrt{70}}{280}$	$0 \quad -\frac{\sqrt{35}}{70} \quad 0 \quad -\frac{\sqrt{14}}{56} \quad \frac{\sqrt{3}}{16} \quad 0 \quad \frac{5\sqrt{7}}{112} \quad 0 \quad \frac{\sqrt{105}}{336} \quad 0 \quad \frac{3\sqrt{21}}{112} \quad 0$
	$\frac{\sqrt{14}}{56}$	$0 \quad \frac{\sqrt{35}}{70} \quad 0 \quad -\frac{\sqrt{70}}{280} \quad 0 \quad 0 \quad \frac{3\sqrt{21}}{112} \quad 0 \quad \frac{\sqrt{105}}{336} \quad 0 \quad \frac{5\sqrt{7}}{112} \quad 0 \quad \frac{\sqrt{3}}{16}$
	$0 \quad \frac{\sqrt{35}}{70}$	$0 \quad \frac{\sqrt{70}}{280} \quad 0 \quad \frac{\sqrt{7}}{28} \quad 0 \quad 0 \quad 0 \quad \frac{3\sqrt{14}}{112} \quad 0 \quad -\frac{\sqrt{210}}{168} \quad 0 \quad \frac{5\sqrt{42}}{336} \quad 0$
	$0 \quad 0 \quad \frac{\sqrt{14}}{56}$	$0 \quad -\frac{\sqrt{7}}{28} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{42}}{112} \quad 0 \quad -\frac{\sqrt{70}}{56} \quad 0 \quad -\frac{\sqrt{30}}{48}$
698	symmetry	$\frac{\sqrt{15}z(x-y)(x+y)}{2}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{T}_{3,2}^{(a)}(T_u, 2)$	$0 \ 0 \ 0 \ -\frac{3\sqrt{70}i}{140} \ 0 \ 0 \ -\frac{\sqrt{6}i}{24} \ 0 \ 0 \ 0 \ -\frac{\sqrt{210}i}{168} \ 0 \ 0 \ 0$	
	$\frac{\sqrt{21}i}{28} \ 0 \ 0 \ 0 \ -\frac{\sqrt{105}i}{140} \ 0 \ 0 \ \frac{\sqrt{14}i}{56} \ 0 \ 0 \ 0 \ -\frac{\sqrt{42}i}{56} \ 0 \ 0 \ 0$	
	$0 \ -\frac{\sqrt{105}i}{140} \ 0 \ 0 \ 0 \ \frac{\sqrt{21}i}{28} \ 0 \ 0 \ \frac{\sqrt{42}i}{56} \ 0 \ 0 \ 0 \ -\frac{\sqrt{14}i}{56} \ 0 \ 0 \ 0$	
	$0 \ 0 \ -\frac{3\sqrt{70}i}{140} \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ \frac{\sqrt{210}i}{168} \ 0 \ 0 \ 0 \ \frac{\sqrt{6}i}{24}$	
	$0 \ 0 \ \frac{\sqrt{14}i}{28} \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ -\frac{\sqrt{42}i}{42} \ 0 \ 0 \ 0 \ 0 \ 0$	
	$0 \ 0 \ 0 \ \frac{\sqrt{70}i}{140} \ 0 \ 0 \ \frac{\sqrt{6}i}{12} \ 0 \ 0 \ 0 \ -\frac{\sqrt{210}i}{84} \ 0 \ 0 \ 0$	
	$\frac{\sqrt{14}i}{28} \ 0 \ 0 \ 0 \ -\frac{\sqrt{70}i}{140} \ 0 \ 0 \ \frac{\sqrt{21}i}{84} \ 0 \ 0 \ 0 \ -\frac{\sqrt{7}i}{28} \ 0 \ 0 \ 0$	
	$0 \ \frac{\sqrt{70}i}{140} \ 0 \ 0 \ 0 \ -\frac{\sqrt{14}i}{28} \ 0 \ 0 \ -\frac{\sqrt{7}i}{28} \ 0 \ 0 \ 0 \ \frac{\sqrt{21}i}{84} \ 0 \ 0 \ 0$	
	$0 \ 0 \ -\frac{\sqrt{70}i}{140} \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ -\frac{\sqrt{210}i}{84} \ 0 \ 0 \ 0 \ \frac{\sqrt{6}i}{12}$	
	$0 \ 0 \ 0 \ -\frac{\sqrt{14}i}{28} \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ -\frac{\sqrt{42}i}{42} \ 0 \ 0 \ 0$	
699	symmetry	$\frac{3\sqrt{35}xyz(x-y)(x+y)}{2}$
$\mathbb{T}_{5,0}^{(a)}(E_u)$	$0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ \frac{\sqrt{7}}{10} \ 0$	
	$0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ -\frac{\sqrt{3}}{10}$	
	$0 \ 0 \ 0 \ 0 \ 0 \ 0 \ -\frac{\sqrt{3}}{10} \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0$	
	$0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ \frac{\sqrt{7}}{10} \ 0 \ 0 \ 0 \ 0 \ 0 \ 0$	
	$0 \ 0 \ 0 \ 0 \ -\frac{\sqrt{42}}{28} \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ \frac{\sqrt{105}}{70} \ 0 \ 0$	
	$0 \ 0 \ 0 \ 0 \ 0 \ \frac{\sqrt{42}}{28} \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ \frac{\sqrt{7}}{70} \ 0$	
	$0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ -\frac{\sqrt{2}}{10}$	
	$0 \ 0 \ 0 \ 0 \ 0 \ 0 \ \frac{\sqrt{2}}{10} \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0$	
	$\frac{\sqrt{42}}{28} \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ -\frac{\sqrt{7}}{70} \ 0 \ 0 \ 0 \ 0 \ 0 \ 0$	
	$0 \ -\frac{\sqrt{42}}{28} \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ -\frac{\sqrt{105}}{70} \ 0 \ 0 \ 0 \ 0 \ 0$	
700	symmetry	$\frac{\sqrt{105}xyz(x^2+y^2-2z^2)}{2}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{T}_{5,1}^{(a)}(E_u)$	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 0 $\frac{\sqrt{21}}{20}$ 0 0	
	0 0 0 0 0 0 0 0 $\frac{\sqrt{21}}{20}$ 0 0 0 0 $-\frac{\sqrt{7}}{20}$ 0	
	0 0 0 0 0 0 0 0 0 $-\frac{\sqrt{105}}{60}$ 0 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 0 $-\frac{\sqrt{35}}{28}$ 0 0 $-\frac{\sqrt{3}}{30}$ 0 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 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 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 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 0	
701	symmetry	$\frac{x(8x^4 - 40x^2y^2 - 40x^2z^2 + 15y^4 + 30y^2z^2 + 15z^4)}{8}$
$\mathbb{T}_{5,0}^{(a)}(T_u, 1)$	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 $\frac{\sqrt{7}i}{224}$	
702	symmetry	$\frac{y(15x^4 - 40x^2y^2 + 30x^2z^2 + 8y^4 - 40y^2z^2 + 15z^4)}{8}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{T}_{5,1}^{(a)}(T_u, 1)$	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 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 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 $\frac{\sqrt{7}}{224}$	
703	symmetry	$\frac{z(15x^4+30x^2y^2-40x^2z^2+15y^4-40y^2z^2+8z^4)}{8}$
$\mathbb{T}_{5,2}^{(a)}(T_u, 1)$	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 0 $-\frac{\sqrt{3}i}{6}$ 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 0 $-\frac{\sqrt{15}i}{30}$ 0 0	
	$-\frac{\sqrt{6}i}{84}$ 0 0 0 0 0 0 $\frac{i}{14}$ 0 0 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	
	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 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 0 0 $-\frac{5\sqrt{6}i}{84}$ 0 0 0 0 0 0 0 $-\frac{3\sqrt{15}i}{70}$ 0 0	
704	symmetry	$\frac{3\sqrt{35}x(y^2-2yz-z^2)(y^2+2yz-z^2)}{8}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{T}_{5,0}^{(a)}(T_u, 2)$	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 $\frac{\sqrt{5}i}{160}$	
705	symmetry	$\frac{3\sqrt{35}y(x^2 - 2xz - z^2)(x^2 + 2xz - z^2)}{8}$
$\mathbb{T}_{5,1}^{(a)}(T_u, 2)$	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 $\frac{\sqrt{5}}{160}$	
706	symmetry	$\frac{3\sqrt{35}z(x^2 - 2xy - y^2)(x^2 + 2xy - y^2)}{8}$

continued ...

Table 9

No.	multipole	matrix
	$\mathbb{T}_{5,2}^{(a)}(T_u, 2)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}i}{10} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{10} \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{10} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}i}{10} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{42}i}{28} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{105}i}{70} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{42}i}{28} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}i}{70} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}i}{10} \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}i}{10} & 0 & 0 & 0 & 0 & 0 & 0 \\ -\frac{\sqrt{42}i}{28} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}i}{70} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{42}i}{28} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{105}i}{70} & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
707	symmetry	$\frac{\sqrt{105}x(y-z)(y+z)(2x^2-y^2-z^2)}{4}$ $\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{21}i}{120} & 0 & \frac{\sqrt{105}i}{120} & 0 & -\frac{\sqrt{7}i}{40} & 0 & -\frac{\sqrt{3}i}{8} \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{i}{40} & 0 & \frac{\sqrt{21}i}{40} & 0 & -\frac{\sqrt{35}i}{40} & 0 & \frac{\sqrt{7}i}{40} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}i}{40} & 0 & -\frac{\sqrt{35}i}{40} & 0 & \frac{\sqrt{21}i}{40} & 0 & -\frac{i}{40} \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{8} & 0 & -\frac{\sqrt{7}i}{40} & 0 & \frac{\sqrt{105}i}{120} & 0 & -\frac{\sqrt{21}i}{120} & 0 \\ 0 & -\frac{\sqrt{14}i}{112} & 0 & \frac{\sqrt{7}i}{56} & 0 & \frac{3\sqrt{70}i}{112} & -\frac{\sqrt{15}i}{240} & 0 & \frac{\sqrt{35}i}{112} & 0 & -\frac{\sqrt{21}i}{112} & 0 & -\frac{\sqrt{105}i}{112} & 0 \\ -\frac{\sqrt{14}i}{112} & 0 & \frac{\sqrt{35}i}{56} & 0 & -\frac{\sqrt{70}i}{112} & 0 & 0 & \frac{23\sqrt{21}i}{1680} & 0 & -\frac{13\sqrt{105}i}{1680} & 0 & \frac{3\sqrt{7}i}{560} & 0 & -\frac{\sqrt{3}i}{16} \\ 0 & \frac{\sqrt{35}i}{56} & 0 & -\frac{\sqrt{70}i}{56} & 0 & \frac{\sqrt{7}i}{56} & \frac{\sqrt{6}i}{80} & 0 & -\frac{11\sqrt{14}i}{560} & 0 & \frac{\sqrt{210}i}{1680} & 0 & \frac{3\sqrt{42}i}{560} & 0 \\ \frac{\sqrt{7}i}{56} & 0 & -\frac{\sqrt{70}i}{56} & 0 & \frac{\sqrt{35}i}{56} & 0 & 0 & -\frac{3\sqrt{42}i}{560} & 0 & -\frac{\sqrt{210}i}{1680} & 0 & \frac{11\sqrt{14}i}{560} & 0 & -\frac{\sqrt{6}i}{80} \\ 0 & -\frac{\sqrt{70}i}{112} & 0 & \frac{\sqrt{35}i}{56} & 0 & -\frac{\sqrt{14}i}{112} & \frac{\sqrt{3}i}{16} & 0 & -\frac{3\sqrt{7}i}{560} & 0 & \frac{13\sqrt{105}i}{1680} & 0 & -\frac{23\sqrt{21}i}{1680} & 0 \\ \frac{3\sqrt{70}i}{112} & 0 & \frac{\sqrt{7}i}{56} & 0 & -\frac{\sqrt{14}i}{112} & 0 & 0 & \frac{\sqrt{105}i}{112} & 0 & \frac{\sqrt{21}i}{112} & 0 & -\frac{\sqrt{35}i}{112} & 0 & \frac{\sqrt{15}i}{240} \end{bmatrix}$
708	symmetry	$\frac{\sqrt{105}y(x-z)(x+z)(x^2-2y^2+z^2)}{4}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{T}_{5,1}^{(a)}(T_u, 3)$	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 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 $-\frac{\sqrt{15}}{240}$	
709	symmetry	$-\frac{\sqrt{105}z(x-y)(x+y)(x^2+y^2-2z^2)}{4}$
$\mathbb{T}_{5,2}^{(a)}(T_u, 3)$	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 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	
710	symmetry	$\sqrt{15}xyz$

continued ...

Table 9

No.	multipole	matrix
$T_3^{(1,-1;a)}(A_u)$	0 0 0 $-\frac{\sqrt{5}}{35}$ 0 0 $\frac{\sqrt{21}}{28}$ 0 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	
	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	
	0 0 $\frac{\sqrt{5}}{35}$ 0 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 0 $\frac{2\sqrt{3}}{21}$ 0 0 0 0 0	
	0 0 0 $\frac{3\sqrt{5}}{140}$ 0 0 $\frac{\sqrt{21}}{21}$ 0 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 0 $\frac{\sqrt{2}}{14}$ 0 0 0	
	0 $-\frac{3\sqrt{5}}{140}$ 0 0 0 $-\frac{3}{28}$ 0 0 $-\frac{\sqrt{2}}{14}$ 0 0 0 0 $-\frac{\sqrt{6}}{42}$ 0	
	0 0 $\frac{3\sqrt{5}}{140}$ 0 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 0 $-\frac{2\sqrt{3}}{21}$ 0 0 0 0	
711	symmetry	$\frac{x(2x^2-3y^2-3z^2)}{2}$
$T_{3,0}^{(1,-1;a)}(T_u, 1)$	$-\frac{\sqrt{30}i}{280}$ 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	
	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 0 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 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 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	
	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 0 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 0 $-\frac{\sqrt{15}i}{28}$ 0 $\frac{i}{14}$ 0 $\frac{\sqrt{5}i}{28}$ 0 0 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 0 $-\frac{\sqrt{7}i}{28}$	
712	symmetry	$-\frac{y(3x^2-2y^2+3z^2)}{2}$

continued ..

Table 9

No.	multipole	matrix
$\mathbb{T}_{3,1}^{(1,-1;a)}(T_u, 1)$	$\frac{\sqrt{30}}{280} 0 \frac{3\sqrt{3}}{140} 0 \frac{\sqrt{6}}{56} 0 0 \frac{3\sqrt{5}}{56} 0 \frac{3}{28} 0 \frac{\sqrt{15}}{56} 0 0$	
	$0 -\frac{\sqrt{2}}{40} 0 -\frac{1}{140} 0 \frac{\sqrt{10}}{56} -\frac{\sqrt{105}}{56} 0 0 0 \frac{3\sqrt{3}}{56} 0 \frac{\sqrt{15}}{28} 0$	
	$\frac{\sqrt{10}}{56} 0 -\frac{1}{140} 0 -\frac{\sqrt{2}}{40} 0 0 0 -\frac{\sqrt{15}}{28} 0 -\frac{3\sqrt{3}}{56} 0 0 0 \frac{\sqrt{105}}{56}$	
	$0 \frac{\sqrt{6}}{56} 0 \frac{3\sqrt{3}}{140} 0 \frac{\sqrt{30}}{280} 0 0 -\frac{\sqrt{15}}{56} 0 -\frac{3}{28} 0 -\frac{3\sqrt{5}}{56} 0$	
	$0 -\frac{3\sqrt{30}}{280} 0 -\frac{\sqrt{15}}{56} 0 0 -\frac{\sqrt{7}}{28} 0 -\frac{\sqrt{3}}{14} 0 -\frac{\sqrt{5}}{28} 0 0 0$	
	$\frac{3\sqrt{30}}{280} 0 \frac{3\sqrt{3}}{280} 0 -\frac{\sqrt{6}}{28} 0 0 \frac{\sqrt{5}}{28} 0 -\frac{1}{14} 0 -\frac{\sqrt{15}}{28} 0 0$	
	$0 -\frac{3\sqrt{3}}{280} 0 \frac{3\sqrt{6}}{140} 0 -\frac{\sqrt{15}}{56} -\frac{\sqrt{70}}{56} 0 \frac{\sqrt{30}}{56} 0 \frac{\sqrt{2}}{56} 0 -\frac{3\sqrt{10}}{56} 0$	
	$\frac{\sqrt{15}}{56} 0 -\frac{3\sqrt{6}}{140} 0 \frac{3\sqrt{3}}{280} 0 0 0 -\frac{3\sqrt{10}}{56} 0 \frac{\sqrt{2}}{56} 0 \frac{\sqrt{30}}{56} 0 -\frac{\sqrt{70}}{56}$	
	$0 \frac{\sqrt{6}}{28} 0 -\frac{3\sqrt{3}}{280} 0 -\frac{3\sqrt{30}}{280} 0 0 0 -\frac{\sqrt{15}}{28} 0 -\frac{1}{14} 0 \frac{\sqrt{5}}{28} 0$	
	$0 0 \frac{\sqrt{15}}{56} 0 \frac{3\sqrt{30}}{280} 0 0 0 0 0 -\frac{\sqrt{5}}{28} 0 -\frac{\sqrt{3}}{14} 0 -\frac{\sqrt{7}}{28}$	
713	symmetry	$-\frac{z(3x^2+3y^2-2z^2)}{2}$
$\mathbb{T}_{3,2}^{(1,-1;a)}(T_u, 1)$	$0 -\frac{\sqrt{6}i}{35} 0 0 0 0 0 0 -\frac{\sqrt{15}i}{14} 0 0 0 0 0$	
	$0 0 \frac{2i}{35} 0 0 0 0 0 0 -\frac{\sqrt{3}i}{14} 0 0 0 0 0$	
	$0 0 0 \frac{2i}{35} 0 0 0 0 0 0 \frac{\sqrt{3}i}{14} 0 0 0 0$	
	$0 0 0 0 -\frac{\sqrt{6}i}{35} 0 0 0 0 0 0 \frac{\sqrt{15}i}{14} 0 0$	
	$\frac{\sqrt{6}i}{28} 0 0 0 0 0 0 0 \frac{2i}{7} 0 0 0 0 0 0$	
	$0 -\frac{\sqrt{6}i}{20} 0 0 0 0 0 0 0 0 0 0 0 0 0$	
	$0 0 -\frac{\sqrt{6}i}{35} 0 0 0 0 0 0 -\frac{\sqrt{2}i}{7} 0 0 0 0 0$	
	$0 0 0 \frac{\sqrt{6}i}{35} 0 0 0 0 0 0 0 -\frac{\sqrt{2}i}{7} 0 0 0$	
	$0 0 0 0 \frac{\sqrt{6}i}{20} 0 0 0 0 0 0 0 0 0 0$	
	$0 0 0 0 0 -\frac{\sqrt{6}i}{28} 0 0 0 0 0 0 0 0 \frac{2i}{7} 0$	
714	symmetry	$\frac{\sqrt{15}x(y-z)(y+z)}{2}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{T}_{3,0}^{(1,-1;a)}(T_u, 2)$	$-\frac{\sqrt{2}i}{56} \quad 0 \quad \frac{3\sqrt{5}i}{140} \quad 0 \quad \frac{3\sqrt{10}i}{280} \quad 0 \quad 0 \quad -\frac{5\sqrt{3}i}{56} \quad 0 \quad \frac{\sqrt{15}i}{28} \quad 0 \quad \frac{3i}{56} \quad 0 \quad 0 \quad 0$	
	$0 \quad \frac{\sqrt{30}i}{120} \quad 0 \quad -\frac{\sqrt{15}i}{420} \quad 0 \quad \frac{\sqrt{6}i}{56} \quad \frac{3\sqrt{7}i}{56} \quad 0 \quad 0 \quad 0 \quad \frac{3\sqrt{5}i}{56} \quad 0 \quad \frac{3i}{28} \quad 0 \quad 0$	
	$-\frac{\sqrt{6}i}{56} \quad 0 \quad \frac{\sqrt{15}i}{420} \quad 0 \quad -\frac{\sqrt{30}i}{120} \quad 0 \quad 0 \quad \frac{3i}{28} \quad 0 \quad \frac{3\sqrt{5}i}{56} \quad 0 \quad 0 \quad 0 \quad \frac{3\sqrt{7}i}{56} \quad 0$	
	$0 \quad -\frac{3\sqrt{10}i}{280} \quad 0 \quad -\frac{3\sqrt{5}i}{140} \quad 0 \quad \frac{\sqrt{2}i}{56} \quad 0 \quad 0 \quad \frac{3i}{56} \quad 0 \quad \frac{\sqrt{15}i}{28} \quad 0 \quad -\frac{5\sqrt{3}i}{56} \quad 0 \quad 0$	
	$0 \quad -\frac{3\sqrt{2}i}{56} \quad 0 \quad -\frac{3i}{56} \quad 0 \quad 0 \quad \frac{\sqrt{105}i}{84} \quad 0 \quad -\frac{\sqrt{5}i}{14} \quad 0 \quad -\frac{\sqrt{3}i}{28} \quad 0 \quad 0 \quad 0 \quad 0$	
	$-\frac{3\sqrt{2}i}{56} \quad 0 \quad \frac{3\sqrt{5}i}{280} \quad 0 \quad -\frac{3\sqrt{10}i}{140} \quad 0 \quad 0 \quad -\frac{5\sqrt{3}i}{84} \quad 0 \quad -\frac{\sqrt{15}i}{42} \quad 0 \quad -\frac{3i}{28} \quad 0 \quad 0 \quad 0$	
	$0 \quad \frac{3\sqrt{5}i}{280} \quad 0 \quad \frac{3\sqrt{10}i}{140} \quad 0 \quad -\frac{3i}{56} \quad \frac{\sqrt{42}i}{56} \quad 0 \quad -\frac{5\sqrt{2}i}{56} \quad 0 \quad \frac{\sqrt{30}i}{168} \quad 0 \quad -\frac{3\sqrt{6}i}{56} \quad 0 \quad 0$	
	$-\frac{3i}{56} \quad 0 \quad \frac{3\sqrt{10}i}{140} \quad 0 \quad \frac{3\sqrt{5}i}{280} \quad 0 \quad 0 \quad \frac{3\sqrt{6}i}{56} \quad 0 \quad -\frac{\sqrt{30}i}{168} \quad 0 \quad \frac{5\sqrt{2}i}{56} \quad 0 \quad -\frac{\sqrt{42}i}{56} \quad 0$	
	$0 \quad -\frac{3\sqrt{10}i}{140} \quad 0 \quad \frac{3\sqrt{5}i}{280} \quad 0 \quad -\frac{3\sqrt{2}i}{56} \quad 0 \quad 0 \quad \frac{3i}{28} \quad 0 \quad \frac{\sqrt{15}i}{42} \quad 0 \quad \frac{5\sqrt{3}i}{84} \quad 0 \quad 0$	
	$0 \quad 0 \quad -\frac{3i}{56} \quad 0 \quad -\frac{3\sqrt{2}i}{56} \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{3}i}{28} \quad 0 \quad \frac{\sqrt{5}i}{14} \quad 0 \quad -\frac{\sqrt{105}i}{84} \quad 0$	
715	symmetry	$-\frac{\sqrt{15}y(x-z)(x+z)}{2}$
$\mathbb{T}_{3,1}^{(1,-1;a)}(T_u, 2)$	$-\frac{\sqrt{2}}{56} \quad 0 \quad -\frac{3\sqrt{5}}{140} \quad 0 \quad \frac{3\sqrt{10}}{280} \quad 0 \quad 0 \quad -\frac{5\sqrt{3}}{56} \quad 0 \quad -\frac{\sqrt{15}}{28} \quad 0 \quad \frac{3}{56} \quad 0 \quad 0 \quad 0$	
	$0 \quad \frac{\sqrt{30}}{120} \quad 0 \quad \frac{\sqrt{15}}{420} \quad 0 \quad \frac{\sqrt{6}}{56} \quad -\frac{3\sqrt{7}}{56} \quad 0 \quad 0 \quad 0 \quad -\frac{3\sqrt{5}}{56} \quad 0 \quad \frac{3}{28} \quad 0 \quad 0$	
	$\frac{\sqrt{6}}{56} \quad 0 \quad \frac{\sqrt{15}}{420} \quad 0 \quad \frac{\sqrt{30}}{120} \quad 0 \quad 0 \quad -\frac{3}{28} \quad 0 \quad \frac{3\sqrt{5}}{56} \quad 0 \quad 0 \quad 0 \quad \frac{3\sqrt{7}}{56} \quad 0$	
	$0 \quad \frac{3\sqrt{10}}{280} \quad 0 \quad -\frac{3\sqrt{5}}{140} \quad 0 \quad -\frac{\sqrt{2}}{56} \quad 0 \quad 0 \quad -\frac{3}{56} \quad 0 \quad \frac{\sqrt{15}}{28} \quad 0 \quad \frac{5\sqrt{3}}{56} \quad 0 \quad 0$	
	$0 \quad \frac{3\sqrt{2}}{56} \quad 0 \quad -\frac{3}{56} \quad 0 \quad 0 \quad \frac{\sqrt{105}}{84} \quad 0 \quad \frac{\sqrt{5}}{14} \quad 0 \quad -\frac{\sqrt{3}}{28} \quad 0 \quad 0 \quad 0 \quad 0$	
	$-\frac{3\sqrt{2}}{56} \quad 0 \quad -\frac{3\sqrt{5}}{280} \quad 0 \quad -\frac{3\sqrt{10}}{140} \quad 0 \quad 0 \quad 0 \quad -\frac{5\sqrt{3}}{84} \quad 0 \quad \frac{\sqrt{15}}{42} \quad 0 \quad -\frac{3}{28} \quad 0 \quad 0$	
	$0 \quad \frac{3\sqrt{5}}{280} \quad 0 \quad -\frac{3\sqrt{10}}{140} \quad 0 \quad -\frac{3}{56} \quad -\frac{\sqrt{42}}{56} \quad 0 \quad -\frac{5\sqrt{2}}{56} \quad 0 \quad -\frac{\sqrt{30}}{168} \quad 0 \quad -\frac{3\sqrt{6}}{56} \quad 0 \quad 0$	
	$\frac{3}{56} \quad 0 \quad \frac{3\sqrt{10}}{140} \quad 0 \quad -\frac{3\sqrt{5}}{280} \quad 0 \quad 0 \quad 0 \quad -\frac{3\sqrt{6}}{56} \quad 0 \quad -\frac{\sqrt{30}}{168} \quad 0 \quad -\frac{5\sqrt{2}}{56} \quad 0 \quad -\frac{\sqrt{42}}{56} \quad 0$	
	$0 \quad \frac{3\sqrt{10}}{140} \quad 0 \quad \frac{3\sqrt{5}}{280} \quad 0 \quad \frac{3\sqrt{2}}{56} \quad 0 \quad 0 \quad -\frac{3}{28} \quad 0 \quad \frac{\sqrt{15}}{42} \quad 0 \quad -\frac{5\sqrt{3}}{84} \quad 0 \quad 0$	
	$0 \quad 0 \quad \frac{3}{56} \quad 0 \quad -\frac{3\sqrt{2}}{56} \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{3}}{28} \quad 0 \quad \frac{\sqrt{5}}{14} \quad 0 \quad \frac{\sqrt{105}}{84} \quad 0$	
716	symmetry	$\frac{\sqrt{15}z(x-y)(x+y)}{2}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{T}_{3,2}^{(1,-1;a)}(T_u, 2)$	$0 \quad 0 \quad 0 \quad -\frac{\sqrt{5}i}{35} \quad 0 \quad 0 \quad -\frac{\sqrt{21}i}{28} \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{15}i}{28} \quad 0 \quad 0 \quad 0$	
	$\frac{\sqrt{6}i}{42} \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{30}i}{210} \quad 0 \quad 0 \quad \frac{3i}{28} \quad 0 \quad 0 \quad 0 \quad -\frac{3\sqrt{3}i}{28} \quad 0 \quad 0$	
	$0 \quad -\frac{\sqrt{30}i}{210} \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{6}i}{42} \quad 0 \quad 0 \quad \frac{3\sqrt{3}i}{28} \quad 0 \quad 0 \quad 0 \quad -\frac{3i}{28} \quad 0$	
	$0 \quad 0 \quad -\frac{\sqrt{5}i}{35} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{15}i}{28} \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{21}i}{28}$	
	$0 \quad 0 \quad \frac{3i}{28} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{2\sqrt{3}i}{21} \quad 0 \quad 0 \quad 0 \quad 0$	
	$0 \quad 0 \quad 0 \quad \frac{3\sqrt{5}i}{140} \quad 0 \quad 0 \quad -\frac{\sqrt{21}i}{21} \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{15}i}{21} \quad 0 \quad 0 \quad 0$	
	$\frac{3i}{28} \quad 0 \quad 0 \quad 0 \quad -\frac{3\sqrt{5}i}{140} \quad 0 \quad 0 \quad -\frac{\sqrt{6}i}{42} \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{2}i}{14} \quad 0 \quad 0$	
	$0 \quad \frac{3\sqrt{5}i}{140} \quad 0 \quad 0 \quad 0 \quad -\frac{3i}{28} \quad 0 \quad 0 \quad \frac{\sqrt{2}i}{14} \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{6}i}{42} \quad 0$	
	$0 \quad 0 \quad -\frac{3\sqrt{5}i}{140} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{15}i}{21} \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{21}i}{21}$	
	$0 \quad 0 \quad 0 \quad -\frac{3i}{28} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{2\sqrt{3}i}{21} \quad 0 \quad 0 \quad 0$	
717	symmetry	$\frac{3\sqrt{35}xyz(x-y)(x+y)}{2}$
$\mathbb{T}_{5,0}^{(1,-1;a)}(E_u)$	$0 \quad 0 \quad \frac{\sqrt{210}}{100} \quad 0$	
	$0 \quad 0 \quad -\frac{3\sqrt{10}}{100}$	
	$0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{3\sqrt{10}}{100} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0$	
	$0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{210}}{100} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0$	
	$0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{35}}{70} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{3\sqrt{14}}{35} \quad 0 \quad 0$	
	$0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{35}}{70} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{210}}{175} \quad 0$	
	$0 \quad 0 \quad \frac{2\sqrt{15}}{25}$	
	$0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{2\sqrt{15}}{25} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0$	
	$\frac{\sqrt{35}}{70} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{210}}{175} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0$	
718	symmetry	$\frac{\sqrt{105}xyz(x^2+y^2-2z^2)}{2}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{T}_{5,1}^{(1,-1;a)}(E_u)$	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	
719	symmetry	$\frac{x(8x^4 - 40x^2y^2 - 40x^2z^2 + 15y^4 + 30y^2z^2 + 15z^4)}{8}$
$\mathbb{T}_{5,0}^{(1,-1;a)}(T_u, 1)$	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 $-\frac{\sqrt{210}i}{560}$	
720	symmetry	$\frac{y(15x^4 - 40x^2y^2 + 30x^2z^2 + 8y^4 - 40y^2z^2 + 15z^4)}{8}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{T}_{5,1}^{(1,-1;a)}(T_u, 1)$	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 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 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 $-\frac{\sqrt{210}}{560}$	
721	symmetry	$\frac{z(15x^4+30x^2y^2-40x^2z^2+15y^4-40y^2z^2+8z^4)}{8}$
$\mathbb{T}_{5,2}^{(1,-1;a)}(T_u, 1)$	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 0 $-\frac{\sqrt{10}i}{20}$ 0 0 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 0 $-\frac{\sqrt{2}i}{20}$ 0 0	
	$-\frac{\sqrt{5}i}{210}$ 0 0 0 0 0 0 $-\frac{\sqrt{30}i}{35}$ 0 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 0 $-\frac{\sqrt{5}i}{21}$ 0 0 0 0 0 0 $-\frac{2\sqrt{15}i}{35}$ 0 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 0 $-\frac{\sqrt{5}i}{42}$ 0 0 0 0 0 0 0 $\frac{9\sqrt{2}i}{35}$ 0 0	
722	symmetry	$\frac{3\sqrt{35}x(y^2-2yz-z^2)(y^2+2yz-z^2)}{8}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{T}_{5,0}^{(1,-1;a)}(T_u, 2)$	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 $-\frac{\sqrt{6}i}{80}$	
723	symmetry	$\frac{3\sqrt{35}y(x^2 - 2xz - z^2)(x^2 + 2xz - z^2)}{8}$
$\mathbb{T}_{5,1}^{(1,-1;a)}(T_u, 2)$	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 $-\frac{\sqrt{6}}{80}$	
724	symmetry	$\frac{3\sqrt{35}z(x^2 - 2xy - y^2)(x^2 + 2xy - y^2)}{8}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{T}_{5,2}^{(1,-1;a)}(T_u, 2)$	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 0 0 0 0	0 $-\frac{3\sqrt{10}i}{100}$
	0 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 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 0 0 0
	0 0 0 0 $-\frac{\sqrt{35}i}{70}$ 0 0 0 0 0 0 0 0	0 0 0 0 $-\frac{3\sqrt{14}i}{35}$ 0 0 0
	0 0 0 0 0 0 $\frac{\sqrt{35}i}{70}$ 0 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 0 0	0 $\frac{2\sqrt{15}i}{25}$ 0 0 0
	0 0 0 0 0 0 0 $\frac{2\sqrt{15}i}{25}$ 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0
	$-\frac{\sqrt{35}i}{70}$ 0 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 0 0
	0 $\frac{\sqrt{35}i}{70}$ 0 0 0 0 0 0 0 $-\frac{3\sqrt{14}i}{35}$ 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0
725	symmetry	$\frac{\sqrt{105}x(y-z)(y+z)(2x^2-y^2-z^2)}{4}$
$\mathbb{T}_{5,0}^{(1,-1;a)}(T_u, 3)$	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 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 $\frac{\sqrt{210}i}{400}$ 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 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 $-\frac{\sqrt{105}i}{840}$ 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 $-\frac{\sqrt{2}i}{40}$	
726	symmetry	$\frac{\sqrt{105}y(x-z)(x+z)(x^2-2y^2+z^2)}{4}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{T}_{5,1}^{(1,-1;a)}(T_u, 3)$	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 $\frac{\sqrt{2}}{40}$	
727	symmetry	$-\frac{\sqrt{105}z(x-y)(x+y)(x^2+y^2-2z^2)}{4}$
$\mathbb{T}_{5,2}^{(1,-1;a)}(T_u, 3)$	0 0 0 0 0 0 $\frac{\sqrt{10i}}{200}$ 0 0 0 $\frac{\sqrt{14i}}{40}$ 0 0 0	
	0 0 0 0 0 0 0 $-\frac{\sqrt{210i}}{200}$ 0 0 0 $-\frac{3\sqrt{70i}}{200}$ 0 0 0	
	0 0 0 0 0 0 0 0 $\frac{3\sqrt{70i}}{200}$ 0 0 0 $\frac{\sqrt{210i}}{200}$ 0	
	0 0 0 0 0 0 0 0 0 $-\frac{\sqrt{14i}}{40}$ 0 0 0 $-\frac{\sqrt{10i}}{200}$	
	0 0 $-\frac{\sqrt{210i}}{420}$ 0 0 0 0 0 0 $-\frac{\sqrt{70i}}{35}$ 0 0 0 0 0	
	0 0 0 $\frac{\sqrt{42i}}{84}$ 0 0 $\frac{\sqrt{10i}}{25}$ 0 0 0 $\frac{2\sqrt{14i}}{35}$ 0 0 0	
	$-\frac{\sqrt{210i}}{420}$ 0 0 0 $-\frac{\sqrt{42i}}{84}$ 0 0 $-\frac{8\sqrt{35i}}{175}$ 0 0 0 $\frac{2\sqrt{105i}}{175}$ 0 0	
	0 $\frac{\sqrt{42i}}{84}$ 0 0 0 $\frac{\sqrt{210i}}{420}$ 0 0 $\frac{2\sqrt{105i}}{175}$ 0 0 0 $-\frac{8\sqrt{35i}}{175}$ 0	
	0 0 $-\frac{\sqrt{42i}}{84}$ 0 0 0 0 0 0 $\frac{2\sqrt{14i}}{35}$ 0 0 0 $\frac{\sqrt{10i}}{25}$	
	0 0 0 $\frac{\sqrt{210i}}{420}$ 0 0 0 0 0 0 $-\frac{\sqrt{70i}}{35}$ 0 0 0	
728	symmetry	x

continued ...

Table 9

No.	multipole	matrix
$\mathbb{T}_{1,0}^{(1,0;a)}(T_u)$	$-\frac{\sqrt{10}i}{20}$	0 $\frac{i}{20}$ 0 0 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	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 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 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
	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	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 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 0 $-\frac{3\sqrt{10}i}{70}$ 0 0 0 0 0 0 $\frac{i}{28}$ 0 $-\frac{\sqrt{21}i}{28}$
729	symmetry	y
$\mathbb{T}_{1,1}^{(1,0;a)}(T_u)$	$\frac{\sqrt{10}}{20}$	0 $\frac{1}{20}$ 0 0 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
	0	0 0 $\frac{\sqrt{3}}{20}$ 0 $\frac{\sqrt{6}}{20}$ 0 0 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
	0	$-\frac{3\sqrt{10}}{70}$ 0 0 0 0 $-\frac{\sqrt{21}}{28}$ 0 $-\frac{1}{28}$ 0 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
	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 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 0 $\frac{3\sqrt{10}}{70}$ 0 0 0 0 0 0 $-\frac{1}{28}$ 0 $-\frac{\sqrt{21}}{28}$
730	symmetry	z

continued ...

Table 9

No.	multipole	matrix
$\mathbb{T}_{1,2}^{(1,0;a)}(T_u)$	0	$\frac{\sqrt{2}i}{10}$ 0 0 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	0 0 0 $\frac{\sqrt{3}i}{10}$ 0 0 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 0
	$-\frac{3\sqrt{2}i}{14}$	0 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	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 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 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 0 $\frac{3\sqrt{2}i}{14}$ 0 0 0 0 0 0 $-\frac{\sqrt{3}i}{14}$ 0
731	symmetry	$\sqrt{15}xyz$
$\mathbb{T}_3^{(1,0;a)}(A_u)$	0	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 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 0 $\frac{\sqrt{210}}{280}$ 0 0 0 0 0 0 $\frac{\sqrt{70}}{56}$ 0 0 0 $-\frac{\sqrt{2}}{8}$
	0	0 0 $\frac{\sqrt{42}}{28}$ 0 0 0 0 0 0 0 $\frac{\sqrt{14}}{84}$ 0 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 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 0 $-\frac{\sqrt{42}}{28}$ 0 0 $-\frac{\sqrt{21}}{168}$ 0 0 0 $-\frac{\sqrt{7}}{168}$ 0
	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 0 $\frac{\sqrt{42}}{28}$ 0 0 0 0 0 0 $-\frac{\sqrt{14}}{84}$ 0 0 0 0
732	symmetry	$\frac{x(2x^2-3y^2-3z^2)}{2}$

continued ...

Table 9

No.	multipole	matrix
$T_{3,0}^{(1,0;a)}(T_u, 1)$	$\begin{bmatrix} -\frac{3\sqrt{35}i}{1120} & 0 & \frac{9\sqrt{14}i}{1120} & 0 & -\frac{3\sqrt{7}i}{224} & 0 & 0 & \frac{\sqrt{210}i}{112} & 0 & -\frac{\sqrt{42}i}{56} & 0 & \frac{\sqrt{70}i}{112} & 0 & 0 \\ 0 & \frac{\sqrt{21}i}{160} & 0 & -\frac{\sqrt{42}i}{1120} & 0 & -\frac{\sqrt{105}i}{224} & \frac{\sqrt{10}i}{16} & 0 & 0 & 0 & -\frac{3\sqrt{14}i}{112} & 0 & \frac{\sqrt{70}i}{56} & 0 \\ \frac{\sqrt{105}i}{224} & 0 & \frac{\sqrt{42}i}{1120} & 0 & -\frac{\sqrt{21}i}{160} & 0 & 0 & \frac{\sqrt{70}i}{56} & 0 & -\frac{3\sqrt{14}i}{112} & 0 & 0 & 0 & \frac{\sqrt{10}i}{16} \\ 0 & \frac{3\sqrt{7}i}{224} & 0 & -\frac{9\sqrt{14}i}{1120} & 0 & \frac{3\sqrt{35}i}{1120} & 0 & 0 & \frac{\sqrt{70}i}{112} & 0 & -\frac{\sqrt{42}i}{56} & 0 & \frac{\sqrt{210}i}{112} & 0 \\ 0 & -\frac{3\sqrt{35}i}{140} & 0 & \frac{\sqrt{70}i}{56} & 0 & 0 & \frac{\sqrt{6}i}{96} & 0 & -\frac{\sqrt{14}i}{112} & 0 & \frac{\sqrt{210}i}{672} & 0 & 0 & 0 \\ -\frac{3\sqrt{35}i}{140} & 0 & \frac{3\sqrt{14}i}{280} & 0 & \frac{\sqrt{7}i}{14} & 0 & 0 & -\frac{\sqrt{210}i}{672} & 0 & -\frac{\sqrt{42}i}{336} & 0 & \frac{\sqrt{70}i}{224} & 0 & 0 \\ 0 & \frac{3\sqrt{14}i}{280} & 0 & \frac{3\sqrt{7}i}{70} & 0 & \frac{\sqrt{70}i}{56} & -\frac{\sqrt{15}i}{96} & 0 & -\frac{\sqrt{35}i}{224} & 0 & \frac{\sqrt{21}i}{672} & 0 & \frac{\sqrt{105}i}{224} & 0 \\ \frac{\sqrt{70}i}{56} & 0 & \frac{3\sqrt{7}i}{70} & 0 & \frac{3\sqrt{14}i}{280} & 0 & 0 & -\frac{\sqrt{105}i}{224} & 0 & -\frac{\sqrt{21}i}{672} & 0 & \frac{\sqrt{35}i}{224} & 0 & \frac{\sqrt{15}i}{96} \\ 0 & \frac{\sqrt{7}i}{14} & 0 & \frac{3\sqrt{14}i}{280} & 0 & -\frac{3\sqrt{35}i}{140} & 0 & 0 & -\frac{\sqrt{70}i}{224} & 0 & \frac{\sqrt{42}i}{336} & 0 & \frac{\sqrt{210}i}{672} & 0 \\ 0 & 0 & \frac{\sqrt{70}i}{56} & 0 & -\frac{3\sqrt{35}i}{140} & 0 & 0 & 0 & 0 & -\frac{\sqrt{210}i}{672} & 0 & \frac{\sqrt{14}i}{112} & 0 & -\frac{\sqrt{6}i}{96} \end{bmatrix}$	
	$- \frac{y(3x^2 - 2y^2 + 3z^2)}{2}$	
	733	symmetry
	$\begin{bmatrix} \frac{3\sqrt{35}}{1120} & 0 & \frac{9\sqrt{14}}{1120} & 0 & \frac{3\sqrt{7}}{224} & 0 & 0 & -\frac{\sqrt{210}}{112} & 0 & -\frac{\sqrt{42}}{56} & 0 & -\frac{\sqrt{70}}{112} & 0 & 0 \\ 0 & -\frac{\sqrt{21}}{160} & 0 & -\frac{\sqrt{42}}{1120} & 0 & \frac{\sqrt{105}}{224} & \frac{\sqrt{10}}{16} & 0 & 0 & 0 & -\frac{3\sqrt{14}}{112} & 0 & -\frac{\sqrt{70}}{56} & 0 \\ \frac{\sqrt{105}}{224} & 0 & -\frac{\sqrt{42}}{1120} & 0 & -\frac{\sqrt{21}}{160} & 0 & 0 & \frac{\sqrt{70}}{56} & 0 & \frac{3\sqrt{14}}{112} & 0 & 0 & 0 & -\frac{\sqrt{10}}{16} \\ 0 & \frac{3\sqrt{7}}{224} & 0 & \frac{9\sqrt{14}}{1120} & 0 & \frac{3\sqrt{35}}{1120} & 0 & 0 & \frac{\sqrt{70}}{112} & 0 & \frac{\sqrt{42}}{56} & 0 & \frac{\sqrt{210}}{112} & 0 \\ 0 & -\frac{3\sqrt{35}}{140} & 0 & -\frac{\sqrt{70}}{56} & 0 & 0 & -\frac{\sqrt{6}}{96} & 0 & -\frac{\sqrt{14}}{112} & 0 & -\frac{\sqrt{210}}{672} & 0 & 0 & 0 \\ \frac{3\sqrt{35}}{140} & 0 & \frac{3\sqrt{14}}{280} & 0 & -\frac{\sqrt{7}}{14} & 0 & 0 & \frac{\sqrt{210}}{672} & 0 & -\frac{\sqrt{42}}{336} & 0 & -\frac{\sqrt{70}}{224} & 0 & 0 \\ 0 & -\frac{3\sqrt{14}}{280} & 0 & \frac{3\sqrt{7}}{70} & 0 & -\frac{\sqrt{70}}{56} & -\frac{\sqrt{15}}{96} & 0 & \frac{\sqrt{35}}{224} & 0 & \frac{\sqrt{21}}{672} & 0 & -\frac{\sqrt{105}}{224} & 0 \\ \frac{\sqrt{70}}{56} & 0 & -\frac{3\sqrt{7}}{70} & 0 & \frac{3\sqrt{14}}{280} & 0 & 0 & -\frac{\sqrt{105}}{224} & 0 & \frac{\sqrt{21}}{672} & 0 & \frac{\sqrt{35}}{224} & 0 & -\frac{\sqrt{15}}{96} \\ 0 & \frac{\sqrt{7}}{14} & 0 & -\frac{3\sqrt{14}}{280} & 0 & -\frac{3\sqrt{35}}{140} & 0 & 0 & -\frac{\sqrt{70}}{224} & 0 & -\frac{\sqrt{42}}{336} & 0 & \frac{\sqrt{210}}{672} & 0 \\ 0 & 0 & \frac{\sqrt{70}}{56} & 0 & \frac{3\sqrt{35}}{140} & 0 & 0 & 0 & 0 & -\frac{\sqrt{210}}{672} & 0 & -\frac{\sqrt{14}}{112} & 0 & -\frac{\sqrt{6}}{96} \end{bmatrix}$	
	$- \frac{y(3x^2 - 2y^2 + 3z^2)}{2}$	
	734	symmetry
	$- \frac{z(3x^2 + 3y^2 - 2z^2)}{2}$	

continued ...

Table 9

No.	multipole	matrix
$\mathbb{T}_{3,2}^{(1,0;a)}(T_u, 1)$	$0 - \frac{3\sqrt{7}i}{140} 0 0 0 0 0 0 0 \frac{\sqrt{70}i}{28} 0 0 0 0 0 0$	
	$0 0 \frac{\sqrt{42}i}{140} 0 0 0 0 0 0 0 \frac{\sqrt{14}i}{28} 0 0 0 0 0$	
	$0 0 0 \frac{\sqrt{42}i}{140} 0 0 0 0 0 0 0 -\frac{\sqrt{14}i}{28} 0 0 0 0$	
	$0 0 0 0 -\frac{3\sqrt{7}i}{140} 0 0 0 0 0 0 0 -\frac{\sqrt{70}i}{28} 0 0$	
	$\frac{\sqrt{7}i}{14} 0 0 0 0 0 0 0 \frac{\sqrt{42}i}{84} 0 0 0 0 0 0$	
	$0 -\frac{\sqrt{7}i}{10} 0 0 0 0 0 0 0 0 0 0 0 0 0 0$	
	$0 0 -\frac{2\sqrt{7}i}{35} 0 0 0 0 0 0 -\frac{\sqrt{21}i}{84} 0 0 0 0 0$	
	$0 0 0 \frac{2\sqrt{7}i}{35} 0 0 0 0 0 0 -\frac{\sqrt{21}i}{84} 0 0 0 0$	
	$0 0 0 0 \frac{\sqrt{7}i}{10} 0 0 0 0 0 0 0 0 0 0 0$	
	$0 0 0 0 0 -\frac{\sqrt{7}i}{14} 0 0 0 0 0 0 \frac{\sqrt{42}i}{84} 0$	
735	symmetry	$\frac{\sqrt{15}x(y-z)(y+z)}{2}$
$\mathbb{T}_{3,0}^{(1,0;a)}(T_u, 2)$	$-\frac{\sqrt{21}i}{224} 0 \frac{3\sqrt{210}i}{1120} 0 \frac{3\sqrt{105}i}{1120} 0 0 \frac{5\sqrt{14}i}{112} 0 -\frac{\sqrt{70}i}{56} 0 -\frac{\sqrt{42}i}{112} 0 0$	
	$0 \frac{\sqrt{35}i}{160} 0 -\frac{\sqrt{70}i}{1120} 0 \frac{3\sqrt{7}i}{224} -\frac{\sqrt{6}i}{16} 0 0 0 -\frac{\sqrt{210}i}{112} 0 -\frac{\sqrt{42}i}{56} 0$	
	$-\frac{3\sqrt{7}i}{224} 0 \frac{\sqrt{70}i}{1120} 0 -\frac{\sqrt{35}i}{160} 0 0 -\frac{\sqrt{42}i}{56} 0 -\frac{\sqrt{210}i}{112} 0 0 0 -\frac{\sqrt{6}i}{16}$	
	$0 -\frac{3\sqrt{105}i}{1120} 0 -\frac{3\sqrt{210}i}{1120} 0 \frac{\sqrt{21}i}{224} 0 0 -\frac{\sqrt{42}i}{112} 0 -\frac{\sqrt{70}i}{56} 0 \frac{5\sqrt{14}i}{112} 0$	
	$0 -\frac{\sqrt{21}i}{28} 0 -\frac{\sqrt{42}i}{56} 0 0 \frac{\sqrt{10}i}{96} 0 -\frac{\sqrt{210}i}{336} 0 -\frac{\sqrt{14}i}{224} 0 0 0$	
	$-\frac{\sqrt{21}i}{28} 0 \frac{\sqrt{210}i}{280} 0 -\frac{\sqrt{105}i}{70} 0 0 -\frac{5\sqrt{14}i}{672} 0 -\frac{\sqrt{70}i}{336} 0 -\frac{\sqrt{42}i}{224} 0 0$	
	$0 \frac{\sqrt{210}i}{280} 0 \frac{\sqrt{105}i}{70} 0 -\frac{\sqrt{42}i}{56} \frac{i}{32} 0 -\frac{5\sqrt{21}i}{672} 0 \frac{\sqrt{35}i}{672} 0 -\frac{3\sqrt{7}i}{224} 0$	
	$-\frac{\sqrt{42}i}{56} 0 \frac{\sqrt{105}i}{70} 0 \frac{\sqrt{210}i}{280} 0 0 \frac{3\sqrt{7}i}{224} 0 -\frac{\sqrt{35}i}{672} 0 \frac{5\sqrt{21}i}{672} 0 -\frac{i}{32}$	
	$0 -\frac{\sqrt{105}i}{70} 0 \frac{\sqrt{210}i}{280} 0 -\frac{\sqrt{21}i}{28} 0 0 \frac{\sqrt{42}i}{224} 0 \frac{\sqrt{70}i}{336} 0 \frac{5\sqrt{14}i}{672} 0$	
	$0 0 -\frac{\sqrt{42}i}{56} 0 -\frac{\sqrt{21}i}{28} 0 0 0 \frac{\sqrt{14}i}{224} 0 \frac{\sqrt{210}i}{336} 0 -\frac{\sqrt{10}i}{96}$	
736	symmetry	$-\frac{\sqrt{15}y(x-z)(x+z)}{2}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{T}_{3,1}^{(1,0;a)}(T_u, 2)$	$\begin{bmatrix} -\frac{\sqrt{21}}{224} & 0 & -\frac{3\sqrt{210}}{1120} & 0 & \frac{3\sqrt{105}}{1120} & 0 & 0 & \frac{5\sqrt{14}}{112} & 0 & \frac{\sqrt{70}}{56} & 0 & -\frac{\sqrt{42}}{112} & 0 & 0 \\ 0 & \frac{\sqrt{35}}{160} & 0 & \frac{\sqrt{70}}{1120} & 0 & \frac{3\sqrt{7}}{224} & \frac{\sqrt{6}}{16} & 0 & 0 & 0 & \frac{\sqrt{210}}{112} & 0 & -\frac{\sqrt{42}}{56} & 0 \\ \frac{3\sqrt{7}}{224} & 0 & \frac{\sqrt{70}}{1120} & 0 & \frac{\sqrt{35}}{160} & 0 & 0 & \frac{\sqrt{42}}{56} & 0 & -\frac{\sqrt{210}}{112} & 0 & 0 & 0 & -\frac{\sqrt{6}}{16} \\ 0 & \frac{3\sqrt{105}}{1120} & 0 & -\frac{3\sqrt{210}}{1120} & 0 & -\frac{\sqrt{21}}{224} & 0 & 0 & \frac{\sqrt{42}}{112} & 0 & -\frac{\sqrt{70}}{56} & 0 & -\frac{5\sqrt{14}}{112} & 0 \\ 0 & \frac{\sqrt{21}}{28} & 0 & -\frac{\sqrt{42}}{56} & 0 & 0 & \frac{\sqrt{10}}{96} & 0 & \frac{\sqrt{210}}{336} & 0 & -\frac{\sqrt{14}}{224} & 0 & 0 & 0 \\ -\frac{\sqrt{21}}{28} & 0 & -\frac{\sqrt{210}}{280} & 0 & -\frac{\sqrt{105}}{70} & 0 & 0 & -\frac{5\sqrt{14}}{672} & 0 & \frac{\sqrt{70}}{336} & 0 & -\frac{\sqrt{42}}{224} & 0 & 0 \\ 0 & \frac{\sqrt{210}}{280} & 0 & -\frac{\sqrt{105}}{70} & 0 & -\frac{\sqrt{42}}{56} & -\frac{1}{32} & 0 & -\frac{5\sqrt{21}}{672} & 0 & -\frac{\sqrt{35}}{672} & 0 & -\frac{3\sqrt{7}}{224} & 0 \\ \frac{\sqrt{42}}{56} & 0 & \frac{\sqrt{105}}{70} & 0 & -\frac{\sqrt{210}}{280} & 0 & 0 & -\frac{3\sqrt{7}}{224} & 0 & -\frac{\sqrt{35}}{672} & 0 & -\frac{5\sqrt{21}}{672} & 0 & -\frac{1}{32} \\ 0 & \frac{\sqrt{105}}{70} & 0 & \frac{\sqrt{210}}{280} & 0 & \frac{\sqrt{21}}{28} & 0 & 0 & -\frac{\sqrt{42}}{224} & 0 & \frac{\sqrt{70}}{336} & 0 & -\frac{5\sqrt{14}}{672} & 0 \\ 0 & 0 & \frac{\sqrt{42}}{56} & 0 & -\frac{\sqrt{21}}{28} & 0 & 0 & 0 & 0 & -\frac{\sqrt{14}}{224} & 0 & \frac{\sqrt{210}}{336} & 0 & \frac{\sqrt{10}}{96} \end{bmatrix}$	
	$\sqrt{15}z(x-y)(x+y)$	
	$\begin{bmatrix} 0 & 0 & 0 & -\frac{\sqrt{210}i}{280} & 0 & 0 & \frac{\sqrt{2}i}{8} & 0 & 0 & 0 & \frac{\sqrt{70}i}{56} & 0 & 0 & 0 \\ \frac{\sqrt{7}i}{56} & 0 & 0 & 0 & -\frac{\sqrt{35}i}{280} & 0 & 0 & -\frac{\sqrt{42}i}{56} & 0 & 0 & 0 & \frac{3\sqrt{14}i}{56} & 0 & 0 \\ 0 & -\frac{\sqrt{35}i}{280} & 0 & 0 & 0 & \frac{\sqrt{7}i}{56} & 0 & 0 & -\frac{3\sqrt{14}i}{56} & 0 & 0 & 0 & \frac{\sqrt{42}i}{56} & 0 \\ 0 & 0 & -\frac{\sqrt{210}i}{280} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}i}{56} & 0 & 0 & 0 & -\frac{\sqrt{2}i}{8} \\ 0 & 0 & \frac{\sqrt{42}i}{28} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{14}i}{84} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{210}i}{140} & 0 & 0 & -\frac{\sqrt{2}i}{24} & 0 & 0 & 0 & \frac{\sqrt{70}i}{168} & 0 & 0 & 0 \\ \frac{\sqrt{42}i}{28} & 0 & 0 & 0 & -\frac{\sqrt{210}i}{140} & 0 & 0 & -\frac{\sqrt{7}i}{168} & 0 & 0 & 0 & \frac{\sqrt{21}i}{168} & 0 & 0 \\ 0 & \frac{\sqrt{210}i}{140} & 0 & 0 & 0 & -\frac{\sqrt{42}i}{28} & 0 & 0 & \frac{\sqrt{21}i}{168} & 0 & 0 & 0 & -\frac{\sqrt{7}i}{168} & 0 \\ 0 & 0 & -\frac{\sqrt{210}i}{140} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{70}i}{168} & 0 & 0 & 0 & -\frac{\sqrt{2}i}{24} \\ 0 & 0 & 0 & -\frac{\sqrt{42}i}{28} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{14}i}{84} & 0 & 0 & 0 \end{bmatrix}$	
	$\frac{3\sqrt{35}xyz(x-y)(x+y)}{2}$	
737	symmetry	
$\mathbb{T}_{3,2}^{(1,0;a)}(T_u, 2)$	$\begin{bmatrix} 0 & 0 & 0 & -\frac{\sqrt{210}i}{280} & 0 & 0 & \frac{\sqrt{2}i}{8} & 0 & 0 & 0 & \frac{\sqrt{70}i}{56} & 0 & 0 & 0 \\ \frac{\sqrt{7}i}{56} & 0 & 0 & 0 & -\frac{\sqrt{35}i}{280} & 0 & 0 & -\frac{\sqrt{42}i}{56} & 0 & 0 & 0 & \frac{3\sqrt{14}i}{56} & 0 & 0 \\ 0 & -\frac{\sqrt{35}i}{280} & 0 & 0 & 0 & \frac{\sqrt{7}i}{56} & 0 & 0 & -\frac{3\sqrt{14}i}{56} & 0 & 0 & 0 & \frac{\sqrt{42}i}{56} & 0 \\ 0 & 0 & -\frac{\sqrt{210}i}{280} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}i}{56} & 0 & 0 & 0 & -\frac{\sqrt{2}i}{8} \\ 0 & 0 & \frac{\sqrt{42}i}{28} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{14}i}{84} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{210}i}{140} & 0 & 0 & -\frac{\sqrt{2}i}{24} & 0 & 0 & 0 & \frac{\sqrt{70}i}{168} & 0 & 0 & 0 \\ \frac{\sqrt{42}i}{28} & 0 & 0 & 0 & -\frac{\sqrt{210}i}{140} & 0 & 0 & -\frac{\sqrt{7}i}{168} & 0 & 0 & 0 & \frac{\sqrt{21}i}{168} & 0 & 0 \\ 0 & \frac{\sqrt{210}i}{140} & 0 & 0 & 0 & -\frac{\sqrt{42}i}{28} & 0 & 0 & \frac{\sqrt{21}i}{168} & 0 & 0 & 0 & -\frac{\sqrt{7}i}{168} & 0 \\ 0 & 0 & -\frac{\sqrt{210}i}{140} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{70}i}{168} & 0 & 0 & 0 & -\frac{\sqrt{2}i}{24} \\ 0 & 0 & 0 & -\frac{\sqrt{42}i}{28} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{14}i}{84} & 0 & 0 & 0 \end{bmatrix}$	
	$\frac{3\sqrt{35}xyz(x-y)(x+y)}{2}$	
738	symmetry	

continued ...

Table 9

No.	multipole	matrix
$\mathbb{T}_{5,0}^{(1,0;a)}(E_u)$	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 0 0 0 0 0 $\frac{3\sqrt{10}}{50}$	
	0 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 0 0 $-\frac{\sqrt{210}}{50}$ 0 0 0 0 0 0 0	
	0 0 0 0 $-\frac{3\sqrt{35}}{70}$ 0 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 0 $-\frac{\sqrt{210}}{2100}$ 0	
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 $\frac{\sqrt{15}}{150}$	
	0 0 0 0 0 0 0 $-\frac{\sqrt{15}}{150}$ 0 0 0 0 0 0 0 0	
	$\frac{3\sqrt{35}}{70}$ 0 0 0 0 0 0 0 $\frac{\sqrt{210}}{2100}$ 0 0 0 0 0 0 0	
	0 $-\frac{3\sqrt{35}}{70}$ 0 0 0 0 0 0 0 $\frac{\sqrt{14}}{140}$ 0 0 0 0 0 0 0	
739	symmetry	$\frac{\sqrt{105}xyz(x^2+y^2-2z^2)}{2}$
$\mathbb{T}_{5,1}^{(1,0;a)}(E_u)$	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 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	
740	symmetry	$\frac{x(8x^4-40x^2y^2-40x^2z^2+15y^4+30y^2z^2+15z^4)}{8}$

continued ...

Table 9

No.	multipole	matrix
$T_{5,0}^{(1,0;a)}(T_u, 1)$	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 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 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 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 $-\frac{\sqrt{210}i}{6720}$	
741	symmetry	$\frac{y(15x^4 - 40x^2y^2 + 30x^2z^2 + 8y^4 - 40y^2z^2 + 15z^4)}{8}$
$T_{5,1}^{(1,0;a)}(T_u, 1)$	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 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 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 $-\frac{\sqrt{210}}{6720}$	
742	symmetry	$\frac{z(15x^4 + 30x^2y^2 - 40x^2z^2 + 15y^4 - 40y^2z^2 + 8z^4)}{8}$

continued ...

Table 9

No.	multipole	matrix
	$\mathbb{T}_{5,2}^{(1,0;a)}(T_u, 1)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}i}{10} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}i}{10} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}i}{10} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2}i}{10} & 0 & 0 \\ -\frac{\sqrt{5}i}{70} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}i}{420} & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{5}i}{14} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{2}i}{140} & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{5}i}{7} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{210} & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{5}i}{7} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{210} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{14} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{2}i}{140} & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{5}i}{70} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}i}{420} & 0 \end{bmatrix}$
743	symmetry	$\frac{3\sqrt{35}x(y^2-2yz-z^2)(y^2+2yz-z^2)}{8}$
	$\mathbb{T}_{5,0}^{(1,0;a)}(T_u, 2)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{210}i}{400} & 0 & -\frac{\sqrt{42}i}{80} & 0 & -\frac{9\sqrt{70}i}{400} & 0 & -\frac{\sqrt{30}i}{80} \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{9\sqrt{10}i}{400} & 0 & -\frac{3\sqrt{210}i}{400} & 0 & \frac{3\sqrt{14}i}{80} & 0 & \frac{9\sqrt{70}i}{400} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{9\sqrt{70}i}{400} & 0 & \frac{3\sqrt{14}i}{80} & 0 & -\frac{3\sqrt{210}i}{400} & 0 & -\frac{9\sqrt{10}i}{400} \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}i}{80} & 0 & -\frac{9\sqrt{70}i}{400} & 0 & -\frac{\sqrt{42}i}{80} & 0 & \frac{\sqrt{210}i}{400} & 0 \\ 0 & -\frac{3\sqrt{35}i}{560} & 0 & -\frac{9\sqrt{70}i}{560} & 0 & -\frac{3\sqrt{7}i}{112} & \frac{\sqrt{6}i}{960} & 0 & -\frac{\sqrt{14}i}{448} & 0 & -\frac{3\sqrt{210}i}{2240} & 0 & -\frac{\sqrt{42}i}{1344} & 0 \\ -\frac{3\sqrt{35}i}{560} & 0 & \frac{3\sqrt{14}i}{112} & 0 & \frac{9\sqrt{7}i}{112} & 0 & 0 & -\frac{23\sqrt{210}i}{33600} & 0 & \frac{13\sqrt{42}i}{6720} & 0 & \frac{9\sqrt{70}i}{11200} & 0 & -\frac{\sqrt{30}i}{960} \\ 0 & \frac{3\sqrt{14}i}{112} & 0 & -\frac{3\sqrt{7}i}{56} & 0 & -\frac{9\sqrt{70}i}{560} & \frac{3\sqrt{15}i}{800} & 0 & \frac{11\sqrt{35}i}{5600} & 0 & -\frac{\sqrt{21}i}{3360} & 0 & \frac{9\sqrt{105}i}{5600} & 0 \\ -\frac{9\sqrt{70}i}{560} & 0 & -\frac{3\sqrt{7}i}{56} & 0 & \frac{3\sqrt{14}i}{112} & 0 & 0 & -\frac{9\sqrt{105}i}{5600} & 0 & \frac{\sqrt{21}i}{3360} & 0 & -\frac{11\sqrt{35}i}{5600} & 0 & -\frac{3\sqrt{15}i}{800} \\ 0 & \frac{9\sqrt{7}i}{112} & 0 & \frac{3\sqrt{14}i}{112} & 0 & -\frac{3\sqrt{35}i}{560} & \frac{\sqrt{30}i}{960} & 0 & -\frac{9\sqrt{70}i}{11200} & 0 & -\frac{13\sqrt{42}i}{6720} & 0 & \frac{23\sqrt{210}i}{33600} & 0 \\ -\frac{3\sqrt{7}i}{112} & 0 & -\frac{9\sqrt{70}i}{560} & 0 & -\frac{3\sqrt{35}i}{560} & 0 & 0 & \frac{\sqrt{42}i}{1344} & 0 & \frac{3\sqrt{210}i}{2240} & 0 & \frac{\sqrt{14}i}{448} & 0 & -\frac{\sqrt{6}i}{960} \end{bmatrix}$
744	symmetry	$\frac{3\sqrt{35}y(x^2-2xz-z^2)(x^2+2xz-z^2)}{8}$

continued ...

Table 9

No.	multipole	matrix
$T_{5,1}^{(1,0;a)}(T_u, 2)$	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 $-\frac{3\sqrt{7}}{112}$ $-\frac{\sqrt{6}}{960}$ 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 $-\frac{\sqrt{6}}{960}$	
745	symmetry	$\frac{3\sqrt{35}z(x^2 - 2xy - y^2)(x^2 + 2xy - y^2)}{8}$
$T_{5,2}^{(1,0;a)}(T_u, 2)$	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 $\frac{\sqrt{15}i}{150}$	
	$-\frac{3\sqrt{35}i}{70}$ 0 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 0 $-\frac{\sqrt{14}i}{140}$ 0 0 0 0 0 0	
746	symmetry	$\frac{\sqrt{105}x(y-z)(y+z)(2x^2 - y^2 - z^2)}{4}$

continued ...

Table 9

No.	multipole	matrix
$T_{5,0}^{(1,0;a)}(T_u, 3)$	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 $-\frac{\sqrt{2}i}{480}$	
747	symmetry	$\frac{\sqrt{105}y(x-z)(x+z)(x^2-2y^2+z^2)}{4}$
$T_{5,1}^{(1,0;a)}(T_u, 3)$	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 0 $-\frac{\sqrt{14}}{224}$ 0 $\frac{\sqrt{70}}{1120}$ 0 $\frac{\sqrt{42}}{672}$ 0 $\frac{\sqrt{2}}{480}$	
748	symmetry	$-\frac{\sqrt{105}z(x-y)(x+y)(x^2+y^2-2z^2)}{4}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{T}_{5,2}^{(1,0;a)}(T_u, 3)$	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 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	
	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 0	
749	symmetry	x
$\mathbb{T}_{1,0}^{(1,1;a)}(T_u)$	$\frac{\sqrt{5}i}{10}$ 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 0 $-\frac{\sqrt{42}i}{56}$ 0 $\frac{\sqrt{2}i}{56}$ 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 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 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 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 0 $-\frac{\sqrt{2}i}{56}$ 0 $\frac{\sqrt{42}i}{56}$	
750	symmetry	y

continued ...

Table 9

No.	multipole	matrix
$\mathbb{T}_{1,1}^{(1,1;a)}(T_u)$	$-\frac{\sqrt{5}}{10}$	0 $-\frac{\sqrt{2}}{20}$ 0 0 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
	0	0 0 $-\frac{\sqrt{6}}{20}$ 0 $-\frac{\sqrt{3}}{10}$ 0 0 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
	0	$-\frac{2\sqrt{5}}{35}$ 0 0 0 0 $\frac{\sqrt{42}}{56}$ 0 $\frac{\sqrt{2}}{56}$ 0 0 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 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
	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 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 0 $\frac{2\sqrt{5}}{35}$ 0 0 0 0 0 0 $\frac{\sqrt{2}}{56}$ 0 $\frac{\sqrt{42}}{56}$
751	symmetry	z
$\mathbb{T}_{1,2}^{(1,1;a)}(T_u)$	0	$-\frac{i}{5}$ 0 0 0 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
	0	0 0 0 $-\frac{\sqrt{6}i}{10}$ 0 0 0 0 0 0 0 0 0 0 0
	0	0 0 0 0 $-\frac{i}{5}$ 0 0 0 0 0 0 0 0 0 0 0
	$-\frac{2i}{7}$	0 0 0 0 0 0 0 $\frac{\sqrt{6}i}{28}$ 0 0 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
	0	0 0 $-\frac{2i}{35}$ 0 0 0 0 0 0 $\frac{\sqrt{3}i}{14}$ 0 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 0 $\frac{6i}{35}$ 0 0 0 0 0 0 0 $\frac{\sqrt{10}i}{28}$ 0 0
	0	0 0 0 0 0 $\frac{2i}{7}$ 0 0 0 0 0 0 0 $\frac{\sqrt{6}i}{28}$ 0
752	symmetry	$\sqrt{15}xyz$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{T}_3^{(1,1;a)}(A_u)$	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	
753	symmetry	$\frac{x(2x^2-3y^2-3z^2)}{2}$
$\mathbb{T}_{3,0}^{(1,1;a)}(T_u, 1)$	$\frac{9\sqrt{5}i}{224}$ 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 $\frac{\sqrt{30}i}{224}$ 0 $-\frac{3\sqrt{2}i}{112}$ 0 $\frac{\sqrt{42}i}{224}$	
754	symmetry	$-\frac{y(3x^2-2y^2+3z^2)}{2}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{T}_{3,1}^{(1,1;a)}(T_u, 1)$	$-\frac{9\sqrt{5}}{224}$	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 $\frac{\sqrt{42}}{224}$
755	symmetry	$-\frac{z(3x^2+3y^2-2z^2)}{2}$
$\mathbb{T}_{3,2}^{(1,1;a)}(T_u, 1)$	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 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 0 $-\frac{\sqrt{6}i}{28}$ 0 0 0 0 0
	0	$-\frac{i}{6}$ 0 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 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
756	symmetry	$\frac{\sqrt{15}x(y-z)(y+z)}{2}$

continued ...

Table 9

No.	multipole	matrix
$T_{3,0}^{(1,1;a)}(T_u, 2)$	$\frac{15\sqrt{3}i}{224}$	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	$-\frac{5\sqrt{6}i}{168}$ 0 $-\frac{5\sqrt{3}i}{84}$ 0 0 0 0 $-\frac{3\sqrt{2}i}{224}$ 0 $-\frac{\sqrt{30}i}{112}$ 0 $-\frac{\sqrt{70}i}{224}$
757	symmetry	$-\frac{\sqrt{15}y(x-z)(x+z)}{2}$
$T_{3,1}^{(1,1;a)}(T_u, 2)$	$\frac{15\sqrt{3}}{224}$	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	$0 \frac{5\sqrt{6}}{168} 0 -\frac{5\sqrt{3}}{84} 0 0 0 0 \frac{3\sqrt{2}}{224} 0 -\frac{\sqrt{30}}{112} 0 -\frac{\sqrt{70}}{224}$
758	symmetry	$\frac{\sqrt{15}z(x-y)(x+y)}{2}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{T}_{3,2}^{(1,1;a)}(T_u, 2)$	0 0 0 $\frac{3\sqrt{30}i}{56}$ 0 0 $-\frac{\sqrt{14}i}{56}$ 0 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	
	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 0 $\frac{3\sqrt{30}i}{56}$ 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 $-\frac{\sqrt{2}i}{28}$ 0 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 $-\frac{\sqrt{10}i}{56}$ 0 0 0 $\frac{\sqrt{14}i}{56}$	
759 symmetry	0 0 0 $-\frac{x^2}{2} - \frac{y^2}{2} + z^2$ 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 0 $-\frac{\sqrt{15}}{35}$ 0 0 0 0 0 0 $\frac{3\sqrt{5}}{70}$ 0 0 0 0	
	0 0 0 0 $-\frac{3\sqrt{10}}{35}$ 0 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 0 $\frac{\sqrt{10}}{35}$ 0 0 0 0 0 0 $\frac{\sqrt{30}}{70}$ 0 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 0 $\frac{\sqrt{10}}{140}$ 0 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 0 $-\frac{\sqrt{15}}{14}$ 0	
760 symmetry	$\frac{\sqrt{3}(x-y)(x+y)}{2}$	

continued ...

Table 9

No.	multipole	matrix
$\mathbb{M}_{2,1}^{(a)}(E_u)$	$\sqrt{3}yz$	$\begin{bmatrix} 0 & 0 & 0 & \frac{\sqrt{15}}{35} & 0 & 0 & \frac{\sqrt{7}}{28} & 0 & 0 & 0 & \frac{\sqrt{5}}{140} & 0 & 0 & 0 \\ -\frac{\sqrt{2}}{7} & 0 & 0 & 0 & 0 & \frac{2\sqrt{10}}{35} & 0 & 0 & \frac{\sqrt{3}}{28} & 0 & 0 & 0 & \frac{1}{28} & 0 & 0 \\ 0 & -\frac{2\sqrt{10}}{35} & 0 & 0 & 0 & 0 & \frac{\sqrt{2}}{7} & 0 & 0 & \frac{1}{28} & 0 & 0 & 0 & \frac{\sqrt{3}}{28} & 0 \\ 0 & 0 & -\frac{\sqrt{15}}{35} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{5}}{140} & 0 & 0 & 0 & \frac{\sqrt{7}}{28} \\ 0 & 0 & -\frac{\sqrt{3}}{28} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{1}{14} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{3\sqrt{15}}{140} & 0 & 0 & -\frac{\sqrt{7}}{14} & 0 & 0 & 0 & \frac{2\sqrt{5}}{35} & 0 & 0 & 0 & 0 \\ -\frac{\sqrt{3}}{28} & 0 & 0 & 0 & -\frac{3\sqrt{15}}{140} & 0 & 0 & -\frac{\sqrt{2}}{7} & 0 & 0 & 0 & \frac{\sqrt{6}}{14} & 0 & 0 & 0 \\ 0 & -\frac{3\sqrt{15}}{140} & 0 & 0 & 0 & -\frac{\sqrt{3}}{28} & 0 & 0 & -\frac{\sqrt{6}}{14} & 0 & 0 & 0 & \frac{\sqrt{2}}{7} & 0 & 0 \\ 0 & 0 & -\frac{3\sqrt{15}}{140} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{2\sqrt{5}}{35} & 0 & 0 & 0 & \frac{\sqrt{7}}{14} & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{3}}{28} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{1}{14} & 0 & 0 & 0 & 0 \end{bmatrix}$
	$\sqrt{3}xz$	
761	symmetry	$\sqrt{3}yz$
$\mathbb{M}_{2,0}^{(a)}(T_u)$	$\sqrt{3}yz$	$\begin{bmatrix} -\frac{\sqrt{6}i}{14} & 0 & -\frac{3\sqrt{15}i}{70} & 0 & 0 & 0 & 0 & -\frac{i}{14} & 0 & -\frac{\sqrt{5}i}{70} & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{10}i}{70} & 0 & -\frac{\sqrt{5}i}{14} & 0 & 0 & 0 & 0 & -\frac{i}{14} & 0 & -\frac{\sqrt{15}i}{70} & 0 & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{5}i}{14} & 0 & -\frac{\sqrt{10}i}{70} & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{70} & 0 & -\frac{i}{14} & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{3\sqrt{15}i}{70} & 0 & \frac{\sqrt{6}i}{14} & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{70} & 0 & -\frac{i}{14} & 0 & 0 \\ 0 & \frac{\sqrt{6}i}{28} & 0 & 0 & 0 & 0 & -\frac{\sqrt{35}i}{28} & 0 & -\frac{\sqrt{15}i}{28} & 0 & 0 & 0 & 0 & 0 & 0 \\ -\frac{\sqrt{6}i}{28} & 0 & \frac{\sqrt{15}i}{70} & 0 & 0 & 0 & 0 & -\frac{i}{28} & 0 & -\frac{11\sqrt{5}i}{140} & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{15}i}{70} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}i}{28} & 0 & -\frac{\sqrt{10}i}{20} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{70} & 0 & 0 & 0 & 0 & \frac{\sqrt{10}i}{20} & 0 & -\frac{\sqrt{6}i}{28} & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{15}i}{70} & 0 & -\frac{\sqrt{6}i}{28} & 0 & 0 & 0 & 0 & \frac{11\sqrt{5}i}{140} & 0 & \frac{i}{28} & 0 & 0 \end{bmatrix}$
	$\sqrt{3}xz$	
762	symmetry	$\sqrt{3}xz$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{M}_{2,1}^{(a)}(T_u)$	$\sqrt{3}xy$	$\begin{bmatrix} -\frac{\sqrt{6}}{14} & 0 & \frac{3\sqrt{15}}{70} & 0 & 0 & 0 & 0 & -\frac{1}{14} & 0 & \frac{\sqrt{5}}{70} & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{10}}{70} & 0 & \frac{\sqrt{5}}{14} & 0 & 0 & 0 & 0 & -\frac{1}{14} & 0 & \frac{\sqrt{15}}{70} & 0 & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{5}}{14} & 0 & \frac{\sqrt{10}}{70} & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{70} & 0 & \frac{1}{14} & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{3\sqrt{15}}{70} & 0 & -\frac{\sqrt{6}}{14} & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}}{70} & 0 & \frac{1}{14} & 0 & 0 \\ 0 & -\frac{\sqrt{6}}{28} & 0 & 0 & 0 & 0 & -\frac{\sqrt{35}}{28} & 0 & \frac{\sqrt{15}}{28} & 0 & 0 & 0 & 0 & 0 & 0 \\ -\frac{\sqrt{6}}{28} & 0 & -\frac{\sqrt{15}}{70} & 0 & 0 & 0 & 0 & -\frac{1}{28} & 0 & \frac{11\sqrt{5}}{140} & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{15}}{70} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{28} & 0 & \frac{\sqrt{10}}{20} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{70} & 0 & 0 & 0 & 0 & \frac{\sqrt{10}}{20} & 0 & \frac{\sqrt{6}}{28} & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{15}}{70} & 0 & \frac{\sqrt{6}}{28} & 0 & 0 & 0 & 0 & \frac{11\sqrt{5}}{140} & 0 & -\frac{1}{28} & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{28} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{28} & 0 & -\frac{\sqrt{35}}{28} & 0 & 0 \end{bmatrix}$
	763 symmetry	$\sqrt{3}xy$
	$\mathbb{M}_{2,2}^{(a)}(T_u)$	$\begin{bmatrix} 0 & 0 & 0 & -\frac{\sqrt{15}i}{35} & 0 & 0 & \frac{\sqrt{7}i}{28} & 0 & 0 & 0 & -\frac{\sqrt{5}i}{140} & 0 & 0 & 0 \\ -\frac{\sqrt{2}i}{7} & 0 & 0 & 0 & -\frac{2\sqrt{10}i}{35} & 0 & 0 & \frac{\sqrt{3}i}{28} & 0 & 0 & 0 & -\frac{i}{28} & 0 & 0 & 0 \\ 0 & -\frac{2\sqrt{10}i}{35} & 0 & 0 & 0 & -\frac{\sqrt{2}i}{7} & 0 & 0 & \frac{i}{28} & 0 & 0 & 0 & -\frac{\sqrt{3}i}{28} & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{15}i}{35} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{5}i}{140} & 0 & 0 & 0 & -\frac{\sqrt{7}i}{28} & 0 \\ 0 & 0 & \frac{\sqrt{3}i}{28} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{i}{14} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{3\sqrt{15}i}{140} & 0 & 0 & -\frac{\sqrt{7}i}{14} & 0 & 0 & 0 & -\frac{2\sqrt{5}i}{35} & 0 & 0 & 0 & 0 \\ -\frac{\sqrt{3}i}{28} & 0 & 0 & 0 & \frac{3\sqrt{15}i}{140} & 0 & 0 & -\frac{\sqrt{2}i}{7} & 0 & 0 & 0 & -\frac{\sqrt{6}i}{14} & 0 & 0 & 0 \\ 0 & -\frac{3\sqrt{15}i}{140} & 0 & 0 & 0 & \frac{\sqrt{3}i}{28} & 0 & 0 & -\frac{\sqrt{6}i}{14} & 0 & 0 & 0 & -\frac{\sqrt{2}i}{7} & 0 & 0 \\ 0 & 0 & -\frac{3\sqrt{15}i}{140} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{2\sqrt{5}i}{35} & 0 & 0 & 0 & -\frac{\sqrt{7}i}{14} & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{3}i}{28} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{i}{14} & 0 & 0 & 0 & 0 \end{bmatrix}$
		$\sqrt{21}(x^4 - 3x^2y^2 - 3x^2z^2 + y^4 - 3y^2z^2 + z^4)$
		6

continued ...

Table 9

No.	multipole	matrix
$M_4^{(a)}(A_u)$	$0 - \frac{\sqrt{21}}{84} 0 0 0 - \frac{\sqrt{105}}{84} 0 0 - \frac{3\sqrt{210}}{280} 0 0 0 - \frac{3\sqrt{70}}{280} 0$	
	$0 0 \frac{\sqrt{14}}{28} 0 0 0 0 0 0 \frac{\sqrt{42}}{56} 0 0 0 - \frac{\sqrt{30}}{40}$	
	$0 0 0 - \frac{\sqrt{14}}{28} 0 0 - \frac{\sqrt{30}}{40} 0 0 0 \frac{\sqrt{42}}{56} 0 0 0$	
	$\frac{\sqrt{105}}{84} 0 0 0 \frac{\sqrt{21}}{84} 0 0 - \frac{3\sqrt{70}}{280} 0 0 0 - \frac{3\sqrt{210}}{280} 0 0$	
	$\frac{\sqrt{21}}{84} 0 0 0 \frac{\sqrt{105}}{84} 0 0 - \frac{\sqrt{14}}{28} 0 0 0 - \frac{\sqrt{42}}{84} 0 0$	
	$0 - \frac{\sqrt{21}}{28} 0 0 0 \frac{\sqrt{105}}{84} 0 0 \frac{\sqrt{210}}{105} 0 0 0 - \frac{\sqrt{70}}{70} 0$	
	$0 0 \frac{\sqrt{21}}{42} 0 0 0 0 0 0 \frac{\sqrt{7}}{28} 0 0 0 - \frac{\sqrt{5}}{20}$	
	$0 0 0 \frac{\sqrt{21}}{42} 0 0 \frac{\sqrt{5}}{20} 0 0 0 - \frac{\sqrt{7}}{28} 0 0 0$	
	$\frac{\sqrt{105}}{84} 0 0 0 - \frac{\sqrt{21}}{28} 0 0 \frac{\sqrt{70}}{70} 0 0 0 - \frac{\sqrt{210}}{105} 0 0$	
	$0 \frac{\sqrt{105}}{84} 0 0 0 \frac{\sqrt{21}}{84} 0 0 0 \frac{\sqrt{42}}{84} 0 0 0 \frac{\sqrt{14}}{28} 0$	
765	symmetry	$-\frac{\sqrt{15}(x^4 - 12x^2y^2 + 6x^2z^2 + y^4 + 6y^2z^2 - 2z^4)}{12}$
$M_{4,0}^{(a)}(E_u)$	$0 - \frac{\sqrt{15}}{84} 0 0 0 \frac{\sqrt{3}}{12} 0 0 - \frac{3\sqrt{6}}{56} 0 0 0 \frac{3\sqrt{2}}{40} 0$	
	$0 0 \frac{\sqrt{10}}{28} 0 0 0 0 0 0 \frac{\sqrt{30}}{56} 0 0 0 0 \frac{\sqrt{42}}{40}$	
	$0 0 0 - \frac{\sqrt{10}}{28} 0 0 \frac{\sqrt{42}}{40} 0 0 0 \frac{\sqrt{30}}{56} 0 0 0$	
	$- \frac{\sqrt{3}}{12} 0 0 0 \frac{\sqrt{15}}{84} 0 0 \frac{3\sqrt{2}}{40} 0 0 0 - \frac{3\sqrt{6}}{56} 0 0$	
	$\frac{\sqrt{15}}{84} 0 0 0 - \frac{\sqrt{3}}{12} 0 0 - \frac{\sqrt{10}}{28} 0 0 0 \frac{\sqrt{30}}{60} 0 0$	
	$0 - \frac{\sqrt{15}}{28} 0 0 0 - \frac{\sqrt{3}}{12} 0 0 \frac{\sqrt{6}}{21} 0 0 0 0 \frac{\sqrt{2}}{10} 0$	
	$0 0 \frac{\sqrt{15}}{42} 0 0 0 0 0 0 \frac{\sqrt{5}}{28} 0 0 0 0 \frac{\sqrt{7}}{20}$	
	$0 0 0 \frac{\sqrt{15}}{42} 0 0 - \frac{\sqrt{7}}{20} 0 0 0 - \frac{\sqrt{5}}{28} 0 0 0$	
	$- \frac{\sqrt{3}}{12} 0 0 0 - \frac{\sqrt{15}}{28} 0 0 - \frac{\sqrt{2}}{10} 0 0 0 - \frac{\sqrt{6}}{21} 0 0$	
	$0 - \frac{\sqrt{3}}{12} 0 0 0 \frac{\sqrt{15}}{84} 0 0 - \frac{\sqrt{30}}{60} 0 0 0 \frac{\sqrt{10}}{28} 0$	
766	symmetry	$\frac{\sqrt{5}(x-y)(x+y)(x^2+y^2-6z^2)}{4}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{M}_{4,1}^{(a)}(E_u)$	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	
	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	
	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 0 $-\frac{\sqrt{6}}{14}$ 0 0 0	
767	symmetry	$\frac{\sqrt{35}yz(y-z)(y+z)}{2}$
$\mathbb{M}_{4,0}^{(a)}(T_u, 1)$	$-\frac{\sqrt{7}i}{112}$ 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	
768	symmetry	$-\frac{\sqrt{35}xz(x-z)(x+z)}{2}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{M}_{4,1}^{(a)}(T_u, 1)$	$\frac{\sqrt{7}}{112} 0 -\frac{\sqrt{70}}{112} 0 \frac{\sqrt{35}}{112} 0 0 \frac{9\sqrt{42}}{560} 0 -\frac{3\sqrt{210}}{280} 0 \frac{9\sqrt{14}}{560} 0 0$	
	$0 -\frac{\sqrt{105}}{112} 0 \frac{\sqrt{210}}{112} 0 -\frac{\sqrt{21}}{112} \frac{3\sqrt{2}}{80} 0 -\frac{3\sqrt{42}}{140} 0 \frac{3\sqrt{70}}{560} 0 \frac{3\sqrt{14}}{280} 0$	
	$-\frac{\sqrt{21}}{112} 0 \frac{\sqrt{210}}{112} 0 -\frac{\sqrt{105}}{112} 0 0 -\frac{3\sqrt{14}}{280} 0 -\frac{3\sqrt{70}}{560} 0 \frac{3\sqrt{42}}{140} 0 -\frac{3\sqrt{2}}{80}$	
	$0 \frac{\sqrt{35}}{112} 0 -\frac{\sqrt{70}}{112} 0 \frac{\sqrt{7}}{112} 0 0 -\frac{9\sqrt{14}}{560} 0 \frac{3\sqrt{210}}{280} 0 -\frac{9\sqrt{42}}{560} 0$	
	$0 \frac{\sqrt{7}}{28} 0 -\frac{\sqrt{14}}{56} 0 0 \frac{\sqrt{30}}{80} 0 -\frac{\sqrt{70}}{56} 0 \frac{\sqrt{42}}{112} 0 0 0$	
	$\frac{\sqrt{7}}{28} 0 -\frac{\sqrt{70}}{56} 0 0 0 0 -\frac{13\sqrt{42}}{560} 0 \frac{\sqrt{210}}{280} 0 \frac{\sqrt{14}}{80} 0 0$	
	$0 -\frac{\sqrt{70}}{56} 0 0 0 \frac{\sqrt{14}}{56} -\frac{3\sqrt{3}}{80} 0 \frac{\sqrt{7}}{560} 0 \frac{\sqrt{105}}{80} 0 -\frac{\sqrt{21}}{560} 0$	
	$-\frac{\sqrt{14}}{56} 0 0 0 \frac{\sqrt{70}}{56} 0 0 -\frac{\sqrt{21}}{560} 0 \frac{\sqrt{105}}{80} 0 \frac{\sqrt{7}}{560} 0 -\frac{3\sqrt{3}}{80}$	
	$0 0 0 \frac{\sqrt{70}}{56} 0 -\frac{\sqrt{7}}{28} 0 0 \frac{\sqrt{14}}{80} 0 \frac{\sqrt{210}}{280} 0 -\frac{13\sqrt{42}}{560} 0$	
$\mathbb{M}_{4,2}^{(a)}(T_u, 1)$	$0 0 0 0 0 \frac{\sqrt{7}i}{14} 0 0 0 0 0 0 \frac{3\sqrt{42}i}{140} 0$	$\frac{\sqrt{35}xy(x-y)(x+y)}{2}$
	$0 0 0 0 0 0 0 0 0 0 0 0 0 \frac{3\sqrt{2}i}{20}$	
	$0 0 0 0 0 0 0 -\frac{3\sqrt{2}i}{20} 0 0 0 0 0 0 0$	
	$\frac{\sqrt{7}i}{14} 0 0 0 0 0 0 0 -\frac{3\sqrt{42}i}{140} 0 0 0 0 0 0$	
	$0 0 0 0 -\frac{\sqrt{7}i}{14} 0 0 0 0 0 \frac{\sqrt{70}i}{70} 0 0$	
	$0 0 0 0 0 -\frac{\sqrt{7}i}{14} 0 0 0 0 0 \frac{\sqrt{42}i}{35} 0$	
	$0 0 0 0 0 0 0 0 0 0 0 0 0 \frac{\sqrt{3}i}{10}$	
	$0 0 0 0 0 0 0 \frac{\sqrt{3}i}{10} 0 0 0 0 0 0 0$	
	$\frac{\sqrt{7}i}{14} 0 0 0 0 0 0 0 \frac{\sqrt{42}i}{35} 0 0 0 0 0 0$	
770	symmetry	$\frac{\sqrt{5}yz(6x^2-y^2-z^2)}{2}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{M}_{4,0}^{(a)}(T_u, 2)$	$-\frac{i}{112} \quad 0 \quad -\frac{\sqrt{10}i}{112} \quad 0 \quad \frac{\sqrt{5}i}{16} \quad 0 \quad 0 \quad -\frac{9\sqrt{6}i}{560} \quad 0 \quad -\frac{3\sqrt{30}i}{280} \quad 0 \quad \frac{9\sqrt{2}i}{80} \quad 0 \quad 0$	
	$0 \quad \frac{\sqrt{15}i}{112} \quad 0 \quad \frac{\sqrt{30}i}{112} \quad 0 \quad -\frac{\sqrt{3}i}{16} \quad -\frac{3\sqrt{14}i}{80} \quad 0 \quad \frac{3\sqrt{6}i}{140} \quad 0 \quad \frac{3\sqrt{10}i}{560} \quad 0 \quad \frac{3\sqrt{2}i}{40} \quad 0$	
	$\frac{\sqrt{3}i}{16} \quad 0 \quad -\frac{\sqrt{30}i}{112} \quad 0 \quad -\frac{\sqrt{15}i}{112} \quad 0 \quad 0 \quad \frac{3\sqrt{2}i}{40} \quad 0 \quad \frac{3\sqrt{10}i}{560} \quad 0 \quad \frac{3\sqrt{6}i}{140} \quad 0 \quad -\frac{3\sqrt{14}i}{80}$	
	$0 \quad -\frac{\sqrt{5}i}{16} \quad 0 \quad \frac{\sqrt{10}i}{112} \quad 0 \quad \frac{i}{112} \quad 0 \quad 0 \quad \frac{9\sqrt{2}i}{80} \quad 0 \quad -\frac{3\sqrt{30}i}{280} \quad 0 \quad -\frac{9\sqrt{6}i}{560} \quad 0$	
	$0 \quad \frac{i}{28} \quad 0 \quad -\frac{\sqrt{2}i}{8} \quad 0 \quad 0 \quad -\frac{\sqrt{210}i}{560} \quad 0 \quad -\frac{\sqrt{10}i}{56} \quad 0 \quad \frac{\sqrt{6}i}{16} \quad 0 \quad 0 \quad 0$	
	$-\frac{i}{28} \quad 0 \quad -\frac{\sqrt{10}i}{56} \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{13\sqrt{6}i}{560} \quad 0 \quad \frac{\sqrt{30}i}{280} \quad 0 \quad \frac{7\sqrt{2}i}{80} \quad 0 \quad 0$	
	$0 \quad \frac{\sqrt{10}i}{56} \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{2}i}{8} \quad \frac{3\sqrt{21}i}{80} \quad 0 \quad -\frac{i}{560} \quad 0 \quad \frac{\sqrt{15}i}{80} \quad 0 \quad -\frac{\sqrt{3}i}{80} \quad 0$	
	$\frac{\sqrt{2}i}{8} \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{10}i}{56} \quad 0 \quad 0 \quad \frac{\sqrt{3}i}{80} \quad 0 \quad -\frac{\sqrt{15}i}{80} \quad 0 \quad \frac{i}{560} \quad 0 \quad -\frac{3\sqrt{21}i}{80}$	
	$0 \quad 0 \quad 0 \quad -\frac{\sqrt{10}i}{56} \quad 0 \quad -\frac{i}{28} \quad 0 \quad 0 \quad -\frac{7\sqrt{2}i}{80} \quad 0 \quad -\frac{\sqrt{30}i}{280} \quad 0 \quad -\frac{13\sqrt{6}i}{560} \quad 0$	
	$0 \quad 0 \quad -\frac{\sqrt{2}i}{8} \quad 0 \quad \frac{i}{28} \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{6}i}{16} \quad 0 \quad \frac{\sqrt{10}i}{56} \quad 0 \quad \frac{\sqrt{210}i}{560}$	
771	symmetry	$-\frac{\sqrt{5}xz(x^2-6y^2+z^2)}{2}$
$\mathbb{M}_{4,1}^{(a)}(T_u, 2)$	$-\frac{1}{112} \quad 0 \quad \frac{\sqrt{10}}{112} \quad 0 \quad \frac{\sqrt{5}}{16} \quad 0 \quad 0 \quad -\frac{9\sqrt{6}}{560} \quad 0 \quad \frac{3\sqrt{30}}{280} \quad 0 \quad \frac{9\sqrt{2}}{80} \quad 0 \quad 0$	
	$0 \quad \frac{\sqrt{15}}{112} \quad 0 \quad -\frac{\sqrt{30}}{112} \quad 0 \quad -\frac{\sqrt{3}}{16} \quad \frac{3\sqrt{14}}{80} \quad 0 \quad \frac{3\sqrt{6}}{140} \quad 0 \quad -\frac{3\sqrt{10}}{560} \quad 0 \quad \frac{3\sqrt{2}}{40} \quad 0$	
	$-\frac{\sqrt{3}}{16} \quad 0 \quad -\frac{\sqrt{30}}{112} \quad 0 \quad \frac{\sqrt{15}}{112} \quad 0 \quad 0 \quad -\frac{3\sqrt{2}}{40} \quad 0 \quad \frac{3\sqrt{10}}{560} \quad 0 \quad -\frac{3\sqrt{6}}{140} \quad 0 \quad -\frac{3\sqrt{14}}{80}$	
	$0 \quad \frac{\sqrt{5}}{16} \quad 0 \quad \frac{\sqrt{10}}{112} \quad 0 \quad -\frac{1}{112} \quad 0 \quad 0 \quad -\frac{9\sqrt{2}}{80} \quad 0 \quad -\frac{3\sqrt{30}}{280} \quad 0 \quad \frac{9\sqrt{6}}{560} \quad 0$	
	$0 \quad -\frac{1}{28} \quad 0 \quad -\frac{\sqrt{2}}{8} \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{210}}{560} \quad 0 \quad \frac{\sqrt{10}}{56} \quad 0 \quad \frac{\sqrt{6}}{16} \quad 0 \quad 0 \quad 0$	
	$-\frac{1}{28} \quad 0 \quad \frac{\sqrt{10}}{56} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{13\sqrt{6}}{560} \quad 0 \quad -\frac{\sqrt{30}}{280} \quad 0 \quad \frac{7\sqrt{2}}{80} \quad 0 \quad 0$	
	$0 \quad \frac{\sqrt{10}}{56} \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{2}}{8} \quad -\frac{3\sqrt{21}}{80} \quad 0 \quad -\frac{1}{560} \quad 0 \quad -\frac{\sqrt{15}}{80} \quad 0 \quad -\frac{\sqrt{3}}{80} \quad 0$	
	$-\frac{\sqrt{2}}{8} \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{10}}{56} \quad 0 \quad 0 \quad -\frac{\sqrt{3}}{80} \quad 0 \quad -\frac{\sqrt{15}}{80} \quad 0 \quad -\frac{1}{560} \quad 0 \quad -\frac{3\sqrt{21}}{80}$	
	$0 \quad 0 \quad 0 \quad -\frac{\sqrt{10}}{56} \quad 0 \quad \frac{1}{28} \quad 0 \quad 0 \quad 0 \quad \frac{7\sqrt{2}}{80} \quad 0 \quad -\frac{\sqrt{30}}{280} \quad 0 \quad \frac{13\sqrt{6}}{560} \quad 0$	
	$0 \quad 0 \quad \frac{\sqrt{2}}{8} \quad 0 \quad \frac{1}{28} \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{6}}{16} \quad 0 \quad \frac{\sqrt{10}}{56} \quad 0 \quad -\frac{\sqrt{210}}{560}$	
772	symmetry	$-\frac{\sqrt{5}xy(x^2+y^2-6z^2)}{2}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{M}_{4,2}^{(a)}(T_u, 2)$	$0 \ 0 \ 0 \ \frac{\sqrt{10}i}{28} \ 0 \ 0 \ -\frac{3\sqrt{42}i}{280} \ 0 \ 0 \ 0 \ \frac{9\sqrt{30}i}{280} \ 0 \ 0 \ 0$	
	$\frac{\sqrt{3}i}{28} \ 0 \ 0 \ 0 \ -\frac{\sqrt{15}i}{28} \ 0 \ 0 \ \frac{33\sqrt{2}i}{280} \ 0 \ 0 \ 0 \ \frac{3\sqrt{6}i}{280} \ 0 \ 0 \ 0$	
	$0 \ -\frac{\sqrt{15}i}{28} \ 0 \ 0 \ 0 \ \frac{\sqrt{3}i}{28} \ 0 \ 0 \ -\frac{3\sqrt{6}i}{280} \ 0 \ 0 \ 0 \ -\frac{33\sqrt{2}i}{280} \ 0$	
	$0 \ 0 \ \frac{\sqrt{10}i}{28} \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ -\frac{9\sqrt{30}i}{280} \ 0 \ 0 \ 0 \ \frac{3\sqrt{42}i}{280}$	
	$0 \ 0 \ -\frac{3\sqrt{2}i}{28} \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ \frac{\sqrt{6}i}{14} \ 0 \ 0 \ 0 \ 0$	
	$0 \ 0 \ 0 \ \frac{\sqrt{10}i}{28} \ 0 \ 0 \ \frac{3\sqrt{42}i}{140} \ 0 \ 0 \ 0 \ \frac{\sqrt{30}i}{140} \ 0 \ 0 \ 0$	
	$\frac{3\sqrt{2}i}{28} \ 0 \ 0 \ 0 \ \frac{\sqrt{10}i}{28} \ 0 \ 0 \ -\frac{9\sqrt{3}i}{140} \ 0 \ 0 \ 0 \ -\frac{17i}{140} \ 0 \ 0 \ 0$	
	$0 \ -\frac{\sqrt{10}i}{28} \ 0 \ 0 \ 0 \ -\frac{3\sqrt{2}i}{28} \ 0 \ 0 \ -\frac{17i}{140} \ 0 \ 0 \ 0 \ -\frac{9\sqrt{3}i}{140} \ 0$	
	$0 \ 0 \ -\frac{\sqrt{10}i}{28} \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ \frac{\sqrt{30}i}{140} \ 0 \ 0 \ 0 \ \frac{3\sqrt{42}i}{140}$	
	$0 \ 0 \ 0 \ \frac{3\sqrt{2}i}{28} \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ \frac{\sqrt{6}i}{14} \ 0 \ 0 \ 0$	
773	symmetry	$-\frac{x^2}{2} - \frac{y^2}{2} + z^2$
$\mathbb{M}_{2,0}^{(1,-1;a)}(E_u)$	$0 \ -\frac{3\sqrt{6}}{70} \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ -\frac{2\sqrt{15}}{35} \ 0 \ 0 \ 0 \ 0 \ 0 \ 0$	
	$0 \ 0 \ -\frac{3}{70} \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ -\frac{6\sqrt{3}}{35} \ 0 \ 0 \ 0 \ 0 \ 0$	
	$0 \ 0 \ 0 \ \frac{3}{70} \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ -\frac{6\sqrt{3}}{35} \ 0 \ 0 \ 0$	
	$0 \ 0 \ 0 \ 0 \ \frac{3\sqrt{6}}{70} \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ -\frac{2\sqrt{15}}{35} \ 0 \ 0$	
	$\frac{\sqrt{6}}{21} \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ \frac{3}{14} \ 0 \ 0 \ 0 \ 0 \ 0 \ 0$	
	$0 \ -\frac{\sqrt{6}}{105} \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ \frac{3\sqrt{15}}{70} \ 0 \ 0 \ 0 \ 0 \ 0$	
	$0 \ 0 \ -\frac{4\sqrt{6}}{105} \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ \frac{3\sqrt{2}}{70} \ 0 \ 0 \ 0 \ 0$	
	$0 \ 0 \ 0 \ -\frac{4\sqrt{6}}{105} \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ -\frac{3\sqrt{2}}{70} \ 0 \ 0 \ 0$	
	$0 \ 0 \ 0 \ 0 \ -\frac{\sqrt{6}}{105} \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ -\frac{3\sqrt{15}}{70} \ 0 \ 0$	
774	symmetry	$\frac{\sqrt{3}(x-y)(x+y)}{2}$

continued ...

Table 9

No.	multipole	matrix
	$\mathbb{M}_{2,1}^{(1,-1;a)}(E_u)$	$\begin{bmatrix} 0 & 0 & 0 & -\frac{3}{70} & 0 & 0 & -\frac{\sqrt{105}}{35} & 0 & 0 & 0 & -\frac{\sqrt{3}}{35} & 0 & 0 & 0 & 0 \\ \frac{\sqrt{30}}{70} & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}}{35} & 0 & 0 & -\frac{3\sqrt{5}}{35} & 0 & 0 & 0 & -\frac{\sqrt{15}}{35} & 0 & 0 \\ 0 & \frac{\sqrt{6}}{35} & 0 & 0 & 0 & -\frac{\sqrt{30}}{70} & 0 & 0 & -\frac{\sqrt{15}}{35} & 0 & 0 & 0 & -\frac{3\sqrt{5}}{35} & 0 & 0 \\ 0 & 0 & \frac{3}{70} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{35} & 0 & 0 & 0 & 0 & -\frac{\sqrt{105}}{35} \\ 0 & 0 & \frac{\sqrt{5}}{35} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{70} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{3}{35} & 0 & 0 & -\frac{\sqrt{105}}{70} & 0 & 0 & 0 & \frac{2\sqrt{3}}{35} & 0 & 0 & 0 & 0 \\ \frac{\sqrt{5}}{35} & 0 & 0 & 0 & \frac{3}{35} & 0 & 0 & -\frac{\sqrt{30}}{35} & 0 & 0 & 0 & \frac{3\sqrt{10}}{70} & 0 & 0 & 0 \\ 0 & \frac{3}{35} & 0 & 0 & 0 & \frac{\sqrt{5}}{35} & 0 & 0 & -\frac{3\sqrt{10}}{70} & 0 & 0 & 0 & \frac{\sqrt{30}}{35} & 0 & 0 \\ 0 & 0 & \frac{3}{35} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{2\sqrt{3}}{35} & 0 & 0 & 0 & 0 & \frac{\sqrt{105}}{70} \\ 0 & 0 & 0 & \frac{\sqrt{5}}{35} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{70} & 0 & 0 & 0 & 0 \end{bmatrix}$
775	symmetry	$\sqrt{3}yz$
	$\mathbb{M}_{2,0}^{(1,-1;a)}(T_u)$	$\begin{bmatrix} \frac{3\sqrt{10}i}{140} & 0 & \frac{9i}{140} & 0 & 0 & 0 & 0 & 0 & \frac{2\sqrt{15}i}{35} & 0 & \frac{2\sqrt{3}i}{35} & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{6}i}{140} & 0 & \frac{\sqrt{3}i}{28} & 0 & 0 & 0 & 0 & 0 & \frac{2\sqrt{15}i}{35} & 0 & \frac{6i}{35} & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{3}i}{28} & 0 & \frac{\sqrt{6}i}{140} & 0 & 0 & 0 & 0 & 0 & \frac{6i}{35} & 0 & \frac{2\sqrt{15}i}{35} & 0 & 0 \\ 0 & 0 & 0 & -\frac{9i}{140} & 0 & -\frac{3\sqrt{10}i}{140} & 0 & 0 & 0 & 0 & \frac{2\sqrt{3}i}{35} & 0 & \frac{2\sqrt{15}i}{35} & 0 & 0 \\ 0 & -\frac{\sqrt{10}i}{35} & 0 & 0 & 0 & 0 & -\frac{\sqrt{21}i}{28} & 0 & -\frac{3i}{28} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ \frac{\sqrt{10}i}{35} & 0 & -\frac{2i}{35} & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{140} & 0 & -\frac{11\sqrt{3}i}{140} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{2i}{35} & 0 & 0 & 0 & \frac{2i}{35} & 0 & 0 & 0 & \frac{3\sqrt{10}i}{140} & 0 & -\frac{\sqrt{6}i}{20} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{2i}{35} & 0 & \frac{\sqrt{10}i}{35} & 0 & 0 & 0 & \frac{\sqrt{6}i}{20} & 0 & -\frac{3\sqrt{10}i}{140} & 0 & 0 \\ 0 & 0 & 0 & -\frac{2i}{35} & 0 & \frac{\sqrt{10}i}{35} & 0 & 0 & 0 & 0 & \frac{11\sqrt{3}i}{140} & 0 & \frac{\sqrt{15}i}{140} & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{10}i}{35} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3i}{28} & 0 & \frac{\sqrt{21}i}{28} & 0 & 0 \end{bmatrix}$
776	symmetry	$\sqrt{3}xz$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{M}_{2,1}^{(1,-1;a)}(T_u)$	$\sqrt{3}xy$	$\begin{bmatrix} \frac{3\sqrt{10}}{140} & 0 & -\frac{9}{140} & 0 & 0 & 0 & 0 & \frac{2\sqrt{15}}{35} & 0 & -\frac{2\sqrt{3}}{35} & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{6}}{140} & 0 & -\frac{\sqrt{3}}{28} & 0 & 0 & 0 & 0 & \frac{2\sqrt{15}}{35} & 0 & -\frac{6}{35} & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{3}}{28} & 0 & -\frac{\sqrt{6}}{140} & 0 & 0 & 0 & 0 & \frac{6}{35} & 0 & -\frac{2\sqrt{15}}{35} & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{9}{140} & 0 & \frac{3\sqrt{10}}{140} & 0 & 0 & 0 & 0 & \frac{2\sqrt{3}}{35} & 0 & -\frac{2\sqrt{15}}{35} & 0 & 0 \\ 0 & \frac{\sqrt{10}}{35} & 0 & 0 & 0 & 0 & -\frac{\sqrt{21}}{28} & 0 & \frac{3}{28} & 0 & 0 & 0 & 0 & 0 & 0 \\ \frac{\sqrt{10}}{35} & 0 & \frac{2}{35} & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{140} & 0 & \frac{11\sqrt{3}}{140} & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{2}{35} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{10}}{140} & 0 & \frac{\sqrt{6}}{20} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{2}{35} & 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{20} & 0 & \frac{3\sqrt{10}}{140} & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{2}{35} & 0 & -\frac{\sqrt{10}}{35} & 0 & 0 & 0 & 0 & \frac{11\sqrt{3}}{140} & 0 & -\frac{\sqrt{15}}{140} & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{10}}{35} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3}{28} & 0 & -\frac{\sqrt{21}}{28} & 0 \end{bmatrix}$
	777 symmetry	$\sqrt{3}xy$
	$\mathbb{M}_{2,2}^{(1,-1;a)}(T_u)$	$\sqrt{3}xy$
		$\begin{bmatrix} 0 & 0 & 0 & \frac{3i}{70} & 0 & 0 & -\frac{\sqrt{105}i}{35} & 0 & 0 & 0 & \frac{\sqrt{3}i}{35} & 0 & 0 & 0 & 0 \\ \frac{\sqrt{30}i}{70} & 0 & 0 & 0 & \frac{\sqrt{6}i}{35} & 0 & 0 & -\frac{3\sqrt{5}i}{35} & 0 & 0 & 0 & \frac{\sqrt{15}i}{35} & 0 & 0 & 0 \\ 0 & \frac{\sqrt{6}i}{35} & 0 & 0 & 0 & \frac{\sqrt{30}i}{70} & 0 & 0 & -\frac{\sqrt{15}i}{35} & 0 & 0 & 0 & \frac{3\sqrt{5}i}{35} & 0 & 0 \\ 0 & 0 & \frac{3i}{70} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{35} & 0 & 0 & 0 & 0 & \frac{\sqrt{105}i}{35} \\ 0 & 0 & -\frac{\sqrt{5}i}{35} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{70} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{3i}{35} & 0 & 0 & -\frac{\sqrt{105}i}{70} & 0 & 0 & 0 & -\frac{2\sqrt{3}i}{35} & 0 & 0 & 0 & 0 \\ \frac{\sqrt{5}i}{35} & 0 & 0 & 0 & -\frac{3i}{35} & 0 & 0 & -\frac{\sqrt{30}i}{35} & 0 & 0 & 0 & -\frac{3\sqrt{10}i}{70} & 0 & 0 & 0 \\ 0 & \frac{3i}{35} & 0 & 0 & 0 & -\frac{\sqrt{5}i}{35} & 0 & 0 & -\frac{3\sqrt{10}i}{70} & 0 & 0 & 0 & -\frac{\sqrt{30}i}{35} & 0 & 0 \\ 0 & 0 & \frac{3i}{35} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{2\sqrt{3}i}{35} & 0 & 0 & 0 & 0 & -\frac{\sqrt{105}i}{70} \\ 0 & 0 & 0 & \frac{\sqrt{5}i}{35} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{70} & 0 & 0 & 0 & 0 \end{bmatrix}$
		$\sqrt{21}(x^4 - 3x^2y^2 - 3x^2z^2 + y^4 - 3y^2z^2 + z^4)$
778	symmetry	$\sqrt{21}(x^4 - 3x^2y^2 - 3x^2z^2 + y^4 - 3y^2z^2 + z^4)$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{M}_4^{(1,-1;a)}(A_u)$	0	$\frac{\sqrt{7}}{168} \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{35}}{168} \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{70}}{56} \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{210}}{168} \quad 0$
	0	$0 \quad 0 \quad -\frac{\sqrt{42}}{168} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{5\sqrt{14}}{168} \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{10}}{24}$
	0	$0 \quad 0 \quad 0 \quad \frac{\sqrt{42}}{168} \quad 0 \quad 0 \quad \frac{\sqrt{10}}{24} \quad 0 \quad 0 \quad 0 \quad -\frac{5\sqrt{14}}{168} \quad 0 \quad 0 \quad 0 \quad 0$
	$-\frac{\sqrt{35}}{168}$	$0 \quad 0 \quad 0 \quad -\frac{\sqrt{7}}{168} \quad 0 \quad 0 \quad \frac{\sqrt{210}}{168} \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{70}}{56} \quad 0 \quad 0 \quad 0$
	$-\frac{\sqrt{7}}{84}$	$0 \quad 0 \quad 0 \quad -\frac{\sqrt{35}}{84} \quad 0 \quad 0 \quad -\frac{5\sqrt{42}}{168} \quad 0 \quad 0 \quad 0 \quad -\frac{5\sqrt{14}}{168} \quad 0 \quad 0 \quad 0 \quad 0$
	0	$\frac{\sqrt{7}}{28} \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{35}}{84} \quad 0 \quad 0 \quad \frac{\sqrt{70}}{42} \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{210}}{84} \quad 0$
	0	$0 \quad 0 \quad -\frac{\sqrt{7}}{42} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{5\sqrt{21}}{168} \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{15}}{24}$
	0	$0 \quad 0 \quad 0 \quad -\frac{\sqrt{7}}{42} \quad 0 \quad 0 \quad \frac{\sqrt{15}}{24} \quad 0 \quad 0 \quad 0 \quad -\frac{5\sqrt{21}}{168} \quad 0 \quad 0 \quad 0 \quad 0$
	$-\frac{\sqrt{35}}{84}$	$0 \quad 0 \quad 0 \quad \frac{\sqrt{7}}{28} \quad 0 \quad 0 \quad \frac{\sqrt{210}}{84} \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{70}}{42} \quad 0 \quad 0 \quad 0$
	0	$-\frac{\sqrt{35}}{84} \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{7}}{84} \quad 0 \quad 0 \quad \frac{5\sqrt{14}}{168} \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{5\sqrt{42}}{168} \quad 0$
779	symmetry	$-\frac{\sqrt{15}(x^4 - 12x^2y^2 + 6x^2z^2 + y^4 + 6y^2z^2 - 2z^4)}{12}$
$\mathbb{M}_{4,0}^{(1,-1;a)}(E_u)$	0	$\frac{\sqrt{5}}{168} \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{1}{24} \quad 0 \quad 0 \quad 0 \quad \frac{5\sqrt{2}}{56} \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{6}}{24} \quad 0$
	0	$0 \quad 0 \quad -\frac{\sqrt{30}}{168} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{5\sqrt{10}}{168} \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{14}}{24}$
	0	$0 \quad 0 \quad 0 \quad \frac{\sqrt{30}}{168} \quad 0 \quad 0 \quad -\frac{\sqrt{14}}{24} \quad 0 \quad 0 \quad 0 \quad -\frac{5\sqrt{10}}{168} \quad 0 \quad 0 \quad 0 \quad 0$
	$\frac{1}{24}$	$0 \quad 0 \quad 0 \quad -\frac{\sqrt{5}}{168} \quad 0 \quad 0 \quad -\frac{\sqrt{6}}{24} \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{5\sqrt{2}}{56} \quad 0 \quad 0 \quad 0$
	$-\frac{\sqrt{5}}{84}$	$0 \quad 0 \quad 0 \quad \frac{1}{12} \quad 0 \quad 0 \quad -\frac{5\sqrt{30}}{168} \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{10}}{24} \quad 0 \quad 0 \quad 0$
	0	$\frac{\sqrt{5}}{28} \quad 0 \quad 0 \quad 0 \quad \frac{1}{12} \quad 0 \quad 0 \quad 0 \quad \frac{5\sqrt{2}}{42} \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{6}}{12} \quad 0$
	0	$0 \quad 0 \quad -\frac{\sqrt{5}}{42} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{5\sqrt{15}}{168} \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{21}}{24}$
	0	$0 \quad 0 \quad 0 \quad -\frac{\sqrt{5}}{42} \quad 0 \quad 0 \quad -\frac{\sqrt{21}}{24} \quad 0 \quad 0 \quad 0 \quad -\frac{5\sqrt{15}}{168} \quad 0 \quad 0 \quad 0 \quad 0$
	$\frac{1}{12}$	$0 \quad 0 \quad 0 \quad \frac{\sqrt{5}}{28} \quad 0 \quad 0 \quad -\frac{\sqrt{6}}{12} \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{5\sqrt{2}}{42} \quad 0 \quad 0 \quad 0$
	0	$\frac{1}{12} \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{5}}{84} \quad 0 \quad 0 \quad -\frac{\sqrt{10}}{24} \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{5\sqrt{30}}{168} \quad 0$
780	symmetry	$\frac{\sqrt{5}(x-y)(x+y)(x^2+y^2-6z^2)}{4}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{M}_{4,1}^{(1,-1;a)}(E_u)$	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	
	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	
	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	
781	symmetry	$\frac{\sqrt{35}yz(y-z)(y+z)}{2}$
$\mathbb{M}_{4,0}^{(1,-1;a)}(T_u, 1)$	$\frac{\sqrt{21}i}{672}$ 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 $\frac{\sqrt{10}i}{32}$	
782	symmetry	$-\frac{\sqrt{35}xz(x-z)(x+z)}{2}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{M}_{4,1}^{(1,-1;a)}(T_u, 1)$	$-\frac{\sqrt{21}}{672} \quad 0 \quad \frac{\sqrt{210}}{672} \quad 0 \quad -\frac{\sqrt{105}}{672} \quad 0 \quad 0 \quad -\frac{3\sqrt{14}}{112} \quad 0 \quad \frac{\sqrt{70}}{56} \quad 0 \quad -\frac{\sqrt{42}}{112} \quad 0 \quad 0 \quad 0$	
	$0 \quad \frac{\sqrt{35}}{224} \quad 0 \quad -\frac{\sqrt{70}}{224} \quad 0 \quad \frac{\sqrt{7}}{224} \quad -\frac{\sqrt{6}}{48} \quad 0 \quad \frac{\sqrt{14}}{28} \quad 0 \quad -\frac{\sqrt{210}}{336} \quad 0 \quad -\frac{\sqrt{42}}{168} \quad 0 \quad 0$	
	$\frac{\sqrt{7}}{224} \quad 0 \quad -\frac{\sqrt{70}}{224} \quad 0 \quad \frac{\sqrt{35}}{224} \quad 0 \quad 0 \quad \frac{\sqrt{42}}{168} \quad 0 \quad \frac{\sqrt{210}}{336} \quad 0 \quad -\frac{\sqrt{14}}{28} \quad 0 \quad 0 \quad \frac{\sqrt{6}}{48}$	
	$0 \quad -\frac{\sqrt{105}}{672} \quad 0 \quad \frac{\sqrt{210}}{672} \quad 0 \quad -\frac{\sqrt{21}}{672} \quad 0 \quad 0 \quad \frac{\sqrt{42}}{112} \quad 0 \quad -\frac{\sqrt{70}}{56} \quad 0 \quad \frac{3\sqrt{14}}{112} \quad 0 \quad 0$	
	$0 \quad -\frac{\sqrt{21}}{84} \quad 0 \quad \frac{\sqrt{42}}{168} \quad 0 \quad 0 \quad \frac{\sqrt{10}}{32} \quad 0 \quad -\frac{5\sqrt{210}}{336} \quad 0 \quad \frac{5\sqrt{14}}{224} \quad 0 \quad 0 \quad 0 \quad 0$	
	$-\frac{\sqrt{21}}{84} \quad 0 \quad \frac{\sqrt{210}}{168} \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{13\sqrt{14}}{224} \quad 0 \quad \frac{\sqrt{70}}{112} \quad 0 \quad \frac{\sqrt{42}}{96} \quad 0 \quad 0 \quad 0$	
	$0 \quad \frac{\sqrt{210}}{168} \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{42}}{168} \quad -\frac{3}{32} \quad 0 \quad \frac{\sqrt{21}}{672} \quad 0 \quad \frac{\sqrt{35}}{32} \quad 0 \quad -\frac{\sqrt{7}}{224} \quad 0 \quad 0$	
	$\frac{\sqrt{42}}{168} \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{210}}{168} \quad 0 \quad 0 \quad -\frac{\sqrt{7}}{224} \quad 0 \quad \frac{\sqrt{35}}{32} \quad 0 \quad \frac{\sqrt{21}}{672} \quad 0 \quad -\frac{3}{32} \quad 0$	
	$0 \quad 0 \quad 0 \quad -\frac{\sqrt{210}}{168} \quad 0 \quad \frac{\sqrt{21}}{84} \quad 0 \quad 0 \quad \frac{\sqrt{42}}{96} \quad 0 \quad \frac{\sqrt{70}}{112} \quad 0 \quad -\frac{13\sqrt{14}}{224} \quad 0 \quad 0$	
	$0 \quad 0 \quad -\frac{\sqrt{42}}{168} \quad 0 \quad \frac{\sqrt{21}}{84} \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{5\sqrt{14}}{224} \quad 0 \quad -\frac{5\sqrt{210}}{336} \quad 0 \quad 0 \quad \frac{\sqrt{10}}{32}$	
783	symmetry	$\frac{\sqrt{35}xy(x-y)(x+y)}{2}$
$\mathbb{M}_{4,2}^{(1,-1;a)}(T_u, 1)$	$0 \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{21}i}{84} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{14}i}{28} \quad 0$	
	$0 \quad 0 \quad -\frac{\sqrt{6}i}{12}$	
	$0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{6}i}{12} \quad 0 \quad 0$	
	$-\frac{\sqrt{21}i}{84} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{14}i}{28} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0$	
	$0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{21}i}{42} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{210}i}{84} \quad 0 \quad 0$	
	$0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{21}i}{42} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{14}i}{14} \quad 0$	
	$0 \quad 0 \quad \frac{i}{4}$	
	$0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{i}{4} \quad 0 \quad 0$	
	$-\frac{\sqrt{21}i}{42} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{14}i}{14} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0$	
784	symmetry	$\frac{\sqrt{5}yz(6x^2-y^2-z^2)}{2}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{M}_{4,0}^{(1,-1;a)}(T_u, 2)$	$\frac{\sqrt{3}i}{672} 0 \frac{\sqrt{30}i}{672} 0 -\frac{\sqrt{15}i}{96} 0 0 \frac{3\sqrt{2}i}{112} 0 \frac{\sqrt{10}i}{56} 0 -\frac{\sqrt{6}i}{16} 0 0$	
	$0 -\frac{\sqrt{5}i}{224} 0 -\frac{\sqrt{10}i}{224} 0 \frac{i}{32} \frac{\sqrt{42}i}{48} 0 -\frac{\sqrt{2}i}{28} 0 -\frac{\sqrt{30}i}{336} 0 -\frac{\sqrt{6}i}{24} 0$	
	$-\frac{i}{32} 0 \frac{\sqrt{10}i}{224} 0 \frac{\sqrt{5}i}{224} 0 0 -\frac{\sqrt{6}i}{24} 0 -\frac{\sqrt{30}i}{336} 0 -\frac{\sqrt{2}i}{28} 0 \frac{\sqrt{42}i}{48}$	
	$0 \frac{\sqrt{15}i}{96} 0 -\frac{\sqrt{30}i}{672} 0 -\frac{\sqrt{3}i}{672} 0 0 -\frac{\sqrt{6}i}{16} 0 \frac{\sqrt{10}i}{56} 0 \frac{3\sqrt{2}i}{112} 0$	
	$0 -\frac{\sqrt{3}i}{84} 0 \frac{\sqrt{6}i}{24} 0 0 -\frac{\sqrt{70}i}{224} 0 -\frac{5\sqrt{30}i}{336} 0 \frac{5\sqrt{2}i}{32} 0 0 0$	
	$\frac{\sqrt{3}i}{84} 0 \frac{\sqrt{30}i}{168} 0 0 0 0 \frac{13\sqrt{2}i}{224} 0 \frac{\sqrt{10}i}{112} 0 \frac{7\sqrt{6}i}{96} 0 0$	
	$0 -\frac{\sqrt{30}i}{168} 0 0 0 -\frac{\sqrt{6}i}{24} \frac{3\sqrt{7}i}{32} 0 -\frac{\sqrt{3}i}{672} 0 \frac{\sqrt{5}i}{32} 0 -\frac{i}{32} 0$	
	$-\frac{\sqrt{6}i}{24} 0 0 0 -\frac{\sqrt{30}i}{168} 0 0 \frac{i}{32} 0 -\frac{\sqrt{5}i}{32} 0 \frac{\sqrt{3}i}{672} 0 -\frac{3\sqrt{7}i}{32}$	
	$0 0 0 \frac{\sqrt{30}i}{168} 0 \frac{\sqrt{3}i}{84} 0 0 -\frac{7\sqrt{6}i}{96} 0 -\frac{\sqrt{10}i}{112} 0 -\frac{13\sqrt{2}i}{224} 0$	
	$0 0 \frac{\sqrt{6}i}{24} 0 -\frac{\sqrt{3}i}{84} 0 0 0 0 -\frac{5\sqrt{2}i}{32} 0 \frac{5\sqrt{30}i}{336} 0 0 \frac{\sqrt{70}i}{224}$	
785	symmetry	$-\frac{\sqrt{5}xz(x^2-6y^2+z^2)}{2}$
$\mathbb{M}_{4,1}^{(1,-1;a)}(T_u, 2)$	$\frac{\sqrt{3}}{672} 0 -\frac{\sqrt{30}}{672} 0 -\frac{\sqrt{15}}{96} 0 0 \frac{3\sqrt{2}}{112} 0 -\frac{\sqrt{10}}{56} 0 -\frac{\sqrt{6}}{16} 0 0$	
	$0 -\frac{\sqrt{5}}{224} 0 \frac{\sqrt{10}}{224} 0 \frac{1}{32} -\frac{\sqrt{42}}{48} 0 -\frac{\sqrt{2}}{28} 0 \frac{\sqrt{30}}{336} 0 -\frac{\sqrt{6}}{24} 0$	
	$\frac{1}{32} 0 \frac{\sqrt{10}}{224} 0 -\frac{\sqrt{5}}{224} 0 0 \frac{\sqrt{6}}{24} 0 -\frac{\sqrt{30}}{336} 0 \frac{\sqrt{2}}{28} 0 \frac{\sqrt{42}}{48}$	
	$0 -\frac{\sqrt{15}}{96} 0 -\frac{\sqrt{30}}{672} 0 \frac{\sqrt{3}}{672} 0 0 \frac{\sqrt{6}}{16} 0 \frac{\sqrt{10}}{56} 0 -\frac{3\sqrt{2}}{112} 0$	
	$0 \frac{\sqrt{3}}{84} 0 \frac{\sqrt{6}}{24} 0 0 -\frac{\sqrt{70}}{224} 0 \frac{5\sqrt{30}}{336} 0 \frac{5\sqrt{2}}{32} 0 0 0$	
	$\frac{\sqrt{3}}{84} 0 -\frac{\sqrt{30}}{168} 0 0 0 0 \frac{13\sqrt{2}}{224} 0 -\frac{\sqrt{10}}{112} 0 \frac{7\sqrt{6}}{96} 0 0$	
	$0 -\frac{\sqrt{30}}{168} 0 0 0 -\frac{\sqrt{6}}{24} -\frac{3\sqrt{7}}{32} 0 -\frac{\sqrt{3}}{672} 0 -\frac{\sqrt{5}}{32} 0 -\frac{1}{32} 0$	
	$\frac{\sqrt{6}}{24} 0 0 0 \frac{\sqrt{30}}{168} 0 0 -\frac{1}{32} 0 -\frac{\sqrt{5}}{32} 0 -\frac{\sqrt{3}}{672} 0 -\frac{3\sqrt{7}}{32}$	
	$0 0 0 \frac{\sqrt{30}}{168} 0 -\frac{\sqrt{3}}{84} 0 0 \frac{7\sqrt{6}}{96} 0 -\frac{\sqrt{10}}{112} 0 \frac{13\sqrt{2}}{224} 0$	
	$0 0 -\frac{\sqrt{6}}{24} 0 -\frac{\sqrt{3}}{84} 0 0 0 0 \frac{5\sqrt{2}}{32} 0 \frac{5\sqrt{30}}{336} 0 0 -\frac{\sqrt{70}}{224}$	
786	symmetry	$-\frac{\sqrt{5}xy(x^2+y^2-6z^2)}{2}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{M}_{4,2}^{(1,-1;a)}(T_u, 2)$	$\begin{bmatrix} 0 & 0 & 0 & -\frac{\sqrt{30}i}{168} & 0 & 0 & \frac{\sqrt{14}i}{56} & 0 & 0 & 0 & -\frac{3\sqrt{10}i}{56} & 0 & 0 & 0 \\ -\frac{i}{56} & 0 & 0 & 0 & \frac{\sqrt{5}i}{56} & 0 & 0 & -\frac{11\sqrt{6}i}{168} & 0 & 0 & 0 & -\frac{\sqrt{2}i}{56} & 0 & 0 & 0 \\ 0 & \frac{\sqrt{5}i}{56} & 0 & 0 & 0 & -\frac{i}{56} & 0 & 0 & \frac{\sqrt{2}i}{56} & 0 & 0 & 0 & \frac{11\sqrt{6}i}{168} & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{30}i}{168} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{10}i}{56} & 0 & 0 & 0 & -\frac{\sqrt{14}i}{56} & 0 \\ 0 & 0 & \frac{\sqrt{6}i}{28} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{5\sqrt{2}i}{28} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{30}i}{84} & 0 & 0 & \frac{3\sqrt{14}i}{56} & 0 & 0 & 0 & \frac{\sqrt{10}i}{56} & 0 & 0 & 0 & 0 \\ -\frac{\sqrt{6}i}{28} & 0 & 0 & 0 & -\frac{\sqrt{30}i}{84} & 0 & 0 & -\frac{9i}{56} & 0 & 0 & 0 & -\frac{17\sqrt{3}i}{168} & 0 & 0 & 0 \\ 0 & \frac{\sqrt{30}i}{84} & 0 & 0 & 0 & \frac{\sqrt{6}i}{28} & 0 & 0 & -\frac{17\sqrt{3}i}{168} & 0 & 0 & 0 & -\frac{9i}{56} & 0 & 0 \\ 0 & 0 & \frac{\sqrt{30}i}{84} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}i}{56} & 0 & 0 & 0 & \frac{3\sqrt{14}i}{56} & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{6}i}{28} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{5\sqrt{2}i}{28} & 0 & 0 & 0 & 0 \end{bmatrix}$	
	787	symmetry
$\mathbb{M}_6^{(1,-1;a)}(A_u, 1)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{33}}{264} & 0 & 0 & 0 & -\frac{7\sqrt{11}}{88} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{55}}{88} & 0 & 0 & 0 & \frac{7\sqrt{165}}{264} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{5\sqrt{66}}{264} & 0 & 0 & 0 & -\frac{\sqrt{2310}}{264} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2310}}{264} & 0 & 0 & 0 & -\frac{5\sqrt{66}}{264} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{7\sqrt{165}}{264} & 0 & 0 & 0 & \frac{\sqrt{55}}{88} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{7\sqrt{11}}{88} & 0 & 0 & 0 & -\frac{\sqrt{33}}{264} & 0 & 0 \end{bmatrix}$	
	788	symmetry

continued ...

Table 9

No.	multipole	matrix
	$\mathbb{M}_6^{(1,-1;a)}(A_u, 2)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}}{24} & 0 & 0 & 0 & 0 & \frac{\sqrt{5}}{8} \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{1}{24} & 0 & 0 & 0 & \frac{\sqrt{35}}{24} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{14}}{24} & 0 & 0 & 0 & -\frac{\sqrt{42}}{24} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{42}}{24} & 0 & 0 & 0 & \frac{\sqrt{14}}{24} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{35}}{24} & 0 & 0 & 0 & 0 & -\frac{1}{24} \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}}{8} & 0 & 0 & 0 & \frac{\sqrt{7}}{24} & 0 & 0 & 0 & 0 \end{bmatrix}$
789	symmetry	$-\frac{\sqrt{14}(x^6 - 15x^4z^2 + 15x^2z^4 + y^6 - 15y^4z^2 + 15y^2z^4 - 2z^6)}{8}$
	$\mathbb{M}_{6,0}^{(1,-1;a)}(E_u)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{231}}{264} & 0 & 0 & 0 & \frac{\sqrt{77}}{88} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{385}}{88} & 0 & 0 & 0 & -\frac{\sqrt{1155}}{264} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{5\sqrt{462}}{264} & 0 & 0 & 0 & \frac{\sqrt{330}}{264} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{330}}{264} & 0 & 0 & 0 & -\frac{5\sqrt{462}}{264} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{1155}}{264} & 0 & 0 & 0 & \frac{\sqrt{385}}{88} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{77}}{88} & 0 & 0 & 0 & -\frac{\sqrt{231}}{264} & 0 & 0 \end{bmatrix}$
790	symmetry	$\frac{\sqrt{42}(x-y)(x+y)(x^4 - 9x^2y^2 - 5x^2z^2 + y^4 - 5y^2z^2 + 5z^4)}{8}$

continued ...

Table 9

No.	multipole	matrix
	$\mathbb{M}_{6,1}^{(1,-1;a)}(E_u)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{385}}{264} & 0 & 0 & 0 & \frac{\sqrt{11}}{8} \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{55}}{264} & 0 & 0 & 0 & -\frac{5\sqrt{77}}{264} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{770}}{264} & 0 & 0 & 0 & \frac{\sqrt{2310}}{264} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2310}}{264} & 0 & 0 & 0 & -\frac{\sqrt{770}}{264} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{5\sqrt{77}}{264} & 0 & 0 & 0 & \frac{\sqrt{55}}{264} \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{11}}{8} & 0 & 0 & 0 & -\frac{\sqrt{385}}{264} & 0 & 0 & 0 \end{bmatrix}$
791	symmetry	$\frac{3\sqrt{7}yz(y-z)(y+z)(10x^2-y^2-z^2)}{4}$
	$\mathbb{M}_{6,0}^{(1,-1;a)}(T_u, 1)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{66i}}{1056} & 0 & -\frac{\sqrt{154i}}{352} & 0 & \frac{\sqrt{2310i}}{352} & 0 & \frac{\sqrt{462i}}{96} \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2310i}}{1056} & 0 & \frac{5\sqrt{462i}}{1056} & 0 & -\frac{3\sqrt{770i}}{352} & 0 & -\frac{\sqrt{330i}}{96} \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{165i}}{176} & 0 & -\frac{\sqrt{385i}}{176} & 0 & -\frac{5\sqrt{231i}}{528} & 0 & \frac{\sqrt{1155i}}{176} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{1155i}}{176} & 0 & \frac{5\sqrt{231i}}{528} & 0 & \frac{\sqrt{385i}}{176} & 0 & -\frac{\sqrt{165i}}{176} \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{330i}}{96} & 0 & \frac{3\sqrt{770i}}{352} & 0 & -\frac{5\sqrt{462i}}{1056} & 0 & -\frac{\sqrt{2310i}}{1056} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{462i}}{96} & 0 & -\frac{\sqrt{2310i}}{352} & 0 & \frac{\sqrt{154i}}{352} & 0 & \frac{\sqrt{66i}}{1056} \end{bmatrix}$
792	symmetry	$\frac{3\sqrt{7}xz(x-z)(x+z)(x^2-10y^2+z^2)}{4}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{M}_{6,1}^{(1,-1;a)}(T_u, 1)$	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{66}}{1056} & 0 & -\frac{\sqrt{154}}{352} & 0 & -\frac{\sqrt{2310}}{352} & 0 & \frac{\sqrt{462}}{96} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2310}}{1056} & 0 & \frac{5\sqrt{462}}{1056} & 0 & \frac{3\sqrt{770}}{352} & 0 & -\frac{\sqrt{330}}{96} \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{165}}{176} & 0 & \frac{\sqrt{385}}{176} & 0 & -\frac{5\sqrt{231}}{528} & 0 & -\frac{\sqrt{1155}}{176} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{1155}}{176} & 0 & -\frac{5\sqrt{231}}{528} & 0 & \frac{\sqrt{385}}{176} & 0 & \frac{\sqrt{165}}{176} \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{330}}{96} & 0 & \frac{3\sqrt{770}}{352} & 0 & \frac{5\sqrt{462}}{1056} & 0 & -\frac{\sqrt{2310}}{1056} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{462}}{96} & 0 & -\frac{\sqrt{2310}}{352} & 0 & -\frac{\sqrt{154}}{352} & 0 & \frac{\sqrt{66}}{1056} \end{bmatrix}$
	793 symmetry	$-\frac{3\sqrt{7}xy(x-y)(x+y)(x^2+y^2-10z^2)}{4}$
$\mathbb{M}_{6,2}^{(1,-1;a)}(T_u, 1)$	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{154}i}{44} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2310}i}{132} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{165}i}{66} & \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{165}i}{66} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2310}i}{132} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{154}i}{44} & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
	794 symmetry	$\frac{\sqrt{462}yz(y^2-3z^2)(3y^2-z^2)}{16}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{M}_{6,0}^{(1,-1;a)}(T_u, 2)$	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{i}{64} & 0 & 0 & -\frac{\sqrt{21}i}{64} & 0 & -\frac{\sqrt{35}i}{64} & 0 & -\frac{\sqrt{7}i}{64} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{35}i}{64} & 0 & \frac{5\sqrt{7}i}{64} & 0 & \frac{\sqrt{105}i}{64} & 0 & \frac{\sqrt{5}i}{64} \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}i}{64} & 0 & -\frac{\sqrt{210}i}{64} & 0 & -\frac{5\sqrt{14}i}{64} & 0 & -\frac{\sqrt{70}i}{64} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{70}i}{64} & 0 & \frac{5\sqrt{14}i}{64} & 0 & \frac{\sqrt{210}i}{64} & 0 & \frac{\sqrt{10}i}{64} \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{64} & 0 & -\frac{\sqrt{105}i}{64} & 0 & -\frac{5\sqrt{7}i}{64} & 0 & -\frac{\sqrt{35}i}{64} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}i}{64} & 0 & \frac{\sqrt{35}i}{64} & 0 & \frac{\sqrt{21}i}{64} & 0 & \frac{i}{64} \end{bmatrix}$
	795 symmetry	$\frac{\sqrt{462}xz(x^2-3z^2)(3x^2-z^2)}{16}$
$\mathbb{M}_{6,1}^{(1,-1;a)}(T_u, 2)$	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{1}{64} & 0 & 0 & \frac{\sqrt{21}}{64} & 0 & -\frac{\sqrt{35}}{64} & 0 & \frac{\sqrt{7}}{64} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{35}}{64} & 0 & -\frac{5\sqrt{7}}{64} & 0 & \frac{\sqrt{105}}{64} & 0 & -\frac{\sqrt{5}}{64} \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}}{64} & 0 & -\frac{\sqrt{210}}{64} & 0 & \frac{5\sqrt{14}}{64} & 0 & -\frac{\sqrt{70}}{64} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}}{64} & 0 & \frac{5\sqrt{14}}{64} & 0 & -\frac{\sqrt{210}}{64} & 0 & \frac{\sqrt{10}}{64} \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}}{64} & 0 & \frac{\sqrt{105}}{64} & 0 & -\frac{5\sqrt{7}}{64} & 0 & \frac{\sqrt{35}}{64} \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}}{64} & 0 & -\frac{\sqrt{35}}{64} & 0 & \frac{\sqrt{21}}{64} & 0 & -\frac{1}{64} \end{bmatrix}$
	796 symmetry	$\frac{\sqrt{462}xy(x^2-3y^2)(3x^2-y^2)}{16}$

continued ...

Table 9

No.	multipole	matrix
	$\mathbb{M}_{6,2}^{(1,-1;a)}(T_u, 2)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{i}{2} \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
797	symmetry	$\frac{\sqrt{210}yz(16x^4 - 16x^2y^2 - 16x^2z^2 + y^4 + 2y^2z^2 + z^4)}{16}$ $\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{55}i}{2112} & 0 & -\frac{\sqrt{1155}i}{2112} & 0 & \frac{9\sqrt{77}i}{704} & 0 & -\frac{\sqrt{385}i}{64} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{5\sqrt{77}i}{2112} & 0 & \frac{5\sqrt{385}i}{2112} & 0 & -\frac{9\sqrt{231}i}{704} & 0 & \frac{5\sqrt{11}i}{64} \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{9\sqrt{22}i}{704} & 0 & -\frac{5\sqrt{462}i}{2112} & 0 & -\frac{5\sqrt{770}i}{2112} & 0 & \frac{9\sqrt{154}i}{704} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{9\sqrt{154}i}{704} & 0 & \frac{5\sqrt{770}i}{2112} & 0 & \frac{5\sqrt{462}i}{2112} & 0 & -\frac{9\sqrt{22}i}{704} \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{5\sqrt{11}i}{64} & 0 & \frac{9\sqrt{231}i}{704} & 0 & -\frac{5\sqrt{385}i}{2112} & 0 & -\frac{5\sqrt{77}i}{2112} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{385}i}{64} & 0 & -\frac{9\sqrt{77}i}{704} & 0 & \frac{\sqrt{1155}i}{2112} & 0 & \frac{\sqrt{55}i}{2112} & 0 \end{bmatrix}$
798	symmetry	$\frac{\sqrt{210}xz(x^4 - 16x^2y^2 + 2x^2z^2 + 16y^4 - 16y^2z^2 + z^4)}{16}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{M}_{6,1}^{(1,-1;a)}(T_u, 3)$	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{55}}{2112} & 0 & \frac{\sqrt{1155}}{2112} & 0 & \frac{9\sqrt{77}}{704} & 0 & \frac{\sqrt{385}}{64} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{5\sqrt{77}}{2112} & 0 & -\frac{5\sqrt{385}}{2112} & 0 & -\frac{9\sqrt{231}}{704} & 0 & -\frac{5\sqrt{11}}{64} \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{9\sqrt{22}}{704} & 0 & -\frac{5\sqrt{462}}{2112} & 0 & \frac{5\sqrt{770}}{2112} & 0 & \frac{9\sqrt{154}}{704} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{9\sqrt{154}}{704} & 0 & \frac{5\sqrt{770}}{2112} & 0 & -\frac{5\sqrt{462}}{2112} & 0 & -\frac{9\sqrt{22}}{704} \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{5\sqrt{11}}{64} & 0 & -\frac{9\sqrt{231}}{704} & 0 & -\frac{5\sqrt{385}}{2112} & 0 & \frac{5\sqrt{77}}{2112} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{385}}{64} & 0 & \frac{9\sqrt{77}}{704} & 0 & \frac{\sqrt{1155}}{2112} & 0 & -\frac{\sqrt{55}}{2112} \end{bmatrix}$
	799 symmetry	$\frac{\sqrt{210}xy(x^4+2x^2y^2-16x^2z^2+y^4-16y^2z^2+16z^4)}{16}$
$\mathbb{M}_{6,2}^{(1,-1;a)}(T_u, 3)$	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{77}i}{66} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{11}i}{66} & 0 & 0 & 0 & \frac{\sqrt{385}i}{66} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{154}i}{66} & 0 & 0 & 0 & 0 & -\frac{\sqrt{462}i}{66} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{462}i}{66} & 0 & 0 & 0 & 0 & \frac{\sqrt{154}i}{66} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{385}i}{66} & 0 & 0 & 0 & 0 & -\frac{\sqrt{11}i}{66} \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{77}i}{66} & 0 & 0 & 0 & 0 \end{bmatrix}$
	800 symmetry	$-\frac{x^2}{2} - \frac{y^2}{2} + z^2$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{M}_{2,0}^{(1,0;a)}(E_u)$	0	$-\frac{\sqrt{15}}{35}$ 0 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 0 0 $\frac{\sqrt{10}}{70}$ 0 0 0 0 0 $\frac{3\sqrt{30}}{70}$ 0 0 0 0 0
	0	0 0 0 0 $\frac{\sqrt{15}}{35}$ 0 0 0 0 0 0 $\frac{\sqrt{6}}{14}$ 0 0 0
	$\frac{\sqrt{15}}{14}$	0 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	0 $-\frac{2\sqrt{15}}{35}$ 0 0 0 0 0 0 $\frac{\sqrt{5}}{70}$ 0 0 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 0 0 $-\frac{\sqrt{15}}{70}$ 0 0 0 0 0 0 $-\frac{\sqrt{6}}{28}$ 0 0 0
	0	0 0 0 0 0 $\frac{\sqrt{15}}{14}$ 0 0 0 0 0 0 $-\frac{\sqrt{10}}{28}$ 0
801	symmetry	$\frac{\sqrt{3}(x-y)(x+y)}{2}$
$\mathbb{M}_{2,1}^{(1,0;a)}(E_u)$	0	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 0 $-\frac{2\sqrt{15}}{105}$ 0 0 $\frac{3\sqrt{2}}{28}$ 0 0 0 0 $\frac{\sqrt{6}}{28}$ 0 0
	0	$\frac{2\sqrt{15}}{105}$ 0 0 0 0 $-\frac{\sqrt{3}}{21}$ 0 0 $\frac{\sqrt{6}}{28}$ 0 0 0 $\frac{3\sqrt{2}}{28}$ 0
	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 0 $\frac{3\sqrt{2}}{28}$ 0 0 0 0 0 0 $\frac{\sqrt{6}}{84}$ 0 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 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 0 $\frac{3\sqrt{2}}{28}$ 0 0 $-\frac{1}{14}$ 0 0 0 $\frac{\sqrt{3}}{21}$ 0
	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 0 $\frac{3\sqrt{2}}{28}$ 0 0 0 0 0 0 $-\frac{\sqrt{6}}{84}$ 0 0 0
802	symmetry	$\sqrt{3}yz$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{M}_{2,0}^{(1,0;a)}(T_u)$	$\frac{i}{14} \quad 0 \quad \frac{3\sqrt{10}i}{140} \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{6}i}{14} \quad 0 \quad -\frac{\sqrt{30}i}{70} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0$	
	$0 \quad -\frac{\sqrt{15}i}{210} \quad 0 \quad \frac{\sqrt{30}i}{84} \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{6}i}{14} \quad 0 \quad -\frac{3\sqrt{10}i}{70} \quad 0 \quad 0 \quad 0 \quad 0$	
	$0 \quad 0 \quad -\frac{\sqrt{30}i}{84} \quad 0 \quad \frac{\sqrt{15}i}{210} \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{3\sqrt{10}i}{70} \quad 0 \quad -\frac{\sqrt{6}i}{14} \quad 0 \quad 0 \quad 0$	
	$0 \quad 0 \quad 0 \quad -\frac{3\sqrt{10}i}{140} \quad 0 \quad -\frac{i}{14} \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{30}i}{70} \quad 0 \quad -\frac{\sqrt{6}i}{14} \quad 0 \quad 0$	
	$0 \quad -\frac{3i}{14} \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{210}i}{168} \quad 0 \quad -\frac{\sqrt{10}i}{56} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0$	
	$\frac{3i}{14} \quad 0 \quad -\frac{3\sqrt{10}i}{70} \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{6}i}{168} \quad 0 \quad -\frac{11\sqrt{30}i}{840} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0$	
	$0 \quad \frac{3\sqrt{10}i}{70} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{i}{28} \quad 0 \quad -\frac{\sqrt{15}i}{60} \quad 0 \quad 0 \quad 0 \quad 0$	
	$0 \quad 0 \quad 0 \quad 0 \quad \frac{3\sqrt{10}i}{70} \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{15}i}{60} \quad 0 \quad -\frac{i}{28} \quad 0 \quad 0 \quad 0$	
	$0 \quad 0 \quad 0 \quad -\frac{3\sqrt{10}i}{70} \quad 0 \quad \frac{3i}{14} \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{11\sqrt{30}i}{840} \quad 0 \quad \frac{\sqrt{6}i}{168} \quad 0 \quad 0$	
	$0 \quad 0 \quad 0 \quad 0 \quad -\frac{3i}{14} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{10}i}{56} \quad 0 \quad \frac{\sqrt{210}i}{168} \quad 0 \quad 0$	
803	symmetry	$\sqrt{3}xz$
$\mathbb{M}_{2,1}^{(1,0;a)}(T_u)$	$\frac{1}{14} \quad 0 \quad -\frac{3\sqrt{10}}{140} \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{6}}{14} \quad 0 \quad \frac{\sqrt{30}}{70} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0$	
	$0 \quad -\frac{\sqrt{15}}{210} \quad 0 \quad -\frac{\sqrt{30}}{84} \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{6}}{14} \quad 0 \quad \frac{3\sqrt{10}}{70} \quad 0 \quad 0 \quad 0 \quad 0$	
	$0 \quad 0 \quad -\frac{\sqrt{30}}{84} \quad 0 \quad -\frac{\sqrt{15}}{210} \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{3\sqrt{10}}{70} \quad 0 \quad \frac{\sqrt{6}}{14} \quad 0 \quad 0 \quad 0$	
	$0 \quad 0 \quad 0 \quad -\frac{3\sqrt{10}}{140} \quad 0 \quad \frac{1}{14} \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{30}}{70} \quad 0 \quad \frac{\sqrt{6}}{14} \quad 0 \quad 0$	
	$0 \quad \frac{3}{14} \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{210}}{168} \quad 0 \quad \frac{\sqrt{10}}{56} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0$	
	$\frac{3}{14} \quad 0 \quad \frac{3\sqrt{10}}{70} \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{6}}{168} \quad 0 \quad \frac{11\sqrt{30}}{840} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0$	
	$0 \quad \frac{3\sqrt{10}}{70} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{1}{28} \quad 0 \quad \frac{\sqrt{15}}{60} \quad 0 \quad 0 \quad 0 \quad 0$	
	$0 \quad 0 \quad 0 \quad 0 \quad -\frac{3\sqrt{10}}{70} \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{15}}{60} \quad 0 \quad \frac{1}{28} \quad 0 \quad 0 \quad 0$	
	$0 \quad 0 \quad 0 \quad -\frac{3\sqrt{10}}{70} \quad 0 \quad -\frac{3}{14} \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{11\sqrt{30}}{840} \quad 0 \quad -\frac{\sqrt{6}}{168} \quad 0 \quad 0$	
	$0 \quad 0 \quad 0 \quad 0 \quad -\frac{3}{14} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{10}}{56} \quad 0 \quad -\frac{\sqrt{210}}{168} \quad 0 \quad 0$	
804	symmetry	$\sqrt{3}xy$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{M}_{2,2}^{(1,0;a)}(T_u)$	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 $\frac{\sqrt{6}i}{21}$ 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 $\frac{\sqrt{30}i}{140}$ 0 0 0 $-\frac{\sqrt{42}i}{28}$	
	0 0 $-\frac{3\sqrt{2}i}{28}$ 0 0 0 0 0 $-\frac{\sqrt{6}i}{84}$ 0 0 0 0	
	0 0 0 $-\frac{9\sqrt{10}i}{140}$ 0 0 $-\frac{\sqrt{42}i}{84}$ 0 0 $-\frac{\sqrt{30}i}{105}$ 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 $-\frac{\sqrt{30}i}{105}$ 0 0 0 $-\frac{\sqrt{42}i}{84}$	
	0 0 0 $\frac{3\sqrt{2}i}{28}$ 0 0 0 0 0 $-\frac{\sqrt{6}i}{84}$ 0 0 0	
805	symmetry	$\frac{\sqrt{21}(x^4 - 3x^2y^2 - 3x^2z^2 + y^4 - 3y^2z^2 + z^4)}{6}$
$\mathbb{M}_4^{(1,0;a)}(A_u)$	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	
806	symmetry	$-\frac{\sqrt{15}(x^4 - 12x^2y^2 + 6x^2z^2 + y^4 + 6y^2z^2 - 2z^4)}{12}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{M}_{4,0}^{(1,0;a)}(E_u)$	0	$\begin{bmatrix} 0 & \frac{\sqrt{3}}{168} & 0 & 0 & 0 & -\frac{\sqrt{15}}{120} & 0 & 0 & -\frac{9\sqrt{30}}{280} & 0 & 0 & 0 & \frac{9\sqrt{10}}{200} & 0 \\ 0 & 0 & -\frac{\sqrt{2}}{56} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{6}}{56} & 0 & 0 & 0 & \frac{3\sqrt{210}}{200} \\ 0 & 0 & 0 & \frac{\sqrt{2}}{56} & 0 & 0 & \frac{3\sqrt{210}}{200} & 0 & 0 & 0 & \frac{3\sqrt{6}}{56} & 0 & 0 & 0 \\ \frac{\sqrt{15}}{120} & 0 & 0 & 0 & -\frac{\sqrt{3}}{168} & 0 & 0 & \frac{9\sqrt{10}}{200} & 0 & 0 & 0 & -\frac{9\sqrt{30}}{280} & 0 & 0 \\ -\frac{\sqrt{3}}{28} & 0 & 0 & 0 & \frac{\sqrt{15}}{20} & 0 & 0 & -\frac{\sqrt{2}}{56} & 0 & 0 & 0 & \frac{\sqrt{6}}{120} & 0 & 0 \\ 0 & \frac{3\sqrt{3}}{28} & 0 & 0 & 0 & \frac{\sqrt{15}}{20} & 0 & 0 & \frac{\sqrt{30}}{210} & 0 & 0 & 0 & \frac{\sqrt{10}}{100} & 0 \\ 0 & 0 & -\frac{\sqrt{3}}{14} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{1}{56} & 0 & 0 & 0 & \frac{\sqrt{35}}{200} \\ 0 & 0 & 0 & -\frac{\sqrt{3}}{14} & 0 & 0 & -\frac{\sqrt{35}}{200} & 0 & 0 & 0 & -\frac{1}{56} & 0 & 0 & 0 \\ \frac{\sqrt{15}}{20} & 0 & 0 & 0 & \frac{3\sqrt{3}}{28} & 0 & 0 & -\frac{\sqrt{10}}{100} & 0 & 0 & 0 & -\frac{\sqrt{30}}{210} & 0 & 0 \\ 0 & \frac{\sqrt{15}}{20} & 0 & 0 & 0 & -\frac{\sqrt{3}}{28} & 0 & 0 & -\frac{\sqrt{6}}{120} & 0 & 0 & 0 & \frac{\sqrt{2}}{56} & 0 \end{bmatrix}$
	807	symmetry
		$\frac{\sqrt{5}(x-y)(x+y)(x^2+y^2-6z^2)}{4}$
	$\mathbb{M}_{4,1}^{(1,0;a)}(E_u)$	$\begin{bmatrix} 0 & 0 & 0 & -\frac{\sqrt{2}}{56} & 0 & 0 & \frac{9\sqrt{210}}{1400} & 0 & 0 & 0 & \frac{27\sqrt{6}}{280} & 0 & 0 & 0 \\ \frac{\sqrt{15}}{280} & 0 & 0 & 0 & \frac{\sqrt{3}}{56} & 0 & 0 & -\frac{99\sqrt{10}}{1400} & 0 & 0 & 0 & \frac{9\sqrt{30}}{1400} & 0 & 0 \\ 0 & -\frac{\sqrt{3}}{56} & 0 & 0 & 0 & -\frac{\sqrt{15}}{280} & 0 & 0 & \frac{9\sqrt{30}}{1400} & 0 & 0 & 0 & -\frac{99\sqrt{10}}{1400} & 0 \\ 0 & 0 & \frac{\sqrt{2}}{56} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{27\sqrt{6}}{280} & 0 & 0 & 0 & \frac{9\sqrt{210}}{1400} \\ 0 & 0 & \frac{9\sqrt{10}}{140} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{140} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{3\sqrt{2}}{28} & 0 & 0 & -\frac{3\sqrt{210}}{1400} & 0 & 0 & 0 & \frac{\sqrt{6}}{280} & 0 & 0 & 0 \\ \frac{9\sqrt{10}}{140} & 0 & 0 & 0 & -\frac{3\sqrt{2}}{28} & 0 & 0 & \frac{9\sqrt{15}}{1400} & 0 & 0 & 0 & -\frac{17\sqrt{5}}{1400} & 0 & 0 \\ 0 & -\frac{3\sqrt{2}}{28} & 0 & 0 & 0 & \frac{9\sqrt{10}}{140} & 0 & 0 & \frac{17\sqrt{5}}{1400} & 0 & 0 & 0 & -\frac{9\sqrt{15}}{1400} & 0 \\ 0 & 0 & -\frac{3\sqrt{2}}{28} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}}{280} & 0 & 0 & 0 & \frac{3\sqrt{210}}{1400} \\ 0 & 0 & 0 & \frac{9\sqrt{10}}{140} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}}{140} & 0 & 0 & 0 \end{bmatrix}$
	808	symmetry
		$\frac{\sqrt{35}yz(y-z)(y+z)}{2}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{M}_{4,0}^{(1,0;a)}(T_u, 1)$	$\frac{\sqrt{35}i}{1120} 0 \frac{\sqrt{14}i}{224} 0 \frac{\sqrt{7}i}{224} 0 0 -\frac{27\sqrt{210}i}{2800} 0 -\frac{9\sqrt{42}i}{280} 0 -\frac{27\sqrt{70}i}{2800} 0 0$	
	$0 -\frac{\sqrt{21}i}{224} 0 -\frac{\sqrt{42}i}{224} 0 -\frac{\sqrt{105}i}{1120} \frac{9\sqrt{10}i}{400} 0 \frac{9\sqrt{210}i}{700} 0 \frac{9\sqrt{14}i}{560} 0 -\frac{9\sqrt{70}i}{1400} 0 -\frac{9\sqrt{70}i}{1400}$	
	$\frac{\sqrt{105}i}{1120} 0 \frac{\sqrt{42}i}{224} 0 \frac{\sqrt{21}i}{224} 0 0 -\frac{9\sqrt{70}i}{1400} 0 \frac{9\sqrt{14}i}{560} 0 \frac{9\sqrt{210}i}{700} 0 \frac{9\sqrt{10}i}{400}$	
	$0 -\frac{\sqrt{7}i}{224} 0 -\frac{\sqrt{14}i}{224} 0 -\frac{\sqrt{35}i}{1120} 0 0 -\frac{27\sqrt{70}i}{2800} 0 -\frac{9\sqrt{42}i}{280} 0 -\frac{27\sqrt{210}i}{2800} 0$	
	$0 -\frac{3\sqrt{35}i}{140} 0 -\frac{3\sqrt{70}i}{280} 0 0 -\frac{\sqrt{6}i}{160} 0 -\frac{\sqrt{14}i}{112} 0 -\frac{\sqrt{210}i}{1120} 0 0 0$	
	$\frac{3\sqrt{35}i}{140} 0 \frac{3\sqrt{14}i}{56} 0 0 0 0 \frac{13\sqrt{210}i}{5600} 0 \frac{\sqrt{42}i}{560} 0 -\frac{\sqrt{70}i}{800} 0$	
	$0 -\frac{3\sqrt{14}i}{56} 0 0 0 \frac{3\sqrt{70}i}{280} -\frac{3\sqrt{15}i}{800} 0 -\frac{\sqrt{35}i}{5600} 0 \frac{\sqrt{21}i}{160} 0 \frac{\sqrt{105}i}{5600} 0$	
	$\frac{3\sqrt{70}i}{280} 0 0 0 -\frac{3\sqrt{14}i}{56} 0 0 0 -\frac{\sqrt{105}i}{5600} 0 -\frac{\sqrt{21}i}{160} 0 \frac{\sqrt{35}i}{5600} 0 \frac{3\sqrt{15}i}{800}$	
	$0 0 0 \frac{3\sqrt{14}i}{56} 0 \frac{3\sqrt{35}i}{140} 0 0 0 \frac{\sqrt{70}i}{800} 0 -\frac{\sqrt{42}i}{560} 0 -\frac{13\sqrt{210}i}{5600} 0$	
	$0 0 -\frac{3\sqrt{70}i}{280} 0 -\frac{3\sqrt{35}i}{140} 0 0 0 0 \frac{\sqrt{210}i}{1120} 0 \frac{\sqrt{14}i}{112} 0 \frac{\sqrt{6}i}{160}$	
809	symmetry	$-\frac{\sqrt{35}xz(x-z)(x+z)}{2}$
$\mathbb{M}_{4,1}^{(1,0;a)}(T_u, 1)$	$-\frac{\sqrt{35}}{1120} 0 \frac{\sqrt{14}}{224} 0 -\frac{\sqrt{7}}{224} 0 0 \frac{27\sqrt{210}}{2800} 0 -\frac{9\sqrt{42}}{280} 0 \frac{27\sqrt{70}}{2800} 0 0$	
	$0 \frac{\sqrt{21}}{224} 0 -\frac{\sqrt{42}}{224} 0 \frac{\sqrt{105}}{1120} \frac{9\sqrt{10}}{400} 0 -\frac{9\sqrt{210}}{700} 0 \frac{9\sqrt{14}}{560} 0 \frac{9\sqrt{70}}{1400} 0$	
	$\frac{\sqrt{105}}{1120} 0 -\frac{\sqrt{42}}{224} 0 \frac{\sqrt{21}}{224} 0 0 -\frac{9\sqrt{70}}{1400} 0 -\frac{9\sqrt{14}}{560} 0 \frac{9\sqrt{210}}{700} 0 -\frac{9\sqrt{10}}{400}$	
	$0 -\frac{\sqrt{7}}{224} 0 \frac{\sqrt{14}}{224} 0 -\frac{\sqrt{35}}{1120} 0 0 -\frac{27\sqrt{70}}{2800} 0 \frac{9\sqrt{42}}{280} 0 -\frac{27\sqrt{210}}{2800} 0$	
	$0 -\frac{3\sqrt{35}}{140} 0 \frac{3\sqrt{70}}{280} 0 0 \frac{\sqrt{6}}{160} 0 -\frac{\sqrt{14}}{112} 0 \frac{\sqrt{210}}{1120} 0 0 0$	
	$-\frac{3\sqrt{35}}{140} 0 \frac{3\sqrt{14}}{56} 0 0 0 0 -\frac{13\sqrt{210}}{5600} 0 \frac{\sqrt{42}}{560} 0 \frac{\sqrt{70}}{800} 0 0 0$	
	$0 \frac{3\sqrt{14}}{56} 0 0 0 -\frac{3\sqrt{70}}{280} -\frac{3\sqrt{15}}{800} 0 \frac{\sqrt{35}}{5600} 0 \frac{\sqrt{21}}{160} 0 \frac{\sqrt{105}}{5600} 0$	
	$\frac{3\sqrt{70}}{280} 0 0 0 -\frac{3\sqrt{14}}{56} 0 \frac{3\sqrt{35}}{140} 0 0 0 -\frac{\sqrt{105}}{5600} 0 \frac{\sqrt{21}}{160} 0 \frac{\sqrt{35}}{5600} 0 -\frac{3\sqrt{15}}{800}$	
	$0 0 0 -\frac{3\sqrt{14}}{56} 0 \frac{3\sqrt{35}}{140} 0 0 0 \frac{\sqrt{70}}{800} 0 \frac{\sqrt{42}}{560} 0 -\frac{13\sqrt{210}}{5600} 0$	
	$0 0 -\frac{3\sqrt{70}}{280} 0 \frac{3\sqrt{35}}{140} 0 0 0 0 \frac{\sqrt{210}}{1120} 0 -\frac{\sqrt{14}}{112} 0 \frac{\sqrt{6}}{160}$	
810	symmetry	$\frac{\sqrt{35}xy(x-y)(x+y)}{2}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{M}_{4,2}^{(1,0;a)}(T_u, 1)$	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 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	
	$-\frac{\sqrt{35}i}{140}$ 0 0 0 0 0 0 $-\frac{9\sqrt{210}i}{700}$ 0 0 0 0 0 0	
	0 0 0 0 $\frac{3\sqrt{35}i}{70}$ 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 $\frac{\sqrt{210}i}{350}$ 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 0	
811	symmetry	$\frac{\sqrt{5}yz(6x^2-y^2-z^2)}{2}$
$\mathbb{M}_{4,0}^{(1,0;a)}(T_u, 2)$	$\frac{\sqrt{5}i}{1120}$ 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 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 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 $\frac{\sqrt{42}i}{1120}$	
812	symmetry	$-\frac{\sqrt{5}xz(x^2-6y^2+z^2)}{2}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{M}_{4,1}^{(1,0;a)}(T_u, 2)$	$\frac{\sqrt{5}}{1120} \begin{pmatrix} 0 & -\frac{\sqrt{2}}{224} & 0 & -\frac{1}{32} & 0 & 0 & 0 & -\frac{27\sqrt{30}}{2800} & 0 & \frac{9\sqrt{6}}{280} & 0 & \frac{27\sqrt{10}}{400} & 0 & 0 \\ 0 & -\frac{\sqrt{3}}{224} & 0 & \frac{\sqrt{6}}{224} & 0 & \frac{\sqrt{15}}{160} & \frac{9\sqrt{70}}{400} & 0 & \frac{9\sqrt{30}}{700} & 0 & -\frac{9\sqrt{2}}{560} & 0 & \frac{9\sqrt{10}}{200} & 0 & 0 \\ \frac{\sqrt{15}}{160} & 0 & \frac{\sqrt{6}}{224} & 0 & -\frac{\sqrt{3}}{224} & 0 & 0 & -\frac{9\sqrt{10}}{200} & 0 & \frac{9\sqrt{2}}{560} & 0 & -\frac{9\sqrt{30}}{700} & 0 & -\frac{9\sqrt{70}}{400} \\ 0 & -\frac{1}{32} & 0 & -\frac{\sqrt{2}}{224} & 0 & \frac{\sqrt{5}}{1120} & 0 & 0 & -\frac{27\sqrt{10}}{400} & 0 & -\frac{9\sqrt{6}}{280} & 0 & \frac{27\sqrt{30}}{2800} & 0 & 0 \\ 0 & \frac{3\sqrt{5}}{140} & 0 & \frac{3\sqrt{10}}{40} & 0 & 0 & -\frac{\sqrt{42}}{1120} & 0 & \frac{\sqrt{2}}{112} & 0 & \frac{\sqrt{30}}{160} & 0 & 0 & 0 & 0 \\ \frac{3\sqrt{5}}{140} & 0 & -\frac{3\sqrt{2}}{56} & 0 & 0 & 0 & 0 & \frac{13\sqrt{30}}{5600} & 0 & -\frac{\sqrt{6}}{560} & 0 & \frac{7\sqrt{10}}{800} & 0 & 0 & 0 \\ 0 & -\frac{3\sqrt{2}}{56} & 0 & 0 & 0 & -\frac{3\sqrt{10}}{40} & -\frac{3\sqrt{105}}{800} & 0 & -\frac{\sqrt{5}}{5600} & 0 & -\frac{\sqrt{3}}{160} & 0 & -\frac{\sqrt{15}}{800} & 0 & 0 \\ \frac{3\sqrt{10}}{40} & 0 & 0 & 0 & \frac{3\sqrt{2}}{56} & 0 & 0 & -\frac{\sqrt{15}}{800} & 0 & -\frac{\sqrt{3}}{160} & 0 & -\frac{\sqrt{5}}{5600} & 0 & -\frac{3\sqrt{105}}{800} \\ 0 & 0 & 0 & \frac{3\sqrt{2}}{56} & 0 & -\frac{3\sqrt{5}}{140} & 0 & 0 & \frac{7\sqrt{10}}{800} & 0 & -\frac{\sqrt{6}}{560} & 0 & \frac{13\sqrt{30}}{5600} & 0 & 0 \\ 0 & 0 & -\frac{3\sqrt{10}}{40} & 0 & -\frac{3\sqrt{5}}{140} & 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{160} & 0 & \frac{\sqrt{2}}{112} & 0 & -\frac{\sqrt{42}}{1120} & 0 & 0 \end{pmatrix}$	
	$-\frac{\sqrt{5}xy(x^2+y^2-6z^2)}{2}$	
		$\frac{0}{0} \begin{pmatrix} 0 & 0 & 0 & -\frac{\sqrt{2}i}{56} & 0 & 0 & -\frac{9\sqrt{210}i}{1400} & 0 & 0 & 0 & \frac{27\sqrt{6}i}{280} & 0 & 0 & 0 \\ -\frac{\sqrt{15}i}{280} & 0 & 0 & 0 & \frac{\sqrt{3}i}{56} & 0 & 0 & \frac{99\sqrt{10}i}{1400} & 0 & 0 & 0 & \frac{9\sqrt{30}i}{1400} & 0 & 0 & 0 \\ 0 & \frac{\sqrt{3}i}{56} & 0 & 0 & 0 & -\frac{\sqrt{15}i}{280} & 0 & 0 & -\frac{9\sqrt{30}i}{1400} & 0 & 0 & 0 & -\frac{99\sqrt{10}i}{1400} & 0 & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{2}i}{56} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{27\sqrt{6}i}{280} & 0 & 0 & 0 & \frac{9\sqrt{210}i}{1400} & 0 & 0 & 0 \\ 0 & 0 & \frac{9\sqrt{10}i}{140} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}i}{140} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{3\sqrt{2}i}{28} & 0 & 0 & \frac{3\sqrt{210}i}{1400} & 0 & 0 & 0 & \frac{\sqrt{6}i}{280} & 0 & 0 & 0 & 0 & 0 & 0 \\ -\frac{9\sqrt{10}i}{140} & 0 & 0 & 0 & -\frac{3\sqrt{2}i}{28} & 0 & 0 & -\frac{9\sqrt{15}i}{1400} & 0 & 0 & 0 & -\frac{17\sqrt{5}i}{1400} & 0 & 0 & 0 \\ 0 & \frac{3\sqrt{2}i}{28} & 0 & 0 & 0 & \frac{9\sqrt{10}i}{140} & 0 & 0 & -\frac{17\sqrt{5}i}{1400} & 0 & 0 & 0 & -\frac{9\sqrt{15}i}{1400} & 0 & 0 & 0 \\ 0 & 0 & \frac{3\sqrt{2}i}{28} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}i}{280} & 0 & 0 & 0 & 0 & \frac{3\sqrt{210}i}{1400} & 0 & 0 \\ 0 & 0 & 0 & -\frac{9\sqrt{10}i}{140} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}i}{140} & 0 & 0 & 0 & 0 & 0 & 0 \end{pmatrix}$
813	symmetry	
814	symmetry	1

continued ...

Table 9

No.	multipole	matrix
	$\mathbb{M}_0^{(1,1;a)}(A_u)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ -\frac{\sqrt{3}}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{3}}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{3}}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{3}}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
815	symmetry	$-\frac{x^2}{2} - \frac{y^2}{2} + z^2$
	$\mathbb{M}_{2,0}^{(1,1;a)}(E_u)$	$\begin{bmatrix} 0 & \frac{12}{35} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{10}}{140} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & \frac{2\sqrt{6}}{35} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{9\sqrt{2}}{140} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{2\sqrt{6}}{35} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{9\sqrt{2}}{140} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{12}{35} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{10}}{140} & 0 & 0 \\ \frac{3}{14} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}}{21} & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{3}{70} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}}{35} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{6}{35} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{2\sqrt{3}}{105} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{6}{35} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{2\sqrt{3}}{105} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{3}{70} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}}{35} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{3}{14} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{21} & 0 \end{bmatrix}$
816	symmetry	$\frac{\sqrt{3}(x-y)(x+y)}{2}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{M}_{2,1}^{(1,1;a)}(E_u)$	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	
	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	
	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 0 $\frac{9\sqrt{6}}{140}$ 0 0 $\frac{\sqrt{70}}{105}$ 0 0 0 $-\frac{4\sqrt{2}}{105}$ 0 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	
	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 0	
817	symmetry	$\sqrt{3}yz$
$\mathbb{M}_{2,0}^{(1,1;a)}(T_u)$	$-\frac{2\sqrt{15}i}{35}$ 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 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 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 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 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 $-\frac{\sqrt{14}i}{42}$	
818	symmetry	$\sqrt{3}xz$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{M}_{2,1}^{(1,1;a)}(T_u)$	$\sqrt{3}xy$	$\begin{bmatrix} -\frac{2\sqrt{15}}{35} & 0 & \frac{3\sqrt{6}}{35} & 0 & 0 & 0 & 0 & \frac{3\sqrt{10}}{140} & 0 & -\frac{3\sqrt{2}}{140} & 0 & 0 & 0 & 0 \\ 0 & \frac{2}{35} & 0 & \frac{\sqrt{2}}{7} & 0 & 0 & 0 & 0 & \frac{3\sqrt{10}}{140} & 0 & -\frac{3\sqrt{6}}{140} & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{2}}{7} & 0 & \frac{2}{35} & 0 & 0 & 0 & 0 & \frac{3\sqrt{6}}{140} & 0 & -\frac{3\sqrt{10}}{140} & 0 & 0 \\ 0 & 0 & 0 & \frac{3\sqrt{6}}{35} & 0 & -\frac{2\sqrt{15}}{35} & 0 & 0 & 0 & 0 & \frac{3\sqrt{2}}{140} & 0 & -\frac{3\sqrt{10}}{140} & 0 \\ 0 & \frac{3\sqrt{15}}{70} & 0 & 0 & 0 & 0 & \frac{\sqrt{14}}{42} & 0 & -\frac{\sqrt{6}}{42} & 0 & 0 & 0 & 0 & 0 \\ \frac{3\sqrt{15}}{70} & 0 & \frac{3\sqrt{6}}{70} & 0 & 0 & 0 & 0 & \frac{\sqrt{10}}{210} & 0 & -\frac{11\sqrt{2}}{210} & 0 & 0 & 0 & 0 \\ 0 & \frac{3\sqrt{6}}{70} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{105} & 0 & -\frac{1}{15} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{3\sqrt{6}}{70} & 0 & 0 & 0 & 0 & -\frac{1}{15} & 0 & -\frac{\sqrt{15}}{105} & 0 & 0 \\ 0 & 0 & 0 & -\frac{3\sqrt{6}}{70} & 0 & -\frac{3\sqrt{15}}{70} & 0 & 0 & 0 & 0 & -\frac{11\sqrt{2}}{210} & 0 & \frac{\sqrt{10}}{210} & 0 \\ 0 & 0 & 0 & 0 & -\frac{3\sqrt{15}}{70} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}}{42} & 0 & \frac{\sqrt{14}}{42} \end{bmatrix}$
819	symmetry	$\sqrt{3}xy$
$\mathbb{M}_{2,2}^{(1,1;a)}(T_u)$	$\sqrt{3}xy$	$\begin{bmatrix} 0 & 0 & 0 & -\frac{2\sqrt{6}i}{35} & 0 & 0 & -\frac{3\sqrt{70}i}{280} & 0 & 0 & 0 & \frac{3\sqrt{2}i}{280} & 0 & 0 & 0 \\ -\frac{4\sqrt{5}i}{35} & 0 & 0 & 0 & -\frac{8i}{35} & 0 & 0 & -\frac{3\sqrt{30}i}{280} & 0 & 0 & 0 & \frac{3\sqrt{10}i}{280} & 0 & 0 \\ 0 & -\frac{8i}{35} & 0 & 0 & 0 & -\frac{4\sqrt{5}i}{35} & 0 & 0 & -\frac{3\sqrt{10}i}{280} & 0 & 0 & 0 & \frac{3\sqrt{30}i}{280} & 0 \\ 0 & 0 & -\frac{2\sqrt{6}i}{35} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{2}i}{280} & 0 & 0 & 0 & \frac{3\sqrt{70}i}{280} \\ 0 & 0 & -\frac{3\sqrt{30}i}{140} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}i}{105} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{9\sqrt{6}i}{140} & 0 & 0 & \frac{\sqrt{70}i}{105} & 0 & 0 & 0 & \frac{4\sqrt{2}i}{105} & 0 & 0 & 0 \\ \frac{3\sqrt{30}i}{140} & 0 & 0 & 0 & -\frac{9\sqrt{6}i}{140} & 0 & 0 & \frac{4\sqrt{5}i}{105} & 0 & 0 & 0 & \frac{2\sqrt{15}i}{105} & 0 & 0 \\ 0 & \frac{9\sqrt{6}i}{140} & 0 & 0 & 0 & -\frac{3\sqrt{30}i}{140} & 0 & 0 & \frac{2\sqrt{15}i}{105} & 0 & 0 & 0 & \frac{4\sqrt{5}i}{105} & 0 \\ 0 & 0 & \frac{9\sqrt{6}i}{140} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{4\sqrt{2}i}{105} & 0 & 0 & 0 & \frac{\sqrt{70}i}{105} \\ 0 & 0 & 0 & \frac{3\sqrt{30}i}{140} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}i}{105} & 0 & 0 & 0 \end{bmatrix}$
820	symmetry	$\frac{\sqrt{21}(x^4 - 3x^2y^2 - 3x^2z^2 + y^4 - 3y^2z^2 + z^4)}{6}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{M}_4^{(1,1;a)}(A_u)$	$0 - \frac{\sqrt{770}}{210} 0 0 0 -\frac{\sqrt{154}}{42} 0 0 \frac{\sqrt{77}}{140} 0 0 0 0 \frac{\sqrt{231}}{420} 0$	
	$0 0 \frac{\sqrt{1155}}{105} 0 0 0 0 0 0 -\frac{\sqrt{385}}{420} 0 0 0 0 \frac{\sqrt{11}}{60}$	
	$0 0 0 -\frac{\sqrt{1155}}{105} 0 0 \frac{\sqrt{11}}{60} 0 0 0 -\frac{\sqrt{385}}{420} 0 0 0 0$	
	$\frac{\sqrt{154}}{42} 0 0 0 \frac{\sqrt{770}}{210} 0 0 \frac{\sqrt{231}}{420} 0 0 0 0 \frac{\sqrt{77}}{140} 0 0$	
	$-\frac{\sqrt{770}}{840} 0 0 0 -\frac{\sqrt{154}}{168} 0 0 \frac{\sqrt{1155}}{1155} 0 0 0 0 \frac{\sqrt{385}}{1155} 0 0$	
	$0 \frac{\sqrt{770}}{280} 0 0 0 -\frac{\sqrt{154}}{168} 0 0 -\frac{4\sqrt{77}}{1155} 0 0 0 0 \frac{2\sqrt{231}}{1155} 0$	
	$0 0 -\frac{\sqrt{770}}{420} 0 0 0 0 0 0 -\frac{\sqrt{2310}}{2310} 0 0 0 0 \frac{\sqrt{66}}{330}$	
	$0 0 0 -\frac{\sqrt{770}}{420} 0 0 -\frac{\sqrt{66}}{330} 0 0 0 0 \frac{\sqrt{2310}}{2310} 0 0 0$	
	$-\frac{\sqrt{154}}{168} 0 0 0 \frac{\sqrt{770}}{280} 0 0 -\frac{2\sqrt{231}}{1155} 0 0 0 0 \frac{4\sqrt{77}}{1155} 0 0$	
	$0 -\frac{\sqrt{154}}{168} 0 0 0 -\frac{\sqrt{770}}{840} 0 0 -\frac{\sqrt{385}}{1155} 0 0 0 0 -\frac{\sqrt{1155}}{1155} 0$	
821 symmetry	$-\frac{\sqrt{15}(x^4 - 12x^2y^2 + 6x^2z^2 + y^4 + 6y^2z^2 - 2z^4)}{12}$	
	$0 -\frac{\sqrt{22}}{42} 0 0 0 \frac{\sqrt{110}}{30} 0 0 \frac{\sqrt{55}}{140} 0 0 0 0 -\frac{\sqrt{165}}{300} 0$	
	$0 0 \frac{\sqrt{33}}{21} 0 0 0 0 0 0 -\frac{\sqrt{11}}{84} 0 0 0 0 -\frac{\sqrt{385}}{300}$	
	$0 0 0 -\frac{\sqrt{33}}{21} 0 0 -\frac{\sqrt{385}}{300} 0 0 0 0 -\frac{\sqrt{11}}{84} 0 0 0$	
	$-\frac{\sqrt{110}}{30} 0 0 0 \frac{\sqrt{22}}{42} 0 0 -\frac{\sqrt{165}}{300} 0 0 0 0 \frac{\sqrt{55}}{140} 0 0$	
	$-\frac{\sqrt{22}}{168} 0 0 0 \frac{\sqrt{110}}{120} 0 0 \frac{\sqrt{33}}{231} 0 0 0 0 -\frac{\sqrt{11}}{165} 0 0$	
	$0 \frac{\sqrt{22}}{56} 0 0 0 \frac{\sqrt{110}}{120} 0 0 -\frac{4\sqrt{55}}{1155} 0 0 0 0 -\frac{2\sqrt{165}}{825} 0$	
	$0 0 -\frac{\sqrt{22}}{84} 0 0 0 0 0 0 -\frac{\sqrt{66}}{462} 0 0 0 0 -\frac{\sqrt{2310}}{1650}$	
	$0 0 0 -\frac{\sqrt{22}}{84} 0 0 \frac{\sqrt{2310}}{1650} 0 0 0 0 \frac{\sqrt{66}}{462} 0 0 0$	
	$\frac{\sqrt{110}}{120} 0 0 0 \frac{\sqrt{22}}{56} 0 0 \frac{2\sqrt{165}}{825} 0 0 0 0 \frac{4\sqrt{55}}{1155} 0 0$	
822 symmetry	$\frac{\sqrt{5}(x-y)(x+y)(x^2+y^2-6z^2)}{4}$	

continued ...

Table 9

No.	multipole	matrix	
$\mathbb{M}_{4,1}^{(1,1;a)}(E_u)$		$\begin{bmatrix} 0 & 0 & 0 & \frac{\sqrt{33}}{21} & 0 & 0 & -\frac{\sqrt{385}}{700} & 0 & 0 & 0 & -\frac{3\sqrt{11}}{140} & 0 & 0 & 0 \\ -\frac{\sqrt{110}}{70} & 0 & 0 & 0 & -\frac{\sqrt{22}}{14} & 0 & 0 & \frac{11\sqrt{165}}{2100} & 0 & 0 & 0 & -\frac{\sqrt{55}}{700} & 0 & 0 \\ 0 & \frac{\sqrt{22}}{14} & 0 & 0 & 0 & \frac{\sqrt{110}}{70} & 0 & 0 & -\frac{\sqrt{55}}{700} & 0 & 0 & 0 & \frac{11\sqrt{165}}{2100} & 0 \\ 0 & 0 & -\frac{\sqrt{33}}{21} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{11}}{140} & 0 & 0 & 0 & -\frac{\sqrt{385}}{700} \\ 0 & 0 & \frac{\sqrt{165}}{140} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{2\sqrt{55}}{385} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{33}}{84} & 0 & 0 & \frac{3\sqrt{385}}{1925} & 0 & 0 & 0 & -\frac{\sqrt{11}}{385} & 0 & 0 & 0 \\ \frac{\sqrt{165}}{140} & 0 & 0 & 0 & -\frac{\sqrt{33}}{84} & 0 & 0 & -\frac{9\sqrt{110}}{3850} & 0 & 0 & 0 & \frac{17\sqrt{330}}{11550} & 0 & 0 \\ 0 & -\frac{\sqrt{33}}{84} & 0 & 0 & 0 & \frac{\sqrt{165}}{140} & 0 & 0 & -\frac{17\sqrt{330}}{11550} & 0 & 0 & 0 & \frac{9\sqrt{110}}{3850} & 0 \\ 0 & 0 & -\frac{\sqrt{33}}{84} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{11}}{385} & 0 & 0 & 0 & -\frac{3\sqrt{385}}{1925} \\ 0 & 0 & 0 & \frac{\sqrt{165}}{140} & 0 & 0 & 0 & 0 & 0 & \frac{2\sqrt{55}}{385} & 0 & 0 & 0 & 0 \end{bmatrix}$	
823	symmetry	$\frac{\sqrt{35}yz(y-z)(y+z)}{2}$	
$\mathbb{M}_{4,0}^{(1,1;a)}(T_u, 1)$		$\begin{bmatrix} -\frac{\sqrt{2310}i}{840} & 0 & -\frac{\sqrt{231}i}{84} & 0 & -\frac{\sqrt{462}i}{168} & 0 & 0 & \frac{3\sqrt{385}i}{1400} & 0 & \frac{\sqrt{77}i}{140} & 0 & \frac{\sqrt{1155}i}{1400} & 0 & 0 \\ 0 & \frac{\sqrt{154}i}{56} & 0 & \frac{\sqrt{77}i}{28} & 0 & \frac{\sqrt{770}i}{280} & -\frac{\sqrt{165}i}{600} & 0 & -\frac{\sqrt{385}i}{350} & 0 & -\frac{\sqrt{231}i}{840} & 0 & \frac{\sqrt{1155}i}{2100} & 0 \\ -\frac{\sqrt{770}i}{280} & 0 & -\frac{\sqrt{77}i}{28} & 0 & -\frac{\sqrt{154}i}{56} & 0 & 0 & \frac{\sqrt{1155}i}{2100} & 0 & -\frac{\sqrt{231}i}{840} & 0 & -\frac{\sqrt{385}i}{350} & 0 & -\frac{\sqrt{165}i}{600} \\ 0 & \frac{\sqrt{462}i}{168} & 0 & \frac{\sqrt{231}i}{84} & 0 & \frac{\sqrt{2310}i}{840} & 0 & 0 & \frac{\sqrt{1155}i}{1400} & 0 & \frac{\sqrt{77}i}{140} & 0 & \frac{3\sqrt{385}i}{1400} & 0 \\ 0 & -\frac{\sqrt{2310}i}{840} & 0 & -\frac{\sqrt{1155}i}{840} & 0 & 0 & \frac{\sqrt{11}i}{220} & 0 & \frac{\sqrt{231}i}{462} & 0 & \frac{\sqrt{385}i}{1540} & 0 & 0 & 0 \\ \frac{\sqrt{2310}i}{840} & 0 & \frac{\sqrt{231}i}{168} & 0 & 0 & 0 & 0 & -\frac{13\sqrt{385}i}{7700} & 0 & -\frac{\sqrt{77}i}{770} & 0 & \frac{\sqrt{1155}i}{3300} & 0 & 0 \\ 0 & -\frac{\sqrt{231}i}{168} & 0 & 0 & 0 & \frac{\sqrt{1155}i}{840} & \frac{3\sqrt{110}i}{2200} & 0 & \frac{\sqrt{2310}i}{46200} & 0 & -\frac{\sqrt{154}i}{440} & 0 & -\frac{\sqrt{770}i}{15400} & 0 \\ \frac{\sqrt{1155}i}{840} & 0 & 0 & 0 & -\frac{\sqrt{231}i}{168} & 0 & 0 & \frac{\sqrt{770}i}{15400} & 0 & \frac{\sqrt{154}i}{440} & 0 & -\frac{\sqrt{2310}i}{46200} & 0 & -\frac{3\sqrt{110}i}{2200} \\ 0 & 0 & 0 & \frac{\sqrt{231}i}{168} & 0 & \frac{\sqrt{2310}i}{840} & 0 & 0 & -\frac{\sqrt{1155}i}{3300} & 0 & \frac{\sqrt{77}i}{770} & 0 & \frac{13\sqrt{385}i}{7700} & 0 \\ 0 & 0 & -\frac{\sqrt{1155}i}{840} & 0 & -\frac{\sqrt{2310}i}{840} & 0 & 0 & 0 & -\frac{\sqrt{385}i}{1540} & 0 & -\frac{\sqrt{231}i}{462} & 0 & -\frac{\sqrt{11}i}{220} & 0 \end{bmatrix}$	
		$\frac{-\sqrt{35}xz(x-z)(x+z)}{2}$	

continued ...

Table 9

No.	multipole	matrix
$\mathbb{M}_{4,1}^{(1,1;a)}(T_u, 1)$	$\frac{\sqrt{2310}}{840} 0 -\frac{\sqrt{231}}{84} 0 \frac{\sqrt{462}}{168} 0 0 -\frac{3\sqrt{385}}{1400} 0 \frac{\sqrt{77}}{140} 0 -\frac{\sqrt{1155}}{1400} 0 0$	
	$0 -\frac{\sqrt{154}}{56} 0 \frac{\sqrt{77}}{28} 0 -\frac{\sqrt{770}}{280} -\frac{\sqrt{165}}{600} 0 \frac{\sqrt{385}}{350} 0 -\frac{\sqrt{231}}{840} 0 -\frac{\sqrt{1155}}{2100} 0$	
	$-\frac{\sqrt{770}}{280} 0 \frac{\sqrt{77}}{28} 0 -\frac{\sqrt{154}}{56} 0 0 0 \frac{\sqrt{1155}}{2100} 0 \frac{\sqrt{231}}{840} 0 -\frac{\sqrt{385}}{350} 0 \frac{\sqrt{165}}{600}$	
	$0 \frac{\sqrt{462}}{168} 0 -\frac{\sqrt{231}}{84} 0 \frac{\sqrt{2310}}{840} 0 0 \frac{\sqrt{1155}}{1400} 0 -\frac{\sqrt{77}}{140} 0 \frac{3\sqrt{385}}{1400} 0$	
	$0 -\frac{\sqrt{2310}}{840} 0 \frac{\sqrt{1155}}{840} 0 0 -\frac{\sqrt{11}}{220} 0 \frac{\sqrt{231}}{462} 0 -\frac{\sqrt{385}}{1540} 0 0 0$	
	$-\frac{\sqrt{2310}}{840} 0 \frac{\sqrt{231}}{168} 0 0 0 0 \frac{13\sqrt{385}}{7700} 0 -\frac{\sqrt{77}}{770} 0 -\frac{\sqrt{1155}}{3300} 0 0$	
	$0 \frac{\sqrt{231}}{168} 0 0 0 -\frac{\sqrt{1155}}{840} \frac{3\sqrt{110}}{2200} 0 -\frac{\sqrt{2310}}{46200} 0 -\frac{\sqrt{154}}{440} 0 \frac{\sqrt{770}}{15400} 0$	
	$\frac{\sqrt{1155}}{840} 0 0 0 -\frac{\sqrt{231}}{168} 0 0 \frac{\sqrt{770}}{15400} 0 -\frac{\sqrt{154}}{440} 0 -\frac{\sqrt{2310}}{46200} 0 \frac{3\sqrt{110}}{2200}$	
	$0 0 0 -\frac{\sqrt{231}}{168} 0 \frac{\sqrt{2310}}{840} 0 0 -\frac{\sqrt{1155}}{3300} 0 -\frac{\sqrt{77}}{770} 0 \frac{13\sqrt{385}}{7700} 0$	
	$0 0 -\frac{\sqrt{1155}}{840} 0 \frac{\sqrt{2310}}{840} 0 0 0 0 -\frac{\sqrt{385}}{1540} 0 \frac{\sqrt{231}}{462} 0 -\frac{\sqrt{11}}{220}$	
825	symmetry	$\frac{\sqrt{35}xy(x-y)(x+y)}{2}$
$\mathbb{M}_{4,2}^{(1,1;a)}(T_u, 1)$	$0 0 0 0 0 \frac{\sqrt{2310i}}{105} 0 0 0 0 0 0 -\frac{\sqrt{385i}}{350} 0$	
	$0 0 0 0 0 0 0 0 0 0 0 0 0 -\frac{\sqrt{165i}}{150}$	
	$0 0 0 0 0 0 0 \frac{\sqrt{165i}}{150} 0 0 0 0 0 0$	
	$\frac{\sqrt{2310i}}{105} 0 0 0 0 0 0 0 \frac{\sqrt{385i}}{350} 0 0 0 0 0 0$	
	$0 0 0 0 \frac{\sqrt{2310i}}{420} 0 0 0 0 0 0 -\frac{2\sqrt{231i}}{1155} 0 0$	
	$0 0 0 0 0 \frac{\sqrt{2310i}}{420} 0 0 0 0 0 0 -\frac{4\sqrt{385i}}{1925} 0$	
	$0 0 0 0 0 0 0 0 0 0 0 0 0 0 -\frac{\sqrt{110i}}{275}$	
	$0 0 0 0 0 0 -\frac{\sqrt{110i}}{275} 0 0 0 0 0 0 0 0$	
	$-\frac{\sqrt{2310i}}{420} 0 0 0 0 0 0 0 -\frac{4\sqrt{385i}}{1925} 0 0 0 0 0 0$	
	$0 -\frac{\sqrt{2310i}}{420} 0 0 0 0 0 0 0 -\frac{2\sqrt{231i}}{1155} 0 0 0 0 0$	
826	symmetry	$\frac{\sqrt{5}yz(6x^2-y^2-z^2)}{2}$

continued ...

Table 9

No.	multipole	matrix												
$\mathbb{M}_{4,0}^{(1,1;a)}(T_u, 2)$	$-\frac{\sqrt{330}i}{840}$	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
	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	$\frac{3\sqrt{55}i}{1400}$	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	$-\frac{\sqrt{33}i}{168}$	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	
	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	$-\frac{\sqrt{77}i}{1540}$
827	symmetry	$-\frac{\sqrt{5}xz(x^2-6y^2+z^2)}{2}$												
$\mathbb{M}_{4,1}^{(1,1;a)}(T_u, 2)$	$-\frac{\sqrt{330}}{840}$	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	$-\frac{\sqrt{33}}{168}$	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	
	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	$-\frac{\sqrt{55}}{220}$	0	$-\frac{\sqrt{33}}{462}$	0	$\frac{\sqrt{77}}{1540}$	
828	symmetry	$-\frac{\sqrt{5}xy(x^2+y^2-6z^2)}{2}$												

continued ..

Table 9

No.	multipole	matrix
$\mathbb{M}_{4,2}^{(1,1;a)}(T_u, 2)$	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 $\frac{3\sqrt{11}i}{140}$ 0 0 0 $-\frac{\sqrt{385}i}{700}$	
	0 0 $\frac{\sqrt{165}i}{140}$ 0 0 0 0 0 $-\frac{2\sqrt{55}i}{385}$ 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 $-\frac{\sqrt{11}i}{385}$ 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	

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

continued ...

Table 10

No.	multipole	matrix
$\mathbb{Q}_0^{(a)}(A_g)$	$\frac{\sqrt{14}}{14} \quad 0 \quad 0$	
	$0 \quad \frac{\sqrt{14}}{14} \quad 0 \quad 0$	
	$0 \quad 0 \quad \frac{\sqrt{14}}{14} \quad 0 \quad 0$	
	$0 \quad 0 \quad 0 \quad \frac{\sqrt{14}}{14} \quad 0 \quad 0$	
	$0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{14}}{14} \quad 0 \quad 0$	
	$0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{14}}{14} \quad 0 \quad 0$	
	$0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{14}}{14} \quad 0 \quad 0$	
	$0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{14}}{14} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0$	
	$0 \quad 0 \quad \frac{\sqrt{14}}{14} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0$	
	$0 \quad 0 \quad \frac{\sqrt{14}}{14} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0$	
	$0 \quad 0 \quad \frac{\sqrt{14}}{14} \quad 0 \quad 0 \quad 0 \quad 0$	
	$0 \quad 0 \quad \frac{\sqrt{14}}{14} \quad 0 \quad 0 \quad 0$	
	$0 \quad 0 \quad \frac{\sqrt{14}}{14} \quad 0 \quad 0$	
	$0 \quad 0 \quad \frac{\sqrt{14}}{14} \quad 0$	
830	symmetry	$-\frac{x^2}{2} - \frac{y^2}{2} + z^2$

continued ...

Table 10

No.	multipole	matrix													
$\mathbb{Q}_{2,0}^{(a)}(E_g)$	$-\frac{5\sqrt{42}}{98}$	0	0	0	0	0	0	$-\frac{5\sqrt{7}}{98}$	0	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	0	$\frac{2\sqrt{42}}{49}$	0	0	0	0	0	0	$-\frac{\sqrt{14}}{98}$	0	0	0	0	0
	0	0	0	$\frac{2\sqrt{42}}{49}$	0	0	0	0	0	$\frac{\sqrt{14}}{98}$	0	0	0	0	0
	0	0	0	0	$\frac{\sqrt{42}}{98}$	0	0	0	0	0	$\frac{\sqrt{105}}{98}$	0	0	0	0
	0	0	0	0	0	$-\frac{5\sqrt{42}}{98}$	0	0	0	0	0	$\frac{5\sqrt{7}}{98}$	0	0	0
	0	0	0	0	0	0	$-\frac{5\sqrt{42}}{84}$	0	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	$-\frac{\sqrt{105}}{98}$	0	0	0	0	0	0	$\frac{5\sqrt{42}}{196}$	0	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	0	$\frac{\sqrt{14}}{98}$	0	0	0	0	0	0	$\frac{25\sqrt{42}}{588}$	0	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	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	0	$-\frac{5\sqrt{42}}{84}$	0
831	symmetry	$\frac{\sqrt{3}(x-y)(x+y)}{2}$													

continued ...

Table 10

No.	multipole	matrix
$\mathbb{Q}_{2,1}^{(a)}(E_g)$	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	
	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 0 $-\frac{\sqrt{15}}{42}$ 0 0 0 0 0 0 $-\frac{5\sqrt{6}}{84}$ 0 0 0	
832 symmetry		$\sqrt{3}yz$

continued ...

Table 10

No.	multipole	matrix
$\mathbb{Q}_{2,0}^{(a)}(T_g)$	0	$\frac{3\sqrt{70}i}{98}$ 0 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 0 $\frac{\sqrt{105}i}{588}$ 0 $\frac{11\sqrt{21}i}{588}$ 0 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 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 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 0 $\frac{3\sqrt{70}i}{98}$ 0 0 0 0 0 $-\frac{5\sqrt{7}i}{196}$ 0 $-\frac{5\sqrt{3}i}{84}$
	$-\frac{5\sqrt{3}i}{84}$	0 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 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 0 $\frac{\sqrt{105}i}{588}$ 0 0 0 0 0 $\frac{5\sqrt{42}i}{147}$ 0 $-\frac{5\sqrt{2}i}{28}$ 0
	0	0 0 0 0 0 $\frac{5\sqrt{3}i}{84}$ 0 0 0 0 0 $\frac{5\sqrt{2}i}{28}$ 0
833	symmetry	$\sqrt{3}xz$

continued ...

Table 10

No.	multipole	matrix														
$\mathbb{Q}_{2,1}^{(a)}(T_g)$	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	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	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	0	$\frac{3\sqrt{7}}{49}$	0	$\frac{3\sqrt{70}}{98}$	0	0	0	0	$-\frac{\sqrt{42}}{84}$	0	$-\frac{\sqrt{70}}{196}$	0	0	0
	0	0	0	0	$\frac{3\sqrt{70}}{98}$	0	0	0	0	0	$-\frac{11\sqrt{21}}{588}$	0	$\frac{\sqrt{105}}{588}$	0	0	0
	$\frac{5\sqrt{3}}{84}$	0	0	0	0	0	0	$-\frac{5\sqrt{2}}{28}$	0	0	0	0	0	$\frac{5\sqrt{3}}{84}$	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	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	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
	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	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	$\frac{5\sqrt{2}}{28}$	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
$\sqrt{3}xy$																

834 symmetry

 $\sqrt{3}xy$

continued ...

Table 10

No.	multipole	matrix													
$\mathbb{Q}_{2,2}^{(a)}(T_g)$	0	0	$\frac{3\sqrt{35}i}{98}$	0	0	0	0	0	$\frac{\sqrt{105}i}{294}$	0	0	0	0	0	0
	0	0	0	$\frac{9\sqrt{7}i}{98}$	0	0	$\frac{\sqrt{15}i}{42}$	0	0	$\frac{2\sqrt{21}i}{147}$	0	0	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
	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	0	$-\frac{9\sqrt{7}i}{98}$	0	0	0	0	0	$\frac{2\sqrt{21}i}{147}$	0	0	0	$\frac{\sqrt{15}i}{42}$	0	0
	0	0	0	$-\frac{3\sqrt{35}i}{98}$	0	0	0	0	$\frac{\sqrt{105}i}{294}$	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	0	0	0	0
	0	0	$-\frac{\sqrt{210}i}{147}$	0	0	0	0	0	$\frac{5\sqrt{70}i}{196}$	0	0	0	0	0	0
	0	0	0	$-\frac{\sqrt{70}i}{98}$	0	0	$-\frac{5\sqrt{6}i}{84}$	0	0	$\frac{5\sqrt{210}i}{294}$	0	0	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
	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	0	$-\frac{\sqrt{70}i}{98}$	0	0	0	0	0	$-\frac{5\sqrt{210}i}{294}$	0	0	0	$\frac{5\sqrt{6}i}{84}$	0	0
	0	0	0	$-\frac{\sqrt{210}i}{147}$	0	0	0	0	0	$-\frac{5\sqrt{70}i}{196}$	0	0	0	0	0
	0	0	0	0	$-\frac{\sqrt{15}i}{42}$	0	0	0	0	0	$-\frac{5\sqrt{6}i}{84}$	0	0	0	0

835 symmetry

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

continued ...

Table 10

No.	multipole	matrix												
$\mathbb{Q}_4^{(a)}(A_g)$	$\frac{\sqrt{33}}{84}$	0	0	0	$\frac{\sqrt{165}}{84}$	0	0	$\frac{5\sqrt{22}}{154}$	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	$\frac{\sqrt{110}}{77}$	0	
	0	0	$\frac{\sqrt{33}}{42}$	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	
	$\frac{\sqrt{165}}{84}$	0	0	0	$-\frac{\sqrt{33}}{28}$	0	0	$-\frac{\sqrt{110}}{77}$	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	$-\frac{5\sqrt{22}}{154}$	0	
	0	0	0	$-\frac{\sqrt{385}}{154}$	0	0	$\frac{\sqrt{33}}{44}$	0	0	0	$\frac{\sqrt{1155}}{308}$	0	0	
	$\frac{5\sqrt{22}}{154}$	0	0	0	$-\frac{\sqrt{110}}{77}$	0	0	$-\frac{13\sqrt{33}}{308}$	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	$\frac{15\sqrt{11}}{308}$	0	
	0	0	$-\frac{5\sqrt{11}}{154}$	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	
	$\frac{5\sqrt{66}}{462}$	0	0	0	$\frac{2\sqrt{330}}{231}$	0	0	$\frac{15\sqrt{11}}{308}$	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	$-\frac{13\sqrt{33}}{308}$	0	
	0	0	$\frac{\sqrt{385}}{154}$	0	0	0	0	0	$\frac{\sqrt{1155}}{308}$	0	0	0	$\frac{\sqrt{33}}{44}$	
836	symmetry	$\frac{\sqrt{15}(x^4 - 12x^2y^2 + 6x^2z^2 + y^4 + 6y^2z^2 - 2z^4)}{12}$												

continued ...

Table 10

No.	multipole	matrix												
$\mathbb{Q}_{4,0}^{(a)}(E_g)$	$\frac{\sqrt{1155}}{588}$	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	$-\frac{\sqrt{33}}{44}$	0	0	0	$\frac{\sqrt{1155}}{308}$	
837	symmetry	$\frac{\sqrt{5}(x-y)(x+y)(x^2+y^2-6z^2)}{4}$												

continued ...

Table 10

No.	multipole	matrix													
$\mathbb{Q}_{4,1}^{(a)}(E_g)$	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	0	$\frac{\sqrt{770}}{196}$	0	0	$\frac{3\sqrt{66}}{154}$	0	0	0	$-\frac{\sqrt{2310}}{1078}$	0	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
	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	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	0	$-\frac{3\sqrt{154}}{196}$	0	0	0	0	0	$\frac{5\sqrt{462}}{539}$	0	0	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	0	$-\frac{9\sqrt{231}}{1078}$	0	0	0	0	0	0	$-\frac{3\sqrt{77}}{1078}$	0	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	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
	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	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	0	$\frac{9\sqrt{231}}{1078}$	0	0	0	0	0	$-\frac{3\sqrt{77}}{1078}$	0	0	0	0	0
	0	0	0	0	$-\frac{3\sqrt{66}}{154}$	0	0	0	0	0	$-\frac{3\sqrt{165}}{154}$	0	0	0	0
$\frac{\sqrt{35}yz(y-z)(y+z)}{2}$															

838 symmetry

continued ...

Table 10

No.	multipole	matrix													
$\mathbb{Q}_{4,0}^{(a)}(T_g, 1)$	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	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
	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
	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	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
	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	

839 symmetry

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

continued ...

Table 10

No.	multipole	matrix
$\mathbb{Q}_{4,1}^{(a)}(T_g, 1)$	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 $-\frac{\sqrt{11}}{616}$ 0 $\frac{\sqrt{33}}{616}$ 0
	$-\frac{\sqrt{22}}{56}$	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 $-\frac{5\sqrt{66}}{616}$ 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 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

840 symmetry

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

continued ...

Table 10

No.	multipole	matrix													
$\mathbb{Q}_{4,2}^{(a)}(T_g, 1)$	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	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	$\frac{\sqrt{11}i}{14}$	0	0	0	0	0	0	$-\frac{\sqrt{110}i}{77}$	0	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	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	$-\frac{3\sqrt{77}i}{154}$	0	
	0	0	0	0	0	0	$\frac{3\sqrt{77}i}{154}$	0	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	$\frac{2\sqrt{66}i}{77}$	0	0	0	0	0	0	$\frac{3\sqrt{165}i}{154}$	0	0	0	0	0	0
	0	0	$\frac{\sqrt{231}i}{77}$	0	0	0	0	0	0	$\frac{3\sqrt{77}i}{154}$	0	0	0	0	0
841	symmetry	$\frac{\sqrt{5yz}(6x^2-y^2-z^2)}{2}$													

continued ...

Table 10

No.	multipole	matrix														
$\mathbb{Q}_{4,0}^{(a)}(T_g, 2)$	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	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	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	0	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	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
	0	0	$-\frac{\sqrt{154}i}{56}$	0	$\frac{\sqrt{77}i}{196}$	0	0	0	$\frac{5\sqrt{462}i}{616}$	0	$-\frac{5\sqrt{770}i}{2156}$	0	$-\frac{\sqrt{330}i}{616}$	0	0	0
	$-\frac{\sqrt{330}i}{616}$	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	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	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	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	0	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	0
	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
	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	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	0	0

842 symmetry

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

continued ...

Table 10

No.	multipole	matrix													
$\mathbb{Q}_{4,1}^{(a)}(T_g, 2)$	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	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
	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	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	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	0	$\frac{\sqrt{154}}{56}$	0	$\frac{\sqrt{77}}{196}$	0	0	0	$-\frac{5\sqrt{462}}{616}$	0	$-\frac{5\sqrt{770}}{2156}$	0	$\frac{\sqrt{330}}{616}$	0	0
	$\frac{\sqrt{330}}{616}$	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
	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	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
	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	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
	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	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	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	0
843	symmetry	$-\frac{\sqrt{5}xy(x^2+y^2-6z^2)}{2}$													

continued ...

Table 10

No.	multipole	matrix													
$\mathbb{Q}_{4,2}^{(a)}(T_g, 2)$	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	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	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
	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	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	0	$\frac{3\sqrt{154}i}{196}$	0	0	0	0	0	$-\frac{5\sqrt{462}i}{539}$	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	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	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	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
	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	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	0	$-\frac{9\sqrt{231}i}{1078}$	0	0	0	0	0	$\frac{3\sqrt{77}i}{1078}$	0	0	0	0	0
	0	0	0	0	$\frac{3\sqrt{66}i}{154}$	0	0	0	0	0	$\frac{3\sqrt{165}i}{154}$	0	0	0	0
844	symmetry	$\frac{\sqrt{2}(2x^6 - 15x^4y^2 - 15x^4z^2 - 15x^2y^4 + 180x^2y^2z^2 - 15x^2z^4 + 2y^6 - 15y^4z^2 - 15y^2z^4 + 2z^6)}{8}$													

continued ...

Table 10

No.	multipole	matrix
$\mathbb{Q}_6^{(a)}(A_g, 1)$	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 0 $-\frac{\sqrt{55}}{44}$ 0 0 0 $\frac{5\sqrt{77}}{308}$ 0 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 0 $\frac{5\sqrt{231}}{1848}$ 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	$-\frac{\sqrt{2310}(x-y)(x+y)(x-z)(x+z)(y-z)(y+z)}{8}$

continued ...

Table 10

No.	multipole	matrix
$\mathbb{Q}_6^{(a)}(A_g, 2)$	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 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	
846	symmetry	$\frac{\sqrt{14}(x^6 - 15x^4z^2 + 15x^2z^4 + y^6 - 15y^4z^2 + 15y^2z^4 - 2z^6)}{8}$

continued ...

Table 10

No.	multipole	matrix													
$\mathbb{Q}_{6,0}^{(a)}(E_g)$	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 0 0 $-\frac{5\sqrt{11}}{44}$ 0 0 0 $-\frac{\sqrt{385}}{308}$														
	0 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 0 $-\frac{\sqrt{110}}{88}$ 0 0 0 $-\frac{\sqrt{330}}{88}$ 0 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 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 $-\frac{\sqrt{33}}{264}$														
847	symmetry	$\frac{\sqrt{42}(x-y)(x+y)(x^4 - 9x^2y^2 - 5x^2z^2 + y^4 - 5y^2z^2 + 5z^4)}{8}$													

continued ...

Table 10

No.	multipole	matrix													
$\mathbb{Q}_{6,1}^{(a)}(E_g)$	0 0 0 0 0 0 0 0 0 $-\frac{\sqrt{330}}{264}$ 0 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 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 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 $-\frac{\sqrt{165}}{264}$														
	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														
848	symmetry	$\frac{3\sqrt{7}yz(y-z)(y+z)(10x^2-y^2-z^2)}{4}$													

continued ...

Table 10

No.	multipole	matrix													
$\mathbb{Q}_{6,0}^{(a)}(T_g, 1)$	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	$\frac{\sqrt{330}i}{176}$	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	

849 symmetry

$$\frac{3\sqrt{7}xz(x-z)(x+z)(x^2-10y^2+z^2)}{4}$$

continued ...

Table 10

No.	multipole	matrix													
$\mathbb{Q}_{6,1}^{(a)}(T_g, 1)$	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	$\frac{\sqrt{330}}{176}$	0	$\frac{\sqrt{22}}{88}$	0	$-\frac{\sqrt{462}}{1232}$	0	
	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	

850 symmetry

$$-\frac{3\sqrt{7}xy(x-y)(x+y)(x^2+y^2-10z^2)}{4}$$

continued ...

Table 10

No.	multipole	matrix												
$\mathbb{Q}_{6,2}^{(a)}(T_g, 1)$	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	$\sqrt{\frac{33i}{22}}$	0	0										
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0	$-\sqrt{\frac{55i}{22}}$	0										
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0	$\sqrt{\frac{770i}{154}}$	0										
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	$\sqrt{\frac{770i}{154}}$	0	0										
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0	$-\sqrt{\frac{55i}{22}}$	0										
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0	$\sqrt{\frac{33i}{22}}$	0										
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0	$\sqrt{\frac{2310i}{308}}$	0										
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0	$-\sqrt{\frac{22i}{44}}$	0										
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0	$-\sqrt{\frac{22i}{44}}$	0										
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0	$\sqrt{\frac{2310i}{308}}$	0										
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	$-\sqrt{\frac{2310i}{308}}$	0	0										
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0	$\sqrt{\frac{22i}{44}}$	0										
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	$-\sqrt{\frac{22i}{44}}$	0	0										
851	symmetry	$\frac{\sqrt{462yz(y^2-3z^2)(3y^2-z^2)}}{16}$												

continued ...

Table 10

No.	multipole	matrix												
$\mathbb{Q}_{6,0}^{(a)}(T_g, 2)$	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

$$\frac{\sqrt{462}xz(x^2 - 3z^2)(3x^2 - z^2)}{16}$$

continued ...

Table 10

No.	multipole	matrix													
$\mathbb{Q}_{6,1}^{(a)}(T_g, 2)$	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	$\frac{\sqrt{42}}{448}$	
	$\frac{\sqrt{42}}{448}$	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	

853 symmetry

$$\frac{\sqrt{462}xy(x^2 - 3y^2)(3x^2 - y^2)}{16}$$

continued ...

Table 10

No.	multipole	matrix													
$\mathbb{Q}_{6,2}^{(a)}(T_g, 2)$		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	$\frac{\sqrt{42}i}{14}$	0	0	0	0	0	0	0	
		0	0	0	0	0	$-\frac{\sqrt{42}i}{14}$	0	0	0	0	$\frac{\sqrt{7}i}{14}$	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	$-\frac{\sqrt{7}i}{14}$	0	0	0	0	0	0	0	
854	symmetry	$\frac{\sqrt{210}yz(16x^4 - 16x^2y^2 - 16x^2z^2 + y^4 + 2y^2z^2 + z^4)}{16}$													

continued ...

Table 10

No.	multipole	matrix													
$\mathbb{Q}_{6,0}^{(a)}(T_g, 3)$	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	
855	symmetry	$\frac{\sqrt{210}xz(x^4 - 16x^2y^2 + 2x^2z^2 + 16y^4 - 16y^2z^2 + z^4)}{16}$													

continued ...

Table 10

No.	multipole	matrix											
$\mathbb{Q}_{6,1}^{(a)}(T_g, 3)$	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	$-\frac{5\sqrt{66}}{2112}$	0	$\frac{5\sqrt{330}}{2112}$	0	$\frac{27\sqrt{22}}{704}$	0
	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	$-\frac{9\sqrt{33}}{352}$	0	$-\frac{5\sqrt{165}}{1056}$	0	$\frac{5\sqrt{11}}{352}$	0
	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	$-\frac{\sqrt{330}}{64}$	0	$-\frac{9\sqrt{66}}{704}$	0	$-\frac{\sqrt{110}}{704}$	0
	$\frac{\sqrt{2310}}{14784}$	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	$-\frac{5\sqrt{66}}{2112}$	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
	$-\frac{\sqrt{110}}{704}$	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	$\frac{\sqrt{1155}}{224}$
	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	$-\frac{9\sqrt{11}}{352}$
	$-\frac{9\sqrt{66}}{704}$	0	$-\frac{5\sqrt{165}}{1056}$	0	$\frac{5\sqrt{330}}{2112}$	0	0	$\frac{9\sqrt{11}}{352}$	0	0	0	$\frac{5\sqrt{33}}{1056}$	$\frac{9\sqrt{77}}{1232}$
	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	$-\frac{\sqrt{165}}{528}$
	$-\frac{\sqrt{330}}{64}$	0	$-\frac{9\sqrt{33}}{352}$	0	$-\frac{5\sqrt{66}}{2112}$	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	$\frac{\sqrt{385}}{2464}$

$$\frac{\sqrt{210}xy(x^4+2x^2y^2-16x^2z^2+y^4-16y^2z^2+16z^4)}{16}$$

856 symmetry

continued ...

Table 10

No.	multipole	matrix
$\mathbb{Q}_{6,2}^{(a)}(T_g, 3)$	0 0 0 0 0 0 0 0 0 $\frac{\sqrt{66}i}{66}$ 0 0 0 0	
	0 0 0 0 0 0 $\frac{\sqrt{462}i}{462}$ 0 0 0 $-\frac{\sqrt{330}i}{66}$ 0 0 0	
	0 0 0 0 0 0 0 $-\frac{\sqrt{33}i}{33}$ 0 0 0 $\frac{\sqrt{11}i}{11}$ 0 0 0	
	0 0 0 0 0 0 0 0 $\frac{\sqrt{11}i}{11}$ 0 0 0 $-\frac{\sqrt{33}i}{33}$ 0	
	0 0 0 0 0 0 0 0 0 $-\frac{\sqrt{330}i}{66}$ 0 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 0	
	0 $-\frac{\sqrt{462}i}{462}$ 0 0 0 0 0 0 $\frac{\sqrt{1155}i}{462}$ 0 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 0 0 $-\frac{\sqrt{11}i}{11}$ 0 0 0 $-\frac{\sqrt{1155}i}{462}$ 0 0 0 $\frac{\sqrt{33}i}{66}$ 0 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 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 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 0 0 $-\frac{\sqrt{462}i}{462}$ 0 0 0 0 0 0 $-\frac{\sqrt{1155}i}{462}$ 0 0 0	
857	symmetry	$-\frac{x^2}{2} - \frac{y^2}{2} + z^2$

continued ...

Table 10

No.	multipole	matrix													
$\mathbb{Q}_{2,0}^{(1,-1;a)}(E_g)$	$-\frac{5\sqrt{21}}{147}$	0	0	0	0	0	0	$-\frac{15\sqrt{14}}{196}$	0	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	0	$\frac{4\sqrt{21}}{147}$	0	0	0	0	0	0	$-\frac{3\sqrt{7}}{98}$	0	0	0	0	0
	0	0	0	$\frac{4\sqrt{21}}{147}$	0	0	0	0	0	$\frac{3\sqrt{7}}{98}$	0	0	0	0	0
	0	0	0	0	$\frac{\sqrt{21}}{147}$	0	0	0	0	0	$\frac{3\sqrt{210}}{196}$	0	0	0	0
	0	0	0	0	0	$-\frac{5\sqrt{21}}{147}$	0	0	0	0	0	$\frac{15\sqrt{14}}{196}$	0	0	0
	0	0	0	0	0	0	$\frac{\sqrt{21}}{14}$	0	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	$-\frac{3\sqrt{210}}{196}$	0	0	0	0	0	0	$-\frac{3\sqrt{21}}{98}$	0	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	0	$\frac{3\sqrt{7}}{98}$	0	0	0	0	0	0	$-\frac{5\sqrt{21}}{98}$	0	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	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	0	$\frac{\sqrt{21}}{14}$	0
858	symmetry	$\frac{\sqrt{3}(x-y)(x+y)}{2}$													

continued ...

Table 10

No.	multipole	matrix												
$\mathbb{Q}_{2,1}^{(1,-1;a)}(E_g)$	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	$\frac{\sqrt{42}}{49}$	0	0	0	$-\frac{\sqrt{30}}{28}$	
	0	0	0	$-\frac{\sqrt{70}}{98}$	0	0	0	0	0	$\frac{\sqrt{210}}{196}$	0	0	0	
	0	$\frac{\sqrt{30}}{28}$	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	$\frac{3\sqrt{35}}{98}$	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	
	$-\frac{\sqrt{210}}{196}$	0	0	0	$\frac{\sqrt{42}}{49}$	0	0	$\frac{3\sqrt{35}}{98}$	0	0	0	$\frac{\sqrt{105}}{49}$	0	
	0	$-\frac{\sqrt{42}}{49}$	0	0	0	$\frac{\sqrt{210}}{196}$	0	0	$\frac{\sqrt{105}}{49}$	0	0	0	$\frac{3\sqrt{35}}{98}$	
	0	0	$-\frac{3\sqrt{35}}{98}$	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	$\frac{3\sqrt{35}}{98}$	0	0	0	
	0	0	0	0	$-\frac{\sqrt{30}}{28}$	0	0	0	0	0	$\frac{\sqrt{3}}{14}$	0	0	

859 symmetry

 $\sqrt{3}yz$

continued ...

Table 10

No.	multipole	matrix
$\mathbb{Q}_{2,0}^{(1,-1;a)}(T_g)$	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 0
	$-\frac{\sqrt{35}i}{49}$	0 $\frac{\sqrt{14}i}{49}$ 0 0 0 0 0 $\frac{\sqrt{210}i}{392}$ 0 $\frac{11\sqrt{42}i}{392}$ 0 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 0 0 $-\frac{\sqrt{14}i}{49}$ 0 0 0 $-\frac{\sqrt{21}i}{28}$ 0 $\frac{3\sqrt{35}i}{196}$ 0 0
	0	0 0 0 $\frac{\sqrt{14}i}{49}$ 0 $-\frac{\sqrt{35}i}{49}$ 0 0 0 $-\frac{11\sqrt{42}i}{392}$ 0 $-\frac{\sqrt{210}i}{392}$ 0
	0	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 0 $-\frac{3i}{14}$ 0 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 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
	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	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 0 0 $-\frac{3\sqrt{35}i}{196}$ 0 $\frac{15\sqrt{14}i}{392}$ 0 0 0 $-\frac{\sqrt{105}i}{98}$ 0 $\frac{2\sqrt{21}i}{49}$ 0
	0	0 0 0 0 $\frac{\sqrt{210}i}{392}$ 0 0 0 0 0 $-\frac{2\sqrt{21}i}{49}$ 0 $\frac{3i}{14}$
	0	0 0 0 0 0 $\frac{5\sqrt{6}i}{56}$ 0 0 0 0 0 $-\frac{3i}{14}$ 0
860 symmetry		$\sqrt{3}xz$

continued ...

Table 10

No.	multipole	matrix
$\mathbb{Q}_{2,1}^{(1,-1;a)}(T_g)$	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 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 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 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 0 $\frac{\sqrt{35}}{49}$ 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 0 $\frac{3}{14}$ 0 0 0 0 0 0
	0	$\frac{\sqrt{210}}{392}$ 0 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 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 0 $-\frac{\sqrt{21}}{28}$ 0 $-\frac{11\sqrt{42}}{392}$ 0 0 0 0 0 $-\frac{\sqrt{105}}{98}$ 0 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 0 $\frac{\sqrt{210}}{392}$ 0 0 0 0 0 $-\frac{2\sqrt{21}}{49}$ 0 $-\frac{3}{14}$ 0
861 symmetry		$\sqrt{3}xy$

continued ...

Table 10

No.	multipole	matrix
$\mathbb{Q}_{2,2}^{(1,-1;a)}(T_g)$	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 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	
	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 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 0 $-\frac{\sqrt{70}i}{98}$ 0 0 0 0 0 0 $\frac{\sqrt{210}i}{196}$ 0 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 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 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 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	
	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 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 0 $-\frac{\sqrt{30}i}{28}$ 0 0 0 0 0 0 0 $\frac{\sqrt{3}i}{14}$ 0 0 0	
862	symmetry	$\frac{\sqrt{21}(x^4 - 3x^2y^2 - 3x^2z^2 + y^4 - 3y^2z^2 + z^4)}{6}$

continued ...

Table 10

No.	multipole	matrix
$\mathbb{Q}_4^{(1,-1;a)}(A_g)$	$\frac{1}{42} 0 0 0 \frac{\sqrt{5}}{42} 0 0 \frac{5\sqrt{6}}{84} 0 0 0 \frac{5\sqrt{2}}{84} 0 0$	
	$0 -\frac{1}{14} 0 0 0 \frac{\sqrt{5}}{42} 0 0 -\frac{\sqrt{10}}{21} 0 0 0 \frac{\sqrt{30}}{42} 0$	
	$0 0 \frac{1}{21} 0 0 0 0 0 0 -\frac{5\sqrt{3}}{84} 0 0 0 \frac{\sqrt{105}}{84}$	
	$0 0 0 \frac{1}{21} 0 0 -\frac{\sqrt{105}}{84} 0 0 0 \frac{5\sqrt{3}}{84} 0 0 0$	
	$\frac{\sqrt{5}}{42} 0 0 0 -\frac{1}{14} 0 0 -\frac{\sqrt{30}}{42} 0 0 0 \frac{\sqrt{10}}{21} 0 0$	
	$0 \frac{\sqrt{5}}{42} 0 0 0 \frac{1}{42} 0 0 -\frac{5\sqrt{2}}{84} 0 0 0 -\frac{5\sqrt{6}}{84} 0$	
	$0 0 0 -\frac{\sqrt{105}}{84} 0 0 -\frac{1}{6} 0 0 0 -\frac{\sqrt{35}}{42} 0 0 0$	
	$\frac{5\sqrt{6}}{84} 0 0 0 -\frac{\sqrt{30}}{42} 0 0 \frac{13}{42} 0 0 0 -\frac{5\sqrt{3}}{42} 0 0$	
	$0 -\frac{\sqrt{10}}{21} 0 0 0 -\frac{5\sqrt{2}}{84} 0 0 \frac{1}{14} 0 0 0 -\frac{5\sqrt{3}}{42} 0$	
	$0 0 -\frac{5\sqrt{3}}{84} 0 0 0 0 0 -\frac{3}{14} 0 0 0 -\frac{\sqrt{35}}{42} 0$	
	$0 0 0 \frac{5\sqrt{3}}{84} 0 0 -\frac{\sqrt{35}}{42} 0 0 0 -\frac{3}{14} 0 0 0$	
	$\frac{5\sqrt{2}}{84} 0 0 0 \frac{\sqrt{10}}{21} 0 0 -\frac{5\sqrt{3}}{42} 0 0 0 \frac{1}{14} 0 0$	
	$0 \frac{\sqrt{30}}{42} 0 0 0 -\frac{5\sqrt{6}}{84} 0 0 -\frac{5\sqrt{3}}{42} 0 0 0 \frac{13}{42} 0$	
	$0 0 \frac{\sqrt{105}}{84} 0 0 0 0 0 0 -\frac{\sqrt{35}}{42} 0 0 0 -\frac{1}{6}$	
863	symmetry	$-\frac{\sqrt{15}(x^4 - 12x^2y^2 + 6x^2z^2 + y^4 + 6y^2z^2 - 2z^4)}{12}$

continued ...

Table 10

No.	multipole	matrix													
$\mathbb{Q}_{4,0}^{(1,-1;a)}(E_g)$	$\frac{\sqrt{35}}{294}$	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	$-\frac{3\sqrt{35}}{98}$	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	$\frac{1}{6}$	0	0	0	$-\frac{\sqrt{35}}{42}$		
864	symmetry	$\frac{\sqrt{5}(x-y)(x+y)(x^2+y^2-6z^2)}{4}$													

continued ...

Table 10

No.	multipole	matrix													
$\mathbb{Q}_{4,1}^{(1,-1;a)}(E_g)$	0	0	$-\frac{\sqrt{42}}{98}$	0	0	0	0	0	0	$-\frac{5\sqrt{14}}{98}$	0	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	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
	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	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	0	$-\frac{\sqrt{42}}{98}$	0	0	0	0	0	0	$\frac{5\sqrt{14}}{98}$	0	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	0	$-\frac{9\sqrt{7}}{196}$	0	0	0	0	0	0	$\frac{\sqrt{21}}{147}$	0	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	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
	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	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	0	$\frac{9\sqrt{7}}{196}$	0	0	0	0	0	0	$\frac{\sqrt{21}}{147}$	0	0	0	0
	0	0	0	0	$-\frac{3\sqrt{2}}{28}$	0	0	0	0	0	0	$\frac{\sqrt{5}}{7}$	0	0	0
865	symmetry	$\frac{\sqrt{35}yz(y-z)(y+z)}{2}$													

continued ...

Table 10

No.	multipole	matrix													
$\mathbb{Q}_{4,0}^{(1,-1;a)}(T_g, 1)$	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	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
	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	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	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	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	$-\frac{\sqrt{70}i}{112}$	0
	$-\frac{\sqrt{70}i}{112}$	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
	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	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
	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	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
	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	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	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	0

866 symmetry

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

continued ...

Table 10

No.	multipole	matrix
$\mathbb{Q}_{4,1}^{(1,-1;a)}(T_g, 1)$	0	$\frac{\sqrt{3}}{42} \quad 0 \quad -\frac{\sqrt{6}}{84} \quad 0 \quad 0 \quad -\frac{\sqrt{70}}{112} \quad 0 \quad \frac{5\sqrt{30}}{168} \quad 0 \quad -\frac{5\sqrt{2}}{112} \quad 0 \quad 0 \quad 0 \quad 0$
	$\frac{\sqrt{3}}{42}$	$0 \quad -\frac{\sqrt{30}}{84} \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{13\sqrt{2}}{112} \quad 0 \quad -\frac{\sqrt{10}}{56} \quad 0 \quad -\frac{\sqrt{6}}{48} \quad 0 \quad 0 \quad 0$
	0	$-\frac{\sqrt{30}}{84} \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{6}}{84} \quad \frac{3\sqrt{7}}{112} \quad 0 \quad -\frac{\sqrt{3}}{336} \quad 0 \quad -\frac{\sqrt{5}}{16} \quad 0 \quad \frac{1}{112} \quad 0 \quad 0$
	$-\frac{\sqrt{6}}{84}$	$0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{30}}{84} \quad 0 \quad 0 \quad \frac{1}{112} \quad 0 \quad -\frac{\sqrt{5}}{16} \quad 0 \quad -\frac{\sqrt{3}}{336} \quad 0 \quad \frac{3\sqrt{7}}{112}$
	0	$0 \quad 0 \quad 0 \quad \frac{\sqrt{30}}{84} \quad 0 \quad -\frac{\sqrt{3}}{42} \quad 0 \quad 0 \quad -\frac{\sqrt{6}}{48} \quad 0 \quad -\frac{\sqrt{10}}{56} \quad 0 \quad \frac{13\sqrt{2}}{112} \quad 0$
	0	$0 \quad 0 \quad \frac{\sqrt{6}}{84} \quad 0 \quad -\frac{\sqrt{3}}{42} \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{5\sqrt{2}}{112} \quad 0 \quad \frac{5\sqrt{30}}{168} \quad 0 \quad -\frac{\sqrt{70}}{112}$
	$-\frac{\sqrt{70}}{112}$	$0 \quad \frac{3\sqrt{7}}{112} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{105}}{42} \quad 0 \quad \frac{\sqrt{21}}{42} \quad 0 \quad 0 \quad 0 \quad 0$
	0	$\frac{13\sqrt{2}}{112} \quad 0 \quad \frac{1}{112} \quad 0 \quad 0 \quad -\frac{\sqrt{105}}{42} \quad 0 \quad \frac{\sqrt{5}}{14} \quad 0 \quad \frac{\sqrt{3}}{21} \quad 0 \quad 0 \quad 0 \quad 0$
	$\frac{5\sqrt{30}}{168}$	$0 \quad -\frac{\sqrt{3}}{336} \quad 0 \quad -\frac{\sqrt{6}}{48} \quad 0 \quad 0 \quad \frac{\sqrt{5}}{14} \quad 0 \quad \frac{3}{14} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0$
	0	$-\frac{\sqrt{10}}{56} \quad 0 \quad -\frac{\sqrt{5}}{16} \quad 0 \quad -\frac{5\sqrt{2}}{112} \quad \frac{\sqrt{21}}{42} \quad 0 \quad \frac{3}{14} \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{3}}{21} \quad 0 \quad 0$
	$-\frac{5\sqrt{2}}{112}$	$0 \quad -\frac{\sqrt{5}}{16} \quad 0 \quad -\frac{\sqrt{10}}{56} \quad 0 \quad 0 \quad \frac{\sqrt{3}}{21} \quad 0 \quad 0 \quad 0 \quad -\frac{3}{14} \quad 0 \quad -\frac{\sqrt{21}}{42} \quad 0$
	0	$-\frac{\sqrt{6}}{48} \quad 0 \quad -\frac{\sqrt{3}}{336} \quad 0 \quad \frac{5\sqrt{30}}{168} \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{3}{14} \quad 0 \quad -\frac{\sqrt{5}}{14} \quad 0 \quad 0$
	0	$0 \quad 0 \quad \frac{1}{112} \quad 0 \quad \frac{13\sqrt{2}}{112} \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{3}}{21} \quad 0 \quad -\frac{\sqrt{5}}{14} \quad 0 \quad \frac{\sqrt{105}}{42}$
	0	$0 \quad 0 \quad 0 \quad \frac{3\sqrt{7}}{112} \quad 0 \quad -\frac{\sqrt{70}}{112} \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{21}}{42} \quad 0 \quad \frac{\sqrt{105}}{42} \quad 0 \quad 0$

867 symmetry

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

continued ...

Table 10

No.	multipole	matrix													
$\mathbb{Q}_{4,2}^{(1,-1;a)}(T_g, 1)$	0	0	0	0	$-\frac{\sqrt{3}i}{21}$	0	0	0	0	0	$-\frac{\sqrt{30}i}{42}$	0	0	0	
	0	0	0	0	0	$-\frac{\sqrt{3}i}{21}$	0	0	0	0	0	$-\frac{\sqrt{2}i}{7}$	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	$-\frac{\sqrt{7}i}{14}$	0	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	$\frac{\sqrt{3}i}{21}$	0	0	0	0	0	0	$-\frac{\sqrt{30}i}{42}$	0	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	0	$\frac{\sqrt{2}i}{7}$	0	0	0	0	0	0	$\frac{\sqrt{5}i}{7}$	0	0	0
	0	0	0	0	0	$\frac{\sqrt{30}i}{42}$	0	0	0	0	0	$\frac{\sqrt{5}i}{7}$	0	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	0	0	$-\frac{\sqrt{21}i}{21}$	0	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	$\frac{\sqrt{2}i}{7}$	0	0	0	0	0	0	$-\frac{\sqrt{5}i}{7}$	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
868	symmetry	$\frac{\sqrt{5}yz(6x^2-y^2-z^2)}{2}$													

continued ...

Table 10

No.	multipole	matrix													
$\mathbb{Q}_{4,0}^{(1,-1;a)}(T_g, 2)$	0	$\frac{\sqrt{21}i}{294}$	0	$-\frac{\sqrt{42}i}{84}$	0	0	$\frac{\sqrt{10}i}{112}$	0	$\frac{5\sqrt{210}i}{1176}$	0	$-\frac{5\sqrt{14}i}{112}$	0	0	0	0
	$-\frac{\sqrt{21}i}{294}$	0	$-\frac{\sqrt{210}i}{588}$	0	0	0	0	$-\frac{13\sqrt{14}i}{784}$	0	$-\frac{\sqrt{70}i}{392}$	0	$-\frac{\sqrt{42}i}{48}$	0	0	0
	0	$\frac{\sqrt{210}i}{588}$	0	0	0	$\frac{\sqrt{42}i}{84}$	$-\frac{3i}{16}$	0	$\frac{\sqrt{21}i}{2352}$	0	$-\frac{\sqrt{35}i}{112}$	0	$\frac{\sqrt{7}i}{112}$	0	0
	$\frac{\sqrt{42}i}{84}$	0	0	0	$\frac{\sqrt{210}i}{588}$	0	0	$-\frac{\sqrt{7}i}{112}$	0	$\frac{\sqrt{35}i}{112}$	0	$-\frac{\sqrt{21}i}{2352}$	0	$\frac{3i}{16}$	0
	0	0	0	$-\frac{\sqrt{210}i}{588}$	0	$-\frac{\sqrt{21}i}{294}$	0	0	$\frac{\sqrt{42}i}{48}$	0	$\frac{\sqrt{70}i}{392}$	0	$\frac{13\sqrt{14}i}{784}$	0	0
	0	0	$-\frac{\sqrt{42}i}{84}$	0	$\frac{\sqrt{21}i}{294}$	0	0	0	$\frac{5\sqrt{14}i}{112}$	0	$-\frac{5\sqrt{210}i}{1176}$	0	$-\frac{\sqrt{10}i}{112}$	0	0
	$-\frac{\sqrt{10}i}{112}$	0	$\frac{3i}{16}$	0	0	0	0	$-\frac{\sqrt{15}i}{42}$	0	$\frac{\sqrt{3}i}{6}$	0	0	0	0	0
	0	$\frac{13\sqrt{14}i}{784}$	0	$\frac{\sqrt{7}i}{112}$	0	0	$\frac{\sqrt{15}i}{42}$	0	$\frac{\sqrt{35}i}{98}$	0	$\frac{\sqrt{21}i}{21}$	0	0	0	0
	$-\frac{5\sqrt{210}i}{1176}$	0	$-\frac{\sqrt{21}i}{2352}$	0	$-\frac{\sqrt{42}i}{48}$	0	0	$-\frac{\sqrt{35}i}{98}$	0	$\frac{3\sqrt{7}i}{98}$	0	0	0	0	0
	0	$\frac{\sqrt{70}i}{392}$	0	$-\frac{\sqrt{35}i}{112}$	0	$-\frac{5\sqrt{14}i}{112}$	$-\frac{\sqrt{3}i}{6}$	0	$-\frac{3\sqrt{7}i}{98}$	0	0	0	$-\frac{\sqrt{21}i}{21}$	0	0
	$\frac{5\sqrt{14}i}{112}$	0	$\frac{\sqrt{35}i}{112}$	0	$-\frac{\sqrt{70}i}{392}$	0	0	$-\frac{\sqrt{21}i}{21}$	0	0	0	$-\frac{3\sqrt{7}i}{98}$	0	$-\frac{\sqrt{3}i}{6}$	0
	0	$\frac{\sqrt{42}i}{48}$	0	$\frac{\sqrt{21}i}{2352}$	0	$\frac{5\sqrt{210}i}{1176}$	0	0	0	0	$\frac{3\sqrt{7}i}{98}$	0	$-\frac{\sqrt{35}i}{98}$	0	0
	0	0	$-\frac{\sqrt{7}i}{112}$	0	$-\frac{13\sqrt{14}i}{784}$	0	0	0	0	$\frac{\sqrt{21}i}{21}$	0	$\frac{\sqrt{35}i}{98}$	0	$\frac{\sqrt{15}i}{42}$	0
	0	0	0	$-\frac{3i}{16}$	0	$\frac{\sqrt{10}i}{112}$	0	0	0	0	$\frac{\sqrt{3}i}{6}$	0	$-\frac{\sqrt{15}i}{42}$	0	0

869 symmetry

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

continued ...

Table 10

No.	multipole	matrix													
$\mathbb{Q}_{4,1}^{(1,-1;a)}(T_g, 2)$	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	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
	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	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	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	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	$\frac{\sqrt{10}}{112}$	0
	$\frac{\sqrt{10}}{112}$	0	$\frac{3}{16}$	0	0	0	0	$\frac{\sqrt{15}}{42}$	0	$\frac{\sqrt{3}}{6}$	0	0	0	0	0
	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	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
	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	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
	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	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	0	$\frac{3}{16}$	0	$\frac{\sqrt{10}}{112}$	0	0	0	0	$-\frac{\sqrt{3}}{6}$	0	$-\frac{\sqrt{15}}{42}$	0	0

870 symmetry

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

continued ...

Table 10

No.	multipole	matrix													
$\mathbb{Q}_{4,2}^{(1,-1;a)}(T_g, 2)$	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														
	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 $-\frac{9\sqrt{7}i}{196}$ 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 $\frac{\sqrt{70}i}{196}$ 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 $\frac{4\sqrt{7}i}{49}$ 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 0 $-\frac{\sqrt{5}i}{7}$ 0 0														
871	symmetry	$\frac{\sqrt{2}(2x^6 - 15x^4y^2 - 15x^4z^2 - 15x^2y^4 + 180x^2y^2z^2 - 15x^2z^4 + 2y^6 - 15y^4z^2 - 15y^2z^4 + 2z^6)}{8}$													

continued ...

Table 10

No.	multipole	matrix
$\mathbb{Q}_6^{(1,-1;a)}(A_g, 1)$	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 $-\frac{5\sqrt{154}}{616}$ 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 $-\frac{3\sqrt{110}}{88}$ 0 0 0 $\frac{\sqrt{154}}{616}$	

872 symmetry

$$-\frac{\sqrt{2310}(x-y)(x+y)(x-z)(x+z)(y-z)(y+z)}{8}$$

continued ...

Table 10

No.	multipole	matrix
$\mathbb{Q}_6^{(1,-1;a)}(A_g, 2)$	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 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	
873	symmetry	$-\frac{\sqrt{14}(x^6 - 15x^4z^2 + 15x^2z^4 + y^6 - 15y^4z^2 + 15y^2z^4 - 2z^6)}{8}$

continued ...

Table 10

No.	multipole	matrix												
$\mathbb{Q}_{6,0}^{(1,-1;a)}(E_g)$	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	$\frac{3\sqrt{770}}{616}$	
	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	$\frac{3\sqrt{770}}{616}$	0	0	0	$\frac{\sqrt{22}}{88}$	
874	symmetry	$\frac{\sqrt{42}(x-y)(x+y)(x^4 - 9x^2y^2 - 5x^2z^2 + y^4 - 5y^2z^2 + 5z^4)}{8}$												

continued ...

Table 10

No.	multipole	matrix													
$\mathbb{Q}_{6,1}^{(1,-1;a)}(E_g)$	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	
	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	
875	symmetry	$\frac{3\sqrt{7}yz(y-z)(y+z)(10x^2-y^2-z^2)}{4}$													

continued ...

Table 10

No.	multipole	matrix													
$\mathbb{Q}_{6,0}^{(1,-1;a)}(T_g, 1)$	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	

876 symmetry

$$\frac{3\sqrt{7}xz(x-z)(x+z)(x^2-10y^2+z^2)}{4}$$

continued ...

Table 10

No.	multipole	matrix													
$\mathbb{Q}_{6,1}^{(1,-1;a)}(T_g, 1)$	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	$-\frac{3\sqrt{55}}{88}$	0	$-\frac{\sqrt{33}}{44}$	0	$\frac{3\sqrt{77}}{616}$	0	
	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	

877 symmetry

$$-\frac{3\sqrt{7}xy(x-y)(x+y)(x^2+y^2-10z^2)}{4}$$

continued ...

Table 10

No.	multipole	matrix												
$\mathbb{Q}_{6,2}^{(1,-1;a)}(T_g, 1)$	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 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 0 $\frac{\sqrt{1155}i}{462}$													
	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 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 0 $\frac{\sqrt{22}i}{44}$ 0													
	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 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 0 $-\frac{\sqrt{22}i}{44}$ 0													
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 $\frac{3\sqrt{385}i}{154}$ 0													
	$-\frac{\sqrt{22}i}{44}$ 0 0 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													
	0 0 $-\frac{\sqrt{1155}i}{462}$ 0 0 0 0 0 0 0 0 0 0 0 0 0													
878	symmetry	$\frac{\sqrt{462}yz(y^2-3z^2)(3y^2-z^2)}{16}$												

continued ...

Table 10

No.	multipole	matrix																									
$\mathbb{Q}_{6,0}^{(1,-1;a)}(T_g, 2)$	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 $\frac{\sqrt{30}i}{32}$ 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

879 symmetry

$$\frac{\sqrt{462}xz(x^2 - 3z^2)(3x^2 - z^2)}{16}$$

continued ...

Table 10

No.	multipole	matrix
$\mathbb{Q}_{6,1}^{(1,-1;a)}(T_g, 2)$	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	
$\frac{\sqrt{462}xy(x^2-3y^2)(3x^2-y^2)}{16}$		

880 symmetry

continued ...

Table 10

No.	multipole	matrix
		$\begin{pmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}i}{14} \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}i}{14} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}i}{14} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{42}i}{14} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{42}i}{14} \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{42}i}{14} & 0 & 0 & 0 & 0 & 0 & 0 \\ -\frac{\sqrt{7}i}{14} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{42}i}{14} & 0 & 0 & 0 & 0 & 0 \end{pmatrix}$
881	symmetry	$\frac{\sqrt{210}yz(16x^4 - 16x^2y^2 - 16x^2z^2 + y^4 + 2y^2z^2 + z^4)}{16}$

continued ...

Table 10

No.	multipole	matrix													
$\mathbb{Q}_{6,0}^{(1,-1;a)}(T_g, 3)$	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	$-\frac{\sqrt{385}i}{14784}$	
	$-\frac{\sqrt{385}i}{14784}$	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	

882 symmetry

$$\frac{\sqrt{210}xz(x^4 - 16x^2y^2 + 2x^2z^2 + 16y^4 - 16y^2z^2 + z^4)}{16}$$

continued ...

Table 10

No.	multipole	matrix
$\mathbb{Q}_{6,1}^{(1,-1;a)}(T_g, 3)$	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 $\frac{9\sqrt{66}}{352}$ 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	
883	symmetry	$\frac{\sqrt{210}xy(x^4+2x^2y^2-16x^2z^2+y^4-16y^2z^2+16z^4)}{16}$

continued ...

Table 10

No.	multipole	matrix
$\mathbb{Q}_{6,2}^{(1,-1;a)}(T_g, 3)$	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 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	
	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 0 $-\frac{\sqrt{66}i}{66}$ 0 0 $\frac{\sqrt{770}i}{154}$ 0 0 0 $-\frac{\sqrt{22}i}{22}$ 0 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	
	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 0 $-\frac{\sqrt{77}i}{462}$ 0 0 0 0 0 0 $\frac{\sqrt{770}i}{154}$ 0 0 0	

884 symmetry

1

continued ...

Table 10

No.	multipole	matrix
$\mathbb{Q}_0^{(1,1;a)}(A_g)$	$-\frac{\sqrt{42}}{21}$	0 0 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
	0	0 $-\frac{\sqrt{42}}{21}$ 0 0 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 0 0 $-\frac{\sqrt{42}}{21}$ 0 0 0 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 0 0 0 $-\frac{\sqrt{42}}{21}$ 0 0 0 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 0 0 0 $\frac{\sqrt{42}}{28}$ 0 0 0 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 0 0 0 $\frac{\sqrt{42}}{28}$ 0 0 0 0 0 0
	0	0 0 0 0 0 0 0 0 0 0 $\frac{\sqrt{42}}{28}$ 0 0 0 0 0
885	symmetry	$-\frac{x^2}{2} - \frac{y^2}{2} + z^2$

continued ...

Table 10

No.	multipole	matrix
$\mathbb{Q}_{2,0}^{(1,1;a)}(E_g)$	$\frac{15\sqrt{7}}{98}$	0 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 0 $-\frac{\sqrt{70}}{49}$ 0 0 0 0 0
	0	0 $-\frac{6\sqrt{7}}{49}$ 0 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 0 $\frac{2\sqrt{21}}{147}$ 0 0 0
	0	0 0 0 $-\frac{3\sqrt{7}}{98}$ 0 0 0 0 0 0 0 $\frac{\sqrt{70}}{49}$ 0 0
	0	0 0 0 0 0 $\frac{15\sqrt{7}}{98}$ 0 0 0 0 0 0 0 $\frac{5\sqrt{42}}{147}$ 0
	0	0 0 0 0 0 0 $-\frac{\sqrt{7}}{14}$ 0 0 0 0 0 0 0 0
	$-\frac{5\sqrt{42}}{147}$	0 0 0 0 0 0 0 $-\frac{\sqrt{7}}{98}$ 0 0 0 0 0 0 0
	0	$-\frac{\sqrt{70}}{49}$ 0 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 0 $\frac{5\sqrt{7}}{98}$ 0 0 0 0
	0	0 0 0 $\frac{2\sqrt{21}}{147}$ 0 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 0 $\frac{3\sqrt{7}}{98}$ 0 0
	0	0 0 0 0 0 $\frac{5\sqrt{42}}{147}$ 0 0 0 0 0 0 0 $-\frac{\sqrt{7}}{98}$ 0
	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													
$\mathbb{Q}_{2,1}^{(1,1;a)}(E_g)$	0	0	$\frac{3\sqrt{210}}{196}$	0	0	0	0	0	$-\frac{\sqrt{70}}{147}$	0	0	0	0	0	0
	0	0	0	$\frac{9\sqrt{42}}{196}$	0	0	$\frac{\sqrt{10}}{21}$	0	0	$-\frac{4\sqrt{14}}{147}$	0	0	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	$-\frac{2\sqrt{105}}{147}$	0	0	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	0	$\frac{9\sqrt{42}}{196}$	0	0	0	0	0	$\frac{4\sqrt{14}}{147}$	0	0	0	0	$-\frac{\sqrt{10}}{21}$	0
	0	0	0	$\frac{3\sqrt{210}}{196}$	0	0	0	0	0	$\frac{\sqrt{70}}{147}$	0	0	0	0	0
	0	$\frac{\sqrt{10}}{21}$	0	0	0	0	0	0	$-\frac{1}{14}$	0	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	0	$\frac{2\sqrt{105}}{147}$	0	0	$-\frac{1}{14}$	0	0	0	$-\frac{\sqrt{35}}{49}$	0	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
	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	0	$-\frac{2\sqrt{105}}{147}$	0	0	0	0	0	$-\frac{\sqrt{35}}{49}$	0	0	0	$-\frac{1}{14}$	0	0
	0	0	0	$-\frac{4\sqrt{35}}{147}$	0	0	0	0	0	$-\frac{\sqrt{105}}{98}$	0	0	0	0	0
	0	0	0	0	$-\frac{\sqrt{10}}{21}$	0	0	0	0	0	$-\frac{1}{14}$	0	0	0	0
887	symmetry	$\sqrt{3}yz$													

continued ...

Table 10

No.	multipole	matrix
$\mathbb{Q}_{2,0}^{(1,1;a)}(T_g)$	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 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 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 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
	$-\frac{5\sqrt{2}i}{42}$	0 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 0 $-\frac{2\sqrt{7}i}{49}$ 0 $\frac{\sqrt{35}i}{98}$ 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 0 $-\frac{\sqrt{7}i}{21}$ 0 $\frac{11\sqrt{14}i}{294}$ 0 0 0 0 0 $-\frac{\sqrt{35}i}{98}$ 0 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 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 0 0 $\frac{5\sqrt{2}i}{42}$ 0 0 0 0 0 0 $\frac{\sqrt{3}i}{14}$ 0

888 symmetry

 $\sqrt{3}xz$

continued ...

Table 10

No.	multipole	matrix														
$\mathbb{Q}_{2,1}^{(1,1;a)}(T_g)$	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	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	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	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	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	0	0	$-\frac{3\sqrt{105}}{98}$	0	0	0	0	0	$-\frac{5\sqrt{42}}{294}$	0	$\frac{5\sqrt{2}}{42}$	0	0	0
	$\frac{5\sqrt{2}}{42}$	0	0	0	0	0	0	$-\frac{\sqrt{3}}{14}$	0	0	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	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	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
	0	0	$-\frac{\sqrt{7}}{21}$	0	$-\frac{11\sqrt{14}}{294}$	0	0	0	0	0	$\frac{\sqrt{35}}{98}$	0	0	0	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	0	0	$\frac{\sqrt{70}}{294}$	0	0	0	0	0	$\frac{2\sqrt{7}}{49}$	0	$\frac{\sqrt{3}}{14}$	0	0	0
	0	0	0	0	0	$\frac{5\sqrt{2}}{42}$	0	0	0	0	0	0	$\frac{\sqrt{3}}{14}$	0	0	0
889	symmetry	$\sqrt{3}xy$														

continued ...

Table 10

No.	multipole	matrix													
$\mathbb{Q}_{2,2}^{(1,1;a)}(T_g)$	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 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														
	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														
	0 $-\frac{\sqrt{10}i}{21}$ 0 0 0 0 0 0 0 $\frac{i}{14}$ 0 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 0 0 $-\frac{2\sqrt{105}i}{147}$ 0 0 $-\frac{i}{14}$ 0 0 0 $\frac{\sqrt{35}i}{49}$ 0 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														
	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														
	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														
	0 0 0 $-\frac{4\sqrt{35}i}{147}$ 0 0 0 0 0 0 0 $-\frac{\sqrt{105}i}{98}$ 0 0 0 0														
	0 0 0 0 $-\frac{\sqrt{10}i}{21}$ 0 0 0 0 0 0 0 $-\frac{i}{14}$ 0 0 0														
$\frac{\sqrt{21}(x^4 - 3x^2y^2 - 3x^2z^2 + y^4 - 3y^2z^2 + z^4)}{6}$															

continued ...

Table 10

No.	multipole	matrix												
$\mathbb{Q}_4^{(1,1;a)}(A_g)$	$-\frac{\sqrt{110}}{84}$	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	$\frac{3\sqrt{110}}{616}$	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	$\frac{5\sqrt{154}}{1848}$	0	0	0	$\frac{\sqrt{110}}{264}$	
891	symmetry	$\frac{\sqrt{15}(x^4 - 12x^2y^2 + 6x^2z^2 + y^4 + 6y^2z^2 - 2z^4)}{12}$												

continued ...

Table 10

No.	multipole	matrix													
$\mathbb{Q}_{4,0}^{(1,1;a)}(E_g)$	$-\frac{5\sqrt{154}}{588}$	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	$-\frac{5\sqrt{462}}{1617}$	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	$\frac{15\sqrt{154}}{4312}$	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	$-\frac{\sqrt{110}}{264}$	0	0	0	$\frac{5\sqrt{154}}{1848}$		
892	symmetry	$\frac{\sqrt{5}(x-y)(x+y)(x^2+y^2-6z^2)}{4}$													

continued ...

Table 10

No.	multipole	matrix													
$\mathbb{Q}_{4,1}^{(1,1;a)}(E_g)$	0	0	$\frac{\sqrt{1155}}{98}$	0	0	0	0	0	0	$-\frac{4\sqrt{385}}{539}$	0	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	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
	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	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	0	$\frac{\sqrt{1155}}{98}$	0	0	0	0	0	$\frac{4\sqrt{385}}{539}$	0	0	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	0	$-\frac{9\sqrt{770}}{2695}$	0	0	0	0	0	0	$-\frac{\sqrt{2310}}{6468}$	0	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	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
	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	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	0	$\frac{9\sqrt{770}}{2695}$	0	0	0	0	0	0	$-\frac{\sqrt{2310}}{6468}$	0	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	0

893 symmetry

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

continued ...

Table 10

No.	multipole	matrix
$\mathbb{Q}_{4,0}^{(1,1;a)}(T_g, 1)$	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 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 0 $-\frac{\sqrt{165}i}{84}$ 0 $-\frac{\sqrt{330}i}{84}$ 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 $-\frac{3\sqrt{110}i}{616}$ 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 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

894 symmetry

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

continued ...

Table 10

No.	multipole	matrix														
$\mathbb{Q}_{4,1}^{(1,1;a)}(T_g, 1)$	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	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	
	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	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	
	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	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	
	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		
895	symmetry	$\frac{\sqrt{35}xy(x-y)(x+y)}{2}$														

continued ...

Table 10

No.	multipole	matrix												
$\mathbb{Q}_{4,2}^{(1,1;a)}(T_g, 1)$	0	0	0	0	$\frac{\sqrt{330}i}{42}$	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	$-\frac{8\sqrt{55}i}{385}$	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	$-\frac{\sqrt{2310}i}{924}$	0	0	0	
	0	0	0	0	$\frac{8\sqrt{55}i}{385}$	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	$-\frac{5\sqrt{22}i}{308}$	0	
	0	0	0	0	0	0	0	0	0	0	0	0	$-\frac{\sqrt{2310}i}{924}$	
	$\frac{4\sqrt{33}i}{231}$	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
896	symmetry	$\frac{\sqrt{5yz}(6x^2 - y^2 - z^2)}{2}$												

continued ...

Table 10

No.	multipole	matrix														
$\mathbb{Q}_{4,0}^{(1,1;a)}(T_g, 2)$	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	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	
	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	$\frac{\sqrt{770}i}{1540}$	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	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
	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	$-\frac{\sqrt{11}i}{154}$	0	
	$-\frac{\sqrt{11}i}{154}$	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	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	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	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	0	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	0
	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
	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	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	0	0

897 symmetry

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

continued ...

Table 10

No.	multipole	matrix														
$\mathbb{Q}_{4,1}^{(1,1;a)}(T_g, 2)$	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	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	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	$\frac{\sqrt{770}}{1540}$	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	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
	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	$\frac{\sqrt{11}}{154}$	0	0
	$\frac{\sqrt{11}}{154}$	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	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	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	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	0	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	0
	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	$\frac{5\sqrt{66}}{1848}$	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	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	0	0

898 symmetry

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

continued ...

Table 10

No.	multipole	matrix													
$\mathbb{Q}_{4,2}^{(1,1;a)}(T_g, 2)$	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	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	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
	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	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	0	$-\frac{\sqrt{1155}i}{98}$	0	0	0	0	0	$-\frac{4\sqrt{385}i}{539}$	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	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	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	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
	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	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	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	0	$\frac{6\sqrt{55}i}{385}$	0	0	0	0	0	0	$\frac{5\sqrt{22}i}{308}$	0	0	0

899 symmetry

x

continued ...

Table 10

No.	multipole	matrix
$\mathbb{G}_{1,0}^{(1,0;a)}(T_g)$	0	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 0 $\frac{\sqrt{210}i}{56}$ 0 $-\frac{\sqrt{42}i}{56}$ 0 0 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 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 0 0 0 $\frac{\sqrt{42}i}{56}$ 0 $-\frac{\sqrt{210}i}{56}$ 0
	0	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 0 0
	0	$-\frac{\sqrt{210}i}{56}$ 0 0 0 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 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 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
	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 0 0 0 $\frac{\sqrt{210}i}{56}$ 0 0 0 0 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 0 0 0

900 symmetry

y

continued ...

Table 10

No.	multipole	matrix													
$\mathbb{G}_{1,1}^{(1,0;a)}(T_g)$	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	0	$-\frac{\sqrt{210}}{56}$	0	$-\frac{\sqrt{42}}{56}$	0	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	0	$-\frac{\sqrt{21}}{28}$	0	$-\frac{\sqrt{35}}{28}$	0	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	$-\frac{\sqrt{6}}{8}$	0	0
	$-\frac{\sqrt{6}}{8}$	0	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	0
	$-\frac{\sqrt{14}}{56}$	0	$-\frac{\sqrt{35}}{28}$	0	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	0	$-\frac{\sqrt{21}}{28}$	0	$-\frac{\sqrt{42}}{56}$	0	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	0	$-\frac{\sqrt{210}}{56}$	0	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	0

901 symmetry

z

continued ...

Table 10

No.	multipole	matrix
$\mathbb{G}_{1,2}^{(1,0;a)}(T_g)$	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 $-\frac{\sqrt{70}i}{28}$ 0 0 0 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 0 0 0 $-\frac{\sqrt{21}i}{14}$ 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 0 0 0 0 0 0 0 0 0 0 $-\frac{\sqrt{42}i}{28}$ 0 0
	$\frac{\sqrt{42}i}{28}$	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 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 0
	0	0 0 0 $\frac{\sqrt{21}i}{14}$ 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 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 0 0 0 0 0 0 0 0

902 symmetry

 $\sqrt{15}xyz$

continued ...

Table 10

No.	multipole	matrix
$\mathbb{G}_3^{(1,0;a)}(A_g)$	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 0 0 $\frac{1}{12}$ 0 0 0 $\frac{\sqrt{3}}{12}$ 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 0 0 0 $-\frac{\sqrt{3}}{12}$ 0 0 0 $-\frac{1}{12}$ 0 0 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 0 0 $-\frac{\sqrt{2}}{6}$ 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 $-\frac{\sqrt{2}}{6}$ 0 0 0 0
	0 $\frac{\sqrt{14}}{12}$ 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
	0 0 $\frac{1}{12}$ 0 0 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 0 0 0
	$\frac{\sqrt{2}}{6}$ 0 0 0 $-\frac{\sqrt{10}}{12}$ 0 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 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 0 $\frac{\sqrt{3}}{12}$ 0 0 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 0 0 0 $-\frac{\sqrt{14}}{12}$ 0 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 0 0 0	
		$\frac{x(2x^2 - 3y^2 - 3z^2)}{2}$
903	symmetry	

continued ...

Table 10

No.	multipole	matrix												
$\mathbb{G}_{3,0}^{(1,0;a)}(T_g, 1)$	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
904	symmetry	$-\frac{y(3x^2 - 2y^2 + 3z^2)}{2}$												

continued ...

Table 10

No.	multipole	matrix											
$\mathbb{G}_{3,1}^{(1,0;a)}(T_g, 1)$	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	$\frac{\sqrt{30}}{48}$	0	$-\frac{\sqrt{6}}{24}$	0	$-\frac{\sqrt{10}}{16}$	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	$-\frac{\sqrt{15}}{16}$	0	$\frac{\sqrt{3}}{48}$	0	$\frac{\sqrt{5}}{16}$	$-\frac{\sqrt{105}}{48}$
	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	$-\frac{\sqrt{30}}{48}$	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	$\frac{\sqrt{30}}{48}$	0	$-\frac{\sqrt{15}}{16}$	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	$-\frac{\sqrt{6}}{24}$	0	$\frac{\sqrt{3}}{48}$	0	$-\frac{\sqrt{30}}{48}$	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	$-\frac{\sqrt{10}}{16}$	0	$\frac{\sqrt{5}}{16}$	0	$-\frac{\sqrt{2}}{8}$	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	$-\frac{\sqrt{105}}{48}$	0	$-\frac{\sqrt{42}}{48}$	0	0	0	0	0	0	0
905	symmetry	$-\frac{z(3x^2+3y^2-2z^2)}{2}$											

continued ...

Table 10

No.	multipole	matrix
$\mathbb{G}_{3,2}^{(1,0;a)}(T_g, 1)$		$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}i}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{6} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{6} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}i}{6} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ -\frac{\sqrt{6}i}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{3}i}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{3}i}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
906	symmetry	$\frac{\sqrt{15}x(y-z)(y+z)}{2}$

continued ...

Table 10

No.	multipole	matrix													
$\mathbb{G}_{3,0}^{(1,0;a)}(T_g, 2)$	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	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	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	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	0	$\frac{\sqrt{2}i}{16}$	0	$\frac{\sqrt{30}i}{24}$	0	$-\frac{\sqrt{70}i}{48}$	0	0
	$-\frac{\sqrt{70}i}{48}$	0	$-\frac{\sqrt{7}i}{16}$	0	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	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
	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	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
	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	0	$\frac{3i}{16}$	0	$-\frac{5\sqrt{2}i}{48}$	0	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	0

907 symmetry

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

continued ...

Table 10

No.	multipole	matrix													
$\mathbb{G}_{3,1}^{(1,0;a)}(T_g, 2)$	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	0	$-\frac{5\sqrt{2}}{48}$	0	$\frac{\sqrt{10}}{24}$	0	$-\frac{\sqrt{6}}{16}$	0	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	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	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	0	$-\frac{\sqrt{2}}{16}$	0	$\frac{\sqrt{30}}{24}$	0	$\frac{\sqrt{70}}{48}$	0
	$\frac{\sqrt{70}}{48}$	0	$-\frac{\sqrt{7}}{16}$	0	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	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
	0	$\frac{\sqrt{10}}{24}$	0	$-\frac{\sqrt{5}}{48}$	0	$-\frac{\sqrt{2}}{16}$	0	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
	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	0	$-\frac{3}{16}$	0	$-\frac{5\sqrt{2}}{48}$	0	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	0

908 symmetry

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

continued ...

Table 10

No.	multipole	matrix
$\mathbb{G}_{3,2}^{(1,0;a)}(T_g, 2)$	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 $-\frac{\sqrt{14}i}{12}$ 0 0 0 $\frac{\sqrt{10}i}{12}$ 0 0 0
	0	0 0 0 0 0 0 0 $-\frac{i}{12}$ 0 0 0 0 $\frac{\sqrt{3}i}{12}$ 0 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 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
	0	$\frac{\sqrt{14}i}{12}$ 0 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 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
	0	$-\frac{\sqrt{10}i}{12}$ 0 0 0 $-\frac{\sqrt{2}i}{6}$ 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 0
	0	0 0 0 $\frac{i}{12}$ 0 0 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 0
909	symmetry	$\frac{3\sqrt{35}xyz(x-y)(x+y)}{2}$

continued ...

Table 10

No.	multipole	matrix												
$\mathbb{G}_{5,0}^{(1,0;a)}(E_g)$	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	$-\frac{\sqrt{30}}{60}$	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	$-\frac{\sqrt{105}}{30}$	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
910	symmetry	$\frac{\sqrt{105}xyz(x^2+y^2-2z^2)}{2}$												

continued ...

Table 10

No.	multipole	matrix
$\mathbb{G}_{5,1}^{(1,0;a)}(E_g)$	0 0 0 0 0 0 0 0 0 $\frac{\sqrt{10}}{12}$ 0 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 0 $-\frac{2\sqrt{5}}{15}$ 0 0 0 $-\frac{\sqrt{15}}{30}$ 0 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 0 $\frac{\sqrt{2}}{6}$ 0 0 0 $-\frac{\sqrt{70}}{60}$	
	0 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 0 $-\frac{2\sqrt{5}}{15}$ 0 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 0	
	$\frac{\sqrt{10}}{12}$ 0 0 0 $\frac{\sqrt{2}}{6}$ 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 $-\frac{\sqrt{15}}{30}$ 0 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 0 $-\frac{\sqrt{70}}{60}$ 0 0 0 0 0 0 0 0 0	
911	symmetry	$\frac{x(8x^4 - 40x^2y^2 - 40x^2z^2 + 15y^4 + 30y^2z^2 + 15z^4)}{8}$

continued ...

Table 10

No.	multipole	matrix													
$\mathbb{G}_{5,0}^{(1,0;a)}(T_g, 1)$	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	

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

912 symmetry

continued ...

Table 10

No.	multipole	matrix													
$\mathbb{G}_{5,1}^{(1,0;a)}(T_g, 1)$	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														
	0 $\frac{23\sqrt{42}}{1344}$ 0 $\frac{\sqrt{21}}{32}$ 0 $-\frac{\sqrt{210}}{64}$ 0 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														
	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 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														
	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 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														
	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 0 0														
913	symmetry	$\frac{z(15x^4+30x^2y^2-40x^2z^2+15y^4-40y^2z^2+8z^4)}{8}$													

continued ...

Table 10

No.	multipole	matrix
$\mathbb{G}_{5,2}^{(1,0;a)}(T_g, 1)$	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 $\frac{3\sqrt{14}i}{28}$ 0 0 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 0 0 0 $-\frac{\sqrt{105}i}{42}$ 0 0 0 0 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 0 0 0 0 0 $-\frac{\sqrt{210}i}{84}$ 0 0 0 0 0 0
	0	0 0
	$\frac{\sqrt{210}i}{84}$	0 0
	0	$-\frac{3\sqrt{14}i}{28}$ 0
	0	0 0 $\frac{\sqrt{105}i}{42}$ 0
	0	0 0 0 0 $\frac{\sqrt{105}i}{42}$ 0
	0	0 0 0 0 0 $-\frac{3\sqrt{14}i}{28}$ 0
	0	0 0 0 0 0 0 $\frac{\sqrt{210}i}{84}$ 0
	0	0 0
914	symmetry	$\frac{3\sqrt{35}x(y^2 - 2yz - z^2)(y^2 + 2yz - z^2)}{8}$

continued ...

Table 10

No.	multipole	matrix													
$\mathbb{G}_{5,0}^{(1,0;a)}(T_g, 2)$	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	
915	symmetry	$\frac{3\sqrt{35}y(x^2 - 2xz - z^2)(x^2 + 2xz - z^2)}{8}$													

continued ...

Table 10

No.	multipole	matrix													
$\mathbb{G}_{5,1}^{(1,0;a)}(T_g, 2)$	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
	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	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
	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	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
	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	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
	0	$-\frac{\sqrt{210}}{192}$	0	$\frac{3\sqrt{105}}{160}$	0	$-\frac{\sqrt{42}}{192}$	0	0	0	0	0	0	0	0	0

916 symmetry

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

continued ...

Table 10

No.	multipole	matrix
$\mathbb{G}_{5,2}^{(1,0;a)}(T_g, 2)$	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 $\frac{\sqrt{105}i}{30}$ 0 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 0 $-\frac{\sqrt{2}i}{4}$ 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 0	
	0 0 0 0 $\frac{\sqrt{30}i}{60}$ 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 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 $\frac{\sqrt{30}i}{60}$ 0 0 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 0 0	
917	symmetry	$\frac{\sqrt{105}x(y-z)(y+z)(2x^2-y^2-z^2)}{4}$

continued ...

Table 10

No.	multipole	matrix													
$\mathbb{G}_{5,0}^{(1,0;a)}(T_g, 3)$	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														
$\frac{\sqrt{105}y(x-z)(x+z)(x^2-2y^2+z^2)}{4}$															

918 symmetry

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

continued ...

Table 10

No.	multipole	matrix													
$\mathbb{G}_{5,1}^{(1,0;a)}(T_g, 3)$	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	$\frac{\sqrt{14}}{96}$	
	$\frac{\sqrt{14}}{96}$	0	$\frac{\sqrt{35}}{80}$	0	$-\frac{\sqrt{70}}{32}$	0	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	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
	0	$-\frac{13\sqrt{2}}{96}$	0	$\frac{1}{48}$	0	$\frac{\sqrt{10}}{32}$	0	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
	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	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
	0	$-\frac{\sqrt{70}}{32}$	0	$\frac{\sqrt{35}}{80}$	0	$\frac{\sqrt{14}}{96}$	0	0	0	0	0	0	0	0	0
919	symmetry	$-\frac{\sqrt{105}z(x-y)(x+y)(x^2+y^2-2z^2)}{4}$													

continued ...

Table 10

No.	multipole	matrix
$\mathbb{G}_{5,2}^{(1,0;a)}(T_g, 3)$	0	0 0 0 0 0 0 0 0 0 $-\frac{\sqrt{10}i}{12}$ 0 0 0 0
	0	0 0 0 0 0 0 $\frac{\sqrt{70}i}{60}$ 0 0 0 $\frac{\sqrt{2}i}{6}$ 0 0 0
	0	0 0 0 0 0 0 0 $-\frac{2\sqrt{5}i}{15}$ 0 0 0 $\frac{\sqrt{15}i}{30}$ 0 0
	0	0 0 0 0 0 0 0 0 $\frac{\sqrt{15}i}{30}$ 0 0 0 $-\frac{2\sqrt{5}i}{15}$ 0
	0	0 0 0 0 0 0 0 0 0 $\frac{\sqrt{2}i}{6}$ 0 0 0 $\frac{\sqrt{70}i}{60}$
	0	0 0 0 0 0 0 0 0 0 $-\frac{\sqrt{10}i}{12}$ 0 0 0 0
	0	$-\frac{\sqrt{70}i}{60}$ 0 0 0 0 0 0 0 0 0 0 0 0 0
	0	0 0 $\frac{2\sqrt{5}i}{15}$ 0 0 0 0 0 0 0 0 0 0 0
	0	0 0 0 $-\frac{\sqrt{15}i}{30}$ 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
	0	$-\frac{\sqrt{2}i}{6}$ 0 0 0 0 $\frac{\sqrt{10}i}{12}$ 0 0 0 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 0 0 $\frac{2\sqrt{5}i}{15}$ 0 0 0 0 0 0 0 0 0 0
	0	0 0 0 0 $-\frac{\sqrt{70}i}{60}$ 0 0 0 0 0 0 0 0 0

920 symmetry

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

continued ...

Table 10

No.	multipole	matrix												
$\mathbb{T}_{2,0}^{(1,0;a)}(E_g)$	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	$\frac{\sqrt{70}i}{28}$	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	$-\frac{5\sqrt{42}i}{84}$	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
921	symmetry	$\frac{\sqrt{3}(x-y)(x+y)}{2}$												

continued ...

Table 10

No.	multipole	matrix
$\mathbb{T}_{2,1}^{(1,0;a)}(E_g)$	0	0 0 0 0 0 0 0 0 0 $\frac{\sqrt{70}i}{84}$ 0 0 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 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 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 0 $-\frac{\sqrt{14}i}{21}$ 0 0 0 $\frac{\sqrt{10}i}{12}$
	0	0 0 0 0 0 0 0 0 0 0 $-\frac{\sqrt{70}i}{84}$ 0 0 0 0
	0	$\frac{\sqrt{10}i}{12}$ 0 0 0 0 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	0 0 0 $\frac{\sqrt{105}i}{42}$ 0 0 0 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 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 0
	0	0 0 $-\frac{\sqrt{105}i}{42}$ 0 0 0 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	0 0 0 0 $-\frac{\sqrt{10}i}{12}$ 0 0 0 0 0 0 0 0 0 0 0 0
922 symmetry		$\sqrt{3}yz$

continued ...

Table 10

No.	multipole	matrix
$\mathbb{T}_{2,0}^{(1,0;a)}(T_g)$	0	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 0 $\frac{\sqrt{70}}{168}$ 0 $\frac{11\sqrt{14}}{168}$ 0 0 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 0 0 0 $-\frac{\sqrt{7}}{12}$ 0 $\frac{\sqrt{105}}{84}$ 0 0 0 0
	0	0 0 0 0 0 0 0 0 0 0 $-\frac{11\sqrt{14}}{168}$ 0 $-\frac{\sqrt{70}}{168}$ 0
	$\frac{5\sqrt{2}}{24}$	0 0 0 0 0 0 0 0 0 0 0 $-\frac{5\sqrt{42}}{168}$ 0 $-\frac{5\sqrt{2}}{24}$
	0	$\frac{\sqrt{70}}{168}$ 0 0 0 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 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 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
	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 0 0 0 $-\frac{\sqrt{70}}{168}$ 0 0 0 0 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 0 0 0
923	symmetry	$\sqrt{3}xz$

continued ...

Table 10

No.	multipole	matrix
$\mathbb{T}_{2,1}^{(1,0;a)}(T_g)$	0	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 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 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 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
	$\frac{5\sqrt{2}i}{24}$	0 0 0 0 0 0 0 0 0 0 0 $\frac{5\sqrt{42}i}{168}$ 0 $-\frac{5\sqrt{2}i}{24}$
	0	$\frac{\sqrt{70}i}{168}$ 0 0 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 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
	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 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 0 $\frac{\sqrt{70}i}{168}$ 0 0 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
924 symmetry		$\sqrt{3}xy$

continued ...

Table 10

No.	multipole	matrix
$\mathbb{T}_{2,2}^{(1,0;a)}(T_g)$	0 0 0 0 0 0 0 0 0 $\frac{\sqrt{70}}{84}$ 0 0 0 0 0	
	0 0 0 0 0 0 0 $\frac{\sqrt{10}}{12}$ 0 0 0 0 $\frac{\sqrt{14}}{21}$ 0 0 0	
	0 0 0 0 0 0 0 0 $\frac{\sqrt{35}}{21}$ 0 0 0 0 $\frac{\sqrt{105}}{42}$ 0 0 0	
	0 0 0 0 0 0 0 0 0 $\frac{\sqrt{105}}{42}$ 0 0 0 0 $\frac{\sqrt{35}}{21}$ 0	
	0 0 0 0 0 0 0 0 0 0 $\frac{\sqrt{14}}{21}$ 0 0 0 0 $\frac{\sqrt{10}}{12}$	
	0 0 0 0 0 0 0 0 0 0 0 $\frac{\sqrt{70}}{84}$ 0 0 0 0	
	0 $\frac{\sqrt{10}}{12}$ 0 0 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 0 0 $\frac{\sqrt{105}}{42}$ 0 0 0 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 0	
	0 $\frac{\sqrt{14}}{21}$ 0 0 0 $\frac{\sqrt{70}}{84}$ 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 0 0 0	
	0 0 0 $\frac{\sqrt{35}}{21}$ 0 0 0 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 0 0 0	
925	symmetry	$\frac{\sqrt{21}(x^4 - 3x^2y^2 - 3x^2z^2 + y^4 - 3y^2z^2 + z^4)}{6}$

continued ...

Table 10

No.	multipole	matrix												
$\mathbb{T}_4^{(1,0;a)}(A_g)$	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
$\frac{\sqrt{15}(x^4 - 12x^2y^2 + 6x^2z^2 + y^4 + 6y^2z^2 - 2z^4)}{12}$														
926	symmetry													

continued ...

Table 10

No.	multipole	matrix												
$\mathbb{T}_{4,0}^{(1,0;a)}(E_g)$	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	$\frac{\sqrt{2310}i}{231}$	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
927	symmetry	$\frac{\sqrt{5}(x-y)(x+y)(x^2+y^2-6z^2)}{4}$												

continued ...

Table 10

No.	multipole	matrix														
$\mathbb{T}_{4,1}^{(1,0;a)}(E_g)$	0	0	0	0	0	0	0	0	0	$\frac{\sqrt{2310}i}{154}$	0	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	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	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	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	0	$-\frac{\sqrt{2310}i}{154}$	0	0	0	0	
	0	$\frac{3\sqrt{330}i}{220}$	0	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	0	$-\frac{17\sqrt{385}i}{1540}$	0	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	
	0	$-\frac{\sqrt{462}i}{308}$	0	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	0	$\frac{9\sqrt{1155}i}{1540}$	0	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	0	
928	symmetry	$\frac{\sqrt{35}yz(y-z)(y+z)}{2}$														

continued ...

Table 10

No.	multipole	matrix												
$\mathbb{T}_{4,0}^{(1,0;a)}(T_g, 1)$	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

929 symmetry

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

continued ...

Table 10

No.	multipole	matrix												
$\mathbb{T}_{4,1}^{(1,0;a)}(T_g, 1)$	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
$\frac{\sqrt{35}xy(x-y)(x+y)}{2}$														

930 symmetry

continued ...

Table 10

No.	multipole	matrix												
$\mathbb{T}_{4,2}^{(1,0;a)}(T_g, 1)$	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	$-\frac{\sqrt{330}}{55}$	0	0
	0	0	0	0	0	0	0	0	0	0	0	$-\frac{\sqrt{1155}}{110}$	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
	$-\frac{\sqrt{22}}{22}$	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
931	symmetry	$\frac{\sqrt{5}yz(6x^2-y^2-z^2)}{2}$												

continued ...

Table 10

No.	multipole	matrix											
$\mathbb{T}_{4,0}^{(1,0;a)}(T_g, 2)$	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	$-\frac{13\sqrt{2310}}{6160}$	0	$-\frac{\sqrt{462}}{616}$	0	$-\frac{7\sqrt{770}}{880}$	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	$-\frac{\sqrt{1155}}{880}$	0	$\frac{\sqrt{231}}{176}$	0	$-\frac{\sqrt{385}}{6160}$	$\frac{21\sqrt{165}}{880}$
	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	$\frac{\sqrt{2310}}{176}$	0	$-\frac{5\sqrt{154}}{616}$	0
	$\frac{\sqrt{66}}{176}$	0	$-\frac{21\sqrt{165}}{880}$	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
	$\frac{5\sqrt{154}}{616}$	0	$\frac{\sqrt{385}}{6160}$	0	$\frac{7\sqrt{770}}{880}$	0	0	0	0	0	0	0	0
	0	$-\frac{\sqrt{462}}{616}$	0	$\frac{\sqrt{231}}{176}$	0	$\frac{\sqrt{2310}}{176}$	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	$-\frac{7\sqrt{770}}{880}$	0	$-\frac{\sqrt{385}}{6160}$	0	$-\frac{5\sqrt{154}}{616}$	0	0	0	0	0	0	0
	0	0	$\frac{\sqrt{1155}}{880}$	0	$\frac{13\sqrt{2310}}{6160}$	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
932	symmetry	$-\frac{\sqrt{5}xz(x^2 - 6y^2 + z^2)}{2}$											

continued ...

Table 10

No.	multipole	matrix											
$\mathbb{T}_{4,1}^{(1,0;a)}(T_g, 2)$	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	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	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	0	0	0	0	0	0	$-\frac{\sqrt{1155}i}{880}$	0	$-\frac{\sqrt{231}i}{176}$	0	$-\frac{\sqrt{385}i}{6160}$	$-\frac{21\sqrt{165}i}{880}$
	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	0	0	0	0	0	0	0	0	$\frac{\sqrt{2310}i}{176}$	0	$\frac{5\sqrt{154}i}{616}$	0
	$\frac{\sqrt{66}i}{176}$	0	$\frac{21\sqrt{165}i}{880}$	0	0	0	0	0	0	0	0	0	$-\frac{\sqrt{66}i}{176}$
	0	$-\frac{13\sqrt{2310}i}{6160}$	0	$\frac{\sqrt{1155}i}{880}$	0	0	0	0	0	0	0	0	0
	$-\frac{5\sqrt{154}i}{616}$	0	$\frac{\sqrt{385}i}{6160}$	0	$-\frac{7\sqrt{770}i}{880}$	0	0	0	0	0	0	0	0
	0	$\frac{\sqrt{462}i}{616}$	0	$\frac{\sqrt{231}i}{176}$	0	$-\frac{\sqrt{2310}i}{176}$	0	0	0	0	0	0	0
	$-\frac{\sqrt{2310}i}{176}$	0	$\frac{\sqrt{231}i}{176}$	0	$\frac{\sqrt{462}i}{616}$	0	0	0	0	0	0	0	0
	0	$-\frac{7\sqrt{770}i}{880}$	0	$\frac{\sqrt{385}i}{6160}$	0	$-\frac{5\sqrt{154}i}{616}$	0	0	0	0	0	0	0
	0	0	$\frac{\sqrt{1155}i}{880}$	0	$-\frac{13\sqrt{2310}i}{6160}$	0	0	0	0	0	0	0	0
	0	0	0	$\frac{21\sqrt{165}i}{880}$	0	$\frac{\sqrt{66}i}{176}$	0	0	0	0	0	0	0
933	symmetry	$-\frac{\sqrt{5}xy(x^2+y^2-6z^2)}{2}$											

continued ...

Table 10

No.	multipole	matrix
$\mathbb{T}_{4,2}^{(1,0;a)}(T_g, 2)$	0 0 0 0 0 0 0 0 0 $-\frac{\sqrt{2310}}{154}$ 0 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 0 $\frac{9\sqrt{1155}}{1540}$ 0 0 0 $\frac{17\sqrt{385}}{1540}$ 0 0 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 0 $-\frac{\sqrt{462}}{308}$ 0 0 0 $-\frac{3\sqrt{330}}{220}$	
	0 0 0 0 0 0 0 0 0 0 $-\frac{\sqrt{2310}}{154}$ 0 0 0	
	0 $-\frac{3\sqrt{330}}{220}$ 0 0 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 0 0 $\frac{17\sqrt{385}}{1540}$ 0 0 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	
	0 0 $-\frac{\sqrt{462}}{308}$ 0 0 0 $-\frac{\sqrt{2310}}{154}$ 0 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 0 $-\frac{3\sqrt{330}}{220}$ 0 0 0 0 0 0 0 0 0	
934	symmetry	$\frac{\sqrt{2}(2x^6 - 15x^4y^2 - 15x^4z^2 - 15x^2y^4 + 180x^2y^2z^2 - 15x^2z^4 + 2y^6 - 15y^4z^2 - 15y^2z^4 + 2z^6)}{8}$

continued ...

Table 10

No.	multipole	matrix
$\mathbb{T}_6^{(1,0;a)}(A_g, 1)$	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 0 $\frac{5\sqrt{66}i}{264}$ 0 0 0 $-\frac{\sqrt{2310}i}{264}$ 0	
	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 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 0 $-\frac{\sqrt{2310}i}{264}$ 0 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 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 0	
$-\frac{\sqrt{2310}(x-y)(x+y)(x-z)(x+z)(y-z)(y+z)}{8}$		

935 symmetry

continued ...

Table 10

No.	multipole	matrix
$\mathbb{T}_6^{(1,0;a)}(A_g, 2)$	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 0 $\frac{i}{24}$ 0 0 0 0 $\frac{\sqrt{35}i}{24}$ 0 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 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 0 $-\frac{\sqrt{35}i}{24}$ 0 0 0 $-\frac{i}{24}$
	0	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
	0	0 $\frac{\sqrt{14}i}{24}$ 0 0 0 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 0
	$\frac{\sqrt{7}i}{24}$	0 0 0 $\frac{\sqrt{35}i}{24}$ 0 0 0 0 0 0 0 0 0 0 0
	0	$-\frac{\sqrt{35}i}{24}$ 0 0 0 0 $-\frac{\sqrt{7}i}{24}$ 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 0 0
	0	0 0 0 $-\frac{\sqrt{14}i}{24}$ 0 0 0 0 0 0 0 0 0 0 0
936 symmetry		$\frac{\sqrt{14}(x^6 - 15x^4z^2 + 15x^2z^4 + y^6 - 15y^4z^2 + 15y^2z^4 - 2z^6)}{8}$

continued ...

Table 10

No.	multipole	matrix
$\mathbb{T}_{6,0}^{(1,0;a)}(E_g)$	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 0 $\frac{5\sqrt{462}i}{264}$ 0 0 0 $\frac{\sqrt{330}i}{264}$ 0	
	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 $\frac{\sqrt{385}i}{88}$ 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 $\frac{\sqrt{1155}i}{264}$ 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	
937	symmetry	$\frac{\sqrt{42}(x-y)(x+y)(x^4-9x^2y^2-5x^2z^2+y^4-5y^2z^2+5z^4)}{8}$

continued ...

Table 10

No.	multipole	matrix													
$\mathbb{T}_{6,1}^{(1,0;a)}(E_g)$	0	0	0	0	0	0	0	0	0	$\frac{\sqrt{385}i}{264}$	0	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	0	$\frac{\sqrt{770}i}{264}$	0	0	0	$\frac{\sqrt{2310}i}{264}$	0	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	0	$\frac{5\sqrt{77}i}{264}$	0	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
	0	$\frac{\sqrt{55}i}{264}$	0	0	0	$\frac{\sqrt{11}i}{8}$	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	0	0
	0	0	0	$\frac{\sqrt{2310}i}{264}$	0	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
	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	0	$-\frac{\sqrt{2310}i}{264}$	0	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	0
	$-\frac{\sqrt{11}i}{8}$	0	0	0	$-\frac{\sqrt{55}i}{264}$	0	0	0	0	0	0	0	0	0	0
938	symmetry	$\frac{3\sqrt{7}yz(y-z)(y+z)(10x^2-y^2-z^2)}{4}$													

continued ...

Table 10

No.	multipole	matrix													
$T_{6,0}^{(1,0;a)}(T_g, 1)$	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	
939	symmetry	$\frac{3\sqrt{7}xz(x-z)(x+z)(x^2-10y^2+z^2)}{4}$													

continued ...

Table 10

No.	multipole	matrix											
$T_{6,1}^{(1,0;a)}(T_g, 1)$	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	$-\frac{\sqrt{2310}i}{1056}$	0	$\frac{5\sqrt{462}i}{1056}$	0	$\frac{3\sqrt{770}i}{352}$	0
	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	$-\frac{\sqrt{1155}i}{176}$	0	$-\frac{5\sqrt{231}i}{528}$	0	$\frac{\sqrt{385}i}{176}$	0
	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	$\frac{\sqrt{462}i}{96}$	0	$-\frac{\sqrt{2310}i}{352}$	0	$-\frac{\sqrt{154}i}{352}$	0
	$-\frac{\sqrt{66}i}{1056}$	0	$-\frac{\sqrt{165}i}{176}$	0	$\frac{\sqrt{330}i}{96}$	0	0	0	0	0	0	0	0
	0	$\frac{\sqrt{2310}i}{1056}$	0	$\frac{\sqrt{1155}i}{176}$	0	$-\frac{\sqrt{462}i}{96}$	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	$-\frac{5\sqrt{462}i}{1056}$	0	$\frac{5\sqrt{231}i}{528}$	0	$\frac{\sqrt{2310}i}{352}$	0	0	0	0	0	0	0
	$\frac{\sqrt{2310}i}{352}$	0	$\frac{5\sqrt{231}i}{528}$	0	$-\frac{5\sqrt{462}i}{1056}$	0	0	0	0	0	0	0	0
	0	$-\frac{3\sqrt{770}i}{352}$	0	$-\frac{\sqrt{385}i}{176}$	0	$\frac{\sqrt{154}i}{352}$	0	0	0	0	0	0	0
	$-\frac{\sqrt{462}i}{96}$	0	$\frac{\sqrt{1155}i}{176}$	0	$\frac{\sqrt{2310}i}{1056}$	0	0	0	0	0	0	0	0
	0	$\frac{\sqrt{330}i}{96}$	0	$-\frac{\sqrt{165}i}{176}$	0	$-\frac{\sqrt{66}i}{1056}$	0	0	0	0	0	0	0

940 symmetry

$$\frac{3\sqrt{7}xy(x-y)(x+y)(x^2+y^2-10z^2)}{4}$$

continued ...

Table 10

No.	multipole	matrix
$T_{6,2}^{(1,0;a)}(T_g, 1)$	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 0 $\frac{\sqrt{165}}{66}$	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 0 0 - $\frac{\sqrt{2310}}{132}$ 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 $\frac{\sqrt{165}}{66}$ 0 0 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 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
	$\frac{\sqrt{154}}{44}$ 0 0 0 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	0
	0 0 $\frac{\sqrt{165}}{66}$ 0 0 0 0 0 0 0 0 0 0 0 0 0	0
941	symmetry	$\frac{\sqrt{462yz(y^2-3z^2)(3y^2-z^2)}}{16}$

continued ...

Table 10

No.	multipole	matrix
$\mathbb{T}_{6,0}^{(1,0;a)}(T_g, 2)$	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 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 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 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 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 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
	0	$-\frac{\sqrt{35}}{64}$ 0 $-\frac{\sqrt{70}}{64}$ 0 $-\frac{\sqrt{7}}{64}$ 0 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
	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 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
	0	$-\frac{\sqrt{105}}{64}$ 0 $-\frac{\sqrt{210}}{64}$ 0 $-\frac{\sqrt{21}}{64}$ 0 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
	0	$-\frac{\sqrt{5}}{64}$ 0 $-\frac{\sqrt{10}}{64}$ 0 $-\frac{1}{64}$ 0 0 0 0 0 0 0 0 0
$\frac{\sqrt{462xz}(x^2 - 3z^2)(3x^2 - z^2)}{16}$		

942 symmetry

continued ...

Table 10

No.	multipole	matrix											
$\mathbb{T}_{6,1}^{(1,0;a)}(T_g, 2)$	0	0	0	0	0	0	$-\frac{i}{64}$	$\frac{\sqrt{21}i}{64}$	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
	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	$-\frac{\sqrt{70}i}{64}$	0	$\frac{5\sqrt{14}i}{64}$	0	$-\frac{\sqrt{210}i}{64}$	0
	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	$\frac{\sqrt{7}i}{64}$	0	$-\frac{\sqrt{35}i}{64}$	0	$\frac{\sqrt{21}i}{64}$	0
	$\frac{i}{64}$	0	$-\frac{\sqrt{10}i}{64}$	0	$\frac{\sqrt{5}i}{64}$	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
	$-\frac{\sqrt{21}i}{64}$	0	$\frac{\sqrt{210}i}{64}$	0	$-\frac{\sqrt{105}i}{64}$	0	0	0	0	0	0	0	0
	0	$\frac{5\sqrt{7}i}{64}$	0	$-\frac{5\sqrt{14}i}{64}$	0	$\frac{\sqrt{35}i}{64}$	0	0	0	0	0	0	0
	$\frac{\sqrt{35}i}{64}$	0	$-\frac{5\sqrt{14}i}{64}$	0	$\frac{5\sqrt{7}i}{64}$	0	0	0	0	0	0	0	0
	0	$-\frac{\sqrt{105}i}{64}$	0	$\frac{\sqrt{210}i}{64}$	0	$-\frac{\sqrt{21}i}{64}$	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	$\frac{\sqrt{5}i}{64}$	0	$-\frac{\sqrt{10}i}{64}$	0	$\frac{i}{64}$	0	0	0	0	0	0	0
943	symmetry	$\frac{\sqrt{462}xy(x^2 - 3y^2)(3x^2 - y^2)}{16}$											

continued ...

Table 10

continued ..

Table 10

No.	multipole	matrix													
$T_{6,0}^{(1,0;a)}(T_g, 3)$	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	
945	symmetry	$\frac{\sqrt{210}xz(x^4 - 16x^2y^2 + 2x^2z^2 + 16y^4 - 16y^2z^2 + z^4)}{16}$													

continued ...

Table 10

No.	multipole	matrix												
$\mathbb{T}_{6,1}^{(1,0;a)}(T_g, 3)$	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

$$\frac{\sqrt{210}xy(x^4+2x^2y^2-16x^2z^2+y^4-16y^2z^2+16z^4)}{16}$$

946 symmetry

continued ...

Table 10

No.	multipole	matrix
$T_{6,2}^{(1,0;a)}(T_g, 3)$	0	0 0 0 0 0 0 0 0 0 $\frac{\sqrt{77}}{66}$ 0 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 0 $-\frac{\sqrt{154}}{66}$ 0 0 0 $\frac{\sqrt{462}}{66}$ 0 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 0 $-\frac{\sqrt{385}}{66}$ 0 0 0 $\frac{\sqrt{11}}{66}$
	0	0 0 0 0 0 0 0 0 0 0 $\frac{\sqrt{77}}{66}$ 0 0 0 0
	0	$\frac{\sqrt{11}}{66}$ 0 0 0 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 0 0 $\frac{\sqrt{462}}{66}$ 0 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 0
	0	$-\frac{\sqrt{385}}{66}$ 0 0 0 0 $\frac{\sqrt{77}}{66}$ 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 0 0
	0	0 0 0 $-\frac{\sqrt{154}}{66}$ 0 0 0 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 0 0

947 symmetry

x

continued ...

Table 10

No.	multipole	matrix
$\mathbb{M}_{1,0}^{(a)}(T_g)$	0	$\frac{\sqrt{70}}{49} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{3}}{28} \quad 0 \quad \frac{\sqrt{7}}{196} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0$
	$\frac{\sqrt{70}}{49}$	$0 \quad \frac{4\sqrt{7}}{49} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{105}}{196} \quad 0 \quad \frac{\sqrt{21}}{196} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0$
	0	$\frac{4\sqrt{7}}{49} \quad 0 \quad \frac{3\sqrt{14}}{49} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{70}}{196} \quad 0 \quad \frac{\sqrt{42}}{196} \quad 0 \quad 0 \quad 0 \quad 0$
	0	$0 \quad \frac{3\sqrt{14}}{49} \quad 0 \quad \frac{4\sqrt{7}}{49} \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{42}}{196} \quad 0 \quad \frac{\sqrt{70}}{196} \quad 0 \quad 0 \quad 0 \quad 0$
	0	$0 \quad 0 \quad 0 \quad \frac{4\sqrt{7}}{49} \quad 0 \quad \frac{\sqrt{70}}{49} \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{21}}{196} \quad 0 \quad \frac{\sqrt{105}}{196} \quad 0 \quad 0$
	0	$0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{70}}{49} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{7}}{196} \quad 0 \quad \frac{\sqrt{3}}{28} \quad 0$
	$-\frac{\sqrt{3}}{28}$	$0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{3\sqrt{2}}{28} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0$
	0	$0 \quad -\frac{\sqrt{105}}{196} \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{3\sqrt{2}}{28} \quad 0 \quad \frac{3\sqrt{42}}{98} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0$
	$\frac{\sqrt{7}}{196}$	$0 \quad -\frac{\sqrt{70}}{196} \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{3\sqrt{42}}{98} \quad 0 \quad \frac{3\sqrt{210}}{196} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0$
	0	$\frac{\sqrt{21}}{196} \quad 0 \quad -\frac{\sqrt{42}}{196} \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{3\sqrt{210}}{196} \quad 0 \quad \frac{3\sqrt{14}}{49} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0$
	0	$0 \quad 0 \quad \frac{\sqrt{42}}{196} \quad 0 \quad -\frac{\sqrt{21}}{196} \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{3\sqrt{14}}{49} \quad 0 \quad \frac{3\sqrt{210}}{196} \quad 0 \quad 0 \quad 0$
	0	$0 \quad 0 \quad 0 \quad \frac{\sqrt{70}}{196} \quad 0 \quad -\frac{\sqrt{7}}{196} \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{3\sqrt{210}}{196} \quad 0 \quad \frac{3\sqrt{42}}{98} \quad 0 \quad 0$
	0	$0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{105}}{196} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{3\sqrt{42}}{98} \quad 0 \quad \frac{3\sqrt{2}}{28} \quad 0$
	0	$0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{3}}{28} \quad 0 \quad \frac{3\sqrt{2}}{28} \quad 0$

948 symmetry

y

continued ...

Table 10

No.	multipole	matrix													
$\mathbb{M}_{1,1}^{(a)}(T_g)$	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	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
	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	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	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	0	$\frac{\sqrt{70}i}{49}$	0	0	0	0	0	$-\frac{\sqrt{7}i}{196}$	0	$-\frac{\sqrt{3}i}{28}$	0	0
	$\frac{\sqrt{3}i}{28}$	0	0	0	0	0	0	$-\frac{3\sqrt{2}i}{28}$	0	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	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
	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	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	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	0	$\frac{\sqrt{105}i}{196}$	0	0	0	0	0	$\frac{3\sqrt{42}i}{98}$	0	$-\frac{3\sqrt{2}i}{28}$	0	0
	0	0	0	0	0	$\frac{\sqrt{3}i}{28}$	0	0	0	0	0	$\frac{3\sqrt{2}i}{28}$	0	0	0

949 symmetry

z

continued ...

Table 10

No.	multipole	matrix													
$\mathbb{M}_{1,2}^{(a)}(T_g)$	$\frac{5\sqrt{14}}{49}$	0	0	0	0	0	0	$\frac{\sqrt{21}}{98}$	0	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	0	$\frac{\sqrt{14}}{49}$	0	0	0	0	0	0	$\frac{\sqrt{42}}{98}$	0	0	0	0	0
	0	0	0	$-\frac{\sqrt{14}}{49}$	0	0	0	0	0	$\frac{\sqrt{42}}{98}$	0	0	0	0	0
	0	0	0	0	$-\frac{3\sqrt{14}}{49}$	0	0	0	0	0	$\frac{\sqrt{35}}{98}$	0	0	0	0
	0	0	0	0	0	$-\frac{5\sqrt{14}}{49}$	0	0	0	0	0	$\frac{\sqrt{21}}{98}$	0	0	0
	0	0	0	0	0	0	$\frac{3\sqrt{14}}{28}$	0	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	$\frac{\sqrt{35}}{98}$	0	0	0	0	0	0	$\frac{9\sqrt{14}}{196}$	0	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	0	$\frac{\sqrt{42}}{98}$	0	0	0	0	0	0	$-\frac{3\sqrt{14}}{196}$	0	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	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	0	$-\frac{3\sqrt{14}}{28}$	0
950	symmetry	$\sqrt{15}xyz$													

continued ...

Table 10

No.	multipole	matrix													
$\mathbb{M}_3^{(a)}(A_g)$	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	0	$\frac{\sqrt{10}i}{28}$	0	0	$\frac{\sqrt{42}i}{42}$	0	0	0	$\frac{\sqrt{30}i}{42}$	0	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
	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	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	0	$\frac{5\sqrt{2}i}{28}$	0	0	0	0	0	$-\frac{\sqrt{6}i}{21}$	0	0	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	0	$-\frac{\sqrt{3}i}{42}$	0	0	0	0	0	0	$\frac{3i}{14}$	0	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	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
	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	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	0	$\frac{\sqrt{3}i}{42}$	0	0	0	0	0	0	$\frac{3i}{14}$	0	0	0	0
	0	0	0	0	$\frac{\sqrt{42}i}{42}$	0	0	0	0	0	$\frac{\sqrt{105}i}{42}$	0	0	0	0
951	symmetry	$\frac{x(2x^2 - 3y^2 - 3z^2)}{2}$													

continued ...

Table 10

No.	multipole	matrix													
$\mathbb{M}_{3,0}^{(a)}(T_g, 1)$	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	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
	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	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
	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	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	$\frac{\sqrt{14}}{56}$	0
	$-\frac{\sqrt{14}}{56}$	0	$\frac{\sqrt{35}}{56}$	0	0	0	0	$\frac{\sqrt{21}}{28}$	0	$-\frac{\sqrt{105}}{84}$	0	0	0	0	0
	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	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
	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	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
	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	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	0	$-\frac{\sqrt{35}}{56}$	0	$\frac{\sqrt{14}}{56}$	0	0	0	0	$-\frac{\sqrt{105}}{84}$	0	$\frac{\sqrt{21}}{28}$	0	0

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

continued ...

Table 10

No.	multipole	matrix													
$\mathbb{M}_{3,1}^{(a)}(T_g, 1)$	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	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
	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	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
	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	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	$-\frac{\sqrt{14}i}{56}$	0
	$\frac{\sqrt{14}i}{56}$	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
	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	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
	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	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
	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	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	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	0

953 symmetry

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

continued ...

Table 10

No.	multipole	matrix														
$\mathbb{M}_{3,2}^{(a)}(T_g, 1)$	$-\frac{5\sqrt{3}}{42}$	0	0	0	0	0	0	$-\frac{\sqrt{2}}{7}$	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	0	$\frac{2\sqrt{3}}{21}$	0	0	0	0	0	0	$\frac{1}{7}$	0	0	0	0	0	0
	0	0	0	$-\frac{2\sqrt{3}}{21}$	0	0	0	0	0	$\frac{1}{7}$	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	0	$\frac{5\sqrt{3}}{42}$	0	0	0	0	0	0	$-\frac{\sqrt{2}}{7}$	0	0	0
	0	0	0	0	0	0	$-\frac{\sqrt{3}}{6}$	0	0	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	0	0	$\frac{\sqrt{3}}{6}$	0	0	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	$\frac{1}{7}$	0	0	0	0	0	0	$-\frac{\sqrt{3}}{14}$	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	$-\frac{\sqrt{3}}{6}$	0	0	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	0	$\frac{\sqrt{3}}{6}$	0	0	0
954	symmetry	$\frac{\sqrt{15}x(y-z)(y+z)}{2}$														

continued ...

Table 10

No.	multipole	matrix													
$\mathbb{M}_{3,0}^{(a)}(T_g, 2)$	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	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
	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	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
	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	0	$\frac{5\sqrt{2}}{56}$	0	$\frac{5}{28}$	0	0	0	0	$-\frac{\sqrt{6}}{56}$	0	$-\frac{\sqrt{10}}{28}$	0	$\frac{\sqrt{210}}{168}$	0
	$-\frac{\sqrt{210}}{168}$	0	$-\frac{\sqrt{21}}{56}$	0	0	0	0	$\frac{\sqrt{35}}{28}$	0	$\frac{\sqrt{7}}{28}$	0	0	0	0	0
	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	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
	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	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
	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	$\frac{\sqrt{35}}{28}$
	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	0	$\frac{\sqrt{21}}{56}$	0	$\frac{\sqrt{210}}{168}$	0	0	0	$\frac{\sqrt{7}}{28}$	0	$\frac{\sqrt{35}}{28}$	0	0	0

955 symmetry

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

continued ...

Table 10

No.	multipole	matrix													
$\mathbb{M}_{3,1}^{(a)}(T_g, 2)$	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	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
	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	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	$-\frac{\sqrt{2}i}{56}$	0
	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	0
	0	0	$\frac{5\sqrt{2}i}{56}$	0	$-\frac{5i}{28}$	0	0	0	$-\frac{\sqrt{6}i}{56}$	0	$\frac{\sqrt{10}i}{28}$	0	$\frac{\sqrt{210}i}{168}$	0	0
	$-\frac{\sqrt{210}i}{168}$	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
	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	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
	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	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
	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	0	$\frac{3\sqrt{3}i}{56}$	0	$\frac{5\sqrt{6}i}{168}$	0	0	0	$\frac{i}{7}$	0	$-\frac{\sqrt{15}i}{84}$	0	$\frac{\sqrt{35}i}{28}$	0	0
	0	0	0	$\frac{\sqrt{21}i}{56}$	0	$-\frac{\sqrt{210}i}{168}$	0	0	0	$\frac{\sqrt{7}i}{28}$	0	$-\frac{\sqrt{35}i}{28}$	0	0	0
$\frac{\sqrt{15}z(x-y)(x+y)}{2}$															

956 symmetry

continued ...

Table 10

No.	multipole	matrix													
$\mathbb{M}_{3,2}^{(a)}(T_g, 2)$	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	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
	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	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	0	$\frac{5\sqrt{2}}{28}$	0	0	0	0	0	$-\frac{\sqrt{6}}{21}$	0	0	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	0	$\frac{\sqrt{3}}{42}$	0	0	0	0	0	0	$-\frac{3}{14}$	0	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	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
	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	0	$-\frac{1}{14}$	0	0	0	0	0	0	$\frac{\sqrt{3}}{21}$	0	0	0	$\frac{\sqrt{105}}{42}$	0
	0	0	0	$\frac{\sqrt{3}}{42}$	0	0	0	0	0	$\frac{3}{14}$	0	0	0	0	0
	0	0	0	0	$\frac{\sqrt{42}}{42}$	0	0	0	0	0	$\frac{\sqrt{105}}{42}$	0	0	0	0
957	symmetry	$\frac{3\sqrt{35}xyz(x-y)(x+y)}{2}$													

continued ...

Table 10

No.	multipole	matrix													
$\mathbb{M}_{5,0}^{(a)}(E_g)$	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	$-\frac{\sqrt{10}i}{28}$	0	0	0	
	0	0	0	0	0	$-\frac{\sqrt{15}i}{14}$	0	0	0	0	0	$\frac{\sqrt{10}i}{28}$	0	0	
	0	0	0	0	0	0	$\frac{\sqrt{42}i}{28}$	0	0	0	0	0	0	$\frac{\sqrt{42}i}{28}$	
	$\frac{\sqrt{15}i}{14}$	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	
958	symmetry	$\frac{\sqrt{105}xyz(x^2+y^2-2z^2)}{2}$													

continued ...

Table 10

No.	multipole	matrix
$\mathbb{M}_{5,1}^{(a)}(E_g)$	0	0 $\frac{i}{14}$ 0 0 0 0 0 0 0 $\frac{5\sqrt{3}i}{42}$ 0 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 0
	$-\frac{i}{14}$	0 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 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 0
	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 0 0 $\frac{i}{14}$ 0 0 0 0 0 0 $-\frac{5\sqrt{3}i}{42}$ 0 0 0 0 0
	0	$-\frac{\sqrt{21}i}{42}$ 0 0 0 0 0 0 0 $\frac{\sqrt{210}i}{84}$ 0 0 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	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 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 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 0
	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 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	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
959	symmetry	$\frac{x(8x^4 - 40x^2y^2 - 40x^2z^2 + 15y^4 + 30y^2z^2 + 15z^4)}{8}$

continued ...

Table 10

No.	multipole	matrix
$\mathbb{M}_{5,0}^{(a)}(T_g, 1)$	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 $-\frac{\sqrt{105}}{168}$ $\frac{\sqrt{10}}{32}$ 0 $-\frac{11\sqrt{210}}{1568}$ 0 $\frac{5\sqrt{14}}{1568}$ 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 $-\frac{3\sqrt{5}}{32}$ 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 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 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 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 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 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

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

continued ...

Table 10

No.	multipole	matrix
$\mathbb{M}_{5,1}^{(a)}(T_g, 1)$	0	$-\frac{\sqrt{210}i}{784} \quad 0 \quad -\frac{\sqrt{105}i}{168} \quad 0 \quad -\frac{3\sqrt{42}i}{112} \quad -\frac{5i}{224} \quad 0 \quad -\frac{25\sqrt{21}i}{1568} \quad 0 \quad -\frac{5\sqrt{35}i}{224} \quad 0 \quad -\frac{15\sqrt{7}i}{224} \quad 0$
	$\frac{\sqrt{210}i}{784}$	$0 \quad \frac{5\sqrt{21}i}{392} \quad 0 \quad \frac{5\sqrt{42}i}{336} \quad 0 \quad 0 \quad \frac{23\sqrt{35}i}{1568} \quad 0 \quad \frac{65\sqrt{7}i}{1568} \quad 0 \quad \frac{\sqrt{105}i}{224} \quad 0 \quad -\frac{3\sqrt{5}i}{32}$
	0	$-\frac{5\sqrt{21}i}{392} \quad 0 \quad -\frac{5\sqrt{42}i}{392} \quad 0 \quad -\frac{\sqrt{105}i}{168} \quad -\frac{\sqrt{10}i}{32} \quad 0 \quad -\frac{11\sqrt{210}i}{1568} \quad 0 \quad -\frac{5\sqrt{14}i}{1568} \quad 0 \quad \frac{3\sqrt{70}i}{224} \quad 0$
	$\frac{\sqrt{105}i}{168}$	$0 \quad \frac{5\sqrt{42}i}{392} \quad 0 \quad \frac{5\sqrt{21}i}{392} \quad 0 \quad 0 \quad \frac{3\sqrt{70}i}{224} \quad 0 \quad -\frac{5\sqrt{14}i}{1568} \quad 0 \quad -\frac{11\sqrt{210}i}{1568} \quad 0 \quad -\frac{\sqrt{10}i}{32}$
	0	$-\frac{5\sqrt{42}i}{336} \quad 0 \quad -\frac{5\sqrt{21}i}{392} \quad 0 \quad -\frac{\sqrt{210}i}{784} \quad -\frac{3\sqrt{5}i}{32} \quad 0 \quad \frac{\sqrt{105}i}{224} \quad 0 \quad \frac{65\sqrt{7}i}{1568} \quad 0 \quad \frac{23\sqrt{35}i}{1568} \quad 0$
	$\frac{3\sqrt{42}i}{112}$	$0 \quad \frac{\sqrt{105}i}{168} \quad 0 \quad \frac{\sqrt{210}i}{784} \quad 0 \quad 0 \quad -\frac{15\sqrt{7}i}{224} \quad 0 \quad -\frac{5\sqrt{35}i}{224} \quad 0 \quad -\frac{25\sqrt{21}i}{1568} \quad 0 \quad -\frac{5i}{224}$
	$\frac{5i}{224}$	$0 \quad \frac{\sqrt{10}i}{32} \quad 0 \quad \frac{3\sqrt{5}i}{32} \quad 0 \quad 0 \quad -\frac{5\sqrt{6}i}{224} \quad 0 \quad -\frac{\sqrt{30}i}{48} \quad 0 \quad -\frac{3\sqrt{2}i}{32} \quad 0 \quad 0$
	0	$-\frac{23\sqrt{35}i}{1568} \quad 0 \quad -\frac{3\sqrt{70}i}{224} \quad 0 \quad \frac{15\sqrt{7}i}{224} \quad \frac{5\sqrt{6}i}{224} \quad 0 \quad \frac{5\sqrt{14}i}{196} \quad 0 \quad \frac{\sqrt{210}i}{672} \quad 0 \quad -\frac{3\sqrt{42}i}{112} \quad 0$
	$\frac{25\sqrt{21}i}{1568}$	$0 \quad \frac{11\sqrt{210}i}{1568} \quad 0 \quad -\frac{\sqrt{105}i}{224} \quad 0 \quad 0 \quad -\frac{5\sqrt{14}i}{196} \quad 0 \quad -\frac{\sqrt{70}i}{1568} \quad 0 \quad \frac{5\sqrt{42}i}{336} \quad 0 \quad -\frac{3\sqrt{2}i}{32}$
	0	$-\frac{65\sqrt{7}i}{1568} \quad 0 \quad \frac{5\sqrt{14}i}{1568} \quad 0 \quad \frac{5\sqrt{35}i}{224} \quad \frac{\sqrt{30}i}{48} \quad 0 \quad \frac{\sqrt{70}i}{1568} \quad 0 \quad -\frac{5\sqrt{42}i}{392} \quad 0 \quad \frac{\sqrt{210}i}{672} \quad 0$
	$\frac{5\sqrt{35}i}{224}$	$0 \quad \frac{5\sqrt{14}i}{1568} \quad 0 \quad -\frac{65\sqrt{7}i}{1568} \quad 0 \quad 0 \quad -\frac{\sqrt{210}i}{672} \quad 0 \quad \frac{5\sqrt{42}i}{392} \quad 0 \quad -\frac{\sqrt{70}i}{1568} \quad 0 \quad -\frac{\sqrt{30}i}{48}$
	0	$-\frac{\sqrt{105}i}{224} \quad 0 \quad \frac{11\sqrt{210}i}{1568} \quad 0 \quad \frac{25\sqrt{21}i}{1568} \quad \frac{3\sqrt{2}i}{32} \quad 0 \quad -\frac{5\sqrt{42}i}{336} \quad 0 \quad \frac{\sqrt{70}i}{1568} \quad 0 \quad \frac{5\sqrt{14}i}{196} \quad 0$
	$\frac{15\sqrt{7}i}{224}$	$0 \quad -\frac{3\sqrt{70}i}{224} \quad 0 \quad -\frac{23\sqrt{35}i}{1568} \quad 0 \quad 0 \quad \frac{3\sqrt{42}i}{112} \quad 0 \quad -\frac{\sqrt{210}i}{672} \quad 0 \quad -\frac{5\sqrt{14}i}{196} \quad 0 \quad -\frac{5\sqrt{6}i}{224}$
	0	$\frac{3\sqrt{5}i}{32} \quad 0 \quad \frac{\sqrt{10}i}{32} \quad 0 \quad \frac{5i}{224} \quad 0 \quad 0 \quad \frac{3\sqrt{2}i}{32} \quad 0 \quad \frac{\sqrt{30}i}{48} \quad 0 \quad \frac{5\sqrt{6}i}{224} \quad 0$

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

961 symmetry

continued ...

Table 10

No.	multipole	matrix													
$\mathbb{M}_{5,2}^{(a)}(T_g, 1)$	$\frac{\sqrt{42}}{294}$	0	0	0	0	0	0	$\frac{5\sqrt{7}}{98}$	0	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	0	$\frac{5\sqrt{42}}{147}$	0	0	0	0	0	0	$\frac{5\sqrt{14}}{98}$	0	0	0	0	0
	0	0	0	$-\frac{5\sqrt{42}}{147}$	0	0	0	0	0	$\frac{5\sqrt{14}}{98}$	0	0	0	0	0
	0	0	0	0	$\frac{5\sqrt{42}}{294}$	0	0	0	0	0	$-\frac{3\sqrt{105}}{98}$	0	0	0	0
	0	0	0	0	0	$-\frac{\sqrt{42}}{294}$	0	0	0	0	0	$\frac{5\sqrt{7}}{98}$	0	0	0
	0	0	0	0	0	0	$\frac{\sqrt{42}}{84}$	0	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	$-\frac{3\sqrt{105}}{98}$	0	0	0	0	0	0	$\frac{17\sqrt{42}}{588}$	0	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	0	$\frac{5\sqrt{14}}{98}$	0	0	0	0	0	0	$-\frac{5\sqrt{42}}{196}$	0	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	0	$\frac{5\sqrt{7}}{98}$	0	0	0	0	0	$\frac{23\sqrt{42}}{588}$	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	$-\frac{\sqrt{42}}{84}$	0	0
962	symmetry	$\frac{3\sqrt{35}x(y^2 - 2yz - z^2)(y^2 + 2yz - z^2)}{8}$													

continued ...

Table 10

No.	multipole	matrix													
$\mathbb{M}_{5,0}^{(a)}(T_g, 2)$	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	

963 symmetry

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

continued ...

Table 10

No.	multipole	matrix
$\mathbb{M}_{5,1}^{(a)}(T_g, 2)$	0	$-\frac{\sqrt{6}i}{112}$
	$\frac{\sqrt{6}i}{112}$	0
	0	$\frac{\sqrt{15}i}{56}$
	$-\frac{3\sqrt{30}i}{56}$	0
	0	$-\frac{3\sqrt{30}i}{56}$
	$-\frac{3\sqrt{5}i}{56}$	0
	0	$\frac{\sqrt{30}i}{56}$
	$-\frac{3\sqrt{30}i}{112}$	0
	0	$-\frac{3\sqrt{3}i}{56}$
	$\frac{\sqrt{35}i}{224}$	0
	0	$-\frac{9\sqrt{14}i}{224}$
	$-\frac{23i}{224}$	0
	$\frac{5\sqrt{15}i}{224}$	0
	0	$-\frac{13\sqrt{5}i}{224}$
	$-\frac{45i}{224}$	0
	0	$\frac{9\sqrt{3}i}{224}$
	$\frac{5\sqrt{5}i}{224}$	0
	0	$-\frac{9\sqrt{14}i}{224}$
$\frac{3\sqrt{35}z(x^2 - 2xy - y^2)(x^2 + 2xy - y^2)}{8}$		

964 symmetry

Table 10

No.	multipole	matrix													
$\mathbb{M}_{5,2}^{(a)}(T_g, 2)$	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 0 $-\frac{\sqrt{14}}{14}$ 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 $-\frac{\sqrt{14}}{14}$ 0 0													
	$\frac{\sqrt{6}}{14}$ 0 0 0 0 0 0 0 $\frac{1}{14}$ 0 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 0 $-\frac{\sqrt{14}}{14}$ 0 0 0 0 0 0 0 $\frac{\sqrt{42}}{28}$ 0 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 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 $\frac{\sqrt{42}}{28}$ 0 0 0 0 0 0													
	$\frac{\sqrt{15}}{14}$ 0 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 0 $-\frac{\sqrt{14}}{14}$ 0 0 0 0 0 0 0 $-\frac{\sqrt{42}}{28}$ 0 0 0 0 0	$\frac{\sqrt{105}x(y-z)(y+z)(2x^2-y^2-z^2)}{4}$													
965	symmetry														

continued ...

Table 10

No.	multipole	matrix													
$\mathbb{M}_{5,0}^{(a)}(T_g, 3)$	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	

966 symmetry

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

continued ...

Table 10

No.	multipole	matrix
$\mathbb{M}_{5,1}^{(a)}(T_g, 3)$	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

967 symmetry

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

continued ...

Table 10

No.	multipole	matrix
$\mathbb{M}_{5,2}^{(a)}(T_g, 3)$	0	0 $\frac{1}{14}$ 0 0 0 0 0 0 0 $\frac{5\sqrt{3}}{42}$ 0 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 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 0 $-\frac{1}{14}$ 0 0 $-\frac{\sqrt{2}}{14}$ 0 0 0 $\frac{2\sqrt{6}}{21}$ 0
	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 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 0 $\frac{\sqrt{210}}{84}$ 0 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 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 0 $\frac{5\sqrt{3}}{42}$ 0 0 $-\frac{\sqrt{6}}{21}$ 0 0 0 $\frac{3\sqrt{2}}{28}$ 0
	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 0 $\frac{2\sqrt{6}}{21}$ 0 0 0 0 0 0 $\frac{3\sqrt{2}}{28}$ 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

968 symmetry

x

continued ...

Table 10

No.	multipole	matrix
$\mathbb{M}_{1,0}^{(1,-1;a)}(T_g)$	0	$-\frac{\sqrt{70}}{98}$ 0 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 0 $\frac{\sqrt{105}}{49}$ 0 $-\frac{\sqrt{21}}{49}$ 0 0 0 0 0
	0	$-\frac{2\sqrt{7}}{49}$ 0 $-\frac{3\sqrt{14}}{98}$ 0 0 0 0 0 $\frac{\sqrt{70}}{49}$ 0 $-\frac{\sqrt{42}}{49}$ 0 0 0 0
	0	0 $-\frac{3\sqrt{14}}{98}$ 0 $-\frac{2\sqrt{7}}{49}$ 0 0 0 0 0 $\frac{\sqrt{42}}{49}$ 0 $-\frac{\sqrt{70}}{49}$ 0 0 0
	0	0 0 $-\frac{2\sqrt{7}}{49}$ 0 $-\frac{\sqrt{70}}{98}$ 0 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 0 $-\frac{\sqrt{3}}{7}$
	$\frac{\sqrt{3}}{7}$	0 0 0 0 0 0 0 $\frac{\sqrt{2}}{14}$ 0 0 0 0 0 0 0
	0	$\frac{\sqrt{105}}{49}$ 0 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 0 $\frac{\sqrt{42}}{49}$ 0 $\frac{\sqrt{210}}{98}$ 0 0 0 0 0
	0	$-\frac{\sqrt{21}}{49}$ 0 $\frac{\sqrt{42}}{49}$ 0 0 0 0 0 $\frac{\sqrt{210}}{98}$ 0 $\frac{2\sqrt{14}}{49}$ 0 0 0 0
	0	0 $-\frac{\sqrt{42}}{49}$ 0 $\frac{\sqrt{21}}{49}$ 0 0 0 0 0 $\frac{2\sqrt{14}}{49}$ 0 $\frac{\sqrt{210}}{98}$ 0 0 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 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 0 $-\frac{\sqrt{3}}{7}$ 0 0 0 0 0 0 $\frac{\sqrt{2}}{14}$ 0

969 symmetry

y

continued ...

Table 10

No.	multipole	matrix													
$\mathbb{M}_{1,1}^{(1,-1;a)}(T_g)$	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	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
	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	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	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	0	$-\frac{\sqrt{70}i}{98}$	0	0	0	0	0	$\frac{\sqrt{7}i}{49}$	0	$\frac{\sqrt{3}i}{7}$	0	0
	$-\frac{\sqrt{3}i}{7}$	0	0	0	0	0	0	$-\frac{\sqrt{2}i}{14}$	0	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	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
	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	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	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	0	$-\frac{\sqrt{105}i}{49}$	0	0	0	0	0	$\frac{\sqrt{42}i}{49}$	0	$-\frac{\sqrt{2}i}{14}$	0	0
	0	0	0	0	0	$-\frac{\sqrt{3}i}{7}$	0	0	0	0	0	$\frac{\sqrt{2}i}{14}$	0	0	0

970 symmetry

z

continued ...

Table 10

No.	multipole	matrix													
$\mathbb{M}_{1,2}^{(1,-1;a)}(T_g)$	$-\frac{5\sqrt{14}}{98}$	0	0	0	0	0	0	$-\frac{2\sqrt{21}}{49}$	0	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	0	$-\frac{\sqrt{14}}{98}$	0	0	0	0	0	0	$-\frac{2\sqrt{42}}{49}$	0	0	0	0	0
	0	0	0	$\frac{\sqrt{14}}{98}$	0	0	0	0	0	$-\frac{2\sqrt{42}}{49}$	0	0	0	0	0
	0	0	0	0	$\frac{3\sqrt{14}}{98}$	0	0	0	0	0	$-\frac{2\sqrt{35}}{49}$	0	0	0	0
	0	0	0	0	0	$\frac{5\sqrt{14}}{98}$	0	0	0	0	0	$-\frac{2\sqrt{21}}{49}$	0	0	0
	0	0	0	0	0	0	$\frac{\sqrt{14}}{14}$	0	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	$-\frac{2\sqrt{35}}{49}$	0	0	0	0	0	0	$\frac{3\sqrt{14}}{98}$	0	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	0	$-\frac{2\sqrt{42}}{49}$	0	0	0	0	0	0	$-\frac{\sqrt{14}}{98}$	0	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	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	0	$-\frac{\sqrt{14}}{14}$	0
971	symmetry	$\sqrt{15}xyz$													

continued ...

Table 10

No.	multipole	matrix													
$\mathbb{M}_3^{(1,-1;a)}(A_g)$	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	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	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
	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	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	0	$-\frac{\sqrt{105}i}{98}$	0	0	0	0	0	$\frac{4\sqrt{35}i}{147}$	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	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	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	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
	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	0	$\frac{\sqrt{210}i}{147}$	0	0	0	0	0	$\frac{\sqrt{70}i}{98}$	0	0	0	$-\frac{5\sqrt{2}i}{28}$	0	0
	0	0	0	$-\frac{\sqrt{70}i}{147}$	0	0	0	0	0	$\frac{3\sqrt{210}i}{196}$	0	0	0	0	0
	0	0	0	0	$-\frac{2\sqrt{5}i}{21}$	0	0	0	0	0	$\frac{5\sqrt{2}i}{28}$	0	0	0	0
972	symmetry	$\frac{x(2x^2 - 3y^2 - 3z^2)}{2}$													

continued ...

Table 10

No.	multipole	matrix													
$\mathbb{M}_{3,0}^{(1,-1;a)}(T_g, 1)$	0	$-\frac{3\sqrt{14}}{196}$	0	$\frac{5\sqrt{7}}{196}$	0	$\frac{\sqrt{15}}{42}$	0	$-\frac{\sqrt{35}}{49}$	0	$\frac{5\sqrt{21}}{294}$	0	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	$-\frac{5\sqrt{21}}{294}$	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	$-\frac{5\sqrt{14}}{98}$	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	$-\frac{5\sqrt{2}}{56}$	0	$\frac{3\sqrt{10}}{56}$	0		
973	symmetry	$-\frac{y(3x^2 - 2y^2 + 3z^2)}{2}$													

continued ...

Table 10

No.	multipole	matrix
$M_{3,1}^{(1,-1;a)}(T_g, 1)$	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 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 0
	$-\frac{5\sqrt{7}i}{196}$	0 $\frac{3\sqrt{70}i}{490}$ 0 - $\frac{3\sqrt{35}i}{980}$ 0 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
	0	- $\frac{\sqrt{70}i}{98}$ 0 $\frac{3\sqrt{35}i}{980}$ 0 $\frac{3\sqrt{14}i}{196}$ 0 0 0 $\frac{5\sqrt{7}i}{98}$ 0 $\frac{\sqrt{105}i}{147}$ 0 $-\frac{5\sqrt{21}i}{294}$ 0 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 $\frac{\sqrt{15}i}{42}$ 0
	$-\frac{\sqrt{15}i}{42}$	0 - $\frac{5\sqrt{6}i}{84}$ 0 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 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 0 $\frac{\sqrt{210}i}{392}$ 0 $\frac{5\sqrt{42}i}{392}$ 0 $-\frac{5\sqrt{70}i}{196}$ 0 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 0
	$-\frac{5\sqrt{21}i}{294}$	0 $\frac{\sqrt{210}i}{588}$ 0 - $\frac{\sqrt{105}i}{147}$ 0 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
	0	- $\frac{5\sqrt{7}i}{98}$ 0 $\frac{5\sqrt{14}i}{196}$ 0 $-\frac{\sqrt{35}i}{49}$ 0 0 0 $\frac{5\sqrt{70}i}{196}$ 0 $-\frac{5\sqrt{42}i}{392}$ 0 $-\frac{\sqrt{210}i}{392}$ 0 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 0 0 - $\frac{5\sqrt{6}i}{84}$ 0 $-\frac{\sqrt{15}i}{42}$ 0 0 0 $\frac{5\sqrt{2}i}{56}$ 0 $\frac{3\sqrt{10}i}{56}$ 0 0

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

continued ...

Table 10

No.	multipole	matrix												
$\mathbb{M}_{3,2}^{(1,-1;a)}(T_g, 1)$	$\frac{\sqrt{70}}{98}$	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	$-\frac{2\sqrt{210}}{147}$	0	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	$\frac{4\sqrt{105}}{147}$	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	$\frac{\sqrt{70}}{28}$	0	0	0	0	0	0
	0	0	$-\frac{2\sqrt{210}}{147}$	0	0	0	0	0	$\frac{3\sqrt{70}}{196}$	0	0	0	0	0
	0	0	0	$-\frac{2\sqrt{210}}{147}$	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	0	$\frac{4\sqrt{105}}{147}$	0	0	0	0	0	$-\frac{5\sqrt{70}}{196}$	0	0
	0	0	0	0	0	0	0	0	0	0	0	$\frac{\sqrt{70}}{28}$	0	0
975	symmetry	$\frac{\sqrt{15}x(y-z)(y+z)}{2}$												

continued ...

Table 10

No.	multipole	matrix													
$M_{3,0}^{(1,-1;a)}(T_g, 2)$	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	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
	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	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
	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	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	$-\frac{5}{42}$	0
	$\frac{5}{42}$	0	$\frac{\sqrt{10}}{28}$	0	0	0	0	$\frac{5\sqrt{6}}{56}$	0	$\frac{\sqrt{30}}{56}$	0	0	0	0	0
	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	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
	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	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
	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	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	0	$-\frac{\sqrt{10}}{28}$	0	$-\frac{5}{42}$	0	0	0	0	$\frac{\sqrt{30}}{56}$	0	$\frac{5\sqrt{6}}{56}$	0	0
$-\frac{\sqrt{15}y(x-z)(x+z)}{2}$															

976 symmetry

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

continued ...

Table 10

No.	multipole	matrix													
$\mathbb{M}_{3,1}^{(1,-1;a)}(T_g, 2)$	0	$-\frac{\sqrt{210}i}{196}$	0	$\frac{\sqrt{105}i}{196}$	0	$-\frac{5i}{42}$	0	$-\frac{5\sqrt{21}i}{147}$	0	$\frac{\sqrt{35}i}{98}$	0	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	
$\frac{\sqrt{15}z(x-y)(x+y)}{2}$															
977	symmetry														

continued ...

Table 10

No.	multipole	matrix													
$\mathbb{M}_{3,2}^{(1,-1;a)}(T_g, 2)$	0	0	$\frac{\sqrt{105}}{98}$	0	0	0	0	0	0	$\frac{4\sqrt{35}}{147}$	0	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	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
	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	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	0	$-\frac{\sqrt{105}}{98}$	0	0	0	0	0	$\frac{4\sqrt{35}}{147}$	0	0	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	0	$-\frac{\sqrt{70}}{147}$	0	0	0	0	0	0	$-\frac{3\sqrt{210}}{196}$	0	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	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
	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	0	$\frac{\sqrt{210}}{147}$	0	0	0	0	0	$\frac{\sqrt{70}}{98}$	0	0	0	$\frac{5\sqrt{2}}{28}$	0	0
	0	0	0	$-\frac{\sqrt{70}}{147}$	0	0	0	0	0	$\frac{3\sqrt{210}}{196}$	0	0	0	0	0
	0	0	0	0	$-\frac{2\sqrt{5}}{21}$	0	0	0	0	0	$\frac{5\sqrt{2}}{28}$	0	0	0	0
978	symmetry	$\frac{3\sqrt{35}xyz(x-y)(x+y)}{2}$													

continued ...

Table 10

No.	multipole	matrix													
$\mathbb{M}_{5,0}^{(1,-1;a)}(E_g)$	0	0	0	0	$\frac{\sqrt{55}i}{154}$	0	0	0	0	0	$\frac{3\sqrt{22}i}{77}$	0	0	0	
	0	0	0	0	0	$-\frac{\sqrt{55}i}{154}$	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	0	$\frac{2\sqrt{1155}i}{385}$	0	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	$\frac{\sqrt{55}i}{154}$	0	0	0	0	0	0	$-\frac{3\sqrt{22}i}{77}$	0	0	0	0	0	0
	0	0	0	$-\frac{2\sqrt{1155}i}{385}$	0	0	0	0	0	$-\frac{3\sqrt{385}i}{154}$	0	0	0	0	
	0	0	0	0	$\frac{\sqrt{330}i}{385}$	0	0	0	0	0	$-\frac{5\sqrt{33}i}{154}$	0	0	0	
	0	0	0	0	0	$\frac{3\sqrt{22}i}{77}$	0	0	0	0	0	$\frac{5\sqrt{33}i}{154}$	0	0	
	0	0	0	0	0	0	$\frac{3\sqrt{385}i}{154}$	0	0	0	0	0	$\frac{3\sqrt{385}i}{154}$	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	$\frac{\sqrt{105xyz(x^2+y^2-2z^2)}}{2}$													

continued ...

Table 10

No.	multipole	matrix
$\mathbb{M}_{5,1}^{(1,-1;a)}(E_g)$	0	$0 \ 0 \ -\frac{\sqrt{330}i}{924} \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ -\frac{\sqrt{110}i}{77} \ 0 \ 0 \ 0 \ 0$
	0	$0 \ 0 \ 0 \ \frac{5\sqrt{66}i}{924} \ 0 \ 0 \ -\frac{\sqrt{770}i}{385} \ 0 \ 0 \ 0 \ \frac{2\sqrt{22}i}{77} \ 0 \ 0 \ 0$
	$\frac{\sqrt{330}i}{924}$	$0 \ 0 \ 0 \ 0 \ -\frac{5\sqrt{66}i}{924} \ 0 \ 0 \ \frac{8\sqrt{55}i}{385} \ 0 \ 0 \ 0 \ \frac{2\sqrt{165}i}{385} \ 0 \ 0$
	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	$0 \ 0 \ \frac{5\sqrt{66}i}{924} \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ -\frac{2\sqrt{22}i}{77} \ 0 \ 0 \ 0 \ \frac{\sqrt{770}i}{385}$
	0	$0 \ 0 \ 0 \ -\frac{\sqrt{330}i}{924} \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ \frac{\sqrt{110}i}{77} \ 0 \ 0 \ 0$
	0	$\frac{\sqrt{770}i}{385} \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0$
	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	$0 \ 0 \ 0 \ \frac{2\sqrt{165}i}{385} \ 0 \ 0 \ -\frac{5\sqrt{77}i}{154} \ 0 \ 0 \ 0 \ -\frac{2\sqrt{55}i}{77} \ 0 \ 0 \ 0$
	$\frac{\sqrt{110}i}{77}$	$0 \ 0 \ 0 \ 0 \ \frac{2\sqrt{22}i}{77} \ 0 \ 0 \ \frac{3\sqrt{165}i}{154} \ 0 \ 0 \ 0 \ \frac{2\sqrt{55}i}{77} \ 0 \ 0$
	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	$0 \ 0 \ -\frac{2\sqrt{165}i}{385} \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ -\frac{2\sqrt{55}i}{77} \ 0 \ 0 \ 0 \ -\frac{5\sqrt{77}i}{154}$
	0	$0 \ 0 \ 0 \ \frac{8\sqrt{55}i}{385} \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ -\frac{3\sqrt{165}i}{154} \ 0 \ 0 \ 0$
	0	$0 \ 0 \ 0 \ 0 \ -\frac{\sqrt{770}i}{385} \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ \frac{5\sqrt{77}i}{154} \ 0 \ 0$
$\frac{x(8x^4 - 40x^2y^2 - 40x^2z^2 + 15y^4 + 30y^2z^2 + 15z^4)}{8}$		

980 symmetry

continued ...

Table 10

No.	multipole	matrix
$M_{5,0}^{(1,-1;a)}(T_g, 1)$	0	$-\frac{5\sqrt{77}}{8624} \quad 0 \quad \frac{5\sqrt{154}}{3696} \quad 0 \quad -\frac{3\sqrt{385}}{1232} \quad \frac{\sqrt{330}}{1232} \quad 0 \quad -\frac{15\sqrt{770}}{8624} \quad 0 \quad \frac{5\sqrt{462}}{1232} \quad 0 \quad -\frac{3\sqrt{2310}}{1232} \quad 0$
	$-\frac{5\sqrt{77}}{8624}$	$0 \quad \frac{5\sqrt{770}}{8624} \quad 0 \quad -\frac{5\sqrt{385}}{3696} \quad 0 \quad 0 \quad -\frac{23\sqrt{462}}{8624} \quad 0 \quad \frac{13\sqrt{2310}}{8624} \quad 0 \quad -\frac{3\sqrt{154}}{1232} \quad 0 \quad -\frac{3\sqrt{66}}{176}$
	0	$\frac{5\sqrt{770}}{8624} \quad 0 \quad -\frac{5\sqrt{385}}{4312} \quad 0 \quad \frac{5\sqrt{154}}{3696} \quad -\frac{\sqrt{33}}{88} \quad 0 \quad \frac{3\sqrt{77}}{392} \quad 0 \quad -\frac{\sqrt{1155}}{4312} \quad 0 \quad -\frac{3\sqrt{231}}{616} \quad 0$
	$\frac{5\sqrt{154}}{3696}$	$0 \quad -\frac{5\sqrt{385}}{4312} \quad 0 \quad \frac{5\sqrt{770}}{8624} \quad 0 \quad 0 \quad \frac{3\sqrt{231}}{616} \quad 0 \quad \frac{\sqrt{1155}}{4312} \quad 0 \quad -\frac{3\sqrt{77}}{392} \quad 0 \quad \frac{\sqrt{33}}{88}$
	0	$-\frac{5\sqrt{385}}{3696} \quad 0 \quad \frac{5\sqrt{770}}{8624} \quad 0 \quad -\frac{5\sqrt{77}}{8624} \quad \frac{3\sqrt{66}}{176} \quad 0 \quad \frac{3\sqrt{154}}{1232} \quad 0 \quad -\frac{13\sqrt{2310}}{8624} \quad 0 \quad \frac{23\sqrt{462}}{8624} \quad 0$
	$-\frac{3\sqrt{385}}{1232}$	$0 \quad \frac{5\sqrt{154}}{3696} \quad 0 \quad -\frac{5\sqrt{77}}{8624} \quad 0 \quad 0 \quad \frac{3\sqrt{2310}}{1232} \quad 0 \quad -\frac{5\sqrt{462}}{1232} \quad 0 \quad \frac{15\sqrt{770}}{8624} \quad 0 \quad -\frac{\sqrt{330}}{1232}$
	$\frac{\sqrt{330}}{1232}$	$0 \quad -\frac{\sqrt{33}}{88} \quad 0 \quad \frac{3\sqrt{66}}{176} \quad 0 \quad 0 \quad \frac{15\sqrt{55}}{1232} \quad 0 \quad -\frac{5\sqrt{11}}{88} \quad 0 \quad \frac{3\sqrt{165}}{176} \quad 0 \quad 0$
	0	$-\frac{23\sqrt{462}}{8624} \quad 0 \quad \frac{3\sqrt{231}}{616} \quad 0 \quad \frac{3\sqrt{2310}}{1232} \quad \frac{15\sqrt{55}}{1232} \quad 0 \quad -\frac{5\sqrt{1155}}{1078} \quad 0 \quad \frac{5\sqrt{77}}{1232} \quad 0 \quad \frac{9\sqrt{385}}{616} \quad 0$
	$-\frac{15\sqrt{770}}{8624}$	$0 \quad \frac{3\sqrt{77}}{392} \quad 0 \quad \frac{3\sqrt{154}}{1232} \quad 0 \quad 0 \quad -\frac{5\sqrt{1155}}{1078} \quad 0 \quad \frac{5\sqrt{231}}{8624} \quad 0 \quad \frac{5\sqrt{385}}{616} \quad 0 \quad \frac{3\sqrt{165}}{176}$
	0	$\frac{13\sqrt{2310}}{8624} \quad 0 \quad \frac{\sqrt{1155}}{4312} \quad 0 \quad -\frac{5\sqrt{462}}{1232} \quad -\frac{5\sqrt{11}}{88} \quad 0 \quad \frac{5\sqrt{231}}{8624} \quad 0 \quad \frac{15\sqrt{385}}{2156} \quad 0 \quad \frac{5\sqrt{77}}{1232} \quad 0$
	$\frac{5\sqrt{462}}{1232}$	$0 \quad -\frac{\sqrt{1155}}{4312} \quad 0 \quad -\frac{13\sqrt{2310}}{8624} \quad 0 \quad 0 \quad \frac{5\sqrt{77}}{1232} \quad 0 \quad \frac{15\sqrt{385}}{2156} \quad 0 \quad \frac{5\sqrt{231}}{8624} \quad 0 \quad -\frac{5\sqrt{11}}{88}$
	0	$-\frac{3\sqrt{154}}{1232} \quad 0 \quad -\frac{3\sqrt{77}}{392} \quad 0 \quad \frac{15\sqrt{770}}{8624} \quad \frac{3\sqrt{165}}{176} \quad 0 \quad \frac{5\sqrt{385}}{616} \quad 0 \quad \frac{5\sqrt{231}}{8624} \quad 0 \quad -\frac{5\sqrt{1155}}{1078} \quad 0$
	$-\frac{3\sqrt{2310}}{1232}$	$0 \quad -\frac{3\sqrt{231}}{616} \quad 0 \quad \frac{23\sqrt{462}}{8624} \quad 0 \quad 0 \quad \frac{9\sqrt{385}}{616} \quad 0 \quad \frac{5\sqrt{77}}{1232} \quad 0 \quad -\frac{5\sqrt{1155}}{1078} \quad 0 \quad \frac{15\sqrt{55}}{1232}$
	0	$-\frac{3\sqrt{66}}{176} \quad 0 \quad \frac{\sqrt{33}}{88} \quad 0 \quad -\frac{\sqrt{330}}{1232} \quad 0 \quad 0 \quad \frac{3\sqrt{165}}{176} \quad 0 \quad -\frac{5\sqrt{11}}{88} \quad 0 \quad \frac{15\sqrt{55}}{1232} \quad 0$

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

981 symmetry

continued ...

Table 10

No.	multipole	matrix
$M_{5,1}^{(1,-1;a)}(T_g, 1)$	0	$\frac{5\sqrt{77}i}{8624} \quad 0 \quad \frac{5\sqrt{154}i}{3696} \quad 0 \quad \frac{3\sqrt{385}i}{1232} \quad \frac{\sqrt{330}i}{1232} \quad 0 \quad \frac{15\sqrt{770}i}{8624} \quad 0 \quad \frac{5\sqrt{462}i}{1232} \quad 0 \quad \frac{3\sqrt{2310}i}{1232} \quad 0$
	$-\frac{5\sqrt{77}i}{8624}$	$0 \quad -\frac{5\sqrt{770}i}{8624} \quad 0 \quad -\frac{5\sqrt{385}i}{3696} \quad 0 \quad 0 \quad -\frac{23\sqrt{462}i}{8624} \quad 0 \quad -\frac{13\sqrt{2310}i}{8624} \quad 0 \quad -\frac{3\sqrt{154}i}{1232} \quad 0 \quad \frac{3\sqrt{66}i}{176}$
	0	$\frac{5\sqrt{770}i}{8624} \quad 0 \quad \frac{5\sqrt{385}i}{4312} \quad 0 \quad \frac{5\sqrt{154}i}{3696} \quad \frac{\sqrt{33}i}{88} \quad 0 \quad \frac{3\sqrt{77}i}{392} \quad 0 \quad \frac{\sqrt{1155}i}{4312} \quad 0 \quad -\frac{3\sqrt{231}i}{616} \quad 0$
	$-\frac{5\sqrt{154}i}{3696}$	$0 \quad -\frac{5\sqrt{385}i}{4312} \quad 0 \quad -\frac{5\sqrt{770}i}{8624} \quad 0 \quad 0 \quad -\frac{3\sqrt{231}i}{616} \quad 0 \quad \frac{\sqrt{1155}i}{4312} \quad 0 \quad \frac{3\sqrt{77}i}{392} \quad 0 \quad \frac{\sqrt{33}i}{88}$
	0	$\frac{5\sqrt{385}i}{3696} \quad 0 \quad \frac{5\sqrt{770}i}{8624} \quad 0 \quad \frac{5\sqrt{77}i}{8624} \quad \frac{3\sqrt{66}i}{176} \quad 0 \quad -\frac{3\sqrt{154}i}{1232} \quad 0 \quad -\frac{13\sqrt{2310}i}{8624} \quad 0 \quad -\frac{23\sqrt{462}i}{8624} \quad 0$
	$-\frac{3\sqrt{385}i}{1232}$	$0 \quad -\frac{5\sqrt{154}i}{3696} \quad 0 \quad -\frac{5\sqrt{77}i}{8624} \quad 0 \quad 0 \quad \frac{3\sqrt{2310}i}{1232} \quad 0 \quad \frac{5\sqrt{462}i}{1232} \quad 0 \quad \frac{15\sqrt{770}i}{8624} \quad 0 \quad \frac{\sqrt{330}i}{1232}$
	$-\frac{\sqrt{330}i}{1232}$	$0 \quad -\frac{\sqrt{33}i}{88} \quad 0 \quad -\frac{3\sqrt{66}i}{176} \quad 0 \quad 0 \quad -\frac{15\sqrt{55}i}{1232} \quad 0 \quad -\frac{5\sqrt{11}i}{88} \quad 0 \quad -\frac{3\sqrt{165}i}{176} \quad 0 \quad 0$
	0	$\frac{23\sqrt{462}i}{8624} \quad 0 \quad \frac{3\sqrt{231}i}{616} \quad 0 \quad -\frac{3\sqrt{2310}i}{1232} \quad \frac{15\sqrt{55}i}{1232} \quad 0 \quad \frac{5\sqrt{1155}i}{1078} \quad 0 \quad \frac{5\sqrt{77}i}{1232} \quad 0 \quad -\frac{9\sqrt{385}i}{616} \quad 0$
	$-\frac{15\sqrt{770}i}{8624}$	$0 \quad -\frac{3\sqrt{77}i}{392} \quad 0 \quad \frac{3\sqrt{154}i}{1232} \quad 0 \quad 0 \quad -\frac{5\sqrt{1155}i}{1078} \quad 0 \quad -\frac{5\sqrt{231}i}{8624} \quad 0 \quad \frac{5\sqrt{385}i}{616} \quad 0 \quad -\frac{3\sqrt{165}i}{176}$
	0	$\frac{13\sqrt{2310}i}{8624} \quad 0 \quad -\frac{\sqrt{1155}i}{4312} \quad 0 \quad -\frac{5\sqrt{462}i}{1232} \quad \frac{5\sqrt{11}i}{88} \quad 0 \quad \frac{5\sqrt{231}i}{8624} \quad 0 \quad -\frac{15\sqrt{385}i}{2156} \quad 0 \quad \frac{5\sqrt{77}i}{1232} \quad 0$
	$-\frac{5\sqrt{462}i}{1232}$	$0 \quad -\frac{\sqrt{1155}i}{4312} \quad 0 \quad \frac{13\sqrt{2310}i}{8624} \quad 0 \quad 0 \quad -\frac{5\sqrt{77}i}{1232} \quad 0 \quad \frac{15\sqrt{385}i}{2156} \quad 0 \quad -\frac{5\sqrt{231}i}{8624} \quad 0 \quad -\frac{5\sqrt{11}i}{88}$
	0	$\frac{3\sqrt{154}i}{1232} \quad 0 \quad -\frac{3\sqrt{77}i}{392} \quad 0 \quad -\frac{15\sqrt{770}i}{8624} \quad \frac{3\sqrt{165}i}{176} \quad 0 \quad -\frac{5\sqrt{385}i}{616} \quad 0 \quad \frac{5\sqrt{231}i}{8624} \quad 0 \quad \frac{5\sqrt{1155}i}{1078} \quad 0$
	$-\frac{3\sqrt{2310}i}{1232}$	$0 \quad \frac{3\sqrt{231}i}{616} \quad 0 \quad -\frac{\sqrt{33}i}{88} \quad 0 \quad 0 \quad \frac{9\sqrt{385}i}{616} \quad 0 \quad -\frac{5\sqrt{77}i}{1232} \quad 0 \quad -\frac{5\sqrt{1155}i}{1078} \quad 0 \quad -\frac{15\sqrt{55}i}{1232}$
	0	$-\frac{3\sqrt{66}i}{176} \quad 0 \quad -\frac{\sqrt{33}i}{88} \quad 0 \quad -\frac{\sqrt{330}i}{1232} \quad 0 \quad 0 \quad \frac{3\sqrt{165}i}{176} \quad 0 \quad \frac{5\sqrt{11}i}{88} \quad 0 \quad \frac{15\sqrt{55}i}{1232} \quad 0$

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

982 symmetry

continued ...

Table 10

No.	multipole	matrix													
$\mathbb{M}_{5,2}^{(1,-1;a)}(T_g, 1)$	$-\frac{\sqrt{385}}{3234}$	0	0	0	0	0	0	$-\frac{\sqrt{2310}}{539}$	0	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	0	$-\frac{5\sqrt{385}}{1617}$	0	0	0	0	0	0	$-\frac{2\sqrt{1155}}{539}$	0	0	0	0	0
	0	0	0	$\frac{5\sqrt{385}}{1617}$	0	0	0	0	0	$-\frac{2\sqrt{1155}}{539}$	0	0	0	0	0
	0	0	0	0	$-\frac{5\sqrt{385}}{3234}$	0	0	0	0	0	$\frac{9\sqrt{154}}{539}$	0	0	0	0
	0	0	0	0	0	$\frac{\sqrt{385}}{3234}$	0	0	0	0	0	$-\frac{\sqrt{2310}}{539}$	0	0	0
	0	0	0	0	0	0	$\frac{\sqrt{385}}{154}$	0	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	$\frac{9\sqrt{154}}{539}$	0	0	0	0	0	0	$\frac{17\sqrt{385}}{1078}$	0	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	0	$-\frac{2\sqrt{1155}}{539}$	0	0	0	0	0	0	$-\frac{15\sqrt{385}}{1078}$	0	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	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	0	$-\frac{\sqrt{385}}{154}$	0
983	symmetry	$\frac{3\sqrt{35}x(y^2 - 2yz - z^2)(y^2 + 2yz - z^2)}{8}$													

continued ...

Table 10

No.	multipole	matrix														
$M_{5,0}^{(1,-1;a)}(T_g, 2)$	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	
	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		
$\frac{3\sqrt{35}y(x^2 - 2xz - z^2)(x^2 + 2xz - z^2)}{8}$																

984 symmetry

Table 10

No.	multipole	matrix
$\mathbb{M}_{5,1}^{(1,-1;a)}(T_g, 2)$	0	$\frac{\sqrt{55}i}{1232} \quad 0 \quad -\frac{3\sqrt{110}i}{1232} \quad 0 \quad \frac{5\sqrt{11}i}{1232} \quad \frac{\sqrt{462}i}{1232} \quad 0 \quad \frac{15\sqrt{22}i}{1232} \quad 0 \quad -\frac{9\sqrt{330}i}{1232} \quad 0 \quad \frac{5\sqrt{66}i}{1232} \quad 0$
	$-\frac{\sqrt{55}i}{1232}$	$0 \quad -\frac{5\sqrt{22}i}{1232} \quad 0 \quad \frac{15\sqrt{11}i}{1232} \quad 0 \quad 0 \quad 0 \quad -\frac{23\sqrt{330}i}{6160} \quad 0 \quad -\frac{13\sqrt{66}i}{1232} \quad 0 \quad \frac{27\sqrt{110}i}{6160} \quad 0 \quad \frac{\sqrt{2310}i}{1232}$
	0	$\frac{5\sqrt{22}i}{1232} \quad 0 \quad \frac{5\sqrt{11}i}{616} \quad 0 \quad -\frac{3\sqrt{110}i}{1232} \quad -\frac{9\sqrt{1155}i}{3080} \quad 0 \quad \frac{3\sqrt{55}i}{280} \quad 0 \quad \frac{\sqrt{33}i}{616} \quad 0 \quad \frac{27\sqrt{165}i}{3080} \quad 0$
	$\frac{3\sqrt{110}i}{1232}$	$0 \quad -\frac{5\sqrt{11}i}{616} \quad 0 \quad -\frac{5\sqrt{22}i}{1232} \quad 0 \quad 0 \quad \frac{27\sqrt{165}i}{3080} \quad 0 \quad \frac{\sqrt{33}i}{616} \quad 0 \quad \frac{3\sqrt{55}i}{280} \quad 0 \quad -\frac{9\sqrt{1155}i}{3080}$
	0	$-\frac{15\sqrt{11}i}{1232} \quad 0 \quad \frac{5\sqrt{22}i}{1232} \quad 0 \quad \frac{\sqrt{55}i}{1232} \quad \frac{\sqrt{2310}i}{1232} \quad 0 \quad \frac{27\sqrt{110}i}{6160} \quad 0 \quad -\frac{13\sqrt{66}i}{1232} \quad 0 \quad -\frac{23\sqrt{330}i}{6160} \quad 0$
	$-\frac{5\sqrt{11}i}{1232}$	$0 \quad \frac{3\sqrt{110}i}{1232} \quad 0 \quad -\frac{\sqrt{55}i}{1232} \quad 0 \quad 0 \quad 0 \quad \frac{5\sqrt{66}i}{1232} \quad 0 \quad -\frac{9\sqrt{330}i}{1232} \quad 0 \quad \frac{15\sqrt{22}i}{1232} \quad 0 \quad \frac{\sqrt{462}i}{1232}$
	$-\frac{\sqrt{462}i}{1232}$	$0 \quad \frac{9\sqrt{1155}i}{3080} \quad 0 \quad -\frac{\sqrt{2310}i}{1232} \quad 0 \quad 0 \quad 0 \quad -\frac{15\sqrt{77}i}{1232} \quad 0 \quad \frac{9\sqrt{385}i}{616} \quad 0 \quad -\frac{5\sqrt{231}i}{1232} \quad 0 \quad 0$
	0	$\frac{23\sqrt{330}i}{6160} \quad 0 \quad -\frac{27\sqrt{165}i}{3080} \quad 0 \quad -\frac{5\sqrt{66}i}{1232} \quad \frac{15\sqrt{77}i}{1232} \quad 0 \quad \frac{5\sqrt{33}i}{154} \quad 0 \quad -\frac{9\sqrt{55}i}{1232} \quad 0 \quad -\frac{15\sqrt{11}i}{616} \quad 0$
	$-\frac{15\sqrt{22}i}{1232}$	$0 \quad -\frac{3\sqrt{55}i}{280} \quad 0 \quad -\frac{27\sqrt{110}i}{6160} \quad 0 \quad 0 \quad 0 \quad -\frac{5\sqrt{33}i}{154} \quad 0 \quad -\frac{\sqrt{165}i}{1232} \quad 0 \quad -\frac{45\sqrt{11}i}{616} \quad 0 \quad -\frac{5\sqrt{231}i}{1232}$
	0	$\frac{13\sqrt{66}i}{1232} \quad 0 \quad -\frac{\sqrt{33}i}{616} \quad 0 \quad \frac{9\sqrt{330}i}{1232} \quad -\frac{9\sqrt{385}i}{616} \quad 0 \quad \frac{\sqrt{165}i}{1232} \quad 0 \quad -\frac{15\sqrt{11}i}{308} \quad 0 \quad -\frac{9\sqrt{55}i}{1232} \quad 0$
	$\frac{9\sqrt{330}i}{1232}$	$0 \quad -\frac{\sqrt{33}i}{616} \quad 0 \quad \frac{13\sqrt{66}i}{1232} \quad 0 \quad 0 \quad 0 \quad \frac{9\sqrt{55}i}{1232} \quad 0 \quad \frac{15\sqrt{11}i}{308} \quad 0 \quad -\frac{\sqrt{165}i}{1232} \quad 0 \quad \frac{9\sqrt{385}i}{616}$
	0	$-\frac{27\sqrt{110}i}{6160} \quad 0 \quad -\frac{3\sqrt{55}i}{280} \quad 0 \quad -\frac{15\sqrt{22}i}{1232} \quad \frac{5\sqrt{231}i}{1232} \quad 0 \quad \frac{45\sqrt{11}i}{616} \quad 0 \quad \frac{\sqrt{165}i}{1232} \quad 0 \quad \frac{5\sqrt{33}i}{154} \quad 0$
	$-\frac{5\sqrt{66}i}{1232}$	$0 \quad -\frac{27\sqrt{165}i}{3080} \quad 0 \quad \frac{23\sqrt{330}i}{6160} \quad 0 \quad 0 \quad 0 \quad \frac{15\sqrt{11}i}{616} \quad 0 \quad \frac{9\sqrt{55}i}{1232} \quad 0 \quad -\frac{5\sqrt{33}i}{154} \quad 0 \quad -\frac{15\sqrt{77}i}{1232}$
	0	$-\frac{\sqrt{2310}i}{1232} \quad 0 \quad \frac{9\sqrt{1155}i}{3080} \quad 0 \quad -\frac{\sqrt{462}i}{1232} \quad 0 \quad 0 \quad \frac{5\sqrt{231}i}{1232} \quad 0 \quad -\frac{9\sqrt{385}i}{616} \quad 0 \quad \frac{15\sqrt{77}i}{1232} \quad 0$

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

985 symmetry

continued ...

Table 10

No.	multipole	matrix													
$\mathbb{M}_{5,2}^{(1,-1;a)}(T_g, 2)$	0	0	0	0	$-\frac{\sqrt{55}}{154}$	0	0	0	0	0	$-\frac{3\sqrt{22}}{77}$	0	0	0	
	0	0	0	0	0	$\frac{\sqrt{55}}{154}$	0	0	0	0	0	$-\frac{\sqrt{330}}{385}$	0	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	0	0	$\frac{2\sqrt{1155}}{385}$	0	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	$\frac{\sqrt{55}}{154}$	0	0	0	0	0	0	$-\frac{3\sqrt{22}}{77}$	0	0	0	0	0	0
	0	0	0	$\frac{2\sqrt{1155}}{385}$	0	0	0	0	0	$\frac{3\sqrt{385}}{154}$	0	0	0	0	0
	0	0	0	0	$-\frac{\sqrt{330}}{385}$	0	0	0	0	0	$\frac{5\sqrt{33}}{154}$	0	0	0	0
	0	0	0	0	0	$-\frac{3\sqrt{22}}{77}$	0	0	0	0	0	$-\frac{5\sqrt{33}}{154}$	0	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	0	0	$\frac{3\sqrt{385}}{154}$	0	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	$-\frac{\sqrt{330}}{385}$	0	0	0	0	0	0	$-\frac{5\sqrt{33}}{154}$	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
986	symmetry	$\frac{\sqrt{105}x(y-z)(y+z)(2x^2-y^2-z^2)}{4}$													

continued ...

Table 10

No.	multipole	matrix
$M_{5,0}^{(1,-1;a)}(T_g, 3)$	0	$-\frac{\sqrt{165}}{1848}$
	$-\frac{\sqrt{165}}{1848}$	0
	0	$\frac{5\sqrt{66}}{1848}$
	$\frac{5\sqrt{66}}{1848}$	0
	0	$-\frac{5\sqrt{33}}{924}$
	$-\frac{5\sqrt{33}}{924}$	0
	0	$\frac{5\sqrt{66}}{1848}$
	$\frac{5\sqrt{66}}{1848}$	0
	0	$-\frac{5\sqrt{33}}{1848}$
	$-\frac{5\sqrt{33}}{1848}$	0
	0	$\frac{\sqrt{330}}{1848}$
	$\frac{\sqrt{330}}{1848}$	0
	0	$-\frac{5\sqrt{66}}{1848}$
	$-\frac{5\sqrt{66}}{1848}$	0
$\frac{\sqrt{105}y(x-z)(x+z)(x^2-2y^2+z^2)}{4}$		
987	symmetry	

continued ...

Table 10

No.	multipole	matrix														
$\mathbb{M}_{5,1}^{(1,-1;a)}(T_g, 3)$	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		
$\frac{\sqrt{105}z(x-y)(x+y)(x^2+y^2-2z^2)}{4}$																

988 symmetry

continued ...

Table 10

No.	multipole	matrix													
$\mathbb{M}_{5,2}^{(1,-1;a)}(T_g, 3)$	0 0 $-\frac{\sqrt{330}}{924}$ 0 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 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														
	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 $-\frac{8\sqrt{55}}{385}$ 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 0 $\frac{3\sqrt{165}}{154}$ 0 0 0														
	0 0 0 0 $\frac{\sqrt{770}}{385}$ 0 0 0 0 0 0 0 $-\frac{5\sqrt{77}}{154}$ 0 0														
989	symmetry	$\frac{\sqrt{91xyz(3x^4 - 5x^2y^2 - 5x^2z^2 + 3y^4 - 5y^2z^2 + 3z^4)}}{2}$													

continued ...

Table 10

No.	multipole	matrix
$\mathbb{M}_7^{(1,-1;a)}(A_g)$	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 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 0 $\frac{\sqrt{66}i}{24}$ 0
	0 0 0 0 0 0 0 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 0 $-\frac{\sqrt{22}i}{88}$ 0 0 0 $\frac{\sqrt{770}i}{88}$ 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
	0 0 0 0 0 0 0 0 $\frac{\sqrt{2310}i}{264}$ 0 0 0 $-\frac{\sqrt{770}i}{88}$ 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
	0 0 0 0 0 0 0 0 0 $-\frac{\sqrt{770}i}{88}$ 0 0 0 0 $\frac{\sqrt{2310}i}{264}$ 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
	0 0 0 0 0 0 0 0 0 0 0 0 $\frac{\sqrt{770}i}{88}$ 0 0 0 $-\frac{\sqrt{22}i}{88}$ 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
	0 0 0 0 0 0 0 0 0 0 0 0 $-\frac{\sqrt{66}i}{24}$ 0 0 0 $-\frac{\sqrt{2310}i}{264}$ 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
	0 0 0 0 0 0 0 0 0 0 0 0 $\frac{\sqrt{66}i}{24}$ 0 0 0 $\frac{\sqrt{22}i}{88}$ 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0

continued ..

Table 10

No.	multipole	matrix
$\mathbb{M}_{7,0}^{(1,-1;a)}(E_g)$	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{130}i}{52} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{546}i}{52} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{546}i}{52} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{130}i}{52} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{130}i}{52} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{546}i}{52} & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
	991 symmetry	$-\frac{\sqrt{77}xyz(3x^4 - 20x^2y^2 + 10x^2z^2 + 3y^4 + 10y^2z^2 - 6z^4)}{4}$

continued ...

Table 10

No.	multipole	matrix
$\mathbb{M}_{7,1}^{(1,-1;a)}(E_g)$	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 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 0 $-\frac{\sqrt{78}i}{24}$ 0
	0 0 0 0 0 0 0 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 0 $-\frac{\sqrt{26}i}{104}$ 0 0 0 0 0 0 0	0 0 0 $\frac{\sqrt{910}i}{104}$ 0 0 0 0
	0 0 0 0 0 0 0 0 $\frac{\sqrt{2730}i}{312}$ 0 0 0 0 0	0 0 0 0 $-\frac{\sqrt{910}i}{104}$ 0 0 0
	0 0 0 0 0 0 0 0 0 $-\frac{\sqrt{910}i}{104}$ 0 0 0 0 $\frac{\sqrt{2730}i}{312}$	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0

continued ...

Table 10

No.	multipole	matrix									
$\mathbb{M}_{7,0}^{(1,-1;a)}(T_g, 1)$	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	0	0	0	0	0	0	0
	0 0 0 0 0 0 0 0 0 0 0 0	0	0	0	0	0	0	0	0	0	0
	0 0 0 0 0 0 0 0 0 0 0 0	0	0	0	0	0	0	0	0	0	0
	0 0 0 0 0 0 0 0 0 0 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 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 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 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		
993 symmetry	0 0 0 0 0 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 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 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 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		
$\frac{y(35x^6 - 210x^4y^2 + 105x^4z^2 + 168x^2y^4 - 420x^2y^2z^2 + 105x^2z^4 - 16y^6 + 168y^4z^2 - 210y^2z^4 + 35z^6)}{16}$											

continued ...

Table 10

No.	multipole	matrix							
$\mathbb{M}_{7,1}^{(1,-1;a)}(T_g, 1)$	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 0 0 0 0 0	0	0	0	0	0	0	0	0
	0 0 0 0 0 0 0 0 0 0	0	0	0	0	0	0	0	0
	0 0 0 0 0 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 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 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 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
994 symmetry	0 0 0 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 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 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	$-\frac{5\sqrt{6006}i}{27456}$
$\frac{z(35x^6 + 105x^4y^2 - 210x^4z^2 + 105x^2y^4 - 420x^2y^2z^2 + 168x^2z^4 + 35y^6 - 210y^4z^2 + 168y^2z^4 - 16z^6)}{16}$									

continued ...

Table 10

continued ..

Table 10

No.	multipole	matrix									
$M_{7,0}^{(1,-1;a)}(T_g, 2)$	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 0 0 0 0 0 0 0 0	0	0	0	0	0	0	0	0	0	0
	0 0 0 0 0 0 0 0 0 0 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 0 0 0 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 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 0 0 0 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 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 0 0 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 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 0 0 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	0	0
996	symmetry	$\frac{\sqrt{231}y(x^2 - 2xz - z^2)(x^2 + 2xz - z^2)(3x^2 - 10y^2 + 3z^2)}{16}$									

continued ...

Table 10

No.	multipole	matrix									
$\mathbb{M}_{7,1}^{(1,-1;a)}(T_g, 2)$	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 0 0 0 0 0 0 0 0	0	0	0	0	0	0	0	0	0	0
	0 0 0 0 0 0 0 0 0 0 0 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 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 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 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 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 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 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 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		
997	symmetry	$-\frac{\sqrt{231}z(x^2 - 2xy - y^2)(x^2 + 2xy - y^2)(3x^2 + 3y^2 - 10z^2)}{16}$									

continued ...

Table 10

No.	multipole	matrix
$\mathbb{M}_{7,2}^{(1,-1;a)}(T_g, 2)$	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 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
998	symmetry	$\frac{\sqrt{6006}x(y-z)(y+z)(y^2-4yz+z^2)(y^2+4yz+z^2)}{32}$

continued ...

Table 10

No.	multipole	matrix									
$\mathbb{M}_{7,0}^{(1,-1;a)}(T_g, 3)$	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 0 0 0 0 0 0 0 0 0 0 0	0	0	0	0	0	0	0	0	0	0
	0 0 0 0 0 0 0 0 0 0 0 0	0	0	0	0	0	0	0	0	0	0
	0 0 0 0 0 0 0 0 0 0 0 0	0	0	0	0	0	0	0	0	0	0
	0 0 0 0 0 0 0 0 0 0 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	$\frac{\sqrt{7}}{64}$	0
	0 0 0 0 0 0 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	$-\frac{5\sqrt{7}}{64}$	0
	0 0 0 0 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	$\frac{5\sqrt{3}}{64}$	0
	0 0 0 0 0 0 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	$-\frac{3\sqrt{35}}{64}$	0
	0 0 0 0 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	$\frac{3\sqrt{5}}{64}$	0
	0 0 0 0 0 0 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	$-\frac{\sqrt{21}}{64}$	0
	0 0 0 0 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	$-\frac{\sqrt{21}}{64}$	0	$\frac{1}{64}$	0
	0 0 0 0 0 0 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	$\frac{1}{64}$	0
999	symmetry	$-\frac{\sqrt{6006}y(x-z)(x+z)(x^2-4xz+z^2)(x^2+4xz+z^2)}{32}$									

continued ...

Table 10

No.	multipole	matrix									
$\mathbb{M}_{7,1}^{(1,-1;a)}(T_g, 3)$	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 0 0 0 0 0 0 0 0 0 0 0	0	0	0	0	0	0	0	0	0	0
	0 0 0 0 0 0 0 0 0 0 0 0	0	0	0	0	0	0	0	0	0	0
	0 0 0 0 0 0 0 0 0 0 0 0	0	0	0	0	0	0	0	0	0	0
	0 0 0 0 0 0 0 0 0 0 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 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 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 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		
1000 symmetry	0 0 0 0 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 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 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 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		
$\frac{\sqrt{6006}z(x-y)(x+y)(x^2-4xy+y^2)(x^2+4xy+y^2)}{32}$											

continued ...

Table 10

No.	multipole	matrix
$\mathbb{M}_{7,2}^{(1,-1;a)}(T_g, 3)$		$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{1}{2} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
1001	symmetry	$\frac{\sqrt{42}x(y-z)(y+z)(48x^4-80x^2y^2-80x^2z^2+15y^4+30y^2z^2+15z^4)}{32}$

continued ...

Table 10

No.	multipole	matrix							
$\mathbb{M}_{7,0}^{(1,-1;a)}(T_g, 4)$	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
	0 0 0 0 0 0 0 0 0 0	0	0	0	0	0	0	0	0
	0 0 0 0 0 0 0 0 0 0	0	0	0	0	0	0	0	0
	0 0 0 0 0 0 0 0 0 0	0	0	0	0	0	0	0	0
	0 0 0 0 0 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 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 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 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
1002 symmetry	0 0 0 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 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 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 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
$\frac{\sqrt{42}y(x-z)(x+z)(15x^4 - 80x^2y^2 + 30x^2z^2 + 48y^4 - 80y^2z^2 + 15z^4)}{32}$									

continued ...

Table 10

No.	multipole	matrix							
$\mathbb{M}_{7,1}^{(1,-1;a)}(T_g, 4)$	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
	0 0 0 0 0 0 0 0 0 0	0	0	0	0	0	0	0	0
	0 0 0 0 0 0 0 0 0 0	0	0	0	0	0	0	0	0
	0 0 0 0 0 0 0 0 0 0	0	0	0	0	0	0	0	0
	0 0 0 0 0 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 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 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 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
1003 symmetry	0 0 0 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 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 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 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

$$\frac{\sqrt{42}z(x-y)(x+y)(15x^4+30x^2y^2-80x^2z^2+15y^4-80y^2z^2+48z^4)}{32}$$

continued ...

Table 10

continued ...

Table 10

No.	multipole	matrix
$\mathbb{M}_{1,0}^{(1,1;a)}(T_g)$	0	$\frac{2\sqrt{21}}{49}$ 0 0 0 0 0 $\frac{3\sqrt{10}}{56}$ 0 $-\frac{\sqrt{210}}{392}$ 0 0 0 0 0 0
	$\frac{2\sqrt{21}}{49}$	0 $\frac{4\sqrt{210}}{245}$ 0 0 0 0 0 $\frac{15\sqrt{14}}{392}$ 0 $-\frac{3\sqrt{70}}{392}$ 0 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	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 0 $\frac{2\sqrt{21}}{49}$ 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 0 $-\frac{\sqrt{15}}{42}$ 0 0 0 0 0 0
	0	$\frac{15\sqrt{14}}{392}$ 0 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 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 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 0 $-\frac{15\sqrt{14}}{392}$ 0 0 0 0 0 $-\frac{\sqrt{35}}{49}$ 0 $-\frac{\sqrt{15}}{42}$
	0	0 0 0 0 0 $-\frac{3\sqrt{10}}{56}$ 0 0 0 0 0 $-\frac{\sqrt{15}}{42}$ 0
1005	symmetry	y

continued ...

Table 10

No.	multipole	matrix
$\mathbb{M}_{1,1}^{(1,1;a)}(T_g)$	0	$-\frac{2\sqrt{21}i}{49}$ 0 0 0 0 0 $\frac{3\sqrt{10}i}{56}$ 0 $\frac{\sqrt{210}i}{392}$ 0 0 0 0 0
	$\frac{2\sqrt{21}i}{49}$	0 $-\frac{4\sqrt{210}i}{245}$ 0 0 0 0 0 $\frac{15\sqrt{14}i}{392}$ 0 $\frac{3\sqrt{70}i}{392}$ 0 0 0 0 0
	0	$\frac{4\sqrt{210}i}{245}$ 0 $-\frac{6\sqrt{105}i}{245}$ 0 0 0 0 0 $\frac{5\sqrt{21}i}{196}$ 0 $\frac{3\sqrt{35}i}{196}$ 0 0 0 0
	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 0
	0	0 0 $\frac{4\sqrt{210}i}{245}$ 0 $-\frac{2\sqrt{21}i}{49}$ 0 0 0 0 0 $\frac{3\sqrt{70}i}{392}$ 0 $\frac{15\sqrt{14}i}{392}$ 0
	0	0 0 0 0 $\frac{2\sqrt{21}i}{49}$ 0 0 0 0 0 0 $\frac{\sqrt{210}i}{392}$ 0 $\frac{3\sqrt{10}i}{56}$ 0 0
	$-\frac{3\sqrt{10}i}{56}$	0 0 0 0 0 0 0 $\frac{\sqrt{15}i}{42}$ 0 0 0 0 0 0 0
	0	$-\frac{15\sqrt{14}i}{392}$ 0 0 0 0 0 $-\frac{\sqrt{15}i}{42}$ 0 $\frac{\sqrt{35}i}{49}$ 0 0 0 0 0
	$-\frac{\sqrt{210}i}{392}$	0 $-\frac{5\sqrt{21}i}{196}$ 0 0 0 0 0 $-\frac{\sqrt{35}i}{49}$ 0 $\frac{5\sqrt{7}i}{98}$ 0 0 0 0
	0	$-\frac{3\sqrt{70}i}{392}$ 0 $-\frac{3\sqrt{35}i}{196}$ 0 0 0 0 0 $-\frac{5\sqrt{7}i}{98}$ 0 $\frac{2\sqrt{105}i}{147}$ 0 0 0
	0	0 $-\frac{3\sqrt{35}i}{196}$ 0 $-\frac{3\sqrt{70}i}{392}$ 0 0 0 0 0 $-\frac{2\sqrt{105}i}{147}$ 0 $\frac{5\sqrt{7}i}{98}$ 0 0
	0	0 0 $-\frac{5\sqrt{21}i}{196}$ 0 $-\frac{\sqrt{210}i}{392}$ 0 0 0 0 0 $-\frac{5\sqrt{7}i}{98}$ 0 $\frac{\sqrt{35}i}{49}$ 0
	0	0 0 0 0 $-\frac{15\sqrt{14}i}{392}$ 0 0 0 0 0 0 $-\frac{\sqrt{35}i}{49}$ 0 $\frac{\sqrt{15}i}{42}$ 0
	0	0 0 0 0 0 $-\frac{3\sqrt{10}i}{56}$ 0 0 0 0 0 0 $-\frac{\sqrt{15}i}{42}$ 0

1006 symmetry

z

continued ...

Table 10

No.	multipole	matrix													
$\mathbb{M}_{1,2}^{(1,1;a)}(T_g)$	$\frac{2\sqrt{105}}{49}$	0	0	0	0	0	0	$-\frac{3\sqrt{70}}{196}$	0	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	0	$\frac{2\sqrt{105}}{245}$	0	0	0	0	0	$-\frac{3\sqrt{35}}{98}$	0	0	0	0	0	0
	0	0	0	$-\frac{2\sqrt{105}}{245}$	0	0	0	0	0	$-\frac{3\sqrt{35}}{98}$	0	0	0	0	0
	0	0	0	0	$-\frac{6\sqrt{105}}{245}$	0	0	0	0	0	$-\frac{5\sqrt{42}}{196}$	0	0	0	0
	0	0	0	0	0	$-\frac{2\sqrt{105}}{49}$	0	0	0	0	0	$-\frac{3\sqrt{70}}{196}$	0	0	0
	0	0	0	0	0	0	$-\frac{\sqrt{105}}{42}$	0	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	$-\frac{5\sqrt{42}}{196}$	0	0	0	0	0	0	$-\frac{\sqrt{105}}{98}$	0	0	0	0	0	0
	0	0	$-\frac{3\sqrt{35}}{98}$	0	0	0	0	0	$-\frac{\sqrt{105}}{294}$	0	0	0	0	0	0
	0	0	0	$-\frac{3\sqrt{35}}{98}$	0	0	0	0	0	$\frac{\sqrt{105}}{294}$	0	0	0	0	0
	0	0	0	0	$-\frac{5\sqrt{42}}{196}$	0	0	0	0	0	$\frac{\sqrt{105}}{98}$	0	0	0	0
	0	0	0	0	0	$-\frac{3\sqrt{70}}{196}$	0	0	0	0	0	$\frac{5\sqrt{105}}{294}$	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	$\frac{\sqrt{105}}{42}$	0	0	0
1007	symmetry	$\sqrt{15}xyz$													

continued ...

Table 10

No.	multipole	matrix													
$\mathbb{M}_3^{(1,1;a)}(A_g)$	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 0 $-\frac{\sqrt{55}i}{77}$ 0 0														
1008	symmetry	$\frac{x(2x^2 - 3y^2 - 3z^2)}{2}$													

continued ...

Table 10

No.	multipole	matrix													
$\mathbb{M}_{3,0}^{(1,1;a)}(T_g, 1)$	0	$\frac{\sqrt{385}}{98}$	0	$-\frac{5\sqrt{770}}{588}$	0	$\frac{\sqrt{66}}{112}$	0	$-\frac{3\sqrt{154}}{392}$	0	$\frac{\sqrt{2310}}{784}$	0	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	$-\frac{5\sqrt{154}}{196}$	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	$-\frac{\sqrt{2310}}{784}$	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	$\frac{2\sqrt{385}}{539}$	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	$\frac{\sqrt{55}}{154}$	0	$-\frac{3\sqrt{11}}{154}$	0		
1009	symmetry	$-\frac{y(3x^2 - 2y^2 + 3z^2)}{2}$													

continued ...

Table 10

No.	multipole	matrix													
$\mathbb{M}_{3,1}^{(1,1;a)}(T_g, 1)$	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	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
	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	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
	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	0	$\frac{5\sqrt{770}i}{588}$	0	$\frac{\sqrt{385}i}{98}$	0	0	0	$\frac{\sqrt{2310}i}{784}$	0	$\frac{3\sqrt{154}i}{392}$	0	$\frac{\sqrt{66}i}{112}$	0	0
	$-\frac{\sqrt{66}i}{112}$	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
	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	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
	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	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
	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	0	$-\frac{3\sqrt{1155}i}{784}$	0	$\frac{\sqrt{2310}i}{784}$	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	0	0	$-\frac{\sqrt{165}i}{112}$	0	$-\frac{\sqrt{66}i}{112}$	0	0	0	$-\frac{\sqrt{55}i}{154}$	0	$-\frac{3\sqrt{11}i}{154}$	0	0	0
1010	symmetry	$-\frac{z(3x^2+3y^2-2z^2)}{2}$													

continued ...

Table 10

No.	multipole	matrix													
$\mathbb{M}_{3,2}^{(1,1;a)}(T_g, 1)$	$-\frac{5\sqrt{77}}{147}$	0	0	0	0	0	0	$\frac{\sqrt{462}}{98}$	0	0	0	0	0	0	0
	0	$\frac{\sqrt{77}}{21}$	0	0	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	0	0	$-\frac{4\sqrt{77}}{147}$	0	0	0	0	0	$-\frac{\sqrt{231}}{98}$	0	0	0	0	0
	0	0	0	0	$-\frac{\sqrt{77}}{21}$	0	0	0	0	0	$-\frac{\sqrt{231}}{98}$	0	0	0	0
	0	0	0	0	0	$\frac{5\sqrt{77}}{147}$	0	0	0	0	0	0	$\frac{\sqrt{462}}{98}$	0	0
	0	0	0	0	0	0	$\frac{\sqrt{77}}{77}$	0	0	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	0	0	$-\frac{\sqrt{77}}{77}$	0	0	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	$-\frac{\sqrt{231}}{98}$	0	0	0	0	0	0	$\frac{3\sqrt{77}}{539}$	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	$\frac{\sqrt{77}}{77}$	0	0	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	0	0	$-\frac{\sqrt{77}}{77}$	0
1011	symmetry	$\frac{\sqrt{15}x(y-z)(y+z)}{2}$													

continued ...

Table 10

No.	multipole	matrix
$\mathbb{M}_{3,0}^{(1,1;a)}(T_g, 2)$	0	$\begin{bmatrix} 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 \end{bmatrix}$
	1012	symmetry
	$-\frac{\sqrt{15}y(x-z)(x+z)}{2}$	

continued ...

Table 10

No.	multipole	matrix														
$\mathbb{M}_{3,1}^{(1,1;a)}(T_g, 2)$	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	0	
	$-\frac{5\sqrt{231}i}{294}$	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	0	
	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	0	
	$\frac{5\sqrt{462}i}{588}$	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	$\frac{3\sqrt{11}i}{112}$	0	
	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	0	
	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	0	$-\frac{\sqrt{110}i}{112}$	
	$\frac{\sqrt{110}i}{112}$	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	0	
	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	0	
	$\frac{\sqrt{2310}i}{392}$	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	0	
	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	0	
	$-\frac{3\sqrt{154}i}{784}$	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	$\frac{\sqrt{33}i}{154}$	0	
	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	0	
	0	0	$-\frac{9\sqrt{77}i}{784}$	0	$-\frac{5\sqrt{154}i}{784}$	0	0	0	$-\frac{2\sqrt{231}i}{539}$	0	$\frac{\sqrt{385}i}{1078}$	0	$-\frac{\sqrt{165}i}{154}$	0	0	
	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	0	
1013	symmetry	$\frac{\sqrt{15}z(x-y)(x+y)}{2}$														

continued ...

Table 10

No.	multipole	matrix													
$\mathbb{M}_{3,2}^{(1,1;a)}(T_g, 2)$	0	0	$-\frac{5\sqrt{462}}{294}$	0	0	0	0	0	0	$\frac{\sqrt{154}}{98}$	0	0	0	0	0
	0	0	0	$-\frac{\sqrt{2310}}{294}$	0	0	$-\frac{\sqrt{22}}{28}$	0	0	0	$\frac{\sqrt{770}}{196}$	0	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
	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	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	0	$\frac{5\sqrt{462}}{294}$	0	0	0	0	0	0	$\frac{\sqrt{154}}{98}$	0	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	0	$-\frac{\sqrt{77}}{196}$	0	0	0	0	0	0	$\frac{3\sqrt{231}}{539}$	0	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	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
	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	0	$\frac{\sqrt{231}}{196}$	0	0	0	0	0	$-\frac{2\sqrt{77}}{539}$	0	0	0	$-\frac{\sqrt{55}}{77}$	0	0
	0	0	0	$-\frac{\sqrt{77}}{196}$	0	0	0	0	0	$-\frac{3\sqrt{231}}{539}$	0	0	0	0	0
	0	0	0	0	$-\frac{\sqrt{22}}{28}$	0	0	0	0	0	$-\frac{\sqrt{55}}{77}$	0	0	0	0

1014 symmetry

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

continued ...

Table 10

No.	multipole	matrix													
$\mathbb{M}_{5,0}^{(1,1;a)}(E_g)$	0	0	0	0	$-\frac{3\sqrt{143}i}{77}$	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	$\frac{\sqrt{858}i}{924}$	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	$\frac{3\sqrt{1001}i}{2002}$	0	0	0		
	0	0	0	0	$\frac{\sqrt{858}i}{924}$	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	$-\frac{\sqrt{2145}i}{2002}$	0		
	0	0	0	0	0	0	$-\frac{3\sqrt{1001}i}{2002}$	0	0	0	0	0	$-\frac{3\sqrt{1001}i}{2002}$		
	$-\frac{\sqrt{1430}i}{308}$	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	
1015	symmetry	$\frac{\sqrt{105xyz(x^2+y^2-2z^2)}}{2}$													

continued ...

Table 10

No.	multipole	matrix													
$\mathbb{M}_{5,1}^{(1,1;a)}(E_g)$	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	0	$-\frac{\sqrt{4290}i}{154}$	0	0	$-\frac{\sqrt{2002}i}{924}$	0	0	0	$\frac{\sqrt{1430}i}{462}$	0	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
	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	0	$-\frac{\sqrt{4290}i}{154}$	0	0	0	0	0	$-\frac{\sqrt{1430}i}{462}$	0	0	0	$\frac{\sqrt{2002}i}{924}$	0	0
	0	0	0	$\frac{\sqrt{858}i}{154}$	0	0	0	0	0	$\frac{5\sqrt{286}i}{924}$	0	0	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	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	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	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
	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	0	$-\frac{\sqrt{429}i}{462}$	0	0	0	0	0	$\frac{2\sqrt{143}i}{1001}$	0	0	0	$\frac{\sqrt{5005}i}{2002}$	0	0
	0	0	0	$\frac{2\sqrt{143}i}{231}$	0	0	0	0	0	$\frac{3\sqrt{429}i}{2002}$	0	0	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	0
1016	symmetry	$\frac{x(8x^4 - 40x^2y^2 - 40x^2z^2 + 15y^4 + 30y^2z^2 + 15z^4)}{8}$													

continued ...

Table 10

No.	multipole	matrix
$\mathbb{M}_{5,0}^{(1,1;a)}(T_g, 1)$	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	$-\frac{\sqrt{4290}}{704}, 0, \frac{\sqrt{2145}}{1056}, 0, -\frac{5\sqrt{858}}{14784}, 0, 0, -\frac{3\sqrt{429}}{2288}, 0, \frac{\sqrt{715}}{1144}, 0, -\frac{15\sqrt{143}}{16016}, 0$

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

1017 symmetry

continued ...

Table 10

No.	multipole	matrix														
$\mathbb{M}_{5,1}^{(1,1;a)}(T_g, 1)$	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	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	
	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	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	
	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	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	$\frac{5\sqrt{858}i}{14784}$	0	
	$-\frac{5\sqrt{858}i}{14784}$	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	
	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	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	
	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	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	
	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	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	
	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	0	
1018	symmetry	$\frac{z(15x^4 + 30x^2y^2 - 40x^2z^2 + 15y^4 - 40y^2z^2 + 8z^4)}{8}$														

continued ...

Table 10

No.	multipole	matrix													
$\mathbb{M}_{5,2}^{(1,1;a)}(T_g, 1)$	$\frac{\sqrt{1001}}{539}$	0	0	0	0	0	0	$-\frac{5\sqrt{6006}}{6468}$	0	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	0	$\frac{10\sqrt{1001}}{539}$	0	0	0	0	0	0	$-\frac{5\sqrt{3003}}{3234}$	0	0	0	0	0
	0	0	0	$-\frac{10\sqrt{1001}}{539}$	0	0	0	0	0	$-\frac{5\sqrt{3003}}{3234}$	0	0	0	0	0
	0	0	0	0	$\frac{5\sqrt{1001}}{539}$	0	0	0	0	0	$\frac{3\sqrt{10010}}{2156}$	0	0	0	0
	0	0	0	0	0	$-\frac{\sqrt{1001}}{539}$	0	0	0	0	0	$-\frac{5\sqrt{6006}}{6468}$	0	0	0
	0	0	0	0	0	0	$-\frac{\sqrt{1001}}{2002}$	0	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	$\frac{3\sqrt{10010}}{2156}$	0	0	0	0	0	0	$-\frac{17\sqrt{1001}}{14014}$	0	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	0	$-\frac{5\sqrt{3003}}{3234}$	0	0	0	0	0	0	$\frac{15\sqrt{1001}}{14014}$	0	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	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	$\frac{\sqrt{1001}}{2002}$	0	0
1019	symmetry	$\frac{3\sqrt{35x(y^2-2yz-z^2)(y^2+2yz-z^2)}}{8}$													

continued ...

Table 10

No.	multipole	matrix
$\mathbb{M}_{5,0}^{(1,1;a)}(T_g, 2)$	0	$\begin{array}{cccccccccccccc} 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 \end{array}$

1020 symmetry

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

continued ...

Table 10

No.	multipole	matrix
$\mathbb{M}_{5,1}^{(1,1;a)}(T_g, 2)$	0	$-\frac{3\sqrt{143}i}{616}$
	$\frac{3\sqrt{143}i}{616}$	0
	0	$\frac{3\sqrt{1430}i}{616}$
	$-\frac{9\sqrt{715}i}{616}$	0
	0	$-\frac{3\sqrt{715}i}{308}$
	$-\frac{9\sqrt{286}i}{616}$	0
	0	$\frac{3\sqrt{715}i}{308}$
	0	$-\frac{3\sqrt{1430}i}{616}$
	$\frac{9\sqrt{715}i}{616}$	0
	$-\frac{\sqrt{30030}i}{14784}$	0
	0	$\frac{23\sqrt{858}i}{14784}$
	$-\frac{5\sqrt{1430}i}{4928}$	0
	0	$\frac{13\sqrt{4290}i}{14784}$
	$\frac{15\sqrt{858}i}{4928}$	0
	0	$-\frac{9\sqrt{286}i}{4928}$
	$-\frac{5\sqrt{4290}i}{14784}$	0
	0	$-\frac{5\sqrt{143}i}{616}$
	$-\frac{3\sqrt{715}i}{616}$	0
	0	$-\frac{9\sqrt{286}i}{616}$
	$-\frac{3\sqrt{3003}i}{2464}$	0
	0	$-\frac{3\sqrt{1430}i}{14784}$
	$-\frac{9\sqrt{6006}i}{14784}$	0
	0	$-\frac{5\sqrt{143}i}{616}$
	$-\frac{3\sqrt{3003}i}{2464}$	0
	0	$-\frac{3\sqrt{1430}i}{616}$
	$-\frac{9\sqrt{286}i}{616}$	0
	0	$-\frac{5\sqrt{4290}i}{14784}$
	$-\frac{9\sqrt{286}i}{616}$	0
	0	$-\frac{3\sqrt{3003}i}{2464}$
	$-\frac{9\sqrt{6006}i}{14784}$	0
$\frac{3\sqrt{35}z(x^2 - 2xy - y^2)(x^2 + 2xy - y^2)}{8}$		

1021 symmetry

Table 10

No.	multipole	matrix													
$\mathbb{M}_{5,2}^{(1,1;a)}(T_g, 2)$	0	0	0	0	$\frac{3\sqrt{143}}{77}$	0	0	0	0	0	$-\frac{\sqrt{1430}}{308}$	0	0	0	
	0	0	0	0	0	$-\frac{3\sqrt{143}}{77}$	0	0	0	0	0	$-\frac{\sqrt{858}}{924}$	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	$\frac{\sqrt{3003}}{462}$	0
	0	0	0	0	0	0	$\frac{\sqrt{3003}}{462}$	0	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	$-\frac{3\sqrt{143}}{77}$	0	0	0	0	0	0	$-\frac{\sqrt{1430}}{308}$	0	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	0	$-\frac{\sqrt{858}}{924}$	0	0	0	0	0	$-\frac{\sqrt{2145}}{2002}$	0	0	0	0
	0	0	0	0	0	$-\frac{\sqrt{1430}}{308}$	0	0	0	0	0	$\frac{\sqrt{2145}}{2002}$	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	$\frac{3\sqrt{1001}}{2002}$	0	0
	0	0	$-\frac{3\sqrt{1001}}{2002}$	0	0	0	0	0	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	$-\frac{\sqrt{858}}{924}$	0	0	0	0	0	0	$\frac{\sqrt{2145}}{2002}$	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
1022	symmetry	$\frac{\sqrt{105}x(y-z)(y+z)(2x^2-y^2-z^2)}{4}$													

continued ...

Table 10

No.	multipole	matrix
$\mathbb{M}_{5,0}^{(1,1;a)}(T_g, 3)$	0	$\frac{\sqrt{429}}{308} \quad 0 \quad -\frac{\sqrt{858}}{308} \quad 0 \quad -\frac{3\sqrt{2145}}{308} \quad \frac{\sqrt{10010}}{7392} \quad 0 \quad -\frac{5\sqrt{4290}}{7392} \quad 0 \quad \frac{5\sqrt{286}}{2464} \quad 0 \quad \frac{5\sqrt{1430}}{2464} \quad 0$
	$\frac{\sqrt{429}}{308}$	$0 \quad -\frac{\sqrt{4290}}{308} \quad 0 \quad \frac{\sqrt{2145}}{308} \quad 0 \quad 0 \quad -\frac{23\sqrt{286}}{7392} \quad 0 \quad \frac{13\sqrt{1430}}{7392} \quad 0 \quad -\frac{\sqrt{858}}{2464} \quad 0 \quad \frac{5\sqrt{2002}}{2464}$
	0	$-\frac{\sqrt{4290}}{308} \quad 0 \quad \frac{\sqrt{2145}}{154} \quad 0 \quad -\frac{\sqrt{858}}{308} \quad -\frac{\sqrt{1001}}{1232} \quad 0 \quad \frac{\sqrt{429}}{336} \quad 0 \quad -\frac{\sqrt{715}}{3696} \quad 0 \quad -\frac{3\sqrt{143}}{1232} \quad 0$
	$-\frac{\sqrt{858}}{308}$	$0 \quad \frac{\sqrt{2145}}{154} \quad 0 \quad -\frac{\sqrt{4290}}{308} \quad 0 \quad 0 \quad \frac{3\sqrt{143}}{1232} \quad 0 \quad \frac{\sqrt{715}}{3696} \quad 0 \quad -\frac{\sqrt{429}}{336} \quad 0 \quad \frac{\sqrt{1001}}{1232}$
	0	$\frac{\sqrt{2145}}{308} \quad 0 \quad -\frac{\sqrt{4290}}{308} \quad 0 \quad \frac{\sqrt{429}}{308} \quad -\frac{5\sqrt{2002}}{2464} \quad 0 \quad \frac{\sqrt{858}}{2464} \quad 0 \quad -\frac{13\sqrt{1430}}{7392} \quad 0 \quad \frac{23\sqrt{286}}{7392} \quad 0$
	$-\frac{3\sqrt{2145}}{308}$	$0 \quad -\frac{\sqrt{858}}{308} \quad 0 \quad \frac{\sqrt{429}}{308} \quad 0 \quad 0 \quad -\frac{5\sqrt{1430}}{2464} \quad 0 \quad -\frac{5\sqrt{286}}{2464} \quad 0 \quad \frac{5\sqrt{4290}}{7392} \quad 0 \quad -\frac{\sqrt{10010}}{7392}$
	$\frac{\sqrt{10010}}{7392}$	$0 \quad -\frac{\sqrt{1001}}{1232} \quad 0 \quad -\frac{5\sqrt{2002}}{2464} \quad 0 \quad 0 \quad -\frac{\sqrt{15015}}{8008} \quad 0 \quad \frac{\sqrt{3003}}{4004} \quad 0 \quad \frac{3\sqrt{5005}}{8008} \quad 0 \quad 0$
	0	$-\frac{23\sqrt{286}}{7392} \quad 0 \quad \frac{3\sqrt{143}}{1232} \quad 0 \quad -\frac{5\sqrt{1430}}{2464} \quad -\frac{\sqrt{15015}}{8008} \quad 0 \quad \frac{\sqrt{715}}{1001} \quad 0 \quad -\frac{\sqrt{429}}{8008} \quad 0 \quad \frac{3\sqrt{2145}}{4004} \quad 0$
	$-\frac{5\sqrt{4290}}{7392}$	$0 \quad \frac{\sqrt{429}}{336} \quad 0 \quad \frac{\sqrt{858}}{2464} \quad 0 \quad 0 \quad \frac{\sqrt{715}}{1001} \quad 0 \quad -\frac{\sqrt{143}}{8008} \quad 0 \quad -\frac{\sqrt{2145}}{4004} \quad 0 \quad \frac{3\sqrt{5005}}{8008}$
	0	$\frac{13\sqrt{1430}}{7392} \quad 0 \quad \frac{\sqrt{715}}{3696} \quad 0 \quad -\frac{5\sqrt{286}}{2464} \quad \frac{\sqrt{3003}}{4004} \quad 0 \quad -\frac{\sqrt{143}}{8008} \quad 0 \quad -\frac{\sqrt{2145}}{2002} \quad 0 \quad -\frac{\sqrt{429}}{8008} \quad 0$
	$\frac{5\sqrt{286}}{2464}$	$0 \quad -\frac{\sqrt{715}}{3696} \quad 0 \quad -\frac{13\sqrt{1430}}{7392} \quad 0 \quad 0 \quad -\frac{\sqrt{429}}{8008} \quad 0 \quad -\frac{\sqrt{2145}}{2002} \quad 0 \quad -\frac{\sqrt{143}}{8008} \quad 0 \quad \frac{\sqrt{3003}}{4004}$
	0	$-\frac{\sqrt{858}}{2464} \quad 0 \quad -\frac{\sqrt{429}}{336} \quad 0 \quad \frac{5\sqrt{4290}}{7392} \quad \frac{3\sqrt{5005}}{8008} \quad 0 \quad -\frac{\sqrt{2145}}{4004} \quad 0 \quad -\frac{\sqrt{143}}{8008} \quad 0 \quad \frac{\sqrt{715}}{1001} \quad 0$
	$\frac{5\sqrt{1430}}{2464}$	$0 \quad -\frac{3\sqrt{143}}{1232} \quad 0 \quad \frac{23\sqrt{286}}{7392} \quad 0 \quad 0 \quad \frac{3\sqrt{2145}}{4004} \quad 0 \quad -\frac{\sqrt{429}}{8008} \quad 0 \quad \frac{\sqrt{715}}{1001} \quad 0 \quad -\frac{\sqrt{15015}}{8008}$
	0	$\frac{5\sqrt{2002}}{2464} \quad 0 \quad \frac{\sqrt{1001}}{1232} \quad 0 \quad -\frac{\sqrt{10010}}{7392} \quad 0 \quad 0 \quad \frac{3\sqrt{5005}}{8008} \quad 0 \quad \frac{\sqrt{3003}}{4004} \quad 0 \quad -\frac{\sqrt{15015}}{8008} \quad 0$

1023 symmetry

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

continued ...

Table 10

No.	multipole	matrix
$\mathbb{M}_{5,1}^{(1,1;a)}(T_g, 3)$	0	$\frac{\sqrt{429}i}{308} \quad 0 \quad \frac{\sqrt{858}i}{308} \quad 0 \quad -\frac{3\sqrt{2145}i}{308} \quad -\frac{\sqrt{10010}i}{7392} \quad 0 \quad -\frac{5\sqrt{4290}i}{7392} \quad 0 \quad -\frac{5\sqrt{286}i}{2464} \quad 0 \quad \frac{5\sqrt{1430}i}{2464} \quad 0$
	$-\frac{\sqrt{429}i}{308}$	$0 \quad -\frac{\sqrt{4290}i}{308} \quad 0 \quad -\frac{\sqrt{2145}i}{308} \quad 0 \quad \frac{23\sqrt{286}i}{7392} \quad 0 \quad \frac{13\sqrt{1430}i}{7392} \quad 0 \quad \frac{\sqrt{858}i}{2464} \quad 0 \quad \frac{5\sqrt{2002}i}{2464}$
	0	$\frac{\sqrt{4290}i}{308} \quad 0 \quad \frac{\sqrt{2145}i}{154} \quad 0 \quad \frac{\sqrt{858}i}{308} \quad -\frac{\sqrt{1001}i}{1232} \quad 0 \quad -\frac{\sqrt{429}i}{336} \quad 0 \quad -\frac{\sqrt{715}i}{3696} \quad 0 \quad \frac{3\sqrt{143}i}{1232} \quad 0$
	$-\frac{\sqrt{858}i}{308}$	$0 \quad -\frac{\sqrt{2145}i}{154} \quad 0 \quad -\frac{\sqrt{4290}i}{308} \quad 0 \quad \frac{3\sqrt{143}i}{1232} \quad 0 \quad -\frac{\sqrt{715}i}{3696} \quad 0 \quad -\frac{\sqrt{429}i}{336} \quad 0 \quad -\frac{\sqrt{1001}i}{1232}$
	0	$\frac{\sqrt{2145}i}{308} \quad 0 \quad \frac{\sqrt{4290}i}{308} \quad 0 \quad \frac{\sqrt{429}i}{308} \quad \frac{5\sqrt{2002}i}{2464} \quad 0 \quad \frac{\sqrt{858}i}{2464} \quad 0 \quad \frac{13\sqrt{1430}i}{7392} \quad 0 \quad \frac{23\sqrt{286}i}{7392} \quad 0$
	$\frac{3\sqrt{2145}i}{308}$	$0 \quad -\frac{\sqrt{858}i}{308} \quad 0 \quad -\frac{\sqrt{429}i}{308} \quad 0 \quad 0 \quad \frac{5\sqrt{1430}i}{2464} \quad 0 \quad -\frac{5\sqrt{286}i}{2464} \quad 0 \quad -\frac{5\sqrt{4290}i}{7392} \quad 0 \quad -\frac{\sqrt{10010}i}{7392}$
	$\frac{\sqrt{10010}i}{7392}$	$0 \quad \frac{\sqrt{1001}i}{1232} \quad 0 \quad -\frac{5\sqrt{2002}i}{2464} \quad 0 \quad 0 \quad -\frac{\sqrt{15015}i}{8008} \quad 0 \quad -\frac{\sqrt{3003}i}{4004} \quad 0 \quad \frac{3\sqrt{5005}i}{8008} \quad 0 \quad 0$
	0	$-\frac{23\sqrt{286}i}{7392} \quad 0 \quad -\frac{3\sqrt{143}i}{1232} \quad 0 \quad -\frac{5\sqrt{1430}i}{2464} \quad \frac{\sqrt{15015}i}{8008} \quad 0 \quad \frac{\sqrt{715}i}{1001} \quad 0 \quad \frac{\sqrt{429}i}{8008} \quad 0 \quad \frac{3\sqrt{2145}i}{4004} \quad 0$
	$\frac{5\sqrt{4290}i}{7392}$	$0 \quad \frac{\sqrt{429}i}{336} \quad 0 \quad -\frac{\sqrt{858}i}{2464} \quad 0 \quad 0 \quad -\frac{\sqrt{715}i}{1001} \quad 0 \quad -\frac{\sqrt{143}i}{8008} \quad 0 \quad \frac{\sqrt{2145}i}{4004} \quad 0 \quad \frac{3\sqrt{5005}i}{8008}$
	0	$-\frac{13\sqrt{1430}i}{7392} \quad 0 \quad \frac{\sqrt{715}i}{3696} \quad 0 \quad \frac{5\sqrt{286}i}{2464} \quad \frac{\sqrt{3003}i}{4004} \quad 0 \quad \frac{\sqrt{143}i}{8008} \quad 0 \quad -\frac{\sqrt{2145}i}{2002} \quad 0 \quad \frac{\sqrt{429}i}{8008} \quad 0$
	$\frac{5\sqrt{286}i}{2464}$	$0 \quad \frac{\sqrt{715}i}{3696} \quad 0 \quad -\frac{13\sqrt{1430}i}{7392} \quad 0 \quad 0 \quad -\frac{\sqrt{429}i}{8008} \quad 0 \quad \frac{\sqrt{2145}i}{2002} \quad 0 \quad -\frac{\sqrt{143}i}{8008} \quad 0 \quad -\frac{\sqrt{3003}i}{4004}$
	0	$-\frac{\sqrt{858}i}{2464} \quad 0 \quad \frac{\sqrt{429}i}{336} \quad 0 \quad \frac{5\sqrt{4290}i}{7392} \quad -\frac{3\sqrt{5005}i}{8008} \quad 0 \quad -\frac{\sqrt{2145}i}{4004} \quad 0 \quad \frac{\sqrt{143}i}{8008} \quad 0 \quad \frac{\sqrt{715}i}{1001} \quad 0$
	$-\frac{5\sqrt{1430}i}{2464}$	$0 \quad -\frac{3\sqrt{143}i}{1232} \quad 0 \quad -\frac{23\sqrt{286}i}{7392} \quad 0 \quad 0 \quad -\frac{3\sqrt{2145}i}{4004} \quad 0 \quad -\frac{\sqrt{429}i}{8008} \quad 0 \quad -\frac{\sqrt{715}i}{1001} \quad 0 \quad -\frac{\sqrt{15015}i}{8008}$
	0	$-\frac{5\sqrt{2002}i}{2464} \quad 0 \quad \frac{\sqrt{1001}i}{1232} \quad 0 \quad \frac{\sqrt{10010}i}{7392} \quad 0 \quad 0 \quad -\frac{3\sqrt{5005}i}{8008} \quad 0 \quad \frac{\sqrt{3003}i}{4004} \quad 0 \quad \frac{\sqrt{15015}i}{8008} \quad 0$

1024 symmetry

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

continued ...

Table 10

No.	multipole	matrix
$\mathbb{M}_{5,2}^{(1,1;a)}(T_g, 3)$	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 $-\frac{\sqrt{4290}}{154}$ 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 $-\frac{2\sqrt{143}}{231}$ 0 0 0 0 0 0 $\frac{3\sqrt{429}}{2002}$ 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 $\frac{\sqrt{1430}}{462}$ 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 0	