

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

bra: $= \langle s, \uparrow |, \langle s, \downarrow |$
ket: $= |s, \uparrow \rangle, |s, \downarrow \rangle$

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: $= \langle s, \uparrow |, \langle s, \downarrow |$
ket: $= |p_x, \uparrow \rangle, |p_x, \downarrow \rangle, |p_y, \uparrow \rangle, |p_y, \downarrow \rangle, |p_z, \uparrow \rangle, |p_z, \downarrow \rangle$

Table 2: (s,p) block.

No.	multipole	matrix
5	symmetry	x
	$\mathbb{Q}_{1,0}^{(a)}(T_u)$	$\begin{bmatrix} \frac{1}{2} & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{1}{2} & 0 & 0 & 0 & 0 \end{bmatrix}$
6	symmetry	y
	$\mathbb{Q}_{1,1}^{(a)}(T_u)$	$\begin{bmatrix} 0 & 0 & \frac{1}{2} & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{1}{2} & 0 & 0 \end{bmatrix}$

continued ...

Table 2

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

continued ...

Table 2

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

continued ...

Table 2

No.	multipole	matrix
	$\mathbb{M}_{2,0}^{(1,-1;a)}(T_u)$	$\begin{bmatrix} 0 & 0 & \frac{\sqrt{2}}{4} & 0 & 0 & -\frac{\sqrt{2}i}{4} \\ 0 & 0 & 0 & -\frac{\sqrt{2}}{4} & \frac{\sqrt{2}i}{4} & 0 \end{bmatrix}$
26	symmetry	$\sqrt{3}xz$
	$\mathbb{M}_{2,1}^{(1,-1;a)}(T_u)$	$\begin{bmatrix} \frac{\sqrt{2}}{4} & 0 & 0 & 0 & 0 & \frac{\sqrt{2}}{4} \\ 0 & -\frac{\sqrt{2}}{4} & 0 & 0 & \frac{\sqrt{2}}{4} & 0 \end{bmatrix}$
27	symmetry	$\sqrt{3}xy$
	$\mathbb{M}_{2,2}^{(1,-1;a)}(T_u)$	$\begin{bmatrix} 0 & -\frac{\sqrt{2}i}{4} & 0 & \frac{\sqrt{2}}{4} & 0 & 0 \\ \frac{\sqrt{2}i}{4} & 0 & \frac{\sqrt{2}}{4} & 0 & 0 & 0 \end{bmatrix}$
28	symmetry	1
	$\mathbb{M}_0^{(1,1;a)}(A_u)$	$\begin{bmatrix} 0 & \frac{\sqrt{3}}{6} & 0 & -\frac{\sqrt{3}i}{6} & \frac{\sqrt{3}}{6} & 0 \\ \frac{\sqrt{3}}{6} & 0 & \frac{\sqrt{3}i}{6} & 0 & 0 & -\frac{\sqrt{3}}{6} \end{bmatrix}$

bra: $= \langle s, \uparrow |, \langle s, \downarrow |$ ket: $= |d_u, \uparrow \rangle, |d_u, \downarrow \rangle, |d_v, \uparrow \rangle, |d_v, \downarrow \rangle, |d_{yz}, \uparrow \rangle, |d_{yz}, \downarrow \rangle, |d_{xz}, \uparrow \rangle, |d_{xz}, \downarrow \rangle, |d_{xy}, \uparrow \rangle, |d_{xy}, \downarrow \rangle$

Table 3: (s,d) block.

No.	multipole	matrix
29	symmetry	$-\frac{x^2}{2} - \frac{y^2}{2} + z^2$
	$\mathbb{Q}_{2,0}^{(a)}(E_g)$	$\begin{bmatrix} \frac{1}{2} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{1}{2} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
30	symmetry	$\frac{\sqrt{3}(x-y)(x+y)}{2}$
	$\mathbb{Q}_{2,1}^{(a)}(E_g)$	$\begin{bmatrix} 0 & 0 & \frac{1}{2} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{1}{2} & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
31	symmetry	$\sqrt{3}yz$
	$\mathbb{Q}_{2,0}^{(a)}(T_g)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & \frac{1}{2} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{1}{2} & 0 & 0 & 0 & 0 \end{bmatrix}$
32	symmetry	$\sqrt{3}xz$

continued ...

Table 3

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

continued ...

Table 3

No.	multipole	matrix
	$\mathbb{G}_{3,1}^{(1,-1;a)}(T_g, 1)$	$\begin{bmatrix} 0 & -\frac{\sqrt{15}}{20} & 0 & -\frac{3\sqrt{5}}{20} & -\frac{\sqrt{5}i}{10} & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{10} \\ \frac{\sqrt{15}}{20} & 0 & \frac{3\sqrt{5}}{20} & 0 & 0 & \frac{\sqrt{5}i}{10} & 0 & 0 & -\frac{\sqrt{5}i}{10} & 0 \end{bmatrix}$
42	symmetry	$-\frac{z(3x^2+3y^2-2z^2)}{2}$
	$\mathbb{G}_{3,2}^{(1,-1;a)}(T_g, 1)$	$\begin{bmatrix} \frac{\sqrt{15}i}{10} & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}}{10} & 0 & -\frac{\sqrt{5}i}{10} & 0 & 0 \\ 0 & -\frac{\sqrt{15}i}{10} & 0 & 0 & \frac{\sqrt{5}}{10} & 0 & -\frac{\sqrt{5}i}{10} & 0 & 0 & 0 \end{bmatrix}$
43	symmetry	$\frac{\sqrt{15}x(y-z)(y+z)}{2}$
	$\mathbb{G}_{3,0}^{(1,-1;a)}(T_g, 2)$	$\begin{bmatrix} 0 & -\frac{i}{4} & 0 & -\frac{\sqrt{3}i}{12} & 0 & 0 & -\frac{\sqrt{3}i}{6} & 0 & 0 & \frac{\sqrt{3}}{6} \\ -\frac{i}{4} & 0 & -\frac{\sqrt{3}i}{12} & 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{6} & -\frac{\sqrt{3}}{6} & 0 \end{bmatrix}$
44	symmetry	$-\frac{\sqrt{15}y(x-z)(x+z)}{2}$
	$\mathbb{G}_{3,1}^{(1,-1;a)}(T_g, 2)$	$\begin{bmatrix} 0 & \frac{1}{4} & 0 & -\frac{\sqrt{3}}{12} & \frac{\sqrt{3}i}{6} & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{6} \\ -\frac{1}{4} & 0 & \frac{\sqrt{3}}{12} & 0 & 0 & -\frac{\sqrt{3}i}{6} & 0 & 0 & -\frac{\sqrt{3}i}{6} & 0 \end{bmatrix}$
45	symmetry	$\frac{\sqrt{15}z(x-y)(x+y)}{2}$
	$\mathbb{G}_{3,2}^{(1,-1;a)}(T_g, 2)$	$\begin{bmatrix} 0 & 0 & \frac{\sqrt{3}i}{6} & 0 & 0 & -\frac{\sqrt{3}}{6} & 0 & \frac{\sqrt{3}i}{6} & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{3}i}{6} & \frac{\sqrt{3}}{6} & 0 & \frac{\sqrt{3}i}{6} & 0 & 0 & 0 \end{bmatrix}$
46	symmetry	x
	$\mathbb{G}_{1,0}^{(1,1;a)}(T_g)$	$\begin{bmatrix} 0 & -\frac{\sqrt{10}i}{20} & 0 & \frac{\sqrt{30}i}{20} & 0 & 0 & \frac{\sqrt{30}i}{20} & 0 & 0 & \frac{\sqrt{30}}{20} \\ -\frac{\sqrt{10}i}{20} & 0 & \frac{\sqrt{30}i}{20} & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}i}{20} & -\frac{\sqrt{30}}{20} & 0 \end{bmatrix}$
47	symmetry	y
	$\mathbb{G}_{1,1}^{(1,1;a)}(T_g)$	$\begin{bmatrix} 0 & -\frac{\sqrt{10}}{20} & 0 & -\frac{\sqrt{30}}{20} & \frac{\sqrt{30}i}{20} & 0 & 0 & 0 & 0 & \frac{\sqrt{30}i}{20} \\ \frac{\sqrt{10}}{20} & 0 & \frac{\sqrt{30}}{20} & 0 & 0 & -\frac{\sqrt{30}i}{20} & 0 & 0 & \frac{\sqrt{30}i}{20} & 0 \end{bmatrix}$
48	symmetry	z
	$\mathbb{G}_{1,2}^{(1,1;a)}(T_g)$	$\begin{bmatrix} \frac{\sqrt{10}i}{10} & 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{20} & 0 & \frac{\sqrt{30}i}{20} & 0 & 0 \\ 0 & -\frac{\sqrt{10}i}{10} & 0 & 0 & -\frac{\sqrt{30}}{20} & 0 & \frac{\sqrt{30}i}{20} & 0 & 0 & 0 \end{bmatrix}$
49	symmetry	$-\frac{x^2}{2} - \frac{y^2}{2} + z^2$
	$\mathbb{T}_{2,0}^{(a)}(E_g)$	$\begin{bmatrix} \frac{i}{2} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{i}{2} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
50	symmetry ...	$\frac{\sqrt{3}(x-y)(x+y)}{2}$

continued ...

Table 3

No.	multipole	matrix
	$\mathbb{T}_{2,1}^{(a)}(E_g)$	$\begin{bmatrix} 0 & 0 & \frac{i}{2} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{i}{2} & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
51	symmetry	$\sqrt{3}yz$ $\mathbb{T}_{2,0}^{(a)}(T_g)$ $\begin{bmatrix} 0 & 0 & 0 & 0 & \frac{i}{2} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{i}{2} & 0 & 0 & 0 & 0 \end{bmatrix}$
52	symmetry	$\sqrt{3}xz$ $\mathbb{T}_{2,1}^{(a)}(T_g)$ $\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & \frac{i}{2} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{i}{2} & 0 & 0 \end{bmatrix}$
53	symmetry	$\sqrt{3}xy$ $\mathbb{T}_{2,2}^{(a)}(T_g)$ $\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{i}{2} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{i}{2} \end{bmatrix}$
54	symmetry	$-\frac{x^2}{2} - \frac{y^2}{2} + z^2$ $\mathbb{T}_{2,0}^{(1,0;a)}(E_g)$ $\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2}}{4} & 0 & \frac{\sqrt{2}i}{4} & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{2}}{4} & 0 & -\frac{\sqrt{2}i}{4} & 0 & 0 & 0 \end{bmatrix}$
55	symmetry	$\frac{\sqrt{3}(x-y)(x+y)}{2}$ $\mathbb{T}_{2,1}^{(1,0;a)}(E_g)$ $\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{12} & 0 & -\frac{\sqrt{6}i}{12} & -\frac{\sqrt{6}}{6} & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{12} & 0 & \frac{\sqrt{6}i}{12} & 0 & 0 & \frac{\sqrt{6}}{6} \end{bmatrix}$
56	symmetry	$\sqrt{3}yz$ $\mathbb{T}_{2,0}^{(1,0;a)}(T_g)$ $\begin{bmatrix} 0 & -\frac{\sqrt{2}}{4} & 0 & -\frac{\sqrt{6}}{12} & 0 & 0 & \frac{\sqrt{6}}{12} & 0 & 0 & \frac{\sqrt{6}i}{12} \\ -\frac{\sqrt{2}}{4} & 0 & -\frac{\sqrt{6}}{12} & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}}{12} & -\frac{\sqrt{6}i}{12} & 0 \end{bmatrix}$
57	symmetry	$\sqrt{3}xz$ $\mathbb{T}_{2,1}^{(1,0;a)}(T_g)$ $\begin{bmatrix} 0 & -\frac{\sqrt{2}i}{4} & 0 & \frac{\sqrt{6}i}{12} & -\frac{\sqrt{6}}{12} & 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{12} \\ \frac{\sqrt{2}i}{4} & 0 & -\frac{\sqrt{6}i}{12} & 0 & 0 & \frac{\sqrt{6}}{12} & 0 & 0 & \frac{\sqrt{6}}{12} & 0 \end{bmatrix}$
58	symmetry	$\sqrt{3}xy$ $\mathbb{T}_{2,2}^{(1,0;a)}(T_g)$ $\begin{bmatrix} 0 & 0 & \frac{\sqrt{6}}{6} & 0 & 0 & -\frac{\sqrt{6}i}{12} & 0 & -\frac{\sqrt{6}}{12} & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{6}}{6} & \frac{\sqrt{6}i}{12} & 0 & -\frac{\sqrt{6}}{12} & 0 & 0 & 0 \end{bmatrix}$
59	symmetry ...	$\sqrt{15}xyz$

continued ...

Table 3

No.	multipole	matrix
	$\mathbb{M}_3^{(1,-1;a)}(A_g)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{6} & 0 & -\frac{\sqrt{3}i}{6} & \frac{\sqrt{3}}{6} & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{6} & 0 & \frac{\sqrt{3}i}{6} & 0 & 0 & -\frac{\sqrt{3}}{6} \end{bmatrix}$
60	symmetry	$\frac{x(2x^2-3y^2-3z^2)}{2}$
	$\mathbb{M}_{3,0}^{(1,-1;a)}(T_g, 1)$	$\begin{bmatrix} 0 & -\frac{\sqrt{15}}{20} & 0 & \frac{3\sqrt{5}}{20} & 0 & 0 & -\frac{\sqrt{5}}{10} & 0 & 0 & \frac{\sqrt{5}i}{10} \\ -\frac{\sqrt{15}}{20} & 0 & \frac{3\sqrt{5}}{20} & 0 & 0 & 0 & 0 & \frac{\sqrt{5}}{10} & -\frac{\sqrt{5}i}{10} & 0 \end{bmatrix}$
61	symmetry	$-\frac{y(3x^2-2y^2+3z^2)}{2}$
	$\mathbb{M}_{3,1}^{(1,-1;a)}(T_g, 1)$	$\begin{bmatrix} 0 & \frac{\sqrt{15}i}{20} & 0 & \frac{3\sqrt{5}i}{20} & -\frac{\sqrt{5}}{10} & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}}{10} \\ -\frac{\sqrt{15}i}{20} & 0 & -\frac{3\sqrt{5}i}{20} & 0 & 0 & \frac{\sqrt{5}}{10} & 0 & 0 & -\frac{\sqrt{5}}{10} & 0 \end{bmatrix}$
62	symmetry	$-\frac{z(3x^2+3y^2-2z^2)}{2}$
	$\mathbb{M}_{3,2}^{(1,-1;a)}(T_g, 1)$	$\begin{bmatrix} \frac{\sqrt{15}}{10} & 0 & 0 & 0 & 0 & \frac{\sqrt{5}i}{10} & 0 & -\frac{\sqrt{5}}{10} & 0 & 0 \\ 0 & -\frac{\sqrt{15}}{10} & 0 & 0 & -\frac{\sqrt{5}i}{10} & 0 & -\frac{\sqrt{5}}{10} & 0 & 0 & 0 \end{bmatrix}$
63	symmetry	$\frac{\sqrt{15}x(y-z)(y+z)}{2}$
	$\mathbb{M}_{3,0}^{(1,-1;a)}(T_g, 2)$	$\begin{bmatrix} 0 & -\frac{1}{4} & 0 & -\frac{\sqrt{3}}{12} & 0 & 0 & -\frac{\sqrt{3}}{6} & 0 & 0 & -\frac{\sqrt{3}i}{6} \\ -\frac{1}{4} & 0 & -\frac{\sqrt{3}}{12} & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{6} & \frac{\sqrt{3}i}{6} & 0 \end{bmatrix}$
64	symmetry	$-\frac{\sqrt{15}y(x-z)(x+z)}{2}$
	$\mathbb{M}_{3,1}^{(1,-1;a)}(T_g, 2)$	$\begin{bmatrix} 0 & -\frac{i}{4} & 0 & \frac{\sqrt{3}i}{12} & \frac{\sqrt{3}}{6} & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{6} \\ \frac{i}{4} & 0 & -\frac{\sqrt{3}i}{12} & 0 & 0 & -\frac{\sqrt{3}}{6} & 0 & 0 & -\frac{\sqrt{3}}{6} & 0 \end{bmatrix}$
65	symmetry	$\frac{\sqrt{15}z(x-y)(x+y)}{2}$
	$\mathbb{M}_{3,2}^{(1,-1;a)}(T_g, 2)$	$\begin{bmatrix} 0 & 0 & \frac{\sqrt{3}}{6} & 0 & 0 & \frac{\sqrt{3}i}{6} & 0 & \frac{\sqrt{3}}{6} & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{3}}{6} & -\frac{\sqrt{3}i}{6} & 0 & \frac{\sqrt{3}}{6} & 0 & 0 & 0 \end{bmatrix}$
66	symmetry	x
	$\mathbb{M}_{1,0}^{(1,1;a)}(T_g)$	$\begin{bmatrix} 0 & -\frac{\sqrt{10}}{20} & 0 & \frac{\sqrt{30}}{20} & 0 & 0 & \frac{\sqrt{30}}{20} & 0 & 0 & -\frac{\sqrt{30}i}{20} \\ -\frac{\sqrt{10}}{20} & 0 & \frac{\sqrt{30}}{20} & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}}{20} & \frac{\sqrt{30}i}{20} & 0 \end{bmatrix}$
67	symmetry	y
	$\mathbb{M}_{1,1}^{(1,1;a)}(T_g)$	$\begin{bmatrix} 0 & \frac{\sqrt{10}i}{20} & 0 & \frac{\sqrt{30}i}{20} & \frac{\sqrt{30}}{20} & 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{20} \\ -\frac{\sqrt{10}i}{20} & 0 & -\frac{\sqrt{30}i}{20} & 0 & 0 & -\frac{\sqrt{30}}{20} & 0 & 0 & \frac{\sqrt{30}}{20} & 0 \end{bmatrix}$
68	symmetry	z

continued ...

Table 3

No.	multipole	matrix
	$\mathbb{M}_{1,2}^{(1,1;a)}(T_g)$	$\begin{bmatrix} \frac{\sqrt{10}}{10} & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}i}{20} & 0 & \frac{\sqrt{30}}{20} & 0 & 0 \\ 0 & -\frac{\sqrt{10}}{10} & 0 & 0 & \frac{\sqrt{30}i}{20} & 0 & \frac{\sqrt{30}}{20} & 0 & 0 & 0 \end{bmatrix}$

bra: $= \langle s, \uparrow |, \langle s, \downarrow |$ ket: $= |f_3, \uparrow \rangle, |f_3, \downarrow \rangle, |f_{ax}, \uparrow \rangle, |f_{ax}, \downarrow \rangle, |f_{ay}, \uparrow \rangle, |f_{ay}, \downarrow \rangle, |f_{az}, \uparrow \rangle, |f_{az}, \downarrow \rangle, |f_{bx}, \uparrow \rangle, |f_{bx}, \downarrow \rangle, |f_{by}, \uparrow \rangle, |f_{by}, \downarrow \rangle, |f_{bz}, \uparrow \rangle, |f_{bz}, \downarrow \rangle$

Table 4: (s,f) block.

No.	multipole	matrix
69	symmetry	$\sqrt{15}xyz$
	$\mathbb{Q}_3^{(a)}(A_u)$	$\begin{bmatrix} \frac{1}{2} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{1}{2} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
70	symmetry	$\frac{x(2x^2-3y^2-3z^2)}{2}$
	$\mathbb{Q}_{3,0}^{(a)}(T_u, 1)$	$\begin{bmatrix} 0 & 0 & \frac{1}{2} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{1}{2} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
71	symmetry	$-\frac{y(3x^2-2y^2+3z^2)}{2}$
	$\mathbb{Q}_{3,1}^{(a)}(T_u, 1)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & \frac{1}{2} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{1}{2} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
72	symmetry	$-\frac{z(3x^2+3y^2-2z^2)}{2}$
	$\mathbb{Q}_{3,2}^{(a)}(T_u, 1)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & \frac{1}{2} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{1}{2} & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
73	symmetry	$\frac{\sqrt{15}x(y-z)(y+z)}{2}$
	$\mathbb{Q}_{3,0}^{(a)}(T_u, 2)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{1}{2} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{1}{2} & 0 & 0 & 0 & 0 \end{bmatrix}$
74	symmetry	$-\frac{\sqrt{15}y(x-z)(x+z)}{2}$
	$\mathbb{Q}_{3,1}^{(a)}(T_u, 2)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{1}{2} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{1}{2} & 0 & 0 & 0 \end{bmatrix}$
75	symmetry	$\frac{\sqrt{15}z(x-y)(x+y)}{2}$

continued ...

Table 4

No.	multipole	matrix
	$\mathbb{Q}_{3,2}^{(a)}(T_u, 2)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{1}{2} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{1}{2} \end{bmatrix}$
76	symmetry	$\sqrt{15}xyz$
	$\mathbb{Q}_3^{(1,0;a)}(A_u)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{6} & 0 & \frac{\sqrt{3}}{6} & \frac{\sqrt{3}i}{6} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{6} & 0 & -\frac{\sqrt{3}}{6} & 0 & 0 & -\frac{\sqrt{3}i}{6} \end{bmatrix}$
77	symmetry	$\frac{x(2x^2-3y^2-3z^2)}{2}$
	$\mathbb{Q}_{3,0}^{(1,0;a)}(T_u, 1)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{8} & 0 & 0 & -\frac{\sqrt{3}}{8} & 0 & 0 & \frac{\sqrt{5}i}{8} & 0 & 0 & \frac{\sqrt{5}}{8} \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{8} & \frac{\sqrt{3}}{8} & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{8} & -\frac{\sqrt{5}}{8} & 0 \end{bmatrix}$
78	symmetry	$-\frac{y(3x^2-2y^2+3z^2)}{2}$
	$\mathbb{Q}_{3,1}^{(1,0;a)}(T_u, 1)$	$\begin{bmatrix} 0 & 0 & -\frac{\sqrt{3}i}{8} & 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{8} & \frac{\sqrt{5}i}{8} & 0 & 0 & 0 & 0 & \frac{\sqrt{5}i}{8} \\ 0 & 0 & 0 & \frac{\sqrt{3}i}{8} & 0 & 0 & \frac{\sqrt{3}i}{8} & 0 & 0 & -\frac{\sqrt{5}i}{8} & 0 & 0 & \frac{\sqrt{5}i}{8} & 0 \end{bmatrix}$
79	symmetry	$-\frac{z(3x^2+3y^2-2z^2)}{2}$
	$\mathbb{Q}_{3,2}^{(1,0;a)}(T_u, 1)$	$\begin{bmatrix} 0 & 0 & 0 & \frac{\sqrt{3}}{8} & 0 & -\frac{\sqrt{3}i}{8} & 0 & 0 & 0 & \frac{\sqrt{5}}{8} & 0 & \frac{\sqrt{5}i}{8} & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{3}}{8} & 0 & -\frac{\sqrt{3}i}{8} & 0 & 0 & 0 & -\frac{\sqrt{5}}{8} & 0 & \frac{\sqrt{5}i}{8} & 0 & 0 & 0 \end{bmatrix}$
80	symmetry	$\frac{\sqrt{15}x(y-z)(y+z)}{2}$
	$\mathbb{Q}_{3,0}^{(1,0;a)}(T_u, 2)$	$\begin{bmatrix} 0 & -\frac{\sqrt{3}i}{6} & 0 & 0 & -\frac{\sqrt{5}i}{8} & 0 & 0 & -\frac{\sqrt{5}}{8} & 0 & 0 & -\frac{\sqrt{3}i}{24} & 0 & 0 & \frac{\sqrt{3}}{24} \\ -\frac{\sqrt{3}i}{6} & 0 & 0 & 0 & 0 & \frac{\sqrt{5}i}{8} & \frac{\sqrt{5}}{8} & 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{24} & -\frac{\sqrt{3}}{24} & 0 \end{bmatrix}$
81	symmetry	$-\frac{\sqrt{15}y(x-z)(x+z)}{2}$
	$\mathbb{Q}_{3,1}^{(1,0;a)}(T_u, 2)$	$\begin{bmatrix} 0 & -\frac{\sqrt{3}}{6} & -\frac{\sqrt{5}i}{8} & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{8} & \frac{\sqrt{3}i}{24} & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{24} \\ \frac{\sqrt{3}}{6} & 0 & 0 & \frac{\sqrt{5}i}{8} & 0 & 0 & -\frac{\sqrt{5}i}{8} & 0 & 0 & -\frac{\sqrt{3}i}{24} & 0 & 0 & -\frac{\sqrt{3}i}{24} & 0 \end{bmatrix}$
82	symmetry	$\frac{\sqrt{15}z(x-y)(x+y)}{2}$
	$\mathbb{Q}_{3,2}^{(1,0;a)}(T_u, 2)$	$\begin{bmatrix} -\frac{\sqrt{3}i}{6} & 0 & 0 & -\frac{\sqrt{5}}{8} & 0 & -\frac{\sqrt{5}i}{8} & 0 & 0 & 0 & -\frac{\sqrt{3}}{24} & 0 & \frac{\sqrt{3}i}{24} & 0 & 0 \\ 0 & \frac{\sqrt{3}i}{6} & \frac{\sqrt{5}}{8} & 0 & -\frac{\sqrt{5}i}{8} & 0 & 0 & 0 & \frac{\sqrt{3}}{24} & 0 & \frac{\sqrt{3}i}{24} & 0 & 0 & 0 \end{bmatrix}$
83	symmetry	$\frac{\sqrt{21}(x^4-3x^2y^2-3x^2z^2+y^4-3y^2z^2+z^4)}{6}$
	$\mathbb{G}_4^{(1,-1;a)}(A_u)$	$\begin{bmatrix} 0 & 0 & 0 & \frac{\sqrt{3}i}{6} & 0 & \frac{\sqrt{3}}{6} & \frac{\sqrt{3}i}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{3}i}{6} & 0 & -\frac{\sqrt{3}}{6} & 0 & 0 & -\frac{\sqrt{3}i}{6} & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
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
	$\mathbb{G}_{4,0}^{(1,-1;a)}(E_u)$	$\begin{bmatrix} 0 & 0 & 0 & -\frac{\sqrt{105}i}{84} & 0 & -\frac{\sqrt{105}}{84} & \frac{\sqrt{105}i}{42} & 0 & 0 & \frac{3\sqrt{7}i}{28} & 0 & -\frac{3\sqrt{7}}{28} & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{105}i}{84} & 0 & \frac{\sqrt{105}}{84} & 0 & 0 & -\frac{\sqrt{105}i}{42} & \frac{3\sqrt{7}i}{28} & 0 & \frac{3\sqrt{7}}{28} & 0 & 0 & 0 \end{bmatrix}$
85	symmetry	$\frac{\sqrt{5}(x-y)(x+y)(x^2+y^2-6z^2)}{4}$
	$\mathbb{G}_{4,1}^{(1,-1;a)}(E_u)$	$\begin{bmatrix} 0 & 0 & 0 & \frac{\sqrt{35}i}{28} & 0 & -\frac{\sqrt{35}}{28} & 0 & 0 & 0 & \frac{\sqrt{21}i}{28} & 0 & \frac{\sqrt{21}}{28} & -\frac{\sqrt{21}i}{14} & 0 \\ 0 & 0 & \frac{\sqrt{35}i}{28} & 0 & \frac{\sqrt{35}}{28} & 0 & 0 & 0 & \frac{\sqrt{21}i}{28} & 0 & -\frac{\sqrt{21}}{28} & 0 & 0 & \frac{\sqrt{21}i}{14} \end{bmatrix}$
86	symmetry	$\frac{\sqrt{35}yz(y-z)(y+z)}{2}$
	$\mathbb{G}_{4,0}^{(1,-1;a)}(T_u, 1)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & \frac{\sqrt{5}i}{8} & 0 & 0 & -\frac{\sqrt{5}}{8} & 0 & 0 & -\frac{\sqrt{3}i}{8} & 0 & 0 & -\frac{\sqrt{3}}{8} \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{8} & \frac{\sqrt{5}}{8} & 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{8} & \frac{\sqrt{3}}{8} & 0 \end{bmatrix}$
87	symmetry	$-\frac{\sqrt{35}xz(x-z)(x+z)}{2}$
	$\mathbb{G}_{4,1}^{(1,-1;a)}(T_u, 1)$	$\begin{bmatrix} 0 & 0 & -\frac{\sqrt{5}i}{8} & 0 & 0 & 0 & 0 & \frac{\sqrt{5}i}{8} & -\frac{\sqrt{3}i}{8} & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{8} \\ 0 & 0 & 0 & \frac{\sqrt{5}i}{8} & 0 & 0 & \frac{\sqrt{5}i}{8} & 0 & 0 & \frac{\sqrt{3}i}{8} & 0 & 0 & -\frac{\sqrt{3}i}{8} & 0 \end{bmatrix}$
88	symmetry	$\frac{\sqrt{35}xy(x-y)(x+y)}{2}$
	$\mathbb{G}_{4,2}^{(1,-1;a)}(T_u, 1)$	$\begin{bmatrix} 0 & 0 & 0 & \frac{\sqrt{5}}{8} & 0 & -\frac{\sqrt{5}i}{8} & 0 & 0 & 0 & -\frac{\sqrt{3}}{8} & 0 & -\frac{\sqrt{3}i}{8} & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{5}}{8} & 0 & -\frac{\sqrt{5}i}{8} & 0 & 0 & 0 & \frac{\sqrt{3}}{8} & 0 & -\frac{\sqrt{3}i}{8} & 0 & 0 & 0 \end{bmatrix}$
89	symmetry	$\frac{\sqrt{5}yz(6x^2-y^2-z^2)}{2}$
	$\mathbb{G}_{4,0}^{(1,-1;a)}(T_u, 2)$	$\begin{bmatrix} 0 & \frac{\sqrt{21}i}{14} & 0 & 0 & -\frac{\sqrt{35}i}{56} & 0 & 0 & -\frac{\sqrt{35}}{56} & 0 & 0 & -\frac{3\sqrt{21}i}{56} & 0 & 0 & \frac{3\sqrt{21}}{56} \\ \frac{\sqrt{21}i}{14} & 0 & 0 & 0 & 0 & \frac{\sqrt{35}i}{56} & \frac{\sqrt{35}}{56} & 0 & 0 & 0 & 0 & \frac{3\sqrt{21}i}{56} & -\frac{3\sqrt{21}}{56} & 0 \end{bmatrix}$
90	symmetry	$-\frac{\sqrt{5}xz(x^2-6y^2+z^2)}{2}$
	$\mathbb{G}_{4,1}^{(1,-1;a)}(T_u, 2)$	$\begin{bmatrix} 0 & \frac{\sqrt{21}}{14} & -\frac{\sqrt{35}i}{56} & 0 & 0 & 0 & 0 & -\frac{\sqrt{35}i}{56} & \frac{3\sqrt{21}i}{56} & 0 & 0 & 0 & 0 & -\frac{3\sqrt{21}i}{56} \\ -\frac{\sqrt{21}}{14} & 0 & 0 & \frac{\sqrt{35}i}{56} & 0 & 0 & -\frac{\sqrt{35}i}{56} & 0 & 0 & -\frac{3\sqrt{21}i}{56} & 0 & 0 & -\frac{3\sqrt{21}i}{56} & 0 \end{bmatrix}$
91	symmetry	$-\frac{\sqrt{5}xy(x^2+y^2-6z^2)}{2}$
	$\mathbb{G}_{4,2}^{(1,-1;a)}(T_u, 2)$	$\begin{bmatrix} \frac{\sqrt{21}i}{14} & 0 & 0 & -\frac{\sqrt{35}}{56} & 0 & -\frac{\sqrt{35}i}{56} & 0 & 0 & 0 & -\frac{3\sqrt{21}}{56} & 0 & \frac{3\sqrt{21}i}{56} & 0 & 0 \\ 0 & -\frac{\sqrt{21}i}{14} & \frac{\sqrt{35}}{56} & 0 & -\frac{\sqrt{35}i}{56} & 0 & 0 & 0 & \frac{3\sqrt{21}}{56} & 0 & \frac{3\sqrt{21}i}{56} & 0 & 0 & 0 \end{bmatrix}$
92	symmetry	$-\frac{x^2}{2} - \frac{y^2}{2} + z^2$
	$\mathbb{G}_{2,0}^{(1,1;a)}(E_u)$	$\begin{bmatrix} 0 & 0 & 0 & -\frac{\sqrt{21}i}{28} & 0 & -\frac{\sqrt{21}}{28} & \frac{\sqrt{21}i}{14} & 0 & 0 & -\frac{\sqrt{35}i}{28} & 0 & \frac{\sqrt{35}}{28} & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{21}i}{28} & 0 & \frac{\sqrt{21}}{28} & 0 & 0 & -\frac{\sqrt{21}i}{14} & -\frac{\sqrt{35}i}{28} & 0 & -\frac{\sqrt{35}}{28} & 0 & 0 & 0 \end{bmatrix}$
93	symmetry	$\frac{\sqrt{3}(x-y)(x+y)}{2}$

continued ...

Table 4

No.	multipole	matrix
	$\mathbb{G}_{2,1}^{(1,1;a)}(E_u)$	$\begin{bmatrix} 0 & 0 & 0 & \frac{3\sqrt{7}i}{28} & 0 & -\frac{3\sqrt{7}}{28} & 0 & 0 & 0 & -\frac{\sqrt{105}i}{84} & 0 & -\frac{\sqrt{105}}{84} & \frac{\sqrt{105}i}{42} & 0 \\ 0 & 0 & \frac{3\sqrt{7}i}{28} & 0 & \frac{3\sqrt{7}}{28} & 0 & 0 & 0 & -\frac{\sqrt{105}i}{84} & 0 & \frac{\sqrt{105}}{84} & 0 & 0 & -\frac{\sqrt{105}i}{42} \end{bmatrix}$
94	symmetry	$\sqrt{3}yz$
	$\mathbb{G}_{2,0}^{(1,1;a)}(T_u)$	$\begin{bmatrix} 0 & \frac{\sqrt{105}i}{42} & 0 & 0 & -\frac{\sqrt{7}i}{14} & 0 & 0 & -\frac{\sqrt{7}}{14} & 0 & 0 & \frac{\sqrt{105}i}{42} & 0 & 0 & -\frac{\sqrt{105}}{42} \\ \frac{\sqrt{105}i}{42} & 0 & 0 & 0 & 0 & \frac{\sqrt{7}i}{14} & \frac{\sqrt{7}}{14} & 0 & 0 & 0 & -\frac{\sqrt{105}i}{42} & \frac{\sqrt{105}}{42} & 0 & 0 \end{bmatrix}$
95	symmetry	$\sqrt{3}xz$
	$\mathbb{G}_{2,1}^{(1,1;a)}(T_u)$	$\begin{bmatrix} 0 & \frac{\sqrt{105}}{42} & -\frac{\sqrt{7}i}{14} & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}i}{14} & -\frac{\sqrt{105}i}{42} & 0 & 0 & 0 & 0 & \frac{\sqrt{105}i}{42} \\ -\frac{\sqrt{105}}{42} & 0 & 0 & \frac{\sqrt{7}i}{14} & 0 & 0 & -\frac{\sqrt{7}i}{14} & 0 & 0 & \frac{\sqrt{105}i}{42} & 0 & 0 & \frac{\sqrt{105}i}{42} & 0 \end{bmatrix}$
96	symmetry	$\sqrt{3}xy$
	$\mathbb{G}_{2,2}^{(1,1;a)}(T_u)$	$\begin{bmatrix} \frac{\sqrt{105}i}{42} & 0 & 0 & -\frac{\sqrt{7}}{14} & 0 & -\frac{\sqrt{7}i}{14} & 0 & 0 & 0 & \frac{\sqrt{105}}{42} & 0 & -\frac{\sqrt{105}i}{42} & 0 & 0 \\ 0 & -\frac{\sqrt{105}i}{42} & \frac{\sqrt{7}}{14} & 0 & -\frac{\sqrt{7}i}{14} & 0 & 0 & 0 & -\frac{\sqrt{105}}{42} & 0 & -\frac{\sqrt{105}i}{42} & 0 & 0 & 0 \end{bmatrix}$
97	symmetry	$\sqrt{15}xyz$
	$\mathbb{T}_3^{(a)}(A_u)$	$\begin{bmatrix} \frac{i}{2} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{i}{2} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
98	symmetry	$\frac{x(2x^2-3y^2-3z^2)}{2}$
	$\mathbb{T}_{3,0}^{(a)}(T_u, 1)$	$\begin{bmatrix} 0 & 0 & \frac{i}{2} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{i}{2} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
99	symmetry	$-\frac{y(3x^2-2y^2+3z^2)}{2}$
	$\mathbb{T}_{3,1}^{(a)}(T_u, 1)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & \frac{i}{2} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{i}{2} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
100	symmetry	$-\frac{z(3x^2+3y^2-2z^2)}{2}$
	$\mathbb{T}_{3,2}^{(a)}(T_u, 1)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & \frac{i}{2} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{i}{2} & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
101	symmetry	$\frac{\sqrt{15}x(y-z)(y+z)}{2}$
	$\mathbb{T}_{3,0}^{(a)}(T_u, 2)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{i}{2} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{i}{2} & 0 & 0 & 0 & 0 \end{bmatrix}$
102	symmetry	$-\frac{\sqrt{15}y(x-z)(x+z)}{2}$

continued ...

Table 4

No.	multipole	matrix
	$\mathbb{T}_{3,1}^{(a)}(T_u, 2)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{i}{2} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{i}{2} & 0 & 0 \end{bmatrix}$
103	symmetry	$\frac{\sqrt{15}z(x-y)(x+y)}{2}$
	$\mathbb{T}_{3,2}^{(a)}(T_u, 2)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{i}{2} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{i}{2} \end{bmatrix}$
104	symmetry	$\sqrt{15}xyz$
	$\mathbb{T}_3^{(1,0;a)}(A_u)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{6} & 0 & -\frac{\sqrt{3}i}{6} & \frac{\sqrt{3}}{6} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{6} & 0 & \frac{\sqrt{3}i}{6} & 0 & 0 & -\frac{\sqrt{3}}{6} \end{bmatrix}$
105	symmetry	$\frac{x(2x^2-3y^2-3z^2)}{2}$
	$\mathbb{T}_{3,0}^{(1,0;a)}(T_u, 1)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{8} & 0 & 0 & \frac{\sqrt{3}i}{8} & 0 & 0 & \frac{\sqrt{5}}{8} & 0 & 0 & -\frac{\sqrt{5}i}{8} \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{8} & -\frac{\sqrt{3}i}{8} & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}}{8} & \frac{\sqrt{5}i}{8} & 0 \end{bmatrix}$
106	symmetry	$-\frac{y(3x^2-2y^2+3z^2)}{2}$
	$\mathbb{T}_{3,1}^{(1,0;a)}(T_u, 1)$	$\begin{bmatrix} 0 & 0 & -\frac{\sqrt{3}}{8} & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{8} & \frac{\sqrt{5}}{8} & 0 & 0 & 0 & 0 & \frac{\sqrt{5}}{8} \\ 0 & 0 & 0 & \frac{\sqrt{3}}{8} & 0 & 0 & \frac{\sqrt{3}}{8} & 0 & 0 & -\frac{\sqrt{5}}{8} & 0 & 0 & \frac{\sqrt{5}}{8} & 0 \end{bmatrix}$
107	symmetry	$-\frac{z(3x^2+3y^2-2z^2)}{2}$
	$\mathbb{T}_{3,2}^{(1,0;a)}(T_u, 1)$	$\begin{bmatrix} 0 & 0 & 0 & -\frac{\sqrt{3}i}{8} & 0 & -\frac{\sqrt{3}}{8} & 0 & 0 & 0 & -\frac{\sqrt{5}i}{8} & 0 & \frac{\sqrt{5}}{8} & 0 & 0 \\ 0 & 0 & \frac{\sqrt{3}i}{8} & 0 & -\frac{\sqrt{3}}{8} & 0 & 0 & 0 & \frac{\sqrt{5}i}{8} & 0 & \frac{\sqrt{5}}{8} & 0 & 0 & 0 \end{bmatrix}$
108	symmetry	$\frac{\sqrt{15}x(y-z)(y+z)}{2}$
	$\mathbb{T}_{3,0}^{(1,0;a)}(T_u, 2)$	$\begin{bmatrix} 0 & -\frac{\sqrt{3}}{6} & 0 & 0 & -\frac{\sqrt{5}}{8} & 0 & 0 & \frac{\sqrt{5}i}{8} & 0 & 0 & -\frac{\sqrt{3}}{24} & 0 & 0 & -\frac{\sqrt{3}i}{24} \\ -\frac{\sqrt{3}}{6} & 0 & 0 & 0 & 0 & \frac{\sqrt{5}}{8} & -\frac{\sqrt{5}i}{8} & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{24} & \frac{\sqrt{3}i}{24} & 0 \end{bmatrix}$
109	symmetry	$-\frac{\sqrt{15}y(x-z)(x+z)}{2}$
	$\mathbb{T}_{3,1}^{(1,0;a)}(T_u, 2)$	$\begin{bmatrix} 0 & \frac{\sqrt{3}i}{6} & -\frac{\sqrt{5}}{8} & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}}{8} & \frac{\sqrt{3}}{24} & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{24} \\ -\frac{\sqrt{3}i}{6} & 0 & 0 & \frac{\sqrt{5}}{8} & 0 & 0 & -\frac{\sqrt{5}}{8} & 0 & 0 & -\frac{\sqrt{3}}{24} & 0 & 0 & -\frac{\sqrt{3}}{24} & 0 \end{bmatrix}$
110	symmetry	$\frac{\sqrt{15}z(x-y)(x+y)}{2}$
	$\mathbb{T}_{3,2}^{(1,0;a)}(T_u, 2)$	$\begin{bmatrix} -\frac{\sqrt{3}}{6} & 0 & 0 & \frac{\sqrt{5}i}{8} & 0 & -\frac{\sqrt{5}}{8} & 0 & 0 & 0 & \frac{\sqrt{3}i}{24} & 0 & \frac{\sqrt{3}}{24} & 0 & 0 \\ 0 & \frac{\sqrt{3}}{6} & -\frac{\sqrt{5}i}{8} & 0 & -\frac{\sqrt{5}}{8} & 0 & 0 & 0 & -\frac{\sqrt{3}i}{24} & 0 & \frac{\sqrt{3}}{24} & 0 & 0 & 0 \end{bmatrix}$
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
	$\mathbb{M}_4^{(1,-1;a)}(A_u)$	$\begin{bmatrix} 0 & 0 & 0 & \frac{\sqrt{3}}{6} & 0 & -\frac{\sqrt{3}i}{6} & \frac{\sqrt{3}}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{3}}{6} & 0 & \frac{\sqrt{3}i}{6} & 0 & 0 & -\frac{\sqrt{3}}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
112	symmetry	$-\frac{\sqrt{15}(x^4 - 12x^2y^2 + 6x^2z^2 + y^4 + 6y^2z^2 - 2z^4)}{12}$
	$\mathbb{M}_{4,0}^{(1,-1;a)}(E_u)$	$\begin{bmatrix} 0 & 0 & 0 & -\frac{\sqrt{105}}{84} & 0 & \frac{\sqrt{105}i}{84} & \frac{\sqrt{105}}{42} & 0 & 0 & \frac{3\sqrt{7}}{28} & 0 & \frac{3\sqrt{7}i}{28} & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{105}}{84} & 0 & -\frac{\sqrt{105}i}{84} & 0 & 0 & -\frac{\sqrt{105}}{42} & \frac{3\sqrt{7}}{28} & 0 & -\frac{3\sqrt{7}i}{28} & 0 & 0 & 0 \end{bmatrix}$
113	symmetry	$\frac{\sqrt{5}(x-y)(x+y)(x^2+y^2-6z^2)}{4}$
	$\mathbb{M}_{4,1}^{(1,-1;a)}(E_u)$	$\begin{bmatrix} 0 & 0 & 0 & \frac{\sqrt{35}}{28} & 0 & \frac{\sqrt{35}i}{28} & 0 & 0 & 0 & \frac{\sqrt{21}}{28} & 0 & -\frac{\sqrt{21}i}{28} & -\frac{\sqrt{21}}{14} & 0 \\ 0 & 0 & \frac{\sqrt{35}}{28} & 0 & -\frac{\sqrt{35}i}{28} & 0 & 0 & 0 & \frac{\sqrt{21}}{28} & 0 & \frac{\sqrt{21}i}{28} & 0 & 0 & \frac{\sqrt{21}}{14} \end{bmatrix}$
114	symmetry	$\frac{\sqrt{35}yz(y-z)(y+z)}{2}$
	$\mathbb{M}_{4,0}^{(1,-1;a)}(T_u, 1)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & \frac{\sqrt{5}}{8} & 0 & 0 & \frac{\sqrt{5}i}{8} & 0 & 0 & -\frac{\sqrt{3}}{8} & 0 & 0 & \frac{\sqrt{3}i}{8} \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}}{8} & -\frac{\sqrt{5}i}{8} & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{8} & -\frac{\sqrt{3}i}{8} & 0 \end{bmatrix}$
115	symmetry	$-\frac{\sqrt{35}xz(x-z)(x+z)}{2}$
	$\mathbb{M}_{4,1}^{(1,-1;a)}(T_u, 1)$	$\begin{bmatrix} 0 & 0 & -\frac{\sqrt{5}}{8} & 0 & 0 & 0 & 0 & \frac{\sqrt{5}}{8} & -\frac{\sqrt{3}}{8} & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{8} \\ 0 & 0 & 0 & \frac{\sqrt{5}}{8} & 0 & 0 & \frac{\sqrt{5}}{8} & 0 & 0 & \frac{\sqrt{3}}{8} & 0 & 0 & -\frac{\sqrt{3}}{8} & 0 \end{bmatrix}$
116	symmetry	$\frac{\sqrt{35}xy(x-y)(x+y)}{2}$
	$\mathbb{M}_{4,2}^{(1,-1;a)}(T_u, 1)$	$\begin{bmatrix} 0 & 0 & 0 & -\frac{\sqrt{5}i}{8} & 0 & -\frac{\sqrt{5}}{8} & 0 & 0 & 0 & \frac{\sqrt{3}i}{8} & 0 & -\frac{\sqrt{3}}{8} & 0 & 0 \\ 0 & 0 & \frac{\sqrt{5}i}{8} & 0 & -\frac{\sqrt{5}}{8} & 0 & 0 & 0 & -\frac{\sqrt{3}i}{8} & 0 & -\frac{\sqrt{3}}{8} & 0 & 0 & 0 \end{bmatrix}$
117	symmetry	$\frac{\sqrt{5}yz(6x^2-y^2-z^2)}{2}$
	$\mathbb{M}_{4,0}^{(1,-1;a)}(T_u, 2)$	$\begin{bmatrix} 0 & \frac{\sqrt{21}}{14} & 0 & 0 & -\frac{\sqrt{35}}{56} & 0 & 0 & \frac{\sqrt{35}i}{56} & 0 & 0 & -\frac{3\sqrt{21}}{56} & 0 & 0 & -\frac{3\sqrt{21}i}{56} \\ \frac{\sqrt{21}}{14} & 0 & 0 & 0 & 0 & \frac{\sqrt{35}}{56} & -\frac{\sqrt{35}i}{56} & 0 & 0 & 0 & 0 & \frac{3\sqrt{21}}{56} & \frac{3\sqrt{21}i}{56} & 0 \end{bmatrix}$
118	symmetry	$-\frac{\sqrt{5}xz(x^2-6y^2+z^2)}{2}$
	$\mathbb{M}_{4,1}^{(1,-1;a)}(T_u, 2)$	$\begin{bmatrix} 0 & -\frac{\sqrt{21}i}{14} & -\frac{\sqrt{35}}{56} & 0 & 0 & 0 & 0 & -\frac{\sqrt{35}}{56} & \frac{3\sqrt{21}}{56} & 0 & 0 & 0 & 0 & -\frac{3\sqrt{21}}{56} \\ \frac{\sqrt{21}i}{14} & 0 & 0 & \frac{\sqrt{35}}{56} & 0 & 0 & -\frac{\sqrt{35}}{56} & 0 & 0 & -\frac{3\sqrt{21}}{56} & 0 & 0 & -\frac{3\sqrt{21}}{56} & 0 \end{bmatrix}$
119	symmetry	$-\frac{\sqrt{5}xy(x^2+y^2-6z^2)}{2}$
	$\mathbb{M}_{4,2}^{(1,-1;a)}(T_u, 2)$	$\begin{bmatrix} \frac{\sqrt{21}}{14} & 0 & 0 & \frac{\sqrt{35}i}{56} & 0 & -\frac{\sqrt{35}}{56} & 0 & 0 & 0 & \frac{3\sqrt{21}i}{56} & 0 & \frac{3\sqrt{21}}{56} & 0 & 0 \\ 0 & -\frac{\sqrt{21}}{14} & -\frac{\sqrt{35}i}{56} & 0 & -\frac{\sqrt{35}}{56} & 0 & 0 & 0 & -\frac{3\sqrt{21}i}{56} & 0 & \frac{3\sqrt{21}}{56} & 0 & 0 & 0 \end{bmatrix}$
120	symmetry	$-\frac{x^2}{2} - \frac{y^2}{2} + z^2$

continued ...

Table 4

No.	multipole	matrix
	$\mathbb{M}_{2,0}^{(1,1;a)}(E_u)$	$\begin{bmatrix} 0 & 0 & 0 & -\frac{\sqrt{21}}{28} & 0 & \frac{\sqrt{21}i}{28} & \frac{\sqrt{21}}{14} & 0 & 0 & -\frac{\sqrt{35}}{28} & 0 & -\frac{\sqrt{35}i}{28} & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{21}}{28} & 0 & -\frac{\sqrt{21}i}{28} & 0 & 0 & -\frac{\sqrt{21}}{14} & -\frac{\sqrt{35}}{28} & 0 & \frac{\sqrt{35}i}{28} & 0 & 0 & 0 \end{bmatrix}$
121	symmetry	$\frac{\sqrt{3}(x-y)(x+y)}{2}$
	$\mathbb{M}_{2,1}^{(1,1;a)}(E_u)$	$\begin{bmatrix} 0 & 0 & 0 & \frac{3\sqrt{7}}{28} & 0 & \frac{3\sqrt{7}i}{28} & 0 & 0 & 0 & -\frac{\sqrt{105}}{84} & 0 & \frac{\sqrt{105}i}{84} & \frac{\sqrt{105}}{42} & 0 \\ 0 & 0 & \frac{3\sqrt{7}}{28} & 0 & -\frac{3\sqrt{7}i}{28} & 0 & 0 & 0 & -\frac{\sqrt{105}}{84} & 0 & -\frac{\sqrt{105}i}{84} & 0 & 0 & -\frac{\sqrt{105}}{42} \end{bmatrix}$
122	symmetry	$\sqrt{3}yz$
	$\mathbb{M}_{2,0}^{(1,1;a)}(T_u)$	$\begin{bmatrix} 0 & \frac{\sqrt{105}}{42} & 0 & 0 & -\frac{\sqrt{7}}{14} & 0 & 0 & \frac{\sqrt{7}i}{14} & 0 & 0 & \frac{\sqrt{105}}{42} & 0 & 0 & \frac{\sqrt{105}i}{42} \\ \frac{\sqrt{105}}{42} & 0 & 0 & 0 & 0 & \frac{\sqrt{7}}{14} & -\frac{\sqrt{7}i}{14} & 0 & 0 & 0 & -\frac{\sqrt{105}}{42} & -\frac{\sqrt{105}i}{42} & 0 \end{bmatrix}$
123	symmetry	$\sqrt{3}xz$
	$\mathbb{M}_{2,1}^{(1,1;a)}(T_u)$	$\begin{bmatrix} 0 & -\frac{\sqrt{105}i}{42} & -\frac{\sqrt{7}}{14} & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}}{14} & -\frac{\sqrt{105}}{42} & 0 & 0 & 0 & 0 & \frac{\sqrt{105}}{42} \\ \frac{\sqrt{105}i}{42} & 0 & 0 & \frac{\sqrt{7}}{14} & 0 & 0 & -\frac{\sqrt{7}}{14} & 0 & 0 & \frac{\sqrt{105}}{42} & 0 & 0 & \frac{\sqrt{105}}{42} & 0 \end{bmatrix}$
124	symmetry	$\sqrt{3}xy$
	$\mathbb{M}_{2,2}^{(1,1;a)}(T_u)$	$\begin{bmatrix} \frac{\sqrt{105}}{42} & 0 & 0 & \frac{\sqrt{7}i}{14} & 0 & -\frac{\sqrt{7}}{14} & 0 & 0 & 0 & -\frac{\sqrt{105}i}{42} & 0 & -\frac{\sqrt{105}}{42} & 0 & 0 \\ 0 & -\frac{\sqrt{105}}{42} & -\frac{\sqrt{7}i}{14} & 0 & -\frac{\sqrt{7}}{14} & 0 & 0 & 0 & \frac{\sqrt{105}i}{42} & 0 & -\frac{\sqrt{105}}{42} & 0 & 0 & 0 \end{bmatrix}$

bra: = $\langle p_x, \uparrow |, \langle p_x, \downarrow |, \langle p_y, \uparrow |, \langle p_y, \downarrow |, \langle p_z, \uparrow |, \langle p_z, \downarrow |$ ket: = $|p_x, \uparrow \rangle, |p_x, \downarrow \rangle, |p_y, \uparrow \rangle, |p_y, \downarrow \rangle, |p_z, \uparrow \rangle, |p_z, \downarrow \rangle$

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	$-\frac{x^2}{2} - \frac{y^2}{2} + z^2$ $\begin{bmatrix} -\frac{\sqrt{3}}{6} & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{3}}{6} & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{3}}{6} & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{3}}{6} & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{3} & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{3} \end{bmatrix}$
127	symmetry	$\frac{\sqrt{3}(x-y)(x+y)}{2}$ $\begin{bmatrix} \frac{1}{2} & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{1}{2} & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{1}{2} & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{1}{2} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
128	symmetry	$\sqrt{3}yz$ $\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{1}{2} & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & \frac{1}{2} & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{1}{2} & 0 & 0 \end{bmatrix}$
129	symmetry	$\sqrt{3}xz$ $\begin{bmatrix} 0 & 0 & 0 & 0 & \frac{1}{2} & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 \\ \frac{1}{2} & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{1}{2} & 0 & 0 & 0 & 0 \end{bmatrix}$
130	symmetry	$\sqrt{3}xy$

continued ...

Table 5

No.	multipole	matrix
	$\mathbb{Q}_{2,2}^{(a)}(T_g)$	$\begin{bmatrix} 0 & 0 & \frac{1}{2} & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{1}{2} & 0 & 0 \\ \frac{1}{2} & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{1}{2} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
131	symmetry	$-\frac{x^2}{2} - \frac{y^2}{2} + z^2$ $\begin{bmatrix} 0 & 0 & -\frac{\sqrt{6}i}{6} & 0 & 0 & -\frac{\sqrt{6}}{12} \\ 0 & 0 & 0 & \frac{\sqrt{6}i}{6} & \frac{\sqrt{6}}{12} & 0 \\ \frac{\sqrt{6}i}{6} & 0 & 0 & 0 & 0 & \frac{\sqrt{6}i}{12} \\ 0 & -\frac{\sqrt{6}i}{6} & 0 & 0 & \frac{\sqrt{6}i}{12} & 0 \\ 0 & \frac{\sqrt{6}}{12} & 0 & -\frac{\sqrt{6}i}{12} & 0 & 0 \\ -\frac{\sqrt{6}}{12} & 0 & -\frac{\sqrt{6}i}{12} & 0 & 0 & 0 \end{bmatrix}$
132	symmetry	$\frac{\sqrt{3}(x-y)(x+y)}{2}$ $\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}}{4} \\ 0 & 0 & 0 & 0 & \frac{\sqrt{2}}{4} & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}i}{4} \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{2}i}{4} & 0 \\ 0 & \frac{\sqrt{2}}{4} & 0 & \frac{\sqrt{2}i}{4} & 0 & 0 \\ -\frac{\sqrt{2}}{4} & 0 & \frac{\sqrt{2}i}{4} & 0 & 0 & 0 \end{bmatrix}$
133	symmetry	$\sqrt{3}yz$ $\begin{bmatrix} 0 & 0 & 0 & -\frac{\sqrt{2}}{4} & \frac{\sqrt{2}i}{4} & 0 \\ 0 & 0 & \frac{\sqrt{2}}{4} & 0 & 0 & -\frac{\sqrt{2}i}{4} \\ 0 & \frac{\sqrt{2}}{4} & 0 & 0 & 0 & 0 \\ -\frac{\sqrt{2}}{4} & 0 & 0 & 0 & 0 & 0 \\ -\frac{\sqrt{2}i}{4} & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{2}i}{4} & 0 & 0 & 0 & 0 \end{bmatrix}$
134	symmetry	$\sqrt{3}xz$

continued ...

Table 5

No.	multipole	matrix
		$\begin{bmatrix} 0 & 0 & 0 & -\frac{\sqrt{2}i}{4} & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{2}i}{4} & 0 & 0 & 0 \\ 0 & \frac{\sqrt{2}i}{4} & 0 & 0 & -\frac{\sqrt{2}i}{4} & 0 \\ \frac{\sqrt{2}i}{4} & 0 & 0 & 0 & 0 & \frac{\sqrt{2}i}{4} \\ 0 & 0 & \frac{\sqrt{2}i}{4} & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{2}i}{4} & 0 & 0 \end{bmatrix}$
135	symmetry	$\sqrt{3}xy$
		$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2}i}{4} \\ 0 & 0 & 0 & 0 & \frac{\sqrt{2}i}{4} & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}}{4} \\ 0 & 0 & 0 & 0 & \frac{\sqrt{2}}{4} & 0 \\ 0 & -\frac{\sqrt{2}i}{4} & 0 & \frac{\sqrt{2}}{4} & 0 & 0 \\ -\frac{\sqrt{2}i}{4} & 0 & -\frac{\sqrt{2}}{4} & 0 & 0 & 0 \end{bmatrix}$
136	symmetry	1
		$\begin{bmatrix} 0 & 0 & -\frac{\sqrt{3}i}{6} & 0 & 0 & \frac{\sqrt{3}}{6} \\ 0 & 0 & 0 & \frac{\sqrt{3}i}{6} & -\frac{\sqrt{3}}{6} & 0 \\ \frac{\sqrt{3}i}{6} & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{6} \\ 0 & -\frac{\sqrt{3}i}{6} & 0 & 0 & -\frac{\sqrt{3}i}{6} & 0 \\ 0 & -\frac{\sqrt{3}}{6} & 0 & \frac{\sqrt{3}i}{6} & 0 & 0 \\ \frac{\sqrt{3}}{6} & 0 & \frac{\sqrt{3}i}{6} & 0 & 0 & 0 \end{bmatrix}$
137	symmetry	x
		$\begin{bmatrix} 0 & 0 & 0 & -\frac{\sqrt{2}}{4} & -\frac{\sqrt{2}i}{4} & 0 \\ 0 & 0 & \frac{\sqrt{2}}{4} & 0 & 0 & \frac{\sqrt{2}i}{4} \\ 0 & \frac{\sqrt{2}}{4} & 0 & 0 & 0 & 0 \\ -\frac{\sqrt{2}}{4} & 0 & 0 & 0 & 0 & 0 \\ \frac{\sqrt{2}i}{4} & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{2}i}{4} & 0 & 0 & 0 & 0 \end{bmatrix}$
138	symmetry	y

continued ...

Table 5

No.	multipole	matrix
		$\begin{bmatrix} 0 & 0 & 0 & \frac{\sqrt{2}i}{4} & 0 & 0 \\ 0 & 0 & \frac{\sqrt{2}i}{4} & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{2}i}{4} & 0 & 0 & -\frac{\sqrt{2}i}{4} & 0 \\ -\frac{\sqrt{2}i}{4} & 0 & 0 & 0 & 0 & \frac{\sqrt{2}i}{4} \\ 0 & 0 & \frac{\sqrt{2}i}{4} & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{2}i}{4} & 0 & 0 \end{bmatrix}$
139	symmetry	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2}i}{4} \\ 0 & 0 & 0 & 0 & \frac{\sqrt{2}i}{4} & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2}}{4} \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{2}}{4} & 0 \\ 0 & -\frac{\sqrt{2}i}{4} & 0 & -\frac{\sqrt{2}}{4} & 0 & 0 \\ -\frac{\sqrt{2}i}{4} & 0 & \frac{\sqrt{2}}{4} & 0 & 0 & 0 \end{bmatrix}$
140	symmetry	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2}i}{4} \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{2}i}{4} & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2}}{4} \\ 0 & 0 & 0 & 0 & \frac{\sqrt{2}}{4} & 0 \\ 0 & \frac{\sqrt{2}i}{4} & 0 & \frac{\sqrt{2}}{4} & 0 & 0 \\ -\frac{\sqrt{2}i}{4} & 0 & \frac{\sqrt{2}}{4} & 0 & 0 & 0 \end{bmatrix}$
141	symmetry	$\begin{bmatrix} 0 & 0 & -\frac{\sqrt{6}}{6} & 0 & 0 & -\frac{\sqrt{6}i}{12} \\ 0 & 0 & 0 & \frac{\sqrt{6}}{6} & \frac{\sqrt{6}i}{12} & 0 \\ -\frac{\sqrt{6}}{6} & 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{12} \\ 0 & \frac{\sqrt{6}}{6} & 0 & 0 & \frac{\sqrt{6}}{12} & 0 \\ 0 & -\frac{\sqrt{6}i}{12} & 0 & \frac{\sqrt{6}}{12} & 0 & 0 \\ \frac{\sqrt{6}i}{12} & 0 & \frac{\sqrt{6}}{12} & 0 & 0 & 0 \end{bmatrix}$
142	symmetry	$\begin{bmatrix} \sqrt{3}(x-y)(x+y) \\ \sqrt{3}yz \end{bmatrix}$

continued ...

Table 5

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

continued ...

Table 5

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

continued ...

Table 5

No.	multipole	matrix
		$\begin{bmatrix} \frac{\sqrt{6}}{6} & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{6}}{6} & 0 & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{6}}{6} & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{6}}{6} & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{6} & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}}{6} \end{bmatrix}$
151	symmetry	$\sqrt{15}xyz$
		$\begin{bmatrix} 0 & 0 & \frac{\sqrt{3}}{6} & 0 & 0 & -\frac{\sqrt{3}i}{6} \\ 0 & 0 & 0 & -\frac{\sqrt{3}}{6} & \frac{\sqrt{3}i}{6} & 0 \\ \frac{\sqrt{3}}{6} & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{6} \\ 0 & -\frac{\sqrt{3}}{6} & 0 & 0 & \frac{\sqrt{3}}{6} & 0 \\ 0 & -\frac{\sqrt{3}i}{6} & 0 & \frac{\sqrt{3}}{6} & 0 & 0 \\ \frac{\sqrt{3}i}{6} & 0 & \frac{\sqrt{3}}{6} & 0 & 0 & 0 \end{bmatrix}$
152	symmetry	$\frac{x(2x^2-3y^2-3z^2)}{2}$
		$\begin{bmatrix} 0 & \frac{\sqrt{5}}{5} & 0 & \frac{\sqrt{5}i}{10} & -\frac{\sqrt{5}}{10} & 0 \\ \frac{\sqrt{5}}{5} & 0 & -\frac{\sqrt{5}i}{10} & 0 & 0 & \frac{\sqrt{5}}{10} \\ 0 & \frac{\sqrt{5}i}{10} & 0 & -\frac{\sqrt{5}}{10} & 0 & 0 \\ -\frac{\sqrt{5}i}{10} & 0 & -\frac{\sqrt{5}}{10} & 0 & 0 & 0 \\ -\frac{\sqrt{5}}{10} & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}}{10} \\ 0 & \frac{\sqrt{5}}{10} & 0 & 0 & -\frac{\sqrt{5}}{10} & 0 \end{bmatrix}$
153	symmetry	$-\frac{y(3x^2-2y^2+3z^2)}{2}$
		$\begin{bmatrix} 0 & \frac{\sqrt{5}i}{10} & 0 & -\frac{\sqrt{5}}{10} & 0 & 0 \\ -\frac{\sqrt{5}i}{10} & 0 & -\frac{\sqrt{5}}{10} & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{5}}{10} & 0 & -\frac{\sqrt{5}i}{5} & -\frac{\sqrt{5}}{10} & 0 \\ -\frac{\sqrt{5}}{10} & 0 & \frac{\sqrt{5}i}{5} & 0 & 0 & \frac{\sqrt{5}}{10} \\ 0 & 0 & -\frac{\sqrt{5}}{10} & 0 & 0 & \frac{\sqrt{5}i}{10} \\ 0 & 0 & 0 & \frac{\sqrt{5}}{10} & -\frac{\sqrt{5}i}{10} & 0 \end{bmatrix}$
154	symmetry	$-\frac{z(3x^2+3y^2-2z^2)}{2}$

continued ...

Table 5

No.	multipole	matrix
		$\begin{bmatrix} -\frac{\sqrt{5}}{10} & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}}{10} \\ 0 & \frac{\sqrt{5}}{10} & 0 & 0 & -\frac{\sqrt{5}}{10} & 0 \\ 0 & 0 & -\frac{\sqrt{5}}{10} & 0 & 0 & \frac{\sqrt{5}i}{10} \\ 0 & 0 & 0 & \frac{\sqrt{5}}{10} & -\frac{\sqrt{5}i}{10} & 0 \\ 0 & -\frac{\sqrt{5}}{10} & 0 & \frac{\sqrt{5}i}{10} & \frac{\sqrt{5}}{5} & 0 \\ -\frac{\sqrt{5}}{10} & 0 & -\frac{\sqrt{5}i}{10} & 0 & 0 & -\frac{\sqrt{5}}{5} \end{bmatrix}$
155	symmetry	$\frac{\sqrt{15}x(y-z)(y+z)}{2}$
		$\begin{bmatrix} 0 & 0 & 0 & -\frac{\sqrt{3}i}{6} & -\frac{\sqrt{3}}{6} & 0 \\ 0 & 0 & \frac{\sqrt{3}i}{6} & 0 & 0 & \frac{\sqrt{3}}{6} \\ 0 & -\frac{\sqrt{3}i}{6} & 0 & \frac{\sqrt{3}}{6} & 0 & 0 \\ \frac{\sqrt{3}i}{6} & 0 & \frac{\sqrt{3}}{6} & 0 & 0 & 0 \\ -\frac{\sqrt{3}}{6} & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{6} \\ 0 & \frac{\sqrt{3}}{6} & 0 & 0 & -\frac{\sqrt{3}}{6} & 0 \end{bmatrix}$
156	symmetry	$-\frac{\sqrt{15}y(x-z)(x+z)}{2}$
		$\begin{bmatrix} 0 & \frac{\sqrt{3}i}{6} & 0 & -\frac{\sqrt{3}}{6} & 0 & 0 \\ -\frac{\sqrt{3}i}{6} & 0 & -\frac{\sqrt{3}}{6} & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{3}}{6} & 0 & 0 & \frac{\sqrt{3}}{6} & 0 \\ -\frac{\sqrt{3}}{6} & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{6} \\ 0 & 0 & \frac{\sqrt{3}}{6} & 0 & 0 & -\frac{\sqrt{3}i}{6} \\ 0 & 0 & 0 & -\frac{\sqrt{3}}{6} & \frac{\sqrt{3}i}{6} & 0 \end{bmatrix}$
157	symmetry	$\frac{\sqrt{15}z(x-y)(x+y)}{2}$
		$\begin{bmatrix} \frac{\sqrt{3}}{6} & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{6} \\ 0 & -\frac{\sqrt{3}}{6} & 0 & 0 & \frac{\sqrt{3}}{6} & 0 \\ 0 & 0 & -\frac{\sqrt{3}}{6} & 0 & 0 & \frac{\sqrt{3}i}{6} \\ 0 & 0 & 0 & \frac{\sqrt{3}}{6} & -\frac{\sqrt{3}i}{6} & 0 \\ 0 & \frac{\sqrt{3}}{6} & 0 & \frac{\sqrt{3}i}{6} & 0 & 0 \\ \frac{\sqrt{3}}{6} & 0 & -\frac{\sqrt{3}i}{6} & 0 & 0 & 0 \end{bmatrix}$
158	symmetry	x

continued ...

Table 5

No.	multipole	matrix
		$\begin{bmatrix} 0 & \frac{\sqrt{30}}{15} & 0 & -\frac{\sqrt{30}i}{20} & \frac{\sqrt{30}}{20} & 0 \\ \frac{\sqrt{30}}{15} & 0 & \frac{\sqrt{30}i}{20} & 0 & 0 & -\frac{\sqrt{30}}{20} \\ 0 & -\frac{\sqrt{30}i}{20} & 0 & -\frac{\sqrt{30}}{30} & 0 & 0 \\ \frac{\sqrt{30}i}{20} & 0 & -\frac{\sqrt{30}}{30} & 0 & 0 & 0 \\ \frac{\sqrt{30}}{20} & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}}{30} \\ 0 & -\frac{\sqrt{30}}{20} & 0 & 0 & -\frac{\sqrt{30}}{30} & 0 \end{bmatrix}$
159	symmetry	y $\begin{bmatrix} 0 & \frac{\sqrt{30}i}{30} & 0 & \frac{\sqrt{30}}{20} & 0 & 0 \\ -\frac{\sqrt{30}i}{30} & 0 & \frac{\sqrt{30}}{20} & 0 & 0 & 0 \\ 0 & \frac{\sqrt{30}}{20} & 0 & -\frac{\sqrt{30}i}{15} & \frac{\sqrt{30}}{20} & 0 \\ \frac{\sqrt{30}}{20} & 0 & \frac{\sqrt{30}i}{15} & 0 & 0 & -\frac{\sqrt{30}}{20} \\ 0 & 0 & \frac{\sqrt{30}}{20} & 0 & 0 & \frac{\sqrt{30}i}{30} \\ 0 & 0 & 0 & -\frac{\sqrt{30}}{20} & -\frac{\sqrt{30}i}{30} & 0 \end{bmatrix}$
160	symmetry	z $\begin{bmatrix} -\frac{\sqrt{30}}{30} & 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{20} \\ 0 & \frac{\sqrt{30}}{30} & 0 & 0 & \frac{\sqrt{30}}{20} & 0 \\ 0 & 0 & -\frac{\sqrt{30}}{30} & 0 & 0 & -\frac{\sqrt{30}i}{20} \\ 0 & 0 & 0 & \frac{\sqrt{30}}{30} & \frac{\sqrt{30}i}{20} & 0 \\ 0 & \frac{\sqrt{30}}{20} & 0 & -\frac{\sqrt{30}i}{20} & \frac{\sqrt{30}}{15} & 0 \\ \frac{\sqrt{30}}{20} & 0 & \frac{\sqrt{30}i}{20} & 0 & 0 & -\frac{\sqrt{30}}{15} \end{bmatrix}$
		$\mathbb{M}_{1,0}^{(1,1;a)}(T_g)$
		$\mathbb{M}_{1,1}^{(1,1;a)}(T_g)$
		$\mathbb{M}_{1,2}^{(1,1;a)}(T_g)$

bra: = $\langle p_x, \uparrow |, \langle p_x, \downarrow |, \langle p_y, \uparrow |, \langle p_y, \downarrow |, \langle p_z, \uparrow |, \langle p_z, \downarrow |$ ket: = $|d_u, \uparrow \rangle, |d_u, \downarrow \rangle, |d_v, \uparrow \rangle, |d_v, \downarrow \rangle, |d_{yz}, \uparrow \rangle, |d_{yz}, \downarrow \rangle, |d_{xz}, \uparrow \rangle, |d_{xz}, \downarrow \rangle, |d_{xy}, \uparrow \rangle, |d_{xy}, \downarrow \rangle$

Table 6: (p,d) block.

No.	multipole	matrix
161	symmetry	x

continued ...

Table 6

No.	multipole	matrix
		$\begin{bmatrix} -\frac{\sqrt{10}}{20} & 0 & \frac{\sqrt{30}}{20} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{10}}{20} & 0 & \frac{\sqrt{30}}{20} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{20} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{20} \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{20} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{20} & 0 & 0 \end{bmatrix}$
162	symmetry	$\begin{bmatrix} & & & & & & & y \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{20} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{20} \\ -\frac{\sqrt{10}}{20} & 0 & -\frac{\sqrt{30}}{20} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{10}}{20} & 0 & -\frac{\sqrt{30}}{20} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{20} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{20} & 0 & 0 & 0 & 0 \end{bmatrix}$
163	symmetry	$\begin{bmatrix} & & & & & & & z \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{20} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{20} & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{20} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{20} & 0 & 0 & 0 & 0 \\ \frac{\sqrt{10}}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{10}}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
164	symmetry	$\begin{bmatrix} & & & & & & & \sqrt{15}xyz \\ 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{6} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{6} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{6} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{6} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{6} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{6} \end{bmatrix}$
165	symmetry	$\begin{bmatrix} & & & & & & & \frac{x(2x^2-3y^2-3z^2)}{2} \\ & & & & & & & \end{bmatrix}$

continued ...

Table 6

No.	multipole	matrix
		$\begin{bmatrix} -\frac{\sqrt{15}}{20} & 0 & \frac{3\sqrt{5}}{20} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{15}}{20} & 0 & \frac{3\sqrt{5}}{20} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}}{10} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}}{10} \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}}{10} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}}{10} & 0 & 0 \end{bmatrix}$
166	$\mathbb{Q}_{3,0}^{(a)}(T_u, 1)$	$-\frac{y(3x^2 - 2y^2 + 3z^2)}{2}$
		$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}}{10} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}}{10} \\ -\frac{\sqrt{15}}{20} & 0 & -\frac{3\sqrt{5}}{20} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{15}}{20} & 0 & -\frac{3\sqrt{5}}{20} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{5}}{10} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}}{10} & 0 & 0 & 0 & 0 \end{bmatrix}$
167	$\mathbb{Q}_{3,1}^{(a)}(T_u, 1)$	$-\frac{z(3x^2 + 3y^2 - 2z^2)}{2}$
		$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}}{10} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}}{10} & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{5}}{10} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}}{10} & 0 & 0 & 0 & 0 \\ \frac{\sqrt{15}}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{15}}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
168	$\mathbb{Q}_{3,2}^{(a)}(T_u, 1)$	$\frac{\sqrt{15}x(y-z)(y+z)}{2}$
		$\begin{bmatrix} -\frac{1}{4} & 0 & -\frac{\sqrt{3}}{12} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{1}{4} & 0 & -\frac{\sqrt{3}}{12} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{6} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{6} \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{6} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{6} & 0 & 0 \end{bmatrix}$
169	$\mathbb{Q}_{3,0}^{(a)}(T_u, 2)$	$-\frac{\sqrt{15}y(x-z)(x+z)}{2}$

continued ...

Table 6

No.	multipole	matrix
		$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{6} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{6} \\ \frac{1}{4} & 0 & -\frac{\sqrt{3}}{12} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{1}{4} & 0 & -\frac{\sqrt{3}}{12} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{6} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{6} & 0 & 0 & 0 & 0 \end{bmatrix}$
170	symmetry	$\frac{\sqrt{15}z(x-y)(x+y)}{2}$ $\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{6} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{6} & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{6} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{6} & 0 & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{3}}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{3}}{6} & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
171	symmetry	$\sqrt{15}xyz$ $\begin{bmatrix} 0 & \frac{\sqrt{6}i}{12} & 0 & \frac{\sqrt{2}i}{12} & 0 & 0 & \frac{\sqrt{2}i}{12} & 0 & 0 & -\frac{\sqrt{2}}{12} \\ \frac{\sqrt{6}i}{12} & 0 & \frac{\sqrt{2}i}{12} & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}i}{12} & \frac{\sqrt{2}}{12} & 0 \\ 0 & -\frac{\sqrt{6}}{12} & 0 & \frac{\sqrt{2}}{12} & -\frac{\sqrt{2}i}{12} & 0 & 0 & 0 & 0 & \frac{\sqrt{2}i}{12} \\ \frac{\sqrt{6}}{12} & 0 & -\frac{\sqrt{2}}{12} & 0 & 0 & \frac{\sqrt{2}i}{12} & 0 & 0 & \frac{\sqrt{2}i}{12} & 0 \\ 0 & 0 & -\frac{\sqrt{2}i}{6} & 0 & 0 & \frac{\sqrt{2}}{12} & 0 & -\frac{\sqrt{2}i}{12} & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{2}i}{6} & -\frac{\sqrt{2}}{12} & 0 & -\frac{\sqrt{2}i}{12} & 0 & 0 & 0 \end{bmatrix}$
172	symmetry	$\frac{x(2x^2-3y^2-3z^2)}{2}$ $\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}}{60} & \frac{\sqrt{30}i}{60} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{60} & 0 & 0 & -\frac{\sqrt{30}i}{60} \\ \frac{\sqrt{10}i}{20} & 0 & -\frac{\sqrt{30}i}{60} & 0 & 0 & \frac{\sqrt{30}}{60} & 0 & -\frac{\sqrt{30}i}{20} & 0 & 0 \\ 0 & -\frac{\sqrt{10}i}{20} & 0 & \frac{\sqrt{30}i}{60} & -\frac{\sqrt{30}}{60} & 0 & -\frac{\sqrt{30}i}{20} & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{30}}{30} & -\frac{\sqrt{30}i}{60} & 0 & 0 & 0 & 0 & \frac{\sqrt{30}i}{20} \\ 0 & 0 & -\frac{\sqrt{30}}{30} & 0 & 0 & \frac{\sqrt{30}i}{60} & 0 & 0 & \frac{\sqrt{30}i}{20} & 0 \end{bmatrix}$
173	symmetry	$-\frac{y(3x^2-2y^2+3z^2)}{2}$

continued ...

Table 6

No.	multipole	matrix
	$\mathbb{Q}_{3,1}^{(1,-1;a)}(T_u, 1)$	$\begin{bmatrix} -\frac{\sqrt{10}i}{20} & 0 & -\frac{\sqrt{30}i}{60} & 0 & 0 & \frac{\sqrt{30}}{20} & 0 & -\frac{\sqrt{30}i}{60} & 0 & 0 \\ 0 & \frac{\sqrt{10}i}{20} & 0 & \frac{\sqrt{30}i}{60} & -\frac{\sqrt{30}}{20} & 0 & -\frac{\sqrt{30}i}{60} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}i}{60} & 0 & 0 & -\frac{\sqrt{30}i}{60} & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{30}i}{60} & 0 & 0 & 0 & 0 & \frac{\sqrt{30}i}{60} \\ 0 & 0 & 0 & \frac{\sqrt{30}i}{30} & 0 & 0 & \frac{\sqrt{30}i}{60} & 0 & 0 & -\frac{\sqrt{30}}{20} \\ 0 & 0 & \frac{\sqrt{30}i}{30} & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}i}{60} & \frac{\sqrt{30}}{20} & 0 \end{bmatrix}$
174	symmetry	$-\frac{z(3x^2+3y^2-2z^2)}{2}$
	$\mathbb{Q}_{3,2}^{(1,-1;a)}(T_u, 1)$	$\begin{bmatrix} 0 & -\frac{\sqrt{10}}{20} & 0 & -\frac{\sqrt{30}}{60} & -\frac{\sqrt{30}i}{20} & 0 & 0 & 0 & 0 & \frac{\sqrt{30}i}{60} \\ \frac{\sqrt{10}}{20} & 0 & \frac{\sqrt{30}}{60} & 0 & 0 & \frac{\sqrt{30}i}{20} & 0 & 0 & 0 & \frac{\sqrt{30}i}{60} \\ 0 & \frac{\sqrt{10}i}{20} & 0 & -\frac{\sqrt{30}i}{60} & 0 & 0 & \frac{\sqrt{30}i}{20} & 0 & 0 & -\frac{\sqrt{30}}{60} \\ \frac{\sqrt{10}i}{20} & 0 & -\frac{\sqrt{30}i}{60} & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}i}{20} & \frac{\sqrt{30}}{60} & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}i}{60} & 0 & \frac{\sqrt{30}}{60} & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{30}i}{60} & 0 & -\frac{\sqrt{30}}{60} & 0 & 0 & 0 \end{bmatrix}$
175	symmetry	$\frac{\sqrt{15}x(y-z)(y+z)}{2}$
	$\mathbb{Q}_{3,0}^{(1,-1;a)}(T_u, 2)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2}i}{6} & 0 & \frac{\sqrt{2}}{12} & \frac{\sqrt{2}i}{12} & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{2}i}{6} & 0 & -\frac{\sqrt{2}}{12} & 0 & 0 & -\frac{\sqrt{2}i}{12} \\ \frac{\sqrt{6}i}{12} & 0 & -\frac{\sqrt{2}i}{12} & 0 & 0 & -\frac{\sqrt{2}}{12} & 0 & -\frac{\sqrt{2}i}{12} & 0 & 0 \\ 0 & -\frac{\sqrt{6}i}{12} & 0 & \frac{\sqrt{2}i}{12} & \frac{\sqrt{2}}{12} & 0 & -\frac{\sqrt{2}i}{12} & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{2}}{6} & -\frac{\sqrt{2}i}{12} & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}i}{12} \\ 0 & 0 & \frac{\sqrt{2}}{6} & 0 & 0 & \frac{\sqrt{2}i}{12} & 0 & 0 & -\frac{\sqrt{2}i}{12} & 0 \end{bmatrix}$
176	symmetry	$-\frac{\sqrt{15}y(x-z)(x+z)}{2}$
	$\mathbb{Q}_{3,1}^{(1,-1;a)}(T_u, 2)$	$\begin{bmatrix} \frac{\sqrt{6}i}{12} & 0 & \frac{\sqrt{2}i}{12} & 0 & 0 & -\frac{\sqrt{2}}{12} & 0 & -\frac{\sqrt{2}i}{12} & 0 & 0 \\ 0 & -\frac{\sqrt{6}i}{12} & 0 & -\frac{\sqrt{2}i}{12} & \frac{\sqrt{2}}{12} & 0 & -\frac{\sqrt{2}i}{12} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2}i}{12} & 0 & \frac{\sqrt{2}}{6} & \frac{\sqrt{2}i}{12} & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{2}i}{12} & 0 & -\frac{\sqrt{2}}{6} & 0 & 0 & -\frac{\sqrt{2}i}{12} \\ 0 & 0 & 0 & \frac{\sqrt{2}i}{6} & 0 & 0 & -\frac{\sqrt{2}i}{12} & 0 & 0 & -\frac{\sqrt{2}}{12} \\ 0 & 0 & \frac{\sqrt{2}i}{6} & 0 & 0 & 0 & 0 & \frac{\sqrt{2}i}{12} & \frac{\sqrt{2}}{12} & 0 \end{bmatrix}$
177	symmetry	$\frac{\sqrt{15}z(x-y)(x+y)}{2}$

continued ...

Table 6

No.	multipole	matrix
	$\mathbb{Q}_{3,2}^{(1,-1;a)}(T_u, 2)$	$\begin{bmatrix} 0 & -\frac{\sqrt{6}}{12} & 0 & -\frac{\sqrt{2}}{12} & -\frac{\sqrt{2}i}{12} & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}i}{12} \\ \frac{\sqrt{6}}{12} & 0 & \frac{\sqrt{2}}{12} & 0 & 0 & \frac{\sqrt{2}i}{12} & 0 & 0 & -\frac{\sqrt{2}i}{12} & 0 \\ 0 & -\frac{\sqrt{6}i}{12} & 0 & \frac{\sqrt{2}i}{12} & 0 & 0 & -\frac{\sqrt{2}i}{12} & 0 & 0 & -\frac{\sqrt{2}}{12} \\ -\frac{\sqrt{6}i}{12} & 0 & \frac{\sqrt{2}i}{12} & 0 & 0 & 0 & 0 & \frac{\sqrt{2}i}{12} & \frac{\sqrt{2}}{12} & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2}i}{12} & 0 & \frac{\sqrt{2}}{12} & \frac{\sqrt{2}i}{6} & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{2}i}{12} & 0 & -\frac{\sqrt{2}}{12} & 0 & 0 & -\frac{\sqrt{2}i}{6} \end{bmatrix}$
178	symmetry	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{20} & -\frac{\sqrt{15}i}{20} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{20} & 0 & 0 & \frac{\sqrt{15}i}{20} \\ \frac{\sqrt{5}i}{20} & 0 & \frac{\sqrt{15}i}{20} & 0 & 0 & \frac{\sqrt{15}}{20} & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{5}i}{20} & 0 & -\frac{\sqrt{15}i}{20} & -\frac{\sqrt{15}}{20} & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{5}}{10} & 0 & 0 & -\frac{\sqrt{15}i}{20} & 0 & 0 & 0 & 0 & 0 \\ -\frac{\sqrt{5}}{10} & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{20} & 0 & 0 & 0 & 0 \end{bmatrix}$
179	symmetry	$\begin{bmatrix} -\frac{\sqrt{5}i}{20} & 0 & \frac{\sqrt{15}i}{20} & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{20} & 0 & 0 \\ 0 & \frac{\sqrt{5}i}{20} & 0 & -\frac{\sqrt{15}i}{20} & 0 & 0 & -\frac{\sqrt{15}i}{20} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{20} & 0 & 0 & \frac{\sqrt{15}i}{20} & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{20} & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{20} \\ 0 & -\frac{\sqrt{5}i}{10} & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{20} & 0 & 0 & 0 \\ -\frac{\sqrt{5}i}{10} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{20} & 0 & 0 \end{bmatrix}$
180	symmetry	$\begin{bmatrix} 0 & \frac{\sqrt{5}}{20} & 0 & -\frac{\sqrt{15}}{20} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{20} \\ -\frac{\sqrt{5}}{20} & 0 & \frac{\sqrt{15}}{20} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{20} & 0 \\ 0 & -\frac{\sqrt{5}i}{20} & 0 & -\frac{\sqrt{15}i}{20} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{20} \\ -\frac{\sqrt{5}i}{20} & 0 & -\frac{\sqrt{15}i}{20} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{20} & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{20} & 0 & -\frac{\sqrt{15}}{20} & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{20} & 0 & \frac{\sqrt{15}}{20} & 0 & 0 & 0 \end{bmatrix}$
181	symmetry	$\begin{bmatrix} & & & & & \sqrt{15}xyz & & & & \end{bmatrix}$

continued ...

Table 6

No.	multipole	matrix
	$\mathbb{Q}_3^{(1,0;a)}(A_u)$	$\begin{bmatrix} 0 & -\frac{\sqrt{3}i}{12} & 0 & -\frac{i}{12} & 0 & 0 & \frac{i}{6} & 0 & 0 & -\frac{1}{6} \\ -\frac{\sqrt{3}i}{12} & 0 & -\frac{i}{12} & 0 & 0 & 0 & 0 & -\frac{i}{6} & \frac{1}{6} & 0 \\ 0 & \frac{\sqrt{3}}{12} & 0 & -\frac{1}{12} & -\frac{i}{6} & 0 & 0 & 0 & 0 & \frac{i}{6} \\ -\frac{\sqrt{3}}{12} & 0 & \frac{1}{12} & 0 & 0 & \frac{i}{6} & 0 & 0 & \frac{i}{6} & 0 \\ 0 & 0 & \frac{i}{6} & 0 & 0 & \frac{1}{6} & 0 & -\frac{i}{6} & 0 & 0 \\ 0 & 0 & 0 & -\frac{i}{6} & -\frac{1}{6} & 0 & -\frac{i}{6} & 0 & 0 & 0 \end{bmatrix}$
182	symmetry	$\frac{x(2x^2-3y^2-3z^2)}{2}$ $\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{15} & -\frac{\sqrt{15}i}{15} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{15} & 0 & 0 & \frac{\sqrt{15}i}{15} \\ \frac{\sqrt{5}i}{40} & 0 & -\frac{7\sqrt{15}i}{120} & 0 & 0 & -\frac{\sqrt{15}}{60} & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{5}i}{40} & 0 & \frac{7\sqrt{15}i}{120} & \frac{\sqrt{15}}{60} & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{3\sqrt{5}}{40} & 0 & \frac{\sqrt{15}}{24} & \frac{\sqrt{15}i}{60} & 0 & 0 & 0 & 0 & 0 \\ \frac{3\sqrt{5}}{40} & 0 & -\frac{\sqrt{15}}{24} & 0 & 0 & -\frac{\sqrt{15}i}{60} & 0 & 0 & 0 & 0 \end{bmatrix}$
183	symmetry	$-\frac{y(3x^2-2y^2+3z^2)}{2}$ $\begin{bmatrix} -\frac{\sqrt{5}i}{40} & 0 & -\frac{7\sqrt{15}i}{120} & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{60} & 0 & 0 \\ 0 & \frac{\sqrt{5}i}{40} & 0 & \frac{7\sqrt{15}i}{120} & 0 & 0 & \frac{\sqrt{15}i}{60} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{15} & 0 & 0 & \frac{\sqrt{15}i}{15} & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{15} & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{15} \\ 0 & \frac{3\sqrt{5}i}{40} & 0 & \frac{\sqrt{15}i}{24} & 0 & 0 & -\frac{\sqrt{15}i}{60} & 0 & 0 & 0 \\ \frac{3\sqrt{5}i}{40} & 0 & \frac{\sqrt{15}i}{24} & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{60} & 0 & 0 \end{bmatrix}$
184	symmetry	$-\frac{z(3x^2+3y^2-2z^2)}{2}$ $\begin{bmatrix} 0 & -\frac{\sqrt{5}}{10} & 0 & \frac{\sqrt{15}}{60} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{60} \\ \frac{\sqrt{5}}{10} & 0 & -\frac{\sqrt{15}}{60} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{60} & 0 \\ 0 & \frac{\sqrt{5}i}{10} & 0 & \frac{\sqrt{15}i}{60} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{60} \\ \frac{\sqrt{5}i}{10} & 0 & \frac{\sqrt{15}i}{60} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{60} & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{15} & 0 & -\frac{\sqrt{15}}{15} & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{15} & 0 & \frac{\sqrt{15}}{15} & 0 & 0 & 0 \end{bmatrix}$
185	symmetry	$\frac{\sqrt{15}x(y-z)(y+z)}{2}$

continued ...

Table 6

No.	multipole	matrix
	$\mathbb{Q}_{3,0}^{(1,0;a)}(T_u, 2)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & -\frac{i}{6} & 0 & \frac{1}{6} & \frac{i}{6} & 0 \\ 0 & 0 & 0 & 0 & -\frac{i}{6} & 0 & -\frac{1}{6} & 0 & 0 & -\frac{i}{6} \\ \frac{\sqrt{3}i}{24} & 0 & \frac{5i}{24} & 0 & 0 & \frac{1}{12} & 0 & -\frac{i}{6} & 0 & 0 \\ 0 & -\frac{\sqrt{3}i}{24} & 0 & -\frac{5i}{24} & -\frac{1}{12} & 0 & -\frac{i}{6} & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{3}}{8} & 0 & \frac{1}{24} & \frac{i}{12} & 0 & 0 & 0 & 0 & -\frac{i}{6} \\ \frac{\sqrt{3}}{8} & 0 & -\frac{1}{24} & 0 & 0 & -\frac{i}{12} & 0 & 0 & -\frac{i}{6} & 0 \end{bmatrix}$
186	symmetry	$-\frac{\sqrt{15}y(x-z)(x+z)}{2}$
	$\mathbb{Q}_{3,1}^{(1,0;a)}(T_u, 2)$	$\begin{bmatrix} \frac{\sqrt{3}i}{24} & 0 & -\frac{5i}{24} & 0 & 0 & -\frac{1}{6} & 0 & \frac{i}{12} & 0 & 0 \\ 0 & -\frac{\sqrt{3}i}{24} & 0 & \frac{5i}{24} & \frac{1}{6} & 0 & \frac{i}{12} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{i}{6} & 0 & -\frac{1}{6} & \frac{i}{6} & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{i}{6} & 0 & \frac{1}{6} & 0 & 0 & -\frac{i}{6} \\ 0 & -\frac{\sqrt{3}i}{8} & 0 & -\frac{i}{24} & 0 & 0 & \frac{i}{12} & 0 & 0 & -\frac{1}{6} \\ -\frac{\sqrt{3}i}{8} & 0 & -\frac{i}{24} & 0 & 0 & 0 & 0 & -\frac{i}{12} & \frac{1}{6} & 0 \end{bmatrix}$
187	symmetry	$\frac{\sqrt{15}z(x-y)(x+y)}{2}$
	$\mathbb{Q}_{3,2}^{(1,0;a)}(T_u, 2)$	$\begin{bmatrix} 0 & \frac{\sqrt{3}}{12} & 0 & -\frac{1}{6} & -\frac{i}{6} & 0 & 0 & 0 & 0 & \frac{i}{12} \\ -\frac{\sqrt{3}}{12} & 0 & \frac{1}{6} & 0 & 0 & \frac{i}{6} & 0 & 0 & \frac{i}{12} & 0 \\ 0 & \frac{\sqrt{3}i}{12} & 0 & \frac{i}{6} & 0 & 0 & -\frac{i}{6} & 0 & 0 & \frac{1}{12} \\ \frac{\sqrt{3}i}{12} & 0 & \frac{i}{6} & 0 & 0 & 0 & 0 & \frac{i}{6} & -\frac{1}{12} & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{i}{6} & 0 & \frac{1}{6} & -\frac{i}{6} & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{i}{6} & 0 & -\frac{1}{6} & 0 & \frac{i}{6} \end{bmatrix}$
188	symmetry	x
	$\mathbb{Q}_{1,0}^{(1,1;a)}(T_u)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{5}}{20} & -\frac{\sqrt{5}i}{20} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}}{20} & 0 & 0 & \frac{\sqrt{5}i}{20} \\ -\frac{\sqrt{15}i}{20} & 0 & \frac{\sqrt{5}i}{20} & 0 & 0 & -\frac{\sqrt{5}}{20} & 0 & -\frac{\sqrt{5}i}{10} & 0 & 0 & 0 \\ 0 & \frac{\sqrt{15}i}{20} & 0 & -\frac{\sqrt{5}i}{20} & \frac{\sqrt{5}}{20} & 0 & -\frac{\sqrt{5}i}{10} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{5}}{10} & \frac{\sqrt{5}i}{20} & 0 & 0 & 0 & 0 & \frac{\sqrt{5}i}{10} & 0 \\ 0 & 0 & \frac{\sqrt{5}}{10} & 0 & 0 & -\frac{\sqrt{5}i}{20} & 0 & 0 & \frac{\sqrt{5}i}{10} & 0 & 0 \end{bmatrix}$
189	symmetry	y

continued ...

Table 6

No.	multipole	matrix
	$\mathbb{Q}_{1,1}^{(1,1;a)}(T_u)$	$\begin{bmatrix} \frac{\sqrt{15}i}{20} & 0 & \frac{\sqrt{5}i}{20} & 0 & 0 & \frac{\sqrt{5}}{10} & 0 & \frac{\sqrt{5}i}{20} & 0 & 0 \\ 0 & -\frac{\sqrt{15}i}{20} & 0 & -\frac{\sqrt{5}i}{20} & -\frac{\sqrt{5}}{10} & 0 & \frac{\sqrt{5}i}{20} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{20} & 0 & 0 & \frac{\sqrt{5}i}{20} & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{20} & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{20} \\ 0 & 0 & 0 & -\frac{\sqrt{5}i}{10} & 0 & 0 & -\frac{\sqrt{5}i}{20} & 0 & 0 & -\frac{\sqrt{5}}{10} \\ 0 & 0 & -\frac{\sqrt{5}i}{10} & 0 & 0 & 0 & 0 & \frac{\sqrt{5}i}{20} & \frac{\sqrt{5}}{10} & 0 \end{bmatrix}$
190	symmetry	$\begin{bmatrix} 0 & \frac{\sqrt{15}}{20} & 0 & \frac{\sqrt{5}}{20} & -\frac{\sqrt{5}i}{10} & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{20} \\ -\frac{\sqrt{15}}{20} & 0 & -\frac{\sqrt{5}}{20} & 0 & 0 & \frac{\sqrt{5}i}{10} & 0 & 0 & -\frac{\sqrt{5}i}{20} & 0 \\ 0 & -\frac{\sqrt{15}i}{20} & 0 & \frac{\sqrt{5}i}{20} & 0 & 0 & \frac{\sqrt{5}i}{10} & 0 & 0 & \frac{\sqrt{5}}{20} \\ -\frac{\sqrt{15}i}{20} & 0 & \frac{\sqrt{5}i}{20} & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{10} & -\frac{\sqrt{5}}{20} & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{5}i}{20} & 0 & -\frac{\sqrt{5}}{20} & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{5}i}{20} & 0 & \frac{\sqrt{5}}{20} & 0 & 0 & 0 \end{bmatrix}$
191	symmetry	$\begin{bmatrix} 0 & 0 & 0 & 0 & \frac{\sqrt{2}}{4} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2}}{4} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}}{4} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}}{4} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
192	symmetry	$\begin{bmatrix} 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{12} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{12} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{12} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{12} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}}{6} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}}{6} \end{bmatrix}$
193	symmetry	$\begin{bmatrix} \sqrt{3}(x-y)(x+y) \\ \sqrt{3}yz \end{bmatrix}$

continued ...

Table 6

No.	multipole	matrix
	$\mathbb{G}_{2,0}^{(a)}(T_u)$	$\begin{bmatrix} -\frac{\sqrt{2}}{4} & 0 & -\frac{\sqrt{6}}{12} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{2}}{4} & 0 & -\frac{\sqrt{6}}{12} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}}{12} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}}{12} \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{12} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{12} & 0 & 0 \end{bmatrix}$
194	symmetry	$\sqrt{3}xz$ $\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{12} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{12} \\ \frac{\sqrt{2}}{4} & 0 & -\frac{\sqrt{6}}{12} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{2}}{4} & 0 & -\frac{\sqrt{6}}{12} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{6}}{12} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}}{12} & 0 & 0 & 0 & 0 \end{bmatrix}$
195	symmetry	$\sqrt{3}xy$ $\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}}{12} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}}{12} & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{12} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{12} & 0 & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{6}}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{6}}{6} & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
196	symmetry	$-\frac{x^2}{2} - \frac{y^2}{2} + z^2$ $\begin{bmatrix} 0 & \frac{\sqrt{15}i}{60} & 0 & -\frac{\sqrt{5}i}{20} & 0 & 0 & \frac{\sqrt{5}i}{10} & 0 & 0 & -\frac{\sqrt{5}}{20} \\ \frac{\sqrt{15}i}{60} & 0 & -\frac{\sqrt{5}i}{20} & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{10} & \frac{\sqrt{5}}{20} & 0 \\ 0 & \frac{\sqrt{15}}{60} & 0 & \frac{\sqrt{5}}{20} & \frac{\sqrt{5}i}{10} & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{20} \\ -\frac{\sqrt{15}}{60} & 0 & -\frac{\sqrt{5}}{20} & 0 & 0 & -\frac{\sqrt{5}i}{10} & 0 & 0 & -\frac{\sqrt{5}i}{20} & 0 \\ \frac{\sqrt{15}i}{15} & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}}{20} & 0 & -\frac{\sqrt{5}i}{20} & 0 & 0 \\ 0 & -\frac{\sqrt{15}i}{15} & 0 & 0 & \frac{\sqrt{5}}{20} & 0 & -\frac{\sqrt{5}i}{20} & 0 & 0 & 0 \end{bmatrix}$
197	symmetry	$\frac{\sqrt{3}(x-y)(x+y)}{2}$

continued ...

Table 6

No.	multipole	matrix
	$\mathbb{G}_{2,1}^{(1,-1;a)}(E_u)$	$\begin{bmatrix} 0 & -\frac{\sqrt{5}i}{20} & 0 & \frac{\sqrt{15}i}{20} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{20} \\ -\frac{\sqrt{5}i}{20} & 0 & \frac{\sqrt{15}i}{20} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{20} & 0 \\ 0 & \frac{\sqrt{5}}{20} & 0 & \frac{\sqrt{15}}{20} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{20} \\ -\frac{\sqrt{5}}{20} & 0 & -\frac{\sqrt{15}}{20} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{20} & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{20} & 0 & \frac{\sqrt{15}i}{20} & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{20} & 0 & \frac{\sqrt{15}i}{20} & 0 & 0 & 0 \end{bmatrix}$
198	symmetry	$\sqrt{3}yz$
	$\mathbb{G}_{2,0}^{(1,-1;a)}(T_u)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{20} & \frac{\sqrt{15}i}{20} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{20} & 0 & 0 & -\frac{\sqrt{15}i}{20} \\ -\frac{\sqrt{5}i}{20} & 0 & -\frac{\sqrt{15}i}{20} & 0 & 0 & \frac{\sqrt{15}}{20} & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{5}i}{20} & 0 & \frac{\sqrt{15}i}{20} & -\frac{\sqrt{15}}{20} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{5}}{10} & 0 & 0 & \frac{\sqrt{15}i}{20} & 0 & 0 & 0 & 0 & 0 & 0 \\ -\frac{\sqrt{5}}{10} & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{20} & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
199	symmetry	$\sqrt{3}xz$
	$\mathbb{G}_{2,1}^{(1,-1;a)}(T_u)$	$\begin{bmatrix} -\frac{\sqrt{5}i}{20} & 0 & \frac{\sqrt{15}i}{20} & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{20} & 0 & 0 \\ 0 & \frac{\sqrt{5}i}{20} & 0 & -\frac{\sqrt{15}i}{20} & 0 & 0 & \frac{\sqrt{15}i}{20} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{20} & 0 & 0 & 0 & \frac{\sqrt{15}i}{20} & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{20} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{20} \\ 0 & \frac{\sqrt{5}i}{10} & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{20} & 0 & 0 & 0 & 0 \\ \frac{\sqrt{5}i}{10} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{20} & 0 & 0 & 0 \end{bmatrix}$
200	symmetry	$\sqrt{3}xy$
	$\mathbb{G}_{2,2}^{(1,-1;a)}(T_u)$	$\begin{bmatrix} 0 & -\frac{\sqrt{5}}{20} & 0 & \frac{\sqrt{15}}{20} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{20} \\ \frac{\sqrt{5}}{20} & 0 & -\frac{\sqrt{15}}{20} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{20} & 0 \\ 0 & -\frac{\sqrt{5}i}{20} & 0 & -\frac{\sqrt{15}i}{20} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{20} \\ -\frac{\sqrt{5}i}{20} & 0 & -\frac{\sqrt{15}i}{20} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{20} & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{20} & 0 & \frac{\sqrt{15}}{20} & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{20} & 0 & -\frac{\sqrt{15}}{20} & 0 & 0 & 0 \end{bmatrix}$
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
	$\mathbb{G}_4^{(1,-1;a)}(A_u)$	$\begin{bmatrix} 0 & -\frac{\sqrt{5}i}{20} & 0 & \frac{\sqrt{15}i}{20} & 0 & 0 & -\frac{\sqrt{15}i}{30} & 0 & 0 & -\frac{\sqrt{15}}{30} \\ -\frac{\sqrt{5}i}{20} & 0 & \frac{\sqrt{15}i}{20} & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{30} & \frac{\sqrt{15}}{30} & 0 \\ 0 & -\frac{\sqrt{5}}{20} & 0 & -\frac{\sqrt{15}}{20} & -\frac{\sqrt{15}i}{30} & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{30} \\ \frac{\sqrt{5}}{20} & 0 & \frac{\sqrt{15}}{20} & 0 & 0 & \frac{\sqrt{15}i}{30} & 0 & 0 & -\frac{\sqrt{15}i}{30} & 0 \\ \frac{\sqrt{5}i}{10} & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{30} & 0 & -\frac{\sqrt{15}i}{30} & 0 & 0 \\ 0 & -\frac{\sqrt{5}i}{10} & 0 & 0 & \frac{\sqrt{15}}{30} & 0 & -\frac{\sqrt{15}i}{30} & 0 & 0 & 0 \end{bmatrix}$
202	symmetry	$-\frac{\sqrt{15}(x^4 - 12x^2y^2 + 6x^2z^2 + y^4 + 6y^2z^2 - 2z^4)}{12}$ $\begin{bmatrix} 0 & -\frac{\sqrt{7}i}{28} & 0 & -\frac{\sqrt{21}i}{28} & 0 & 0 & -\frac{\sqrt{21}i}{42} & 0 & 0 & \frac{\sqrt{21}}{21} \\ -\frac{\sqrt{7}i}{28} & 0 & -\frac{\sqrt{21}i}{28} & 0 & 0 & 0 & 0 & \frac{\sqrt{21}i}{42} & -\frac{\sqrt{21}}{21} & 0 \\ 0 & -\frac{\sqrt{7}}{28} & 0 & \frac{\sqrt{21}}{28} & -\frac{\sqrt{21}i}{42} & 0 & 0 & 0 & 0 & \frac{\sqrt{21}i}{21} \\ \frac{\sqrt{7}}{28} & 0 & -\frac{\sqrt{21}}{28} & 0 & 0 & \frac{\sqrt{21}i}{42} & 0 & 0 & \frac{\sqrt{21}i}{21} & 0 \\ \frac{\sqrt{7}i}{14} & 0 & 0 & 0 & 0 & -\frac{\sqrt{21}}{42} & 0 & -\frac{\sqrt{21}i}{42} & 0 & 0 \\ 0 & -\frac{\sqrt{7}i}{14} & 0 & 0 & \frac{\sqrt{21}}{42} & 0 & -\frac{\sqrt{21}i}{42} & 0 & 0 & 0 \end{bmatrix}$
203	symmetry	$\frac{\sqrt{5}(x-y)(x+y)(x^2+y^2-6z^2)}{4}$ $\begin{bmatrix} 0 & -\frac{\sqrt{21}i}{28} & 0 & \frac{\sqrt{7}i}{28} & 0 & 0 & -\frac{\sqrt{7}i}{14} & 0 & 0 & 0 \\ -\frac{\sqrt{21}i}{28} & 0 & \frac{\sqrt{7}i}{28} & 0 & 0 & 0 & 0 & \frac{\sqrt{7}i}{14} & 0 & 0 \\ 0 & \frac{\sqrt{21}}{28} & 0 & \frac{\sqrt{7}}{28} & \frac{\sqrt{7}i}{14} & 0 & 0 & 0 & 0 & 0 \\ -\frac{\sqrt{21}}{28} & 0 & -\frac{\sqrt{7}}{28} & 0 & 0 & -\frac{\sqrt{7}i}{14} & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{7}i}{14} & 0 & 0 & \frac{\sqrt{7}}{14} & 0 & -\frac{\sqrt{7}i}{14} & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{7}i}{14} & -\frac{\sqrt{7}}{14} & 0 & -\frac{\sqrt{7}i}{14} & 0 & 0 & 0 \end{bmatrix}$
204	symmetry	$\frac{\sqrt{35}yz(y-z)(y+z)}{2}$ $\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ -\frac{\sqrt{3}i}{8} & 0 & -\frac{i}{8} & 0 & 0 & \frac{1}{4} & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{3}i}{8} & 0 & \frac{i}{8} & -\frac{1}{4} & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{3}}{8} & 0 & -\frac{1}{8} & -\frac{i}{4} & 0 & 0 & 0 & 0 & 0 \\ \frac{\sqrt{3}}{8} & 0 & \frac{1}{8} & 0 & 0 & \frac{i}{4} & 0 & 0 & 0 & 0 \end{bmatrix}$
205	symmetry	$-\frac{\sqrt{35}xz(x-z)(x+z)}{2}$

continued ...

Table 6

No.	multipole	matrix
	$\mathbb{G}_{4,1}^{(1,-1;a)}(T_u, 1)$	$\begin{bmatrix} \frac{\sqrt{3}i}{8} & 0 & -\frac{i}{8} & 0 & 0 & 0 & 0 & -\frac{i}{4} & 0 & 0 \\ 0 & -\frac{\sqrt{3}i}{8} & 0 & \frac{i}{8} & 0 & 0 & -\frac{i}{4} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{3}i}{8} & 0 & -\frac{i}{8} & 0 & 0 & \frac{i}{4} & 0 & 0 & 0 \\ \frac{\sqrt{3}i}{8} & 0 & -\frac{i}{8} & 0 & 0 & 0 & 0 & -\frac{i}{4} & 0 & 0 \end{bmatrix}$
206	symmetry	$\frac{\sqrt{35}xy(x-y)(x+y)}{2}$ $\begin{bmatrix} 0 & 0 & 0 & \frac{1}{4} & 0 & 0 & 0 & 0 & 0 & \frac{i}{4} \\ 0 & 0 & -\frac{1}{4} & 0 & 0 & 0 & 0 & 0 & \frac{i}{4} & 0 \\ 0 & 0 & 0 & \frac{i}{4} & 0 & 0 & 0 & 0 & 0 & -\frac{1}{4} \\ 0 & 0 & \frac{i}{4} & 0 & 0 & 0 & 0 & 0 & \frac{1}{4} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
207	symmetry	$\frac{\sqrt{5}yz(6x^2-y^2-z^2)}{2}$ $\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}i}{14} & 0 & \frac{\sqrt{7}}{14} & \frac{\sqrt{7}i}{14} & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{7}i}{14} & 0 & -\frac{\sqrt{7}}{14} & 0 & 0 & -\frac{\sqrt{7}i}{14} \\ -\frac{\sqrt{21}i}{56} & 0 & \frac{3\sqrt{7}i}{56} & 0 & 0 & -\frac{\sqrt{7}}{28} & 0 & \frac{\sqrt{7}i}{14} & 0 & 0 \\ 0 & \frac{\sqrt{21}i}{56} & 0 & -\frac{3\sqrt{7}i}{56} & \frac{\sqrt{7}}{28} & 0 & \frac{\sqrt{7}i}{14} & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{21}}{56} & 0 & \frac{3\sqrt{7}}{56} & -\frac{\sqrt{7}i}{28} & 0 & 0 & 0 & 0 & \frac{\sqrt{7}i}{14} \\ \frac{\sqrt{21}}{56} & 0 & -\frac{3\sqrt{7}}{56} & 0 & 0 & \frac{\sqrt{7}i}{28} & 0 & 0 & \frac{\sqrt{7}i}{14} & 0 \end{bmatrix}$
208	symmetry	$-\frac{\sqrt{5}xz(x^2-6y^2+z^2)}{2}$ $\begin{bmatrix} -\frac{\sqrt{21}i}{56} & 0 & -\frac{3\sqrt{7}i}{56} & 0 & 0 & \frac{\sqrt{7}}{14} & 0 & -\frac{\sqrt{7}i}{28} & 0 & 0 \\ 0 & \frac{\sqrt{21}i}{56} & 0 & \frac{3\sqrt{7}i}{56} & -\frac{\sqrt{7}}{14} & 0 & -\frac{\sqrt{7}i}{28} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}i}{14} & 0 & \frac{\sqrt{7}}{14} & \frac{\sqrt{7}i}{14} & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{7}i}{14} & 0 & -\frac{\sqrt{7}}{14} & 0 & 0 & -\frac{\sqrt{7}i}{14} \\ 0 & -\frac{\sqrt{21}i}{56} & 0 & -\frac{3\sqrt{7}i}{56} & 0 & 0 & -\frac{\sqrt{7}i}{28} & 0 & 0 & \frac{\sqrt{7}}{14} \\ -\frac{\sqrt{21}i}{56} & 0 & -\frac{3\sqrt{7}i}{56} & 0 & 0 & 0 & 0 & \frac{\sqrt{7}i}{28} & -\frac{\sqrt{7}}{14} & 0 \end{bmatrix}$
209	symmetry	$-\frac{\sqrt{5}xy(x^2+y^2-6z^2)}{2}$

continued ...

Table 6

No.	multipole	matrix
	$\mathbb{G}_{4,2}^{(1,-1;a)}(T_u, 2)$	$\begin{bmatrix} 0 & \frac{\sqrt{21}}{28} & 0 & 0 & \frac{\sqrt{7}i}{14} & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}i}{28} \\ -\frac{\sqrt{21}}{28} & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}i}{14} & 0 & 0 & -\frac{\sqrt{7}i}{28} & 0 \\ 0 & \frac{\sqrt{21}i}{28} & 0 & 0 & 0 & 0 & \frac{\sqrt{7}i}{14} & 0 & 0 & -\frac{\sqrt{7}}{28} \\ \frac{\sqrt{21}i}{28} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}i}{14} & \frac{\sqrt{7}}{28} & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}i}{14} & 0 & \frac{\sqrt{7}}{14} & \frac{\sqrt{7}i}{14} & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{7}i}{14} & 0 & -\frac{\sqrt{7}}{14} & 0 & 0 & -\frac{\sqrt{7}i}{14} \end{bmatrix}$
210	symmetry	$-\frac{x^2}{2} - \frac{y^2}{2} + z^2$
	$\mathbb{G}_{2,0}^{(1,0;a)}(E_u)$	$\begin{bmatrix} 0 & \frac{i}{4} & 0 & \frac{\sqrt{3}i}{12} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{12} \\ \frac{i}{4} & 0 & \frac{\sqrt{3}i}{12} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{12} & 0 \\ 0 & \frac{1}{4} & 0 & -\frac{\sqrt{3}}{12} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{12} \\ -\frac{1}{4} & 0 & \frac{\sqrt{3}}{12} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{12} & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{12} & 0 & -\frac{\sqrt{3}i}{12} & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{12} & 0 & -\frac{\sqrt{3}i}{12} & 0 & 0 & 0 \end{bmatrix}$
211	symmetry	$\frac{\sqrt{3}(x-y)(x+y)}{2}$
	$\mathbb{G}_{2,1}^{(1,0;a)}(E_u)$	$\begin{bmatrix} 0 & \frac{\sqrt{3}i}{12} & 0 & \frac{i}{12} & 0 & 0 & -\frac{i}{6} & 0 & 0 & -\frac{1}{12} \\ \frac{\sqrt{3}i}{12} & 0 & \frac{i}{12} & 0 & 0 & 0 & 0 & \frac{i}{6} & \frac{1}{12} & 0 \\ 0 & -\frac{\sqrt{3}}{12} & 0 & \frac{1}{12} & \frac{i}{6} & 0 & 0 & 0 & 0 & \frac{i}{12} \\ \frac{\sqrt{3}}{12} & 0 & -\frac{1}{12} & 0 & 0 & -\frac{i}{6} & 0 & 0 & \frac{i}{12} & 0 \\ 0 & 0 & \frac{i}{3} & 0 & 0 & \frac{1}{12} & 0 & -\frac{i}{12} & 0 & 0 \\ 0 & 0 & 0 & -\frac{i}{3} & -\frac{1}{12} & 0 & -\frac{i}{12} & 0 & 0 & 0 \end{bmatrix}$
212	symmetry	$\sqrt{3}yz$
	$\mathbb{G}_{2,0}^{(1,0;a)}(T_u)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & \frac{i}{3} & 0 & -\frac{1}{12} & -\frac{i}{12} & 0 \\ 0 & 0 & 0 & 0 & \frac{i}{3} & 0 & \frac{1}{12} & 0 & 0 & \frac{i}{12} \\ -\frac{\sqrt{3}i}{12} & 0 & \frac{i}{12} & 0 & 0 & \frac{1}{12} & 0 & -\frac{i}{6} & 0 & 0 \\ 0 & \frac{\sqrt{3}i}{12} & 0 & -\frac{i}{12} & -\frac{1}{12} & 0 & -\frac{i}{6} & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{1}{6} & \frac{i}{12} & 0 & 0 & 0 & 0 & -\frac{i}{6} \\ 0 & 0 & -\frac{1}{6} & 0 & 0 & -\frac{i}{12} & 0 & 0 & -\frac{i}{6} & 0 \end{bmatrix}$
213	symmetry	$\sqrt{3}xz$

continued ...

Table 6

No.	multipole	matrix
	$\mathbb{G}_{2,1}^{(1,0;a)}(T_u)$	$\begin{bmatrix} -\frac{\sqrt{3}i}{12} & 0 & -\frac{i}{12} & 0 & 0 & -\frac{1}{6} & 0 & \frac{i}{12} & 0 & 0 \\ 0 & \frac{\sqrt{3}i}{12} & 0 & \frac{i}{12} & \frac{1}{6} & 0 & \frac{i}{12} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{i}{12} & 0 & \frac{1}{3} & -\frac{i}{12} & 0 \\ 0 & 0 & 0 & 0 & -\frac{i}{12} & 0 & -\frac{1}{3} & 0 & 0 & \frac{i}{12} \\ 0 & 0 & 0 & -\frac{i}{6} & 0 & 0 & \frac{i}{12} & 0 & 0 & -\frac{1}{6} \\ 0 & 0 & -\frac{i}{6} & 0 & 0 & 0 & 0 & -\frac{i}{12} & \frac{1}{6} & 0 \end{bmatrix}$
214	symmetry	$\sqrt{3}xy$ $\begin{bmatrix} 0 & \frac{\sqrt{3}}{12} & 0 & \frac{1}{12} & -\frac{i}{6} & 0 & 0 & 0 & 0 & \frac{i}{12} \\ -\frac{\sqrt{3}}{12} & 0 & -\frac{1}{12} & 0 & 0 & \frac{i}{6} & 0 & 0 & 0 & \frac{i}{12} \\ 0 & \frac{\sqrt{3}i}{12} & 0 & -\frac{i}{12} & 0 & 0 & -\frac{i}{6} & 0 & 0 & \frac{1}{12} \\ \frac{\sqrt{3}i}{12} & 0 & -\frac{i}{12} & 0 & 0 & 0 & 0 & \frac{i}{6} & -\frac{1}{12} & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{i}{12} & 0 & -\frac{1}{12} & \frac{i}{3} & 0 \\ 0 & 0 & 0 & 0 & -\frac{i}{12} & 0 & \frac{1}{12} & 0 & 0 & -\frac{i}{3} \end{bmatrix}$
215	symmetry	1 $\begin{bmatrix} 0 & -\frac{\sqrt{30}i}{60} & 0 & \frac{\sqrt{10}i}{20} & 0 & 0 & \frac{\sqrt{10}i}{20} & 0 & 0 & \frac{\sqrt{10}}{20} \\ -\frac{\sqrt{30}i}{60} & 0 & \frac{\sqrt{10}i}{20} & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}i}{20} & -\frac{\sqrt{10}}{20} & 0 \\ 0 & -\frac{\sqrt{30}}{60} & 0 & -\frac{\sqrt{10}}{20} & \frac{\sqrt{10}i}{20} & 0 & 0 & 0 & 0 & \frac{\sqrt{10}i}{20} \\ \frac{\sqrt{30}}{60} & 0 & \frac{\sqrt{10}}{20} & 0 & 0 & -\frac{\sqrt{10}i}{20} & 0 & 0 & \frac{\sqrt{10}i}{20} & 0 \\ \frac{\sqrt{30}i}{30} & 0 & 0 & 0 & 0 & \frac{\sqrt{10}}{20} & 0 & \frac{\sqrt{10}i}{20} & 0 & 0 \\ 0 & -\frac{\sqrt{30}i}{30} & 0 & 0 & -\frac{\sqrt{10}}{20} & 0 & \frac{\sqrt{10}i}{20} & 0 & 0 & 0 \end{bmatrix}$
216	symmetry	$-\frac{x^2}{2} - \frac{y^2}{2} + z^2$ $\begin{bmatrix} 0 & \frac{\sqrt{35}i}{35} & 0 & -\frac{\sqrt{105}i}{210} & 0 & 0 & -\frac{\sqrt{105}i}{70} & 0 & 0 & -\frac{\sqrt{105}}{210} \\ \frac{\sqrt{35}i}{35} & 0 & -\frac{\sqrt{105}i}{210} & 0 & 0 & 0 & 0 & \frac{\sqrt{105}i}{70} & \frac{\sqrt{105}}{210} & 0 \\ 0 & \frac{\sqrt{35}}{35} & 0 & \frac{\sqrt{105}}{210} & -\frac{\sqrt{105}i}{70} & 0 & 0 & 0 & 0 & -\frac{\sqrt{105}i}{210} \\ -\frac{\sqrt{35}}{35} & 0 & -\frac{\sqrt{105}}{210} & 0 & 0 & \frac{\sqrt{105}i}{70} & 0 & 0 & -\frac{\sqrt{105}i}{210} & 0 \\ \frac{3\sqrt{35}i}{70} & 0 & 0 & 0 & 0 & \frac{2\sqrt{105}}{105} & 0 & \frac{2\sqrt{105}i}{105} & 0 & 0 \\ 0 & -\frac{3\sqrt{35}i}{70} & 0 & 0 & -\frac{2\sqrt{105}}{105} & 0 & \frac{2\sqrt{105}i}{105} & 0 & 0 & 0 \end{bmatrix}$
217	symmetry	$\frac{\sqrt{3}(x-y)(x+y)}{2}$

continued ...

Table 6

No.	multipole	matrix
		$\begin{bmatrix} 0 & -\frac{\sqrt{105}i}{210} & 0 & \frac{4\sqrt{35}i}{105} & 0 & 0 & \frac{\sqrt{35}i}{42} & 0 & 0 & \frac{\sqrt{35}}{30} \\ -\frac{\sqrt{105}i}{210} & 0 & \frac{4\sqrt{35}i}{105} & 0 & 0 & 0 & 0 & -\frac{\sqrt{35}i}{42} & -\frac{\sqrt{35}}{30} & 0 \\ 0 & \frac{\sqrt{105}}{210} & 0 & \frac{4\sqrt{35}}{105} & -\frac{\sqrt{35}i}{42} & 0 & 0 & 0 & 0 & -\frac{\sqrt{35}i}{30} \\ -\frac{\sqrt{105}}{210} & 0 & -\frac{4\sqrt{35}}{105} & 0 & 0 & \frac{\sqrt{35}i}{42} & 0 & 0 & -\frac{\sqrt{35}i}{30} & 0 \\ 0 & 0 & \frac{\sqrt{35}i}{42} & 0 & 0 & \frac{\sqrt{35}}{105} & 0 & -\frac{\sqrt{35}i}{105} & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{35}i}{42} & -\frac{\sqrt{35}}{105} & 0 & -\frac{\sqrt{35}i}{105} & 0 & 0 & 0 \end{bmatrix}$
218	symmetry	$\sqrt{3}yz$ $\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{35}i}{42} & 0 & -\frac{\sqrt{35}}{105} & -\frac{\sqrt{35}i}{105} & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{35}i}{42} & 0 & \frac{\sqrt{35}}{105} & 0 & 0 & \frac{\sqrt{35}i}{105} \\ \frac{2\sqrt{105}i}{105} & 0 & \frac{\sqrt{35}i}{105} & 0 & 0 & \frac{4\sqrt{35}}{105} & 0 & \frac{\sqrt{35}i}{42} & 0 & 0 \\ 0 & -\frac{2\sqrt{105}i}{105} & 0 & -\frac{\sqrt{35}i}{105} & -\frac{4\sqrt{35}}{105} & 0 & \frac{\sqrt{35}i}{42} & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{105}}{70} & 0 & -\frac{\sqrt{35}}{42} & \frac{4\sqrt{35}i}{105} & 0 & 0 & 0 & 0 & \frac{\sqrt{35}i}{42} \\ \frac{\sqrt{105}}{70} & 0 & \frac{\sqrt{35}}{42} & 0 & 0 & -\frac{4\sqrt{35}i}{105} & 0 & 0 & \frac{\sqrt{35}i}{42} & 0 \end{bmatrix}$
219	symmetry	$\sqrt{3}xz$ $\begin{bmatrix} \frac{2\sqrt{105}i}{105} & 0 & -\frac{\sqrt{35}i}{105} & 0 & 0 & \frac{\sqrt{35}}{42} & 0 & \frac{4\sqrt{35}i}{105} & 0 & 0 \\ 0 & -\frac{2\sqrt{105}i}{105} & 0 & \frac{\sqrt{35}i}{105} & -\frac{\sqrt{35}}{42} & 0 & \frac{4\sqrt{35}i}{105} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{35}i}{105} & 0 & \frac{\sqrt{35}}{42} & -\frac{\sqrt{35}i}{105} & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{35}i}{105} & 0 & -\frac{\sqrt{35}}{42} & 0 & 0 & \frac{\sqrt{35}i}{105} \\ 0 & -\frac{\sqrt{105}i}{70} & 0 & \frac{\sqrt{35}i}{42} & 0 & 0 & \frac{4\sqrt{35}i}{105} & 0 & 0 & \frac{\sqrt{35}}{42} \\ -\frac{\sqrt{105}i}{70} & 0 & \frac{\sqrt{35}i}{42} & 0 & 0 & 0 & 0 & -\frac{4\sqrt{35}i}{105} & -\frac{\sqrt{35}}{42} & 0 \end{bmatrix}$
220	symmetry	$\sqrt{3}xy$ $\begin{bmatrix} 0 & -\frac{\sqrt{105}}{210} & 0 & -\frac{\sqrt{35}}{30} & \frac{\sqrt{35}i}{42} & 0 & 0 & 0 & 0 & \frac{4\sqrt{35}i}{105} \\ \frac{\sqrt{105}}{210} & 0 & \frac{\sqrt{35}}{30} & 0 & 0 & -\frac{\sqrt{35}i}{42} & 0 & 0 & \frac{4\sqrt{35}i}{105} & 0 \\ 0 & -\frac{\sqrt{105}i}{210} & 0 & \frac{\sqrt{35}i}{30} & 0 & 0 & \frac{\sqrt{35}i}{42} & 0 & 0 & \frac{4\sqrt{35}}{105} \\ -\frac{\sqrt{105}i}{210} & 0 & \frac{\sqrt{35}i}{30} & 0 & 0 & 0 & 0 & -\frac{\sqrt{35}i}{42} & -\frac{4\sqrt{35}}{105} & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{35}i}{105} & 0 & -\frac{\sqrt{35}}{105} & \frac{\sqrt{35}i}{42} & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{35}i}{105} & 0 & \frac{\sqrt{35}}{105} & 0 & 0 & -\frac{\sqrt{35}i}{42} \end{bmatrix}$
221	symmetry	x

continued ...

Table 6

No.	multipole	matrix
		$\begin{bmatrix} -\frac{\sqrt{10}i}{20} & 0 & \frac{\sqrt{30}i}{20} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{10}i}{20} & 0 & \frac{\sqrt{30}i}{20} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}i}{20} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}i}{20} \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}i}{20} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}i}{20} & 0 & 0 \end{bmatrix}$
222	symmetry	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}i}{20} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}i}{20} \\ -\frac{\sqrt{10}i}{20} & 0 & -\frac{\sqrt{30}i}{20} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{10}i}{20} & 0 & -\frac{\sqrt{30}i}{20} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{30}i}{20} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}i}{20} & 0 & 0 & 0 & 0 \end{bmatrix}$
223	symmetry	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}i}{20} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}i}{20} & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{30}i}{20} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}i}{20} & 0 & 0 & 0 & 0 \\ \frac{\sqrt{10}i}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{10}i}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
224	symmetry	$\begin{bmatrix} 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{6} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{6} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{6} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{6} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{6} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{6} \end{bmatrix}$
225	symmetry	$\frac{x(2x^2-3y^2-3z^2)}{2}$

continued ...

Table 6

No.	multipole	matrix
	$\mathbb{T}_{3,0}^{(a)}(T_u, 1)$	$\begin{bmatrix} -\frac{\sqrt{15}i}{20} & 0 & \frac{3\sqrt{5}i}{20} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{15}i}{20} & 0 & \frac{3\sqrt{5}i}{20} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{10} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{10} \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{10} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{10} & 0 & 0 \end{bmatrix}$
226	symmetry	$-\frac{y(3x^2 - 2y^2 + 3z^2)}{2}$ $\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{10} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{10} \\ -\frac{\sqrt{15}i}{20} & 0 & -\frac{3\sqrt{5}i}{20} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{15}i}{20} & 0 & -\frac{3\sqrt{5}i}{20} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{10} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{10} & 0 & 0 & 0 & 0 \end{bmatrix}$
227	symmetry	$-\frac{z(3x^2 + 3y^2 - 2z^2)}{2}$ $\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{10} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{10} & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{10} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{10} & 0 & 0 & 0 & 0 \\ \frac{\sqrt{15}i}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{15}i}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
228	symmetry	$\frac{\sqrt{15}x(y-z)(y+z)}{2}$ $\begin{bmatrix} -\frac{i}{4} & 0 & -\frac{\sqrt{3}i}{12} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{i}{4} & 0 & -\frac{\sqrt{3}i}{12} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{6} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{6} \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{6} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{6} & 0 & 0 \end{bmatrix}$
229	symmetry	$-\frac{\sqrt{15}y(x-z)(x+z)}{2}$

continued ...

Table 6

No.	multipole	matrix
		$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{6} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{6} \\ \frac{i}{4} & 0 & -\frac{\sqrt{3}i}{12} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{i}{4} & 0 & -\frac{\sqrt{3}i}{12} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{6} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{6} & 0 & 0 & 0 & 0 \end{bmatrix}$
230	symmetry	$\frac{\sqrt{15}z(x-y)(x+y)}{2}$ $\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{6} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{6} & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{6} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{6} & 0 & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{3}i}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{3}i}{6} & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
231	symmetry	$\sqrt{15}xyz$ $\begin{bmatrix} 0 & -\frac{\sqrt{6}}{12} & 0 & -\frac{\sqrt{2}}{12} & 0 & 0 & -\frac{\sqrt{2}}{12} & 0 & 0 & -\frac{\sqrt{2}i}{12} \\ -\frac{\sqrt{6}}{12} & 0 & -\frac{\sqrt{2}}{12} & 0 & 0 & 0 & 0 & \frac{\sqrt{2}}{12} & \frac{\sqrt{2}i}{12} & 0 \\ 0 & -\frac{\sqrt{6}i}{12} & 0 & \frac{\sqrt{2}i}{12} & \frac{\sqrt{2}}{12} & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}}{12} \\ \frac{\sqrt{6}i}{12} & 0 & -\frac{\sqrt{2}i}{12} & 0 & 0 & -\frac{\sqrt{2}}{12} & 0 & 0 & -\frac{\sqrt{2}}{12} & 0 \\ 0 & 0 & \frac{\sqrt{2}}{6} & 0 & 0 & \frac{\sqrt{2}i}{12} & 0 & \frac{\sqrt{2}}{12} & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{2}}{6} & -\frac{\sqrt{2}i}{12} & 0 & \frac{\sqrt{2}}{12} & 0 & 0 & 0 \end{bmatrix}$
232	symmetry	$\frac{x(2x^2-3y^2-3z^2)}{2}$ $\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}i}{60} & -\frac{\sqrt{30}}{60} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}i}{60} & 0 & 0 & \frac{\sqrt{30}}{60} \\ -\frac{\sqrt{10}}{20} & 0 & \frac{\sqrt{30}}{60} & 0 & 0 & \frac{\sqrt{30}i}{60} & 0 & \frac{\sqrt{30}}{20} & 0 & 0 \\ 0 & \frac{\sqrt{10}}{20} & 0 & -\frac{\sqrt{30}}{60} & -\frac{\sqrt{30}i}{60} & 0 & \frac{\sqrt{30}}{20} & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{30}i}{30} & \frac{\sqrt{30}}{60} & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}}{20} \\ 0 & 0 & -\frac{\sqrt{30}i}{30} & 0 & 0 & -\frac{\sqrt{30}}{60} & 0 & 0 & -\frac{\sqrt{30}}{20} & 0 \end{bmatrix}$
233	symmetry	$-\frac{y(3x^2-2y^2+3z^2)}{2}$

continued ...

Table 6

No.	multipole	matrix
	$\mathbb{T}_{3,1}^{(1,-1;a)}(T_u, 1)$	$\begin{bmatrix} \frac{\sqrt{10}}{20} & 0 & \frac{\sqrt{30}}{60} & 0 & 0 & \frac{\sqrt{30}i}{20} & 0 & \frac{\sqrt{30}}{60} & 0 & 0 \\ 0 & -\frac{\sqrt{10}}{20} & 0 & -\frac{\sqrt{30}}{60} & -\frac{\sqrt{30}i}{20} & 0 & \frac{\sqrt{30}}{60} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}}{60} & 0 & 0 & \frac{\sqrt{30}}{60} & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{30}}{60} & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}}{60} \\ 0 & 0 & 0 & -\frac{\sqrt{30}}{30} & 0 & 0 & -\frac{\sqrt{30}}{60} & 0 & 0 & -\frac{\sqrt{30}i}{20} \\ 0 & 0 & -\frac{\sqrt{30}}{30} & 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{60} & \frac{\sqrt{30}i}{20} & 0 \end{bmatrix}$
234	symmetry	$-\frac{z(3x^2+3y^2-2z^2)}{2}$ $\begin{bmatrix} 0 & -\frac{\sqrt{10}i}{20} & 0 & -\frac{\sqrt{30}i}{60} & \frac{\sqrt{30}}{20} & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}}{60} \\ \frac{\sqrt{10}i}{20} & 0 & \frac{\sqrt{30}i}{60} & 0 & 0 & -\frac{\sqrt{30}}{20} & 0 & 0 & -\frac{\sqrt{30}}{60} & 0 \\ 0 & -\frac{\sqrt{10}}{20} & 0 & \frac{\sqrt{30}}{60} & 0 & 0 & -\frac{\sqrt{30}}{20} & 0 & 0 & -\frac{\sqrt{30}i}{60} \\ -\frac{\sqrt{10}}{20} & 0 & \frac{\sqrt{30}}{60} & 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{20} & \frac{\sqrt{30}i}{60} & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{60} & 0 & \frac{\sqrt{30}i}{60} & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{60} & 0 & -\frac{\sqrt{30}i}{60} & 0 & 0 & 0 \end{bmatrix}$
235	symmetry	$\frac{\sqrt{15}x(y-z)(y+z)}{2}$ $\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}}{6} & 0 & \frac{\sqrt{2}i}{12} & -\frac{\sqrt{2}}{12} & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{2}}{6} & 0 & -\frac{\sqrt{2}i}{12} & 0 & 0 & \frac{\sqrt{2}}{12} \\ -\frac{\sqrt{6}}{12} & 0 & \frac{\sqrt{2}}{12} & 0 & 0 & -\frac{\sqrt{2}i}{12} & 0 & \frac{\sqrt{2}}{12} & 0 & 0 \\ 0 & \frac{\sqrt{6}}{12} & 0 & -\frac{\sqrt{2}}{12} & \frac{\sqrt{2}i}{12} & 0 & \frac{\sqrt{2}}{12} & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{2}i}{6} & \frac{\sqrt{2}}{12} & 0 & 0 & 0 & 0 & \frac{\sqrt{2}}{12} \\ 0 & 0 & \frac{\sqrt{2}i}{6} & 0 & 0 & -\frac{\sqrt{2}}{12} & 0 & 0 & \frac{\sqrt{2}}{12} & 0 \end{bmatrix}$
236	symmetry	$-\frac{\sqrt{15}y(x-z)(x+z)}{2}$ $\begin{bmatrix} -\frac{\sqrt{6}}{12} & 0 & -\frac{\sqrt{2}}{12} & 0 & 0 & -\frac{\sqrt{2}i}{12} & 0 & \frac{\sqrt{2}}{12} & 0 & 0 \\ 0 & \frac{\sqrt{6}}{12} & 0 & \frac{\sqrt{2}}{12} & \frac{\sqrt{2}i}{12} & 0 & \frac{\sqrt{2}}{12} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}}{12} & 0 & \frac{\sqrt{2}i}{6} & -\frac{\sqrt{2}}{12} & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{2}}{12} & 0 & -\frac{\sqrt{2}i}{6} & 0 & 0 & \frac{\sqrt{2}}{12} \\ 0 & 0 & 0 & -\frac{\sqrt{2}}{6} & 0 & 0 & \frac{\sqrt{2}}{12} & 0 & 0 & -\frac{\sqrt{2}i}{12} \\ 0 & 0 & -\frac{\sqrt{2}}{6} & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}}{12} & \frac{\sqrt{2}i}{12} & 0 \end{bmatrix}$
237	symmetry	$\frac{\sqrt{15}z(x-y)(x+y)}{2}$

continued ...

Table 6

No.	multipole	matrix
		$\begin{bmatrix} 0 & -\frac{\sqrt{6}i}{12} & 0 & -\frac{\sqrt{2}i}{12} & \frac{\sqrt{2}}{12} & 0 & 0 & 0 & 0 & \frac{\sqrt{2}}{12} \\ \frac{\sqrt{6}i}{12} & 0 & \frac{\sqrt{2}i}{12} & 0 & 0 & -\frac{\sqrt{2}}{12} & 0 & 0 & \frac{\sqrt{2}}{12} & 0 \\ 0 & \frac{\sqrt{6}}{12} & 0 & -\frac{\sqrt{2}}{12} & 0 & 0 & \frac{\sqrt{2}}{12} & 0 & 0 & -\frac{\sqrt{2}i}{12} \\ \frac{\sqrt{6}}{12} & 0 & -\frac{\sqrt{2}}{12} & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}}{12} & \frac{\sqrt{2}i}{12} & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}}{12} & 0 & \frac{\sqrt{2}i}{12} & -\frac{\sqrt{2}}{6} & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{2}}{12} & 0 & -\frac{\sqrt{2}i}{12} & 0 & 0 & \frac{\sqrt{2}}{6} \end{bmatrix}$
238	symmetry	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{20} & -\frac{\sqrt{15}}{20} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{20} & 0 & 0 & \frac{\sqrt{15}}{20} \\ \frac{\sqrt{5}}{20} & 0 & \frac{\sqrt{15}}{20} & 0 & 0 & -\frac{\sqrt{15}i}{20} & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{5}}{20} & 0 & -\frac{\sqrt{15}}{20} & \frac{\sqrt{15}i}{20} & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{5}i}{10} & 0 & 0 & -\frac{\sqrt{15}}{20} & 0 & 0 & 0 & 0 & 0 \\ \frac{\sqrt{5}i}{10} & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{20} & 0 & 0 & 0 & 0 \end{bmatrix}$
239	symmetry	$\begin{bmatrix} -\frac{\sqrt{5}}{20} & 0 & \frac{\sqrt{15}}{20} & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{20} & 0 & 0 \\ 0 & \frac{\sqrt{5}}{20} & 0 & -\frac{\sqrt{15}}{20} & 0 & 0 & -\frac{\sqrt{15}}{20} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{20} & 0 & 0 & \frac{\sqrt{15}}{20} & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{20} & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{20} \\ 0 & -\frac{\sqrt{5}}{10} & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{20} & 0 & 0 & 0 \\ -\frac{\sqrt{5}}{10} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{20} & 0 & 0 \end{bmatrix}$
240	symmetry	$\begin{bmatrix} 0 & -\frac{\sqrt{5}i}{20} & 0 & \frac{\sqrt{15}i}{20} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{20} \\ \frac{\sqrt{5}i}{20} & 0 & -\frac{\sqrt{15}i}{20} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{20} & 0 \\ 0 & -\frac{\sqrt{5}}{20} & 0 & -\frac{\sqrt{15}}{20} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{20} \\ -\frac{\sqrt{5}}{20} & 0 & -\frac{\sqrt{15}}{20} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{20} & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{20} & 0 & \frac{\sqrt{15}i}{20} & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{20} & 0 & -\frac{\sqrt{15}i}{20} & 0 & 0 & 0 \end{bmatrix}$
241	symmetry	$\sqrt{15}xyz$

continued ...

Table 6

No.	multipole	matrix
	$\mathbb{T}_3^{(1,0;a)}(A_u)$	$\begin{bmatrix} 0 & -\frac{\sqrt{3}}{12} & 0 & -\frac{1}{12} & 0 & 0 & \frac{1}{6} & 0 & 0 & \frac{i}{6} \\ -\frac{\sqrt{3}}{12} & 0 & -\frac{1}{12} & 0 & 0 & 0 & 0 & -\frac{1}{6} & -\frac{i}{6} & 0 \\ 0 & -\frac{\sqrt{3}i}{12} & 0 & \frac{i}{12} & -\frac{1}{6} & 0 & 0 & 0 & 0 & \frac{1}{6} \\ \frac{\sqrt{3}i}{12} & 0 & -\frac{i}{12} & 0 & 0 & \frac{1}{6} & 0 & 0 & \frac{1}{6} & 0 \\ 0 & 0 & \frac{1}{6} & 0 & 0 & -\frac{i}{6} & 0 & -\frac{1}{6} & 0 & 0 \\ 0 & 0 & 0 & -\frac{1}{6} & \frac{i}{6} & 0 & -\frac{1}{6} & 0 & 0 & 0 \end{bmatrix}$
242	symmetry	$\frac{x(2x^2-3y^2-3z^2)}{2}$ $\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{15} & -\frac{\sqrt{15}}{15} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{15} & 0 & 0 & \frac{\sqrt{15}}{15} \\ \frac{\sqrt{5}}{40} & 0 & -\frac{7\sqrt{15}}{120} & 0 & 0 & \frac{\sqrt{15}i}{60} & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{5}}{40} & 0 & \frac{7\sqrt{15}}{120} & -\frac{\sqrt{15}i}{60} & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{3\sqrt{5}i}{40} & 0 & -\frac{\sqrt{15}i}{24} & \frac{\sqrt{15}}{60} & 0 & 0 & 0 & 0 & 0 \\ -\frac{3\sqrt{5}i}{40} & 0 & \frac{\sqrt{15}i}{24} & 0 & 0 & -\frac{\sqrt{15}}{60} & 0 & 0 & 0 & 0 \end{bmatrix}$
243	symmetry	$-\frac{y(3x^2-2y^2+3z^2)}{2}$ $\begin{bmatrix} -\frac{\sqrt{5}}{40} & 0 & -\frac{7\sqrt{15}}{120} & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{60} & 0 & 0 \\ 0 & \frac{\sqrt{5}}{40} & 0 & \frac{7\sqrt{15}}{120} & 0 & 0 & \frac{\sqrt{15}}{60} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{15} & 0 & 0 & \frac{\sqrt{15}}{15} & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{15} & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{15} \\ 0 & \frac{3\sqrt{5}}{40} & 0 & \frac{\sqrt{15}}{24} & 0 & 0 & -\frac{\sqrt{15}}{60} & 0 & 0 & 0 \\ \frac{3\sqrt{5}}{40} & 0 & \frac{\sqrt{15}}{24} & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{60} & 0 & 0 \end{bmatrix}$
244	symmetry	$-\frac{z(3x^2+3y^2-2z^2)}{2}$ $\begin{bmatrix} 0 & \frac{\sqrt{5}i}{10} & 0 & -\frac{\sqrt{15}i}{60} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{60} \\ -\frac{\sqrt{5}i}{10} & 0 & \frac{\sqrt{15}i}{60} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{60} & 0 \\ 0 & \frac{\sqrt{5}}{10} & 0 & \frac{\sqrt{15}}{60} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{60} \\ \frac{\sqrt{5}}{10} & 0 & \frac{\sqrt{15}}{60} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{60} & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{15} & 0 & \frac{\sqrt{15}i}{15} & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{15} & 0 & -\frac{\sqrt{15}i}{15} & 0 & 0 & 0 \end{bmatrix}$
245	symmetry	$\frac{\sqrt{15}x(y-z)(y+z)}{2}$

continued ...

Table 6

No.	multipole	matrix
	$\mathbb{T}_{3,0}^{(1,0;a)}(T_u, 2)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & -\frac{1}{6} & 0 & -\frac{i}{6} & \frac{1}{6} & 0 \\ 0 & 0 & 0 & 0 & -\frac{1}{6} & 0 & \frac{i}{6} & 0 & 0 & -\frac{1}{6} \\ \frac{\sqrt{3}}{24} & 0 & \frac{5}{24} & 0 & 0 & -\frac{i}{12} & 0 & -\frac{1}{6} & 0 & 0 \\ 0 & -\frac{\sqrt{3}}{24} & 0 & -\frac{5}{24} & \frac{i}{12} & 0 & -\frac{1}{6} & 0 & 0 & 0 \\ 0 & \frac{\sqrt{3}i}{8} & 0 & -\frac{i}{24} & \frac{1}{12} & 0 & 0 & 0 & 0 & -\frac{1}{6} \\ -\frac{\sqrt{3}i}{8} & 0 & \frac{i}{24} & 0 & 0 & -\frac{1}{12} & 0 & 0 & -\frac{1}{6} & 0 \end{bmatrix}$
246	symmetry	$-\frac{\sqrt{15}y(x-z)(x+z)}{2}$
	$\mathbb{T}_{3,1}^{(1,0;a)}(T_u, 2)$	$\begin{bmatrix} \frac{\sqrt{3}}{24} & 0 & -\frac{5}{24} & 0 & 0 & \frac{i}{6} & 0 & \frac{1}{12} & 0 & 0 \\ 0 & -\frac{\sqrt{3}}{24} & 0 & \frac{5}{24} & -\frac{i}{6} & 0 & \frac{1}{12} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{1}{6} & 0 & \frac{i}{6} & \frac{1}{6} & 0 \\ 0 & 0 & 0 & 0 & \frac{1}{6} & 0 & -\frac{i}{6} & 0 & 0 & -\frac{1}{6} \\ 0 & -\frac{\sqrt{3}}{8} & 0 & -\frac{1}{24} & 0 & 0 & \frac{1}{12} & 0 & 0 & \frac{i}{6} \\ -\frac{\sqrt{3}}{8} & 0 & -\frac{1}{24} & 0 & 0 & 0 & 0 & -\frac{1}{12} & -\frac{i}{6} & 0 \end{bmatrix}$
247	symmetry	$\frac{\sqrt{15}z(x-y)(x+y)}{2}$
	$\mathbb{T}_{3,2}^{(1,0;a)}(T_u, 2)$	$\begin{bmatrix} 0 & -\frac{\sqrt{3}i}{12} & 0 & \frac{i}{6} & -\frac{1}{6} & 0 & 0 & 0 & 0 & \frac{1}{12} \\ \frac{\sqrt{3}i}{12} & 0 & -\frac{i}{6} & 0 & 0 & \frac{1}{6} & 0 & 0 & \frac{1}{12} & 0 \\ 0 & \frac{\sqrt{3}}{12} & 0 & \frac{1}{6} & 0 & 0 & -\frac{1}{6} & 0 & 0 & -\frac{i}{12} \\ \frac{\sqrt{3}}{12} & 0 & \frac{1}{6} & 0 & 0 & 0 & 0 & \frac{1}{6} & \frac{i}{12} & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{1}{6} & 0 & -\frac{i}{6} & -\frac{1}{6} & 0 \\ 0 & 0 & 0 & 0 & \frac{1}{6} & 0 & \frac{i}{6} & 0 & 0 & \frac{1}{6} \end{bmatrix}$
248	symmetry	x
	$\mathbb{T}_{1,0}^{(1,1;a)}(T_u)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{5}i}{20} & \frac{\sqrt{5}}{20} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{20} & 0 & 0 & -\frac{\sqrt{5}}{20} \\ \frac{\sqrt{15}}{20} & 0 & -\frac{\sqrt{5}}{20} & 0 & 0 & -\frac{\sqrt{5}i}{20} & 0 & \frac{\sqrt{5}}{10} & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{15}}{20} & 0 & \frac{\sqrt{5}}{20} & \frac{\sqrt{5}i}{20} & 0 & \frac{\sqrt{5}}{10} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{5}i}{10} & -\frac{\sqrt{5}}{20} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}}{10} \\ 0 & 0 & \frac{\sqrt{5}i}{10} & 0 & 0 & \frac{\sqrt{5}}{20} & 0 & 0 & -\frac{\sqrt{5}}{10} & 0 & 0 \end{bmatrix}$
249	symmetry	y

continued ...

Table 6

No.	multipole	matrix
		$\begin{bmatrix} -\frac{\sqrt{15}}{20} & 0 & -\frac{\sqrt{5}}{20} & 0 & 0 & \frac{\sqrt{5}i}{10} & 0 & -\frac{\sqrt{5}}{20} & 0 & 0 \\ 0 & \frac{\sqrt{15}}{20} & 0 & \frac{\sqrt{5}}{20} & -\frac{\sqrt{5}i}{10} & 0 & -\frac{\sqrt{5}}{20} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{5}}{20} & 0 & 0 & -\frac{\sqrt{5}}{20} & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{5}}{20} & 0 & 0 & 0 & 0 & \frac{\sqrt{5}}{20} \\ 0 & 0 & 0 & \frac{\sqrt{5}}{10} & 0 & 0 & \frac{\sqrt{5}}{20} & 0 & 0 & -\frac{\sqrt{5}i}{10} \\ 0 & 0 & \frac{\sqrt{5}}{10} & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}}{20} & \frac{\sqrt{5}i}{10} & 0 \end{bmatrix}$
250	symmetry	$\begin{bmatrix} 0 & \frac{\sqrt{15}i}{20} & 0 & \frac{\sqrt{5}i}{20} & \frac{\sqrt{5}}{10} & 0 & 0 & 0 & 0 & \frac{\sqrt{5}}{20} \\ -\frac{\sqrt{15}i}{20} & 0 & -\frac{\sqrt{5}i}{20} & 0 & 0 & -\frac{\sqrt{5}}{10} & 0 & 0 & \frac{\sqrt{5}}{20} & 0 \\ 0 & \frac{\sqrt{15}}{20} & 0 & -\frac{\sqrt{5}}{20} & 0 & 0 & -\frac{\sqrt{5}}{10} & 0 & 0 & \frac{\sqrt{5}i}{20} \\ \frac{\sqrt{15}}{20} & 0 & -\frac{\sqrt{5}}{20} & 0 & 0 & 0 & 0 & \frac{\sqrt{5}}{10} & -\frac{\sqrt{5}i}{20} & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}}{20} & 0 & -\frac{\sqrt{5}i}{20} & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{5}}{20} & 0 & \frac{\sqrt{5}i}{20} & 0 & 0 & 0 \end{bmatrix}$
251	symmetry	$\begin{bmatrix} 0 & 0 & 0 & 0 & -\frac{\sqrt{2}i}{4} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}i}{4} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2}i}{4} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2}i}{4} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
252	symmetry	$\begin{bmatrix} 0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{12} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{12} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{12} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{12} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}i}{6} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}i}{6} \end{bmatrix}$
253	symmetry	$\begin{bmatrix} \sqrt{3}(x-y)(x+y) \\ \sqrt{3}yz \end{bmatrix}$

continued ...

Table 6

No.	multipole	matrix
		$\begin{bmatrix} \frac{\sqrt{2}i}{4} & 0 & \frac{\sqrt{6}i}{12} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{2}i}{4} & 0 & \frac{\sqrt{6}i}{12} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}i}{12} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}i}{12} \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{12} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{12} & 0 & 0 \end{bmatrix}$
254	symmetry	$\sqrt{3}xz$ $\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{12} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{12} \\ -\frac{\sqrt{2}i}{4} & 0 & \frac{\sqrt{6}i}{12} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{2}i}{4} & 0 & \frac{\sqrt{6}i}{12} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{6}i}{12} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}i}{12} & 0 & 0 & 0 & 0 \end{bmatrix}$
255	symmetry	$\sqrt{3}xy$ $\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}i}{12} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}i}{12} & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{12} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{12} & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{6}i}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{6}i}{6} & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
256	symmetry	$-\frac{x^2}{2} - \frac{y^2}{2} + z^2$ $\begin{bmatrix} 0 & \frac{\sqrt{15}}{60} & 0 & -\frac{\sqrt{5}}{20} & 0 & 0 & \frac{\sqrt{5}}{10} & 0 & 0 & \frac{\sqrt{5}i}{20} \\ \frac{\sqrt{15}}{60} & 0 & -\frac{\sqrt{5}}{20} & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}}{10} & -\frac{\sqrt{5}i}{20} & 0 \\ 0 & -\frac{\sqrt{15}i}{60} & 0 & -\frac{\sqrt{5}i}{20} & \frac{\sqrt{5}}{10} & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}}{20} \\ \frac{\sqrt{15}i}{60} & 0 & \frac{\sqrt{5}i}{20} & 0 & 0 & -\frac{\sqrt{5}}{10} & 0 & 0 & -\frac{\sqrt{5}}{20} & 0 \\ \frac{\sqrt{15}}{15} & 0 & 0 & 0 & 0 & \frac{\sqrt{5}i}{20} & 0 & -\frac{\sqrt{5}}{20} & 0 & 0 \\ 0 & -\frac{\sqrt{15}}{15} & 0 & 0 & -\frac{\sqrt{5}i}{20} & 0 & -\frac{\sqrt{5}}{20} & 0 & 0 & 0 \end{bmatrix}$
257	symmetry	$\frac{\sqrt{3}(x-y)(x+y)}{2}$

continued ...

Table 6

No.	multipole	matrix
	$\mathbb{M}_{2,1}^{(1,-1;a)}(E_u)$	$\begin{bmatrix} 0 & -\frac{\sqrt{5}}{20} & 0 & \frac{\sqrt{15}}{20} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{20} \\ -\frac{\sqrt{5}}{20} & 0 & \frac{\sqrt{15}}{20} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{20} & 0 \\ 0 & -\frac{\sqrt{5}i}{20} & 0 & -\frac{\sqrt{15}i}{20} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{20} \\ \frac{\sqrt{5}i}{20} & 0 & \frac{\sqrt{15}i}{20} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{20} & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{20} & 0 & \frac{\sqrt{15}}{20} & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{20} & 0 & \frac{\sqrt{15}}{20} & 0 & 0 & 0 \end{bmatrix}$
258	symmetry	$\sqrt{3}yz$
	$\mathbb{M}_{2,0}^{(1,-1;a)}(T_u)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{20} & \frac{\sqrt{15}}{20} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{20} & 0 & 0 & -\frac{\sqrt{15}}{20} \\ -\frac{\sqrt{5}}{20} & 0 & -\frac{\sqrt{15}}{20} & 0 & 0 & -\frac{\sqrt{15}i}{20} & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{5}}{20} & 0 & \frac{\sqrt{15}}{20} & \frac{\sqrt{15}i}{20} & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{5}i}{10} & 0 & 0 & \frac{\sqrt{15}}{20} & 0 & 0 & 0 & 0 & 0 \\ \frac{\sqrt{5}i}{10} & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{20} & 0 & 0 & 0 & 0 \end{bmatrix}$
259	symmetry	$\sqrt{3}xz$
	$\mathbb{M}_{2,1}^{(1,-1;a)}(T_u)$	$\begin{bmatrix} -\frac{\sqrt{5}}{20} & 0 & \frac{\sqrt{15}}{20} & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{20} & 0 & 0 \\ 0 & \frac{\sqrt{5}}{20} & 0 & -\frac{\sqrt{15}}{20} & 0 & 0 & \frac{\sqrt{15}}{20} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{20} & 0 & 0 & \frac{\sqrt{15}}{20} \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{20} & 0 & 0 & 0 & -\frac{\sqrt{15}}{20} \\ 0 & \frac{\sqrt{5}}{10} & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{20} & 0 & 0 & 0 \\ \frac{\sqrt{5}}{10} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{20} & 0 & 0 \end{bmatrix}$
260	symmetry	$\sqrt{3}xy$
	$\mathbb{M}_{2,2}^{(1,-1;a)}(T_u)$	$\begin{bmatrix} 0 & \frac{\sqrt{5}i}{20} & 0 & -\frac{\sqrt{15}i}{20} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{20} \\ -\frac{\sqrt{5}i}{20} & 0 & \frac{\sqrt{15}i}{20} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{20} & 0 \\ 0 & -\frac{\sqrt{5}}{20} & 0 & -\frac{\sqrt{15}}{20} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{20} \\ -\frac{\sqrt{5}}{20} & 0 & -\frac{\sqrt{15}}{20} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{20} & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{20} & 0 & -\frac{\sqrt{15}i}{20} & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{20} & 0 & \frac{\sqrt{15}i}{20} & 0 & 0 & 0 \end{bmatrix}$
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
	$\mathbb{M}_4^{(1,-1;a)}(A_u)$	$\begin{bmatrix} 0 & -\frac{\sqrt{5}}{20} & 0 & \frac{\sqrt{15}}{20} & 0 & 0 & -\frac{\sqrt{15}}{30} & 0 & 0 & \frac{\sqrt{15}i}{30} \\ -\frac{\sqrt{5}}{20} & 0 & \frac{\sqrt{15}}{20} & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{30} & -\frac{\sqrt{15}i}{30} & 0 \\ 0 & \frac{\sqrt{5}i}{20} & 0 & \frac{\sqrt{15}i}{20} & -\frac{\sqrt{15}}{30} & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{30} \\ -\frac{\sqrt{5}i}{20} & 0 & -\frac{\sqrt{15}i}{20} & 0 & 0 & \frac{\sqrt{15}}{30} & 0 & 0 & -\frac{\sqrt{15}}{30} & 0 \\ \frac{\sqrt{5}}{10} & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{30} & 0 & -\frac{\sqrt{15}}{30} & 0 & 0 \\ 0 & -\frac{\sqrt{5}}{10} & 0 & 0 & -\frac{\sqrt{15}i}{30} & 0 & -\frac{\sqrt{15}}{30} & 0 & 0 & 0 \end{bmatrix}$
262	symmetry	$-\frac{\sqrt{15}(x^4 - 12x^2y^2 + 6x^2z^2 + y^4 + 6y^2z^2 - 2z^4)}{12}$
	$\mathbb{M}_{4,0}^{(1,-1;a)}(E_u)$	$\begin{bmatrix} 0 & -\frac{\sqrt{7}}{28} & 0 & -\frac{\sqrt{21}}{28} & 0 & 0 & -\frac{\sqrt{21}}{42} & 0 & 0 & -\frac{\sqrt{21}i}{21} \\ -\frac{\sqrt{7}}{28} & 0 & -\frac{\sqrt{21}}{28} & 0 & 0 & 0 & 0 & \frac{\sqrt{21}}{42} & \frac{\sqrt{21}i}{21} & 0 \\ 0 & \frac{\sqrt{7}i}{28} & 0 & -\frac{\sqrt{21}i}{28} & -\frac{\sqrt{21}}{42} & 0 & 0 & 0 & 0 & \frac{\sqrt{21}}{21} \\ -\frac{\sqrt{7}i}{28} & 0 & \frac{\sqrt{21}i}{28} & 0 & 0 & \frac{\sqrt{21}}{42} & 0 & 0 & \frac{\sqrt{21}}{21} & 0 \\ \frac{\sqrt{7}}{14} & 0 & 0 & 0 & 0 & \frac{\sqrt{21}i}{42} & 0 & -\frac{\sqrt{21}}{42} & 0 & 0 \\ 0 & -\frac{\sqrt{7}}{14} & 0 & 0 & -\frac{\sqrt{21}i}{42} & 0 & -\frac{\sqrt{21}}{42} & 0 & 0 & 0 \end{bmatrix}$
263	symmetry	$\frac{\sqrt{5}(x-y)(x+y)(x^2+y^2-6z^2)}{4}$
	$\mathbb{M}_{4,1}^{(1,-1;a)}(E_u)$	$\begin{bmatrix} 0 & -\frac{\sqrt{21}}{28} & 0 & \frac{\sqrt{7}}{28} & 0 & 0 & -\frac{\sqrt{7}}{14} & 0 & 0 & 0 \\ -\frac{\sqrt{21}}{28} & 0 & \frac{\sqrt{7}}{28} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}}{14} & 0 & 0 \\ 0 & -\frac{\sqrt{21}i}{28} & 0 & -\frac{\sqrt{7}i}{28} & \frac{\sqrt{7}}{14} & 0 & 0 & 0 & 0 & 0 & 0 \\ \frac{\sqrt{21}i}{28} & 0 & \frac{\sqrt{7}i}{28} & 0 & 0 & -\frac{\sqrt{7}}{14} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{7}}{14} & 0 & 0 & -\frac{\sqrt{7}i}{14} & 0 & -\frac{\sqrt{7}}{14} & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{7}}{14} & \frac{\sqrt{7}i}{14} & 0 & -\frac{\sqrt{7}}{14} & 0 & 0 & 0 & 0 \end{bmatrix}$
264	symmetry	$\frac{\sqrt{35}yz(y-z)(y+z)}{2}$
	$\mathbb{M}_{4,0}^{(1,-1;a)}(T_u, 1)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ -\frac{\sqrt{3}}{8} & 0 & -\frac{1}{8} & 0 & 0 & -\frac{i}{4} & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{3}}{8} & 0 & \frac{1}{8} & \frac{i}{4} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{3}i}{8} & 0 & \frac{i}{8} & -\frac{1}{4} & 0 & 0 & 0 & 0 & 0 & 0 \\ -\frac{\sqrt{3}i}{8} & 0 & -\frac{i}{8} & 0 & 0 & \frac{1}{4} & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
265	symmetry	$-\frac{\sqrt{35}xz(x-z)(x+z)}{2}$

continued ...

Table 6

No.	multipole	matrix
		$\begin{bmatrix} \frac{\sqrt{3}}{8} & 0 & -\frac{1}{8} & 0 & 0 & 0 & 0 & 0 & -\frac{1}{4} & 0 & 0 \\ 0 & -\frac{\sqrt{3}}{8} & 0 & \frac{1}{8} & 0 & 0 & -\frac{1}{4} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{3}}{8} & 0 & -\frac{1}{8} & 0 & 0 & \frac{1}{4} & 0 & 0 & 0 & 0 \\ \frac{\sqrt{3}}{8} & 0 & -\frac{1}{8} & 0 & 0 & 0 & 0 & -\frac{1}{4} & 0 & 0 & 0 \end{bmatrix}$
266	symmetry	$\frac{\sqrt{35}xy(x-y)(x+y)}{2}$ $\begin{bmatrix} 0 & 0 & 0 & -\frac{i}{4} & 0 & 0 & 0 & 0 & 0 & \frac{1}{4} \\ 0 & 0 & \frac{i}{4} & 0 & 0 & 0 & 0 & 0 & \frac{1}{4} & 0 \\ 0 & 0 & 0 & \frac{1}{4} & 0 & 0 & 0 & 0 & 0 & \frac{i}{4} \\ 0 & 0 & \frac{1}{4} & 0 & 0 & 0 & 0 & 0 & -\frac{i}{4} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
267	symmetry	$\frac{\sqrt{5}yz(6x^2-y^2-z^2)}{2}$ $\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}}{14} & 0 & -\frac{\sqrt{7}i}{14} & \frac{\sqrt{7}}{14} & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{7}}{14} & 0 & \frac{\sqrt{7}i}{14} & 0 & 0 & -\frac{\sqrt{7}}{14} \\ -\frac{\sqrt{21}}{56} & 0 & \frac{3\sqrt{7}}{56} & 0 & 0 & \frac{\sqrt{7}i}{28} & 0 & \frac{\sqrt{7}}{14} & 0 & 0 \\ 0 & \frac{\sqrt{21}}{56} & 0 & -\frac{3\sqrt{7}}{56} & -\frac{\sqrt{7}i}{28} & 0 & \frac{\sqrt{7}}{14} & 0 & 0 & 0 \\ 0 & \frac{\sqrt{21}i}{56} & 0 & -\frac{3\sqrt{7}i}{56} & -\frac{\sqrt{7}}{28} & 0 & 0 & 0 & 0 & \frac{\sqrt{7}}{14} \\ -\frac{\sqrt{21}i}{56} & 0 & \frac{3\sqrt{7}i}{56} & 0 & 0 & \frac{\sqrt{7}}{28} & 0 & 0 & \frac{\sqrt{7}}{14} & 0 \end{bmatrix}$
268	symmetry	$-\frac{\sqrt{5}xz(x^2-6y^2+z^2)}{2}$ $\begin{bmatrix} -\frac{\sqrt{21}}{56} & 0 & -\frac{3\sqrt{7}}{56} & 0 & 0 & -\frac{\sqrt{7}i}{14} & 0 & -\frac{\sqrt{7}}{28} & 0 & 0 \\ 0 & \frac{\sqrt{21}}{56} & 0 & \frac{3\sqrt{7}}{56} & \frac{\sqrt{7}i}{14} & 0 & -\frac{\sqrt{7}}{28} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}}{14} & 0 & -\frac{\sqrt{7}i}{14} & \frac{\sqrt{7}}{14} & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{7}}{14} & 0 & \frac{\sqrt{7}i}{14} & 0 & 0 & -\frac{\sqrt{7}}{14} \\ 0 & -\frac{\sqrt{21}}{56} & 0 & -\frac{3\sqrt{7}}{56} & 0 & 0 & -\frac{\sqrt{7}}{28} & 0 & 0 & -\frac{\sqrt{7}i}{14} \\ -\frac{\sqrt{21}}{56} & 0 & -\frac{3\sqrt{7}}{56} & 0 & 0 & 0 & \frac{\sqrt{7}}{28} & \frac{\sqrt{7}i}{14} & 0 & 0 \end{bmatrix}$
269	symmetry	$-\frac{\sqrt{5}xy(x^2+y^2-6z^2)}{2}$

continued ...

Table 6

No.	multipole	matrix
	$\mathbb{M}_{4,2}^{(1,-1;a)}(T_u, 2)$	$\begin{bmatrix} 0 & -\frac{\sqrt{21}i}{28} & 0 & 0 & \frac{\sqrt{7}}{14} & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}}{28} \\ \frac{\sqrt{21}i}{28} & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}}{14} & 0 & 0 & -\frac{\sqrt{7}}{28} & 0 \\ 0 & \frac{\sqrt{21}}{28} & 0 & 0 & 0 & 0 & \frac{\sqrt{7}}{14} & 0 & 0 & \frac{\sqrt{7}i}{28} \\ \frac{\sqrt{21}}{28} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}}{14} & -\frac{\sqrt{7}i}{28} & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}}{14} & 0 & -\frac{\sqrt{7}i}{14} & \frac{\sqrt{7}}{14} & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{7}}{14} & 0 & \frac{\sqrt{7}i}{14} & 0 & 0 & -\frac{\sqrt{7}}{14} \end{bmatrix}$
270	symmetry	$-\frac{x^2}{2} - \frac{y^2}{2} + z^2$
	$\mathbb{M}_{2,0}^{(1,0;a)}(E_u)$	$\begin{bmatrix} 0 & -\frac{1}{4} & 0 & -\frac{\sqrt{3}}{12} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{12} \\ -\frac{1}{4} & 0 & -\frac{\sqrt{3}}{12} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{12} & 0 \\ 0 & \frac{i}{4} & 0 & -\frac{\sqrt{3}i}{12} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{12} \\ -\frac{i}{4} & 0 & \frac{\sqrt{3}i}{12} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{12} & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{12} & 0 & \frac{\sqrt{3}}{12} & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{12} & 0 & \frac{\sqrt{3}}{12} & 0 & 0 & 0 \end{bmatrix}$
271	symmetry	$\frac{\sqrt{3}(x-y)(x+y)}{2}$
	$\mathbb{M}_{2,1}^{(1,0;a)}(E_u)$	$\begin{bmatrix} 0 & -\frac{\sqrt{3}}{12} & 0 & -\frac{1}{12} & 0 & 0 & \frac{1}{6} & 0 & 0 & -\frac{i}{12} \\ -\frac{\sqrt{3}}{12} & 0 & -\frac{1}{12} & 0 & 0 & 0 & 0 & -\frac{1}{6} & \frac{i}{12} & 0 \\ 0 & -\frac{\sqrt{3}i}{12} & 0 & \frac{i}{12} & -\frac{1}{6} & 0 & 0 & 0 & 0 & -\frac{1}{12} \\ \frac{\sqrt{3}i}{12} & 0 & -\frac{i}{12} & 0 & 0 & \frac{1}{6} & 0 & 0 & -\frac{1}{12} & 0 \\ 0 & 0 & -\frac{1}{3} & 0 & 0 & \frac{i}{12} & 0 & \frac{1}{12} & 0 & 0 \\ 0 & 0 & 0 & \frac{1}{3} & -\frac{i}{12} & 0 & \frac{1}{12} & 0 & 0 & 0 \end{bmatrix}$
272	symmetry	$\sqrt{3}yz$
	$\mathbb{M}_{2,0}^{(1,0;a)}(T_u)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & -\frac{1}{3} & 0 & -\frac{i}{12} & \frac{1}{12} & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{1}{3} & 0 & \frac{i}{12} & 0 & 0 & -\frac{1}{12} \\ \frac{\sqrt{3}}{12} & 0 & -\frac{1}{12} & 0 & 0 & \frac{i}{12} & 0 & \frac{1}{6} & 0 & 0 \\ 0 & -\frac{\sqrt{3}}{12} & 0 & \frac{1}{12} & -\frac{i}{12} & 0 & \frac{1}{6} & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{i}{6} & -\frac{1}{12} & 0 & 0 & 0 & 0 & \frac{1}{6} \\ 0 & 0 & -\frac{i}{6} & 0 & 0 & \frac{1}{12} & 0 & 0 & \frac{1}{6} & 0 \end{bmatrix}$
273	symmetry	$\sqrt{3}xz$

continued ...

Table 6

No.	multipole	matrix
		$\begin{bmatrix} \frac{\sqrt{3}}{12} & 0 & \frac{1}{12} & 0 & 0 & -\frac{i}{6} & 0 & -\frac{1}{12} & 0 & 0 \\ 0 & -\frac{\sqrt{3}}{12} & 0 & -\frac{1}{12} & \frac{i}{6} & 0 & -\frac{1}{12} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{1}{12} & 0 & \frac{i}{3} & \frac{1}{12} & 0 \\ 0 & 0 & 0 & 0 & \frac{1}{12} & 0 & -\frac{i}{3} & 0 & 0 & -\frac{1}{12} \\ 0 & 0 & 0 & \frac{1}{6} & 0 & 0 & -\frac{1}{12} & 0 & 0 & -\frac{i}{6} \\ 0 & 0 & \frac{1}{6} & 0 & 0 & 0 & 0 & \frac{1}{12} & \frac{i}{6} & 0 \end{bmatrix}$
274	symmetry	$\sqrt{3}xy$ $\begin{bmatrix} 0 & \frac{\sqrt{3}i}{12} & 0 & \frac{i}{12} & \frac{1}{6} & 0 & 0 & 0 & 0 & -\frac{1}{12} \\ -\frac{\sqrt{3}i}{12} & 0 & -\frac{i}{12} & 0 & 0 & -\frac{1}{6} & 0 & 0 & -\frac{1}{12} & 0 \\ 0 & -\frac{\sqrt{3}}{12} & 0 & \frac{1}{12} & 0 & 0 & \frac{1}{6} & 0 & 0 & \frac{i}{12} \\ -\frac{\sqrt{3}}{12} & 0 & \frac{1}{12} & 0 & 0 & 0 & 0 & -\frac{1}{6} & -\frac{i}{12} & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{1}{12} & 0 & -\frac{i}{12} & -\frac{1}{3} & 0 \\ 0 & 0 & 0 & 0 & \frac{1}{12} & 0 & \frac{i}{12} & 0 & 0 & \frac{1}{3} \end{bmatrix}$
275	symmetry	1 $\begin{bmatrix} 0 & -\frac{\sqrt{30}}{60} & 0 & \frac{\sqrt{10}}{20} & 0 & 0 & \frac{\sqrt{10}}{20} & 0 & 0 & -\frac{\sqrt{10}i}{20} \\ -\frac{\sqrt{30}}{60} & 0 & \frac{\sqrt{10}}{20} & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}}{20} & \frac{\sqrt{10}i}{20} & 0 \\ 0 & \frac{\sqrt{30}i}{60} & 0 & \frac{\sqrt{10}i}{20} & \frac{\sqrt{10}}{20} & 0 & 0 & 0 & 0 & \frac{\sqrt{10}}{20} \\ -\frac{\sqrt{30}i}{60} & 0 & -\frac{\sqrt{10}i}{20} & 0 & 0 & -\frac{\sqrt{10}}{20} & 0 & 0 & \frac{\sqrt{10}}{20} & 0 \\ \frac{\sqrt{30}}{30} & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}i}{20} & 0 & \frac{\sqrt{10}}{20} & 0 & 0 \\ 0 & -\frac{\sqrt{30}}{30} & 0 & 0 & \frac{\sqrt{10}i}{20} & 0 & \frac{\sqrt{10}}{20} & 0 & 0 & 0 \end{bmatrix}$
276	symmetry	$-\frac{x^2}{2} - \frac{y^2}{2} + z^2$ $\begin{bmatrix} 0 & \frac{\sqrt{35}}{35} & 0 & -\frac{\sqrt{105}}{210} & 0 & 0 & -\frac{\sqrt{105}}{70} & 0 & 0 & \frac{\sqrt{105}i}{210} \\ \frac{\sqrt{35}}{35} & 0 & -\frac{\sqrt{105}}{210} & 0 & 0 & 0 & 0 & \frac{\sqrt{105}}{70} & -\frac{\sqrt{105}i}{210} & 0 \\ 0 & -\frac{\sqrt{35}i}{35} & 0 & -\frac{\sqrt{105}i}{210} & -\frac{\sqrt{105}}{70} & 0 & 0 & 0 & 0 & -\frac{\sqrt{105}}{210} \\ \frac{\sqrt{35}i}{35} & 0 & \frac{\sqrt{105}i}{210} & 0 & 0 & \frac{\sqrt{105}}{70} & 0 & 0 & -\frac{\sqrt{105}}{210} & 0 \\ \frac{3\sqrt{35}}{70} & 0 & 0 & 0 & 0 & -\frac{2\sqrt{105}i}{105} & 0 & \frac{2\sqrt{105}}{105} & 0 & 0 \\ 0 & -\frac{3\sqrt{35}}{70} & 0 & 0 & \frac{2\sqrt{105}i}{105} & 0 & \frac{2\sqrt{105}}{105} & 0 & 0 & 0 \end{bmatrix}$
277	symmetry	$\frac{\sqrt{3}(x-y)(x+y)}{2}$

continued ...

Table 6

No.	multipole	matrix
		$\begin{bmatrix} 0 & -\frac{\sqrt{105}}{210} & 0 & \frac{4\sqrt{35}}{105} & 0 & 0 & \frac{\sqrt{35}}{42} & 0 & 0 & -\frac{\sqrt{35}i}{30} \\ -\frac{\sqrt{105}}{210} & 0 & \frac{4\sqrt{35}}{105} & 0 & 0 & 0 & 0 & -\frac{\sqrt{35}}{42} & \frac{\sqrt{35}i}{30} & 0 \\ 0 & -\frac{\sqrt{105}i}{210} & 0 & -\frac{4\sqrt{35}i}{105} & -\frac{\sqrt{35}}{42} & 0 & 0 & 0 & 0 & -\frac{\sqrt{35}}{30} \\ \frac{\sqrt{105}i}{210} & 0 & \frac{4\sqrt{35}i}{105} & 0 & 0 & \frac{\sqrt{35}}{42} & 0 & 0 & -\frac{\sqrt{35}}{30} & 0 \\ 0 & 0 & \frac{\sqrt{35}}{42} & 0 & 0 & -\frac{\sqrt{35}i}{105} & 0 & -\frac{\sqrt{35}}{105} & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{35}}{42} & \frac{\sqrt{35}i}{105} & 0 & -\frac{\sqrt{35}}{105} & 0 & 0 & 0 \end{bmatrix}$
278	symmetry	$\sqrt{3}yz$ $\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{35}}{42} & 0 & \frac{\sqrt{35}i}{105} & -\frac{\sqrt{35}}{105} & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{35}}{42} & 0 & -\frac{\sqrt{35}i}{105} & 0 & 0 & \frac{\sqrt{35}}{105} \\ \frac{2\sqrt{105}}{105} & 0 & \frac{\sqrt{35}}{105} & 0 & 0 & -\frac{4\sqrt{35}i}{105} & 0 & \frac{\sqrt{35}}{42} & 0 & 0 \\ 0 & -\frac{2\sqrt{105}}{105} & 0 & -\frac{\sqrt{35}}{105} & \frac{4\sqrt{35}i}{105} & 0 & \frac{\sqrt{35}}{42} & 0 & 0 & 0 \\ 0 & \frac{\sqrt{105}i}{70} & 0 & \frac{\sqrt{35}i}{42} & \frac{4\sqrt{35}}{105} & 0 & 0 & 0 & 0 & \frac{\sqrt{35}}{42} \\ -\frac{\sqrt{105}i}{70} & 0 & -\frac{\sqrt{35}i}{42} & 0 & 0 & -\frac{4\sqrt{35}}{105} & 0 & 0 & \frac{\sqrt{35}}{42} & 0 \end{bmatrix}$
279	symmetry	$\sqrt{3}xz$ $\begin{bmatrix} \frac{2\sqrt{105}}{105} & 0 & -\frac{\sqrt{35}}{105} & 0 & 0 & -\frac{\sqrt{35}i}{42} & 0 & \frac{4\sqrt{35}}{105} & 0 & 0 \\ 0 & -\frac{2\sqrt{105}}{105} & 0 & \frac{\sqrt{35}}{105} & \frac{\sqrt{35}i}{42} & 0 & \frac{4\sqrt{35}}{105} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{35}}{105} & 0 & -\frac{\sqrt{35}i}{42} & -\frac{\sqrt{35}}{105} & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{35}}{105} & 0 & \frac{\sqrt{35}i}{42} & 0 & 0 & \frac{\sqrt{35}}{105} \\ 0 & -\frac{\sqrt{105}}{70} & 0 & \frac{\sqrt{35}}{42} & 0 & 0 & \frac{4\sqrt{35}}{105} & 0 & 0 & -\frac{\sqrt{35}i}{42} \\ -\frac{\sqrt{105}}{70} & 0 & \frac{\sqrt{35}}{42} & 0 & 0 & 0 & 0 & -\frac{4\sqrt{35}}{105} & \frac{\sqrt{35}i}{42} & 0 \end{bmatrix}$
280	symmetry	$\sqrt{3}xy$ $\begin{bmatrix} 0 & \frac{\sqrt{105}i}{210} & 0 & \frac{\sqrt{35}i}{30} & \frac{\sqrt{35}}{42} & 0 & 0 & 0 & 0 & \frac{4\sqrt{35}}{105} \\ -\frac{\sqrt{105}i}{210} & 0 & -\frac{\sqrt{35}i}{30} & 0 & 0 & -\frac{\sqrt{35}}{42} & 0 & 0 & \frac{4\sqrt{35}}{105} & 0 \\ 0 & -\frac{\sqrt{105}}{210} & 0 & \frac{\sqrt{35}}{30} & 0 & 0 & \frac{\sqrt{35}}{42} & 0 & 0 & -\frac{4\sqrt{35}i}{105} \\ -\frac{\sqrt{105}}{210} & 0 & \frac{\sqrt{35}}{30} & 0 & 0 & 0 & 0 & -\frac{\sqrt{35}}{42} & \frac{4\sqrt{35}i}{105} & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{35}}{105} & 0 & \frac{\sqrt{35}i}{105} & \frac{\sqrt{35}}{42} & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{35}}{105} & 0 & -\frac{\sqrt{35}i}{105} & 0 & 0 & -\frac{\sqrt{35}}{42} \end{bmatrix}$

bra: $= \langle p_x, \uparrow |, \langle p_x, \downarrow |, \langle p_y, \uparrow |, \langle p_y, \downarrow |, \langle p_z, \uparrow |, \langle p_z, \downarrow |$

ket: $= |f_3, \uparrow \rangle, |f_3, \downarrow \rangle, |f_{ax}, \uparrow \rangle, |f_{ax}, \downarrow \rangle, |f_{ay}, \uparrow \rangle, |f_{ay}, \downarrow \rangle, |f_{az}, \uparrow \rangle, |f_{az}, \downarrow \rangle, |f_{bx}, \uparrow \rangle, |f_{bx}, \downarrow \rangle, |f_{by}, \uparrow \rangle, |f_{by}, \downarrow \rangle, |f_{bz}, \uparrow \rangle, |f_{bz}, \downarrow \rangle$

Table 7: (p,f) block.

No.	multipole	matrix
281	symmetry $\mathbb{Q}_{2,0}^{(a)}(E_g)$	$\begin{pmatrix} 0 & 0 & -\frac{\sqrt{21}}{28} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{35}}{28} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{21}}{28} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{35}}{28} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{21}}{28} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{35}}{28} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{21}}{28} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{35}}{28} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{21}}{14} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{21}}{14} & 0 & 0 & 0 & 0 & 0 & 0 \end{pmatrix}$
282	symmetry $\mathbb{Q}_{2,1}^{(a)}(E_g)$	$\begin{pmatrix} 0 & 0 & \frac{3\sqrt{7}}{28} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{105}}{84} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{3\sqrt{7}}{28} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{105}}{84} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{3\sqrt{7}}{28} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{105}}{84} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{7}}{28} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{105}}{84} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{105}}{42} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{105}}{42} \end{pmatrix}$
283	symmetry $\mathbb{Q}_{2,0}^{(a)}(T_g)$	$\begin{pmatrix} \frac{\sqrt{105}}{42} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{105}}{42} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}}{14} & 0 & 0 & 0 & 0 & -\frac{\sqrt{105}}{42} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}}{14} & 0 & 0 & 0 & 0 & -\frac{\sqrt{105}}{42} \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{7}}{14} & 0 & 0 & 0 & 0 & \frac{\sqrt{105}}{42} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}}{14} & 0 & 0 & 0 & 0 & \frac{\sqrt{105}}{42} & 0 & 0 & 0 \end{pmatrix}$
284	symmetry	$\sqrt{3}xz$

continued ...

Table 7

No.	multipole	matrix
	$\mathbb{Q}_{2,1}^{(a)}(T_g)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}}{14} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{105}}{42} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}}{14} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{105}}{42} \\ \frac{\sqrt{105}}{42} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{105}}{42} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{7}}{14} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{105}}{42} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{7}}{14} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{105}}{42} & 0 & 0 & 0 & 0 \end{bmatrix}$
285	symmetry	$\sqrt{3}xy$ $\begin{bmatrix} 0 & 0 & 0 & 0 & -\frac{\sqrt{7}}{14} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{105}}{42} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}}{14} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{105}}{42} & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{7}}{14} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{105}}{42} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{7}}{14} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{105}}{42} & 0 & 0 & 0 & 0 \\ \frac{\sqrt{105}}{42} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{105}}{42} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
286	symmetry	$\frac{\sqrt{21}(x^4 - 3x^2y^2 - 3x^2z^2 + y^4 - 3y^2z^2 + z^4)}{6}$ $\begin{bmatrix} 0 & 0 & \frac{\sqrt{3}}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{3}}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{6} & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
287	symmetry	$-\frac{\sqrt{15}(x^4 - 12x^2y^2 + 6x^2z^2 + y^4 + 6y^2z^2 - 2z^4)}{12}$ $\begin{bmatrix} 0 & 0 & -\frac{\sqrt{105}}{84} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{7}}{28} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{105}}{84} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{7}}{28} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{105}}{84} & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{7}}{28} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{105}}{84} & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{7}}{28} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{105}}{42} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{105}}{42} & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
288	symmetry	$\frac{\sqrt{5}(x-y)(x+y)(x^2+y^2-6z^2)}{4}$

continued ...

Table 7

No.	multipole	matrix
	$\mathbb{Q}_{4,1}^{(a)}(E_g)$	$\begin{bmatrix} 0 & 0 & \frac{\sqrt{35}}{28} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{21}}{28} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{35}}{28} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{21}}{28} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{35}}{28} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{21}}{28} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{35}}{28} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{21}}{28} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{21}}{14} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{21}}{14} & 0 \end{bmatrix}$
289	symmetry	$\frac{\sqrt{35}yz(y-z)(y+z)}{2}$ $\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}}{8} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{8} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}}{8} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{8} \\ 0 & 0 & 0 & 0 & \frac{\sqrt{5}}{8} & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{8} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{5}}{8} & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{8} & 0 & 0 & 0 \end{bmatrix}$
290	symmetry	$\frac{-\sqrt{35}xz(x-z)(x+z)}{2}$ $\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{5}}{8} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{8} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{5}}{8} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{8} \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{5}}{8} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{8} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{5}}{8} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{8} & 0 & 0 & 0 & 0 \end{bmatrix}$
291	symmetry	$\frac{\sqrt{35}xy(x-y)(x+y)}{2}$ $\begin{bmatrix} 0 & 0 & 0 & 0 & -\frac{\sqrt{5}}{8} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{8} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}}{8} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{8} & 0 & 0 \\ 0 & 0 & \frac{\sqrt{5}}{8} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{8} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{5}}{8} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{8} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
292	symmetry	$\frac{\sqrt{5}yz(6x^2-y^2-z^2)}{2}$

continued ...

Table 7

No.	multipole	matrix
	$\mathbb{Q}_{4,0}^{(a)}(T_g, 2)$	$\begin{bmatrix} \frac{\sqrt{21}}{14} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{21}}{14} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{35}}{56} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{21}}{56} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{35}}{56} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{21}}{56} \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{35}}{56} & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{21}}{56} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{35}}{56} & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{21}}{56} & 0 & 0 & 0 \end{bmatrix}$
293	symmetry	$-\frac{\sqrt{5}xz(x^2-6y^2+z^2)}{2}$
	$\mathbb{Q}_{4,1}^{(a)}(T_g, 2)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{35}}{56} & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{21}}{56} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{35}}{56} & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{21}}{56} \\ \frac{\sqrt{21}}{14} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{21}}{14} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{35}}{56} & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{21}}{56} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{35}}{56} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{21}}{56} & 0 & 0 & 0 & 0 \end{bmatrix}$
294	symmetry	$-\frac{\sqrt{5}xy(x^2+y^2-6z^2)}{2}$
	$\mathbb{Q}_{4,2}^{(a)}(T_g, 2)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & -\frac{\sqrt{35}}{56} & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{21}}{56} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{35}}{56} & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{21}}{56} & 0 & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{35}}{56} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{21}}{56} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{35}}{56} & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{21}}{56} & 0 & 0 & 0 & 0 & 0 \\ \frac{\sqrt{21}}{14} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{21}}{14} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
295	symmetry	$\frac{\sqrt{21}(x^4-3x^2y^2-3x^2z^2+y^4-3y^2z^2+z^4)}{6}$
	$\mathbb{Q}_4^{(1,-1;a)}(A_g)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & \frac{i}{8} & 0 & 0 & -\frac{1}{8} & 0 & 0 & -\frac{\sqrt{15}i}{24} & 0 & 0 & -\frac{\sqrt{15}}{24} \\ 0 & 0 & 0 & 0 & 0 & -\frac{i}{8} & \frac{1}{8} & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{24} & \frac{\sqrt{15}}{24} & 0 \\ 0 & 0 & -\frac{i}{8} & 0 & 0 & 0 & 0 & \frac{i}{8} & -\frac{\sqrt{15}i}{24} & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{24} \\ 0 & 0 & 0 & \frac{i}{8} & 0 & 0 & \frac{i}{8} & 0 & 0 & \frac{\sqrt{15}i}{24} & 0 & 0 & -\frac{\sqrt{15}i}{24} & 0 \\ 0 & 0 & 0 & \frac{1}{8} & 0 & -\frac{i}{8} & 0 & 0 & 0 & -\frac{\sqrt{15}}{24} & 0 & -\frac{\sqrt{15}i}{24} & 0 & 0 \\ 0 & 0 & -\frac{1}{8} & 0 & -\frac{i}{8} & 0 & 0 & 0 & \frac{\sqrt{15}}{24} & 0 & -\frac{\sqrt{15}i}{24} & 0 & 0 & 0 \end{bmatrix}$
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
	$\mathbb{Q}_{4,0}^{(1,-1;a)}(E_g)$	$\begin{bmatrix} 0 & \frac{\sqrt{21}i}{28} & 0 & 0 & \frac{\sqrt{35}i}{56} & 0 & 0 & -\frac{\sqrt{35}}{56} & 0 & 0 & -\frac{5\sqrt{21}i}{168} & 0 & 0 & \frac{\sqrt{21}}{168} \\ \frac{\sqrt{21}i}{28} & 0 & 0 & 0 & 0 & -\frac{\sqrt{35}i}{56} & \frac{\sqrt{35}}{56} & 0 & 0 & 0 & 0 & \frac{5\sqrt{21}i}{168} & -\frac{\sqrt{21}}{168} & 0 \\ 0 & -\frac{\sqrt{21}}{28} & -\frac{\sqrt{35}i}{56} & 0 & 0 & 0 & 0 & \frac{\sqrt{35}i}{56} & -\frac{5\sqrt{21}i}{168} & 0 & 0 & 0 & 0 & \frac{\sqrt{21}i}{168} \\ \frac{\sqrt{21}}{28} & 0 & 0 & \frac{\sqrt{35}i}{56} & 0 & 0 & \frac{\sqrt{35}i}{56} & 0 & 0 & \frac{5\sqrt{21}i}{168} & 0 & 0 & \frac{\sqrt{21}i}{168} & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{35}}{28} & 0 & \frac{\sqrt{35}i}{28} & 0 & 0 & 0 & \frac{\sqrt{21}}{42} & 0 & \frac{\sqrt{21}i}{42} & 0 & 0 \\ 0 & 0 & \frac{\sqrt{35}}{28} & 0 & \frac{\sqrt{35}i}{28} & 0 & 0 & 0 & -\frac{\sqrt{21}}{42} & 0 & \frac{\sqrt{21}i}{42} & 0 & 0 & 0 \end{bmatrix}$
297	symmetry	$\frac{\sqrt{5}(x-y)(x+y)(x^2+y^2-6z^2)}{4}$ $\begin{bmatrix} 0 & \frac{\sqrt{7}i}{28} & 0 & 0 & -\frac{\sqrt{105}i}{56} & 0 & 0 & \frac{\sqrt{105}}{56} & 0 & 0 & \frac{\sqrt{7}i}{56} & 0 & 0 & \frac{3\sqrt{7}}{56} \\ \frac{\sqrt{7}i}{28} & 0 & 0 & 0 & 0 & \frac{\sqrt{105}i}{56} & -\frac{\sqrt{105}}{56} & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}i}{56} & -\frac{3\sqrt{7}}{56} & 0 \\ 0 & \frac{\sqrt{7}}{28} & -\frac{\sqrt{105}i}{56} & 0 & 0 & 0 & 0 & \frac{\sqrt{105}i}{56} & -\frac{\sqrt{7}i}{56} & 0 & 0 & 0 & 0 & -\frac{3\sqrt{7}i}{56} \\ -\frac{\sqrt{7}}{28} & 0 & 0 & \frac{\sqrt{105}i}{56} & 0 & 0 & \frac{\sqrt{105}i}{56} & 0 & 0 & \frac{\sqrt{7}i}{56} & 0 & 0 & -\frac{3\sqrt{7}i}{56} & 0 \\ -\frac{\sqrt{7}i}{14} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}}{28} & 0 & -\frac{\sqrt{7}i}{28} & 0 & 0 \\ 0 & \frac{\sqrt{7}i}{14} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}}{28} & 0 & -\frac{\sqrt{7}i}{28} & 0 & 0 & 0 \end{bmatrix}$
298	symmetry	$\frac{\sqrt{35}yz(y-z)(y+z)}{2}$ $\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{16} & -\frac{\sqrt{15}i}{16} & 0 & 0 & 0 & 0 & \frac{3}{16} & -\frac{3i}{16} & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{16} & 0 & 0 & \frac{\sqrt{15}i}{16} & 0 & 0 & -\frac{3}{16} & 0 & 0 & \frac{3i}{16} \\ -\frac{i}{8} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{1}{8} & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{i}{8} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{1}{8} & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{1}{8} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{i}{8} & 0 & 0 & 0 & 0 & 0 \\ \frac{1}{8} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{i}{8} & 0 & 0 & 0 & 0 \end{bmatrix}$
299	symmetry	$-\frac{\sqrt{35}xz(x-z)(x+z)}{2}$ $\begin{bmatrix} -\frac{i}{8} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{i}{8} & 0 & 0 \\ 0 & \frac{i}{8} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{i}{8} & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{15}i}{16} & 0 & 0 & -\frac{\sqrt{15}i}{16} & 0 & 0 & -\frac{3i}{16} & 0 & 0 & \frac{3i}{16} & 0 \\ 0 & 0 & -\frac{\sqrt{15}i}{16} & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{16} & -\frac{3i}{16} & 0 & 0 & 0 & 0 & -\frac{3i}{16} \\ 0 & -\frac{i}{8} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{i}{8} & 0 & 0 & 0 & 0 \\ -\frac{i}{8} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{i}{8} & 0 & 0 & 0 \end{bmatrix}$
300	symmetry	$\frac{\sqrt{35}xy(x-y)(x+y)}{2}$

continued ...

Table 7

No.	multipole	matrix
	$\mathbb{Q}_{4,2}^{(1,-1;a)}(T_g, 1)$	$\begin{bmatrix} 0 & -\frac{1}{8} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{i}{8} \\ \frac{1}{8} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{i}{8} \\ 0 & -\frac{i}{8} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{1}{8} \\ -\frac{i}{8} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{1}{8} \\ 0 & 0 & 0 & -\frac{\sqrt{15}i}{16} & 0 & -\frac{\sqrt{15}}{16} & 0 & 0 & 0 & \frac{3i}{16} & 0 & -\frac{3}{16} & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{15}i}{16} & 0 & \frac{\sqrt{15}}{16} & 0 & 0 & 0 & \frac{3i}{16} & 0 & \frac{3}{16} & 0 & 0 & 0 \end{bmatrix}$
301	symmetry	$\frac{\sqrt{5}yz(6x^2-y^2-z^2)}{2}$ $\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{105}}{112} & -\frac{\sqrt{105}i}{112} & 0 & 0 & -\frac{\sqrt{7}i}{14} & 0 & \frac{\sqrt{7}}{112} & \frac{\sqrt{7}i}{112} & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{105}}{112} & 0 & 0 & \frac{\sqrt{105}i}{112} & -\frac{\sqrt{7}i}{14} & 0 & -\frac{\sqrt{7}}{112} & 0 & 0 & -\frac{\sqrt{7}i}{112} \\ -\frac{3\sqrt{7}i}{56} & 0 & 0 & \frac{\sqrt{105}}{56} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}}{28} & 0 & -\frac{\sqrt{7}i}{14} & 0 & 0 \\ 0 & \frac{3\sqrt{7}i}{56} & -\frac{\sqrt{105}}{56} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}}{28} & 0 & -\frac{\sqrt{7}i}{14} & 0 & 0 & 0 \\ 0 & \frac{3\sqrt{7}}{56} & -\frac{\sqrt{105}i}{56} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}i}{28} & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}i}{14} \\ -\frac{3\sqrt{7}}{56} & 0 & 0 & \frac{\sqrt{105}i}{56} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}i}{28} & 0 & 0 & 0 & -\frac{\sqrt{7}i}{14} \end{bmatrix}$
302	symmetry	$-\frac{\sqrt{5}xz(x^2-6y^2+z^2)}{2}$ $\begin{bmatrix} \frac{3\sqrt{7}i}{56} & 0 & 0 & 0 & 0 & -\frac{\sqrt{105}i}{56} & 0 & 0 & 0 & -\frac{\sqrt{7}}{14} & 0 & \frac{\sqrt{7}i}{28} & 0 & 0 \\ 0 & -\frac{3\sqrt{7}i}{56} & 0 & 0 & -\frac{\sqrt{105}i}{56} & 0 & 0 & 0 & \frac{\sqrt{7}}{14} & 0 & \frac{\sqrt{7}i}{28} & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{105}i}{112} & 0 & 0 & \frac{\sqrt{105}i}{112} & 0 & 0 & \frac{\sqrt{7}i}{112} & 0 & -\frac{\sqrt{7}}{14} & \frac{\sqrt{7}i}{112} & 0 \\ 0 & 0 & -\frac{\sqrt{105}i}{112} & 0 & 0 & 0 & 0 & -\frac{\sqrt{105}i}{112} & \frac{\sqrt{7}i}{112} & 0 & \frac{\sqrt{7}}{14} & 0 & 0 & -\frac{\sqrt{7}i}{112} \\ 0 & -\frac{3\sqrt{7}i}{56} & 0 & 0 & \frac{\sqrt{105}i}{56} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}i}{28} & 0 & 0 & -\frac{\sqrt{7}i}{14} \\ -\frac{3\sqrt{7}i}{56} & 0 & 0 & 0 & 0 & -\frac{\sqrt{105}i}{56} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}i}{28} & \frac{\sqrt{7}}{14} & 0 \end{bmatrix}$
303	symmetry	$-\frac{\sqrt{5}xy(x^2+y^2-6z^2)}{2}$ $\begin{bmatrix} 0 & -\frac{3\sqrt{7}}{56} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{105}i}{56} & -\frac{\sqrt{7}i}{14} & 0 & 0 & 0 & 0 & \frac{\sqrt{7}i}{28} \\ \frac{3\sqrt{7}}{56} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{105}i}{56} & 0 & 0 & \frac{\sqrt{7}i}{14} & 0 & 0 & \frac{\sqrt{7}i}{28} & 0 \\ 0 & \frac{3\sqrt{7}i}{56} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{105}}{56} & 0 & 0 & -\frac{\sqrt{7}i}{14} & 0 & 0 & \frac{\sqrt{7}}{28} \\ \frac{3\sqrt{7}i}{56} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{105}}{56} & 0 & 0 & 0 & \frac{\sqrt{7}i}{14} & -\frac{\sqrt{7}}{28} & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{105}i}{112} & 0 & -\frac{\sqrt{105}}{112} & 0 & 0 & 0 & \frac{\sqrt{7}i}{112} & 0 & \frac{\sqrt{7}}{112} & -\frac{\sqrt{7}i}{14} & 0 \\ 0 & 0 & \frac{\sqrt{105}i}{112} & 0 & \frac{\sqrt{105}}{112} & 0 & 0 & 0 & \frac{\sqrt{7}i}{112} & 0 & -\frac{\sqrt{7}}{112} & 0 & 0 & \frac{\sqrt{7}i}{14} \end{bmatrix}$
304	symmetry	$-\frac{x^2}{2} - \frac{y^2}{2} + z^2$

continued ...

Table 7

No.	multipole	matrix
	$\mathbb{Q}_{2,0}^{(1,0;a)}(E_g)$	$\begin{bmatrix} 0 & \frac{\sqrt{210}i}{84} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{14}}{28} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{210}}{84} \\ \frac{\sqrt{210}i}{84} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{14}}{28} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{210}}{84} & 0 \\ 0 & -\frac{\sqrt{210}}{84} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{14}i}{28} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{210}i}{84} \\ \frac{\sqrt{210}}{84} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{14}i}{28} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{210}i}{84} & 0 \\ 0 & 0 & 0 & \frac{\sqrt{14}}{28} & 0 & -\frac{\sqrt{14}i}{28} & 0 & 0 & 0 & \frac{\sqrt{210}}{84} & 0 & \frac{\sqrt{210}i}{84} & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{14}}{28} & 0 & -\frac{\sqrt{14}i}{28} & 0 & 0 & 0 & -\frac{\sqrt{210}}{84} & 0 & \frac{\sqrt{210}i}{84} & 0 & 0 & 0 \end{bmatrix}$
305	symmetry	$\frac{\sqrt{3}(x-y)(x+y)}{2}$ $\begin{bmatrix} 0 & \frac{\sqrt{70}i}{84} & 0 & 0 & \frac{\sqrt{42}i}{42} & 0 & 0 & -\frac{\sqrt{42}}{84} & 0 & 0 & \frac{\sqrt{70}i}{42} & 0 & 0 & \frac{\sqrt{70}}{84} \\ \frac{\sqrt{70}i}{84} & 0 & 0 & 0 & 0 & -\frac{\sqrt{42}i}{42} & \frac{\sqrt{42}}{84} & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}i}{42} & -\frac{\sqrt{70}}{84} & 0 \\ 0 & \frac{\sqrt{70}}{84} & \frac{\sqrt{42}i}{42} & 0 & 0 & 0 & 0 & -\frac{\sqrt{42}i}{84} & -\frac{\sqrt{70}i}{42} & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}i}{84} \\ -\frac{\sqrt{70}}{84} & 0 & 0 & -\frac{\sqrt{42}i}{42} & 0 & 0 & -\frac{\sqrt{42}i}{84} & 0 & 0 & \frac{\sqrt{70}i}{42} & 0 & 0 & -\frac{\sqrt{70}i}{84} & 0 \\ -\frac{\sqrt{70}i}{42} & 0 & 0 & -\frac{\sqrt{42}}{84} & 0 & -\frac{\sqrt{42}i}{84} & 0 & 0 & 0 & -\frac{\sqrt{70}}{84} & 0 & \frac{\sqrt{70}i}{84} & 0 & 0 \\ 0 & \frac{\sqrt{70}i}{42} & \frac{\sqrt{42}}{84} & 0 & -\frac{\sqrt{42}i}{84} & 0 & 0 & 0 & \frac{\sqrt{70}}{84} & 0 & \frac{\sqrt{70}i}{84} & 0 & 0 & 0 \end{bmatrix}$
306	symmetry	$\sqrt{3}yz$ $\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{42}}{84} & -\frac{\sqrt{42}i}{84} & 0 & 0 & \frac{\sqrt{70}i}{42} & 0 & \frac{\sqrt{70}}{84} & \frac{\sqrt{70}i}{84} & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{42}}{84} & 0 & 0 & \frac{\sqrt{42}i}{84} & \frac{\sqrt{70}i}{42} & 0 & -\frac{\sqrt{70}}{84} & 0 & 0 & -\frac{\sqrt{70}i}{84} \\ \frac{\sqrt{70}i}{84} & 0 & 0 & \frac{\sqrt{42}}{84} & 0 & \frac{\sqrt{42}i}{28} & 0 & 0 & 0 & -\frac{\sqrt{70}}{84} & 0 & -\frac{\sqrt{70}i}{84} & 0 & 0 \\ 0 & -\frac{\sqrt{70}i}{84} & -\frac{\sqrt{42}}{84} & 0 & \frac{\sqrt{42}i}{28} & 0 & 0 & 0 & \frac{\sqrt{70}}{84} & 0 & -\frac{\sqrt{70}i}{84} & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{70}}{84} & -\frac{\sqrt{42}i}{84} & 0 & 0 & 0 & -\frac{\sqrt{42}i}{28} & -\frac{\sqrt{70}i}{84} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}i}{84} \\ \frac{\sqrt{70}}{84} & 0 & 0 & \frac{\sqrt{42}i}{84} & 0 & 0 & -\frac{\sqrt{42}i}{28} & 0 & 0 & \frac{\sqrt{70}i}{84} & 0 & 0 & 0 & -\frac{\sqrt{70}i}{84} \end{bmatrix}$
307	symmetry	$\sqrt{3}xz$ $\begin{bmatrix} -\frac{\sqrt{70}i}{84} & 0 & 0 & -\frac{\sqrt{42}}{28} & 0 & -\frac{\sqrt{42}i}{84} & 0 & 0 & 0 & -\frac{\sqrt{70}}{84} & 0 & -\frac{\sqrt{70}i}{84} & 0 & 0 \\ 0 & \frac{\sqrt{70}i}{84} & \frac{\sqrt{42}}{28} & 0 & -\frac{\sqrt{42}i}{84} & 0 & 0 & 0 & \frac{\sqrt{70}}{84} & 0 & -\frac{\sqrt{70}i}{84} & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{42}i}{84} & 0 & 0 & \frac{\sqrt{42}i}{84} & 0 & 0 & \frac{\sqrt{70}i}{84} & 0 & \frac{\sqrt{70}}{42} & \frac{\sqrt{70}i}{84} & 0 \\ 0 & 0 & -\frac{\sqrt{42}i}{84} & 0 & 0 & 0 & 0 & -\frac{\sqrt{42}i}{84} & \frac{\sqrt{70}i}{84} & 0 & -\frac{\sqrt{70}}{42} & 0 & 0 & -\frac{\sqrt{70}i}{84} \\ 0 & \frac{\sqrt{70}i}{84} & 0 & 0 & \frac{\sqrt{42}i}{84} & 0 & 0 & \frac{\sqrt{42}}{28} & 0 & 0 & -\frac{\sqrt{70}i}{84} & 0 & 0 & -\frac{\sqrt{70}}{84} \\ \frac{\sqrt{70}i}{84} & 0 & 0 & 0 & 0 & -\frac{\sqrt{42}i}{84} & -\frac{\sqrt{42}}{28} & 0 & 0 & 0 & 0 & \frac{\sqrt{70}i}{84} & \frac{\sqrt{70}}{84} & 0 \end{bmatrix}$
308	symmetry	$\sqrt{3}xy$

continued ...

Table 7

No.	multipole	matrix
	$\mathbb{Q}_{2,2}^{(1,0;a)}(T_g)$	$\begin{bmatrix} 0 & \frac{\sqrt{70}}{84} & \frac{\sqrt{42}i}{28} & 0 & 0 & 0 & 0 & \frac{\sqrt{42}i}{84} & -\frac{\sqrt{70}i}{84} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}i}{84} \\ -\frac{\sqrt{70}}{84} & 0 & 0 & -\frac{\sqrt{42}i}{28} & 0 & 0 & \frac{\sqrt{42}i}{84} & 0 & 0 & \frac{\sqrt{70}i}{84} & 0 & 0 & 0 & -\frac{\sqrt{70}i}{84} & 0 \\ 0 & -\frac{\sqrt{70}i}{84} & 0 & 0 & -\frac{\sqrt{42}i}{28} & 0 & 0 & -\frac{\sqrt{42}}{84} & 0 & 0 & -\frac{\sqrt{70}i}{84} & 0 & 0 & 0 & -\frac{\sqrt{70}}{84} \\ -\frac{\sqrt{70}i}{84} & 0 & 0 & 0 & 0 & \frac{\sqrt{42}i}{28} & \frac{\sqrt{42}}{84} & 0 & 0 & 0 & 0 & \frac{\sqrt{70}i}{84} & \frac{\sqrt{70}}{84} & 0 \\ 0 & 0 & 0 & \frac{\sqrt{42}i}{84} & 0 & -\frac{\sqrt{42}}{84} & 0 & 0 & 0 & \frac{\sqrt{70}i}{84} & 0 & \frac{\sqrt{70}}{84} & \frac{\sqrt{70}i}{42} & 0 \\ 0 & 0 & \frac{\sqrt{42}i}{84} & 0 & \frac{\sqrt{42}}{84} & 0 & 0 & 0 & \frac{\sqrt{70}i}{84} & 0 & -\frac{\sqrt{70}}{84} & 0 & 0 & -\frac{\sqrt{70}i}{42} \end{bmatrix}$
309	symmetry	$\frac{\sqrt{21}(x^4 - 3x^2y^2 - 3x^2z^2 + y^4 - 3y^2z^2 + z^4)}{6}$ $\begin{bmatrix} 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{24} & 0 & 0 & -\frac{\sqrt{15}}{24} & 0 & 0 & \frac{i}{8} & 0 & 0 & \frac{1}{8} \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{24} & \frac{\sqrt{15}}{24} & 0 & 0 & 0 & 0 & -\frac{i}{8} & -\frac{1}{8} & 0 \\ 0 & 0 & -\frac{\sqrt{15}i}{24} & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{24} & \frac{i}{8} & 0 & 0 & 0 & 0 & \frac{i}{8} \\ 0 & 0 & 0 & \frac{\sqrt{15}i}{24} & 0 & 0 & \frac{\sqrt{15}i}{24} & 0 & 0 & -\frac{i}{8} & 0 & 0 & \frac{i}{8} & 0 \\ 0 & 0 & 0 & \frac{\sqrt{15}}{24} & 0 & -\frac{\sqrt{15}i}{24} & 0 & 0 & 0 & \frac{1}{8} & 0 & \frac{i}{8} & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{15}}{24} & 0 & -\frac{\sqrt{15}i}{24} & 0 & 0 & 0 & -\frac{1}{8} & 0 & \frac{i}{8} & 0 & 0 & 0 \end{bmatrix}$
310	symmetry	$-\frac{\sqrt{15}(x^4 - 12x^2y^2 + 6x^2z^2 + y^4 + 6y^2z^2 - 2z^4)}{12}$ $\begin{bmatrix} 0 & -\frac{3\sqrt{35}i}{140} & 0 & 0 & -\frac{\sqrt{21}i}{24} & 0 & 0 & -\frac{5\sqrt{21}}{168} & 0 & 0 & -\frac{\sqrt{35}i}{40} & 0 & 0 & -\frac{\sqrt{35}}{280} \\ -\frac{3\sqrt{35}i}{140} & 0 & 0 & 0 & 0 & \frac{\sqrt{21}i}{24} & \frac{5\sqrt{21}}{168} & 0 & 0 & 0 & 0 & \frac{\sqrt{35}i}{40} & \frac{\sqrt{35}}{280} & 0 \\ 0 & \frac{3\sqrt{35}}{140} & \frac{\sqrt{21}i}{24} & 0 & 0 & 0 & 0 & \frac{5\sqrt{21}i}{168} & -\frac{\sqrt{35}i}{40} & 0 & 0 & 0 & 0 & -\frac{\sqrt{35}i}{280} \\ -\frac{3\sqrt{35}}{140} & 0 & 0 & -\frac{\sqrt{21}i}{24} & 0 & 0 & \frac{5\sqrt{21}i}{168} & 0 & 0 & \frac{\sqrt{35}i}{40} & 0 & 0 & -\frac{\sqrt{35}i}{280} & 0 \\ 0 & 0 & 0 & \frac{\sqrt{21}}{84} & 0 & -\frac{\sqrt{21}i}{84} & 0 & 0 & 0 & \frac{\sqrt{35}}{35} & 0 & \frac{\sqrt{35}i}{35} & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{21}}{84} & 0 & -\frac{\sqrt{21}i}{84} & 0 & 0 & 0 & -\frac{\sqrt{35}}{35} & 0 & \frac{\sqrt{35}i}{35} & 0 & 0 & 0 \end{bmatrix}$
311	symmetry	$\frac{\sqrt{5}(x-y)(x+y)(x^2+y^2-6z^2)}{4}$ $\begin{bmatrix} 0 & -\frac{\sqrt{105}i}{140} & 0 & 0 & -\frac{\sqrt{7}i}{56} & 0 & 0 & -\frac{3\sqrt{7}}{56} & 0 & 0 & \frac{3\sqrt{105}i}{280} & 0 & 0 & \frac{\sqrt{105}}{56} \\ -\frac{\sqrt{105}i}{140} & 0 & 0 & 0 & 0 & \frac{\sqrt{7}i}{56} & \frac{3\sqrt{7}}{56} & 0 & 0 & 0 & 0 & -\frac{3\sqrt{105}i}{280} & -\frac{\sqrt{105}}{56} & 0 \\ 0 & -\frac{\sqrt{105}}{140} & -\frac{\sqrt{7}i}{56} & 0 & 0 & 0 & 0 & -\frac{3\sqrt{7}i}{56} & -\frac{3\sqrt{105}i}{280} & 0 & 0 & 0 & 0 & -\frac{\sqrt{105}i}{56} \\ \frac{\sqrt{105}}{140} & 0 & 0 & \frac{\sqrt{7}i}{56} & 0 & 0 & -\frac{3\sqrt{7}i}{56} & 0 & 0 & \frac{3\sqrt{105}i}{280} & 0 & 0 & -\frac{\sqrt{105}i}{56} & 0 \\ \frac{\sqrt{105}i}{70} & 0 & 0 & \frac{\sqrt{7}}{14} & 0 & \frac{\sqrt{7}i}{14} & 0 & 0 & 0 & \frac{\sqrt{105}}{140} & 0 & -\frac{\sqrt{105}i}{140} & 0 & 0 \\ 0 & -\frac{\sqrt{105}i}{70} & -\frac{\sqrt{7}}{14} & 0 & \frac{\sqrt{7}i}{14} & 0 & 0 & 0 & -\frac{\sqrt{105}}{140} & 0 & -\frac{\sqrt{105}i}{140} & 0 & 0 & 0 \end{bmatrix}$
312	symmetry	$\frac{\sqrt{35}yz(y-z)(y+z)}{2}$

continued ...

Table 7

No.	multipole	matrix
		$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & -\frac{1}{16} & -\frac{i}{16} & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{80} & -\frac{\sqrt{15}i}{80} & 0 \\ 0 & 0 & 0 & 0 & \frac{1}{16} & 0 & 0 & \frac{i}{16} & 0 & 0 & -\frac{\sqrt{15}}{80} & 0 & 0 & \frac{\sqrt{15}i}{80} \\ \frac{\sqrt{15}i}{40} & 0 & 0 & 0 & 0 & \frac{i}{4} & 0 & 0 & 0 & -\frac{\sqrt{15}}{40} & 0 & -\frac{\sqrt{15}i}{20} & 0 & 0 \\ 0 & -\frac{\sqrt{15}i}{40} & 0 & 0 & \frac{i}{4} & 0 & 0 & 0 & \frac{\sqrt{15}}{40} & 0 & -\frac{\sqrt{15}i}{20} & 0 & 0 & 0 \\ 0 & \frac{\sqrt{15}}{40} & 0 & 0 & 0 & 0 & 0 & \frac{i}{4} & \frac{\sqrt{15}i}{40} & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{20} \\ -\frac{\sqrt{15}}{40} & 0 & 0 & 0 & 0 & 0 & \frac{i}{4} & 0 & 0 & -\frac{\sqrt{15}i}{40} & 0 & 0 & \frac{\sqrt{15}i}{20} & 0 \end{bmatrix}$
313	symmetry	$-\frac{\sqrt{35}xz(x-z)(x+z)}{2}$ $\begin{bmatrix} \frac{\sqrt{15}i}{40} & 0 & 0 & \frac{1}{4} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{20} & 0 & \frac{\sqrt{15}i}{40} & 0 & 0 \\ 0 & -\frac{\sqrt{15}i}{40} & -\frac{1}{4} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{20} & 0 & \frac{\sqrt{15}i}{40} & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{i}{16} & 0 & 0 & -\frac{i}{16} & 0 & 0 & -\frac{\sqrt{15}i}{80} & 0 & 0 & \frac{\sqrt{15}i}{80} & 0 \\ 0 & 0 & -\frac{i}{16} & 0 & 0 & 0 & 0 & \frac{i}{16} & -\frac{\sqrt{15}i}{80} & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{80} \\ 0 & \frac{\sqrt{15}i}{40} & 0 & 0 & 0 & 0 & \frac{1}{4} & 0 & 0 & -\frac{\sqrt{15}i}{40} & 0 & 0 & -\frac{\sqrt{15}}{20} & 0 \\ \frac{\sqrt{15}i}{40} & 0 & 0 & 0 & 0 & 0 & -\frac{1}{4} & 0 & 0 & 0 & \frac{\sqrt{15}i}{40} & \frac{\sqrt{15}}{20} & 0 & 0 \end{bmatrix}$
314	symmetry	$\frac{\sqrt{35}xy(x-y)(x+y)}{2}$ $\begin{bmatrix} 0 & \frac{\sqrt{15}}{40} & \frac{i}{4} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{20} & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{40} \\ -\frac{\sqrt{15}}{40} & 0 & 0 & -\frac{i}{4} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{20} & 0 & 0 & 0 & -\frac{\sqrt{15}i}{40} & 0 \\ 0 & \frac{\sqrt{15}i}{40} & 0 & 0 & \frac{i}{4} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{20} & 0 & 0 & 0 & \frac{\sqrt{15}}{40} \\ \frac{\sqrt{15}i}{40} & 0 & 0 & 0 & 0 & -\frac{i}{4} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{20} & -\frac{\sqrt{15}}{40} & 0 & 0 \\ 0 & 0 & 0 & -\frac{i}{16} & 0 & -\frac{1}{16} & 0 & 0 & 0 & \frac{\sqrt{15}i}{80} & 0 & -\frac{\sqrt{15}}{80} & 0 & 0 & 0 \\ 0 & 0 & -\frac{i}{16} & 0 & \frac{1}{16} & 0 & 0 & 0 & \frac{\sqrt{15}i}{80} & 0 & \frac{\sqrt{15}}{80} & 0 & 0 & 0 & 0 \end{bmatrix}$
315	symmetry	$\frac{\sqrt{5}yz(6x^2-y^2-z^2)}{2}$ $\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}}{112} & -\frac{\sqrt{7}i}{112} & 0 & 0 & \frac{\sqrt{105}i}{70} & 0 & \frac{11\sqrt{105}}{560} & \frac{11\sqrt{105}i}{560} & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{7}}{112} & 0 & 0 & \frac{\sqrt{7}i}{112} & \frac{\sqrt{105}i}{70} & 0 & -\frac{11\sqrt{105}}{560} & 0 & 0 & -\frac{11\sqrt{105}i}{560} \\ -\frac{\sqrt{105}i}{56} & 0 & 0 & -\frac{3\sqrt{7}}{56} & 0 & -\frac{\sqrt{7}i}{28} & 0 & 0 & 0 & -\frac{\sqrt{105}}{140} & 0 & -\frac{\sqrt{105}i}{140} & 0 & 0 & 0 \\ 0 & \frac{\sqrt{105}i}{56} & \frac{3\sqrt{7}}{56} & 0 & -\frac{\sqrt{7}i}{28} & 0 & 0 & 0 & \frac{\sqrt{105}}{140} & 0 & -\frac{\sqrt{105}i}{140} & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{105}}{56} & \frac{3\sqrt{7}i}{56} & 0 & 0 & 0 & 0 & \frac{\sqrt{7}i}{28} & -\frac{\sqrt{105}i}{140} & 0 & 0 & 0 & 0 & -\frac{\sqrt{105}i}{140} & 0 \\ -\frac{\sqrt{105}}{56} & 0 & 0 & -\frac{3\sqrt{7}i}{56} & 0 & 0 & \frac{\sqrt{7}i}{28} & 0 & 0 & \frac{\sqrt{105}i}{140} & 0 & 0 & -\frac{\sqrt{105}i}{140} & 0 & 0 \end{bmatrix}$
316	symmetry	$-\frac{\sqrt{5}xz(x^2-6y^2+z^2)}{2}$

continued ...

Table 7

No.	multipole	matrix
		$\begin{bmatrix} \frac{\sqrt{105}i}{56} & 0 & 0 & \frac{\sqrt{7}}{28} & 0 & \frac{3\sqrt{7}i}{56} & 0 & 0 & 0 & -\frac{\sqrt{105}}{140} & 0 & -\frac{\sqrt{105}i}{140} & 0 & 0 \\ 0 & -\frac{\sqrt{105}i}{56} & -\frac{\sqrt{7}}{28} & 0 & \frac{3\sqrt{7}i}{56} & 0 & 0 & 0 & \frac{\sqrt{105}}{140} & 0 & -\frac{\sqrt{105}i}{140} & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{7}i}{112} & 0 & 0 & \frac{\sqrt{7}i}{112} & 0 & 0 & \frac{11\sqrt{105}i}{560} & 0 & \frac{\sqrt{105}}{70} & \frac{11\sqrt{105}i}{560} & 0 \\ 0 & 0 & -\frac{\sqrt{7}i}{112} & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}i}{112} & \frac{11\sqrt{105}i}{560} & 0 & -\frac{\sqrt{105}}{70} & 0 & 0 & -\frac{11\sqrt{105}i}{560} \\ 0 & -\frac{\sqrt{105}i}{56} & 0 & 0 & -\frac{3\sqrt{7}i}{56} & 0 & 0 & -\frac{\sqrt{7}}{28} & 0 & 0 & -\frac{\sqrt{105}i}{140} & 0 & 0 & -\frac{\sqrt{105}}{140} \\ -\frac{\sqrt{105}i}{56} & 0 & 0 & 0 & 0 & \frac{3\sqrt{7}i}{56} & \frac{\sqrt{7}}{28} & 0 & 0 & 0 & \frac{\sqrt{105}i}{140} & \frac{\sqrt{105}}{140} & 0 & 0 \end{bmatrix}$
317	symmetry	$-\frac{\sqrt{5}xy(x^2+y^2-6z^2)}{2}$
		$\begin{bmatrix} 0 & -\frac{\sqrt{105}}{56} & -\frac{\sqrt{7}i}{28} & 0 & 0 & 0 & 0 & -\frac{3\sqrt{7}i}{56} & -\frac{\sqrt{105}i}{140} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{105}i}{140} \\ \frac{\sqrt{105}}{56} & 0 & 0 & \frac{\sqrt{7}i}{28} & 0 & 0 & -\frac{3\sqrt{7}i}{56} & 0 & 0 & \frac{\sqrt{105}i}{140} & 0 & 0 & 0 & -\frac{\sqrt{105}i}{140} & 0 \\ 0 & \frac{\sqrt{105}i}{56} & 0 & 0 & \frac{\sqrt{7}i}{28} & 0 & 0 & \frac{3\sqrt{7}}{56} & 0 & 0 & -\frac{\sqrt{105}i}{140} & 0 & 0 & -\frac{\sqrt{105}}{140} & 0 \\ \frac{\sqrt{105}i}{56} & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}i}{28} & -\frac{3\sqrt{7}}{56} & 0 & 0 & 0 & 0 & \frac{\sqrt{105}i}{140} & \frac{\sqrt{105}}{140} & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{7}i}{112} & 0 & -\frac{\sqrt{7}}{112} & 0 & 0 & 0 & \frac{11\sqrt{105}i}{560} & 0 & \frac{11\sqrt{105}}{560} & \frac{\sqrt{105}i}{70} & 0 & 0 \\ 0 & 0 & \frac{\sqrt{7}i}{112} & 0 & \frac{\sqrt{7}}{112} & 0 & 0 & 0 & \frac{11\sqrt{105}i}{560} & 0 & -\frac{11\sqrt{105}}{560} & 0 & 0 & -\frac{\sqrt{105}i}{70} & 0 \end{bmatrix}$
318	symmetry	$-\frac{x^2}{2} - \frac{y^2}{2} + z^2$
		$\begin{bmatrix} 0 & -\frac{\sqrt{105}i}{84} & 0 & 0 & \frac{3\sqrt{7}i}{56} & 0 & 0 & \frac{\sqrt{7}}{14} & 0 & 0 & -\frac{\sqrt{105}i}{56} & 0 & 0 & 0 & \frac{\sqrt{105}}{84} \\ -\frac{\sqrt{105}i}{84} & 0 & 0 & 0 & 0 & -\frac{3\sqrt{7}i}{56} & -\frac{\sqrt{7}}{14} & 0 & 0 & 0 & 0 & \frac{\sqrt{105}i}{56} & -\frac{\sqrt{105}}{84} & 0 & 0 \\ 0 & \frac{\sqrt{105}}{84} & -\frac{3\sqrt{7}i}{56} & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}i}{14} & -\frac{\sqrt{105}i}{56} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{105}i}{84} & 0 \\ -\frac{\sqrt{105}}{84} & 0 & 0 & \frac{3\sqrt{7}i}{56} & 0 & 0 & -\frac{\sqrt{7}i}{14} & 0 & 0 & \frac{\sqrt{105}i}{56} & 0 & 0 & 0 & \frac{\sqrt{105}i}{84} & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{7}}{56} & 0 & -\frac{\sqrt{7}i}{56} & 0 & 0 & 0 & \frac{\sqrt{105}}{168} & 0 & \frac{\sqrt{105}}{168} & 0 & \frac{\sqrt{105}i}{168} & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{7}}{56} & 0 & -\frac{\sqrt{7}i}{56} & 0 & 0 & 0 & -\frac{\sqrt{105}}{168} & 0 & \frac{\sqrt{105}i}{168} & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
319	symmetry	$\frac{\sqrt{3}(x-y)(x+y)}{2}$
		$\begin{bmatrix} 0 & -\frac{\sqrt{35}i}{84} & 0 & 0 & \frac{5\sqrt{21}i}{168} & 0 & 0 & \frac{\sqrt{21}}{84} & 0 & 0 & -\frac{\sqrt{35}i}{168} & 0 & 0 & 0 & \frac{\sqrt{35}}{42} \\ -\frac{\sqrt{35}i}{84} & 0 & 0 & 0 & 0 & -\frac{5\sqrt{21}i}{168} & -\frac{\sqrt{21}}{84} & 0 & 0 & 0 & 0 & \frac{\sqrt{35}i}{168} & -\frac{\sqrt{35}}{42} & 0 & 0 \\ 0 & -\frac{\sqrt{35}}{84} & \frac{5\sqrt{21}i}{168} & 0 & 0 & 0 & 0 & \frac{\sqrt{21}i}{84} & \frac{\sqrt{35}i}{168} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{35}i}{42} & 0 \\ \frac{\sqrt{35}}{84} & 0 & 0 & -\frac{5\sqrt{21}i}{168} & 0 & 0 & \frac{\sqrt{21}i}{84} & 0 & 0 & -\frac{\sqrt{35}i}{168} & 0 & 0 & 0 & -\frac{\sqrt{35}i}{42} & 0 & 0 \\ \frac{\sqrt{35}i}{42} & 0 & 0 & -\frac{\sqrt{21}}{24} & 0 & -\frac{\sqrt{21}i}{24} & 0 & 0 & 0 & \frac{5\sqrt{35}}{168} & 0 & -\frac{5\sqrt{35}i}{168} & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{35}i}{42} & \frac{\sqrt{21}}{24} & 0 & -\frac{\sqrt{21}i}{24} & 0 & 0 & 0 & -\frac{5\sqrt{35}}{168} & 0 & -\frac{5\sqrt{35}i}{168} & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
320	symmetry	$\sqrt{3}yz$

continued ...

Table 7

No.	multipole	matrix
	$\mathbb{Q}_{2,0}^{(1,1;a)}(T_g)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{21}}{21} & \frac{\sqrt{21}i}{21} & 0 & 0 & -\frac{\sqrt{35}i}{42} & 0 & \frac{\sqrt{35}}{42} & \frac{\sqrt{35}i}{42} & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{21}}{21} & 0 & 0 & -\frac{\sqrt{21}i}{21} & -\frac{\sqrt{35}i}{42} & 0 & -\frac{\sqrt{35}}{42} & 0 & 0 & -\frac{\sqrt{35}i}{42} \\ \frac{\sqrt{35}i}{42} & 0 & 0 & -\frac{\sqrt{21}}{84} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{35}}{84} & 0 & -\frac{\sqrt{35}i}{42} & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{35}i}{42} & \frac{\sqrt{21}}{84} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{35}}{84} & 0 & -\frac{\sqrt{35}i}{42} & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{35}}{42} & \frac{\sqrt{21}i}{84} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{35}i}{84} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{35}i}{42} \\ \frac{\sqrt{35}}{42} & 0 & 0 & -\frac{\sqrt{21}i}{84} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{35}i}{84} & 0 & 0 & 0 & -\frac{\sqrt{35}i}{42} & 0 \end{bmatrix}$
321	symmetry	$\sqrt{3}xz$
	$\mathbb{Q}_{2,1}^{(1,1;a)}(T_g)$	$\begin{bmatrix} -\frac{\sqrt{35}i}{42} & 0 & 0 & 0 & 0 & \frac{\sqrt{21}i}{84} & 0 & 0 & 0 & -\frac{\sqrt{35}}{42} & 0 & \frac{\sqrt{35}i}{84} & 0 & 0 \\ 0 & \frac{\sqrt{35}i}{42} & 0 & 0 & \frac{\sqrt{21}i}{84} & 0 & 0 & 0 & \frac{\sqrt{35}}{42} & 0 & \frac{\sqrt{35}i}{84} & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{21}i}{21} & 0 & 0 & -\frac{\sqrt{21}i}{21} & 0 & 0 & \frac{\sqrt{35}i}{42} & 0 & -\frac{\sqrt{35}}{42} & \frac{\sqrt{35}i}{42} & 0 \\ 0 & 0 & \frac{\sqrt{21}i}{21} & 0 & 0 & 0 & 0 & \frac{\sqrt{21}i}{21} & \frac{\sqrt{35}i}{42} & 0 & \frac{\sqrt{35}}{42} & 0 & 0 & -\frac{\sqrt{35}i}{42} \\ 0 & \frac{\sqrt{35}i}{42} & 0 & 0 & -\frac{\sqrt{21}i}{84} & 0 & 0 & 0 & 0 & \frac{\sqrt{35}i}{84} & 0 & 0 & 0 & -\frac{\sqrt{35}}{42} \\ \frac{\sqrt{35}i}{42} & 0 & 0 & 0 & 0 & \frac{\sqrt{21}i}{84} & 0 & 0 & 0 & 0 & -\frac{\sqrt{35}i}{84} & \frac{\sqrt{35}}{42} & 0 & 0 \end{bmatrix}$
322	symmetry	$\sqrt{3}xy$
	$\mathbb{Q}_{2,2}^{(1,1;a)}(T_g)$	$\begin{bmatrix} 0 & \frac{\sqrt{35}}{42} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{21}i}{84} & -\frac{\sqrt{35}i}{42} & 0 & 0 & 0 & 0 & \frac{\sqrt{35}i}{84} \\ -\frac{\sqrt{35}}{42} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{21}i}{84} & 0 & 0 & \frac{\sqrt{35}i}{42} & 0 & 0 & \frac{\sqrt{35}i}{84} & 0 \\ 0 & -\frac{\sqrt{35}i}{42} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{21}}{84} & 0 & 0 & -\frac{\sqrt{35}i}{42} & 0 & 0 & \frac{\sqrt{35}}{84} \\ -\frac{\sqrt{35}i}{42} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{21}}{84} & 0 & 0 & 0 & 0 & \frac{\sqrt{35}i}{42} & -\frac{\sqrt{35}}{84} & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{21}i}{21} & 0 & \frac{\sqrt{21}}{21} & 0 & 0 & 0 & \frac{\sqrt{35}i}{42} & 0 & \frac{\sqrt{35}}{42} & -\frac{\sqrt{35}i}{42} & 0 \\ 0 & 0 & -\frac{\sqrt{21}i}{21} & 0 & -\frac{\sqrt{21}}{21} & 0 & 0 & 0 & \frac{\sqrt{35}i}{42} & 0 & -\frac{\sqrt{35}}{42} & 0 & 0 & \frac{\sqrt{35}i}{42} \end{bmatrix}$
323	symmetry	$\sqrt{15}xyz$
	$\mathbb{G}_3^{(a)}(A_g)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{6} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{6} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{6} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{6} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{6} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{6} \end{bmatrix}$
324	symmetry	$\frac{x(2x^2-3y^2-3z^2)}{2}$

continued ...

Table 7

No.	multipole	matrix
	$\mathbb{G}_{3,0}^{(a)}(T_g, 1)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{8} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{5}}{8} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{8} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{5}}{8} \\ 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{8} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{5}}{8} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{8} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{5}}{8} & 0 & 0 \end{bmatrix}$
325	symmetry	$-\frac{y(3x^2 - 2y^2 + 3z^2)}{2}$ $\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{8} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{5}}{8} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{8} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{5}}{8} \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{3}}{8} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{5}}{8} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{3}}{8} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{5}}{8} & 0 & 0 & 0 & 0 \end{bmatrix}$
326	symmetry	$-\frac{z(3x^2 + 3y^2 - 2z^2)}{2}$ $\begin{bmatrix} 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{8} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{5}}{8} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{8} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{5}}{8} & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{3}}{8} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{5}}{8} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{3}}{8} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{5}}{8} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
327	symmetry	$\frac{\sqrt{15}x(y-z)(y+z)}{2}$ $\begin{bmatrix} -\frac{\sqrt{3}}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{3}}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}}{8} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{24} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}}{8} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{24} \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{5}}{8} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{24} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}}{8} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{24} & 0 & 0 & 0 \end{bmatrix}$
328	symmetry	$-\frac{\sqrt{15}y(x-z)(x+z)}{2}$

continued ...

Table 7

No.	multipole	matrix
	$\mathbb{G}_{3,1}^{(a)}(T_g, 2)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}}{8} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{24} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}}{8} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{24} \\ -\frac{\sqrt{3}}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{3}}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{5}}{8} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{24} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{5}}{8} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{24} & 0 & 0 & 0 & 0 \end{bmatrix}$
329	symmetry	$\frac{\sqrt{15}z(x-y)(x+y)}{2}$ $\begin{bmatrix} 0 & 0 & 0 & 0 & -\frac{\sqrt{5}}{8} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{24} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}}{8} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{24} & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{5}}{8} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{24} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{5}}{8} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{24} & 0 & 0 & 0 & 0 \\ -\frac{\sqrt{3}}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{3}}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
330	symmetry	$\frac{\sqrt{15}xyz}{2}$ $\begin{bmatrix} 0 & \frac{\sqrt{35}i}{42} & 0 & 0 & -\frac{\sqrt{21}i}{42} & 0 & 0 & -\frac{\sqrt{21}}{42} & 0 & 0 & -\frac{\sqrt{35}i}{42} & 0 & 0 & \frac{\sqrt{35}}{42} \\ \frac{\sqrt{35}i}{42} & 0 & 0 & 0 & 0 & \frac{\sqrt{21}i}{42} & \frac{\sqrt{21}}{42} & 0 & 0 & 0 & 0 & \frac{\sqrt{35}i}{42} & -\frac{\sqrt{35}}{42} & 0 \\ 0 & \frac{\sqrt{35}}{42} & -\frac{\sqrt{21}i}{42} & 0 & 0 & 0 & 0 & -\frac{\sqrt{21}i}{42} & \frac{\sqrt{35}i}{42} & 0 & 0 & 0 & 0 & -\frac{\sqrt{35}i}{42} \\ -\frac{\sqrt{35}}{42} & 0 & 0 & \frac{\sqrt{21}i}{42} & 0 & 0 & -\frac{\sqrt{21}i}{42} & 0 & 0 & -\frac{\sqrt{35}i}{42} & 0 & 0 & -\frac{\sqrt{35}i}{42} & 0 \\ \frac{\sqrt{35}i}{42} & 0 & 0 & -\frac{\sqrt{21}}{42} & 0 & -\frac{\sqrt{21}i}{42} & 0 & 0 & 0 & -\frac{\sqrt{35}}{42} & 0 & \frac{\sqrt{35}i}{42} & 0 & 0 \\ 0 & -\frac{\sqrt{35}i}{42} & \frac{\sqrt{21}}{42} & 0 & -\frac{\sqrt{21}i}{42} & 0 & 0 & 0 & \frac{\sqrt{35}}{42} & 0 & \frac{\sqrt{35}i}{42} & 0 & 0 & 0 \end{bmatrix}$
331	symmetry	$\frac{x(2x^2-3y^2-3z^2)}{2}$ $\begin{bmatrix} 0 & 0 & 0 & \frac{3\sqrt{35}i}{70} & 0 & \frac{\sqrt{35}}{70} & \frac{\sqrt{35}i}{70} & 0 & 0 & 0 & 0 & \frac{\sqrt{21}}{42} & -\frac{\sqrt{21}i}{42} & 0 \\ 0 & 0 & \frac{3\sqrt{35}i}{70} & 0 & -\frac{\sqrt{35}}{70} & 0 & 0 & -\frac{\sqrt{35}i}{70} & 0 & 0 & -\frac{\sqrt{21}}{42} & 0 & 0 & \frac{\sqrt{21}i}{42} \\ -\frac{\sqrt{21}i}{42} & 0 & 0 & \frac{\sqrt{35}}{70} & 0 & -\frac{3\sqrt{35}i}{140} & 0 & 0 & 0 & -\frac{\sqrt{21}}{42} & 0 & -\frac{\sqrt{21}i}{28} & 0 & 0 \\ 0 & \frac{\sqrt{21}i}{42} & -\frac{\sqrt{35}}{70} & 0 & -\frac{3\sqrt{35}i}{140} & 0 & 0 & 0 & \frac{\sqrt{21}}{42} & 0 & -\frac{\sqrt{21}i}{28} & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{21}}{42} & \frac{\sqrt{35}i}{70} & 0 & 0 & 0 & 0 & -\frac{3\sqrt{35}i}{140} & \frac{\sqrt{21}i}{42} & 0 & 0 & 0 & 0 & \frac{\sqrt{21}i}{28} \\ \frac{\sqrt{21}}{42} & 0 & 0 & -\frac{\sqrt{35}i}{70} & 0 & 0 & -\frac{3\sqrt{35}i}{140} & 0 & 0 & -\frac{\sqrt{21}i}{42} & 0 & 0 & 0 & \frac{\sqrt{21}i}{28} \end{bmatrix}$
332	symmetry	$-\frac{y(3x^2-2y^2+3z^2)}{2}$

continued ...

Table 7

No.	multipole	matrix
		$\begin{bmatrix} -\frac{\sqrt{21}i}{42} & 0 & 0 & -\frac{3\sqrt{35}}{140} & 0 & \frac{\sqrt{35}i}{70} & 0 & 0 & 0 & \frac{\sqrt{21}}{28} & 0 & \frac{\sqrt{21}i}{42} & 0 & 0 \\ 0 & \frac{\sqrt{21}i}{42} & \frac{3\sqrt{35}}{140} & 0 & \frac{\sqrt{35}i}{70} & 0 & 0 & 0 & -\frac{\sqrt{21}}{28} & 0 & \frac{\sqrt{21}i}{42} & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{35}i}{70} & 0 & \frac{3\sqrt{35}}{70} & \frac{\sqrt{35}i}{70} & 0 & 0 & -\frac{\sqrt{21}i}{42} & 0 & 0 & 0 & \frac{\sqrt{21}i}{42} \\ 0 & 0 & \frac{\sqrt{35}i}{70} & 0 & -\frac{3\sqrt{35}}{70} & 0 & 0 & -\frac{\sqrt{35}i}{70} & -\frac{\sqrt{21}i}{42} & 0 & 0 & 0 & 0 & -\frac{\sqrt{21}i}{42} \\ 0 & -\frac{\sqrt{21}i}{42} & 0 & 0 & \frac{\sqrt{35}i}{70} & 0 & 0 & -\frac{3\sqrt{35}}{140} & 0 & 0 & -\frac{\sqrt{21}i}{42} & 0 & 0 & -\frac{\sqrt{21}}{28} \\ -\frac{\sqrt{21}i}{42} & 0 & 0 & 0 & 0 & -\frac{\sqrt{35}i}{70} & \frac{3\sqrt{35}}{140} & 0 & 0 & 0 & 0 & \frac{\sqrt{21}i}{42} & \frac{\sqrt{21}}{28} & 0 \end{bmatrix}$
333	symmetry	$-\frac{z(3x^2+3y^2-2z^2)}{2}$
		$\begin{bmatrix} 0 & -\frac{\sqrt{21}}{42} & -\frac{3\sqrt{35}i}{140} & 0 & 0 & 0 & 0 & \frac{\sqrt{35}i}{70} & -\frac{\sqrt{21}i}{28} & 0 & 0 & 0 & 0 & -\frac{\sqrt{21}i}{42} \\ \frac{\sqrt{21}}{42} & 0 & 0 & \frac{3\sqrt{35}i}{140} & 0 & 0 & \frac{\sqrt{35}i}{70} & 0 & 0 & \frac{\sqrt{21}i}{28} & 0 & 0 & -\frac{\sqrt{21}i}{42} & 0 \\ 0 & -\frac{\sqrt{21}i}{42} & 0 & 0 & -\frac{3\sqrt{35}i}{140} & 0 & 0 & \frac{\sqrt{35}}{70} & 0 & 0 & \frac{\sqrt{21}i}{28} & 0 & 0 & \frac{\sqrt{21}}{42} \\ -\frac{\sqrt{21}i}{42} & 0 & 0 & 0 & 0 & \frac{3\sqrt{35}i}{140} & -\frac{\sqrt{35}}{70} & 0 & 0 & 0 & 0 & -\frac{\sqrt{21}i}{28} & -\frac{\sqrt{21}}{42} & 0 \\ 0 & 0 & 0 & \frac{\sqrt{35}i}{70} & 0 & \frac{\sqrt{35}}{70} & \frac{3\sqrt{35}i}{70} & 0 & 0 & \frac{\sqrt{21}i}{42} & 0 & -\frac{\sqrt{21}}{42} & 0 & 0 \\ 0 & 0 & \frac{\sqrt{35}i}{70} & 0 & -\frac{\sqrt{35}}{70} & 0 & 0 & -\frac{3\sqrt{35}i}{70} & \frac{\sqrt{21}i}{42} & 0 & \frac{\sqrt{21}}{42} & 0 & 0 & 0 \end{bmatrix}$
334	symmetry	$\frac{\sqrt{15}x(y-z)(y+z)}{2}$
		$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{21}}{42} & \frac{\sqrt{21}i}{42} & 0 & 0 & \frac{\sqrt{35}i}{42} & 0 & -\frac{\sqrt{35}}{42} & -\frac{\sqrt{35}i}{42} & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{21}}{42} & 0 & 0 & -\frac{\sqrt{21}i}{42} & \frac{\sqrt{35}i}{42} & 0 & \frac{\sqrt{35}}{42} & 0 & 0 & \frac{\sqrt{35}i}{42} \\ -\frac{\sqrt{35}i}{42} & 0 & 0 & -\frac{\sqrt{21}}{42} & 0 & \frac{\sqrt{21}i}{28} & 0 & 0 & 0 & \frac{\sqrt{35}}{42} & 0 & -\frac{\sqrt{35}i}{84} & 0 & 0 \\ 0 & \frac{\sqrt{35}i}{42} & \frac{\sqrt{21}}{42} & 0 & \frac{\sqrt{21}i}{28} & 0 & 0 & 0 & -\frac{\sqrt{35}}{42} & 0 & -\frac{\sqrt{35}i}{84} & 0 & 0 & 0 \\ 0 & \frac{\sqrt{35}}{42} & \frac{\sqrt{21}i}{42} & 0 & 0 & 0 & 0 & -\frac{\sqrt{21}i}{28} & \frac{\sqrt{35}i}{42} & 0 & 0 & 0 & 0 & -\frac{\sqrt{35}i}{84} \\ -\frac{\sqrt{35}}{42} & 0 & 0 & -\frac{\sqrt{21}i}{42} & 0 & 0 & -\frac{\sqrt{21}i}{28} & 0 & 0 & -\frac{\sqrt{35}i}{42} & 0 & 0 & 0 & -\frac{\sqrt{35}i}{84} \end{bmatrix}$
335	symmetry	$-\frac{\sqrt{15}y(x-z)(x+z)}{2}$
		$\begin{bmatrix} \frac{\sqrt{35}i}{42} & 0 & 0 & -\frac{\sqrt{21}}{28} & 0 & \frac{\sqrt{21}i}{42} & 0 & 0 & 0 & -\frac{\sqrt{35}}{84} & 0 & \frac{\sqrt{35}i}{42} & 0 & 0 \\ 0 & -\frac{\sqrt{35}i}{42} & \frac{\sqrt{21}}{28} & 0 & \frac{\sqrt{21}i}{42} & 0 & 0 & 0 & \frac{\sqrt{35}}{84} & 0 & \frac{\sqrt{35}i}{42} & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{21}i}{42} & 0 & 0 & -\frac{\sqrt{21}i}{42} & 0 & 0 & -\frac{\sqrt{35}i}{42} & 0 & \frac{\sqrt{35}}{42} & -\frac{\sqrt{35}i}{42} & 0 \\ 0 & 0 & \frac{\sqrt{21}i}{42} & 0 & 0 & 0 & 0 & \frac{\sqrt{21}i}{42} & -\frac{\sqrt{35}i}{42} & 0 & -\frac{\sqrt{35}}{42} & 0 & 0 & \frac{\sqrt{35}i}{42} \\ 0 & -\frac{\sqrt{35}i}{42} & 0 & 0 & -\frac{\sqrt{21}i}{42} & 0 & 0 & \frac{\sqrt{21}i}{28} & 0 & 0 & \frac{\sqrt{35}i}{42} & 0 & 0 & -\frac{\sqrt{35}}{84} \\ -\frac{\sqrt{35}i}{42} & 0 & 0 & 0 & 0 & \frac{\sqrt{21}i}{42} & -\frac{\sqrt{21}}{28} & 0 & 0 & 0 & 0 & -\frac{\sqrt{35}i}{42} & \frac{\sqrt{35}}{84} & 0 \end{bmatrix}$
336	symmetry	$\frac{\sqrt{15}z(x-y)(x+y)}{2}$

continued ...

Table 7

No.	multipole	matrix
	$\mathbb{G}_{3,2}^{(1,-1;a)}(T_g, 2)$	$\begin{bmatrix} 0 & -\frac{\sqrt{35}}{42} & \frac{\sqrt{21}i}{28} & 0 & 0 & 0 & 0 & -\frac{\sqrt{21}i}{42} & -\frac{\sqrt{35}i}{84} & 0 & 0 & 0 & 0 & \frac{\sqrt{35}i}{42} \\ \frac{\sqrt{35}}{42} & 0 & 0 & -\frac{\sqrt{21}i}{28} & 0 & 0 & -\frac{\sqrt{21}i}{42} & 0 & 0 & \frac{\sqrt{35}i}{84} & 0 & 0 & 0 & \frac{\sqrt{35}i}{42} & 0 \\ 0 & \frac{\sqrt{35}i}{42} & 0 & 0 & -\frac{\sqrt{21}i}{28} & 0 & 0 & \frac{\sqrt{21}}{42} & 0 & 0 & -\frac{\sqrt{35}i}{84} & 0 & 0 & 0 & \frac{\sqrt{35}}{42} \\ \frac{\sqrt{35}i}{42} & 0 & 0 & 0 & 0 & \frac{\sqrt{21}i}{28} & -\frac{\sqrt{21}}{42} & 0 & 0 & 0 & 0 & \frac{\sqrt{35}i}{84} & -\frac{\sqrt{35}}{42} & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{21}i}{42} & 0 & \frac{\sqrt{21}}{42} & 0 & 0 & 0 & -\frac{\sqrt{35}i}{42} & 0 & -\frac{\sqrt{35}}{42} & \frac{\sqrt{35}i}{42} & 0 \\ 0 & 0 & -\frac{\sqrt{21}i}{42} & 0 & -\frac{\sqrt{21}}{42} & 0 & 0 & 0 & -\frac{\sqrt{35}i}{42} & 0 & \frac{\sqrt{35}}{42} & 0 & 0 & -\frac{\sqrt{35}i}{42} \end{bmatrix}$
337	symmetry	$\frac{3\sqrt{35}xyz(x-y)(x+y)}{2}$ $\begin{bmatrix} 0 & \frac{\sqrt{15}i}{20} & 0 & 0 & -\frac{i}{8} & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{40} & 0 & 0 & 0 & \frac{\sqrt{15}}{20} \\ \frac{\sqrt{15}i}{20} & 0 & 0 & 0 & 0 & \frac{i}{8} & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{40} & -\frac{\sqrt{15}}{20} & 0 & 0 \\ 0 & -\frac{\sqrt{15}}{20} & \frac{i}{8} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{40} & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{20} \\ \frac{\sqrt{15}}{20} & 0 & 0 & -\frac{i}{8} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{40} & 0 & 0 & \frac{\sqrt{15}i}{20} & 0 \\ 0 & 0 & 0 & \frac{1}{8} & 0 & -\frac{i}{8} & 0 & 0 & 0 & -\frac{\sqrt{15}}{40} & 0 & -\frac{\sqrt{15}i}{40} & 0 & 0 \\ 0 & 0 & -\frac{1}{8} & 0 & -\frac{i}{8} & 0 & 0 & 0 & \frac{\sqrt{15}}{40} & 0 & -\frac{\sqrt{15}i}{40} & 0 & 0 & 0 \end{bmatrix}$
338	symmetry	$\frac{\sqrt{105}xyz(x^2+y^2-2z^2)}{2}$ $\begin{bmatrix} 0 & \frac{\sqrt{5}i}{20} & 0 & 0 & \frac{\sqrt{3}i}{24} & 0 & 0 & -\frac{\sqrt{3}}{12} & 0 & 0 & -\frac{3\sqrt{5}i}{40} & 0 & 0 & 0 \\ \frac{\sqrt{5}i}{20} & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{24} & \frac{\sqrt{3}}{12} & 0 & 0 & 0 & 0 & \frac{3\sqrt{5}i}{40} & 0 & 0 \\ 0 & \frac{\sqrt{5}}{20} & \frac{\sqrt{3}i}{24} & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{12} & \frac{3\sqrt{5}i}{40} & 0 & 0 & 0 & 0 & 0 \\ -\frac{\sqrt{5}}{20} & 0 & 0 & -\frac{\sqrt{3}i}{24} & 0 & 0 & -\frac{\sqrt{3}i}{12} & 0 & 0 & -\frac{3\sqrt{5}i}{40} & 0 & 0 & 0 & 0 \\ -\frac{\sqrt{5}i}{10} & 0 & 0 & \frac{\sqrt{3}}{24} & 0 & \frac{\sqrt{3}i}{24} & 0 & 0 & 0 & \frac{3\sqrt{5}}{40} & 0 & -\frac{3\sqrt{5}i}{40} & 0 & 0 \\ 0 & \frac{\sqrt{5}i}{10} & -\frac{\sqrt{3}}{24} & 0 & \frac{\sqrt{3}i}{24} & 0 & 0 & 0 & -\frac{3\sqrt{5}}{40} & 0 & -\frac{3\sqrt{5}i}{40} & 0 & 0 & 0 \end{bmatrix}$
339	symmetry	$\frac{x(8x^4-40x^2y^2-40x^2z^2+15y^4+30y^2z^2+15z^4)}{8}$ $\begin{bmatrix} 0 & 0 & 0 & \frac{\sqrt{35}i}{21} & 0 & \frac{\sqrt{35}}{56} & \frac{\sqrt{35}i}{56} & 0 & 0 & 0 & 0 & \frac{5\sqrt{21}}{168} & -\frac{5\sqrt{21}i}{168} & 0 \\ 0 & 0 & \frac{\sqrt{35}i}{21} & 0 & -\frac{\sqrt{35}}{56} & 0 & 0 & -\frac{\sqrt{35}i}{56} & 0 & 0 & -\frac{5\sqrt{21}}{168} & 0 & 0 & \frac{5\sqrt{21}i}{168} \\ \frac{\sqrt{21}i}{84} & 0 & 0 & -\frac{\sqrt{35}}{42} & 0 & \frac{\sqrt{35}i}{56} & 0 & 0 & 0 & \frac{\sqrt{21}}{84} & 0 & \frac{5\sqrt{21}i}{168} & 0 & 0 \\ 0 & -\frac{\sqrt{21}i}{84} & \frac{\sqrt{35}}{42} & 0 & \frac{\sqrt{35}i}{56} & 0 & 0 & 0 & -\frac{\sqrt{21}}{84} & 0 & \frac{5\sqrt{21}i}{168} & 0 & 0 & 0 \\ 0 & \frac{\sqrt{21}}{84} & -\frac{\sqrt{35}i}{42} & 0 & 0 & 0 & 0 & \frac{\sqrt{35}i}{56} & -\frac{\sqrt{21}i}{84} & 0 & 0 & 0 & 0 & -\frac{5\sqrt{21}i}{168} \\ -\frac{\sqrt{21}}{84} & 0 & 0 & \frac{\sqrt{35}i}{42} & 0 & 0 & \frac{\sqrt{35}i}{56} & 0 & 0 & \frac{\sqrt{21}i}{84} & 0 & 0 & -\frac{5\sqrt{21}i}{168} & 0 \end{bmatrix}$
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
	$\mathbb{G}_{5,1}^{(1,-1;a)}(T_g, 1)$	$\begin{bmatrix} \frac{\sqrt{21}i}{84} & 0 & 0 & \frac{\sqrt{35}}{56} & 0 & -\frac{\sqrt{35}i}{42} & 0 & 0 & 0 & -\frac{5\sqrt{21}}{168} & 0 & -\frac{\sqrt{21}i}{84} & 0 & 0 \\ 0 & -\frac{\sqrt{21}i}{84} & -\frac{\sqrt{35}}{56} & 0 & -\frac{\sqrt{35}i}{42} & 0 & 0 & 0 & 0 & \frac{5\sqrt{21}}{168} & 0 & -\frac{\sqrt{21}i}{84} & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{35}i}{56} & 0 & \frac{\sqrt{35}}{21} & \frac{\sqrt{35}i}{56} & 0 & 0 & -\frac{5\sqrt{21}i}{168} & 0 & 0 & \frac{5\sqrt{21}i}{168} & 0 \\ 0 & 0 & \frac{\sqrt{35}i}{56} & 0 & -\frac{\sqrt{35}}{21} & 0 & 0 & -\frac{\sqrt{35}i}{56} & -\frac{5\sqrt{21}i}{168} & 0 & 0 & 0 & 0 & -\frac{5\sqrt{21}i}{168} \\ 0 & \frac{\sqrt{21}i}{84} & 0 & 0 & -\frac{\sqrt{35}i}{42} & 0 & 0 & \frac{\sqrt{35}}{56} & 0 & 0 & \frac{\sqrt{21}i}{84} & 0 & 0 & \frac{5\sqrt{21}}{168} \\ \frac{\sqrt{21}i}{84} & 0 & 0 & 0 & 0 & \frac{\sqrt{35}i}{42} & -\frac{\sqrt{35}}{56} & 0 & 0 & 0 & 0 & -\frac{\sqrt{21}i}{84} & -\frac{5\sqrt{21}}{168} & 0 \end{bmatrix}$
341	symmetry	$\frac{z(15x^4 + 30x^2y^2 - 40x^2z^2 + 15y^4 - 40y^2z^2 + 8z^4)}{8}$ $\begin{bmatrix} 0 & \frac{\sqrt{21}}{84} & \frac{\sqrt{35}i}{56} & 0 & 0 & 0 & 0 & -\frac{\sqrt{35}i}{42} & \frac{5\sqrt{21}i}{168} & 0 & 0 & 0 & 0 & \frac{\sqrt{21}i}{84} \\ -\frac{\sqrt{21}}{84} & 0 & 0 & -\frac{\sqrt{35}i}{56} & 0 & 0 & -\frac{\sqrt{35}i}{42} & 0 & 0 & -\frac{5\sqrt{21}i}{168} & 0 & 0 & \frac{\sqrt{21}i}{84} & 0 \\ 0 & \frac{\sqrt{21}i}{84} & 0 & 0 & \frac{\sqrt{35}i}{56} & 0 & 0 & -\frac{\sqrt{35}}{42} & 0 & 0 & -\frac{5\sqrt{21}i}{168} & 0 & 0 & -\frac{\sqrt{21}}{84} \\ \frac{\sqrt{21}i}{84} & 0 & 0 & 0 & 0 & -\frac{\sqrt{35}i}{56} & \frac{\sqrt{35}}{42} & 0 & 0 & 0 & 0 & \frac{5\sqrt{21}i}{168} & \frac{\sqrt{21}}{84} & 0 \\ 0 & 0 & 0 & \frac{\sqrt{35}i}{56} & 0 & \frac{\sqrt{35}}{56} & \frac{\sqrt{35}i}{21} & 0 & 0 & \frac{5\sqrt{21}i}{168} & 0 & -\frac{5\sqrt{21}}{168} & 0 & 0 \\ 0 & 0 & \frac{\sqrt{35}i}{56} & 0 & -\frac{\sqrt{35}}{56} & 0 & 0 & -\frac{\sqrt{35}i}{21} & \frac{5\sqrt{21}i}{168} & 0 & \frac{5\sqrt{21}}{168} & 0 & 0 & 0 \end{bmatrix}$
342	symmetry	$\frac{3\sqrt{35}x(y^2 - 2yz - z^2)(y^2 + 2yz - z^2)}{8}$ $\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & \frac{1}{8} & \frac{i}{8} & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{40} & \frac{\sqrt{15}i}{40} & 0 \\ 0 & 0 & 0 & 0 & -\frac{1}{8} & 0 & 0 & -\frac{i}{8} & 0 & 0 & \frac{\sqrt{15}}{40} & 0 & 0 & -\frac{\sqrt{15}i}{40} \\ -\frac{\sqrt{15}i}{20} & 0 & 0 & 0 & 0 & \frac{i}{8} & 0 & 0 & 0 & \frac{\sqrt{15}}{20} & 0 & -\frac{\sqrt{15}i}{40} & 0 & 0 \\ 0 & \frac{\sqrt{15}i}{20} & 0 & 0 & \frac{i}{8} & 0 & 0 & 0 & -\frac{\sqrt{15}}{20} & 0 & -\frac{\sqrt{15}i}{40} & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{15}}{20} & 0 & 0 & 0 & 0 & 0 & \frac{i}{8} & -\frac{\sqrt{15}i}{20} & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{40} \\ \frac{\sqrt{15}}{20} & 0 & 0 & 0 & 0 & 0 & \frac{i}{8} & 0 & 0 & \frac{\sqrt{15}i}{20} & 0 & 0 & 0 & \frac{\sqrt{15}i}{40} \end{bmatrix}$
343	symmetry	$\frac{3\sqrt{35}y(x^2 - 2xz - z^2)(x^2 + 2xz - z^2)}{8}$ $\begin{bmatrix} -\frac{\sqrt{15}i}{20} & 0 & 0 & \frac{1}{8} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{40} & 0 & -\frac{\sqrt{15}i}{20} & 0 & 0 \\ 0 & \frac{\sqrt{15}i}{20} & -\frac{1}{8} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{40} & 0 & -\frac{\sqrt{15}i}{20} & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{i}{8} & 0 & 0 & \frac{i}{8} & 0 & 0 & \frac{\sqrt{15}i}{40} & 0 & 0 & -\frac{\sqrt{15}i}{40} & 0 \\ 0 & 0 & \frac{i}{8} & 0 & 0 & 0 & 0 & -\frac{i}{8} & \frac{\sqrt{15}i}{40} & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{40} \\ 0 & -\frac{\sqrt{15}i}{20} & 0 & 0 & 0 & 0 & 0 & \frac{1}{8} & 0 & 0 & \frac{\sqrt{15}i}{20} & 0 & 0 & -\frac{\sqrt{15}}{40} \\ -\frac{\sqrt{15}i}{20} & 0 & 0 & 0 & 0 & 0 & -\frac{1}{8} & 0 & 0 & 0 & -\frac{\sqrt{15}i}{20} & \frac{\sqrt{15}}{40} & 0 & 0 \end{bmatrix}$
344	symmetry	$\frac{3\sqrt{35}z(x^2 - 2xy - y^2)(x^2 + 2xy - y^2)}{8}$

continued ...

Table 7

No.	multipole	matrix
	$\mathbb{G}_{5,2}^{(1,-1;a)}(T_g, 2)$	$\begin{bmatrix} 0 & -\frac{\sqrt{15}}{20} & \frac{i}{8} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{40} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{20} \\ \frac{\sqrt{15}}{20} & 0 & 0 & -\frac{i}{8} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{40} & 0 & 0 & 0 & \frac{\sqrt{15}i}{20} & 0 \\ 0 & -\frac{\sqrt{15}i}{20} & 0 & 0 & \frac{i}{8} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{40} & 0 & 0 & 0 & -\frac{\sqrt{15}}{20} \\ -\frac{\sqrt{15}i}{20} & 0 & 0 & 0 & 0 & -\frac{i}{8} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{40} & \frac{\sqrt{15}}{20} & 0 & 0 \\ 0 & 0 & 0 & \frac{i}{8} & 0 & \frac{1}{8} & 0 & 0 & 0 & -\frac{\sqrt{15}i}{40} & 0 & \frac{\sqrt{15}}{40} & 0 & 0 & 0 \\ 0 & 0 & \frac{i}{8} & 0 & -\frac{1}{8} & 0 & 0 & 0 & -\frac{\sqrt{15}i}{40} & 0 & -\frac{\sqrt{15}}{40} & 0 & 0 & 0 & 0 \end{bmatrix}$
345	symmetry	$\frac{\sqrt{105}x(y-z)(y+z)(2x^2-y^2-z^2)}{4}$ $\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{12} & \frac{\sqrt{3}i}{12} & 0 & 0 & \frac{\sqrt{5}i}{10} & 0 & -\frac{\sqrt{5}}{20} & -\frac{\sqrt{5}i}{20} & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{12} & 0 & 0 & -\frac{\sqrt{3}i}{12} & \frac{\sqrt{5}i}{10} & 0 & \frac{\sqrt{5}}{20} & 0 & 0 & \frac{\sqrt{5}i}{20} \\ 0 & 0 & 0 & \frac{\sqrt{3}}{12} & 0 & -\frac{\sqrt{3}i}{12} & 0 & 0 & 0 & -\frac{\sqrt{5}}{20} & 0 & -\frac{\sqrt{5}i}{20} & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{3}}{12} & 0 & -\frac{\sqrt{3}i}{12} & 0 & 0 & 0 & \frac{\sqrt{5}}{20} & 0 & -\frac{\sqrt{5}i}{20} & 0 & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{3}i}{12} & 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{12} & -\frac{\sqrt{5}i}{20} & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{20} \\ 0 & 0 & 0 & \frac{\sqrt{3}i}{12} & 0 & 0 & \frac{\sqrt{3}i}{12} & 0 & 0 & \frac{\sqrt{5}i}{20} & 0 & 0 & -\frac{\sqrt{5}i}{20} & 0 \end{bmatrix}$
346	symmetry	$\frac{\sqrt{105}y(x-z)(x+z)(x^2-2y^2+z^2)}{4}$ $\begin{bmatrix} 0 & 0 & 0 & \frac{\sqrt{3}}{12} & 0 & -\frac{\sqrt{3}i}{12} & 0 & 0 & 0 & -\frac{\sqrt{5}}{20} & 0 & -\frac{\sqrt{5}i}{20} & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{3}}{12} & 0 & -\frac{\sqrt{3}i}{12} & 0 & 0 & 0 & \frac{\sqrt{5}}{20} & 0 & -\frac{\sqrt{5}i}{20} & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{3}i}{12} & 0 & 0 & -\frac{\sqrt{3}i}{12} & 0 & 0 & -\frac{\sqrt{5}i}{20} & 0 & \frac{\sqrt{5}}{10} & -\frac{\sqrt{5}i}{20} & 0 \\ 0 & 0 & \frac{\sqrt{3}i}{12} & 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{12} & -\frac{\sqrt{5}i}{20} & 0 & -\frac{\sqrt{5}}{10} & 0 & 0 & \frac{\sqrt{5}i}{20} \\ 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{12} & 0 & 0 & -\frac{\sqrt{3}}{12} & 0 & 0 & -\frac{\sqrt{5}i}{20} & 0 & 0 & -\frac{\sqrt{5}}{20} \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{12} & \frac{\sqrt{3}}{12} & 0 & 0 & 0 & \frac{\sqrt{5}i}{20} & \frac{\sqrt{5}}{20} & 0 & 0 \end{bmatrix}$
347	symmetry	$-\frac{\sqrt{105}z(x-y)(x+y)(x^2+y^2-2z^2)}{4}$ $\begin{bmatrix} 0 & 0 & -\frac{\sqrt{3}i}{12} & 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{12} & -\frac{\sqrt{5}i}{20} & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{20} \\ 0 & 0 & 0 & \frac{\sqrt{3}i}{12} & 0 & 0 & \frac{\sqrt{3}i}{12} & 0 & 0 & \frac{\sqrt{5}i}{20} & 0 & 0 & -\frac{\sqrt{5}i}{20} & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{12} & 0 & 0 & -\frac{\sqrt{3}}{12} & 0 & 0 & -\frac{\sqrt{5}i}{20} & 0 & 0 & -\frac{\sqrt{5}}{20} \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{12} & \frac{\sqrt{3}}{12} & 0 & 0 & 0 & \frac{\sqrt{5}i}{20} & \frac{\sqrt{5}}{20} & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{3}i}{12} & 0 & \frac{\sqrt{3}}{12} & 0 & 0 & 0 & -\frac{\sqrt{5}i}{20} & 0 & -\frac{\sqrt{5}}{20} & \frac{\sqrt{5}i}{10} & 0 \\ 0 & 0 & -\frac{\sqrt{3}i}{12} & 0 & -\frac{\sqrt{3}}{12} & 0 & 0 & 0 & -\frac{\sqrt{5}i}{20} & 0 & \frac{\sqrt{5}}{20} & 0 & 0 & -\frac{\sqrt{5}i}{10} \end{bmatrix}$
348	symmetry	$\sqrt{15}xyz$

continued ...

Table 7

No.	multipole	matrix
	$\mathbb{G}_3^{(1,0;a)}(A_g)$	$\begin{bmatrix} 0 & \frac{i}{6} & 0 & 0 & \frac{\sqrt{15}i}{24} & 0 & 0 & \frac{\sqrt{15}}{24} & 0 & 0 & -\frac{i}{24} & 0 & 0 & \frac{1}{24} \\ \frac{i}{6} & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{24} & -\frac{\sqrt{15}}{24} & 0 & 0 & 0 & 0 & \frac{i}{24} & -\frac{1}{24} & 0 \\ 0 & \frac{1}{6} & \frac{\sqrt{15}i}{24} & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{24} & \frac{i}{24} & 0 & 0 & 0 & 0 & -\frac{i}{24} \\ -\frac{1}{6} & 0 & 0 & -\frac{\sqrt{15}i}{24} & 0 & 0 & \frac{\sqrt{15}i}{24} & 0 & 0 & -\frac{i}{24} & 0 & 0 & -\frac{i}{24} & 0 \\ \frac{i}{6} & 0 & 0 & \frac{\sqrt{15}}{24} & 0 & \frac{\sqrt{15}i}{24} & 0 & 0 & 0 & -\frac{1}{24} & 0 & \frac{i}{24} & 0 & 0 \\ 0 & -\frac{i}{6} & -\frac{\sqrt{15}}{24} & 0 & \frac{\sqrt{15}i}{24} & 0 & 0 & 0 & \frac{1}{24} & 0 & \frac{i}{24} & 0 & 0 & 0 \end{bmatrix}$
349	symmetry	$\frac{x(2x^2-3y^2-3z^2)}{2}$ $\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & \frac{1}{16} & \frac{i}{16} & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{48} & -\frac{\sqrt{15}i}{48} & 0 \\ 0 & 0 & 0 & 0 & -\frac{1}{16} & 0 & 0 & -\frac{i}{16} & 0 & 0 & -\frac{\sqrt{15}}{48} & 0 & 0 & \frac{\sqrt{15}i}{48} \\ \frac{\sqrt{15}i}{24} & 0 & 0 & \frac{1}{4} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{24} & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{15}i}{24} & -\frac{1}{4} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{24} & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{15}}{24} & \frac{i}{4} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{24} & 0 & 0 & 0 & 0 & 0 \\ -\frac{\sqrt{15}}{24} & 0 & 0 & -\frac{i}{4} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{24} & 0 & 0 & 0 & 0 \end{bmatrix}$
350	symmetry	$-\frac{y(3x^2-2y^2+3z^2)}{2}$ $\begin{bmatrix} \frac{\sqrt{15}i}{24} & 0 & 0 & 0 & 0 & \frac{i}{4} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{24} & 0 & 0 \\ 0 & -\frac{\sqrt{15}i}{24} & 0 & 0 & \frac{i}{4} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{24} & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{i}{16} & 0 & 0 & \frac{i}{16} & 0 & 0 & -\frac{\sqrt{15}i}{48} & 0 & 0 & \frac{\sqrt{15}i}{48} & 0 \\ 0 & 0 & \frac{i}{16} & 0 & 0 & 0 & 0 & -\frac{i}{16} & -\frac{\sqrt{15}i}{48} & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{48} \\ 0 & \frac{\sqrt{15}i}{24} & 0 & 0 & \frac{i}{4} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{24} & 0 & 0 & 0 \\ \frac{\sqrt{15}i}{24} & 0 & 0 & 0 & 0 & -\frac{i}{4} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{24} & 0 & 0 \end{bmatrix}$
351	symmetry	$-\frac{z(3x^2+3y^2-2z^2)}{2}$ $\begin{bmatrix} 0 & \frac{\sqrt{15}}{24} & 0 & 0 & 0 & 0 & 0 & \frac{i}{4} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{24} \\ -\frac{\sqrt{15}}{24} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{i}{4} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{24} & 0 \\ 0 & \frac{\sqrt{15}i}{24} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{1}{4} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{24} \\ \frac{\sqrt{15}i}{24} & 0 & 0 & 0 & 0 & 0 & -\frac{1}{4} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{24} & 0 & 0 \\ 0 & 0 & 0 & \frac{i}{16} & 0 & \frac{1}{16} & 0 & 0 & 0 & \frac{\sqrt{15}i}{48} & 0 & -\frac{\sqrt{15}}{48} & 0 & 0 \\ 0 & 0 & \frac{i}{16} & 0 & -\frac{1}{16} & 0 & 0 & 0 & \frac{\sqrt{15}i}{48} & 0 & \frac{\sqrt{15}}{48} & 0 & 0 & 0 \end{bmatrix}$
352	symmetry	$\frac{\sqrt{15}x(y-z)(y+z)}{2}$

continued ...

Table 7

No.	multipole	matrix
	$\mathbb{G}_{3,0}^{(1,0;a)}(T_g, 2)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{48} & \frac{\sqrt{15}i}{48} & 0 & 0 & \frac{i}{6} & 0 & \frac{7}{48} & \frac{7i}{48} & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{48} & 0 & 0 & -\frac{\sqrt{15}i}{48} & \frac{i}{6} & 0 & -\frac{7}{48} & 0 & 0 & -\frac{7i}{48} \\ -\frac{i}{24} & 0 & 0 & \frac{\sqrt{15}}{24} & 0 & 0 & 0 & 0 & 0 & \frac{1}{6} & 0 & \frac{i}{6} & 0 & 0 \\ 0 & \frac{i}{24} & -\frac{\sqrt{15}}{24} & 0 & 0 & 0 & 0 & 0 & -\frac{1}{6} & 0 & \frac{i}{6} & 0 & 0 & 0 \\ 0 & \frac{1}{24} & -\frac{\sqrt{15}i}{24} & 0 & 0 & 0 & 0 & 0 & \frac{i}{6} & 0 & 0 & 0 & 0 & \frac{i}{6} \\ -\frac{1}{24} & 0 & 0 & \frac{\sqrt{15}i}{24} & 0 & 0 & 0 & 0 & 0 & -\frac{i}{6} & 0 & 0 & 0 & \frac{i}{6} \end{bmatrix}$
353	symmetry	$-\frac{\sqrt{15}y(x-z)(x+z)}{2}$
	$\mathbb{G}_{3,1}^{(1,0;a)}(T_g, 2)$	$\begin{bmatrix} \frac{i}{24} & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{24} & 0 & 0 & 0 & \frac{1}{6} & 0 & \frac{i}{6} & 0 & 0 \\ 0 & -\frac{i}{24} & 0 & 0 & -\frac{\sqrt{15}i}{24} & 0 & 0 & 0 & -\frac{1}{6} & 0 & \frac{i}{6} & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{15}i}{48} & 0 & 0 & -\frac{\sqrt{15}i}{48} & 0 & 0 & \frac{7i}{48} & 0 & \frac{1}{6} & \frac{7i}{48} & 0 \\ 0 & 0 & \frac{\sqrt{15}i}{48} & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{48} & \frac{7i}{48} & 0 & -\frac{1}{6} & 0 & 0 & -\frac{7i}{48} \\ 0 & -\frac{i}{24} & 0 & 0 & \frac{\sqrt{15}i}{24} & 0 & 0 & 0 & 0 & 0 & \frac{i}{6} & 0 & 0 & \frac{1}{6} \\ -\frac{i}{24} & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{24} & 0 & 0 & 0 & 0 & -\frac{i}{6} & -\frac{1}{6} & 0 & 0 \end{bmatrix}$
354	symmetry	$\frac{\sqrt{15}z(x-y)(x+y)}{2}$
	$\mathbb{G}_{3,2}^{(1,0;a)}(T_g, 2)$	$\begin{bmatrix} 0 & -\frac{1}{24} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{24} & \frac{i}{6} & 0 & 0 & 0 & 0 & \frac{i}{6} \\ \frac{1}{24} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{24} & 0 & 0 & -\frac{i}{6} & 0 & 0 & \frac{i}{6} \\ 0 & \frac{i}{24} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{24} & 0 & 0 & \frac{i}{6} & 0 & 0 & \frac{1}{6} \\ \frac{i}{24} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{24} & 0 & 0 & 0 & 0 & -\frac{i}{6} & -\frac{1}{6} \\ 0 & 0 & 0 & -\frac{\sqrt{15}i}{48} & 0 & \frac{\sqrt{15}}{48} & 0 & 0 & 0 & \frac{7i}{48} & 0 & \frac{7}{48} & \frac{i}{6} & 0 \\ 0 & 0 & -\frac{\sqrt{15}i}{48} & 0 & -\frac{\sqrt{15}}{48} & 0 & 0 & 0 & \frac{7i}{48} & 0 & -\frac{7}{48} & 0 & 0 & -\frac{i}{6} \end{bmatrix}$
355	symmetry	x
	$\mathbb{G}_{1,0}^{(1,1;a)}(T_g)$	$\begin{bmatrix} 0 & 0 & 0 & \frac{\sqrt{210}i}{70} & 0 & -\frac{\sqrt{210}}{140} & -\frac{\sqrt{210}i}{140} & 0 & 0 & 0 & 0 & -\frac{\sqrt{14}}{28} & \frac{\sqrt{14}i}{28} & 0 \\ 0 & 0 & \frac{\sqrt{210}i}{70} & 0 & \frac{\sqrt{210}}{140} & 0 & 0 & \frac{\sqrt{210}i}{140} & 0 & 0 & \frac{\sqrt{14}}{28} & 0 & 0 & -\frac{\sqrt{14}i}{28} \\ \frac{\sqrt{14}i}{28} & 0 & 0 & -\frac{\sqrt{210}}{140} & 0 & -\frac{\sqrt{210}i}{140} & 0 & 0 & 0 & \frac{\sqrt{14}}{28} & 0 & -\frac{\sqrt{14}i}{28} & 0 & 0 \\ 0 & -\frac{\sqrt{14}i}{28} & \frac{\sqrt{210}}{140} & 0 & -\frac{\sqrt{210}i}{140} & 0 & 0 & 0 & -\frac{\sqrt{14}}{28} & 0 & -\frac{\sqrt{14}i}{28} & 0 & 0 & 0 \\ 0 & \frac{\sqrt{14}}{28} & -\frac{\sqrt{210}i}{140} & 0 & 0 & 0 & 0 & -\frac{\sqrt{210}i}{140} & -\frac{\sqrt{14}i}{28} & 0 & 0 & 0 & 0 & \frac{\sqrt{14}i}{28} \\ -\frac{\sqrt{14}}{28} & 0 & 0 & \frac{\sqrt{210}i}{140} & 0 & 0 & -\frac{\sqrt{210}i}{140} & 0 & 0 & \frac{\sqrt{14}i}{28} & 0 & 0 & 0 & \frac{\sqrt{14}i}{28} \end{bmatrix}$
356	symmetry	y

continued ...

Table 7

No.	multipole	matrix
	$\mathbb{G}_{1,1}^{(1,1;a)}(T_g)$	$\begin{bmatrix} \frac{\sqrt{14}i}{28} & 0 & 0 & -\frac{\sqrt{210}}{140} & 0 & -\frac{\sqrt{210}i}{140} & 0 & 0 & 0 & \frac{\sqrt{14}}{28} & 0 & -\frac{\sqrt{14}i}{28} & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{14}i}{28} & \frac{\sqrt{210}}{140} & 0 & -\frac{\sqrt{210}i}{140} & 0 & 0 & 0 & -\frac{\sqrt{14}}{28} & 0 & -\frac{\sqrt{14}i}{28} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{210}i}{140} & 0 & \frac{\sqrt{210}}{70} & -\frac{\sqrt{210}i}{140} & 0 & 0 & \frac{\sqrt{14}i}{28} & 0 & 0 & -\frac{\sqrt{14}i}{28} & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{210}i}{140} & 0 & -\frac{\sqrt{210}}{70} & 0 & 0 & \frac{\sqrt{210}i}{140} & \frac{\sqrt{14}i}{28} & 0 & 0 & 0 & 0 & \frac{\sqrt{14}i}{28} & 0 \\ 0 & \frac{\sqrt{14}i}{28} & 0 & 0 & -\frac{\sqrt{210}i}{140} & 0 & 0 & -\frac{\sqrt{210}}{140} & 0 & 0 & \frac{\sqrt{14}i}{28} & 0 & 0 & 0 & -\frac{\sqrt{14}}{28} \\ \frac{\sqrt{14}i}{28} & 0 & 0 & 0 & 0 & \frac{\sqrt{210}i}{140} & \frac{\sqrt{210}}{140} & 0 & 0 & 0 & 0 & -\frac{\sqrt{14}i}{28} & \frac{\sqrt{14}}{28} & 0 & 0 \end{bmatrix}$
357	symmetry	$\begin{bmatrix} 0 & \frac{\sqrt{14}}{28} & -\frac{\sqrt{210}i}{140} & 0 & 0 & 0 & 0 & -\frac{\sqrt{210}i}{140} & -\frac{\sqrt{14}i}{28} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{14}i}{28} \\ -\frac{\sqrt{14}}{28} & 0 & 0 & \frac{\sqrt{210}i}{140} & 0 & 0 & -\frac{\sqrt{210}i}{140} & 0 & 0 & \frac{\sqrt{14}i}{28} & 0 & 0 & 0 & \frac{\sqrt{14}i}{28} & 0 \\ 0 & \frac{\sqrt{14}i}{28} & 0 & 0 & -\frac{\sqrt{210}i}{140} & 0 & 0 & -\frac{\sqrt{210}}{140} & 0 & 0 & \frac{\sqrt{14}i}{28} & 0 & 0 & -\frac{\sqrt{14}}{28} \\ \frac{\sqrt{14}i}{28} & 0 & 0 & 0 & 0 & \frac{\sqrt{210}i}{140} & \frac{\sqrt{210}}{140} & 0 & 0 & 0 & 0 & -\frac{\sqrt{14}i}{28} & \frac{\sqrt{14}}{28} & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{210}i}{140} & 0 & -\frac{\sqrt{210}}{140} & \frac{\sqrt{210}i}{70} & 0 & 0 & -\frac{\sqrt{14}i}{28} & 0 & \frac{\sqrt{14}}{28} & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{210}i}{140} & 0 & \frac{\sqrt{210}}{140} & 0 & 0 & -\frac{\sqrt{210}i}{70} & -\frac{\sqrt{14}i}{28} & 0 & -\frac{\sqrt{14}}{28} & 0 & 0 & 0 \end{bmatrix}$
358	symmetry	$\begin{bmatrix} 0 & \frac{\sqrt{7}i}{14} & 0 & 0 & -\frac{\sqrt{105}i}{168} & 0 & 0 & -\frac{\sqrt{105}}{168} & 0 & 0 & \frac{3\sqrt{7}i}{56} & 0 & 0 & -\frac{3\sqrt{7}}{56} \\ \frac{\sqrt{7}i}{14} & 0 & 0 & 0 & 0 & \frac{\sqrt{105}i}{168} & \frac{\sqrt{105}}{168} & 0 & 0 & 0 & 0 & -\frac{3\sqrt{7}i}{56} & \frac{3\sqrt{7}}{56} & 0 \\ 0 & \frac{\sqrt{7}}{14} & -\frac{\sqrt{105}i}{168} & 0 & 0 & 0 & 0 & -\frac{\sqrt{105}i}{168} & -\frac{3\sqrt{7}i}{56} & 0 & 0 & 0 & 0 & \frac{3\sqrt{7}i}{56} \\ -\frac{\sqrt{7}}{14} & 0 & 0 & \frac{\sqrt{105}i}{168} & 0 & 0 & -\frac{\sqrt{105}i}{168} & 0 & 0 & \frac{3\sqrt{7}i}{56} & 0 & 0 & \frac{3\sqrt{7}i}{56} & 0 \\ \frac{\sqrt{7}i}{14} & 0 & 0 & -\frac{\sqrt{105}}{168} & 0 & -\frac{\sqrt{105}i}{168} & 0 & 0 & 0 & \frac{3\sqrt{7}}{56} & 0 & -\frac{3\sqrt{7}i}{56} & 0 & 0 \\ 0 & -\frac{\sqrt{7}i}{14} & \frac{\sqrt{105}}{168} & 0 & -\frac{\sqrt{105}i}{168} & 0 & 0 & 0 & -\frac{3\sqrt{7}}{56} & 0 & -\frac{3\sqrt{7}i}{56} & 0 & 0 & 0 \end{bmatrix}$
359	symmetry	$\begin{bmatrix} 0 & 0 & 0 & \frac{2\sqrt{7}i}{21} & 0 & -\frac{5\sqrt{7}}{112} & -\frac{5\sqrt{7}i}{112} & 0 & 0 & 0 & 0 & -\frac{5\sqrt{105}}{336} & \frac{5\sqrt{105}i}{336} & 0 \\ 0 & 0 & \frac{2\sqrt{7}i}{21} & 0 & \frac{5\sqrt{7}}{112} & 0 & 0 & \frac{5\sqrt{7}i}{112} & 0 & 0 & \frac{5\sqrt{105}}{336} & 0 & 0 & -\frac{5\sqrt{105}i}{336} \\ -\frac{\sqrt{105}i}{168} & 0 & 0 & \frac{5\sqrt{7}}{84} & 0 & \frac{\sqrt{7}i}{28} & 0 & 0 & 0 & -\frac{\sqrt{105}}{168} & 0 & \frac{\sqrt{105}i}{84} & 0 & 0 \\ 0 & \frac{\sqrt{105}i}{168} & -\frac{5\sqrt{7}}{84} & 0 & \frac{\sqrt{7}i}{28} & 0 & 0 & 0 & \frac{\sqrt{105}}{168} & 0 & \frac{\sqrt{105}i}{84} & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{105}}{168} & \frac{5\sqrt{7}i}{84} & 0 & 0 & 0 & 0 & \frac{\sqrt{7}i}{28} & \frac{\sqrt{105}i}{168} & 0 & 0 & 0 & 0 & -\frac{\sqrt{105}i}{84} \\ \frac{\sqrt{105}}{168} & 0 & 0 & -\frac{5\sqrt{7}i}{84} & 0 & 0 & \frac{\sqrt{7}i}{28} & 0 & 0 & -\frac{\sqrt{105}i}{168} & 0 & 0 & -\frac{\sqrt{105}i}{84} & 0 \end{bmatrix}$
360	symmetry	$\begin{bmatrix} & & & & & & & -\frac{y(3x^2-2y^2+3z^2)}{2} & & & & & & & \end{bmatrix}$

continued ...

Table 7

No.	multipole	matrix
	$\mathbb{G}_{3,1}^{(1,1;a)}(T_g, 1)$	$\begin{bmatrix} -\frac{\sqrt{105}i}{168} & 0 & 0 & \frac{\sqrt{7}}{28} & 0 & \frac{5\sqrt{7}i}{84} & 0 & 0 & 0 & -\frac{\sqrt{105}}{84} & 0 & \frac{\sqrt{105}i}{168} & 0 & 0 \\ 0 & \frac{\sqrt{105}i}{168} & -\frac{\sqrt{7}}{28} & 0 & \frac{5\sqrt{7}i}{84} & 0 & 0 & 0 & \frac{\sqrt{105}}{84} & 0 & \frac{\sqrt{105}i}{168} & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{5\sqrt{7}i}{112} & 0 & \frac{2\sqrt{7}}{21} & -\frac{5\sqrt{7}i}{112} & 0 & 0 & \frac{5\sqrt{105}i}{336} & 0 & 0 & -\frac{5\sqrt{105}i}{336} & 0 \\ 0 & 0 & -\frac{5\sqrt{7}i}{112} & 0 & -\frac{2\sqrt{7}}{21} & 0 & 0 & \frac{5\sqrt{7}i}{112} & \frac{5\sqrt{105}i}{336} & 0 & 0 & 0 & 0 & \frac{5\sqrt{105}i}{336} \\ 0 & -\frac{\sqrt{105}i}{168} & 0 & 0 & \frac{5\sqrt{7}i}{84} & 0 & 0 & \frac{\sqrt{7}}{28} & 0 & 0 & -\frac{\sqrt{105}i}{168} & 0 & 0 & \frac{\sqrt{105}}{84} \\ -\frac{\sqrt{105}i}{168} & 0 & 0 & 0 & 0 & -\frac{5\sqrt{7}i}{84} & -\frac{\sqrt{7}}{28} & 0 & 0 & 0 & 0 & \frac{\sqrt{105}i}{168} & -\frac{\sqrt{105}}{84} & 0 \end{bmatrix}$
361	symmetry	$-\frac{z(3x^2+3y^2-2z^2)}{2}$
	$\mathbb{G}_{3,2}^{(1,1;a)}(T_g, 1)$	$\begin{bmatrix} 0 & -\frac{\sqrt{105}}{168} & \frac{\sqrt{7}i}{28} & 0 & 0 & 0 & 0 & \frac{5\sqrt{7}i}{84} & \frac{\sqrt{105}i}{84} & 0 & 0 & 0 & 0 & -\frac{\sqrt{105}i}{168} \\ \frac{\sqrt{105}}{168} & 0 & 0 & -\frac{\sqrt{7}i}{28} & 0 & 0 & \frac{5\sqrt{7}i}{84} & 0 & 0 & -\frac{\sqrt{105}i}{84} & 0 & 0 & 0 & -\frac{\sqrt{105}i}{168} & 0 \\ 0 & -\frac{\sqrt{105}i}{168} & 0 & 0 & \frac{\sqrt{7}i}{28} & 0 & 0 & \frac{5\sqrt{7}}{84} & 0 & 0 & -\frac{\sqrt{105}i}{84} & 0 & 0 & \frac{\sqrt{105}}{168} \\ -\frac{\sqrt{105}i}{168} & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}i}{28} & -\frac{5\sqrt{7}}{84} & 0 & 0 & 0 & 0 & \frac{\sqrt{105}i}{84} & -\frac{\sqrt{105}}{168} & 0 \\ 0 & 0 & 0 & -\frac{5\sqrt{7}i}{112} & 0 & -\frac{5\sqrt{7}}{112} & \frac{2\sqrt{7}i}{21} & 0 & 0 & -\frac{5\sqrt{105}i}{336} & 0 & \frac{5\sqrt{105}}{336} & 0 & 0 \\ 0 & 0 & -\frac{5\sqrt{7}i}{112} & 0 & \frac{5\sqrt{7}}{112} & 0 & 0 & -\frac{2\sqrt{7}i}{21} & -\frac{5\sqrt{105}i}{336} & 0 & -\frac{5\sqrt{105}}{336} & 0 & 0 & 0 \end{bmatrix}$
362	symmetry	$\frac{\sqrt{15}x(y-z)(y+z)}{2}$
	$\mathbb{G}_{3,0}^{(1,1;a)}(T_g, 2)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & \frac{5\sqrt{105}}{336} & -\frac{5\sqrt{105}i}{336} & 0 & 0 & \frac{\sqrt{7}i}{14} & 0 & -\frac{\sqrt{7}}{112} & -\frac{\sqrt{7}i}{112} & 0 \\ 0 & 0 & 0 & 0 & -\frac{5\sqrt{105}}{336} & 0 & 0 & \frac{5\sqrt{105}i}{336} & \frac{\sqrt{7}i}{14} & 0 & \frac{\sqrt{7}}{112} & 0 & 0 & \frac{\sqrt{7}i}{112} \\ \frac{3\sqrt{7}i}{56} & 0 & 0 & -\frac{\sqrt{105}}{168} & 0 & -\frac{\sqrt{105}i}{84} & 0 & 0 & 0 & \frac{\sqrt{7}}{14} & 0 & -\frac{\sqrt{7}i}{28} & 0 & 0 \\ 0 & -\frac{3\sqrt{7}i}{56} & \frac{\sqrt{105}}{168} & 0 & -\frac{\sqrt{105}i}{84} & 0 & 0 & 0 & -\frac{\sqrt{7}}{14} & 0 & -\frac{\sqrt{7}i}{28} & 0 & 0 & 0 \\ 0 & -\frac{3\sqrt{7}}{56} & \frac{\sqrt{105}i}{168} & 0 & 0 & 0 & 0 & \frac{\sqrt{105}i}{84} & \frac{\sqrt{7}i}{14} & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}i}{28} \\ \frac{3\sqrt{7}}{56} & 0 & 0 & -\frac{\sqrt{105}i}{168} & 0 & 0 & \frac{\sqrt{105}i}{84} & 0 & 0 & -\frac{\sqrt{7}i}{14} & 0 & 0 & 0 & -\frac{\sqrt{7}i}{28} \end{bmatrix}$
363	symmetry	$-\frac{\sqrt{15}y(x-z)(x+z)}{2}$
	$\mathbb{G}_{3,1}^{(1,1;a)}(T_g, 2)$	$\begin{bmatrix} -\frac{3\sqrt{7}i}{56} & 0 & 0 & \frac{\sqrt{105}}{84} & 0 & \frac{\sqrt{105}i}{168} & 0 & 0 & 0 & -\frac{\sqrt{7}}{28} & 0 & \frac{\sqrt{7}i}{14} & 0 & 0 \\ 0 & \frac{3\sqrt{7}i}{56} & -\frac{\sqrt{105}}{84} & 0 & \frac{\sqrt{105}i}{168} & 0 & 0 & 0 & \frac{\sqrt{7}}{28} & 0 & \frac{\sqrt{7}i}{14} & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{5\sqrt{105}i}{336} & 0 & 0 & \frac{5\sqrt{105}i}{336} & 0 & 0 & -\frac{\sqrt{7}i}{112} & 0 & \frac{\sqrt{7}}{14} & -\frac{\sqrt{7}i}{112} & 0 \\ 0 & 0 & -\frac{5\sqrt{105}i}{336} & 0 & 0 & 0 & 0 & -\frac{5\sqrt{105}i}{336} & -\frac{\sqrt{7}i}{112} & 0 & -\frac{\sqrt{7}}{14} & 0 & 0 & \frac{\sqrt{7}i}{112} \\ 0 & \frac{3\sqrt{7}i}{56} & 0 & 0 & -\frac{\sqrt{105}i}{168} & 0 & 0 & -\frac{\sqrt{105}}{84} & 0 & 0 & \frac{\sqrt{7}i}{14} & 0 & 0 & -\frac{\sqrt{7}}{28} \\ \frac{3\sqrt{7}i}{56} & 0 & 0 & 0 & 0 & \frac{\sqrt{105}i}{168} & \frac{\sqrt{105}}{84} & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}i}{14} & \frac{\sqrt{7}}{28} & 0 \end{bmatrix}$
364	symmetry	$\frac{\sqrt{15}z(x-y)(x+y)}{2}$

continued ...

Table 7

No.	multipole	matrix
	$\mathbb{G}_{3,2}^{(1,1;a)}(T_g, 2)$	$\begin{bmatrix} 0 & \frac{3\sqrt{7}}{56} & -\frac{\sqrt{105}i}{84} & 0 & 0 & 0 & 0 & -\frac{\sqrt{105}i}{168} & -\frac{\sqrt{7}i}{28} & 0 & 0 & 0 & 0 & \frac{\sqrt{7}i}{14} \\ -\frac{3\sqrt{7}}{56} & 0 & 0 & \frac{\sqrt{105}i}{84} & 0 & 0 & -\frac{\sqrt{105}i}{168} & 0 & 0 & \frac{\sqrt{7}i}{28} & 0 & 0 & \frac{\sqrt{7}i}{14} & 0 \\ 0 & -\frac{3\sqrt{7}i}{56} & 0 & 0 & \frac{\sqrt{105}i}{84} & 0 & 0 & \frac{\sqrt{105}}{168} & 0 & 0 & -\frac{\sqrt{7}i}{28} & 0 & 0 & \frac{\sqrt{7}}{14} \\ -\frac{3\sqrt{7}i}{56} & 0 & 0 & 0 & 0 & -\frac{\sqrt{105}i}{84} & -\frac{\sqrt{105}}{168} & 0 & 0 & 0 & 0 & \frac{\sqrt{7}i}{28} & -\frac{\sqrt{7}}{14} & 0 \\ 0 & 0 & 0 & \frac{5\sqrt{105}i}{336} & 0 & -\frac{5\sqrt{105}}{336} & 0 & 0 & 0 & -\frac{\sqrt{7}i}{112} & 0 & -\frac{\sqrt{7}}{112} & \frac{\sqrt{7}i}{14} & 0 \\ 0 & 0 & \frac{5\sqrt{105}i}{336} & 0 & \frac{5\sqrt{105}}{336} & 0 & 0 & 0 & -\frac{\sqrt{7}i}{112} & 0 & \frac{\sqrt{7}}{112} & 0 & 0 & -\frac{\sqrt{7}i}{14} \end{bmatrix}$
365	symmetry	$-\frac{x^2}{2} - \frac{y^2}{2} + z^2$
	$\mathbb{T}_{2,0}^{(a)}(E_g)$	$\begin{bmatrix} 0 & 0 & -\frac{\sqrt{21}i}{28} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{35}i}{28} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{21}i}{28} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{35}i}{28} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{21}i}{28} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{35}i}{28} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{21}i}{28} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{35}i}{28} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{21}i}{14} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{21}i}{14} & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
366	symmetry	$\frac{\sqrt{3}(x-y)(x+y)}{2}$
	$\mathbb{T}_{2,1}^{(a)}(E_g)$	$\begin{bmatrix} 0 & 0 & \frac{3\sqrt{7}i}{28} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{105}i}{84} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{3\sqrt{7}i}{28} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{105}i}{84} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{3\sqrt{7}i}{28} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{105}i}{84} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{7}i}{28} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{105}i}{84} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{105}i}{42} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{105}i}{42} \end{bmatrix}$
367	symmetry	$\sqrt{3}yz$
	$\mathbb{T}_{2,0}^{(a)}(T_g)$	$\begin{bmatrix} \frac{\sqrt{105}i}{42} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{105}i}{42} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}i}{14} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{105}i}{42} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}i}{14} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{105}i}{42} \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{7}i}{14} & 0 & 0 & 0 & 0 & \frac{\sqrt{105}i}{42} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}i}{14} & 0 & 0 & 0 & 0 & \frac{\sqrt{105}i}{42} & 0 & 0 & 0 \end{bmatrix}$
368	symmetry	$\sqrt{3}xz$

continued ...

Table 7

No.	multipole	matrix
	$\mathbb{T}_{2,1}^{(a)}(T_g)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}i}{14} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{105}i}{42} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}i}{14} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{105}i}{42} \\ \frac{\sqrt{105}i}{42} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{105}i}{42} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{7}i}{14} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{105}i}{42} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{7}i}{14} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{105}i}{42} & 0 & 0 & 0 & 0 \end{bmatrix}$
369	symmetry	$\sqrt{3}xy$ $\begin{bmatrix} 0 & 0 & 0 & 0 & -\frac{\sqrt{7}i}{14} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{105}i}{42} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}i}{14} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{105}i}{42} & 0 & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{7}i}{14} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{105}i}{42} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{7}i}{14} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{105}i}{42} & 0 & 0 & 0 & 0 & 0 \\ \frac{\sqrt{105}i}{42} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{105}i}{42} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
370	symmetry	$\frac{\sqrt{21}(x^4 - 3x^2y^2 - 3x^2z^2 + y^4 - 3y^2z^2 + z^4)}{6}$ $\begin{bmatrix} 0 & 0 & \frac{\sqrt{3}i}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{3}i}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
371	symmetry	$-\frac{\sqrt{15}(x^4 - 12x^2y^2 + 6x^2z^2 + y^4 + 6y^2z^2 - 2z^4)}{12}$ $\begin{bmatrix} 0 & 0 & -\frac{\sqrt{105}i}{84} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{7}i}{28} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{105}i}{84} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{7}i}{28} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{105}i}{84} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{7}i}{28} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{105}i}{84} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{7}i}{28} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{105}i}{42} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{105}i}{42} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
372	symmetry	$\frac{\sqrt{5}(x-y)(x+y)(x^2 + y^2 - 6z^2)}{4}$

continued ...

Table 7

No.	multipole	matrix
	$\mathbb{T}_{4,1}^{(a)}(E_g)$	$\begin{bmatrix} 0 & 0 & \frac{\sqrt{35}i}{28} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{21}i}{28} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{35}i}{28} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{21}i}{28} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{35}i}{28} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{21}i}{28} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{35}i}{28} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{21}i}{28} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{21}i}{14} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{21}i}{14} & 0 \end{bmatrix}$
373	symmetry	$\frac{\sqrt{35}yz(y-z)(y+z)}{2}$ $\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{8} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{8} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{8} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{8} \\ 0 & 0 & 0 & 0 & \frac{\sqrt{5}i}{8} & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{8} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{5}i}{8} & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{8} & 0 & 0 & 0 \end{bmatrix}$
374	symmetry	$\frac{-\sqrt{35}xz(x-z)(x+z)}{2}$ $\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{5}i}{8} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{8} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{5}i}{8} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{8} \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{5}i}{8} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{8} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{5}i}{8} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{8} & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
375	symmetry	$\frac{\sqrt{35}xy(x-y)(x+y)}{2}$ $\begin{bmatrix} 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{8} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{8} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{8} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{8} & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{5}i}{8} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{8} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{5}i}{8} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{8} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
376	symmetry	$\frac{\sqrt{5}yz(6x^2-y^2-z^2)}{2}$

continued ...

Table 7

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

continued ...

Table 7

No.	multipole	matrix
	$\mathbb{T}_{4,2}^{(1,-1;a)}(T_g, 1)$	$\begin{bmatrix} 0 & -\frac{i}{8} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{1}{8} \\ \frac{i}{8} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{1}{8} & 0 \\ 0 & \frac{1}{8} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{i}{8} \\ \frac{1}{8} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{i}{8} & 0 \\ 0 & 0 & 0 & \frac{\sqrt{15}}{16} & 0 & -\frac{\sqrt{15}i}{16} & 0 & 0 & 0 & -\frac{3}{16} & 0 & -\frac{3i}{16} & 0 & 0 \\ 0 & 0 & \frac{\sqrt{15}}{16} & 0 & \frac{\sqrt{15}i}{16} & 0 & 0 & 0 & -\frac{3}{16} & 0 & \frac{3i}{16} & 0 & 0 & 0 \end{bmatrix}$
385	symmetry	$\frac{\sqrt{5}yz(6x^2-y^2-z^2)}{2}$ $\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{105}i}{112} & \frac{\sqrt{105}}{112} & 0 & 0 & \frac{\sqrt{7}}{14} & 0 & \frac{\sqrt{7}i}{112} & -\frac{\sqrt{7}}{112} & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{105}i}{112} & 0 & 0 & -\frac{\sqrt{105}}{112} & \frac{\sqrt{7}}{14} & 0 & -\frac{\sqrt{7}i}{112} & 0 & 0 & \frac{\sqrt{7}}{112} \\ \frac{3\sqrt{7}}{56} & 0 & 0 & \frac{\sqrt{105}i}{56} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}i}{28} & 0 & \frac{\sqrt{7}}{14} & 0 & 0 \\ 0 & -\frac{3\sqrt{7}}{56} & -\frac{\sqrt{105}i}{56} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}i}{28} & 0 & \frac{\sqrt{7}}{14} & 0 & 0 \\ 0 & \frac{3\sqrt{7}i}{56} & \frac{\sqrt{105}}{56} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}}{28} & 0 & 0 & 0 & \frac{\sqrt{7}}{14} \\ -\frac{3\sqrt{7}i}{56} & 0 & 0 & -\frac{\sqrt{105}}{56} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}}{28} & 0 & 0 & \frac{\sqrt{7}}{14} & 0 \end{bmatrix}$
386	symmetry	$-\frac{\sqrt{5}xz(x^2-6y^2+z^2)}{2}$ $\begin{bmatrix} -\frac{3\sqrt{7}}{56} & 0 & 0 & 0 & 0 & \frac{\sqrt{105}}{56} & 0 & 0 & 0 & -\frac{\sqrt{7}i}{14} & 0 & -\frac{\sqrt{7}}{28} & 0 & 0 \\ 0 & \frac{3\sqrt{7}}{56} & 0 & 0 & \frac{\sqrt{105}}{56} & 0 & 0 & 0 & \frac{\sqrt{7}i}{14} & 0 & -\frac{\sqrt{7}}{28} & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{105}}{112} & 0 & 0 & -\frac{\sqrt{105}}{112} & 0 & 0 & -\frac{\sqrt{7}}{112} & 0 & -\frac{\sqrt{7}i}{14} & -\frac{\sqrt{7}}{112} & 0 \\ 0 & 0 & \frac{\sqrt{105}}{112} & 0 & 0 & 0 & 0 & \frac{\sqrt{105}}{112} & -\frac{\sqrt{7}}{112} & 0 & \frac{\sqrt{7}i}{14} & 0 & 0 & \frac{\sqrt{7}}{112} \\ 0 & \frac{3\sqrt{7}}{56} & 0 & 0 & -\frac{\sqrt{105}}{56} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}}{28} & 0 & 0 & 0 & -\frac{\sqrt{7}i}{14} \\ \frac{3\sqrt{7}}{56} & 0 & 0 & 0 & \frac{\sqrt{105}}{56} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}}{28} & \frac{\sqrt{7}i}{14} & 0 & 0 \end{bmatrix}$
387	symmetry	$-\frac{\sqrt{5}xy(x^2+y^2-6z^2)}{2}$ $\begin{bmatrix} 0 & -\frac{3\sqrt{7}i}{56} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{105}}{56} & \frac{\sqrt{7}}{14} & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}}{28} \\ \frac{3\sqrt{7}i}{56} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{105}}{56} & 0 & 0 & -\frac{\sqrt{7}}{14} & 0 & 0 & -\frac{\sqrt{7}}{28} & 0 \\ 0 & -\frac{3\sqrt{7}}{56} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{105}i}{56} & 0 & 0 & \frac{\sqrt{7}}{14} & 0 & 0 & \frac{\sqrt{7}i}{28} \\ -\frac{3\sqrt{7}}{56} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{105}i}{56} & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}}{14} & -\frac{\sqrt{7}i}{28} & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{105}}{112} & 0 & -\frac{\sqrt{105}i}{112} & 0 & 0 & 0 & -\frac{\sqrt{7}}{112} & 0 & \frac{\sqrt{7}i}{112} & \frac{\sqrt{7}}{14} & 0 \\ 0 & 0 & -\frac{\sqrt{105}}{112} & 0 & \frac{\sqrt{105}i}{112} & 0 & 0 & 0 & -\frac{\sqrt{7}}{112} & 0 & -\frac{\sqrt{7}i}{112} & 0 & 0 & -\frac{\sqrt{7}}{14} \end{bmatrix}$
388	symmetry	$-\frac{x^2}{2} - \frac{y^2}{2} + z^2$

continued ...

Table 7

No.	multipole	matrix
	$\mathbb{T}_{2,0}^{(1,0;a)}(E_g)$	$\begin{bmatrix} 0 & \frac{\sqrt{210}}{84} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{14}i}{28} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{210}i}{84} \\ \frac{\sqrt{210}}{84} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{14}i}{28} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{210}i}{84} & 0 \\ 0 & \frac{\sqrt{210}i}{84} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{14}}{28} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{210}}{84} \\ -\frac{\sqrt{210}i}{84} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{14}}{28} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{210}}{84} & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{14}i}{28} & 0 & -\frac{\sqrt{14}}{28} & 0 & 0 & 0 & -\frac{\sqrt{210}i}{84} & 0 & \frac{\sqrt{210}}{84} & 0 & 0 \\ 0 & 0 & \frac{\sqrt{14}i}{28} & 0 & -\frac{\sqrt{14}}{28} & 0 & 0 & 0 & \frac{\sqrt{210}i}{84} & 0 & \frac{\sqrt{210}}{84} & 0 & 0 & 0 \end{bmatrix}$
389	symmetry	$\frac{\sqrt{3}(x-y)(x+y)}{2}$ $\begin{bmatrix} 0 & \frac{\sqrt{70}}{84} & 0 & 0 & \frac{\sqrt{42}}{42} & 0 & 0 & \frac{\sqrt{42}i}{84} & 0 & 0 & \frac{\sqrt{70}}{42} & 0 & 0 & -\frac{\sqrt{70}i}{84} \\ \frac{\sqrt{70}}{84} & 0 & 0 & 0 & 0 & -\frac{\sqrt{42}}{42} & -\frac{\sqrt{42}i}{84} & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}}{42} & \frac{\sqrt{70}i}{84} & 0 \\ 0 & -\frac{\sqrt{70}i}{84} & \frac{\sqrt{42}}{42} & 0 & 0 & 0 & 0 & -\frac{\sqrt{42}}{84} & -\frac{\sqrt{70}}{42} & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}}{84} \\ \frac{\sqrt{70}i}{84} & 0 & 0 & -\frac{\sqrt{42}}{42} & 0 & 0 & -\frac{\sqrt{42}}{84} & 0 & 0 & \frac{\sqrt{70}}{42} & 0 & 0 & 0 & -\frac{\sqrt{70}}{84} \\ -\frac{\sqrt{70}}{42} & 0 & 0 & \frac{\sqrt{42}i}{84} & 0 & -\frac{\sqrt{42}}{84} & 0 & 0 & 0 & \frac{\sqrt{70}i}{84} & 0 & \frac{\sqrt{70}}{84} & 0 & 0 \\ 0 & \frac{\sqrt{70}}{42} & -\frac{\sqrt{42}i}{84} & 0 & -\frac{\sqrt{42}}{84} & 0 & 0 & 0 & -\frac{\sqrt{70}i}{84} & 0 & \frac{\sqrt{70}}{84} & 0 & 0 & 0 \end{bmatrix}$
390	symmetry	$\sqrt{3}yz$ $\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{42}i}{84} & -\frac{\sqrt{42}}{84} & 0 & 0 & \frac{\sqrt{70}}{42} & 0 & -\frac{\sqrt{70}i}{84} & \frac{\sqrt{70}}{84} & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{42}i}{84} & 0 & 0 & \frac{\sqrt{42}}{84} & \frac{\sqrt{70}}{42} & 0 & \frac{\sqrt{70}i}{84} & 0 & -\frac{\sqrt{70}}{84} \\ \frac{\sqrt{70}}{84} & 0 & 0 & -\frac{\sqrt{42}i}{84} & 0 & \frac{\sqrt{42}}{28} & 0 & 0 & 0 & \frac{\sqrt{70}i}{84} & 0 & -\frac{\sqrt{70}}{84} & 0 & 0 \\ 0 & -\frac{\sqrt{70}}{84} & \frac{\sqrt{42}i}{84} & 0 & \frac{\sqrt{42}}{28} & 0 & 0 & 0 & -\frac{\sqrt{70}i}{84} & 0 & -\frac{\sqrt{70}}{84} & 0 & 0 & 0 \\ 0 & \frac{\sqrt{70}i}{84} & -\frac{\sqrt{42}}{84} & 0 & 0 & 0 & -\frac{\sqrt{42}}{28} & -\frac{\sqrt{70}}{84} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}}{84} \\ -\frac{\sqrt{70}i}{84} & 0 & 0 & \frac{\sqrt{42}}{84} & 0 & 0 & -\frac{\sqrt{42}}{28} & 0 & 0 & \frac{\sqrt{70}}{84} & 0 & 0 & -\frac{\sqrt{70}}{84} & 0 \end{bmatrix}$
391	symmetry	$\sqrt{3}xz$ $\begin{bmatrix} -\frac{\sqrt{70}}{84} & 0 & 0 & \frac{\sqrt{42}i}{28} & 0 & -\frac{\sqrt{42}}{84} & 0 & 0 & 0 & \frac{\sqrt{70}i}{84} & 0 & -\frac{\sqrt{70}}{84} & 0 & 0 \\ 0 & \frac{\sqrt{70}}{84} & -\frac{\sqrt{42}i}{28} & 0 & -\frac{\sqrt{42}}{84} & 0 & 0 & 0 & -\frac{\sqrt{70}i}{84} & 0 & -\frac{\sqrt{70}}{84} & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{42}}{84} & 0 & 0 & \frac{\sqrt{42}}{84} & 0 & 0 & \frac{\sqrt{70}}{84} & 0 & -\frac{\sqrt{70}i}{42} & \frac{\sqrt{70}}{84} & 0 \\ 0 & 0 & -\frac{\sqrt{42}}{84} & 0 & 0 & 0 & 0 & -\frac{\sqrt{42}}{84} & \frac{\sqrt{70}}{84} & 0 & \frac{\sqrt{70}i}{42} & 0 & 0 & -\frac{\sqrt{70}}{84} \\ 0 & \frac{\sqrt{70}}{84} & 0 & 0 & \frac{\sqrt{42}}{84} & 0 & 0 & -\frac{\sqrt{42}i}{28} & 0 & 0 & -\frac{\sqrt{70}}{84} & 0 & 0 & \frac{\sqrt{70}i}{84} \\ \frac{\sqrt{70}}{84} & 0 & 0 & 0 & 0 & -\frac{\sqrt{42}}{84} & \frac{\sqrt{42}i}{28} & 0 & 0 & 0 & \frac{\sqrt{70}}{84} & -\frac{\sqrt{70}i}{84} & 0 & 0 \end{bmatrix}$
392	symmetry	$\sqrt{3}xy$

continued ...

Table 7

No.	multipole	matrix
	$\mathbb{T}_{2,2}^{(1,0;a)}(T_g)$	$\begin{bmatrix} 0 & -\frac{\sqrt{70}i}{84} & \frac{\sqrt{42}}{28} & 0 & 0 & 0 & 0 & \frac{\sqrt{42}}{84} & -\frac{\sqrt{70}}{84} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}}{84} \\ \frac{\sqrt{70}i}{84} & 0 & 0 & -\frac{\sqrt{42}}{28} & 0 & 0 & \frac{\sqrt{42}}{84} & 0 & 0 & \frac{\sqrt{70}}{84} & 0 & 0 & 0 & -\frac{\sqrt{70}}{84} & 0 \\ 0 & -\frac{\sqrt{70}}{84} & 0 & 0 & -\frac{\sqrt{42}}{28} & 0 & 0 & \frac{\sqrt{42}i}{84} & 0 & 0 & -\frac{\sqrt{70}}{84} & 0 & 0 & \frac{\sqrt{70}i}{84} \\ -\frac{\sqrt{70}}{84} & 0 & 0 & 0 & 0 & \frac{\sqrt{42}}{28} & -\frac{\sqrt{42}i}{84} & 0 & 0 & 0 & 0 & \frac{\sqrt{70}}{84} & -\frac{\sqrt{70}i}{84} & 0 \\ 0 & 0 & 0 & \frac{\sqrt{42}}{84} & 0 & \frac{\sqrt{42}i}{84} & 0 & 0 & 0 & \frac{\sqrt{70}}{84} & 0 & -\frac{\sqrt{70}i}{84} & \frac{\sqrt{70}}{42} & 0 \\ 0 & 0 & \frac{\sqrt{42}}{84} & 0 & -\frac{\sqrt{42}i}{84} & 0 & 0 & 0 & \frac{\sqrt{70}}{84} & 0 & \frac{\sqrt{70}i}{84} & 0 & 0 & -\frac{\sqrt{70}}{42} \end{bmatrix}$
393	symmetry	$\frac{\sqrt{21}(x^4 - 3x^2y^2 - 3x^2z^2 + y^4 - 3y^2z^2 + z^4)}{6}$ $\begin{bmatrix} 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{24} & 0 & 0 & \frac{\sqrt{15}i}{24} & 0 & 0 & \frac{1}{8} & 0 & 0 & -\frac{i}{8} \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{24} & -\frac{\sqrt{15}i}{24} & 0 & 0 & 0 & 0 & -\frac{1}{8} & \frac{i}{8} & 0 \\ 0 & 0 & -\frac{\sqrt{15}}{24} & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{24} & \frac{1}{8} & 0 & 0 & 0 & 0 & \frac{1}{8} \\ 0 & 0 & 0 & \frac{\sqrt{15}}{24} & 0 & 0 & 0 & \frac{\sqrt{15}}{24} & 0 & 0 & -\frac{1}{8} & 0 & 0 & \frac{1}{8} \\ 0 & 0 & 0 & -\frac{\sqrt{15}i}{24} & 0 & -\frac{\sqrt{15}}{24} & 0 & 0 & 0 & -\frac{i}{8} & 0 & \frac{1}{8} & 0 & 0 \\ 0 & 0 & \frac{\sqrt{15}i}{24} & 0 & -\frac{\sqrt{15}}{24} & 0 & 0 & 0 & \frac{i}{8} & 0 & \frac{1}{8} & 0 & 0 & 0 \end{bmatrix}$
394	symmetry	$-\frac{\sqrt{15}(x^4 - 12x^2y^2 + 6x^2z^2 + y^4 + 6y^2z^2 - 2z^4)}{12}$ $\begin{bmatrix} 0 & -\frac{3\sqrt{35}}{140} & 0 & 0 & -\frac{\sqrt{21}}{24} & 0 & 0 & \frac{5\sqrt{21}i}{168} & 0 & 0 & -\frac{\sqrt{35}}{40} & 0 & 0 & \frac{\sqrt{35}i}{280} \\ -\frac{3\sqrt{35}}{140} & 0 & 0 & 0 & 0 & \frac{\sqrt{21}}{24} & -\frac{5\sqrt{21}i}{168} & 0 & 0 & 0 & 0 & \frac{\sqrt{35}}{40} & -\frac{\sqrt{35}i}{280} & 0 \\ 0 & -\frac{3\sqrt{35}i}{140} & \frac{\sqrt{21}}{24} & 0 & 0 & 0 & 0 & \frac{5\sqrt{21}}{168} & -\frac{\sqrt{35}}{40} & 0 & 0 & 0 & 0 & -\frac{\sqrt{35}}{280} \\ \frac{3\sqrt{35}i}{140} & 0 & 0 & -\frac{\sqrt{21}}{24} & 0 & 0 & \frac{5\sqrt{21}}{168} & 0 & 0 & \frac{\sqrt{35}}{40} & 0 & 0 & -\frac{\sqrt{35}}{280} & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{21}i}{84} & 0 & -\frac{\sqrt{21}}{84} & 0 & 0 & 0 & -\frac{\sqrt{35}i}{35} & 0 & \frac{\sqrt{35}}{35} & 0 & 0 \\ 0 & 0 & \frac{\sqrt{21}i}{84} & 0 & -\frac{\sqrt{21}}{84} & 0 & 0 & 0 & \frac{\sqrt{35}i}{35} & 0 & \frac{\sqrt{35}}{35} & 0 & 0 & 0 \end{bmatrix}$
395	symmetry	$\frac{\sqrt{5}(x-y)(x+y)(x^2+y^2-6z^2)}{4}$ $\begin{bmatrix} 0 & -\frac{\sqrt{105}}{140} & 0 & 0 & -\frac{\sqrt{7}}{56} & 0 & 0 & \frac{3\sqrt{7}i}{56} & 0 & 0 & \frac{3\sqrt{105}}{280} & 0 & 0 & -\frac{\sqrt{105}i}{56} \\ -\frac{\sqrt{105}}{140} & 0 & 0 & 0 & 0 & \frac{\sqrt{7}}{56} & -\frac{3\sqrt{7}i}{56} & 0 & 0 & 0 & 0 & -\frac{3\sqrt{105}}{280} & \frac{\sqrt{105}i}{56} & 0 \\ 0 & \frac{\sqrt{105}i}{140} & -\frac{\sqrt{7}}{56} & 0 & 0 & 0 & 0 & -\frac{3\sqrt{7}}{56} & -\frac{3\sqrt{105}}{280} & 0 & 0 & 0 & 0 & -\frac{\sqrt{105}}{56} \\ -\frac{\sqrt{105}i}{140} & 0 & 0 & \frac{\sqrt{7}}{56} & 0 & 0 & -\frac{3\sqrt{7}}{56} & 0 & 0 & \frac{3\sqrt{105}}{280} & 0 & 0 & -\frac{\sqrt{105}}{56} & 0 \\ \frac{\sqrt{105}}{70} & 0 & 0 & -\frac{\sqrt{7}i}{14} & 0 & \frac{\sqrt{7}}{14} & 0 & 0 & 0 & -\frac{\sqrt{105}i}{140} & 0 & -\frac{\sqrt{105}}{140} & 0 & 0 \\ 0 & -\frac{\sqrt{105}}{70} & \frac{\sqrt{7}i}{14} & 0 & \frac{\sqrt{7}}{14} & 0 & 0 & 0 & \frac{\sqrt{105}i}{140} & 0 & -\frac{\sqrt{105}}{140} & 0 & 0 & 0 \end{bmatrix}$
396	symmetry	$\frac{\sqrt{35}yz(y-z)(y+z)}{2}$

continued ...

Table 7

No.	multipole	matrix
	$\mathbb{T}_{4,0}^{(1,0;a)}(T_g, 1)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & \frac{i}{16} & -\frac{1}{16} & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{80} & -\frac{\sqrt{15}}{80} & 0 \\ 0 & 0 & 0 & 0 & -\frac{i}{16} & 0 & 0 & \frac{1}{16} & 0 & 0 & \frac{\sqrt{15}i}{80} & 0 & 0 & \frac{\sqrt{15}}{80} \\ \frac{\sqrt{15}}{40} & 0 & 0 & 0 & 0 & \frac{1}{4} & 0 & 0 & 0 & \frac{\sqrt{15}i}{40} & 0 & -\frac{\sqrt{15}}{20} & 0 & 0 \\ 0 & -\frac{\sqrt{15}}{40} & 0 & 0 & \frac{1}{4} & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{40} & 0 & -\frac{\sqrt{15}}{20} & 0 & 0 \\ 0 & -\frac{\sqrt{15}i}{40} & 0 & 0 & 0 & 0 & 0 & \frac{1}{4} & \frac{\sqrt{15}}{40} & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{20} \\ \frac{\sqrt{15}i}{40} & 0 & 0 & 0 & 0 & 0 & \frac{1}{4} & 0 & 0 & -\frac{\sqrt{15}}{40} & 0 & 0 & \frac{\sqrt{15}}{20} & 0 \end{bmatrix}$
397	symmetry	$-\frac{\sqrt{35}xz(x-z)(x+z)}{2}$ $\begin{bmatrix} \frac{\sqrt{15}}{40} & 0 & 0 & -\frac{i}{4} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{20} & 0 & \frac{\sqrt{15}}{40} & 0 & 0 \\ 0 & -\frac{\sqrt{15}}{40} & \frac{i}{4} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{20} & 0 & \frac{\sqrt{15}}{40} & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{1}{16} & 0 & 0 & -\frac{1}{16} & 0 & 0 & -\frac{\sqrt{15}}{80} & 0 & 0 & \frac{\sqrt{15}}{80} & 0 \\ 0 & 0 & -\frac{1}{16} & 0 & 0 & 0 & 0 & \frac{1}{16} & -\frac{\sqrt{15}}{80} & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{80} \\ 0 & \frac{\sqrt{15}}{40} & 0 & 0 & 0 & 0 & 0 & -\frac{i}{4} & 0 & 0 & -\frac{\sqrt{15}}{40} & 0 & 0 & \frac{\sqrt{15}i}{20} \\ \frac{\sqrt{15}}{40} & 0 & 0 & 0 & 0 & 0 & \frac{i}{4} & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{40} & -\frac{\sqrt{15}i}{20} & 0 \end{bmatrix}$
398	symmetry	$\frac{\sqrt{35}xy(x-y)(x+y)}{2}$ $\begin{bmatrix} 0 & -\frac{\sqrt{15}i}{40} & \frac{1}{4} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{20} & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{40} \\ \frac{\sqrt{15}i}{40} & 0 & 0 & -\frac{1}{4} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{20} & 0 & 0 & 0 & -\frac{\sqrt{15}}{40} \\ 0 & \frac{\sqrt{15}}{40} & 0 & 0 & \frac{1}{4} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{20} & 0 & 0 & -\frac{\sqrt{15}i}{40} \\ \frac{\sqrt{15}}{40} & 0 & 0 & 0 & 0 & -\frac{1}{4} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{20} & \frac{\sqrt{15}i}{40} & 0 \\ 0 & 0 & 0 & -\frac{1}{16} & 0 & \frac{i}{16} & 0 & 0 & 0 & \frac{\sqrt{15}}{80} & 0 & \frac{\sqrt{15}i}{80} & 0 & 0 \\ 0 & 0 & -\frac{1}{16} & 0 & -\frac{i}{16} & 0 & 0 & 0 & \frac{\sqrt{15}}{80} & 0 & -\frac{\sqrt{15}i}{80} & 0 & 0 & 0 \end{bmatrix}$
399	symmetry	$\frac{\sqrt{5}yz(6x^2-y^2-z^2)}{2}$ $\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}i}{112} & -\frac{\sqrt{7}}{112} & 0 & 0 & \frac{\sqrt{105}}{70} & 0 & -\frac{11\sqrt{105}i}{560} & \frac{11\sqrt{105}}{560} & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{7}i}{112} & 0 & 0 & \frac{\sqrt{7}}{112} & \frac{\sqrt{105}}{70} & 0 & \frac{11\sqrt{105}i}{560} & 0 & 0 & -\frac{11\sqrt{105}}{560} \\ -\frac{\sqrt{105}}{56} & 0 & 0 & \frac{3\sqrt{7}i}{56} & 0 & -\frac{\sqrt{7}}{28} & 0 & 0 & 0 & \frac{\sqrt{105}i}{140} & 0 & -\frac{\sqrt{105}}{140} & 0 & 0 \\ 0 & \frac{\sqrt{105}}{56} & -\frac{3\sqrt{7}i}{56} & 0 & -\frac{\sqrt{7}}{28} & 0 & 0 & 0 & -\frac{\sqrt{105}i}{140} & 0 & -\frac{\sqrt{105}}{140} & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{105}i}{56} & \frac{3\sqrt{7}}{56} & 0 & 0 & 0 & 0 & \frac{\sqrt{7}}{28} & -\frac{\sqrt{105}}{140} & 0 & 0 & 0 & 0 & -\frac{\sqrt{105}}{140} \\ \frac{\sqrt{105}i}{56} & 0 & 0 & -\frac{3\sqrt{7}}{56} & 0 & 0 & \frac{\sqrt{7}}{28} & 0 & 0 & \frac{\sqrt{105}}{140} & 0 & 0 & -\frac{\sqrt{105}}{140} & 0 \end{bmatrix}$
400	symmetry	$-\frac{\sqrt{5}xz(x^2-6y^2+z^2)}{2}$

continued ...

Table 7

No.	multipole	matrix
	$\mathbb{T}_{4,1}^{(1,0;a)}(T_g, 2)$	$\begin{bmatrix} \frac{\sqrt{105}}{56} & 0 & 0 & -\frac{\sqrt{7}i}{28} & 0 & \frac{3\sqrt{7}}{56} & 0 & 0 & 0 & \frac{\sqrt{105}i}{140} & 0 & -\frac{\sqrt{105}}{140} & 0 & 0 \\ 0 & -\frac{\sqrt{105}}{56} & \frac{\sqrt{7}i}{28} & 0 & \frac{3\sqrt{7}}{56} & 0 & 0 & 0 & -\frac{\sqrt{105}i}{140} & 0 & -\frac{\sqrt{105}}{140} & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{7}}{112} & 0 & 0 & \frac{\sqrt{7}}{112} & 0 & 0 & \frac{11\sqrt{105}}{560} & 0 & -\frac{\sqrt{105}i}{70} & \frac{11\sqrt{105}}{560} & 0 \\ 0 & 0 & -\frac{\sqrt{7}}{112} & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}}{112} & \frac{11\sqrt{105}}{560} & 0 & \frac{\sqrt{105}i}{70} & 0 & 0 & -\frac{11\sqrt{105}}{560} \\ 0 & -\frac{\sqrt{105}}{56} & 0 & 0 & -\frac{3\sqrt{7}}{56} & 0 & 0 & \frac{\sqrt{7}i}{28} & 0 & 0 & -\frac{\sqrt{105}}{140} & 0 & 0 & \frac{\sqrt{105}i}{140} \\ -\frac{\sqrt{105}}{56} & 0 & 0 & 0 & 0 & \frac{3\sqrt{7}}{56} & -\frac{\sqrt{7}i}{28} & 0 & 0 & 0 & \frac{\sqrt{105}}{140} & -\frac{\sqrt{105}i}{140} & 0 & 0 \end{bmatrix}$
401	symmetry	$-\frac{\sqrt{5}xy(x^2+y^2-6z^2)}{2}$
	$\mathbb{T}_{4,2}^{(1,0;a)}(T_g, 2)$	$\begin{bmatrix} 0 & \frac{\sqrt{105}i}{56} & -\frac{\sqrt{7}}{28} & 0 & 0 & 0 & 0 & -\frac{3\sqrt{7}}{56} & -\frac{\sqrt{105}}{140} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{105}}{140} \\ -\frac{\sqrt{105}i}{56} & 0 & 0 & \frac{\sqrt{7}}{28} & 0 & 0 & -\frac{3\sqrt{7}}{56} & 0 & 0 & \frac{\sqrt{105}}{140} & 0 & 0 & 0 & -\frac{\sqrt{105}}{140} & 0 \\ 0 & \frac{\sqrt{105}}{56} & 0 & 0 & \frac{\sqrt{7}}{28} & 0 & 0 & -\frac{3\sqrt{7}i}{56} & 0 & 0 & -\frac{\sqrt{105}}{140} & 0 & 0 & 0 & \frac{\sqrt{105}i}{140} \\ \frac{\sqrt{105}}{56} & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}}{28} & \frac{3\sqrt{7}i}{56} & 0 & 0 & 0 & 0 & \frac{\sqrt{105}}{140} & -\frac{\sqrt{105}i}{140} & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{7}}{112} & 0 & \frac{\sqrt{7}i}{112} & 0 & 0 & 0 & \frac{11\sqrt{105}}{560} & 0 & -\frac{11\sqrt{105}i}{560} & \frac{\sqrt{105}}{70} & 0 & 0 \\ 0 & 0 & \frac{\sqrt{7}}{112} & 0 & -\frac{\sqrt{7}i}{112} & 0 & 0 & 0 & \frac{11\sqrt{105}}{560} & 0 & \frac{11\sqrt{105}i}{560} & 0 & 0 & -\frac{\sqrt{105}}{70} & 0 \end{bmatrix}$
402	symmetry	$-\frac{x^2}{2} - \frac{y^2}{2} + z^2$
	$\mathbb{T}_{2,0}^{(1,1;a)}(E_g)$	$\begin{bmatrix} 0 & \frac{\sqrt{105}}{84} & 0 & 0 & -\frac{3\sqrt{7}}{56} & 0 & 0 & \frac{\sqrt{7}i}{14} & 0 & 0 & \frac{\sqrt{105}}{56} & 0 & 0 & 0 & \frac{\sqrt{105}i}{84} \\ \frac{\sqrt{105}}{84} & 0 & 0 & 0 & 0 & \frac{3\sqrt{7}}{56} & -\frac{\sqrt{7}i}{14} & 0 & 0 & 0 & 0 & -\frac{\sqrt{105}}{56} & -\frac{\sqrt{105}i}{84} & 0 & 0 \\ 0 & \frac{\sqrt{105}i}{84} & \frac{3\sqrt{7}}{56} & 0 & 0 & 0 & 0 & \frac{\sqrt{7}}{14} & \frac{\sqrt{105}}{56} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{105}}{84} \\ -\frac{\sqrt{105}i}{84} & 0 & 0 & -\frac{3\sqrt{7}}{56} & 0 & 0 & \frac{\sqrt{7}}{14} & 0 & 0 & -\frac{\sqrt{105}}{56} & 0 & 0 & 0 & -\frac{\sqrt{105}}{84} & 0 \\ 0 & 0 & 0 & \frac{\sqrt{7}i}{56} & 0 & \frac{\sqrt{7}}{56} & 0 & 0 & 0 & \frac{\sqrt{105}i}{168} & 0 & -\frac{\sqrt{105}}{168} & 0 & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{7}i}{56} & 0 & \frac{\sqrt{7}}{56} & 0 & 0 & 0 & -\frac{\sqrt{105}i}{168} & 0 & -\frac{\sqrt{105}}{168} & 0 & 0 & 0 & 0 \end{bmatrix}$
403	symmetry	$\frac{\sqrt{3}(x-y)(x+y)}{2}$
	$\mathbb{T}_{2,1}^{(1,1;a)}(E_g)$	$\begin{bmatrix} 0 & \frac{\sqrt{35}}{84} & 0 & 0 & -\frac{5\sqrt{21}}{168} & 0 & 0 & \frac{\sqrt{21}i}{84} & 0 & 0 & \frac{\sqrt{35}}{168} & 0 & 0 & 0 & \frac{\sqrt{35}i}{42} \\ \frac{\sqrt{35}}{84} & 0 & 0 & 0 & 0 & \frac{5\sqrt{21}}{168} & -\frac{\sqrt{21}i}{84} & 0 & 0 & 0 & 0 & -\frac{\sqrt{35}}{168} & -\frac{\sqrt{35}i}{42} & 0 & 0 \\ 0 & -\frac{\sqrt{35}i}{84} & -\frac{5\sqrt{21}}{168} & 0 & 0 & 0 & 0 & -\frac{\sqrt{21}}{84} & -\frac{\sqrt{35}}{168} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{35}}{42} \\ \frac{\sqrt{35}i}{84} & 0 & 0 & \frac{5\sqrt{21}}{168} & 0 & 0 & -\frac{\sqrt{21}}{84} & 0 & 0 & \frac{\sqrt{35}}{168} & 0 & 0 & 0 & \frac{\sqrt{35}}{42} & 0 \\ -\frac{\sqrt{35}}{42} & 0 & 0 & -\frac{\sqrt{21}i}{24} & 0 & \frac{\sqrt{21}}{24} & 0 & 0 & 0 & \frac{5\sqrt{35}i}{168} & 0 & \frac{5\sqrt{35}}{168} & 0 & 0 & 0 \\ 0 & \frac{\sqrt{35}}{42} & \frac{\sqrt{21}i}{24} & 0 & \frac{\sqrt{21}}{24} & 0 & 0 & 0 & -\frac{5\sqrt{35}i}{168} & 0 & \frac{5\sqrt{35}}{168} & 0 & 0 & 0 & 0 \end{bmatrix}$
404	symmetry	$\sqrt{3}yz$

continued ...

Table 7

No.	multipole	matrix
	$\mathbb{T}_{2,0}^{(1,1;a)}(T_g)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{21}i}{21} & -\frac{\sqrt{21}}{21} & 0 & 0 & \frac{\sqrt{35}}{42} & 0 & \frac{\sqrt{35}i}{42} & -\frac{\sqrt{35}}{42} & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{21}i}{21} & 0 & 0 & \frac{\sqrt{21}}{21} & \frac{\sqrt{35}}{42} & 0 & -\frac{\sqrt{35}i}{42} & 0 & 0 & \frac{\sqrt{35}}{42} \\ -\frac{\sqrt{35}}{42} & 0 & 0 & -\frac{\sqrt{21}i}{84} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{35}i}{84} & 0 & \frac{\sqrt{35}}{42} & 0 & 0 \\ 0 & \frac{\sqrt{35}}{42} & \frac{\sqrt{21}i}{84} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{35}i}{84} & 0 & \frac{\sqrt{35}}{42} & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{35}i}{42} & -\frac{\sqrt{21}}{84} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{35}}{84} & 0 & 0 & 0 & 0 & \frac{\sqrt{35}}{42} \\ \frac{\sqrt{35}i}{42} & 0 & 0 & \frac{\sqrt{21}}{84} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{35}}{84} & 0 & 0 & 0 & \frac{\sqrt{35}}{42} \end{bmatrix}$
405	symmetry	$\sqrt{3}xz$
	$\mathbb{T}_{2,1}^{(1,1;a)}(T_g)$	$\begin{bmatrix} \frac{\sqrt{35}}{42} & 0 & 0 & 0 & 0 & -\frac{\sqrt{21}}{84} & 0 & 0 & 0 & -\frac{\sqrt{35}i}{42} & 0 & -\frac{\sqrt{35}}{84} & 0 & 0 \\ 0 & -\frac{\sqrt{35}}{42} & 0 & 0 & -\frac{\sqrt{21}}{84} & 0 & 0 & 0 & \frac{\sqrt{35}i}{42} & 0 & -\frac{\sqrt{35}}{84} & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{21}}{21} & 0 & 0 & \frac{\sqrt{21}}{21} & 0 & 0 & -\frac{\sqrt{35}}{42} & 0 & -\frac{\sqrt{35}i}{42} & -\frac{\sqrt{35}}{42} & 0 \\ 0 & 0 & -\frac{\sqrt{21}}{21} & 0 & 0 & 0 & 0 & -\frac{\sqrt{21}}{21} & -\frac{\sqrt{35}}{42} & 0 & \frac{\sqrt{35}i}{42} & 0 & 0 & \frac{\sqrt{35}}{42} \\ 0 & -\frac{\sqrt{35}}{42} & 0 & 0 & \frac{\sqrt{21}}{84} & 0 & 0 & 0 & 0 & -\frac{\sqrt{35}}{84} & 0 & 0 & 0 & -\frac{\sqrt{35}i}{42} \\ -\frac{\sqrt{35}}{42} & 0 & 0 & 0 & 0 & -\frac{\sqrt{21}}{84} & 0 & 0 & 0 & 0 & \frac{\sqrt{35}}{84} & \frac{\sqrt{35}i}{42} & 0 & 0 \end{bmatrix}$
406	symmetry	$\sqrt{3}xy$
	$\mathbb{T}_{2,2}^{(1,1;a)}(T_g)$	$\begin{bmatrix} 0 & \frac{\sqrt{35}i}{42} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{21}}{84} & \frac{\sqrt{35}}{42} & 0 & 0 & 0 & 0 & -\frac{\sqrt{35}}{84} \\ -\frac{\sqrt{35}i}{42} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{21}}{84} & 0 & 0 & -\frac{\sqrt{35}}{42} & 0 & 0 & -\frac{\sqrt{35}}{84} & 0 \\ 0 & \frac{\sqrt{35}}{42} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{21}i}{84} & 0 & 0 & \frac{\sqrt{35}}{42} & 0 & 0 & \frac{\sqrt{35}i}{84} \\ \frac{\sqrt{35}}{42} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{21}i}{84} & 0 & 0 & 0 & 0 & -\frac{\sqrt{35}}{42} & -\frac{\sqrt{35}i}{84} & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{21}}{21} & 0 & \frac{\sqrt{21}i}{21} & 0 & 0 & 0 & -\frac{\sqrt{35}}{42} & 0 & \frac{\sqrt{35}i}{42} & \frac{\sqrt{35}}{42} & 0 \\ 0 & 0 & \frac{\sqrt{21}}{21} & 0 & -\frac{\sqrt{21}i}{21} & 0 & 0 & 0 & -\frac{\sqrt{35}}{42} & 0 & -\frac{\sqrt{35}i}{42} & 0 & 0 & -\frac{\sqrt{35}}{42} \end{bmatrix}$
407	symmetry	$\sqrt{15}xyz$
	$\mathbb{M}_3^{(a)}(A_g)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{6} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{6} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{6} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{6} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{6} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{6} \end{bmatrix}$
408	symmetry	$\frac{x(2x^2-3y^2-3z^2)}{2}$

continued ...

Table 7

No.	multipole	matrix
	$\mathbb{M}_{3,0}^{(a)}(T_g, 1)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{8} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{8} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{8} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{8} \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{8} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{8} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{8} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{8} & 0 & 0 \end{bmatrix}$
409	symmetry	$-\frac{y(3x^2 - 2y^2 + 3z^2)}{2}$ $\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{8} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{8} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{8} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{8} \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{3}i}{8} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{8} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{3}i}{8} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{8} & 0 & 0 & 0 & 0 \end{bmatrix}$
410	symmetry	$-\frac{z(3x^2 + 3y^2 - 2z^2)}{2}$ $\begin{bmatrix} 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{8} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{8} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{8} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{8} & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{3}i}{8} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{8} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{3}i}{8} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{8} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
411	symmetry	$\frac{\sqrt{15}x(y-z)(y+z)}{2}$ $\begin{bmatrix} \frac{\sqrt{3}i}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{3}i}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{5}i}{8} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{24} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{5}i}{8} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{24} \\ 0 & 0 & 0 & 0 & \frac{\sqrt{5}i}{8} & 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{24} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{5}i}{8} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{24} & 0 & 0 & 0 \end{bmatrix}$
412	symmetry	$-\frac{\sqrt{15}y(x-z)(x+z)}{2}$

continued ...

Table 7

No.	multipole	matrix
	$\mathbb{M}_{3,1}^{(a)}(T_g, 2)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{5}i}{8} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{24} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{5}i}{8} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{24} \\ \frac{\sqrt{3}i}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{3}i}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{5}i}{8} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{24} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{5}i}{8} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{24} & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
413	symmetry	$\frac{\sqrt{15}z(x-y)(x+y)}{2}$ $\begin{bmatrix} 0 & 0 & 0 & 0 & \frac{\sqrt{5}i}{8} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{24} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{5}i}{8} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{24} & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{5}i}{8} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{24} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{5}i}{8} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{24} & 0 & 0 & 0 & 0 & 0 \\ \frac{\sqrt{3}i}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{3}i}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
414	symmetry	$\sqrt{15}xyz$ $\begin{bmatrix} 0 & \frac{\sqrt{35}}{42} & 0 & 0 & -\frac{\sqrt{21}}{42} & 0 & 0 & \frac{\sqrt{21}i}{42} & 0 & 0 & -\frac{\sqrt{35}}{42} & 0 & 0 & -\frac{\sqrt{35}i}{42} \\ \frac{\sqrt{35}}{42} & 0 & 0 & 0 & 0 & \frac{\sqrt{21}}{42} & -\frac{\sqrt{21}i}{42} & 0 & 0 & 0 & 0 & \frac{\sqrt{35}}{42} & \frac{\sqrt{35}i}{42} & 0 \\ 0 & -\frac{\sqrt{35}i}{42} & -\frac{\sqrt{21}}{42} & 0 & 0 & 0 & 0 & -\frac{\sqrt{21}}{42} & \frac{\sqrt{35}}{42} & 0 & 0 & 0 & 0 & -\frac{\sqrt{35}}{42} \\ \frac{\sqrt{35}i}{42} & 0 & 0 & \frac{\sqrt{21}}{42} & 0 & 0 & -\frac{\sqrt{21}}{42} & 0 & 0 & -\frac{\sqrt{35}}{42} & 0 & 0 & -\frac{\sqrt{35}}{42} & 0 \\ \frac{\sqrt{35}}{42} & 0 & 0 & \frac{\sqrt{21}i}{42} & 0 & -\frac{\sqrt{21}}{42} & 0 & 0 & 0 & \frac{\sqrt{35}i}{42} & 0 & \frac{\sqrt{35}}{42} & 0 & 0 \\ 0 & -\frac{\sqrt{35}}{42} & -\frac{\sqrt{21}i}{42} & 0 & -\frac{\sqrt{21}}{42} & 0 & 0 & 0 & -\frac{\sqrt{35}i}{42} & 0 & \frac{\sqrt{35}}{42} & 0 & 0 & 0 \end{bmatrix}$
415	symmetry	$\frac{x(2x^2-3y^2-3z^2)}{2}$ $\begin{bmatrix} 0 & 0 & 0 & \frac{3\sqrt{35}}{70} & 0 & -\frac{\sqrt{35}i}{70} & \frac{\sqrt{35}}{70} & 0 & 0 & 0 & 0 & -\frac{\sqrt{21}i}{42} & -\frac{\sqrt{21}}{42} & 0 \\ 0 & 0 & \frac{3\sqrt{35}}{70} & 0 & \frac{\sqrt{35}i}{70} & 0 & 0 & -\frac{\sqrt{35}}{70} & 0 & 0 & \frac{\sqrt{21}i}{42} & 0 & 0 & \frac{\sqrt{21}}{42} \\ -\frac{\sqrt{21}}{42} & 0 & 0 & -\frac{\sqrt{35}i}{70} & 0 & -\frac{3\sqrt{35}}{140} & 0 & 0 & 0 & \frac{\sqrt{21}i}{42} & 0 & -\frac{\sqrt{21}}{28} & 0 & 0 \\ 0 & \frac{\sqrt{21}}{42} & \frac{\sqrt{35}i}{70} & 0 & -\frac{3\sqrt{35}}{140} & 0 & 0 & 0 & -\frac{\sqrt{21}i}{42} & 0 & -\frac{\sqrt{21}}{28} & 0 & 0 & 0 \\ 0 & \frac{\sqrt{21}i}{42} & \frac{\sqrt{35}}{70} & 0 & 0 & 0 & 0 & -\frac{3\sqrt{35}}{140} & \frac{\sqrt{21}}{42} & 0 & 0 & 0 & 0 & \frac{\sqrt{21}}{28} \\ -\frac{\sqrt{21}i}{42} & 0 & 0 & -\frac{\sqrt{35}}{70} & 0 & 0 & -\frac{3\sqrt{35}}{140} & 0 & 0 & -\frac{\sqrt{21}i}{42} & 0 & 0 & \frac{\sqrt{21}}{28} & 0 \end{bmatrix}$
416	symmetry	$-\frac{y(3x^2-2y^2+3z^2)}{2}$

continued ...

Table 7

No.	multipole	matrix
		$\begin{bmatrix} -\frac{\sqrt{21}}{42} & 0 & 0 & \frac{3\sqrt{35}i}{140} & 0 & \frac{\sqrt{35}}{70} & 0 & 0 & 0 & -\frac{\sqrt{21}i}{28} & 0 & \frac{\sqrt{21}}{42} & 0 & 0 \\ 0 & \frac{\sqrt{21}}{42} & -\frac{3\sqrt{35}i}{140} & 0 & \frac{\sqrt{35}}{70} & 0 & 0 & 0 & 0 & \frac{\sqrt{21}i}{28} & 0 & \frac{\sqrt{21}}{42} & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{35}}{70} & 0 & -\frac{3\sqrt{35}i}{70} & \frac{\sqrt{35}}{70} & 0 & 0 & -\frac{\sqrt{21}}{42} & 0 & 0 & \frac{\sqrt{21}}{42} & 0 \\ 0 & 0 & \frac{\sqrt{35}}{70} & 0 & \frac{3\sqrt{35}i}{70} & 0 & 0 & -\frac{\sqrt{35}}{70} & -\frac{\sqrt{21}}{42} & 0 & 0 & 0 & 0 & -\frac{\sqrt{21}}{42} \\ 0 & -\frac{\sqrt{21}}{42} & 0 & 0 & \frac{\sqrt{35}}{70} & 0 & 0 & \frac{3\sqrt{35}i}{140} & 0 & 0 & -\frac{\sqrt{21}}{42} & 0 & 0 & \frac{\sqrt{21}i}{28} \\ -\frac{\sqrt{21}}{42} & 0 & 0 & 0 & 0 & -\frac{\sqrt{35}}{70} & -\frac{3\sqrt{35}i}{140} & 0 & 0 & 0 & 0 & \frac{\sqrt{21}}{42} & -\frac{\sqrt{21}i}{28} & 0 \end{bmatrix}$
417	symmetry	$-\frac{z(3x^2+3y^2-2z^2)}{2}$
		$\begin{bmatrix} 0 & \frac{\sqrt{21}i}{42} & -\frac{3\sqrt{35}}{140} & 0 & 0 & 0 & 0 & \frac{\sqrt{35}}{70} & -\frac{\sqrt{21}}{28} & 0 & 0 & 0 & 0 & -\frac{\sqrt{21}}{42} \\ -\frac{\sqrt{21}i}{42} & 0 & 0 & \frac{3\sqrt{35}}{140} & 0 & 0 & 0 & \frac{\sqrt{35}}{70} & 0 & 0 & \frac{\sqrt{21}}{28} & 0 & 0 & -\frac{\sqrt{21}}{42} \\ 0 & -\frac{\sqrt{21}}{42} & 0 & 0 & -\frac{3\sqrt{35}}{140} & 0 & 0 & -\frac{\sqrt{35}i}{70} & 0 & 0 & \frac{\sqrt{21}}{28} & 0 & 0 & -\frac{\sqrt{21}i}{42} \\ -\frac{\sqrt{21}}{42} & 0 & 0 & 0 & 0 & \frac{3\sqrt{35}}{140} & \frac{\sqrt{35}i}{70} & 0 & 0 & 0 & 0 & -\frac{\sqrt{21}}{28} & \frac{\sqrt{21}i}{42} & 0 \\ 0 & 0 & 0 & \frac{\sqrt{35}}{70} & 0 & -\frac{\sqrt{35}i}{70} & \frac{3\sqrt{35}}{70} & 0 & 0 & \frac{\sqrt{21}}{42} & 0 & \frac{\sqrt{21}i}{42} & 0 & 0 \\ 0 & 0 & \frac{\sqrt{35}}{70} & 0 & \frac{\sqrt{35}i}{70} & 0 & 0 & -\frac{3\sqrt{35}}{70} & \frac{\sqrt{21}}{42} & 0 & -\frac{\sqrt{21}i}{42} & 0 & 0 & 0 \end{bmatrix}$
418	symmetry	$\frac{\sqrt{15}x(y-z)(y+z)}{2}$
		$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{21}i}{42} & \frac{\sqrt{21}}{42} & 0 & 0 & \frac{\sqrt{35}}{42} & 0 & \frac{\sqrt{35}i}{42} & -\frac{\sqrt{35}}{42} & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{21}i}{42} & 0 & 0 & -\frac{\sqrt{21}}{42} & \frac{\sqrt{35}}{42} & 0 & -\frac{\sqrt{35}i}{42} & 0 & 0 & \frac{\sqrt{35}}{42} \\ -\frac{\sqrt{35}}{42} & 0 & 0 & \frac{\sqrt{21}i}{42} & 0 & \frac{\sqrt{21}}{28} & 0 & 0 & 0 & -\frac{\sqrt{35}i}{42} & 0 & -\frac{\sqrt{35}}{84} & 0 & 0 \\ 0 & \frac{\sqrt{35}}{42} & -\frac{\sqrt{21}i}{42} & 0 & \frac{\sqrt{21}}{28} & 0 & 0 & 0 & \frac{\sqrt{35}i}{42} & 0 & -\frac{\sqrt{35}}{84} & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{35}i}{42} & \frac{\sqrt{21}}{42} & 0 & 0 & 0 & 0 & -\frac{\sqrt{21}}{28} & \frac{\sqrt{35}}{42} & 0 & 0 & 0 & 0 & -\frac{\sqrt{35}}{84} \\ \frac{\sqrt{35}i}{42} & 0 & 0 & -\frac{\sqrt{21}}{42} & 0 & 0 & -\frac{\sqrt{21}}{28} & 0 & 0 & -\frac{\sqrt{35}}{42} & 0 & 0 & 0 & -\frac{\sqrt{35}}{84} \end{bmatrix}$
419	symmetry	$-\frac{\sqrt{15}y(x-z)(x+z)}{2}$
		$\begin{bmatrix} \frac{\sqrt{35}}{42} & 0 & 0 & \frac{\sqrt{21}i}{28} & 0 & \frac{\sqrt{21}}{42} & 0 & 0 & 0 & \frac{\sqrt{35}i}{84} & 0 & \frac{\sqrt{35}}{42} & 0 & 0 \\ 0 & -\frac{\sqrt{35}}{42} & -\frac{\sqrt{21}i}{28} & 0 & \frac{\sqrt{21}}{42} & 0 & 0 & 0 & -\frac{\sqrt{35}i}{84} & 0 & \frac{\sqrt{35}}{42} & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{21}}{42} & 0 & 0 & -\frac{\sqrt{21}}{42} & 0 & 0 & -\frac{\sqrt{35}}{42} & 0 & -\frac{\sqrt{35}i}{42} & -\frac{\sqrt{35}}{42} & 0 \\ 0 & 0 & \frac{\sqrt{21}}{42} & 0 & 0 & 0 & 0 & \frac{\sqrt{21}}{42} & -\frac{\sqrt{35}}{42} & 0 & \frac{\sqrt{35}i}{42} & 0 & 0 & \frac{\sqrt{35}}{42} \\ 0 & -\frac{\sqrt{35}}{42} & 0 & 0 & -\frac{\sqrt{21}}{42} & 0 & 0 & -\frac{\sqrt{21}i}{28} & 0 & 0 & \frac{\sqrt{35}}{42} & 0 & 0 & \frac{\sqrt{35}i}{84} \\ -\frac{\sqrt{35}}{42} & 0 & 0 & 0 & 0 & \frac{\sqrt{21}}{42} & \frac{\sqrt{21}i}{28} & 0 & 0 & 0 & 0 & -\frac{\sqrt{35}}{42} & -\frac{\sqrt{35}i}{84} & 0 \end{bmatrix}$
420	symmetry	$\frac{\sqrt{15}z(x-y)(x+y)}{2}$

continued ...

Table 7

No.	multipole	matrix
		$\begin{bmatrix} 0 & \frac{\sqrt{35}i}{42} & \frac{\sqrt{21}}{28} & 0 & 0 & 0 & 0 & -\frac{\sqrt{21}}{42} & -\frac{\sqrt{35}}{84} & 0 & 0 & 0 & 0 & \frac{\sqrt{35}}{42} \\ -\frac{\sqrt{35}i}{42} & 0 & 0 & -\frac{\sqrt{21}}{28} & 0 & 0 & -\frac{\sqrt{21}}{42} & 0 & 0 & \frac{\sqrt{35}}{84} & 0 & 0 & 0 & \frac{\sqrt{35}}{42} & 0 \\ 0 & \frac{\sqrt{35}}{42} & 0 & 0 & -\frac{\sqrt{21}}{28} & 0 & 0 & -\frac{\sqrt{21}i}{42} & 0 & 0 & -\frac{\sqrt{35}}{84} & 0 & 0 & -\frac{\sqrt{35}i}{42} \\ \frac{\sqrt{35}}{42} & 0 & 0 & 0 & 0 & \frac{\sqrt{21}}{28} & \frac{\sqrt{21}i}{42} & 0 & 0 & 0 & 0 & \frac{\sqrt{35}}{84} & \frac{\sqrt{35}i}{42} & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{21}}{42} & 0 & -\frac{\sqrt{21}i}{42} & 0 & 0 & 0 & -\frac{\sqrt{35}}{42} & 0 & \frac{\sqrt{35}i}{42} & \frac{\sqrt{35}}{42} & 0 \\ 0 & 0 & -\frac{\sqrt{21}}{42} & 0 & \frac{\sqrt{21}i}{42} & 0 & 0 & 0 & -\frac{\sqrt{35}}{42} & 0 & -\frac{\sqrt{35}i}{42} & 0 & 0 & -\frac{\sqrt{35}}{42} \end{bmatrix}$
421	symmetry	$\frac{3\sqrt{35}xyz(x-y)(x+y)}{2}$
		$\begin{bmatrix} 0 & \frac{\sqrt{15}}{20} & 0 & 0 & -\frac{1}{8} & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{40} & 0 & 0 & -\frac{\sqrt{15}i}{20} \\ \frac{\sqrt{15}}{20} & 0 & 0 & 0 & 0 & \frac{1}{8} & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{40} & \frac{\sqrt{15}i}{20} & 0 \\ 0 & \frac{\sqrt{15}i}{20} & \frac{1}{8} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{40} & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{20} \\ -\frac{\sqrt{15}i}{20} & 0 & 0 & -\frac{1}{8} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{40} & 0 & 0 & \frac{\sqrt{15}}{20} & 0 \\ 0 & 0 & 0 & -\frac{i}{8} & 0 & -\frac{1}{8} & 0 & 0 & 0 & \frac{\sqrt{15}i}{40} & 0 & -\frac{\sqrt{15}}{40} & 0 & 0 \\ 0 & 0 & \frac{i}{8} & 0 & -\frac{1}{8} & 0 & 0 & 0 & -\frac{\sqrt{15}i}{40} & 0 & -\frac{\sqrt{15}}{40} & 0 & 0 & 0 \end{bmatrix}$
422	symmetry	$\frac{\sqrt{105}xyz(x^2+y^2-2z^2)}{2}$
		$\begin{bmatrix} 0 & \frac{\sqrt{5}}{20} & 0 & 0 & \frac{\sqrt{3}}{24} & 0 & 0 & \frac{\sqrt{3}i}{12} & 0 & 0 & -\frac{3\sqrt{5}}{40} & 0 & 0 & 0 \\ \frac{\sqrt{5}}{20} & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{24} & -\frac{\sqrt{3}i}{12} & 0 & 0 & 0 & 0 & \frac{3\sqrt{5}}{40} & 0 & 0 \\ 0 & -\frac{\sqrt{5}i}{20} & \frac{\sqrt{3}}{24} & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{12} & \frac{3\sqrt{5}}{40} & 0 & 0 & 0 & 0 & 0 \\ \frac{\sqrt{5}i}{20} & 0 & 0 & -\frac{\sqrt{3}}{24} & 0 & 0 & -\frac{\sqrt{3}}{12} & 0 & 0 & -\frac{3\sqrt{5}}{40} & 0 & 0 & 0 & 0 \\ -\frac{\sqrt{5}}{10} & 0 & 0 & -\frac{\sqrt{3}i}{24} & 0 & \frac{\sqrt{3}}{24} & 0 & 0 & 0 & -\frac{3\sqrt{5}i}{40} & 0 & -\frac{3\sqrt{5}}{40} & 0 & 0 \\ 0 & \frac{\sqrt{5}}{10} & \frac{\sqrt{3}i}{24} & 0 & \frac{\sqrt{3}}{24} & 0 & 0 & 0 & \frac{3\sqrt{5}i}{40} & 0 & -\frac{3\sqrt{5}}{40} & 0 & 0 & 0 \end{bmatrix}$
423	symmetry	$\frac{x(8x^4-40x^2y^2-40x^2z^2+15y^4+30y^2z^2+15z^4)}{8}$
		$\begin{bmatrix} 0 & 0 & 0 & \frac{\sqrt{35}}{21} & 0 & -\frac{\sqrt{35}i}{56} & \frac{\sqrt{35}}{56} & 0 & 0 & 0 & 0 & -\frac{5\sqrt{21}i}{168} & -\frac{5\sqrt{21}}{168} & 0 \\ 0 & 0 & \frac{\sqrt{35}}{21} & 0 & \frac{\sqrt{35}i}{56} & 0 & 0 & -\frac{\sqrt{35}}{56} & 0 & 0 & \frac{5\sqrt{21}i}{168} & 0 & 0 & \frac{5\sqrt{21}}{168} \\ \frac{\sqrt{21}}{84} & 0 & 0 & \frac{\sqrt{35}i}{42} & 0 & \frac{\sqrt{35}}{56} & 0 & 0 & 0 & -\frac{\sqrt{21}i}{84} & 0 & \frac{5\sqrt{21}}{168} & 0 & 0 \\ 0 & -\frac{\sqrt{21}}{84} & -\frac{\sqrt{35}i}{42} & 0 & \frac{\sqrt{35}}{56} & 0 & 0 & 0 & \frac{\sqrt{21}i}{84} & 0 & \frac{5\sqrt{21}}{168} & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{21}i}{84} & -\frac{\sqrt{35}}{42} & 0 & 0 & 0 & 0 & \frac{\sqrt{35}}{56} & -\frac{\sqrt{21}}{84} & 0 & 0 & 0 & 0 & -\frac{5\sqrt{21}}{168} \\ \frac{\sqrt{21}i}{84} & 0 & 0 & \frac{\sqrt{35}}{42} & 0 & 0 & \frac{\sqrt{35}}{56} & 0 & 0 & \frac{\sqrt{21}}{84} & 0 & 0 & -\frac{5\sqrt{21}}{168} & 0 \end{bmatrix}$
424	symmetry	$\frac{y(15x^4-40x^2y^2+30x^2z^2+8y^4-40y^2z^2+15z^4)}{8}$

continued ...

Table 7

continued ..

Table 7

No.	multipole	matrix
	$\mathbb{M}_{5,2}^{(1,-1;a)}(T_g, 2)$	$\begin{bmatrix} 0 & \frac{\sqrt{15}i}{20} & \frac{1}{8} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{40} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{20} \\ -\frac{\sqrt{15}i}{20} & 0 & 0 & -\frac{1}{8} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{40} & 0 & 0 & 0 & \frac{\sqrt{15}}{20} & 0 \\ 0 & -\frac{\sqrt{15}}{20} & 0 & 0 & \frac{1}{8} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{40} & 0 & 0 & 0 & \frac{\sqrt{15}i}{20} \\ -\frac{\sqrt{15}}{20} & 0 & 0 & 0 & 0 & -\frac{1}{8} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{40} & -\frac{\sqrt{15}i}{20} & 0 & 0 \\ 0 & 0 & 0 & \frac{1}{8} & 0 & -\frac{i}{8} & 0 & 0 & 0 & -\frac{\sqrt{15}}{40} & 0 & 0 & -\frac{\sqrt{15}i}{40} & 0 & 0 \\ 0 & 0 & \frac{1}{8} & 0 & \frac{i}{8} & 0 & 0 & 0 & -\frac{\sqrt{15}}{40} & 0 & \frac{\sqrt{15}i}{40} & 0 & 0 & 0 & 0 \end{bmatrix}$
429	symmetry	$\frac{\sqrt{105}x(y-z)(y+z)(2x^2-y^2-z^2)}{4}$
	$\mathbb{M}_{5,0}^{(1,-1;a)}(T_g, 3)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{12} & \frac{\sqrt{3}}{12} & 0 & 0 & \frac{\sqrt{5}}{10} & 0 & \frac{\sqrt{5}i}{20} & -\frac{\sqrt{5}}{20} & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{12} & 0 & 0 & -\frac{\sqrt{3}}{12} & \frac{\sqrt{5}}{10} & 0 & -\frac{\sqrt{5}i}{20} & 0 & 0 & \frac{\sqrt{5}}{20} \\ 0 & 0 & 0 & -\frac{\sqrt{3}i}{12} & 0 & -\frac{\sqrt{3}}{12} & 0 & 0 & 0 & \frac{\sqrt{5}i}{20} & 0 & -\frac{\sqrt{5}}{20} & 0 & 0 \\ 0 & 0 & \frac{\sqrt{3}i}{12} & 0 & -\frac{\sqrt{3}}{12} & 0 & 0 & 0 & -\frac{\sqrt{5}i}{20} & 0 & -\frac{\sqrt{5}}{20} & 0 & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{3}}{12} & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{12} & -\frac{\sqrt{5}}{20} & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}}{20} \\ 0 & 0 & 0 & \frac{\sqrt{3}}{12} & 0 & 0 & \frac{\sqrt{3}}{12} & 0 & 0 & \frac{\sqrt{5}}{20} & 0 & 0 & 0 & -\frac{\sqrt{5}}{20} & 0 \end{bmatrix}$
430	symmetry	$\frac{\sqrt{105}y(x-z)(x+z)(x^2-2y^2+z^2)}{4}$
	$\mathbb{M}_{5,1}^{(1,-1;a)}(T_g, 3)$	$\begin{bmatrix} 0 & 0 & 0 & -\frac{\sqrt{3}i}{12} & 0 & -\frac{\sqrt{3}}{12} & 0 & 0 & 0 & \frac{\sqrt{5}i}{20} & 0 & -\frac{\sqrt{5}}{20} & 0 & 0 \\ 0 & 0 & \frac{\sqrt{3}i}{12} & 0 & -\frac{\sqrt{3}}{12} & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{20} & 0 & -\frac{\sqrt{5}}{20} & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{3}}{12} & 0 & 0 & -\frac{\sqrt{3}}{12} & 0 & 0 & -\frac{\sqrt{5}}{20} & 0 & -\frac{\sqrt{5}i}{10} & -\frac{\sqrt{5}}{20} & 0 \\ 0 & 0 & \frac{\sqrt{3}}{12} & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{12} & -\frac{\sqrt{5}}{20} & 0 & \frac{\sqrt{5}i}{10} & 0 & 0 & \frac{\sqrt{5}}{20} \\ 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{12} & 0 & 0 & \frac{\sqrt{3}i}{12} & 0 & 0 & -\frac{\sqrt{5}}{20} & 0 & 0 & \frac{\sqrt{5}i}{20} \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{12} & -\frac{\sqrt{3}i}{12} & 0 & 0 & 0 & 0 & \frac{\sqrt{5}}{20} & -\frac{\sqrt{5}i}{20} & 0 \end{bmatrix}$
431	symmetry	$-\frac{\sqrt{105}z(x-y)(x+y)(x^2+y^2-2z^2)}{4}$
	$\mathbb{M}_{5,2}^{(1,-1;a)}(T_g, 3)$	$\begin{bmatrix} 0 & 0 & -\frac{\sqrt{3}}{12} & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{12} & -\frac{\sqrt{5}}{20} & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}}{20} \\ 0 & 0 & 0 & \frac{\sqrt{3}}{12} & 0 & 0 & \frac{\sqrt{3}}{12} & 0 & 0 & \frac{\sqrt{5}}{20} & 0 & 0 & 0 & -\frac{\sqrt{5}}{20} & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{12} & 0 & 0 & \frac{\sqrt{3}i}{12} & 0 & 0 & -\frac{\sqrt{5}}{20} & 0 & 0 & \frac{\sqrt{5}i}{20} \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{12} & -\frac{\sqrt{3}i}{12} & 0 & 0 & 0 & 0 & \frac{\sqrt{5}}{20} & -\frac{\sqrt{5}i}{20} & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{3}}{12} & 0 & -\frac{\sqrt{3}i}{12} & 0 & 0 & 0 & -\frac{\sqrt{5}}{20} & 0 & \frac{\sqrt{5}i}{20} & \frac{\sqrt{5}}{10} & 0 \\ 0 & 0 & -\frac{\sqrt{3}}{12} & 0 & \frac{\sqrt{3}i}{12} & 0 & 0 & 0 & -\frac{\sqrt{5}}{20} & 0 & -\frac{\sqrt{5}i}{20} & 0 & 0 & -\frac{\sqrt{5}}{10} & 0 \end{bmatrix}$
432	symmetry	$\sqrt{15}xyz$

continued ...

Table 7

No.	multipole	matrix
	$\mathbb{M}_3^{(1,0;a)}(A_g)$	$\begin{bmatrix} 0 & -\frac{1}{6} & 0 & 0 & -\frac{\sqrt{15}}{24} & 0 & 0 & \frac{\sqrt{15}i}{24} & 0 & 0 & \frac{1}{24} & 0 & 0 & \frac{i}{24} \\ -\frac{1}{6} & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{24} & -\frac{\sqrt{15}i}{24} & 0 & 0 & 0 & 0 & -\frac{1}{24} & -\frac{i}{24} & 0 \\ 0 & \frac{i}{6} & -\frac{\sqrt{15}}{24} & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{24} & -\frac{1}{24} & 0 & 0 & 0 & 0 & \frac{1}{24} \\ -\frac{i}{6} & 0 & 0 & \frac{\sqrt{15}}{24} & 0 & 0 & -\frac{\sqrt{15}}{24} & 0 & 0 & \frac{1}{24} & 0 & 0 & \frac{1}{24} & 0 \\ -\frac{1}{6} & 0 & 0 & \frac{\sqrt{15}i}{24} & 0 & -\frac{\sqrt{15}}{24} & 0 & 0 & 0 & -\frac{i}{24} & 0 & -\frac{1}{24} & 0 & 0 \\ 0 & \frac{1}{6} & -\frac{\sqrt{15}i}{24} & 0 & -\frac{\sqrt{15}}{24} & 0 & 0 & 0 & \frac{i}{24} & 0 & -\frac{1}{24} & 0 & 0 & 0 \end{bmatrix}$
433	symmetry	$\frac{x(2x^2-3y^2-3z^2)}{2}$ $\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & \frac{i}{16} & -\frac{1}{16} & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{48} & \frac{\sqrt{15}}{48} & 0 \\ 0 & 0 & 0 & 0 & -\frac{i}{16} & 0 & 0 & \frac{1}{16} & 0 & 0 & -\frac{\sqrt{15}i}{48} & 0 & 0 & -\frac{\sqrt{15}}{48} \\ -\frac{\sqrt{15}}{24} & 0 & 0 & \frac{i}{4} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{24} & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{15}}{24} & -\frac{i}{4} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{24} & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{15}i}{24} & -\frac{1}{4} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{24} & 0 & 0 & 0 & 0 & 0 \\ -\frac{\sqrt{15}i}{24} & 0 & 0 & \frac{1}{4} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{24} & 0 & 0 & 0 & 0 \end{bmatrix}$
434	symmetry	$-\frac{y(3x^2-2y^2+3z^2)}{2}$ $\begin{bmatrix} -\frac{\sqrt{15}}{24} & 0 & 0 & 0 & 0 & -\frac{1}{4} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{24} & 0 & 0 \\ 0 & \frac{\sqrt{15}}{24} & 0 & 0 & -\frac{1}{4} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{24} & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{1}{16} & 0 & 0 & -\frac{1}{16} & 0 & 0 & \frac{\sqrt{15}}{48} & 0 & 0 & -\frac{\sqrt{15}}{48} & 0 \\ 0 & 0 & -\frac{1}{16} & 0 & 0 & 0 & 0 & \frac{1}{16} & \frac{\sqrt{15}}{48} & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{48} \\ 0 & -\frac{\sqrt{15}}{24} & 0 & 0 & -\frac{1}{4} & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{24} & 0 & 0 & 0 & 0 \\ -\frac{\sqrt{15}}{24} & 0 & 0 & 0 & 0 & \frac{1}{4} & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{24} & 0 & 0 & 0 \end{bmatrix}$
435	symmetry	$-\frac{z(3x^2+3y^2-2z^2)}{2}$ $\begin{bmatrix} 0 & \frac{\sqrt{15}i}{24} & 0 & 0 & 0 & 0 & 0 & -\frac{1}{4} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{24} \\ -\frac{\sqrt{15}i}{24} & 0 & 0 & 0 & 0 & 0 & -\frac{1}{4} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{24} & 0 \\ 0 & -\frac{\sqrt{15}}{24} & 0 & 0 & 0 & 0 & 0 & \frac{i}{4} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{24} \\ -\frac{\sqrt{15}}{24} & 0 & 0 & 0 & 0 & 0 & -\frac{i}{4} & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{24} & 0 & 0 \\ 0 & 0 & 0 & -\frac{1}{16} & 0 & \frac{i}{16} & 0 & 0 & 0 & -\frac{\sqrt{15}}{48} & 0 & -\frac{\sqrt{15}i}{48} & 0 & 0 \\ 0 & 0 & -\frac{1}{16} & 0 & -\frac{i}{16} & 0 & 0 & 0 & -\frac{\sqrt{15}}{48} & 0 & \frac{\sqrt{15}i}{48} & 0 & 0 & 0 \end{bmatrix}$
436	symmetry	$\frac{\sqrt{15}x(y-z)(y+z)}{2}$

continued ...

Table 7

No.	multipole	matrix
	$\mathbb{M}_{3,0}^{(1,0;a)}(T_g, 2)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{48} & -\frac{\sqrt{15}}{48} & 0 & 0 & -\frac{1}{6} & 0 & \frac{7i}{48} & -\frac{7}{48} & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{48} & 0 & 0 & \frac{\sqrt{15}}{48} & -\frac{1}{6} & 0 & -\frac{7i}{48} & 0 & 0 & \frac{7}{48} \\ \frac{1}{24} & 0 & 0 & \frac{\sqrt{15}i}{24} & 0 & 0 & 0 & 0 & 0 & \frac{i}{6} & 0 & -\frac{1}{6} & 0 & 0 & 0 \\ 0 & -\frac{1}{24} & -\frac{\sqrt{15}i}{24} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{i}{6} & 0 & -\frac{1}{6} & 0 & 0 & 0 \\ 0 & \frac{i}{24} & \frac{\sqrt{15}}{24} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{1}{6} & 0 & 0 & 0 & 0 & -\frac{1}{6} \\ -\frac{i}{24} & 0 & 0 & -\frac{\sqrt{15}}{24} & 0 & 0 & 0 & 0 & 0 & \frac{1}{6} & 0 & 0 & 0 & -\frac{1}{6} & 0 \end{bmatrix}$
437	symmetry	$-\frac{\sqrt{15}y(x-z)(x+z)}{2}$ $\begin{bmatrix} -\frac{1}{24} & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{24} & 0 & 0 & 0 & \frac{i}{6} & 0 & -\frac{1}{6} & 0 & 0 & 0 \\ 0 & \frac{1}{24} & 0 & 0 & \frac{\sqrt{15}}{24} & 0 & 0 & 0 & -\frac{i}{6} & 0 & -\frac{1}{6} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{15}}{48} & 0 & 0 & \frac{\sqrt{15}}{48} & 0 & 0 & -\frac{7}{48} & 0 & \frac{i}{6} & -\frac{7}{48} & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{15}}{48} & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{48} & -\frac{7}{48} & 0 & -\frac{i}{6} & 0 & 0 & \frac{7}{48} & 0 \\ 0 & \frac{1}{24} & 0 & 0 & -\frac{\sqrt{15}}{24} & 0 & 0 & 0 & 0 & 0 & -\frac{1}{6} & 0 & 0 & 0 & \frac{i}{6} \\ \frac{1}{24} & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{24} & 0 & 0 & 0 & 0 & \frac{1}{6} & -\frac{i}{6} & 0 & 0 & 0 \end{bmatrix}$
438	symmetry	$\frac{\sqrt{15}z(x-y)(x+y)}{2}$ $\begin{bmatrix} 0 & -\frac{i}{24} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{24} & -\frac{1}{6} & 0 & 0 & 0 & 0 & 0 & -\frac{1}{6} \\ \frac{i}{24} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{24} & 0 & 0 & \frac{1}{6} & 0 & 0 & 0 & -\frac{1}{6} & 0 \\ 0 & -\frac{1}{24} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{24} & 0 & 0 & -\frac{1}{6} & 0 & 0 & 0 & \frac{i}{6} \\ -\frac{1}{24} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{24} & 0 & 0 & 0 & 0 & \frac{1}{6} & -\frac{i}{6} & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{15}}{48} & 0 & \frac{\sqrt{15}i}{48} & 0 & 0 & 0 & -\frac{7}{48} & 0 & \frac{7i}{48} & -\frac{1}{6} & 0 & 0 \\ 0 & 0 & \frac{\sqrt{15}}{48} & 0 & -\frac{\sqrt{15}i}{48} & 0 & 0 & 0 & -\frac{7}{48} & 0 & -\frac{7i}{48} & 0 & 0 & 0 & \frac{1}{6} \end{bmatrix}$
439	symmetry	x $\begin{bmatrix} 0 & 0 & 0 & \frac{\sqrt{210}}{70} & 0 & \frac{\sqrt{210}i}{140} & -\frac{\sqrt{210}}{140} & 0 & 0 & 0 & 0 & \frac{\sqrt{14}i}{28} & \frac{\sqrt{14}}{28} & 0 \\ 0 & 0 & \frac{\sqrt{210}}{70} & 0 & -\frac{\sqrt{210}i}{140} & 0 & 0 & \frac{\sqrt{210}}{140} & 0 & 0 & -\frac{\sqrt{14}i}{28} & 0 & 0 & -\frac{\sqrt{14}}{28} \\ \frac{\sqrt{14}}{28} & 0 & 0 & \frac{\sqrt{210}i}{140} & 0 & -\frac{\sqrt{210}}{140} & 0 & 0 & 0 & -\frac{\sqrt{14}i}{28} & 0 & -\frac{\sqrt{14}}{28} & 0 & 0 \\ 0 & -\frac{\sqrt{14}}{28} & -\frac{\sqrt{210}i}{140} & 0 & -\frac{\sqrt{210}}{140} & 0 & 0 & 0 & \frac{\sqrt{14}i}{28} & 0 & -\frac{\sqrt{14}}{28} & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{14}i}{28} & -\frac{\sqrt{210}}{140} & 0 & 0 & 0 & 0 & -\frac{\sqrt{210}}{140} & -\frac{\sqrt{14}}{28} & 0 & 0 & 0 & 0 & \frac{\sqrt{14}}{28} \\ \frac{\sqrt{14}i}{28} & 0 & 0 & \frac{\sqrt{210}}{140} & 0 & 0 & -\frac{\sqrt{210}}{140} & 0 & 0 & \frac{\sqrt{14}}{28} & 0 & 0 & 0 & \frac{\sqrt{14}}{28} \end{bmatrix}$
440	symmetry	y

continued ...

Table 7

No.	multipole	matrix
	$\mathbb{M}_{1,1}^{(1,1;a)}(T_g)$	$\begin{bmatrix} \frac{\sqrt{14}}{28} & 0 & 0 & \frac{\sqrt{210}i}{140} & 0 & -\frac{\sqrt{210}}{140} & 0 & 0 & 0 & -\frac{\sqrt{14}i}{28} & 0 & -\frac{\sqrt{14}}{28} & 0 & 0 \\ 0 & -\frac{\sqrt{14}}{28} & -\frac{\sqrt{210}i}{140} & 0 & -\frac{\sqrt{210}}{140} & 0 & 0 & 0 & 0 & \frac{\sqrt{14}i}{28} & 0 & -\frac{\sqrt{14}}{28} & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{210}}{140} & 0 & -\frac{\sqrt{210}i}{70} & -\frac{\sqrt{210}}{140} & 0 & 0 & \frac{\sqrt{14}}{28} & 0 & 0 & -\frac{\sqrt{14}}{28} & 0 \\ 0 & 0 & -\frac{\sqrt{210}}{140} & 0 & \frac{\sqrt{210}i}{70} & 0 & 0 & \frac{\sqrt{210}}{140} & \frac{\sqrt{14}}{28} & 0 & 0 & 0 & 0 & \frac{\sqrt{14}}{28} \\ 0 & \frac{\sqrt{14}}{28} & 0 & 0 & -\frac{\sqrt{210}}{140} & 0 & 0 & \frac{\sqrt{210}i}{140} & 0 & 0 & \frac{\sqrt{14}}{28} & 0 & 0 & \frac{\sqrt{14}i}{28} \\ \frac{\sqrt{14}}{28} & 0 & 0 & 0 & 0 & \frac{\sqrt{210}}{140} & -\frac{\sqrt{210}i}{140} & 0 & 0 & 0 & 0 & -\frac{\sqrt{14}}{28} & -\frac{\sqrt{14}i}{28} & 0 \end{bmatrix}$
441	symmetry	$\begin{bmatrix} 0 & -\frac{\sqrt{14}i}{28} & -\frac{\sqrt{210}}{140} & 0 & 0 & 0 & 0 & -\frac{\sqrt{210}}{140} & -\frac{\sqrt{14}}{28} & 0 & 0 & 0 & 0 & \frac{\sqrt{14}}{28} \\ \frac{\sqrt{14}i}{28} & 0 & 0 & \frac{\sqrt{210}}{140} & 0 & 0 & -\frac{\sqrt{210}}{140} & 0 & 0 & \frac{\sqrt{14}}{28} & 0 & 0 & 0 & \frac{\sqrt{14}}{28} \\ 0 & \frac{\sqrt{14}}{28} & 0 & 0 & -\frac{\sqrt{210}}{140} & 0 & 0 & \frac{\sqrt{210}i}{140} & 0 & 0 & \frac{\sqrt{14}}{28} & 0 & 0 & \frac{\sqrt{14}i}{28} \\ \frac{\sqrt{14}}{28} & 0 & 0 & 0 & 0 & \frac{\sqrt{210}}{140} & -\frac{\sqrt{210}i}{140} & 0 & 0 & 0 & 0 & -\frac{\sqrt{14}}{28} & -\frac{\sqrt{14}i}{28} & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{210}}{140} & 0 & \frac{\sqrt{210}i}{140} & \frac{\sqrt{210}}{70} & 0 & 0 & -\frac{\sqrt{14}}{28} & 0 & -\frac{\sqrt{14}i}{28} & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{210}}{140} & 0 & -\frac{\sqrt{210}i}{140} & 0 & 0 & -\frac{\sqrt{210}}{70} & -\frac{\sqrt{14}}{28} & 0 & \frac{\sqrt{14}i}{28} & 0 & 0 & 0 \end{bmatrix}$
442	symmetry	$\begin{bmatrix} 0 & \frac{\sqrt{7}}{14} & 0 & 0 & -\frac{\sqrt{105}}{168} & 0 & 0 & \frac{\sqrt{105}i}{168} & 0 & 0 & 0 & \frac{3\sqrt{7}}{56} & 0 & 0 & \frac{3\sqrt{7}i}{56} \\ \frac{\sqrt{7}}{14} & 0 & 0 & 0 & 0 & \frac{\sqrt{105}}{168} & -\frac{\sqrt{105}i}{168} & 0 & 0 & 0 & 0 & -\frac{3\sqrt{7}}{56} & -\frac{3\sqrt{7}i}{56} & 0 \\ 0 & -\frac{\sqrt{7}i}{14} & -\frac{\sqrt{105}}{168} & 0 & 0 & 0 & 0 & -\frac{\sqrt{105}}{168} & -\frac{3\sqrt{7}}{56} & 0 & 0 & 0 & 0 & \frac{3\sqrt{7}}{56} \\ \frac{\sqrt{7}i}{14} & 0 & 0 & \frac{\sqrt{105}}{168} & 0 & 0 & -\frac{\sqrt{105}}{168} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{7}}{56} & 0 \\ \frac{\sqrt{7}}{14} & 0 & 0 & \frac{\sqrt{105}i}{168} & 0 & -\frac{\sqrt{105}}{168} & 0 & 0 & 0 & -\frac{3\sqrt{7}i}{56} & 0 & -\frac{3\sqrt{7}}{56} & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{7}}{14} & -\frac{\sqrt{105}i}{168} & 0 & -\frac{\sqrt{105}}{168} & 0 & 0 & 0 & \frac{3\sqrt{7}i}{56} & 0 & -\frac{3\sqrt{7}}{56} & 0 & 0 & 0 & 0 \end{bmatrix}$
443	symmetry	$\begin{bmatrix} 0 & 0 & 0 & \frac{2\sqrt{7}}{21} & 0 & \frac{5\sqrt{7}i}{112} & -\frac{5\sqrt{7}}{112} & 0 & 0 & 0 & 0 & \frac{5\sqrt{105}i}{336} & \frac{5\sqrt{105}}{336} & 0 \\ 0 & 0 & \frac{2\sqrt{7}}{21} & 0 & -\frac{5\sqrt{7}i}{112} & 0 & 0 & \frac{5\sqrt{7}}{112} & 0 & 0 & -\frac{5\sqrt{105}i}{336} & 0 & 0 & -\frac{5\sqrt{105}}{336} \\ -\frac{\sqrt{105}}{168} & 0 & 0 & -\frac{5\sqrt{7}i}{84} & 0 & \frac{\sqrt{7}}{28} & 0 & 0 & 0 & \frac{\sqrt{105}i}{168} & 0 & \frac{\sqrt{105}}{84} & 0 & 0 \\ 0 & \frac{\sqrt{105}}{168} & \frac{5\sqrt{7}i}{84} & 0 & \frac{\sqrt{7}}{28} & 0 & 0 & 0 & -\frac{\sqrt{105}i}{168} & 0 & \frac{\sqrt{105}}{84} & 0 & 0 & 0 \\ 0 & \frac{\sqrt{105}i}{168} & \frac{5\sqrt{7}}{84} & 0 & 0 & 0 & 0 & \frac{\sqrt{7}}{28} & \frac{\sqrt{105}}{168} & 0 & 0 & 0 & 0 & -\frac{\sqrt{105}}{84} \\ -\frac{\sqrt{105}i}{168} & 0 & 0 & -\frac{5\sqrt{7}}{84} & 0 & 0 & \frac{\sqrt{7}}{28} & 0 & 0 & -\frac{\sqrt{105}}{168} & 0 & 0 & -\frac{\sqrt{105}}{84} & 0 \end{bmatrix}$
444	symmetry	$\begin{bmatrix} & & & & & & & -\frac{y(3x^2-2y^2+3z^2)}{2} & & & & & & & \end{bmatrix}$

continued ...

Table 7

No.	multipole	matrix
		$\begin{bmatrix} -\frac{\sqrt{105}}{168} & 0 & 0 & -\frac{\sqrt{7}i}{28} & 0 & \frac{5\sqrt{7}}{84} & 0 & 0 & 0 & \frac{\sqrt{105}i}{84} & 0 & \frac{\sqrt{105}}{168} & 0 & 0 \\ 0 & \frac{\sqrt{105}}{168} & \frac{\sqrt{7}i}{28} & 0 & \frac{5\sqrt{7}}{84} & 0 & 0 & 0 & -\frac{\sqrt{105}i}{84} & 0 & \frac{\sqrt{105}}{168} & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{5\sqrt{7}}{112} & 0 & -\frac{2\sqrt{7}i}{21} & -\frac{5\sqrt{7}}{112} & 0 & 0 & \frac{5\sqrt{105}}{336} & 0 & 0 & -\frac{5\sqrt{105}}{336} & 0 \\ 0 & 0 & -\frac{5\sqrt{7}}{112} & 0 & \frac{2\sqrt{7}i}{21} & 0 & 0 & \frac{5\sqrt{7}}{112} & \frac{5\sqrt{105}}{336} & 0 & 0 & 0 & 0 & \frac{5\sqrt{105}}{336} \\ 0 & -\frac{\sqrt{105}}{168} & 0 & 0 & \frac{5\sqrt{7}}{84} & 0 & 0 & -\frac{\sqrt{7}i}{28} & 0 & 0 & -\frac{\sqrt{105}}{168} & 0 & 0 & -\frac{\sqrt{105}i}{84} \\ -\frac{\sqrt{105}}{168} & 0 & 0 & 0 & 0 & -\frac{5\sqrt{7}}{84} & \frac{\sqrt{7}i}{28} & 0 & 0 & 0 & 0 & \frac{\sqrt{105}}{168} & \frac{\sqrt{105}i}{84} & 0 \end{bmatrix}$
445	symmetry	$-\frac{z(3x^2+3y^2-2z^2)}{2}$
		$\begin{bmatrix} 0 & \frac{\sqrt{105}i}{168} & \frac{\sqrt{7}}{28} & 0 & 0 & 0 & 0 & \frac{5\sqrt{7}}{84} & \frac{\sqrt{105}}{84} & 0 & 0 & 0 & 0 & -\frac{\sqrt{105}}{168} \\ -\frac{\sqrt{105}i}{168} & 0 & 0 & -\frac{\sqrt{7}}{28} & 0 & 0 & \frac{5\sqrt{7}}{84} & 0 & 0 & -\frac{\sqrt{105}}{84} & 0 & 0 & 0 & -\frac{\sqrt{105}}{168} & 0 \\ 0 & -\frac{\sqrt{105}}{168} & 0 & 0 & \frac{\sqrt{7}}{28} & 0 & 0 & -\frac{5\sqrt{7}i}{84} & 0 & 0 & -\frac{\sqrt{105}}{84} & 0 & 0 & 0 & -\frac{\sqrt{105}i}{168} \\ -\frac{\sqrt{105}}{168} & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}}{28} & \frac{5\sqrt{7}i}{84} & 0 & 0 & 0 & 0 & \frac{\sqrt{105}}{84} & \frac{\sqrt{105}i}{168} & 0 \\ 0 & 0 & 0 & -\frac{5\sqrt{7}}{112} & 0 & \frac{5\sqrt{7}i}{112} & \frac{2\sqrt{7}}{21} & 0 & 0 & -\frac{5\sqrt{105}}{336} & 0 & -\frac{5\sqrt{105}i}{336} & 0 & 0 & 0 \\ 0 & 0 & -\frac{5\sqrt{7}}{112} & 0 & -\frac{5\sqrt{7}i}{112} & 0 & 0 & -\frac{2\sqrt{7}}{21} & -\frac{5\sqrt{105}}{336} & 0 & \frac{5\sqrt{105}i}{336} & 0 & 0 & 0 \end{bmatrix}$
446	symmetry	$\frac{\sqrt{15}x(y-z)(y+z)}{2}$
		$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & -\frac{5\sqrt{105}i}{336} & -\frac{5\sqrt{105}}{336} & 0 & 0 & \frac{\sqrt{7}}{14} & 0 & \frac{\sqrt{7}i}{112} & -\frac{\sqrt{7}}{112} & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{5\sqrt{105}i}{336} & 0 & 0 & \frac{5\sqrt{105}}{336} & \frac{\sqrt{7}}{14} & 0 & -\frac{\sqrt{7}i}{112} & 0 & 0 & \frac{\sqrt{7}}{112} \\ \frac{3\sqrt{7}}{56} & 0 & 0 & \frac{\sqrt{105}i}{168} & 0 & -\frac{\sqrt{105}}{84} & 0 & 0 & 0 & -\frac{\sqrt{7}i}{14} & 0 & -\frac{\sqrt{7}}{28} & 0 & 0 & 0 \\ 0 & -\frac{3\sqrt{7}}{56} & -\frac{\sqrt{105}i}{168} & 0 & -\frac{\sqrt{105}}{84} & 0 & 0 & 0 & \frac{\sqrt{7}i}{14} & 0 & -\frac{\sqrt{7}}{28} & 0 & 0 & 0 & 0 \\ 0 & \frac{3\sqrt{7}i}{56} & \frac{\sqrt{105}}{168} & 0 & 0 & 0 & 0 & \frac{\sqrt{105}}{84} & \frac{\sqrt{7}}{14} & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}}{28} & 0 \\ -\frac{3\sqrt{7}i}{56} & 0 & 0 & -\frac{\sqrt{105}}{168} & 0 & 0 & \frac{\sqrt{105}}{84} & 0 & 0 & -\frac{\sqrt{7}}{14} & 0 & 0 & 0 & -\frac{\sqrt{7}}{28} & 0 \end{bmatrix}$
447	symmetry	$-\frac{\sqrt{15}y(x-z)(x+z)}{2}$
		$\begin{bmatrix} -\frac{3\sqrt{7}}{56} & 0 & 0 & -\frac{\sqrt{105}i}{84} & 0 & \frac{\sqrt{105}}{168} & 0 & 0 & 0 & \frac{\sqrt{7}i}{28} & 0 & \frac{\sqrt{7}}{14} & 0 & 0 \\ 0 & \frac{3\sqrt{7}}{56} & \frac{\sqrt{105}i}{84} & 0 & \frac{\sqrt{105}}{168} & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}i}{28} & 0 & \frac{\sqrt{7}}{14} & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{5\sqrt{105}}{336} & 0 & 0 & \frac{5\sqrt{105}}{336} & 0 & 0 & -\frac{\sqrt{7}}{112} & 0 & -\frac{\sqrt{7}i}{14} & -\frac{\sqrt{7}}{112} & 0 \\ 0 & 0 & -\frac{5\sqrt{105}}{336} & 0 & 0 & 0 & 0 & -\frac{5\sqrt{105}}{336} & -\frac{\sqrt{7}}{112} & 0 & \frac{\sqrt{7}i}{14} & 0 & 0 & \frac{\sqrt{7}}{112} \\ 0 & \frac{3\sqrt{7}}{56} & 0 & 0 & -\frac{\sqrt{105}}{168} & 0 & 0 & \frac{\sqrt{105}i}{84} & 0 & 0 & \frac{\sqrt{7}}{14} & 0 & 0 & \frac{\sqrt{7}i}{28} \\ \frac{3\sqrt{7}}{56} & 0 & 0 & 0 & 0 & \frac{\sqrt{105}}{168} & -\frac{\sqrt{105}i}{84} & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}}{14} & -\frac{\sqrt{7}i}{28} & 0 \end{bmatrix}$
448	symmetry	$\frac{\sqrt{15}z(x-y)(x+y)}{2}$

continued ...

Table 7

No.	multipole	matrix
	$\mathbb{M}_{3,2}^{(1,1;a)}(T_g, 2)$	$\begin{bmatrix} 0 & -\frac{3\sqrt{7}i}{56} & -\frac{\sqrt{105}}{84} & 0 & 0 & 0 & 0 & -\frac{\sqrt{105}}{168} & -\frac{\sqrt{7}}{28} & 0 & 0 & 0 & 0 & \frac{\sqrt{7}}{14} \\ \frac{3\sqrt{7}i}{56} & 0 & 0 & \frac{\sqrt{105}}{84} & 0 & 0 & -\frac{\sqrt{105}}{168} & 0 & 0 & \frac{\sqrt{7}}{28} & 0 & 0 & \frac{\sqrt{7}}{14} & 0 \\ 0 & -\frac{3\sqrt{7}}{56} & 0 & 0 & \frac{\sqrt{105}}{84} & 0 & 0 & -\frac{\sqrt{105}i}{168} & 0 & 0 & -\frac{\sqrt{7}}{28} & 0 & 0 & -\frac{\sqrt{7}i}{14} \\ -\frac{3\sqrt{7}}{56} & 0 & 0 & 0 & 0 & -\frac{\sqrt{105}}{84} & \frac{\sqrt{105}i}{168} & 0 & 0 & 0 & 0 & \frac{\sqrt{7}}{28} & \frac{\sqrt{7}i}{14} & 0 \\ 0 & 0 & 0 & \frac{5\sqrt{105}}{336} & 0 & \frac{5\sqrt{105}i}{336} & 0 & 0 & 0 & -\frac{\sqrt{7}}{112} & 0 & \frac{\sqrt{7}i}{112} & \frac{\sqrt{7}}{14} & 0 \\ 0 & 0 & \frac{5\sqrt{105}}{336} & 0 & -\frac{5\sqrt{105}i}{336} & 0 & 0 & 0 & -\frac{\sqrt{7}}{112} & 0 & -\frac{\sqrt{7}i}{112} & 0 & 0 & -\frac{\sqrt{7}}{14} \end{bmatrix}$

bra: = $\langle d_u, \uparrow |, \langle d_u, \downarrow |, \langle d_v, \uparrow |, \langle d_v, \downarrow |, \langle d_{yz}, \uparrow |, \langle d_{yz}, \downarrow |, \langle d_{xz}, \uparrow |, \langle d_{xz}, \downarrow |, \langle d_{xy}, \uparrow |, \langle d_{xy}, \downarrow |$ ket: = $|d_u, \uparrow \rangle, |d_u, \downarrow \rangle, |d_v, \uparrow \rangle, |d_v, \downarrow \rangle, |d_{yz}, \uparrow \rangle, |d_{yz}, \downarrow \rangle, |d_{xz}, \uparrow \rangle, |d_{xz}, \downarrow \rangle, |d_{xy}, \uparrow \rangle, |d_{xy}, \downarrow \rangle$

Table 8: (d,d) block.

No.	multipole	matrix
449	symmetry	$\begin{bmatrix} 1 & & & & & & & & & & & & & & & \\ \frac{\sqrt{10}}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{10}}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{10}}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{10}}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{10}}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}}{10} & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
450	symmetry	$-\frac{x^2}{2} - \frac{y^2}{2} + z^2$

continued ...

Table 8

No.	multipole	matrix
$\mathbb{Q}_{2,0}^{(a)}(E_g)$		$\begin{bmatrix} \frac{\sqrt{7}}{7} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{7}}{7} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{7}}{7} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{7}}{7} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{7}}{14} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}}{14} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}}{14} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}}{14} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}}{7} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}}{7} \end{bmatrix}$
451	symmetry	$\frac{\sqrt{3}(x-y)(x+y)}{2}$ $\begin{bmatrix} 0 & 0 & -\frac{\sqrt{7}}{7} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{7}}{7} & 0 & 0 & 0 & 0 & 0 & 0 \\ -\frac{\sqrt{7}}{7} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{7}}{7} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{21}}{14} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{21}}{14} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{21}}{14} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{21}}{14} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
452	symmetry	$\sqrt{3}yz$

continued ...

Table 8

No.	multipole	matrix
$\mathbb{Q}_{2,0}^{(a)}(T_g)$		$\begin{bmatrix} 0 & 0 & 0 & 0 & \frac{\sqrt{7}}{14} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}}{14} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{21}}{14} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{21}}{14} & 0 & 0 & 0 & 0 \\ \frac{\sqrt{7}}{14} & 0 & -\frac{\sqrt{21}}{14} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{7}}{14} & 0 & -\frac{\sqrt{21}}{14} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{21}}{14} \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{21}}{14} \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{21}}{14} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{21}}{14} & 0 & 0 \end{bmatrix}$
$\mathbb{Q}_{2,1}^{(a)}(T_g)$		$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}}{14} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}}{14} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{21}}{14} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{21}}{14} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{21}}{14} \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{21}}{14} \\ \frac{\sqrt{7}}{14} & 0 & \frac{\sqrt{21}}{14} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{7}}{14} & 0 & \frac{\sqrt{21}}{14} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{21}}{14} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{21}}{14} & 0 & 0 & 0 & 0 \end{bmatrix}$
454	symmetry	$\sqrt{3}xz$
454	symmetry	$\sqrt{3}xy$

continued ...

Table 8

No.	multipole	matrix
		$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}}{7} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}}{7} \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{21}}{14} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{21}}{14} & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{21}}{14} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{21}}{14} & 0 & 0 & 0 & 0 \\ -\frac{\sqrt{7}}{7} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{7}}{7} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
455	symmetry	$\frac{\sqrt{21}(x^4 - 3x^2y^2 - 3x^2z^2 + y^4 - 3y^2z^2 + z^4)}{6}$ $\begin{bmatrix} \frac{\sqrt{15}}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{15}}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{15}}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{15}}{10} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{15} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{15} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{15} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{15} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{15} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{15} \end{bmatrix}$
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
		$\begin{bmatrix} \frac{\sqrt{21}}{14} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{21}}{14} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{21}}{14} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{21}}{14} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{21}}{21} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{21}}{21} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{21}}{21} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{21}}{21} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{2\sqrt{21}}{21} \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{2\sqrt{21}}{21} \end{bmatrix}$
457	symmetry	$\frac{\sqrt{5}(x-y)(x+y)(x^2+y^2-6z^2)}{4}$
		$\begin{bmatrix} 0 & 0 & -\frac{\sqrt{21}}{14} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{21}}{14} & 0 & 0 & 0 & 0 & 0 & 0 \\ -\frac{\sqrt{21}}{14} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{21}}{14} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}}{7} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}}{7} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}}{7} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}}{7} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
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 $-\frac{\sqrt{3}}{4}$ 0 0 0 0 0	
	0 0 0 0 0 $-\frac{\sqrt{3}}{4}$ 0 0 0 0	
	0 0 0 0 $-\frac{1}{4}$ 0 0 0 0 0	
	0 0 0 0 0 $-\frac{1}{4}$ 0 0 0 0	
	$-\frac{\sqrt{3}}{4}$ 0 $-\frac{1}{4}$ 0 0 0 0 0 0 0	
	0 $-\frac{\sqrt{3}}{4}$ 0 $-\frac{1}{4}$ 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	
459	symmetry	$-\frac{\sqrt{35}xz(x-z)(x+z)}{2}$
$\mathbb{Q}_{4,1}^{(a)}(T_g, 1)$	0 0 0 0 0 0 $\frac{\sqrt{3}}{4}$ 0 0 0	
	0 0 0 0 0 0 0 $\frac{\sqrt{3}}{4}$ 0 0	
	0 0 0 0 0 0 0 $-\frac{1}{4}$ 0 0 0	
	0 0 0 0 0 0 0 0 $-\frac{1}{4}$ 0 0	
	0 0 0 0 0 0 0 0 0 0	
	0 0 0 0 0 0 0 0 0 0	
	$\frac{\sqrt{3}}{4}$ 0 $-\frac{1}{4}$ 0 0 0 0 0 0 0	
	0 $\frac{\sqrt{3}}{4}$ 0 $-\frac{1}{4}$ 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	
460	symmetry	$\frac{\sqrt{35}xy(x-y)(x+y)}{2}$

continued ...

Table 8

No.	multipole	matrix
	$\mathbb{Q}_{4,2}^{(a)}(T_g, 1)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{1}{2} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{1}{2} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{1}{2} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
461	symmetry	$\frac{\sqrt{5}yz(6x^2-y^2-z^2)}{2}$ $\begin{bmatrix} 0 & 0 & 0 & 0 & -\frac{\sqrt{21}}{28} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{21}}{28} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{3\sqrt{7}}{28} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{7}}{28} & 0 & 0 & 0 & 0 \\ -\frac{\sqrt{21}}{28} & 0 & \frac{3\sqrt{7}}{28} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{21}}{28} & 0 & \frac{3\sqrt{7}}{28} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}}{7} \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}}{7} \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}}{7} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}}{7} & 0 & 0 \end{bmatrix}$
462	symmetry	$-\frac{\sqrt{5}xz(x^2-6y^2+z^2)}{2}$

continued ...

Table 8

No.	multipole	matrix
$\mathbb{Q}_{4,1}^{(a)}(T_g, 2)$	symmetry	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{21}}{28} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{21}}{28} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{7}}{28} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{7}}{28} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}}{7} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}}{7} \\ -\frac{\sqrt{21}}{28} & 0 & -\frac{3\sqrt{7}}{28} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{21}}{28} & 0 & -\frac{3\sqrt{7}}{28} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{7}}{7} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}}{7} & 0 & 0 & 0 & 0 \end{bmatrix}$
		$-\frac{\sqrt{5}xy(x^2+y^2-6z^2)}{2}$
		$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{21}}{14} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{21}}{14} \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}}{7} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}}{7} & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{7}}{7} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}}{7} & 0 & 0 & 0 & 0 \\ \frac{\sqrt{21}}{14} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{21}}{14} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
		$-\frac{x^2}{2} - \frac{y^2}{2} + z^2$
463	symmetry	
464	symmetry	

continued ...

Table 8

No.	multipole	matrix
$\mathbb{Q}_{2,0}^{(1,-1;a)}(E_g)$		$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}i}{20} & 0 & \frac{\sqrt{10}}{20} & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{10}i}{20} & 0 & -\frac{\sqrt{10}}{20} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}i}{60} & 0 & -\frac{\sqrt{30}}{60} & -\frac{\sqrt{30}i}{15} & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{30}i}{60} & 0 & \frac{\sqrt{30}}{60} & 0 & 0 & \frac{\sqrt{30}i}{15} \\ 0 & \frac{\sqrt{10}i}{20} & 0 & \frac{\sqrt{30}i}{60} & 0 & 0 & \frac{\sqrt{30}i}{30} & 0 & 0 & \frac{\sqrt{30}}{60} \\ \frac{\sqrt{10}i}{20} & 0 & \frac{\sqrt{30}i}{60} & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}i}{30} & -\frac{\sqrt{30}}{60} & 0 \\ 0 & -\frac{\sqrt{10}}{20} & 0 & \frac{\sqrt{30}}{60} & -\frac{\sqrt{30}i}{30} & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}i}{60} \\ \frac{\sqrt{10}}{20} & 0 & -\frac{\sqrt{30}}{60} & 0 & 0 & \frac{\sqrt{30}i}{30} & 0 & 0 & -\frac{\sqrt{30}i}{60} & 0 \\ 0 & 0 & \frac{\sqrt{30}i}{15} & 0 & 0 & -\frac{\sqrt{30}}{60} & 0 & \frac{\sqrt{30}i}{60} & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{30}i}{15} & \frac{\sqrt{30}}{60} & 0 & \frac{\sqrt{30}i}{60} & 0 & 0 & 0 \end{bmatrix}$
		$\frac{\sqrt{3}(x-y)(x+y)}{2}$
		$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}i}{20} & 0 & \frac{\sqrt{30}}{20} & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{30}i}{20} & 0 & -\frac{\sqrt{30}}{20} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}i}{20} & 0 & -\frac{\sqrt{10}}{20} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}i}{20} & 0 & \frac{\sqrt{10}}{20} & 0 & 0 \\ 0 & -\frac{\sqrt{30}i}{20} & 0 & -\frac{\sqrt{10}i}{20} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}}{20} \\ -\frac{\sqrt{30}i}{20} & 0 & -\frac{\sqrt{10}i}{20} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}}{20} & 0 \\ 0 & -\frac{\sqrt{30}}{20} & 0 & \frac{\sqrt{10}}{20} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}i}{20} \\ \frac{\sqrt{30}}{20} & 0 & -\frac{\sqrt{10}}{20} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}i}{20} & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}}{20} & 0 & -\frac{\sqrt{10}i}{20} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}}{20} & 0 & -\frac{\sqrt{10}i}{20} & 0 & 0 \end{bmatrix}$
		$\sqrt{3}yz$
465	symmetry	
$\mathbb{Q}_{2,1}^{(1,-1;a)}(E_g)$		$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}i}{20} & 0 & \frac{\sqrt{30}}{20} & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{30}i}{20} & 0 & -\frac{\sqrt{30}}{20} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}i}{20} & 0 & -\frac{\sqrt{10}}{20} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}i}{20} & 0 & \frac{\sqrt{10}}{20} & 0 & 0 \\ 0 & -\frac{\sqrt{30}i}{20} & 0 & -\frac{\sqrt{10}i}{20} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}}{20} \\ -\frac{\sqrt{30}i}{20} & 0 & -\frac{\sqrt{10}i}{20} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}}{20} & 0 \\ 0 & -\frac{\sqrt{30}}{20} & 0 & \frac{\sqrt{10}}{20} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}i}{20} \\ \frac{\sqrt{30}}{20} & 0 & -\frac{\sqrt{10}}{20} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}i}{20} & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}}{20} & 0 & -\frac{\sqrt{10}i}{20} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}}{20} & 0 & -\frac{\sqrt{10}i}{20} & 0 & 0 \end{bmatrix}$
		$\frac{\sqrt{3}(x-y)(x+y)}{2}$
466	symmetry	

continued ...

Table 8

No.	multipole	matrix
$\mathbb{Q}_{2,0}^{(1,-1;a)}(T_g)$	0 0 0 0 0 0 $-\frac{\sqrt{30}i}{20}$ 0 0 0	
	0 0 0 0 0 0 0 $\frac{\sqrt{30}i}{20}$ 0 0	
	0 0 0 0 0 0 $\frac{\sqrt{10}i}{20}$ 0 0 $-\frac{\sqrt{10}}{10}$	
	0 0 0 0 0 0 0 $-\frac{\sqrt{10}i}{20}$ $\frac{\sqrt{10}}{10}$ 0	
	0 0 0 0 0 0 0 $\frac{\sqrt{10}}{20}$ $-\frac{\sqrt{10}i}{20}$ 0	
	0 0 0 0 0 0 0 $-\frac{\sqrt{10}}{20}$ 0 0 $\frac{\sqrt{10}i}{20}$	
	$\frac{\sqrt{30}i}{20}$ 0 $-\frac{\sqrt{10}i}{20}$ 0 0 $-\frac{\sqrt{10}}{20}$ 0 0 0 0	
	0 $-\frac{\sqrt{30}i}{20}$ 0 $\frac{\sqrt{10}i}{20}$ $\frac{\sqrt{10}}{20}$ 0 0 0 0 0	
	0 0 0 $\frac{\sqrt{10}}{10}$ $\frac{\sqrt{10}i}{20}$ 0 0 0 0 0	
	0 0 $-\frac{\sqrt{10}}{10}$ 0 0 $-\frac{\sqrt{10}i}{20}$ 0 0 0 0	
467	symmetry	$\sqrt{3}xz$
$\mathbb{Q}_{2,1}^{(1,-1;a)}(T_g)$	0 0 0 0 $\frac{\sqrt{30}i}{20}$ 0 0 0 0 0	
	0 0 0 0 0 $-\frac{\sqrt{30}i}{20}$ 0 0 0 0	
	0 0 0 0 $\frac{\sqrt{10}i}{20}$ 0 0 0 0 $-\frac{\sqrt{10}i}{10}$	
	0 0 0 0 0 $-\frac{\sqrt{10}i}{20}$ 0 0 0 $-\frac{\sqrt{10}i}{10}$ 0	
	$-\frac{\sqrt{30}i}{20}$ 0 $-\frac{\sqrt{10}i}{20}$ 0 0 0 0 $\frac{\sqrt{10}i}{20}$ 0 0	
	0 $\frac{\sqrt{30}i}{20}$ 0 $\frac{\sqrt{10}i}{20}$ 0 0 $\frac{\sqrt{10}i}{20}$ 0 0 0	
	0 0 0 0 0 $-\frac{\sqrt{10}i}{20}$ 0 0 $\frac{\sqrt{10}i}{20}$ 0	
	0 0 0 0 $-\frac{\sqrt{10}i}{20}$ 0 0 0 0 $-\frac{\sqrt{10}i}{20}$	
	0 0 0 $\frac{\sqrt{10}i}{10}$ 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	
468	symmetry	$\sqrt{3}xy$

continued ...

Table 8

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

continued ...

Table 8

No.	multipole	matrix
$\mathbb{Q}_{4,0}^{(1,-1;a)}(E_g)$	0 0 0 0 0 $-\frac{\sqrt{7}i}{28}$ 0 $\frac{\sqrt{7}}{28}$ 0 0	
	0 0 0 0 $-\frac{\sqrt{7}i}{28}$ 0 $-\frac{\sqrt{7}}{28}$ 0 0 0	
	0 0 0 0 0 $\frac{5\sqrt{21}i}{84}$ 0 $\frac{5\sqrt{21}}{84}$ $\frac{\sqrt{21}i}{42}$ 0	
	0 0 0 0 $\frac{5\sqrt{21}i}{84}$ 0 $-\frac{5\sqrt{21}}{84}$ 0 0 $-\frac{\sqrt{21}i}{42}$	
	0 $\frac{\sqrt{7}i}{28}$ 0 $-\frac{5\sqrt{21}i}{84}$ 0 0 0 $\frac{\sqrt{21}i}{21}$ 0 0 $\frac{\sqrt{21}}{42}$	
	$\frac{\sqrt{7}i}{28}$ 0 $-\frac{5\sqrt{21}i}{84}$ 0 0 0 0 $-\frac{\sqrt{21}i}{21}$ $-\frac{\sqrt{21}}{42}$ 0	
	0 $-\frac{\sqrt{7}}{28}$ 0 $-\frac{5\sqrt{21}}{84}$ $-\frac{\sqrt{21}i}{21}$ 0 0 0 0 $-\frac{\sqrt{21}i}{42}$	
	$\frac{\sqrt{7}}{28}$ 0 $\frac{5\sqrt{21}}{84}$ 0 0 $\frac{\sqrt{21}i}{21}$ 0 0 $-\frac{\sqrt{21}i}{42}$ 0	
	0 0 $-\frac{\sqrt{21}i}{42}$ 0 0 $-\frac{\sqrt{21}}{42}$ 0 $\frac{\sqrt{21}i}{42}$ 0 0 0	
	0 0 0 $\frac{\sqrt{21}i}{42}$ $\frac{\sqrt{21}}{42}$ 0 $\frac{\sqrt{21}i}{42}$ 0 0 0 0	
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 $-\frac{\sqrt{21}i}{28}$ 0 $-\frac{\sqrt{21}}{28}$ $-\frac{\sqrt{21}i}{14}$ 0	
	0 0 0 0 $-\frac{\sqrt{21}i}{28}$ 0 $\frac{\sqrt{21}}{28}$ 0 0 $\frac{\sqrt{21}i}{14}$	
	0 0 0 0 0 $\frac{\sqrt{7}i}{28}$ 0 $-\frac{\sqrt{7}}{28}$ 0 0 0	
	0 0 0 0 $\frac{\sqrt{7}i}{28}$ 0 $\frac{\sqrt{7}}{28}$ 0 0 0 0	
	0 $\frac{\sqrt{21}i}{28}$ 0 $-\frac{\sqrt{7}i}{28}$ 0 0 0 0 0 $\frac{\sqrt{7}}{14}$	
	$\frac{\sqrt{21}i}{28}$ 0 $-\frac{\sqrt{7}i}{28}$ 0 0 0 0 0 $-\frac{\sqrt{7}}{14}$ 0	
	0 $\frac{\sqrt{21}}{28}$ 0 $\frac{\sqrt{7}}{28}$ 0 0 0 0 0 $\frac{\sqrt{7}i}{14}$	
	$-\frac{\sqrt{21}}{28}$ 0 $-\frac{\sqrt{7}}{28}$ 0 0 0 0 0 $\frac{\sqrt{7}i}{14}$ 0	
	$\frac{\sqrt{21}i}{14}$ 0 0 0 0 $-\frac{\sqrt{7}}{14}$ 0 $-\frac{\sqrt{7}i}{14}$ 0 0	
	0 $-\frac{\sqrt{21}i}{14}$ 0 0 $\frac{\sqrt{7}}{14}$ 0 $-\frac{\sqrt{7}i}{14}$ 0 0 0	
472	symmetry	$\frac{\sqrt{35}yz(y-z)(y+z)}{2}$

continued ...

Table 8

No.	multipole	matrix
	$\mathbb{Q}_{4,0}^{(1,-1;a)}(T_g, 1)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{8} & 0 & 0 & -\frac{\sqrt{3}}{8} \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{8} & \frac{\sqrt{3}}{8} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{i}{8} & 0 & 0 & -\frac{1}{8} \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{i}{8} & \frac{1}{8} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{1}{4} & -\frac{i}{4} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{1}{4} & 0 & 0 & \frac{i}{4} \\ -\frac{\sqrt{3}i}{8} & 0 & -\frac{i}{8} & 0 & 0 & \frac{1}{4} & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{3}i}{8} & 0 & \frac{i}{8} & -\frac{1}{4} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{3}}{8} & 0 & \frac{1}{8} & \frac{i}{4} & 0 & 0 & 0 & 0 & 0 & 0 \\ -\frac{\sqrt{3}}{8} & 0 & -\frac{1}{8} & 0 & 0 & -\frac{i}{4} & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
473	symmetry	$-\frac{\sqrt{35}xz(x-z)(x+z)}{2}$
	$\mathbb{Q}_{4,1}^{(1,-1;a)}(T_g, 1)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{8} & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{8} \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{8} & 0 & 0 & -\frac{\sqrt{3}i}{8} & 0 \\ 0 & 0 & 0 & 0 & -\frac{i}{8} & 0 & 0 & 0 & 0 & \frac{i}{8} \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{i}{8} & 0 & 0 & \frac{i}{8} & 0 \\ -\frac{\sqrt{3}i}{8} & 0 & \frac{i}{8} & 0 & 0 & 0 & 0 & 0 & \frac{i}{4} & 0 & 0 \\ 0 & \frac{\sqrt{3}i}{8} & 0 & -\frac{i}{8} & 0 & 0 & \frac{i}{4} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{i}{4} & 0 & 0 & -\frac{i}{4} & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{i}{4} & 0 & 0 & 0 & 0 & 0 & \frac{i}{4} \\ 0 & \frac{\sqrt{3}i}{8} & 0 & -\frac{i}{8} & 0 & 0 & \frac{i}{4} & 0 & 0 & 0 & 0 \\ \frac{\sqrt{3}i}{8} & 0 & -\frac{i}{8} & 0 & 0 & 0 & 0 & -\frac{i}{4} & 0 & 0 & 0 \end{bmatrix}$
474	symmetry	$\frac{\sqrt{35}xy(x-y)(x+y)}{2}$

continued ...

Table 8

No.	multipole	matrix
		$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{1}{4} & 0 & \frac{i}{4} & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{1}{4} & 0 & \frac{i}{4} & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{1}{4} & 0 & 0 & 0 & 0 & 0 & \frac{i}{4} \\ 0 & 0 & -\frac{1}{4} & 0 & 0 & 0 & 0 & 0 & \frac{i}{4} & 0 \\ 0 & 0 & 0 & -\frac{i}{4} & 0 & 0 & 0 & 0 & 0 & \frac{1}{4} \\ 0 & 0 & -\frac{i}{4} & 0 & 0 & 0 & 0 & 0 & -\frac{1}{4} & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{i}{4} & 0 & -\frac{1}{4} & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{i}{4} & 0 & \frac{1}{4} & 0 & 0 & 0 \end{bmatrix}$
475	symmetry	$\frac{\sqrt{5}yz(6x^2-y^2-z^2)}{2}$
		$\begin{bmatrix} 0 & 0 & 0 & -\frac{\sqrt{21}i}{14} & 0 & 0 & \frac{\sqrt{21}i}{56} & 0 & 0 & \frac{3\sqrt{21}}{56} \\ 0 & 0 & -\frac{\sqrt{21}i}{14} & 0 & 0 & 0 & 0 & -\frac{\sqrt{21}i}{56} & -\frac{3\sqrt{21}}{56} & 0 \\ 0 & \frac{\sqrt{21}i}{14} & 0 & 0 & 0 & 0 & \frac{5\sqrt{7}i}{56} & 0 & 0 & -\frac{\sqrt{7}}{56} \\ \frac{\sqrt{21}i}{14} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{5\sqrt{7}i}{56} & \frac{\sqrt{7}}{56} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}}{28} & \frac{\sqrt{7}i}{28} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}}{28} & 0 & 0 & -\frac{\sqrt{7}i}{28} \\ -\frac{\sqrt{21}i}{56} & 0 & -\frac{5\sqrt{7}i}{56} & 0 & 0 & \frac{\sqrt{7}}{28} & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{21}i}{56} & 0 & \frac{5\sqrt{7}i}{56} & -\frac{\sqrt{7}}{28} & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{3\sqrt{21}}{56} & 0 & \frac{\sqrt{7}}{56} & -\frac{\sqrt{7}i}{28} & 0 & 0 & 0 & 0 & 0 \\ \frac{3\sqrt{21}}{56} & 0 & -\frac{\sqrt{7}}{56} & 0 & 0 & \frac{\sqrt{7}i}{28} & 0 & 0 & 0 & 0 \end{bmatrix}$
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 $-\frac{\sqrt{21}}{14}$ $-\frac{\sqrt{21}i}{56}$ 0 0 0 0 $-\frac{3\sqrt{21}i}{56}$	
	0 0 $\frac{\sqrt{21}}{14}$ 0 0 $\frac{\sqrt{21}i}{56}$ 0 0 0 $-\frac{3\sqrt{21}i}{56}$ 0	
	0 $\frac{\sqrt{21}}{14}$ 0 0 $\frac{5\sqrt{7}i}{56}$ 0 0 0 0 $-\frac{\sqrt{7}i}{56}$	
	$-\frac{\sqrt{21}}{14}$ 0 0 0 0 $-\frac{5\sqrt{7}i}{56}$ 0 0 0 $-\frac{\sqrt{7}i}{56}$ 0	
	$\frac{\sqrt{21}i}{56}$ 0 $-\frac{5\sqrt{7}i}{56}$ 0 0 0 0 $-\frac{\sqrt{7}i}{28}$ 0 0	
	0 $-\frac{\sqrt{21}i}{56}$ 0 $\frac{5\sqrt{7}i}{56}$ 0 0 $-\frac{\sqrt{7}i}{28}$ 0 0 0	
	0 0 0 0 0 $\frac{\sqrt{7}i}{28}$ 0 0 0 $-\frac{\sqrt{7}i}{28}$ 0	
	0 0 0 0 $\frac{\sqrt{7}i}{28}$ 0 0 0 0 $\frac{\sqrt{7}i}{28}$	
	$0 \frac{3\sqrt{21}i}{56} 0 \frac{\sqrt{7}i}{56} 0 0 \frac{\sqrt{7}i}{28} 0 0 0$	
$\mathbb{Q}_{4,2}^{(1,-1;a)}(T_g, 2)$	$0 0 -\frac{\sqrt{21}i}{14} 0 0 \frac{\sqrt{21}}{28} 0 -\frac{\sqrt{21}i}{28} 0 0$	$-\frac{\sqrt{5}xy(x^2+y^2-6z^2)}{2}$
	0 0 0 $\frac{\sqrt{21}i}{14}$ $-\frac{\sqrt{21}}{28}$ 0 $-\frac{\sqrt{21}i}{28}$ 0 0 0	
	$\frac{\sqrt{21}i}{14}$ 0 0 0 0 $-\frac{\sqrt{7}}{14}$ 0 $-\frac{\sqrt{7}i}{14}$ 0 0	
	0 $-\frac{\sqrt{21}i}{14}$ 0 0 $\frac{\sqrt{7}}{14}$ 0 $-\frac{\sqrt{7}i}{14}$ 0 0 0	
	0 $-\frac{\sqrt{21}}{28}$ 0 $\frac{\sqrt{7}}{14}$ 0 0 0 0 0 $\frac{\sqrt{7}i}{28}$	
	$\frac{\sqrt{21}}{28}$ 0 $-\frac{\sqrt{7}}{14}$ 0 0 0 0 0 $\frac{\sqrt{7}i}{28}$ 0	
	0 $\frac{\sqrt{21}i}{28}$ 0 $\frac{\sqrt{7}i}{14}$ 0 0 0 0 0 $-\frac{\sqrt{7}}{28}$	
	$\frac{\sqrt{21}i}{28}$ 0 $\frac{\sqrt{7}i}{14}$ 0 0 0 0 0 $\frac{\sqrt{7}}{28}$ 0	
	0 0 0 0 0 $-\frac{\sqrt{7}i}{28}$ 0 $\frac{\sqrt{7}}{28}$ 0 0	
478	symmetry	
	1	

continued ...

Table 8

No.	multipole	matrix
$\mathbb{Q}_0^{(1,1;a)}(A_g)$		$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{5}i}{10} & 0 & -\frac{\sqrt{5}}{10} & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{5}i}{10} & 0 & \frac{\sqrt{5}}{10} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{30} & 0 & \frac{\sqrt{15}}{30} & -\frac{\sqrt{15}i}{15} & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{30} & 0 & -\frac{\sqrt{15}}{30} & 0 & 0 & \frac{\sqrt{15}i}{15} \\ 0 & -\frac{\sqrt{5}i}{10} & 0 & -\frac{\sqrt{15}i}{30} & 0 & 0 & \frac{\sqrt{15}i}{30} & 0 & 0 & -\frac{\sqrt{15}}{30} \\ -\frac{\sqrt{5}i}{10} & 0 & -\frac{\sqrt{15}i}{30} & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{30} & \frac{\sqrt{15}}{30} & 0 \\ 0 & \frac{\sqrt{5}}{10} & 0 & -\frac{\sqrt{15}}{30} & -\frac{\sqrt{15}i}{30} & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{30} \\ -\frac{\sqrt{5}}{10} & 0 & \frac{\sqrt{15}}{30} & 0 & 0 & \frac{\sqrt{15}i}{30} & 0 & 0 & \frac{\sqrt{15}i}{30} & 0 \\ 0 & 0 & \frac{\sqrt{15}i}{15} & 0 & 0 & \frac{\sqrt{15}}{30} & 0 & -\frac{\sqrt{15}i}{30} & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{15}i}{15} & -\frac{\sqrt{15}}{30} & 0 & -\frac{\sqrt{15}i}{30} & 0 & 0 & 0 \end{bmatrix}$
		$-\frac{x^2}{2} - \frac{y^2}{2} + z^2$
		$\mathbb{Q}_{2,0}^{(1,1;a)}(E_g)$
479	symmetry	$\frac{\sqrt{3}(x-y)(x+y)}{2}$
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 0 0 0 $-\frac{\sqrt{105}i}{210}$ 0 $-\frac{\sqrt{105}}{210}$ $\frac{\sqrt{105}i}{42}$ 0	
	0 0 0 0 $-\frac{\sqrt{105}i}{210}$ 0 $\frac{\sqrt{105}}{210}$ 0 0 $-\frac{\sqrt{105}i}{42}$	
	0 0 0 0 0 $-\frac{\sqrt{35}i}{35}$ 0 $\frac{\sqrt{35}}{35}$ 0 0	
	0 0 0 0 $-\frac{\sqrt{35}i}{35}$ 0 $-\frac{\sqrt{35}}{35}$ 0 0 0	
	0 $\frac{\sqrt{105}i}{210}$ 0 $\frac{\sqrt{35}i}{35}$ 0 0 0 0 0 $\frac{3\sqrt{35}}{70}$	
	$\frac{\sqrt{105}i}{210}$ 0 $\frac{\sqrt{35}i}{35}$ 0 0 0 0 0 $-\frac{3\sqrt{35}}{70}$ 0	
	0 $\frac{\sqrt{105}}{210}$ 0 $-\frac{\sqrt{35}}{35}$ 0 0 0 0 0 $\frac{3\sqrt{35}i}{70}$	
	$-\frac{\sqrt{105}}{210}$ 0 $\frac{\sqrt{35}}{35}$ 0 0 0 0 0 $-\frac{3\sqrt{35}i}{70}$ 0	
	$-\frac{\sqrt{105}i}{42}$ 0 0 0 0 $-\frac{3\sqrt{35}}{70}$ 0 $-\frac{3\sqrt{35}i}{70}$ 0 0	
	0 $\frac{\sqrt{105}i}{42}$ 0 0 $\frac{3\sqrt{35}}{70}$ 0 $-\frac{3\sqrt{35}i}{70}$ 0 0 0	
481	symmetry	$\sqrt{3}yz$
$\mathbb{Q}_{2,0}^{(1,1;a)}(T_g)$	0 0 0 $-\frac{\sqrt{105}i}{42}$ 0 0 $-\frac{2\sqrt{105}i}{105}$ 0 0 $-\frac{\sqrt{105}}{42}$	
	0 0 $-\frac{\sqrt{105}i}{42}$ 0 0 0 0 $\frac{2\sqrt{105}i}{105}$ $\frac{\sqrt{105}}{42}$ 0	
	0 $\frac{\sqrt{105}i}{42}$ 0 0 0 0 $-\frac{\sqrt{35}i}{35}$ 0 0 $-\frac{\sqrt{35}}{70}$	
	$\frac{\sqrt{105}i}{42}$ 0 0 0 0 0 0 $\frac{\sqrt{35}i}{35}$ $\frac{\sqrt{35}}{70}$ 0	
	0 0 0 0 0 0 0 $-\frac{\sqrt{35}}{35}$ $\frac{\sqrt{35}i}{35}$ 0	
	0 0 0 0 0 0 $\frac{\sqrt{35}}{35}$ 0 0 $-\frac{\sqrt{35}i}{35}$	
	$\frac{2\sqrt{105}i}{105}$ 0 $\frac{\sqrt{35}i}{35}$ 0 0 $\frac{\sqrt{35}}{35}$ 0 0 0 0	
	0 $-\frac{2\sqrt{105}i}{105}$ 0 $-\frac{\sqrt{35}i}{35}$ $-\frac{\sqrt{35}}{35}$ 0 0 0 0 0	
	0 $\frac{\sqrt{105}}{42}$ 0 $\frac{\sqrt{35}}{70}$ $-\frac{\sqrt{35}i}{35}$ 0 0 0 0 0	
	$-\frac{\sqrt{105}}{42}$ 0 $-\frac{\sqrt{35}}{70}$ 0 0 $\frac{\sqrt{35}i}{35}$ 0 0 0 0	
482	symmetry	$\sqrt{3}xz$

continued ...

Table 8

No.	multipole	matrix
$\mathbb{Q}_{2,1}^{(1,1;a)}(T_g)$	0	0 0 0 $-\frac{\sqrt{105}}{42}$ $\frac{2\sqrt{105}i}{105}$ 0 0 0 0 $\frac{\sqrt{105}i}{42}$
	0	0 0 $\frac{\sqrt{105}}{42}$ 0 0 $-\frac{2\sqrt{105}i}{105}$ 0 0 0 $\frac{\sqrt{105}i}{42}$ 0
	0	$\frac{\sqrt{105}}{42}$ 0 0 0 $-\frac{\sqrt{35}i}{35}$ 0 0 0 0 $-\frac{\sqrt{35}i}{70}$
	$-\frac{\sqrt{105}}{42}$	0 0 0 0 0 $\frac{\sqrt{35}i}{35}$ 0 0 0 $-\frac{\sqrt{35}i}{70}$ 0
	$-\frac{2\sqrt{105}i}{105}$	0 0 $\frac{\sqrt{35}i}{35}$ 0 0 0 0 $-\frac{\sqrt{35}i}{35}$ 0 0
	0	$\frac{2\sqrt{105}i}{105}$ 0 $-\frac{\sqrt{35}i}{35}$ 0 0 $-\frac{\sqrt{35}i}{35}$ 0 0 0 0
	0	0 0 0 0 0 $\frac{\sqrt{35}i}{35}$ 0 0 0 $-\frac{\sqrt{35}i}{35}$ 0
	0	0 0 0 0 $\frac{\sqrt{35}i}{35}$ 0 0 0 0 $\frac{\sqrt{35}i}{35}$
	0	$-\frac{\sqrt{105}i}{42}$ 0 $\frac{\sqrt{35}i}{70}$ 0 0 0 $\frac{\sqrt{35}i}{35}$ 0 0 0
	$-\frac{\sqrt{105}i}{42}$	0 $\frac{\sqrt{35}i}{70}$ 0 0 0 0 $-\frac{\sqrt{35}i}{35}$ 0 0 0
483 symmetry	$\sqrt{3}xy$	
	0	0 0 $-\frac{\sqrt{105}i}{42}$ 0 0 $-\frac{\sqrt{105}}{210}$ 0 $\frac{\sqrt{105}i}{210}$ 0 0
	0	0 0 0 $\frac{\sqrt{105}i}{42}$ $\frac{\sqrt{105}}{210}$ 0 $\frac{\sqrt{105}i}{210}$ 0 0 0
	$\frac{\sqrt{105}i}{42}$	0 0 0 0 0 $\frac{3\sqrt{35}}{70}$ 0 $\frac{3\sqrt{35}i}{70}$ 0 0
	0	$-\frac{\sqrt{105}i}{42}$ 0 0 0 $-\frac{3\sqrt{35}}{70}$ 0 $\frac{3\sqrt{35}i}{70}$ 0 0 0
	0	$\frac{\sqrt{105}}{210}$ 0 $-\frac{3\sqrt{35}}{70}$ 0 0 0 0 0 0 $\frac{\sqrt{35}i}{35}$
	$-\frac{\sqrt{105}}{210}$	0 $\frac{3\sqrt{35}}{70}$ 0 0 0 0 0 0 $\frac{\sqrt{35}i}{35}$ 0
	0	$-\frac{\sqrt{105}i}{210}$ 0 $-\frac{3\sqrt{35}i}{70}$ 0 0 0 0 0 0 $-\frac{\sqrt{35}}{35}$
	$-\frac{\sqrt{105}i}{210}$	0 $-\frac{3\sqrt{35}i}{70}$ 0 0 0 0 0 0 $\frac{\sqrt{35}}{35}$ 0
	0	0 0 0 0 0 $-\frac{\sqrt{35}i}{35}$ 0 $\frac{\sqrt{35}}{35}$ 0 0
484 symmetry	x	
	<i>continued ...</i>	

Table 8

No.	multipole	matrix
$\mathbb{G}_{1,0}^{(1,0;a)}(T_g)$		$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}i}{20} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}i}{20} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}i}{20} & 0 & 0 & -\frac{\sqrt{10}}{10} \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}i}{20} & \frac{\sqrt{10}}{10} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}}{20} & \frac{\sqrt{10}i}{20} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}}{20} & 0 & -\frac{\sqrt{10}i}{20} \\ -\frac{\sqrt{30}i}{20} & 0 & \frac{\sqrt{10}i}{20} & 0 & 0 & -\frac{\sqrt{10}}{20} & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{30}i}{20} & 0 & -\frac{\sqrt{10}i}{20} & \frac{\sqrt{10}}{20} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{10}}{10} & -\frac{\sqrt{10}i}{20} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{10}}{10} & 0 & 0 & \frac{\sqrt{10}i}{20} & 0 & 0 & 0 & 0 \end{bmatrix}$
$\mathbb{G}_{1,1}^{(1,0;a)}(T_g)$		$\begin{bmatrix} 0 & 0 & 0 & 0 & \frac{\sqrt{30}i}{20} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}i}{20} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{10}i}{20} & 0 & 0 & 0 & 0 & \frac{\sqrt{10}i}{10} \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}i}{20} & 0 & 0 & \frac{\sqrt{10}i}{10} & 0 \\ -\frac{\sqrt{30}i}{20} & 0 & -\frac{\sqrt{10}i}{20} & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}i}{20} & 0 & 0 \\ 0 & \frac{\sqrt{30}i}{20} & 0 & \frac{\sqrt{10}i}{20} & 0 & 0 & -\frac{\sqrt{10}i}{20} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}i}{20} & 0 & 0 & \frac{\sqrt{10}i}{20} & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{10}i}{20} & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}i}{20} \\ 0 & 0 & 0 & -\frac{\sqrt{10}i}{10} & 0 & 0 & -\frac{\sqrt{10}i}{20} & 0 & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{10}i}{10} & 0 & 0 & 0 & 0 & \frac{\sqrt{10}i}{20} & 0 & 0 \end{bmatrix}$
486	symmetry	y
486	symmetry	z

continued ...

Table 8

No.	multipole	matrix
$\mathbb{G}_{1,2}^{(1,0;a)}(T_g)$	0 0 0 0 0 $-\frac{\sqrt{30}}{20}$ 0 $-\frac{\sqrt{30}i}{20}$ 0 0	
	0 0 0 0 $\frac{\sqrt{30}}{20}$ 0 $-\frac{\sqrt{30}i}{20}$ 0 0 0	
	0 0 0 0 0 $-\frac{\sqrt{10}}{20}$ 0 $\frac{\sqrt{10}i}{20}$ 0 0	
	0 0 0 0 $\frac{\sqrt{10}}{20}$ 0 $\frac{\sqrt{10}i}{20}$ 0 0 0	
	0 $\frac{\sqrt{30}}{20}$ 0 $\frac{\sqrt{10}}{20}$ 0 0 0 0 0 $-\frac{\sqrt{10}i}{20}$	
	$-\frac{\sqrt{30}}{20}$ 0 $-\frac{\sqrt{10}}{20}$ 0 0 0 0 0 $-\frac{\sqrt{10}i}{20}$ 0	
	0 $\frac{\sqrt{30}i}{20}$ 0 $-\frac{\sqrt{10}i}{20}$ 0 0 0 0 0 $-\frac{\sqrt{10}}{20}$	
	$\frac{\sqrt{30}i}{20}$ 0 $-\frac{\sqrt{10}i}{20}$ 0 0 0 0 0 0 $\frac{\sqrt{10}}{20}$	
	0 0 0 0 0 $\frac{\sqrt{10}i}{20}$ 0 $\frac{\sqrt{10}}{20}$ 0 0	
	0 0 0 0 $\frac{\sqrt{10}i}{20}$ 0 $-\frac{\sqrt{10}}{20}$ 0 0 0	
487	symmetry	$\sqrt{15}xyz$
$\mathbb{G}_3^{(1,0;a)}(A_g)$	0 0 0 0 0 $-\frac{\sqrt{3}i}{12}$ 0 $-\frac{\sqrt{3}}{12}$ $\frac{\sqrt{3}i}{6}$ 0	
	0 0 0 0 $-\frac{\sqrt{3}i}{12}$ 0 $\frac{\sqrt{3}}{12}$ 0 0 $-\frac{\sqrt{3}i}{6}$	
	0 0 0 0 0 $\frac{i}{4}$ 0 $-\frac{1}{4}$ 0 0	
	0 0 0 0 $\frac{i}{4}$ 0 $\frac{1}{4}$ 0 0 0	
	0 $\frac{\sqrt{3}i}{12}$ 0 $-\frac{i}{4}$ 0 0 0 0 0 0	
	$\frac{\sqrt{3}i}{12}$ 0 $-\frac{i}{4}$ 0 0 0 0 0 0 0	
	0 $\frac{\sqrt{3}}{12}$ 0 $\frac{1}{4}$ 0 0 0 0 0 0	
	$-\frac{\sqrt{3}}{12}$ 0 $-\frac{1}{4}$ 0 0 0 0 0 0 0	
	$-\frac{\sqrt{3}i}{6}$ 0 0 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 0 0 $-\frac{\sqrt{5}i}{40}$ 0 0 $\frac{\sqrt{5}}{8}$	
	0 0 0 0 0 0 0 $\frac{\sqrt{5}i}{40}$ $-\frac{\sqrt{5}}{8}$ 0	
	0 0 0 0 0 0 $-\frac{3\sqrt{15}i}{40}$ 0 0 $-\frac{\sqrt{15}}{40}$	
	0 0 0 0 0 0 0 $\frac{3\sqrt{15}i}{40}$ $\frac{\sqrt{15}}{40}$ 0	
	0 0 0 0 0 0 0 $-\frac{\sqrt{15}}{20}$ $-\frac{\sqrt{15}i}{20}$ 0	
	0 0 0 0 0 0 $\frac{\sqrt{15}}{20}$ 0 0 $\frac{\sqrt{15}i}{20}$	
	$\frac{\sqrt{5}i}{40}$ 0 $\frac{3\sqrt{15}i}{40}$ 0 0 $\frac{\sqrt{15}}{20}$ 0 0 0 0	
	0 $-\frac{\sqrt{5}i}{40}$ 0 $-\frac{3\sqrt{15}i}{40}$ $-\frac{\sqrt{15}}{20}$ 0 0 0 0 0	
	0 $-\frac{\sqrt{5}}{8}$ 0 $\frac{\sqrt{15}}{40}$ $\frac{\sqrt{15}i}{20}$ 0 0 0 0 0	
	$\frac{\sqrt{5}}{8}$ 0 $-\frac{\sqrt{15}}{40}$ 0 0 $-\frac{\sqrt{15}i}{20}$ 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 $-\frac{\sqrt{5}i}{40}$ 0 0 0 0 $\frac{\sqrt{5}i}{8}$	
	0 0 0 0 0 $\frac{\sqrt{5}i}{40}$ 0 0 0 $\frac{\sqrt{5}i}{8}$ 0	
	0 0 0 0 $\frac{3\sqrt{15}i}{40}$ 0 0 0 0 $\frac{\sqrt{15}i}{40}$	
	0 0 0 0 0 $-\frac{3\sqrt{15}i}{40}$ 0 0 0 $\frac{\sqrt{15}i}{40}$	
	$\frac{\sqrt{5}i}{40}$ 0 $-\frac{3\sqrt{15}i}{40}$ 0 0 0 0 $\frac{\sqrt{15}i}{20}$ 0 0	
	0 $-\frac{\sqrt{5}i}{40}$ 0 $\frac{3\sqrt{15}i}{40}$ 0 0 $\frac{\sqrt{15}i}{20}$ 0 0 0	
	0 0 0 0 0 $-\frac{\sqrt{15}i}{20}$ 0 0 $-\frac{\sqrt{15}i}{20}$ 0	
	0 0 0 0 $-\frac{\sqrt{15}i}{20}$ 0 0 0 0 $\frac{\sqrt{15}i}{20}$	
	0 $-\frac{\sqrt{5}i}{8}$ 0 $-\frac{\sqrt{15}i}{40}$ 0 0 0 0 0 0	
	$-\frac{\sqrt{5}i}{8}$ 0 $-\frac{\sqrt{15}i}{40}$ 0 0 0 0 $-\frac{\sqrt{15}i}{20}$ 0 0	
490	symmetry	$-\frac{z(3x^2 + 3y^2 - 2z^2)}{2}$

continued ...

Table 8

No.	multipole	matrix
$\mathbb{G}_{3,2}^{(1,0;a)}(T_g, 1)$	0 0 0 0 0 $-\frac{\sqrt{5}}{10}$ 0 $-\frac{\sqrt{5}i}{10}$ 0 0	
	0 0 0 0 $\frac{\sqrt{5}}{10}$ 0 $-\frac{\sqrt{5}i}{10}$ 0 0 0	
	0 0 0 0 0 $\frac{\sqrt{15}}{20}$ 0 $-\frac{\sqrt{15}i}{20}$ 0 0	
	0 0 0 0 $-\frac{\sqrt{15}}{20}$ 0 $-\frac{\sqrt{15}i}{20}$ 0 0 0	
	0 $\frac{\sqrt{5}}{10}$ 0 $-\frac{\sqrt{15}}{20}$ 0 0 0 0 0 $\frac{\sqrt{15}i}{20}$	
	$-\frac{\sqrt{5}}{10}$ 0 $\frac{\sqrt{15}}{20}$ 0 0 0 0 0 $\frac{\sqrt{15}i}{20}$ 0	
	0 $\frac{\sqrt{5}i}{10}$ 0 $\frac{\sqrt{15}i}{20}$ 0 0 0 0 0 0 $\frac{\sqrt{15}}{20}$	
	$\frac{\sqrt{5}i}{10}$ 0 $\frac{\sqrt{15}i}{20}$ 0 0 0 0 0 0 $-\frac{\sqrt{15}}{20}$ 0	
	0 0 0 0 0 $-\frac{\sqrt{15}i}{20}$ 0 $-\frac{\sqrt{15}}{20}$ 0 0	
	0 0 0 0 $-\frac{\sqrt{15}i}{20}$ 0 $\frac{\sqrt{15}}{20}$ 0 0 0	
491	symmetry	$\frac{\sqrt{15}x(y-z)(y+z)}{2}$
$\mathbb{G}_{3,0}^{(1,0;a)}(T_g, 2)$	0 0 0 $\frac{\sqrt{3}i}{6}$ 0 0 $-\frac{\sqrt{3}i}{24}$ 0 0 $\frac{\sqrt{3}}{24}$	
	0 0 $\frac{\sqrt{3}i}{6}$ 0 0 0 0 $\frac{\sqrt{3}i}{24}$ $-\frac{\sqrt{3}}{24}$ 0	
	0 $-\frac{\sqrt{3}i}{6}$ 0 0 0 0 $\frac{i}{8}$ 0 0 $-\frac{1}{8}$	
	$-\frac{\sqrt{3}i}{6}$ 0 0 0 0 0 0 $-\frac{i}{8}$ $\frac{1}{8}$ 0	
	0 0 0 0 0 0 0 $-\frac{1}{4}$ $\frac{i}{4}$ 0	
	0 0 0 0 0 0 $\frac{1}{4}$ 0 0 $-\frac{i}{4}$	
	$\frac{\sqrt{3}i}{24}$ 0 $-\frac{i}{8}$ 0 0 $\frac{1}{4}$ 0 0 0 0	
	0 $-\frac{\sqrt{3}i}{24}$ 0 $\frac{i}{8}$ $-\frac{1}{4}$ 0 0 0 0 0	
	0 $-\frac{\sqrt{3}}{24}$ 0 $\frac{1}{8}$ $-\frac{i}{4}$ 0 0 0 0 0	
	$\frac{\sqrt{3}}{24}$ 0 $-\frac{1}{8}$ 0 0 $\frac{i}{4}$ 0 0 0 0	
492	symmetry	$-\frac{\sqrt{15}y(x-z)(x+z)}{2}$

continued ...

Table 8

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

continued ...

Table 8

No.	multipole	matrix
$\mathbb{T}_{2,0}^{(1,0;a)}(E_g)$	0 0 0 0 0 $\frac{\sqrt{14}}{28}$ 0 $\frac{\sqrt{14}i}{28}$ 0 0	
	0 0 0 0 $\frac{\sqrt{14}}{28}$ 0 $-\frac{\sqrt{14}i}{28}$ 0 0 0	
	0 0 0 0 0 $-\frac{\sqrt{42}}{28}$ 0 $\frac{\sqrt{42}i}{28}$ 0 0	
	0 0 0 0 $-\frac{\sqrt{42}}{28}$ 0 $-\frac{\sqrt{42}i}{28}$ 0 0 0	
	0 $\frac{\sqrt{14}}{28}$ 0 $-\frac{\sqrt{42}}{28}$ 0 0 0 0 0 $\frac{\sqrt{42}i}{28}$	
	$\frac{\sqrt{14}}{28}$ 0 $-\frac{\sqrt{42}}{28}$ 0 0 0 0 0 $-\frac{\sqrt{42}i}{28}$ 0	
	0 $\frac{\sqrt{14}i}{28}$ 0 $\frac{\sqrt{42}i}{28}$ 0 0 0 0 0 0 $\frac{\sqrt{42}}{28}$	
	$-\frac{\sqrt{14}i}{28}$ 0 $-\frac{\sqrt{42}i}{28}$ 0 0 0 0 0 0 $\frac{\sqrt{42}}{28}$ 0	
	0 0 0 0 0 $\frac{\sqrt{42}i}{28}$ 0 $\frac{\sqrt{42}}{28}$ 0 0 0	
	0 0 0 0 $-\frac{\sqrt{42}i}{28}$ 0 $\frac{\sqrt{42}}{28}$ 0 0 0 0	
495	symmetry	$\frac{\sqrt{3}(x-y)(x+y)}{2}$
$\mathbb{T}_{2,1}^{(1,0;a)}(E_g)$	0 0 0 0 0 $\frac{\sqrt{42}}{84}$ 0 $-\frac{\sqrt{42}i}{84}$ $\frac{\sqrt{42}}{21}$ 0	
	0 0 0 0 $\frac{\sqrt{42}}{84}$ 0 $\frac{\sqrt{42}i}{84}$ 0 0 $-\frac{\sqrt{42}}{21}$	
	0 0 0 0 0 $-\frac{\sqrt{14}}{28}$ 0 $-\frac{\sqrt{14}i}{28}$ 0 0	
	0 0 0 0 $-\frac{\sqrt{14}}{28}$ 0 $\frac{\sqrt{14}i}{28}$ 0 0 0	
	0 $\frac{\sqrt{42}}{84}$ 0 $-\frac{\sqrt{14}}{28}$ 0 0 0 $-\frac{\sqrt{14}}{14}$ 0 0 $-\frac{\sqrt{14}i}{28}$	
	$\frac{\sqrt{42}}{84}$ 0 $-\frac{\sqrt{14}}{28}$ 0 0 0 0 $\frac{\sqrt{14}}{14}$ $\frac{\sqrt{14}i}{28}$ 0	
	0 $-\frac{\sqrt{42}i}{84}$ 0 $-\frac{\sqrt{14}i}{28}$ $-\frac{\sqrt{14}}{14}$ 0 0 0 0 $\frac{\sqrt{14}}{28}$	
	$\frac{\sqrt{42}i}{84}$ 0 $\frac{\sqrt{14}i}{28}$ 0 0 $\frac{\sqrt{14}}{14}$ 0 0 0 $\frac{\sqrt{14}}{28}$ 0	
	$\frac{\sqrt{42}}{21}$ 0 0 0 0 $-\frac{\sqrt{14}i}{28}$ 0 $\frac{\sqrt{14}}{28}$ 0 0 0	
	0 $-\frac{\sqrt{42}}{21}$ 0 0 0 $\frac{\sqrt{14}i}{28}$ 0 $\frac{\sqrt{14}}{28}$ 0 0 0	
496	symmetry	$\sqrt{3}yz$

continued ...

Table 8

No.	multipole	matrix
$\mathbb{T}_{2,0}^{(1,0;a)}(T_g)$	0	$-\frac{\sqrt{14}}{14}$ 0 $\frac{\sqrt{42}}{42}$ 0 0 $\frac{\sqrt{42}}{84}$ 0 0 $-\frac{\sqrt{42}i}{42}$
	$-\frac{\sqrt{14}}{14}$	0 $\frac{\sqrt{42}}{42}$ 0 0 0 0 $-\frac{\sqrt{42}}{84}$ $\frac{\sqrt{42}i}{42}$ 0
	0	$\frac{\sqrt{42}}{42}$ 0 $\frac{\sqrt{14}}{14}$ 0 0 0 $\frac{\sqrt{14}}{28}$ 0 0 0
	$\frac{\sqrt{42}}{42}$	0 $\frac{\sqrt{14}}{14}$ 0 0 0 0 0 $-\frac{\sqrt{14}}{28}$ 0 0
	0	0 0 0 0 0 0 0 $\frac{\sqrt{14}i}{28}$ $\frac{\sqrt{14}}{28}$ 0
	0	0 0 0 0 0 0 $-\frac{\sqrt{14}i}{28}$ 0 0 $-\frac{\sqrt{14}}{28}$
	$\frac{\sqrt{42}}{84}$	0 $\frac{\sqrt{14}}{28}$ 0 0 0 $\frac{\sqrt{14}i}{28}$ 0 $-\frac{\sqrt{14}}{14}$ 0 0
	0	$-\frac{\sqrt{42}}{84}$ 0 $-\frac{\sqrt{14}}{28}$ $-\frac{\sqrt{14}i}{28}$ 0 $-\frac{\sqrt{14}}{14}$ 0 0 0
	0	$-\frac{\sqrt{42}i}{42}$ 0 0 $\frac{\sqrt{14}}{28}$ 0 0 0 0 $\frac{\sqrt{14}}{14}$
	$\frac{\sqrt{42}i}{42}$	0 0 0 0 0 $-\frac{\sqrt{14}}{28}$ 0 0 $\frac{\sqrt{14}}{14}$ 0
$\mathbb{T}_{2,1}^{(1,0;a)}(T_g)$	497	symmetry $\sqrt{3}xz$
	0	$-\frac{\sqrt{14}i}{14}$ 0 $-\frac{\sqrt{42}i}{42}$ $-\frac{\sqrt{42}}{84}$ 0 0 0 0 $-\frac{\sqrt{42}}{42}$
	$\frac{\sqrt{14}i}{14}$	0 $\frac{\sqrt{42}i}{42}$ 0 0 0 $\frac{\sqrt{42}}{84}$ 0 0 $-\frac{\sqrt{42}}{42}$ 0
	0	$-\frac{\sqrt{42}i}{42}$ 0 $\frac{\sqrt{14}i}{14}$ $\frac{\sqrt{14}}{28}$ 0 0 0 0 0 0
	$\frac{\sqrt{42}i}{42}$	0 $-\frac{\sqrt{14}i}{14}$ 0 0 0 $-\frac{\sqrt{14}}{28}$ 0 0 0 0
	$-\frac{\sqrt{42}}{84}$	0 $\frac{\sqrt{14}}{28}$ 0 0 0 $-\frac{\sqrt{14}i}{14}$ 0 $\frac{\sqrt{14}}{28}$ 0 0
	0	$\frac{\sqrt{42}}{84}$ 0 $-\frac{\sqrt{14}}{28}$ $\frac{\sqrt{14}i}{14}$ 0 $\frac{\sqrt{14}}{28}$ 0 0 0 0
	0	0 0 0 0 0 $\frac{\sqrt{14}}{28}$ 0 0 $-\frac{\sqrt{14}}{28}$ 0
	0	0 0 0 0 0 $\frac{\sqrt{14}}{28}$ 0 0 0 $\frac{\sqrt{14}}{28}$
	0	$-\frac{\sqrt{42}}{42}$ 0 0 0 0 0 $-\frac{\sqrt{14}}{28}$ 0 0 $\frac{\sqrt{14}i}{14}$
498	symmetry	$\sqrt{3}xy$

continued ...

Table 8

No.	multipole	matrix
$\mathbb{T}_{2,2}^{(1,0;a)}(T_g)$	0	0 $-\frac{\sqrt{42}}{21}$ 0 0 $-\frac{\sqrt{42}i}{84}$ 0 $-\frac{\sqrt{42}}{84}$ 0 0
	0	0 0 $\frac{\sqrt{42}}{21}$ $\frac{\sqrt{42}i}{84}$ 0 $-\frac{\sqrt{42}}{84}$ 0 0 0
	$-\frac{\sqrt{42}}{21}$	0 0 0 0 0 $\frac{\sqrt{14}i}{28}$ 0 $-\frac{\sqrt{14}}{28}$ 0 0
	0	$\frac{\sqrt{42}}{21}$ 0 0 0 $-\frac{\sqrt{14}i}{28}$ 0 $-\frac{\sqrt{14}}{28}$ 0 0 0
	0	$-\frac{\sqrt{42}i}{84}$ 0 $\frac{\sqrt{14}i}{28}$ $-\frac{\sqrt{14}}{14}$ 0 0 0 0 $-\frac{\sqrt{14}}{28}$
	$\frac{\sqrt{42}i}{84}$	0 $-\frac{\sqrt{14}i}{28}$ 0 0 0 $\frac{\sqrt{14}}{14}$ 0 0 $-\frac{\sqrt{14}}{28}$ 0
	0	$-\frac{\sqrt{42}}{84}$ 0 $-\frac{\sqrt{14}}{28}$ 0 0 0 $\frac{\sqrt{14}}{14}$ 0 0 $-\frac{\sqrt{14}i}{28}$
	$-\frac{\sqrt{42}}{84}$	0 $-\frac{\sqrt{14}}{28}$ 0 0 0 0 0 $-\frac{\sqrt{14}}{14}$ $\frac{\sqrt{14}i}{28}$ 0
	0	0 0 0 0 0 $-\frac{\sqrt{14}}{28}$ 0 $-\frac{\sqrt{14}i}{28}$ 0 0
	0	0 0 0 0 $-\frac{\sqrt{14}}{28}$ 0 $\frac{\sqrt{14}i}{28}$ 0 0 0
499	symmetry	$\frac{\sqrt{21}(x^4 - 3x^2y^2 - 3x^2z^2 + y^4 - 3y^2z^2 + z^4)}{6}$
$\mathbb{T}_4^{(1,0;a)}(A_g)$	0	0 0 0 0 0 $\frac{1}{4}$ 0 $\frac{i}{4}$ 0 0
	0	0 0 0 0 $\frac{1}{4}$ 0 $-\frac{i}{4}$ 0 0 0
	0	0 0 0 0 0 $\frac{\sqrt{3}}{12}$ 0 $-\frac{\sqrt{3}i}{12}$ $-\frac{\sqrt{3}}{6}$ 0
	0	0 0 0 0 $\frac{\sqrt{3}}{12}$ 0 $\frac{\sqrt{3}i}{12}$ 0 0 $\frac{\sqrt{3}}{6}$
	0	$\frac{1}{4}$ 0 $\frac{\sqrt{3}}{12}$ 0 0 0 0 0 0 0
	$\frac{1}{4}$	0 $\frac{\sqrt{3}}{12}$ 0 0 0 0 0 0 0 0
	0	$\frac{i}{4}$ 0 $-\frac{\sqrt{3}i}{12}$ 0 0 0 0 0 0 0
	$-\frac{i}{4}$	0 $\frac{\sqrt{3}i}{12}$ 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 $\frac{\sqrt{3}}{6}$ 0 0 0 0 0 0
500	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
$\mathbb{T}_{4,0}^{(1,0;a)}(E_g)$	0 0 0 0 0 $\frac{\sqrt{35}}{28}$ 0 $\frac{\sqrt{35}i}{28}$ 0 0	
	0 0 0 0 0 $\frac{\sqrt{35}}{28}$ 0 $-\frac{\sqrt{35}i}{28}$ 0 0 0	
	0 0 0 0 0 $-\frac{\sqrt{105}}{420}$ 0 $\frac{\sqrt{105}i}{420}$ $\frac{\sqrt{105}}{30}$ 0	
	0 0 0 0 $-\frac{\sqrt{105}}{420}$ 0 $-\frac{\sqrt{105}i}{420}$ 0 0 $-\frac{\sqrt{105}}{30}$	
	0 $\frac{\sqrt{35}}{28}$ 0 $-\frac{\sqrt{105}}{420}$ 0 0 0 0 0 $-\frac{\sqrt{105}i}{70}$	
	$\frac{\sqrt{35}}{28}$ 0 $-\frac{\sqrt{105}}{420}$ 0 0 0 0 0 $\frac{\sqrt{105}i}{70}$ 0	
	0 $\frac{\sqrt{35}i}{28}$ 0 $\frac{\sqrt{105}i}{420}$ 0 0 0 0 0 $-\frac{\sqrt{105}}{70}$	
	$-\frac{\sqrt{35}i}{28}$ 0 $-\frac{\sqrt{105}i}{420}$ 0 0 0 0 0 $-\frac{\sqrt{105}}{70}$ 0	
	0 0 $\frac{\sqrt{105}}{30}$ 0 0 $-\frac{\sqrt{105}i}{70}$ 0 $-\frac{\sqrt{105}}{70}$ 0 0	
	0 0 0 $-\frac{\sqrt{105}}{30}$ $\frac{\sqrt{105}i}{70}$ 0 $-\frac{\sqrt{105}}{70}$ 0 0 0	
501 symmetry	$\frac{\sqrt{5}(x-y)(x+y)(x^2+y^2-6z^2)}{4}$	
	0 0 0 0 0 $-\frac{3\sqrt{105}}{140}$ 0 $\frac{3\sqrt{105}i}{140}$ $\frac{\sqrt{105}}{70}$ 0	
	0 0 0 0 $-\frac{3\sqrt{105}}{140}$ 0 $-\frac{3\sqrt{105}i}{140}$ 0 0 $-\frac{\sqrt{105}}{70}$	
	0 0 0 0 0 $-\frac{\sqrt{35}}{28}$ 0 $-\frac{\sqrt{35}i}{28}$ 0 0	
	0 0 0 0 $-\frac{\sqrt{35}}{28}$ 0 $\frac{\sqrt{35}i}{28}$ 0 0 0	
	0 $-\frac{3\sqrt{105}}{140}$ 0 $-\frac{\sqrt{35}}{28}$ 0 0 $\frac{\sqrt{35}}{35}$ 0 0 $\frac{\sqrt{35}i}{70}$	
	$-\frac{3\sqrt{105}}{140}$ 0 $-\frac{\sqrt{35}}{28}$ 0 0 0 0 $-\frac{\sqrt{35}}{35}$ $-\frac{\sqrt{35}i}{70}$ 0	
	0 $\frac{3\sqrt{105}i}{140}$ 0 $-\frac{\sqrt{35}i}{28}$ $\frac{\sqrt{35}}{35}$ 0 0 0 0 $-\frac{\sqrt{35}}{70}$	
	$-\frac{3\sqrt{105}i}{140}$ 0 $\frac{\sqrt{35}i}{28}$ 0 0 $-\frac{\sqrt{35}}{35}$ 0 0 $-\frac{\sqrt{35}}{70}$ 0	
	$\frac{\sqrt{105}}{70}$ 0 0 0 0 $\frac{\sqrt{35}i}{70}$ 0 $-\frac{\sqrt{35}}{70}$ 0 0	
502 symmetry	$\frac{\sqrt{35}yz(y-z)(y+z)}{2}$	
	continued ...	

Table 8

No.	multipole	matrix
$\mathbb{T}_{4,0}^{(1,0;a)}(T_g, 1)$	0	$\frac{3\sqrt{5}}{20}$ 0 $\frac{\sqrt{15}}{20}$ 0 0 0 $-\frac{\sqrt{15}}{40}$ 0 0 $-\frac{\sqrt{15}i}{40}$
	$\frac{3\sqrt{5}}{20}$	0 $\frac{\sqrt{15}}{20}$ 0 0 0 0 0 $\frac{\sqrt{15}}{40}$ $\frac{\sqrt{15}i}{40}$ 0
	0	$\frac{\sqrt{15}}{20}$ 0 $\frac{\sqrt{5}}{20}$ 0 0 0 $-\frac{\sqrt{5}}{40}$ 0 0 $-\frac{\sqrt{5}i}{40}$
	$\frac{\sqrt{15}}{20}$	0 $\frac{\sqrt{5}}{20}$ 0 0 0 0 0 $\frac{\sqrt{5}}{40}$ $\frac{\sqrt{5}i}{40}$ 0
	0	0 0 0 0 0 $-\frac{\sqrt{5}}{5}$ 0 $-\frac{\sqrt{5}i}{20}$ $\frac{\sqrt{5}}{20}$ 0
	0	0 0 0 0 $-\frac{\sqrt{5}}{5}$ 0 $\frac{\sqrt{5}i}{20}$ 0 0 $-\frac{\sqrt{5}}{20}$
	$-\frac{\sqrt{15}}{40}$	0 $-\frac{\sqrt{5}}{40}$ 0 0 0 $-\frac{\sqrt{5}i}{20}$ 0 0 0 0
	0	$\frac{\sqrt{15}}{40}$ 0 $\frac{\sqrt{5}}{40}$ $\frac{\sqrt{5}i}{20}$ 0 0 0 0 0 0
	0	$-\frac{\sqrt{15}i}{40}$ 0 $-\frac{\sqrt{5}i}{40}$ $\frac{\sqrt{5}}{20}$ 0 0 0 0 0 0
	$\frac{\sqrt{15}i}{40}$	0 $\frac{\sqrt{5}i}{40}$ 0 0 0 $-\frac{\sqrt{5}}{20}$ 0 0 0 0
503 symmetry	$-\frac{\sqrt{35}xz(x-z)(x+z)}{2}$	
	0	$-\frac{3\sqrt{5}i}{20}$ 0 $\frac{\sqrt{15}i}{20}$ $-\frac{\sqrt{15}}{40}$ 0 0 0 0 $\frac{\sqrt{15}}{40}$
	$\frac{3\sqrt{5}i}{20}$	0 $-\frac{\sqrt{15}i}{20}$ 0 0 0 $\frac{\sqrt{15}}{40}$ 0 0 $\frac{\sqrt{15}}{40}$ 0
	0	$\frac{\sqrt{15}i}{20}$ 0 $-\frac{\sqrt{5}i}{20}$ $\frac{\sqrt{5}}{40}$ 0 0 0 0 $-\frac{\sqrt{5}}{40}$
	$-\frac{\sqrt{15}i}{20}$	0 $\frac{\sqrt{5}i}{20}$ 0 0 0 $-\frac{\sqrt{5}}{40}$ 0 0 $-\frac{\sqrt{5}}{40}$ 0
	$-\frac{\sqrt{15}}{40}$	0 $\frac{\sqrt{5}}{40}$ 0 0 0 0 0 $\frac{\sqrt{5}}{20}$ 0 0
	0	$\frac{\sqrt{15}}{40}$ 0 $-\frac{\sqrt{5}}{40}$ 0 0 0 $\frac{\sqrt{5}}{20}$ 0 0 0
	0	0 0 0 0 0 $\frac{\sqrt{5}}{20}$ 0 $\frac{\sqrt{5}i}{5}$ $\frac{\sqrt{5}}{20}$ 0
	0	0 0 0 0 $\frac{\sqrt{5}}{20}$ 0 $-\frac{\sqrt{5}i}{5}$ 0 0 $-\frac{\sqrt{5}}{20}$
	$\frac{\sqrt{15}}{40}$	0 $-\frac{\sqrt{5}}{40}$ 0 0 0 0 $\frac{\sqrt{5}}{20}$ 0 0 0
504 symmetry	$\frac{\sqrt{35}xy(x-y)(x+y)}{2}$	

continued ...

Table 8

No.	multipole	matrix
		$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{5}}{5} & 0 & 0 & -\frac{\sqrt{5}i}{20} & 0 & -\frac{\sqrt{5}}{20} & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{5}}{5} & \frac{\sqrt{5}i}{20} & 0 & -\frac{\sqrt{5}}{20} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{5}i}{20} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{5}}{20} \\ 0 & 0 & \frac{\sqrt{5}i}{20} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{5}}{20} & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{5}}{20} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{20} \\ 0 & 0 & -\frac{\sqrt{5}}{20} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{5}i}{20} & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{5}}{20} & 0 & -\frac{\sqrt{5}i}{20} & -\frac{\sqrt{5}}{5} & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{5}}{20} & 0 & \frac{\sqrt{5}i}{20} & 0 & 0 & 0 & \frac{\sqrt{5}}{5} \end{bmatrix}$
505	symmetry	$\frac{\sqrt{5}yz(6x^2-y^2-z^2)}{2}$
		$\begin{bmatrix} 0 & \frac{3\sqrt{35}}{140} & 0 & -\frac{\sqrt{105}}{140} & 0 & 0 & -\frac{\sqrt{105}}{280} & 0 & 0 & -\frac{\sqrt{105}i}{56} \\ \frac{3\sqrt{35}}{140} & 0 & -\frac{\sqrt{105}}{140} & 0 & 0 & 0 & 0 & \frac{\sqrt{105}}{280} & \frac{\sqrt{105}i}{56} & 0 \\ 0 & -\frac{\sqrt{105}}{140} & 0 & -\frac{3\sqrt{35}}{140} & 0 & 0 & \frac{11\sqrt{35}}{280} & 0 & 0 & \frac{\sqrt{35}i}{40} \\ -\frac{\sqrt{105}}{140} & 0 & -\frac{3\sqrt{35}}{140} & 0 & 0 & 0 & 0 & -\frac{11\sqrt{35}}{280} & -\frac{\sqrt{35}i}{40} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{35}i}{28} & -\frac{\sqrt{35}}{28} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{35}i}{28} & 0 & 0 & \frac{\sqrt{35}}{28} \\ -\frac{\sqrt{105}}{280} & 0 & \frac{11\sqrt{35}}{280} & 0 & 0 & -\frac{\sqrt{35}i}{28} & 0 & -\frac{\sqrt{35}}{35} & 0 & 0 \\ 0 & \frac{\sqrt{105}}{280} & 0 & -\frac{11\sqrt{35}}{280} & \frac{\sqrt{35}i}{28} & 0 & -\frac{\sqrt{35}}{35} & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{105}i}{56} & 0 & \frac{\sqrt{35}i}{40} & -\frac{\sqrt{35}}{28} & 0 & 0 & 0 & 0 & \frac{\sqrt{35}}{35} \\ \frac{\sqrt{105}i}{56} & 0 & -\frac{\sqrt{35}i}{40} & 0 & 0 & \frac{\sqrt{35}}{28} & 0 & 0 & 0 & \frac{\sqrt{35}}{35} \end{bmatrix}$
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	$\frac{3\sqrt{35}i}{140}$ 0 $\frac{\sqrt{105}i}{140}$ $\frac{\sqrt{105}}{280}$ 0 0 0 0 $-\frac{\sqrt{105}}{56}$
	$-\frac{3\sqrt{35}i}{140}$	0 $-\frac{\sqrt{105}i}{140}$ 0 0 0 $-\frac{\sqrt{105}}{280}$ 0 0 $-\frac{\sqrt{105}}{56}$ 0
	0	$\frac{\sqrt{105}i}{140}$ 0 $-\frac{3\sqrt{35}i}{140}$ $\frac{11\sqrt{35}}{280}$ 0 0 0 0 $-\frac{\sqrt{35}}{40}$
	$-\frac{\sqrt{105}i}{140}$	0 $\frac{3\sqrt{35}i}{140}$ 0 0 0 $-\frac{11\sqrt{35}}{280}$ 0 0 $-\frac{\sqrt{35}}{40}$ 0
	$\frac{\sqrt{105}}{280}$	0 $\frac{11\sqrt{35}}{280}$ 0 0 0 $-\frac{\sqrt{35}i}{35}$ 0 $-\frac{\sqrt{35}}{28}$ 0 0
	0	$-\frac{\sqrt{105}}{280}$ 0 $-\frac{11\sqrt{35}}{280}$ $\frac{\sqrt{35}i}{35}$ 0 $-\frac{\sqrt{35}}{28}$ 0 0 0 0
	0	0 0 0 0 0 $-\frac{\sqrt{35}}{28}$ 0 0 $\frac{\sqrt{35}}{28}$ 0
	0	0 0 0 0 $-\frac{\sqrt{35}}{28}$ 0 0 0 0 $-\frac{\sqrt{35}}{28}$
	0	$-\frac{\sqrt{105}}{56}$ 0 $-\frac{\sqrt{35}}{40}$ 0 0 0 0 $-\frac{\sqrt{35}}{28}$ $-\frac{\sqrt{35}i}{35}$ 0
	$-\frac{\sqrt{105}}{56}$	0 $-\frac{\sqrt{35}}{40}$ 0 0 0 0 0 $-\frac{\sqrt{35}}{28}$ $-\frac{\sqrt{35}i}{35}$ 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 $\frac{\sqrt{105}}{70}$ 0 0 $-\frac{3\sqrt{105}i}{140}$ 0 $-\frac{3\sqrt{105}}{140}$ 0 0
	0	0 0 0 $-\frac{\sqrt{105}}{70}$ $\frac{3\sqrt{105}i}{140}$ 0 $-\frac{3\sqrt{105}}{140}$ 0 0 0
	$\frac{\sqrt{105}}{70}$	0 0 0 0 0 $\frac{\sqrt{35}i}{70}$ 0 $-\frac{\sqrt{35}}{70}$ 0 0
	0	$-\frac{\sqrt{105}}{70}$ 0 0 0 $-\frac{\sqrt{35}i}{70}$ 0 $-\frac{\sqrt{35}}{70}$ 0 0 0
	0	$-\frac{3\sqrt{105}i}{140}$ 0 $\frac{\sqrt{35}i}{70}$ $-\frac{\sqrt{35}}{35}$ 0 0 0 0 0 $\frac{\sqrt{35}}{28}$
	$\frac{3\sqrt{105}i}{140}$	0 $-\frac{\sqrt{35}i}{70}$ 0 0 0 $\frac{\sqrt{35}}{35}$ 0 0 $\frac{\sqrt{35}}{28}$ 0
	0	$-\frac{3\sqrt{105}}{140}$ 0 $-\frac{\sqrt{35}}{70}$ 0 0 0 $\frac{\sqrt{35}}{35}$ 0 0 $\frac{\sqrt{35}i}{28}$
	$-\frac{3\sqrt{105}}{140}$	0 $-\frac{\sqrt{35}}{70}$ 0 0 0 0 0 $-\frac{\sqrt{35}}{35}$ $-\frac{\sqrt{35}i}{28}$ 0
	0	0 0 0 0 0 $\frac{\sqrt{35}}{28}$ 0 $-\frac{\sqrt{35}i}{28}$ 0 0
	0	0 0 0 0 0 $\frac{\sqrt{35}}{28}$ 0 $-\frac{\sqrt{35}i}{28}$ 0 0
508	symmetry	x

continued ...

Table 8

No.	multipole	matrix
$\mathbb{M}_{1,0}^{(a)}(T_g)$		$\begin{bmatrix} 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{10} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{10} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{5}i}{10} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{5}i}{10} & 0 & 0 & 0 \\ -\frac{\sqrt{15}i}{10} & 0 & -\frac{\sqrt{5}i}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{15}i}{10} & 0 & -\frac{\sqrt{5}i}{10} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{5}i}{10} \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{5}i}{10} \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{10} & 0 & 0 \end{bmatrix}$
509	symmetry	y
$\mathbb{M}_{1,1}^{(a)}(T_g)$		$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{10} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{10} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{5}i}{10} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{5}i}{10} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{10} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{10} \\ \frac{\sqrt{15}i}{10} & 0 & -\frac{\sqrt{5}i}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{15}i}{10} & 0 & -\frac{\sqrt{5}i}{10} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{5}i}{10} & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
510	symmetry	z

continued ...

Table 8

No.	multipole	matrix
		$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{5} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{5} \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{5}i}{10} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{5}i}{10} & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{10} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{10} & 0 & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{5}i}{5} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{5}i}{5} & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
511	symmetry	$\sqrt{15}xyz$
		$\begin{bmatrix} 0 & 0 & -\frac{i}{2} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{i}{2} & 0 & 0 & 0 & 0 & 0 & 0 \\ \frac{i}{2} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{i}{2} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
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 0 0 0 $-\frac{\sqrt{15}i}{20}$ 0 0 0 0 0	
	0 0 0 0 0 $-\frac{\sqrt{15}i}{20}$ 0 0 0 0	
	0 0 0 0 $-\frac{\sqrt{5}i}{20}$ 0 0 0 0 0	
	0 0 0 0 0 $-\frac{\sqrt{5}i}{20}$ 0 0 0 0	
	$\frac{\sqrt{15}i}{20}$ 0 $\frac{\sqrt{5}i}{20}$ 0 0 0 0 0 0 0	
	0 $\frac{\sqrt{15}i}{20}$ 0 $\frac{\sqrt{5}i}{20}$ 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 0 0 0 $\frac{\sqrt{5}i}{5}$	
	0 0 0 0 0 0 0 $-\frac{\sqrt{5}i}{5}$ 0 0 0	
	0 0 0 0 0 0 0 0 $-\frac{\sqrt{5}i}{5}$ 0 0 0	
513 symmetry	$-\frac{y(3x^2 - 2y^2 + 3z^2)}{2}$	
	0 0 0 0 0 0 $\frac{\sqrt{15}i}{20}$ 0 0 0	
	0 0 0 0 0 0 0 $\frac{\sqrt{15}i}{20}$ 0 0	
	0 0 0 0 0 0 $-\frac{\sqrt{5}i}{20}$ 0 0 0	
	0 0 0 0 0 0 0 0 $-\frac{\sqrt{5}i}{20}$ 0 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 $-\frac{\sqrt{5}i}{5}$	
	$-\frac{\sqrt{15}i}{20}$ 0 $\frac{\sqrt{5}i}{20}$ 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 0 0 $\frac{\sqrt{5}i}{5}$ 0 0 0 0 0 0	
514 symmetry	$-\frac{z(3x^2 + 3y^2 - 2z^2)}{2}$	
	0 0 0 0 0 0 0 0 0 0 0	

continued ...

Table 8

No.	multipole	matrix
$\mathbb{M}_{3,2}^{(a)}(T_g, 1)$		$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{5}i}{10} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{5}i}{10} \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{5}i}{5} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{5}i}{5} & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{5} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{5} & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{5}i}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{5}i}{10} & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
		$\frac{\sqrt{15}x(y-z)(y+z)}{2}$
		$\begin{bmatrix} 0 & 0 & 0 & 0 & -\frac{i}{4} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{i}{4} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{4} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{4} & 0 & 0 & 0 & 0 \\ \frac{i}{4} & 0 & -\frac{\sqrt{3}i}{4} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{i}{4} & 0 & -\frac{\sqrt{3}i}{4} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
		$\frac{-\sqrt{15}y(x-z)(x+z)}{2}$
515	symmetry	
516	symmetry	

continued ...

Table 8

No.	multipole	matrix
		$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & -\frac{i}{4} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{i}{4} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{4} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{4} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ \frac{i}{4} & 0 & \frac{\sqrt{3}i}{4} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{i}{4} & 0 & \frac{\sqrt{3}i}{4} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
517	$\mathbb{M}_{3,1}^{(a)}(T_g, 2)$	$\frac{\sqrt{15}z(x-y)(x+y)}{2}$
		$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{i}{2} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{i}{2} \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ -\frac{i}{2} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{i}{2} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
518	symmetry	x

continued ...

Table 8

No.	multipole	matrix
		$\begin{bmatrix} 0 & \frac{\sqrt{10}}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ \frac{\sqrt{10}}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{10}}{10} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{10}}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}}{10} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}}{10} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}}{10} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}}{10} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}}{10} \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}}{10} & 0 & 0 \end{bmatrix}$
519	$\mathbb{M}_{1,0}^{(1,-1;a)}(T_g)$	
		$\begin{bmatrix} 0 & -\frac{\sqrt{10}i}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ \frac{\sqrt{10}i}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{10}i}{10} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{10}i}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}i}{10} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}i}{10} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}i}{10} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}i}{10} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}i}{10} \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}i}{10} & 0 \end{bmatrix}$
519	$\mathbb{M}_{1,1}^{(1,-1;a)}(T_g)$	
520	$\mathbb{M}_{1,1}^{(1,-1;a)}(T_g)$	$\begin{bmatrix} & & & & & & & & & \\ & & & & & & & & & \\ & & & & & & & & & \\ & & & & & & & & & \\ & & & & & & & & & \\ & & & & & & & & & \\ & & & & & & & & & \\ & & & & & & & & & \\ & & & & & & & & & \\ & & & & & & & & & \end{bmatrix}$
		y
		z

continued ...

Table 8

No.	multipole	matrix
		$\begin{bmatrix} \frac{\sqrt{10}}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{10}}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{10}}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{10}}{10} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{10}}{10} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}}{10} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}}{10} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}}{10} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}}{10} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}}{10} \end{bmatrix}$
521	symmetry	$\sqrt{15}xyz$
		$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{21}}{42} & 0 & -\frac{\sqrt{21}i}{42} & -\frac{\sqrt{21}}{21} & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{21}}{42} & 0 & \frac{\sqrt{21}i}{42} & 0 & 0 & \frac{\sqrt{21}}{21} \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}}{14} & 0 & -\frac{\sqrt{7}i}{14} & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{7}}{14} & 0 & \frac{\sqrt{7}i}{14} & 0 & 0 & 0 \\ 0 & \frac{\sqrt{21}}{42} & 0 & -\frac{\sqrt{7}}{14} & 0 & 0 & \frac{\sqrt{7}}{14} & 0 & 0 & -\frac{\sqrt{7}i}{14} \\ \frac{\sqrt{21}}{42} & 0 & -\frac{\sqrt{7}}{14} & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}}{14} & \frac{\sqrt{7}i}{14} & 0 \\ 0 & -\frac{\sqrt{21}i}{42} & 0 & -\frac{\sqrt{7}i}{14} & \frac{\sqrt{7}}{14} & 0 & 0 & 0 & 0 & \frac{\sqrt{7}}{14} \\ \frac{\sqrt{21}i}{42} & 0 & \frac{\sqrt{7}i}{14} & 0 & 0 & -\frac{\sqrt{7}}{14} & 0 & 0 & \frac{\sqrt{7}}{14} & 0 \\ -\frac{\sqrt{21}}{21} & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}i}{14} & 0 & \frac{\sqrt{7}}{14} & 0 & 0 \\ 0 & \frac{\sqrt{21}}{21} & 0 & 0 & \frac{\sqrt{7}i}{14} & 0 & \frac{\sqrt{7}}{14} & 0 & 0 & 0 \end{bmatrix}$
522	symmetry	$\frac{x(2x^2-3y^2-3z^2)}{2}$

continued ...

Table 8

No.	multipole	matrix
$\mathbb{M}_{3,0}^{(1,-1;a)}(T_g, 1)$	0	$-\frac{\sqrt{105}}{70}$
	$-\frac{\sqrt{105}}{70}$	0
	0	$-\frac{3\sqrt{35}}{70}$
	$-\frac{3\sqrt{35}}{70}$	0
	0	$\frac{\sqrt{105}}{70}$
	$-\frac{3\sqrt{35}}{70}$	0
	0	$\frac{\sqrt{105}}{70}$
	0	0
	0	$-\frac{\sqrt{105}}{35}$
	$\frac{\sqrt{35}i}{35}$	0
523 symmetry	0	$-\frac{y(3x^2 - 2y^2 + 3z^2)}{2}$
	$\frac{\sqrt{105}i}{70}$	0
	$-\frac{\sqrt{105}i}{70}$	0
	0	$\frac{3\sqrt{35}i}{70}$
	$\frac{3\sqrt{35}i}{70}$	0
	0	$-\frac{3\sqrt{35}i}{70}$
	$\frac{3\sqrt{35}i}{70}$	0
	0	$-\frac{\sqrt{105}i}{70}$
	$-\frac{\sqrt{35}}{70}$	0
	0	$\frac{\sqrt{105}}{70}$
524 symmetry	0	$-\frac{z(3x^2 + 3y^2 - 2z^2)}{2}$
	$\frac{\sqrt{35}i}{35}$	0
	0	$-\frac{\sqrt{105}}{70}$
	0	0
	0	$-\frac{\sqrt{105}}{70}$
	0	0
	$\frac{\sqrt{35}}{35}$	0
	0	0
	0	$-\frac{\sqrt{105}}{70}$
	$\frac{\sqrt{35}i}{35}$	0

continued ...

Table 8

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

continued ...

Table 8

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

continued ...

Table 8

No.	multipole	matrix
		$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{5}}{10} & 0 & -\frac{\sqrt{5}i}{10} & \frac{\sqrt{5}}{10} & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{5}}{10} & 0 & \frac{\sqrt{5}i}{10} & 0 & 0 & -\frac{\sqrt{5}}{10} \\ 0 & 0 & 0 & \frac{\sqrt{5}}{10} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{5}i}{10} \\ 0 & 0 & \frac{\sqrt{5}}{10} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{10} & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{5}i}{10} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{5}}{10} \\ 0 & 0 & \frac{\sqrt{5}i}{10} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{5}}{10} \\ 0 & 0 & \frac{\sqrt{5}}{10} & 0 & 0 & \frac{\sqrt{5}i}{10} & 0 & \frac{\sqrt{5}}{10} & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{5}}{10} & -\frac{\sqrt{5}i}{10} & 0 & \frac{\sqrt{5}}{10} & 0 & 0 & 0 \end{bmatrix}$
529	symmetry	$\frac{\sqrt{105}xyz(x^2+y^2-2z^2)}{2}$
		$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}}{10} & 0 & \frac{\sqrt{5}i}{10} & -\frac{\sqrt{5}}{10} & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{5}}{10} & 0 & -\frac{\sqrt{5}i}{10} & 0 & 0 & \frac{\sqrt{5}}{10} \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{5}}{10} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{15} & 0 & 0 & -\frac{\sqrt{15}i}{30} \\ -\frac{\sqrt{5}}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{15} & \frac{\sqrt{15}i}{30} & 0 \\ 0 & \frac{\sqrt{5}i}{10} & 0 & 0 & -\frac{\sqrt{15}}{15} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{30} \\ -\frac{\sqrt{5}i}{10} & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{15} & 0 & 0 & 0 & \frac{\sqrt{15}}{30} & 0 \\ -\frac{\sqrt{5}}{10} & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{30} & 0 & \frac{\sqrt{15}}{30} & 0 & 0 & 0 \\ 0 & \frac{\sqrt{5}}{10} & 0 & 0 & \frac{\sqrt{15}i}{30} & 0 & \frac{\sqrt{15}}{30} & 0 & 0 & 0 & 0 \end{bmatrix}$
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
		$\begin{bmatrix} 0 & \frac{3\sqrt{7}}{56} & 0 & -\frac{5\sqrt{21}}{168} & 0 & 0 & \frac{\sqrt{21}}{28} & 0 & 0 & -\frac{\sqrt{21}i}{84} \\ \frac{3\sqrt{7}}{56} & 0 & -\frac{5\sqrt{21}}{168} & 0 & 0 & 0 & 0 & -\frac{\sqrt{21}}{28} & \frac{\sqrt{21}i}{84} & 0 \\ 0 & -\frac{5\sqrt{21}}{168} & 0 & \frac{19\sqrt{7}}{168} & 0 & 0 & -\frac{5\sqrt{7}}{84} & 0 & 0 & \frac{\sqrt{7}i}{12} \\ -\frac{5\sqrt{21}}{168} & 0 & \frac{19\sqrt{7}}{168} & 0 & 0 & 0 & 0 & \frac{5\sqrt{7}}{84} & -\frac{\sqrt{7}i}{12} & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}}{42} & 0 & -\frac{\sqrt{7}i}{42} & \frac{\sqrt{7}}{42} & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{7}}{42} & 0 & \frac{\sqrt{7}i}{42} & 0 & 0 & -\frac{\sqrt{7}}{42} \\ \frac{\sqrt{21}}{28} & 0 & -\frac{5\sqrt{7}}{84} & 0 & 0 & -\frac{\sqrt{7}i}{42} & 0 & -\frac{2\sqrt{7}}{21} & 0 & 0 \\ 0 & -\frac{\sqrt{21}}{28} & 0 & \frac{5\sqrt{7}}{84} & \frac{\sqrt{7}i}{42} & 0 & -\frac{2\sqrt{7}}{21} & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{21}i}{84} & 0 & \frac{\sqrt{7}i}{12} & \frac{\sqrt{7}}{42} & 0 & 0 & 0 & 0 & -\frac{2\sqrt{7}}{21} \\ \frac{\sqrt{21}i}{84} & 0 & -\frac{\sqrt{7}i}{12} & 0 & 0 & -\frac{\sqrt{7}}{42} & 0 & 0 & -\frac{2\sqrt{7}}{21} & 0 \end{bmatrix}$
531	symmetry	$\frac{y(15x^4 - 40x^2y^2 + 30x^2z^2 + 8y^4 - 40y^2z^2 + 15z^4)}{8}$ $\begin{bmatrix} 0 & -\frac{3\sqrt{7}i}{56} & 0 & -\frac{5\sqrt{21}i}{168} & \frac{\sqrt{21}}{28} & 0 & 0 & 0 & 0 & \frac{\sqrt{21}}{84} \\ \frac{3\sqrt{7}i}{56} & 0 & \frac{5\sqrt{21}i}{168} & 0 & 0 & -\frac{\sqrt{21}}{28} & 0 & 0 & \frac{\sqrt{21}}{84} & 0 \\ 0 & -\frac{5\sqrt{21}i}{168} & 0 & -\frac{19\sqrt{7}i}{168} & \frac{5\sqrt{7}}{84} & 0 & 0 & 0 & 0 & \frac{\sqrt{7}}{12} \\ \frac{5\sqrt{21}i}{168} & 0 & \frac{19\sqrt{7}i}{168} & 0 & 0 & -\frac{5\sqrt{7}}{84} & 0 & 0 & \frac{\sqrt{7}}{12} & 0 \\ \frac{\sqrt{21}}{28} & 0 & \frac{5\sqrt{7}}{84} & 0 & 0 & \frac{2\sqrt{7}i}{21} & 0 & \frac{\sqrt{7}}{42} & 0 & 0 \\ 0 & -\frac{\sqrt{21}}{28} & 0 & -\frac{5\sqrt{7}}{84} & -\frac{2\sqrt{7}i}{21} & 0 & \frac{\sqrt{7}}{42} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}}{42} & 0 & -\frac{\sqrt{7}i}{42} & \frac{\sqrt{7}}{42} & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{7}}{42} & 0 & \frac{\sqrt{7}i}{42} & 0 & 0 & -\frac{\sqrt{7}}{42} \\ 0 & \frac{\sqrt{21}}{84} & 0 & \frac{\sqrt{7}}{12} & 0 & 0 & \frac{\sqrt{7}}{42} & 0 & 0 & \frac{2\sqrt{7}i}{21} \\ \frac{\sqrt{21}}{84} & 0 & \frac{\sqrt{7}}{12} & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}}{42} & -\frac{2\sqrt{7}i}{21} & 0 \end{bmatrix}$
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
$\mathbb{M}_{5,2}^{(1,-1;a)}(T_g, 1)$	$\frac{\sqrt{7}}{7} \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{21}i}{21} \quad 0 \quad -\frac{\sqrt{21}}{21} \quad 0 \quad 0$	
	$0 \quad -\frac{\sqrt{7}}{7} \quad 0 \quad 0 \quad -\frac{\sqrt{21}i}{21} \quad 0 \quad -\frac{\sqrt{21}}{21} \quad 0 \quad 0 \quad 0$	
	$0 \quad 0 \quad \frac{\sqrt{7}}{42} \quad 0 \quad 0 \quad \frac{\sqrt{7}i}{42} \quad 0 \quad \frac{\sqrt{7}}{42} \quad 0 \quad 0$	
	$0 \quad 0 \quad 0 \quad -\frac{\sqrt{7}}{42} \quad -\frac{\sqrt{7}i}{42} \quad 0 \quad \frac{\sqrt{7}}{42} \quad 0 \quad 0 \quad 0$	
	$0 \quad \frac{\sqrt{21}i}{21} \quad 0 \quad \frac{\sqrt{7}i}{42} \quad -\frac{2\sqrt{7}}{21} \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{7}}{42}$	
	$-\frac{\sqrt{21}i}{21} \quad 0 \quad -\frac{\sqrt{7}i}{42} \quad 0 \quad 0 \quad \frac{2\sqrt{7}}{21} \quad 0 \quad 0 \quad \frac{\sqrt{7}}{42} \quad 0$	
	$0 \quad -\frac{\sqrt{21}}{21} \quad 0 \quad \frac{\sqrt{7}}{42} \quad 0 \quad 0 \quad -\frac{2\sqrt{7}}{21} \quad 0 \quad 0 \quad -\frac{\sqrt{7}i}{42}$	
	$-\frac{\sqrt{21}}{21} \quad 0 \quad \frac{\sqrt{7}}{42} \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{2\sqrt{7}}{21} \quad \frac{\sqrt{7}i}{42} \quad 0$	
	$0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{7}}{42} \quad 0 \quad -\frac{\sqrt{7}i}{42} \quad \frac{\sqrt{7}}{42} \quad 0$	
	$0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{7}}{42} \quad 0 \quad \frac{\sqrt{7}i}{42} \quad 0 \quad 0 \quad -\frac{\sqrt{7}}{42}$	
533	symmetry	$\frac{3\sqrt{35}x(y^2-2yz-z^2)(y^2+2yz-z^2)}{8}$
$\mathbb{M}_{5,0}^{(1,-1;a)}(T_g, 2)$	$0 \quad \frac{3\sqrt{5}}{40} \quad 0 \quad \frac{\sqrt{15}}{40} \quad 0 \quad 0 \quad \frac{\sqrt{15}}{20} \quad 0 \quad 0 \quad \frac{\sqrt{15}i}{20}$	
	$\frac{3\sqrt{5}}{40} \quad 0 \quad \frac{\sqrt{15}}{40} \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{15}}{20} \quad -\frac{\sqrt{15}i}{20} \quad 0$	
	$0 \quad \frac{\sqrt{15}}{40} \quad 0 \quad \frac{\sqrt{5}}{40} \quad 0 \quad 0 \quad \frac{\sqrt{5}}{20} \quad 0 \quad 0 \quad \frac{\sqrt{5}i}{20}$	
	$\frac{\sqrt{15}}{40} \quad 0 \quad \frac{\sqrt{5}}{40} \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{5}}{20} \quad -\frac{\sqrt{5}i}{20} \quad 0$	
	$0 \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{5}}{10} \quad 0 \quad \frac{\sqrt{5}i}{10} \quad -\frac{\sqrt{5}}{10} \quad 0$	
	$0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{5}}{10} \quad 0 \quad -\frac{\sqrt{5}i}{10} \quad 0 \quad 0 \quad \frac{\sqrt{5}}{10}$	
	$\frac{\sqrt{15}}{20} \quad 0 \quad \frac{\sqrt{5}}{20} \quad 0 \quad 0 \quad \frac{\sqrt{5}i}{10} \quad 0 \quad 0 \quad 0 \quad 0$	
	$0 \quad -\frac{\sqrt{15}}{20} \quad 0 \quad -\frac{\sqrt{5}}{20} \quad -\frac{\sqrt{5}i}{10} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0$	
	$0 \quad \frac{\sqrt{15}i}{20} \quad 0 \quad \frac{\sqrt{5}i}{20} \quad -\frac{\sqrt{5}}{10} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0$	
	$-\frac{\sqrt{15}i}{20} \quad 0 \quad -\frac{\sqrt{5}i}{20} \quad 0 \quad 0 \quad \frac{\sqrt{5}}{10} \quad 0 \quad 0 \quad 0 \quad 0$	
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	$-\frac{3\sqrt{5}i}{40}$
	$\frac{3\sqrt{5}i}{40}$	0
	0	$-\frac{\sqrt{15}i}{40}$
	$-\frac{\sqrt{15}i}{40}$	0
	$\frac{\sqrt{15}}{20}$	0
	0	$-\frac{\sqrt{15}}{20}$
	0	$-\frac{\sqrt{5}}{20}$
	0	$-\frac{\sqrt{5}}{20}$
	$-\frac{\sqrt{15}}{20}$	0
	0	$\frac{\sqrt{5}}{20}$
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	$\frac{\sqrt{5}}{10}$
	0	$-\frac{\sqrt{5}}{10}$
	0	$\frac{\sqrt{5}i}{10}$
	0	$-\frac{\sqrt{5}i}{10}$
	0	$-\frac{\sqrt{5}i}{10}$
	0	$\frac{\sqrt{5}i}{10}$
	0	$-\frac{\sqrt{5}i}{10}$
	0	$\frac{\sqrt{5}i}{10}$
536	symmetry	$\frac{\sqrt{105}x(y-z)(y+z)(2x^2 - y^2 - z^2)}{4}$

continued ...

Table 8

No.	multipole	matrix
		$\begin{bmatrix} 0 & \frac{\sqrt{15}}{20} & 0 & -\frac{\sqrt{5}}{20} & 0 & 0 & \frac{\sqrt{5}}{10} & 0 & 0 & 0 \\ \frac{\sqrt{15}}{20} & 0 & -\frac{\sqrt{5}}{20} & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}}{10} & 0 & 0 \\ 0 & -\frac{\sqrt{5}}{20} & 0 & -\frac{\sqrt{15}}{20} & 0 & 0 & -\frac{\sqrt{15}}{30} & 0 & 0 & -\frac{\sqrt{15}i}{15} \\ -\frac{\sqrt{5}}{20} & 0 & -\frac{\sqrt{15}}{20} & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{30} & \frac{\sqrt{15}i}{15} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ \frac{\sqrt{5}}{10} & 0 & -\frac{\sqrt{15}}{30} & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{15} & 0 & 0 \\ 0 & -\frac{\sqrt{5}}{10} & 0 & \frac{\sqrt{15}}{30} & 0 & 0 & -\frac{\sqrt{15}}{15} & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{15}i}{15} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{15} \\ 0 & 0 & \frac{\sqrt{15}i}{15} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{15} & 0 \end{bmatrix}$
537	symmetry	$\frac{\sqrt{105}y(x-z)(x+z)(x^2-2y^2+z^2)}{4}$
		$\begin{bmatrix} 0 & \frac{\sqrt{15}i}{20} & 0 & \frac{\sqrt{5}i}{20} & -\frac{\sqrt{5}}{10} & 0 & 0 & 0 & 0 & 0 \\ -\frac{\sqrt{15}i}{20} & 0 & -\frac{\sqrt{5}i}{20} & 0 & 0 & \frac{\sqrt{5}}{10} & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{5}i}{20} & 0 & -\frac{\sqrt{15}i}{20} & -\frac{\sqrt{15}}{30} & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{15} \\ -\frac{\sqrt{5}i}{20} & 0 & \frac{\sqrt{15}i}{20} & 0 & 0 & \frac{\sqrt{15}}{30} & 0 & 0 & \frac{\sqrt{15}}{15} & 0 \\ -\frac{\sqrt{5}}{10} & 0 & -\frac{\sqrt{15}}{30} & 0 & 0 & -\frac{\sqrt{15}i}{15} & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{5}}{10} & 0 & \frac{\sqrt{15}}{30} & \frac{\sqrt{15}i}{15} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{15}}{15} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{15} \\ 0 & 0 & \frac{\sqrt{15}}{15} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{15} & 0 \end{bmatrix}$
538	symmetry	$-\frac{\sqrt{105}z(x-y)(x+y)(x^2+y^2-2z^2)}{4}$

continued ...

Table 8

No.	multipole	matrix
		$\begin{bmatrix} 0 & 0 & \frac{\sqrt{5}}{10} & 0 & 0 & \frac{\sqrt{5}i}{10} & 0 & \frac{\sqrt{5}}{10} & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{5}}{10} & -\frac{\sqrt{5}i}{10} & 0 & \frac{\sqrt{5}}{10} & 0 & 0 & 0 \\ \frac{\sqrt{5}}{10} & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{30} & 0 & -\frac{\sqrt{15}}{30} & 0 & 0 \\ 0 & -\frac{\sqrt{5}}{10} & 0 & 0 & -\frac{\sqrt{15}i}{30} & 0 & -\frac{\sqrt{15}}{30} & 0 & 0 & 0 \\ 0 & \frac{\sqrt{5}i}{10} & 0 & \frac{\sqrt{15}i}{30} & -\frac{\sqrt{15}}{15} & 0 & 0 & 0 & 0 & 0 \\ -\frac{\sqrt{5}i}{10} & 0 & -\frac{\sqrt{15}i}{30} & 0 & 0 & \frac{\sqrt{15}}{15} & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{5}}{10} & 0 & -\frac{\sqrt{15}}{30} & 0 & 0 & \frac{\sqrt{15}}{15} & 0 & 0 & 0 \\ \frac{\sqrt{5}}{10} & 0 & -\frac{\sqrt{15}}{30} & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{15} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
539	symmetry	<i>x</i>
		$\begin{bmatrix} 0 & -\frac{\sqrt{70}}{70} & 0 & -\frac{\sqrt{210}}{70} & 0 & 0 & 0 & \frac{\sqrt{210}}{140} & 0 & 0 & \frac{\sqrt{210}i}{70} \\ -\frac{\sqrt{70}}{70} & 0 & -\frac{\sqrt{210}}{70} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{210}}{140} & -\frac{\sqrt{210}i}{70} & 0 \\ 0 & -\frac{\sqrt{210}}{70} & 0 & \frac{\sqrt{70}}{70} & 0 & 0 & 0 & \frac{3\sqrt{70}}{140} & 0 & 0 & 0 \\ -\frac{\sqrt{210}}{70} & 0 & \frac{\sqrt{70}}{70} & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{70}}{140} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}}{35} & 0 & -\frac{3\sqrt{70}i}{140} & \frac{3\sqrt{70}}{140} & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}}{35} & 0 & \frac{3\sqrt{70}i}{140} & 0 & 0 & -\frac{3\sqrt{70}}{140} \\ \frac{\sqrt{210}}{140} & 0 & \frac{3\sqrt{70}}{140} & 0 & 0 & -\frac{3\sqrt{70}i}{140} & 0 & \frac{\sqrt{70}}{70} & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{210}}{140} & 0 & -\frac{3\sqrt{70}}{140} & \frac{3\sqrt{70}i}{140} & 0 & \frac{\sqrt{70}}{70} & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{210}i}{70} & 0 & 0 & \frac{3\sqrt{70}}{140} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{70}}{70} \\ -\frac{\sqrt{210}i}{70} & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{70}}{140} & 0 & 0 & \frac{\sqrt{70}}{70} & 0 \end{bmatrix}$
540	symmetry	<i>y</i>

continued ...

Table 8

No.	multipole	matrix
$\mathbb{M}_{1,1}^{(1,1;a)}(T_g)$	0	$\frac{\sqrt{70}i}{70}$ 0 $-\frac{\sqrt{210}i}{70}$ $\frac{\sqrt{210}}{140}$ 0 0 0 0 0 $-\frac{\sqrt{210}}{70}$
	$-\frac{\sqrt{70}i}{70}$	0 $\frac{\sqrt{210}i}{70}$ 0 0 0 $-\frac{\sqrt{210}}{140}$ 0 0 0 $-\frac{\sqrt{210}}{70}$ 0
	0	$-\frac{\sqrt{210}i}{70}$ 0 $-\frac{\sqrt{70}i}{70}$ $-\frac{\sqrt{70}i}{70}$ $-\frac{3\sqrt{70}}{140}$ 0 0 0 0 0
	$\frac{\sqrt{210}i}{70}$	0 $\frac{\sqrt{70}i}{70}$ 0 0 0 $\frac{3\sqrt{70}}{140}$ 0 0 0 0
	$\frac{\sqrt{210}}{140}$	0 0 $-\frac{3\sqrt{70}}{140}$ 0 0 $-\frac{\sqrt{70}i}{70}$ 0 $\frac{3\sqrt{70}}{140}$ 0 0
	0	$-\frac{\sqrt{210}}{140}$ 0 $\frac{3\sqrt{70}}{140}$ $\frac{\sqrt{70}i}{70}$ 0 $\frac{3\sqrt{70}}{140}$ 0 0 0 0
	0	0 0 0 0 0 $\frac{3\sqrt{70}}{140}$ 0 $-\frac{\sqrt{70}i}{35}$ 0 0 $\frac{3\sqrt{70}}{140}$ 0
	0	0 0 0 0 0 0 $\frac{3\sqrt{70}}{140}$ 0 0 0 $-\frac{\sqrt{70}i}{70}$
	$-\frac{\sqrt{210}}{70}$	0 0 0 0 0 0 0 $-\frac{3\sqrt{70}}{140}$ $\frac{\sqrt{70}i}{70}$ 0 0
541	symmetry	z
$\mathbb{M}_{1,2}^{(1,1;a)}(T_g)$	$\frac{\sqrt{70}}{35}$	0 0 0 0 0 $-\frac{\sqrt{210}i}{140}$ 0 $\frac{\sqrt{210}}{140}$ 0 0
	0	$-\frac{\sqrt{70}}{35}$ 0 0 0 $\frac{\sqrt{210}i}{140}$ 0 $\frac{\sqrt{210}}{140}$ 0 0 0
	0	0 $-\frac{\sqrt{70}}{35}$ 0 0 0 $\frac{3\sqrt{70}i}{140}$ 0 $\frac{3\sqrt{70}}{140}$ 0 0
	0	0 0 0 $\frac{\sqrt{70}}{35}$ $-\frac{3\sqrt{70}i}{140}$ 0 $\frac{3\sqrt{70}}{140}$ 0 0 0
	0	$-\frac{\sqrt{210}i}{140}$ 0 $\frac{3\sqrt{70}i}{140}$ $\frac{\sqrt{70}}{70}$ 0 0 0 0 0 $\frac{3\sqrt{70}}{140}$
	$\frac{\sqrt{210}i}{140}$	0 $-\frac{3\sqrt{70}i}{140}$ 0 0 0 $-\frac{\sqrt{70}}{70}$ 0 0 0 $\frac{3\sqrt{70}}{140}$ 0
	0	$\frac{\sqrt{210}}{140}$ 0 $\frac{3\sqrt{70}}{140}$ 0 0 0 $\frac{\sqrt{70}}{70}$ 0 0 0 $-\frac{3\sqrt{70}i}{140}$
	$\frac{\sqrt{210}}{140}$	0 $\frac{3\sqrt{70}}{140}$ 0 0 0 0 0 $-\frac{\sqrt{70}}{70}$ $\frac{3\sqrt{70}i}{140}$ 0
	0	0 0 0 0 0 $\frac{3\sqrt{70}}{140}$ 0 $-\frac{3\sqrt{70}i}{140}$ $-\frac{\sqrt{70}}{35}$ 0
	0	0 0 0 0 $\frac{3\sqrt{70}}{140}$ 0 0 0 0 $\frac{\sqrt{70}}{35}$
542	symmetry	$\sqrt{15}xyz$

continued ...

Table 8

No.	multipole	matrix
$\mathbb{M}_3^{(1,1;a)}(A_g)$		$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}}{28} & 0 & \frac{\sqrt{7}i}{28} & \frac{\sqrt{7}}{14} & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{7}}{28} & 0 & -\frac{\sqrt{7}i}{28} & 0 & 0 & -\frac{\sqrt{7}}{14} \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{21}}{28} & 0 & \frac{\sqrt{21}i}{28} & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{21}}{28} & 0 & -\frac{\sqrt{21}i}{28} & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{7}}{28} & 0 & \frac{\sqrt{21}}{28} & 0 & 0 & \frac{\sqrt{21}}{21} & 0 & 0 & -\frac{\sqrt{21}i}{21} \\ -\frac{\sqrt{7}}{28} & 0 & \frac{\sqrt{21}}{28} & 0 & 0 & 0 & 0 & -\frac{\sqrt{21}}{21} & \frac{\sqrt{21}i}{21} & 0 \\ 0 & \frac{\sqrt{7}i}{28} & 0 & \frac{\sqrt{21}i}{28} & \frac{\sqrt{21}}{21} & 0 & 0 & 0 & 0 & \frac{\sqrt{21}}{21} \\ -\frac{\sqrt{7}i}{28} & 0 & -\frac{\sqrt{21}i}{28} & 0 & 0 & -\frac{\sqrt{21}}{21} & 0 & 0 & \frac{\sqrt{21}}{21} & 0 \\ \frac{\sqrt{7}}{14} & 0 & 0 & 0 & 0 & -\frac{\sqrt{21}i}{21} & 0 & \frac{\sqrt{21}}{21} & 0 & 0 \\ 0 & -\frac{\sqrt{7}}{14} & 0 & 0 & \frac{\sqrt{21}i}{21} & 0 & \frac{\sqrt{21}}{21} & 0 & 0 & 0 \end{bmatrix}$
		$\frac{x(2x^2-3y^2-3z^2)}{2}$
		$\mathbb{M}_{3,0}^{(1,1;a)}(T_g, 1)$
543	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	$-\frac{3\sqrt{35}i}{140}$ 0 $-\frac{\sqrt{105}i}{84}$ $-\frac{\sqrt{105}}{56}$ 0 0 0 0 $-\frac{\sqrt{105}}{168}$
	$\frac{3\sqrt{35}i}{140}$	0 $\frac{\sqrt{105}i}{84}$ 0 0 $\frac{\sqrt{105}}{56}$ 0 0 0 $-\frac{\sqrt{105}}{168}$ 0
	0	$-\frac{\sqrt{105}i}{84}$ 0 $-\frac{19\sqrt{35}i}{420}$ $-\frac{5\sqrt{35}}{168}$ 0 0 0 0 $-\frac{\sqrt{35}}{24}$
	$\frac{\sqrt{105}i}{84}$	0 $\frac{19\sqrt{35}i}{420}$ 0 0 $\frac{5\sqrt{35}}{168}$ 0 0 0 $-\frac{\sqrt{35}}{24}$ 0
	$-\frac{\sqrt{105}}{56}$	0 $-\frac{5\sqrt{35}}{168}$ 0 0 0 $\frac{4\sqrt{35}i}{105}$ 0 0 $-\frac{\sqrt{35}}{84}$ 0
	0	$\frac{\sqrt{105}}{56}$ 0 $\frac{5\sqrt{35}}{168}$ $-\frac{4\sqrt{35}i}{105}$ 0 $-\frac{\sqrt{35}}{84}$ 0 0 0
	0	0 0 0 0 0 $-\frac{\sqrt{35}}{84}$ 0 $\frac{\sqrt{35}i}{105}$ 0 0 $-\frac{\sqrt{35}i}{84}$
	0	0 0 0 0 $-\frac{\sqrt{35}}{84}$ 0 $\frac{\sqrt{35}i}{105}$ 0 0 $\frac{\sqrt{35}}{84}$
	0	$-\frac{\sqrt{105}}{168}$ 0 $-\frac{\sqrt{35}}{24}$ 0 0 0 0 $\frac{\sqrt{35}}{84}$ $-\frac{4\sqrt{35}i}{105}$ 0
	$-\frac{\sqrt{105}}{168}$	0 $-\frac{\sqrt{35}}{24}$ 0 0 0 0 0 $\frac{\sqrt{35}}{84}$ $-\frac{4\sqrt{35}i}{105}$ 0
545	symmetry	$-\frac{z(3x^2+3y^2-2z^2)}{2}$
$\mathbb{M}_{3,2}^{(1,1;a)}(T_g, 1)$	$\frac{2\sqrt{35}}{35}$	0 0 0 0 0 $-\frac{\sqrt{105}i}{42}$ 0 $\frac{\sqrt{105}}{42}$ 0 0
	0	$-\frac{2\sqrt{35}}{35}$ 0 0 $\frac{\sqrt{105}i}{42}$ 0 $\frac{\sqrt{105}}{42}$ 0 0 0
	0	0 $\frac{\sqrt{35}}{105}$ 0 0 $-\frac{\sqrt{35}i}{84}$ 0 $-\frac{\sqrt{35}}{84}$ 0 0
	0	0 0 0 $-\frac{\sqrt{35}}{105}$ $\frac{\sqrt{35}i}{84}$ 0 $-\frac{\sqrt{35}}{84}$ 0 0
	0	$-\frac{\sqrt{105}i}{42}$ 0 $-\frac{\sqrt{35}i}{84}$ $-\frac{4\sqrt{35}}{105}$ 0 0 0 0 $-\frac{\sqrt{35}}{84}$
	$\frac{\sqrt{105}i}{42}$	0 $\frac{\sqrt{35}i}{84}$ 0 0 $\frac{4\sqrt{35}}{105}$ 0 0 0 $-\frac{\sqrt{35}}{84}$ 0
	0	$\frac{\sqrt{105}}{42}$ 0 $-\frac{\sqrt{35}}{84}$ 0 0 $-\frac{4\sqrt{35}}{105}$ 0 0 0 $\frac{\sqrt{35}i}{84}$
	$\frac{\sqrt{105}}{42}$	0 $-\frac{\sqrt{35}}{84}$ 0 0 0 0 $\frac{4\sqrt{35}}{105}$ $-\frac{\sqrt{35}i}{84}$ 0
	0	0 0 0 0 0 $-\frac{\sqrt{35}}{84}$ 0 $\frac{\sqrt{35}i}{84}$ $\frac{\sqrt{35}}{105}$ 0
	0	0 0 0 0 $-\frac{\sqrt{35}}{84}$ 0 $-\frac{\sqrt{35}i}{84}$ 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	$\frac{\sqrt{21}}{28}$ 0 $-\frac{\sqrt{7}}{28}$ 0 0 0 $-\frac{5\sqrt{7}}{56}$ 0 0 $\frac{3\sqrt{7}i}{56}$
	$\frac{\sqrt{21}}{28}$	0 $-\frac{\sqrt{7}}{28}$ 0 0 0 0 0 $\frac{5\sqrt{7}}{56}$ $-\frac{3\sqrt{7}i}{56}$ 0
	0	$-\frac{\sqrt{7}}{28}$ 0 $-\frac{\sqrt{21}}{28}$ 0 0 0 $-\frac{\sqrt{21}}{168}$ 0 0 $\frac{\sqrt{21}i}{24}$
	$-\frac{\sqrt{7}}{28}$	0 $-\frac{\sqrt{21}}{28}$ 0 0 0 0 0 $\frac{\sqrt{21}}{168}$ $-\frac{\sqrt{21}i}{24}$ 0
	0	0 0 0 0 0 0 0 $\frac{\sqrt{21}i}{28}$ $\frac{\sqrt{21}}{28}$ 0
	0	0 0 0 0 0 0 $-\frac{\sqrt{21}i}{28}$ 0 0 $-\frac{\sqrt{21}}{28}$
	$-\frac{5\sqrt{7}}{56}$	0 $-\frac{\sqrt{21}}{168}$ 0 0 0 $\frac{\sqrt{21}i}{28}$ 0 $-\frac{\sqrt{21}}{21}$ 0 0
	0	$\frac{5\sqrt{7}}{56}$ 0 $\frac{\sqrt{21}}{168}$ $-\frac{\sqrt{21}i}{28}$ 0 $-\frac{\sqrt{21}}{21}$ 0 0 0 0
	0	$\frac{3\sqrt{7}i}{56}$ 0 $\frac{\sqrt{21}i}{24}$ $\frac{\sqrt{21}}{28}$ 0 0 0 0 $\frac{\sqrt{21}}{21}$
	$-\frac{3\sqrt{7}i}{56}$	0 $-\frac{\sqrt{21}i}{24}$ 0 0 0 $-\frac{\sqrt{21}}{28}$ 0 0 $\frac{\sqrt{21}}{21}$ 0
$\mathbb{M}_{3,1}^{(1,1;a)}(T_g, 2)$	547	symmetry $-\frac{\sqrt{15}y(x-z)(x+z)}{2}$
	0	$\frac{\sqrt{21}i}{28}$ 0 $\frac{\sqrt{7}i}{28}$ $\frac{5\sqrt{7}}{56}$ 0 0 0 0 $\frac{3\sqrt{7}}{56}$
	$-\frac{\sqrt{21}i}{28}$	0 $-\frac{\sqrt{7}i}{28}$ 0 0 0 $-\frac{5\sqrt{7}}{56}$ 0 0 $\frac{3\sqrt{7}}{56}$ 0
	0	$\frac{\sqrt{7}i}{28}$ 0 $-\frac{\sqrt{21}i}{28}$ $-\frac{\sqrt{21}}{168}$ 0 0 0 0 $-\frac{\sqrt{21}}{24}$
	$-\frac{\sqrt{7}i}{28}$	0 $\frac{\sqrt{21}i}{28}$ 0 0 0 $\frac{\sqrt{21}}{168}$ 0 0 $-\frac{\sqrt{21}}{24}$ 0
	$\frac{5\sqrt{7}}{56}$	0 $-\frac{\sqrt{21}}{168}$ 0 0 0 $-\frac{\sqrt{21}i}{21}$ 0 $\frac{\sqrt{21}}{28}$ 0 0
	0	$-\frac{5\sqrt{7}}{56}$ 0 $\frac{\sqrt{21}}{168}$ $\frac{\sqrt{21}i}{21}$ 0 $\frac{\sqrt{21}}{28}$ 0 0 0 0
	0	0 0 0 0 0 $\frac{\sqrt{21}}{28}$ 0 0 $-\frac{\sqrt{21}}{28}$ 0
	0	0 0 0 0 $\frac{\sqrt{21}}{28}$ 0 0 0 0 $\frac{\sqrt{21}}{28}$
	0	$\frac{3\sqrt{7}}{56}$ 0 $-\frac{\sqrt{21}}{24}$ 0 0 0 $-\frac{\sqrt{21}}{28}$ 0 0 $\frac{\sqrt{21}i}{21}$
	$\frac{3\sqrt{7}}{56}$	0 $-\frac{\sqrt{21}}{24}$ 0 0 0 0 0 $\frac{\sqrt{21}}{28}$ $-\frac{\sqrt{21}i}{21}$ 0
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 $\frac{\sqrt{7}}{14}$ 0 0 $-\frac{\sqrt{7}i}{28}$ 0 $-\frac{\sqrt{7}}{28}$ 0 0 0
	0	0 0 0 $-\frac{\sqrt{7}}{14}$ $\frac{\sqrt{7}i}{28}$ 0 $-\frac{\sqrt{7}}{28}$ 0 0 0
	$\frac{\sqrt{7}}{14}$	0 0 0 0 0 $-\frac{\sqrt{21}i}{21}$ 0 $\frac{\sqrt{21}}{21}$ 0 0 0
	0	$-\frac{\sqrt{7}}{14}$ 0 0 0 $\frac{\sqrt{21}i}{21}$ 0 $\frac{\sqrt{21}}{21}$ 0 0 0
	0	$-\frac{\sqrt{7}i}{28}$ 0 $-\frac{\sqrt{21}i}{21}$ $-\frac{\sqrt{21}}{21}$ 0 0 0 0 $-\frac{\sqrt{21}}{28}$
	$\frac{\sqrt{7}i}{28}$	0 $\frac{\sqrt{21}i}{21}$ 0 0 $\frac{\sqrt{21}}{21}$ 0 0 $-\frac{\sqrt{21}}{28}$ 0 0
	0	$-\frac{\sqrt{7}}{28}$ 0 $\frac{\sqrt{21}}{21}$ 0 0 0 $\frac{\sqrt{21}}{21}$ 0 0 $-\frac{\sqrt{21}i}{28}$
	$-\frac{\sqrt{7}}{28}$	0 $\frac{\sqrt{21}}{21}$ 0 0 0 0 $-\frac{\sqrt{21}}{21}$ $\frac{\sqrt{21}i}{28}$ 0 0
	0	0 0 0 0 0 $-\frac{\sqrt{21}}{28}$ 0 $-\frac{\sqrt{21}i}{28}$ 0 0
	0	0 0 0 0 $-\frac{\sqrt{21}}{28}$ 0 $\frac{\sqrt{21}i}{28}$ 0 0 0

bra: = $\langle d_u, \uparrow |, \langle d_u, \downarrow |, \langle d_v, \uparrow |, \langle d_v, \downarrow |, \langle d_{yz}, \uparrow |, \langle d_{yz}, \downarrow |, \langle d_{xz}, \uparrow |, \langle d_{xz}, \downarrow |, \langle d_{xy}, \uparrow |, \langle d_{xy}, \downarrow |$ ket: = $|f_3, \uparrow \rangle, |f_3, \downarrow \rangle, |f_{ax}, \uparrow \rangle, |f_{ax}, \downarrow \rangle, |f_{ay}, \uparrow \rangle, |f_{ay}, \downarrow \rangle, |f_{az}, \uparrow \rangle, |f_{az}, \downarrow \rangle, |f_{bx}, \uparrow \rangle, |f_{bx}, \downarrow \rangle, |f_{by}, \uparrow \rangle, |f_{by}, \downarrow \rangle, |f_{bz}, \uparrow \rangle, |f_{bz}, \downarrow \rangle$

Table 9: (d,f) block.

No.	multipole	matrix
549	symmetry	x
$\mathbb{Q}_{1,0}^{(a)}(T_u)$	0	0 $-\frac{3\sqrt{35}}{140}$ 0 0 0 0 0 $-\frac{\sqrt{21}}{28}$ 0 0 0 0 0 0
	0	0 0 0 $-\frac{3\sqrt{35}}{140}$ 0 0 0 0 0 $-\frac{\sqrt{21}}{28}$ 0 0 0 0 0
	0	0 0 $\frac{3\sqrt{105}}{140}$ 0 0 0 0 0 $-\frac{\sqrt{7}}{28}$ 0 0 0 0 0 0
	0	0 0 0 $\frac{3\sqrt{105}}{140}$ 0 0 0 0 0 0 $-\frac{\sqrt{7}}{28}$ 0 0 0 0 0
	$\frac{\sqrt{7}}{14}$	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
	0	$\frac{\sqrt{7}}{14}$ 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
	0	0 0 0 0 0 0 $-\frac{\sqrt{105}}{70}$ 0 0 0 0 0 0 $\frac{\sqrt{7}}{14}$ 0
	0	0 0 0 0 0 0 0 $-\frac{\sqrt{105}}{70}$ 0 0 0 0 0 0 $\frac{\sqrt{7}}{14}$ 0
	0	0 0 0 0 $-\frac{\sqrt{105}}{70}$ 0 0 0 0 0 0 $-\frac{\sqrt{7}}{14}$ 0 0 0
	0	0 0 0 0 0 $-\frac{\sqrt{105}}{70}$ 0 0 0 0 0 0 $-\frac{\sqrt{7}}{14}$ 0 0 0

continued ...

Table 9

No.	multipole	matrix
550	symmetry $\mathbb{Q}_{1,1}^{(a)}(T_u)$	<i>y</i>
		$\begin{bmatrix} 0 & 0 & 0 & 0 & -\frac{3\sqrt{35}}{140} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{21}}{28} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{35}}{140} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{21}}{28} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{3\sqrt{105}}{140} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}}{28} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{105}}{140} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}}{28} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{105}}{70} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}}{14} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{105}}{70} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}}{14} & 0 \\ \frac{\sqrt{7}}{14} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{7}}{14} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{105}}{70} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}}{14} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{105}}{70} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}}{14} & 0 & 0 & 0 & 0 \end{bmatrix}$
		<i>z</i>
		$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{35}}{70} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{35}}{70} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}}{14} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}}{14} \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{105}}{70} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}}{14} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{105}}{70} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}}{14} & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{105}}{70} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}}{14} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{105}}{70} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}}{14} & 0 & 0 & 0 & 0 \\ \frac{\sqrt{7}}{14} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{7}}{14} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
		$\sqrt{15}xyz$
551	symmetry	
552	symmetry	

continued ...

Table 9

No.	multipole	matrix
	$\mathbb{Q}_3^{(a)}(A_u)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{3}}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{3}}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
553	symmetry	$\frac{x(2x^2-3y^2-3z^2)}{2}$ $\begin{bmatrix} 0 & 0 & -\frac{\sqrt{15}}{30} & 0 & 0 & 0 & 0 & 0 & \frac{1}{4} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{15}}{30} & 0 & 0 & 0 & 0 & 0 & \frac{1}{4} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{5}}{10} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{12} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{5}}{10} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{12} & 0 & 0 & 0 & 0 \\ -\frac{\sqrt{3}}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{3}}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}}{40} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{24} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}}{40} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{24} & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{5}}{40} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{24} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{5}}{40} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{24} & 0 & 0 & 0 \end{bmatrix}$
554	symmetry	$-\frac{y(3x^2-2y^2+3z^2)}{2}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{Q}_{3,1}^{(a)}(T_u, 1)$	0 0 0 0 $-\frac{\sqrt{15}}{30}$ 0 0 0 0 0 $-\frac{1}{4}$ 0 0 0	
	0 0 0 0 0 $-\frac{\sqrt{15}}{30}$ 0 0 0 0 0 $-\frac{1}{4}$ 0 0 0	
	0 0 0 0 $-\frac{\sqrt{5}}{10}$ 0 0 0 0 0 $\frac{\sqrt{3}}{12}$ 0 0 0 0	
	0 0 0 0 0 $-\frac{\sqrt{5}}{10}$ 0 0 0 0 0 $\frac{\sqrt{3}}{12}$ 0 0 0	
	0 0 0 0 0 0 $-\frac{\sqrt{5}}{40}$ 0 0 0 0 0 $-\frac{\sqrt{3}}{24}$ 0	
	0 0 0 0 0 0 0 $-\frac{\sqrt{5}}{40}$ 0 0 0 0 0 $-\frac{\sqrt{3}}{24}$	
	$-\frac{\sqrt{3}}{6}$ 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 $-\frac{\sqrt{5}}{40}$ 0 0 0 0 0 0 $\frac{\sqrt{3}}{24}$ 0 0 0 0 0	
	0 0 0 $-\frac{\sqrt{5}}{40}$ 0 0 0 0 0 0 $\frac{\sqrt{3}}{24}$ 0 0 0 0 0	
555	symmetry	$-\frac{z(3x^2+3y^2-2z^2)}{2}$
$\mathbb{Q}_{3,2}^{(a)}(T_u, 1)$	0 0 0 0 0 0 $\frac{\sqrt{15}}{15}$ 0 0 0 0 0 0 0 0	
	0 0 0 0 0 0 0 $\frac{\sqrt{15}}{15}$ 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 $-\frac{\sqrt{5}}{40}$ 0 0 0 0 0 $\frac{\sqrt{3}}{24}$ 0 0 0 0	
	0 0 0 0 $-\frac{\sqrt{5}}{40}$ 0 0 0 0 0 $\frac{\sqrt{3}}{24}$ 0 0 0 0	
	0 0 $-\frac{\sqrt{5}}{40}$ 0 0 0 0 0 $-\frac{\sqrt{3}}{24}$ 0 0 0 0 0 0	
	0 0 0 $-\frac{\sqrt{5}}{40}$ 0 0 0 0 0 $-\frac{\sqrt{3}}{24}$ 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	
556	symmetry	$\frac{\sqrt{15}x(y-z)(y+z)}{2}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{Q}_{3,0}^{(a)}(T_u, 2)$	0 0 $\frac{1}{4}$ 0 0 0 0 0 0 0 0 0 0 0 0	$\begin{bmatrix} 0 & 0 & \frac{1}{4} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{1}{4} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{3}}{12} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{3}}{12} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{24} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}}{8} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{24} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}}{8} \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{24} & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}}{8} & 0 & 0 & 0 & 0 \end{bmatrix}$
	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	
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	
557	symmetry	$-\frac{\sqrt{15}y(x-z)(x+z)}{2}$ $\begin{bmatrix} 0 & 0 & 0 & 0 & -\frac{1}{4} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{1}{4} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{12} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{12} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{24} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}}{8} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{24} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}}{8} \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{3}}{24} & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}}{8} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{3}}{24} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}}{8} & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
558	symmetry	$\frac{\sqrt{15}z(x-y)(x+y)}{2}$

continued ...

Table 9

No.	multipole	matrix
	$\mathbb{Q}_{3,2}^{(a)}(T_u, 2)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{24} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}}{8} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{24} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}}{8} & 0 & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{3}}{24} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}}{8} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{3}}{24} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}}{8} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
559	symmetry	$\frac{3\sqrt{35}xyz(x-y)(x+y)}{2}$ $\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ \frac{\sqrt{30}}{20} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{30}}{20} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{2}}{8} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}}{40} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{2}}{8} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}}{40} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{2}}{8} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}}{40} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}}{8} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}}{40} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{20} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{20} & 0 \end{bmatrix}$
560	symmetry	$\frac{\sqrt{105}xyz(x^2+y^2-2z^2)}{2}$

continued ...

Table 9

No.	multipole	matrix
	$\mathbb{Q}_{5,1}^{(a)}(E_u)$	$\begin{bmatrix} -\frac{\sqrt{30}}{20} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{30}}{20} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{6}}{24} & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{10}}{40} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{6}}{24} & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{10}}{40} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{24} & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{10}}{40} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{24} & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{10}}{40} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}}{12} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}}{12} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
561	symmetry	$\frac{x(8x^4 - 40x^2y^2 - 40x^2z^2 + 15y^4 + 30y^2z^2 + 15z^4)}{8}$ $\begin{bmatrix} 0 & 0 & -\frac{\sqrt{210}}{84} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{14}}{56} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{210}}{84} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{14}}{56} & 0 & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{70}}{28} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{42}}{168} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{70}}{28} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{42}}{168} & 0 & 0 & 0 & 0 \\ \frac{\sqrt{42}}{84} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{42}}{84} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{70}}{56} & 0 & 0 & 0 & 0 & 0 & -\frac{5\sqrt{42}}{168} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{70}}{56} & 0 & 0 & 0 & 0 & 0 & -\frac{5\sqrt{42}}{168} \\ 0 & 0 & 0 & 0 & \frac{\sqrt{70}}{56} & 0 & 0 & 0 & 0 & \frac{5\sqrt{42}}{168} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{70}}{56} & 0 & 0 & 0 & 0 & 0 & \frac{5\sqrt{42}}{168} & 0 & 0 \end{bmatrix}$
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 $-\frac{\sqrt{210}}{84}$ 0 0 0 0 0 $\frac{\sqrt{14}}{56}$ 0 0 0	
	0 0 0 0 0 $-\frac{\sqrt{210}}{84}$ 0 0 0 0 0 $\frac{\sqrt{14}}{56}$ 0 0 0	
	0 0 0 0 $-\frac{\sqrt{70}}{28}$ 0 0 0 0 0 $-\frac{\sqrt{42}}{168}$ 0 0 0	
	0 0 0 0 0 $-\frac{\sqrt{70}}{28}$ 0 0 0 0 0 $-\frac{\sqrt{42}}{168}$ 0 0 0	
	0 0 0 0 0 0 $\frac{\sqrt{70}}{56}$ 0 0 0 0 0 $\frac{5\sqrt{42}}{168}$ 0	
	0 0 0 0 0 0 0 $\frac{\sqrt{70}}{56}$ 0 0 0 0 0 $\frac{5\sqrt{42}}{168}$	
	$\frac{\sqrt{42}}{84}$ 0 0 0 0 0 0 0 0 0 0 0 0 0 0	
	0 $\frac{\sqrt{42}}{84}$ 0 0 0 0 0 0 0 0 0 0 0 0 0	
	0 0 $\frac{\sqrt{70}}{56}$ 0 0 0 0 0 $-\frac{5\sqrt{42}}{168}$ 0 0 0 0 0 0	
	0 0 0 $\frac{\sqrt{70}}{56}$ 0 0 0 0 0 $-\frac{5\sqrt{42}}{168}$ 0 0 0 0 0	
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 $\frac{\sqrt{210}}{42}$ 0 0 0 0 0 0 0 0	
	0 0 0 0 0 0 0 $\frac{\sqrt{210}}{42}$ 0 0 0 0 0 0 0	
	0 0 0 0 0 0 0 0 0 0 0 0 $\frac{\sqrt{42}}{84}$ 0	
	0 0 0 0 0 0 0 0 0 0 0 0 0 $\frac{\sqrt{42}}{84}$	
	0 0 0 0 $\frac{\sqrt{70}}{56}$ 0 0 0 0 0 $-\frac{5\sqrt{42}}{168}$ 0 0 0 0	
	0 0 0 0 0 $\frac{\sqrt{70}}{56}$ 0 0 0 0 0 $-\frac{5\sqrt{42}}{168}$ 0 0 0	
	0 0 $\frac{\sqrt{70}}{56}$ 0 0 0 0 0 $\frac{5\sqrt{42}}{168}$ 0 0 0 0 0	
	0 0 0 $\frac{\sqrt{70}}{56}$ 0 0 0 0 0 $\frac{5\sqrt{42}}{168}$ 0 0 0 0	
	$\frac{\sqrt{42}}{84}$ 0 0 0 0 0 0 0 0 0 0 0 0 0 0	
	0 $\frac{\sqrt{42}}{84}$ 0 0 0 0 0 0 0 0 0 0 0 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
	$\mathbb{Q}_{5,0}^{(a)}(T_u, 2)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{10}}{40} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{10}}{40} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}}{40} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}}{40} & 0 & 0 & 0 & 0 & 0 \\ -\frac{\sqrt{30}}{20} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{30}}{20} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2}}{8} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{40} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2}}{8} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{40} \\ 0 & 0 & 0 & 0 & \frac{\sqrt{2}}{8} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}}{40} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{2}}{8} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}}{40} & 0 & 0 & 0 \end{bmatrix}$
565	symmetry	$\frac{3\sqrt{35}y(x^2 - 2xz - z^2)(x^2 + 2xz - z^2)}{8}$ $\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{10}}{40} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{10}}{40} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}}{40} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}}{40} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2}}{8} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}}{40} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2}}{8} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}}{40} \\ -\frac{\sqrt{30}}{20} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{30}}{20} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{2}}{8} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{40} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{2}}{8} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{40} & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
566	symmetry	$\frac{3\sqrt{35}z(x^2 - 2xy - y^2)(x^2 + 2xy - y^2)}{8}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{Q}_{5,2}^{(a)}(T_u, 2)$		$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{20} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{20} \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2}}{8} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{40} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2}}{8} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{40} & 0 & 0 \\ 0 & 0 & \frac{\sqrt{2}}{8} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}}{40} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{2}}{8} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}}{40} & 0 & 0 & 0 & 0 & 0 \\ -\frac{\sqrt{30}}{20} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{30}}{20} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
567	symmetry	$\frac{\sqrt{105}x(y-z)(y+z)(2x^2-y^2-z^2)}{4}$
$\mathbb{Q}_{5,0}^{(a)}(T_u, 3)$		$\begin{bmatrix} 0 & 0 & -\frac{\sqrt{2}}{8} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}}{40} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{2}}{8} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}}{40} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{6}}{24} & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{10}}{40} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{6}}{24} & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{10}}{40} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{12} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}}{20} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{12} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}}{20} & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{6}}{12} & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}}{20} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{6}}{12} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}}{20} & 0 & 0 & 0 & 0 \end{bmatrix}$
568	symmetry	$\frac{\sqrt{105}y(x-z)(x+z)(x^2-2y^2+z^2)}{4}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{Q}_{5,1}^{(a)}(T_u, 3)$		$\begin{bmatrix} 0 & 0 & 0 & 0 & \frac{\sqrt{2}}{8} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}}{40} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2}}{8} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}}{40} & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{6}}{24} & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{10}}{40} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}}{24} & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{10}}{40} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}}{12} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}}{20} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}}{12} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}}{20} \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{6}}{12} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}}{20} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{6}}{12} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}}{20} & 0 & 0 & 0 & 0 \end{bmatrix}$
569	symmetry	$-\frac{\sqrt{105}z(x-y)(x+y)(x^2+y^2-2z^2)}{4}$
$\mathbb{Q}_{5,2}^{(a)}(T_u, 3)$		$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{20} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{20} \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{12} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{12} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{12} & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}}{20} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{12} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}}{20} & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{6}}{12} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}}{20} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{6}}{12} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}}{20} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
570	symmetry	$\sqrt{15}xyz$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{Q}_3^{(1,-1;a)}(A_u)$	$\begin{bmatrix} 0 & 0 & 0 & \frac{\sqrt{14}i}{56} & 0 & -\frac{\sqrt{14}}{56} & 0 & 0 & 0 & \frac{\sqrt{210}i}{168} & 0 & \frac{\sqrt{210}}{168} & -\frac{\sqrt{210}i}{84} & 0 \\ 0 & 0 & \frac{\sqrt{14}i}{56} & 0 & \frac{\sqrt{14}}{56} & 0 & 0 & 0 & \frac{\sqrt{210}i}{168} & 0 & -\frac{\sqrt{210}}{168} & 0 & 0 & \frac{\sqrt{210}i}{84} \\ 0 & 0 & 0 & \frac{\sqrt{42}i}{168} & 0 & \frac{\sqrt{42}}{168} & -\frac{\sqrt{42}i}{84} & 0 & 0 & -\frac{\sqrt{70}i}{56} & 0 & \frac{\sqrt{70}}{56} & 0 & 0 \\ 0 & 0 & \frac{\sqrt{42}i}{168} & 0 & -\frac{\sqrt{42}}{168} & 0 & 0 & \frac{\sqrt{42}i}{84} & -\frac{\sqrt{70}i}{56} & 0 & -\frac{\sqrt{70}}{56} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{42}i}{42} & 0 & 0 & -\frac{\sqrt{42}}{42} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{42}i}{42} & \frac{\sqrt{42}}{42} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{42}i}{42} & 0 & 0 & 0 & 0 & \frac{\sqrt{42}i}{42} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{42}i}{42} & 0 & 0 & \frac{\sqrt{42}i}{42} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{42}}{42} & 0 & -\frac{\sqrt{42}i}{42} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{42}}{42} & 0 & -\frac{\sqrt{42}i}{42} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$	
		$\frac{x(2x^2-3y^2-3z^2)}{2}$
571 symmetry	$\mathbb{Q}_{3,0}^{(1,-1;a)}(T_u, 1)$	$\begin{bmatrix} 0 & \frac{3\sqrt{14}i}{56} & 0 & 0 & \frac{\sqrt{210}i}{280} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{14}i}{56} & 0 & 0 & \frac{\sqrt{14}}{28} \\ \frac{3\sqrt{14}i}{56} & 0 & 0 & 0 & 0 & -\frac{\sqrt{210}i}{280} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{14}i}{56} & -\frac{\sqrt{14}}{28} & 0 \\ 0 & \frac{\sqrt{42}i}{56} & 0 & 0 & -\frac{\sqrt{70}i}{280} & 0 & 0 & \frac{\sqrt{70}}{140} & 0 & 0 & -\frac{\sqrt{42}i}{56} & 0 & 0 & 0 \\ \frac{\sqrt{42}i}{56} & 0 & 0 & 0 & 0 & \frac{\sqrt{70}i}{280} & -\frac{\sqrt{70}}{140} & 0 & 0 & 0 & 0 & \frac{\sqrt{42}i}{56} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}}{70} & \frac{\sqrt{70}i}{70} & 0 & 0 & \frac{\sqrt{42}i}{28} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{70}}{70} & 0 & 0 & -\frac{\sqrt{70}i}{70} & \frac{\sqrt{42}i}{28} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{70}}{70} & 0 & -\frac{3\sqrt{70}i}{280} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{42}i}{56} & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{70}}{70} & 0 & -\frac{3\sqrt{70}i}{280} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{42}i}{56} & 0 & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{70}i}{70} & 0 & 0 & 0 & \frac{3\sqrt{70}i}{280} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{42}i}{56} \\ 0 & 0 & 0 & \frac{\sqrt{70}i}{70} & 0 & 0 & \frac{3\sqrt{70}i}{280} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{42}i}{56} & 0 \end{bmatrix}$
		$\frac{-y(3x^2-2y^2+3z^2)}{2}$
572	symmetry	

continued ...

Table 9

No.	multipole	matrix
$\mathbb{Q}_{3,1}^{(1,-1;a)}(T_u, 1)$	0	$-\frac{3\sqrt{14}}{56} \quad -\frac{\sqrt{210}i}{280} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{14}i}{56} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{14}i}{28}$
	$\frac{3\sqrt{14}}{56}$	$0 \quad 0 \quad 0 \quad \frac{\sqrt{210}i}{280} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{14}i}{56} \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{14}i}{28} \quad 0$
	0	$\frac{\sqrt{42}}{56} \quad -\frac{\sqrt{70}i}{280} \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{70}i}{140} \quad \frac{\sqrt{42}i}{56} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0$
	$-\frac{\sqrt{42}}{56}$	$0 \quad 0 \quad 0 \quad \frac{\sqrt{70}i}{280} \quad 0 \quad 0 \quad \frac{\sqrt{70}i}{140} \quad 0 \quad 0 \quad -\frac{\sqrt{42}i}{56} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0$
	0	$0 \quad 0 \quad 0 \quad \frac{3\sqrt{70}}{280} \quad 0 \quad -\frac{\sqrt{70}i}{70} \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{42}}{56} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0$
	0	$0 \quad 0 \quad -\frac{3\sqrt{70}}{280} \quad 0 \quad -\frac{\sqrt{70}i}{70} \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{42}}{56} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0$
	0	$0 \quad 0 \quad 0 \quad \frac{\sqrt{70}i}{70} \quad 0 \quad 0 \quad -\frac{\sqrt{70}i}{70} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{42}}{28} \quad 0 \quad 0 \quad 0$
	0	$0 \quad 0 \quad \frac{\sqrt{70}i}{70} \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{70}i}{70} \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{42}}{28} \quad 0 \quad 0 \quad 0 \quad 0$
	0	$0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{70}i}{70} \quad 0 \quad 0 \quad -\frac{3\sqrt{70}}{280} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{42}}{56} \quad 0$
	0	$0 \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{70}i}{70} \quad \frac{3\sqrt{70}}{280} \quad 0 \quad \frac{\sqrt{42}}{56} \quad 0$
573	symmetry	$-\frac{z(3x^2+3y^2-2z^2)}{2}$
$\mathbb{Q}_{3,2}^{(1,-1;a)}(T_u, 1)$	0	$0 \quad 0 \quad 0 \quad -\frac{\sqrt{210}}{280} \quad 0 \quad \frac{\sqrt{210}i}{280} \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{14}}{56} \quad 0 \quad -\frac{\sqrt{14}i}{56} \quad 0 \quad 0 \quad 0$
	0	$0 \quad 0 \quad \frac{\sqrt{210}}{280} \quad 0 \quad \frac{\sqrt{210}i}{280} \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{14}}{56} \quad 0 \quad -\frac{\sqrt{14}i}{56} \quad 0 \quad 0 \quad 0 \quad 0$
	$-\frac{\sqrt{42}i}{28}$	$0 \quad 0 \quad -\frac{\sqrt{70}}{280} \quad 0 \quad -\frac{\sqrt{70}i}{280} \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{42}}{56} \quad 0 \quad -\frac{\sqrt{42}i}{56} \quad 0 \quad 0 \quad 0$
	$0 \quad \frac{\sqrt{42}i}{28} \quad \frac{\sqrt{70}}{280} \quad 0 \quad -\frac{\sqrt{70}i}{280} \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{42}}{56} \quad 0 \quad -\frac{\sqrt{42}i}{56} \quad 0 \quad 0 \quad 0 \quad 0$	
	0	$0 \quad 0 \quad -\frac{3\sqrt{70}i}{280} \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{70}i}{70} \quad -\frac{\sqrt{42}i}{56} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0$
	0	$0 \quad 0 \quad 0 \quad \frac{3\sqrt{70}i}{280} \quad 0 \quad 0 \quad \frac{\sqrt{70}i}{70} \quad 0 \quad 0 \quad \frac{\sqrt{42}i}{56} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0$
	0	$0 \quad 0 \quad 0 \quad 0 \quad \frac{3\sqrt{70}i}{280} \quad 0 \quad 0 \quad -\frac{\sqrt{70}}{70} \quad 0 \quad 0 \quad -\frac{\sqrt{42}i}{56} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0$
	0	$0 \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{3\sqrt{70}i}{280} \quad \frac{\sqrt{70}}{70} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{42}i}{56} \quad 0 \quad 0 \quad 0$
	0	$0 \quad 0 \quad 0 \quad -\frac{\sqrt{70}i}{70} \quad 0 \quad \frac{\sqrt{70}}{70} \quad 0 \quad \frac{\sqrt{42}i}{28} \quad 0 \quad 0$
	0	$0 \quad 0 \quad -\frac{\sqrt{70}i}{70} \quad 0 \quad -\frac{\sqrt{70}}{70} \quad 0 \quad -\frac{\sqrt{42}i}{28}$
574	symmetry	$\frac{\sqrt{15}x(y-z)(y+z)}{2}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{Q}_{3,0}^{(1,-1;a)}(T_u, 2)$	0	$-\frac{\sqrt{210}i}{168}$ 0 0 $\frac{\sqrt{14}i}{56}$ 0 0 0 0 0 0 $-\frac{\sqrt{210}i}{168}$ 0 0 $-\frac{\sqrt{210}}{84}$
	$-\frac{\sqrt{210}i}{168}$	0 0 0 0 0 $-\frac{\sqrt{14}i}{56}$ 0 0 0 0 0 $\frac{\sqrt{210}i}{168}$ $\frac{\sqrt{210}}{84}$ 0
	0	$\frac{\sqrt{70}i}{56}$ 0 0 0 $-\frac{\sqrt{42}i}{168}$ 0 0 0 $-\frac{\sqrt{42}}{84}$ 0 0 $-\frac{\sqrt{70}i}{56}$ 0 0 0
	$\frac{\sqrt{70}i}{56}$	0 0 0 0 0 $\frac{\sqrt{42}i}{168}$ $\frac{\sqrt{42}}{84}$ 0 0 0 0 $\frac{\sqrt{70}i}{56}$ 0 0 0
	0	0 0 0 $\frac{\sqrt{42}i}{84}$ 0 $\frac{\sqrt{42}}{42}$ $\frac{\sqrt{42}i}{42}$ 0 0 0 0 0 0 0 0
	0	0 0 $\frac{\sqrt{42}i}{84}$ 0 $-\frac{\sqrt{42}}{42}$ 0 0 0 $-\frac{\sqrt{42}i}{42}$ 0 0 0 0 0 0
	0	0 0 0 $-\frac{\sqrt{42}}{42}$ 0 $-\frac{\sqrt{42}i}{168}$ 0 0 0 0 0 $\frac{\sqrt{70}i}{56}$ 0 0 0
	0	0 0 $\frac{\sqrt{42}}{42}$ 0 $-\frac{\sqrt{42}i}{168}$ 0 0 0 0 0 $\frac{\sqrt{70}i}{56}$ 0 0 0
	0	0 0 $-\frac{\sqrt{42}i}{42}$ 0 0 0 0 $-\frac{\sqrt{42}i}{168}$ 0 0 0 0 0 0 $-\frac{\sqrt{70}i}{56}$
	0	0 0 0 $\frac{\sqrt{42}i}{42}$ 0 0 $-\frac{\sqrt{42}i}{168}$ 0 0 0 0 0 0 $-\frac{\sqrt{70}i}{56}$ 0
575	symmetry	$-\frac{\sqrt{15}y(x-z)(x+z)}{2}$
$\mathbb{Q}_{3,1}^{(1,-1;a)}(T_u, 2)$	0	$-\frac{\sqrt{210}}{168}$ $\frac{\sqrt{14}i}{56}$ 0 0 0 0 0 0 $\frac{\sqrt{210}i}{168}$ 0 0 0 0 $\frac{\sqrt{210}i}{84}$
	$\frac{\sqrt{210}}{168}$	0 0 0 $-\frac{\sqrt{14}i}{56}$ 0 0 0 0 0 0 $-\frac{\sqrt{210}i}{168}$ 0 0 $\frac{\sqrt{210}i}{84}$ 0
	0	$-\frac{\sqrt{70}}{56}$ $\frac{\sqrt{42}i}{168}$ 0 0 0 0 0 $\frac{\sqrt{42}i}{84}$ $-\frac{\sqrt{70}i}{56}$ 0 0 0 0 0 0
	$\frac{\sqrt{70}}{56}$	0 0 0 $-\frac{\sqrt{42}i}{168}$ 0 0 $\frac{\sqrt{42}i}{84}$ 0 0 0 $\frac{\sqrt{70}i}{56}$ 0 0 0 0
	0	0 0 0 $-\frac{\sqrt{42}}{168}$ 0 $-\frac{\sqrt{42}i}{42}$ 0 0 0 0 $-\frac{\sqrt{70}}{56}$ 0 0 0 0
	0	0 0 $\frac{\sqrt{42}}{168}$ 0 $-\frac{\sqrt{42}i}{42}$ 0 0 0 $\frac{\sqrt{70}}{56}$ 0 0 0 0 0
	0	0 0 0 $\frac{\sqrt{42}i}{42}$ 0 0 $\frac{\sqrt{42}}{84}$ $\frac{\sqrt{42}i}{42}$ 0 0 0 0 0 0
	0	0 0 $\frac{\sqrt{42}i}{42}$ 0 $-\frac{\sqrt{42}}{84}$ 0 0 $-\frac{\sqrt{42}i}{42}$ 0 0 0 0 0 0
	0	0 0 0 0 $-\frac{\sqrt{42}i}{42}$ 0 0 $-\frac{\sqrt{42}}{168}$ 0 0 0 0 0 $\frac{\sqrt{70}}{56}$
	0	0 0 0 0 0 $\frac{\sqrt{42}i}{42}$ $\frac{\sqrt{42}}{168}$ 0 0 0 0 0 0 $-\frac{\sqrt{70}}{56}$ 0
576	symmetry	$\frac{\sqrt{15}z(x-y)(x+y)}{2}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{Q}_{3,2}^{(1,-1;a)}(T_u, 2)$	$\frac{\sqrt{210}i}{84}$	0 0 - $\frac{\sqrt{14}}{56}$ 0 - $\frac{\sqrt{14}i}{56}$ 0 0 0 0 - $\frac{\sqrt{210}}{168}$ 0 $\frac{\sqrt{210}i}{168}$ 0 0
	0	- $\frac{\sqrt{210}i}{84}$ $\frac{\sqrt{14}}{56}$ 0 - $\frac{\sqrt{14}i}{56}$ 0 0 0 0 $\frac{\sqrt{210}}{168}$ 0 $\frac{\sqrt{210}i}{168}$ 0 0 0
	0	0 0 0 - $\frac{\sqrt{42}}{168}$ 0 $\frac{\sqrt{42}i}{168}$ 0 0 0 $\frac{\sqrt{70}}{56}$ 0 $\frac{\sqrt{70}i}{56}$ 0 0 0
	0	0 0 $\frac{\sqrt{42}}{168}$ 0 $\frac{\sqrt{42}i}{168}$ 0 0 0 - $\frac{\sqrt{70}}{56}$ 0 $\frac{\sqrt{70}i}{56}$ 0 0 0
	0	0 0 - $\frac{\sqrt{42}i}{168}$ 0 0 0 0 - $\frac{\sqrt{42}i}{42}$ $\frac{\sqrt{70}i}{56}$ 0 0 0 0 0 0
	0	0 0 0 $\frac{\sqrt{42}i}{168}$ 0 0 - $\frac{\sqrt{42}i}{42}$ 0 0 - $\frac{\sqrt{70}i}{56}$ 0 0 0 0 0 0
	0	0 0 0 0 - $\frac{\sqrt{42}i}{168}$ 0 0 - $\frac{\sqrt{42}}{42}$ 0 0 0 - $\frac{\sqrt{70}i}{56}$ 0 0 0 0
	0	0 0 0 0 0 $\frac{\sqrt{42}i}{168}$ $\frac{\sqrt{42}}{42}$ 0 0 0 0 0 $\frac{\sqrt{70}i}{56}$ 0 0 0
	0	0 0 0 $\frac{\sqrt{42}i}{42}$ 0 $\frac{\sqrt{42}}{42}$ $\frac{\sqrt{42}i}{84}$ 0 0 0 0 0 0 0 0 0
	0	0 0 $\frac{\sqrt{42}i}{42}$ 0 - $\frac{\sqrt{42}}{42}$ 0 0 0 - $\frac{\sqrt{42}i}{84}$ 0 0 0 0 0 0 0
577	symmetry	$\frac{3\sqrt{35}xyz(x-y)(x+y)}{2}$
$\mathbb{Q}_{5,0}^{(1,-1;a)}(E_u)$	0 0 0 - $\frac{3\sqrt{5}i}{40}$ 0 - $\frac{3\sqrt{5}}{40}$ 0 0 0 $\frac{3\sqrt{3}i}{40}$ 0 - $\frac{3\sqrt{3}}{40}$ 0 0	
	0 0 - $\frac{3\sqrt{5}i}{40}$ 0 $\frac{3\sqrt{5}}{40}$ 0 0 0 $\frac{3\sqrt{3}i}{40}$ 0 $\frac{3\sqrt{3}}{40}$ 0 0 0	
	0 0 0 - $\frac{\sqrt{15}i}{40}$ 0 $\frac{\sqrt{15}}{40}$ 0 0 0 - $\frac{i}{8}$ 0 - $\frac{1}{8}$ $\frac{i}{10}$ 0	
	0 0 - $\frac{\sqrt{15}i}{40}$ 0 - $\frac{\sqrt{15}}{40}$ 0 0 0 - $\frac{i}{8}$ 0 $\frac{1}{8}$ 0 0 - $\frac{i}{10}$	
	0 $\frac{i}{20}$ 0 0 - $\frac{\sqrt{15}i}{40}$ 0 0 0 0 0 - $\frac{3i}{40}$ 0 0 0 $\frac{1}{20}$	
	$\frac{i}{20}$ 0 0 0 0 $\frac{\sqrt{15}i}{40}$ 0 0 0 0 0 $\frac{3i}{40}$ - $\frac{1}{20}$ 0	
	0 $\frac{1}{20}$ - $\frac{\sqrt{15}i}{40}$ 0 0 0 0 0 $\frac{3i}{40}$ 0 0 0 0 - $\frac{i}{20}$	
	- $\frac{1}{20}$ 0 0 $\frac{\sqrt{15}i}{40}$ 0 0 0 0 - $\frac{3i}{40}$ 0 0 0 - $\frac{i}{20}$ 0	
	- $\frac{i}{10}$ 0 0 $\frac{\sqrt{15}}{40}$ 0 $\frac{\sqrt{15}i}{40}$ 0 0 0 $\frac{1}{8}$ 0 - $\frac{i}{8}$ 0 0	
	0 $\frac{i}{10}$ - $\frac{\sqrt{15}}{40}$ 0 $\frac{\sqrt{15}i}{40}$ 0 0 0 - $\frac{1}{8}$ 0 - $\frac{i}{8}$ 0 0 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 $-\frac{\sqrt{15}i}{40}$ 0 $\frac{\sqrt{15}}{40}$ 0 0 0 $-\frac{i}{40}$ 0 $-\frac{1}{40}$ $\frac{i}{5}$ 0	
	0 0 $-\frac{\sqrt{15}i}{40}$ 0 $-\frac{\sqrt{15}}{40}$ 0 0 0 $-\frac{i}{40}$ 0 $\frac{1}{40}$ 0 0 $-\frac{i}{5}$	
	0 0 0 $-\frac{\sqrt{5}i}{40}$ 0 $-\frac{\sqrt{5}}{40}$ $-\frac{\sqrt{5}i}{10}$ 0 0 $-\frac{3\sqrt{3}i}{40}$ 0 $\frac{3\sqrt{3}}{40}$ 0 0	
	0 0 $-\frac{\sqrt{5}i}{40}$ 0 $\frac{\sqrt{5}}{40}$ 0 0 $\frac{\sqrt{5}i}{10}$ $-\frac{3\sqrt{3}i}{40}$ 0 $-\frac{3\sqrt{3}}{40}$ 0 0 0	
	0 $-\frac{\sqrt{3}i}{20}$ 0 0 $\frac{\sqrt{5}i}{40}$ 0 0 $\frac{\sqrt{5}}{20}$ 0 0 $\frac{7\sqrt{3}i}{120}$ 0 0 $-\frac{\sqrt{3}}{15}$	
	$-\frac{\sqrt{3}i}{20}$ 0 0 0 0 $-\frac{\sqrt{5}i}{40}$ $-\frac{\sqrt{5}}{20}$ 0 0 0 0 $-\frac{7\sqrt{3}i}{120}$ $\frac{\sqrt{3}}{15}$ 0	
	0 $\frac{\sqrt{3}}{20}$ $-\frac{\sqrt{5}i}{40}$ 0 0 0 0 $-\frac{\sqrt{5}i}{20}$ $\frac{7\sqrt{3}i}{120}$ 0 0 0 0 $-\frac{\sqrt{3}i}{15}$	
	$-\frac{\sqrt{3}}{20}$ 0 0 $\frac{\sqrt{5}i}{40}$ 0 0 $-\frac{\sqrt{5}i}{20}$ 0 0 $-\frac{7\sqrt{3}i}{120}$ 0 0 $-\frac{\sqrt{3}i}{15}$ 0	
	0 0 0 $\frac{\sqrt{5}}{40}$ 0 $-\frac{\sqrt{5}i}{40}$ 0 0 0 $\frac{\sqrt{3}}{120}$ 0 $\frac{\sqrt{3}i}{120}$ 0 0 0	
	0 0 $-\frac{\sqrt{5}}{40}$ 0 $-\frac{\sqrt{5}i}{40}$ 0 0 0 $-\frac{\sqrt{3}}{120}$ 0 $\frac{\sqrt{3}i}{120}$ 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 $-\frac{\sqrt{105}i}{84}$ 0 0 $\frac{\sqrt{7}i}{56}$ 0 0 0 0 0 $\frac{3\sqrt{105}i}{280}$ 0 0 $-\frac{\sqrt{105}}{210}$	
	$-\frac{\sqrt{105}i}{84}$ 0 0 0 0 $-\frac{\sqrt{7}i}{56}$ 0 0 0 0 0 $-\frac{3\sqrt{105}i}{280}$ $\frac{\sqrt{105}}{210}$ 0	
	0 $-\frac{\sqrt{35}i}{84}$ 0 0 $-\frac{\sqrt{21}i}{168}$ 0 0 $\frac{\sqrt{21}}{84}$ 0 0 $-\frac{\sqrt{35}i}{840}$ 0 0 $-\frac{\sqrt{35}}{60}$	
	$-\frac{\sqrt{35}i}{84}$ 0 0 0 0 $\frac{\sqrt{21}i}{168}$ $-\frac{\sqrt{21}}{84}$ 0 0 0 0 $\frac{\sqrt{35}i}{840}$ $\frac{\sqrt{35}}{60}$ 0	
	0 0 0 0 0 $\frac{\sqrt{21}}{56}$ $-\frac{\sqrt{21}i}{56}$ 0 0 $-\frac{\sqrt{35}i}{42}$ 0 $\frac{\sqrt{35}}{120}$ $\frac{\sqrt{35}i}{120}$ 0	
	0 0 0 0 $-\frac{\sqrt{21}}{56}$ 0 0 $\frac{\sqrt{21}i}{56}$ $-\frac{\sqrt{35}i}{42}$ 0 0 $-\frac{\sqrt{35}}{120}$ 0 0 $-\frac{\sqrt{35}i}{120}$	
	$-\frac{\sqrt{35}i}{60}$ 0 0 $\frac{\sqrt{21}}{42}$ 0 $-\frac{5\sqrt{21}i}{168}$ 0 0 0 $-\frac{\sqrt{35}}{60}$ 0 $-\frac{5\sqrt{35}i}{168}$ 0 0	
	0 $\frac{\sqrt{35}i}{60}$ $-\frac{\sqrt{21}}{42}$ 0 $-\frac{5\sqrt{21}i}{168}$ 0 0 0 $\frac{\sqrt{35}}{60}$ 0 $-\frac{5\sqrt{35}i}{168}$ 0 0 0	
	0 $\frac{\sqrt{35}}{60}$ $-\frac{\sqrt{21}i}{42}$ 0 0 0 0 $\frac{5\sqrt{21}i}{168}$ $-\frac{\sqrt{35}i}{60}$ 0 0 0 0 $-\frac{5\sqrt{35}i}{168}$	
	$-\frac{\sqrt{35}}{60}$ 0 0 $\frac{\sqrt{21}i}{42}$ 0 0 $\frac{5\sqrt{21}i}{168}$ 0 0 $\frac{\sqrt{35}i}{60}$ 0 0 0 $-\frac{5\sqrt{35}i}{168}$ 0	
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
$\mathbb{Q}_{5,1}^{(1,-1;a)}(T_u, 1)$	$0 \quad \frac{\sqrt{105}}{84} \quad -\frac{\sqrt{7}i}{56} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{3\sqrt{105}i}{280} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{105}i}{210}$	
	$-\frac{\sqrt{105}}{84} \quad 0 \quad 0 \quad \frac{\sqrt{7}i}{56} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{3\sqrt{105}i}{280} \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{105}i}{210} \quad 0$	
	$0 \quad -\frac{\sqrt{35}}{84} \quad -\frac{\sqrt{21}i}{168} \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{21}i}{84} \quad \frac{\sqrt{35}i}{840} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{35}i}{60}$	
	$\frac{\sqrt{35}}{84} \quad 0 \quad 0 \quad \frac{\sqrt{21}i}{168} \quad 0 \quad 0 \quad \frac{\sqrt{21}i}{84} \quad 0 \quad 0 \quad -\frac{\sqrt{35}i}{840} \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{35}i}{60} \quad 0$	
	$\frac{\sqrt{35}i}{60} \quad 0 \quad 0 \quad \frac{5\sqrt{21}}{168} \quad 0 \quad -\frac{\sqrt{21}i}{42} \quad 0 \quad 0 \quad 0 \quad -\frac{5\sqrt{35}}{168} \quad 0 \quad -\frac{\sqrt{35}i}{60} \quad 0 \quad 0 \quad 0$	
	$0 \quad -\frac{\sqrt{35}i}{60} \quad -\frac{5\sqrt{21}}{168} \quad 0 \quad -\frac{\sqrt{21}i}{42} \quad 0 \quad 0 \quad 0 \quad \frac{5\sqrt{35}}{168} \quad 0 \quad -\frac{\sqrt{35}i}{60} \quad 0 \quad 0 \quad 0 \quad 0$	
	$0 \quad 0 \quad 0 \quad -\frac{\sqrt{21}i}{56} \quad 0 \quad 0 \quad \frac{\sqrt{21}i}{56} \quad 0 \quad 0 \quad \frac{\sqrt{35}i}{120} \quad 0 \quad -\frac{\sqrt{35}i}{42} \quad \frac{\sqrt{35}i}{120} \quad 0 \quad 0$	
	$0 \quad 0 \quad -\frac{\sqrt{21}i}{56} \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{21}i}{56} \quad \frac{\sqrt{35}i}{120} \quad 0 \quad \frac{\sqrt{35}}{42} \quad 0 \quad 0 \quad -\frac{\sqrt{35}i}{120} \quad 0$	
	$0 \quad -\frac{\sqrt{35}i}{60} \quad 0 \quad 0 \quad \frac{\sqrt{21}i}{42} \quad 0 \quad 0 \quad -\frac{5\sqrt{21}}{168} \quad 0 \quad 0 \quad -\frac{\sqrt{35}i}{60} \quad 0 \quad 0 \quad 0 \quad -\frac{5\sqrt{35}}{168}$	
	$-\frac{\sqrt{35}i}{60} \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{21}i}{42} \quad \frac{5\sqrt{21}}{168} \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{35}i}{60} \quad \frac{5\sqrt{35}}{168} \quad 0 \quad 0$	
581	symmetry	$\frac{z(15x^4+30x^2y^2-40x^2z^2+15y^4-40y^2z^2+8z^4)}{8}$
$\mathbb{Q}_{5,2}^{(1,-1;a)}(T_u, 1)$	$0 \quad 0 \quad 0 \quad -\frac{\sqrt{7}}{56} \quad 0 \quad \frac{\sqrt{7}i}{56} \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{105}}{168} \quad 0 \quad -\frac{\sqrt{105}i}{168} \quad 0 \quad 0 \quad 0$	
	$0 \quad 0 \quad \frac{\sqrt{7}}{56} \quad 0 \quad \frac{\sqrt{7}i}{56} \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{105}}{168} \quad 0 \quad -\frac{\sqrt{105}i}{168} \quad 0 \quad 0 \quad 0 \quad 0$	
	$\frac{\sqrt{35}i}{42} \quad 0 \quad 0 \quad -\frac{\sqrt{21}}{168} \quad 0 \quad -\frac{\sqrt{21}i}{168} \quad 0 \quad 0 \quad 0 \quad -\frac{13\sqrt{35}}{840} \quad 0 \quad \frac{13\sqrt{35}i}{840} \quad 0 \quad 0 \quad 0$	
	$0 \quad -\frac{\sqrt{35}i}{42} \quad \frac{\sqrt{21}}{168} \quad 0 \quad -\frac{\sqrt{21}i}{168} \quad 0 \quad 0 \quad 0 \quad \frac{13\sqrt{35}}{840} \quad 0 \quad \frac{13\sqrt{35}i}{840} \quad 0 \quad 0 \quad 0 \quad 0$	
	$0 \quad -\frac{\sqrt{35}}{60} \quad -\frac{5\sqrt{21}i}{168} \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{21}i}{42} \quad -\frac{5\sqrt{35}i}{168} \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{35}i}{60} \quad 0$	
	$\frac{\sqrt{35}}{60} \quad 0 \quad 0 \quad \frac{5\sqrt{21}i}{168} \quad 0 \quad 0 \quad \frac{\sqrt{21}i}{42} \quad 0 \quad 0 \quad \frac{5\sqrt{35}i}{168} \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{35}i}{60} \quad 0$	
	$0 \quad \frac{\sqrt{35}i}{60} \quad 0 \quad 0 \quad \frac{5\sqrt{21}i}{168} \quad 0 \quad 0 \quad -\frac{\sqrt{21}}{42} \quad 0 \quad 0 \quad -\frac{5\sqrt{35}i}{168} \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{35}}{60}$	
	$\frac{\sqrt{35}i}{60} \quad 0 \quad 0 \quad 0 \quad -\frac{5\sqrt{21}i}{168} \quad \frac{\sqrt{21}}{42} \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{5\sqrt{35}i}{168} \quad \frac{\sqrt{35}}{60} \quad 0 \quad 0 \quad 0$	
	$0 \quad 0 \quad 0 \quad \frac{\sqrt{21}i}{56} \quad 0 \quad -\frac{\sqrt{21}}{56} \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{35}i}{120} \quad 0 \quad \frac{\sqrt{35}}{120} \quad -\frac{\sqrt{35}i}{42} \quad 0 \quad 0$	
	$0 \quad 0 \quad \frac{\sqrt{21}i}{56} \quad 0 \quad \frac{\sqrt{21}}{56} \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{35}i}{120} \quad 0 \quad -\frac{\sqrt{35}}{120} \quad 0 \quad 0 \quad \frac{\sqrt{35}i}{42} \quad 0$	
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	$\begin{bmatrix} 0 & \frac{\sqrt{3}i}{20} & 0 & 0 & -\frac{3\sqrt{5}i}{40} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{40} & 0 & 0 & \frac{\sqrt{3}}{10} \\ \frac{\sqrt{3}i}{20} & 0 & 0 & 0 & 0 & \frac{3\sqrt{5}i}{40} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{40} & -\frac{\sqrt{3}}{10} & 0 \\ 0 & \frac{i}{20} & 0 & 0 & \frac{\sqrt{15}i}{40} & 0 & 0 & -\frac{\sqrt{15}}{20} & 0 & 0 & -\frac{7i}{40} & 0 & 0 & -\frac{1}{20} \\ \frac{i}{20} & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{40} & \frac{\sqrt{15}}{20} & 0 & 0 & 0 & 0 & \frac{7i}{40} & \frac{1}{20} & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{40} & -\frac{\sqrt{15}i}{40} & 0 & 0 & -\frac{i}{10} & 0 & \frac{1}{8} & \frac{i}{8} & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{40} & 0 & 0 & \frac{\sqrt{15}i}{40} & -\frac{i}{10} & 0 & -\frac{1}{8} & 0 & 0 & -\frac{i}{8} \\ -\frac{i}{20} & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{40} & 0 & 0 & 0 & \frac{1}{20} & 0 & -\frac{3i}{40} & 0 & 0 \\ 0 & \frac{i}{20} & 0 & 0 & \frac{\sqrt{15}i}{40} & 0 & 0 & 0 & -\frac{1}{20} & 0 & -\frac{3i}{40} & 0 & 0 & 0 \\ 0 & \frac{1}{20} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{40} & \frac{i}{20} & 0 & 0 & 0 & 0 & -\frac{3i}{40} \\ -\frac{1}{20} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{40} & 0 & 0 & -\frac{i}{20} & 0 & 0 & -\frac{3i}{40} & 0 \end{bmatrix}$
	583	$\frac{3\sqrt{35}y(x^2-2xz-z^2)(x^2+2xz-z^2)}{8}$
	$\mathbb{Q}_{5,1}^{(1,-1;a)}(T_u, 2)$	$\begin{bmatrix} 0 & -\frac{\sqrt{3}}{20} & \frac{3\sqrt{5}i}{40} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{40} & 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{10} \\ \frac{\sqrt{3}}{20} & 0 & 0 & -\frac{3\sqrt{5}i}{40} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{40} & 0 & 0 & 0 & \frac{\sqrt{3}i}{10} \\ 0 & \frac{1}{20} & \frac{\sqrt{15}i}{40} & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{20} & \frac{7i}{40} & 0 & 0 & 0 & 0 & \frac{i}{20} \\ -\frac{1}{20} & 0 & 0 & -\frac{\sqrt{15}i}{40} & 0 & 0 & -\frac{\sqrt{15}i}{20} & 0 & 0 & -\frac{7i}{40} & 0 & 0 & 0 & \frac{i}{20} \\ \frac{i}{20} & 0 & 0 & -\frac{\sqrt{15}}{40} & 0 & 0 & 0 & 0 & 0 & -\frac{3}{40} & 0 & \frac{i}{20} & 0 & 0 \\ 0 & -\frac{i}{20} & \frac{\sqrt{15}}{40} & 0 & 0 & 0 & 0 & 0 & \frac{3}{40} & 0 & \frac{i}{20} & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{15}i}{40} & 0 & 0 & \frac{\sqrt{15}i}{40} & 0 & 0 & \frac{i}{8} & 0 & -\frac{1}{10} & \frac{i}{8} & 0 \\ 0 & 0 & -\frac{\sqrt{15}i}{40} & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{40} & \frac{i}{8} & 0 & \frac{1}{10} & 0 & 0 & -\frac{i}{8} \\ 0 & -\frac{i}{20} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{40} & 0 & 0 & \frac{i}{20} & 0 & 0 & -\frac{3}{40} \\ -\frac{i}{20} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{40} & 0 & 0 & 0 & 0 & -\frac{i}{20} & \frac{3}{40} & 0 \end{bmatrix}$
	584	$\frac{3\sqrt{35}z(x^2-2xy-y^2)(x^2+2xy-y^2)}{8}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{Q}_{5,2}^{(1,-1;a)}(T_u, 2)$	$0 \quad 0 \quad 0 \quad \frac{3\sqrt{5}}{40} \quad 0 \quad -\frac{3\sqrt{5}i}{40} \quad 0 \quad 0 \quad 0 \quad -\frac{3\sqrt{3}}{40} \quad 0 \quad -\frac{3\sqrt{3}i}{40} \quad 0 \quad 0$	
	$0 \quad 0 \quad -\frac{3\sqrt{5}}{40} \quad 0 \quad -\frac{3\sqrt{5}i}{40} \quad 0 \quad 0 \quad 0 \quad \frac{3\sqrt{3}}{40} \quad 0 \quad -\frac{3\sqrt{3}i}{40} \quad 0 \quad 0 \quad 0$	
	$-\frac{i}{10} \quad 0 \quad 0 \quad \frac{\sqrt{15}}{40} \quad 0 \quad \frac{\sqrt{15}i}{40} \quad 0 \quad 0 \quad 0 \quad \frac{1}{8} \quad 0 \quad -\frac{i}{8} \quad 0 \quad 0$	
	$0 \quad \frac{i}{10} \quad -\frac{\sqrt{15}}{40} \quad 0 \quad \frac{\sqrt{15}i}{40} \quad 0 \quad 0 \quad 0 \quad -\frac{1}{8} \quad 0 \quad -\frac{i}{8} \quad 0 \quad 0 \quad 0$	
	$0 \quad -\frac{1}{20} \quad \frac{\sqrt{15}i}{40} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{3i}{40} \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{i}{20}$	
	$\frac{1}{20} \quad 0 \quad 0 \quad -\frac{\sqrt{15}i}{40} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{3i}{40} \quad 0 \quad 0 \quad 0 \quad \frac{i}{20}$	
	$0 \quad \frac{i}{20} \quad 0 \quad 0 \quad -\frac{\sqrt{15}i}{40} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{3i}{40} \quad 0 \quad 0 \quad \frac{1}{20}$	
	$\frac{i}{20} \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{15}i}{40} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{3i}{40} \quad -\frac{1}{20} \quad 0$	
	$0 \quad 0 \quad 0 \quad \frac{\sqrt{15}i}{40} \quad 0 \quad -\frac{\sqrt{15}}{40} \quad 0 \quad 0 \quad 0 \quad \frac{i}{8} \quad 0 \quad \frac{1}{8} \quad -\frac{i}{10} \quad 0$	
	$0 \quad 0 \quad \frac{\sqrt{15}i}{40} \quad 0 \quad \frac{\sqrt{15}}{40} \quad 0 \quad 0 \quad 0 \quad \frac{i}{8} \quad 0 \quad -\frac{1}{8} \quad 0 \quad 0 \quad \frac{i}{10}$	
585	symmetry	$\frac{\sqrt{105}x(y-z)(y+z)(2x^2-y^2-z^2)}{4}$
$\mathbb{Q}_{5,0}^{(1,-1;a)}(T_u, 3)$	$0 \quad -\frac{i}{10} \quad 0 \quad \frac{i}{10} \quad 0 \quad 0 \quad 0$	
	$-\frac{i}{10} \quad 0 \quad -\frac{i}{10} \quad 0 \quad 0$	
	$0 \quad \frac{\sqrt{3}i}{10} \quad 0 \quad -\frac{\sqrt{3}i}{30} \quad 0 \quad 0 \quad \frac{\sqrt{3}}{15}$	
	$\frac{\sqrt{3}i}{10} \quad 0 \quad \frac{\sqrt{3}i}{30} \quad -\frac{\sqrt{3}}{15} \quad 0$	
	$0 \quad 0 \quad 0 \quad -\frac{\sqrt{5}i}{10} \quad 0 \quad -\frac{\sqrt{5}}{20} \quad -\frac{\sqrt{5}i}{20} \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{3}}{20} \quad \frac{\sqrt{3}i}{20} \quad 0$	
	$0 \quad 0 \quad -\frac{\sqrt{5}i}{10} \quad 0 \quad \frac{\sqrt{5}}{20} \quad 0 \quad 0 \quad \frac{\sqrt{5}i}{20} \quad 0 \quad 0 \quad \frac{\sqrt{3}}{20} \quad 0 \quad 0 \quad -\frac{\sqrt{3}i}{20}$	
	$-\frac{\sqrt{3}i}{15} \quad 0 \quad 0 \quad -\frac{\sqrt{5}}{20} \quad 0 \quad \frac{\sqrt{5}i}{20} \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{3}}{20} \quad 0 \quad -\frac{\sqrt{3}i}{60} \quad 0 \quad 0$	
	$0 \quad \frac{\sqrt{3}i}{15} \quad \frac{\sqrt{5}}{20} \quad 0 \quad \frac{\sqrt{5}i}{20} \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{3}}{20} \quad 0 \quad -\frac{\sqrt{3}i}{60} \quad 0 \quad 0 \quad 0$	
	$0 \quad -\frac{\sqrt{3}}{15} \quad -\frac{\sqrt{5}i}{20} \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{5}i}{20} \quad -\frac{\sqrt{3}i}{20} \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{3}i}{60} \quad 0$	
	$\frac{\sqrt{3}}{15} \quad 0 \quad 0 \quad \frac{\sqrt{5}i}{20} \quad 0 \quad 0 \quad \frac{\sqrt{5}i}{20} \quad 0 \quad 0 \quad \frac{\sqrt{3}i}{20} \quad 0 \quad 0 \quad \frac{\sqrt{3}i}{60} \quad 0$	
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	$-\frac{1}{10}$
	$\frac{1}{10}$	0
	0	$-\frac{\sqrt{3}}{10}$
	$\frac{\sqrt{3}}{10}$	0
	$-\frac{\sqrt{3}i}{15}$	0
	0	$\frac{\sqrt{5}}{20}$
	0	$-\frac{\sqrt{5}i}{20}$
	0	$-\frac{\sqrt{5}i}{20}$
	0	$-\frac{\sqrt{5}i}{20}$
	$-\frac{\sqrt{3}i}{15}$	0
587	symmetry	$-\frac{\sqrt{105}z(x-y)(x+y)(x^2+y^2-2z^2)}{4}$
$\mathbb{Q}_{5,2}^{(1,-1;a)}(T_u, 3)$	$\frac{i}{5}$	0
	0	$-\frac{i}{5}$
	0	0
	0	0
	0	0
	0	$-\frac{\sqrt{3}}{15}$
	$\frac{\sqrt{3}}{15}$	0
	0	$-\frac{\sqrt{3}i}{15}$
	0	0
	0	$-\frac{\sqrt{5}i}{20}$
588	symmetry	x

continued ...

Table 9

No.	multipole	matrix
$\mathbb{Q}_{1,0}^{(1,0;a)}(T_u)$	0 0 0 0 $\frac{3\sqrt{70}i}{280}$ 0 0 $\frac{3\sqrt{70}}{140}$ 0 0 $-\frac{\sqrt{42}i}{56}$ 0 0 0	
	0 0 0 0 0 $-\frac{3\sqrt{70}i}{280}$ $-\frac{3\sqrt{70}}{140}$ 0 0 0 0 $\frac{\sqrt{42}i}{56}$ 0 0 0	
	0 0 0 0 $\frac{3\sqrt{210}i}{280}$ 0 0 0 0 0 $\frac{\sqrt{14}i}{56}$ 0 0 $\frac{\sqrt{14}}{28}$	
	0 0 0 0 0 $-\frac{3\sqrt{210}i}{280}$ 0 0 0 0 0 $-\frac{\sqrt{14}i}{56}$ $-\frac{\sqrt{14}}{28}$ 0	
	0 0 0 0 0 $-\frac{\sqrt{210}}{140}$ $\frac{\sqrt{210}i}{140}$ 0 0 0 0 $\frac{\sqrt{14}}{28}$ $\frac{\sqrt{14}i}{28}$ 0	
	0 0 0 0 $\frac{\sqrt{210}}{140}$ 0 0 $-\frac{\sqrt{210}i}{140}$ 0 0 $-\frac{\sqrt{14}}{28}$ 0 0 $-\frac{\sqrt{14}i}{28}$	
	$-\frac{\sqrt{14}i}{28}$ 0 0 $-\frac{\sqrt{210}}{140}$ 0 0 0 0 $-\frac{\sqrt{14}}{28}$ 0 0 0 0	
	0 $\frac{\sqrt{14}i}{28}$ $\frac{\sqrt{210}}{140}$ 0 0 0 0 $\frac{\sqrt{14}}{28}$ 0 0 0 0 0	
	0 $\frac{\sqrt{14}}{28}$ $\frac{\sqrt{210}i}{140}$ 0 0 0 0 0 $-\frac{\sqrt{14}i}{28}$ 0 0 0 0	
	$-\frac{\sqrt{14}}{28}$ 0 0 $-\frac{\sqrt{210}i}{140}$ 0 0 0 0 0 $\frac{\sqrt{14}i}{28}$ 0 0 0 0	
589	symmetry	y
$\mathbb{Q}_{1,1}^{(1,0;a)}(T_u)$	0 0 $-\frac{3\sqrt{70}i}{280}$ 0 0 0 0 $-\frac{3\sqrt{70}i}{140}$ $-\frac{\sqrt{42}i}{56}$ 0 0 0 0 0	
	0 0 0 $\frac{3\sqrt{70}i}{280}$ 0 0 $-\frac{3\sqrt{70}i}{140}$ 0 0 $\frac{\sqrt{42}i}{56}$ 0 0 0 0 0	
	0 0 $\frac{3\sqrt{210}i}{280}$ 0 0 0 0 0 $-\frac{\sqrt{14}i}{56}$ 0 0 0 0 $-\frac{\sqrt{14}i}{28}$	
	0 0 0 $-\frac{3\sqrt{210}i}{280}$ 0 0 0 0 0 $\frac{\sqrt{14}i}{56}$ 0 0 0 $-\frac{\sqrt{14}i}{28}$ 0	
	$\frac{\sqrt{14}i}{28}$ 0 0 0 0 $\frac{\sqrt{210}i}{140}$ 0 0 0 0 0 $-\frac{\sqrt{14}i}{28}$ 0 0 0	
	0 $-\frac{\sqrt{14}i}{28}$ 0 0 $\frac{\sqrt{210}i}{140}$ 0 0 0 0 0 $-\frac{\sqrt{14}i}{28}$ 0 0 0	
	0 0 0 $\frac{\sqrt{210}i}{140}$ 0 0 $-\frac{\sqrt{210}i}{140}$ 0 0 $\frac{\sqrt{14}i}{28}$ 0 0 $\frac{\sqrt{14}i}{28}$ 0	
	0 0 $\frac{\sqrt{210}i}{140}$ 0 0 0 0 $\frac{\sqrt{210}i}{140}$ $\frac{\sqrt{14}i}{28}$ 0 0 0 $-\frac{\sqrt{14}i}{28}$	
	0 $-\frac{\sqrt{14}i}{28}$ 0 0 $-\frac{\sqrt{210}i}{140}$ 0 0 0 0 0 $-\frac{\sqrt{14}i}{28}$ 0 0 0	
	$-\frac{\sqrt{14}i}{28}$ 0 0 0 0 $\frac{\sqrt{210}i}{140}$ 0 0 0 0 0 $\frac{\sqrt{14}i}{28}$ 0 0 0	
590	symmetry	z

continued ...

Table 9

No.	multipole	matrix
$\mathbb{Q}_{1,2}^{(1,0;a)}(T_u)$	0 0 0 $\frac{3\sqrt{70}}{280}$ 0 $-\frac{3\sqrt{70}i}{280}$ 0 0 0 0 $\frac{\sqrt{42}}{56}$ 0 $\frac{\sqrt{42}i}{56}$ 0 0	
	0 0 $-\frac{3\sqrt{70}}{280}$ 0 $-\frac{3\sqrt{70}i}{280}$ 0 0 0 $-\frac{\sqrt{42}}{56}$ 0 $\frac{\sqrt{42}i}{56}$ 0 0 0	
	0 0 0 $-\frac{3\sqrt{210}}{280}$ 0 $-\frac{3\sqrt{210}i}{280}$ 0 0 0 0 $\frac{\sqrt{14}}{56}$ 0 $-\frac{\sqrt{14}i}{56}$ 0 0	
	0 0 $\frac{3\sqrt{210}}{280}$ 0 $-\frac{3\sqrt{210}i}{280}$ 0 0 0 0 $-\frac{\sqrt{14}}{56}$ 0 $-\frac{\sqrt{14}i}{56}$ 0 0	
	0 $-\frac{\sqrt{14}}{28}$ 0 0 0 0 0 $-\frac{\sqrt{210}i}{140}$ 0 0 0 0 0 $-\frac{\sqrt{14}i}{28}$	
	$\frac{\sqrt{14}}{28}$ 0 0 0 0 0 $-\frac{\sqrt{210}i}{140}$ 0 0 0 0 0 $-\frac{\sqrt{14}i}{28}$ 0	
	0 $\frac{\sqrt{14}i}{28}$ 0 0 0 0 0 $\frac{\sqrt{210}}{140}$ 0 0 0 0 0 $-\frac{\sqrt{14}}{28}$	
	$\frac{\sqrt{14}i}{28}$ 0 0 0 0 0 $-\frac{\sqrt{210}}{140}$ 0 0 0 0 0 $\frac{\sqrt{14}}{28}$ 0	
	0 0 0 $-\frac{\sqrt{210}i}{140}$ 0 $\frac{\sqrt{210}}{140}$ 0 0 0 $\frac{\sqrt{14}i}{28}$ 0 $\frac{\sqrt{14}}{28}$ 0 0	
	0 0 $-\frac{\sqrt{210}i}{140}$ 0 $-\frac{\sqrt{210}}{140}$ 0 0 0 $\frac{\sqrt{14}i}{28}$ 0 $-\frac{\sqrt{14}}{28}$ 0 0 0	
591	symmetry	$\sqrt{15}xyz$
$\mathbb{Q}_3^{(1,0;a)}(A_u)$	0 0 0 $\frac{\sqrt{3}i}{12}$ 0 $-\frac{\sqrt{3}}{12}$ 0 0 0 0 0 0 0 0	
	0 0 $\frac{\sqrt{3}i}{12}$ 0 $\frac{\sqrt{3}}{12}$ 0 0 0 0 0 0 0 0 0	
	0 0 0 $\frac{i}{12}$ 0 $\frac{1}{12}$ $-\frac{i}{6}$ 0 0 0 0 0 0 0 0	
	0 0 $\frac{i}{12}$ 0 $-\frac{1}{12}$ 0 0 $\frac{i}{6}$ 0 0 0 0 0 0 0	
	0 0 0 0 $-\frac{i}{24}$ 0 0 $\frac{1}{24}$ 0 0 $-\frac{\sqrt{15}i}{24}$ 0 0 $-\frac{\sqrt{15}}{24}$	
	0 0 0 0 0 $\frac{i}{24}$ $-\frac{1}{24}$ 0 0 0 0 $\frac{\sqrt{15}i}{24}$ $\frac{\sqrt{15}}{24}$ 0	
	0 0 $\frac{i}{24}$ 0 0 0 0 $-\frac{i}{24}$ $-\frac{\sqrt{15}i}{24}$ 0 0 0 0 $-\frac{\sqrt{15}i}{24}$	
	0 0 0 $-\frac{i}{24}$ 0 0 $-\frac{i}{24}$ 0 0 $\frac{\sqrt{15}i}{24}$ 0 0 $-\frac{\sqrt{15}i}{24}$ 0	
	0 0 0 $-\frac{1}{24}$ 0 $\frac{i}{24}$ 0 0 0 $-\frac{\sqrt{15}}{24}$ 0 $-\frac{\sqrt{15}i}{24}$ 0 0	
592	symmetry	$\frac{x(2x^2-3y^2-3z^2)}{2}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{Q}_{3,0}^{(1,0;a)}(T_u, 1)$	0 0 0 0 0 $-\frac{7\sqrt{5}i}{80}$ 0 0 $-\frac{\sqrt{5}}{20}$ 0 0 $-\frac{\sqrt{3}i}{16}$ 0 0 0	
	0 0 0 0 0 $\frac{7\sqrt{5}i}{80}$ $\frac{\sqrt{5}}{20}$ 0 0 0 0 $\frac{\sqrt{3}i}{16}$ 0 0 0	
	0 0 0 0 0 $-\frac{\sqrt{15}i}{240}$ 0 0 $-\frac{\sqrt{15}}{24}$ 0 0 $\frac{i}{16}$ 0 0 $\frac{1}{8}$	
	0 0 0 0 0 0 $\frac{\sqrt{15}i}{240}$ $\frac{\sqrt{15}}{24}$ 0 0 0 0 $-\frac{i}{16}$ $-\frac{1}{8}$ 0	
	0 0 0 0 0 0 $-\frac{\sqrt{15}}{240}$ $\frac{\sqrt{15}i}{240}$ 0 0 0 0 $-\frac{3}{16}$ $-\frac{3i}{16}$ 0	
	0 0 0 0 0 $\frac{\sqrt{15}}{240}$ 0 0 $-\frac{\sqrt{15}i}{240}$ 0 0 $\frac{3}{16}$ 0 0 $\frac{3i}{16}$	
	$-\frac{i}{8}$ 0 0 $\frac{\sqrt{15}}{60}$ 0 0 0 0 0 $-\frac{1}{8}$ 0 0 0 0 0	
	0 $\frac{i}{8}$ $-\frac{\sqrt{15}}{60}$ 0 0 0 0 0 $\frac{1}{8}$ 0 0 0 0 0 0	
	0 $\frac{1}{8}$ $-\frac{\sqrt{15}i}{60}$ 0 0 0 0 0 $-\frac{i}{8}$ 0 0 0 0 0 0	
	$-\frac{1}{8}$ 0 0 $\frac{\sqrt{15}i}{60}$ 0 0 0 0 0 $\frac{i}{8}$ 0 0 0 0 0	
$-\frac{y(3x^2 - 2y^2 + 3z^2)}{2}$		
$\mathbb{Q}_{3,1}^{(1,0;a)}(T_u, 1)$	0 0 $\frac{7\sqrt{5}i}{80}$ 0 0 0 0 $\frac{\sqrt{5}i}{20}$ $-\frac{\sqrt{3}i}{16}$ 0 0 0 0 0	
	0 0 0 $-\frac{7\sqrt{5}i}{80}$ 0 0 $\frac{\sqrt{5}i}{20}$ 0 0 $\frac{\sqrt{3}i}{16}$ 0 0 0 0 0	
	0 0 $-\frac{\sqrt{15}i}{240}$ 0 0 0 0 $-\frac{\sqrt{15}i}{24}$ $-\frac{i}{16}$ 0 0 0 0 $-\frac{i}{8}$	
	0 0 0 $\frac{\sqrt{15}i}{240}$ 0 0 $-\frac{\sqrt{15}i}{24}$ 0 0 $\frac{i}{16}$ 0 0 $-\frac{i}{8}$ 0	
	$\frac{i}{8}$ 0 0 0 0 0 $-\frac{\sqrt{15}i}{60}$ 0 0 0 0 0 $-\frac{i}{8}$ 0 0 0	
	0 $-\frac{i}{8}$ 0 0 $-\frac{\sqrt{15}i}{60}$ 0 0 0 0 0 $-\frac{i}{8}$ 0 0 0 0	
	0 0 0 $\frac{\sqrt{15}i}{240}$ 0 0 $-\frac{\sqrt{15}i}{240}$ 0 0 $-\frac{3i}{16}$ 0 0 $-\frac{3i}{16}$ 0	
	0 0 $\frac{\sqrt{15}i}{240}$ 0 0 0 0 $\frac{\sqrt{15}i}{240}$ $-\frac{3i}{16}$ 0 0 0 0 $\frac{3i}{16}$	
	0 $-\frac{i}{8}$ 0 0 $\frac{\sqrt{15}i}{60}$ 0 0 0 0 0 $-\frac{i}{8}$ 0 0 0 0	
	$-\frac{i}{8}$ 0 0 0 0 $-\frac{\sqrt{15}i}{60}$ 0 0 0 0 0 $\frac{i}{8}$ 0 0 0	
$-\frac{z(3x^2 + 3y^2 - 2z^2)}{2}$		

continued ...

Table 9

No.	multipole	matrix
$\mathbb{Q}_{3,2}^{(1,0;a)}(T_u, 1)$	0 0 0 $\frac{3\sqrt{5}}{80}$ 0 $-\frac{3\sqrt{5}i}{80}$ 0 0 0 0 $\frac{\sqrt{3}}{16}$ 0 $\frac{\sqrt{3}i}{16}$ 0 0	
	0 0 $-\frac{3\sqrt{5}}{80}$ 0 $-\frac{3\sqrt{5}i}{80}$ 0 0 0 $-\frac{\sqrt{3}}{16}$ 0 $\frac{\sqrt{3}i}{16}$ 0 0 0	
	0 0 0 $\frac{11\sqrt{15}}{240}$ 0 $\frac{11\sqrt{15}i}{240}$ 0 0 0 0 $\frac{1}{16}$ 0 $-\frac{i}{16}$ 0 0 0	
	0 0 $-\frac{11\sqrt{15}}{240}$ 0 $\frac{11\sqrt{15}i}{240}$ 0 0 0 $-\frac{1}{16}$ 0 $-\frac{i}{16}$ 0 0 0	
	0 $-\frac{1}{8}$ 0 0 0 0 0 $\frac{\sqrt{15}i}{60}$ 0 0 0 0 0 0 $-\frac{i}{8}$	
	$\frac{1}{8}$ 0 0 0 0 0 $\frac{\sqrt{15}i}{60}$ 0 0 0 0 0 0 $-\frac{i}{8}$ 0	
	0 $\frac{i}{8}$ 0 0 0 0 0 $-\frac{\sqrt{15}}{60}$ 0 0 0 0 0 0 $-\frac{1}{8}$	
	$\frac{i}{8}$ 0 0 0 0 0 $\frac{\sqrt{15}}{60}$ 0 0 0 0 0 0 $\frac{1}{8}$ 0	
	0 0 0 $-\frac{\sqrt{15}i}{240}$ 0 $\frac{\sqrt{15}}{240}$ 0 0 0 $-\frac{3i}{16}$ 0 $-\frac{3}{16}$ 0 0 0	
	0 0 $-\frac{\sqrt{15}i}{240}$ 0 $-\frac{\sqrt{15}}{240}$ 0 0 0 $-\frac{3i}{16}$ 0 $\frac{3}{16}$ 0 0 0	
595	symmetry	$\frac{\sqrt{15}x(y-z)(y+z)}{2}$
$\mathbb{Q}_{3,0}^{(1,0;a)}(T_u, 2)$	0 0 0 0 $\frac{\sqrt{3}i}{16}$ 0 0 $-\frac{\sqrt{3}}{12}$ 0 0 $\frac{\sqrt{5}i}{16}$ 0 0 0	
	0 0 0 0 0 $-\frac{\sqrt{3}i}{16}$ $\frac{\sqrt{3}}{12}$ 0 0 0 0 $-\frac{\sqrt{5}i}{16}$ 0 0	
	0 0 0 0 $\frac{5i}{48}$ 0 0 $-\frac{1}{24}$ 0 0 $-\frac{\sqrt{15}i}{48}$ 0 0 $\frac{\sqrt{15}}{24}$	
	0 0 0 0 0 $-\frac{5i}{48}$ $\frac{1}{24}$ 0 0 0 0 $\frac{\sqrt{15}i}{48}$ $-\frac{\sqrt{15}}{24}$ 0	
	0 0 0 $\frac{i}{6}$ 0 $\frac{1}{48}$ $\frac{i}{48}$ 0 0 0 0 $-\frac{\sqrt{15}}{48}$ $\frac{\sqrt{15}i}{48}$ 0	
	0 0 $\frac{i}{6}$ 0 $-\frac{1}{48}$ 0 0 $-\frac{i}{48}$ 0 0 $\frac{\sqrt{15}}{48}$ 0 0 $-\frac{\sqrt{15}i}{48}$	
	$\frac{\sqrt{15}i}{24}$ 0 0 $\frac{1}{24}$ 0 $\frac{i}{6}$ 0 0 0 0 0 0 0 0	
	0 $-\frac{\sqrt{15}i}{24}$ $-\frac{1}{24}$ 0 $\frac{i}{6}$ 0 0 0 0 0 0 0 0 0	
	0 $\frac{\sqrt{15}}{24}$ $\frac{i}{24}$ 0 0 0 0 $\frac{i}{6}$ 0 0 0 0 0 0	
	$-\frac{\sqrt{15}}{24}$ 0 0 $-\frac{i}{24}$ 0 0 $\frac{i}{6}$ 0 0 0 0 0 0 0	
596	symmetry	$-\frac{\sqrt{15}y(x-z)(x+z)}{2}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{Q}_{3,1}^{(1,0;a)}(T_u, 2)$	0 0 $\frac{\sqrt{3}i}{16}$ 0 0 0 0 $-\frac{\sqrt{3}i}{12}$ $-\frac{\sqrt{5}i}{16}$ 0 0 0 0 0	
	0 0 0 $-\frac{\sqrt{3}i}{16}$ 0 0 $-\frac{\sqrt{3}i}{12}$ 0 0 $\frac{\sqrt{5}i}{16}$ 0 0 0 0 0	
	0 0 $-\frac{5i}{48}$ 0 0 0 0 $\frac{i}{24}$ $-\frac{\sqrt{15}i}{48}$ 0 0 0 0 $\frac{\sqrt{15}i}{24}$	
	0 0 0 $\frac{5i}{48}$ 0 0 $\frac{i}{24}$ 0 0 $\frac{\sqrt{15}i}{48}$ 0 0 $\frac{\sqrt{15}i}{24}$ 0	
	$\frac{\sqrt{15}i}{24}$ 0 0 $\frac{1}{6}$ 0 $\frac{i}{24}$ 0 0 0 0 0 0 0 0 0	
	0 $-\frac{\sqrt{15}i}{24}$ $-\frac{1}{6}$ 0 $\frac{i}{24}$ 0 0 0 0 0 0 0 0 0 0	
	0 0 0 $\frac{i}{48}$ 0 $\frac{1}{6}$ $\frac{i}{48}$ 0 0 $\frac{\sqrt{15}i}{48}$ 0 0 $-\frac{\sqrt{15}i}{48}$ 0	
	0 0 $\frac{i}{48}$ 0 $-\frac{1}{6}$ 0 0 $-\frac{i}{48}$ $\frac{\sqrt{15}i}{48}$ 0 0 0 0 $\frac{\sqrt{15}i}{48}$	
	0 $\frac{\sqrt{15}i}{24}$ 0 0 $\frac{i}{24}$ 0 0 $\frac{1}{6}$ 0 0 0 0 0 0 0	
	$\frac{\sqrt{15}i}{24}$ 0 0 0 $-\frac{i}{24}$ $-\frac{1}{6}$ 0 0 0 0 0 0 0 0	
597	symmetry	$\frac{\sqrt{15}z(x-y)(x+y)}{2}$
$\mathbb{Q}_{3,2}^{(1,0;a)}(T_u, 2)$	0 0 0 $\frac{\sqrt{3}}{48}$ 0 $\frac{\sqrt{3}i}{48}$ 0 0 0 $-\frac{\sqrt{5}}{16}$ 0 $\frac{\sqrt{5}i}{16}$ 0 0	
	0 0 $-\frac{\sqrt{3}}{48}$ 0 $\frac{\sqrt{3}i}{48}$ 0 0 0 $\frac{\sqrt{5}}{16}$ 0 $\frac{\sqrt{5}i}{16}$ 0 0 0 0	
	0 0 0 $-\frac{7}{48}$ 0 $\frac{7i}{48}$ 0 0 0 $-\frac{\sqrt{15}}{48}$ 0 $-\frac{\sqrt{15}i}{48}$ 0 0 0	
	0 0 $\frac{7}{48}$ 0 $\frac{7i}{48}$ 0 0 0 $\frac{\sqrt{15}}{48}$ 0 $-\frac{\sqrt{15}i}{48}$ 0 0 0 0	
	0 $\frac{\sqrt{15}}{24}$ $\frac{i}{6}$ 0 0 0 0 $\frac{i}{24}$ 0 0 0 0 0 0 0 0	
	$-\frac{\sqrt{15}}{24}$ 0 0 $-\frac{i}{6}$ 0 0 $\frac{i}{24}$ 0 0 0 0 0 0 0 0	
	0 $\frac{\sqrt{15}i}{24}$ 0 0 $\frac{i}{6}$ 0 0 $\frac{1}{24}$ 0 0 0 0 0 0 0 0	
	$\frac{\sqrt{15}i}{24}$ 0 0 0 0 $-\frac{i}{6}$ $-\frac{1}{24}$ 0 0 0 0 0 0 0 0	
	0 0 0 $\frac{i}{48}$ 0 $\frac{1}{48}$ $\frac{i}{6}$ 0 0 $-\frac{\sqrt{15}i}{48}$ 0 $\frac{\sqrt{15}}{48}$ 0 0 0	
	0 0 $\frac{i}{48}$ 0 $-\frac{1}{48}$ 0 0 $-\frac{i}{6}$ $-\frac{\sqrt{15}i}{48}$ 0 $-\frac{\sqrt{15}}{48}$ 0 0 0 0	
598	symmetry	$\frac{3\sqrt{35}xyz(x-y)(x+y)}{2}$

continued ..

Table 9

No.	multipole	matrix
$\mathbb{Q}_{5,0}^{(1,0;a)}(E_u)$	0 0 0 $-\frac{\sqrt{5}i}{40}$ 0 $-\frac{\sqrt{5}}{40}$ 0 0 0 $\frac{\sqrt{3}i}{40}$ 0 $-\frac{\sqrt{3}}{40}$ 0 0	
	0 0 $-\frac{\sqrt{5}i}{40}$ 0 $\frac{\sqrt{5}}{40}$ 0 0 0 $\frac{\sqrt{3}i}{40}$ 0 $\frac{\sqrt{3}}{40}$ 0 0 0	
	0 0 0 $-\frac{\sqrt{15}i}{120}$ 0 $\frac{\sqrt{15}}{120}$ 0 0 0 $\frac{i}{8}$ 0 $\frac{1}{8}$ $\frac{i}{5}$ 0	
	0 0 $-\frac{\sqrt{15}i}{120}$ 0 $-\frac{\sqrt{15}}{120}$ 0 0 0 $\frac{i}{8}$ 0 $-\frac{1}{8}$ 0 0 $-\frac{i}{5}$	
	0 $\frac{i}{10}$ 0 0 $\frac{\sqrt{15}i}{30}$ 0 0 0 0 0 $\frac{i}{10}$ 0 0 $\frac{1}{10}$	
	$\frac{i}{10}$ 0 0 0 0 $-\frac{\sqrt{15}i}{30}$ 0 0 0 0 0 $-\frac{i}{10}$ $-\frac{1}{10}$ 0	
	0 $\frac{1}{10}$ $\frac{\sqrt{15}i}{30}$ 0 0 0 0 0 $-\frac{i}{10}$ 0 0 0 0 $-\frac{i}{10}$	
	$-\frac{1}{10}$ 0 0 $-\frac{\sqrt{15}i}{30}$ 0 0 0 0 0 $\frac{i}{10}$ 0 0 $-\frac{i}{10}$ 0	
	$-\frac{i}{5}$ 0 0 $-\frac{\sqrt{15}}{30}$ 0 $-\frac{\sqrt{15}i}{30}$ 0 0 0 0 0 0 0 0	
	0 $\frac{i}{5}$ $\frac{\sqrt{15}}{30}$ 0 $-\frac{\sqrt{15}i}{30}$ 0 0 0 0 0 0 0 0 0	
599	symmetry	$\frac{\sqrt{105}xyz(x^2+y^2-2z^2)}{2}$
$\mathbb{Q}_{5,1}^{(1,0;a)}(E_u)$	0 0 0 $-\frac{\sqrt{15}i}{120}$ 0 $\frac{\sqrt{15}}{120}$ 0 0 0 $-\frac{7i}{40}$ 0 $-\frac{7}{40}$ $-\frac{i}{10}$ 0	
	0 0 $-\frac{\sqrt{15}i}{120}$ 0 $-\frac{\sqrt{15}}{120}$ 0 0 0 $-\frac{7i}{40}$ 0 $\frac{7}{40}$ 0 0 $\frac{i}{10}$	
	0 0 0 $-\frac{\sqrt{5}i}{120}$ 0 $-\frac{\sqrt{5}}{120}$ $-\frac{\sqrt{5}i}{30}$ 0 0 $-\frac{\sqrt{3}i}{40}$ 0 $\frac{\sqrt{3}}{40}$ 0 0	
	0 0 $-\frac{\sqrt{5}i}{120}$ 0 $\frac{\sqrt{5}}{120}$ 0 0 $\frac{\sqrt{5}i}{30}$ $-\frac{\sqrt{3}i}{40}$ 0 $-\frac{\sqrt{3}}{40}$ 0 0 0	
	0 $-\frac{\sqrt{3}i}{10}$ 0 0 $-\frac{\sqrt{5}i}{30}$ 0 0 $-\frac{\sqrt{5}}{15}$ 0 0 $-\frac{\sqrt{3}i}{30}$ 0 0 $\frac{\sqrt{3}}{30}$	
	$-\frac{\sqrt{3}i}{10}$ 0 0 0 0 $\frac{\sqrt{5}i}{30}$ $\frac{\sqrt{5}}{15}$ 0 0 0 0 $-\frac{\sqrt{3}i}{30}$ $-\frac{\sqrt{3}}{30}$ 0	
	0 $\frac{\sqrt{3}}{10}$ $\frac{\sqrt{5}i}{30}$ 0 0 0 0 $\frac{\sqrt{5}i}{15}$ $\frac{\sqrt{3}i}{30}$ 0 0 0 0 $\frac{\sqrt{3}i}{30}$	
	$-\frac{\sqrt{3}}{10}$ 0 0 $-\frac{\sqrt{5}i}{30}$ 0 0 $\frac{\sqrt{5}i}{15}$ 0 0 $-\frac{\sqrt{3}i}{30}$ 0 0 $\frac{\sqrt{3}i}{30}$ 0	
	0 0 0 $-\frac{\sqrt{5}}{30}$ 0 $\frac{\sqrt{5}i}{30}$ 0 0 0 $-\frac{\sqrt{3}}{15}$ 0 $-\frac{\sqrt{3}i}{15}$ 0 0 0	
	0 0 $\frac{\sqrt{5}}{30}$ 0 $\frac{\sqrt{5}i}{30}$ 0 0 0 $\frac{\sqrt{3}}{15}$ 0 $-\frac{\sqrt{3}i}{15}$ 0 0 0	
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 $-\frac{\sqrt{7}i}{112}$ 0 0 $\frac{5\sqrt{7}}{112}$ 0 0 $-\frac{3\sqrt{105}i}{560}$ 0 0 $-\frac{\sqrt{105}}{80}$	
	0 0 0 0 0 $\frac{\sqrt{7}i}{112}$ $-\frac{5\sqrt{7}}{112}$ 0 0 0 0 $\frac{3\sqrt{105}i}{560}$ $\frac{\sqrt{105}}{80}$ 0	
	0 0 0 0 0 $\frac{11\sqrt{21}i}{336}$ 0 0 $-\frac{\sqrt{21}}{48}$ 0 0 $\frac{17\sqrt{35}i}{560}$ 0 0 $\frac{13\sqrt{35}}{560}$	
	0 0 0 0 0 $-\frac{11\sqrt{21}i}{336}$ $\frac{\sqrt{21}}{48}$ 0 0 0 0 $-\frac{17\sqrt{35}i}{560}$ $-\frac{13\sqrt{35}}{560}$ 0	
	0 0 0 0 0 $\frac{\sqrt{21}}{168}$ $-\frac{\sqrt{21}i}{168}$ 0 0 0 0 $\frac{3\sqrt{35}}{280}$ $\frac{3\sqrt{35}i}{280}$ 0	
	0 0 0 0 0 $-\frac{\sqrt{21}}{168}$ 0 0 $\frac{\sqrt{21}i}{168}$ 0 0 $-\frac{3\sqrt{35}}{280}$ 0 0 $-\frac{3\sqrt{35}i}{280}$	
	$\frac{\sqrt{35}i}{70}$ 0 0 $\frac{\sqrt{21}}{21}$ 0 0 0 0 0 $\frac{\sqrt{35}}{70}$ 0 0 0 0 0	
	0 $-\frac{\sqrt{35}i}{70}$ $-\frac{\sqrt{21}}{21}$ 0 0 0 0 0 $-\frac{\sqrt{35}}{70}$ 0 0 0 0 0	
	0 $-\frac{\sqrt{35}}{70}$ $-\frac{\sqrt{21}i}{21}$ 0 0 0 0 0 $\frac{\sqrt{35}i}{70}$ 0 0 0 0 0	
	$\frac{\sqrt{35}}{70}$ 0 0 $\frac{\sqrt{21}i}{21}$ 0 0 0 0 0 $-\frac{\sqrt{35}i}{70}$ 0 0 0 0	
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 $\frac{\sqrt{7}i}{112}$ 0 0 0 0 $-\frac{5\sqrt{7}i}{112}$ $-\frac{3\sqrt{105}i}{560}$ 0 0 0 0 $-\frac{\sqrt{105}i}{80}$	
	0 0 0 $-\frac{\sqrt{7}i}{112}$ 0 0 $-\frac{5\sqrt{7}i}{112}$ 0 0 $\frac{3\sqrt{105}i}{560}$ 0 0 0 $-\frac{\sqrt{105}i}{80}$ 0	
	0 0 $\frac{11\sqrt{21}i}{336}$ 0 0 0 0 $-\frac{\sqrt{21}i}{48}$ $-\frac{17\sqrt{35}i}{560}$ 0 0 0 0 $-\frac{13\sqrt{35}}{560}$	
	0 0 0 $-\frac{11\sqrt{21}i}{336}$ 0 0 $-\frac{\sqrt{21}i}{48}$ 0 0 $\frac{17\sqrt{35}i}{560}$ 0 0 $-\frac{13\sqrt{35}}{560}$ 0	
	$-\frac{\sqrt{35}i}{70}$ 0 0 0 0 $-\frac{\sqrt{21}i}{21}$ 0 0 0 0 0 $\frac{\sqrt{35}i}{70}$ 0 0 0	
	0 $\frac{\sqrt{35}i}{70}$ 0 0 $-\frac{\sqrt{21}i}{21}$ 0 0 0 0 0 $\frac{\sqrt{35}i}{70}$ 0 0 0	
	0 0 0 $-\frac{\sqrt{21}i}{168}$ 0 0 $\frac{\sqrt{21}i}{168}$ 0 0 $\frac{3\sqrt{35}i}{280}$ 0 0 0 $\frac{3\sqrt{35}i}{280}$ 0	
	0 0 $-\frac{\sqrt{21}i}{168}$ 0 0 0 0 $-\frac{\sqrt{21}i}{168}$ $\frac{3\sqrt{35}i}{280}$ 0 0 0 0 $-\frac{3\sqrt{35}i}{280}$	
	0 $\frac{\sqrt{35}i}{70}$ 0 0 $\frac{\sqrt{21}i}{21}$ 0 0 0 0 0 $\frac{\sqrt{35}i}{70}$ 0 0 0	
	$\frac{\sqrt{35}i}{70}$ 0 0 0 0 $-\frac{\sqrt{21}i}{21}$ 0 0 0 0 0 $-\frac{\sqrt{35}i}{70}$ 0 0 0	
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
$\mathbb{Q}_{5,2}^{(1,0;a)}(T_u, 1)$	0 0 0 $\frac{3\sqrt{7}}{56}$ 0 $-\frac{3\sqrt{7}i}{56}$ 0 0 0 $\frac{\sqrt{105}}{56}$ 0 $\frac{\sqrt{105}i}{56}$ 0 0	
	0 0 $-\frac{3\sqrt{7}}{56}$ 0 $-\frac{3\sqrt{7}i}{56}$ 0 0 0 $-\frac{\sqrt{105}}{56}$ 0 $\frac{\sqrt{105}i}{56}$ 0 0 0	
	0 0 0 $-\frac{\sqrt{21}}{84}$ 0 $-\frac{\sqrt{21}i}{84}$ 0 0 0 $-\frac{\sqrt{35}}{140}$ 0 $\frac{\sqrt{35}i}{140}$ 0 0 0	
	0 0 $\frac{\sqrt{21}}{84}$ 0 $-\frac{\sqrt{21}i}{84}$ 0 0 0 $\frac{\sqrt{35}}{140}$ 0 $\frac{\sqrt{35}i}{140}$ 0 0 0	
	0 $\frac{\sqrt{35}}{70}$ 0 0 0 0 0 $\frac{\sqrt{21}i}{21}$ 0 0 0 0 0 $\frac{\sqrt{35}i}{70}$	
	$-\frac{\sqrt{35}}{70}$ 0 0 0 0 0 $\frac{\sqrt{21}i}{21}$ 0 0 0 0 0 $\frac{\sqrt{35}i}{70}$ 0	
	0 $-\frac{\sqrt{35}i}{70}$ 0 0 0 0 0 $-\frac{\sqrt{21}}{21}$ 0 0 0 0 0 $\frac{\sqrt{35}}{70}$	
	$-\frac{\sqrt{35}i}{70}$ 0 0 0 0 0 $\frac{\sqrt{21}}{21}$ 0 0 0 0 0 $-\frac{\sqrt{35}}{70}$ 0	
	0 0 0 $\frac{\sqrt{21}i}{168}$ 0 $-\frac{\sqrt{21}}{168}$ 0 0 0 $\frac{3\sqrt{35}i}{280}$ 0 $\frac{3\sqrt{35}}{280}$ 0 0	
	0 0 $\frac{\sqrt{21}i}{168}$ 0 $\frac{\sqrt{21}}{168}$ 0 0 0 $\frac{3\sqrt{35}i}{280}$ 0 $-\frac{3\sqrt{35}}{280}$ 0 0 0	
603	symmetry	$\frac{3\sqrt{35}x(y^2 - 2yz - z^2)(y^2 + 2yz - z^2)}{8}$
$\mathbb{Q}_{5,0}^{(1,0;a)}(T_u, 2)$	0 $\frac{\sqrt{3}i}{10}$ 0 0 $\frac{3\sqrt{5}i}{80}$ 0 0 $\frac{\sqrt{5}}{16}$ 0 0 0 $\frac{\sqrt{3}i}{80}$ 0 0 $\frac{\sqrt{3}}{80}$	
	$\frac{\sqrt{3}i}{10}$ 0 0 0 0 $-\frac{3\sqrt{5}i}{80}$ $-\frac{\sqrt{5}}{16}$ 0 0 0 0 $-\frac{\sqrt{3}i}{80}$ $-\frac{\sqrt{3}}{80}$ 0	
	0 $\frac{i}{10}$ 0 0 $\frac{7\sqrt{15}i}{240}$ 0 0 $\frac{\sqrt{15}}{240}$ 0 0 $-\frac{3i}{80}$ 0 0 $-\frac{3}{80}$	
	$\frac{i}{10}$ 0 0 0 0 $-\frac{7\sqrt{15}i}{240}$ $-\frac{\sqrt{15}}{240}$ 0 0 0 0 $\frac{3i}{80}$ $\frac{3}{80}$ 0	
	0 0 0 0 0 $\frac{\sqrt{15}}{120}$ $-\frac{\sqrt{15}i}{120}$ 0 0 $-\frac{i}{5}$ 0 $-\frac{1}{8}$ $-\frac{i}{8}$ 0	
	0 0 0 0 $-\frac{\sqrt{15}}{120}$ 0 0 $\frac{\sqrt{15}i}{120}$ $-\frac{i}{5}$ 0 $\frac{1}{8}$ 0 0 $\frac{i}{8}$	
	$-\frac{i}{10}$ 0 0 0 0 $-\frac{\sqrt{15}i}{30}$ 0 0 0 $\frac{1}{10}$ 0 $\frac{i}{10}$ 0 0	
	0 $\frac{i}{10}$ 0 0 $-\frac{\sqrt{15}i}{30}$ 0 0 0 $-\frac{1}{10}$ 0 $\frac{i}{10}$ 0 0 0	
	0 $\frac{1}{10}$ 0 0 0 0 0 $\frac{\sqrt{15}i}{30}$ $\frac{i}{10}$ 0 0 0 0 $\frac{i}{10}$	
	$-\frac{1}{10}$ 0 0 0 0 0 $\frac{\sqrt{15}i}{30}$ 0 0 $-\frac{i}{10}$ 0 0 0 $\frac{i}{10}$ 0	
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	$-\frac{\sqrt{3}}{10}, -\frac{3\sqrt{5}i}{80}, 0, 0, 0, 0, -\frac{\sqrt{5}i}{16}, \frac{\sqrt{3}i}{80}, 0, 0, 0, 0, \frac{\sqrt{3}i}{80}$
	$\frac{\sqrt{3}}{10}$	$0, 0, 0, \frac{3\sqrt{5}i}{80}, 0, 0, -\frac{\sqrt{5}i}{16}, 0, 0, -\frac{\sqrt{3}i}{80}, 0, 0, \frac{\sqrt{3}i}{80}, 0$
	0	$\frac{1}{10}, \frac{7\sqrt{15}i}{240}, 0, 0, 0, 0, \frac{\sqrt{15}i}{240}, \frac{3i}{80}, 0, 0, 0, 0, \frac{3i}{80}$
	$-\frac{1}{10}$	$0, 0, -\frac{7\sqrt{15}i}{240}, 0, 0, \frac{\sqrt{15}i}{240}, 0, 0, -\frac{3i}{80}, 0, 0, \frac{3i}{80}, 0$
	$\frac{i}{10}$	$0, 0, \frac{\sqrt{15}}{30}, 0, 0, 0, 0, 0, \frac{1}{10}, 0, \frac{i}{10}, 0, 0$
	0	$-\frac{i}{10}, -\frac{\sqrt{15}}{30}, 0, 0, 0, 0, 0, -\frac{1}{10}, 0, \frac{i}{10}, 0, 0, 0$
	0	$0, 0, 0, -\frac{\sqrt{15}i}{120}, 0, 0, \frac{\sqrt{15}i}{120}, 0, 0, -\frac{i}{8}, 0, -\frac{1}{5}, -\frac{i}{8}, 0$
	0	$0, 0, -\frac{\sqrt{15}i}{120}, 0, 0, 0, -\frac{\sqrt{15}i}{120}, -\frac{i}{8}, 0, \frac{1}{5}, 0, 0, \frac{i}{8}$
	$0, -\frac{i}{10}$	$0, 0, 0, 0, 0, 0, -\frac{\sqrt{15}}{30}, 0, 0, \frac{i}{10}, 0, 0, \frac{1}{10}$
	$-\frac{i}{10}$	$0, 0, 0, 0, 0, \frac{\sqrt{15}}{30}, 0, 0, 0, 0, -\frac{i}{10}, -\frac{1}{10}, 0$
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	$0, 0, 0, \frac{\sqrt{5}}{40}, 0, -\frac{\sqrt{5}i}{40}, 0, 0, 0, -\frac{\sqrt{3}}{40}, 0, -\frac{\sqrt{3}i}{40}, 0, 0$
	0	$0, 0, -\frac{\sqrt{5}}{40}, 0, -\frac{\sqrt{5}i}{40}, 0, 0, 0, \frac{\sqrt{3}}{40}, 0, -\frac{\sqrt{3}i}{40}, 0, 0, 0$
	$-\frac{i}{5}$	$0, 0, -\frac{\sqrt{15}}{30}, 0, -\frac{\sqrt{15}i}{30}, 0, 0, 0, 0, 0, 0, 0, 0, 0$
	0	$\frac{i}{5}, \frac{\sqrt{15}}{30}, 0, -\frac{\sqrt{15}i}{30}, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0$
	0	$0, -\frac{1}{10}, -\frac{\sqrt{15}i}{30}, 0, 0, 0, 0, 0, \frac{i}{10}, 0, 0, 0, 0, \frac{i}{10}$
	$\frac{1}{10}$	$0, 0, 0, \frac{\sqrt{15}i}{30}, 0, 0, 0, 0, -\frac{i}{10}, 0, 0, 0, \frac{i}{10}, 0$
	0	$\frac{i}{10}, 0, 0, 0, \frac{\sqrt{15}i}{30}, 0, 0, 0, 0, 0, \frac{i}{10}, 0, 0, \frac{1}{10}$
	$\frac{i}{10}$	$0, 0, 0, 0, 0, -\frac{\sqrt{15}i}{30}, 0, 0, 0, 0, -\frac{i}{10}, -\frac{1}{10}, 0$
	0	$0, 0, 0, \frac{\sqrt{15}i}{120}, 0, -\frac{\sqrt{15}}{120}, 0, 0, 0, -\frac{i}{8}, 0, -\frac{1}{8}, -\frac{i}{5}, 0$
	0	$0, 0, \frac{\sqrt{15}i}{120}, 0, \frac{\sqrt{15}}{120}, 0, 0, 0, -\frac{i}{8}, 0, \frac{1}{8}, 0, 0, \frac{i}{5}$
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	$\begin{bmatrix} 0 & \frac{i}{20} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{24} & 0 & 0 & -\frac{i}{20} & 0 & 0 & -\frac{1}{8} \\ \frac{i}{20} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{24} & 0 & 0 & 0 & 0 & \frac{i}{20} & \frac{1}{8} & 0 \\ 0 & -\frac{\sqrt{3}i}{20} & 0 & 0 & -\frac{\sqrt{5}i}{12} & 0 & 0 & -\frac{\sqrt{5}}{24} & 0 & 0 & -\frac{\sqrt{3}i}{15} & 0 & 0 & \frac{\sqrt{3}}{120} \\ -\frac{\sqrt{3}i}{20} & 0 & 0 & 0 & 0 & \frac{\sqrt{5}i}{12} & \frac{\sqrt{5}}{24} & 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{15} & -\frac{\sqrt{3}}{120} & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{5}i}{30} & 0 & -\frac{\sqrt{5}}{60} & -\frac{\sqrt{5}i}{60} & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{60} & \frac{\sqrt{3}i}{60} & 0 \\ 0 & 0 & -\frac{\sqrt{5}i}{30} & 0 & \frac{\sqrt{5}}{60} & 0 & 0 & \frac{\sqrt{5}i}{60} & 0 & 0 & \frac{\sqrt{3}}{60} & 0 & 0 & -\frac{\sqrt{3}i}{60} \\ \frac{\sqrt{3}i}{30} & 0 & 0 & \frac{\sqrt{5}}{15} & 0 & \frac{\sqrt{5}i}{60} & 0 & 0 & 0 & \frac{\sqrt{3}}{10} & 0 & \frac{\sqrt{3}i}{20} & 0 & 0 \\ 0 & -\frac{\sqrt{3}i}{30} & -\frac{\sqrt{5}}{15} & 0 & \frac{\sqrt{5}i}{60} & 0 & 0 & 0 & -\frac{\sqrt{3}}{10} & 0 & \frac{\sqrt{3}i}{20} & 0 & 0 & 0 \\ 0 & \frac{\sqrt{3}}{30} & \frac{\sqrt{5}i}{15} & 0 & 0 & 0 & 0 & \frac{\sqrt{5}i}{60} & -\frac{\sqrt{3}i}{10} & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{20} \\ -\frac{\sqrt{3}}{30} & 0 & 0 & -\frac{\sqrt{5}i}{15} & 0 & 0 & \frac{\sqrt{5}i}{60} & 0 & 0 & \frac{\sqrt{3}i}{10} & 0 & 0 & -\frac{\sqrt{3}i}{20} & 0 \end{bmatrix}$
	607	symmetry
		$\frac{\sqrt{105}y(x-z)(x+z)(x^2-2y^2+z^2)}{4}$
	$\mathbb{Q}_{5,1}^{(1,0;a)}(T_u, 3)$	$\begin{bmatrix} 0 & \frac{1}{20} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{24} & \frac{i}{20} & 0 & 0 & 0 & 0 & \frac{i}{8} \\ -\frac{1}{20} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{24} & 0 & 0 & -\frac{i}{20} & 0 & 0 & \frac{i}{8} & 0 \\ 0 & \frac{\sqrt{3}}{20} & \frac{\sqrt{5}i}{12} & 0 & 0 & 0 & 0 & \frac{\sqrt{5}i}{24} & -\frac{\sqrt{3}i}{15} & 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{120} \\ -\frac{\sqrt{3}}{20} & 0 & 0 & -\frac{\sqrt{5}i}{12} & 0 & 0 & \frac{\sqrt{5}i}{24} & 0 & 0 & \frac{\sqrt{3}i}{15} & 0 & 0 & \frac{\sqrt{3}i}{120} & 0 \\ \frac{\sqrt{3}i}{30} & 0 & 0 & \frac{\sqrt{5}}{60} & 0 & \frac{\sqrt{5}i}{15} & 0 & 0 & 0 & -\frac{\sqrt{3}}{20} & 0 & -\frac{\sqrt{3}i}{10} & 0 & 0 \\ 0 & -\frac{\sqrt{3}i}{30} & -\frac{\sqrt{5}}{60} & 0 & \frac{\sqrt{5}i}{15} & 0 & 0 & 0 & \frac{\sqrt{3}}{20} & 0 & -\frac{\sqrt{3}i}{10} & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{5}i}{60} & 0 & -\frac{\sqrt{5}}{30} & -\frac{\sqrt{5}i}{60} & 0 & 0 & \frac{\sqrt{3}i}{60} & 0 & 0 & -\frac{\sqrt{3}i}{60} & 0 \\ 0 & 0 & -\frac{\sqrt{5}i}{60} & 0 & \frac{\sqrt{5}}{30} & 0 & 0 & \frac{\sqrt{5}i}{60} & \frac{\sqrt{3}i}{60} & 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{60} \\ 0 & \frac{\sqrt{3}i}{30} & 0 & 0 & \frac{\sqrt{5}i}{15} & 0 & 0 & \frac{\sqrt{5}}{60} & 0 & 0 & \frac{\sqrt{3}i}{10} & 0 & 0 & \frac{\sqrt{3}}{20} \\ \frac{\sqrt{3}i}{30} & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{15} & -\frac{\sqrt{5}}{60} & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{10} & -\frac{\sqrt{3}}{20} & 0 \end{bmatrix}$
		symmetry
		$-\frac{\sqrt{105}z(x-y)(x+y)(x^2+y^2-2z^2)}{4}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{Q}_{5,2}^{(1,0;a)}(T_u, 3)$	$\begin{bmatrix} -\frac{i}{10} & 0 & 0 & -\frac{\sqrt{15}}{24} & 0 & -\frac{\sqrt{15}i}{24} & 0 & 0 & 0 & -\frac{3}{40} & 0 & \frac{3i}{40} & 0 & 0 \\ 0 & \frac{i}{10} & \frac{\sqrt{15}}{24} & 0 & -\frac{\sqrt{15}i}{24} & 0 & 0 & 0 & \frac{3}{40} & 0 & \frac{3i}{40} & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{5}}{24} & 0 & -\frac{\sqrt{5}i}{24} & 0 & 0 & 0 & \frac{7\sqrt{3}}{120} & 0 & \frac{7\sqrt{3}i}{120} & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{5}}{24} & 0 & -\frac{\sqrt{5}i}{24} & 0 & 0 & 0 & -\frac{7\sqrt{3}}{120} & 0 & \frac{7\sqrt{3}i}{120} & 0 & 0 & 0 \\ 0 & \frac{\sqrt{3}}{30} & \frac{\sqrt{5}i}{60} & 0 & 0 & 0 & 0 & \frac{\sqrt{5}i}{15} & \frac{\sqrt{3}i}{20} & 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{10} \\ -\frac{\sqrt{3}}{30} & 0 & 0 & -\frac{\sqrt{5}i}{60} & 0 & 0 & \frac{\sqrt{5}i}{15} & 0 & 0 & -\frac{\sqrt{3}i}{20} & 0 & 0 & \frac{\sqrt{3}i}{10} & 0 \\ 0 & \frac{\sqrt{3}i}{30} & 0 & 0 & \frac{\sqrt{5}i}{60} & 0 & 0 & \frac{\sqrt{5}}{15} & 0 & 0 & -\frac{\sqrt{3}i}{20} & 0 & 0 & -\frac{\sqrt{3}}{10} \\ \frac{\sqrt{3}i}{30} & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{60} & -\frac{\sqrt{5}}{15} & 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{20} & \frac{\sqrt{3}}{10} & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{5}i}{60} & 0 & -\frac{\sqrt{5}}{60} & -\frac{\sqrt{5}i}{30} & 0 & 0 & -\frac{\sqrt{3}i}{60} & 0 & \frac{\sqrt{3}}{60} & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{5}i}{60} & 0 & \frac{\sqrt{5}}{60} & 0 & 0 & \frac{\sqrt{5}i}{30} & -\frac{\sqrt{3}i}{60} & 0 & -\frac{\sqrt{3}}{60} & 0 & 0 & 0 \end{bmatrix}$	
		x
	$\mathbb{Q}_{1,0}^{(1,1;a)}(T_u)$	$\begin{bmatrix} 0 & \frac{\sqrt{21}i}{28} & 0 & 0 & -\frac{3\sqrt{35}i}{280} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{21}i}{56} & 0 & 0 & -\frac{\sqrt{21}}{28} \\ \frac{\sqrt{21}i}{28} & 0 & 0 & 0 & 0 & \frac{3\sqrt{35}i}{280} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{21}i}{56} & \frac{\sqrt{21}}{28} & 0 \\ 0 & \frac{\sqrt{7}i}{28} & 0 & 0 & \frac{\sqrt{105}i}{280} & 0 & 0 & -\frac{\sqrt{105}}{140} & 0 & 0 & \frac{3\sqrt{7}i}{56} & 0 & 0 & 0 \\ \frac{\sqrt{7}i}{28} & 0 & 0 & 0 & 0 & -\frac{\sqrt{105}i}{280} & \frac{\sqrt{105}}{140} & 0 & 0 & 0 & 0 & -\frac{3\sqrt{7}i}{56} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{105}}{70} & -\frac{\sqrt{105}i}{70} & 0 & 0 & \frac{\sqrt{7}i}{14} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{105}}{70} & 0 & -\frac{\sqrt{105}i}{140} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{105}}{70} & 0 & -\frac{\sqrt{105}i}{140} & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}i}{28} & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{105}}{70} & 0 & -\frac{\sqrt{105}i}{140} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}i}{28} & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{105}i}{70} & 0 & 0 & 0 & \frac{\sqrt{105}i}{140} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}i}{28} \\ 0 & 0 & 0 & -\frac{\sqrt{105}i}{70} & 0 & 0 & \frac{\sqrt{105}i}{140} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}i}{28} & 0 \end{bmatrix}$
		y

continued ...

Table 9

No.	multipole	matrix
$\mathbb{Q}_{1,1}^{(1,1;a)}(T_u)$	0	$-\frac{\sqrt{21}}{28}$ $\frac{3\sqrt{35}i}{280}$ 0 0 0 0 0 0 $\frac{\sqrt{21}i}{56}$ 0 0 0 0 0 $-\frac{\sqrt{21}i}{28}$
	$\frac{\sqrt{21}}{28}$	0 0 $-\frac{3\sqrt{35}i}{280}$ 0 0 0 0 0 0 $-\frac{\sqrt{21}i}{56}$ 0 0 0 $-\frac{\sqrt{21}i}{28}$ 0
	0	$\frac{\sqrt{7}}{28}$ $\frac{\sqrt{105}i}{280}$ 0 0 0 0 $-\frac{\sqrt{105}i}{140}$ $-\frac{3\sqrt{7}i}{56}$ 0 0 0 0 0 0
	$-\frac{\sqrt{7}}{28}$	0 0 $-\frac{\sqrt{105}i}{280}$ 0 0 $-\frac{\sqrt{105}i}{140}$ 0 0 $\frac{3\sqrt{7}i}{56}$ 0 0 0 0 0
	0	0 0 $\frac{\sqrt{105}}{140}$ 0 $\frac{\sqrt{105}i}{70}$ 0 0 0 $-\frac{\sqrt{7}}{28}$ 0 0 0 0 0
	0	0 0 $-\frac{\sqrt{105}}{140}$ 0 $\frac{\sqrt{105}i}{70}$ 0 0 0 $\frac{\sqrt{7}}{28}$ 0 0 0 0 0
	0	0 0 0 $-\frac{\sqrt{105}i}{70}$ 0 0 $\frac{\sqrt{105}i}{70}$ 0 0 0 0 $\frac{\sqrt{7}}{14}$ 0 0
	0	0 0 $-\frac{\sqrt{105}i}{70}$ 0 0 0 $-\frac{\sqrt{105}i}{70}$ 0 0 0 $-\frac{\sqrt{7}}{14}$ 0 0 0
	0	0 0 0 0 $-\frac{\sqrt{105}i}{70}$ 0 0 $-\frac{\sqrt{105}}{140}$ 0 0 0 0 0 $-\frac{\sqrt{7}}{28}$
	0	0 0 0 0 0 $\frac{\sqrt{105}i}{70}$ $\frac{\sqrt{105}}{140}$ 0 0 0 0 0 $\frac{\sqrt{7}}{28}$ 0
611	symmetry	z
$\mathbb{Q}_{1,2}^{(1,1;a)}(T_u)$	0	0 0 0 $\frac{3\sqrt{35}}{280}$ 0 $-\frac{3\sqrt{35}i}{280}$ 0 0 0 $\frac{\sqrt{21}}{56}$ 0 $\frac{\sqrt{21}i}{56}$ 0 0
	0	0 0 $-\frac{3\sqrt{35}}{280}$ 0 $-\frac{3\sqrt{35}i}{280}$ 0 0 0 $-\frac{\sqrt{21}}{56}$ 0 $\frac{\sqrt{21}i}{56}$ 0 0 0
	$-\frac{\sqrt{7}i}{14}$	0 0 $\frac{\sqrt{105}}{280}$ 0 $\frac{\sqrt{105}i}{280}$ 0 0 0 0 $-\frac{3\sqrt{7}}{56}$ 0 $\frac{3\sqrt{7}i}{56}$ 0 0
	0	$\frac{\sqrt{7}i}{14}$ $-\frac{\sqrt{105}}{280}$ 0 $\frac{\sqrt{105}i}{280}$ 0 0 0 $\frac{3\sqrt{7}}{56}$ 0 $\frac{3\sqrt{7}i}{56}$ 0 0 0
	0	0 0 $-\frac{\sqrt{105}}{140}$ 0 0 0 0 $-\frac{\sqrt{105}i}{70}$ $-\frac{\sqrt{7}i}{28}$ 0 0 0 0 0
	0	0 0 0 $\frac{\sqrt{105}i}{140}$ 0 0 $-\frac{\sqrt{105}i}{70}$ 0 0 $\frac{\sqrt{7}i}{28}$ 0 0 0 0
	0	0 0 0 0 $\frac{\sqrt{105}i}{140}$ 0 0 $\frac{\sqrt{105}}{70}$ 0 0 0 $-\frac{\sqrt{7}i}{28}$ 0 0 0
	0	0 0 0 0 0 $-\frac{\sqrt{105}i}{140}$ $-\frac{\sqrt{105}}{70}$ 0 0 0 0 $\frac{\sqrt{7}i}{28}$ 0 0
	0	0 0 0 $\frac{\sqrt{105}i}{70}$ 0 $-\frac{\sqrt{105}}{70}$ 0 0 0 0 0 0 $\frac{\sqrt{7}i}{14}$ 0
	0	0 0 $\frac{\sqrt{105}i}{70}$ 0 $\frac{\sqrt{105}}{70}$ 0 0 0 0 0 0 0 $-\frac{\sqrt{7}i}{14}$
612	symmetry	$\sqrt{15}xyz$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{Q}_3^{(1,1;a)}(A_u)$	0 0 0 - $\frac{\sqrt{21}i}{28}$ 0 $\frac{\sqrt{21}}{28}$ 0 0 0 $\frac{\sqrt{35}i}{70}$ 0 $\frac{\sqrt{35}}{70}$ - $\frac{\sqrt{35}i}{35}$ 0	
	0 0 - $\frac{\sqrt{21}i}{28}$ 0 - $\frac{\sqrt{21}}{28}$ 0 0 0 $\frac{\sqrt{35}i}{70}$ 0 - $\frac{\sqrt{35}}{70}$ 0 0 $\frac{\sqrt{35}i}{35}$	
	0 0 0 - $\frac{\sqrt{7}i}{28}$ 0 - $\frac{\sqrt{7}}{28}$ $\frac{\sqrt{7}i}{14}$ 0 0 - $\frac{\sqrt{105}i}{70}$ 0 $\frac{\sqrt{105}}{70}$ 0 0 0	
	0 0 - $\frac{\sqrt{7}i}{28}$ 0 $\frac{\sqrt{7}}{28}$ 0 0 - $\frac{\sqrt{7}i}{14}$ - $\frac{\sqrt{105}i}{70}$ 0 - $\frac{\sqrt{105}}{70}$ 0 0 0	
	0 0 0 0 - $\frac{\sqrt{7}i}{56}$ 0 0 $\frac{\sqrt{7}}{56}$ 0 0 - $\frac{\sqrt{105}i}{120}$ 0 0 0 - $\frac{\sqrt{105}}{120}$	
	0 0 0 0 0 0 $\frac{\sqrt{7}i}{56}$ - $\frac{\sqrt{7}}{56}$ 0 0 0 0 $\frac{\sqrt{105}i}{120}$ $\frac{\sqrt{105}}{120}$ 0	
	0 0 $\frac{\sqrt{7}i}{56}$ 0 0 0 0 - $\frac{\sqrt{7}i}{56}$ - $\frac{\sqrt{105}i}{120}$ 0 0 0 0 - $\frac{\sqrt{105}i}{120}$	
	0 0 0 - $\frac{\sqrt{7}i}{56}$ 0 0 - $\frac{\sqrt{7}i}{56}$ 0 0 $\frac{\sqrt{105}i}{120}$ 0 0 0 - $\frac{\sqrt{105}i}{120}$	
	0 0 0 - $\frac{\sqrt{7}i}{56}$ 0 $\frac{\sqrt{7}i}{56}$ 0 0 0 - $\frac{\sqrt{105}}{120}$ 0 - $\frac{\sqrt{105}i}{120}$ 0 0 0	
	0 0 $\frac{\sqrt{7}}{56}$ 0 $\frac{\sqrt{7}i}{56}$ 0 0 0 $\frac{\sqrt{105}}{120}$ 0 - $\frac{\sqrt{105}i}{120}$ 0 0 0 0	
613	symmetry	$\frac{x(2x^2-3y^2-3z^2)}{2}$
$\mathbb{Q}_{3,0}^{(1,1;a)}(T_u, 1)$	0 - $\frac{\sqrt{21}i}{42}$ 0 0 - $\frac{\sqrt{35}i}{112}$ 0 0 0 0 0 - $\frac{3\sqrt{21}i}{112}$ 0 0 $\frac{\sqrt{21}}{84}$	
	- $\frac{\sqrt{21}i}{42}$ 0 0 0 0 $\frac{\sqrt{35}i}{112}$ 0 0 0 0 0 $\frac{3\sqrt{21}i}{112}$ - $\frac{\sqrt{21}}{84}$ 0	
	0 - $\frac{\sqrt{7}i}{42}$ 0 0 $\frac{\sqrt{105}i}{336}$ 0 0 - $\frac{\sqrt{105}}{168}$ 0 0 $\frac{\sqrt{7}i}{336}$ 0 0 $\frac{\sqrt{7}}{24}$	
	- $\frac{\sqrt{7}i}{42}$ 0 0 0 0 - $\frac{\sqrt{105}i}{336}$ $\frac{\sqrt{105}}{168}$ 0 0 0 0 - $\frac{\sqrt{7}i}{336}$ - $\frac{\sqrt{7}}{24}$ 0	
	0 0 0 0 0 - $\frac{\sqrt{105}}{112}$ $\frac{\sqrt{105}i}{112}$ 0 0 - $\frac{\sqrt{7}i}{21}$ 0 - $\frac{\sqrt{7}}{48}$ - $\frac{\sqrt{7}i}{48}$ 0	
	0 0 0 0 $\frac{\sqrt{105}}{112}$ 0 0 - $\frac{\sqrt{105}i}{112}$ - $\frac{\sqrt{7}i}{21}$ 0 $\frac{\sqrt{7}}{48}$ 0 0 $\frac{\sqrt{7}i}{48}$	
	$\frac{\sqrt{7}i}{24}$ 0 0 - $\frac{\sqrt{105}}{84}$ 0 - $\frac{\sqrt{105}i}{84}$ 0 0 0 $\frac{\sqrt{7}}{24}$ 0 - $\frac{5\sqrt{7}i}{84}$ 0 0 0	
	0 - $\frac{\sqrt{7}i}{24}$ $\frac{\sqrt{105}}{84}$ 0 - $\frac{\sqrt{105}i}{84}$ 0 0 0 - $\frac{\sqrt{7}}{24}$ 0 - $\frac{5\sqrt{7}i}{84}$ 0 0 0	
	0 - $\frac{\sqrt{7}}{24}$ $\frac{\sqrt{105}i}{84}$ 0 0 0 $\frac{\sqrt{105}i}{84}$ $\frac{\sqrt{7}i}{24}$ 0 0 0 0 - $\frac{5\sqrt{7}i}{84}$	
	$\frac{\sqrt{7}}{24}$ 0 0 - $\frac{\sqrt{105}i}{84}$ 0 0 $\frac{\sqrt{105}i}{84}$ 0 0 - $\frac{\sqrt{7}i}{24}$ 0 0 0 - $\frac{5\sqrt{7}i}{84}$	
614	symmetry	$-\frac{y(3x^2-2y^2+3z^2)}{2}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{Q}_{3,1}^{(1,1;a)}(T_u, 1)$	0	$\frac{\sqrt{21}}{42}, \frac{\sqrt{35}i}{112}, 0, 0, 0, 0, 0, 0, -\frac{3\sqrt{21}i}{112}, 0, 0, 0, 0, \frac{\sqrt{21}i}{84}$
	$-\frac{\sqrt{21}}{42}$	$0, 0, -\frac{\sqrt{35}i}{112}, 0, 0, 0, 0, 0, 0, \frac{3\sqrt{21}i}{112}, 0, 0, \frac{\sqrt{21}i}{84}, 0$
	0	$-\frac{\sqrt{7}}{42}, \frac{\sqrt{105}i}{336}, 0, 0, 0, 0, -\frac{\sqrt{105}i}{168}, -\frac{\sqrt{7}i}{336}, 0, 0, 0, 0, -\frac{\sqrt{7}i}{24}, 0$
	$\frac{\sqrt{7}}{42}$	$0, 0, -\frac{\sqrt{105}i}{336}, 0, 0, -\frac{\sqrt{105}i}{168}, 0, 0, \frac{\sqrt{7}i}{336}, 0, 0, -\frac{\sqrt{7}i}{24}, 0$
	$-\frac{\sqrt{7}i}{24}$	$0, 0, \frac{\sqrt{105}}{84}, 0, \frac{\sqrt{105}i}{84}, 0, 0, 0, -\frac{5\sqrt{7}}{84}, 0, \frac{\sqrt{7}i}{24}, 0, 0, 0$
	0	$\frac{\sqrt{7}i}{24}, -\frac{\sqrt{105}}{84}, 0, \frac{\sqrt{105}i}{84}, 0, 0, -\frac{\sqrt{105}i}{112}, 0, 0, -\frac{\sqrt{7}i}{48}, 0, -\frac{\sqrt{7}}{21}, -\frac{\sqrt{7}i}{48}, 0$
	0	$0, 0, \frac{\sqrt{105}i}{112}, 0, 0, 0, \frac{\sqrt{105}i}{112}, -\frac{\sqrt{7}i}{48}, 0, \frac{\sqrt{7}}{21}, 0, 0, \frac{\sqrt{7}i}{48}, 0$
	0	$0, \frac{\sqrt{7}i}{24}, 0, 0, -\frac{\sqrt{105}i}{84}, 0, 0, -\frac{\sqrt{105}}{84}, 0, 0, \frac{\sqrt{7}i}{24}, 0, 0, -\frac{5\sqrt{7}}{84}$
	$\frac{\sqrt{7}i}{24}$	$0, 0, 0, 0, \frac{\sqrt{105}i}{84}, \frac{\sqrt{105}}{84}, 0, 0, 0, 0, -\frac{\sqrt{7}i}{24}, \frac{5\sqrt{7}}{84}, 0$
615	symmetry	$-\frac{z(3x^2+3y^2-2z^2)}{2}$
$\mathbb{Q}_{3,2}^{(1,1;a)}(T_u, 1)$	0	$0, 0, 0, \frac{\sqrt{35}}{112}, 0, -\frac{\sqrt{35}i}{112}, 0, 0, 0, \frac{5\sqrt{21}}{336}, 0, \frac{5\sqrt{21}i}{336}, 0, 0$
	0	$0, 0, -\frac{\sqrt{35}}{112}, 0, -\frac{\sqrt{35}i}{112}, 0, 0, 0, -\frac{5\sqrt{21}}{336}, 0, \frac{5\sqrt{21}i}{336}, 0, 0, 0$
	$\frac{\sqrt{7}i}{21}$	$0, 0, \frac{\sqrt{105}}{336}, 0, \frac{\sqrt{105}i}{336}, 0, 0, 0, 0, \frac{13\sqrt{7}}{336}, 0, -\frac{13\sqrt{7}i}{336}, 0, 0$
	0	$-\frac{\sqrt{7}i}{21}, -\frac{\sqrt{105}}{336}, 0, \frac{\sqrt{105}i}{336}, 0, 0, 0, -\frac{13\sqrt{7}}{336}, 0, -\frac{13\sqrt{7}i}{336}, 0, 0, 0$
	0	$\frac{\sqrt{7}}{24}, -\frac{\sqrt{105}i}{84}, 0, 0, 0, 0, -\frac{\sqrt{105}i}{84}, -\frac{5\sqrt{7}i}{84}, 0, 0, 0, 0, \frac{\sqrt{7}i}{24}, 0$
	$-\frac{\sqrt{7}}{24}$	$0, 0, \frac{\sqrt{105}i}{84}, 0, 0, -\frac{\sqrt{105}i}{84}, 0, 0, \frac{5\sqrt{7}i}{84}, 0, 0, \frac{\sqrt{7}i}{24}, 0$
	0	$-\frac{\sqrt{7}i}{24}, 0, 0, \frac{\sqrt{105}i}{84}, 0, 0, \frac{\sqrt{105}}{84}, 0, 0, 0, -\frac{5\sqrt{7}i}{84}, 0, 0, \frac{\sqrt{7}}{24}$
	$-\frac{\sqrt{7}i}{24}$	$0, 0, 0, 0, -\frac{\sqrt{105}i}{84}, -\frac{\sqrt{105}}{84}, 0, 0, 0, 0, \frac{5\sqrt{7}i}{84}, -\frac{\sqrt{7}}{24}, 0$
	0	$0, 0, 0, -\frac{\sqrt{105}i}{112}, 0, \frac{\sqrt{105}}{112}, 0, 0, 0, -\frac{\sqrt{7}i}{48}, 0, -\frac{\sqrt{7}}{48}, -\frac{\sqrt{7}i}{21}, 0$
	0	$0, 0, -\frac{\sqrt{105}i}{112}, 0, -\frac{\sqrt{105}}{112}, 0, 0, 0, -\frac{\sqrt{7}i}{48}, 0, \frac{\sqrt{7}}{48}, 0, 0, \frac{\sqrt{7}i}{21}$
616	symmetry	$\frac{\sqrt{15}x(y-z)(y+z)}{2}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{Q}_{3,0}^{(1,1;a)}(T_u, 2)$	0	$-\frac{\sqrt{35}i}{70} \quad 0 \quad 0 \quad 0 \quad \frac{3\sqrt{21}i}{112} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{35}i}{560} \quad 0 \quad 0 \quad \frac{3\sqrt{35}}{140}$
	$-\frac{\sqrt{35}i}{70}$	$0 \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{3\sqrt{21}i}{112} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{35}i}{560} \quad -\frac{3\sqrt{35}}{140} \quad 0$
	0	$\frac{\sqrt{105}i}{70} \quad 0 \quad 0 \quad -\frac{3\sqrt{7}i}{112} \quad 0 \quad 0 \quad -\frac{3\sqrt{7}}{56} \quad 0 \quad 0 \quad \frac{5\sqrt{105}i}{336} \quad 0 \quad 0 \quad -\frac{\sqrt{105}}{120}$
	$\frac{\sqrt{105}i}{70}$	$0 \quad 0 \quad 0 \quad 0 \quad \frac{3\sqrt{7}i}{112} \quad \frac{3\sqrt{7}}{56} \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{5\sqrt{105}i}{336} \quad \frac{\sqrt{105}}{120} \quad 0$
	0	$0 \quad 0 \quad -\frac{\sqrt{7}i}{14} \quad 0 \quad \frac{5\sqrt{7}}{112} \quad \frac{5\sqrt{7}i}{112} \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{105}}{80} \quad -\frac{\sqrt{105}i}{80} \quad 0$
	0	$0 \quad 0 \quad -\frac{\sqrt{7}i}{14} \quad 0 \quad -\frac{5\sqrt{7}}{112} \quad 0 \quad 0 \quad -\frac{5\sqrt{7}i}{112} \quad 0 \quad 0 \quad -\frac{\sqrt{105}}{80} \quad 0 \quad 0 \quad \frac{\sqrt{105}i}{80}$
	$\frac{\sqrt{105}i}{120}$	$0 \quad 0 \quad 0 \quad \frac{\sqrt{7}}{56} \quad 0 \quad \frac{\sqrt{7}i}{28} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{105}i}{420} \quad 0 \quad 0 \quad 0$
	0	$0 \quad -\frac{\sqrt{105}i}{120} \quad -\frac{\sqrt{7}}{56} \quad 0 \quad \frac{\sqrt{7}i}{28} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{105}i}{420} \quad 0 \quad 0 \quad 0$
	$-\frac{\sqrt{105}}{120}$	$0 \quad 0 \quad \frac{\sqrt{105}}{120} \quad \frac{\sqrt{7}i}{56} \quad 0 \quad 0 \quad \frac{\sqrt{7}i}{28} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{105}i}{420} \quad 0$
617	symmetry	$-\frac{\sqrt{15}y(x-z)(x+z)}{2}$
$\mathbb{Q}_{3,1}^{(1,1;a)}(T_u, 2)$	0	$-\frac{\sqrt{35}}{70} \quad \frac{3\sqrt{21}i}{112} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{35}i}{560} \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{3\sqrt{35}i}{140}$
	$\frac{\sqrt{35}}{70}$	$0 \quad 0 \quad -\frac{3\sqrt{21}i}{112} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{35}i}{560} \quad 0 \quad 0 \quad -\frac{3\sqrt{35}i}{140} \quad 0$
	0	$-\frac{\sqrt{105}}{70} \quad \frac{3\sqrt{7}i}{112} \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{3\sqrt{7}i}{56} \quad \frac{5\sqrt{105}i}{336} \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{105}i}{120}$
	$\frac{\sqrt{105}}{70}$	$0 \quad 0 \quad -\frac{3\sqrt{7}i}{112} \quad 0 \quad 0 \quad \frac{3\sqrt{7}i}{56} \quad 0 \quad 0 \quad -\frac{5\sqrt{105}i}{336} \quad 0 \quad 0 \quad -\frac{\sqrt{105}i}{120} \quad 0$
	$\frac{\sqrt{105}i}{120}$	$0 \quad 0 \quad \frac{\sqrt{7}}{28} \quad 0 \quad \frac{\sqrt{7}i}{56} \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{105}}{420} \quad 0 \quad 0 \quad 0 \quad 0$
	0	$0 \quad -\frac{\sqrt{105}i}{120} \quad -\frac{\sqrt{7}}{28} \quad 0 \quad \frac{\sqrt{7}i}{56} \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{105}}{420} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0$
	0	$0 \quad 0 \quad 0 \quad \frac{5\sqrt{7}i}{112} \quad 0 \quad -\frac{\sqrt{7}}{14} \quad \frac{5\sqrt{7}i}{112} \quad 0 \quad 0 \quad -\frac{\sqrt{105}i}{80} \quad 0 \quad 0 \quad \frac{\sqrt{105}i}{80} \quad 0$
	0	$0 \quad 0 \quad \frac{5\sqrt{7}i}{112} \quad 0 \quad \frac{\sqrt{7}}{14} \quad 0 \quad 0 \quad -\frac{5\sqrt{7}i}{112} \quad -\frac{\sqrt{105}i}{80} \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{105}i}{80}$
	$\frac{\sqrt{105}i}{120}$	$0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{7}i}{56} \quad 0 \quad 0 \quad \frac{\sqrt{7}}{28} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{105}}{420} \quad 0$
618	symmetry	$\frac{\sqrt{15}z(x-y)(x+y)}{2}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{Q}_{3,2}^{(1,1;a)}(T_u, 2)$	$\frac{\sqrt{35}i}{35} \quad 0 \quad 0 \quad -\frac{3\sqrt{21}}{112} \quad 0 \quad -\frac{3\sqrt{21}i}{112} \quad 0 \quad 0 \quad 0 \quad \frac{13\sqrt{35}}{560} \quad 0 \quad -\frac{13\sqrt{35}i}{560} \quad 0 \quad 0$	
	$0 \quad -\frac{\sqrt{35}i}{35} \quad \frac{3\sqrt{21}}{112} \quad 0 \quad -\frac{3\sqrt{21}i}{112} \quad 0 \quad 0 \quad 0 \quad -\frac{13\sqrt{35}}{560} \quad 0 \quad -\frac{13\sqrt{35}i}{560} \quad 0 \quad 0 \quad 0$	
	$0 \quad 0 \quad 0 \quad -\frac{3\sqrt{7}}{112} \quad 0 \quad \frac{3\sqrt{7}i}{112} \quad 0 \quad 0 \quad 0 \quad -\frac{11\sqrt{105}}{1680} \quad 0 \quad -\frac{11\sqrt{105}i}{1680} \quad 0 \quad 0$	
	$0 \quad 0 \quad \frac{3\sqrt{7}}{112} \quad 0 \quad \frac{3\sqrt{7}i}{112} \quad 0 \quad 0 \quad 0 \quad \frac{11\sqrt{105}}{1680} \quad 0 \quad -\frac{11\sqrt{105}i}{1680} \quad 0 \quad 0 \quad 0$	
	$0 \quad \frac{\sqrt{105}}{120} \quad \frac{\sqrt{7}i}{28} \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{7}i}{56} \quad -\frac{\sqrt{105}i}{420} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0$	
	$-\frac{\sqrt{105}}{120} \quad 0 \quad 0 \quad -\frac{\sqrt{7}i}{28} \quad 0 \quad 0 \quad \frac{\sqrt{7}i}{56} \quad 0 \quad 0 \quad \frac{\sqrt{105}i}{420} \quad 0 \quad 0 \quad 0 \quad 0$	
	$0 \quad \frac{\sqrt{105}i}{120} \quad 0 \quad 0 \quad \frac{\sqrt{7}i}{28} \quad 0 \quad 0 \quad \frac{\sqrt{7}}{56} \quad 0 \quad 0 \quad \frac{\sqrt{105}i}{420} \quad 0 \quad 0 \quad 0$	
	$\frac{\sqrt{105}i}{120} \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{7}i}{28} \quad -\frac{\sqrt{7}}{56} \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{105}i}{420} \quad 0 \quad 0$	
	$0 \quad 0 \quad 0 \quad \frac{5\sqrt{7}i}{112} \quad 0 \quad \frac{5\sqrt{7}}{112} \quad -\frac{\sqrt{7}i}{14} \quad 0 \quad 0 \quad \frac{\sqrt{105}i}{80} \quad 0 \quad -\frac{\sqrt{105}}{80} \quad 0 \quad 0$	
	$0 \quad 0 \quad \frac{5\sqrt{7}i}{112} \quad 0 \quad -\frac{5\sqrt{7}}{112} \quad 0 \quad 0 \quad \frac{\sqrt{7}i}{14} \quad \frac{\sqrt{105}i}{80} \quad 0 \quad \frac{\sqrt{105}}{80} \quad 0 \quad 0 \quad 0$	
619	symmetry	$-\frac{x^2}{2} - \frac{y^2}{2} + z^2$
$\mathbb{G}_{2,0}^{(a)}(E_u)$	$0 \quad 0 \quad 0$	
	$0 \quad 0 \quad 0$	
	$\frac{\sqrt{70}}{28} \quad 0 \quad 0$	
	$0 \quad \frac{\sqrt{70}}{28} \quad 0 \quad 0$	
	$0 \quad 0 \quad \frac{\sqrt{42}}{56} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{70}}{56} \quad 0 \quad 0 \quad 0 \quad 0$	
	$0 \quad 0 \quad 0 \quad \frac{\sqrt{42}}{56} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{70}}{56} \quad 0 \quad 0 \quad 0 \quad 0$	
	$0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{42}}{56} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{70}}{56} \quad 0 \quad 0 \quad 0$	
	$0 \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{42}}{56} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{70}}{56} \quad 0 \quad 0$	
	$0 \quad 0 \quad -\frac{\sqrt{70}}{28} \quad 0$	
	$0 \quad 0 \quad -\frac{\sqrt{70}}{28}$	
620	symmetry	$\frac{\sqrt{3}(x-y)(x+y)}{2}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{G}_{2,1}^{(a)}(E_u)$	$-\frac{\sqrt{70}}{28}$	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 0 0 0 0 0 0 0 0 0
	0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
	0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
	0	0 0 $\frac{\sqrt{14}}{56}$ 0 0 0 0 0 $-\frac{\sqrt{210}}{56}$ 0 0 0 0 0 0 0
	0	0 0 0 $\frac{\sqrt{14}}{56}$ 0 0 0 0 0 $-\frac{\sqrt{210}}{56}$ 0 0 0 0 0 0
	0	0 0 0 0 $\frac{\sqrt{14}}{56}$ 0 0 0 0 0 $\frac{\sqrt{210}}{56}$ 0 0 0 0 0
	0	0 0 0 0 0 $\frac{\sqrt{14}}{56}$ 0 0 0 0 0 0 $\frac{\sqrt{210}}{56}$ 0 0
	0	0 0 0 0 0 0 $-\frac{\sqrt{14}}{28}$ 0 0 0 0 0 0 0 0 0
	0	0 0 0 0 0 0 0 $-\frac{\sqrt{14}}{28}$ 0 0 0 0 0 0 0 0
621 symmetry		$\sqrt{3}yz$
	0	0 0 $-\frac{\sqrt{42}}{56}$ 0 0 0 0 0 $-\frac{\sqrt{70}}{56}$ 0 0 0 0 0 0
	0	0 0 0 $-\frac{\sqrt{42}}{56}$ 0 0 0 0 0 $-\frac{\sqrt{70}}{56}$ 0 0 0 0 0
	0	0 0 $-\frac{\sqrt{14}}{56}$ 0 0 0 0 0 $\frac{\sqrt{210}}{56}$ 0 0 0 0 0
	0	0 0 0 $-\frac{\sqrt{14}}{56}$ 0 0 0 0 0 $\frac{\sqrt{210}}{56}$ 0 0 0 0
	0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
	0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
	0	0 0 0 0 0 0 $-\frac{\sqrt{14}}{14}$ 0 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 $\frac{\sqrt{14}}{14}$ 0 0 0 0 0 0 0 0 0 0 0
622 symmetry		$\sqrt{3}xz$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{G}_{2,1}^{(a)}(T_u)$		$\begin{bmatrix} 0 & 0 & 0 & 0 & \frac{\sqrt{42}}{56} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}}{56} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{42}}{56} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}}{56} & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{14}}{56} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{210}}{56} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{14}}{56} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{210}}{56} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{14}}{14} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{14}}{14} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{14}}{14} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{14}}{14} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
623	symmetry	$\sqrt{3}xy$
$\mathbb{G}_{2,2}^{(a)}(T_u)$		$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{70}}{28} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{70}}{28} \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{14}}{28} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{14}}{28} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{14}}{14} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{14}}{14} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{14}}{14} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{14}}{14} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
624	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
	$\mathbb{G}_4^{(a)}(A_u)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{6} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{6} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{6} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{6} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{6} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{6} & 0 \end{bmatrix}$
625	symmetry	$-\frac{\sqrt{15}(x^4 - 12x^2y^2 + 6x^2z^2 + y^4 + 6y^2z^2 - 2z^4)}{12}$ $\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ -\frac{\sqrt{105}}{35} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{105}}{35} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & \frac{3\sqrt{7}}{28} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{105}}{420} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{3\sqrt{7}}{28} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{105}}{420} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{3\sqrt{7}}{28} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{105}}{420} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{7}}{28} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{105}}{420} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{105}}{210} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{105}}{210} \end{bmatrix}$
626	symmetry	$\frac{\sqrt{5}(x-y)(x+y)(x^2+y^2-6z^2)}{4}$

continued ...

Table 9

No.	multipole	matrix
	$\mathbb{G}_{4,1}^{(a)}(E_u)$	$\begin{bmatrix} \frac{\sqrt{105}}{35} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{105}}{35} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{21}}{28} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{35}}{140} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{21}}{28} & 0 & 0 & 0 & 0 & -\frac{\sqrt{35}}{140} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{21}}{28} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{35}}{140} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{21}}{28} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{35}}{140} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{21}}{14} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{21}}{14} & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
627	symmetry	$\frac{\sqrt{35}yz(y-z)(y+z)}{2}$ $\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{20} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{20} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{5}}{20} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{5}}{20} & 0 & 0 & 0 & 0 \\ \frac{\sqrt{5}}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{5}}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{8} & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{5}}{40} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{8} & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{5}}{40} \\ 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{8} & 0 & 0 & 0 & 0 & -\frac{3\sqrt{5}}{40} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{8} & 0 & 0 & 0 & 0 & -\frac{3\sqrt{5}}{40} & 0 & 0 & 0 & 0 \end{bmatrix}$
628	symmetry	$-\frac{\sqrt{35}xz(x-z)(x+z)}{2}$

continued ...

Table 9

No.	multipole	matrix
	$\mathbb{G}_{4,1}^{(a)}(T_u, 1)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{20} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{20} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{5}}{20} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{5}}{20} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{5}}{40} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{8} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{8} & 0 & 0 & 0 & 0 & -\frac{3\sqrt{5}}{40} \\ \frac{\sqrt{5}}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{5}}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{3}}{8} & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{5}}{40} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{3}}{8} & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{5}}{40} & 0 & 0 & 0 & 0 \end{bmatrix}$
629	symmetry	$\frac{\sqrt{35}xy(x-y)(x+y)}{2}$ $\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}}{10} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}}{10} \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{8} & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{5}}{40} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{8} & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{5}}{40} & 0 \\ 0 & 0 & 0 & \frac{\sqrt{3}}{8} & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{5}}{40} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{3}}{8} & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{5}}{40} & 0 & 0 & 0 & 0 \\ \frac{\sqrt{5}}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{5}}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
630	symmetry	$\frac{\sqrt{5}yz(6x^2-y^2-z^2)}{2}$

continued ...

Table 9

No.	multipole	matrix
$\text{Gr}_{4,0}^{(a)}(T_u, 2)$	$0 \ 0 \ \frac{3\sqrt{7}}{28} \ 0 \ 0 \ 0 \ 0 \ 0 \ -\frac{\sqrt{105}}{70} \ 0 \ 0 \ 0 \ 0 \ 0 \ 0$	
	$0 \ 0 \ 0 \ \frac{3\sqrt{7}}{28} \ 0 \ 0 \ 0 \ 0 \ 0 \ -\frac{\sqrt{105}}{70} \ 0 \ 0 \ 0 \ 0 \ 0 \ 0$	
	$0 \ 0 \ \frac{\sqrt{21}}{28} \ 0 \ 0 \ 0 \ 0 \ 0 \ \frac{3\sqrt{35}}{70} \ 0 \ 0 \ 0 \ 0 \ 0 \ 0$	
	$0 \ 0 \ 0 \ \frac{\sqrt{21}}{28} \ 0 \ 0 \ 0 \ 0 \ 0 \ \frac{3\sqrt{35}}{70} \ 0 \ 0 \ 0 \ 0 \ 0 \ 0$	
	$0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0$	
	$0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0$	
	$0 \ 0 \ 0 \ 0 \ 0 \ 0 \ \frac{\sqrt{21}}{56} \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ \frac{\sqrt{35}}{40} \ 0$	
	$0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ \frac{\sqrt{21}}{56} \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ \frac{\sqrt{35}}{40}$	
	$0 \ 0 \ 0 \ 0 \ -\frac{\sqrt{21}}{56} \ 0 \ 0 \ 0 \ 0 \ 0 \ \frac{\sqrt{35}}{40} \ 0 \ 0 \ 0 \ 0$	
	$0 \ 0 \ 0 \ 0 \ 0 \ -\frac{\sqrt{21}}{56} \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ \frac{\sqrt{35}}{40} \ 0 \ 0$	
631	symmetry	$-\frac{\sqrt{5}xz(x^2-6y^2+z^2)}{2}$
$\text{Gr}_{4,1}^{(a)}(T_u, 2)$	$0 \ 0 \ 0 \ 0 \ -\frac{3\sqrt{7}}{28} \ 0 \ 0 \ 0 \ 0 \ 0 \ -\frac{\sqrt{105}}{70} \ 0 \ 0 \ 0 \ 0 \ 0$	
	$0 \ 0 \ 0 \ 0 \ 0 \ -\frac{3\sqrt{7}}{28} \ 0 \ 0 \ 0 \ 0 \ 0 \ -\frac{\sqrt{105}}{70} \ 0 \ 0 \ 0 \ 0$	
	$0 \ 0 \ 0 \ 0 \ \frac{\sqrt{21}}{28} \ 0 \ 0 \ 0 \ 0 \ 0 \ -\frac{3\sqrt{35}}{70} \ 0 \ 0 \ 0 \ 0$	
	$0 \ 0 \ 0 \ 0 \ 0 \ \frac{\sqrt{21}}{28} \ 0 \ 0 \ 0 \ 0 \ 0 \ -\frac{3\sqrt{35}}{70} \ 0 \ 0 \ 0$	
	$0 \ 0 \ 0 \ 0 \ 0 \ 0 \ -\frac{\sqrt{21}}{56} \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ \frac{\sqrt{35}}{40} \ 0$	
	$0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ -\frac{\sqrt{21}}{56} \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ \frac{\sqrt{35}}{40}$	
	$0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0$	
	$0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0$	
	$0 \ 0 \ \frac{\sqrt{21}}{56} \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ \frac{\sqrt{35}}{40} \ 0 \ 0 \ 0 \ 0 \ 0 \ 0$	
	$0 \ 0 \ 0 \ \frac{\sqrt{21}}{56} \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ \frac{\sqrt{35}}{40} \ 0 \ 0 \ 0 \ 0 \ 0 \ 0$	
632	symmetry	$-\frac{\sqrt{5}xy(x^2+y^2-6z^2)}{2}$

continued ..

Table 9

No.	multipole	matrix
	$\mathbb{G}_{4,2}^{(a)}(T_u, 2)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{105}}{35} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{105}}{35} \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{21}}{14} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{21}}{14} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{21}}{56} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{35}}{40} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{21}}{56} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{35}}{40} & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{21}}{56} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{35}}{40} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{21}}{56} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{35}}{40} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
633	symmetry	$-\frac{x^2}{2} - \frac{y^2}{2} + z^2$
	$\mathbb{G}_{2,0}^{(1,-1;a)}(E_u)$	$\begin{bmatrix} 0 & 0 & 0 & \frac{\sqrt{210}i}{280} & 0 & \frac{\sqrt{210}}{280} & \frac{\sqrt{210}i}{70} & 0 & 0 & \frac{\sqrt{14}i}{56} & 0 & -\frac{\sqrt{14}}{56} & 0 & 0 \\ 0 & 0 & \frac{\sqrt{210}i}{280} & 0 & -\frac{\sqrt{210}}{280} & 0 & 0 & -\frac{\sqrt{210}i}{70} & \frac{\sqrt{14}i}{56} & 0 & \frac{\sqrt{14}}{56} & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{3\sqrt{70}i}{280} & 0 & \frac{3\sqrt{70}}{280} & 0 & 0 & 0 & \frac{\sqrt{42}i}{168} & 0 & \frac{\sqrt{42}}{168} & \frac{\sqrt{42}i}{42} & 0 \\ 0 & 0 & -\frac{3\sqrt{70}i}{280} & 0 & -\frac{3\sqrt{70}}{280} & 0 & 0 & 0 & \frac{\sqrt{42}i}{168} & 0 & -\frac{\sqrt{42}}{168} & 0 & 0 & -\frac{\sqrt{42}i}{42} \\ 0 & -\frac{\sqrt{42}i}{84} & 0 & 0 & -\frac{\sqrt{70}i}{70} & 0 & 0 & \frac{\sqrt{70}}{140} & 0 & 0 & \frac{\sqrt{42}i}{42} & 0 & 0 & \frac{\sqrt{42}}{84} \\ -\frac{\sqrt{42}i}{84} & 0 & 0 & 0 & 0 & \frac{\sqrt{70}i}{70} & -\frac{\sqrt{70}}{140} & 0 & 0 & 0 & 0 & -\frac{\sqrt{42}i}{42} & -\frac{\sqrt{42}}{84} & 0 \\ 0 & -\frac{\sqrt{42}}{84} & -\frac{\sqrt{70}i}{70} & 0 & 0 & 0 & 0 & \frac{\sqrt{70}i}{140} & -\frac{\sqrt{42}i}{42} & 0 & 0 & 0 & 0 & -\frac{\sqrt{42}i}{84} & 0 \\ \frac{\sqrt{42}}{84} & 0 & 0 & \frac{\sqrt{70}i}{70} & 0 & 0 & \frac{\sqrt{70}i}{140} & 0 & 0 & \frac{\sqrt{42}i}{42} & 0 & 0 & -\frac{\sqrt{42}i}{84} & 0 \\ \frac{\sqrt{42}i}{42} & 0 & 0 & \frac{\sqrt{70}}{140} & 0 & \frac{\sqrt{70}i}{140} & 0 & 0 & 0 & -\frac{\sqrt{42}}{84} & 0 & \frac{\sqrt{42}i}{84} & 0 & 0 \\ 0 & -\frac{\sqrt{42}i}{42} & -\frac{\sqrt{70}}{140} & 0 & \frac{\sqrt{70}i}{140} & 0 & 0 & 0 & \frac{\sqrt{42}}{84} & 0 & \frac{\sqrt{42}i}{84} & 0 & 0 & 0 \end{bmatrix}$
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 $-\frac{3\sqrt{70}i}{280}$ 0 $\frac{3\sqrt{70}}{280}$ 0 0 0 0 $-\frac{\sqrt{42}i}{56}$ 0 $-\frac{\sqrt{42}}{56}$ 0 0	
	0 0 $-\frac{3\sqrt{70}i}{280}$ 0 $-\frac{3\sqrt{70}}{280}$ 0 0 0 0 $-\frac{\sqrt{42}i}{56}$ 0 $\frac{\sqrt{42}}{56}$ 0 0 0	
	0 0 0 $\frac{3\sqrt{210}i}{280}$ 0 $\frac{3\sqrt{210}}{280}$ 0 0 0 0 $-\frac{\sqrt{14}i}{56}$ 0 $\frac{\sqrt{14}}{56}$ 0 0 0	
	0 0 $\frac{3\sqrt{210}i}{280}$ 0 $-\frac{3\sqrt{210}}{280}$ 0 0 0 0 $-\frac{\sqrt{14}i}{56}$ 0 $-\frac{\sqrt{14}}{56}$ 0 0 0	
	0 $\frac{\sqrt{14}i}{28}$ 0 0 0 0 0 $\frac{\sqrt{210}}{140}$ 0 0 0 0 0 0 $\frac{\sqrt{14}}{28}$	
	$\frac{\sqrt{14}i}{28}$ 0 0 0 0 0 $-\frac{\sqrt{210}}{140}$ 0 0 0 0 0 0 $-\frac{\sqrt{14}}{28}$ 0	
	0 $-\frac{\sqrt{14}}{28}$ 0 0 0 0 0 $-\frac{\sqrt{210}i}{140}$ 0 0 0 0 0 0 $\frac{\sqrt{14}i}{28}$	
	$\frac{\sqrt{14}}{28}$ 0 0 0 0 0 $-\frac{\sqrt{210}i}{140}$ 0 0 0 0 0 0 $\frac{\sqrt{14}i}{28}$ 0	
	0 0 0 $\frac{\sqrt{210}}{140}$ 0 $-\frac{\sqrt{210}i}{140}$ 0 0 0 0 $-\frac{\sqrt{14}}{28}$ 0 $-\frac{\sqrt{14}i}{28}$ 0 0	
	0 0 $-\frac{\sqrt{210}}{140}$ 0 $-\frac{\sqrt{210}i}{140}$ 0 0 0 0 $\frac{\sqrt{14}}{28}$ 0 $-\frac{\sqrt{14}i}{28}$ 0 0 0	
635	symmetry	$\sqrt{3}yz$
$\mathbb{G}_{2,0}^{(1,-1;a)}(T_u)$	0 0 0 0 $-\frac{3\sqrt{70}i}{280}$ 0 0 $\frac{3\sqrt{70}}{140}$ 0 0 0 $\frac{\sqrt{42}i}{56}$ 0 0 0	
	0 0 0 0 0 $\frac{3\sqrt{70}i}{280}$ $-\frac{3\sqrt{70}}{140}$ 0 0 0 0 0 $-\frac{\sqrt{42}i}{56}$ 0 0 0	
	0 0 0 0 $-\frac{3\sqrt{210}i}{280}$ 0 0 0 0 0 $-\frac{\sqrt{14}i}{56}$ 0 0 0 $\frac{\sqrt{14}}{28}$	
	0 0 0 0 0 $\frac{3\sqrt{210}i}{280}$ 0 0 0 0 0 0 $\frac{\sqrt{14}i}{56}$ $-\frac{\sqrt{14}}{28}$ 0	
	0 0 0 0 0 $-\frac{\sqrt{210}}{140}$ $-\frac{\sqrt{210}i}{140}$ 0 0 0 0 0 $\frac{\sqrt{14}}{28}$ $-\frac{\sqrt{14}i}{28}$ 0	
	0 0 0 0 $\frac{\sqrt{210}}{140}$ 0 0 $\frac{\sqrt{210}i}{140}$ 0 0 0 $-\frac{\sqrt{14}}{28}$ 0 0 0 $\frac{\sqrt{14}i}{28}$	
	$\frac{\sqrt{14}i}{28}$ 0 0 $-\frac{\sqrt{210}}{140}$ 0 0 0 0 0 $-\frac{\sqrt{14}}{28}$ 0 0 0 0	
	0 $-\frac{\sqrt{14}i}{28}$ $\frac{\sqrt{210}}{140}$ 0 0 0 0 0 $\frac{\sqrt{14}}{28}$ 0 0 0 0 0	
	0 $\frac{\sqrt{14}}{28}$ $-\frac{\sqrt{210}i}{140}$ 0 0 0 0 0 0 $\frac{\sqrt{14}i}{28}$ 0 0 0 0	
	$-\frac{\sqrt{14}}{28}$ 0 0 $\frac{\sqrt{210}i}{140}$ 0 0 0 0 0 $-\frac{\sqrt{14}i}{28}$ 0 0 0 0	
636	symmetry	$\sqrt{3}xz$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{G}_{2,1}^{(1,-1;a)}(T_u)$	0 0 $-\frac{3\sqrt{70}i}{280}$ 0 0 0 0 $\frac{3\sqrt{70}i}{140}$ $-\frac{\sqrt{42}i}{56}$ 0 0 0 0 0 0	
	0 0 0 $\frac{3\sqrt{70}i}{280}$ 0 0 0 $\frac{3\sqrt{70}i}{140}$ 0 0 $\frac{\sqrt{42}i}{56}$ 0 0 0 0 0	
	0 0 $\frac{3\sqrt{210}i}{280}$ 0 0 0 0 0 0 $-\frac{\sqrt{14}i}{56}$ 0 0 0 0 0 $\frac{\sqrt{14}i}{28}$	
	0 0 0 $-\frac{3\sqrt{210}i}{280}$ 0 0 0 0 0 0 $\frac{\sqrt{14}i}{56}$ 0 0 0 $\frac{\sqrt{14}i}{28}$ 0	
	$\frac{\sqrt{14}i}{28}$ 0 0 0 0 $-\frac{\sqrt{210}i}{140}$ 0 0 0 0 0 0 $\frac{\sqrt{14}i}{28}$ 0 0 0	
	0 $-\frac{\sqrt{14}i}{28}$ 0 0 $-\frac{\sqrt{210}i}{140}$ 0 0 0 $-\frac{\sqrt{210}i}{140}$ 0 0 $-\frac{\sqrt{14}i}{28}$ 0 0 $\frac{\sqrt{14}i}{28}$ 0	
	0 0 0 $-\frac{\sqrt{210}i}{140}$ 0 0 0 $-\frac{\sqrt{210}i}{140}$ 0 0 $-\frac{\sqrt{14}i}{28}$ 0 0 0 $\frac{\sqrt{14}i}{28}$ 0	
	0 $\frac{\sqrt{14}i}{28}$ 0 0 $-\frac{\sqrt{210}i}{140}$ 0 0 0 0 0 0 $-\frac{\sqrt{14}i}{28}$ 0 0 0	
	$\frac{\sqrt{14}i}{28}$ 0 0 0 0 $\frac{\sqrt{210}i}{140}$ 0 0 0 0 0 $\frac{\sqrt{14}i}{28}$ 0 0 0	
637	symmetry	$\sqrt{3}xy$
$\mathbb{G}_{2,2}^{(1,-1;a)}(T_u)$	0 0 0 $-\frac{3\sqrt{70}}{280}$ 0 $-\frac{3\sqrt{70}i}{280}$ 0 0 0 $-\frac{\sqrt{42}}{56}$ 0 $\frac{\sqrt{42}i}{56}$ 0 0	
	0 0 $\frac{3\sqrt{70}}{280}$ 0 $-\frac{3\sqrt{70}i}{280}$ 0 0 0 $\frac{\sqrt{42}}{56}$ 0 $\frac{\sqrt{42}i}{56}$ 0 0 0	
	0 0 0 $\frac{3\sqrt{210}}{280}$ 0 $-\frac{3\sqrt{210}i}{280}$ 0 0 0 $-\frac{\sqrt{14}}{56}$ 0 $-\frac{\sqrt{14}i}{56}$ 0 0 0	
	0 0 $-\frac{3\sqrt{210}}{280}$ 0 $-\frac{3\sqrt{210}i}{280}$ 0 0 0 $\frac{\sqrt{14}}{56}$ 0 $-\frac{\sqrt{14}i}{56}$ 0 0 0	
	$\frac{\sqrt{14}}{28}$ 0 0 0 0 0 $-\frac{\sqrt{210}i}{140}$ 0 0 0 0 0 0 $-\frac{\sqrt{14}i}{28}$	
	$-\frac{\sqrt{14}}{28}$ 0 0 0 0 0 $-\frac{\sqrt{210}i}{140}$ 0 0 0 0 0 $-\frac{\sqrt{14}i}{28}$ 0	
	0 $\frac{\sqrt{14}i}{28}$ 0 0 0 0 $-\frac{\sqrt{210}}{140}$ 0 0 0 0 0 0 $\frac{\sqrt{14}}{28}$	
	$\frac{\sqrt{14}i}{28}$ 0 0 0 0 $\frac{\sqrt{210}}{140}$ 0 0 0 0 0 0 $-\frac{\sqrt{14}}{28}$ 0	
	0 0 0 $-\frac{\sqrt{210}i}{140}$ 0 $-\frac{\sqrt{210}}{140}$ 0 0 0 $\frac{\sqrt{14}i}{28}$ 0 $-\frac{\sqrt{14}}{28}$ 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 0 0 $-\frac{\sqrt{5}i}{30}$ 0 $-\frac{\sqrt{5}}{30}$ $\frac{\sqrt{5}i}{15}$ 0 0 $\frac{\sqrt{3}i}{12}$ 0 $-\frac{\sqrt{3}}{12}$ 0 0	
	0 0 $-\frac{\sqrt{5}i}{30}$ 0 $\frac{\sqrt{5}}{30}$ 0 0 $-\frac{\sqrt{5}i}{15}$ $\frac{\sqrt{3}i}{12}$ 0 $\frac{\sqrt{3}}{12}$ 0 0 0	
	0 0 0 $\frac{\sqrt{15}i}{30}$ 0 $-\frac{\sqrt{15}}{30}$ 0 0 0 $\frac{i}{12}$ 0 $\frac{1}{12}$ $-\frac{i}{6}$ 0	
	0 0 $\frac{\sqrt{15}i}{30}$ 0 $\frac{\sqrt{15}}{30}$ 0 0 0 $\frac{i}{12}$ 0 $-\frac{1}{12}$ 0 0 $\frac{i}{6}$	
	0 $-\frac{i}{6}$ 0 0 $-\frac{\sqrt{15}i}{120}$ 0 0 $-\frac{\sqrt{15}}{120}$ 0 0 $\frac{i}{24}$ 0 0 $-\frac{1}{24}$	
	$-\frac{i}{6}$ 0 0 0 0 $\frac{\sqrt{15}i}{120}$ $\frac{\sqrt{15}}{120}$ 0 0 0 0 $-\frac{i}{24}$ $\frac{1}{24}$ 0	
	0 $-\frac{1}{6}$ $-\frac{\sqrt{15}i}{120}$ 0 0 0 0 $-\frac{\sqrt{15}i}{120}$ $-\frac{i}{24}$ 0 0 0 0 $\frac{i}{24}$	
	$\frac{1}{6}$ 0 0 $\frac{\sqrt{15}i}{120}$ 0 0 0 $-\frac{\sqrt{15}i}{120}$ 0 0 $\frac{i}{24}$ 0 0 $\frac{i}{24}$ 0	
	$-\frac{i}{6}$ 0 0 $-\frac{\sqrt{15}}{120}$ 0 $-\frac{\sqrt{15}i}{120}$ 0 0 0 $\frac{1}{24}$ 0 $-\frac{i}{24}$ 0 0	
	0 $\frac{i}{6}$ $\frac{\sqrt{15}}{120}$ 0 $-\frac{\sqrt{15}i}{120}$ 0 0 0 $-\frac{1}{24}$ 0 $-\frac{i}{24}$ 0 0 0	
639	symmetry	$-\frac{\sqrt{15}(x^4 - 12x^2y^2 + 6x^2z^2 + y^4 + 6y^2z^2 - 2z^4)}{12}$
$\mathbb{G}_{4,0}^{(1,-1;a)}(E_u)$	0 0 0 $\frac{11\sqrt{7}i}{168}$ 0 $\frac{11\sqrt{7}}{168}$ $\frac{\sqrt{7}i}{21}$ 0 0 $-\frac{\sqrt{105}i}{168}$ 0 $\frac{\sqrt{105}}{168}$ 0 0	
	0 0 $\frac{11\sqrt{7}i}{168}$ 0 $-\frac{11\sqrt{7}}{168}$ 0 0 $-\frac{\sqrt{7}i}{21}$ $-\frac{\sqrt{105}i}{168}$ 0 $-\frac{\sqrt{105}}{168}$ 0 0 0	
	0 0 0 $\frac{\sqrt{21}i}{168}$ 0 $-\frac{\sqrt{21}}{168}$ 0 0 0 $-\frac{\sqrt{35}i}{168}$ 0 $-\frac{\sqrt{35}}{168}$ $-\frac{\sqrt{35}i}{42}$ 0	
	0 0 $\frac{\sqrt{21}i}{168}$ 0 $\frac{\sqrt{21}}{168}$ 0 0 0 $-\frac{\sqrt{35}i}{168}$ 0 $\frac{\sqrt{35}}{168}$ 0 0 $\frac{\sqrt{35}i}{42}$	
	0 $\frac{\sqrt{35}i}{84}$ 0 0 $-\frac{\sqrt{21}i}{168}$ 0 0 $-\frac{\sqrt{21}}{168}$ 0 0 $\frac{\sqrt{35}i}{168}$ 0 0 $\frac{5\sqrt{35}}{168}$	
	$\frac{\sqrt{35}i}{84}$ 0 0 0 $\frac{\sqrt{21}i}{168}$ $\frac{\sqrt{21}}{168}$ 0 0 0 0 $-\frac{\sqrt{35}i}{168}$ $-\frac{5\sqrt{35}}{168}$ 0	
	0 $\frac{\sqrt{35}}{84}$ $-\frac{\sqrt{21}i}{168}$ 0 0 0 0 $-\frac{\sqrt{21}i}{168}$ $-\frac{\sqrt{35}i}{168}$ 0 0 0 0 $-\frac{5\sqrt{35}i}{168}$	
	$-\frac{\sqrt{35}}{84}$ 0 0 $\frac{\sqrt{21}i}{168}$ 0 0 $-\frac{\sqrt{21}i}{168}$ 0 0 $\frac{\sqrt{35}i}{168}$ 0 0 $-\frac{5\sqrt{35}i}{168}$ 0	
	$-\frac{\sqrt{35}i}{42}$ 0 0 $\frac{\sqrt{21}}{84}$ 0 $\frac{\sqrt{21}i}{84}$ 0 0 0 $\frac{\sqrt{35}}{42}$ 0 $-\frac{\sqrt{35}i}{42}$ 0 0	
	0 $\frac{\sqrt{35}i}{42}$ $-\frac{\sqrt{21}}{84}$ 0 $\frac{\sqrt{21}i}{84}$ 0 0 0 $-\frac{\sqrt{35}}{42}$ 0 $-\frac{\sqrt{35}i}{42}$ 0 0 0	
640	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 $\frac{\sqrt{21}i}{168}$ 0 $-\frac{\sqrt{21}}{168}$ 0 0 0 $\frac{\sqrt{35}i}{56}$ 0 $\frac{\sqrt{35}}{56}$ 0 0	
	0 0 $\frac{\sqrt{21}i}{168}$ 0 $\frac{\sqrt{21}}{168}$ 0 0 0 $\frac{\sqrt{35}i}{56}$ 0 $-\frac{\sqrt{35}}{56}$ 0 0 0	
	0 0 0 $\frac{3\sqrt{7}i}{56}$ 0 $\frac{3\sqrt{7}}{56}$ $\frac{\sqrt{7}i}{14}$ 0 0 $\frac{\sqrt{105}i}{168}$ 0 $-\frac{\sqrt{105}}{168}$ 0 0	
	0 0 $\frac{3\sqrt{7}i}{56}$ 0 $-\frac{3\sqrt{7}}{56}$ 0 0 $-\frac{\sqrt{7}i}{14}$ $\frac{\sqrt{105}i}{168}$ 0 $\frac{\sqrt{105}}{168}$ 0 0 0	
	0 $-\frac{\sqrt{105}i}{84}$ 0 0 $\frac{\sqrt{7}i}{56}$ 0 0 $\frac{\sqrt{7}}{56}$ 0 0 $\frac{\sqrt{105}i}{56}$ 0 0 $-\frac{\sqrt{105}}{168}$	
	$-\frac{\sqrt{105}i}{84}$ 0 0 0 $-\frac{\sqrt{7}i}{56}$ $-\frac{\sqrt{7}}{56}$ 0 0 0 0 $-\frac{\sqrt{105}i}{56}$ $\frac{\sqrt{105}}{168}$ 0	
	0 $\frac{\sqrt{105}}{84}$ $-\frac{\sqrt{7}i}{56}$ 0 0 0 0 $-\frac{\sqrt{7}i}{56}$ $\frac{\sqrt{105}i}{56}$ 0 0 0 0 $-\frac{\sqrt{105}i}{168}$	
	$-\frac{\sqrt{105}}{84}$ 0 0 $\frac{\sqrt{7}i}{56}$ 0 0 $-\frac{\sqrt{7}i}{56}$ 0 0 $-\frac{\sqrt{105}i}{56}$ 0 0 $-\frac{\sqrt{105}i}{168}$ 0	
	0 0 0 0 0 0 0 0 $-\frac{\sqrt{105}}{84}$ 0 $-\frac{\sqrt{105}i}{84}$ 0 0 0	
	0 0 0 0 0 0 0 0 $\frac{\sqrt{105}}{84}$ 0 $-\frac{\sqrt{105}i}{84}$ 0 0 0	
641	symmetry	$\frac{\sqrt{35}yz(y-z)(y+z)}{2}$
$\mathbb{G}_{4,0}^{(1,-1;a)}(T_u, 1)$	0 0 0 0 $\frac{\sqrt{3}i}{48}$ 0 0 $-\frac{\sqrt{3}}{12}$ 0 0 $-\frac{\sqrt{5}i}{16}$ 0 0 0	
	0 0 0 0 0 $-\frac{\sqrt{3}i}{48}$ $\frac{\sqrt{3}}{12}$ 0 0 0 0 $\frac{\sqrt{5}i}{16}$ 0 0 0	
	0 0 0 0 $-\frac{3i}{16}$ 0 0 $\frac{1}{8}$ 0 0 $\frac{\sqrt{15}i}{48}$ 0 0 $\frac{\sqrt{15}}{24}$	
	0 0 0 0 0 $\frac{3i}{16}$ $-\frac{1}{8}$ 0 0 0 0 $-\frac{\sqrt{15}i}{48}$ $-\frac{\sqrt{15}}{24}$ 0	
	0 0 0 0 0 $\frac{1}{16}$ $-\frac{i}{16}$ 0 0 0 0 $\frac{\sqrt{15}}{48}$ $\frac{\sqrt{15}i}{48}$ 0	
	0 0 0 0 $-\frac{1}{16}$ 0 0 $\frac{i}{16}$ 0 0 $-\frac{\sqrt{15}}{48}$ 0 0 $-\frac{\sqrt{15}i}{48}$	
	$-\frac{\sqrt{15}i}{24}$ 0 0 0 0 0 0 0 $\frac{\sqrt{15}}{24}$ 0 0 0 0 0	
	0 $\frac{\sqrt{15}i}{24}$ 0 0 0 0 0 0 $-\frac{\sqrt{15}}{24}$ 0 0 0 0 0	
	0 $\frac{\sqrt{15}}{24}$ 0 0 0 0 0 0 $\frac{\sqrt{15}i}{24}$ 0 0 0 0 0	
	$-\frac{\sqrt{15}}{24}$ 0 0 0 0 0 0 0 $-\frac{\sqrt{15}i}{24}$ 0 0 0 0 0	
642	symmetry	$-\frac{\sqrt{35}xz(x-z)(x+z)}{2}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{G}_{4,1}^{(1,-1;a)}(T_u, 1)$	$\frac{\sqrt{15}i}{24}$	$\begin{bmatrix} 0 & 0 & -\frac{\sqrt{3}i}{48} & 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{12} & -\frac{\sqrt{5}i}{16} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{3}i}{48} & 0 & 0 & \frac{\sqrt{3}i}{12} & 0 & 0 & \frac{\sqrt{5}i}{16} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{3i}{16} & 0 & 0 & 0 & 0 & \frac{i}{8} & -\frac{\sqrt{15}i}{48} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{24} \\ 0 & 0 & 0 & \frac{3i}{16} & 0 & 0 & \frac{i}{8} & 0 & 0 & \frac{\sqrt{15}i}{48} & 0 & 0 & -\frac{\sqrt{15}i}{24} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{24} & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{15}i}{24} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{24} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{i}{16} & 0 & 0 & \frac{i}{16} & 0 & 0 & \frac{\sqrt{15}i}{48} & 0 & 0 & \frac{\sqrt{15}i}{48} & 0 & 0 \\ 0 & 0 & -\frac{i}{16} & 0 & 0 & 0 & 0 & -\frac{i}{16} & \frac{\sqrt{15}i}{48} & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{48} & 0 \\ 0 & -\frac{\sqrt{15}i}{24} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{24} & 0 & 0 & 0 & 0 \\ -\frac{\sqrt{15}i}{24} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{24} & 0 & 0 & 0 \end{bmatrix}$
	$\frac{\sqrt{15}i}{24}$	
643	symmetry	$\frac{\sqrt{35}xy(x-y)(x+y)}{2}$
$\mathbb{G}_{4,2}^{(1,-1;a)}(T_u, 1)$	$\frac{\sqrt{15}}{24}$	$\begin{bmatrix} 0 & 0 & 0 & -\frac{5\sqrt{3}}{48} & 0 & \frac{5\sqrt{3}i}{48} & 0 & 0 & 0 & \frac{\sqrt{5}}{16} & 0 & \frac{\sqrt{5}i}{16} & 0 & 0 \\ 0 & 0 & \frac{5\sqrt{3}}{48} & 0 & \frac{5\sqrt{3}i}{48} & 0 & 0 & 0 & -\frac{\sqrt{5}}{16} & 0 & \frac{\sqrt{5}i}{16} & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{1}{16} & 0 & \frac{i}{16} & 0 & 0 & 0 & \frac{\sqrt{15}}{48} & 0 & -\frac{\sqrt{15}i}{48} & 0 & 0 \\ 0 & 0 & -\frac{1}{16} & 0 & \frac{i}{16} & 0 & 0 & 0 & -\frac{\sqrt{15}}{48} & 0 & -\frac{\sqrt{15}i}{48} & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{15}}{24} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{24} & 0 & 0 \\ \frac{\sqrt{15}}{24} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{24} & 0 & 0 \\ 0 & \frac{\sqrt{15}i}{24} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{24} & 0 \\ \frac{\sqrt{15}i}{24} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{24} & 0 & 0 \\ 0 & 0 & 0 & \frac{i}{16} & 0 & -\frac{1}{16} & 0 & 0 & 0 & \frac{\sqrt{15}i}{48} & 0 & \frac{\sqrt{15}}{48} & 0 & 0 \end{bmatrix}$
	$\frac{\sqrt{15}}{24}$	
644	symmetry	$\frac{\sqrt{5}yz(6x^2-y^2-z^2)}{2}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{G}_{4,0}^{(1,-1;a)}(T_u, 2)$	0 0 0 0 $\frac{11\sqrt{21}i}{336}$ 0 0 $-\frac{\sqrt{21}}{84}$ 0 0 $\frac{\sqrt{35}i}{112}$ 0 0 0	
	0 0 0 0 0 $-\frac{11\sqrt{21}i}{336}$ $\frac{\sqrt{21}}{84}$ 0 0 0 0 $-\frac{\sqrt{35}i}{112}$ 0 0	
	0 0 0 0 $-\frac{\sqrt{7}i}{112}$ 0 0 $-\frac{3\sqrt{7}}{56}$ 0 0 $-\frac{\sqrt{105}i}{336}$ 0 0 $\frac{\sqrt{105}}{168}$	
	0 0 0 0 0 $\frac{\sqrt{7}i}{112}$ $\frac{3\sqrt{7}}{56}$ 0 0 0 0 $\frac{\sqrt{105}i}{336}$ $-\frac{\sqrt{105}}{168}$ 0	
	0 0 0 $-\frac{\sqrt{7}i}{14}$ 0 $-\frac{\sqrt{7}}{112}$ $-\frac{\sqrt{7}i}{112}$ 0 0 0 0 $-\frac{5\sqrt{105}}{336}$ $\frac{5\sqrt{105}i}{336}$ 0	
	0 0 $-\frac{\sqrt{7}i}{14}$ 0 $\frac{\sqrt{7}}{112}$ 0 0 $\frac{\sqrt{7}i}{112}$ 0 0 $\frac{5\sqrt{105}}{336}$ 0 0 $-\frac{5\sqrt{105}i}{336}$	
	$\frac{\sqrt{105}i}{168}$ 0 0 $\frac{\sqrt{7}}{56}$ 0 $-\frac{\sqrt{7}i}{14}$ 0 0 0 $-\frac{\sqrt{105}}{84}$ 0 0 0	
	0 $-\frac{\sqrt{105}i}{168}$ $-\frac{\sqrt{7}}{56}$ 0 $-\frac{\sqrt{7}i}{14}$ 0 0 0 $\frac{\sqrt{105}}{84}$ 0 0 0 0	
	0 $\frac{\sqrt{105}}{168}$ $\frac{\sqrt{7}i}{56}$ 0 0 0 0 $-\frac{\sqrt{7}i}{14}$ $\frac{\sqrt{105}i}{84}$ 0 0 0 0	
	$-\frac{\sqrt{105}}{168}$ 0 0 $-\frac{\sqrt{7}i}{56}$ 0 0 $-\frac{\sqrt{7}i}{14}$ 0 0 $-\frac{\sqrt{105}i}{84}$ 0 0 0	
645	symmetry	$-\frac{\sqrt{5}xz(x^2 - 6y^2 + z^2)}{2}$
$\mathbb{G}_{4,1}^{(1,-1;a)}(T_u, 2)$	0 0 $\frac{11\sqrt{21}i}{336}$ 0 0 0 0 $-\frac{\sqrt{21}i}{84}$ $-\frac{\sqrt{35}i}{112}$ 0 0 0 0	
	0 0 0 $-\frac{11\sqrt{21}i}{336}$ 0 0 $-\frac{\sqrt{21}i}{84}$ 0 0 $\frac{\sqrt{35}i}{112}$ 0 0 0 0	
	0 0 $\frac{\sqrt{7}i}{112}$ 0 0 0 0 $\frac{3\sqrt{7}i}{56}$ $-\frac{\sqrt{105}i}{336}$ 0 0 0 0 $\frac{\sqrt{105}i}{168}$	
	0 0 0 $-\frac{\sqrt{7}i}{112}$ 0 0 $\frac{3\sqrt{7}i}{56}$ 0 0 $\frac{\sqrt{105}i}{336}$ 0 0 $\frac{\sqrt{105}i}{168}$ 0	
	$\frac{\sqrt{105}i}{168}$ 0 0 $-\frac{\sqrt{7}}{14}$ 0 $\frac{\sqrt{7}i}{56}$ 0 0 0 0 0 $\frac{\sqrt{105}i}{84}$ 0 0	
	0 $-\frac{\sqrt{105}i}{168}$ $\frac{\sqrt{7}}{14}$ 0 $\frac{\sqrt{7}i}{56}$ 0 0 0 0 0 $\frac{\sqrt{105}i}{84}$ 0 0 0	
	0 0 0 $-\frac{\sqrt{7}i}{112}$ 0 $-\frac{\sqrt{7}}{14}$ $-\frac{\sqrt{7}i}{112}$ 0 0 $\frac{5\sqrt{105}i}{336}$ 0 0 0 $-\frac{5\sqrt{105}i}{336}$	
	0 0 $-\frac{\sqrt{7}i}{112}$ 0 $\frac{\sqrt{7}}{14}$ 0 0 $\frac{\sqrt{7}i}{112}$ $\frac{5\sqrt{105}i}{336}$ 0 0 0 $\frac{5\sqrt{105}i}{336}$	
	0 $\frac{\sqrt{105}i}{168}$ 0 0 $\frac{\sqrt{7}i}{56}$ 0 0 $-\frac{\sqrt{7}i}{14}$ 0 0 $-\frac{\sqrt{105}i}{84}$ 0 0 0	
	$-\frac{\sqrt{105}i}{168}$ 0 0 0 0 $-\frac{\sqrt{7}i}{56}$ $\frac{\sqrt{7}}{14}$ 0 0 0 0 $\frac{\sqrt{105}i}{84}$ 0 0	
646	symmetry	$-\frac{\sqrt{5}xy(x^2 + y^2 - 6z^2)}{2}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{G}_{4,2}^{(1,-1;a)}(T_u, 2)$	0 0 0 $-\frac{\sqrt{21}}{48}$ 0 $-\frac{\sqrt{21}i}{48}$ 0 0 0 $-\frac{\sqrt{35}}{112}$ 0 $\frac{\sqrt{35}i}{112}$ 0 0	
	0 0 $\frac{\sqrt{21}}{48}$ 0 $-\frac{\sqrt{21}i}{48}$ 0 0 0 $\frac{\sqrt{35}}{112}$ 0 $\frac{\sqrt{35}i}{112}$ 0 0 0	
	0 0 0 $-\frac{5\sqrt{7}}{112}$ 0 $\frac{5\sqrt{7}i}{112}$ 0 0 0 $-\frac{\sqrt{105}}{336}$ 0 $-\frac{\sqrt{105}i}{336}$ 0 0 0	
	0 0 $\frac{5\sqrt{7}}{112}$ 0 $\frac{5\sqrt{7}i}{112}$ 0 0 0 $\frac{\sqrt{105}}{336}$ 0 $-\frac{\sqrt{105}i}{336}$ 0 0 0	
	0 $\frac{\sqrt{105}}{168}$ $-\frac{\sqrt{7}i}{14}$ 0 0 0 0 $\frac{\sqrt{7}i}{56}$ 0 0 0 0 0 $-\frac{\sqrt{105}i}{84}$	
	$-\frac{\sqrt{105}}{168}$ 0 0 $\frac{\sqrt{7}i}{14}$ 0 0 $\frac{\sqrt{7}i}{56}$ 0 0 0 0 0 $-\frac{\sqrt{105}i}{84}$ 0	
	0 $\frac{\sqrt{105}i}{168}$ 0 0 $-\frac{\sqrt{7}i}{14}$ 0 0 $\frac{\sqrt{7}}{56}$ 0 0 0 0 0 $\frac{\sqrt{105}}{84}$	
	$\frac{\sqrt{105}i}{168}$ 0 0 0 0 $\frac{\sqrt{7}i}{14}$ $-\frac{\sqrt{7}}{56}$ 0 0 0 0 0 $-\frac{\sqrt{105}}{84}$ 0	
	0 0 0 $-\frac{\sqrt{7}i}{112}$ 0 $-\frac{\sqrt{7}}{112}$ $-\frac{\sqrt{7}i}{14}$ 0 0 $-\frac{5\sqrt{105}i}{336}$ 0 $\frac{5\sqrt{105}}{336}$ 0 0	
	0 0 $-\frac{\sqrt{7}i}{112}$ 0 $\frac{\sqrt{7}}{112}$ 0 0 $\frac{\sqrt{7}i}{14}$ $-\frac{5\sqrt{105}i}{336}$ 0 $-\frac{5\sqrt{105}}{336}$ 0 0	
647	symmetry	$\frac{\sqrt{2}(2x^6 - 15x^4y^2 - 15x^4z^2 - 15x^2y^4 + 180x^2y^2z^2 - 15x^2z^4 + 2y^6 - 15y^4z^2 - 15y^2z^4 + 2z^6)}{8}$
$\mathbb{G}_6^{(1,-1;a)}(A_u, 1)$	0 0 0 $-\frac{\sqrt{770}i}{616}$ 0 $-\frac{\sqrt{770}}{616}$ $\frac{\sqrt{770}i}{308}$ 0 0 $\frac{3\sqrt{462}i}{616}$ 0 $-\frac{3\sqrt{462}}{616}$ 0 0	
	0 0 $-\frac{\sqrt{770}i}{616}$ 0 $\frac{\sqrt{770}}{616}$ 0 0 $-\frac{\sqrt{770}i}{308}$ $\frac{3\sqrt{462}i}{616}$ 0 $\frac{3\sqrt{462}}{616}$ 0 0	
	0 0 0 $\frac{\sqrt{2310}i}{616}$ 0 $-\frac{\sqrt{2310}}{616}$ 0 0 0 $\frac{3\sqrt{154}i}{616}$ 0 $\frac{3\sqrt{154}}{616}$ $-\frac{3\sqrt{154}i}{308}$ 0	
	0 0 $\frac{\sqrt{2310}i}{616}$ 0 $\frac{\sqrt{2310}}{616}$ 0 0 0 $\frac{3\sqrt{154}i}{616}$ 0 $-\frac{3\sqrt{154}}{616}$ 0 0 $\frac{3\sqrt{154}i}{308}$	
	0 $\frac{\sqrt{154}i}{77}$ 0 0 $-\frac{\sqrt{2310}i}{924}$ 0 0 $-\frac{\sqrt{2310}}{924}$ 0 0 $-\frac{3\sqrt{154}i}{308}$ 0 0 $\frac{3\sqrt{154}}{308}$	
	$\frac{\sqrt{154}i}{77}$ 0 0 0 $\frac{\sqrt{2310}i}{924}$ $\frac{\sqrt{2310}}{924}$ 0 0 0 0 $\frac{3\sqrt{154}i}{308}$ $-\frac{3\sqrt{154}}{308}$ 0	
	0 $\frac{\sqrt{154}}{77}$ $-\frac{\sqrt{2310}i}{924}$ 0 0 0 0 $-\frac{\sqrt{2310}i}{924}$ $\frac{3\sqrt{154}i}{308}$ 0 0 0 0 $-\frac{3\sqrt{154}i}{308}$	
	$-\frac{\sqrt{154}}{77}$ 0 0 $\frac{\sqrt{2310}i}{924}$ 0 0 $-\frac{\sqrt{2310}i}{924}$ 0 0 $-\frac{3\sqrt{154}i}{308}$ 0 0 $-\frac{3\sqrt{154}i}{308}$ 0	
	$\frac{\sqrt{154}i}{77}$ 0 0 $-\frac{\sqrt{2310}}{924}$ 0 $-\frac{\sqrt{2310}i}{924}$ 0 0 0 $-\frac{3\sqrt{154}i}{308}$ 0 $\frac{3\sqrt{154}i}{308}$ 0 0	
	0 $-\frac{\sqrt{154}i}{77}$ $\frac{\sqrt{2310}}{924}$ 0 $-\frac{\sqrt{2310}i}{924}$ 0 0 0 $\frac{3\sqrt{154}}{308}$ 0 $\frac{3\sqrt{154}i}{308}$ 0 0	
648	symmetry	$-\frac{\sqrt{2310}(x-y)(x+y)(x-z)(x+z)(y-z)(y+z)}{8}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{G}_6^{(1,-1;a)}(A_u, 2)$	0 0 0 $\frac{\sqrt{6}i}{24}$ 0 $-\frac{\sqrt{6}}{24}$ 0 0 0 $\frac{\sqrt{10}i}{40}$ 0 $\frac{\sqrt{10}}{40}$ $-\frac{\sqrt{10}i}{20}$ 0	
	0 0 $\frac{\sqrt{6}i}{24}$ 0 $\frac{\sqrt{6}}{24}$ 0 0 0 $\frac{\sqrt{10}i}{40}$ 0 $-\frac{\sqrt{10}}{40}$ 0 0 $\frac{\sqrt{10}i}{20}$	
	0 0 0 $\frac{\sqrt{2}i}{24}$ 0 $\frac{\sqrt{2}}{24}$ $-\frac{\sqrt{2}i}{12}$ 0 0 $-\frac{\sqrt{30}i}{40}$ 0 $\frac{\sqrt{30}}{40}$ 0 0 0	
	0 0 $\frac{\sqrt{2}i}{24}$ 0 $-\frac{\sqrt{2}}{24}$ 0 0 $\frac{\sqrt{2}i}{12}$ $-\frac{\sqrt{30}i}{40}$ 0 $-\frac{\sqrt{30}}{40}$ 0 0 0	
	0 0 0 0 $-\frac{\sqrt{2}i}{12}$ 0 0 $\frac{\sqrt{2}}{12}$ 0 0 $\frac{\sqrt{30}i}{60}$ 0 0 $\frac{\sqrt{30}}{60}$	
	0 0 0 0 0 $\frac{\sqrt{2}i}{12}$ $-\frac{\sqrt{2}}{12}$ 0 0 0 0 $-\frac{\sqrt{30}i}{60}$ $-\frac{\sqrt{30}}{60}$ 0	
	0 0 $\frac{\sqrt{2}i}{12}$ 0 0 0 $-\frac{\sqrt{2}i}{12}$ $\frac{\sqrt{30}i}{60}$ 0 0 0 0 $\frac{\sqrt{30}i}{60}$	
	0 0 0 $-\frac{\sqrt{2}i}{12}$ 0 0 $-\frac{\sqrt{2}i}{12}$ 0 0 $-\frac{\sqrt{30}i}{60}$ 0 0 $\frac{\sqrt{30}i}{60}$ 0	
	0 0 0 $-\frac{\sqrt{2}}{12}$ 0 $\frac{\sqrt{2}i}{12}$ 0 0 0 $\frac{\sqrt{30}}{60}$ 0 $\frac{\sqrt{30}i}{60}$ 0 0	
	0 0 $\frac{\sqrt{2}}{12}$ 0 $\frac{\sqrt{2}i}{12}$ 0 0 0 $-\frac{\sqrt{30}}{60}$ 0 $\frac{\sqrt{30}i}{60}$ 0 0 0	
649	symmetry	$-\frac{\sqrt{14}(x^6 - 15x^4z^2 + 15x^2z^4 + y^6 - 15y^4z^2 + 15y^2z^4 - 2z^6)}{8}$
$\mathbb{G}_{6,0}^{(1,-1;a)}(E_u)$	0 0 0 $\frac{\sqrt{110}i}{88}$ 0 $\frac{\sqrt{110}}{88}$ $\frac{\sqrt{110}i}{44}$ 0 0 $\frac{\sqrt{66}i}{88}$ 0 $-\frac{\sqrt{66}}{88}$ 0 0	
	0 0 $\frac{\sqrt{110}i}{88}$ 0 $-\frac{\sqrt{110}}{88}$ 0 0 $-\frac{\sqrt{110}i}{44}$ $\frac{\sqrt{66}i}{88}$ 0 $\frac{\sqrt{66}}{88}$ 0 0 0	
	0 0 0 $-\frac{\sqrt{330}i}{264}$ 0 $\frac{\sqrt{330}}{264}$ 0 0 0 $-\frac{\sqrt{22}i}{88}$ 0 $-\frac{\sqrt{22}}{88}$ $\frac{\sqrt{22}i}{44}$ 0	
	0 0 $-\frac{\sqrt{330}i}{264}$ 0 $-\frac{\sqrt{330}}{264}$ 0 0 0 $-\frac{\sqrt{22}i}{88}$ 0 $\frac{\sqrt{22}}{88}$ 0 0 $-\frac{\sqrt{22}i}{44}$	
	0 0 0 0 $\frac{\sqrt{330}i}{132}$ 0 0 $-\frac{\sqrt{330}}{132}$ 0 0 $-\frac{\sqrt{22}i}{44}$ 0 0 0 $-\frac{\sqrt{22}}{44}$	
	0 0 0 0 0 $-\frac{\sqrt{330}i}{132}$ $\frac{\sqrt{330}}{132}$ 0 0 0 0 $\frac{\sqrt{22}i}{44}$ $\frac{\sqrt{22}}{44}$ 0	
	0 0 $\frac{\sqrt{330}i}{132}$ 0 0 0 0 $-\frac{\sqrt{330}i}{132}$ $\frac{\sqrt{22}i}{44}$ 0 0 0 0 $\frac{\sqrt{22}i}{44}$	
	0 0 0 $-\frac{\sqrt{330}i}{132}$ 0 0 $-\frac{\sqrt{330}i}{132}$ 0 0 $-\frac{\sqrt{22}i}{44}$ 0 0 0 $\frac{\sqrt{22}i}{44}$ 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	
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
$\mathbb{G}_{6,1}^{(1,-1;a)}(E_u)$	0 0 0 $-\frac{\sqrt{330}i}{264}$ 0 $\frac{\sqrt{330}}{264}$ 0 0 0 $-\frac{\sqrt{22}i}{88}$ 0 $-\frac{\sqrt{22}}{88}$ $\frac{\sqrt{22}i}{44}$ 0	
	0 0 $-\frac{\sqrt{330}i}{264}$ 0 $-\frac{\sqrt{330}}{264}$ 0 0 0 $-\frac{\sqrt{22}i}{88}$ 0 $\frac{\sqrt{22}}{88}$ 0 0 $-\frac{\sqrt{22}i}{44}$	
	0 0 0 $\frac{5\sqrt{110}i}{264}$ 0 $\frac{5\sqrt{110}}{264}$ $\frac{\sqrt{110}i}{132}$ 0 0 0 $-\frac{\sqrt{66}i}{88}$ 0 $\frac{\sqrt{66}}{88}$ 0 0 0	
	0 0 $\frac{5\sqrt{110}i}{264}$ 0 $-\frac{5\sqrt{110}}{264}$ 0 0 0 $-\frac{\sqrt{110}i}{132}$ $-\frac{\sqrt{66}i}{88}$ 0 $-\frac{\sqrt{66}}{88}$ 0 0 0	
	0 0 0 0 $\frac{\sqrt{110}i}{132}$ 0 0 0 $-\frac{\sqrt{110}}{132}$ 0 0 0 $-\frac{\sqrt{66}i}{132}$ 0 0 $-\frac{\sqrt{66}}{132}$	
	0 0 0 0 0 $-\frac{\sqrt{110}i}{132}$ $\frac{\sqrt{110}}{132}$ 0 0 0 0 $\frac{\sqrt{66}i}{132}$ $\frac{\sqrt{66}}{132}$ 0 0	
	0 0 $-\frac{\sqrt{110}i}{132}$ 0 0 0 0 $\frac{\sqrt{110}i}{132}$ $-\frac{\sqrt{66}i}{132}$ 0 0 0 0 $-\frac{\sqrt{66}i}{132}$	
	0 0 0 $\frac{\sqrt{110}i}{132}$ 0 0 $\frac{\sqrt{110}i}{132}$ 0 0 0 $\frac{\sqrt{66}i}{132}$ 0 0 $-\frac{\sqrt{66}i}{132}$ 0	
	0 0 0 $-\frac{\sqrt{110}}{66}$ 0 $\frac{\sqrt{110}i}{66}$ 0 0 0 $\frac{\sqrt{66}}{66}$ 0 $\frac{\sqrt{66}i}{66}$ 0 0 0	
	0 0 $\frac{\sqrt{110}}{66}$ 0 $\frac{\sqrt{110}i}{66}$ 0 0 0 $-\frac{\sqrt{66}}{66}$ 0 $\frac{\sqrt{66}i}{66}$ 0 0 0	
651	symmetry	$\frac{3\sqrt{7}yz(y-z)(y+z)(10x^2-y^2-z^2)}{4}$
$\mathbb{G}_{6,0}^{(1,-1;a)}(T_u, 1)$	0 $-\frac{\sqrt{33}i}{44}$ 0 0 0 0 0 $\frac{\sqrt{55}}{88}$ 0 0 0 $\frac{\sqrt{33}i}{44}$ 0 0 $-\frac{\sqrt{33}}{88}$	
	$-\frac{\sqrt{33}i}{44}$ 0 0 0 0 0 $-\frac{\sqrt{55}}{88}$ 0 0 0 0 $-\frac{\sqrt{33}i}{44}$ $\frac{\sqrt{33}}{88}$ 0	
	0 $-\frac{\sqrt{11}i}{44}$ 0 0 $\frac{\sqrt{165}i}{132}$ 0 0 $-\frac{\sqrt{165}}{264}$ 0 0 0 0 0 0 $-\frac{3\sqrt{11}}{88}$	
	$-\frac{\sqrt{11}i}{44}$ 0 0 0 0 $-\frac{\sqrt{165}i}{132}$ $\frac{\sqrt{165}}{264}$ 0 0 0 0 0 $\frac{3\sqrt{11}}{88}$ 0	
	0 0 0 0 0 $-\frac{\sqrt{165}}{132}$ $\frac{\sqrt{165}i}{132}$ 0 0 $\frac{\sqrt{11}i}{22}$ 0 $-\frac{\sqrt{11}}{44}$ $-\frac{\sqrt{11}i}{44}$ 0	
	0 0 0 0 $\frac{\sqrt{165}}{132}$ 0 0 $-\frac{\sqrt{165}i}{132}$ $\frac{\sqrt{11}i}{22}$ 0 $\frac{\sqrt{11}}{44}$ 0 0 $\frac{\sqrt{11}i}{44}$	
	$-\frac{\sqrt{11}i}{22}$ 0 0 0 0 $\frac{\sqrt{165}i}{132}$ 0 0 0 $\frac{\sqrt{11}}{22}$ 0 $-\frac{\sqrt{11}i}{44}$ 0 0 0	
	0 $\frac{\sqrt{11}i}{22}$ 0 0 $\frac{\sqrt{165}i}{132}$ 0 0 0 $-\frac{\sqrt{11}}{22}$ 0 $-\frac{\sqrt{11}i}{44}$ 0 0 0	
	0 $\frac{\sqrt{11}}{22}$ 0 0 0 0 0 $-\frac{\sqrt{165}i}{132}$ $\frac{\sqrt{11}i}{22}$ 0 0 0 0 $-\frac{\sqrt{11}i}{44}$ 0	
	$-\frac{\sqrt{11}}{22}$ 0 0 0 0 0 $-\frac{\sqrt{165}i}{132}$ 0 0 $-\frac{\sqrt{11}i}{22}$ 0 0 0 $-\frac{\sqrt{11}i}{44}$ 0	
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	$\frac{\sqrt{33}}{44} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{55}i}{88} \quad \frac{\sqrt{33}i}{44} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{33}i}{88}$
	$-\frac{\sqrt{33}}{44}$	$0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{55}i}{88} \quad 0 \quad 0 \quad -\frac{\sqrt{33}i}{44} \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{33}i}{88} \quad 0$
	0	$-\frac{\sqrt{11}}{44} \quad \frac{\sqrt{165}i}{132} \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{165}i}{264} \quad 0 \quad \frac{3\sqrt{11}i}{88}$
	$\frac{\sqrt{11}}{44}$	$0 \quad 0 \quad -\frac{\sqrt{165}i}{132} \quad 0 \quad 0 \quad -\frac{\sqrt{165}i}{264} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{3\sqrt{11}i}{88} \quad 0$
	$\frac{\sqrt{11}i}{22}$	$0 \quad 0 \quad -\frac{\sqrt{165}}{132} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{11}}{44} \quad 0 \quad 0 \quad \frac{\sqrt{11}i}{22} \quad 0 \quad 0$
	0	$-\frac{\sqrt{11}i}{22} \quad \frac{\sqrt{165}}{132} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{11}}{44} \quad 0 \quad \frac{\sqrt{11}i}{22} \quad 0 \quad 0 \quad 0 \quad 0$
	0	$0 \quad 0 \quad \frac{\sqrt{165}i}{132} \quad 0 \quad 0 \quad -\frac{\sqrt{165}i}{132} \quad 0 \quad 0 \quad -\frac{\sqrt{11}i}{44} \quad 0 \quad 0 \quad \frac{\sqrt{11}i}{22} \quad -\frac{\sqrt{11}i}{44} \quad 0$
	0	$0 \quad 0 \quad \frac{\sqrt{165}i}{132} \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{165}i}{132} \quad -\frac{\sqrt{11}i}{44} \quad 0 \quad -\frac{\sqrt{11}}{22} \quad 0 \quad 0 \quad \frac{\sqrt{11}i}{44}$
	$0 \quad -\frac{\sqrt{11}i}{22}$	$0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{165}}{132} \quad 0 \quad 0 \quad \frac{\sqrt{11}i}{22} \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{11}i}{44}$
	$-\frac{\sqrt{11}i}{22}$	$0 \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{165}}{132} \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{11}i}{22} \quad \frac{\sqrt{11}}{44} \quad 0$
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	$0 \quad 0 \quad 0 \quad \frac{\sqrt{55}}{88} \quad 0 \quad -\frac{\sqrt{55}i}{88} \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{33}}{88} \quad 0 \quad -\frac{\sqrt{33}i}{88} \quad 0 \quad 0$
	0	$0 \quad 0 \quad -\frac{\sqrt{55}}{88} \quad 0 \quad -\frac{\sqrt{55}i}{88} \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{33}}{88} \quad 0 \quad -\frac{\sqrt{33}i}{88} \quad 0 \quad 0 \quad 0$
	$\frac{\sqrt{11}i}{22}$	$0 \quad 0 \quad 0 \quad -\frac{\sqrt{165}}{264} \quad 0 \quad -\frac{\sqrt{165}i}{264} \quad 0 \quad 0 \quad 0 \quad -\frac{3\sqrt{11}}{88} \quad 0 \quad \frac{3\sqrt{11}i}{88} \quad 0 \quad 0$
	0	$-\frac{\sqrt{11}i}{22} \quad \frac{\sqrt{165}}{264} \quad 0 \quad -\frac{\sqrt{165}i}{264} \quad 0 \quad 0 \quad 0 \quad \frac{3\sqrt{11}}{88} \quad 0 \quad \frac{3\sqrt{11}i}{88} \quad 0 \quad 0 \quad 0$
	0	$-\frac{\sqrt{11}}{22} \quad \frac{\sqrt{165}i}{132} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{11}i}{44} \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{11}i}{22}$
	$\frac{\sqrt{11}}{22}$	$0 \quad 0 \quad 0 \quad -\frac{\sqrt{165}i}{132} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{11}i}{44} \quad 0 \quad 0 \quad \frac{\sqrt{11}i}{22} \quad 0$
	0	$\frac{\sqrt{11}i}{22} \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{165}i}{132} \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{11}i}{44} \quad 0 \quad 0 \quad \frac{\sqrt{11}i}{22} \quad 0$
	$\frac{\sqrt{11}i}{22}$	$0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{165}i}{132} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{11}i}{44} \quad -\frac{\sqrt{11}}{22} \quad 0$
	0	$0 \quad 0 \quad 0 \quad -\frac{\sqrt{165}i}{132} \quad 0 \quad \frac{\sqrt{165}}{132} \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{11}i}{44} \quad 0 \quad -\frac{\sqrt{11}}{44} \quad \frac{\sqrt{11}i}{22} \quad 0$
	0	$0 \quad 0 \quad -\frac{\sqrt{165}i}{132} \quad 0 \quad -\frac{\sqrt{165}}{132} \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{11}i}{44} \quad 0 \quad \frac{\sqrt{11}}{44} \quad 0 \quad 0 \quad -\frac{\sqrt{11}i}{22}$
654	symmetry	$\frac{\sqrt{462}yz(y^2-3z^2)(3y^2-z^2)}{16}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{G}_{6,0}^{(1,-1;a)}(T_u, 2)$	0 0 0 0 $-\frac{\sqrt{30}i}{32}$ 0 0 $\frac{\sqrt{30}}{32}$ 0 0 $\frac{3\sqrt{2}i}{32}$ 0 0 $\frac{3\sqrt{2}}{32}$	
	0 0 0 0 0 $\frac{\sqrt{30}i}{32}$ $-\frac{\sqrt{30}}{32}$ 0 0 0 0 $-\frac{3\sqrt{2}i}{32}$ $-\frac{3\sqrt{2}}{32}$ 0	
	0 0 0 0 $-\frac{\sqrt{10}i}{32}$ 0 0 $\frac{\sqrt{10}}{32}$ 0 0 $\frac{\sqrt{6}i}{32}$ 0 0 $\frac{\sqrt{6}}{32}$	
	0 0 0 0 0 $\frac{\sqrt{10}i}{32}$ $-\frac{\sqrt{10}}{32}$ 0 0 0 0 $-\frac{\sqrt{6}i}{32}$ $-\frac{\sqrt{6}}{32}$ 0	
	0 0 0 0 0 $\frac{\sqrt{10}}{16}$ $\frac{\sqrt{10}i}{16}$ 0 0 0 0 $-\frac{\sqrt{6}}{16}$ $\frac{\sqrt{6}i}{16}$ 0	
	0 0 0 0 $-\frac{\sqrt{10}}{16}$ 0 0 $-\frac{\sqrt{10}i}{16}$ 0 0 $\frac{\sqrt{6}}{16}$ 0 0 $-\frac{\sqrt{6}i}{16}$	
	0 0 0 0 0 0 0 0 0 0 0 0 0 0	
	0 0 0 0 0 0 0 0 0 0 0 0 0 0	
	0 0 0 0 0 0 0 0 0 0 0 0 0 0	
	0 0 0 0 0 0 0 0 0 0 0 0 0 0	
655	symmetry	$\frac{\sqrt{462}xz(x^2-3z^2)(3x^2-z^2)}{16}$
$\mathbb{G}_{6,1}^{(1,-1;a)}(T_u, 2)$	0 0 $-\frac{\sqrt{30}i}{32}$ 0 0 0 0 $\frac{\sqrt{30}i}{32}$ $-\frac{3\sqrt{2}i}{32}$ 0 0 0 0 $-\frac{3\sqrt{2}i}{32}$	
	0 0 0 $\frac{\sqrt{30}i}{32}$ 0 0 $\frac{\sqrt{30}i}{32}$ 0 0 $\frac{3\sqrt{2}i}{32}$ 0 0 $-\frac{3\sqrt{2}i}{32}$ 0	
	0 0 $\frac{\sqrt{10}i}{32}$ 0 0 0 0 $-\frac{\sqrt{10}i}{32}$ $\frac{\sqrt{6}i}{32}$ 0 0 0 0 $\frac{\sqrt{6}i}{32}$	
	0 0 0 $-\frac{\sqrt{10}i}{32}$ 0 0 $-\frac{\sqrt{10}i}{32}$ 0 0 $-\frac{\sqrt{6}i}{32}$ 0 0 $\frac{\sqrt{6}i}{32}$ 0	
	0 0 0 0 0 0 0 0 0 0 0 0 0 0	
	0 0 0 0 0 0 0 0 0 0 0 0 0 0	
	0 0 0 $\frac{\sqrt{10}i}{16}$ 0 0 $\frac{\sqrt{10}i}{16}$ 0 0 $\frac{\sqrt{6}i}{16}$ 0 0 $-\frac{\sqrt{6}i}{16}$ 0	
	0 0 $\frac{\sqrt{10}i}{16}$ 0 0 0 0 $-\frac{\sqrt{10}i}{16}$ $\frac{\sqrt{6}i}{16}$ 0 0 0 0 $\frac{\sqrt{6}i}{16}$	
	0 0 0 0 0 0 0 0 0 0 0 0 0 0	
	0 0 0 0 0 0 0 0 0 0 0 0 0 0	
656	symmetry	$\frac{\sqrt{462}xy(x^2-3y^2)(3x^2-y^2)}{16}$

continued ..

Table 9

No.	multipole	matrix
	$\mathbb{G}_{6,2}^{(1,-1;a)}(T_u, 2)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{10}}{16} & 0 & -\frac{\sqrt{10}i}{16} & 0 & 0 & 0 & -\frac{\sqrt{6}}{16} & 0 & -\frac{\sqrt{6}i}{16} & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{10}}{16} & 0 & -\frac{\sqrt{10}i}{16} & 0 & 0 & 0 & \frac{\sqrt{6}}{16} & 0 & -\frac{\sqrt{6}i}{16} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{10}i}{16} & 0 & \frac{\sqrt{10}}{16} & 0 & 0 & 0 & -\frac{\sqrt{6}i}{16} & 0 & \frac{\sqrt{6}}{16} & 0 & 0 \\ 0 & 0 & \frac{\sqrt{10}i}{16} & 0 & -\frac{\sqrt{10}}{16} & 0 & 0 & 0 & -\frac{\sqrt{6}i}{16} & 0 & -\frac{\sqrt{6}}{16} & 0 & 0 & 0 \end{bmatrix}$
657	symmetry	$\frac{\sqrt{210}yz(16x^4 - 16x^2y^2 - 16x^2z^2 + y^4 + 2y^2z^2 + z^4)}{16}$ $\begin{bmatrix} 0 & -\frac{\sqrt{110}i}{110} & 0 & 0 & \frac{\sqrt{66}i}{352} & 0 & 0 & \frac{5\sqrt{66}}{1056} & 0 & 0 & \frac{13\sqrt{110}i}{1760} & 0 & 0 & -\frac{\sqrt{110}}{160} \\ -\frac{\sqrt{110}i}{110} & 0 & 0 & 0 & 0 & -\frac{\sqrt{66}i}{352} & -\frac{5\sqrt{66}}{1056} & 0 & 0 & 0 & -\frac{13\sqrt{110}i}{1760} & \frac{\sqrt{110}}{160} & 0 & 0 \\ 0 & \frac{\sqrt{330}i}{110} & 0 & 0 & -\frac{13\sqrt{22}i}{1056} & 0 & 0 & -\frac{\sqrt{22}}{96} & 0 & 0 & -\frac{7\sqrt{330}i}{1056} & 0 & 0 & \frac{37\sqrt{330}}{5280} \\ \frac{\sqrt{330}i}{110} & 0 & 0 & 0 & 0 & \frac{13\sqrt{22}i}{1056} & \frac{\sqrt{22}}{96} & 0 & 0 & 0 & \frac{7\sqrt{330}i}{1056} & -\frac{37\sqrt{330}}{5280} & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{22}i}{33} & 0 & \frac{5\sqrt{22}}{528} & \frac{5\sqrt{22}i}{528} & 0 & 0 & 0 & \frac{\sqrt{330}}{240} & -\frac{\sqrt{330}i}{240} & 0 & 0 \\ 0 & 0 & \frac{\sqrt{22}i}{33} & 0 & -\frac{5\sqrt{22}}{528} & 0 & 0 & -\frac{5\sqrt{22}i}{528} & 0 & 0 & -\frac{\sqrt{330}}{240} & 0 & 0 & \frac{\sqrt{330}i}{240} \\ -\frac{\sqrt{330}i}{165} & 0 & 0 & \frac{\sqrt{22}}{33} & 0 & -\frac{\sqrt{22}i}{66} & 0 & 0 & 0 & 0 & -\frac{\sqrt{330}i}{110} & 0 & 0 & 0 \\ 0 & \frac{\sqrt{330}i}{165} & -\frac{\sqrt{22}}{33} & 0 & -\frac{\sqrt{22}i}{66} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{330}i}{110} & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{330}}{165} & \frac{\sqrt{22}i}{33} & 0 & 0 & 0 & 0 & -\frac{\sqrt{22}i}{66} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{330}i}{110} \\ \frac{\sqrt{330}}{165} & 0 & 0 & -\frac{\sqrt{22}i}{33} & 0 & 0 & -\frac{\sqrt{22}i}{66} & 0 & 0 & 0 & 0 & \frac{\sqrt{330}i}{110} & 0 & 0 \end{bmatrix}$
658	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
$\mathbb{G}_{6,1}^{(1,-1;a)}(T_u, 3)$	$0 \quad -\frac{\sqrt{110}}{110} \quad \frac{\sqrt{66}i}{352} \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{5\sqrt{66}i}{1056} \quad -\frac{13\sqrt{110}i}{1760} \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{110}i}{160}$	
	$\frac{\sqrt{110}}{110} \quad 0 \quad 0 \quad -\frac{\sqrt{66}i}{352} \quad 0 \quad 0 \quad \frac{5\sqrt{66}i}{1056} \quad 0 \quad 0 \quad \frac{13\sqrt{110}i}{1760} \quad 0 \quad 0 \quad \frac{\sqrt{110}i}{160} \quad 0$	
	$0 \quad -\frac{\sqrt{330}}{110} \quad \frac{13\sqrt{22}i}{1056} \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{22}i}{96} \quad -\frac{7\sqrt{330}i}{1056} \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{37\sqrt{330}i}{5280}$	
	$\frac{\sqrt{330}}{110} \quad 0 \quad 0 \quad -\frac{13\sqrt{22}i}{1056} \quad 0 \quad 0 \quad \frac{\sqrt{22}i}{96} \quad 0 \quad 0 \quad \frac{7\sqrt{330}i}{1056} \quad 0 \quad 0 \quad \frac{37\sqrt{330}i}{5280} \quad 0$	
	$-\frac{\sqrt{330}i}{165} \quad 0 \quad 0 \quad -\frac{\sqrt{22}}{66} \quad 0 \quad \frac{\sqrt{22}i}{33} \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{330}}{110} \quad 0 \quad 0 \quad 0 \quad 0$	
	$0 \quad \frac{\sqrt{330}i}{165} \quad \frac{\sqrt{22}}{66} \quad 0 \quad \frac{\sqrt{22}i}{33} \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{330}}{110} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0$	
	$0 \quad 0 \quad 0 \quad \frac{5\sqrt{22}i}{528} \quad 0 \quad \frac{\sqrt{22}}{33} \quad \frac{5\sqrt{22}i}{528} \quad 0 \quad 0 \quad -\frac{\sqrt{330}i}{240} \quad 0 \quad 0 \quad \frac{\sqrt{330}i}{240} \quad 0$	
	$0 \quad 0 \quad \frac{5\sqrt{22}i}{528} \quad 0 \quad -\frac{\sqrt{22}}{33} \quad 0 \quad 0 \quad -\frac{5\sqrt{22}i}{528} \quad -\frac{\sqrt{330}i}{240} \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{330}i}{240}$	
	$0 \quad -\frac{\sqrt{330}i}{165} \quad 0 \quad 0 \quad \frac{\sqrt{22}i}{33} \quad 0 \quad 0 \quad -\frac{\sqrt{22}}{66} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{330}}{110}$	
	$-\frac{\sqrt{330}i}{165} \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{22}i}{33} \quad \frac{\sqrt{22}}{66} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{330}}{110} \quad 0$	
659	symmetry	$\frac{\sqrt{210}xy(x^4+2x^2y^2-16x^2z^2+y^4-16y^2z^2+16z^4)}{16}$
$\mathbb{G}_{6,2}^{(1,-1;a)}(T_u, 3)$	$\frac{\sqrt{110}i}{55} \quad 0 \quad 0 \quad -\frac{\sqrt{66}}{132} \quad 0 \quad -\frac{\sqrt{66}i}{132} \quad 0 \quad 0 \quad 0 \quad -\frac{3\sqrt{110}}{220} \quad 0 \quad \frac{3\sqrt{110}i}{220} \quad 0 \quad 0$	
	$0 \quad -\frac{\sqrt{110}i}{55} \quad \frac{\sqrt{66}}{132} \quad 0 \quad -\frac{\sqrt{66}i}{132} \quad 0 \quad 0 \quad 0 \quad \frac{3\sqrt{110}}{220} \quad 0 \quad \frac{3\sqrt{110}i}{220} \quad 0 \quad 0 \quad 0$	
	$0 \quad 0 \quad 0 \quad \frac{\sqrt{22}}{528} \quad 0 \quad -\frac{\sqrt{22}i}{528} \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{330}}{2640} \quad 0 \quad -\frac{\sqrt{330}i}{2640} \quad 0 \quad 0$	
	$0 \quad 0 \quad -\frac{\sqrt{22}}{528} \quad 0 \quad -\frac{\sqrt{22}i}{528} \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{330}}{2640} \quad 0 \quad -\frac{\sqrt{330}i}{2640} \quad 0 \quad 0 \quad 0$	
	$0 \quad -\frac{\sqrt{330}}{165} \quad -\frac{\sqrt{22}i}{66} \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{22}i}{33} \quad -\frac{\sqrt{330}i}{110} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0$	
	$\frac{\sqrt{330}}{165} \quad 0 \quad 0 \quad \frac{\sqrt{22}i}{66} \quad 0 \quad 0 \quad \frac{\sqrt{22}i}{33} \quad 0 \quad 0 \quad \frac{\sqrt{330}i}{110} \quad 0 \quad 0 \quad 0 \quad 0$	
	$0 \quad -\frac{\sqrt{330}i}{165} \quad 0 \quad 0 \quad -\frac{\sqrt{22}i}{66} \quad 0 \quad 0 \quad \frac{\sqrt{22}}{33} \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{330}i}{110} \quad 0 \quad 0 \quad 0$	
	$-\frac{\sqrt{330}i}{165} \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{22}i}{66} \quad -\frac{\sqrt{22}}{33} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{330}i}{110} \quad 0 \quad 0$	
	$0 \quad 0 \quad 0 \quad \frac{5\sqrt{22}i}{528} \quad 0 \quad \frac{5\sqrt{22}}{528} \quad \frac{\sqrt{22}i}{33} \quad 0 \quad 0 \quad \frac{\sqrt{330}i}{240} \quad 0 \quad -\frac{\sqrt{330}i}{240} \quad 0 \quad 0 \quad 0$	
	$0 \quad 0 \quad \frac{5\sqrt{22}i}{528} \quad 0 \quad -\frac{5\sqrt{22}}{528} \quad 0 \quad 0 \quad -\frac{\sqrt{22}i}{33} \quad \frac{\sqrt{330}i}{240} \quad 0 \quad \frac{\sqrt{330}}{240} \quad 0 \quad 0 \quad 0$	
660	symmetry	$-\frac{x^2}{2} - \frac{y^2}{2} + z^2$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{G}_{2,0}^{(1,0;a)}(E_u)$	$\frac{\sqrt{21}i}{56}$	$\begin{bmatrix} 0 & 0 & 0 & \frac{\sqrt{21}i}{56} & 0 & \frac{\sqrt{21}}{56} & 0 & 0 & 0 & \frac{\sqrt{35}i}{56} & 0 & -\frac{\sqrt{35}}{56} & 0 & 0 \\ 0 & 0 & \frac{\sqrt{21}i}{56} & 0 & -\frac{\sqrt{21}}{56} & 0 & 0 & 0 & \frac{\sqrt{35}i}{56} & 0 & \frac{\sqrt{35}}{56} & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{7}i}{56} & 0 & -\frac{\sqrt{7}}{56} & 0 & 0 & 0 & -\frac{\sqrt{105}i}{56} & 0 & -\frac{\sqrt{105}}{56} & 0 & 0 \\ 0 & 0 & \frac{\sqrt{7}i}{56} & 0 & \frac{\sqrt{7}}{56} & 0 & 0 & 0 & -\frac{\sqrt{105}i}{56} & 0 & \frac{\sqrt{105}}{56} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}}{14} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}}{14} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}i}{14} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}i}{14} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{7}}{14} & 0 & -\frac{\sqrt{7}i}{14} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{7}}{14} & 0 & -\frac{\sqrt{7}i}{14} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
	$\frac{\sqrt{7}i}{56}$	
	$\frac{\sqrt{7}i}{14}$	
661	symmetry	$\frac{\sqrt{3}(x-y)(x+y)}{2}$
$\mathbb{G}_{2,1}^{(1,0;a)}(E_u)$	$\frac{\sqrt{7}i}{56}$	$\begin{bmatrix} 0 & 0 & 0 & \frac{\sqrt{7}i}{56} & 0 & -\frac{\sqrt{7}}{56} & 0 & 0 & 0 & \frac{\sqrt{105}i}{168} & 0 & \frac{\sqrt{105}}{168} & \frac{\sqrt{105}i}{42} & 0 \\ 0 & 0 & \frac{\sqrt{7}i}{56} & 0 & \frac{\sqrt{7}}{56} & 0 & 0 & 0 & \frac{\sqrt{105}i}{168} & 0 & -\frac{\sqrt{105}}{168} & 0 & 0 & -\frac{\sqrt{105}i}{42} \\ 0 & 0 & 0 & \frac{\sqrt{21}i}{168} & 0 & \frac{\sqrt{21}}{168} & \frac{\sqrt{21}i}{42} & 0 & 0 & -\frac{\sqrt{35}i}{56} & 0 & \frac{\sqrt{35}}{56} & 0 & 0 \\ 0 & 0 & \frac{\sqrt{21}i}{168} & 0 & -\frac{\sqrt{21}}{168} & 0 & 0 & -\frac{\sqrt{21}i}{42} & -\frac{\sqrt{35}i}{56} & 0 & -\frac{\sqrt{35}}{56} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{21}i}{21} & 0 & 0 & -\frac{\sqrt{21}}{42} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{21}i}{21} & \frac{\sqrt{21}}{42} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{21}i}{21} & 0 & 0 & 0 & 0 & \frac{\sqrt{21}i}{42} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{21}i}{21} & 0 & 0 & \frac{\sqrt{21}i}{42} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{21}}{42} & 0 & -\frac{\sqrt{21}i}{42} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{21}}{42} & 0 & -\frac{\sqrt{21}i}{42} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
	$\frac{\sqrt{21}i}{168}$	
	$\frac{\sqrt{21}i}{42}$	
662	symmetry	$\sqrt{3}yz$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{G}_{2,0}^{(1,0;a)}(T_u)$	0	$-\frac{\sqrt{105}i}{84}$ 0 0 0 $-\frac{\sqrt{7}i}{56}$ 0 0 0 0 0 $\frac{\sqrt{105}i}{168}$ 0 0 $\frac{\sqrt{105}}{84}$
	$-\frac{\sqrt{105}i}{84}$	0 0 0 0 0 $\frac{\sqrt{7}i}{56}$ 0 0 0 0 0 $-\frac{\sqrt{105}i}{168}$ $-\frac{\sqrt{105}}{84}$ 0
	0	$\frac{\sqrt{35}i}{28}$ 0 0 0 $\frac{\sqrt{21}i}{168}$ 0 0 0 $\frac{\sqrt{21}}{84}$ 0 0 $\frac{\sqrt{35}i}{56}$ 0 0 0
	$\frac{\sqrt{35}i}{28}$	0 0 0 0 0 $-\frac{\sqrt{21}i}{168}$ $-\frac{\sqrt{21}}{84}$ 0 0 0 0 $-\frac{\sqrt{35}i}{56}$ 0 0 0
	0	0 0 0 $\frac{\sqrt{21}i}{42}$ 0 $-\frac{\sqrt{21}}{42}$ $-\frac{\sqrt{21}i}{42}$ 0 0 0 0 0 0 0 0
	0	0 0 $\frac{\sqrt{21}i}{42}$ 0 $\frac{\sqrt{21}}{42}$ 0 0 0 $\frac{\sqrt{21}i}{42}$ 0 0 0 0 0 0 0
	0	0 0 0 $\frac{\sqrt{21}}{42}$ 0 $-\frac{\sqrt{21}i}{84}$ 0 0 0 0 0 $\frac{\sqrt{35}i}{28}$ 0 0 0
	0	0 0 $-\frac{\sqrt{21}}{42}$ 0 $-\frac{\sqrt{21}i}{84}$ 0 0 0 0 0 $\frac{\sqrt{35}i}{28}$ 0 0 0
	0	0 0 $\frac{\sqrt{21}i}{42}$ 0 0 0 $-\frac{\sqrt{21}i}{84}$ 0 0 0 0 0 0 $-\frac{\sqrt{35}i}{28}$ 0
	0	0 0 0 $-\frac{\sqrt{21}i}{42}$ 0 0 $-\frac{\sqrt{21}i}{84}$ 0 0 0 0 0 0 $-\frac{\sqrt{35}i}{28}$ 0
663	symmetry	$\sqrt{3}xz$
$\mathbb{G}_{2,1}^{(1,0;a)}(T_u)$	0	$-\frac{\sqrt{105}}{84}$ $-\frac{\sqrt{7}i}{56}$ 0 0 0 0 0 $-\frac{\sqrt{105}i}{168}$ 0 0 0 0 $-\frac{\sqrt{105}i}{84}$
	$\frac{\sqrt{105}}{84}$	0 0 $\frac{\sqrt{7}i}{56}$ 0 0 0 0 0 0 $\frac{\sqrt{105}i}{168}$ 0 0 $-\frac{\sqrt{105}i}{84}$ 0
	0	$-\frac{\sqrt{35}}{28}$ $-\frac{\sqrt{21}i}{168}$ 0 0 0 0 $-\frac{\sqrt{21}i}{84}$ $\frac{\sqrt{35}i}{56}$ 0 0 0 0 0 0
	$\frac{\sqrt{35}}{28}$	0 0 $\frac{\sqrt{21}i}{168}$ 0 0 $-\frac{\sqrt{21}i}{84}$ 0 0 $-\frac{\sqrt{35}i}{56}$ 0 0 0 0 0 0
	0	0 0 0 $-\frac{\sqrt{21}}{84}$ 0 $\frac{\sqrt{21}i}{42}$ 0 0 0 0 $-\frac{\sqrt{35}}{28}$ 0 0 0 0
	0	0 0 $\frac{\sqrt{21}}{84}$ 0 $\frac{\sqrt{21}i}{42}$ 0 0 0 $\frac{\sqrt{35}}{28}$ 0 0 0 0 0 0
	0	0 0 0 $-\frac{\sqrt{21}i}{42}$ 0 $\frac{\sqrt{21}}{42}$ $-\frac{\sqrt{21}i}{42}$ 0 0 0 0 0 0 0 0
	0	0 0 $-\frac{\sqrt{21}i}{42}$ 0 $-\frac{\sqrt{21}}{42}$ 0 0 $\frac{\sqrt{21}i}{42}$ 0 0 0 0 0 0 0
	0	0 0 0 0 $\frac{\sqrt{21}i}{42}$ 0 0 $-\frac{\sqrt{21}}{84}$ 0 0 0 0 0 $\frac{\sqrt{35}}{28}$
	0	0 0 0 0 0 $-\frac{\sqrt{21}i}{42}$ $\frac{\sqrt{21}}{84}$ 0 0 0 0 0 0 $-\frac{\sqrt{35}}{28}$ 0
664	symmetry	$\sqrt{3}xy$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{G}_{2,2}^{(1,0;a)}(T_u)$	$\frac{\sqrt{105i}}{42} \quad 0 \quad 0 \quad \frac{\sqrt{7}}{56} \quad 0 \quad \frac{\sqrt{7}i}{56} \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{105}}{168} \quad 0 \quad -\frac{\sqrt{105}i}{168} \quad 0 \quad 0$	
	$0 \quad -\frac{\sqrt{105}i}{42} \quad -\frac{\sqrt{7}}{56} \quad 0 \quad \frac{\sqrt{7}i}{56} \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{105}}{168} \quad 0 \quad -\frac{\sqrt{105}i}{168} \quad 0 \quad 0 \quad 0$	
	$0 \quad 0 \quad 0 \quad \frac{\sqrt{21}}{168} \quad 0 \quad -\frac{\sqrt{21}i}{168} \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{35}}{56} \quad 0 \quad -\frac{\sqrt{35}i}{56} \quad 0 \quad 0$	
	$0 \quad 0 \quad -\frac{\sqrt{21}}{168} \quad 0 \quad -\frac{\sqrt{21}i}{168} \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{35}}{56} \quad 0 \quad -\frac{\sqrt{35}i}{56} \quad 0 \quad 0 \quad 0$	
	$0 \quad 0 \quad -\frac{\sqrt{21}i}{84} \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{21}i}{42} \quad \frac{\sqrt{35}i}{28} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0$	
	$0 \quad 0 \quad 0 \quad \frac{\sqrt{21}i}{84} \quad 0 \quad 0 \quad \frac{\sqrt{21}i}{42} \quad 0 \quad 0 \quad -\frac{\sqrt{35}i}{28} \quad 0 \quad 0 \quad 0 \quad 0$	
	$0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{21}i}{84} \quad 0 \quad 0 \quad \frac{\sqrt{21}}{42} \quad 0 \quad 0 \quad -\frac{\sqrt{35}i}{28} \quad 0 \quad 0 \quad 0$	
	$0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{21}i}{84} \quad -\frac{\sqrt{21}}{42} \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{35}i}{28} \quad 0 \quad 0$	
	$0 \quad 0 \quad 0 \quad -\frac{\sqrt{21}i}{42} \quad 0 \quad -\frac{\sqrt{21}}{42} \quad \frac{\sqrt{21}i}{42} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0$	
	$0 \quad 0 \quad -\frac{\sqrt{21}i}{42} \quad 0 \quad \frac{\sqrt{21}}{42} \quad 0 \quad 0 \quad -\frac{\sqrt{21}i}{42} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0$	
665	symmetry	$\frac{\sqrt{21}(x^4 - 3x^2y^2 - 3x^2z^2 + y^4 - 3y^2z^2 + z^4)}{6}$
$\mathbb{G}_4^{(1,0;a)}(A_u)$	$0 \quad 0 \quad \frac{\sqrt{5}i}{20} \quad 0 \quad -\frac{\sqrt{5}}{20} \quad 0 \quad 0$	
	$0 \quad 0 \quad \frac{\sqrt{5}i}{20} \quad 0 \quad \frac{\sqrt{5}}{20} \quad 0 \quad 0 \quad 0$	
	$0 \quad 0 \quad \frac{\sqrt{15}i}{60} \quad 0 \quad \frac{\sqrt{15}}{60} \quad -\frac{\sqrt{15}i}{30} \quad 0$	
	$0 \quad 0 \quad \frac{\sqrt{15}i}{60} \quad 0 \quad -\frac{\sqrt{15}}{60} \quad 0 \quad 0 \quad \frac{\sqrt{15}i}{30}$	
	$0 \quad \frac{\sqrt{15}i}{30} \quad 0 \quad 0 \quad \frac{i}{8} \quad 0 \quad 0 \quad \frac{1}{8} \quad 0 \quad 0 \quad \frac{\sqrt{15}i}{40} \quad 0 \quad 0 \quad -\frac{\sqrt{15}}{40}$	
	$\frac{\sqrt{15}i}{30} \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{i}{8} \quad -\frac{1}{8} \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{15}i}{40} \quad \frac{\sqrt{15}}{40} \quad 0$	
	$0 \quad \frac{\sqrt{15}}{30} \quad \frac{i}{8} \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{i}{8} \quad -\frac{\sqrt{15}i}{40} \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{15}i}{40}$	
	$-\frac{\sqrt{15}}{30} \quad 0 \quad 0 \quad -\frac{i}{8} \quad 0 \quad 0 \quad \frac{i}{8} \quad 0 \quad 0 \quad \frac{\sqrt{15}i}{40} \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{15}i}{40}$	
	$\frac{\sqrt{15}i}{30} \quad 0 \quad 0 \quad \frac{1}{8} \quad 0 \quad \frac{i}{8} \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{15}}{40} \quad 0 \quad -\frac{\sqrt{15}i}{40} \quad 0 \quad 0$	
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
$\mathbb{G}_{4,0}^{(1,0;a)}(E_u)$	0 0 0 $\frac{3\sqrt{105}i}{280}$ 0 $\frac{3\sqrt{105}}{280}$ 0 0 0 $\frac{\sqrt{7}i}{280}$ 0 $-\frac{\sqrt{7}}{280}$ 0 0	
	0 0 $\frac{3\sqrt{105}i}{280}$ 0 $-\frac{3\sqrt{105}}{280}$ 0 0 0 $\frac{\sqrt{7}i}{280}$ 0 $\frac{\sqrt{7}}{280}$ 0 0 0	
	0 0 0 $\frac{3\sqrt{35}i}{280}$ 0 $-\frac{3\sqrt{35}}{280}$ 0 0 0 $\frac{5\sqrt{21}i}{168}$ 0 $\frac{5\sqrt{21}}{168}$ $\frac{\sqrt{21}i}{30}$ 0	
	0 0 $\frac{3\sqrt{35}i}{280}$ 0 $\frac{3\sqrt{35}}{280}$ 0 0 0 $\frac{5\sqrt{21}i}{168}$ 0 $-\frac{5\sqrt{21}}{168}$ 0 0 $-\frac{\sqrt{21}i}{30}$	
	0 $\frac{\sqrt{21}i}{60}$ 0 0 $-\frac{\sqrt{35}i}{40}$ 0 0 0 $\frac{\sqrt{35}}{56}$ 0 0 $-\frac{\sqrt{21}i}{40}$ 0 0 $-\frac{\sqrt{21}}{40}$	
	$\frac{\sqrt{21}i}{60}$ 0 0 0 $\frac{\sqrt{35}i}{40}$ $-\frac{\sqrt{35}}{56}$ 0 0 0 0 $\frac{\sqrt{21}i}{40}$ $\frac{\sqrt{21}}{40}$ 0	
	0 $\frac{\sqrt{21}}{60}$ $-\frac{\sqrt{35}i}{40}$ 0 0 0 $\frac{\sqrt{35}i}{56}$ $\frac{\sqrt{21}i}{40}$ 0 0 0 0 $\frac{\sqrt{21}i}{40}$	
	$-\frac{\sqrt{21}}{60}$ 0 0 $\frac{\sqrt{35}i}{40}$ 0 0 $\frac{\sqrt{35}i}{56}$ 0 0 $-\frac{\sqrt{21}i}{40}$ 0 0 $\frac{\sqrt{21}i}{40}$ 0	
	$-\frac{\sqrt{21}i}{30}$ 0 0 $\frac{\sqrt{35}}{140}$ 0 $\frac{\sqrt{35}i}{140}$ 0 0 0 0 0 0 0 0	
	0 $\frac{\sqrt{21}i}{30}$ $-\frac{\sqrt{35}}{140}$ 0 $\frac{\sqrt{35}i}{140}$ 0 0 0 0 0 0 0 0 0	
667	symmetry	$\frac{\sqrt{5}(x-y)(x+y)(x^2+y^2-6z^2)}{4}$
$\mathbb{G}_{4,1}^{(1,0;a)}(E_u)$	0 0 0 $\frac{3\sqrt{35}i}{280}$ 0 $-\frac{3\sqrt{35}}{280}$ 0 0 0 $-\frac{9\sqrt{21}i}{280}$ 0 $-\frac{9\sqrt{21}}{280}$ $-\frac{\sqrt{21}i}{35}$ 0	
	0 0 $\frac{3\sqrt{35}i}{280}$ 0 $\frac{3\sqrt{35}}{280}$ 0 0 0 $-\frac{9\sqrt{21}i}{280}$ 0 $\frac{9\sqrt{21}}{280}$ 0 0 $\frac{\sqrt{21}i}{35}$	
	0 0 0 $\frac{\sqrt{105}i}{280}$ 0 $\frac{\sqrt{105}}{280}$ $\frac{\sqrt{105}i}{70}$ 0 0 $-\frac{\sqrt{7}i}{280}$ 0 $\frac{\sqrt{7}}{280}$ 0 0	
	0 0 $\frac{\sqrt{105}i}{280}$ 0 $-\frac{\sqrt{105}}{280}$ 0 0 $-\frac{\sqrt{105}i}{70}$ $-\frac{\sqrt{7}i}{280}$ 0 $-\frac{\sqrt{7}}{280}$ 0 0 0	
	0 $-\frac{\sqrt{7}i}{20}$ 0 0 $-\frac{\sqrt{105}i}{280}$ 0 0 $\frac{3\sqrt{105}}{280}$ 0 0 $-\frac{\sqrt{7}i}{40}$ 0 0 $-\frac{\sqrt{7}}{40}$	
	$-\frac{\sqrt{7}i}{20}$ 0 0 0 $\frac{\sqrt{105}i}{280}$ $-\frac{3\sqrt{105}}{280}$ 0 0 0 0 $\frac{\sqrt{7}i}{40}$ $\frac{\sqrt{7}}{40}$ 0	
	0 $\frac{\sqrt{7}}{20}$ $\frac{\sqrt{105}i}{280}$ 0 0 0 $-\frac{3\sqrt{105}i}{280}$ $-\frac{\sqrt{7}i}{40}$ 0 0 0 0 $-\frac{\sqrt{7}i}{40}$	
	$-\frac{\sqrt{7}}{20}$ 0 0 $-\frac{\sqrt{105}i}{280}$ 0 0 $-\frac{3\sqrt{105}i}{280}$ 0 0 $\frac{\sqrt{7}i}{40}$ 0 0 $-\frac{\sqrt{7}i}{40}$ 0	
	0 0 0 $\frac{\sqrt{105}}{70}$ 0 $-\frac{\sqrt{105}i}{70}$ 0 0 0 $\frac{\sqrt{7}}{20}$ 0 $\frac{\sqrt{7}i}{20}$ 0 0 0	
	0 0 $-\frac{\sqrt{105}}{70}$ 0 $-\frac{\sqrt{105}i}{70}$ 0 0 0 $-\frac{\sqrt{7}}{20}$ 0 $\frac{\sqrt{7}i}{20}$ 0 0 0	
668	symmetry	$\frac{\sqrt{35}yz(y-z)(y+z)}{2}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{G}_{4,0}^{(1,0;a)}(T_u, 1)$	0	$\begin{bmatrix} 0 & \frac{\sqrt{3}i}{10} & 0 & 0 & \frac{3\sqrt{5}i}{80} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{80} & 0 & 0 & -\frac{\sqrt{3}}{20} \\ \frac{\sqrt{3}i}{10} & 0 & 0 & 0 & 0 & -\frac{3\sqrt{5}i}{80} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{80} & \frac{\sqrt{3}}{20} & 0 \\ 0 & \frac{i}{10} & 0 & 0 & -\frac{\sqrt{15}i}{80} & 0 & 0 & \frac{\sqrt{15}}{40} & 0 & 0 & \frac{7i}{80} & 0 & 0 & \frac{1}{40} \\ \frac{i}{10} & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{80} & -\frac{\sqrt{15}}{40} & 0 & 0 & 0 & 0 & -\frac{7i}{80} & -\frac{1}{40} & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{80} & \frac{\sqrt{15}i}{80} & 0 & 0 & -\frac{i}{5} & 0 & -\frac{1}{16} & -\frac{i}{16} & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{80} & 0 & 0 & -\frac{\sqrt{15}i}{80} & -\frac{i}{5} & 0 & \frac{1}{16} & 0 & 0 & \frac{i}{16} \\ \frac{i}{40} & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{20} & 0 & 0 & 0 & -\frac{1}{40} & 0 & -\frac{3i}{20} & 0 & 0 \\ 0 & -\frac{i}{40} & 0 & 0 & \frac{\sqrt{15}i}{20} & 0 & 0 & 0 & \frac{1}{40} & 0 & -\frac{3i}{20} & 0 & 0 & 0 \\ 0 & -\frac{1}{40} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{20} & -\frac{i}{40} & 0 & 0 & 0 & 0 & -\frac{3i}{20} \\ \frac{1}{40} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{20} & 0 & 0 & \frac{i}{40} & 0 & 0 & -\frac{3i}{20} & 0 \end{bmatrix}$
	669	$-\frac{\sqrt{35}xz(x-z)(x+z)}{2}$
	$\mathbb{G}_{4,1}^{(1,0;a)}(T_u, 1)$	$\begin{bmatrix} 0 & -\frac{\sqrt{3}}{10} & -\frac{3\sqrt{5}i}{80} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{80} & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{20} \\ \frac{\sqrt{3}}{10} & 0 & 0 & \frac{3\sqrt{5}i}{80} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{80} & 0 & 0 & 0 & -\frac{\sqrt{3}i}{20} \\ 0 & \frac{1}{10} & -\frac{\sqrt{15}i}{80} & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{40} & -\frac{7i}{80} & 0 & 0 & 0 & 0 & -\frac{i}{40} \\ -\frac{1}{10} & 0 & 0 & \frac{\sqrt{15}i}{80} & 0 & 0 & \frac{\sqrt{15}i}{40} & 0 & 0 & \frac{7i}{80} & 0 & 0 & 0 & -\frac{i}{40} \\ -\frac{i}{40} & 0 & 0 & -\frac{\sqrt{15}}{20} & 0 & 0 & 0 & 0 & 0 & -\frac{3}{20} & 0 & -\frac{i}{40} & 0 & 0 \\ 0 & \frac{i}{40} & \frac{\sqrt{15}}{20} & 0 & 0 & 0 & 0 & 0 & \frac{3}{20} & 0 & -\frac{i}{40} & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{15}i}{80} & 0 & 0 & -\frac{\sqrt{15}i}{80} & 0 & 0 & -\frac{i}{16} & 0 & -\frac{1}{5} & -\frac{i}{16} & 0 \\ 0 & 0 & \frac{\sqrt{15}i}{80} & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{80} & -\frac{i}{16} & 0 & \frac{1}{5} & 0 & 0 & \frac{i}{16} \\ 0 & \frac{i}{40} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{20} & 0 & 0 & -\frac{i}{40} & 0 & 0 & -\frac{3}{20} \\ \frac{i}{40} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{20} & 0 & 0 & 0 & \frac{i}{40} & \frac{3}{20} & 0 & 0 \end{bmatrix}$
	670	$\frac{\sqrt{35}xy(x-y)(x+y)}{2}$

continued ...

Table 9

No.	multipole	matrix
	$\mathbb{G}_{4,2}^{(1,0;a)}(T_u, 1)$	$\begin{bmatrix} 0 & 0 & 0 & -\frac{3\sqrt{5}}{80} & 0 & \frac{3\sqrt{5}i}{80} & 0 & 0 & 0 & \frac{3\sqrt{3}}{80} & 0 & \frac{3\sqrt{3}i}{80} & 0 & 0 \\ 0 & 0 & \frac{3\sqrt{5}}{80} & 0 & \frac{3\sqrt{5}i}{80} & 0 & 0 & 0 & -\frac{3\sqrt{3}}{80} & 0 & \frac{3\sqrt{3}i}{80} & 0 & 0 & 0 \\ -\frac{i}{5} & 0 & 0 & -\frac{\sqrt{15}}{80} & 0 & -\frac{\sqrt{15}i}{80} & 0 & 0 & 0 & -\frac{1}{16} & 0 & \frac{i}{16} & 0 & 0 \\ 0 & \frac{i}{5} & \frac{\sqrt{15}}{80} & 0 & -\frac{\sqrt{15}i}{80} & 0 & 0 & 0 & \frac{1}{16} & 0 & \frac{i}{16} & 0 & 0 & 0 \\ 0 & \frac{1}{40} & \frac{\sqrt{15}i}{20} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3i}{20} & 0 & 0 & 0 & -\frac{i}{40} \\ -\frac{1}{40} & 0 & 0 & -\frac{\sqrt{15}i}{20} & 0 & 0 & 0 & 0 & 0 & \frac{3i}{20} & 0 & 0 & -\frac{i}{40} & 0 \\ 0 & -\frac{i}{40} & 0 & 0 & -\frac{\sqrt{15}i}{20} & 0 & 0 & 0 & 0 & 0 & -\frac{3i}{20} & 0 & 0 & -\frac{1}{40} \\ -\frac{i}{40} & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{20} & 0 & 0 & 0 & 0 & 0 & \frac{3i}{20} & \frac{1}{40} & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{15}i}{80} & 0 & \frac{\sqrt{15}}{80} & 0 & 0 & 0 & -\frac{i}{16} & 0 & -\frac{1}{16} & -\frac{i}{5} & 0 \\ 0 & 0 & -\frac{\sqrt{15}i}{80} & 0 & -\frac{\sqrt{15}}{80} & 0 & 0 & 0 & -\frac{i}{16} & 0 & \frac{1}{16} & 0 & 0 & \frac{i}{5} \end{bmatrix}$
671	symmetry	$\frac{\sqrt{5}yz(6x^2-y^2-z^2)}{2}$ $\begin{bmatrix} 0 & -\frac{\sqrt{21}i}{70} & 0 & 0 & -\frac{3\sqrt{35}i}{112} & 0 & 0 & 0 & 0 & 0 & -\frac{17\sqrt{21}i}{560} & 0 & 0 & -\frac{\sqrt{21}}{28} \\ -\frac{\sqrt{21}i}{70} & 0 & 0 & 0 & 0 & \frac{3\sqrt{35}i}{112} & 0 & 0 & 0 & 0 & 0 & \frac{17\sqrt{21}i}{560} & \frac{\sqrt{21}}{28} & 0 \\ 0 & \frac{3\sqrt{7}i}{70} & 0 & 0 & \frac{\sqrt{105}i}{112} & 0 & 0 & \frac{\sqrt{105}}{56} & 0 & 0 & -\frac{23\sqrt{7}i}{560} & 0 & 0 & -\frac{\sqrt{7}}{40} \\ \frac{3\sqrt{7}i}{70} & 0 & 0 & 0 & 0 & -\frac{\sqrt{105}i}{112} & -\frac{\sqrt{105}}{56} & 0 & 0 & 0 & 0 & \frac{23\sqrt{7}i}{560} & \frac{\sqrt{7}}{40} & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{105}i}{70} & 0 & \frac{\sqrt{105}}{560} & \frac{\sqrt{105}i}{560} & 0 & 0 & 0 & 0 & -\frac{\sqrt{7}}{80} & \frac{\sqrt{7}i}{80} & 0 \\ 0 & 0 & -\frac{\sqrt{105}i}{70} & 0 & -\frac{\sqrt{105}}{560} & 0 & 0 & -\frac{\sqrt{105}i}{560} & 0 & 0 & \frac{\sqrt{7}}{80} & 0 & 0 & -\frac{\sqrt{7}i}{80} \\ \frac{\sqrt{7}i}{40} & 0 & 0 & \frac{3\sqrt{105}}{280} & 0 & \frac{\sqrt{105}i}{140} & 0 & 0 & 0 & -\frac{\sqrt{7}}{20} & 0 & -\frac{\sqrt{7}i}{140} & 0 & 0 \\ 0 & -\frac{\sqrt{7}i}{40} & -\frac{3\sqrt{105}}{280} & 0 & \frac{\sqrt{105}i}{140} & 0 & 0 & 0 & \frac{\sqrt{7}}{20} & 0 & -\frac{\sqrt{7}i}{140} & 0 & 0 & 0 \\ 0 & \frac{\sqrt{7}}{40} & \frac{3\sqrt{105}}{280} & 0 & 0 & 0 & 0 & \frac{\sqrt{105}i}{140} & \frac{\sqrt{7}i}{20} & 0 & 0 & 0 & 0 & \frac{\sqrt{7}i}{140} \\ -\frac{\sqrt{7}}{40} & 0 & 0 & -\frac{3\sqrt{105}i}{280} & 0 & 0 & \frac{\sqrt{105}i}{140} & 0 & 0 & -\frac{\sqrt{7}i}{20} & 0 & 0 & 0 & \frac{\sqrt{7}i}{140} \end{bmatrix}$
672	symmetry	$-\frac{\sqrt{5}xz(x^2-6y^2+z^2)}{2}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{G}_{4,1}^{(1,0;a)}(T_u, 2)$	$0 - \frac{\sqrt{21}}{70} - \frac{3\sqrt{35}i}{112} 0 0 0 0 0 0 \frac{17\sqrt{21}i}{560} 0 0 0 0 \frac{\sqrt{21}i}{28}$	
	$\frac{\sqrt{21}}{70} 0 0 \frac{3\sqrt{35}i}{112} 0 0 0 0 0 - \frac{17\sqrt{21}i}{560} 0 0 0 \frac{\sqrt{21}i}{28} 0$	
	$0 - \frac{3\sqrt{7}}{70} - \frac{\sqrt{105}i}{112} 0 0 0 0 - \frac{\sqrt{105}i}{56} - \frac{23\sqrt{7}i}{560} 0 0 0 0 - \frac{\sqrt{7}i}{40}$	
	$\frac{3\sqrt{7}}{70} 0 0 \frac{\sqrt{105}i}{112} 0 0 - \frac{\sqrt{105}i}{56} 0 0 \frac{23\sqrt{7}i}{560} 0 0 - \frac{\sqrt{7}i}{40} 0$	
	$\frac{\sqrt{7}i}{40} 0 0 \frac{\sqrt{105}}{140} 0 \frac{3\sqrt{105}i}{280} 0 0 0 \frac{\sqrt{7}}{140} 0 \frac{\sqrt{7}i}{20} 0 0 0$	
	$0 - \frac{\sqrt{7}i}{40} - \frac{\sqrt{105}}{140} 0 \frac{3\sqrt{105}i}{280} 0 0 0 - \frac{\sqrt{7}}{140} 0 \frac{\sqrt{7}i}{20} 0 0 0$	
	$0 0 0 \frac{\sqrt{105}i}{560} 0 - \frac{\sqrt{105}}{70} \frac{\sqrt{105}i}{560} 0 0 \frac{\sqrt{7}i}{80} 0 0 - \frac{\sqrt{7}i}{80} 0$	
	$0 0 \frac{\sqrt{105}i}{560} 0 \frac{\sqrt{105}}{70} 0 0 - \frac{\sqrt{105}i}{560} \frac{\sqrt{7}i}{80} 0 0 0 0 \frac{\sqrt{7}i}{80}$	
	$0 \frac{\sqrt{7}i}{40} 0 0 \frac{3\sqrt{105}i}{280} 0 0 \frac{\sqrt{105}}{140} 0 0 - \frac{\sqrt{7}i}{20} 0 0 - \frac{\sqrt{7}}{140}$	
	$\frac{\sqrt{7}i}{40} 0 0 0 - \frac{3\sqrt{105}i}{280} - \frac{\sqrt{105}}{140} 0 0 0 0 0 \frac{\sqrt{7}i}{20} \frac{\sqrt{7}}{140} 0$	
673	symmetry	$-\frac{\sqrt{5}xy(x^2+y^2-6z^2)}{2}$
$\mathbb{G}_{4,2}^{(1,0;a)}(T_u, 2)$	$\frac{\sqrt{21}i}{35} 0 0 \frac{3\sqrt{35}}{112} 0 \frac{3\sqrt{35}i}{112} 0 0 0 - \frac{3\sqrt{21}}{560} 0 \frac{3\sqrt{21}i}{560} 0 0$	
	$0 - \frac{\sqrt{21}i}{35} - \frac{3\sqrt{35}}{112} 0 \frac{3\sqrt{35}i}{112} 0 0 0 \frac{3\sqrt{21}}{560} 0 \frac{3\sqrt{21}i}{560} 0 0 0$	
	$0 0 0 \frac{\sqrt{105}}{112} 0 - \frac{\sqrt{105}i}{112} 0 0 0 \frac{37\sqrt{7}}{560} 0 \frac{37\sqrt{7}i}{560} 0 0$	
	$0 0 - \frac{\sqrt{105}}{112} 0 - \frac{\sqrt{105}i}{112} 0 0 0 - \frac{37\sqrt{7}}{560} 0 \frac{37\sqrt{7}i}{560} 0 0 0$	
	$0 \frac{\sqrt{7}}{40} \frac{\sqrt{105}i}{140} 0 0 0 0 \frac{3\sqrt{105}i}{280} - \frac{\sqrt{7}i}{140} 0 0 0 0 - \frac{\sqrt{7}i}{20}$	
	$-\frac{\sqrt{7}}{40} 0 0 - \frac{\sqrt{105}i}{140} 0 0 \frac{3\sqrt{105}i}{280} 0 0 \frac{\sqrt{7}i}{140} 0 0 - \frac{\sqrt{7}i}{20} 0$	
	$0 \frac{\sqrt{7}i}{40} 0 0 \frac{\sqrt{105}i}{140} 0 0 \frac{3\sqrt{105}}{280} 0 0 0 \frac{\sqrt{7}i}{140} 0 0 \frac{\sqrt{7}}{20}$	
	$\frac{\sqrt{7}i}{40} 0 0 0 - \frac{\sqrt{105}i}{140} - \frac{3\sqrt{105}}{280} 0 0 0 0 - \frac{\sqrt{7}i}{140} - \frac{\sqrt{7}}{20} 0$	
	$0 0 0 \frac{\sqrt{105}i}{560} 0 \frac{\sqrt{105}}{560} - \frac{\sqrt{105}i}{70} 0 0 - \frac{\sqrt{7}i}{80} 0 \frac{\sqrt{7}}{80} 0 0$	
	$0 0 \frac{\sqrt{105}i}{560} 0 - \frac{\sqrt{105}}{560} 0 0 \frac{\sqrt{105}i}{70} - \frac{\sqrt{7}i}{80} 0 - \frac{\sqrt{7}}{80} 0 0 0$	
674	symmetry	1

continued ...

Table 9

No.	multipole	matrix
$\mathbb{G}_0^{(1,1;a)}(A_u)$	0 0 0 $-\frac{\sqrt{105}i}{140}$ 0 $-\frac{\sqrt{105}}{140}$ $\frac{\sqrt{105}i}{70}$ 0 0 $-\frac{\sqrt{7}i}{28}$ 0 $\frac{\sqrt{7}}{28}$ 0 0	
	0 0 $-\frac{\sqrt{105}i}{140}$ 0 $\frac{\sqrt{105}}{140}$ 0 0 $-\frac{\sqrt{105}i}{70}$ $-\frac{\sqrt{7}i}{28}$ 0 $-\frac{\sqrt{7}}{28}$ 0 0 0	
	0 0 0 $\frac{3\sqrt{35}i}{140}$ 0 $-\frac{3\sqrt{35}}{140}$ 0 0 0 $-\frac{\sqrt{21}i}{84}$ 0 $-\frac{\sqrt{21}}{84}$ $\frac{\sqrt{21}i}{42}$ 0	
	0 0 $\frac{3\sqrt{35}i}{140}$ 0 $\frac{3\sqrt{35}}{140}$ 0 0 0 $-\frac{\sqrt{21}i}{84}$ 0 $\frac{\sqrt{21}}{84}$ 0 0 $-\frac{\sqrt{21}i}{42}$	
	0 $\frac{\sqrt{21}i}{42}$ 0 0 $-\frac{\sqrt{35}i}{70}$ 0 0 $-\frac{\sqrt{35}}{70}$ 0 0 $\frac{\sqrt{21}i}{42}$ 0 0 $-\frac{\sqrt{21}}{42}$	
	$\frac{\sqrt{21}i}{42}$ 0 0 0 $\frac{\sqrt{35}i}{70}$ $\frac{\sqrt{35}}{70}$ 0 0 0 0 $-\frac{\sqrt{21}i}{42}$ $\frac{\sqrt{21}}{42}$ 0	
	0 $\frac{\sqrt{21}}{42}$ $-\frac{\sqrt{35}i}{70}$ 0 0 0 0 $-\frac{\sqrt{35}i}{70}$ $-\frac{\sqrt{21}i}{42}$ 0 0 0 0 $\frac{\sqrt{21}i}{42}$	
	$-\frac{\sqrt{21}}{42}$ 0 0 $\frac{\sqrt{35}i}{70}$ 0 0 $-\frac{\sqrt{35}i}{70}$ 0 0 $\frac{\sqrt{21}i}{42}$ 0 0 $\frac{\sqrt{21}i}{42}$ 0	
	$\frac{\sqrt{21}i}{42}$ 0 0 $-\frac{\sqrt{35}}{70}$ 0 $-\frac{\sqrt{35}i}{70}$ 0 0 0 $\frac{\sqrt{21}}{42}$ 0 $-\frac{\sqrt{21}i}{42}$ 0 0	
	0 $-\frac{\sqrt{21}i}{42}$ $\frac{\sqrt{35}}{70}$ 0 $-\frac{\sqrt{35}i}{70}$ 0 0 0 $-\frac{\sqrt{21}}{42}$ 0 $-\frac{\sqrt{21}i}{42}$ 0 0 0	
675	symmetry	$-\frac{x^2}{2} - \frac{y^2}{2} + z^2$
$\mathbb{G}_{2,0}^{(1,1;a)}(E_u)$	0 0 0 $-\frac{3\sqrt{35}i}{280}$ 0 $-\frac{3\sqrt{35}}{280}$ $\frac{\sqrt{35}i}{35}$ 0 0 $-\frac{\sqrt{21}i}{56}$ 0 $\frac{\sqrt{21}}{56}$ 0 0	
	0 0 $-\frac{3\sqrt{35}i}{280}$ 0 $\frac{3\sqrt{35}}{280}$ 0 0 $-\frac{\sqrt{35}i}{35}$ $-\frac{\sqrt{21}i}{56}$ 0 $-\frac{\sqrt{21}}{56}$ 0 0 0	
	0 0 0 $-\frac{11\sqrt{105}i}{840}$ 0 $\frac{11\sqrt{105}}{840}$ 0 0 0 $-\frac{\sqrt{7}i}{56}$ 0 $-\frac{\sqrt{7}}{56}$ $-\frac{\sqrt{7}i}{14}$ 0	
	0 0 $-\frac{11\sqrt{105}i}{840}$ 0 $-\frac{11\sqrt{105}}{840}$ 0 0 0 $-\frac{\sqrt{7}i}{56}$ 0 $\frac{\sqrt{7}}{56}$ 0 0 $\frac{\sqrt{7}i}{14}$	
	0 $\frac{\sqrt{7}i}{28}$ 0 0 $-\frac{\sqrt{105}i}{280}$ 0 0 $\frac{\sqrt{105}}{210}$ 0 0 $\frac{\sqrt{7}i}{56}$ 0 0 $-\frac{\sqrt{7}}{28}$	
	$\frac{\sqrt{7}i}{28}$ 0 0 0 $\frac{\sqrt{105}i}{280}$ $-\frac{\sqrt{105}}{210}$ 0 0 0 0 $-\frac{\sqrt{7}i}{56}$ $\frac{\sqrt{7}}{28}$ 0	
	0 $\frac{\sqrt{7}}{28}$ $-\frac{\sqrt{105}i}{280}$ 0 0 0 $\frac{\sqrt{105}i}{210}$ $-\frac{\sqrt{7}i}{56}$ 0 0 0 0 $\frac{\sqrt{7}i}{28}$	
	$-\frac{\sqrt{7}}{28}$ 0 0 $\frac{\sqrt{105}i}{280}$ 0 0 $\frac{\sqrt{105}}{210}$ 0 0 $\frac{\sqrt{7}i}{56}$ 0 0 $\frac{\sqrt{7}i}{28}$ 0	
	$-\frac{\sqrt{7}i}{14}$ 0 0 $-\frac{\sqrt{105}}{840}$ 0 $-\frac{\sqrt{105}i}{840}$ 0 0 0 $-\frac{3\sqrt{7}}{56}$ 0 $\frac{3\sqrt{7}i}{56}$ 0 0	
	0 $\frac{\sqrt{7}i}{14}$ $\frac{\sqrt{105}}{840}$ 0 $-\frac{\sqrt{105}i}{840}$ 0 0 0 $\frac{3\sqrt{7}}{56}$ 0 $\frac{3\sqrt{7}i}{56}$ 0 0 0	
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 $-\frac{11\sqrt{105}i}{840}$ 0 $\frac{11\sqrt{105}}{840}$ 0 0 0 $\frac{3\sqrt{7}i}{56}$ 0 $\frac{3\sqrt{7}}{56}$ 0 0	
	0 0 $-\frac{11\sqrt{105}i}{840}$ 0 $-\frac{11\sqrt{105}}{840}$ 0 0 0 $\frac{3\sqrt{7}i}{56}$ 0 $-\frac{3\sqrt{7}}{56}$ 0 0 0	
	0 0 0 $\frac{13\sqrt{35}i}{840}$ 0 $\frac{13\sqrt{35}}{840}$ $-\frac{\sqrt{35}i}{42}$ 0 0 $\frac{\sqrt{21}i}{56}$ 0 $-\frac{\sqrt{21}}{56}$ 0 0	
	0 0 $\frac{13\sqrt{35}i}{840}$ 0 $-\frac{13\sqrt{35}}{840}$ 0 0 $\frac{\sqrt{35}i}{42}$ $\frac{\sqrt{21}i}{56}$ 0 $\frac{\sqrt{21}}{56}$ 0 0 0	
	0 $-\frac{\sqrt{21}i}{28}$ 0 0 $-\frac{\sqrt{35}i}{168}$ 0 0 $\frac{\sqrt{35}}{420}$ 0 0 $-\frac{5\sqrt{21}i}{168}$ 0 0 $\frac{\sqrt{21}}{42}$	
	$-\frac{\sqrt{21}i}{28}$ 0 0 0 $\frac{\sqrt{35}i}{168}$ $-\frac{\sqrt{35}}{420}$ 0 0 0 0 $\frac{5\sqrt{21}i}{168}$ $-\frac{\sqrt{21}}{42}$ 0	
	0 $\frac{\sqrt{21}}{28}$ $\frac{\sqrt{35}i}{168}$ 0 0 0 0 $-\frac{\sqrt{35}i}{420}$ $-\frac{5\sqrt{21}i}{168}$ 0 0 0 0 $\frac{\sqrt{21}i}{42}$	
	$-\frac{\sqrt{21}}{28}$ 0 0 $-\frac{\sqrt{35}i}{168}$ 0 0 $-\frac{\sqrt{35}i}{420}$ 0 0 $\frac{5\sqrt{21}i}{168}$ 0 0 $\frac{\sqrt{21}i}{42}$ 0	
	0 0 0 $\frac{\sqrt{35}}{120}$ 0 $-\frac{\sqrt{35}i}{120}$ 0 0 0 $\frac{\sqrt{21}}{168}$ 0 $\frac{\sqrt{21}i}{168}$ 0 0 0	
	0 0 $-\frac{\sqrt{35}}{120}$ 0 $-\frac{\sqrt{35}i}{120}$ 0 0 0 $-\frac{\sqrt{21}}{168}$ 0 $\frac{\sqrt{21}i}{168}$ 0 0 0	
677	symmetry	$\sqrt{3}yz$
$\mathbb{G}_{2,0}^{(1,1;a)}(T_u)$	0 0 0 0 $-\frac{\sqrt{105}i}{140}$ 0 0 $-\frac{\sqrt{105}}{105}$ 0 0 $\frac{\sqrt{7}i}{28}$ 0 0 0	
	0 0 0 0 0 $\frac{\sqrt{105}i}{140}$ $\frac{\sqrt{105}}{105}$ 0 0 0 0 0 $-\frac{\sqrt{7}i}{28}$ 0 0	
	0 0 0 0 $\frac{11\sqrt{35}i}{420}$ 0 0 $\frac{\sqrt{35}}{42}$ 0 0 $-\frac{\sqrt{21}i}{84}$ 0 0 $\frac{\sqrt{21}}{42}$	
	0 0 0 0 0 $-\frac{11\sqrt{35}i}{420}$ $-\frac{\sqrt{35}}{42}$ 0 0 0 0 $\frac{\sqrt{21}i}{84}$ $-\frac{\sqrt{21}}{42}$ 0	
	0 0 0 $-\frac{\sqrt{35}i}{42}$ 0 $\frac{\sqrt{35}}{105}$ $\frac{\sqrt{35}i}{105}$ 0 0 0 0 $\frac{\sqrt{21}}{42}$ $-\frac{\sqrt{21}i}{42}$ 0	
	0 0 $-\frac{\sqrt{35}i}{42}$ 0 $-\frac{\sqrt{35}}{105}$ 0 0 $-\frac{\sqrt{35}i}{105}$ 0 0 $-\frac{\sqrt{21}i}{42}$ 0 0 $\frac{\sqrt{21}i}{42}$	
	$\frac{\sqrt{21}i}{42}$ 0 0 $-\frac{\sqrt{35}}{420}$ 0 $-\frac{\sqrt{35}i}{42}$ 0 0 0 $\frac{\sqrt{21}}{28}$ 0 0 0	
	0 $-\frac{\sqrt{21}i}{42}$ $\frac{\sqrt{35}}{420}$ 0 $-\frac{\sqrt{35}i}{42}$ 0 0 0 $-\frac{\sqrt{21}}{28}$ 0 0 0 0	
	0 $\frac{\sqrt{21}}{42}$ $-\frac{\sqrt{35}i}{420}$ 0 0 0 0 $-\frac{\sqrt{35}i}{42}$ $-\frac{\sqrt{21}i}{28}$ 0 0 0 0	
	$-\frac{\sqrt{21}}{42}$ 0 0 $\frac{\sqrt{35}i}{420}$ 0 0 $-\frac{\sqrt{35}i}{42}$ 0 0 $\frac{\sqrt{21}i}{28}$ 0 0 0	
678	symmetry	$\sqrt{3}xz$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{G}_{2,1}^{(1,1;a)}(T_u)$	0 0 $-\frac{\sqrt{105}i}{140}$ 0 0 0 0 $-\frac{\sqrt{105}i}{105}$ $-\frac{\sqrt{7}i}{28}$ 0 0 0 0 0 0	
	0 0 0 $\frac{\sqrt{105}i}{140}$ 0 0 $-\frac{\sqrt{105}i}{105}$ 0 0 $\frac{\sqrt{7}i}{28}$ 0 0 0 0 0 0	
	0 0 $-\frac{11\sqrt{35}i}{420}$ 0 0 0 0 $-\frac{\sqrt{35}i}{42}$ $-\frac{\sqrt{21}i}{84}$ 0 0 0 0 0 $\frac{\sqrt{21}i}{42}$	
	0 0 0 $\frac{11\sqrt{35}i}{420}$ 0 0 $-\frac{\sqrt{35}i}{42}$ 0 0 $\frac{\sqrt{21}i}{84}$ 0 0 0 $\frac{\sqrt{21}i}{42}$ 0	
	$\frac{\sqrt{21}i}{42}$ 0 0 $-\frac{\sqrt{35}}{42}$ 0 $-\frac{\sqrt{35}i}{420}$ 0 0 0 0 0 $-\frac{\sqrt{21}i}{28}$ 0 0 0	
	0 $-\frac{\sqrt{21}i}{42}$ $\frac{\sqrt{35}}{42}$ 0 $-\frac{\sqrt{35}i}{420}$ 0 0 0 0 $-\frac{\sqrt{21}i}{28}$ 0 0 0 0 0	
	0 0 0 $\frac{\sqrt{35}i}{105}$ 0 $-\frac{\sqrt{35}}{42}$ $\frac{\sqrt{35}i}{105}$ 0 0 $-\frac{\sqrt{21}i}{42}$ 0 0 0 $\frac{\sqrt{21}i}{42}$ 0	
	0 0 $\frac{\sqrt{35}i}{105}$ 0 $\frac{\sqrt{35}}{42}$ 0 0 $-\frac{\sqrt{35}i}{105}$ $-\frac{\sqrt{21}i}{42}$ 0 0 0 0 $-\frac{\sqrt{21}i}{42}$	
	0 $\frac{\sqrt{21}i}{42}$ 0 0 $-\frac{\sqrt{35}i}{420}$ 0 0 $-\frac{\sqrt{35}}{42}$ 0 0 $\frac{\sqrt{21}i}{28}$ 0 0 0 0	
	$\frac{\sqrt{21}i}{42}$ 0 0 0 $\frac{\sqrt{35}i}{420}$ $\frac{\sqrt{35}}{42}$ 0 0 0 0 $-\frac{\sqrt{21}i}{28}$ 0 0 0	
679	symmetry	$\sqrt{3}xy$
$\mathbb{G}_{2,2}^{(1,1;a)}(T_u)$	0 0 0 $\frac{\sqrt{105}}{60}$ 0 $\frac{\sqrt{105}i}{60}$ 0 0 0 $-\frac{\sqrt{7}}{28}$ 0 $\frac{\sqrt{7}i}{28}$ 0 0	
	0 0 $-\frac{\sqrt{105}}{60}$ 0 $\frac{\sqrt{105}i}{60}$ 0 0 0 $\frac{\sqrt{7}}{28}$ 0 $\frac{\sqrt{7}i}{28}$ 0 0 0	
	0 0 0 $-\frac{\sqrt{35}}{420}$ 0 $\frac{\sqrt{35}i}{420}$ 0 0 0 $-\frac{\sqrt{21}}{84}$ 0 $-\frac{\sqrt{21}i}{84}$ 0 0	
	0 0 $\frac{\sqrt{35}}{420}$ 0 $-\frac{\sqrt{35}i}{420}$ 0 0 0 $\frac{\sqrt{21}}{84}$ 0 $-\frac{\sqrt{21}i}{84}$ 0 0 0	
	0 $\frac{\sqrt{21}}{42}$ $-\frac{\sqrt{35}i}{42}$ 0 0 0 0 $-\frac{\sqrt{35}i}{420}$ 0 0 0 0 0 $\frac{\sqrt{21}i}{28}$	
	$-\frac{\sqrt{21}}{42}$ 0 0 $\frac{\sqrt{35}i}{42}$ 0 0 $-\frac{\sqrt{35}i}{420}$ 0 0 0 0 0 $\frac{\sqrt{21}i}{28}$ 0	
	0 $\frac{\sqrt{21}i}{42}$ 0 0 $-\frac{\sqrt{35}i}{42}$ 0 0 $-\frac{\sqrt{35}}{420}$ 0 0 0 0 0 $-\frac{\sqrt{21}}{28}$	
	$\frac{\sqrt{21}i}{42}$ 0 0 0 $\frac{\sqrt{35}i}{42}$ $\frac{\sqrt{35}}{420}$ 0 0 0 0 0 $\frac{\sqrt{21}i}{28}$ 0	
	0 0 0 $\frac{\sqrt{35}i}{105}$ 0 $\frac{\sqrt{35}}{105}$ $-\frac{\sqrt{35}i}{42}$ 0 0 $\frac{\sqrt{21}i}{42}$ 0 $-\frac{\sqrt{21}}{42}$ 0 0	
	0 0 $\frac{\sqrt{35}i}{105}$ 0 $-\frac{\sqrt{35}}{105}$ 0 0 $\frac{\sqrt{35}i}{42}$ $\frac{\sqrt{21}i}{42}$ 0 $\frac{\sqrt{21}}{42}$ 0 0 0	
680	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 0 0 $-\frac{5\sqrt{22}i}{264}$ 0 $-\frac{5\sqrt{22}}{264}$ $\frac{5\sqrt{22}i}{132}$ 0 0 $-\frac{7\sqrt{330}i}{1320}$ 0 $\frac{7\sqrt{330}}{1320}$ 0 0	
	0 0 $-\frac{5\sqrt{22}i}{264}$ 0 $\frac{5\sqrt{22}}{264}$ 0 0 $-\frac{5\sqrt{22}i}{132}$ $-\frac{7\sqrt{330}i}{1320}$ 0 $-\frac{7\sqrt{330}}{1320}$ 0 0 0	
	0 0 0 $\frac{5\sqrt{66}i}{264}$ 0 $-\frac{5\sqrt{66}}{264}$ 0 0 0 $-\frac{7\sqrt{110}i}{1320}$ 0 $-\frac{7\sqrt{110}}{1320}$ $\frac{7\sqrt{110}i}{660}$ 0	
	0 0 $\frac{5\sqrt{66}i}{264}$ 0 $\frac{5\sqrt{66}}{264}$ 0 0 0 $-\frac{7\sqrt{110}i}{1320}$ 0 $\frac{7\sqrt{110}}{1320}$ 0 0 $-\frac{7\sqrt{110}i}{660}$	
	0 $-\frac{\sqrt{110}i}{330}$ 0 0 $\frac{\sqrt{66}i}{66}$ 0 0 $\frac{\sqrt{66}}{66}$ 0 0 $-\frac{\sqrt{110}i}{165}$ 0 0 0 $\frac{\sqrt{110}}{165}$	
	$-\frac{\sqrt{110}i}{330}$ 0 0 0 $-\frac{\sqrt{66}i}{66}$ $-\frac{\sqrt{66}}{66}$ 0 0 0 0 0 $\frac{\sqrt{110}i}{165}$ $-\frac{\sqrt{110}}{165}$ 0	
	0 $-\frac{\sqrt{110}}{330}$ $\frac{\sqrt{66}i}{66}$ 0 0 0 0 $\frac{\sqrt{66}i}{66}$ $\frac{\sqrt{110}i}{165}$ 0 0 0 0 $-\frac{\sqrt{110}i}{165}$	
	$\frac{\sqrt{110}}{330}$ 0 0 $-\frac{\sqrt{66}i}{66}$ 0 0 $\frac{\sqrt{66}i}{66}$ 0 0 $-\frac{\sqrt{110}i}{165}$ 0 0 0 $-\frac{\sqrt{110}i}{165}$ 0	
	$-\frac{\sqrt{110}i}{330}$ 0 0 $\frac{\sqrt{66}}{66}$ 0 $\frac{\sqrt{66}i}{66}$ 0 0 0 $-\frac{\sqrt{110}}{165}$ 0 $\frac{\sqrt{110}i}{165}$ 0 0 0	
	0 $\frac{\sqrt{110}i}{330}$ $-\frac{\sqrt{66}}{66}$ 0 $\frac{\sqrt{66}i}{66}$ 0 0 0 $\frac{\sqrt{110}}{165}$ 0 $\frac{\sqrt{110}i}{165}$ 0 0 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 0 0 $-\frac{19\sqrt{770}i}{9240}$ 0 $-\frac{19\sqrt{770}}{9240}$ $\frac{5\sqrt{770}i}{924}$ 0 0 $-\frac{41\sqrt{462}i}{9240}$ 0 $\frac{41\sqrt{462}}{9240}$ 0 0	
	0 0 $-\frac{19\sqrt{770}i}{9240}$ 0 $\frac{19\sqrt{770}}{9240}$ 0 0 $-\frac{5\sqrt{770}i}{924}$ $-\frac{41\sqrt{462}i}{9240}$ 0 $-\frac{41\sqrt{462}}{9240}$ 0 0 0	
	0 0 0 $-\frac{23\sqrt{2310}i}{9240}$ 0 $\frac{23\sqrt{2310}}{9240}$ 0 0 0 $-\frac{17\sqrt{154}i}{1848}$ 0 $\frac{17\sqrt{154}}{1848}$ $-\frac{19\sqrt{154}i}{4620}$ 0	
	0 0 $-\frac{23\sqrt{2310}i}{9240}$ 0 $-\frac{23\sqrt{2310}}{9240}$ 0 0 0 $\frac{17\sqrt{154}i}{1848}$ 0 $-\frac{17\sqrt{154}}{1848}$ 0 0 $\frac{19\sqrt{154}i}{4620}$	
	0 $-\frac{\sqrt{154}i}{210}$ 0 0 $\frac{\sqrt{2310}i}{4620}$ 0 0 $\frac{\sqrt{2310}}{462}$ 0 0 $-\frac{47\sqrt{154}i}{4620}$ 0 0 0 $\frac{2\sqrt{154}}{1155}$	
	$-\frac{\sqrt{154}i}{210}$ 0 0 0 $-\frac{\sqrt{2310}i}{4620}$ $-\frac{\sqrt{2310}}{462}$ 0 0 0 0 $\frac{47\sqrt{154}i}{4620}$ $-\frac{2\sqrt{154}}{1155}$ 0	
	0 $-\frac{\sqrt{154}}{210}$ $\frac{\sqrt{2310}i}{4620}$ 0 0 0 0 $\frac{\sqrt{2310}i}{462}$ $\frac{47\sqrt{154}i}{4620}$ 0 0 0 0 $-\frac{2\sqrt{154}i}{1155}$	
	$\frac{\sqrt{154}}{210}$ 0 0 $-\frac{\sqrt{2310}i}{4620}$ 0 0 $\frac{\sqrt{2310}i}{462}$ 0 0 0 $-\frac{47\sqrt{154}i}{4620}$ 0 0 0 $-\frac{2\sqrt{154}i}{1155}$ 0	
	$\frac{\sqrt{154}i}{105}$ 0 0 $-\frac{\sqrt{2310}}{420}$ 0 $-\frac{\sqrt{2310}i}{420}$ 0 0 0 $\frac{\sqrt{154}}{84}$ 0 $-\frac{\sqrt{154}i}{84}$ 0 0 0	
	0 $-\frac{\sqrt{154}i}{105}$ $\frac{\sqrt{2310}}{420}$ 0 $-\frac{\sqrt{2310}i}{420}$ 0 0 0 $-\frac{\sqrt{154}}{84}$ 0 $-\frac{\sqrt{154}i}{84}$ 0 0 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 $-\frac{23\sqrt{2310}i}{9240}$ 0 $\frac{23\sqrt{2310}}{9240}$ 0 0 0 $-\frac{\sqrt{154}i}{3080}$ 0 $-\frac{\sqrt{154}}{3080}$ $-\frac{3\sqrt{154}i}{220}$ 0	
	0 0 $-\frac{23\sqrt{2310}i}{9240}$ 0 $-\frac{23\sqrt{2310}}{9240}$ 0 0 0 $-\frac{\sqrt{154}i}{3080}$ 0 $\frac{\sqrt{154}}{3080}$ 0 0 $\frac{3\sqrt{154}i}{220}$	
	0 0 0 $\frac{9\sqrt{770}i}{3080}$ 0 $\frac{9\sqrt{770}}{3080}$ $-\frac{\sqrt{770}i}{220}$ 0 0 $\frac{41\sqrt{462}i}{9240}$ 0 $-\frac{41\sqrt{462}}{9240}$ 0 0	
	0 0 $\frac{9\sqrt{770}i}{3080}$ 0 $-\frac{9\sqrt{770}}{3080}$ 0 0 $\frac{\sqrt{770}i}{220}$ $\frac{41\sqrt{462}i}{9240}$ 0 $\frac{41\sqrt{462}}{9240}$ 0 0	
	0 $\frac{\sqrt{462}i}{210}$ 0 0 $-\frac{\sqrt{770}i}{220}$ 0 0 $-\frac{\sqrt{770}}{385}$ 0 0 $\frac{\sqrt{462}i}{220}$ 0 0 $-\frac{17\sqrt{462}}{2310}$	
	$\frac{\sqrt{462}i}{210}$ 0 0 0 $\frac{\sqrt{770}i}{220}$ $\frac{\sqrt{770}}{385}$ 0 0 0 0 $-\frac{\sqrt{462}i}{220}$ $\frac{17\sqrt{462}}{2310}$ 0	
	0 $-\frac{\sqrt{462}}{210}$ $\frac{\sqrt{770}i}{220}$ 0 0 0 0 $\frac{\sqrt{770}i}{385}$ $\frac{\sqrt{462}i}{220}$ 0 0 0 $-\frac{17\sqrt{462}i}{2310}$ 0	
	$\frac{\sqrt{462}}{210}$ 0 0 $-\frac{\sqrt{770}i}{220}$ 0 0 $-\frac{\sqrt{770}i}{385}$ 0 0 $-\frac{\sqrt{462}i}{220}$ 0 0 $-\frac{17\sqrt{462}i}{2310}$ 0	
	0 0 0 $\frac{3\sqrt{770}}{1540}$ 0 $-\frac{3\sqrt{770}i}{1540}$ 0 0 0 $\frac{13\sqrt{462}}{4620}$ 0 $\frac{13\sqrt{462}i}{4620}$ 0 0	
	0 0 $-\frac{3\sqrt{770}}{1540}$ 0 $-\frac{3\sqrt{770}i}{1540}$ 0 0 0 $-\frac{13\sqrt{462}}{4620}$ 0 $\frac{13\sqrt{462}i}{4620}$ 0 0	
683	symmetry	$\frac{\sqrt{35}yz(y-z)(y+z)}{2}$
$\mathbb{G}_{4,0}^{(1,1;a)}(T_u, 1)$	0 $-\frac{9\sqrt{22}i}{440}$ 0 0 $\frac{\sqrt{330}i}{120}$ 0 0 $\frac{\sqrt{330}}{132}$ 0 0 $-\frac{13\sqrt{22}i}{440}$ 0 0 $\frac{3\sqrt{22}}{110}$	
	$-\frac{9\sqrt{22}i}{440}$ 0 0 0 0 $-\frac{\sqrt{330}i}{120}$ $-\frac{\sqrt{330}}{132}$ 0 0 0 0 $\frac{13\sqrt{22}i}{440}$ $-\frac{3\sqrt{22}}{110}$ 0	
	0 $-\frac{3\sqrt{66}i}{440}$ 0 0 $\frac{3\sqrt{110}i}{440}$ 0 0 $\frac{\sqrt{110}}{110}$ 0 0 $-\frac{\sqrt{66}i}{120}$ 0 0 $\frac{7\sqrt{66}}{660}$	
	$-\frac{3\sqrt{66}i}{440}$ 0 0 0 0 $-\frac{3\sqrt{110}i}{440}$ $-\frac{\sqrt{110}}{110}$ 0 0 0 0 $\frac{\sqrt{66}i}{120}$ $-\frac{7\sqrt{66}}{660}$ 0	
	0 0 0 0 0 $\frac{\sqrt{110}}{55}$ $-\frac{\sqrt{110}i}{55}$ 0 0 $\frac{3\sqrt{66}i}{220}$ 0 $-\frac{\sqrt{66}}{66}$ $-\frac{\sqrt{66}i}{66}$ 0	
	0 0 0 0 $-\frac{\sqrt{110}}{55}$ 0 0 $\frac{\sqrt{110}i}{55}$ $\frac{3\sqrt{66}i}{220}$ 0 $\frac{\sqrt{66}}{66}$ 0 0 $\frac{\sqrt{66}i}{66}$	
	$\frac{\sqrt{66}i}{330}$ 0 0 0 0 $\frac{3\sqrt{110}i}{440}$ 0 0 0 $-\frac{\sqrt{66}}{330}$ 0 $-\frac{3\sqrt{66}i}{440}$ 0 0	
	0 $-\frac{\sqrt{66}i}{330}$ 0 0 $\frac{3\sqrt{110}i}{440}$ 0 0 0 $\frac{\sqrt{66}}{330}$ 0 $-\frac{3\sqrt{66}i}{440}$ 0 0	
	0 $-\frac{\sqrt{66}}{330}$ 0 0 0 0 0 $-\frac{3\sqrt{110}i}{440}$ $-\frac{\sqrt{66}i}{330}$ 0 0 0 0 $-\frac{3\sqrt{66}i}{440}$	
	$\frac{\sqrt{66}}{330}$ 0 0 0 0 0 $-\frac{3\sqrt{110}i}{440}$ 0 0 $\frac{\sqrt{66}i}{330}$ 0 0 $-\frac{3\sqrt{66}i}{440}$ 0	
684	symmetry	$-\frac{\sqrt{35}xz(x-z)(x+z)}{2}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{G}_{4,1}^{(1,1;a)}(T_u, 1)$	0	$\begin{bmatrix} 0 & \frac{9\sqrt{22}}{440} & -\frac{\sqrt{330}i}{120} & 0 & 0 & 0 & 0 & -\frac{\sqrt{330}i}{132} & -\frac{13\sqrt{22}i}{440} & 0 & 0 & 0 & 0 & \frac{3\sqrt{22}i}{110} \\ -\frac{9\sqrt{22}}{440} & 0 & 0 & \frac{\sqrt{330}i}{120} & 0 & 0 & -\frac{\sqrt{330}i}{132} & 0 & 0 & \frac{13\sqrt{22}i}{440} & 0 & 0 & 0 & \frac{3\sqrt{22}i}{110} & 0 \\ 0 & -\frac{3\sqrt{66}}{440} & \frac{3\sqrt{110}i}{440} & 0 & 0 & 0 & 0 & \frac{\sqrt{110}i}{110} & \frac{\sqrt{66}i}{120} & 0 & 0 & 0 & 0 & -\frac{7\sqrt{66}i}{660} \\ \frac{3\sqrt{66}}{440} & 0 & 0 & -\frac{3\sqrt{110}i}{440} & 0 & 0 & \frac{\sqrt{110}i}{110} & 0 & 0 & -\frac{\sqrt{66}i}{120} & 0 & 0 & 0 & -\frac{7\sqrt{66}i}{660} & 0 \\ -\frac{\sqrt{66}i}{330} & 0 & 0 & -\frac{3\sqrt{110}}{440} & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{66}}{440} & 0 & -\frac{\sqrt{66}i}{330} & 0 & 0 & 0 \\ 0 & \frac{\sqrt{66}i}{330} & \frac{3\sqrt{110}}{440} & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{66}}{440} & 0 & -\frac{\sqrt{66}i}{330} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{110}i}{55} & 0 & 0 & \frac{\sqrt{110}i}{55} & 0 & 0 & -\frac{\sqrt{66}i}{66} & 0 & \frac{3\sqrt{66}}{220} & -\frac{\sqrt{66}i}{66} & 0 \\ 0 & 0 & -\frac{\sqrt{110}i}{55} & 0 & 0 & 0 & 0 & -\frac{\sqrt{110}i}{55} & -\frac{\sqrt{66}i}{66} & 0 & -\frac{3\sqrt{66}}{220} & 0 & 0 & \frac{\sqrt{66}i}{66} \\ 0 & \frac{\sqrt{66}i}{330} & 0 & 0 & 0 & 0 & \frac{3\sqrt{110}}{440} & 0 & 0 & 0 & -\frac{\sqrt{66}i}{330} & 0 & 0 & 0 & -\frac{3\sqrt{66}}{440} \\ \frac{\sqrt{66}i}{330} & 0 & 0 & 0 & 0 & -\frac{3\sqrt{110}}{440} & 0 & 0 & 0 & 0 & \frac{\sqrt{66}i}{330} & \frac{3\sqrt{66}}{440} & 0 & 0 \end{bmatrix}$
	685	$\sqrt{35}xy(x-y)(x+y)/2$
	$\mathbb{G}_{4,2}^{(1,1;a)}(T_u, 1)$	$\begin{bmatrix} 0 & 0 & 0 & -\frac{\sqrt{330}}{1320} & 0 & \frac{\sqrt{330}i}{1320} & 0 & 0 & 0 & \frac{\sqrt{22}}{440} & 0 & \frac{\sqrt{22}i}{440} & 0 & 0 \\ 0 & 0 & \frac{\sqrt{330}}{1320} & 0 & \frac{\sqrt{330}i}{1320} & 0 & 0 & 0 & -\frac{\sqrt{22}}{440} & 0 & \frac{\sqrt{22}i}{440} & 0 & 0 & 0 & 0 \\ \frac{3\sqrt{66}i}{220} & 0 & 0 & -\frac{7\sqrt{110}}{440} & 0 & -\frac{7\sqrt{110}i}{440} & 0 & 0 & 0 & \frac{5\sqrt{66}}{264} & 0 & -\frac{5\sqrt{66}i}{264} & 0 & 0 & 0 \\ 0 & -\frac{3\sqrt{66}i}{220} & \frac{7\sqrt{110}}{440} & 0 & -\frac{7\sqrt{110}i}{440} & 0 & 0 & 0 & -\frac{5\sqrt{66}}{264} & 0 & -\frac{5\sqrt{66}i}{264} & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{66}}{330} & \frac{3\sqrt{110}i}{440} & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{66}i}{440} & 0 & 0 & 0 & 0 & -\frac{\sqrt{66}i}{330} & 0 \\ -\frac{\sqrt{66}}{330} & 0 & 0 & -\frac{3\sqrt{110}i}{440} & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{66}i}{440} & 0 & 0 & 0 & -\frac{\sqrt{66}i}{330} & 0 \\ 0 & -\frac{\sqrt{66}i}{330} & 0 & 0 & -\frac{3\sqrt{110}i}{440} & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{66}i}{440} & 0 & 0 & 0 & -\frac{\sqrt{66}i}{330} \\ -\frac{\sqrt{66}i}{330} & 0 & 0 & 0 & 0 & \frac{3\sqrt{110}i}{440} & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{66}i}{440} & \frac{\sqrt{66}}{330} & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{110}i}{55} & 0 & -\frac{\sqrt{110}}{55} & 0 & 0 & 0 & -\frac{\sqrt{66}i}{66} & 0 & -\frac{\sqrt{66}}{66} & \frac{3\sqrt{66}i}{220} & 0 & 0 \\ 0 & 0 & \frac{\sqrt{110}i}{55} & 0 & \frac{\sqrt{110}}{55} & 0 & 0 & 0 & -\frac{\sqrt{66}i}{66} & 0 & \frac{\sqrt{66}}{66} & 0 & 0 & -\frac{3\sqrt{66}i}{220} \end{bmatrix}$
	686	$\sqrt{5}yz(6x^2-y^2-z^2)/2$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{G}_{4,0}^{(1,1;a)}(T_u, 2)$	0	$-\frac{3\sqrt{154}i}{440}$ 0 0 0 $-\frac{\sqrt{2310}i}{1848}$ 0 0 $\frac{\sqrt{2310}}{924}$ 0 0 $-\frac{29\sqrt{154}i}{3080}$ 0 0 0
	$-\frac{3\sqrt{154}i}{440}$	0 0 0 0 0 $\frac{\sqrt{2310}i}{1848}$ $-\frac{\sqrt{2310}}{924}$ 0 0 0 0 $\frac{29\sqrt{154}i}{3080}$ 0 0
	0	$\frac{3\sqrt{462}i}{440}$ 0 0 0 $-\frac{\sqrt{770}i}{616}$ 0 0 0 0 0 $\frac{29\sqrt{462}i}{9240}$ 0 0 $-\frac{29\sqrt{462}}{4620}$
	$\frac{3\sqrt{462}i}{440}$	0 0 0 0 0 $\frac{\sqrt{770}i}{616}$ 0 0 0 0 0 $-\frac{29\sqrt{462}i}{9240}$ $\frac{29\sqrt{462}}{4620}$ 0
	0	0 0 0 $\frac{\sqrt{770}i}{220}$ 0 $-\frac{\sqrt{770}}{385}$ $-\frac{\sqrt{770}i}{385}$ 0 0 0 0 $-\frac{\sqrt{462}}{210}$ $\frac{\sqrt{462}i}{210}$ 0
	0	0 0 $\frac{\sqrt{770}i}{220}$ 0 $\frac{\sqrt{770}}{385}$ 0 0 $\frac{\sqrt{770}i}{385}$ 0 0 $\frac{\sqrt{462}}{210}$ 0 0 $-\frac{\sqrt{462}i}{210}$
	$\frac{17\sqrt{462}i}{2310}$	0 0 $-\frac{\sqrt{770}}{385}$ 0 $-\frac{\sqrt{770}i}{440}$ 0 0 0 0 $\frac{\sqrt{462}}{210}$ 0 $-\frac{3\sqrt{462}i}{440}$ 0 0
	0	$-\frac{17\sqrt{462}i}{2310}$ $\frac{\sqrt{770}}{385}$ 0 $-\frac{\sqrt{770}i}{440}$ 0 0 0 $-\frac{\sqrt{462}}{210}$ 0 $-\frac{3\sqrt{462}i}{440}$ 0 0 0
	0	$\frac{17\sqrt{462}}{2310}$ $-\frac{\sqrt{770}i}{385}$ 0 0 0 0 $-\frac{\sqrt{770}i}{440}$ $-\frac{\sqrt{462}i}{210}$ 0 0 0 0 $\frac{3\sqrt{462}i}{440}$
	$-\frac{17\sqrt{462}}{2310}$	0 0 $\frac{\sqrt{770}i}{385}$ 0 0 $-\frac{\sqrt{770}i}{440}$ 0 0 $\frac{\sqrt{462}i}{210}$ 0 0 0 $\frac{3\sqrt{462}i}{440}$ 0
687	symmetry	$-\frac{\sqrt{5}xz(x^2 - 6y^2 + z^2)}{2}$
$\mathbb{G}_{4,1}^{(1,1;a)}(T_u, 2)$	0	$-\frac{3\sqrt{154}}{440}$ $-\frac{\sqrt{2310}i}{1848}$ 0 0 0 0 $\frac{\sqrt{2310}i}{924}$ $\frac{29\sqrt{154}i}{3080}$ 0 0 0 0 0
	$\frac{3\sqrt{154}}{440}$	0 0 0 $\frac{\sqrt{2310}i}{1848}$ 0 0 $\frac{\sqrt{2310}i}{924}$ 0 0 $-\frac{29\sqrt{154}i}{3080}$ 0 0 0 0
	0	$-\frac{3\sqrt{462}}{440}$ $\frac{\sqrt{770}i}{616}$ 0 0 0 0 0 0 $\frac{29\sqrt{462}i}{9240}$ 0 0 0 0 $-\frac{29\sqrt{462}i}{4620}$
	$\frac{3\sqrt{462}}{440}$	0 0 $-\frac{\sqrt{770}i}{616}$ 0 0 0 0 0 0 $-\frac{29\sqrt{462}i}{9240}$ 0 0 0 $-\frac{29\sqrt{462}i}{4620}$
	$\frac{17\sqrt{462}i}{2310}$	0 0 $-\frac{\sqrt{770}}{440}$ 0 $-\frac{\sqrt{770}i}{385}$ 0 0 0 0 $\frac{3\sqrt{462}}{440}$ 0 $-\frac{\sqrt{462}i}{210}$ 0 0
	0	$-\frac{17\sqrt{462}i}{2310}$ $\frac{\sqrt{770}}{440}$ 0 $-\frac{\sqrt{770}i}{385}$ 0 0 0 $-\frac{3\sqrt{462}}{440}$ 0 $-\frac{\sqrt{462}i}{210}$ 0 0 0
	0	0 0 0 $-\frac{\sqrt{770}i}{385}$ 0 $\frac{\sqrt{770}}{220}$ $-\frac{\sqrt{770}i}{385}$ 0 0 $\frac{\sqrt{462}i}{210}$ 0 0 $-\frac{\sqrt{462}i}{210}$ 0
	0	0 0 $-\frac{\sqrt{770}i}{385}$ 0 $-\frac{\sqrt{770}}{220}$ 0 0 $\frac{\sqrt{770}i}{385}$ $\frac{\sqrt{462}i}{210}$ 0 0 0 0 $\frac{\sqrt{462}i}{210}$
	0	$\frac{17\sqrt{462}i}{2310}$ 0 0 0 $-\frac{\sqrt{770}i}{385}$ 0 0 $-\frac{\sqrt{770}}{440}$ 0 0 0 $\frac{\sqrt{462}i}{210}$ 0 0 $-\frac{3\sqrt{462}}{440}$
	$\frac{17\sqrt{462}i}{2310}$	0 0 0 0 $\frac{\sqrt{770}i}{385}$ $\frac{\sqrt{770}}{440}$ 0 0 0 0 $-\frac{\sqrt{462}i}{210}$ $\frac{3\sqrt{462}}{440}$ 0 0
688	symmetry	$-\frac{\sqrt{5}xy(x^2 + y^2 - 6z^2)}{2}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{G}_{4,2}^{(1,1;a)}(T_u, 2)$	$\frac{3\sqrt{154}i}{220}$	0 0 0 $-\frac{\sqrt{2310}}{1848}$ 0 $-\frac{\sqrt{2310}i}{1848}$ 0 0 0 $\frac{29\sqrt{154}}{3080}$ 0 $-\frac{29\sqrt{154}i}{3080}$ 0 0
	0	$-\frac{3\sqrt{154}i}{220}$ $\frac{\sqrt{2310}}{1848}$ 0 $-\frac{\sqrt{2310}i}{1848}$ 0 0 0 $-\frac{29\sqrt{154}}{3080}$ 0 $-\frac{29\sqrt{154}i}{3080}$ 0 0 0
	0	0 0 0 $\frac{\sqrt{770}}{616}$ 0 $-\frac{\sqrt{770}i}{616}$ 0 0 0 $\frac{29\sqrt{462}}{9240}$ 0 $\frac{29\sqrt{462}i}{9240}$ 0 0 0
	0	0 0 $-\frac{\sqrt{770}}{616}$ 0 $-\frac{\sqrt{770}i}{616}$ 0 0 0 $-\frac{29\sqrt{462}}{9240}$ 0 $\frac{29\sqrt{462}i}{9240}$ 0 0 0
	0	$\frac{17\sqrt{462}}{2310}$ $-\frac{\sqrt{770}i}{440}$ 0 0 0 0 $-\frac{\sqrt{770}i}{385}$ $-\frac{3\sqrt{462}i}{440}$ 0 0 0 0 $\frac{\sqrt{462}i}{210}$
	$-\frac{17\sqrt{462}}{2310}$	0 0 $\frac{\sqrt{770}i}{440}$ 0 0 $-\frac{\sqrt{770}i}{385}$ 0 0 $\frac{3\sqrt{462}i}{440}$ 0 0 $\frac{\sqrt{462}i}{210}$ 0
	0	$\frac{17\sqrt{462}i}{2310}$ 0 0 $-\frac{\sqrt{770}i}{440}$ 0 0 $-\frac{\sqrt{770}}{385}$ 0 0 $\frac{3\sqrt{462}i}{440}$ 0 0 $-\frac{\sqrt{462}}{210}$
	$\frac{17\sqrt{462}i}{2310}$	0 0 0 0 $\frac{\sqrt{770}i}{440}$ $\frac{\sqrt{770}}{385}$ 0 0 0 0 $-\frac{3\sqrt{462}i}{440}$ $\frac{\sqrt{462}}{210}$ 0
	0	0 0 0 $-\frac{\sqrt{770}i}{385}$ 0 $-\frac{\sqrt{770}}{385}$ $\frac{\sqrt{770}i}{220}$ 0 0 $-\frac{\sqrt{462}i}{210}$ 0 $\frac{\sqrt{462}}{210}$ 0 0
	0	0 0 $-\frac{\sqrt{770}i}{385}$ 0 $\frac{\sqrt{770}}{385}$ 0 0 $-\frac{\sqrt{770}i}{220}$ $-\frac{\sqrt{462}i}{210}$ 0 $-\frac{\sqrt{462}}{210}$ 0 0 0
689	symmetry	x
$\mathbb{T}_{1,0}^{(a)}(T_u)$	0 0 $-\frac{3\sqrt{35}i}{140}$ 0 0 0 0 0 $-\frac{\sqrt{21}i}{28}$ 0 0 0 0 0	
	0 0 0 $-\frac{3\sqrt{35}i}{140}$ 0 0 0 0 0 $-\frac{\sqrt{21}i}{28}$ 0 0 0 0 0	
	0 0 $\frac{3\sqrt{105}i}{140}$ 0 0 0 0 0 $-\frac{\sqrt{7}i}{28}$ 0 0 0 0 0	
	0 0 0 $\frac{3\sqrt{105}i}{140}$ 0 0 0 0 0 $-\frac{\sqrt{7}i}{28}$ 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 $\frac{\sqrt{7}i}{14}$ 0 0 0 0 0 0 0 0 0 0 0 0 0	
	0 0 0 0 0 0 $-\frac{\sqrt{105}i}{70}$ 0 0 0 0 0 0 $\frac{\sqrt{7}i}{14}$ 0	
	0 0 0 0 0 0 0 $-\frac{\sqrt{105}i}{70}$ 0 0 0 0 0 0 $\frac{\sqrt{7}i}{14}$	
	0 0 0 0 $-\frac{\sqrt{105}i}{70}$ 0 0 0 0 0 0 $-\frac{\sqrt{7}i}{14}$ 0 0 0	
	0 0 0 0 0 $-\frac{\sqrt{105}i}{70}$ 0 0 0 0 0 0 $-\frac{\sqrt{7}i}{14}$ 0 0 0	
690	symmetry	y

continued ...

Table 9

No.	multipole	matrix
$\mathbb{T}_{1,1}^{(a)}(T_u)$	0 0 0 0 $-\frac{3\sqrt{35}i}{140}$ 0 0 0 0 0 $\frac{\sqrt{21}i}{28}$ 0 0 0	
	0 0 0 0 0 $-\frac{3\sqrt{35}i}{140}$ 0 0 0 0 0 $\frac{\sqrt{21}i}{28}$ 0 0 0	
	0 0 0 0 0 $-\frac{3\sqrt{105}i}{140}$ 0 0 0 0 0 $-\frac{\sqrt{7}i}{28}$ 0 0 0	
	0 0 0 0 0 0 $-\frac{3\sqrt{105}i}{140}$ 0 0 0 0 0 $-\frac{\sqrt{7}i}{28}$ 0 0 0	
	0 0 0 0 0 0 0 $-\frac{\sqrt{105}i}{70}$ 0 0 0 0 0 $-\frac{\sqrt{7}i}{14}$ 0	
	0 0 0 0 0 0 0 0 $-\frac{\sqrt{105}i}{70}$ 0 0 0 0 0 $-\frac{\sqrt{7}i}{14}$	
	$\frac{\sqrt{7}i}{14}$ 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 0 0	
	0 0 $-\frac{\sqrt{105}i}{70}$ 0 0 0 0 0 0 $\frac{\sqrt{7}i}{14}$ 0 0 0 0 0 0	
	0 0 0 $-\frac{\sqrt{105}i}{70}$ 0 0 0 0 0 0 $\frac{\sqrt{7}i}{14}$ 0 0 0 0 0	
691	symmetry	z
$\mathbb{T}_{1,2}^{(a)}(T_u)$	0 0 0 0 0 0 0 $\frac{3\sqrt{35}i}{70}$ 0 0 0 0 0 0 0 0	
	0 0 0 0 0 0 0 0 $\frac{3\sqrt{35}i}{70}$ 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 0 0 0 $\frac{\sqrt{7}i}{14}$	
	0 0 0 0 0 $-\frac{\sqrt{105}i}{70}$ 0 0 0 0 0 0 $\frac{\sqrt{7}i}{14}$ 0 0 0	
	0 0 0 0 0 0 $-\frac{\sqrt{105}i}{70}$ 0 0 0 0 0 $\frac{\sqrt{7}i}{14}$ 0 0 0	
	0 0 $-\frac{\sqrt{105}i}{70}$ 0 0 0 0 0 0 $-\frac{\sqrt{7}i}{14}$ 0 0 0 0 0	
	0 0 0 $-\frac{\sqrt{105}i}{70}$ 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 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	
692	symmetry	$\sqrt{15}xyz$

continued ...

Table 9

No.	multipole	matrix
	$\mathbb{T}_3^{(a)}(A_u)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{3}i}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{3}i}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{6} & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
693	symmetry	$\frac{x(2x^2-3y^2-3z^2)}{2}$ $\begin{bmatrix} 0 & 0 & -\frac{\sqrt{15}i}{30} & 0 & 0 & 0 & 0 & 0 & \frac{i}{4} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{15}i}{30} & 0 & 0 & 0 & 0 & 0 & \frac{i}{4} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{5}i}{10} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{12} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{5}i}{10} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{12} & 0 & 0 & 0 & 0 \\ -\frac{\sqrt{3}i}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{3}i}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{40} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{24} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{40} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{24} \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{40} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{24} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{40} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{24} & 0 & 0 & 0 \end{bmatrix}$
694	symmetry	$-\frac{y(3x^2-2y^2+3z^2)}{2}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{T}_{3,1}^{(a)}(T_u, 1)$	0 0 0 0 $-\frac{\sqrt{15}i}{30}$ 0 0 0 0 0 $-\frac{i}{4}$ 0 0 0	
	0 0 0 0 0 $-\frac{\sqrt{15}i}{30}$ 0 0 0 0 0 $-\frac{i}{4}$ 0 0 0	
	0 0 0 0 $-\frac{\sqrt{5}i}{10}$ 0 0 0 0 0 $\frac{\sqrt{3}i}{12}$ 0 0 0 0	
	0 0 0 0 0 $-\frac{\sqrt{5}i}{10}$ 0 0 0 0 0 $\frac{\sqrt{3}i}{12}$ 0 0 0	
	0 0 0 0 0 0 $-\frac{\sqrt{5}i}{40}$ 0 0 0 0 0 $-\frac{\sqrt{3}i}{24}$ 0	
	0 0 0 0 0 0 0 $-\frac{\sqrt{5}i}{40}$ 0 0 0 0 0 $-\frac{\sqrt{3}i}{24}$	
	$-\frac{\sqrt{3}i}{6}$ 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 $-\frac{\sqrt{5}i}{40}$ 0 0 0 0 0 0 $\frac{\sqrt{3}i}{24}$ 0 0 0 0 0	
	0 0 0 $-\frac{\sqrt{5}i}{40}$ 0 0 0 0 0 0 $\frac{\sqrt{3}i}{24}$ 0 0 0 0	
695	symmetry	$-\frac{z(3x^2+3y^2-2z^2)}{2}$
$\mathbb{T}_{3,2}^{(a)}(T_u, 1)$	0 0 0 0 0 0 $\frac{\sqrt{15}i}{15}$ 0 0 0 0 0 0 0 0	
	0 0 0 0 0 0 0 $\frac{\sqrt{15}i}{15}$ 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 $-\frac{\sqrt{5}i}{40}$ 0 0 0 0 0 0 $\frac{\sqrt{3}i}{24}$ 0 0 0	
	0 0 0 0 0 $-\frac{\sqrt{5}i}{40}$ 0 0 0 0 0 $\frac{\sqrt{3}i}{24}$ 0 0 0	
	0 0 $-\frac{\sqrt{5}i}{40}$ 0 0 0 0 0 $-\frac{\sqrt{3}i}{24}$ 0 0 0 0 0 0	
	0 0 0 $-\frac{\sqrt{5}i}{40}$ 0 0 0 0 0 $-\frac{\sqrt{3}i}{24}$ 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	
696	symmetry	$\frac{\sqrt{15}x(y-z)(y+z)}{2}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{T}_{3,0}^{(a)}(T_u, 2)$	0 0 $\frac{i}{4}$ 0 0 0 0 0 0 0 0 0 0 0 0	
	0 0 0 $\frac{i}{4}$ 0 0 0 0 0 0 0 0 0 0 0	
	0 0 $\frac{\sqrt{3}i}{12}$ 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 0	
	0 0 0 0 0 0 0 0 0 0 0 0 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 0 0 0 0 0 $-\frac{\sqrt{5}i}{8}$ 0	
	0 0 0 0 0 0 0 $-\frac{\sqrt{3}i}{24}$ 0 0 0 0 0 0 $-\frac{\sqrt{5}i}{8}$	
	0 0 0 0 $\frac{\sqrt{3}i}{24}$ 0 0 0 0 0 $-\frac{\sqrt{5}i}{8}$ 0 0 0 0	
	0 0 0 0 0 $\frac{\sqrt{3}i}{24}$ 0 0 0 0 0 $-\frac{\sqrt{5}i}{8}$ 0 0 0	
697	symmetry	$-\frac{\sqrt{15}y(x-z)(x+z)}{2}$
$\mathbb{T}_{3,1}^{(a)}(T_u, 2)$	0 0 0 0 $-\frac{i}{4}$ 0 0 0 0 0 0 0 0 0 0	
	0 0 0 0 0 $-\frac{i}{4}$ 0 0 0 0 0 0 0 0 0	
	0 0 0 0 $\frac{\sqrt{3}i}{12}$ 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 0 0 0 0 0 $\frac{\sqrt{3}i}{24}$ 0 0 0 0 0 0 $-\frac{\sqrt{5}i}{8}$ 0	
	0 0 0 0 0 0 0 $\frac{\sqrt{3}i}{24}$ 0 0 0 0 0 $-\frac{\sqrt{5}i}{8}$	
	0 0 0 0 0 0 0 0 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 0 0 0 0 $-\frac{\sqrt{5}i}{8}$ 0 0 0 0 0 0	
	0 0 0 $-\frac{\sqrt{3}i}{24}$ 0 0 0 0 0 $-\frac{\sqrt{5}i}{8}$ 0 0 0 0 0	
698	symmetry	$\frac{\sqrt{15}z(x-y)(x+y)}{2}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{T}_{3,2}^{(a)}(T_u, 2)$		$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{24} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{8} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{24} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{8} & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{3}i}{24} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{8} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{3}i}{24} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{8} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
699	symmetry	$\frac{3\sqrt{35}xyz(x-y)(x+y)}{2}$
$\mathbb{T}_{5,0}^{(a)}(E_u)$		$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ \frac{\sqrt{30}i}{20} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{30}i}{20} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{2}i}{8} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}i}{40} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{2}i}{8} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}i}{40} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{2}i}{8} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}i}{40} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}i}{8} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}i}{40} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}i}{20} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}i}{20} & 0 & 0 \end{bmatrix}$
700	symmetry	$\frac{\sqrt{105}xyz(x^2+y^2-2z^2)}{2}$

continued ..

Table 9

No.	multipole	matrix
	$\mathbb{T}_{5,1}^{(a)}(E_u)$	$\begin{bmatrix} -\frac{\sqrt{30}i}{20} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{30}i}{20} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{6}i}{24} & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{10}i}{40} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{6}i}{24} & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{10}i}{40} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{6}i}{24} & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{10}i}{40} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}i}{24} & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{10}i}{40} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{12} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{12} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
701	symmetry	$\frac{x(8x^4 - 40x^2y^2 - 40x^2z^2 + 15y^4 + 30y^2z^2 + 15z^4)}{8}$ $\begin{bmatrix} 0 & 0 & -\frac{\sqrt{210}i}{84} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{14}i}{56} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{210}i}{84} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{14}i}{56} & 0 & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{70}i}{28} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{42}i}{168} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{70}i}{28} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{42}i}{168} & 0 & 0 & 0 & 0 \\ \frac{\sqrt{42}i}{84} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{42}i}{84} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{70}i}{56} & 0 & 0 & 0 & 0 & 0 & -\frac{5\sqrt{42}i}{168} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{70}i}{56} & 0 & 0 & 0 & 0 & 0 & -\frac{5\sqrt{42}i}{168} \\ 0 & 0 & 0 & 0 & \frac{\sqrt{70}i}{56} & 0 & 0 & 0 & 0 & \frac{5\sqrt{42}i}{168} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{70}i}{56} & 0 & 0 & 0 & 0 & 0 & \frac{5\sqrt{42}i}{168} & 0 & 0 \end{bmatrix}$
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
$\mathbb{T}_{5,1}^{(a)}(T_u, 1)$	$0 \ 0 \ 0 \ 0 \ -\frac{\sqrt{210}i}{84} \ 0 \ 0 \ 0 \ 0 \ 0 \ \frac{\sqrt{14}i}{56} \ 0 \ 0 \ 0$	
	$0 \ 0 \ 0 \ 0 \ 0 \ -\frac{\sqrt{210}i}{84} \ 0 \ 0 \ 0 \ 0 \ 0 \ \frac{\sqrt{14}i}{56} \ 0 \ 0 \ 0$	
	$0 \ 0 \ 0 \ 0 \ -\frac{\sqrt{70}i}{28} \ 0 \ 0 \ 0 \ 0 \ 0 \ -\frac{\sqrt{42}i}{168} \ 0 \ 0 \ 0$	
	$0 \ 0 \ 0 \ 0 \ 0 \ -\frac{\sqrt{70}i}{28} \ 0 \ 0 \ 0 \ 0 \ 0 \ -\frac{\sqrt{42}i}{168} \ 0 \ 0 \ 0$	
	$0 \ 0 \ 0 \ 0 \ 0 \ 0 \ \frac{\sqrt{70}i}{56} \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ \frac{5\sqrt{42}i}{168} \ 0$	
	$0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ \frac{\sqrt{70}i}{56} \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ \frac{5\sqrt{42}i}{168}$	
	$\frac{\sqrt{42}i}{84} \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0$	
	$0 \ \frac{\sqrt{42}i}{84} \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0$	
	$0 \ 0 \ \frac{\sqrt{70}i}{56} \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ -\frac{5\sqrt{42}i}{168} \ 0 \ 0 \ 0 \ 0 \ 0 \ 0$	
	$0 \ 0 \ 0 \ \frac{\sqrt{70}i}{56} \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ -\frac{5\sqrt{42}i}{168} \ 0 \ 0 \ 0 \ 0 \ 0 \ 0$	
703	symmetry	$\frac{z(15x^4+30x^2y^2-40x^2z^2+15y^4-40y^2z^2+8z^4)}{8}$
$\mathbb{T}_{5,2}^{(a)}(T_u, 1)$	$0 \ 0 \ 0 \ 0 \ 0 \ 0 \ \frac{\sqrt{210}i}{42} \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0$	
	$0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ \frac{\sqrt{210}i}{42} \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0$	
	$0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ \frac{\sqrt{42}i}{84} \ 0$	
	$0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ \frac{\sqrt{42}i}{84}$	
	$0 \ 0 \ 0 \ 0 \ 0 \ \frac{\sqrt{70}i}{56} \ 0 \ 0 \ 0 \ 0 \ 0 \ -\frac{5\sqrt{42}i}{168} \ 0 \ 0 \ 0$	
	$0 \ 0 \ 0 \ 0 \ 0 \ 0 \ \frac{\sqrt{70}i}{56} \ 0 \ 0 \ 0 \ 0 \ 0 \ -\frac{5\sqrt{42}i}{168} \ 0 \ 0 \ 0$	
	$0 \ 0 \ \frac{\sqrt{70}i}{56} \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ \frac{5\sqrt{42}i}{168} \ 0 \ 0 \ 0 \ 0 \ 0 \ 0$	
	$0 \ 0 \ 0 \ \frac{\sqrt{70}i}{56} \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ \frac{5\sqrt{42}i}{168} \ 0 \ 0 \ 0 \ 0 \ 0 \ 0$	
	$\frac{\sqrt{42}i}{84} \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0$	
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 0 $-\frac{3\sqrt{10}i}{40}$ 0 0 0 0 0	
	0 0 0 0 0 0 0 0 0 $-\frac{3\sqrt{10}i}{40}$ 0 0 0 0	
	0 0 0 0 0 0 0 0 $-\frac{\sqrt{30}i}{40}$ 0 0 0 0 0	
	0 0 0 0 0 0 0 0 0 $-\frac{\sqrt{30}i}{40}$ 0 0 0 0	
	$-\frac{\sqrt{30}i}{20}$ 0 0 0 0 0 0 0 0 0 0 0 0 0	
	0 $-\frac{\sqrt{30}i}{20}$ 0 0 0 0 0 0 0 0 0 0 0 0	
	0 0 0 0 0 0 $\frac{\sqrt{2}i}{8}$ 0 0 0 0 0 0 $\frac{\sqrt{30}i}{40}$ 0	
	0 0 0 0 0 0 0 $\frac{\sqrt{2}i}{8}$ 0 0 0 0 0 $\frac{\sqrt{30}i}{40}$ 0	
	0 0 0 0 $\frac{\sqrt{2}i}{8}$ 0 0 0 0 0 0 $-\frac{\sqrt{30}i}{40}$ 0 0 0	
	0 0 0 0 $\frac{\sqrt{2}i}{8}$ 0 0 0 0 0 0 0 $-\frac{\sqrt{30}i}{40}$ 0 0	
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 0 0 $\frac{3\sqrt{10}i}{40}$ 0 0 0	
	0 0 0 0 0 0 0 0 0 0 $\frac{3\sqrt{10}i}{40}$ 0 0 0	
	0 0 0 0 0 0 0 0 0 $-\frac{\sqrt{30}i}{40}$ 0 0 0	
	0 0 0 0 0 0 0 0 0 0 $-\frac{\sqrt{30}i}{40}$ 0 0 0	
	0 0 0 0 0 0 $\frac{\sqrt{2}i}{8}$ 0 0 0 0 0 $-\frac{\sqrt{30}i}{40}$ 0	
	0 0 0 0 0 0 $\frac{\sqrt{2}i}{8}$ 0 0 0 0 0 $-\frac{\sqrt{30}i}{40}$ 0	
	$-\frac{\sqrt{30}i}{20}$ 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 0 0 0 0 0	
	0 0 $\frac{\sqrt{2}i}{8}$ 0 0 0 0 0 $\frac{\sqrt{30}i}{40}$ 0 0 0 0 0	
	0 0 0 $\frac{\sqrt{2}i}{8}$ 0 0 0 0 0 $\frac{\sqrt{30}i}{40}$ 0 0 0 0	
706	symmetry	$\frac{3\sqrt{35}z(x^2-2xy-y^2)(x^2+2xy-y^2)}{8}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{T}_{5,2}^{(a)}(T_u, 2)$		$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}i}{20} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}i}{20} \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2}i}{8} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}i}{40} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2}i}{8} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}i}{40} & 0 \\ 0 & 0 & 0 & \frac{\sqrt{2}i}{8} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}i}{40} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{2}i}{8} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}i}{40} & 0 & 0 & 0 & 0 \\ -\frac{\sqrt{30}i}{20} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{30}i}{20} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
		$\frac{\sqrt{105}x(y-z)(y+z)(2x^2-y^2-z^2)}{4}$
707	symmetry	
$\mathbb{T}_{5,0}^{(a)}(T_u, 3)$		$\begin{bmatrix} 0 & 0 & -\frac{\sqrt{2}i}{8} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}i}{40} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{2}i}{8} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}i}{40} & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{6}i}{24} & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{10}i}{40} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{6}i}{24} & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{10}i}{40} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}i}{12} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}i}{20} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}i}{12} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}i}{20} \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{12} & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}i}{20} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{12} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}i}{20} & 0 & 0 & 0 \end{bmatrix}$
		$\frac{\sqrt{105}y(x-z)(x+z)(x^2-2y^2+z^2)}{4}$
708	symmetry	

continued ...

Table 9

No.	multipole	matrix
$\mathbb{T}_{5,1}^{(a)}(T_u, 3)$		$\begin{bmatrix} 0 & 0 & 0 & 0 & \frac{\sqrt{2}i}{8} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}i}{40} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2}i}{8} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}i}{40} & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{24} & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{10}i}{40} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{24} & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{10}i}{40} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{12} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}i}{20} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{12} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}i}{20} \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{6}i}{12} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}i}{20} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{6}i}{12} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}i}{20} & 0 & 0 & 0 & 0 \end{bmatrix}$
709	symmetry	$-\frac{\sqrt{105}z(x-y)(x+y)(x^2+y^2-2z^2)}{4}$
$\mathbb{T}_{5,2}^{(a)}(T_u, 3)$		$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}i}{20} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}i}{20} \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}i}{12} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}i}{12} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}i}{12} & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}i}{20} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}i}{12} & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}i}{20} & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{6}i}{12} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}i}{20} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{6}i}{12} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}i}{20} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
710	symmetry	$\sqrt{15}xyz$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{T}_3^{(1,-1;a)}(A_u)$	0 0 0 $-\frac{\sqrt{14}}{56}$ 0 $-\frac{\sqrt{14}i}{56}$ 0 0 0 $-\frac{\sqrt{210}}{168}$ 0 $\frac{\sqrt{210}i}{168}$ $\frac{\sqrt{210}}{84}$ 0	
	0 0 $-\frac{\sqrt{14}}{56}$ 0 $\frac{\sqrt{14}i}{56}$ 0 0 0 $-\frac{\sqrt{210}}{168}$ 0 $-\frac{\sqrt{210}i}{168}$ 0 0 $-\frac{\sqrt{210}}{84}$	
	0 0 0 $-\frac{\sqrt{42}}{168}$ 0 $\frac{\sqrt{42}i}{168}$ $\frac{\sqrt{42}}{84}$ 0 0 $\frac{\sqrt{70}}{56}$ 0 $\frac{\sqrt{70}i}{56}$ 0 0	
	0 0 $-\frac{\sqrt{42}}{168}$ 0 $-\frac{\sqrt{42}i}{168}$ 0 0 $-\frac{\sqrt{42}}{84}$ $\frac{\sqrt{70}}{56}$ 0 $-\frac{\sqrt{70}i}{56}$ 0 0 0	
	0 0 0 0 $-\frac{\sqrt{42}}{42}$ 0 0 $-\frac{\sqrt{42}i}{42}$ 0 0 0 0 0 0 0	
	0 0 0 0 0 $\frac{\sqrt{42}}{42}$ $\frac{\sqrt{42}i}{42}$ 0 0 0 0 0 0 0 0	
	0 0 $\frac{\sqrt{42}}{42}$ 0 0 0 0 $-\frac{\sqrt{42}}{42}$ 0 0 0 0 0 0 0	
	0 0 0 $-\frac{\sqrt{42}}{42}$ 0 0 $-\frac{\sqrt{42}}{42}$ 0 0 0 0 0 0 0 0	
	0 0 0 $\frac{\sqrt{42}i}{42}$ 0 $\frac{\sqrt{42}}{42}$ 0 0 0 0 0 0 0 0 0	
	0 0 $-\frac{\sqrt{42}i}{42}$ 0 $\frac{\sqrt{42}}{42}$ 0 0 0 0 0 0 0 0 0 0	
711	symmetry	$\frac{x(2x^2-3y^2-3z^2)}{2}$
$\mathbb{T}_{3,0}^{(1,-1;a)}(T_u, 1)$	0 $-\frac{3\sqrt{14}}{56}$ 0 0 $-\frac{\sqrt{210}}{280}$ 0 0 0 0 $\frac{\sqrt{14}}{56}$ 0 0 $\frac{\sqrt{14}i}{28}$	
	$-\frac{3\sqrt{14}}{56}$ 0 0 0 0 $\frac{\sqrt{210}}{280}$ 0 0 0 0 0 $-\frac{\sqrt{14}}{56}$ $-\frac{\sqrt{14}i}{28}$ 0	
	0 $-\frac{\sqrt{42}}{56}$ 0 0 $\frac{\sqrt{70}}{280}$ 0 0 $\frac{\sqrt{70}i}{140}$ 0 0 $\frac{\sqrt{42}}{56}$ 0 0 0	
	$-\frac{\sqrt{42}}{56}$ 0 0 0 0 $-\frac{\sqrt{70}}{280}$ $-\frac{\sqrt{70}i}{140}$ 0 0 0 0 $-\frac{\sqrt{42}}{56}$ 0 0	
	0 0 0 0 0 $-\frac{\sqrt{70}i}{70}$ $-\frac{\sqrt{70}}{70}$ 0 0 $-\frac{\sqrt{42}}{28}$ 0 0 0 0	
	0 0 0 0 0 $\frac{\sqrt{70}i}{70}$ 0 $\frac{\sqrt{70}}{70}$ $-\frac{\sqrt{42}}{28}$ 0 0 0 0 0	
	0 0 0 $\frac{\sqrt{70}i}{70}$ 0 $\frac{3\sqrt{70}}{280}$ 0 0 0 0 0 $\frac{\sqrt{42}}{56}$ 0 0	
	0 0 $-\frac{\sqrt{70}i}{70}$ 0 $\frac{3\sqrt{70}}{280}$ 0 0 0 0 0 $\frac{\sqrt{42}}{56}$ 0 0 0	
	0 0 $\frac{\sqrt{70}}{70}$ 0 0 0 0 $-\frac{3\sqrt{70}}{280}$ 0 0 0 0 0 $\frac{\sqrt{42}}{56}$	
	0 0 0 $-\frac{\sqrt{70}}{70}$ 0 0 0 $-\frac{3\sqrt{70}}{280}$ 0 0 0 0 0 $\frac{\sqrt{42}}{56}$ 0	
712	symmetry	$-\frac{y(3x^2-2y^2+3z^2)}{2}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{T}_{3,1}^{(1,-1;a)}(T_u, 1)$	0	$-\frac{3\sqrt{14}i}{56}, \frac{\sqrt{210}}{280}, 0, 0, 0, 0, 0, 0, \frac{\sqrt{14}}{56}, 0, 0, 0, 0, -\frac{\sqrt{14}}{28}$
	$\frac{3\sqrt{14}i}{56}$	$0, 0, -\frac{\sqrt{210}}{280}, 0, 0, 0, 0, 0, -\frac{\sqrt{14}}{56}, 0, 0, 0, -\frac{\sqrt{14}}{28}, 0$
	0	$\frac{\sqrt{42}i}{56}, \frac{\sqrt{70}}{280}, 0, 0, 0, 0, -\frac{\sqrt{70}}{140}, -\frac{\sqrt{42}}{56}, 0, 0, 0, 0, 0, 0$
	$-\frac{\sqrt{42}i}{56}$	$0, 0, -\frac{\sqrt{70}}{280}, 0, 0, -\frac{\sqrt{70}}{140}, 0, 0, \frac{\sqrt{42}}{56}, 0, 0, 0, 0, 0$
	0	$0, 0, \frac{3\sqrt{70}i}{280}, 0, \frac{\sqrt{70}}{70}, 0, 0, 0, -\frac{\sqrt{42}i}{56}, 0, 0, 0, 0, 0$
	0	$0, 0, -\frac{3\sqrt{70}i}{280}, 0, \frac{\sqrt{70}}{70}, 0, 0, 0, \frac{\sqrt{42}i}{56}, 0, 0, 0, 0, 0$
	0	$0, 0, 0, -\frac{\sqrt{70}}{70}, 0, 0, \frac{\sqrt{70}}{70}, 0, 0, 0, 0, \frac{\sqrt{42}i}{28}, 0, 0, 0$
	0	$0, 0, -\frac{\sqrt{70}}{70}, 0, 0, 0, -\frac{\sqrt{70}}{70}, 0, 0, 0, -\frac{\sqrt{42}i}{28}, 0, 0, 0$
	0	$0, 0, 0, 0, -\frac{\sqrt{70}}{70}, 0, 0, -\frac{3\sqrt{70}i}{280}, 0, 0, 0, 0, 0, -\frac{\sqrt{42}i}{56}$
	0	$0, 0, 0, 0, 0, \frac{\sqrt{70}}{70}, \frac{3\sqrt{70}i}{280}, 0, 0, 0, 0, 0, 0, \frac{\sqrt{42}i}{56}, 0$
713	symmetry	$-\frac{z(3x^2+3y^2-2z^2)}{2}$
$\mathbb{T}_{3,2}^{(1,-1;a)}(T_u, 1)$	0	$0, 0, 0, -\frac{\sqrt{210}i}{280}, 0, -\frac{\sqrt{210}}{280}, 0, 0, 0, -\frac{\sqrt{14}i}{56}, 0, \frac{\sqrt{14}}{56}, 0, 0$
	0	$0, 0, \frac{\sqrt{210}i}{280}, 0, -\frac{\sqrt{210}}{280}, 0, 0, 0, \frac{\sqrt{14}i}{56}, 0, \frac{\sqrt{14}}{56}, 0, 0, 0$
	$\frac{\sqrt{42}}{28}$	$0, 0, -\frac{\sqrt{70}i}{280}, 0, \frac{\sqrt{70}}{280}, 0, 0, 0, 0, \frac{\sqrt{42}i}{56}, 0, \frac{\sqrt{42}}{56}, 0, 0, 0$
	$0, -\frac{\sqrt{42}}{28}$	$\frac{\sqrt{70}i}{280}, 0, \frac{\sqrt{70}}{280}, 0, 0, 0, 0, -\frac{\sqrt{42}i}{56}, 0, \frac{\sqrt{42}}{56}, 0, 0, 0, 0$
	0	$0, 0, \frac{3\sqrt{70}}{280}, 0, 0, 0, 0, -\frac{\sqrt{70}}{70}, \frac{\sqrt{42}}{56}, 0, 0, 0, 0, 0, 0$
	0	$0, 0, 0, -\frac{3\sqrt{70}}{280}, 0, 0, -\frac{\sqrt{70}}{70}, 0, 0, -\frac{\sqrt{42}}{56}, 0, 0, 0, 0, 0$
	0	$0, 0, 0, 0, -\frac{3\sqrt{70}}{280}, 0, 0, -\frac{\sqrt{70}i}{70}, 0, 0, \frac{\sqrt{42}}{56}, 0, 0, 0, 0$
	0	$0, 0, 0, 0, 0, \frac{3\sqrt{70}}{280}, \frac{\sqrt{70}i}{70}, 0, 0, 0, 0, 0, -\frac{\sqrt{42}}{56}, 0, 0$
	0	$0, 0, 0, \frac{\sqrt{70}}{70}, 0, \frac{\sqrt{70}i}{70}, 0, 0, 0, 0, 0, 0, 0, 0, -\frac{\sqrt{42}}{28}, 0$
	0	$0, 0, \frac{\sqrt{70}}{70}, 0, -\frac{\sqrt{70}i}{70}, 0, 0, 0, 0, 0, 0, 0, 0, 0, \frac{\sqrt{42}}{28}$
714	symmetry	$\frac{\sqrt{15}x(y-z)(y+z)}{2}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{T}_{3,0}^{(1,-1;a)}(T_u, 2)$	0	$\frac{\sqrt{210}}{168}$ 0 0 0 $-\frac{\sqrt{14}}{56}$ 0 0 0 0 0 $\frac{\sqrt{210}}{168}$ 0 0 $-\frac{\sqrt{210}i}{84}$
	$\frac{\sqrt{210}}{168}$	0 0 0 0 0 $\frac{\sqrt{14}}{56}$ 0 0 0 0 0 $-\frac{\sqrt{210}}{168}$ $\frac{\sqrt{210}i}{84}$ 0
	0 $-\frac{\sqrt{70}}{56}$	0 0 0 $\frac{\sqrt{42}}{168}$ 0 0 0 $-\frac{\sqrt{42}i}{84}$ 0 0 $\frac{\sqrt{70}}{56}$ 0 0 0
	$-\frac{\sqrt{70}}{56}$	0 0 0 0 0 $-\frac{\sqrt{42}}{168}$ $\frac{\sqrt{42}i}{84}$ 0 0 0 0 $-\frac{\sqrt{70}}{56}$ 0 0
	0 0 0 $-\frac{\sqrt{42}}{84}$	0 0 $\frac{\sqrt{42}i}{42}$ $-\frac{\sqrt{42}}{42}$ 0 0 0 0 0 0 0 0
	0 0 $-\frac{\sqrt{42}}{84}$	0 $-\frac{\sqrt{42}i}{42}$ 0 0 $\frac{\sqrt{42}}{42}$ 0 0 0 0 0 0 0
	0 0 0 $-\frac{\sqrt{42}i}{42}$	0 0 $\frac{\sqrt{42}}{168}$ 0 0 0 0 0 0 $-\frac{\sqrt{70}}{56}$ 0 0
	0 0 $\frac{\sqrt{42}i}{42}$	0 0 $\frac{\sqrt{42}}{168}$ 0 0 0 0 0 0 $-\frac{\sqrt{70}}{56}$ 0 0
	0 0 $\frac{\sqrt{42}}{42}$	0 0 0 0 0 $-\frac{\sqrt{42}}{168}$ 0 0 0 0 0 0 $\frac{\sqrt{70}}{56}$
	0 0 0 $-\frac{\sqrt{42}}{42}$	0 0 0 $\frac{\sqrt{42}}{168}$ 0 0 0 0 0 0 0 $\frac{\sqrt{70}}{56}$ 0
715	symmetry	$-\frac{\sqrt{15}y(x-z)(x+z)}{2}$
$\mathbb{T}_{3,1}^{(1,-1;a)}(T_u, 2)$	0 $-\frac{\sqrt{210}i}{168}$ $-\frac{\sqrt{14}}{56}$	0 0 0 0 0 0 0 $-\frac{\sqrt{210}}{168}$ 0 0 0 0 $-\frac{\sqrt{210}}{84}$
	$\frac{\sqrt{210}i}{168}$	0 0 $\frac{\sqrt{14}}{56}$ 0 0 0 0 0 0 $\frac{\sqrt{210}}{168}$ 0 0 $-\frac{\sqrt{210}}{84}$ 0
	0 $-\frac{\sqrt{70}i}{56}$ $-\frac{\sqrt{42}}{168}$	0 0 0 0 0 0 $-\frac{\sqrt{42}}{84}$ $\frac{\sqrt{70}}{56}$ 0 0 0 0 0
	$-\frac{\sqrt{70}i}{56}$	0 0 $\frac{\sqrt{42}}{168}$ 0 0 $-\frac{\sqrt{42}}{84}$ 0 0 $-\frac{\sqrt{70}}{56}$ 0 0 0 0
	0 0 0 $-\frac{\sqrt{42}i}{168}$	0 0 $\frac{\sqrt{42}}{42}$ 0 0 0 0 $-\frac{\sqrt{70}i}{56}$ 0 0 0 0
	0 0 $\frac{\sqrt{42}i}{168}$	0 0 $\frac{\sqrt{42}}{42}$ 0 0 0 0 $\frac{\sqrt{70}i}{56}$ 0 0 0 0
	0 0 0 $-\frac{\sqrt{42}}{42}$	0 0 $\frac{\sqrt{42}i}{84}$ $-\frac{\sqrt{42}}{42}$ 0 0 0 0 0 0 0
	0 0 $-\frac{\sqrt{42}}{42}$	0 0 $-\frac{\sqrt{42}i}{84}$ 0 0 $\frac{\sqrt{42}}{42}$ 0 0 0 0 0
	0 0 0 0 $\frac{\sqrt{42}}{42}$	0 0 0 $-\frac{\sqrt{42}i}{168}$ 0 0 0 0 0 0 $\frac{\sqrt{70}i}{56}$
	0 0 0 0 0	$-\frac{\sqrt{42}}{42}$ $\frac{\sqrt{42}i}{168}$ 0 0 0 0 0 0 $-\frac{\sqrt{70}i}{56}$ 0
716	symmetry	$\frac{\sqrt{15}z(x-y)(x+y)}{2}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{T}_{3,2}^{(1,-1;a)}(T_u, 2)$	$\begin{bmatrix} -\frac{\sqrt{210}}{84} & 0 & 0 & -\frac{\sqrt{14}i}{56} & 0 & \frac{\sqrt{14}}{56} & 0 & 0 & 0 & -\frac{\sqrt{210}i}{168} & 0 & -\frac{\sqrt{210}}{168} & 0 & 0 \\ 0 & \frac{\sqrt{210}}{84} & \frac{\sqrt{14}i}{56} & 0 & \frac{\sqrt{14}}{56} & 0 & 0 & 0 & 0 & \frac{\sqrt{210}i}{168} & 0 & -\frac{\sqrt{210}}{168} & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{42}i}{168} & 0 & -\frac{\sqrt{42}}{168} & 0 & 0 & 0 & \frac{\sqrt{70}i}{56} & 0 & -\frac{\sqrt{70}}{56} & 0 & 0 \\ 0 & 0 & \frac{\sqrt{42}i}{168} & 0 & -\frac{\sqrt{42}}{168} & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}i}{56} & 0 & -\frac{\sqrt{70}}{56} & 0 & 0 \\ 0 & 0 & \frac{\sqrt{42}}{168} & 0 & 0 & 0 & 0 & \frac{\sqrt{42}}{42} & -\frac{\sqrt{70}}{56} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{42}}{168} & 0 & 0 & \frac{\sqrt{42}}{42} & 0 & 0 & \frac{\sqrt{70}}{56} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{42}}{168} & 0 & 0 & -\frac{\sqrt{42}i}{42} & 0 & 0 & 0 & \frac{\sqrt{70}}{56} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{42}}{168} & \frac{\sqrt{42}i}{42} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}}{56} & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{42}}{42} & 0 & \frac{\sqrt{42}i}{42} & -\frac{\sqrt{42}}{84} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{42}}{42} & 0 & -\frac{\sqrt{42}i}{42} & 0 & 0 & \frac{\sqrt{42}}{84} & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$	
	$\frac{3\sqrt{35}xyz(x-y)(x+y)}{2}$	
$\mathbb{T}_{5,0}^{(1,-1;a)}(E_u)$	$\begin{bmatrix} 0 & 0 & 0 & \frac{3\sqrt{5}}{40} & 0 & -\frac{3\sqrt{5}i}{40} & 0 & 0 & 0 & -\frac{3\sqrt{3}}{40} & 0 & -\frac{3\sqrt{3}i}{40} & 0 & 0 \\ 0 & 0 & \frac{3\sqrt{5}}{40} & 0 & \frac{3\sqrt{5}i}{40} & 0 & 0 & 0 & -\frac{3\sqrt{3}}{40} & 0 & \frac{3\sqrt{3}i}{40} & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{15}}{40} & 0 & \frac{\sqrt{15}i}{40} & 0 & 0 & 0 & \frac{1}{8} & 0 & -\frac{i}{8} & -\frac{1}{10} & 0 \\ 0 & 0 & \frac{\sqrt{15}}{40} & 0 & -\frac{\sqrt{15}i}{40} & 0 & 0 & 0 & \frac{1}{8} & 0 & \frac{i}{8} & 0 & 0 & \frac{1}{10} \\ 0 & -\frac{1}{20} & 0 & 0 & \frac{\sqrt{15}}{40} & 0 & 0 & 0 & 0 & 0 & \frac{3}{40} & 0 & 0 & \frac{i}{20} \\ -\frac{1}{20} & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{40} & 0 & 0 & 0 & 0 & 0 & -\frac{3}{40} & -\frac{i}{20} & 0 \\ 0 & \frac{i}{20} & \frac{\sqrt{15}}{40} & 0 & 0 & 0 & 0 & 0 & -\frac{3}{40} & 0 & 0 & 0 & 0 & \frac{1}{20} \\ -\frac{i}{20} & 0 & 0 & -\frac{\sqrt{15}}{40} & 0 & 0 & 0 & 0 & \frac{3}{40} & 0 & 0 & 0 & \frac{1}{20} & 0 \\ \frac{1}{10} & 0 & 0 & \frac{\sqrt{15}i}{40} & 0 & -\frac{\sqrt{15}}{40} & 0 & 0 & 0 & \frac{i}{8} & 0 & \frac{1}{8} & 0 & 0 \\ 0 & -\frac{1}{10} & -\frac{\sqrt{15}i}{40} & 0 & -\frac{\sqrt{15}}{40} & 0 & 0 & 0 & -\frac{i}{8} & 0 & \frac{1}{8} & 0 & 0 & 0 \end{bmatrix}$	
	$\frac{\sqrt{105}xyz(x^2+y^2-2z^2)}{2}$	

continued ...

Table 9

No.	multipole	matrix
$\mathbb{T}_{5,1}^{(1,-1;a)}(E_u)$	0	0 0 0 $\frac{\sqrt{15}}{40}$ 0 $\frac{\sqrt{15}i}{40}$ 0 0 0 $\frac{1}{40}$ 0 $-\frac{i}{40}$ $-\frac{1}{5}$ 0
	0	0 0 $\frac{\sqrt{15}}{40}$ 0 $-\frac{\sqrt{15}i}{40}$ 0 0 0 $\frac{1}{40}$ 0 $\frac{i}{40}$ 0 0 $\frac{1}{5}$
	0	0 0 0 $\frac{\sqrt{5}}{40}$ 0 $-\frac{\sqrt{5}i}{40}$ $\frac{\sqrt{5}}{10}$ 0 0 $\frac{3\sqrt{3}}{40}$ 0 $\frac{3\sqrt{3}i}{40}$ 0 0
	0	0 0 $\frac{\sqrt{5}}{40}$ 0 $\frac{\sqrt{5}i}{40}$ 0 0 $-\frac{\sqrt{5}}{10}$ $\frac{3\sqrt{3}}{40}$ 0 $-\frac{3\sqrt{3}i}{40}$ 0 0 0
	0	$\frac{\sqrt{3}}{20}$ 0 0 $-\frac{\sqrt{5}}{40}$ 0 0 $\frac{\sqrt{5}i}{20}$ 0 0 $-\frac{7\sqrt{3}}{120}$ 0 0 $-\frac{\sqrt{3}i}{15}$
	$\frac{\sqrt{3}}{20}$	0 0 0 0 0 $\frac{\sqrt{5}}{40}$ $-\frac{\sqrt{5}i}{20}$ 0 0 0 0 $\frac{7\sqrt{3}}{120}$ $\frac{\sqrt{3}i}{15}$ 0
	0	$\frac{\sqrt{3}i}{20}$ $\frac{\sqrt{5}}{40}$ 0 0 0 0 0 $\frac{\sqrt{5}}{20}$ $-\frac{7\sqrt{3}}{120}$ 0 0 0 0 $\frac{\sqrt{3}}{15}$
	$-\frac{\sqrt{3}i}{20}$	0 0 $-\frac{\sqrt{5}}{40}$ 0 0 0 $\frac{\sqrt{5}}{20}$ 0 0 $\frac{7\sqrt{3}}{120}$ 0 0 $\frac{\sqrt{3}}{15}$ 0
	0	0 0 0 $\frac{\sqrt{5}i}{40}$ 0 $\frac{\sqrt{5}}{40}$ 0 0 0 $\frac{\sqrt{3}i}{120}$ 0 $-\frac{\sqrt{3}}{120}$ 0 0 0
	0	0 0 $-\frac{\sqrt{5}i}{40}$ 0 $\frac{\sqrt{5}}{40}$ 0 0 0 $-\frac{\sqrt{3}i}{120}$ 0 $-\frac{\sqrt{3}}{120}$ 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	$\frac{\sqrt{105}}{84}$ 0 0 $-\frac{\sqrt{7}}{56}$ 0 0 0 0 0 $-\frac{3\sqrt{105}}{280}$ 0 0 $-\frac{\sqrt{105}i}{210}$
	$\frac{\sqrt{105}}{84}$	0 0 0 0 $\frac{\sqrt{7}}{56}$ 0 0 0 0 0 0 $\frac{3\sqrt{105}}{280}$ $\frac{\sqrt{105}i}{210}$ 0
	0	$\frac{\sqrt{35}}{84}$ 0 0 $\frac{\sqrt{21}}{168}$ 0 0 $\frac{\sqrt{21}i}{84}$ 0 0 $\frac{\sqrt{35}}{840}$ 0 0 $-\frac{\sqrt{35}i}{60}$
	$\frac{\sqrt{35}}{84}$	0 0 0 0 0 $-\frac{\sqrt{21}}{168}$ $-\frac{\sqrt{21}i}{84}$ 0 0 0 0 $-\frac{\sqrt{35}}{840}$ $\frac{\sqrt{35}i}{60}$ 0
	0	0 0 0 0 0 $\frac{\sqrt{21}i}{56}$ $\frac{\sqrt{21}}{56}$ 0 0 $\frac{\sqrt{35}}{42}$ 0 $\frac{\sqrt{35}i}{120}$ $-\frac{\sqrt{35}}{120}$ 0
	0	0 0 0 0 $-\frac{\sqrt{21}i}{56}$ 0 0 $-\frac{\sqrt{21}}{56}$ $\frac{\sqrt{35}}{42}$ 0 $-\frac{\sqrt{35}i}{120}$ 0 0 $\frac{\sqrt{35}}{120}$
	$\frac{\sqrt{35}}{60}$	0 0 0 $\frac{\sqrt{21}i}{42}$ 0 $\frac{5\sqrt{21}}{168}$ 0 0 0 $-\frac{\sqrt{35}i}{60}$ 0 $\frac{5\sqrt{35}}{168}$ 0 0
	0	$-\frac{\sqrt{35}}{60}$ $-\frac{\sqrt{21}i}{42}$ 0 $\frac{5\sqrt{21}}{168}$ 0 0 0 $\frac{\sqrt{35}i}{60}$ 0 $\frac{5\sqrt{35}}{168}$ 0 0 0
	0	$\frac{\sqrt{35}i}{60}$ $\frac{\sqrt{21}}{42}$ 0 0 0 0 $-\frac{5\sqrt{21}}{168}$ $\frac{\sqrt{35}}{60}$ 0 0 0 0 $\frac{5\sqrt{35}}{168}$
	$-\frac{\sqrt{35}i}{60}$	0 0 $-\frac{\sqrt{21}}{42}$ 0 0 $-\frac{5\sqrt{21}}{168}$ 0 0 $-\frac{\sqrt{35}}{60}$ 0 0 $\frac{5\sqrt{35}}{168}$ 0
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	$\frac{\sqrt{105}i}{84} \quad \frac{\sqrt{7}}{56} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{3\sqrt{105}}{280} \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{105}}{210}$
	$-\frac{\sqrt{105}i}{84}$	$0 \quad 0 \quad 0 \quad -\frac{\sqrt{7}}{56} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{3\sqrt{105}}{280} \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{105}}{210} \quad 0$
	0	$- \frac{\sqrt{35}i}{84} \quad \frac{\sqrt{21}}{168} \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{21}}{84} \quad -\frac{\sqrt{35}}{840} \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{35}}{60}$
	$\frac{\sqrt{35}i}{84}$	$0 \quad 0 \quad -\frac{\sqrt{21}}{168} \quad 0 \quad 0 \quad -\frac{\sqrt{21}}{84} \quad 0 \quad 0 \quad \frac{\sqrt{35}}{840} \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{35}}{60} \quad 0$
	$-\frac{\sqrt{35}}{60}$	$0 \quad 0 \quad \frac{5\sqrt{21}i}{168} \quad 0 \quad \frac{\sqrt{21}}{42} \quad 0 \quad 0 \quad 0 \quad -\frac{5\sqrt{35}i}{168} \quad 0 \quad \frac{\sqrt{35}}{60} \quad 0 \quad 0$
	0	$\frac{\sqrt{35}}{60} \quad -\frac{5\sqrt{21}i}{168} \quad 0 \quad \frac{\sqrt{21}}{42} \quad 0 \quad 0 \quad 0 \quad \frac{5\sqrt{35}i}{168} \quad 0 \quad \frac{\sqrt{35}}{60} \quad 0 \quad 0 \quad 0$
	0	$0 \quad 0 \quad 0 \quad \frac{\sqrt{21}}{56} \quad 0 \quad 0 \quad -\frac{\sqrt{21}}{56} \quad 0 \quad 0 \quad -\frac{\sqrt{35}}{120} \quad 0 \quad -\frac{\sqrt{35}i}{42} \quad -\frac{\sqrt{35}}{120} \quad 0$
	0	$0 \quad 0 \quad \frac{\sqrt{21}}{56} \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{21}}{56} \quad -\frac{\sqrt{35}}{120} \quad 0 \quad \frac{\sqrt{35}i}{42} \quad 0 \quad 0 \quad \frac{\sqrt{35}}{120}$
	0	$\frac{\sqrt{35}}{60} \quad 0 \quad 0 \quad -\frac{\sqrt{21}}{42} \quad 0 \quad 0 \quad -\frac{5\sqrt{21}i}{168} \quad 0 \quad 0 \quad \frac{\sqrt{35}}{60} \quad 0 \quad 0 \quad -\frac{5\sqrt{35}i}{168}$
	$\frac{\sqrt{35}}{60}$	$0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{21}}{42} \quad \frac{5\sqrt{21}i}{168} \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{35}}{60} \quad \frac{5\sqrt{35}i}{168} \quad 0$
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	$0 \quad 0 \quad 0 \quad -\frac{\sqrt{7}i}{56} \quad 0 \quad -\frac{\sqrt{7}}{56} \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{105}i}{168} \quad 0 \quad \frac{\sqrt{105}}{168} \quad 0 \quad 0$
	0	$0 \quad 0 \quad \frac{\sqrt{7}i}{56} \quad 0 \quad -\frac{\sqrt{7}}{56} \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{105}i}{168} \quad 0 \quad \frac{\sqrt{105}}{168} \quad 0 \quad 0 \quad 0$
	$-\frac{\sqrt{35}}{42}$	$0 \quad 0 \quad -\frac{\sqrt{21}i}{168} \quad 0 \quad \frac{\sqrt{21}}{168} \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{13\sqrt{35}i}{840} \quad 0 \quad -\frac{13\sqrt{35}}{840} \quad 0 \quad 0$
	0	$\frac{\sqrt{35}}{42} \quad \frac{\sqrt{21}i}{168} \quad 0 \quad \frac{\sqrt{21}}{168} \quad 0 \quad 0 \quad 0 \quad \frac{13\sqrt{35}i}{840} \quad 0 \quad -\frac{13\sqrt{35}}{840} \quad 0 \quad 0 \quad 0$
	0	$-\frac{\sqrt{35}i}{60} \quad \frac{5\sqrt{21}}{168} \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{21}}{42} \quad \frac{5\sqrt{35}}{168} \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{35}}{60}$
	$\frac{\sqrt{35}i}{60}$	$0 \quad 0 \quad -\frac{5\sqrt{21}}{168} \quad 0 \quad 0 \quad -\frac{\sqrt{21}}{42} \quad 0 \quad 0 \quad -\frac{5\sqrt{35}}{168} \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{35}}{60}$
	0	$-\frac{\sqrt{35}}{60} \quad 0 \quad 0 \quad -\frac{5\sqrt{21}}{168} \quad 0 \quad 0 \quad -\frac{\sqrt{21}i}{42} \quad 0 \quad 0 \quad \frac{5\sqrt{35}}{168} \quad 0 \quad 0 \quad -\frac{\sqrt{35}i}{60}$
	$-\frac{\sqrt{35}}{60}$	$0 \quad 0 \quad 0 \quad 0 \quad \frac{5\sqrt{21}}{168} \quad \frac{\sqrt{21}i}{42} \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{5\sqrt{35}}{168} \quad \frac{\sqrt{35}i}{60} \quad 0$
	0	$0 \quad 0 \quad 0 \quad -\frac{\sqrt{21}}{56} \quad 0 \quad -\frac{\sqrt{21}i}{56} \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{35}}{120} \quad 0 \quad \frac{\sqrt{35}i}{120} \quad \frac{\sqrt{35}}{42} \quad 0$
	0	$0 \quad 0 \quad -\frac{\sqrt{21}}{56} \quad 0 \quad \frac{\sqrt{21}i}{56} \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{35}}{120} \quad 0 \quad -\frac{\sqrt{35}i}{120} \quad 0 \quad 0 \quad -\frac{\sqrt{35}}{42}$
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	$-\frac{\sqrt{3}}{20} \quad 0 \quad 0 \quad \frac{3\sqrt{5}}{40} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{3}}{40} \quad 0 \quad 0 \quad \frac{\sqrt{3}i}{10}$
	$-\frac{\sqrt{3}}{20}$	$0 \quad 0 \quad 0 \quad 0 \quad -\frac{3\sqrt{5}}{40} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{3}}{40} \quad -\frac{\sqrt{3}i}{10} \quad 0$
	0	$-\frac{1}{20} \quad 0 \quad 0 \quad -\frac{\sqrt{15}}{40} \quad 0 \quad 0 \quad -\frac{\sqrt{15}i}{20} \quad 0 \quad 0 \quad \frac{7}{40} \quad 0 \quad 0 \quad -\frac{i}{20}$
	$-\frac{1}{20}$	$0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{15}}{40} \quad \frac{\sqrt{15}i}{20} \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{7}{40} \quad \frac{i}{20} \quad 0$
	0	$0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{15}i}{40} \quad \frac{\sqrt{15}}{40} \quad 0 \quad 0 \quad \frac{1}{10} \quad 0 \quad \frac{i}{8} \quad -\frac{1}{8} \quad 0$
	0	$0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{15}i}{40} \quad 0 \quad 0 \quad -\frac{\sqrt{15}}{40} \quad \frac{1}{10} \quad 0 \quad -\frac{i}{8} \quad 0 \quad 0 \quad \frac{1}{8}$
	$\frac{1}{20}$	$0 \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{15}}{40} \quad 0 \quad 0 \quad 0 \quad \frac{i}{20} \quad 0 \quad \frac{3}{40} \quad 0 \quad 0 \quad 0$
	0	$-\frac{1}{20} \quad 0 \quad 0 \quad -\frac{\sqrt{15}}{40} \quad 0 \quad 0 \quad 0 \quad -\frac{i}{20} \quad 0 \quad \frac{3}{40} \quad 0 \quad 0 \quad 0 \quad 0$
	$\frac{i}{20}$	$0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{15}}{40} \quad -\frac{1}{20} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{3}{40}$
	$-\frac{i}{20}$	$0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{15}}{40} \quad 0 \quad 0 \quad \frac{1}{20} \quad 0 \quad 0 \quad \frac{3}{40} \quad 0$
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	$-\frac{\sqrt{3}i}{20} \quad -\frac{3\sqrt{5}}{40} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{3}}{40} \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{3}}{10}$
	$\frac{\sqrt{3}i}{20}$	$0 \quad 0 \quad \frac{3\sqrt{5}}{40} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{3}}{40} \quad 0 \quad 0 \quad -\frac{\sqrt{3}}{10} \quad 0$
	0	$\frac{i}{20} \quad -\frac{\sqrt{15}}{40} \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{15}}{20} \quad -\frac{7}{40} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{1}{20}$
	$-\frac{i}{20}$	$0 \quad 0 \quad \frac{\sqrt{15}}{40} \quad 0 \quad 0 \quad \frac{\sqrt{15}}{20} \quad 0 \quad 0 \quad \frac{7}{40} \quad 0 \quad 0 \quad 0 \quad -\frac{1}{20} \quad 0$
	$-\frac{1}{20}$	$0 \quad 0 \quad -\frac{\sqrt{15}i}{40} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{3i}{40} \quad 0 \quad -\frac{1}{20} \quad 0 \quad 0 \quad 0$
	$\frac{1}{20}$	$\frac{1}{20} \quad \frac{\sqrt{15}i}{40} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{3i}{40} \quad 0 \quad -\frac{1}{20} \quad 0 \quad 0 \quad 0 \quad 0$
	0	$0 \quad 0 \quad 0 \quad \frac{\sqrt{15}}{40} \quad 0 \quad 0 \quad -\frac{\sqrt{15}}{40} \quad 0 \quad 0 \quad -\frac{1}{8} \quad 0 \quad -\frac{i}{10} \quad -\frac{1}{8} \quad 0$
	0	$0 \quad 0 \quad \frac{\sqrt{15}}{40} \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{15}}{40} \quad -\frac{1}{8} \quad 0 \quad \frac{i}{10} \quad 0 \quad 0 \quad \frac{1}{8}$
	$\frac{1}{20}$	$0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{15}i}{40} \quad 0 \quad 0 \quad -\frac{1}{20} \quad 0 \quad 0 \quad -\frac{3i}{40} \quad 0$
	$\frac{1}{20}$	$0 \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{15}i}{40} \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{1}{20} \quad \frac{3i}{40} \quad 0$
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 $\frac{3\sqrt{5}i}{40}$ 0 $\frac{3\sqrt{5}}{40}$ 0 0 0 $-\frac{3\sqrt{3}i}{40}$ 0 $\frac{3\sqrt{3}}{40}$ 0 0 0	
	0 0 $-\frac{3\sqrt{5}i}{40}$ 0 $\frac{3\sqrt{5}}{40}$ 0 0 0 $\frac{3\sqrt{3}i}{40}$ 0 $\frac{3\sqrt{3}}{40}$ 0 0 0	
	$\frac{1}{10}$ 0 0 $\frac{\sqrt{15}i}{40}$ 0 $-\frac{\sqrt{15}}{40}$ 0 0 0 $\frac{i}{8}$ 0 $\frac{1}{8}$ 0 0 0	
	0 $-\frac{1}{10}$ $-\frac{\sqrt{15}i}{40}$ 0 $-\frac{\sqrt{15}}{40}$ 0 0 0 $-\frac{i}{8}$ 0 $\frac{1}{8}$ 0 0 0	
	0 $-\frac{i}{20}$ $-\frac{\sqrt{15}}{40}$ 0 0 0 0 0 $\frac{3}{40}$ 0 0 0 0 $-\frac{1}{20}$	
	$\frac{i}{20}$ 0 0 $\frac{\sqrt{15}}{40}$ 0 0 0 0 0 $-\frac{3}{40}$ 0 0 0 $-\frac{1}{20}$ 0	
	0 $-\frac{1}{20}$ 0 0 $\frac{\sqrt{15}}{40}$ 0 0 0 0 0 $\frac{3}{40}$ 0 0 0 $\frac{i}{20}$	
	$-\frac{1}{20}$ 0 0 0 0 $-\frac{\sqrt{15}}{40}$ 0 0 0 0 0 0 $-\frac{3}{40}$ $-\frac{i}{20}$ 0	
	0 0 0 $-\frac{\sqrt{15}}{40}$ 0 $-\frac{\sqrt{15}i}{40}$ 0 0 0 $-\frac{1}{8}$ 0 $\frac{i}{8}$ $\frac{1}{10}$ 0	
	0 0 $-\frac{\sqrt{15}}{40}$ 0 $\frac{\sqrt{15}i}{40}$ 0 0 0 $-\frac{1}{8}$ 0 $-\frac{i}{8}$ 0 0 $-\frac{1}{10}$	
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 $\frac{1}{10}$ 0 0 0 0 0 0 0 0 $-\frac{1}{10}$ 0 0 0 0	
	$\frac{1}{10}$ 0 0 0 0 0 0 0 0 0 0 $\frac{1}{10}$ 0 0 0	
	0 $-\frac{\sqrt{3}}{10}$ 0 0 0 0 0 0 0 0 0 $\frac{\sqrt{3}}{30}$ 0 0 0 $\frac{\sqrt{3}i}{15}$	
	$-\frac{\sqrt{3}}{10}$ 0 0 0 0 0 0 0 0 0 0 $-\frac{\sqrt{3}}{30}$ $-\frac{\sqrt{3}i}{15}$ 0	
	0 0 0 $\frac{\sqrt{5}}{10}$ 0 $-\frac{\sqrt{5}i}{20}$ $\frac{\sqrt{5}}{20}$ 0 0 0 0 $-\frac{\sqrt{3}i}{20}$ $-\frac{\sqrt{3}}{20}$ 0	
	0 0 $\frac{\sqrt{5}}{10}$ 0 $\frac{\sqrt{5}i}{20}$ 0 0 $-\frac{\sqrt{5}}{20}$ 0 0 $\frac{\sqrt{3}i}{20}$ 0 0 $\frac{\sqrt{3}}{20}$	
	$\frac{\sqrt{3}}{15}$ 0 0 $-\frac{\sqrt{5}i}{20}$ 0 $-\frac{\sqrt{5}}{20}$ 0 0 0 $\frac{\sqrt{3}i}{20}$ 0 $\frac{\sqrt{3}}{60}$ 0 0	
	0 $-\frac{\sqrt{3}}{15}$ $\frac{\sqrt{5}i}{20}$ 0 $-\frac{\sqrt{5}}{20}$ 0 0 0 $-\frac{\sqrt{3}i}{20}$ 0 $\frac{\sqrt{3}}{60}$ 0 0 0	
	0 $-\frac{\sqrt{3}i}{15}$ $\frac{\sqrt{5}}{20}$ 0 0 0 0 $-\frac{\sqrt{5}}{20}$ $\frac{\sqrt{3}}{20}$ 0 0 0 0 $-\frac{\sqrt{3}}{60}$	
	$\frac{\sqrt{3}i}{15}$ 0 0 $-\frac{\sqrt{5}}{20}$ 0 0 $-\frac{\sqrt{5}}{20}$ 0 0 $-\frac{\sqrt{3}}{20}$ 0 0 0 $-\frac{\sqrt{3}}{60}$	
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	$-\frac{i}{10} \quad 0 \quad \frac{1}{10} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0$
	$\frac{i}{10}$	$0 \quad 0 \quad -\frac{1}{10} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0$
	$0 \quad -\frac{\sqrt{3}i}{10}$	$0 \quad 0 \quad \frac{\sqrt{3}}{30} \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{3}}{15}$
	$\frac{\sqrt{3}i}{10}$	$0 \quad 0 \quad -\frac{\sqrt{3}}{30} \quad 0 \quad 0 \quad -\frac{\sqrt{3}}{15} \quad 0$
	$\frac{\sqrt{3}}{15}$	$0 \quad 0 \quad \frac{\sqrt{5}i}{20} \quad 0 \quad \frac{\sqrt{5}}{20} \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{3}i}{60} \quad 0 \quad \frac{\sqrt{3}}{20} \quad 0 \quad 0 \quad 0$
	$0 \quad -\frac{\sqrt{3}}{15} \quad -\frac{\sqrt{5}i}{20}$	$0 \quad \frac{\sqrt{5}}{20} \quad 0 \quad -\frac{\sqrt{5}i}{10} \quad \frac{\sqrt{5}}{20} \quad 0 \quad 0 \quad -\frac{\sqrt{3}i}{60} \quad 0 \quad \frac{\sqrt{3}}{20} \quad 0 \quad 0 \quad 0$
	$0 \quad 0 \quad 0 \quad \frac{\sqrt{5}}{20} \quad 0 \quad -\frac{\sqrt{5}i}{10}$	$0 \quad 0 \quad -\frac{\sqrt{5}}{20} \quad -\frac{\sqrt{3}}{20} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{3}}{20} \quad 0 \quad 0$
	$0 \quad 0 \quad \frac{\sqrt{3}}{15} \quad 0 \quad 0 \quad \frac{\sqrt{5}}{20}$	$0 \quad 0 \quad 0 \quad \frac{\sqrt{5}i}{20} \quad 0 \quad 0 \quad -\frac{\sqrt{3}}{20} \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{3}}{60}$
	$\frac{\sqrt{3}}{15}$	$0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{5}}{20} \quad -\frac{\sqrt{5}i}{20} \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{3}}{20} \quad \frac{\sqrt{3}i}{60} \quad 0$
		$-\frac{\sqrt{105}z(x-y)(x+y)(x^2+y^2-2z^2)}{4}$
727	symmetry	
$\mathbb{T}_{5,2}^{(1,-1;a)}(T_u, 3)$	$-\frac{1}{5} \quad 0 \quad -\frac{i}{10} \quad 0 \quad -\frac{1}{10} \quad 0 \quad 0 \quad 0$	
	$0 \quad \frac{1}{5} \quad 0 \quad \frac{i}{10} \quad 0 \quad -\frac{1}{10} \quad 0 \quad 0 \quad 0$	
	$0 \quad 0 \quad -\frac{\sqrt{3}i}{30} \quad 0 \quad \frac{\sqrt{3}}{30} \quad 0 \quad 0 \quad 0$	
	$0 \quad 0 \quad \frac{\sqrt{3}i}{30} \quad 0 \quad \frac{\sqrt{3}}{30} \quad 0 \quad 0 \quad 0$	
	$0 \quad -\frac{\sqrt{3}i}{15} \quad -\frac{\sqrt{5}}{20} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{5}}{20} \quad \frac{\sqrt{3}}{60} \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{3}}{20}$	
	$\frac{\sqrt{3}i}{15} \quad 0 \quad 0 \quad \frac{\sqrt{5}}{20} \quad 0 \quad 0 \quad \frac{\sqrt{5}}{20} \quad 0 \quad 0 \quad -\frac{\sqrt{3}}{60} \quad 0 \quad 0 \quad -\frac{\sqrt{3}}{20} \quad 0$	
	$0 \quad \frac{\sqrt{3}}{15} \quad 0 \quad 0 \quad -\frac{\sqrt{5}}{20} \quad 0 \quad 0 \quad -\frac{\sqrt{5}i}{20} \quad 0 \quad 0 \quad -\frac{\sqrt{3}}{60} \quad 0 \quad 0 \quad -\frac{\sqrt{3}i}{20} \quad 0$	
	$\frac{\sqrt{3}}{15} \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{5}}{20} \quad \frac{\sqrt{5}i}{20} \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{3}}{60} \quad \frac{\sqrt{3}i}{20} \quad 0$	
	$0 \quad 0 \quad 0 \quad \frac{\sqrt{5}}{20} \quad 0 \quad -\frac{\sqrt{5}i}{20} \quad \frac{\sqrt{5}}{10} \quad 0 \quad 0 \quad \frac{\sqrt{3}}{20} \quad 0 \quad \frac{\sqrt{3}i}{20} \quad 0 \quad 0$	
	$0 \quad 0 \quad \frac{\sqrt{5}}{20} \quad 0 \quad \frac{\sqrt{5}i}{20} \quad 0 \quad 0 \quad -\frac{\sqrt{5}}{10} \quad \frac{\sqrt{3}}{20} \quad 0 \quad -\frac{\sqrt{3}i}{20} \quad 0 \quad 0 \quad 0$	
728	symmetry	x

continued ...

Table 9

No.	multipole	matrix
$T_{1,0}^{(1,0;a)}(T_u)$	0 0 0 0 $\frac{3\sqrt{70}}{280}$ 0 0 $-\frac{3\sqrt{70}i}{140}$ 0 0 $-\frac{\sqrt{42}}{56}$ 0 0 0	
	0 0 0 0 0 $-\frac{3\sqrt{70}}{280}$ $\frac{3\sqrt{70}i}{140}$ 0 0 0 0 $\frac{\sqrt{42}}{56}$ 0 0 0	
	0 0 0 0 $\frac{3\sqrt{210}}{280}$ 0 0 0 0 0 $\frac{\sqrt{14}}{56}$ 0 0 $-\frac{\sqrt{14}i}{28}$	
	0 0 0 0 0 $-\frac{3\sqrt{210}}{280}$ 0 0 0 0 0 $-\frac{\sqrt{14}}{56}$ $\frac{\sqrt{14}i}{28}$ 0	
	0 0 0 0 0 $\frac{\sqrt{210}i}{140}$ $\frac{\sqrt{210}}{140}$ 0 0 0 0 $-\frac{\sqrt{14}i}{28}$ $\frac{\sqrt{14}}{28}$ 0	
	0 0 0 0 $-\frac{\sqrt{210}i}{140}$ 0 0 $-\frac{\sqrt{210}}{140}$ 0 0 $\frac{\sqrt{14}i}{28}$ 0 0 $-\frac{\sqrt{14}}{28}$	
	$-\frac{\sqrt{14}}{28}$ 0 0 $\frac{\sqrt{210}i}{140}$ 0 0 0 0 0 $\frac{\sqrt{14}i}{28}$ 0 0 0 0	
	0 $\frac{\sqrt{14}}{28}$ $-\frac{\sqrt{210}i}{140}$ 0 0 0 0 0 $-\frac{\sqrt{14}i}{28}$ 0 0 0 0 0	
	0 $-\frac{\sqrt{14}i}{28}$ $\frac{\sqrt{210}}{140}$ 0 0 0 0 0 $-\frac{\sqrt{14}}{28}$ 0 0 0 0 0	
	$\frac{\sqrt{14}i}{28}$ 0 0 $-\frac{\sqrt{210}}{140}$ 0 0 0 0 0 $\frac{\sqrt{14}}{28}$ 0 0 0 0 0	
729	symmetry	y
$T_{1,1}^{(1,0;a)}(T_u)$	0 0 $-\frac{3\sqrt{70}}{280}$ 0 0 0 0 $-\frac{3\sqrt{70}}{140}$ $-\frac{\sqrt{42}}{56}$ 0 0 0 0 0	
	0 0 0 $\frac{3\sqrt{70}}{280}$ 0 0 $-\frac{3\sqrt{70}}{140}$ 0 0 $\frac{\sqrt{42}}{56}$ 0 0 0 0 0	
	0 0 $\frac{3\sqrt{210}}{280}$ 0 0 0 0 0 $-\frac{\sqrt{14}}{56}$ 0 0 0 0 $-\frac{\sqrt{14}}{28}$	
	0 0 0 $-\frac{3\sqrt{210}}{280}$ 0 0 0 0 0 $\frac{\sqrt{14}}{56}$ 0 0 0 $-\frac{\sqrt{14}}{28}$ 0	
	$\frac{\sqrt{14}}{28}$ 0 0 0 0 $\frac{\sqrt{210}}{140}$ 0 0 0 0 0 $-\frac{\sqrt{14}}{28}$ 0 0 0	
	0 $-\frac{\sqrt{14}}{28}$ 0 0 $\frac{\sqrt{210}}{140}$ 0 0 0 0 0 $-\frac{\sqrt{14}}{28}$ 0 0 0 0	
	0 0 0 $\frac{\sqrt{210}}{140}$ 0 0 $-\frac{\sqrt{210}}{140}$ 0 0 $\frac{\sqrt{14}}{28}$ 0 0 $\frac{\sqrt{14}}{28}$ 0	
	0 0 $\frac{\sqrt{210}}{140}$ 0 0 0 0 $\frac{\sqrt{210}}{140}$ $\frac{\sqrt{14}}{28}$ 0 0 0 0 $-\frac{\sqrt{14}}{28}$	
	0 $-\frac{\sqrt{14}}{28}$ 0 0 $-\frac{\sqrt{210}}{140}$ 0 0 0 0 0 $-\frac{\sqrt{14}}{28}$ 0 0 0 0	
	$-\frac{\sqrt{14}}{28}$ 0 0 0 0 $\frac{\sqrt{210}}{140}$ 0 0 0 0 0 $\frac{\sqrt{14}}{28}$ 0 0 0	
730	symmetry	z

continued ..

Table 9

No.	multipole	matrix
$\mathbb{T}_{1,2}^{(1,0;a)}(T_u)$	0 0 0 $-\frac{3\sqrt{70}i}{280}$ 0 $-\frac{3\sqrt{70}}{280}$ 0 0 0 $-\frac{\sqrt{42}i}{56}$ 0 $\frac{\sqrt{42}}{56}$ 0 0	
	0 0 $\frac{3\sqrt{70}i}{280}$ 0 $-\frac{3\sqrt{70}}{280}$ 0 0 0 $\frac{\sqrt{42}i}{56}$ 0 $\frac{\sqrt{42}}{56}$ 0 0 0	
	0 0 0 $\frac{3\sqrt{210}i}{280}$ 0 $-\frac{3\sqrt{210}}{280}$ 0 0 0 $-\frac{\sqrt{14}i}{56}$ 0 $-\frac{\sqrt{14}}{56}$ 0 0 0	
	0 0 $-\frac{3\sqrt{210}i}{280}$ 0 $-\frac{3\sqrt{210}}{280}$ 0 0 0 $\frac{\sqrt{14}i}{56}$ 0 $-\frac{\sqrt{14}}{56}$ 0 0 0	
	0 $\frac{\sqrt{14}i}{28}$ 0 0 0 0 0 $-\frac{\sqrt{210}}{140}$ 0 0 0 0 0 $-\frac{\sqrt{14}}{28}$	
	$-\frac{\sqrt{14}i}{28}$ 0 0 0 0 0 $-\frac{\sqrt{210}}{140}$ 0 0 0 0 0 $-\frac{\sqrt{14}}{28}$ 0	
	0 $\frac{\sqrt{14}}{28}$ 0 0 0 0 0 $-\frac{\sqrt{210}i}{140}$ 0 0 0 0 0 $\frac{\sqrt{14}i}{28}$	
	$\frac{\sqrt{14}}{28}$ 0 0 0 0 0 $\frac{\sqrt{210}i}{140}$ 0 0 0 0 0 $-\frac{\sqrt{14}i}{28}$ 0	
	0 0 0 $-\frac{\sqrt{210}}{140}$ 0 $-\frac{\sqrt{210}i}{140}$ 0 0 0 $\frac{\sqrt{14}}{28}$ 0 $-\frac{\sqrt{14}i}{28}$ 0 0	
	0 0 $-\frac{\sqrt{210}}{140}$ 0 $\frac{\sqrt{210}i}{140}$ 0 0 0 $\frac{\sqrt{14}}{28}$ 0 $\frac{\sqrt{14}i}{28}$ 0 0 0	
731	symmetry	$\sqrt{15}xyz$
$\mathbb{T}_3^{(1,0;a)}(A_u)$	0 0 0 $\frac{\sqrt{3}}{12}$ 0 $\frac{\sqrt{3}i}{12}$ 0 0 0 0 0 0 0 0	
	0 0 $\frac{\sqrt{3}}{12}$ 0 $-\frac{\sqrt{3}i}{12}$ 0 0 0 0 0 0 0 0 0	
	0 0 0 $\frac{1}{12}$ 0 $-\frac{i}{12}$ $-\frac{1}{6}$ 0 0 0 0 0 0 0 0	
	0 0 $\frac{1}{12}$ 0 $\frac{i}{12}$ 0 0 $\frac{1}{6}$ 0 0 0 0 0 0 0	
	0 0 0 0 $-\frac{1}{24}$ 0 0 $-\frac{i}{24}$ 0 0 $-\frac{\sqrt{15}}{24}$ 0 0 $\frac{\sqrt{15}i}{24}$	
	0 0 0 0 0 $\frac{1}{24}$ $\frac{i}{24}$ 0 0 0 0 $\frac{\sqrt{15}}{24}$ $-\frac{\sqrt{15}i}{24}$ 0	
	0 0 $\frac{1}{24}$ 0 0 0 0 $-\frac{1}{24}$ $-\frac{\sqrt{15}}{24}$ 0 0 0 0 $-\frac{\sqrt{15}}{24}$	
	0 0 0 $-\frac{1}{24}$ 0 0 $-\frac{1}{24}$ 0 0 $\frac{\sqrt{15}}{24}$ 0 0 $-\frac{\sqrt{15}}{24}$ 0	
	0 0 0 $\frac{i}{24}$ 0 $\frac{1}{24}$ 0 0 0 $\frac{\sqrt{15}i}{24}$ 0 $-\frac{\sqrt{15}}{24}$ 0 0	
	0 0 $-\frac{i}{24}$ 0 $\frac{1}{24}$ 0 0 0 $-\frac{\sqrt{15}i}{24}$ 0 $-\frac{\sqrt{15}}{24}$ 0 0 0	
732	symmetry	$\frac{x(2x^2-3y^2-3z^2)}{2}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{T}_{3,0}^{(1,0;a)}(T_u, 1)$	0 0 0 0 $-\frac{7\sqrt{5}}{80}$ 0 0 $\frac{\sqrt{5}i}{20}$ 0 0 $-\frac{\sqrt{3}}{16}$ 0 0 0	
	0 0 0 0 0 $\frac{7\sqrt{5}}{80}$ $-\frac{\sqrt{5}i}{20}$ 0 0 0 0 $\frac{\sqrt{3}}{16}$ 0 0 0	
	0 0 0 0 $-\frac{\sqrt{15}}{240}$ 0 0 $\frac{\sqrt{15}i}{24}$ 0 0 $\frac{1}{16}$ 0 0 $-\frac{i}{8}$	
	0 0 0 0 0 $\frac{\sqrt{15}}{240}$ $-\frac{\sqrt{15}i}{24}$ 0 0 0 0 $-\frac{1}{16}$ $\frac{i}{8}$ 0	
	0 0 0 0 0 $\frac{\sqrt{15}i}{240}$ $\frac{\sqrt{15}}{240}$ 0 0 0 0 $\frac{3i}{16}$ $-\frac{3}{16}$ 0	
	0 0 0 0 $-\frac{\sqrt{15}i}{240}$ 0 0 $-\frac{\sqrt{15}}{240}$ 0 0 $-\frac{3i}{16}$ 0 0 $\frac{3}{16}$	
	$-\frac{1}{8}$ 0 0 $-\frac{\sqrt{15}i}{60}$ 0 0 0 0 0 $\frac{i}{8}$ 0 0 0 0 0	
	0 $\frac{1}{8}$ $\frac{\sqrt{15}i}{60}$ 0 0 0 0 0 $-\frac{i}{8}$ 0 0 0 0 0 0	
	0 $-\frac{i}{8}$ $-\frac{\sqrt{15}}{60}$ 0 0 0 0 0 $-\frac{1}{8}$ 0 0 0 0 0 0	
	$\frac{i}{8}$ 0 0 $\frac{\sqrt{15}}{60}$ 0 0 0 0 0 $\frac{1}{8}$ 0 0 0 0 0	
733	symmetry	$-\frac{y(3x^2 - 2y^2 + 3z^2)}{2}$
$\mathbb{T}_{3,1}^{(1,0;a)}(T_u, 1)$	0 0 $\frac{7\sqrt{5}}{80}$ 0 0 0 0 $\frac{\sqrt{5}}{20}$ $-\frac{\sqrt{3}}{16}$ 0 0 0 0 0	
	0 0 0 $-\frac{7\sqrt{5}}{80}$ 0 0 0 $\frac{\sqrt{5}}{20}$ 0 0 $\frac{\sqrt{3}}{16}$ 0 0 0 0	
	0 0 $-\frac{\sqrt{15}}{240}$ 0 0 0 0 $-\frac{\sqrt{15}}{24}$ $-\frac{1}{16}$ 0 0 0 0 $-\frac{1}{8}$	
	0 0 0 $\frac{\sqrt{15}}{240}$ 0 0 0 $-\frac{\sqrt{15}}{24}$ 0 0 $\frac{1}{16}$ 0 0 $-\frac{1}{8}$ 0	
	$\frac{1}{8}$ 0 0 0 0 0 $-\frac{\sqrt{15}}{60}$ 0 0 0 0 0 $-\frac{1}{8}$ 0 0 0	
	0 $-\frac{1}{8}$ 0 0 $-\frac{\sqrt{15}}{60}$ 0 0 0 0 0 $-\frac{1}{8}$ 0 0 0 0 0	
	0 0 0 $\frac{\sqrt{15}}{240}$ 0 0 0 $-\frac{\sqrt{15}}{240}$ 0 0 $-\frac{3}{16}$ 0 0 $-\frac{3}{16}$ 0	
	0 0 $\frac{\sqrt{15}}{240}$ 0 0 0 0 0 $\frac{\sqrt{15}}{240}$ $-\frac{3}{16}$ 0 0 0 0 $\frac{3}{16}$	
	0 $-\frac{1}{8}$ 0 0 $\frac{\sqrt{15}}{60}$ 0 0 0 0 0 $-\frac{1}{8}$ 0 0 0 0 0	
	$-\frac{1}{8}$ 0 0 0 0 $-\frac{\sqrt{15}}{60}$ 0 0 0 0 0 $\frac{1}{8}$ 0 0 0	
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 0 0 $-\frac{3\sqrt{5}i}{80}$ 0 $-\frac{3\sqrt{5}}{80}$ 0 0 0 $-\frac{\sqrt{3}i}{16}$ 0 $\frac{\sqrt{3}}{16}$ 0 0 0	
	0 0 $\frac{3\sqrt{5}i}{80}$ 0 $-\frac{3\sqrt{5}}{80}$ 0 0 0 $\frac{\sqrt{3}i}{16}$ 0 $\frac{\sqrt{3}}{16}$ 0 0 0 0	
	0 0 0 $-\frac{11\sqrt{15}i}{240}$ 0 $\frac{11\sqrt{15}}{240}$ 0 0 0 $-\frac{i}{16}$ 0 $-\frac{1}{16}$ 0 0 0 0	
	0 0 $\frac{11\sqrt{15}i}{240}$ 0 $\frac{11\sqrt{15}}{240}$ 0 0 0 $\frac{i}{16}$ 0 $-\frac{1}{16}$ 0 0 0 0	
	0 $\frac{i}{8}$ 0 0 0 0 0 $\frac{\sqrt{15}}{60}$ 0 0 0 0 0 0 $-\frac{1}{8}$ 0	
	$-\frac{i}{8}$ 0 0 0 0 0 $\frac{\sqrt{15}}{60}$ 0 0 0 0 0 0 $-\frac{1}{8}$ 0	
	0 $\frac{1}{8}$ 0 0 0 0 0 $\frac{\sqrt{15}i}{60}$ 0 0 0 0 0 0 $\frac{i}{8}$ 0	
	$\frac{1}{8}$ 0 0 0 0 0 $-\frac{\sqrt{15}i}{60}$ 0 0 0 0 0 0 $-\frac{i}{8}$ 0	
	0 0 0 $-\frac{\sqrt{15}}{240}$ 0 $-\frac{\sqrt{15}i}{240}$ 0 0 0 $-\frac{3}{16}$ 0 $\frac{3i}{16}$ 0 0 0	
	0 0 $-\frac{\sqrt{15}}{240}$ 0 $\frac{\sqrt{15}i}{240}$ 0 0 0 $-\frac{3}{16}$ 0 $-\frac{3i}{16}$ 0 0 0 0	
735	symmetry	$\frac{\sqrt{15}x(y-z)(y+z)}{2}$
$\mathbb{T}_{3,0}^{(1,0;a)}(T_u, 2)$	0 0 0 0 $\frac{\sqrt{3}}{16}$ 0 0 $\frac{\sqrt{3}i}{12}$ 0 0 $\frac{\sqrt{5}}{16}$ 0 0 0 0	
	0 0 0 0 0 $-\frac{\sqrt{3}}{16}$ $-\frac{\sqrt{3}i}{12}$ 0 0 0 0 $-\frac{\sqrt{5}}{16}$ 0 0 0	
	0 0 0 0 $\frac{5}{48}$ 0 0 $\frac{i}{24}$ 0 0 $-\frac{\sqrt{15}}{48}$ 0 0 $-\frac{\sqrt{15}i}{24}$ 0	
	0 0 0 0 0 $-\frac{5}{48}$ $-\frac{i}{24}$ 0 0 0 0 $\frac{\sqrt{15}}{48}$ $\frac{\sqrt{15}i}{24}$ 0	
	0 0 0 $\frac{1}{6}$ 0 $-\frac{i}{48}$ $\frac{1}{48}$ 0 0 0 0 $\frac{\sqrt{15}i}{48}$ $\frac{\sqrt{15}}{48}$ 0	
	0 0 $\frac{1}{6}$ 0 $\frac{i}{48}$ 0 0 $-\frac{1}{48}$ 0 0 $-\frac{\sqrt{15}i}{48}$ 0 0 $-\frac{\sqrt{15}}{48}$ 0	
	$\frac{\sqrt{15}}{24}$ 0 0 $-\frac{i}{24}$ 0 $\frac{1}{6}$ 0 0 0 0 0 0 0 0 0	
	0 $-\frac{\sqrt{15}}{24}$ $\frac{i}{24}$ 0 $\frac{1}{6}$ 0 0 0 0 0 0 0 0 0 0	
	0 $-\frac{\sqrt{15}i}{24}$ $\frac{1}{24}$ 0 0 0 0 0 $\frac{1}{6}$ 0 0 0 0 0 0	
	$\frac{\sqrt{15}i}{24}$ 0 0 $-\frac{1}{24}$ 0 0 $\frac{1}{6}$ 0 0 0 0 0 0 0 0	
736	symmetry	$-\frac{\sqrt{15}y(x-z)(x+z)}{2}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{T}_{3,1}^{(1,0;a)}(T_u, 2)$	0 0 $\frac{\sqrt{3}}{16}$ 0 0 0 0 $-\frac{\sqrt{3}}{12}$ $-\frac{\sqrt{5}}{16}$ 0 0 0 0 0	
	0 0 0 $-\frac{\sqrt{3}}{16}$ 0 0 $-\frac{\sqrt{3}}{12}$ 0 0 $\frac{\sqrt{5}}{16}$ 0 0 0 0 0	
	0 0 $-\frac{5}{48}$ 0 0 0 0 $\frac{1}{24}$ $-\frac{\sqrt{15}}{48}$ 0 0 0 0 $\frac{\sqrt{15}}{24}$	
	0 0 0 $\frac{5}{48}$ 0 0 $\frac{1}{24}$ 0 0 $\frac{\sqrt{15}}{48}$ 0 0 $\frac{\sqrt{15}}{24}$ 0	
	$\frac{\sqrt{15}}{24}$ 0 0 $-\frac{i}{6}$ 0 $\frac{1}{24}$ 0 0 0 0 0 0 0 0 0	
	0 $-\frac{\sqrt{15}}{24}$ $\frac{i}{6}$ 0 $\frac{1}{24}$ 0 0 0 0 0 0 0 0 0 0	
	0 0 0 $\frac{1}{48}$ 0 $-\frac{i}{6}$ $\frac{1}{48}$ 0 0 $\frac{\sqrt{15}}{48}$ 0 0 $-\frac{\sqrt{15}}{48}$ 0	
	0 0 $\frac{1}{48}$ 0 $\frac{i}{6}$ 0 0 $-\frac{1}{48}$ $\frac{\sqrt{15}}{48}$ 0 0 0 0 $\frac{\sqrt{15}}{48}$	
	0 $\frac{\sqrt{15}}{24}$ 0 0 $\frac{1}{24}$ 0 0 $-\frac{i}{6}$ 0 0 0 0 0 0 0	
	$\frac{\sqrt{15}}{24}$ 0 0 0 $-\frac{1}{24}$ $\frac{i}{6}$ 0 0 0 0 0 0 0 0 0	
737	symmetry	$\frac{\sqrt{15}z(x-y)(x+y)}{2}$
$\mathbb{T}_{3,2}^{(1,0;a)}(T_u, 2)$	0 0 0 $-\frac{\sqrt{3}i}{48}$ 0 $\frac{\sqrt{3}}{48}$ 0 0 0 $\frac{\sqrt{5}i}{16}$ 0 $\frac{\sqrt{5}}{16}$ 0 0	
	0 0 $\frac{\sqrt{3}i}{48}$ 0 $\frac{\sqrt{3}}{48}$ 0 0 0 $-\frac{\sqrt{5}i}{16}$ 0 $\frac{\sqrt{5}}{16}$ 0 0 0	
	0 0 0 $\frac{7i}{48}$ 0 $\frac{7}{48}$ 0 0 0 $\frac{\sqrt{15}i}{48}$ 0 $-\frac{\sqrt{15}}{48}$ 0 0	
	0 0 $-\frac{7i}{48}$ 0 $\frac{7}{48}$ 0 0 0 $-\frac{\sqrt{15}i}{48}$ 0 $-\frac{\sqrt{15}}{48}$ 0 0 0	
	0 $-\frac{\sqrt{15}i}{24}$ $\frac{1}{6}$ 0 0 0 0 $\frac{1}{24}$ 0 0 0 0 0 0 0	
	$\frac{\sqrt{15}i}{24}$ 0 0 $-\frac{1}{6}$ 0 0 $\frac{1}{24}$ 0 0 0 0 0 0 0 0	
	0 $\frac{\sqrt{15}}{24}$ 0 0 $\frac{1}{6}$ 0 0 $-\frac{i}{24}$ 0 0 0 0 0 0 0	
	$\frac{\sqrt{15}}{24}$ 0 0 0 0 $-\frac{1}{6}$ $\frac{i}{24}$ 0 0 0 0 0 0 0	
	0 0 0 $\frac{1}{48}$ 0 $-\frac{i}{48}$ $\frac{1}{6}$ 0 0 $-\frac{\sqrt{15}}{48}$ 0 $-\frac{\sqrt{15}i}{48}$ 0 0	
	0 0 $\frac{1}{48}$ 0 $\frac{i}{48}$ 0 0 $-\frac{1}{6}$ $-\frac{\sqrt{15}}{48}$ 0 $\frac{\sqrt{15}i}{48}$ 0 0 0	
738	symmetry	$\frac{3\sqrt{35}xyz(x-y)(x+y)}{2}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{T}_{5,0}^{(1,0;a)}(E_u)$	0 0 0 $-\frac{\sqrt{5}}{40}$ 0 $\frac{\sqrt{5}i}{40}$ 0 0 0 $\frac{\sqrt{3}}{40}$ 0 $\frac{\sqrt{3}i}{40}$ 0 0	
	0 0 $-\frac{\sqrt{5}}{40}$ 0 $-\frac{\sqrt{5}i}{40}$ 0 0 0 $\frac{\sqrt{3}}{40}$ 0 $-\frac{\sqrt{3}i}{40}$ 0 0 0	
	0 0 0 $-\frac{\sqrt{15}}{120}$ 0 $-\frac{\sqrt{15}i}{120}$ 0 0 0 $\frac{1}{8}$ 0 $-\frac{i}{8}$ $\frac{1}{5}$ 0	
	0 0 $-\frac{\sqrt{15}}{120}$ 0 $\frac{\sqrt{15}i}{120}$ 0 0 0 $\frac{1}{8}$ 0 $\frac{i}{8}$ 0 0 $-\frac{1}{5}$	
	0 $\frac{1}{10}$ 0 0 $\frac{\sqrt{15}}{30}$ 0 0 0 0 0 $\frac{1}{10}$ 0 0 $-\frac{i}{10}$	
	$\frac{1}{10}$ 0 0 0 0 $-\frac{\sqrt{15}}{30}$ 0 0 0 0 0 $-\frac{1}{10}$ $\frac{i}{10}$ 0	
	0 $-\frac{i}{10}$ $\frac{\sqrt{15}}{30}$ 0 0 0 0 0 $-\frac{1}{10}$ 0 0 0 0 $-\frac{1}{10}$	
	$\frac{i}{10}$ 0 0 $-\frac{\sqrt{15}}{30}$ 0 0 0 0 $\frac{1}{10}$ 0 0 $-\frac{1}{10}$ 0	
	$-\frac{1}{5}$ 0 0 $\frac{\sqrt{15}i}{30}$ 0 $-\frac{\sqrt{15}}{30}$ 0 0 0 0 0 0 0 0	
	0 $\frac{1}{5}$ $-\frac{\sqrt{15}i}{30}$ 0 $-\frac{\sqrt{15}}{30}$ 0 0 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 $-\frac{\sqrt{15}}{120}$ 0 $-\frac{\sqrt{15}i}{120}$ 0 0 0 $-\frac{7}{40}$ 0 $\frac{7i}{40}$ $-\frac{1}{10}$ 0	
	0 0 $-\frac{\sqrt{15}}{120}$ 0 $\frac{\sqrt{15}i}{120}$ 0 0 0 $-\frac{7}{40}$ 0 $-\frac{7i}{40}$ 0 0 $\frac{1}{10}$	
	0 0 0 $-\frac{\sqrt{5}}{120}$ 0 $\frac{\sqrt{5}i}{120}$ $-\frac{\sqrt{5}}{30}$ 0 0 $-\frac{\sqrt{3}}{40}$ 0 $-\frac{\sqrt{3}i}{40}$ 0 0	
	0 0 $-\frac{\sqrt{5}}{120}$ 0 $-\frac{\sqrt{5}i}{120}$ 0 0 $\frac{\sqrt{5}}{30}$ $-\frac{\sqrt{3}}{40}$ 0 $\frac{\sqrt{3}i}{40}$ 0 0 0	
	0 $-\frac{\sqrt{3}}{10}$ 0 0 $-\frac{\sqrt{5}}{30}$ 0 0 $\frac{\sqrt{5}i}{15}$ 0 0 $\frac{\sqrt{3}}{30}$ 0 0 $-\frac{\sqrt{3}i}{30}$	
	$-\frac{\sqrt{3}}{10}$ 0 0 0 0 $\frac{\sqrt{5}}{30}$ $-\frac{\sqrt{5}i}{15}$ 0 0 0 0 $-\frac{\sqrt{3}}{30}$ $\frac{\sqrt{3}i}{30}$ 0	
	0 $-\frac{\sqrt{3}i}{10}$ $\frac{\sqrt{5}}{30}$ 0 0 0 0 $\frac{\sqrt{5}}{15}$ $\frac{\sqrt{3}}{30}$ 0 0 0 0 $\frac{\sqrt{3}}{30}$	
	$\frac{\sqrt{3}i}{10}$ 0 0 $-\frac{\sqrt{5}}{30}$ 0 0 $\frac{\sqrt{5}}{15}$ 0 0 $-\frac{\sqrt{3}}{30}$ 0 0 $\frac{\sqrt{3}}{30}$ 0	
	0 0 0 $\frac{\sqrt{5}i}{30}$ 0 $\frac{\sqrt{5}}{30}$ 0 0 0 $\frac{\sqrt{3}i}{15}$ 0 $-\frac{\sqrt{3}}{15}$ 0 0 0	
	0 0 $-\frac{\sqrt{5}i}{30}$ 0 $\frac{\sqrt{5}}{30}$ 0 0 0 $-\frac{\sqrt{3}i}{15}$ 0 $-\frac{\sqrt{3}}{15}$ 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
$\mathbb{T}_{5,0}^{(1,0;a)}(T_u, 1)$	0 0 0 0 $-\frac{\sqrt{7}}{112}$ 0 0 $-\frac{5\sqrt{7}i}{112}$ 0 0 $-\frac{3\sqrt{105}}{560}$ 0 0 $\frac{\sqrt{105}i}{80}$	
	0 0 0 0 0 $\frac{\sqrt{7}}{112}$ $\frac{5\sqrt{7}i}{112}$ 0 0 0 0 $\frac{3\sqrt{105}}{560}$ $-\frac{\sqrt{105}i}{80}$ 0	
	0 0 0 0 $\frac{11\sqrt{21}}{336}$ 0 0 $\frac{\sqrt{21}i}{48}$ 0 0 $\frac{17\sqrt{35}}{560}$ 0 0 $-\frac{13\sqrt{35}i}{560}$	
	0 0 0 0 0 $-\frac{11\sqrt{21}}{336}$ $-\frac{\sqrt{21}i}{48}$ 0 0 0 0 $-\frac{17\sqrt{35}}{560}$ $\frac{13\sqrt{35}i}{560}$ 0	
	0 0 0 0 0 $-\frac{\sqrt{21}i}{168}$ $-\frac{\sqrt{21}}{168}$ 0 0 0 0 $-\frac{3\sqrt{35}i}{280}$ $\frac{3\sqrt{35}}{280}$ 0	
	0 0 0 0 0 $\frac{\sqrt{21}i}{168}$ 0 0 $\frac{\sqrt{21}}{168}$ 0 0 $\frac{3\sqrt{35}i}{280}$ 0 0 $-\frac{3\sqrt{35}}{280}$	
	$\frac{\sqrt{35}}{70}$ 0 0 $-\frac{\sqrt{21}i}{21}$ 0 0 0 0 0 $-\frac{\sqrt{35}i}{70}$ 0 0 0 0 0	
	0 $-\frac{\sqrt{35}}{70}$ $\frac{\sqrt{21}i}{21}$ 0 0 0 0 0 $\frac{\sqrt{35}i}{70}$ 0 0 0 0 0	
	0 $\frac{\sqrt{35}i}{70}$ $-\frac{\sqrt{21}}{21}$ 0 0 0 0 0 $\frac{\sqrt{35}}{70}$ 0 0 0 0 0	
	$-\frac{\sqrt{35}i}{70}$ 0 0 $\frac{\sqrt{21}}{21}$ 0 0 0 0 0 $-\frac{\sqrt{35}}{70}$ 0 0 0 0 0	
741	symmetry	$\frac{y(15x^4 - 40x^2y^2 + 30x^2z^2 + 8y^4 - 40y^2z^2 + 15z^4)}{8}$
$\mathbb{T}_{5,1}^{(1,0;a)}(T_u, 1)$	0 0 $\frac{\sqrt{7}}{112}$ 0 0 0 0 $-\frac{5\sqrt{7}}{112}$ $-\frac{3\sqrt{105}}{560}$ 0 0 0 0 $-\frac{\sqrt{105}}{80}$	
	0 0 0 $-\frac{\sqrt{7}}{112}$ 0 0 $-\frac{5\sqrt{7}}{112}$ 0 0 $\frac{3\sqrt{105}}{560}$ 0 0 0 $-\frac{\sqrt{105}}{80}$ 0	
	0 0 $\frac{11\sqrt{21}}{336}$ 0 0 0 0 $-\frac{\sqrt{21}}{48}$ $-\frac{17\sqrt{35}}{560}$ 0 0 0 0 $-\frac{13\sqrt{35}}{560}$	
	0 0 0 $-\frac{11\sqrt{21}}{336}$ 0 0 $-\frac{\sqrt{21}}{48}$ 0 0 $\frac{17\sqrt{35}}{560}$ 0 0 0 $-\frac{13\sqrt{35}}{560}$ 0	
	$-\frac{\sqrt{35}}{70}$ 0 0 0 0 $-\frac{\sqrt{21}}{21}$ 0 0 0 0 0 $\frac{\sqrt{35}}{70}$ 0 0 0	
	0 $\frac{\sqrt{35}}{70}$ 0 0 $-\frac{\sqrt{21}}{21}$ 0 0 0 0 0 $\frac{\sqrt{35}}{70}$ 0 0 0	
	0 0 0 $-\frac{\sqrt{21}}{168}$ 0 0 $\frac{\sqrt{21}}{168}$ 0 0 $\frac{3\sqrt{35}}{280}$ 0 0 0 $\frac{3\sqrt{35}}{280}$ 0	
	0 0 $-\frac{\sqrt{21}}{168}$ 0 0 0 0 $-\frac{\sqrt{21}}{168}$ $\frac{3\sqrt{35}}{280}$ 0 0 0 0 $-\frac{3\sqrt{35}}{280}$	
	0 $\frac{\sqrt{35}}{70}$ 0 0 $\frac{\sqrt{21}}{21}$ 0 0 0 0 0 $\frac{\sqrt{35}}{70}$ 0 0 0	
	$\frac{\sqrt{35}}{70}$ 0 0 0 0 $-\frac{\sqrt{21}}{21}$ 0 0 0 0 0 $-\frac{\sqrt{35}}{70}$ 0 0 0	
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
$\mathbb{T}_{5,2}^{(1,0;a)}(T_u, 1)$	0 0 0 $-\frac{3\sqrt{7}i}{56}$ 0 $-\frac{3\sqrt{7}}{56}$ 0 0 0 $-\frac{\sqrt{105}i}{56}$ 0 $\frac{\sqrt{105}}{56}$ 0 0	
	0 0 $\frac{3\sqrt{7}i}{56}$ 0 $-\frac{3\sqrt{7}}{56}$ 0 0 0 $\frac{\sqrt{105}i}{56}$ 0 $\frac{\sqrt{105}}{56}$ 0 0 0	
	0 0 0 $\frac{\sqrt{21}i}{84}$ 0 $-\frac{\sqrt{21}}{84}$ 0 0 0 $\frac{\sqrt{35}i}{140}$ 0 $\frac{\sqrt{35}}{140}$ 0 0 0	
	0 0 $-\frac{\sqrt{21}i}{84}$ 0 $-\frac{\sqrt{21}}{84}$ 0 0 0 $-\frac{\sqrt{35}i}{140}$ 0 $\frac{\sqrt{35}}{140}$ 0 0 0	
	0 $-\frac{\sqrt{35}i}{70}$ 0 0 0 0 $\frac{\sqrt{21}}{21}$ 0 0 0 0 0 0 $\frac{\sqrt{35}}{70}$	
	$\frac{\sqrt{35}i}{70}$ 0 0 0 0 $\frac{\sqrt{21}}{21}$ 0 0 0 0 0 0 $\frac{\sqrt{35}}{70}$ 0	
	0 $-\frac{\sqrt{35}}{70}$ 0 0 0 0 0 $\frac{\sqrt{21}i}{21}$ 0 0 0 0 0 $-\frac{\sqrt{35}i}{70}$	
	$-\frac{\sqrt{35}}{70}$ 0 0 0 0 0 $-\frac{\sqrt{21}i}{21}$ 0 0 0 0 0 $\frac{\sqrt{35}i}{70}$ 0	
	0 0 0 $\frac{\sqrt{21}}{168}$ 0 $\frac{\sqrt{21}i}{168}$ 0 0 0 $\frac{3\sqrt{35}}{280}$ 0 $-\frac{3\sqrt{35}i}{280}$ 0 0	
	0 0 $\frac{\sqrt{21}}{168}$ 0 $-\frac{\sqrt{21}i}{168}$ 0 0 0 $\frac{3\sqrt{35}}{280}$ 0 $\frac{3\sqrt{35}i}{280}$ 0 0	
743	symmetry	$\frac{3\sqrt{35}x(y^2 - 2yz - z^2)(y^2 + 2yz - z^2)}{8}$
$\mathbb{T}_{5,0}^{(1,0;a)}(T_u, 2)$	0 $\frac{\sqrt{3}}{10}$ 0 0 $\frac{3\sqrt{5}}{80}$ 0 0 $-\frac{\sqrt{5}i}{16}$ 0 0 $\frac{\sqrt{3}}{80}$ 0 0 $-\frac{\sqrt{3}i}{80}$	
	$\frac{\sqrt{3}}{10}$ 0 0 0 0 $-\frac{3\sqrt{5}}{80}$ $\frac{\sqrt{5}i}{16}$ 0 0 0 0 $-\frac{\sqrt{3}}{80}$ $\frac{\sqrt{3}i}{80}$ 0	
	0 $\frac{1}{10}$ 0 0 $\frac{7\sqrt{15}}{240}$ 0 0 $-\frac{\sqrt{15}i}{240}$ 0 0 $-\frac{3}{80}$ 0 0 $\frac{3i}{80}$	
	$\frac{1}{10}$ 0 0 0 0 $-\frac{7\sqrt{15}}{240}$ $\frac{\sqrt{15}i}{240}$ 0 0 0 0 $\frac{3}{80}$ $-\frac{3i}{80}$ 0	
	0 0 0 0 0 $-\frac{\sqrt{15}i}{120}$ $-\frac{\sqrt{15}}{120}$ 0 0 $-\frac{1}{5}$ 0 $\frac{i}{8}$ $-\frac{1}{8}$ 0	
	0 0 0 0 $\frac{\sqrt{15}i}{120}$ 0 0 $\frac{\sqrt{15}}{120}$ $-\frac{1}{5}$ 0 $-\frac{i}{8}$ 0 0 $\frac{1}{8}$	
	$-\frac{1}{10}$ 0 0 0 0 $-\frac{\sqrt{15}}{30}$ 0 0 0 $-\frac{i}{10}$ 0 $\frac{1}{10}$ 0 0	
	0 $\frac{1}{10}$ 0 0 $-\frac{\sqrt{15}}{30}$ 0 0 0 $\frac{i}{10}$ 0 $\frac{1}{10}$ 0 0 0	
	0 $-\frac{i}{10}$ 0 0 0 0 0 $\frac{\sqrt{15}}{30}$ $\frac{1}{10}$ 0 0 0 0 $\frac{1}{10}$	
	$\frac{i}{10}$ 0 0 0 0 0 $\frac{\sqrt{15}}{30}$ 0 0 $-\frac{1}{10}$ 0 0 0 $\frac{1}{10}$ 0	
744	symmetry	$\frac{3\sqrt{35}y(x^2 - 2xz - z^2)(x^2 + 2xz - z^2)}{8}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{T}_{5,1}^{(1,0;a)}(T_u, 2)$	0	$\frac{\sqrt{3}i}{10} - \frac{3\sqrt{5}}{80} 0 0 0 0 -\frac{\sqrt{5}}{16} \frac{\sqrt{3}}{80} 0 0 0 0 \frac{\sqrt{3}}{80}$
	$-\frac{\sqrt{3}i}{10}$	$0 0 0 \frac{3\sqrt{5}}{80} 0 0 -\frac{\sqrt{5}}{16} 0 0 -\frac{\sqrt{3}}{80} 0 0 \frac{\sqrt{3}}{80} 0$
	0	$-\frac{i}{10} \frac{7\sqrt{15}}{240} 0 0 0 0 \frac{\sqrt{15}}{240} \frac{3}{80} 0 0 0 0 \frac{3}{80}$
	$\frac{i}{10}$	$0 0 -\frac{7\sqrt{15}}{240} 0 0 \frac{\sqrt{15}}{240} 0 0 -\frac{3}{80} 0 0 \frac{3}{80} 0$
	$\frac{1}{10}$	$0 0 -\frac{\sqrt{15}i}{30} 0 0 0 0 0 0 -\frac{i}{10} 0 \frac{1}{10} 0 0$
	0	$-\frac{1}{10} \frac{\sqrt{15}i}{30} 0 0 0 0 0 \frac{i}{10} 0 \frac{1}{10} 0 0 0 0$
	0	$0 0 -\frac{\sqrt{15}}{120} 0 0 \frac{\sqrt{15}}{120} 0 0 -\frac{1}{8} 0 \frac{i}{5} -\frac{1}{8} 0$
	0	$0 0 -\frac{\sqrt{15}}{120} 0 0 0 -\frac{\sqrt{15}}{120} -\frac{1}{8} 0 -\frac{i}{5} 0 0 \frac{1}{8}$
	0	$-\frac{1}{10} 0 0 0 0 0 \frac{\sqrt{15}i}{30} 0 0 \frac{1}{10} 0 0 -\frac{i}{10}$
	$-\frac{1}{10}$	$0 0 0 0 0 -\frac{\sqrt{15}i}{30} 0 0 0 -\frac{1}{10} \frac{i}{10} 0$
745	symmetry	$\frac{3\sqrt{35}z(x^2-2xy-y^2)(x^2+2xy-y^2)}{8}$
$\mathbb{T}_{5,2}^{(1,0;a)}(T_u, 2)$	0	$0 0 0 -\frac{\sqrt{5}i}{40} 0 -\frac{\sqrt{5}}{40} 0 0 0 \frac{\sqrt{3}i}{40} 0 -\frac{\sqrt{3}}{40} 0 0$
	0	$0 0 \frac{\sqrt{5}i}{40} 0 -\frac{\sqrt{5}}{40} 0 0 0 -\frac{\sqrt{3}i}{40} 0 -\frac{\sqrt{3}}{40} 0 0 0$
	$-\frac{1}{5}$	$0 0 \frac{\sqrt{15}i}{30} 0 -\frac{\sqrt{15}}{30} 0 0 0 0 0 0 0 0 0$
	0	$\frac{1}{5} -\frac{\sqrt{15}i}{30} 0 -\frac{\sqrt{15}}{30} 0 0 0 0 0 0 0 0 0 0$
	0	$\frac{i}{10} -\frac{\sqrt{15}}{30} 0 0 0 0 0 0 \frac{1}{10} 0 0 0 0 \frac{1}{10}$
	$-\frac{i}{10}$	$0 0 \frac{\sqrt{15}}{30} 0 0 0 0 0 -\frac{1}{10} 0 0 0 \frac{1}{10} 0$
	0	$\frac{1}{10} 0 0 0 \frac{\sqrt{15}}{30} 0 0 0 0 0 \frac{1}{10} 0 0 -\frac{i}{10}$
	$\frac{1}{10}$	$0 0 0 0 -\frac{\sqrt{15}}{30} 0 0 0 0 0 -\frac{1}{10} \frac{i}{10} 0$
	0	$0 0 0 \frac{\sqrt{15}}{120} 0 \frac{\sqrt{15}i}{120} 0 0 0 -\frac{1}{8} 0 \frac{i}{8} -\frac{1}{5} 0$
	0	$0 0 \frac{\sqrt{15}}{120} 0 -\frac{\sqrt{15}i}{120} 0 0 0 -\frac{1}{8} 0 -\frac{i}{8} 0 0 \frac{1}{5}$
746	symmetry	$\frac{\sqrt{105}x(y-z)(y+z)(2x^2-y^2-z^2)}{4}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{T}_{5,0}^{(1,0;a)}(T_u, 3)$	0	$\begin{bmatrix} 0 & \frac{1}{20} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{24} & 0 & 0 & -\frac{1}{20} & 0 & 0 & \frac{i}{8} \\ \frac{1}{20} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{24} & 0 & 0 & 0 & 0 & \frac{1}{20} & -\frac{i}{8} & 0 \\ 0 & -\frac{\sqrt{3}}{20} & 0 & 0 & -\frac{\sqrt{5}}{12} & 0 & 0 & \frac{\sqrt{5}i}{24} & 0 & 0 & -\frac{\sqrt{3}}{15} & 0 & 0 & -\frac{\sqrt{3}i}{120} \\ -\frac{\sqrt{3}}{20} & 0 & 0 & 0 & 0 & \frac{\sqrt{5}}{12} & -\frac{\sqrt{5}i}{24} & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{15} & \frac{\sqrt{3}i}{120} & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{5}}{30} & 0 & \frac{\sqrt{5}i}{60} & -\frac{\sqrt{5}}{60} & 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{60} & \frac{\sqrt{3}}{60} & 0 \\ 0 & 0 & -\frac{\sqrt{5}}{30} & 0 & -\frac{\sqrt{5}i}{60} & 0 & 0 & \frac{\sqrt{5}}{60} & 0 & 0 & -\frac{\sqrt{3}i}{60} & 0 & 0 & -\frac{\sqrt{3}}{60} \\ \frac{\sqrt{3}}{30} & 0 & 0 & -\frac{\sqrt{5}i}{15} & 0 & \frac{\sqrt{5}}{60} & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{10} & 0 & \frac{\sqrt{3}}{20} & 0 & 0 \\ 0 & -\frac{\sqrt{3}}{30} & \frac{\sqrt{5}i}{15} & 0 & \frac{\sqrt{5}}{60} & 0 & 0 & 0 & \frac{\sqrt{3}i}{10} & 0 & \frac{\sqrt{3}}{20} & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{3}i}{30} & \frac{\sqrt{5}}{15} & 0 & 0 & 0 & 0 & \frac{\sqrt{5}}{60} & -\frac{\sqrt{3}}{10} & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{20} & 0 \\ \frac{\sqrt{3}i}{30} & 0 & 0 & -\frac{\sqrt{5}}{15} & 0 & 0 & \frac{\sqrt{5}}{60} & 0 & 0 & \frac{\sqrt{3}}{10} & 0 & 0 & 0 & -\frac{\sqrt{3}}{20} & 0 \end{bmatrix}$
	747	symmetry
		$\frac{\sqrt{105}y(x-z)(x+z)(x^2-2y^2+z^2)}{4}$
	$\mathbb{T}_{5,1}^{(1,0;a)}(T_u, 3)$	$\begin{bmatrix} 0 & -\frac{i}{20} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{24} & \frac{1}{20} & 0 & 0 & 0 & 0 & \frac{1}{8} \\ \frac{i}{20} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{24} & 0 & 0 & -\frac{1}{20} & 0 & 0 & \frac{1}{8} & 0 \\ 0 & -\frac{\sqrt{3}i}{20} & \frac{\sqrt{5}}{12} & 0 & 0 & 0 & 0 & \frac{\sqrt{5}}{24} & -\frac{\sqrt{3}}{15} & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{120} \\ \frac{\sqrt{3}i}{20} & 0 & 0 & -\frac{\sqrt{5}}{12} & 0 & 0 & \frac{\sqrt{5}}{24} & 0 & 0 & \frac{\sqrt{3}}{15} & 0 & 0 & \frac{\sqrt{3}}{120} & 0 \\ \frac{\sqrt{3}}{30} & 0 & 0 & -\frac{\sqrt{5}i}{60} & 0 & \frac{\sqrt{5}}{15} & 0 & 0 & 0 & \frac{\sqrt{3}i}{20} & 0 & -\frac{\sqrt{3}}{10} & 0 & 0 \\ 0 & -\frac{\sqrt{3}}{30} & \frac{\sqrt{5}i}{60} & 0 & \frac{\sqrt{5}}{15} & 0 & 0 & 0 & -\frac{\sqrt{3}i}{20} & 0 & -\frac{\sqrt{3}}{10} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{5}}{60} & 0 & \frac{\sqrt{5}i}{30} & -\frac{\sqrt{5}}{60} & 0 & 0 & \frac{\sqrt{3}}{60} & 0 & 0 & -\frac{\sqrt{3}}{60} & 0 \\ 0 & 0 & -\frac{\sqrt{5}}{60} & 0 & -\frac{\sqrt{5}i}{30} & 0 & 0 & \frac{\sqrt{5}}{60} & \frac{\sqrt{3}}{60} & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{60} \\ 0 & \frac{\sqrt{3}}{30} & 0 & 0 & \frac{\sqrt{5}}{15} & 0 & 0 & -\frac{\sqrt{5}i}{60} & 0 & 0 & \frac{\sqrt{3}}{10} & 0 & 0 & -\frac{\sqrt{3}i}{20} & 0 \\ \frac{\sqrt{3}}{30} & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}}{15} & \frac{\sqrt{5}i}{60} & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{10} & \frac{\sqrt{3}i}{20} & 0 & 0 \end{bmatrix}$
		symmetry
		$-\frac{\sqrt{105}z(x-y)(x+y)(x^2+y^2-2z^2)}{4}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{T}_{5,2}^{(1,0;a)}(T_u, 3)$	$\begin{bmatrix} -\frac{1}{10} & 0 & 0 & \frac{\sqrt{15}i}{24} & 0 & -\frac{\sqrt{15}}{24} & 0 & 0 & 0 & \frac{3i}{40} & 0 & \frac{3}{40} & 0 & 0 \\ 0 & \frac{1}{10} & -\frac{\sqrt{15}i}{24} & 0 & -\frac{\sqrt{15}}{24} & 0 & 0 & 0 & -\frac{3i}{40} & 0 & \frac{3}{40} & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{5}i}{24} & 0 & -\frac{\sqrt{5}}{24} & 0 & 0 & 0 & -\frac{7\sqrt{3}i}{120} & 0 & \frac{7\sqrt{3}}{120} & 0 & 0 \\ 0 & 0 & \frac{\sqrt{5}i}{24} & 0 & -\frac{\sqrt{5}}{24} & 0 & 0 & 0 & \frac{7\sqrt{3}i}{120} & 0 & \frac{7\sqrt{3}}{120} & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{3}i}{30} & \frac{\sqrt{5}}{60} & 0 & 0 & 0 & 0 & \frac{\sqrt{5}}{15} & \frac{\sqrt{3}}{20} & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{10} \\ \frac{\sqrt{3}i}{30} & 0 & 0 & -\frac{\sqrt{5}}{60} & 0 & 0 & \frac{\sqrt{5}}{15} & 0 & 0 & -\frac{\sqrt{3}}{20} & 0 & 0 & 0 & \frac{\sqrt{3}}{10} \\ 0 & \frac{\sqrt{3}}{30} & 0 & 0 & \frac{\sqrt{5}}{60} & 0 & 0 & -\frac{\sqrt{5}i}{15} & 0 & 0 & -\frac{\sqrt{3}}{20} & 0 & 0 & \frac{\sqrt{3}i}{10} \\ \frac{\sqrt{3}}{30} & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}}{60} & \frac{\sqrt{5}i}{15} & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{20} & -\frac{\sqrt{3}i}{10} & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{5}}{60} & 0 & \frac{\sqrt{5}i}{60} & -\frac{\sqrt{5}}{30} & 0 & 0 & -\frac{\sqrt{3}}{60} & 0 & -\frac{\sqrt{3}i}{60} & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{5}}{60} & 0 & -\frac{\sqrt{5}i}{60} & 0 & 0 & \frac{\sqrt{5}}{30} & -\frac{\sqrt{3}}{60} & 0 & \frac{\sqrt{3}i}{60} & 0 & 0 & 0 \end{bmatrix}$	
	x	
	$\mathbb{T}_{1,0}^{(1,1;a)}(T_u)$	$\begin{bmatrix} 0 & -\frac{\sqrt{21}}{28} & 0 & 0 & \frac{3\sqrt{35}}{280} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{21}}{56} & 0 & 0 & -\frac{\sqrt{21}i}{28} \\ -\frac{\sqrt{21}}{28} & 0 & 0 & 0 & 0 & -\frac{3\sqrt{35}}{280} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{21}}{56} & \frac{\sqrt{21}i}{28} & 0 \\ 0 & -\frac{\sqrt{7}}{28} & 0 & 0 & -\frac{\sqrt{105}}{280} & 0 & 0 & -\frac{\sqrt{105}i}{140} & 0 & 0 & -\frac{3\sqrt{7}}{56} & 0 & 0 & 0 \\ -\frac{\sqrt{7}}{28} & 0 & 0 & 0 & 0 & \frac{\sqrt{105}}{280} & \frac{\sqrt{105}i}{140} & 0 & 0 & 0 & 0 & \frac{3\sqrt{7}}{56} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{105}i}{70} & \frac{\sqrt{105}}{70} & 0 & 0 & -\frac{\sqrt{7}}{14} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{105}i}{70} & 0 & 0 & -\frac{\sqrt{105}}{70} & -\frac{\sqrt{7}}{14} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{105}i}{70} & 0 & 0 & \frac{\sqrt{105}}{140} & 0 & 0 & 0 & 0 & \frac{\sqrt{7}}{28} & 0 & 0 \\ 0 & 0 & \frac{\sqrt{105}i}{70} & 0 & \frac{\sqrt{105}}{140} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}}{28} & 0 & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{105}}{70} & 0 & 0 & 0 & 0 & -\frac{\sqrt{105}}{140} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}}{28} \\ 0 & 0 & 0 & \frac{\sqrt{105}}{70} & 0 & 0 & -\frac{\sqrt{105}}{140} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{7}}{28} & 0 \end{bmatrix}$
	y	
749	symmetry	
750	symmetry	

continued ...

Table 9

No.	multipole	matrix
$\mathbb{T}_{1,1}^{(1,1;a)}(T_u)$	0	$-\frac{\sqrt{21}i}{28} \quad -\frac{3\sqrt{35}}{280} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{21}}{56} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{21}}{28}$
	$\frac{\sqrt{21}i}{28}$	$0 \quad 0 \quad 0 \quad \frac{3\sqrt{35}}{280} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{21}}{56} \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{21}}{28} \quad 0$
	0	$\frac{\sqrt{7}i}{28} \quad -\frac{\sqrt{105}}{280} \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{105}}{140} \quad \frac{3\sqrt{7}}{56} \quad 0 \quad 0$
	$-\frac{\sqrt{7}i}{28}$	$0 \quad 0 \quad 0 \quad \frac{\sqrt{105}}{280} \quad 0 \quad 0 \quad \frac{\sqrt{105}}{140} \quad 0 \quad 0 \quad -\frac{3\sqrt{7}}{56} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0$
	0	$0 \quad 0 \quad 0 \quad \frac{\sqrt{105}i}{140} \quad 0 \quad -\frac{\sqrt{105}}{70} \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{7}i}{28} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0$
	0	$0 \quad 0 \quad -\frac{\sqrt{105}i}{140} \quad 0 \quad -\frac{\sqrt{105}}{70} \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{7}i}{28} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0$
	0	$0 \quad 0 \quad 0 \quad \frac{\sqrt{105}}{70} \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{105}}{70} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{7}i}{14} \quad 0 \quad 0$
	0	$0 \quad 0 \quad \frac{\sqrt{105}}{70} \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{105}}{70} \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{7}i}{14} \quad 0 \quad 0 \quad 0 \quad 0$
	0	$0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{105}}{70} \quad 0 \quad 0 \quad -\frac{\sqrt{105}i}{140} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{7}i}{28} \quad 0$
	0	$0 \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{105}}{70} \quad \frac{\sqrt{105}i}{140} \quad 0 \quad \frac{\sqrt{7}i}{28} \quad 0$
751	symmetry	z
$\mathbb{T}_{1,2}^{(1,1;a)}(T_u)$	0	$0 \quad 0 \quad 0 \quad \frac{3\sqrt{35}i}{280} \quad 0 \quad \frac{3\sqrt{35}}{280} \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{21}i}{56} \quad 0 \quad -\frac{\sqrt{21}}{56} \quad 0 \quad 0 \quad 0$
	0	$0 \quad 0 \quad -\frac{3\sqrt{35}i}{280} \quad 0 \quad \frac{3\sqrt{35}}{280} \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{21}i}{56} \quad 0 \quad -\frac{\sqrt{21}}{56} \quad 0 \quad 0 \quad 0 \quad 0$
	$\frac{\sqrt{7}}{14}$	$0 \quad 0 \quad 0 \quad \frac{\sqrt{105}i}{280} \quad 0 \quad -\frac{\sqrt{105}}{280} \quad 0 \quad 0 \quad 0 \quad -\frac{3\sqrt{7}i}{56} \quad 0 \quad -\frac{3\sqrt{7}}{56} \quad 0 \quad 0 \quad 0$
	$0 \quad -\frac{\sqrt{7}}{14} \quad -\frac{\sqrt{105}i}{280} \quad 0 \quad -\frac{\sqrt{105}}{280} \quad 0 \quad 0 \quad 0 \quad \frac{3\sqrt{7}i}{56} \quad 0 \quad -\frac{3\sqrt{7}}{56} \quad 0 \quad 0 \quad 0 \quad 0$	
	0	$0 \quad 0 \quad \frac{\sqrt{105}}{140} \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{105}}{70} \quad \frac{\sqrt{7}}{28} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0$
	0	$0 \quad 0 \quad 0 \quad -\frac{\sqrt{105}}{140} \quad 0 \quad 0 \quad \frac{\sqrt{105}}{70} \quad 0 \quad 0 \quad -\frac{\sqrt{7}}{28} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0$
	0	$0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{105}}{140} \quad 0 \quad 0 \quad \frac{\sqrt{105}i}{70} \quad 0 \quad 0 \quad \frac{\sqrt{7}}{28} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0$
	0	$0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{105}}{140} \quad -\frac{\sqrt{105}i}{70} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{7}}{28} \quad 0 \quad 0 \quad 0$
	0	$0 \quad 0 \quad 0 \quad -\frac{\sqrt{105}}{70} \quad 0 \quad -\frac{\sqrt{105}i}{70} \quad 0 \quad -\frac{\sqrt{7}}{14} \quad 0$
	0	$0 \quad 0 \quad -\frac{\sqrt{105}}{70} \quad 0 \quad \frac{\sqrt{105}i}{70} \quad 0 \quad \frac{\sqrt{7}}{14}$
752	symmetry	$\sqrt{15}xyz$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{T}_3^{(1,1;a)}(A_u)$	0 0 0 $\frac{\sqrt{21}}{28}$ 0 $\frac{\sqrt{21}i}{28}$ 0 0 0 $-\frac{\sqrt{35}}{70}$ 0 $\frac{\sqrt{35}i}{70}$ $\frac{\sqrt{35}}{35}$ 0	
	0 0 $\frac{\sqrt{21}}{28}$ 0 $-\frac{\sqrt{21}i}{28}$ 0 0 0 $-\frac{\sqrt{35}}{70}$ 0 $-\frac{\sqrt{35}i}{70}$ 0 0 $-\frac{\sqrt{35}}{35}$	
	0 0 0 $\frac{\sqrt{7}}{28}$ 0 $-\frac{\sqrt{7}i}{28}$ $-\frac{\sqrt{7}}{14}$ 0 0 $\frac{\sqrt{105}}{70}$ 0 $\frac{\sqrt{105}i}{70}$ 0 0 0	
	0 0 $\frac{\sqrt{7}}{28}$ 0 $\frac{\sqrt{7}i}{28}$ 0 0 $\frac{\sqrt{7}}{14}$ $\frac{\sqrt{105}}{70}$ 0 $-\frac{\sqrt{105}i}{70}$ 0 0 0	
	0 0 0 0 $\frac{\sqrt{7}}{56}$ 0 0 $\frac{\sqrt{7}i}{56}$ 0 0 $\frac{\sqrt{105}}{120}$ 0 0 0 $-\frac{\sqrt{105}i}{120}$	
	0 0 0 0 0 $-\frac{\sqrt{7}}{56}$ $-\frac{\sqrt{7}i}{56}$ 0 0 0 0 $-\frac{\sqrt{105}}{120}$ $\frac{\sqrt{105}i}{120}$ 0	
	0 0 $-\frac{\sqrt{7}}{56}$ 0 0 0 $\frac{\sqrt{7}}{56}$ $\frac{\sqrt{105}}{120}$ 0 0 0 0 $\frac{\sqrt{105}}{120}$	
	0 0 0 $\frac{\sqrt{7}}{56}$ 0 0 $\frac{\sqrt{7}}{56}$ 0 0 $-\frac{\sqrt{105}}{120}$ 0 0 $\frac{\sqrt{105}}{120}$ 0	
	0 0 0 $-\frac{\sqrt{7}i}{56}$ 0 $-\frac{\sqrt{7}}{56}$ 0 0 0 $-\frac{\sqrt{105}i}{120}$ 0 $\frac{\sqrt{105}}{120}$ 0 0	
	0 0 $\frac{\sqrt{7}i}{56}$ 0 $-\frac{\sqrt{7}}{56}$ 0 0 0 $\frac{\sqrt{105}i}{120}$ 0 $\frac{\sqrt{105}}{120}$ 0 0 0	
753	symmetry	$\frac{x(2x^2-3y^2-3z^2)}{2}$
$\mathbb{T}_{3,0}^{(1,1;a)}(T_u, 1)$	0 $\frac{\sqrt{21}}{42}$ 0 0 $\frac{\sqrt{35}}{112}$ 0 0 0 0 $\frac{3\sqrt{21}}{112}$ 0 0 $\frac{\sqrt{21}i}{84}$	
	$\frac{\sqrt{21}}{42}$ 0 0 0 0 $-\frac{\sqrt{35}}{112}$ 0 0 0 0 0 $-\frac{3\sqrt{21}}{112}$ $-\frac{\sqrt{21}i}{84}$ 0	
	0 $\frac{\sqrt{7}}{42}$ 0 0 $-\frac{\sqrt{105}}{336}$ 0 0 $-\frac{\sqrt{105}i}{168}$ 0 0 $-\frac{\sqrt{7}}{336}$ 0 0 $\frac{\sqrt{7}i}{24}$	
	$\frac{\sqrt{7}}{42}$ 0 0 0 0 $\frac{\sqrt{105}}{336}$ $\frac{\sqrt{105}i}{168}$ 0 0 0 0 $\frac{\sqrt{7}}{336}$ $-\frac{\sqrt{7}i}{24}$ 0	
	0 0 0 0 0 $-\frac{\sqrt{105}i}{112}$ $-\frac{\sqrt{105}}{112}$ 0 0 $\frac{\sqrt{7}}{21}$ 0 $-\frac{\sqrt{7}i}{48}$ $\frac{\sqrt{7}}{48}$ 0	
	0 0 0 0 $\frac{\sqrt{105}i}{112}$ 0 0 $\frac{\sqrt{105}}{112}$ $\frac{\sqrt{7}}{21}$ 0 $\frac{\sqrt{7}i}{48}$ 0 0 $-\frac{\sqrt{7}}{48}$	
	$-\frac{\sqrt{7}}{24}$ 0 0 $-\frac{\sqrt{105}i}{84}$ 0 $\frac{\sqrt{105}}{84}$ 0 0 0 $\frac{\sqrt{7}i}{24}$ 0 $\frac{5\sqrt{7}}{84}$ 0 0	
	0 $\frac{\sqrt{7}}{24}$ $\frac{\sqrt{105}i}{84}$ 0 $\frac{\sqrt{105}}{84}$ 0 0 0 $-\frac{\sqrt{7}i}{24}$ 0 $\frac{5\sqrt{7}}{84}$ 0 0 0	
	0 $-\frac{\sqrt{7}i}{24}$ $-\frac{\sqrt{105}}{84}$ 0 0 0 0 $-\frac{\sqrt{105}}{84}$ $-\frac{\sqrt{7}}{24}$ 0 0 0 $\frac{5\sqrt{7}}{84}$	
	$\frac{\sqrt{7}i}{24}$ 0 0 $\frac{\sqrt{105}}{84}$ 0 0 $-\frac{\sqrt{105}}{84}$ 0 0 $\frac{\sqrt{7}}{24}$ 0 0 $\frac{5\sqrt{7}}{84}$ 0	
754	symmetry	$-\frac{y(3x^2-2y^2+3z^2)}{2}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{T}_{3,1}^{(1,1;a)}(T_u, 1)$	0	$\frac{\sqrt{21}i}{42} - \frac{\sqrt{35}}{112} 0 0 0 0 0 0 0 \frac{3\sqrt{21}}{112} 0 0 0 0 -\frac{\sqrt{21}}{84}$
	$-\frac{\sqrt{21}i}{42}$	$0 0 0 \frac{\sqrt{35}}{112} 0 0 0 0 0 -\frac{3\sqrt{21}}{112} 0 0 0 -\frac{\sqrt{21}}{84} 0$
	0	$-\frac{\sqrt{7}i}{42} -\frac{\sqrt{105}}{336} 0 0 0 0 \frac{\sqrt{105}}{168} \frac{\sqrt{7}}{336} 0 0 0 0 0 \frac{\sqrt{7}}{24}$
	$\frac{\sqrt{7}i}{42}$	$0 0 0 \frac{\sqrt{105}}{336} 0 0 \frac{\sqrt{105}}{168} 0 0 -\frac{\sqrt{7}}{336} 0 0 0 \frac{\sqrt{7}}{24} 0$
	$\frac{\sqrt{7}}{24}$	$0 0 0 \frac{\sqrt{105}i}{84} 0 -\frac{\sqrt{105}}{84} 0 0 0 -\frac{5\sqrt{7}i}{84} 0 -\frac{\sqrt{7}}{24} 0 0 0$
	0	$-\frac{\sqrt{7}}{24} -\frac{\sqrt{105}i}{84} 0 -\frac{\sqrt{105}}{84} 0 0 0 \frac{5\sqrt{7}i}{84} 0 -\frac{\sqrt{7}}{24} 0 0 0 0$
	0	$0 0 0 -\frac{\sqrt{105}}{112} 0 0 0 \frac{\sqrt{105}}{112} 0 0 \frac{\sqrt{7}}{48} 0 -\frac{\sqrt{7}i}{21} \frac{\sqrt{7}}{48} 0$
	0	$0 0 -\frac{\sqrt{105}}{112} 0 0 0 0 -\frac{\sqrt{105}}{112} \frac{\sqrt{7}}{48} 0 \frac{\sqrt{7}i}{21} 0 0 -\frac{\sqrt{7}}{48}$
	0	$-\frac{\sqrt{7}}{24} 0 0 \frac{\sqrt{105}}{84} 0 0 0 -\frac{\sqrt{105}i}{84} 0 0 -\frac{\sqrt{7}}{24} 0 0 -\frac{5\sqrt{7}i}{84}$
	$-\frac{\sqrt{7}}{24}$	$0 0 0 0 -\frac{\sqrt{105}}{84} \frac{\sqrt{105}i}{84} 0 0 0 0 \frac{\sqrt{7}}{24} \frac{5\sqrt{7}i}{84} 0$
755	symmetry	$-\frac{z(3x^2+3y^2-2z^2)}{2}$
$\mathbb{T}_{3,2}^{(1,1;a)}(T_u, 1)$	0	$0 0 0 \frac{\sqrt{35}i}{112} 0 \frac{\sqrt{35}}{112} 0 0 0 \frac{5\sqrt{21}i}{336} 0 -\frac{5\sqrt{21}}{336} 0 0$
	0	$0 0 -\frac{\sqrt{35}i}{112} 0 \frac{\sqrt{35}}{112} 0 0 0 0 -\frac{5\sqrt{21}i}{336} 0 -\frac{5\sqrt{21}}{336} 0 0 0$
	$-\frac{\sqrt{7}}{21}$	$0 0 0 \frac{\sqrt{105}i}{336} 0 -\frac{\sqrt{105}}{336} 0 0 0 0 \frac{13\sqrt{7}i}{336} 0 \frac{13\sqrt{7}}{336} 0 0$
	0	$\frac{\sqrt{7}}{21} -\frac{\sqrt{105}i}{336} 0 -\frac{\sqrt{105}}{336} 0 0 0 0 -\frac{13\sqrt{7}i}{336} 0 \frac{13\sqrt{7}}{336} 0 0 0$
	0	$0 \frac{\sqrt{7}i}{24} \frac{\sqrt{105}}{84} 0 0 0 0 \frac{\sqrt{105}}{84} \frac{5\sqrt{7}}{84} 0 0 0 0 -\frac{\sqrt{7}}{24}$
	$-\frac{\sqrt{7}i}{24}$	$0 0 -\frac{\sqrt{105}}{84} 0 0 0 \frac{\sqrt{105}}{84} 0 0 -\frac{5\sqrt{7}}{84} 0 0 -\frac{\sqrt{7}}{24} 0$
	0	$\frac{\sqrt{7}i}{24} 0 0 -\frac{\sqrt{105}}{84} 0 0 \frac{\sqrt{105}i}{84} 0 0 0 \frac{5\sqrt{7}}{84} 0 0 \frac{\sqrt{7}i}{24}$
	$\frac{\sqrt{7}}{24}$	$0 0 0 0 \frac{\sqrt{105}}{84} -\frac{\sqrt{105}i}{84} 0 0 0 0 -\frac{5\sqrt{7}}{84} -\frac{\sqrt{7}i}{24} 0$
	0	$0 0 0 \frac{\sqrt{105}}{112} 0 \frac{\sqrt{105}i}{112} 0 0 0 \frac{\sqrt{7}}{48} 0 -\frac{\sqrt{7}i}{48} \frac{\sqrt{7}}{21} 0$
	0	$0 0 \frac{\sqrt{105}}{112} 0 -\frac{\sqrt{105}i}{112} 0 0 0 \frac{\sqrt{7}}{48} 0 \frac{\sqrt{7}i}{48} 0 0 -\frac{\sqrt{7}}{21}$
756	symmetry	$\frac{\sqrt{15}x(y-z)(y+z)}{2}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{T}_{3,0}^{(1,1;a)}(T_u, 2)$	0	$\frac{\sqrt{35}}{70} \quad 0 \quad 0 \quad -\frac{3\sqrt{21}}{112} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{35}}{560} \quad 0 \quad 0 \quad \frac{3\sqrt{35}i}{140}$
	$\frac{\sqrt{35}}{70}$	$0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{3\sqrt{21}}{112} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{35}}{560} \quad -\frac{3\sqrt{35}i}{140} \quad 0$
	0	$- \frac{\sqrt{105}}{70} \quad 0 \quad 0 \quad 0 \quad \frac{3\sqrt{7}}{112} \quad 0 \quad 0 \quad 0 \quad -\frac{3\sqrt{7}i}{56} \quad 0 \quad 0 \quad -\frac{5\sqrt{105}}{336} \quad 0 \quad 0 \quad -\frac{\sqrt{105}i}{120}$
	$-\frac{\sqrt{105}}{70}$	$0 \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{3\sqrt{7}}{112} \quad \frac{3\sqrt{7}i}{56} \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{5\sqrt{105}}{336} \quad \frac{\sqrt{105}i}{120} \quad 0$
	0	$0 \quad 0 \quad 0 \quad \frac{\sqrt{7}}{14} \quad 0 \quad \frac{5\sqrt{7}i}{112} \quad -\frac{5\sqrt{7}}{112} \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{105}i}{80} \quad \frac{\sqrt{105}}{80} \quad 0$
	0	$0 \quad 0 \quad \frac{\sqrt{7}}{14} \quad 0 \quad -\frac{5\sqrt{7}i}{112} \quad 0 \quad 0 \quad \frac{5\sqrt{7}}{112} \quad 0 \quad 0 \quad -\frac{\sqrt{105}i}{80} \quad 0 \quad 0 \quad -\frac{\sqrt{105}}{80}$
	$-\frac{\sqrt{105}}{120}$	$0 \quad 0 \quad 0 \quad \frac{\sqrt{7}i}{56} \quad 0 \quad -\frac{\sqrt{7}}{28} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{105}}{420} \quad 0 \quad 0 \quad 0$
	0	$\frac{\sqrt{105}}{120} \quad -\frac{\sqrt{7}i}{56} \quad 0 \quad -\frac{\sqrt{7}}{28} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{105}}{420} \quad 0 \quad 0 \quad 0$
	0	$\frac{\sqrt{105}i}{120} \quad -\frac{\sqrt{7}}{56} \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{7}}{28} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{105}}{420}$
	$-\frac{\sqrt{105}i}{120}$	$0 \quad 0 \quad 0 \quad \frac{\sqrt{7}}{56} \quad 0 \quad 0 \quad -\frac{\sqrt{7}}{28} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{105}}{420} \quad 0$
757	symmetry	$-\frac{\sqrt{15}y(x-z)(x+z)}{2}$
$\mathbb{T}_{3,1}^{(1,1;a)}(T_u, 2)$	0	$0 \quad -\frac{\sqrt{35}i}{70} \quad -\frac{3\sqrt{21}}{112} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{35}}{560} \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{3\sqrt{35}}{140}$
	$\frac{\sqrt{35}i}{70}$	$0 \quad 0 \quad 0 \quad \frac{3\sqrt{21}}{112} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{35}}{560} \quad 0 \quad 0 \quad 0 \quad \frac{3\sqrt{35}}{140} \quad 0$
	0	$0 \quad -\frac{\sqrt{105}i}{70} \quad -\frac{3\sqrt{7}}{112} \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{3\sqrt{7}}{56} \quad -\frac{5\sqrt{105}}{336} \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{105}}{120}$
	$\frac{\sqrt{105}i}{70}$	$0 \quad 0 \quad 0 \quad \frac{3\sqrt{7}}{112} \quad 0 \quad 0 \quad -\frac{3\sqrt{7}}{56} \quad 0 \quad 0 \quad \frac{5\sqrt{105}}{336} \quad 0 \quad 0 \quad \frac{\sqrt{105}}{120} \quad 0$
	$-\frac{\sqrt{105}}{120}$	$0 \quad 0 \quad 0 \quad \frac{\sqrt{7}i}{28} \quad 0 \quad -\frac{\sqrt{7}}{56} \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{105}i}{420} \quad 0 \quad 0 \quad 0 \quad 0$
	0	$0 \quad \frac{\sqrt{105}}{120} \quad -\frac{\sqrt{7}i}{28} \quad 0 \quad -\frac{\sqrt{7}}{56} \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{105}i}{420} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0$
	0	$0 \quad 0 \quad 0 \quad -\frac{5\sqrt{7}}{112} \quad 0 \quad -\frac{\sqrt{7}i}{14} \quad -\frac{5\sqrt{7}}{112} \quad 0 \quad 0 \quad \frac{\sqrt{105}}{80} \quad 0 \quad 0 \quad -\frac{\sqrt{105}}{80} \quad 0$
	0	$0 \quad 0 \quad -\frac{5\sqrt{7}}{112} \quad 0 \quad \frac{\sqrt{7}i}{14} \quad 0 \quad 0 \quad \frac{5\sqrt{7}}{112} \quad \frac{\sqrt{105}}{80} \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{105}}{80}$
	0	$0 \quad -\frac{\sqrt{105}}{120} \quad 0 \quad 0 \quad -\frac{\sqrt{7}}{56} \quad 0 \quad 0 \quad \frac{\sqrt{7}i}{28} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{105}i}{420}$
	$-\frac{\sqrt{105}}{120}$	$0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{7}}{56} \quad -\frac{\sqrt{7}i}{28} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{105}i}{420} \quad 0$
758	symmetry	$\frac{\sqrt{15}z(x-y)(x+y)}{2}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{T}_{3,2}^{(1,1;a)}(T_u, 2)$	$-\frac{\sqrt{35}}{35}$	0 0 $-\frac{3\sqrt{21}i}{112}$ 0 $\frac{3\sqrt{21}}{112}$ 0 0 0 $\frac{13\sqrt{35}i}{560}$ 0 $\frac{13\sqrt{35}}{560}$ 0 0
	0 $\frac{\sqrt{35}}{35}$	$\frac{3\sqrt{21}i}{112}$ 0 $\frac{3\sqrt{21}}{112}$ 0 0 0 $-\frac{13\sqrt{35}i}{560}$ 0 $\frac{13\sqrt{35}}{560}$ 0 0 0
	0 0 0	$-\frac{3\sqrt{7}i}{112}$ 0 $-\frac{3\sqrt{7}}{112}$ 0 0 0 0 $-\frac{11\sqrt{105}i}{1680}$ 0 $\frac{11\sqrt{105}}{1680}$ 0 0
	0 0 $\frac{3\sqrt{7}i}{112}$	0 $-\frac{3\sqrt{7}}{112}$ 0 0 0 $\frac{11\sqrt{105}i}{1680}$ 0 $\frac{11\sqrt{105}}{1680}$ 0 0 0
	0 $\frac{\sqrt{105}i}{120}$	$-\frac{\sqrt{7}}{28}$ 0 0 0 0 $-\frac{\sqrt{7}}{56}$ $\frac{\sqrt{105}}{420}$ 0 0 0 0
	$-\frac{\sqrt{105}i}{120}$	0 0 $\frac{\sqrt{7}}{28}$ 0 0 $-\frac{\sqrt{7}}{56}$ 0 0 $-\frac{\sqrt{105}}{420}$ 0 0 0
	0 $-\frac{\sqrt{105}}{120}$	0 0 0 $-\frac{\sqrt{7}}{28}$ 0 0 $\frac{\sqrt{7}i}{56}$ 0 0 $-\frac{\sqrt{105}}{420}$ 0 0 0
	$-\frac{\sqrt{105}}{120}$	0 0 0 0 $\frac{\sqrt{7}}{28}$ $-\frac{\sqrt{7}i}{56}$ 0 0 0 0 $\frac{\sqrt{105}}{420}$ 0 0
	0 0 0	$-\frac{5\sqrt{7}}{112}$ 0 $\frac{5\sqrt{7}i}{112}$ $\frac{\sqrt{7}}{14}$ 0 0 0 $-\frac{\sqrt{105}}{80}$ 0 $-\frac{\sqrt{105}i}{80}$ 0 0
	0 0 $-\frac{5\sqrt{7}}{112}$	0 $-\frac{5\sqrt{7}i}{112}$ 0 0 $-\frac{\sqrt{7}}{14}$ $-\frac{\sqrt{105}}{80}$ 0 $\frac{\sqrt{105}i}{80}$ 0 0 0
759	symmetry	$-\frac{x^2}{2} - \frac{y^2}{2} + z^2$
$\mathbb{M}_{2,0}^{(a)}(E_u)$	0 0 0 0 0 0 0 0 0 0 0 0	$\left[\begin{array}{cccccccccc} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ -\frac{\sqrt{70}i}{28} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{70}i}{28} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{42}i}{56} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}i}{56} & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{42}i}{56} & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}i}{56} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{42}i}{56} & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}i}{56} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{42}i}{56} & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}i}{56} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{70}i}{28} \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{70}i}{28} \end{array} \right]$
760	symmetry	$\frac{\sqrt{3}(x-y)(x+y)}{2}$

continued ..

Table 9

No.	multipole	matrix
$\mathbb{M}_{2,1}^{(a)}(E_u)$	$\sqrt{70i}$	$\begin{bmatrix} \frac{\sqrt{70i}}{28} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{70i}}{28} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{14i}}{56} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{210i}}{56} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{14i}}{56} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{210i}}{56} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{14i}}{56} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{210i}}{56} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{14i}}{56} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{210i}}{56} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{14i}}{28} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{14i}}{28} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
	$\sqrt{3}yz$	
	$\mathbb{M}_{2,0}^{(a)}(T_u)$	$\begin{bmatrix} 0 & 0 & \frac{\sqrt{42i}}{56} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{70i}}{56} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{42i}}{56} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{70i}}{56} & 0 & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{14i}}{56} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{210i}}{56} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{14i}}{56} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{210i}}{56} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{14i}}{14} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{14i}}{14} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{14i}}{14} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{14i}}{14} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
	$\sqrt{3}xz$	
761	symmetry	
762	symmetry	

continued ...

Table 9

No.	multipole	matrix
$\mathbb{M}_{2,1}^{(a)}(T_u)$		$\begin{bmatrix} 0 & 0 & 0 & 0 & -\frac{\sqrt{42}i}{56} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{70}i}{56} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{42}i}{56} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{70}i}{56} & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{14}i}{56} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{210}i}{56} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{14}i}{56} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{210}i}{56} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{14}i}{14} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{14}i}{14} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{14}i}{14} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{14}i}{14} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
763	symmetry	$\sqrt{3}xy$
$\mathbb{M}_{2,2}^{(a)}(T_u)$		$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}i}{28} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}i}{28} \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{14}i}{28} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{14}i}{28} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{14}i}{14} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{14}i}{14} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{14}i}{14} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{14}i}{14} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
764	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
	$\mathbb{M}_4^{(a)}(A_u)$	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{6} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{6} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{6} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{6} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{6} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{6} & 0 \end{bmatrix}$
765	symmetry	$-\frac{\sqrt{15}(x^4 - 12x^2y^2 + 6x^2z^2 + y^4 + 6y^2z^2 - 2z^4)}{12}$ $\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ \frac{\sqrt{105}i}{35} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{105}i}{35} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{3\sqrt{7}i}{28} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{105}i}{420} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{3\sqrt{7}i}{28} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{105}i}{420} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{3\sqrt{7}i}{28} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{105}i}{420} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{7}i}{28} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{105}i}{420} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{105}i}{210} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{105}i}{210} & 0 \end{bmatrix}$
766	symmetry	$\frac{\sqrt{5}(x-y)(x+y)(x^2+y^2-6z^2)}{4}$

continued ...

Table 9

No.	multipole	matrix
	$\mathbb{M}_{4,1}^{(a)}(E_u)$	$\begin{bmatrix} -\frac{\sqrt{105}i}{35} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{105}i}{35} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{21}i}{28} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{35}i}{140} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{21}i}{28} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{35}i}{140} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{21}i}{28} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{35}i}{140} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{21}i}{28} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{35}i}{140} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{21}i}{14} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{21}i}{14} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
767	symmetry	$\frac{\sqrt{35}yz(y-z)(y+z)}{2}$ $\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{20} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{20} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{20} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{20} & 0 & 0 & 0 & 0 \\ -\frac{\sqrt{5}i}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{5}i}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{8} & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{5}i}{40} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{8} & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{5}i}{40} \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{8} & 0 & 0 & 0 & 0 & \frac{3\sqrt{5}i}{40} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{8} & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{5}i}{40} & 0 & 0 \end{bmatrix}$
768	symmetry	$-\frac{\sqrt{35}xz(x-z)(x+z)}{2}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{M}_{4,1}^{(a)}(T_u, 1)$		$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{20} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{20} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{20} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}i}{20} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{8} & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{5}i}{40} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{8} & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{5}i}{40} \\ -\frac{\sqrt{5}i}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{5}i}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{3}i}{8} & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{5}i}{40} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{3}i}{8} & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{5}i}{40} & 0 & 0 & 0 & 0 \end{bmatrix}$
769	symmetry	$\frac{\sqrt{35}xy(x-y)(x+y)}{2}$
$\mathbb{M}_{4,2}^{(a)}(T_u, 1)$		$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{5}i}{10} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{5}i}{10} \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{8} & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{5}i}{40} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{8} & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{5}i}{40} & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{3}i}{8} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{5}i}{40} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{3}i}{8} & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{5}i}{40} & 0 & 0 & 0 & 0 \\ -\frac{\sqrt{5}i}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{5}i}{10} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
770	symmetry	$\frac{\sqrt{5}yz(6x^2-y^2-z^2)}{2}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{M}_{4,0}^{(a)}(T_u, 2)$	0 0 $-\frac{3\sqrt{7}i}{28}$ 0 0 0 0 0 $\frac{\sqrt{105}i}{70}$ 0 0 0 0 0 0	
	0 0 0 $-\frac{3\sqrt{7}i}{28}$ 0 0 0 0 0 $\frac{\sqrt{105}i}{70}$ 0 0 0 0 0	
	0 0 $-\frac{\sqrt{21}i}{28}$ 0 0 0 0 0 $-\frac{3\sqrt{35}i}{70}$ 0 0 0 0 0	
	0 0 0 $-\frac{\sqrt{21}i}{28}$ 0 0 0 0 0 $-\frac{3\sqrt{35}i}{70}$ 0 0 0 0 0	
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	
	0 0 0 0 0 0 $-\frac{\sqrt{21}i}{56}$ 0 0 0 0 0 0 $-\frac{\sqrt{35}i}{40}$ 0	
	0 0 0 0 0 0 0 $-\frac{\sqrt{21}i}{56}$ 0 0 0 0 0 0 $-\frac{\sqrt{35}i}{40}$	
	0 0 0 0 $\frac{\sqrt{21}i}{56}$ 0 0 0 0 0 0 $-\frac{\sqrt{35}i}{40}$ 0 0 0	
	0 0 0 0 0 $\frac{\sqrt{21}i}{56}$ 0 0 0 0 0 0 $-\frac{\sqrt{35}i}{40}$ 0 0 0	
771	symmetry	$-\frac{\sqrt{5}xz(x^2 - 6y^2 + z^2)}{2}$
$\mathbb{M}_{4,1}^{(a)}(T_u, 2)$	0 0 0 0 $\frac{3\sqrt{7}i}{28}$ 0 0 0 0 0 $\frac{\sqrt{105}i}{70}$ 0 0 0 0	
	0 0 0 0 0 $\frac{3\sqrt{7}i}{28}$ 0 0 0 0 0 $\frac{\sqrt{105}i}{70}$ 0 0 0	
	0 0 0 0 $-\frac{\sqrt{21}i}{28}$ 0 0 0 0 0 $\frac{3\sqrt{35}i}{70}$ 0 0 0	
	0 0 0 0 0 $-\frac{\sqrt{21}i}{28}$ 0 0 0 0 0 $\frac{3\sqrt{35}i}{70}$ 0 0 0	
	0 0 0 0 0 0 $\frac{\sqrt{21}i}{56}$ 0 0 0 0 0 $-\frac{\sqrt{35}i}{40}$ 0	
	0 0 0 0 0 0 0 $\frac{\sqrt{21}i}{56}$ 0 0 0 0 0 $-\frac{\sqrt{35}i}{40}$	
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	
	0 0 $-\frac{\sqrt{21}i}{56}$ 0 0 0 0 0 $-\frac{\sqrt{35}i}{40}$ 0 0 0 0 0 0	
	0 0 0 $-\frac{\sqrt{21}i}{56}$ 0 0 0 0 0 $-\frac{\sqrt{35}i}{40}$ 0 0 0 0 0 0	
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 0 0 0 0 0 0 0 0 0 0 0 0 0	$-\frac{\sqrt{105}i}{35} 0$
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	$0 -\frac{\sqrt{105}i}{35}$
	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 $\frac{\sqrt{21}i}{14}$ 0 0 0 0 0 0 0	0
	0 0 0 0 $-\frac{\sqrt{21}i}{56}$ 0 0 0 0 0 0 0 $-\frac{\sqrt{35}i}{40}$ 0 0 0	0
	0 0 0 0 0 0 $-\frac{\sqrt{21}i}{56}$ 0 0 0 0 0 0 0 $-\frac{\sqrt{35}i}{40}$ 0 0 0	0
	0 0 $\frac{\sqrt{21}i}{56}$ 0 0 0 0 0 0 $-\frac{\sqrt{35}i}{40}$ 0 0 0 0 0 0	0
	0 0 0 $\frac{\sqrt{21}i}{56}$ 0 0 0 0 0 0 $-\frac{\sqrt{35}i}{40}$ 0 0 0 0 0 0	0
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 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 0 0 $\frac{\sqrt{210}}{280}$ 0 $-\frac{\sqrt{210}i}{280}$ $\frac{\sqrt{210}}{70}$ 0 0 $\frac{\sqrt{14}}{56}$ 0 $\frac{\sqrt{14}i}{56}$ 0 0	0
	0 0 $\frac{\sqrt{210}}{280}$ 0 $\frac{\sqrt{210}i}{280}$ 0 0 $-\frac{\sqrt{210}}{70}$ $\frac{\sqrt{14}}{56}$ 0 $-\frac{\sqrt{14}i}{56}$ 0 0 0	0
	0 0 0 $-\frac{3\sqrt{70}}{280}$ 0 $-\frac{3\sqrt{70}i}{280}$ 0 0 0 $\frac{\sqrt{42}}{168}$ 0 $-\frac{\sqrt{42}i}{168}$ $\frac{\sqrt{42}}{42}$ 0	0
	0 0 $-\frac{3\sqrt{70}}{280}$ 0 $\frac{3\sqrt{70}i}{280}$ 0 0 0 $\frac{\sqrt{42}}{168}$ 0 $\frac{\sqrt{42}i}{168}$ 0 0 $-\frac{\sqrt{42}}{42}$	0
	0 $-\frac{\sqrt{42}}{84}$ 0 0 $-\frac{\sqrt{70}}{70}$ 0 0 $-\frac{\sqrt{70}i}{140}$ 0 0 $\frac{\sqrt{42}}{42}$ 0 0 $-\frac{\sqrt{42}i}{84}$	0
	$-\frac{\sqrt{42}}{84}$ 0 0 0 $\frac{\sqrt{70}}{70}$ $\frac{\sqrt{70}i}{140}$ 0 0 0 0 $-\frac{\sqrt{42}}{42}$ $\frac{\sqrt{42}i}{84}$ 0	0
	0 $\frac{\sqrt{42}i}{84}$ $-\frac{\sqrt{70}}{70}$ 0 0 0 0 $\frac{\sqrt{70}}{140}$ $-\frac{\sqrt{42}}{42}$ 0 0 0 0 $-\frac{\sqrt{42}}{84}$	0
	$-\frac{\sqrt{42}i}{84}$ 0 0 $\frac{\sqrt{70}}{70}$ 0 0 $\frac{\sqrt{70}}{140}$ 0 0 0 0 0 $-\frac{\sqrt{42}}{84}$ 0	0
	$\frac{\sqrt{42}}{42}$ 0 0 $-\frac{\sqrt{70}i}{140}$ 0 $\frac{\sqrt{70}}{140}$ 0 0 0 $\frac{\sqrt{42}i}{84}$ 0 $\frac{\sqrt{42}}{84}$ 0 0	0
	0 $-\frac{\sqrt{42}}{42}$ $\frac{\sqrt{70}i}{140}$ 0 $\frac{\sqrt{70}}{140}$ 0 0 0 $-\frac{\sqrt{42}i}{84}$ 0 $\frac{\sqrt{42}}{84}$ 0 0 0	0
774	symmetry	$\frac{\sqrt{3}(x-y)(x+y)}{2}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{M}_{2,1}^{(1,-1;a)}(E_u)$	0 0 0 $-\frac{3\sqrt{70}}{280}$ 0 $-\frac{3\sqrt{70}i}{280}$ 0 0 0 0 $-\frac{\sqrt{42}}{56}$ 0 $\frac{\sqrt{42}i}{56}$ 0 0	
	0 0 $-\frac{3\sqrt{70}}{280}$ 0 $\frac{3\sqrt{70}i}{280}$ 0 0 0 0 $-\frac{\sqrt{42}}{56}$ 0 $-\frac{\sqrt{42}i}{56}$ 0 0 0	
	0 0 0 $\frac{3\sqrt{210}}{280}$ 0 $-\frac{3\sqrt{210}i}{280}$ 0 0 0 0 $-\frac{\sqrt{14}}{56}$ 0 $-\frac{\sqrt{14}i}{56}$ 0 0 0	
	0 0 $\frac{3\sqrt{210}}{280}$ 0 $\frac{3\sqrt{210}i}{280}$ 0 0 0 0 $-\frac{\sqrt{14}}{56}$ 0 $\frac{\sqrt{14}i}{56}$ 0 0 0	
	0 $\frac{\sqrt{14}}{28}$ 0 0 0 0 0 $-\frac{\sqrt{210}i}{140}$ 0 0 0 0 0 0 $-\frac{\sqrt{14}i}{28}$	
	$\frac{\sqrt{14}}{28}$ 0 0 0 0 $\frac{\sqrt{210}i}{140}$ 0 0 0 0 0 0 $\frac{\sqrt{14}i}{28}$ 0	
	0 $\frac{\sqrt{14}i}{28}$ 0 0 0 0 0 $-\frac{\sqrt{210}}{140}$ 0 0 0 0 0 $\frac{\sqrt{14}}{28}$	
	$-\frac{\sqrt{14}i}{28}$ 0 0 0 0 $-\frac{\sqrt{210}}{140}$ 0 0 0 0 0 0 $\frac{\sqrt{14}}{28}$ 0	
	0 0 0 $-\frac{\sqrt{210}i}{140}$ 0 $-\frac{\sqrt{210}}{140}$ 0 0 0 0 $\frac{\sqrt{14}i}{28}$ 0 $-\frac{\sqrt{14}}{28}$ 0 0	
	0 0 $\frac{\sqrt{210}i}{140}$ 0 $-\frac{\sqrt{210}}{140}$ 0 0 0 0 $-\frac{\sqrt{14}i}{28}$ 0 $-\frac{\sqrt{14}}{28}$ 0 0 0	
775	symmetry	$\sqrt{3}yz$
$\mathbb{M}_{2,0}^{(1,-1;a)}(T_u)$	0 0 0 0 $-\frac{3\sqrt{70}}{280}$ 0 0 $-\frac{3\sqrt{70}i}{140}$ 0 0 0 $\frac{\sqrt{42}}{56}$ 0 0 0	
	0 0 0 0 0 $\frac{3\sqrt{70}}{280}$ $\frac{3\sqrt{70}i}{140}$ 0 0 0 0 0 $-\frac{\sqrt{42}}{56}$ 0 0 0	
	0 0 0 0 $-\frac{3\sqrt{210}}{280}$ 0 0 0 0 0 0 $-\frac{\sqrt{14}}{56}$ 0 0 0 $-\frac{\sqrt{14}i}{28}$	
	0 0 0 0 0 $\frac{3\sqrt{210}}{280}$ 0 0 0 0 0 0 $\frac{\sqrt{14}}{56}$ $\frac{\sqrt{14}i}{28}$ 0	
	0 0 0 0 0 $\frac{\sqrt{210}i}{140}$ $-\frac{\sqrt{210}}{140}$ 0 0 0 0 0 $-\frac{\sqrt{14}i}{28}$ $-\frac{\sqrt{14}}{28}$ 0	
	0 0 0 0 $-\frac{\sqrt{210}i}{140}$ 0 0 $\frac{\sqrt{210}}{140}$ 0 0 0 $\frac{\sqrt{14}i}{28}$ 0 0 $\frac{\sqrt{14}}{28}$	
	$\frac{\sqrt{14}}{28}$ 0 0 $\frac{\sqrt{210}i}{140}$ 0 0 0 0 0 $\frac{\sqrt{14}i}{28}$ 0 0 0 0	
	0 $-\frac{\sqrt{14}}{28}$ $-\frac{\sqrt{210}i}{140}$ 0 0 0 0 0 $-\frac{\sqrt{14}i}{28}$ 0 0 0 0 0	
	0 $-\frac{\sqrt{14}i}{28}$ $-\frac{\sqrt{210}}{140}$ 0 0 0 0 0 0 $\frac{\sqrt{14}}{28}$ 0 0 0 0 0	
	$\frac{\sqrt{14}i}{28}$ 0 0 $\frac{\sqrt{210}}{140}$ 0 0 0 0 0 $-\frac{\sqrt{14}}{28}$ 0 0 0 0 0	
776	symmetry	$\sqrt{3}xz$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{M}_{2,1}^{(1,-1;a)}(T_u)$	0 0 $-\frac{3\sqrt{70}}{280}$ 0 0 0 0 $\frac{3\sqrt{70}}{140}$ $-\frac{\sqrt{42}}{56}$ 0 0 0 0 0 0	
	0 0 0 $\frac{3\sqrt{70}}{280}$ 0 0 $\frac{3\sqrt{70}}{140}$ 0 0 $\frac{\sqrt{42}}{56}$ 0 0 0 0 0	
	0 0 $\frac{3\sqrt{210}}{280}$ 0 0 0 0 0 $-\frac{\sqrt{14}}{56}$ 0 0 0 0 0 $\frac{\sqrt{14}}{28}$	
	0 0 0 $-\frac{3\sqrt{210}}{280}$ 0 0 0 0 0 $\frac{\sqrt{14}}{56}$ 0 0 0 $\frac{\sqrt{14}}{28}$ 0	
	$\frac{\sqrt{14}}{28}$ 0 0 0 0 $-\frac{\sqrt{210}}{140}$ 0 0 0 0 0 $\frac{\sqrt{14}}{28}$ 0 0 0	
	0 $-\frac{\sqrt{14}}{28}$ 0 0 $-\frac{\sqrt{210}}{140}$ 0 0 $-\frac{\sqrt{210}}{140}$ 0 0 $-\frac{\sqrt{14}}{28}$ 0 0 $\frac{\sqrt{14}}{28}$ 0	
	0 0 0 $-\frac{\sqrt{210}}{140}$ 0 0 $-\frac{\sqrt{210}}{140}$ 0 0 $-\frac{\sqrt{14}}{28}$ 0 0 $\frac{\sqrt{14}}{28}$ 0	
	0 0 $-\frac{\sqrt{210}}{140}$ 0 0 0 0 $\frac{\sqrt{210}}{140}$ $-\frac{\sqrt{14}}{28}$ 0 0 0 0 $-\frac{\sqrt{14}}{28}$	
	0 $\frac{\sqrt{14}}{28}$ 0 0 $-\frac{\sqrt{210}}{140}$ 0 0 0 0 0 $-\frac{\sqrt{14}}{28}$ 0 0 0	
	$\frac{\sqrt{14}}{28}$ 0 0 0 0 $\frac{\sqrt{210}}{140}$ 0 0 0 0 0 $\frac{\sqrt{14}}{28}$ 0 0	
777	symmetry	$\sqrt{3}xy$
$\mathbb{M}_{2,2}^{(1,-1;a)}(T_u)$	0 0 0 $\frac{3\sqrt{70}i}{280}$ 0 $-\frac{3\sqrt{70}}{280}$ 0 0 0 $\frac{\sqrt{42}i}{56}$ 0 $\frac{\sqrt{42}}{56}$ 0 0 0	
	0 0 $-\frac{3\sqrt{70}i}{280}$ 0 $-\frac{3\sqrt{70}}{280}$ 0 0 0 $-\frac{\sqrt{42}i}{56}$ 0 $\frac{\sqrt{42}}{56}$ 0 0 0	
	0 0 0 $-\frac{3\sqrt{210}i}{280}$ 0 $-\frac{3\sqrt{210}}{280}$ 0 0 0 $\frac{\sqrt{14}i}{56}$ 0 $-\frac{\sqrt{14}}{56}$ 0 0	
	0 0 $\frac{3\sqrt{210}i}{280}$ 0 $-\frac{3\sqrt{210}}{280}$ 0 0 0 $-\frac{\sqrt{14}i}{56}$ 0 $-\frac{\sqrt{14}}{56}$ 0 0 0	
	0 $-\frac{\sqrt{14}i}{28}$ 0 0 0 0 0 $-\frac{\sqrt{210}}{140}$ 0 0 0 0 0 $-\frac{\sqrt{14}}{28}$	
	$\frac{\sqrt{14}i}{28}$ 0 0 0 0 0 $-\frac{\sqrt{210}}{140}$ 0 0 0 0 0 $-\frac{\sqrt{14}}{28}$ 0	
	0 $\frac{\sqrt{14}}{28}$ 0 0 0 0 $\frac{\sqrt{210}i}{140}$ 0 0 0 0 0 0 $-\frac{\sqrt{14}i}{28}$	
	$\frac{\sqrt{14}}{28}$ 0 0 0 0 $-\frac{\sqrt{210}i}{140}$ 0 0 0 0 0 $\frac{\sqrt{14}i}{28}$ 0	
	0 0 0 $-\frac{\sqrt{210}}{140}$ 0 $\frac{\sqrt{210}i}{140}$ 0 0 0 $\frac{\sqrt{14}}{28}$ 0 $\frac{\sqrt{14}i}{28}$ 0 0	
	0 0 $-\frac{\sqrt{210}}{140}$ 0 $-\frac{\sqrt{210}i}{140}$ 0 0 0 $\frac{\sqrt{14}}{28}$ 0 $-\frac{\sqrt{14}i}{28}$ 0 0 0	
778	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 0 0 $-\frac{\sqrt{5}}{30}$ 0 $\frac{\sqrt{5}i}{30}$ $\frac{\sqrt{5}}{15}$ 0 0 $\frac{\sqrt{3}}{12}$ 0 $\frac{\sqrt{3}i}{12}$ 0 0	
	0 0 $-\frac{\sqrt{5}}{30}$ 0 $-\frac{\sqrt{5}i}{30}$ 0 0 $-\frac{\sqrt{5}}{15}$ $\frac{\sqrt{3}}{12}$ 0 $-\frac{\sqrt{3}i}{12}$ 0 0 0	
	0 0 0 $\frac{\sqrt{15}}{30}$ 0 $\frac{\sqrt{15}i}{30}$ 0 0 0 0 $\frac{1}{12}$ 0 $-\frac{i}{12}$ $-\frac{1}{6}$ 0	
	0 0 $\frac{\sqrt{15}}{30}$ 0 $-\frac{\sqrt{15}i}{30}$ 0 0 0 0 $\frac{1}{12}$ 0 $\frac{i}{12}$ 0 0 $\frac{1}{6}$	
	0 $-\frac{1}{6}$ 0 0 $-\frac{\sqrt{15}}{120}$ 0 0 $\frac{\sqrt{15}i}{120}$ 0 0 $\frac{1}{24}$ 0 0 0 $\frac{i}{24}$	
	$-\frac{1}{6}$ 0 0 0 0 $\frac{\sqrt{15}}{120}$ $-\frac{\sqrt{15}i}{120}$ 0 0 0 0 $-\frac{1}{24}$ $-\frac{i}{24}$ 0	
	0 $\frac{i}{6}$ $-\frac{\sqrt{15}}{120}$ 0 0 0 0 $-\frac{\sqrt{15}}{120}$ $-\frac{1}{24}$ 0 0 0 0 $\frac{1}{24}$	
	$-\frac{i}{6}$ 0 0 $\frac{\sqrt{15}}{120}$ 0 0 $-\frac{\sqrt{15}}{120}$ 0 0 $\frac{1}{24}$ 0 0 0 $\frac{1}{24}$ 0	
	$-\frac{1}{6}$ 0 0 $\frac{\sqrt{15}i}{120}$ 0 $-\frac{\sqrt{15}}{120}$ 0 0 0 $-\frac{i}{24}$ 0 $-\frac{1}{24}$ 0 0	
	0 $\frac{1}{6}$ $-\frac{\sqrt{15}i}{120}$ 0 $-\frac{\sqrt{15}}{120}$ 0 0 0 $\frac{i}{24}$ 0 $-\frac{1}{24}$ 0 0 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 0 0 $\frac{11\sqrt{7}}{168}$ 0 $-\frac{11\sqrt{7}i}{168}$ $\frac{\sqrt{7}}{21}$ 0 0 $-\frac{\sqrt{105}}{168}$ 0 $-\frac{\sqrt{105}i}{168}$ 0 0	
	0 0 $\frac{11\sqrt{7}}{168}$ 0 $\frac{11\sqrt{7}i}{168}$ 0 0 $-\frac{\sqrt{7}}{21}$ $-\frac{\sqrt{105}}{168}$ 0 $\frac{\sqrt{105}i}{168}$ 0 0 0	
	0 0 0 $\frac{\sqrt{21}}{168}$ 0 $\frac{\sqrt{21}i}{168}$ 0 0 0 0 $-\frac{\sqrt{35}}{168}$ 0 $\frac{\sqrt{35}i}{168}$ $-\frac{\sqrt{35}}{42}$ 0	
	0 0 $\frac{\sqrt{21}}{168}$ 0 $-\frac{\sqrt{21}i}{168}$ 0 0 0 0 $-\frac{\sqrt{35}}{168}$ 0 $-\frac{\sqrt{35}i}{168}$ 0 0 $\frac{\sqrt{35}}{42}$	
	0 $\frac{\sqrt{35}}{84}$ 0 0 $-\frac{\sqrt{21}}{168}$ 0 0 $\frac{\sqrt{21}i}{168}$ 0 0 $\frac{\sqrt{35}}{168}$ 0 0 0 $-\frac{5\sqrt{35}i}{168}$	
	$\frac{\sqrt{35}}{84}$ 0 0 0 0 $\frac{\sqrt{21}}{168}$ $-\frac{\sqrt{21}i}{168}$ 0 0 0 0 0 $-\frac{\sqrt{35}}{168}$ $\frac{5\sqrt{35}i}{168}$ 0	
	0 $-\frac{\sqrt{35}i}{84}$ $-\frac{\sqrt{21}}{168}$ 0 0 0 0 $-\frac{\sqrt{21}}{168}$ $-\frac{\sqrt{35}}{168}$ 0 0 0 0 $-\frac{5\sqrt{35}}{168}$	
	$\frac{\sqrt{35}i}{84}$ 0 0 $\frac{\sqrt{21}}{168}$ 0 0 $-\frac{\sqrt{21}}{168}$ 0 0 $\frac{\sqrt{35}}{168}$ 0 0 0 $-\frac{5\sqrt{35}}{168}$ 0	
	$-\frac{\sqrt{35}}{42}$ 0 0 $-\frac{\sqrt{21}i}{84}$ 0 $\frac{\sqrt{21}}{84}$ 0 0 0 $-\frac{\sqrt{35}i}{42}$ 0 $-\frac{\sqrt{35}}{42}$ 0 0	
	0 $\frac{\sqrt{35}}{42}$ $\frac{\sqrt{21}i}{84}$ 0 $\frac{\sqrt{21}}{84}$ 0 0 0 $\frac{\sqrt{35}i}{42}$ 0 $-\frac{\sqrt{35}}{42}$ 0 0 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 $\frac{\sqrt{21}}{168}$ 0 $\frac{\sqrt{21}i}{168}$ 0 0 0 $\frac{\sqrt{35}}{56}$ 0 $-\frac{\sqrt{35}i}{56}$ 0 0	
	0 0 $\frac{\sqrt{21}}{168}$ 0 $-\frac{\sqrt{21}i}{168}$ 0 0 0 $\frac{\sqrt{35}}{56}$ 0 $\frac{\sqrt{35}i}{56}$ 0 0 0	
	0 0 0 $\frac{3\sqrt{7}}{56}$ 0 $-\frac{3\sqrt{7}i}{56}$ $\frac{\sqrt{7}}{14}$ 0 0 $\frac{\sqrt{105}}{168}$ 0 $\frac{\sqrt{105}i}{168}$ 0 0 0	
	0 0 $\frac{3\sqrt{7}}{56}$ 0 $\frac{3\sqrt{7}i}{56}$ 0 0 $-\frac{\sqrt{7}}{14}$ $\frac{\sqrt{105}}{168}$ 0 $-\frac{\sqrt{105}i}{168}$ 0 0 0	
	0 $-\frac{\sqrt{105}}{84}$ 0 0 $\frac{\sqrt{7}}{56}$ 0 0 $-\frac{\sqrt{7}i}{56}$ 0 0 $\frac{\sqrt{105}}{56}$ 0 0 $\frac{\sqrt{105}i}{168}$	
	$-\frac{\sqrt{105}}{84}$ 0 0 0 $-\frac{\sqrt{7}}{56}$ $\frac{\sqrt{7}i}{56}$ 0 0 0 0 $-\frac{\sqrt{105}}{56}$ $-\frac{\sqrt{105}i}{168}$ 0	
	0 $-\frac{\sqrt{105}i}{84}$ $-\frac{\sqrt{7}}{56}$ 0 0 0 0 $-\frac{\sqrt{7}}{56}$ $\frac{\sqrt{105}}{56}$ 0 0 0 0 $-\frac{\sqrt{105}}{168}$	
	$\frac{\sqrt{105}i}{84}$ 0 0 $\frac{\sqrt{7}}{56}$ 0 0 $-\frac{\sqrt{7}}{56}$ 0 0 $-\frac{\sqrt{105}}{56}$ 0 0 0 $-\frac{\sqrt{105}}{168}$	
	0 0 0 0 0 0 0 0 $\frac{\sqrt{105}i}{84}$ 0 $-\frac{\sqrt{105}}{84}$ 0 0 0	
	0 0 0 0 0 0 0 0 $-\frac{\sqrt{105}i}{84}$ 0 $-\frac{\sqrt{105}}{84}$ 0 0 0	
781	symmetry	$\frac{\sqrt{35}yz(y-z)(y+z)}{2}$
$\mathbb{M}_{4,0}^{(1,-1;a)}(T_u, 1)$	0 0 0 0 $\frac{\sqrt{3}}{48}$ 0 0 $\frac{\sqrt{3}i}{12}$ 0 0 0 $-\frac{\sqrt{5}}{16}$ 0 0 0	
	0 0 0 0 0 $-\frac{\sqrt{3}}{48}$ $-\frac{\sqrt{3}i}{12}$ 0 0 0 0 $\frac{\sqrt{5}}{16}$ 0 0 0	
	0 0 0 0 $-\frac{3}{16}$ 0 0 $-\frac{i}{8}$ 0 0 0 $\frac{\sqrt{15}}{48}$ 0 0 $-\frac{\sqrt{15}i}{24}$	
	0 0 0 0 0 $\frac{3}{16}$ $\frac{i}{8}$ 0 0 0 0 $-\frac{\sqrt{15}}{48}$ $\frac{\sqrt{15}i}{24}$ 0	
	0 0 0 0 0 $-\frac{i}{16}$ $-\frac{1}{16}$ 0 0 0 0 $-\frac{\sqrt{15}i}{48}$ $\frac{\sqrt{15}}{48}$ 0	
	0 0 0 0 $\frac{i}{16}$ 0 0 $\frac{1}{16}$ 0 0 0 $\frac{\sqrt{15}i}{48}$ 0 0 $-\frac{\sqrt{15}}{48}$	
	$-\frac{\sqrt{15}}{24}$ 0 0 0 0 0 0 0 0 $-\frac{\sqrt{15}i}{24}$ 0 0 0 0	
	0 $\frac{\sqrt{15}}{24}$ 0 0 0 0 0 0 $\frac{\sqrt{15}i}{24}$ 0 0 0 0 0	
	0 $-\frac{\sqrt{15}i}{24}$ 0 0 0 0 0 0 $\frac{\sqrt{15}}{24}$ 0 0 0 0 0	
	$\frac{\sqrt{15}i}{24}$ 0 0 0 0 0 0 0 $-\frac{\sqrt{15}}{24}$ 0 0 0 0 0	
782	symmetry	$-\frac{\sqrt{35}xz(x-z)(x+z)}{2}$

continued ...

Table 9

No.	multipole	matrix
		$\begin{bmatrix} 0 & 0 & -\frac{\sqrt{3}}{48} & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{12} & -\frac{\sqrt{5}}{16} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{3}}{48} & 0 & 0 & \frac{\sqrt{3}}{12} & 0 & 0 & \frac{\sqrt{5}}{16} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{3}{16} & 0 & 0 & 0 & 0 & \frac{1}{8} & -\frac{\sqrt{15}}{48} & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{24} & 0 \\ 0 & 0 & 0 & \frac{3}{16} & 0 & 0 & \frac{1}{8} & 0 & 0 & \frac{\sqrt{15}}{48} & 0 & 0 & 0 & -\frac{\sqrt{15}}{24} & 0 \\ \frac{\sqrt{15}}{24} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{24} & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{15}}{24} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{24} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{1}{16} & 0 & 0 & \frac{1}{16} & 0 & 0 & \frac{\sqrt{15}}{48} & 0 & 0 & 0 & \frac{\sqrt{15}}{48} & 0 \\ 0 & 0 & -\frac{1}{16} & 0 & 0 & 0 & 0 & -\frac{1}{16} & \frac{\sqrt{15}}{48} & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{48} & 0 \\ 0 & -\frac{\sqrt{15}}{24} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{24} & 0 & 0 & 0 & 0 \\ -\frac{\sqrt{15}}{24} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{24} & 0 & 0 & 0 \end{bmatrix}$
783	symmetry	$\frac{\sqrt{35}xy(x-y)(x+y)}{2}$ $\begin{bmatrix} 0 & 0 & 0 & \frac{5\sqrt{3}i}{48} & 0 & \frac{5\sqrt{3}}{48} & 0 & 0 & 0 & -\frac{\sqrt{5}i}{16} & 0 & \frac{\sqrt{5}}{16} & 0 & 0 \\ 0 & 0 & -\frac{5\sqrt{3}i}{48} & 0 & \frac{5\sqrt{3}}{48} & 0 & 0 & 0 & \frac{\sqrt{5}i}{16} & 0 & \frac{\sqrt{5}}{16} & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{i}{16} & 0 & \frac{1}{16} & 0 & 0 & 0 & -\frac{\sqrt{15}i}{48} & 0 & -\frac{\sqrt{15}}{48} & 0 & 0 \\ 0 & 0 & \frac{i}{16} & 0 & \frac{1}{16} & 0 & 0 & 0 & \frac{\sqrt{15}i}{48} & 0 & -\frac{\sqrt{15}}{48} & 0 & 0 & 0 \\ 0 & \frac{\sqrt{15}i}{24} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{24} & 0 \\ -\frac{\sqrt{15}i}{24} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{24} & 0 \\ 0 & \frac{\sqrt{15}}{24} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}i}{24} \\ \frac{\sqrt{15}}{24} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}i}{24} & 0 \\ 0 & 0 & 0 & \frac{1}{16} & 0 & \frac{i}{16} & 0 & 0 & 0 & \frac{\sqrt{15}}{48} & 0 & -\frac{\sqrt{15}i}{48} & 0 & 0 \\ 0 & 0 & \frac{1}{16} & 0 & -\frac{i}{16} & 0 & 0 & 0 & \frac{\sqrt{15}}{48} & 0 & \frac{\sqrt{15}i}{48} & 0 & 0 & 0 \end{bmatrix}$
784	symmetry	$\frac{\sqrt{5}yz(6x^2-y^2-z^2)}{2}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{M}_{4,0}^{(1,-1;a)}(T_u, 2)$	0 0 0 0 $\frac{11\sqrt{21}}{336}$ 0 0 $\frac{\sqrt{21}i}{84}$ 0 0 $\frac{\sqrt{35}}{112}$ 0 0 0	
	0 0 0 0 0 $-\frac{11\sqrt{21}}{336}$ $-\frac{\sqrt{21}i}{84}$ 0 0 0 0 $-\frac{\sqrt{35}}{112}$ 0 0	
	0 0 0 0 $-\frac{\sqrt{7}}{112}$ 0 0 $\frac{3\sqrt{7}i}{56}$ 0 0 $-\frac{\sqrt{105}}{336}$ 0 0 $-\frac{\sqrt{105}i}{168}$	
	0 0 0 0 0 $\frac{\sqrt{7}}{112}$ $-\frac{3\sqrt{7}i}{56}$ 0 0 0 0 $\frac{\sqrt{105}}{336}$ $\frac{\sqrt{105}i}{168}$ 0	
	0 0 0 $-\frac{\sqrt{7}}{14}$ 0 $\frac{\sqrt{7}i}{112}$ $-\frac{\sqrt{7}}{112}$ 0 0 0 0 $\frac{5\sqrt{105}i}{336}$ $\frac{5\sqrt{105}}{336}$ 0	
	0 0 $-\frac{\sqrt{7}}{14}$ 0 $-\frac{\sqrt{7}i}{112}$ 0 0 $\frac{\sqrt{7}}{112}$ 0 0 $-\frac{5\sqrt{105}i}{336}$ 0 0 $-\frac{5\sqrt{105}}{336}$	
	$\frac{\sqrt{105}}{168}$ 0 0 $-\frac{\sqrt{7}i}{56}$ 0 $-\frac{\sqrt{7}}{14}$ 0 0 0 $\frac{\sqrt{105}i}{84}$ 0 0 0	
	0 $-\frac{\sqrt{105}}{168}$ $\frac{\sqrt{7}i}{56}$ 0 $-\frac{\sqrt{7}}{14}$ 0 0 0 $-\frac{\sqrt{105}i}{84}$ 0 0 0 0	
	0 $-\frac{\sqrt{105}i}{168}$ $\frac{\sqrt{7}}{56}$ 0 0 0 0 $-\frac{\sqrt{7}}{14}$ $\frac{\sqrt{105}}{84}$ 0 0 0 0	
	$\frac{\sqrt{105}i}{168}$ 0 0 $-\frac{\sqrt{7}}{56}$ 0 0 $-\frac{\sqrt{7}}{14}$ 0 0 $-\frac{\sqrt{105}}{84}$ 0 0 0	
785	symmetry	$-\frac{\sqrt{5}xz(x^2 - 6y^2 + z^2)}{2}$
$\mathbb{M}_{4,1}^{(1,-1;a)}(T_u, 2)$	0 0 $\frac{11\sqrt{21}}{336}$ 0 0 0 0 $-\frac{\sqrt{21}}{84}$ $-\frac{\sqrt{35}}{112}$ 0 0 0 0 0	
	0 0 0 $-\frac{11\sqrt{21}}{336}$ 0 0 $-\frac{\sqrt{21}}{84}$ 0 0 $\frac{\sqrt{35}}{112}$ 0 0 0 0 0	
	0 0 $\frac{\sqrt{7}}{112}$ 0 0 0 0 $\frac{3\sqrt{7}}{56}$ $-\frac{\sqrt{105}}{336}$ 0 0 0 0 $\frac{\sqrt{105}}{168}$	
	0 0 0 $-\frac{\sqrt{7}}{112}$ 0 0 $\frac{3\sqrt{7}}{56}$ 0 0 $\frac{\sqrt{105}}{336}$ 0 0 $\frac{\sqrt{105}}{168}$ 0	
	$\frac{\sqrt{105}}{168}$ 0 0 $\frac{\sqrt{7}i}{14}$ 0 $\frac{\sqrt{7}}{56}$ 0 0 0 0 0 $\frac{\sqrt{105}}{84}$ 0 0	
	0 $-\frac{\sqrt{105}}{168}$ $-\frac{\sqrt{7}i}{14}$ 0 $\frac{\sqrt{7}}{56}$ 0 0 0 0 0 $\frac{\sqrt{105}}{84}$ 0 0 0	
	0 0 0 $-\frac{\sqrt{7}}{112}$ 0 $\frac{\sqrt{7}i}{14}$ $-\frac{\sqrt{7}}{112}$ 0 0 $\frac{5\sqrt{105}}{336}$ 0 0 $-\frac{5\sqrt{105}}{336}$ 0	
	0 0 $-\frac{\sqrt{7}}{112}$ 0 $-\frac{\sqrt{7}i}{14}$ 0 0 $\frac{\sqrt{7}}{112}$ $\frac{5\sqrt{105}}{336}$ 0 0 0 $\frac{5\sqrt{105}}{336}$	
	0 $\frac{\sqrt{105}}{168}$ 0 0 $\frac{\sqrt{7}}{56}$ 0 0 $\frac{\sqrt{7}i}{14}$ 0 0 $-\frac{\sqrt{105}}{84}$ 0 0 0	
	$\frac{\sqrt{105}}{168}$ 0 0 0 0 $-\frac{\sqrt{7}}{56}$ $-\frac{\sqrt{7}i}{14}$ 0 0 0 0 $\frac{\sqrt{105}}{84}$ 0 0	
786	symmetry	$-\frac{\sqrt{5}xy(x^2 + y^2 - 6z^2)}{2}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{M}_{4,2}^{(1,-1;a)}(T_u, 2)$	0 0 0 $\frac{\sqrt{21}i}{48}$ 0 $-\frac{\sqrt{21}}{48}$ 0 0 0 $\frac{\sqrt{35}i}{112}$ 0 $\frac{\sqrt{35}}{112}$ 0 0	
	0 0 $-\frac{\sqrt{21}i}{48}$ 0 $-\frac{\sqrt{21}}{48}$ 0 0 0 $-\frac{\sqrt{35}i}{112}$ 0 $\frac{\sqrt{35}}{112}$ 0 0 0	
	0 0 0 $\frac{5\sqrt{7}i}{112}$ 0 $\frac{5\sqrt{7}}{112}$ 0 0 0 $\frac{\sqrt{105}i}{336}$ 0 $-\frac{\sqrt{105}}{336}$ 0 0 0	
	0 0 $-\frac{5\sqrt{7}i}{112}$ 0 $\frac{5\sqrt{7}}{112}$ 0 0 0 $-\frac{\sqrt{105}i}{336}$ 0 $-\frac{\sqrt{105}}{336}$ 0 0 0	
	0 $-\frac{\sqrt{105}i}{168}$ $-\frac{\sqrt{7}}{14}$ 0 0 0 0 $\frac{\sqrt{7}}{56}$ 0 0 0 0 0 $-\frac{\sqrt{105}}{84}$	
	$\frac{\sqrt{105}i}{168}$ 0 0 $\frac{\sqrt{7}}{14}$ 0 0 $\frac{\sqrt{7}}{56}$ 0 0 0 0 0 $-\frac{\sqrt{105}}{84}$ 0	
	0 $\frac{\sqrt{105}}{168}$ 0 0 $-\frac{\sqrt{7}}{14}$ 0 0 $-\frac{\sqrt{7}i}{56}$ 0 0 0 0 0 $-\frac{\sqrt{105}}{84}$	
	$\frac{\sqrt{105}}{168}$ 0 0 0 0 $\frac{\sqrt{7}}{14}$ $\frac{\sqrt{7}i}{56}$ 0 0 0 0 0 $\frac{\sqrt{105}i}{84}$ 0	
	0 0 0 $-\frac{\sqrt{7}}{112}$ 0 $\frac{\sqrt{7}i}{112}$ $-\frac{\sqrt{7}}{14}$ 0 0 $-\frac{5\sqrt{105}}{336}$ 0 $-\frac{5\sqrt{105}i}{336}$ 0 0	
	0 0 $-\frac{\sqrt{7}}{112}$ 0 $-\frac{\sqrt{7}i}{112}$ 0 0 $\frac{\sqrt{7}}{14}$ $-\frac{5\sqrt{105}}{336}$ 0 $\frac{5\sqrt{105}i}{336}$ 0 0 0	
787	symmetry	$\frac{\sqrt{2}(2x^6 - 15x^4y^2 - 15x^4z^2 - 15x^2y^4 + 180x^2y^2z^2 - 15x^2z^4 + 2y^6 - 15y^4z^2 - 15y^2z^4 + 2z^6)}{8}$
$\mathbb{M}_6^{(1,-1;a)}(A_u, 1)$	0 0 0 $-\frac{\sqrt{770}}{616}$ 0 $\frac{\sqrt{770}i}{616}$ $\frac{\sqrt{770}}{308}$ 0 0 $\frac{3\sqrt{462}}{616}$ 0 $\frac{3\sqrt{462}i}{616}$ 0 0	
	0 0 $-\frac{\sqrt{770}}{616}$ 0 $-\frac{\sqrt{770}i}{616}$ 0 0 $-\frac{\sqrt{770}}{308}$ $\frac{3\sqrt{462}}{616}$ 0 $-\frac{3\sqrt{462}i}{616}$ 0 0 0	
	0 0 0 $\frac{\sqrt{2310}}{616}$ 0 $\frac{\sqrt{2310}i}{616}$ 0 0 0 $\frac{3\sqrt{154}}{616}$ 0 $-\frac{3\sqrt{154}i}{616}$ $-\frac{3\sqrt{154}}{308}$ 0	
	0 0 $\frac{\sqrt{2310}}{616}$ 0 $-\frac{\sqrt{2310}i}{616}$ 0 0 0 $\frac{3\sqrt{154}}{616}$ 0 $\frac{3\sqrt{154}i}{616}$ 0 0 $\frac{3\sqrt{154}}{308}$	
	0 $\frac{\sqrt{154}}{77}$ 0 0 $-\frac{\sqrt{2310}}{924}$ 0 0 $\frac{\sqrt{2310}i}{924}$ 0 0 $-\frac{3\sqrt{154}}{308}$ 0 0 $-\frac{3\sqrt{154}i}{308}$	
	$\frac{\sqrt{154}}{77}$ 0 0 0 $\frac{\sqrt{2310}}{924}$ $-\frac{\sqrt{2310}i}{924}$ 0 0 0 0 $\frac{3\sqrt{154}}{308}$ $\frac{3\sqrt{154}i}{308}$ 0	
	0 $-\frac{\sqrt{154}i}{77}$ $-\frac{\sqrt{2310}}{924}$ 0 0 0 0 $-\frac{\sqrt{2310}}{924}$ $\frac{3\sqrt{154}}{308}$ 0 0 0 0 $-\frac{3\sqrt{154}}{308}$	
	$\frac{\sqrt{154}i}{77}$ 0 0 $\frac{\sqrt{2310}}{924}$ 0 0 $-\frac{\sqrt{2310}}{924}$ 0 0 $-\frac{3\sqrt{154}}{308}$ 0 0 0 $-\frac{3\sqrt{154}i}{308}$	
	$\frac{\sqrt{154}}{77}$ 0 0 $\frac{\sqrt{2310}i}{924}$ 0 $-\frac{\sqrt{2310}}{924}$ 0 0 0 $\frac{3\sqrt{154}i}{308}$ 0 $\frac{3\sqrt{154}}{308}$ 0 0	
	0 $-\frac{\sqrt{154}}{77}$ $-\frac{\sqrt{2310}i}{924}$ 0 $-\frac{\sqrt{2310}}{924}$ 0 0 0 $-\frac{3\sqrt{154}i}{308}$ 0 $\frac{3\sqrt{154}}{308}$ 0 0 0	
788	symmetry	$-\frac{\sqrt{2310}(x-y)(x+y)(x-z)(x+z)(y-z)(y+z)}{8}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{M}_6^{(1,-1;a)}(A_u, 2)$	0 0 0 $\frac{\sqrt{6}}{24}$ 0 $\frac{\sqrt{6}i}{24}$ 0 0 0 $\frac{\sqrt{10}}{40}$ 0 $-\frac{\sqrt{10}i}{40}$ $-\frac{\sqrt{10}}{20}$ 0	
	0 0 $\frac{\sqrt{6}}{24}$ 0 $-\frac{\sqrt{6}i}{24}$ 0 0 0 $\frac{\sqrt{10}}{40}$ 0 $\frac{\sqrt{10}i}{40}$ 0 0 $\frac{\sqrt{10}}{20}$	
	0 0 0 $\frac{\sqrt{2}}{24}$ 0 $-\frac{\sqrt{2}i}{24}$ $-\frac{\sqrt{2}}{12}$ 0 0 $-\frac{\sqrt{30}}{40}$ 0 $-\frac{\sqrt{30}i}{40}$ 0 0	
	0 0 $\frac{\sqrt{2}}{24}$ 0 $\frac{\sqrt{2}i}{24}$ 0 0 $\frac{\sqrt{2}}{12}$ $-\frac{\sqrt{30}}{40}$ 0 $\frac{\sqrt{30}i}{40}$ 0 0 0	
	0 0 0 0 $-\frac{\sqrt{2}}{12}$ 0 0 $-\frac{\sqrt{2}i}{12}$ 0 0 $\frac{\sqrt{30}}{60}$ 0 0 $-\frac{\sqrt{30}i}{60}$	
	0 0 0 0 0 $\frac{\sqrt{2}}{12}$ $\frac{\sqrt{2}i}{12}$ 0 0 0 0 $-\frac{\sqrt{30}}{60}$ $\frac{\sqrt{30}i}{60}$ 0	
	0 0 $\frac{\sqrt{2}}{12}$ 0 0 0 0 $-\frac{\sqrt{2}}{12}$ $\frac{\sqrt{30}}{60}$ 0 0 0 0 $\frac{\sqrt{30}}{60}$	
	0 0 0 $-\frac{\sqrt{2}}{12}$ 0 0 $-\frac{\sqrt{2}}{12}$ 0 0 $-\frac{\sqrt{30}}{60}$ 0 0 $\frac{\sqrt{30}}{60}$ 0	
	0 0 0 $\frac{\sqrt{2}i}{12}$ 0 $\frac{\sqrt{2}}{12}$ 0 0 0 $-\frac{\sqrt{30}i}{60}$ 0 $\frac{\sqrt{30}}{60}$ 0 0	
	0 0 $-\frac{\sqrt{2}i}{12}$ 0 $\frac{\sqrt{2}}{12}$ 0 0 0 $-\frac{\sqrt{30}i}{60}$ 0 $\frac{\sqrt{30}}{60}$ 0 0 0	
789	symmetry	$-\frac{\sqrt{14}(x^6 - 15x^4z^2 + 15x^2z^4 + y^6 - 15y^4z^2 + 15y^2z^4 - 2z^6)}{8}$
$\mathbb{M}_{6,0}^{(1,-1;a)}(E_u)$	0 0 0 $\frac{\sqrt{110}}{88}$ 0 $-\frac{\sqrt{110}i}{88}$ $\frac{\sqrt{110}}{44}$ 0 0 $\frac{\sqrt{66}}{88}$ 0 $\frac{\sqrt{66}i}{88}$ 0 0	
	0 0 $\frac{\sqrt{110}}{88}$ 0 $\frac{\sqrt{110}i}{88}$ 0 0 $-\frac{\sqrt{110}}{44}$ $\frac{\sqrt{66}}{88}$ 0 $-\frac{\sqrt{66}i}{88}$ 0 0 0	
	0 0 0 $-\frac{\sqrt{330}}{264}$ 0 $-\frac{\sqrt{330}i}{264}$ 0 0 0 $-\frac{\sqrt{22}}{88}$ 0 $\frac{\sqrt{22}i}{88}$ $\frac{\sqrt{22}}{44}$ 0	
	0 0 $-\frac{\sqrt{330}}{264}$ 0 $\frac{\sqrt{330}i}{264}$ 0 0 0 $-\frac{\sqrt{22}}{88}$ 0 $-\frac{\sqrt{22}i}{88}$ 0 0 $-\frac{\sqrt{22}}{44}$	
	0 0 0 0 $\frac{\sqrt{330}}{132}$ 0 0 $\frac{\sqrt{330}i}{132}$ 0 0 $-\frac{\sqrt{22}}{44}$ 0 0 $\frac{\sqrt{22}i}{44}$ 0	
	0 0 0 0 0 $-\frac{\sqrt{330}}{132}$ $-\frac{\sqrt{330}i}{132}$ 0 0 0 0 $\frac{\sqrt{22}}{44}$ $-\frac{\sqrt{22}i}{44}$ 0	
	0 0 $\frac{\sqrt{330}}{132}$ 0 0 0 0 $-\frac{\sqrt{330}}{132}$ $\frac{\sqrt{22}}{44}$ 0 0 0 0 $\frac{\sqrt{22}}{44}$	
	0 0 0 $-\frac{\sqrt{330}}{132}$ 0 0 $-\frac{\sqrt{330}}{132}$ 0 0 $-\frac{\sqrt{22}}{44}$ 0 0 $\frac{\sqrt{22}}{44}$ 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	
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
$\mathbb{M}_{6,1}^{(1,-1;a)}(E_u)$	0 0 0 $-\frac{\sqrt{330}}{264}$ 0 $-\frac{\sqrt{330}i}{264}$ 0 0 0 $-\frac{\sqrt{22}}{88}$ 0 $\frac{\sqrt{22}i}{88}$ $\frac{\sqrt{22}}{44}$ 0	
	0 0 $-\frac{\sqrt{330}}{264}$ 0 $\frac{\sqrt{330}i}{264}$ 0 0 0 $-\frac{\sqrt{22}}{88}$ 0 $-\frac{\sqrt{22}i}{88}$ 0 0 $-\frac{\sqrt{22}}{44}$	
	0 0 0 $\frac{5\sqrt{110}}{264}$ 0 $-\frac{5\sqrt{110}i}{264}$ $\frac{\sqrt{110}}{132}$ 0 0 0 $-\frac{\sqrt{66}}{88}$ 0 $-\frac{\sqrt{66}i}{88}$ 0 0 0	
	0 0 $\frac{5\sqrt{110}}{264}$ 0 $\frac{5\sqrt{110}i}{264}$ 0 0 0 $-\frac{\sqrt{110}}{132}$ $-\frac{\sqrt{66}}{88}$ 0 $\frac{\sqrt{66}i}{88}$ 0 0 0	
	0 0 0 0 $\frac{\sqrt{110}}{132}$ 0 0 0 $\frac{\sqrt{110}i}{132}$ 0 0 0 $-\frac{\sqrt{66}}{132}$ 0 0 $\frac{\sqrt{66}i}{132}$ 0 0 $\frac{\sqrt{66}i}{132}$	
	0 0 0 0 0 $-\frac{\sqrt{110}}{132}$ $-\frac{\sqrt{110}i}{132}$ 0 0 0 0 $-\frac{\sqrt{66}}{132}$ $-\frac{\sqrt{66}i}{132}$ 0 0 0 $-\frac{\sqrt{66}}{132}$	
	0 0 $-\frac{\sqrt{110}}{132}$ 0 0 0 0 $\frac{\sqrt{110}}{132}$ $-\frac{\sqrt{66}}{132}$ 0 0 0 0 0 0 $-\frac{\sqrt{66}}{132}$ 0	
	0 0 0 $\frac{\sqrt{110}}{132}$ 0 0 0 $\frac{\sqrt{110}}{132}$ 0 0 0 $\frac{\sqrt{66}}{132}$ 0 0 0 $-\frac{\sqrt{66}}{132}$ 0 0 0	
	0 0 0 $\frac{\sqrt{110}i}{66}$ 0 $\frac{\sqrt{110}}{66}$ 0 0 0 0 $-\frac{\sqrt{66}i}{66}$ 0 $\frac{\sqrt{66}}{66}$ 0 0 0	
	0 0 $-\frac{\sqrt{110}i}{66}$ 0 $\frac{\sqrt{110}}{66}$ 0 0 0 0 $\frac{\sqrt{66}i}{66}$ 0 $\frac{\sqrt{66}}{66}$ 0 0 0	
791	symmetry	$\frac{3\sqrt{7}yz(y-z)(y+z)(10x^2-y^2-z^2)}{4}$
$\mathbb{M}_{6,0}^{(1,-1;a)}(T_u, 1)$	0 $-\frac{\sqrt{33}}{44}$ 0 0 0 0 0 $-\frac{\sqrt{55}i}{88}$ 0 0 0 $\frac{\sqrt{33}}{44}$ 0 0 $\frac{\sqrt{33}i}{88}$	
	$-\frac{\sqrt{33}}{44}$ 0 0 0 0 0 $\frac{\sqrt{55}i}{88}$ 0 0 0 0 0 $-\frac{\sqrt{33}}{44}$ $-\frac{\sqrt{33}i}{88}$ 0	
	0 $-\frac{\sqrt{11}}{44}$ 0 0 $\frac{\sqrt{165}}{132}$ 0 0 $\frac{\sqrt{165}i}{264}$ 0 0 0 0 0 0 $\frac{3\sqrt{11}i}{88}$	
	$-\frac{\sqrt{11}}{44}$ 0 0 0 0 $-\frac{\sqrt{165}}{132}$ $-\frac{\sqrt{165}i}{264}$ 0 0 0 0 0 0 $-\frac{3\sqrt{11}i}{88}$ 0	
	0 0 0 0 0 $\frac{\sqrt{165}i}{132}$ $\frac{\sqrt{165}}{132}$ 0 0 $\frac{\sqrt{11}}{22}$ 0 $\frac{\sqrt{11}i}{44}$ $-\frac{\sqrt{11}}{44}$ 0	
	0 0 0 0 $-\frac{\sqrt{165}i}{132}$ 0 0 $-\frac{\sqrt{165}}{132}$ $\frac{\sqrt{11}}{22}$ 0 $-\frac{\sqrt{11}i}{44}$ 0 0 $\frac{\sqrt{11}}{44}$	
	$-\frac{\sqrt{11}}{22}$ 0 0 0 0 $\frac{\sqrt{165}}{132}$ 0 0 0 $-\frac{\sqrt{11}i}{22}$ 0 $-\frac{\sqrt{11}}{44}$ 0 0 0	
	0 $\frac{\sqrt{11}}{22}$ 0 0 $\frac{\sqrt{165}}{132}$ 0 0 0 $\frac{\sqrt{11}i}{22}$ 0 $-\frac{\sqrt{11}}{44}$ 0 0 0	
	0 $-\frac{\sqrt{11}i}{22}$ 0 0 0 0 0 $-\frac{\sqrt{165}}{132}$ $\frac{\sqrt{11}}{22}$ 0 0 0 0 $-\frac{\sqrt{11}}{44}$	
	$\frac{\sqrt{11}i}{22}$ 0 0 0 0 0 $-\frac{\sqrt{165}}{132}$ 0 0 $-\frac{\sqrt{11}}{22}$ 0 0 0 $-\frac{\sqrt{11}}{44}$ 0	
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	$-\frac{\sqrt{33}i}{44} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{55}}{88} \quad \frac{\sqrt{33}}{44} \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{33}}{88}$
	$\frac{\sqrt{33}i}{44}$	$0 \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{55}}{88} \quad 0 \quad 0 \quad -\frac{\sqrt{33}}{44} \quad 0 \quad 0 \quad -\frac{\sqrt{33}}{88} \quad 0$
	0	$\frac{\sqrt{11}i}{44} \quad \frac{\sqrt{165}}{132} \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{165}}{264} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{3\sqrt{11}}{88}$
	$-\frac{\sqrt{11}i}{44}$	$0 \quad 0 \quad -\frac{\sqrt{165}}{132} \quad 0 \quad 0 \quad -\frac{\sqrt{165}}{264} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{3\sqrt{11}}{88} \quad 0$
	$\frac{\sqrt{11}}{22}$	$0 \quad 0 \quad \frac{\sqrt{165}i}{132} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{11}i}{44} \quad 0 \quad \frac{\sqrt{11}}{22} \quad 0 \quad 0$
	0	$-\frac{\sqrt{11}}{22} \quad -\frac{\sqrt{165}i}{132} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{11}i}{44} \quad 0 \quad \frac{\sqrt{11}}{22} \quad 0 \quad 0 \quad 0$
	0	$0 \quad 0 \quad 0 \quad \frac{\sqrt{165}}{132} \quad 0 \quad 0 \quad -\frac{\sqrt{165}}{132} \quad 0 \quad 0 \quad -\frac{\sqrt{11}}{44} \quad 0 \quad -\frac{\sqrt{11}i}{22} \quad -\frac{\sqrt{11}}{44} \quad 0$
	0	$0 \quad 0 \quad \frac{\sqrt{165}}{132} \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{165}}{132} \quad -\frac{\sqrt{11}}{44} \quad 0 \quad \frac{\sqrt{11}i}{22} \quad 0 \quad 0 \quad \frac{\sqrt{11}}{44}$
	$0 \quad -\frac{\sqrt{11}}{22}$	$0 \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{165}i}{132} \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{11}}{22} \quad 0 \quad 0 \quad \frac{\sqrt{11}i}{44}$
	$-\frac{\sqrt{11}}{22}$	$0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{165}i}{132} \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{11}}{22} \quad -\frac{\sqrt{11}i}{44} \quad 0$
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	$0 \quad 0 \quad 0 \quad -\frac{\sqrt{55}i}{88} \quad 0 \quad -\frac{\sqrt{55}}{88} \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{33}i}{88} \quad 0 \quad -\frac{\sqrt{33}}{88} \quad 0 \quad 0$
	0	$0 \quad 0 \quad \frac{\sqrt{55}i}{88} \quad 0 \quad -\frac{\sqrt{55}}{88} \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{33}i}{88} \quad 0 \quad -\frac{\sqrt{33}}{88} \quad 0 \quad 0 \quad 0$
	$\frac{\sqrt{11}}{22}$	$0 \quad 0 \quad \frac{\sqrt{165}i}{264} \quad 0 \quad -\frac{\sqrt{165}}{264} \quad 0 \quad 0 \quad 0 \quad \frac{3\sqrt{11}i}{88} \quad 0 \quad \frac{3\sqrt{11}}{88} \quad 0 \quad 0$
	$0 \quad -\frac{\sqrt{11}}{22}$	$-\frac{\sqrt{165}i}{264} \quad 0 \quad -\frac{\sqrt{165}}{264} \quad 0 \quad 0 \quad 0 \quad -\frac{3\sqrt{11}i}{88} \quad 0 \quad \frac{3\sqrt{11}}{88} \quad 0 \quad 0 \quad 0$
	$0 \quad \frac{\sqrt{11}i}{22} \quad \frac{\sqrt{165}}{132}$	$0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{11}}{44} \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{11}}{22}$
	$-\frac{\sqrt{11}i}{22}$	$0 \quad 0 \quad -\frac{\sqrt{165}}{132} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{11}}{44} \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{11}}{22} \quad 0$
	$0 \quad \frac{\sqrt{11}}{22}$	$0 \quad 0 \quad 0 \quad -\frac{\sqrt{165}}{132} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{11}}{44} \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{11}i}{22}$
	$\frac{\sqrt{11}}{22}$	$0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{165}}{132} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{11}}{44} \quad \frac{\sqrt{11}i}{22} \quad 0$
	0	$0 \quad 0 \quad 0 \quad -\frac{\sqrt{165}}{132} \quad 0 \quad -\frac{\sqrt{165}i}{132} \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{11}}{44} \quad 0 \quad \frac{\sqrt{11}i}{44} \quad \frac{\sqrt{11}}{22} \quad 0$
	0	$0 \quad 0 \quad -\frac{\sqrt{165}}{132} \quad 0 \quad \frac{\sqrt{165}i}{132} \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{11}}{44} \quad 0 \quad -\frac{\sqrt{11}i}{44} \quad 0 \quad 0 \quad -\frac{\sqrt{11}}{22}$
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 $-\frac{\sqrt{30}}{32}$ 0 0 $-\frac{\sqrt{30}i}{32}$ 0 0 $\frac{3\sqrt{2}}{32}$ 0 0 $-\frac{3\sqrt{2}i}{32}$	
	0 0 0 0 0 $\frac{\sqrt{30}}{32}$ $\frac{\sqrt{30}i}{32}$ 0 0 0 0 $-\frac{3\sqrt{2}}{32}$ $\frac{3\sqrt{2}i}{32}$ 0	
	0 0 0 0 $-\frac{\sqrt{10}}{32}$ 0 0 $-\frac{\sqrt{10}i}{32}$ 0 0 $\frac{\sqrt{6}}{32}$ 0 0 $-\frac{\sqrt{6}i}{32}$	
	0 0 0 0 0 $\frac{\sqrt{10}}{32}$ $\frac{\sqrt{10}i}{32}$ 0 0 0 0 $-\frac{\sqrt{6}}{32}$ $\frac{\sqrt{6}i}{32}$ 0	
	0 0 0 0 0 $-\frac{\sqrt{10}i}{16}$ $\frac{\sqrt{10}}{16}$ 0 0 0 0 $\frac{\sqrt{6}i}{16}$ $\frac{\sqrt{6}}{16}$ 0	
	0 0 0 0 $\frac{\sqrt{10}i}{16}$ 0 0 $-\frac{\sqrt{10}}{16}$ 0 0 $-\frac{\sqrt{6}i}{16}$ 0 0 $-\frac{\sqrt{6}}{16}$	
	0 0 0 0 0 0 0 0 0 0 0 0 0 0	
	0 0 0 0 0 0 0 0 0 0 0 0 0 0	
	0 0 0 0 0 0 0 0 0 0 0 0 0 0	
	0 0 0 0 0 0 0 0 0 0 0 0 0 0	
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 $-\frac{\sqrt{30}}{32}$ 0 0 0 0 $\frac{\sqrt{30}}{32}$ $-\frac{3\sqrt{2}}{32}$ 0 0 0 0 $-\frac{3\sqrt{2}}{32}$	
	0 0 0 $\frac{\sqrt{30}}{32}$ 0 0 $\frac{\sqrt{30}}{32}$ 0 0 $\frac{3\sqrt{2}}{32}$ 0 0 $-\frac{3\sqrt{2}}{32}$ 0	
	0 0 $\frac{\sqrt{10}}{32}$ 0 0 0 0 $-\frac{\sqrt{10}}{32}$ $\frac{\sqrt{6}}{32}$ 0 0 0 0 $\frac{\sqrt{6}}{32}$	
	0 0 0 $-\frac{\sqrt{10}}{32}$ 0 0 $-\frac{\sqrt{10}}{32}$ 0 0 $-\frac{\sqrt{6}}{32}$ 0 0 $\frac{\sqrt{6}}{32}$ 0	
	0 0 0 0 0 0 0 0 0 0 0 0 0 0	
	0 0 0 0 0 0 0 0 0 0 0 0 0 0	
	0 0 0 $\frac{\sqrt{10}}{16}$ 0 0 $\frac{\sqrt{10}}{16}$ 0 0 $\frac{\sqrt{6}}{16}$ 0 0 $-\frac{\sqrt{6}}{16}$ 0	
	0 0 $\frac{\sqrt{10}}{16}$ 0 0 0 0 $-\frac{\sqrt{10}}{16}$ $\frac{\sqrt{6}}{16}$ 0 0 0 0 $\frac{\sqrt{6}}{16}$	
	0 0 0 0 0 0 0 0 0 0 0 0 0 0	
	0 0 0 0 0 0 0 0 0 0 0 0 0 0	
796	symmetry	$\frac{\sqrt{462}xy(x^2-3y^2)(3x^2-y^2)}{16}$

continued ...

Table 9

No.	multipole	matrix
		$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{10}i}{16} & 0 & -\frac{\sqrt{10}}{16} & 0 & 0 & 0 & \frac{\sqrt{6}i}{16} & 0 & -\frac{\sqrt{6}}{16} & 0 & 0 \\ 0 & 0 & \frac{\sqrt{10}i}{16} & 0 & -\frac{\sqrt{10}}{16} & 0 & 0 & 0 & -\frac{\sqrt{6}i}{16} & 0 & -\frac{\sqrt{6}}{16} & 0 & 0 & 0 \\ \mathbb{M}_{6,2}^{(1,-1;a)}(T_u, 2) & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{10}}{16} & 0 & -\frac{\sqrt{10}i}{16} & 0 & 0 & 0 & -\frac{\sqrt{6}}{16} & 0 & -\frac{\sqrt{6}i}{16} & 0 & 0 \\ 0 & 0 & \frac{\sqrt{10}}{16} & 0 & \frac{\sqrt{10}i}{16} & 0 & 0 & 0 & -\frac{\sqrt{6}}{16} & 0 & \frac{\sqrt{6}i}{16} & 0 & 0 & 0 \end{bmatrix}$
797	symmetry	$\frac{\sqrt{210}yz(16x^4 - 16x^2y^2 - 16x^2z^2 + y^4 + 2y^2z^2 + z^4)}{16}$ $\begin{bmatrix} 0 & -\frac{\sqrt{110}}{110} & 0 & 0 & \frac{\sqrt{66}}{352} & 0 & 0 & -\frac{5\sqrt{66}i}{1056} & 0 & 0 & \frac{13\sqrt{110}}{1760} & 0 & 0 & \frac{\sqrt{110}i}{160} \\ -\frac{\sqrt{110}}{110} & 0 & 0 & 0 & 0 & -\frac{\sqrt{66}}{352} & \frac{5\sqrt{66}i}{1056} & 0 & 0 & 0 & 0 & -\frac{13\sqrt{110}}{1760} & -\frac{\sqrt{110}i}{160} & 0 \\ 0 & \frac{\sqrt{330}}{110} & 0 & 0 & -\frac{13\sqrt{22}}{1056} & 0 & 0 & \frac{\sqrt{22}i}{96} & 0 & 0 & -\frac{7\sqrt{330}}{1056} & 0 & 0 & -\frac{37\sqrt{330}i}{5280} \\ \frac{\sqrt{330}}{110} & 0 & 0 & 0 & 0 & \frac{13\sqrt{22}}{1056} & -\frac{\sqrt{22}i}{96} & 0 & 0 & 0 & 0 & \frac{7\sqrt{330}}{1056} & \frac{37\sqrt{330}i}{5280} & 0 \\ \mathbb{M}_{6,0}^{(1,-1;a)}(T_u, 3) & 0 & 0 & 0 & \frac{\sqrt{22}}{33} & 0 & -\frac{5\sqrt{22}i}{528} & \frac{5\sqrt{22}}{528} & 0 & 0 & 0 & 0 & -\frac{\sqrt{330}i}{240} & -\frac{\sqrt{330}}{240} & 0 \\ 0 & 0 & 0 & \frac{\sqrt{22}}{33} & 0 & \frac{5\sqrt{22}i}{528} & 0 & 0 & -\frac{5\sqrt{22}}{528} & 0 & 0 & \frac{\sqrt{330}i}{240} & 0 & 0 & \frac{\sqrt{330}}{240} \\ 0 & 0 & \frac{\sqrt{22}}{33} & 0 & -\frac{\sqrt{22}i}{33} & 0 & -\frac{\sqrt{22}}{66} & 0 & 0 & 0 & 0 & -\frac{\sqrt{330}}{110} & 0 & 0 & 0 \\ -\frac{\sqrt{330}}{165} & 0 & 0 & -\frac{\sqrt{22}i}{33} & 0 & -\frac{\sqrt{22}}{66} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{330}}{110} & 0 & 0 & 0 \\ 0 & \frac{\sqrt{330}}{165} & \frac{\sqrt{22}i}{33} & 0 & -\frac{\sqrt{22}}{66} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{330}}{110} & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{330}i}{165} & \frac{\sqrt{22}}{33} & 0 & 0 & 0 & 0 & -\frac{\sqrt{22}}{66} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{330}}{110} \\ -\frac{\sqrt{330}i}{165} & 0 & 0 & -\frac{\sqrt{22}}{33} & 0 & 0 & -\frac{\sqrt{22}}{66} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{330}}{110} & 0 & 0 \end{bmatrix}$
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
$\mathbb{M}_{6,1}^{(1,-1;a)}(T_u, 3)$	$0 \quad \frac{\sqrt{110}i}{110} \quad \frac{\sqrt{66}}{352} \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{5\sqrt{66}}{1056} \quad -\frac{13\sqrt{110}}{1760} \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{110}}{160}$	
	$-\frac{\sqrt{110}i}{110} \quad 0 \quad 0 \quad -\frac{\sqrt{66}}{352} \quad 0 \quad 0 \quad \frac{5\sqrt{66}}{1056} \quad 0 \quad 0 \quad \frac{13\sqrt{110}}{1760} \quad 0 \quad 0 \quad \frac{\sqrt{110}}{160} \quad 0$	
	$0 \quad \frac{\sqrt{330}i}{110} \quad \frac{13\sqrt{22}}{1056} \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{22}}{96} \quad -\frac{7\sqrt{330}}{1056} \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{37\sqrt{330}}{5280}$	
	$-\frac{\sqrt{330}i}{110} \quad 0 \quad 0 \quad -\frac{13\sqrt{22}}{1056} \quad 0 \quad 0 \quad \frac{\sqrt{22}}{96} \quad 0 \quad 0 \quad \frac{7\sqrt{330}}{1056} \quad 0 \quad 0 \quad \frac{37\sqrt{330}}{5280} \quad 0$	
	$-\frac{\sqrt{330}}{165} \quad 0 \quad 0 \quad \frac{\sqrt{22}i}{66} \quad 0 \quad \frac{\sqrt{22}}{33} \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{330}i}{110} \quad 0 \quad 0 \quad 0 \quad 0$	
	$0 \quad \frac{\sqrt{330}}{165} \quad -\frac{\sqrt{22}i}{66} \quad 0 \quad \frac{\sqrt{22}}{33} \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{330}i}{110} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0$	
	$0 \quad 0 \quad 0 \quad \frac{5\sqrt{22}}{528} \quad 0 \quad -\frac{\sqrt{22}i}{33} \quad \frac{5\sqrt{22}}{528} \quad 0 \quad 0 \quad -\frac{\sqrt{330}}{240} \quad 0 \quad 0 \quad \frac{\sqrt{330}}{240} \quad 0$	
	$0 \quad 0 \quad \frac{5\sqrt{22}}{528} \quad 0 \quad \frac{\sqrt{22}i}{33} \quad 0 \quad 0 \quad -\frac{5\sqrt{22}}{528} \quad -\frac{\sqrt{330}}{240} \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{330}}{240}$	
	$0 \quad -\frac{\sqrt{330}}{165} \quad 0 \quad 0 \quad \frac{\sqrt{22}}{33} \quad 0 \quad 0 \quad \frac{\sqrt{22}i}{66} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{330}i}{110}$	
799 symmetry	$\frac{\sqrt{210}xy(x^4+2x^2y^2-16x^2z^2+y^4-16y^2z^2+16z^4)}{16}$	
	$\frac{\sqrt{110}}{55} \quad 0 \quad 0 \quad \frac{\sqrt{66}i}{132} \quad 0 \quad -\frac{\sqrt{66}}{132} \quad 0 \quad 0 \quad 0 \quad \frac{3\sqrt{110}i}{220} \quad 0 \quad \frac{3\sqrt{110}}{220} \quad 0 \quad 0$	
	$0 \quad -\frac{\sqrt{110}}{55} \quad -\frac{\sqrt{66}i}{132} \quad 0 \quad -\frac{\sqrt{66}}{132} \quad 0 \quad 0 \quad 0 \quad -\frac{3\sqrt{110}i}{220} \quad 0 \quad \frac{3\sqrt{110}}{220} \quad 0 \quad 0 \quad 0$	
	$0 \quad 0 \quad 0 \quad -\frac{\sqrt{22}i}{528} \quad 0 \quad -\frac{\sqrt{22}}{528} \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{330}i}{2640} \quad 0 \quad -\frac{\sqrt{330}}{2640} \quad 0 \quad 0$	
	$0 \quad 0 \quad \frac{\sqrt{22}i}{528} \quad 0 \quad -\frac{\sqrt{22}}{528} \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{330}i}{2640} \quad 0 \quad -\frac{\sqrt{330}}{2640} \quad 0 \quad 0 \quad 0$	
	$0 \quad \frac{\sqrt{330}i}{165} \quad -\frac{\sqrt{22}}{66} \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{22}}{33} \quad -\frac{\sqrt{330}}{110} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0$	
	$-\frac{\sqrt{330}i}{165} \quad 0 \quad 0 \quad \frac{\sqrt{22}}{66} \quad 0 \quad 0 \quad \frac{\sqrt{22}}{33} \quad 0 \quad 0 \quad \frac{\sqrt{330}}{110} \quad 0 \quad 0 \quad 0 \quad 0$	
	$0 \quad -\frac{\sqrt{330}}{165} \quad 0 \quad 0 \quad -\frac{\sqrt{22}}{66} \quad 0 \quad 0 \quad -\frac{\sqrt{22}i}{33} \quad 0 \quad 0 \quad \frac{\sqrt{330}}{110} \quad 0 \quad 0 \quad 0$	
	$-\frac{\sqrt{330}}{165} \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{22}}{66} \quad \frac{\sqrt{22}i}{33} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{330}}{110} \quad 0 \quad 0$	
800 symmetry	$-\frac{x^2}{2} - \frac{y^2}{2} + z^2$	
	$continued \dots$	

Table 9

No.	multipole	matrix
$\mathbb{M}_{2,0}^{(1,0;a)}(E_u)$	0 0 0 $-\frac{\sqrt{21}}{56}$ 0 $\frac{\sqrt{21}i}{56}$ 0 0 0 $-\frac{\sqrt{35}}{56}$ 0 $-\frac{\sqrt{35}i}{56}$ 0 0	
	0 0 $-\frac{\sqrt{21}}{56}$ 0 $-\frac{\sqrt{21}i}{56}$ 0 0 0 $-\frac{\sqrt{35}}{56}$ 0 $\frac{\sqrt{35}i}{56}$ 0 0 0	
	0 0 0 $-\frac{\sqrt{7}}{56}$ 0 $-\frac{\sqrt{7}i}{56}$ 0 0 0 $\frac{\sqrt{105}}{56}$ 0 $-\frac{\sqrt{105}i}{56}$ 0 0	
	0 0 $-\frac{\sqrt{7}}{56}$ 0 $\frac{\sqrt{7}i}{56}$ 0 0 0 $\frac{\sqrt{105}}{56}$ 0 $\frac{\sqrt{105}i}{56}$ 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 $-\frac{\sqrt{7}i}{14}$ 0 0 0 0 0 0	
	0 0 0 0 0 0 0 0 $-\frac{\sqrt{7}}{14}$ 0 0 0 0 0 0	
	0 0 0 0 0 0 0 $-\frac{\sqrt{7}}{14}$ 0 0 0 0 0 0	
	0 0 $-\frac{\sqrt{7}i}{14}$ 0 $\frac{\sqrt{7}}{14}$ 0 0 0 0 0 0 0 0 0	
	0 0 $\frac{\sqrt{7}i}{14}$ 0 $\frac{\sqrt{7}}{14}$ 0 0 0 0 0 0 0 0 0	
801	symmetry	$\frac{\sqrt{3}(x-y)(x+y)}{2}$
$\mathbb{M}_{2,1}^{(1,0;a)}(E_u)$	0 0 0 $-\frac{\sqrt{7}}{56}$ 0 $-\frac{\sqrt{7}i}{56}$ 0 0 0 $-\frac{\sqrt{105}}{168}$ 0 $\frac{\sqrt{105}i}{168}$ $-\frac{\sqrt{105}}{42}$ 0	
	0 0 $-\frac{\sqrt{7}}{56}$ 0 $\frac{\sqrt{7}i}{56}$ 0 0 0 $-\frac{\sqrt{105}}{168}$ 0 $-\frac{\sqrt{105}i}{168}$ 0 0 $\frac{\sqrt{105}}{42}$	
	0 0 0 $-\frac{\sqrt{21}}{168}$ 0 $\frac{\sqrt{21}i}{168}$ $-\frac{\sqrt{21}}{42}$ 0 0 $\frac{\sqrt{35}}{56}$ 0 $\frac{\sqrt{35}i}{56}$ 0 0	
	0 0 $-\frac{\sqrt{21}}{168}$ 0 $-\frac{\sqrt{21}i}{168}$ 0 0 $\frac{\sqrt{21}}{42}$ $\frac{\sqrt{35}}{56}$ 0 $-\frac{\sqrt{35}i}{56}$ 0 0 0	
	0 0 0 0 $\frac{\sqrt{21}}{21}$ 0 0 $-\frac{\sqrt{21}i}{42}$ 0 0 0 0 0 0 0	
	0 0 0 0 0 $-\frac{\sqrt{21}}{21}$ $\frac{\sqrt{21}i}{42}$ 0 0 0 0 0 0 0 0	
	0 0 $-\frac{\sqrt{21}}{21}$ 0 0 0 0 $-\frac{\sqrt{21}}{42}$ 0 0 0 0 0 0 0	
	0 0 0 $\frac{\sqrt{21}}{21}$ 0 0 $-\frac{\sqrt{21}}{42}$ 0 0 0 0 0 0 0	
	0 0 0 $\frac{\sqrt{21}i}{42}$ 0 $\frac{\sqrt{21}}{42}$ 0 0 0 0 0 0 0 0	
	0 0 $-\frac{\sqrt{21}i}{42}$ 0 $\frac{\sqrt{21}}{42}$ 0 0 0 0 0 0 0 0 0	
802	symmetry	$\sqrt{3}yz$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{M}_{2,0}^{(1,0;a)}(T_u)$	0	$\frac{\sqrt{105}}{84}$ 0 0 0 $\frac{\sqrt{7}}{56}$ 0 0 0 0 0 $-\frac{\sqrt{105}}{168}$ 0 0 $\frac{\sqrt{105}i}{84}$
	$\frac{\sqrt{105}}{84}i$	0 0 0 0 0 $-\frac{\sqrt{7}}{56}$ 0 0 0 0 0 $\frac{\sqrt{105}}{168}$ $-\frac{\sqrt{105}i}{84}$ 0
	0 $-\frac{\sqrt{35}}{28}$	0 0 0 $-\frac{\sqrt{21}}{168}$ 0 0 0 $\frac{\sqrt{21}i}{84}$ 0 0 $-\frac{\sqrt{35}}{56}$ 0 0 0
	$-\frac{\sqrt{35}}{28}i$	0 0 0 0 0 $\frac{\sqrt{21}}{168}$ $-\frac{\sqrt{21}i}{84}$ 0 0 0 0 $\frac{\sqrt{35}}{56}$ 0 0 0
	0 0 0 $-\frac{\sqrt{21}}{42}$	0 0 $-\frac{\sqrt{21}i}{42}$ 0 $-\frac{\sqrt{21}i}{42}$ $\frac{\sqrt{21}}{42}$ 0 0 0 0 0 0 0 0
	0 0 $-\frac{\sqrt{21}}{42}i$	0 $\frac{\sqrt{21}i}{42}$ 0 0 0 $-\frac{\sqrt{21}}{42}$ 0 0 0 0 0 0 0 0
	0 0 0 $\frac{\sqrt{21}i}{42}$	0 0 $\frac{\sqrt{21}}{84}$ 0 0 0 0 0 0 0 $-\frac{\sqrt{35}}{28}$ 0 0 0
	0 0 $-\frac{\sqrt{21}i}{42}i$	0 $\frac{\sqrt{21}}{84}$ 0 0 0 0 0 0 0 0 $-\frac{\sqrt{35}}{28}$ 0 0 0
	0 0 $-\frac{\sqrt{21}}{42}$	0 0 0 0 0 $\frac{\sqrt{21}}{84}$ 0 0 0 0 0 0 0 $\frac{\sqrt{35}}{28}$
	0 0 0 $\frac{\sqrt{21}}{42}i$	0 0 0 0 0 $\frac{\sqrt{21}}{84}$ 0 0 0 0 0 0 0 $\frac{\sqrt{35}}{28}$ 0
803	symmetry	$\sqrt{3}xz$
$\mathbb{M}_{2,1}^{(1,0;a)}(T_u)$	0 $-\frac{\sqrt{105}i}{84}$ $\frac{\sqrt{7}}{56}$	0 0 0 0 0 0 $\frac{\sqrt{105}}{168}$ 0 0 0 0 0 $\frac{\sqrt{105}}{84}$
	$\frac{\sqrt{105}i}{84}$	0 0 $-\frac{\sqrt{7}}{56}$ 0 0 0 0 0 0 $-\frac{\sqrt{105}}{168}$ 0 0 $\frac{\sqrt{105}}{84}$ 0
	0 $-\frac{\sqrt{35}i}{28}$ $\frac{\sqrt{21}}{168}$	0 0 0 0 0 0 $\frac{\sqrt{21}}{84}$ $-\frac{\sqrt{35}}{56}$ 0 0 0 0 0 0
	$\frac{\sqrt{35}i}{28}$	0 0 $-\frac{\sqrt{21}}{168}$ 0 0 $\frac{\sqrt{21}}{84}$ 0 0 0 $\frac{\sqrt{35}}{56}$ 0 0 0 0
	0 0 0 $-\frac{\sqrt{21}i}{84}$	0 0 $-\frac{\sqrt{21}i}{42}$ 0 0 0 0 0 0 $-\frac{\sqrt{35}i}{28}$ 0 0 0 0
	0 0 $\frac{\sqrt{21}i}{84}$	0 0 $-\frac{\sqrt{21}}{42}$ 0 0 0 $\frac{\sqrt{35}i}{28}$ 0 0 0 0 0 0 0
	0 0 0 $\frac{\sqrt{21}}{42}$	0 0 $\frac{\sqrt{21}i}{42}$ $\frac{\sqrt{21}}{42}$ 0 0 0 0 0 0 0 0 0 0
	0 0 $\frac{\sqrt{21}}{42}i$	0 0 $-\frac{\sqrt{21}i}{42}$ 0 0 0 $-\frac{\sqrt{21}}{42}$ 0 0 0 0 0 0 0
	0 0 0 $-\frac{\sqrt{21}}{42}$	0 0 0 0 0 $-\frac{\sqrt{21}}{84}$ 0 0 0 0 0 0 0 $\frac{\sqrt{35}i}{28}$
	0 0 0 0 $\frac{\sqrt{21}}{42}$	0 0 0 0 $\frac{\sqrt{21}}{84}$ $\frac{\sqrt{21}i}{84}$ 0 0 0 0 0 0 0 $-\frac{\sqrt{35}i}{28}$ 0
804	symmetry	$\sqrt{3}xy$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{M}_{2,2}^{(1,0;a)}(T_u)$	$-\frac{\sqrt{105}}{42}$	0 0 $\frac{\sqrt{7}i}{56}$ 0 $-\frac{\sqrt{7}}{56}$ 0 0 0 $\frac{\sqrt{105}i}{168}$ 0 $\frac{\sqrt{105}}{168}$ 0 0
	0	$\frac{\sqrt{105}}{42}$ 0 $-\frac{\sqrt{7}i}{56}$ 0 $-\frac{\sqrt{7}}{56}$ 0 0 0 $-\frac{\sqrt{105}i}{168}$ 0 $\frac{\sqrt{105}}{168}$ 0 0 0
	0	0 0 0 $\frac{\sqrt{21}i}{168}$ 0 $\frac{\sqrt{21}}{168}$ 0 0 0 $-\frac{\sqrt{35}i}{56}$ 0 $\frac{\sqrt{35}}{56}$ 0 0 0
	0	0 0 $-\frac{\sqrt{21}i}{168}$ 0 $\frac{\sqrt{21}}{168}$ 0 0 0 $\frac{\sqrt{35}i}{56}$ 0 $\frac{\sqrt{35}}{56}$ 0 0 0
	0	0 0 $\frac{\sqrt{21}}{84}$ 0 0 0 0 $-\frac{\sqrt{21}}{42}$ $-\frac{\sqrt{35}}{28}$ 0 0 0 0 0
	0	0 0 0 $-\frac{\sqrt{21}}{84}$ 0 0 $-\frac{\sqrt{21}}{42}$ 0 0 $\frac{\sqrt{35}}{28}$ 0 0 0 0
	0	0 0 0 0 $\frac{\sqrt{21}}{84}$ 0 0 $\frac{\sqrt{21}i}{42}$ 0 0 0 $\frac{\sqrt{35}}{28}$ 0 0 0
	0	0 0 0 0 0 $-\frac{\sqrt{21}}{84}$ $-\frac{\sqrt{21}i}{42}$ 0 0 0 0 0 $-\frac{\sqrt{35}}{28}$ 0 0
	0	0 0 0 $\frac{\sqrt{21}}{42}$ 0 $-\frac{\sqrt{21}i}{42}$ $-\frac{\sqrt{21}}{42}$ 0 0 0 0 0 0 0
	0	0 0 $\frac{\sqrt{21}}{42}$ 0 $\frac{\sqrt{21}i}{42}$ 0 0 $\frac{\sqrt{21}}{42}$ 0 0 0 0 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 0 0 0 0 0 0 0 0 $-\frac{\sqrt{5}}{20}$ 0 $-\frac{\sqrt{5}i}{20}$ 0 0	
	0 0 0 0 0 0 0 0 0 $-\frac{\sqrt{5}}{20}$ 0 $\frac{\sqrt{5}i}{20}$ 0 0 0	
	0 0 0 0 0 0 0 0 0 $-\frac{\sqrt{15}}{60}$ 0 $\frac{\sqrt{15}i}{60}$ $\frac{\sqrt{15}}{30}$ 0	
	0 0 0 0 0 0 0 0 0 $-\frac{\sqrt{15}}{60}$ 0 $-\frac{\sqrt{15}i}{60}$ 0 0 $-\frac{\sqrt{15}}{30}$	
	0 $-\frac{\sqrt{15}}{30}$ 0 0 $-\frac{1}{8}$ 0 0 $\frac{i}{8}$ 0 0 $-\frac{\sqrt{15}}{40}$ 0 0 $-\frac{\sqrt{15}i}{40}$ 0	
	$-\frac{\sqrt{15}}{30}$ 0 0 0 0 $\frac{1}{8}$ $-\frac{i}{8}$ 0 0 0 0 $\frac{\sqrt{15}}{40}$ 0 0 $\frac{\sqrt{15}i}{40}$ 0	
	0 $\frac{\sqrt{15}i}{30}$ $-\frac{1}{8}$ 0 0 0 0 $-\frac{1}{8}$ $\frac{\sqrt{15}}{40}$ 0 0 0 0 $-\frac{\sqrt{15}}{40}$ 0	
	$-\frac{\sqrt{15}i}{30}$ 0 0 $\frac{1}{8}$ 0 0 $-\frac{1}{8}$ 0 0 $-\frac{\sqrt{15}}{40}$ 0 0 0 $-\frac{\sqrt{15}}{40}$ 0	
	$-\frac{\sqrt{15}}{30}$ 0 0 $\frac{i}{8}$ 0 $-\frac{1}{8}$ 0 0 0 $\frac{\sqrt{15}i}{40}$ 0 $\frac{\sqrt{15}}{40}$ 0 0 0	
	0 $\frac{\sqrt{15}}{30}$ $-\frac{i}{8}$ 0 $-\frac{1}{8}$ 0 0 0 $-\frac{\sqrt{15}i}{40}$ 0 $\frac{\sqrt{15}}{40}$ 0 0 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 0 0 $-\frac{3\sqrt{105}}{280}$ 0 $\frac{3\sqrt{105}i}{280}$ 0 0 0 0 $-\frac{\sqrt{7}}{280}$ 0 $-\frac{\sqrt{7}i}{280}$ 0 0	
	0 0 $-\frac{3\sqrt{105}}{280}$ 0 $-\frac{3\sqrt{105}i}{280}$ 0 0 0 0 $-\frac{\sqrt{7}}{280}$ 0 $\frac{\sqrt{7}i}{280}$ 0 0 0	
	0 0 0 $-\frac{3\sqrt{35}}{280}$ 0 $-\frac{3\sqrt{35}i}{280}$ 0 0 0 0 $-\frac{5\sqrt{21}}{168}$ 0 $\frac{5\sqrt{21}i}{168}$ $-\frac{\sqrt{21}}{30}$ 0	
	0 0 $-\frac{3\sqrt{35}}{280}$ 0 $\frac{3\sqrt{35}i}{280}$ 0 0 0 0 $-\frac{5\sqrt{21}}{168}$ 0 $-\frac{5\sqrt{21}i}{168}$ 0 0 $\frac{\sqrt{21}}{30}$	
	0 $-\frac{\sqrt{21}}{60}$ 0 0 $\frac{\sqrt{35}}{40}$ 0 0 0 $\frac{\sqrt{35}i}{56}$ 0 0 $\frac{\sqrt{21}}{40}$ 0 0 $-\frac{\sqrt{21}i}{40}$	
	$-\frac{\sqrt{21}}{60}$ 0 0 0 0 $-\frac{\sqrt{35}}{40}$ $-\frac{\sqrt{35}i}{56}$ 0 0 0 0 $-\frac{\sqrt{21}}{40}$ $\frac{\sqrt{21}i}{40}$ 0	
	0 $\frac{\sqrt{21}i}{60}$ $\frac{\sqrt{35}}{40}$ 0 0 0 0 $-\frac{\sqrt{35}}{56}$ $-\frac{\sqrt{21}}{40}$ 0 0 0 0 0 $-\frac{\sqrt{21}}{40}$	
	$-\frac{\sqrt{21}i}{60}$ 0 0 $-\frac{\sqrt{35}}{40}$ 0 0 $-\frac{\sqrt{35}}{56}$ 0 0 $\frac{\sqrt{21}}{40}$ 0 0 0 $-\frac{\sqrt{21}}{40}$ 0	
	$\frac{\sqrt{21}}{30}$ 0 0 $\frac{\sqrt{35}i}{140}$ 0 $-\frac{\sqrt{35}}{140}$ 0 0 0 0 0 0 0 0 0	
	0 $-\frac{\sqrt{21}}{30}$ $-\frac{\sqrt{35}i}{140}$ 0 $-\frac{\sqrt{35}}{140}$ 0 0 0 0 0 0 0 0 0 0	
807	symmetry	$\frac{\sqrt{5}(x-y)(x+y)(x^2+y^2-6z^2)}{4}$
$\mathbb{M}_{4,1}^{(1,0;a)}(E_u)$	0 0 0 $-\frac{3\sqrt{35}}{280}$ 0 $-\frac{3\sqrt{35}i}{280}$ 0 0 0 0 $\frac{9\sqrt{21}}{280}$ 0 $-\frac{9\sqrt{21}i}{280}$ $\frac{\sqrt{21}}{35}$ 0	
	0 0 $-\frac{3\sqrt{35}}{280}$ 0 $\frac{3\sqrt{35}i}{280}$ 0 0 0 0 $\frac{9\sqrt{21}}{280}$ 0 $\frac{9\sqrt{21}i}{280}$ 0 0 $-\frac{\sqrt{21}}{35}$	
	0 0 0 $-\frac{\sqrt{105}}{280}$ 0 $\frac{\sqrt{105}i}{280}$ $-\frac{\sqrt{105}}{70}$ 0 0 $\frac{\sqrt{7}}{280}$ 0 $\frac{\sqrt{7}i}{280}$ 0 0 0	
	0 0 $-\frac{\sqrt{105}}{280}$ 0 $-\frac{\sqrt{105}i}{280}$ 0 0 $\frac{\sqrt{105}}{70}$ $\frac{\sqrt{7}}{280}$ 0 $-\frac{\sqrt{7}i}{280}$ 0 0 0	
	0 $\frac{\sqrt{7}}{20}$ 0 0 $\frac{\sqrt{105}}{280}$ 0 0 $\frac{3\sqrt{105}i}{280}$ 0 0 $\frac{\sqrt{7}}{40}$ 0 0 $-\frac{\sqrt{7}i}{40}$	
	$\frac{\sqrt{7}}{20}$ 0 0 0 0 $-\frac{\sqrt{105}}{280}$ $-\frac{3\sqrt{105}i}{280}$ 0 0 0 0 $-\frac{\sqrt{7}}{40}$ $\frac{\sqrt{7}i}{40}$ 0	
	0 $\frac{\sqrt{7}i}{20}$ $-\frac{\sqrt{105}}{280}$ 0 0 0 0 $\frac{3\sqrt{105}}{280}$ $\frac{\sqrt{7}}{40}$ 0 0 0 0 $\frac{\sqrt{7}}{40}$	
	$-\frac{\sqrt{7}i}{20}$ 0 0 $\frac{\sqrt{105}}{280}$ 0 0 $\frac{3\sqrt{105}}{280}$ 0 0 $-\frac{\sqrt{7}}{40}$ 0 0 $\frac{\sqrt{7}}{40}$ 0	
	0 0 0 $\frac{\sqrt{105}i}{70}$ 0 $\frac{\sqrt{105}}{70}$ 0 0 0 $\frac{\sqrt{7}i}{20}$ 0 $-\frac{\sqrt{7}}{20}$ 0 0 0	
	0 0 $-\frac{\sqrt{105}i}{70}$ 0 $\frac{\sqrt{105}}{70}$ 0 0 0 $-\frac{\sqrt{7}i}{20}$ 0 $-\frac{\sqrt{7}}{20}$ 0 0 0	
808	symmetry	$\frac{\sqrt{35}yz(y-z)(y+z)}{2}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{M}_{4,0}^{(1,0;a)}(T_u, 1)$	0	$-\frac{\sqrt{3}}{10} \ 0 \ 0 \ -\frac{3\sqrt{5}}{80} \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ -\frac{\sqrt{3}}{80} \ 0 \ 0 \ -\frac{\sqrt{3}i}{20}$
	$-\frac{\sqrt{3}}{10}$	$0 \ 0 \ 0 \ 0 \ 0 \ \frac{3\sqrt{5}}{80} \ 0 \ 0 \ 0 \ 0 \ 0 \ \frac{\sqrt{3}}{80} \ \frac{\sqrt{3}i}{20} \ 0$
	$0 \ -\frac{1}{10} \ 0 \ 0 \ \frac{\sqrt{15}}{80} \ 0 \ 0 \ \frac{\sqrt{15}i}{40} \ 0 \ 0 \ -\frac{7}{80} \ 0 \ 0 \ \frac{i}{40}$	
	$-\frac{1}{10}$	$0 \ 0 \ 0 \ 0 \ 0 \ -\frac{\sqrt{15}}{80} \ -\frac{\sqrt{15}i}{40} \ 0 \ 0 \ 0 \ \frac{7}{80} \ -\frac{i}{40} \ 0$
	$0 \ 0 \ 0 \ 0 \ 0 \ -\frac{\sqrt{15}i}{80} \ -\frac{\sqrt{15}}{80} \ 0 \ 0 \ \frac{1}{5} \ 0 \ -\frac{i}{16} \ \frac{1}{16} \ 0$	
	$0 \ 0 \ 0 \ 0 \ \frac{\sqrt{15}i}{80} \ 0 \ 0 \ \frac{\sqrt{15}}{80} \ \frac{1}{5} \ 0 \ \frac{i}{16} \ 0 \ 0 \ -\frac{1}{16}$	
	$-\frac{1}{40}$	$0 \ 0 \ 0 \ 0 \ 0 \ -\frac{\sqrt{15}}{20} \ 0 \ 0 \ 0 \ -\frac{i}{40} \ 0 \ \frac{3}{20} \ 0 \ 0 \ 0$
	$0 \ \frac{1}{40} \ 0 \ 0 \ -\frac{\sqrt{15}}{20} \ 0 \ 0 \ 0 \ \frac{i}{40} \ 0 \ \frac{3}{20} \ 0 \ 0 \ 0 \ 0$	
	$0 \ -\frac{i}{40} \ 0 \ 0 \ 0 \ 0 \ 0 \ \frac{\sqrt{15}}{20} \ \frac{1}{40} \ 0 \ 0 \ 0 \ 0 \ \frac{3}{20}$	
	$\frac{i}{40}$	$0 \ 0 \ 0 \ 0 \ 0 \ \frac{\sqrt{15}}{20} \ 0 \ 0 \ -\frac{1}{40} \ 0 \ 0 \ \frac{3}{20} \ 0 \ 0$
809	symmetry	$-\frac{\sqrt{35}xz(x-z)(x+z)}{2}$
$\mathbb{M}_{4,1}^{(1,0;a)}(T_u, 1)$	0	$-\frac{\sqrt{3}i}{10} \ \frac{3\sqrt{5}}{80} \ 0 \ 0 \ 0 \ 0 \ 0 \ -\frac{\sqrt{3}}{80} \ 0 \ 0 \ 0 \ 0 \ 0 \ \frac{\sqrt{3}}{20}$
	$\frac{\sqrt{3}i}{10}$	$0 \ 0 \ -\frac{3\sqrt{5}}{80} \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ \frac{\sqrt{3}}{80} \ 0 \ 0 \ 0 \ \frac{\sqrt{3}}{20} \ 0$
	$0 \ \frac{i}{10} \ \frac{\sqrt{15}}{80} \ 0 \ 0 \ 0 \ 0 \ -\frac{\sqrt{15}}{40} \ \frac{7}{80} \ 0 \ 0 \ 0 \ 0 \ 0 \ \frac{1}{40}$	
	$-\frac{i}{10}$	$0 \ 0 \ -\frac{\sqrt{15}}{80} \ 0 \ 0 \ -\frac{\sqrt{15}}{40} \ 0 \ 0 \ -\frac{7}{80} \ 0 \ 0 \ 0 \ \frac{1}{40} \ 0$
	$\frac{1}{40}$	$0 \ 0 \ -\frac{\sqrt{15}i}{20} \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ -\frac{3i}{20} \ 0 \ \frac{1}{40} \ 0 \ 0 \ 0$
	$0 \ -\frac{1}{40} \ \frac{\sqrt{15}i}{20} \ 0 \ 0 \ 0 \ 0 \ 0 \ \frac{3i}{20} \ 0 \ \frac{1}{40} \ 0 \ 0 \ 0 \ 0$	
	$0 \ 0 \ 0 \ -\frac{\sqrt{15}}{80} \ 0 \ 0 \ \frac{\sqrt{15}}{80} \ 0 \ 0 \ \frac{1}{16} \ 0 \ -\frac{i}{5} \ \frac{1}{16} \ 0$	
	$0 \ 0 \ -\frac{\sqrt{15}}{80} \ 0 \ 0 \ 0 \ -\frac{\sqrt{15}}{80} \ \frac{1}{16} \ 0 \ \frac{i}{5} \ 0 \ 0 \ -\frac{1}{16}$	
	$0 \ -\frac{1}{40} \ 0 \ 0 \ 0 \ 0 \ 0 \ \frac{\sqrt{15}i}{20} \ 0 \ 0 \ \frac{1}{40} \ 0 \ 0 \ -\frac{3i}{20}$	
	$-\frac{1}{40}$	$0 \ 0 \ 0 \ 0 \ 0 \ -\frac{\sqrt{15}i}{20} \ 0 \ 0 \ 0 \ 0 \ -\frac{1}{40} \ \frac{3i}{20} \ 0 \ 0$
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 $-\frac{3\sqrt{5}i}{80}$ 0 $-\frac{3\sqrt{5}}{80}$ 0 0 0 $\frac{3\sqrt{3}i}{80}$ 0 $-\frac{3\sqrt{3}}{80}$ 0 0	
	0 0 $\frac{3\sqrt{5}i}{80}$ 0 $-\frac{3\sqrt{5}}{80}$ 0 0 0 $-\frac{3\sqrt{3}i}{80}$ 0 $-\frac{3\sqrt{3}}{80}$ 0 0 0	
	$\frac{1}{5}$ 0 0 $-\frac{\sqrt{15}i}{80}$ 0 $\frac{\sqrt{15}}{80}$ 0 0 0 $-\frac{i}{16}$ 0 $-\frac{1}{16}$ 0 0 0	
	0 $-\frac{1}{5}$ $\frac{\sqrt{15}i}{80}$ 0 $\frac{\sqrt{15}}{80}$ 0 0 0 $\frac{i}{16}$ 0 $-\frac{1}{16}$ 0 0 0	
	0 $\frac{i}{40}$ $-\frac{\sqrt{15}}{20}$ 0 0 0 0 0 $\frac{3}{20}$ 0 0 0 0 $\frac{1}{40}$	
	$-\frac{i}{40}$ 0 0 $\frac{\sqrt{15}}{20}$ 0 0 0 0 0 $-\frac{3}{20}$ 0 0 0 $\frac{1}{40}$ 0	
	0 $\frac{1}{40}$ 0 0 $\frac{\sqrt{15}}{20}$ 0 0 0 0 0 $\frac{3}{20}$ 0 0 0 $-\frac{i}{40}$	
	$\frac{1}{40}$ 0 0 0 0 $-\frac{\sqrt{15}}{20}$ 0 0 0 0 0 $-\frac{3}{20}$ $\frac{i}{40}$ 0	
	0 0 0 $\frac{\sqrt{15}}{80}$ 0 $\frac{\sqrt{15}i}{80}$ 0 0 0 $\frac{1}{16}$ 0 $-\frac{i}{16}$ $\frac{1}{5}$ 0	
	0 0 $\frac{\sqrt{15}}{80}$ 0 $-\frac{\sqrt{15}i}{80}$ 0 0 0 $\frac{1}{16}$ 0 $\frac{i}{16}$ 0 0 $-\frac{1}{5}$	
811	symmetry	$\frac{\sqrt{5}yz(6x^2-y^2-z^2)}{2}$
$\mathbb{M}_{4,0}^{(1,0;a)}(T_u, 2)$	0 $\frac{\sqrt{21}}{70}$ 0 0 $\frac{3\sqrt{35}}{112}$ 0 0 0 0 $\frac{17\sqrt{21}}{560}$ 0 0 $-\frac{\sqrt{21}i}{28}$	
	$\frac{\sqrt{21}}{70}$ 0 0 0 0 $-\frac{3\sqrt{35}}{112}$ 0 0 0 0 0 $-\frac{17\sqrt{21}}{560}$ $\frac{\sqrt{21}i}{28}$ 0	
	0 $-\frac{3\sqrt{7}}{70}$ 0 0 $-\frac{\sqrt{105}}{112}$ 0 0 $\frac{\sqrt{105}i}{56}$ 0 0 $\frac{23\sqrt{7}}{560}$ 0 0 $-\frac{\sqrt{7}i}{40}$	
	$-\frac{3\sqrt{7}}{70}$ 0 0 0 0 $\frac{\sqrt{105}}{112}$ $-\frac{\sqrt{105}i}{56}$ 0 0 0 0 $-\frac{23\sqrt{7}}{560}$ $\frac{\sqrt{7}i}{40}$ 0	
	0 0 0 $\frac{\sqrt{105}}{70}$ 0 $\frac{\sqrt{105}i}{560}$ $-\frac{\sqrt{105}}{560}$ 0 0 0 0 $-\frac{\sqrt{7}i}{80}$ $-\frac{\sqrt{7}}{80}$ 0	
	0 0 $\frac{\sqrt{105}}{70}$ 0 $-\frac{\sqrt{105}i}{560}$ 0 0 $\frac{\sqrt{105}}{560}$ 0 0 $\frac{\sqrt{7}i}{80}$ 0 0 $\frac{\sqrt{7}}{80}$	
	$-\frac{\sqrt{7}}{40}$ 0 0 $\frac{3\sqrt{105}i}{280}$ 0 $-\frac{\sqrt{105}}{140}$ 0 0 0 $-\frac{\sqrt{7}i}{20}$ 0 $\frac{\sqrt{7}}{140}$ 0 0	
	0 $\frac{\sqrt{7}}{40}$ $-\frac{3\sqrt{105}i}{280}$ 0 $-\frac{\sqrt{105}}{140}$ 0 0 0 $\frac{\sqrt{7}i}{20}$ 0 $\frac{\sqrt{7}}{140}$ 0 0 0	
	0 $\frac{\sqrt{7}i}{40}$ $-\frac{3\sqrt{105}}{280}$ 0 0 0 0 $-\frac{\sqrt{105}}{140}$ $-\frac{\sqrt{7}}{20}$ 0 0 0 0 $-\frac{\sqrt{7}}{140}$	
	$-\frac{\sqrt{7}i}{40}$ 0 0 $\frac{3\sqrt{105}}{280}$ 0 0 0 $-\frac{\sqrt{105}}{140}$ 0 0 $\frac{\sqrt{7}}{20}$ 0 0 $-\frac{\sqrt{7}}{140}$ 0	
812	symmetry	$-\frac{\sqrt{5}xz(x^2-6y^2+z^2)}{2}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{M}_{4,1}^{(1,0;a)}(T_u, 2)$	0	$-\frac{\sqrt{21}i}{70} \quad \frac{3\sqrt{35}}{112} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{17\sqrt{21}}{560} \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{21}}{28}$
	$\frac{\sqrt{21}i}{70}$	$0 \quad 0 \quad -\frac{3\sqrt{35}}{112} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{17\sqrt{21}}{560} \quad 0 \quad 0 \quad -\frac{\sqrt{21}}{28} \quad 0$
	0	$-\frac{3\sqrt{7}i}{70} \quad \frac{\sqrt{105}}{112} \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{105}}{56} \quad \frac{23\sqrt{7}}{560} \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{7}}{40}$
	$\frac{3\sqrt{7}i}{70}$	$0 \quad 0 \quad -\frac{\sqrt{105}}{112} \quad 0 \quad 0 \quad \frac{\sqrt{105}}{56} \quad 0 \quad 0 \quad -\frac{23\sqrt{7}}{560} \quad 0 \quad 0 \quad \frac{\sqrt{7}}{40} \quad 0$
	$-\frac{\sqrt{7}}{40}$	$0 \quad 0 \quad \frac{\sqrt{105}i}{140} \quad 0 \quad -\frac{3\sqrt{105}}{280} \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{7}i}{140} \quad 0 \quad -\frac{\sqrt{7}}{20} \quad 0 \quad 0$
	0	$\frac{\sqrt{7}}{40} \quad -\frac{\sqrt{105}i}{140} \quad 0 \quad -\frac{3\sqrt{105}}{280} \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{7}i}{140} \quad 0 \quad -\frac{\sqrt{7}}{20} \quad 0 \quad 0 \quad 0$
	0	$0 \quad 0 \quad -\frac{\sqrt{105}}{560} \quad 0 \quad -\frac{\sqrt{105}i}{70} \quad -\frac{\sqrt{105}}{560} \quad 0 \quad 0 \quad -\frac{\sqrt{7}}{80} \quad 0 \quad 0 \quad \frac{\sqrt{7}}{80} \quad 0$
	0	$0 \quad 0 \quad -\frac{\sqrt{105}}{560} \quad 0 \quad \frac{\sqrt{105}i}{70} \quad 0 \quad 0 \quad \frac{\sqrt{105}}{560} \quad -\frac{\sqrt{7}}{80} \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{7}}{80}$
	$0 \quad -\frac{\sqrt{7}}{40}$	$0 \quad 0 \quad -\frac{3\sqrt{105}}{280} \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{105}i}{140} \quad 0 \quad 0 \quad \frac{\sqrt{7}}{20} \quad 0 \quad 0 \quad -\frac{\sqrt{7}i}{140}$
	$-\frac{\sqrt{7}}{40}$	$0 \quad 0 \quad 0 \quad 0 \quad \frac{3\sqrt{105}}{280} \quad -\frac{\sqrt{105}i}{140} \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{7}}{20} \quad \frac{\sqrt{7}i}{140} \quad 0$
813	symmetry	$-\frac{\sqrt{5}xy(x^2+y^2-6z^2)}{2}$
$\mathbb{M}_{4,2}^{(1,0;a)}(T_u, 2)$	$-\frac{\sqrt{21}}{35} \quad 0 \quad 0 \quad \frac{3\sqrt{35}i}{112} \quad 0 \quad -\frac{3\sqrt{35}}{112} \quad 0 \quad 0 \quad 0 \quad -\frac{3\sqrt{21}i}{560} \quad 0 \quad -\frac{3\sqrt{21}}{560} \quad 0 \quad 0$	
	0	$\frac{\sqrt{21}}{35} \quad -\frac{3\sqrt{35}i}{112} \quad 0 \quad -\frac{3\sqrt{35}}{112} \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{3\sqrt{21}i}{560} \quad 0 \quad -\frac{3\sqrt{21}}{560} \quad 0 \quad 0 \quad 0$
	0	$0 \quad 0 \quad 0 \quad \frac{\sqrt{105}i}{112} \quad 0 \quad \frac{\sqrt{105}}{112} \quad 0 \quad 0 \quad 0 \quad \frac{37\sqrt{7}i}{560} \quad 0 \quad -\frac{37\sqrt{7}}{560} \quad 0 \quad 0$
	0	$0 \quad 0 \quad -\frac{\sqrt{105}i}{112} \quad 0 \quad \frac{\sqrt{105}}{112} \quad 0 \quad 0 \quad 0 \quad -\frac{37\sqrt{7}i}{560} \quad 0 \quad -\frac{37\sqrt{7}}{560} \quad 0 \quad 0 \quad 0$
	0	$\frac{\sqrt{7}i}{40} \quad -\frac{\sqrt{105}}{140} \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{3\sqrt{105}}{280} \quad \frac{\sqrt{7}}{140} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{7}}{20}$
	$-\frac{\sqrt{7}i}{40}$	$0 \quad 0 \quad \frac{\sqrt{105}}{140} \quad 0 \quad 0 \quad -\frac{3\sqrt{105}}{280} \quad 0 \quad 0 \quad -\frac{\sqrt{7}i}{140} \quad 0 \quad 0 \quad \frac{\sqrt{7}}{20} \quad 0$
	$0 \quad -\frac{\sqrt{7}}{40}$	$0 \quad 0 \quad 0 \quad -\frac{\sqrt{105}}{140} \quad 0 \quad 0 \quad \frac{3\sqrt{105}i}{280} \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{7}i}{140} \quad 0 \quad 0 \quad \frac{\sqrt{7}i}{20}$
	$-\frac{\sqrt{7}}{40}$	$0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{105}}{140} \quad -\frac{3\sqrt{105}i}{280} \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{7}}{140} \quad -\frac{\sqrt{7}i}{20} \quad 0 \quad 0$
	0	$0 \quad 0 \quad 0 \quad -\frac{\sqrt{105}}{560} \quad 0 \quad \frac{\sqrt{105}i}{560} \quad \frac{\sqrt{105}}{70} \quad 0 \quad 0 \quad \frac{\sqrt{7}}{80} \quad 0 \quad \frac{\sqrt{7}i}{80} \quad 0 \quad 0$
	0	$0 \quad 0 \quad -\frac{\sqrt{105}}{560} \quad 0 \quad -\frac{\sqrt{105}i}{560} \quad 0 \quad 0 \quad -\frac{\sqrt{105}}{70} \quad \frac{\sqrt{7}}{80} \quad 0 \quad -\frac{\sqrt{7}i}{80} \quad 0 \quad 0 \quad 0$
814	symmetry	1

continued ...

Table 9

No.	multipole	matrix
$\mathbb{M}_0^{(1,1;a)}(A_u)$	0 0 0 $-\frac{\sqrt{105}}{140}$ 0 $\frac{\sqrt{105}i}{140}$ $\frac{\sqrt{105}}{70}$ 0 0 $-\frac{\sqrt{7}}{28}$ 0 $-\frac{\sqrt{7}i}{28}$ 0 0	
	0 0 $-\frac{\sqrt{105}}{140}$ 0 $-\frac{\sqrt{105}i}{140}$ 0 0 $-\frac{\sqrt{105}}{70}$ $-\frac{\sqrt{7}}{28}$ 0 $\frac{\sqrt{7}i}{28}$ 0 0 0	
	0 0 0 $\frac{3\sqrt{35}}{140}$ 0 $\frac{3\sqrt{35}i}{140}$ 0 0 0 0 $-\frac{\sqrt{21}}{84}$ 0 $\frac{\sqrt{21}i}{84}$ $\frac{\sqrt{21}}{42}$ 0	
	0 0 $\frac{3\sqrt{35}}{140}$ 0 $-\frac{3\sqrt{35}i}{140}$ 0 0 0 $-\frac{\sqrt{21}}{84}$ 0 $-\frac{\sqrt{21}i}{84}$ 0 0 $-\frac{\sqrt{21}}{42}$	
	0 $\frac{\sqrt{21}}{42}$ 0 0 $-\frac{\sqrt{35}}{70}$ 0 0 $\frac{\sqrt{35}i}{70}$ 0 0 $\frac{\sqrt{21}}{42}$ 0 0 $\frac{\sqrt{21}i}{42}$	
	$\frac{\sqrt{21}}{42}$ 0 0 0 $\frac{\sqrt{35}}{70}$ $-\frac{\sqrt{35}i}{70}$ 0 0 0 0 $-\frac{\sqrt{21}}{42}$ $-\frac{\sqrt{21}i}{42}$ 0	
	0 $-\frac{\sqrt{21}i}{42}$ $-\frac{\sqrt{35}}{70}$ 0 0 0 0 $-\frac{\sqrt{35}}{70}$ $-\frac{\sqrt{21}}{42}$ 0 0 0 0 $\frac{\sqrt{21}}{42}$	
	$\frac{\sqrt{21}i}{42}$ 0 0 $\frac{\sqrt{35}}{70}$ 0 0 $-\frac{\sqrt{35}}{70}$ 0 0 $\frac{\sqrt{21}}{42}$ 0 0 $\frac{\sqrt{21}}{42}$ 0	
	$\frac{\sqrt{21}}{42}$ 0 0 $\frac{\sqrt{35}i}{70}$ 0 $-\frac{\sqrt{35}}{70}$ 0 0 0 $-\frac{\sqrt{21}i}{42}$ 0 $-\frac{\sqrt{21}}{42}$ 0 0	
	0 $-\frac{\sqrt{21}}{42}$ $-\frac{\sqrt{35}i}{70}$ 0 $-\frac{\sqrt{35}}{70}$ 0 0 0 $\frac{\sqrt{21}i}{42}$ 0 $-\frac{\sqrt{21}}{42}$ 0 0 0	
815	symmetry	$-\frac{x^2}{2} - \frac{y^2}{2} + z^2$
$\mathbb{M}_{2,0}^{(1,1;a)}(E_u)$	0 0 0 $-\frac{3\sqrt{35}}{280}$ 0 $\frac{3\sqrt{35}i}{280}$ $\frac{\sqrt{35}}{35}$ 0 0 $-\frac{\sqrt{21}}{56}$ 0 $-\frac{\sqrt{21}i}{56}$ 0 0	
	0 0 $-\frac{3\sqrt{35}}{280}$ 0 $-\frac{3\sqrt{35}i}{280}$ 0 0 $-\frac{\sqrt{35}}{35}$ $-\frac{\sqrt{21}}{56}$ 0 $\frac{\sqrt{21}i}{56}$ 0 0 0	
	0 0 0 $-\frac{11\sqrt{105}}{840}$ 0 $-\frac{11\sqrt{105}i}{840}$ 0 0 0 0 $-\frac{\sqrt{7}}{56}$ 0 $-\frac{\sqrt{7}i}{56}$ 0 $\frac{\sqrt{7}i}{56}$ $-\frac{\sqrt{7}}{14}$ 0	
	0 0 $-\frac{11\sqrt{105}}{840}$ 0 $\frac{11\sqrt{105}i}{840}$ 0 0 0 0 $-\frac{\sqrt{7}}{56}$ 0 $-\frac{\sqrt{7}i}{56}$ 0 0 $\frac{\sqrt{7}}{14}$	
	0 $\frac{\sqrt{7}}{28}$ 0 0 $-\frac{\sqrt{105}}{280}$ 0 0 $-\frac{\sqrt{105}i}{210}$ 0 0 $\frac{\sqrt{7}}{56}$ 0 0 $\frac{\sqrt{7}i}{56}$ 0 0 $\frac{\sqrt{7}i}{28}$	
	$\frac{\sqrt{7}}{28}$ 0 0 0 $\frac{\sqrt{105}}{280}$ $\frac{\sqrt{105}i}{210}$ 0 0 0 0 $-\frac{\sqrt{7}}{56}$ 0 0 $-\frac{\sqrt{7}i}{56}$ $-\frac{\sqrt{7}i}{28}$ 0	
	0 $-\frac{\sqrt{7}i}{28}$ $-\frac{\sqrt{105}}{280}$ 0 0 0 0 $\frac{\sqrt{105}}{210}$ $-\frac{\sqrt{7}}{56}$ 0 0 0 0 0 $\frac{\sqrt{7}}{28}$	
	$\frac{\sqrt{7}i}{28}$ 0 0 $\frac{\sqrt{105}}{280}$ 0 0 $\frac{\sqrt{105}i}{210}$ 0 0 $\frac{\sqrt{7}}{56}$ 0 0 0 $\frac{\sqrt{7}}{28}$ 0	
	$-\frac{\sqrt{7}}{14}$ 0 0 $\frac{\sqrt{105}i}{840}$ 0 $-\frac{\sqrt{105}}{840}$ 0 0 0 $\frac{3\sqrt{7}i}{56}$ 0 $\frac{3\sqrt{7}}{56}$ 0 0 0	
	0 $\frac{\sqrt{7}}{14}$ $-\frac{\sqrt{105}i}{840}$ 0 $-\frac{\sqrt{105}}{840}$ 0 0 0 $-\frac{3\sqrt{7}i}{56}$ 0 $\frac{3\sqrt{7}}{56}$ 0 0 0	
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 $-\frac{11\sqrt{105}}{840}$ 0 $-\frac{11\sqrt{105}i}{840}$ 0 0 0 $\frac{3\sqrt{7}}{56}$ 0 $-\frac{3\sqrt{7}i}{56}$ 0 0	
	0 0 $-\frac{11\sqrt{105}}{840}$ 0 $\frac{11\sqrt{105}i}{840}$ 0 0 0 $\frac{3\sqrt{7}}{56}$ 0 $\frac{3\sqrt{7}i}{56}$ 0 0 0	
	0 0 0 $\frac{13\sqrt{35}}{840}$ 0 $-\frac{13\sqrt{35}i}{840}$ $-\frac{\sqrt{35}}{42}$ 0 0 $\frac{\sqrt{21}}{56}$ 0 $\frac{\sqrt{21}i}{56}$ 0 0 0	
	0 0 $\frac{13\sqrt{35}}{840}$ 0 $\frac{13\sqrt{35}i}{840}$ 0 0 $\frac{\sqrt{35}}{42}$ $\frac{\sqrt{21}}{56}$ 0 $-\frac{\sqrt{21}i}{56}$ 0 0 0	
	0 $-\frac{\sqrt{21}}{28}$ 0 0 $-\frac{\sqrt{35}}{168}$ 0 0 $-\frac{\sqrt{35}i}{420}$ 0 0 $-\frac{5\sqrt{21}}{168}$ 0 0 $-\frac{\sqrt{21}i}{42}$	
	$-\frac{\sqrt{21}}{28}$ 0 0 0 $\frac{\sqrt{35}}{168}$ $\frac{\sqrt{35}i}{420}$ 0 0 0 0 $\frac{5\sqrt{21}}{168}$ $\frac{\sqrt{21}i}{42}$ 0	
	0 $-\frac{\sqrt{21}i}{28}$ $\frac{\sqrt{35}}{168}$ 0 0 0 $-\frac{\sqrt{35}}{420}$ $-\frac{5\sqrt{21}}{168}$ 0 0 0 0 $\frac{\sqrt{21}}{42}$	
	$\frac{\sqrt{21}i}{28}$ 0 0 $-\frac{\sqrt{35}}{168}$ 0 0 $-\frac{\sqrt{35}}{420}$ 0 0 $\frac{5\sqrt{21}}{168}$ 0 0 $\frac{\sqrt{21}}{42}$ 0	
	0 0 0 $-\frac{\sqrt{35}i}{120}$ 0 $-\frac{\sqrt{35}}{120}$ 0 0 0 $-\frac{\sqrt{21}i}{168}$ 0 $\frac{\sqrt{21}}{168}$ 0 0 0	
	0 0 $\frac{\sqrt{35}i}{120}$ 0 $-\frac{\sqrt{35}}{120}$ 0 0 0 $\frac{\sqrt{21}i}{168}$ 0 $\frac{\sqrt{21}}{168}$ 0 0 0	
817	symmetry	$\sqrt{3}yz$
$\mathbb{M}_{2,0}^{(1,1;a)}(T_u)$	0 0 0 0 $-\frac{\sqrt{105}}{140}$ 0 0 $\frac{\sqrt{105}i}{105}$ 0 0 $\frac{\sqrt{7}}{28}$ 0 0 0	
	0 0 0 0 0 $\frac{\sqrt{105}}{140}$ $-\frac{\sqrt{105}i}{105}$ 0 0 0 0 $-\frac{\sqrt{7}}{28}$ 0 0 0	
	0 0 0 0 $\frac{11\sqrt{35}}{420}$ 0 0 $-\frac{\sqrt{35}i}{42}$ 0 0 $-\frac{\sqrt{21}}{84}$ 0 0 $-\frac{\sqrt{21}i}{42}$	
	0 0 0 0 0 $-\frac{11\sqrt{35}}{420}$ $\frac{\sqrt{35}i}{42}$ 0 0 0 0 $\frac{\sqrt{21}}{84}$ $\frac{\sqrt{21}i}{42}$ 0	
	0 0 0 $-\frac{\sqrt{35}}{42}$ 0 $-\frac{\sqrt{35}i}{105}$ $\frac{\sqrt{35}}{105}$ 0 0 0 0 $-\frac{\sqrt{21}i}{42}$ $-\frac{\sqrt{21}}{42}$ 0	
	0 0 $-\frac{\sqrt{35}}{42}$ 0 $\frac{\sqrt{35}i}{105}$ 0 0 $-\frac{\sqrt{35}}{105}$ 0 0 $\frac{\sqrt{21}i}{42}$ 0 0 $\frac{\sqrt{21}}{42}$	
	$\frac{\sqrt{21}}{42}$ 0 0 $\frac{\sqrt{35}i}{420}$ 0 $-\frac{\sqrt{35}}{42}$ 0 0 0 $-\frac{\sqrt{21}i}{28}$ 0 0 0 0	
	0 $-\frac{\sqrt{21}}{42}$ $-\frac{\sqrt{35}i}{420}$ 0 $-\frac{\sqrt{35}}{42}$ 0 0 0 $\frac{\sqrt{21}i}{28}$ 0 0 0 0	
	0 $-\frac{\sqrt{21}i}{42}$ $-\frac{\sqrt{35}}{420}$ 0 0 0 0 $-\frac{\sqrt{35}}{42}$ $-\frac{\sqrt{21}}{28}$ 0 0 0 0	
	$\frac{\sqrt{21}i}{42}$ 0 0 $\frac{\sqrt{35}}{420}$ 0 0 $-\frac{\sqrt{35}}{42}$ 0 0 $\frac{\sqrt{21}}{28}$ 0 0 0 0	
818	symmetry	$\sqrt{3}xz$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{M}_{2,1}^{(1,1;a)}(T_u)$	0 0 $-\frac{\sqrt{105}}{140}$ 0 0 0 0 $-\frac{\sqrt{105}}{105}$ $-\frac{\sqrt{7}}{28}$ 0 0 0 0 0 0	
	0 0 0 $\frac{\sqrt{105}}{140}$ 0 0 $-\frac{\sqrt{105}}{105}$ 0 0 $\frac{\sqrt{7}}{28}$ 0 0 0 0 0	
	0 0 $-\frac{11\sqrt{35}}{420}$ 0 0 0 0 $-\frac{\sqrt{35}}{42}$ $-\frac{\sqrt{21}}{84}$ 0 0 0 0 0 $\frac{\sqrt{21}}{42}$	
	0 0 0 $\frac{11\sqrt{35}}{420}$ 0 0 $-\frac{\sqrt{35}}{42}$ 0 0 $\frac{\sqrt{21}}{84}$ 0 0 0 $\frac{\sqrt{21}}{42}$ 0	
	$\frac{\sqrt{21}}{42}$ 0 0 $\frac{\sqrt{35}i}{42}$ 0 $-\frac{\sqrt{35}}{420}$ 0 0 0 0 0 $-\frac{\sqrt{21}}{28}$ 0 0 0	
	0 $-\frac{\sqrt{21}}{42}$ $-\frac{\sqrt{35}i}{42}$ 0 $-\frac{\sqrt{35}}{420}$ 0 0 0 0 0 $-\frac{\sqrt{21}}{28}$ 0 0 0	
	0 0 0 $\frac{\sqrt{35}}{105}$ 0 $\frac{\sqrt{35}i}{42}$ $\frac{\sqrt{35}}{105}$ 0 0 $-\frac{\sqrt{21}}{42}$ 0 0 0 $\frac{\sqrt{21}}{42}$ 0	
	0 0 $\frac{\sqrt{35}}{105}$ 0 $-\frac{\sqrt{35}i}{42}$ 0 0 $-\frac{\sqrt{35}}{105}$ $-\frac{\sqrt{21}}{42}$ 0 0 0 0 $-\frac{\sqrt{21}}{42}$	
	0 $\frac{\sqrt{21}}{42}$ 0 0 $-\frac{\sqrt{35}}{420}$ 0 0 $\frac{\sqrt{35}i}{42}$ 0 0 $\frac{\sqrt{21}}{28}$ 0 0 0	
	$\frac{\sqrt{21}}{42}$ 0 0 0 0 $\frac{\sqrt{35}}{420}$ $-\frac{\sqrt{35}i}{42}$ 0 0 0 0 $-\frac{\sqrt{21}}{28}$ 0 0	
819	symmetry	$\sqrt{3}xy$
$\mathbb{M}_{2,2}^{(1,1;a)}(T_u)$	0 0 0 $-\frac{\sqrt{105}i}{60}$ 0 $\frac{\sqrt{105}}{60}$ 0 0 0 $\frac{\sqrt{7}i}{28}$ 0 $\frac{\sqrt{7}}{28}$ 0 0	
	0 0 $\frac{\sqrt{105}i}{60}$ 0 $\frac{\sqrt{105}}{60}$ 0 0 0 $-\frac{\sqrt{7}i}{28}$ 0 $\frac{\sqrt{7}}{28}$ 0 0 0	
	0 0 0 $\frac{\sqrt{35}i}{420}$ 0 $\frac{\sqrt{35}}{420}$ 0 0 0 $\frac{\sqrt{21}i}{84}$ 0 $-\frac{\sqrt{21}}{84}$ 0 0 0	
	0 0 $-\frac{\sqrt{35}i}{420}$ 0 $\frac{\sqrt{35}}{420}$ 0 0 0 $-\frac{\sqrt{21}i}{84}$ 0 $-\frac{\sqrt{21}}{84}$ 0 0 0	
	0 $-\frac{\sqrt{21}i}{42}$ $-\frac{\sqrt{35}}{42}$ 0 0 0 0 $-\frac{\sqrt{35}}{420}$ 0 0 0 0 0 $\frac{\sqrt{21}}{28}$	
	$\frac{\sqrt{21}i}{42}$ 0 0 $\frac{\sqrt{35}}{42}$ 0 0 $-\frac{\sqrt{35}}{420}$ 0 0 0 0 0 $\frac{\sqrt{21}}{28}$ 0	
	0 $\frac{\sqrt{21}}{42}$ 0 0 $-\frac{\sqrt{35}}{42}$ 0 0 $\frac{\sqrt{35}i}{420}$ 0 0 0 0 0 $\frac{\sqrt{21}i}{28}$	
	$\frac{\sqrt{21}}{42}$ 0 0 0 0 $\frac{\sqrt{35}}{42}$ $-\frac{\sqrt{35}i}{420}$ 0 0 0 0 0 $-\frac{\sqrt{21}i}{28}$ 0	
	0 0 0 $\frac{\sqrt{35}}{105}$ 0 $-\frac{\sqrt{35}i}{105}$ $-\frac{\sqrt{35}}{42}$ 0 0 $\frac{\sqrt{21}}{42}$ 0 $\frac{\sqrt{21}i}{42}$ 0 0	
	0 0 $\frac{\sqrt{35}}{105}$ 0 $\frac{\sqrt{35}i}{105}$ 0 0 $\frac{\sqrt{35}}{42}$ $\frac{\sqrt{21}}{42}$ 0 $-\frac{\sqrt{21}i}{42}$ 0 0 0	
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 0 0 $-\frac{5\sqrt{22}}{264}$ 0 $\frac{5\sqrt{22}i}{264}$ $\frac{5\sqrt{22}}{132}$ 0 0 $-\frac{7\sqrt{330}}{1320}$ 0 $-\frac{7\sqrt{330}i}{1320}$ 0 0	
	0 0 $-\frac{5\sqrt{22}}{264}$ 0 $-\frac{5\sqrt{22}i}{264}$ 0 0 $-\frac{5\sqrt{22}}{132}$ $-\frac{7\sqrt{330}}{1320}$ 0 $\frac{7\sqrt{330}i}{1320}$ 0 0 0	
	0 0 0 $\frac{5\sqrt{66}}{264}$ 0 $\frac{5\sqrt{66}i}{264}$ 0 0 0 $-\frac{7\sqrt{110}}{1320}$ 0 $\frac{7\sqrt{110}i}{1320}$ $\frac{7\sqrt{110}}{660}$ 0	
	0 0 $\frac{5\sqrt{66}}{264}$ 0 $-\frac{5\sqrt{66}i}{264}$ 0 0 0 $-\frac{7\sqrt{110}}{1320}$ 0 $-\frac{7\sqrt{110}i}{1320}$ 0 0 $-\frac{7\sqrt{110}}{660}$	
	0 $-\frac{\sqrt{110}}{330}$ 0 0 $\frac{\sqrt{66}}{66}$ 0 0 $-\frac{\sqrt{66}i}{66}$ 0 0 $-\frac{\sqrt{110}}{165}$ 0 0 $-\frac{\sqrt{110}i}{165}$	
	$-\frac{\sqrt{110}}{330}$ 0 0 0 0 $-\frac{\sqrt{66}}{66}$ $\frac{\sqrt{66}i}{66}$ 0 0 0 0 $\frac{\sqrt{110}}{165}$ $\frac{\sqrt{110}i}{165}$ 0	
	0 $\frac{\sqrt{110}i}{330}$ $\frac{\sqrt{66}}{66}$ 0 0 0 0 $\frac{\sqrt{66}}{66}$ $\frac{\sqrt{110}}{165}$ 0 0 0 0 $-\frac{\sqrt{110}}{165}$	
	$-\frac{\sqrt{110}i}{330}$ 0 0 $-\frac{\sqrt{66}}{66}$ 0 0 $\frac{\sqrt{66}}{66}$ 0 0 $-\frac{\sqrt{110}}{165}$ 0 0 $-\frac{\sqrt{110}}{165}$ 0	
	$-\frac{\sqrt{110}}{330}$ 0 0 $-\frac{\sqrt{66}i}{66}$ 0 $\frac{\sqrt{66}}{66}$ 0 0 0 $\frac{\sqrt{110}i}{165}$ 0 $\frac{\sqrt{110}}{165}$ 0 0	
	0 $\frac{\sqrt{110}}{330}$ $\frac{\sqrt{66}i}{66}$ 0 $\frac{\sqrt{66}}{66}$ 0 0 0 $-\frac{\sqrt{110}i}{165}$ 0 $\frac{\sqrt{110}}{165}$ 0 0 0	
821	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 0 0 $-\frac{19\sqrt{770}}{9240}$ 0 $\frac{19\sqrt{770}i}{9240}$ $\frac{5\sqrt{770}}{924}$ 0 0 $-\frac{41\sqrt{462}}{9240}$ 0 $-\frac{41\sqrt{462}i}{9240}$ 0 0	
	0 0 $-\frac{19\sqrt{770}}{9240}$ 0 $-\frac{19\sqrt{770}i}{9240}$ 0 0 $-\frac{5\sqrt{770}}{924}$ $-\frac{41\sqrt{462}}{9240}$ 0 $\frac{41\sqrt{462}i}{9240}$ 0 0 0	
	0 0 0 $-\frac{23\sqrt{2310}}{9240}$ 0 $-\frac{23\sqrt{2310}i}{9240}$ 0 0 0 $\frac{17\sqrt{154}}{1848}$ 0 $-\frac{17\sqrt{154}i}{1848}$ $-\frac{19\sqrt{154}}{4620}$ 0	
	0 0 $-\frac{23\sqrt{2310}}{9240}$ 0 $\frac{23\sqrt{2310}i}{9240}$ 0 0 0 $\frac{17\sqrt{154}}{1848}$ 0 $\frac{17\sqrt{154}i}{1848}$ 0 0 $\frac{19\sqrt{154}}{4620}$	
	0 $-\frac{\sqrt{154}}{210}$ 0 0 $\frac{\sqrt{2310}}{4620}$ 0 0 $-\frac{\sqrt{2310}i}{462}$ 0 0 $-\frac{47\sqrt{154}}{4620}$ 0 0 $-\frac{2\sqrt{154}i}{1155}$	
	$-\frac{\sqrt{154}}{210}$ 0 0 0 0 $-\frac{\sqrt{2310}}{4620}$ $\frac{\sqrt{2310}i}{462}$ 0 0 0 0 $\frac{47\sqrt{154}}{4620}$ $\frac{2\sqrt{154}i}{1155}$ 0	
	0 $\frac{\sqrt{154}i}{210}$ $\frac{\sqrt{2310}}{4620}$ 0 0 0 0 $\frac{\sqrt{2310}}{462}$ $\frac{47\sqrt{154}}{4620}$ 0 0 0 0 $-\frac{2\sqrt{154}}{1155}$	
	$-\frac{\sqrt{154}i}{210}$ 0 0 $-\frac{\sqrt{2310}}{4620}$ 0 0 $\frac{\sqrt{2310}}{462}$ 0 0 $-\frac{47\sqrt{154}}{4620}$ 0 0 $-\frac{2\sqrt{154}}{1155}$ 0	
	$\frac{\sqrt{154}}{105}$ 0 0 $\frac{\sqrt{2310}i}{420}$ 0 $-\frac{\sqrt{2310}}{420}$ 0 0 0 $-\frac{\sqrt{154}i}{84}$ 0 $-\frac{\sqrt{154}}{84}$ 0 0	
	0 $-\frac{\sqrt{154}}{105}$ $-\frac{\sqrt{2310}i}{420}$ 0 $-\frac{\sqrt{2310}}{420}$ 0 0 0 $\frac{\sqrt{154}i}{84}$ 0 $-\frac{\sqrt{154}}{84}$ 0 0 0	
822	symmetry	$\frac{\sqrt{5}(x-y)(x+y)(x^2+y^2-6z^2)}{4}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{M}_{4,1}^{(1,1;a)}(E_u)$	0 0 0 $-\frac{23\sqrt{2310}}{9240}$ 0 $-\frac{23\sqrt{2310}i}{9240}$ 0 0 0 $-\frac{\sqrt{154}}{3080}$ 0 $\frac{\sqrt{154}i}{3080}$ $-\frac{3\sqrt{154}}{220}$ 0	
	0 0 $-\frac{23\sqrt{2310}}{9240}$ 0 $\frac{23\sqrt{2310}i}{9240}$ 0 0 0 $-\frac{\sqrt{154}}{3080}$ 0 $-\frac{\sqrt{154}i}{3080}$ 0 0 $\frac{3\sqrt{154}}{220}$	
	0 0 0 $\frac{9\sqrt{770}}{3080}$ 0 $-\frac{9\sqrt{770}i}{3080}$ $-\frac{\sqrt{770}}{220}$ 0 0 $\frac{41\sqrt{462}}{9240}$ 0 $\frac{41\sqrt{462}i}{9240}$ 0 0	
	0 0 $\frac{9\sqrt{770}}{3080}$ 0 $\frac{9\sqrt{770}i}{3080}$ 0 0 $\frac{\sqrt{770}}{220}$ $\frac{41\sqrt{462}}{9240}$ 0 $-\frac{41\sqrt{462}i}{9240}$ 0 0 0	
	0 $\frac{\sqrt{462}}{210}$ 0 0 $-\frac{\sqrt{770}}{220}$ 0 0 $\frac{\sqrt{770}i}{385}$ 0 0 $\frac{\sqrt{462}}{220}$ 0 0 $\frac{17\sqrt{462}i}{2310}$	
	$\frac{\sqrt{462}}{210}$ 0 0 0 $\frac{\sqrt{770}}{220}$ $-\frac{\sqrt{770}i}{385}$ 0 0 0 0 $-\frac{\sqrt{462}}{220}$ $-\frac{17\sqrt{462}i}{2310}$ 0	
	0 $\frac{\sqrt{462}i}{210}$ $\frac{\sqrt{770}}{220}$ 0 0 0 0 $\frac{\sqrt{770}}{385}$ $\frac{\sqrt{462}}{220}$ 0 0 0 0 $-\frac{17\sqrt{462}}{2310}$	
	$-\frac{\sqrt{462}i}{210}$ 0 0 $-\frac{\sqrt{770}}{220}$ 0 0 $\frac{\sqrt{770}}{385}$ 0 0 $-\frac{\sqrt{462}}{220}$ 0 0 $-\frac{17\sqrt{462}}{2310}$ 0	
	0 0 0 $-\frac{3\sqrt{770}i}{1540}$ 0 $-\frac{3\sqrt{770}}{1540}$ 0 0 0 $-\frac{13\sqrt{462}i}{4620}$ 0 $\frac{13\sqrt{462}}{4620}$ 0 0	
	0 0 $\frac{3\sqrt{770}i}{1540}$ 0 $-\frac{3\sqrt{770}}{1540}$ 0 0 0 $\frac{13\sqrt{462}i}{4620}$ 0 $\frac{13\sqrt{462}}{4620}$ 0 0	
823	symmetry	$\frac{\sqrt{35}yz(y-z)(y+z)}{2}$
$\mathbb{M}_{4,0}^{(1,1;a)}(T_u, 1)$	0 $-\frac{9\sqrt{22}}{440}$ 0 0 $\frac{\sqrt{330}}{120}$ 0 0 $-\frac{\sqrt{330}i}{132}$ 0 0 $-\frac{13\sqrt{22}}{440}$ 0 0 $-\frac{3\sqrt{22}i}{110}$	
	$-\frac{9\sqrt{22}}{440}$ 0 0 0 0 $-\frac{\sqrt{330}}{120}$ $\frac{\sqrt{330}i}{132}$ 0 0 0 0 $\frac{13\sqrt{22}}{440}$ $\frac{3\sqrt{22}i}{110}$ 0	
	0 $-\frac{3\sqrt{66}}{440}$ 0 0 $\frac{3\sqrt{110}}{440}$ 0 0 $-\frac{\sqrt{110}i}{110}$ 0 0 $-\frac{\sqrt{66}}{120}$ 0 0 $-\frac{7\sqrt{66}i}{660}$	
	$-\frac{3\sqrt{66}}{440}$ 0 0 0 0 $-\frac{3\sqrt{110}}{440}$ $\frac{\sqrt{110}i}{110}$ 0 0 0 0 $\frac{\sqrt{66}}{120}$ $\frac{7\sqrt{66}i}{660}$ 0	
	0 0 0 0 0 $-\frac{\sqrt{110}i}{55}$ $-\frac{\sqrt{110}}{55}$ 0 0 $\frac{3\sqrt{66}}{220}$ 0 $\frac{\sqrt{66}i}{66}$ $-\frac{\sqrt{66}}{66}$ 0	
	0 0 0 0 $\frac{\sqrt{110}i}{55}$ 0 0 $\frac{\sqrt{110}}{55}$ $\frac{3\sqrt{66}}{220}$ 0 $-\frac{\sqrt{66}i}{66}$ 0 0 $\frac{\sqrt{66}}{66}$	
	$\frac{\sqrt{66}}{330}$ 0 0 0 0 $\frac{3\sqrt{110}}{440}$ 0 0 0 $\frac{\sqrt{66}i}{330}$ 0 $-\frac{3\sqrt{66}}{440}$ 0 0	
	0 $-\frac{\sqrt{66}}{330}$ 0 0 $\frac{3\sqrt{110}}{440}$ 0 0 0 $-\frac{\sqrt{66}i}{330}$ 0 $-\frac{3\sqrt{66}}{440}$ 0 0	
	0 $\frac{\sqrt{66}i}{330}$ 0 0 0 0 0 $-\frac{3\sqrt{110}}{440}$ $-\frac{\sqrt{66}}{330}$ 0 0 0 0 $-\frac{3\sqrt{66}}{440}$	
	$-\frac{\sqrt{66}i}{330}$ 0 0 0 0 0 $-\frac{3\sqrt{110}}{440}$ 0 0 $\frac{\sqrt{66}}{330}$ 0 0 $-\frac{3\sqrt{66}}{440}$ 0	
824	symmetry	$-\frac{\sqrt{35}xz(x-z)(x+z)}{2}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{M}_{4,1}^{(1,1;a)}(T_u, 1)$	0	$-\frac{9\sqrt{22}i}{440} \quad -\frac{\sqrt{330}}{120} \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{330}}{132} \quad -\frac{13\sqrt{22}}{440} \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{3\sqrt{22}}{110}$
	$\frac{9\sqrt{22}i}{440}$	$0 \quad 0 \quad \frac{\sqrt{330}}{120} \quad 0 \quad 0 \quad -\frac{\sqrt{330}}{132} \quad 0 \quad 0 \quad \frac{13\sqrt{22}}{440} \quad 0 \quad 0 \quad \frac{3\sqrt{22}}{110} \quad 0$
	0	$\frac{3\sqrt{66}i}{440} \quad \frac{3\sqrt{110}}{440} \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{110}}{110} \quad \frac{\sqrt{66}}{120} \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{7\sqrt{66}}{660}$
	$-\frac{3\sqrt{66}i}{440}$	$0 \quad 0 \quad -\frac{3\sqrt{110}}{440} \quad 0 \quad 0 \quad \frac{\sqrt{110}}{110} \quad 0 \quad 0 \quad -\frac{\sqrt{66}}{120} \quad 0 \quad 0 \quad -\frac{7\sqrt{66}}{660} \quad 0$
	$-\frac{\sqrt{66}}{330}$	$0 \quad 0 \quad \frac{3\sqrt{110}i}{440} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{3\sqrt{66}i}{440} \quad 0 \quad -\frac{\sqrt{66}}{330} \quad 0 \quad 0$
	0	$\frac{\sqrt{66}}{330} \quad -\frac{3\sqrt{110}i}{440} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{3\sqrt{66}i}{440} \quad 0 \quad -\frac{\sqrt{66}}{330} \quad 0 \quad 0 \quad 0$
	0	$0 \quad 0 \quad -\frac{\sqrt{110}}{55} \quad 0 \quad 0 \quad \frac{\sqrt{110}}{55} \quad 0 \quad 0 \quad -\frac{\sqrt{66}}{66} \quad 0 \quad -\frac{3\sqrt{66}i}{220} \quad -\frac{\sqrt{66}}{66} \quad 0$
	0	$0 \quad 0 \quad -\frac{\sqrt{110}}{55} \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{110}}{55} \quad -\frac{\sqrt{66}}{66} \quad 0 \quad \frac{3\sqrt{66}i}{220} \quad 0 \quad 0 \quad \frac{\sqrt{66}}{66}$
	$\frac{\sqrt{66}}{330}$	$0 \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{3\sqrt{110}i}{440} \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{66}}{330} \quad 0 \quad 0 \quad \frac{3\sqrt{66}i}{440}$
	$\frac{\sqrt{66}}{330}$	$0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{3\sqrt{110}i}{440} \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{66}}{330} \quad -\frac{3\sqrt{66}i}{440} \quad 0$
825	symmetry	$\frac{\sqrt{35}xy(x-y)(x+y)}{2}$
$\mathbb{M}_{4,2}^{(1,1;a)}(T_u, 1)$	0	$0 \quad 0 \quad 0 \quad \frac{\sqrt{330}i}{1320} \quad 0 \quad \frac{\sqrt{330}}{1320} \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{22}i}{440} \quad 0 \quad \frac{\sqrt{22}}{440} \quad 0 \quad 0$
	0	$0 \quad 0 \quad -\frac{\sqrt{330}i}{1320} \quad 0 \quad \frac{\sqrt{330}}{1320} \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{22}i}{440} \quad 0 \quad \frac{\sqrt{22}}{440} \quad 0 \quad 0 \quad 0$
	$\frac{3\sqrt{66}}{220}$	$0 \quad 0 \quad \frac{7\sqrt{110}i}{440} \quad 0 \quad -\frac{7\sqrt{110}}{440} \quad 0 \quad 0 \quad 0 \quad -\frac{5\sqrt{66}i}{264} \quad 0 \quad -\frac{5\sqrt{66}}{264} \quad 0 \quad 0 \quad 0$
	$0 \quad -\frac{3\sqrt{66}}{220} \quad -\frac{7\sqrt{110}i}{440} \quad 0 \quad -\frac{7\sqrt{110}}{440} \quad 0 \quad 0 \quad 0 \quad \frac{5\sqrt{66}i}{264} \quad 0 \quad -\frac{5\sqrt{66}}{264} \quad 0 \quad 0 \quad 0$	
	$0 \quad -\frac{\sqrt{66}i}{330} \quad \frac{3\sqrt{110}}{440} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{3\sqrt{66}}{440} \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{66}}{330}$	
	$\frac{\sqrt{66}i}{330}$	$0 \quad 0 \quad -\frac{3\sqrt{110}}{440} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{3\sqrt{66}}{440} \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{66}}{330} \quad 0$
	$0 \quad -\frac{\sqrt{66}}{330} \quad 0 \quad 0 \quad -\frac{3\sqrt{110}}{440} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{3\sqrt{66}}{440} \quad 0 \quad 0 \quad \frac{\sqrt{66}i}{330}$	
	$-\frac{\sqrt{66}}{330}$	$0 \quad 0 \quad 0 \quad 0 \quad \frac{3\sqrt{110}}{440} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{3\sqrt{66}}{440} \quad -\frac{\sqrt{66}i}{330} \quad 0$
	0	$0 \quad 0 \quad 0 \quad \frac{\sqrt{110}}{55} \quad 0 \quad \frac{\sqrt{110}i}{55} \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{66}}{66} \quad 0 \quad \frac{\sqrt{66}i}{66} \quad \frac{3\sqrt{66}}{220} \quad 0$
	0	$0 \quad 0 \quad \frac{\sqrt{110}}{55} \quad 0 \quad -\frac{\sqrt{110}i}{55} \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{66}}{66} \quad 0 \quad -\frac{\sqrt{66}i}{66} \quad 0 \quad 0 \quad -\frac{3\sqrt{66}}{220}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{M}_{4,0}^{(1,1;a)}(T_u, 2)$	0	$-\frac{3\sqrt{154}}{440}$
	$-\frac{3\sqrt{154}}{440}$	0
	0	$-\frac{\sqrt{2310}}{1848}$
	$\frac{3\sqrt{462}}{440}$	0
	0	$-\frac{\sqrt{770}}{616}$
	$\frac{3\sqrt{462}}{440}$	0
	0	$-\frac{\sqrt{770}}{220}$
	0	$-\frac{\sqrt{770}}{385}$
	$\frac{17\sqrt{462}}{2310}$	0
	0	$-\frac{\sqrt{770}}{385}$
827	symmetry	$-\frac{\sqrt{5}xz(x^2 - 6y^2 + z^2)}{2}$
$\mathbb{M}_{4,1}^{(1,1;a)}(T_u, 2)$	0	$\frac{3\sqrt{154}}{440}$
	$-\frac{3\sqrt{154}}{440}$	0
	0	$-\frac{\sqrt{2310}}{1848}$
	0	$\frac{\sqrt{2310}}{1848}$
	$\frac{3\sqrt{462}}{440}$	0
	0	$\frac{\sqrt{770}}{616}$
	$-\frac{3\sqrt{462}}{440}$	0
	0	$-\frac{\sqrt{770}}{616}$
	$\frac{17\sqrt{462}}{2310}$	0
	0	$-\frac{\sqrt{770}}{440}$
828	symmetry	$-\frac{\sqrt{5}xy(x^2 + y^2 - 6z^2)}{2}$

continued ...

Table 9

No.	multipole	matrix
$\mathbb{M}_{4,2}^{(1,1;a)}(T_u, 2)$	$\frac{3\sqrt{154}}{220}$	0 0 $\frac{\sqrt{2310}i}{1848}$ 0 $-\frac{\sqrt{2310}}{1848}$ 0 0 0 $-\frac{29\sqrt{154}i}{3080}$ 0 $-\frac{29\sqrt{154}}{3080}$ 0 0
	0	$-\frac{3\sqrt{154}}{220}$ $-\frac{\sqrt{2310}i}{1848}$ 0 $-\frac{\sqrt{2310}}{1848}$ 0 0 0 $\frac{29\sqrt{154}i}{3080}$ 0 $-\frac{29\sqrt{154}}{3080}$ 0 0 0
	0	0 0 0 $-\frac{\sqrt{770}i}{616}$ 0 $-\frac{\sqrt{770}}{616}$ 0 0 0 $-\frac{29\sqrt{462}i}{9240}$ 0 $\frac{29\sqrt{462}}{9240}$ 0 0
	0	0 0 $\frac{\sqrt{770}i}{616}$ 0 $-\frac{\sqrt{770}}{616}$ 0 0 0 $\frac{29\sqrt{462}i}{9240}$ 0 $\frac{29\sqrt{462}}{9240}$ 0 0 0
	0	$-\frac{17\sqrt{462}i}{2310}$ $-\frac{\sqrt{770}}{440}$ 0 0 0 0 $-\frac{\sqrt{770}}{385}$ $-\frac{3\sqrt{462}}{440}$ 0 0 0 0 $\frac{\sqrt{462}}{210}$
	$\frac{17\sqrt{462}i}{2310}$	0 0 $\frac{\sqrt{770}}{440}$ 0 0 $-\frac{\sqrt{770}}{385}$ 0 0 $\frac{3\sqrt{462}}{440}$ 0 0 $\frac{\sqrt{462}}{210}$ 0
	0	$\frac{17\sqrt{462}}{2310}$ 0 0 $-\frac{\sqrt{770}}{440}$ 0 0 $\frac{\sqrt{770}i}{385}$ 0 0 $\frac{3\sqrt{462}}{440}$ 0 0 $\frac{\sqrt{462}i}{210}$
	$\frac{17\sqrt{462}}{2310}$	0 0 0 0 $\frac{\sqrt{770}}{440}$ $-\frac{\sqrt{770}i}{385}$ 0 0 0 0 $-\frac{3\sqrt{462}}{440}$ $-\frac{\sqrt{462}i}{210}$ 0
	0	0 0 0 $-\frac{\sqrt{770}}{385}$ 0 $\frac{\sqrt{770}i}{385}$ $\frac{\sqrt{770}}{220}$ 0 0 $-\frac{\sqrt{462}}{210}$ 0 $-\frac{\sqrt{462}i}{210}$ 0 0
	0	0 0 $-\frac{\sqrt{770}}{385}$ 0 $-\frac{\sqrt{770}i}{385}$ 0 0 $-\frac{\sqrt{770}}{220}$ $-\frac{\sqrt{462}}{210}$ 0 $\frac{\sqrt{462}i}{210}$ 0 0 0

bra: $= \langle f_3, \uparrow |, \langle f_3, \downarrow |, \langle f_{ax}, \uparrow |, \langle f_{ax}, \downarrow |, \langle f_{ay}, \uparrow |, \langle f_{ay}, \downarrow |, \langle f_{az}, \uparrow |, \langle f_{az}, \downarrow |, \langle f_{bx}, \uparrow |, \langle f_{bx}, \downarrow |, \langle f_{by}, \uparrow |, \langle f_{by}, \downarrow |, \langle f_{bz}, \uparrow |, \langle f_{bz}, \downarrow |$ ket: $= |f_3, \uparrow \rangle, |f_3, \downarrow \rangle, |f_{ax}, \uparrow \rangle, |f_{ax}, \downarrow \rangle, |f_{ay}, \uparrow \rangle, |f_{ay}, \downarrow \rangle, |f_{az}, \uparrow \rangle, |f_{az}, \downarrow \rangle, |f_{bx}, \uparrow \rangle, |f_{bx}, \downarrow \rangle, |f_{by}, \uparrow \rangle, |f_{by}, \downarrow \rangle, |f_{bz}, \uparrow \rangle, |f_{bz}, \downarrow \rangle$

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
$\mathbb{Q}_{2,0}^{(a)}(E_g)$	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{42}}{42} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{70}}{28} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{42}}{42} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{70}}{28} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{42}}{42} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}}{28} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{42}}{42} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}}{28} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{42}}{21} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{42}}{21} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{70}}{28} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{70}}{28} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{70}}{28} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}}{28} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
	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 0 0 0 0 0 0 0 0 0 0 0 0 0	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{14}}{14} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{210}}{84} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{14}}{14} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{210}}{84} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{14}}{14} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{210}}{84} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{14}}{14} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{210}}{84} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{210}}{42} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{210}}{42} \\ 0 & 0 & 0 & \frac{\sqrt{210}}{84} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{210}}{84} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{210}}{84} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{210}}{42} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{210}}{42} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
	832 symmetry	$\sqrt{3}yz$

continued ...

Table 10

No.	multipole	matrix
$\mathbb{Q}_{2,0}^{(a)}(T_g)$	0	0 0 $-\frac{\sqrt{210}}{42}$ 0 0 0 0 0 0 0 0 0 0 0
	0	0 0 0 $-\frac{\sqrt{210}}{42}$ 0 0 0 0 0 0 0 0 0 0
	$-\frac{\sqrt{210}}{42}$	0 0 0 0 0 0 0 0 0 0 0 0 0 0
	0	$-\frac{\sqrt{210}}{42}$ 0 0 0 0 0 0 0 0 0 0 0 0 0
	0	0 0 0 0 0 0 $-\frac{\sqrt{14}}{56}$ 0 0 0 0 0 $-\frac{\sqrt{210}}{168}$ 0
	0	0 0 0 0 0 0 0 $-\frac{\sqrt{14}}{56}$ 0 0 0 0 0 $-\frac{\sqrt{210}}{168}$
	0	0 0 0 0 $-\frac{\sqrt{14}}{56}$ 0 0 0 0 0 $\frac{\sqrt{210}}{168}$ 0 0 0
	0	0 0 0 0 0 $-\frac{\sqrt{14}}{56}$ 0 0 0 0 0 $\frac{\sqrt{210}}{168}$ 0 0 0
	0	0 0 0 0 0 0 0 0 0 0 0 0 0 0
	0	0 0 0 0 0 0 $\frac{\sqrt{210}}{168}$ 0 0 0 0 0 $-\frac{5\sqrt{14}}{56}$ 0
	0	0 0 0 0 0 0 0 $\frac{\sqrt{210}}{168}$ 0 0 0 0 0 $-\frac{5\sqrt{14}}{56}$
	0	0 0 0 0 $-\frac{\sqrt{210}}{168}$ 0 0 0 0 $-\frac{5\sqrt{14}}{56}$ 0 0 0
	0	0 0 0 0 0 $-\frac{\sqrt{210}}{168}$ 0 0 0 0 0 $-\frac{5\sqrt{14}}{56}$ 0 0 0

833 symmetry

 $\sqrt{3}xz$

continued ...

Table 10

No.	multipole	matrix
$\mathbb{Q}_{2,1}^{(a)}(T_g)$	0	0 0 0 0 $-\frac{\sqrt{210}}{42}$ 0 0 0 0 0 0 0 0 0 0
	0	0 0 0 0 0 $-\frac{\sqrt{210}}{42}$ 0 0 0 0 0 0 0 0 0
	0	0 0 0 0 0 0 $-\frac{\sqrt{14}}{56}$ 0 0 0 0 0 0 $\frac{\sqrt{210}}{168}$ 0
	0	0 0 0 0 0 0 0 $-\frac{\sqrt{14}}{56}$ 0 0 0 0 0 $\frac{\sqrt{210}}{168}$ 0
	$-\frac{\sqrt{210}}{42}$	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
	0	$-\frac{\sqrt{210}}{42}$ 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
	0	0 0 $-\frac{\sqrt{14}}{56}$ 0 0 0 0 0 0 $-\frac{\sqrt{210}}{168}$ 0 0 0 0 0 0
	0	0 0 0 $-\frac{\sqrt{14}}{56}$ 0 0 0 0 0 0 $-\frac{\sqrt{210}}{168}$ 0 0 0 0 0 0
	0	0 0 0 0 0 0 $-\frac{\sqrt{210}}{168}$ 0 0 0 0 0 $-\frac{5\sqrt{14}}{56}$ 0
	0	0 0 0 0 0 0 0 $-\frac{\sqrt{210}}{168}$ 0 0 0 0 0 $-\frac{5\sqrt{14}}{56}$ 0
	0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
	0	0 0 $\frac{\sqrt{210}}{168}$ 0 0 0 0 0 0 $-\frac{5\sqrt{14}}{56}$ 0 0 0 0 0 0
	0	0 0 0 $\frac{\sqrt{210}}{168}$ 0 0 0 0 0 0 $-\frac{5\sqrt{14}}{56}$ 0 0 0 0 0 0

834 symmetry

 $\sqrt{3}xy$

continued ...

Table 10

No.	multipole	matrix
$\mathbb{Q}_{2,2}^{(a)}(T_g)$	0	0 0 0 0 0 0 $-\frac{\sqrt{210}}{42}$ 0 0 0 0 0 0 0
	0	0 0 0 0 0 0 0 $-\frac{\sqrt{210}}{42}$ 0 0 0 0 0 0
	0	0 0 0 0 $-\frac{\sqrt{14}}{56}$ 0 0 0 0 0 $-\frac{\sqrt{210}}{168}$ 0 0 0
	0	0 0 0 0 0 $-\frac{\sqrt{14}}{56}$ 0 0 0 0 0 $-\frac{\sqrt{210}}{168}$ 0 0
	0	0 0 $-\frac{\sqrt{14}}{56}$ 0 0 0 0 0 $\frac{\sqrt{210}}{168}$ 0 0 0 0 0
	0	0 0 0 $-\frac{\sqrt{14}}{56}$ 0 0 0 0 0 $\frac{\sqrt{210}}{168}$ 0 0 0 0
	$-\frac{\sqrt{210}}{42}$	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
	0	$-\frac{\sqrt{210}}{42}$ 0 0 0 0 0 0 0 0 0 0 0 0 0 0
	0	0 0 0 0 $\frac{\sqrt{210}}{168}$ 0 0 0 0 0 $-\frac{5\sqrt{14}}{56}$ 0 0 0
	0	0 0 0 0 0 $\frac{\sqrt{210}}{168}$ 0 0 0 0 0 $-\frac{5\sqrt{14}}{56}$ 0 0
	0	0 0 $-\frac{\sqrt{210}}{168}$ 0 0 0 0 0 $-\frac{5\sqrt{14}}{56}$ 0 0 0 0
	0	0 0 0 $-\frac{\sqrt{210}}{168}$ 0 0 0 0 0 $-\frac{5\sqrt{14}}{56}$ 0 0 0
	0	0 0 0 0 0 0 0 0 0 0 0 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
$\mathbb{Q}_4^{(a)}(A_g)$	$-\frac{\sqrt{33}}{11} \quad 0 \quad 0$	
	$0 \quad -\frac{\sqrt{33}}{11} \quad 0 \quad 0$	
	$0 \quad 0 \quad \frac{\sqrt{33}}{22} \quad 0 \quad 0$	
	$0 \quad 0 \quad 0 \quad \frac{\sqrt{33}}{22} \quad 0 \quad 0$	
	$0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{33}}{22} \quad 0 \quad 0$	
	$0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{33}}{22} \quad 0 \quad 0$	
	$0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{33}}{22} \quad 0 \quad 0$	
	$0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{33}}{22} \quad 0 \quad 0$	
	$0 \quad 0 \quad -\frac{\sqrt{33}}{66} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0$	
	$0 \quad 0 \quad -\frac{\sqrt{33}}{66} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0$	
	$0 \quad 0 \quad -\frac{\sqrt{33}}{66} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0$	
	$0 \quad 0 \quad -\frac{\sqrt{33}}{66} \quad 0 \quad 0 \quad 0 \quad 0$	
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
$\mathbb{Q}_{4,0}^{(a)}(E_g)$	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{1155}}{308} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{77}}{308} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{1155}}{308} & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{77}}{308} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{1155}}{308} & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{77}}{308} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{1155}}{308} & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{77}}{308} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{1155}}{154} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{1155}}{154} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{3\sqrt{77}}{308} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{1155}}{132} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{3\sqrt{77}}{308} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{1155}}{132} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{3\sqrt{77}}{308} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{1155}}{132} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{77}}{308} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{1155}}{132} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{1155}}{66} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{1155}}{66} & 0 \end{bmatrix}$
	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 0 0 0 0 0 0 0 0 0 0 0 0 0	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & \frac{3\sqrt{385}}{308} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{231}}{308} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{3\sqrt{385}}{308} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{231}}{308} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{3\sqrt{385}}{308} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{231}}{308} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{385}}{308} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{231}}{308} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{385}}{308} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{231}}{308} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{231}}{154} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{231}}{154} \\ 0 & 0 & -\frac{\sqrt{231}}{308} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{385}}{44} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{231}}{308} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{385}}{44} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{231}}{308} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{385}}{44} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{231}}{308} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{385}}{44} & 0 & 0 \end{bmatrix}$
	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	
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	
838	symmetry	$\frac{\sqrt{35}yz(y-z)(y+z)}{2}$

continued ...

Table 10

No.	multipole	matrix
$\mathbb{Q}_{4,0}^{(a)}(T_g, 1)$	0 0 0 0 0 0 0 0 $\frac{\sqrt{55}}{22}$ 0 0 0 0 0 0	
	0 0 0 0 0 0 0 0 0 $\frac{\sqrt{55}}{22}$ 0 0 0 0 0	
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 $-\frac{\sqrt{33}}{22}$ 0	
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 $-\frac{\sqrt{33}}{22}$	
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	
	$\frac{\sqrt{55}}{22}$ 0 0 0 0 0 0 0 0 0 0 0 0 0 0	
	0 $\frac{\sqrt{55}}{22}$ 0 0 0 0 0 0 0 0 0 0 0 0 0	
	0 0 0 0 0 0 0 $-\frac{\sqrt{33}}{22}$ 0 0 0 0 0 0 0 0	
	0 0 0 0 0 0 0 $-\frac{\sqrt{33}}{22}$ 0 0 0 0 0 0 0 0	
	0 0 0 0 $-\frac{\sqrt{33}}{22}$ 0 0 0 0 0 0 0 0 0 0 0	
	0 0 0 0 0 $-\frac{\sqrt{33}}{22}$ 0 0 0 0 0 0 0 0 0 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 0 0 0 0 0 0 0 0 0 0 0 $\frac{\sqrt{55}}{22}$ 0 0 0	0 0 0 0 0 0 0 0 0 0 0 $\frac{\sqrt{55}}{22}$ 0 0 0													
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 $-\frac{\sqrt{33}}{22}$ 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 $-\frac{\sqrt{33}}{22}$ 0													
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0													
	0 0 0 0 0 0 0 0 0 0 0 $-\frac{\sqrt{33}}{22}$ 0 0 0 0 0	0 0 0 0 0 0 0 0 $-\frac{\sqrt{33}}{22}$ 0 0 0 0 0 0													
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 $-\frac{\sqrt{33}}{22}$ 0 0 0 0 0 0													
	0 0 0 0 0 0 0 0 0 0 0 $-\frac{\sqrt{33}}{22}$ 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0													
	$\frac{\sqrt{55}}{22}$ 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0													
	0 $\frac{\sqrt{55}}{22}$ 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0													
	0 0 $-\frac{\sqrt{33}}{22}$ 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0													
	0 0 0 $-\frac{\sqrt{33}}{22}$ 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0													
	0 0 0 0 $-\frac{\sqrt{33}}{22}$ 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0													

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 0 0 0 0 0 0 0 0 $\frac{\sqrt{55}}{22}$ 0	0 0 0 0 0 0 0 0 0 0 0 0 $\frac{\sqrt{55}}{22}$ 0													
	0 0 0 0 0 0 0 0 0 0 0 0 $-\frac{\sqrt{33}}{22}$ 0 0 0	0 0 0 0 0 0 0 0 0 0 0 $-\frac{\sqrt{33}}{22}$ 0 0 0													
	0 0 0 0 0 0 0 0 0 0 0 0 $-\frac{\sqrt{33}}{22}$ 0 0 0	0 0 0 0 0 0 0 0 0 0 0 $-\frac{\sqrt{33}}{22}$ 0 0 0													
	0 0 0 0 0 0 0 0 0 0 0 0 $-\frac{\sqrt{33}}{22}$ 0 0 0	0 0 0 0 0 0 0 0 0 0 0 $-\frac{\sqrt{33}}{22}$ 0 0 0													
	0 0 0 0 0 0 0 0 0 0 0 0 $-\frac{\sqrt{33}}{22}$ 0 0 0	0 0 0 0 0 0 0 0 0 0 0 $-\frac{\sqrt{33}}{22}$ 0 0 0													
	0 0 0 0 0 0 0 0 0 0 0 0 $-\frac{\sqrt{33}}{22}$ 0 0 0	0 0 0 0 0 0 0 0 0 0 0 $-\frac{\sqrt{33}}{22}$ 0 0 0													
	0 0 0 0 0 0 0 0 0 0 0 0 $-\frac{\sqrt{33}}{22}$ 0 0 0	0 0 0 0 0 0 0 0 0 0 0 $-\frac{\sqrt{33}}{22}$ 0 0 0													
	0 0 0 0 0 0 0 0 0 0 0 0 $-\frac{\sqrt{33}}{22}$ 0 0 0	0 0 0 0 0 0 0 0 0 0 0 $-\frac{\sqrt{33}}{22}$ 0 0 0													
	0 0 $-\frac{\sqrt{33}}{22}$ 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 $-\frac{\sqrt{33}}{22}$ 0 0 0 0 0 0 0 0 0 0 0 0 0													
	0 0 0 $-\frac{\sqrt{33}}{22}$ 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 $-\frac{\sqrt{33}}{22}$ 0 0 0 0 0 0 0 0 0 0 0 0 0													
	$\frac{\sqrt{55}}{22}$ 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0													
	0 $\frac{\sqrt{55}}{22}$ 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0													
841	symmetry	$\frac{\sqrt{5}yz(6x^2-y^2-z^2)}{2}$													

continued ...

Table 10

No.	multipole	matrix
$\mathbb{Q}_{4,0}^{(a)}(T_g, 2)$	0	0 $-\frac{\sqrt{231}}{154}$ 0 0 0 0 0 0 0 0 0 0 0 0
	0	0 0 $-\frac{\sqrt{231}}{154}$ 0 0 0 0 0 0 0 0 0 0 0
	$-\frac{\sqrt{231}}{154}$	0 0 0 0 0 0 0 0 0 0 0 0 0 0
	0	$-\frac{\sqrt{231}}{154}$ 0 0 0 0 0 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 $-\frac{\sqrt{231}}{77}$ 0
	0	0 0 0 0 0 0 0 $\frac{3\sqrt{385}}{154}$ 0 0 0 0 0 $-\frac{\sqrt{231}}{77}$
	0	0 0 0 0 0 $\frac{3\sqrt{385}}{154}$ 0 0 0 0 $\frac{\sqrt{231}}{77}$ 0 0 0
	0	0 0 0 0 0 0 $\frac{3\sqrt{385}}{154}$ 0 0 0 0 0 $\frac{\sqrt{231}}{77}$ 0 0
	0	0 0 0 0 0 0 0 0 0 0 0 0 0 0
	0	0 0 0 0 0 0 0 0 0 0 0 0 0 0
	0	0 0 0 0 0 0 0 $\frac{\sqrt{231}}{77}$ 0 0 0 0 0 $\frac{\sqrt{385}}{154}$ 0
	0	0 0 0 0 0 0 0 $\frac{\sqrt{231}}{77}$ 0 0 0 0 0 0 $\frac{\sqrt{385}}{154}$
	0	0 0 0 0 $-\frac{\sqrt{231}}{77}$ 0 0 0 0 0 $\frac{\sqrt{385}}{154}$ 0 0 0
	0	0 0 0 0 0 $-\frac{\sqrt{231}}{77}$ 0 0 0 0 0 $\frac{\sqrt{385}}{154}$ 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	0 0 0 0 $-\frac{\sqrt{231}}{154}$ 0 0 0 0 0 0 0 0 0 0
	0	0 0 0 0 0 $-\frac{\sqrt{231}}{154}$ 0 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 $\frac{\sqrt{231}}{77}$ 0
	0	0 0 0 0 0 0 0 $\frac{3\sqrt{385}}{154}$ 0 0 0 0 0 $\frac{\sqrt{231}}{77}$
	$-\frac{\sqrt{231}}{154}$	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
	0	$-\frac{\sqrt{231}}{154}$ 0 0 0 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 $-\frac{\sqrt{231}}{77}$ 0 0 0 0 0 0
	0	0 0 0 $\frac{3\sqrt{385}}{154}$ 0 0 0 0 0 $-\frac{\sqrt{231}}{77}$ 0 0 0 0 0 0
	0	0 0 0 0 0 0 $-\frac{\sqrt{231}}{77}$ 0 0 0 0 0 $\frac{\sqrt{385}}{154}$ 0
	0	0 0 0 0 0 0 0 $-\frac{\sqrt{231}}{77}$ 0 0 0 0 0 $\frac{\sqrt{385}}{154}$
	0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
	0	0 0 0 $\frac{\sqrt{231}}{77}$ 0 0 0 0 0 $\frac{\sqrt{385}}{154}$ 0 0 0 0 0 0
	0	0 0 0 $\frac{\sqrt{231}}{77}$ 0 0 0 0 0 0 $\frac{\sqrt{385}}{154}$ 0 0 0 0 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 0 0 0 0 0 $-\frac{\sqrt{231}}{154}$ 0 0 0 0 0 0 0
	0	0 0 0 0 0 0 0 $-\frac{\sqrt{231}}{154}$ 0 0 0 0 0 0
	0	0 0 0 0 $\frac{3\sqrt{385}}{154}$ 0 0 0 0 0 $-\frac{\sqrt{231}}{77}$ 0 0 0 0
	0	0 0 0 0 0 $\frac{3\sqrt{385}}{154}$ 0 0 0 0 0 $-\frac{\sqrt{231}}{77}$ 0 0 0
	0	0 0 $\frac{3\sqrt{385}}{154}$ 0 0 0 0 0 $\frac{\sqrt{231}}{77}$ 0 0 0 0 0
	0	0 0 0 $\frac{3\sqrt{385}}{154}$ 0 0 0 0 0 $\frac{\sqrt{231}}{77}$ 0 0 0 0
	$-\frac{\sqrt{231}}{154}$	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
	0	$-\frac{\sqrt{231}}{154}$ 0 0 0 0 0 0 0 0 0 0 0 0 0 0
	0	0 0 0 0 $\frac{\sqrt{231}}{77}$ 0 0 0 0 0 $\frac{\sqrt{385}}{154}$ 0 0 0
	0	0 0 0 0 0 $\frac{\sqrt{231}}{77}$ 0 0 0 0 0 $\frac{\sqrt{385}}{154}$ 0 0 0
	0	0 0 $-\frac{\sqrt{231}}{77}$ 0 0 0 0 0 0 $\frac{\sqrt{385}}{154}$ 0 0 0 0
	0	0 0 0 $-\frac{\sqrt{231}}{77}$ 0 0 0 0 0 0 $\frac{\sqrt{385}}{154}$ 0 0 0 0
	0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
	0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
$\frac{\sqrt{2}(2x^6 - 15x^4y^2 - 15x^4z^2 - 15x^2y^4 + 180x^2y^2z^2 - 15x^2z^4 + 2y^6 - 15y^4z^2 - 15y^2z^4 + 2z^6)}{8}$		

844 symmetry

continued ...

Table 10

No.	multipole	matrix
$\mathbb{Q}_6^{(a)}(A_g, 1)$	$\frac{2\sqrt{231}}{77} \quad 0 \quad 0$	
	$0 \quad \frac{2\sqrt{231}}{77} \quad 0 \quad 0$	
	$0 \quad 0 \quad \frac{5\sqrt{231}}{462} \quad 0 \quad 0$	
	$0 \quad 0 \quad 0 \quad \frac{5\sqrt{231}}{462} \quad 0 \quad 0$	
	$0 \quad 0 \quad 0 \quad 0 \quad \frac{5\sqrt{231}}{462} \quad 0 \quad 0$	
	$0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{5\sqrt{231}}{462} \quad 0 \quad 0$	
	$0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{5\sqrt{231}}{462} \quad 0 \quad 0$	
	$0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{5\sqrt{231}}{462} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0$	
	$0 \quad 0 \quad -\frac{3\sqrt{231}}{154} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0$	
	$0 \quad 0 \quad -\frac{3\sqrt{231}}{154} \quad 0 \quad 0 \quad 0 \quad 0 \quad 0$	
	$0 \quad 0 \quad -\frac{3\sqrt{231}}{154} \quad 0 \quad 0 \quad 0 \quad 0$	
	$0 \quad 0 \quad -\frac{3\sqrt{231}}{154} \quad 0 \quad 0 \quad 0$	
	$0 \quad 0 \quad -\frac{3\sqrt{231}}{154} \quad 0 \quad 0$	
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 0 0 0 0 0 0	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{6} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{6} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{6} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{6} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{6} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{6} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{6} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{6} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{6} \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	$\frac{\sqrt{14}(x^6 - 15x^4z^2 + 15x^2z^4 + y^6 - 15y^4z^2 + 15y^2z^4 - 2z^6)}{8}$
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	
846	symmetry	

continued ...

Table 10

No.	multipole	matrix
$\mathbb{Q}_{6,0}^{(a)}(E_g)$	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{5\sqrt{33}}{132} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{55}}{44} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{5\sqrt{33}}{132} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{55}}{44} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{5\sqrt{33}}{132} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{55}}{44} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{5\sqrt{33}}{132} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{55}}{44} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{5\sqrt{33}}{66} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{55}}{44} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{5\sqrt{33}}{66} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{55}}{44} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{33}}{44} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{55}}{44} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{33}}{44} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{55}}{44} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{33}}{44} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{55}}{44} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{33}}{44} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{33}}{22} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{33}}{22} \end{bmatrix}$
	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 0 0 0 0 0 0	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & \frac{5\sqrt{11}}{44} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{165}}{132} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{5\sqrt{11}}{44} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{165}}{132} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{5\sqrt{11}}{44} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{165}}{132} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{5\sqrt{11}}{44} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{165}}{132} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{5\sqrt{11}}{44} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{165}}{132} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{165}}{66} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{165}}{66} \\ 0 & 0 & 0 & -\frac{\sqrt{165}}{132} & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{11}}{44} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{165}}{132} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{11}}{44} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{165}}{132} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{11}}{44} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{165}}{132} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{11}}{44} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{165}}{66} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{165}}{66} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
	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 0 0 $\frac{\sqrt{66}}{22}$ 0 0 0 0 0	
	0 0 0 0 0 0 0 0 0 $\frac{\sqrt{66}}{22}$ 0 0 0 0	
	0 0 0 0 0 0 0 0 0 0 0 0 0 0	
	0 0 0 0 0 0 0 0 0 0 0 0 0 0	
	0 0 0 0 0 0 0 0 0 0 0 0 0 $\frac{\sqrt{110}}{44}$ 0	
	0 0 0 0 0 0 0 0 0 0 0 0 0 $\frac{\sqrt{110}}{44}$	
	0 0 0 0 0 0 0 0 0 0 $\frac{\sqrt{110}}{44}$ 0 0 0	
	0 0 0 0 0 0 0 0 0 0 0 0 $\frac{\sqrt{110}}{44}$ 0 0	
	$\frac{\sqrt{66}}{22}$ 0 0 0 0 0 0 0 0 0 0 0 0 0 0	
	0 $\frac{\sqrt{66}}{22}$ 0 0 0 0 0 0 0 0 0 0 0 0 0	
	0 0 0 0 0 0 0 $\frac{\sqrt{110}}{44}$ 0 0 0 0 0 0 0	
	0 0 0 0 0 0 0 0 $\frac{\sqrt{110}}{44}$ 0 0 0 0 0 0	
	0 0 0 0 0 $\frac{\sqrt{110}}{44}$ 0 0 0 0 0 0 0 0 0	
	0 0 0 0 0 0 $\frac{\sqrt{110}}{44}$ 0 0 0 0 0 0 0 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 0 0 0 0 $\frac{\sqrt{66}}{22}$ 0 0 0	
	0 0 0 0 0 0 0 0 0 0 0 $\frac{\sqrt{66}}{22}$ 0 0 0	
	0 0 0 0 0 0 0 0 0 0 0 0 0 $\frac{\sqrt{110}}{44}$ 0	
	0 0 0 0 0 0 0 0 0 0 0 0 0 $\frac{\sqrt{110}}{44}$	
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	
	0 0 0 0 0 0 0 0 0 $\frac{\sqrt{110}}{44}$ 0 0 0 0 0	
	0 0 0 0 0 0 0 0 0 0 $\frac{\sqrt{110}}{44}$ 0 0 0 0	
	0 0 0 0 0 0 $\frac{\sqrt{110}}{44}$ 0 0 0 0 0 0 0	
	0 0 0 0 0 0 0 $\frac{\sqrt{110}}{44}$ 0 0 0 0 0 0	
	$\frac{\sqrt{66}}{22}$ 0 0 0 0 0 0 0 0 0 0 0 0 0 0	
	0 $\frac{\sqrt{66}}{22}$ 0 0 0 0 0 0 0 0 0 0 0 0 0	
	0 0 $\frac{\sqrt{110}}{44}$ 0 0 0 0 0 0 0 0 0 0 0 0	
	0 0 0 $\frac{\sqrt{110}}{44}$ 0 0 0 0 0 0 0 0 0 0 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 $\frac{\sqrt{66}}{22}$ 0
	0	0 0 0 0 0 0 0 0 0 0 0 0 $\frac{\sqrt{66}}{22}$
	0	0 0 0 0 0 0 0 0 0 0 $\frac{\sqrt{110}}{44}$ 0 0 0
	0	0 0 0 0 0 0 0 0 0 0 0 $\frac{\sqrt{110}}{44}$ 0 0
	0	0 0 0 0 0 0 0 0 $\frac{\sqrt{110}}{44}$ 0 0 0 0 0
	0	0 0 0 0 0 0 0 0 0 $\frac{\sqrt{110}}{44}$ 0 0 0 0
	0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
	0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
	0	0 0 0 0 $\frac{\sqrt{110}}{44}$ 0 0 0 0 0 0 0 0 0 0
	0	0 0 0 0 0 $\frac{\sqrt{110}}{44}$ 0 0 0 0 0 0 0 0 0
	0	0 0 $\frac{\sqrt{110}}{44}$ 0 0 0 0 0 0 0 0 0 0 0 0
	0	0 0 0 $\frac{\sqrt{110}}{44}$ 0 0 0 0 0 0 0 0 0 0 0
	$\frac{\sqrt{66}}{22}$	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
	0	$\frac{\sqrt{66}}{22}$ 0 0 0 0 0 0 0 0 0 0 0 0 0 0

continued ...

Table 10

No.	multipole	matrix
$\mathbb{Q}_{6,0}^{(a)}(T_g, 2)$	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 $-\frac{5}{16}$ 0 0 0 0 0 $-\frac{\sqrt{15}}{16}$ 0	
	0 0 0 0 0 0 0 $-\frac{5}{16}$ 0 0 0 0 0 0 $-\frac{\sqrt{15}}{16}$	
	0 0 0 0 $-\frac{5}{16}$ 0 0 0 0 0 $\frac{\sqrt{15}}{16}$ 0 0 0	
	0 0 0 0 0 $-\frac{5}{16}$ 0 0 0 0 0 $\frac{\sqrt{15}}{16}$ 0 0 0	
	0 0 0 0 0 0 0 0 0 0 0 0 0 0	
	0 0 0 0 0 0 0 $\frac{\sqrt{15}}{16}$ 0 0 0 0 0 $\frac{3}{16}$ 0	
	0 0 0 0 0 0 0 $\frac{\sqrt{15}}{16}$ 0 0 0 0 0 0 $\frac{3}{16}$	
	0 0 0 0 $-\frac{\sqrt{15}}{16}$ 0 0 0 0 0 $\frac{3}{16}$ 0 0 0	
	0 0 0 0 0 $-\frac{\sqrt{15}}{16}$ 0 0 0 0 0 0 $\frac{3}{16}$ 0 0 0	
$\frac{\sqrt{462}xz(x^2-3z^2)(3x^2-z^2)}{16}$		
852	symmetry	

continued ...

Table 10

No.	multipole	matrix
$\mathbb{Q}_{6,1}^{(a)}(T_g, 2)$	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{5}{16} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{16} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{5}{16} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{16} \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{5}{16} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{16} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{5}{16} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{16} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{16} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3}{16} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{16} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3}{16} \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{15}}{16} & 0 & 0 & 0 & 0 & 0 & \frac{3}{16} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{15}}{16} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3}{16} & 0 & 0 & 0 & 0 \end{bmatrix}$
	853 symmetry	$\frac{\sqrt{462}xy(x^2-3y^2)(3x^2-y^2)}{16}$

continued ...

Table 10

No.	multipole	matrix
		$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{5}{16} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{16} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{5}{16} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{15}}{16} & 0 & 0 \\ 0 & 0 & -\frac{5}{16} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{16} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{5}{16} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{16} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{16} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3}{16} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{15}}{16} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3}{16} & 0 \\ 0 & 0 & -\frac{\sqrt{15}}{16} & 0 & 0 & 0 & 0 & 0 & \frac{3}{16} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{15}}{16} & 0 & 0 & 0 & 0 & 0 & \frac{3}{16} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
$\mathbb{Q}_{6,2}^{(a)}(T_g, 2)$		$\frac{\sqrt{210}yz(16x^4 - 16x^2y^2 - 16x^2z^2 + y^4 + 2y^2z^2 + z^4)}{16}$
854	symmetry	

continued ...

Table 10

No.	multipole	matrix
$\mathbb{Q}_{6,0}^{(a)}(T_g, 3)$	0 0 $\frac{2\sqrt{33}}{33}$ 0 0 0 0 0 0 0 0 0 0 0	
	0 0 0 $\frac{2\sqrt{33}}{33}$ 0 0 0 0 0 0 0 0 0 0	
	$\frac{2\sqrt{33}}{33}$ 0 0 0 0 0 0 0 0 0 0 0 0 0	
	0 $\frac{2\sqrt{33}}{33}$ 0 0 0 0 0 0 0 0 0 0 0 0	
	0 0 0 0 0 0 $\frac{\sqrt{55}}{176}$ 0 0 0 0 0 $-\frac{13\sqrt{33}}{528}$ 0	
	0 0 0 0 0 0 0 $\frac{\sqrt{55}}{176}$ 0 0 0 0 0 $-\frac{13\sqrt{33}}{528}$	
	0 0 0 0 0 $\frac{\sqrt{55}}{176}$ 0 0 0 0 $-\frac{13\sqrt{33}}{528}$ 0 0 0	
	0 0 0 0 0 0 $\frac{\sqrt{55}}{176}$ 0 0 0 0 $-\frac{13\sqrt{33}}{528}$ 0 0 0	
	0 0 0 0 0 0 0 0 0 0 0 0 0 0	
	0 0 0 0 0 0 0 0 0 0 0 0 0 0	
	0 0 0 0 0 0 0 $\frac{13\sqrt{33}}{528}$ 0 0 0 0 0 $-\frac{7\sqrt{55}}{176}$ 0	
	0 0 0 0 0 0 0 $\frac{13\sqrt{33}}{528}$ 0 0 0 0 0 $-\frac{7\sqrt{55}}{176}$	
	0 0 0 0 0 $-\frac{13\sqrt{33}}{528}$ 0 0 0 0 $-\frac{7\sqrt{55}}{176}$ 0 0 0	
	0 0 0 0 0 $-\frac{13\sqrt{33}}{528}$ 0 0 0 0 0 $-\frac{7\sqrt{55}}{176}$ 0 0 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 $\frac{2\sqrt{33}}{33}$ 0 0 0 0 0 0 0 0 0 0	
	0 0 0 0 0 $\frac{2\sqrt{33}}{33}$ 0 0 0 0 0 0 0 0 0	
	0 0 0 0 0 0 $\frac{\sqrt{55}}{176}$ 0 0 0 0 0 0 $\frac{13\sqrt{33}}{528}$ 0	
	0 0 0 0 0 0 0 $\frac{\sqrt{55}}{176}$ 0 0 0 0 0 0 $\frac{13\sqrt{33}}{528}$	
	$\frac{2\sqrt{33}}{33}$ 0 0 0 0 0 0 0 0 0 0 0 0 0 0	
	0 $\frac{2\sqrt{33}}{33}$ 0 0 0 0 0 0 0 0 0 0 0 0 0	
	0 0 $\frac{\sqrt{55}}{176}$ 0 0 0 0 0 $-\frac{13\sqrt{33}}{528}$ 0 0 0 0 0 0	
	0 0 0 $\frac{\sqrt{55}}{176}$ 0 0 0 0 0 $-\frac{13\sqrt{33}}{528}$ 0 0 0 0 0 0	
	0 0 0 0 0 0 $-\frac{13\sqrt{33}}{528}$ 0 0 0 0 0 $-\frac{7\sqrt{55}}{176}$ 0	
	0 0 0 0 0 0 0 $-\frac{13\sqrt{33}}{528}$ 0 0 0 0 0 $-\frac{7\sqrt{55}}{176}$	
	0 0 0 $\frac{13\sqrt{33}}{528}$ 0 0 0 0 0 $-\frac{7\sqrt{55}}{176}$ 0 0 0 0 0	
	0 0 0 $\frac{13\sqrt{33}}{528}$ 0 0 0 0 0 0 $-\frac{7\sqrt{55}}{176}$ 0 0 0 0 0	
$\frac{\sqrt{210}xy(x^4+2x^2y^2-16x^2z^2+y^4-16y^2z^2+16z^4)}{16}$		
856	symmetry	

continued ...

Table 10

No.	multipole	matrix
$\mathbb{Q}_{6,2}^{(a)}(T_g, 3)$	0 0 0 0 0 0 $\frac{2\sqrt{33}}{33}$ 0 0 0 0 0 0	
	0 0 0 0 0 0 0 $\frac{2\sqrt{33}}{33}$ 0 0 0 0 0 0	
	0 0 0 0 $\frac{\sqrt{55}}{176}$ 0 0 0 0 0 $-\frac{13\sqrt{33}}{528}$ 0 0 0 0	
	0 0 0 0 0 $\frac{\sqrt{55}}{176}$ 0 0 0 0 0 $-\frac{13\sqrt{33}}{528}$ 0 0 0	
	0 0 $\frac{\sqrt{55}}{176}$ 0 0 0 0 0 $\frac{13\sqrt{33}}{528}$ 0 0 0 0 0	
	0 0 0 $\frac{\sqrt{55}}{176}$ 0 0 0 0 0 $\frac{13\sqrt{33}}{528}$ 0 0 0 0	
	$\frac{2\sqrt{33}}{33}$ 0 0 0 0 0 0 0 0 0 0 0 0 0 0	
	0 $\frac{2\sqrt{33}}{33}$ 0 0 0 0 0 0 0 0 0 0 0 0 0	
	0 0 0 0 $\frac{13\sqrt{33}}{528}$ 0 0 0 0 0 $-\frac{7\sqrt{55}}{176}$ 0 0 0 0	
	0 0 0 0 0 $\frac{13\sqrt{33}}{528}$ 0 0 0 0 0 $-\frac{7\sqrt{55}}{176}$ 0 0 0	
	0 0 $-\frac{13\sqrt{33}}{528}$ 0 0 0 0 $-\frac{7\sqrt{55}}{176}$ 0 0 0 0 0 0	
	0 0 0 $-\frac{13\sqrt{33}}{528}$ 0 0 0 0 0 $-\frac{7\sqrt{55}}{176}$ 0 0 0 0	
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	
857 symmetry		$-\frac{x^2}{2} - \frac{y^2}{2} + z^2$

continued ...

Table 10

No.	multipole	matrix													
$\mathbb{Q}_{2,0}^{(1,-1;a)}(E_g)$	0	0	0	0	0	0	0	0	$-\frac{\sqrt{21}i}{42}$	0	$-\frac{\sqrt{21}}{42}$	$\frac{\sqrt{21}i}{21}$	0	0	
	0	0	0	0	0	0	0	$-\frac{\sqrt{21}i}{42}$	0	$\frac{\sqrt{21}}{42}$	0	0	$-\frac{\sqrt{21}i}{21}$	0	
	0	0	0	0	$\frac{\sqrt{21}i}{28}$	0	0	$\frac{\sqrt{21}}{56}$	0	0	$\frac{\sqrt{35}i}{28}$	0	0	$-\frac{\sqrt{35}}{56}$	
	0	0	0	0	0	$-\frac{\sqrt{21}i}{28}$	$-\frac{\sqrt{21}}{56}$	0	0	0	0	$-\frac{\sqrt{35}i}{28}$	$\frac{\sqrt{35}}{56}$	0	
	0	0	$-\frac{\sqrt{21}i}{28}$	0	0	0	0	$-\frac{\sqrt{21}i}{56}$	$\frac{\sqrt{35}i}{28}$	0	0	0	0	$-\frac{\sqrt{35}i}{56}$	
	0	0	0	$\frac{\sqrt{21}i}{28}$	0	0	$-\frac{\sqrt{21}i}{56}$	0	0	$-\frac{\sqrt{35}i}{28}$	0	0	$-\frac{\sqrt{35}i}{56}$	0	
	0	0	0	$-\frac{\sqrt{21}}{56}$	0	$\frac{\sqrt{21}i}{56}$	0	0	0	$-\frac{\sqrt{35}}{56}$	0	$-\frac{\sqrt{35}i}{56}$	0	0	
	0	0	$\frac{\sqrt{21}}{56}$	0	$\frac{\sqrt{21}i}{56}$	0	0	0	$\frac{\sqrt{35}}{56}$	0	$-\frac{\sqrt{35}i}{56}$	0	0	0	
	0	$\frac{\sqrt{21}i}{42}$	0	0	$-\frac{\sqrt{35}i}{28}$	0	0	$\frac{\sqrt{35}}{56}$	0	0	$-\frac{\sqrt{21}i}{84}$	0	0	$-\frac{\sqrt{21}}{168}$	
	$\frac{\sqrt{21}i}{42}$	0	0	0	0	$\frac{\sqrt{35}i}{28}$	$-\frac{\sqrt{35}}{56}$	0	0	0	0	$\frac{\sqrt{21}i}{84}$	$\frac{\sqrt{21}}{168}$	0	
	0	$\frac{\sqrt{21}}{42}$	$-\frac{\sqrt{35}i}{28}$	0	0	0	0	$\frac{\sqrt{35}i}{56}$	$\frac{\sqrt{21}i}{84}$	0	0	0	0	$\frac{\sqrt{21}i}{168}$	
	$-\frac{\sqrt{21}}{42}$	0	0	$\frac{\sqrt{35}i}{28}$	0	0	$\frac{\sqrt{35}i}{56}$	0	0	$-\frac{\sqrt{21}i}{84}$	0	0	$\frac{\sqrt{21}i}{168}$	0	
	$-\frac{\sqrt{21}i}{21}$	0	0	$\frac{\sqrt{35}}{56}$	0	$\frac{\sqrt{35}i}{56}$	0	0	0	$\frac{\sqrt{21}}{168}$	0	$-\frac{\sqrt{21}i}{168}$	0	0	
	0	$\frac{\sqrt{21}i}{21}$	$-\frac{\sqrt{35}}{56}$	0	$\frac{\sqrt{35}i}{56}$	0	0	0	$-\frac{\sqrt{21}}{168}$	0	$-\frac{\sqrt{21}i}{168}$	0	0	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 0 0 0 0 0 0 0 $\frac{\sqrt{7}i}{14}$ 0 $-\frac{\sqrt{7}}{14}$ 0 0	0 0 0 0 0 0 0 0 $\frac{\sqrt{7}i}{14}$ 0 $\frac{\sqrt{7}}{14}$ 0 0 0 0	0 0 0 0 0 0 0 $\frac{3\sqrt{7}}{56}$ 0 0 0 0 0 $-\frac{\sqrt{105}}{56}$	0 0 0 0 0 0 0 $-\frac{3\sqrt{7}}{56}$ 0 0 0 0 0 $\frac{\sqrt{105}}{56}$ 0	0 0 0 0 0 0 0 $\frac{3\sqrt{7}i}{56}$ 0 0 0 0 0 $-\frac{\sqrt{105}i}{56}$	0 0 0 0 0 0 0 $\frac{3\sqrt{7}i}{56}$ 0 0 0 0 0 $\frac{\sqrt{105}i}{56}$ 0	0 0 0 $-\frac{3\sqrt{7}}{56}$ 0 $-\frac{3\sqrt{7}i}{56}$ 0 0 0 $-\frac{\sqrt{105}}{56}$ 0 $\frac{\sqrt{105}i}{56}$ 0 0 0	0 0 $\frac{3\sqrt{7}}{56}$ 0 $-\frac{3\sqrt{7}i}{56}$ 0 0 0 $\frac{\sqrt{105}}{56}$ 0 $\frac{\sqrt{105}i}{56}$ 0 0 0 0	0 $-\frac{\sqrt{7}i}{14}$ 0 0 0 0 0 $\frac{\sqrt{105}}{56}$ 0 0 0 0 0 $-\frac{\sqrt{7}}{56}$	$-\frac{\sqrt{7}i}{14}$ 0 0 0 0 0 $-\frac{\sqrt{105}}{56}$ 0 0 0 0 0 $\frac{\sqrt{7}}{56}$ 0	0 $\frac{\sqrt{7}}{14}$ 0 0 0 0 0 $-\frac{\sqrt{105}i}{56}$ 0 0 0 0 0 $-\frac{\sqrt{7}i}{56}$	$-\frac{\sqrt{7}}{14}$ 0 0 0 0 0 $-\frac{\sqrt{105}i}{56}$ 0 0 0 0 0 $-\frac{\sqrt{7}i}{56}$ 0	0 0 0 $\frac{\sqrt{105}}{56}$ 0 $-\frac{\sqrt{105}i}{56}$ 0 0 0 $\frac{\sqrt{7}}{56}$ 0 $\frac{\sqrt{7}i}{56}$ 0 0 0	0 0 $-\frac{\sqrt{105}}{56}$ 0 $-\frac{\sqrt{105}i}{56}$ 0 0 0 $-\frac{\sqrt{7}}{56}$ 0 $\frac{\sqrt{7}i}{56}$ 0 0 0 0	
	symmetry	$\sqrt{3}yz$													

continued ...

Table 10

No.	multipole	matrix
$\mathbb{Q}_{2,0}^{(1,-1;a)}(T_g)$	0 0 0 0 0 0 0 0 0 0 $\frac{\sqrt{7}i}{14}$ 0 0 $\frac{\sqrt{7}}{14}$	
	0 0 0 0 0 0 0 0 0 0 0 $-\frac{\sqrt{7}i}{14}$ $-\frac{\sqrt{7}}{14}$ 0	
	0 0 0 0 0 $\frac{3\sqrt{7}}{56}$ $-\frac{3\sqrt{7}i}{56}$ 0 0 0 0 $\frac{\sqrt{105}}{56}$ $\frac{\sqrt{105}i}{56}$ 0	
	0 0 0 0 $-\frac{3\sqrt{7}}{56}$ 0 0 $\frac{3\sqrt{7}i}{56}$ 0 0 $-\frac{\sqrt{105}}{56}$ 0 0 $-\frac{\sqrt{105}i}{56}$	
	0 0 0 $-\frac{3\sqrt{7}}{56}$ 0 0 0 0 $\frac{\sqrt{105}}{56}$ 0 0 0 0	
	0 0 $\frac{3\sqrt{7}}{56}$ 0 0 0 0 0 $-\frac{\sqrt{105}}{56}$ 0 0 0 0	
	0 0 $\frac{3\sqrt{7}i}{56}$ 0 0 0 0 0 0 $\frac{\sqrt{105}i}{56}$ 0 0 0 0	
	0 0 0 $-\frac{3\sqrt{7}i}{56}$ 0 0 0 0 0 $-\frac{\sqrt{105}i}{56}$ 0 0 0 0	
	0 0 0 0 0 $-\frac{\sqrt{105}}{56}$ $-\frac{\sqrt{105}i}{56}$ 0 0 0 0 $-\frac{\sqrt{7}}{56}$ $\frac{\sqrt{7}i}{56}$ 0	
	0 0 0 0 $\frac{\sqrt{105}}{56}$ 0 0 $\frac{\sqrt{105}i}{56}$ 0 0 $\frac{\sqrt{7}}{56}$ 0 0 $-\frac{\sqrt{7}i}{56}$	
	$-\frac{\sqrt{7}i}{14}$ 0 0 $-\frac{\sqrt{105}}{56}$ 0 0 0 0 $\frac{\sqrt{7}i}{56}$ 0 0 0 0	
	0 $\frac{\sqrt{7}i}{14}$ $\frac{\sqrt{105}}{56}$ 0 0 0 0 0 $-\frac{\sqrt{7}}{56}$ 0 0 0 0	
	0 $-\frac{\sqrt{7}}{14}$ $-\frac{\sqrt{105}i}{56}$ 0 0 0 0 0 $-\frac{\sqrt{7}i}{56}$ 0 0 0 0	
	$\frac{\sqrt{7}}{14}$ 0 0 $\frac{\sqrt{105}i}{56}$ 0 0 0 0 0 $\frac{\sqrt{7}i}{56}$ 0 0 0 0	
$\sqrt{3}xz$		

continued ...

Table 10

No.	multipole	matrix
$\mathbb{Q}_{2,1}^{(1,-1;a)}(T_g)$	0 0 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 0 0 $-\frac{\sqrt{7}i}{14}$ 0 0 $\frac{\sqrt{7}i}{14}$ 0	
	0 0 0 0 0 $\frac{3\sqrt{7}i}{56}$ 0 0 0 0 0 $\frac{\sqrt{105}i}{56}$ 0 0	
	0 0 0 0 $\frac{3\sqrt{7}i}{56}$ 0 0 0 0 0 $\frac{\sqrt{105}i}{56}$ 0 0 0	
	0 0 0 $-\frac{3\sqrt{7}i}{56}$ 0 0 $\frac{3\sqrt{7}i}{56}$ 0 0 $\frac{\sqrt{105}i}{56}$ 0 0 $\frac{\sqrt{105}i}{56}$ 0	
	0 0 $-\frac{3\sqrt{7}i}{56}$ 0 0 0 $-\frac{3\sqrt{7}i}{56}$ $\frac{\sqrt{105}i}{56}$ 0 0 0 0 $-\frac{\sqrt{105}i}{56}$	
	0 0 0 0 $-\frac{3\sqrt{7}i}{56}$ 0 0 0 0 0 $\frac{\sqrt{105}i}{56}$ 0 0 0 0	
	0 0 0 0 0 $\frac{3\sqrt{7}i}{56}$ 0 0 0 0 0 $-\frac{\sqrt{105}i}{56}$ 0 0	
	$-\frac{\sqrt{7}i}{14}$ 0 0 0 0 $-\frac{\sqrt{105}i}{56}$ 0 0 0 0 0 $-\frac{\sqrt{7}i}{56}$ 0 0	
	0 $\frac{\sqrt{7}i}{14}$ 0 0 $-\frac{\sqrt{105}i}{56}$ 0 0 0 0 0 $-\frac{\sqrt{7}i}{56}$ 0 0 0	
	0 0 0 $-\frac{\sqrt{105}i}{56}$ 0 0 $-\frac{\sqrt{105}i}{56}$ 0 0 $\frac{\sqrt{7}i}{56}$ 0 0 $-\frac{\sqrt{7}i}{56}$ 0	
	0 0 $-\frac{\sqrt{105}i}{56}$ 0 0 0 0 $\frac{\sqrt{105}i}{56}$ $\frac{\sqrt{7}i}{56}$ 0 0 0 0 $\frac{\sqrt{7}i}{56}$	
	0 $-\frac{\sqrt{7}i}{14}$ 0 0 $-\frac{\sqrt{105}i}{56}$ 0 0 0 0 0 $\frac{\sqrt{7}i}{56}$ 0 0 0	
	$-\frac{\sqrt{7}i}{14}$ 0 0 0 0 $\frac{\sqrt{105}i}{56}$ 0 0 0 0 0 $-\frac{\sqrt{7}i}{56}$ 0 0	
861 symmetry		$\sqrt{3}xy$

continued ...

Table 10

No.	multipole	matrix
$\mathbb{Q}_{2,2}^{(1,-1;a)}(T_g)$	0 0 0 0 0 0 0 0 0 $\frac{\sqrt{7}}{14}$ 0 $\frac{\sqrt{7}i}{14}$ 0 0	
	0 0 0 0 0 0 0 0 $-\frac{\sqrt{7}}{14}$ 0 $\frac{\sqrt{7}i}{14}$ 0 0 0	
	0 0 0 0 0 0 0 $-\frac{3\sqrt{7}i}{56}$ 0 0 0 0 0 $\frac{\sqrt{105}i}{56}$	
	0 0 0 0 0 0 0 $-\frac{3\sqrt{7}i}{56}$ 0 0 0 0 0 $\frac{\sqrt{105}i}{56}$ 0	
	0 0 0 0 0 0 0 $\frac{3\sqrt{7}}{56}$ 0 0 0 0 0 $\frac{\sqrt{105}}{56}$	
	0 0 0 0 0 0 0 $-\frac{3\sqrt{7}}{56}$ 0 0 0 0 0 $-\frac{\sqrt{105}}{56}$ 0	
	0 0 0 $\frac{3\sqrt{7}i}{56}$ 0 $-\frac{3\sqrt{7}}{56}$ 0 0 0 $\frac{\sqrt{105}i}{56}$ 0 $\frac{\sqrt{105}}{56}$ 0 0	
	0 0 $\frac{3\sqrt{7}i}{56}$ 0 $\frac{3\sqrt{7}}{56}$ 0 0 0 $\frac{\sqrt{105}i}{56}$ 0 $-\frac{\sqrt{105}}{56}$ 0 0 0	
	0 $-\frac{\sqrt{7}}{14}$ 0 0 0 0 0 $-\frac{\sqrt{105}i}{56}$ 0 0 0 0 0 $\frac{\sqrt{7}i}{56}$	
	$\frac{\sqrt{7}}{14}$ 0 0 0 0 0 $-\frac{\sqrt{105}i}{56}$ 0 0 0 0 0 $\frac{\sqrt{7}i}{56}$ 0	
	0 $-\frac{\sqrt{7}i}{14}$ 0 0 0 0 0 $-\frac{\sqrt{105}}{56}$ 0 0 0 0 0 $-\frac{\sqrt{7}}{56}$	
	$-\frac{\sqrt{7}i}{14}$ 0 0 0 0 0 $\frac{\sqrt{105}}{56}$ 0 0 0 0 0 $\frac{\sqrt{7}}{56}$ 0	
	0 0 0 $-\frac{\sqrt{105}i}{56}$ 0 $-\frac{\sqrt{105}}{56}$ 0 0 0 $-\frac{\sqrt{7}i}{56}$ 0 $\frac{\sqrt{7}}{56}$ 0 0	
	0 0 $-\frac{\sqrt{105}i}{56}$ 0 $\frac{\sqrt{105}}{56}$ 0 0 0 $-\frac{\sqrt{7}i}{56}$ 0 $-\frac{\sqrt{7}}{56}$ 0 0 0	

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

862 symmetry

continued ...

Table 10

No.	multipole	matrix
		$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{i}{6} & 0 & \frac{1}{6} & \frac{i}{6} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{i}{6} & 0 & -\frac{1}{6} & 0 & 0 & -\frac{i}{6} \\ 0 & 0 & 0 & 0 & -\frac{i}{6} & 0 & 0 & 0 & \frac{1}{6} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{i}{6} & -\frac{1}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & \frac{i}{6} & 0 & 0 & 0 & 0 & -\frac{i}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{i}{6} & 0 & 0 & 0 & -\frac{i}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{1}{6} & 0 & \frac{i}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & \frac{1}{6} & 0 & \frac{i}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{i}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{i}{6} & 0 & 0 & -\frac{1}{6} \\ -\frac{i}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{i}{6} & \frac{1}{6} & 0 \\ 0 & -\frac{1}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{i}{6} & 0 & 0 & 0 & 0 & \frac{i}{6} \\ \frac{1}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{i}{6} & 0 & 0 & \frac{i}{6} & 0 \\ -\frac{i}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{1}{6} & 0 & -\frac{i}{6} & 0 & 0 \\ 0 & \frac{i}{6} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{1}{6} & 0 & -\frac{i}{6} & 0 & 0 & 0 & 0 \end{bmatrix}$
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													
$\mathbb{Q}_{4,0}^{(1,-1;a)}(E_g)$	0	0	0	$-\frac{\sqrt{21}i}{28}$	0	$\frac{\sqrt{21}}{28}$	0	0	0	$-\frac{\sqrt{35}i}{84}$	0	$-\frac{\sqrt{35}}{84}$	$\frac{\sqrt{35}i}{42}$	0	
	0	0	$-\frac{\sqrt{21}i}{28}$	0	$-\frac{\sqrt{21}}{28}$	0	0	0	$-\frac{\sqrt{35}i}{84}$	0	$\frac{\sqrt{35}}{84}$	0	0	$-\frac{\sqrt{35}i}{42}$	
	0	$\frac{\sqrt{21}i}{28}$	0	0	$-\frac{\sqrt{35}i}{42}$	0	0	$-\frac{\sqrt{35}}{84}$	0	0	0	0	0	$\frac{\sqrt{21}}{28}$	
	$\frac{\sqrt{21}i}{28}$	0	0	0	0	$\frac{\sqrt{35}i}{42}$	$\frac{\sqrt{35}}{84}$	0	0	0	0	0	$-\frac{\sqrt{21}}{28}$	0	
	0	$-\frac{\sqrt{21}}{28}$	$\frac{\sqrt{35}i}{42}$	0	0	0	0	$\frac{\sqrt{35}i}{84}$	0	0	0	0	0	$\frac{\sqrt{21}i}{28}$	
	$\frac{\sqrt{21}}{28}$	0	0	$-\frac{\sqrt{35}i}{42}$	0	0	$\frac{\sqrt{35}i}{84}$	0	0	0	0	0	$\frac{\sqrt{21}i}{28}$	0	
	0	0	0	$\frac{\sqrt{35}}{84}$	0	$-\frac{\sqrt{35}i}{84}$	0	0	0	$-\frac{\sqrt{21}}{28}$	0	$-\frac{\sqrt{21}i}{28}$	0	0	
	0	0	$-\frac{\sqrt{35}}{84}$	0	$-\frac{\sqrt{35}i}{84}$	0	0	0	$\frac{\sqrt{21}}{28}$	0	$-\frac{\sqrt{21}i}{28}$	0	0	0	
	0	$\frac{\sqrt{35}i}{84}$	0	0	0	0	$\frac{\sqrt{21}}{28}$	0	0	$\frac{\sqrt{35}i}{42}$	0	0	0	$\frac{\sqrt{35}}{84}$	
	$\frac{\sqrt{35}i}{84}$	0	0	0	0	0	$-\frac{\sqrt{21}}{28}$	0	0	0	$-\frac{\sqrt{35}i}{42}$	$-\frac{\sqrt{35}}{84}$	0		
	0	$\frac{\sqrt{35}}{84}$	0	0	0	0	$\frac{\sqrt{21}i}{28}$	$-\frac{\sqrt{35}i}{42}$	0	0	0	0	0	$-\frac{\sqrt{35}i}{84}$	
	$-\frac{\sqrt{35}}{84}$	0	0	0	0	0	$\frac{\sqrt{21}i}{28}$	0	0	$\frac{\sqrt{35}i}{42}$	0	0	$-\frac{\sqrt{35}i}{84}$	0	
	$-\frac{\sqrt{35}i}{42}$	0	0	$-\frac{\sqrt{21}}{28}$	0	$-\frac{\sqrt{21}i}{28}$	0	0	0	$-\frac{\sqrt{35}}{84}$	0	$\frac{\sqrt{35}i}{84}$	0	0	
	0	$\frac{\sqrt{35}i}{42}$	$\frac{\sqrt{21}}{28}$	0	$-\frac{\sqrt{21}i}{28}$	0	0	0	$\frac{\sqrt{35}}{84}$	0	$\frac{\sqrt{35}i}{84}$	0	0	0	

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

continued ...

Table 10

No.	multipole	matrix
$\mathbb{Q}_{4,1}^{(1,-1;a)}(E_g)$	0	0 0 0 $-\frac{\sqrt{7}i}{28}$ 0 $-\frac{\sqrt{7}}{28}$ $\frac{\sqrt{7}i}{14}$ 0 0 $\frac{\sqrt{105}i}{84}$ 0 $-\frac{\sqrt{105}}{84}$ 0 0
	0	0 0 $-\frac{\sqrt{7}i}{28}$ 0 $\frac{\sqrt{7}}{28}$ 0 0 $-\frac{\sqrt{7}i}{14}$ $\frac{\sqrt{105}i}{84}$ 0 $\frac{\sqrt{105}}{84}$ 0 0 0
	0	$\frac{\sqrt{7}i}{28}$ 0 0 0 0 0 0 $-\frac{\sqrt{105}}{84}$ 0 0 $-\frac{\sqrt{7}i}{14}$ 0 0 $-\frac{\sqrt{7}}{28}$
	$\frac{\sqrt{7}i}{28}$	0 0 0 0 0 0 $\frac{\sqrt{105}}{84}$ 0 0 0 0 $\frac{\sqrt{7}i}{14}$ $\frac{\sqrt{7}}{28}$ 0
	0	$\frac{\sqrt{7}}{28}$ 0 0 0 0 0 0 $-\frac{\sqrt{105}i}{84}$ $\frac{\sqrt{7}i}{14}$ 0 0 0 0 $\frac{\sqrt{7}i}{28}$
	$-\frac{\sqrt{7}}{28}$	0 0 0 0 0 0 $-\frac{\sqrt{105}i}{84}$ 0 0 $-\frac{\sqrt{7}i}{14}$ 0 0 0 $\frac{\sqrt{7}i}{28}$ 0
	$-\frac{\sqrt{7}i}{14}$	0 0 $\frac{\sqrt{105}}{84}$ 0 $\frac{\sqrt{105}i}{84}$ 0 0 0 0 $\frac{\sqrt{7}}{28}$ 0 $-\frac{\sqrt{7}i}{28}$ 0 0
	0	$\frac{\sqrt{7}i}{14}$ $-\frac{\sqrt{105}}{84}$ 0 $\frac{\sqrt{105}i}{84}$ 0 0 0 $-\frac{\sqrt{7}}{28}$ 0 $-\frac{\sqrt{7}i}{28}$ 0 0 0
	0	$-\frac{\sqrt{105}i}{84}$ 0 0 $-\frac{\sqrt{7}i}{14}$ 0 0 $-\frac{\sqrt{7}}{28}$ 0 0 0 0 0 $\frac{\sqrt{105}}{84}$
	$-\frac{\sqrt{105}i}{84}$	0 0 0 0 0 $\frac{\sqrt{7}i}{14}$ $\frac{\sqrt{7}}{28}$ 0 0 0 0 0 $-\frac{\sqrt{105}}{84}$ 0
	0	$\frac{\sqrt{105}}{84}$ $\frac{\sqrt{7}i}{14}$ 0 0 0 0 $\frac{\sqrt{7}i}{28}$ 0 0 0 0 0 $\frac{\sqrt{105}i}{84}$
	$-\frac{\sqrt{105}}{84}$	0 0 $-\frac{\sqrt{7}i}{14}$ 0 0 $\frac{\sqrt{7}i}{28}$ 0 0 0 0 0 $\frac{\sqrt{105}i}{84}$ 0
	0	0 0 0 $\frac{\sqrt{7}}{28}$ 0 $-\frac{\sqrt{7}i}{28}$ 0 0 0 $-\frac{\sqrt{105}}{84}$ 0 $-\frac{\sqrt{105}i}{84}$ 0 0
	0	0 0 $-\frac{\sqrt{7}}{28}$ 0 $-\frac{\sqrt{7}i}{28}$ 0 0 0 $\frac{\sqrt{105}}{84}$ 0 $-\frac{\sqrt{105}i}{84}$ 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	0	0	0	$\frac{i}{8}$	0	0	$\frac{1}{8}$	0	0	$\frac{\sqrt{15}i}{24}$	0	0	$-\frac{\sqrt{15}}{24}$		
	0	0	0	0	0	$-\frac{i}{8}$	$-\frac{1}{8}$	0	0	0	0	$-\frac{\sqrt{15}i}{24}$	$\frac{\sqrt{15}}{24}$	0		
	0	0	0	0	0	$\frac{\sqrt{15}}{24}$	$\frac{\sqrt{15}i}{24}$	0	0	0	0	$-\frac{1}{8}$	$\frac{i}{8}$	0		
	0	0	0	0	$-\frac{\sqrt{15}}{24}$	0	0	$-\frac{\sqrt{15}i}{24}$	0	0	$\frac{1}{8}$	0	0	$-\frac{i}{8}$		
	$-\frac{i}{8}$	0	0	$-\frac{\sqrt{15}}{24}$	0	0	0	0	0	$\frac{1}{8}$	0	0	0	0		
	0	$\frac{i}{8}$	$\frac{\sqrt{15}}{24}$	0	0	0	0	0	$-\frac{1}{8}$	0	0	0	0	0		
	0	$-\frac{1}{8}$	$-\frac{\sqrt{15}i}{24}$	0	0	0	0	0	$-\frac{i}{8}$	0	0	0	0	0		
	$\frac{1}{8}$	0	0	$\frac{\sqrt{15}i}{24}$	0	0	0	0	0	$\frac{i}{8}$	0	0	0	0		
	0	0	0	0	0	$-\frac{1}{8}$	$\frac{i}{8}$	0	0	0	0	$-\frac{\sqrt{15}}{24}$	$-\frac{\sqrt{15}i}{24}$	0		
	0	0	0	0	$\frac{1}{8}$	0	0	$-\frac{i}{8}$	0	0	$\frac{\sqrt{15}}{24}$	0	0	$\frac{\sqrt{15}i}{24}$		
	$-\frac{\sqrt{15}i}{24}$	0	0	$\frac{1}{8}$	0	0	0	0	0	$\frac{\sqrt{15}}{24}$	0	0	0	0		
	0	$\frac{\sqrt{15}i}{24}$	$-\frac{1}{8}$	0	0	0	0	0	$-\frac{\sqrt{15}}{24}$	0	0	0	0	0		
	0	$\frac{\sqrt{15}}{24}$	$-\frac{i}{8}$	0	0	0	0	0	$\frac{\sqrt{15}i}{24}$	0	0	0	0	0		
	$-\frac{\sqrt{15}}{24}$	0	0	$\frac{i}{8}$	0	0	0	0	$-\frac{\sqrt{15}i}{24}$	0	0	0	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	0 0 $\frac{i}{8}$ 0 0 0 0 0 $\frac{i}{8}$ $-\frac{\sqrt{15}i}{24}$ 0 0 0 0 $\frac{\sqrt{15}i}{24}$
	0	0 0 0 $-\frac{i}{8}$ 0 0 $\frac{i}{8}$ 0 0 0 $\frac{\sqrt{15}i}{24}$ 0 0 0 $\frac{\sqrt{15}i}{24}$ 0
	$-\frac{i}{8}$	0 0 0 0 0 $-\frac{\sqrt{15}i}{24}$ 0 0 0 0 0 0 0 $-\frac{i}{8}$ 0 0
	0	$\frac{i}{8}$ 0 0 $-\frac{\sqrt{15}i}{24}$ 0 0 0 0 0 0 $-\frac{i}{8}$ 0 0 0 0
	0	0 0 0 $\frac{\sqrt{15}i}{24}$ 0 0 $\frac{\sqrt{15}i}{24}$ 0 0 $\frac{i}{8}$ 0 0 $-\frac{i}{8}$ 0 0
	0	0 0 $\frac{\sqrt{15}i}{24}$ 0 0 0 0 $-\frac{\sqrt{15}i}{24}$ $\frac{i}{8}$ 0 0 0 0 $\frac{i}{8}$
	$-\frac{i}{8}$	0 0 0 $-\frac{\sqrt{15}i}{24}$ 0 0 0 0 0 $\frac{i}{8}$ 0 0 0 0 0 0
	$-\frac{i}{8}$	0 0 0 0 0 $\frac{\sqrt{15}i}{24}$ 0 0 0 0 0 $-\frac{i}{8}$ 0 0 0 0
	$\frac{\sqrt{15}i}{24}$	0 0 0 0 $-\frac{i}{8}$ 0 0 0 0 0 0 $\frac{\sqrt{15}i}{24}$ 0 0 0 0
	0	$-\frac{\sqrt{15}i}{24}$ 0 0 $-\frac{i}{8}$ 0 0 0 0 0 $\frac{\sqrt{15}i}{24}$ 0 0 0 0
	0	0 0 0 $\frac{i}{8}$ 0 0 $-\frac{i}{8}$ 0 0 $-\frac{\sqrt{15}i}{24}$ 0 0 $-\frac{\sqrt{15}i}{24}$ 0 0
	0	0 0 $\frac{i}{8}$ 0 0 0 0 $\frac{i}{8}$ $-\frac{\sqrt{15}i}{24}$ 0 0 0 0 $\frac{\sqrt{15}i}{24}$
	0	$-\frac{\sqrt{15}i}{24}$ 0 0 $\frac{i}{8}$ 0 0 0 0 0 $\frac{\sqrt{15}i}{24}$ 0 0 0 0
	$-\frac{\sqrt{15}i}{24}$	0 0 0 0 0 $-\frac{i}{8}$ 0 0 0 0 0 $-\frac{\sqrt{15}i}{24}$ 0 0 0 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 $\frac{1}{8}$ 0 $\frac{i}{8}$ 0 0 0 $\frac{\sqrt{15}}{24}$ 0 $-\frac{\sqrt{15}i}{24}$ 0 0	
	0 0 $-\frac{1}{8}$ 0 $\frac{i}{8}$ 0 0 0 $-\frac{\sqrt{15}}{24}$ 0 $-\frac{\sqrt{15}i}{24}$ 0 0 0 0	
	0 $-\frac{1}{8}$ 0 0 0 0 0 $-\frac{\sqrt{15}i}{24}$ 0 0 0 0 0 0 $\frac{i}{8}$	
	$\frac{1}{8}$ 0 0 0 0 0 $-\frac{\sqrt{15}i}{24}$ 0 0 0 0 0 0 $\frac{i}{8}$ 0	
	0 $-\frac{i}{8}$ 0 0 0 0 0 $-\frac{\sqrt{15}}{24}$ 0 0 0 0 0 0 $-\frac{1}{8}$	
	$-\frac{i}{8}$ 0 0 0 0 0 $\frac{\sqrt{15}}{24}$ 0 0 0 0 0 0 $\frac{1}{8}$ 0	
	0 0 0 $\frac{\sqrt{15}i}{24}$ 0 $\frac{\sqrt{15}}{24}$ 0 0 0 $-\frac{i}{8}$ 0 $\frac{1}{8}$ 0 0 0	
	0 0 $\frac{\sqrt{15}i}{24}$ 0 $-\frac{\sqrt{15}}{24}$ 0 0 0 $-\frac{i}{8}$ 0 $-\frac{1}{8}$ 0 0 0 0	
	0 $-\frac{\sqrt{15}}{24}$ 0 0 0 0 0 $\frac{i}{8}$ 0 0 0 0 0 0 $\frac{\sqrt{15}i}{24}$	
	$\frac{\sqrt{15}}{24}$ 0 0 0 0 0 $\frac{i}{8}$ 0 0 0 0 0 0 $\frac{\sqrt{15}i}{24}$ 0	
	0 $\frac{\sqrt{15}i}{24}$ 0 0 0 0 0 $-\frac{1}{8}$ 0 0 0 0 0 0 $\frac{\sqrt{15}}{24}$	
	$\frac{\sqrt{15}i}{24}$ 0 0 0 0 0 $\frac{1}{8}$ 0 0 0 0 0 0 $-\frac{\sqrt{15}}{24}$ 0	
	0 0 0 $-\frac{i}{8}$ 0 $\frac{1}{8}$ 0 0 0 $-\frac{\sqrt{15}i}{24}$ 0 $-\frac{\sqrt{15}}{24}$ 0 0 0	
	0 0 $-\frac{i}{8}$ 0 $-\frac{1}{8}$ 0 0 0 $-\frac{\sqrt{15}i}{24}$ 0 $\frac{\sqrt{15}}{24}$ 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	0	0	0	$\frac{3\sqrt{7}i}{56}$	0	0	$-\frac{3\sqrt{7}}{56}$	0	0	$-\frac{\sqrt{105}i}{168}$	0	0	$-\frac{\sqrt{105}}{168}$		
	0	0	0	0	0	$-\frac{3\sqrt{7}i}{56}$	$\frac{3\sqrt{7}}{56}$	0	0	0	0	$\frac{\sqrt{105}i}{168}$	$\frac{\sqrt{105}}{168}$	0		
	0	0	0	0	0	$\frac{\sqrt{105}}{168}$	$-\frac{\sqrt{105}i}{168}$	0	0	$-\frac{\sqrt{7}i}{14}$	0	$\frac{3\sqrt{7}}{56}$	$\frac{3\sqrt{7}i}{56}$	0		
	0	0	0	0	$-\frac{\sqrt{105}}{168}$	0	0	$\frac{\sqrt{105}i}{168}$	$-\frac{\sqrt{7}i}{14}$	0	$-\frac{3\sqrt{7}}{56}$	0	0	$-\frac{3\sqrt{7}i}{56}$		
	$-\frac{3\sqrt{7}i}{56}$	0	0	$-\frac{\sqrt{105}}{168}$	0	0	0	0	0	$-\frac{3\sqrt{7}}{56}$	0	$-\frac{\sqrt{7}i}{14}$	0	0		
	0	$\frac{3\sqrt{7}i}{56}$	$\frac{\sqrt{105}}{168}$	0	0	0	0	0	$\frac{3\sqrt{7}}{56}$	0	$-\frac{\sqrt{7}i}{14}$	0	0	0		
	0	$\frac{3\sqrt{7}}{56}$	$\frac{\sqrt{105}i}{168}$	0	0	0	0	0	$-\frac{3\sqrt{7}i}{56}$	0	0	0	0	$-\frac{\sqrt{7}i}{14}$		
	$-\frac{3\sqrt{7}}{56}$	0	0	$-\frac{\sqrt{105}i}{168}$	0	0	0	0	0	$\frac{3\sqrt{7}i}{56}$	0	0	0	$-\frac{\sqrt{7}i}{14}$	0	
	0	0	0	$\frac{\sqrt{7}i}{14}$	0	$\frac{3\sqrt{7}}{56}$	$\frac{3\sqrt{7}i}{56}$	0	0	0	0	$-\frac{\sqrt{105}}{168}$	$\frac{\sqrt{105}i}{168}$	0		
	0	0	$\frac{\sqrt{7}i}{14}$	0	$-\frac{3\sqrt{7}}{56}$	0	0	$-\frac{3\sqrt{7}i}{56}$	0	0	$\frac{\sqrt{105}}{168}$	0	0	$-\frac{\sqrt{105}i}{168}$		
	$\frac{\sqrt{105}i}{168}$	0	0	$-\frac{3\sqrt{7}}{56}$	0	$\frac{\sqrt{7}i}{14}$	0	0	0	$\frac{\sqrt{105}}{168}$	0	0	0	0		
	0	$-\frac{\sqrt{105}i}{168}$	$\frac{3\sqrt{7}}{56}$	0	$\frac{\sqrt{7}i}{14}$	0	0	0	$-\frac{\sqrt{105}}{168}$	0	0	0	0	0		
	0	$\frac{\sqrt{105}}{168}$	$-\frac{3\sqrt{7}i}{56}$	0	0	0	0	$\frac{\sqrt{7}i}{14}$	$-\frac{\sqrt{105}i}{168}$	0	0	0	0	0		
	$-\frac{\sqrt{105}}{168}$	0	0	$\frac{3\sqrt{7}i}{56}$	0	0	$\frac{\sqrt{7}i}{14}$	0	0	$\frac{\sqrt{105}i}{168}$	0	0	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	0	$-\frac{3\sqrt{7}i}{56}$	0	0	0	0	$\frac{3\sqrt{7}i}{56}$	$-\frac{\sqrt{105}i}{168}$	0	0	0	0	$-\frac{\sqrt{105}i}{168}$	
	0	0	0	$\frac{3\sqrt{7}i}{56}$	0	0	$\frac{3\sqrt{7}i}{56}$	0	0	$\frac{\sqrt{105}i}{168}$	0	0	$-\frac{\sqrt{105}i}{168}$	0	
	$\frac{3\sqrt{7}i}{56}$	0	0	0	0	$\frac{\sqrt{105}i}{168}$	0	0	0	$-\frac{\sqrt{7}}{14}$	0	$-\frac{3\sqrt{7}i}{56}$	0	0	
	0	$-\frac{3\sqrt{7}i}{56}$	0	0	$\frac{\sqrt{105}i}{168}$	0	0	0	$\frac{\sqrt{7}}{14}$	0	$-\frac{3\sqrt{7}i}{56}$	0	0	0	
	0	0	0	$-\frac{\sqrt{105}i}{168}$	0	0	$\frac{\sqrt{105}i}{168}$	0	0	$\frac{3\sqrt{7}i}{56}$	0	$-\frac{\sqrt{7}}{14}$	$\frac{3\sqrt{7}i}{56}$	0	
	0	0	$-\frac{\sqrt{105}i}{168}$	0	0	0	0	$-\frac{\sqrt{105}i}{168}$	$\frac{3\sqrt{7}i}{56}$	0	$\frac{\sqrt{7}}{14}$	0	0	$-\frac{3\sqrt{7}i}{56}$	
	0	$-\frac{3\sqrt{7}i}{56}$	0	0	$-\frac{\sqrt{105}i}{168}$	0	0	0	0	$-\frac{3\sqrt{7}i}{56}$	0	0	$-\frac{\sqrt{7}}{14}$		
	$-\frac{3\sqrt{7}i}{56}$	0	0	0	0	$\frac{\sqrt{105}i}{168}$	0	0	0	0	$\frac{3\sqrt{7}i}{56}$	$\frac{\sqrt{7}}{14}$	0		
	$\frac{\sqrt{105}i}{168}$	0	0	$\frac{\sqrt{7}}{14}$	0	$-\frac{3\sqrt{7}i}{56}$	0	0	0	0	$-\frac{\sqrt{105}i}{168}$	0	0		
	0	$-\frac{\sqrt{105}i}{168}$	$-\frac{\sqrt{7}}{14}$	0	$-\frac{3\sqrt{7}i}{56}$	0	0	0	0	$-\frac{\sqrt{105}i}{168}$	0	0	0		
	0	0	0	$\frac{3\sqrt{7}i}{56}$	0	$\frac{\sqrt{7}}{14}$	$\frac{3\sqrt{7}i}{56}$	0	0	$\frac{\sqrt{105}i}{168}$	0	0	$-\frac{\sqrt{105}i}{168}$		
	0	$\frac{3\sqrt{7}i}{56}$	0	$-\frac{\sqrt{7}}{14}$	0	0	$-\frac{3\sqrt{7}i}{56}$	$\frac{\sqrt{105}i}{168}$	0	0	0	0	$\frac{\sqrt{105}i}{168}$		
	0	$\frac{\sqrt{105}i}{168}$	0	0	$-\frac{3\sqrt{7}i}{56}$	0	0	$\frac{\sqrt{7}}{14}$	0	0	$\frac{\sqrt{105}i}{168}$	0	0	0	
	$\frac{\sqrt{105}i}{168}$	0	0	0	0	$\frac{3\sqrt{7}i}{56}$	$-\frac{\sqrt{7}}{14}$	0	0	0	0	$-\frac{\sqrt{105}i}{168}$	0	0	
$\frac{\sqrt{5}xy(x^2+y^2-6z^2)}{2}$															
870	symmetry														

continued ...

Table 10

No.	multipole	matrix														
$\mathbb{Q}_{4,2}^{(1,-1;a)}(T_g, 2)$	0	0	0	$\frac{3\sqrt{7}}{56}$	0	$-\frac{3\sqrt{7}i}{56}$	0	0	0	$-\frac{\sqrt{105}}{168}$	0	$-\frac{\sqrt{105}i}{168}$	0	0	0	
	0	0	$-\frac{3\sqrt{7}}{56}$	0	$-\frac{3\sqrt{7}i}{56}$	0	0	0	$\frac{\sqrt{105}}{168}$	0	$-\frac{\sqrt{105}i}{168}$	0	0	0	0	
	0	$-\frac{3\sqrt{7}}{56}$	0	0	0	0	0	$-\frac{\sqrt{105}i}{168}$	$-\frac{\sqrt{7}i}{14}$	0	0	0	0	0	$-\frac{3\sqrt{7}i}{56}$	
	$\frac{3\sqrt{7}}{56}$	0	0	0	0	0	$-\frac{\sqrt{105}i}{168}$	0	0	$\frac{\sqrt{7}i}{14}$	0	0	$-\frac{3\sqrt{7}i}{56}$	0	0	
	0	$\frac{3\sqrt{7}i}{56}$	0	0	0	0	0	$\frac{\sqrt{105}}{168}$	0	0	$-\frac{\sqrt{7}i}{14}$	0	0	$-\frac{3\sqrt{7}}{56}$	0	
	$\frac{3\sqrt{7}i}{56}$	0	0	0	0	0	$-\frac{\sqrt{105}}{168}$	0	0	0	$\frac{\sqrt{7}i}{14}$	$\frac{3\sqrt{7}}{56}$	0	0	0	
	0	0	0	$\frac{\sqrt{105}i}{168}$	0	$-\frac{\sqrt{105}}{168}$	0	0	0	$\frac{3\sqrt{7}i}{56}$	0	$\frac{3\sqrt{7}}{56}$	$-\frac{\sqrt{7}i}{14}$	0	0	
	0	0	$\frac{\sqrt{105}i}{168}$	0	$\frac{\sqrt{105}}{168}$	0	0	0	$\frac{3\sqrt{7}i}{56}$	0	$-\frac{3\sqrt{7}}{56}$	0	0	$\frac{\sqrt{7}i}{14}$	0	
	0	$\frac{\sqrt{105}}{168}$	$\frac{\sqrt{7}i}{14}$	0	0	0	0	$-\frac{3\sqrt{7}i}{56}$	0	0	0	0	0	$\frac{\sqrt{105}i}{168}$	0	
	$-\frac{\sqrt{105}}{168}$	0	0	$-\frac{\sqrt{7}i}{14}$	0	0	$-\frac{3\sqrt{7}i}{56}$	0	0	0	0	0	$\frac{\sqrt{105}i}{168}$	0	0	
	0	$\frac{\sqrt{105}i}{168}$	0	0	$\frac{\sqrt{7}i}{14}$	0	0	$-\frac{3\sqrt{7}}{56}$	0	0	0	0	0	0	$-\frac{\sqrt{105}}{168}$	0
	$\frac{\sqrt{105}i}{168}$	0	0	0	0	$-\frac{\sqrt{7}i}{14}$	$\frac{3\sqrt{7}}{56}$	0	0	0	0	0	$\frac{\sqrt{105}}{168}$	0	0	0
	0	0	0	$\frac{3\sqrt{7}i}{56}$	0	$\frac{3\sqrt{7}}{56}$	$\frac{\sqrt{7}i}{14}$	0	0	$-\frac{\sqrt{105}i}{168}$	0	$\frac{\sqrt{105}}{168}$	0	0	0	0
	0	0	$\frac{3\sqrt{7}i}{56}$	0	$-\frac{3\sqrt{7}}{56}$	0	0	$-\frac{\sqrt{7}i}{14}$	$-\frac{\sqrt{105}i}{168}$	0	$-\frac{\sqrt{105}}{168}$	0	0	0	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 0 0 $-\frac{\sqrt{154}i}{154}$ 0 $-\frac{\sqrt{154}i}{154}$ 0 0	0 0 0 0 0 0 0 0 $-\frac{\sqrt{154}i}{154}$ 0 $\frac{\sqrt{154}}{154}$ 0 0 $\frac{\sqrt{154}i}{154}$													
	0 0 0 0 $-\frac{5\sqrt{154}i}{308}$ 0 0 0 $\frac{5\sqrt{154}}{308}$ 0 0 $\frac{\sqrt{2310}i}{462}$ 0 0 $\frac{\sqrt{2310}}{462}$	0 0 0 0 $-\frac{5\sqrt{154}i}{308}$ 0 0 $-\frac{5\sqrt{154}i}{308}$ $\frac{5\sqrt{154}}{308}$ 0 0 $\frac{\sqrt{2310}i}{462}$ 0 0 $\frac{\sqrt{2310}}{462}$													
	0 0 0 0 0 $\frac{5\sqrt{154}i}{308}$ 0 0 0 $-\frac{5\sqrt{154}i}{308}$ $\frac{5\sqrt{154}i}{308}$ 0 0 0 0 $-\frac{\sqrt{2310}i}{462}$ $-\frac{\sqrt{2310}}{462}$ 0	0 0 0 0 0 0 0 $-\frac{5\sqrt{154}i}{308}$ $\frac{5\sqrt{154}i}{308}$ 0 0 $-\frac{\sqrt{2310}i}{462}$ 0 0 $\frac{\sqrt{2310}}{462}$ 0													
	0 0 $\frac{5\sqrt{154}i}{308}$ 0 0 0 0 0 $-\frac{5\sqrt{154}i}{308}$ $\frac{\sqrt{2310}i}{462}$ 0 0 0 0 $\frac{\sqrt{2310}i}{462}$ 0	0 0 0 0 $-\frac{5\sqrt{154}i}{308}$ 0 0 $-\frac{5\sqrt{154}i}{308}$ 0 0 $-\frac{\sqrt{2310}i}{462}$ 0 0 $\frac{\sqrt{2310}i}{462}$ 0													
	0 0 0 $-\frac{5\sqrt{154}}{308}$ 0 $\frac{5\sqrt{154}i}{308}$ 0 0 0 0 $\frac{\sqrt{2310}}{462}$ 0 0 $\frac{\sqrt{2310}i}{462}$ 0 0 0	0 0 0 $-\frac{5\sqrt{154}}{308}$ 0 $\frac{5\sqrt{154}i}{308}$ 0 0 0 0 $\frac{\sqrt{2310}}{462}$ 0 0 $\frac{\sqrt{2310}i}{462}$ 0 0 0													
	0 0 $\frac{5\sqrt{154}}{308}$ 0 $\frac{5\sqrt{154}i}{308}$ 0 0 0 0 $-\frac{\sqrt{2310}}{462}$ 0 0 $\frac{\sqrt{2310}i}{462}$ 0 0 0 0	0 0 $\frac{\sqrt{154}i}{154}$ 0 0 $-\frac{\sqrt{2310}i}{462}$ 0 0 $-\frac{\sqrt{2310}}{462}$ 0 0 $-\frac{3\sqrt{154}i}{308}$ 0 0 $\frac{3\sqrt{154}}{308}$ 0													
	$\frac{\sqrt{154}i}{154}$ 0 0 0 0 $\frac{\sqrt{2310}i}{462}$ $\frac{\sqrt{2310}}{462}$ 0 0 0 0 $\frac{3\sqrt{154}i}{308}$ $-\frac{3\sqrt{154}}{308}$ 0	0 $\frac{\sqrt{154}}{154}$ $-\frac{\sqrt{2310}i}{462}$ 0 0 0 0 $-\frac{\sqrt{2310}i}{462}$ $\frac{3\sqrt{154}i}{308}$ 0 0 0 0 $-\frac{3\sqrt{154}i}{308}$													
	$-\frac{\sqrt{154}}{154}$ 0 0 $\frac{\sqrt{2310}i}{462}$ 0 0 $-\frac{\sqrt{2310}i}{462}$ 0 0 0 $-\frac{3\sqrt{154}i}{308}$ 0 0 $-\frac{3\sqrt{154}}{308}$ 0	$\frac{\sqrt{154}i}{154}$ 0 0 $-\frac{\sqrt{2310}}{462}$ 0 0 $-\frac{\sqrt{2310}i}{462}$ 0 0 0 $-\frac{3\sqrt{154}i}{308}$ 0 0 0													
	0 $-\frac{\sqrt{154}i}{154}$ $\frac{\sqrt{2310}}{462}$ 0 $-\frac{\sqrt{2310}i}{462}$ 0 0 0 $\frac{3\sqrt{154}}{308}$ 0 $\frac{3\sqrt{154}i}{308}$ 0 0 0 0	$-\frac{\sqrt{2310}(x-y)(x+y)(x-z)(x+z)(y-z)(y+z)}{8}$													

872 symmetry

continued ...

Table 10

No.	multipole	matrix
$\mathbb{Q}_6^{(1,-1;a)}(A_g, 2)$	0	0 0 0 $\frac{\sqrt{2}i}{6}$ 0 $\frac{\sqrt{2}}{6}$ $\frac{\sqrt{2}i}{6}$ 0 0 0 0 0 0 0 0
	0	0 0 $\frac{\sqrt{2}i}{6}$ 0 $-\frac{\sqrt{2}}{6}$ 0 0 $-\frac{\sqrt{2}i}{6}$ 0 0 0 0 0 0 0
	0	$-\frac{\sqrt{2}i}{6}$ 0 0 0 0 0 0 0 0 0 $\frac{\sqrt{2}i}{12}$ 0 0 $-\frac{\sqrt{2}}{12}$
	$-\frac{\sqrt{2}i}{6}$	0 0 0 0 0 0 0 0 0 0 0 $-\frac{\sqrt{2}i}{12}$ $\frac{\sqrt{2}}{12}$ 0
	0	$-\frac{\sqrt{2}}{6}$ 0 0 0 0 0 0 0 $-\frac{\sqrt{2}i}{12}$ 0 0 0 0 $\frac{\sqrt{2}i}{12}$
	$\frac{\sqrt{2}}{6}$	0 0 0 0 0 0 0 0 0 $\frac{\sqrt{2}i}{12}$ 0 0 $\frac{\sqrt{2}i}{12}$ 0
	$-\frac{\sqrt{2}i}{6}$	0 0 0 0 0 0 0 0 0 $\frac{\sqrt{2}}{12}$ 0 $-\frac{\sqrt{2}i}{12}$ 0 0
	0	$\frac{\sqrt{2}i}{6}$ 0 0 0 0 0 0 $-\frac{\sqrt{2}}{12}$ 0 $-\frac{\sqrt{2}i}{12}$ 0 0 0 0
	0	0 0 0 $\frac{\sqrt{2}i}{12}$ 0 0 $-\frac{\sqrt{2}}{12}$ 0 0 0 0 0 0 0
	0	0 0 0 0 $-\frac{\sqrt{2}i}{12}$ $\frac{\sqrt{2}}{12}$ 0 0 0 0 0 0 0 0
	0	0 0 $-\frac{\sqrt{2}i}{12}$ 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 $\frac{\sqrt{2}i}{12}$ 0 0 0 0 0 0 0
	0	0 0 0 $\frac{\sqrt{2}}{12}$ 0 $-\frac{\sqrt{2}i}{12}$ 0 0 0 0 0 0 0 0
	0	0 0 $-\frac{\sqrt{2}}{12}$ 0 $-\frac{\sqrt{2}i}{12}$ 0 0 0 0 0 0 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 $\frac{\sqrt{330}i}{132}$ 0 $-\frac{\sqrt{330}}{132}$ 0 0 0 $\frac{\sqrt{22}i}{44}$ 0 $\frac{\sqrt{22}}{44}$ $-\frac{\sqrt{22}i}{22}$ 0	
	0 0 $\frac{\sqrt{330}i}{132}$ 0 $\frac{\sqrt{330}}{132}$ 0 0 0 $\frac{\sqrt{22}i}{44}$ 0 $-\frac{\sqrt{22}}{44}$ 0 0 $\frac{\sqrt{22}i}{22}$	
	0 $-\frac{\sqrt{330}i}{132}$ 0 0 0 0 0 0 0 $\frac{\sqrt{330}i}{132}$ 0 0 0 0	
	$-\frac{\sqrt{330}i}{132}$ 0 0 0 0 0 0 0 0 0 $-\frac{\sqrt{330}i}{132}$ 0 0 0	
	0 $\frac{\sqrt{330}}{132}$ 0 0 0 0 0 0 $\frac{\sqrt{330}i}{132}$ 0 0 0 0 0	
	$-\frac{\sqrt{330}}{132}$ 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 $-\frac{\sqrt{330}}{132}$ 0 $-\frac{\sqrt{330}i}{132}$ 0 0 0	
	0 0 0 0 0 0 0 0 $\frac{\sqrt{330}}{132}$ 0 $-\frac{\sqrt{330}i}{132}$ 0 0 0	
	0 $-\frac{\sqrt{22}i}{44}$ 0 0 $-\frac{\sqrt{330}i}{132}$ 0 0 $\frac{\sqrt{330}}{132}$ 0 0 $\frac{\sqrt{22}i}{22}$ 0 0 $\frac{\sqrt{22}}{44}$	
	$-\frac{\sqrt{22}i}{44}$ 0 0 0 0 $\frac{\sqrt{330}i}{132}$ $-\frac{\sqrt{330}}{132}$ 0 0 0 0 $-\frac{\sqrt{22}i}{22}$ $-\frac{\sqrt{22}}{44}$ 0	
	0 $-\frac{\sqrt{22}}{44}$ $-\frac{\sqrt{330}i}{132}$ 0 0 0 0 $\frac{\sqrt{330}i}{132}$ $-\frac{\sqrt{22}i}{22}$ 0 0 0 0 $-\frac{\sqrt{22}i}{44}$	
	$\frac{\sqrt{22}}{44}$ 0 0 $\frac{\sqrt{330}i}{132}$ 0 0 $\frac{\sqrt{330}i}{132}$ 0 0 $\frac{\sqrt{22}i}{22}$ 0 0 $-\frac{\sqrt{22}i}{44}$ 0	
	$\frac{\sqrt{22}i}{22}$ 0 0 0 0 0 0 0 $-\frac{\sqrt{22}}{44}$ 0 $\frac{\sqrt{22}i}{44}$ 0 0 0	
	0 $-\frac{\sqrt{22}i}{22}$ 0 0 0 0 0 0 $\frac{\sqrt{22}}{44}$ 0 $\frac{\sqrt{22}i}{44}$ 0 0 0	
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 $\frac{\sqrt{110}i}{132}$ 0 $\frac{\sqrt{110}}{132}$ $-\frac{\sqrt{110}i}{66}$ 0 0 $-\frac{\sqrt{66}i}{44}$ 0 $\frac{\sqrt{66}}{44}$ 0 0
	0	0 0 $\frac{\sqrt{110}i}{132}$ 0 $-\frac{\sqrt{110}}{132}$ 0 0 $\frac{\sqrt{110}i}{66}$ $-\frac{\sqrt{66}i}{44}$ 0 $-\frac{\sqrt{66}}{44}$ 0 0 0
	0	$-\frac{\sqrt{110}i}{132}$ 0 0 0 0 0 0 0 0 0 $-\frac{\sqrt{110}i}{132}$ 0 0 $-\frac{\sqrt{110}}{66}$
	$-\frac{\sqrt{110}i}{132}$	0 0 0 0 0 0 0 0 0 0 0 $\frac{\sqrt{110}i}{132}$ $\frac{\sqrt{110}}{66}$ 0
	0	$-\frac{\sqrt{110}}{132}$ 0 0 0 0 0 0 0 $\frac{\sqrt{110}i}{132}$ 0 0 0 0 $\frac{\sqrt{110}i}{66}$
	$\frac{\sqrt{110}}{132}$	0 0 0 0 0 0 0 0 0 $-\frac{\sqrt{110}i}{132}$ 0 0 $\frac{\sqrt{110}i}{66}$ 0
	$\frac{\sqrt{110}i}{66}$	0 0 0 0 0 0 0 0 0 $-\frac{\sqrt{110}}{132}$ 0 $\frac{\sqrt{110}i}{132}$ 0 0
	0	$-\frac{\sqrt{110}i}{66}$ 0 0 0 0 0 0 0 $\frac{\sqrt{110}}{132}$ 0 $\frac{\sqrt{110}i}{132}$ 0 0 0
	0	$\frac{\sqrt{66}i}{44}$ 0 0 $-\frac{\sqrt{110}i}{132}$ 0 0 $\frac{\sqrt{110}}{132}$ 0 0 0 0 0 0 $\frac{\sqrt{66}}{44}$
	$\frac{\sqrt{66}i}{44}$	0 0 0 0 0 $\frac{\sqrt{110}i}{132}$ $-\frac{\sqrt{110}}{132}$ 0 0 0 0 0 0 $-\frac{\sqrt{66}}{44}$ 0
	0	$-\frac{\sqrt{66}}{44}$ $\frac{\sqrt{110}i}{132}$ 0 0 0 0 $-\frac{\sqrt{110}i}{132}$ 0 0 0 0 0 0 $\frac{\sqrt{66}i}{44}$
	$\frac{\sqrt{66}}{44}$	0 0 $-\frac{\sqrt{110}i}{132}$ 0 0 $-\frac{\sqrt{110}i}{66}$ 0 0 0 0 0 0 0 $\frac{\sqrt{66}i}{44}$ 0
	0	0 0 0 $\frac{\sqrt{110}}{66}$ 0 $-\frac{\sqrt{110}i}{66}$ 0 0 0 $-\frac{\sqrt{66}}{44}$ 0 $-\frac{\sqrt{66}i}{44}$ 0 0 0
	0	0 0 $-\frac{\sqrt{110}}{66}$ 0 $-\frac{\sqrt{110}i}{66}$ 0 0 0 $\frac{\sqrt{66}}{44}$ 0 $-\frac{\sqrt{66}i}{44}$ 0 0 0
$\frac{3\sqrt{7}yz(y-z)(y+z)(10x^2-y^2-z^2)}{4}$		
875	symmetry	

continued ...

Table 10

No.	multipole	matrix													
$\mathbb{Q}_{6,0}^{(1,-1;a)}(T_g, 1)$	0 0 0 0 $\frac{\sqrt{165}i}{132}$ 0 0 $\frac{\sqrt{165}}{132}$ 0 0 $\frac{\sqrt{11}i}{44}$ 0 0 $-\frac{\sqrt{11}i}{44}$														
	0 0 0 0 0 $-\frac{\sqrt{165}i}{132}$ $-\frac{\sqrt{165}}{132}$ 0 0 0 0 $-\frac{\sqrt{11}i}{44}$ $\frac{\sqrt{11}}{44}$ 0														
	0 0 0 0 0 $-\frac{5\sqrt{11}}{88}$ $-\frac{5\sqrt{11}i}{88}$ 0 0 0 0 $\frac{\sqrt{165}}{88}$ $-\frac{\sqrt{165}i}{88}$ 0														
	0 0 0 0 $\frac{5\sqrt{11}}{88}$ 0 0 $\frac{5\sqrt{11}i}{88}$ 0 0 $-\frac{\sqrt{165}}{88}$ 0 0 $\frac{\sqrt{165}i}{88}$														
	$-\frac{\sqrt{165}i}{132}$ 0 0 $\frac{5\sqrt{11}}{88}$ 0 0 0 0 $\frac{\sqrt{165}}{264}$ 0 $-\frac{\sqrt{165}i}{66}$ 0 0														
	0 $\frac{\sqrt{165}i}{132}$ $-\frac{5\sqrt{11}}{88}$ 0 0 0 0 0 $-\frac{\sqrt{165}}{264}$ 0 $-\frac{\sqrt{165}i}{66}$ 0 0 0														
	0 $-\frac{\sqrt{165}}{132}$ $\frac{5\sqrt{11}i}{88}$ 0 0 0 0 0 $-\frac{\sqrt{165}i}{264}$ 0 0 0 0 $\frac{\sqrt{165}i}{66}$														
	$\frac{\sqrt{165}}{132}$ 0 0 $-\frac{5\sqrt{11}i}{88}$ 0 0 0 0 0 $\frac{\sqrt{165}i}{264}$ 0 0 $\frac{\sqrt{165}i}{66}$ 0														
	0 0 0 0 0 $-\frac{\sqrt{165}}{264}$ $\frac{\sqrt{165}i}{264}$ 0 0 0 0 $-\frac{3\sqrt{11}}{88}$ $-\frac{3\sqrt{11}i}{88}$ 0														
	0 0 0 0 $\frac{\sqrt{165}}{264}$ 0 0 $-\frac{\sqrt{165}i}{264}$ 0 0 0 $\frac{3\sqrt{11}}{88}$ 0 0 $\frac{3\sqrt{11}i}{88}$														
	$-\frac{\sqrt{11}i}{44}$ 0 0 $-\frac{\sqrt{165}}{88}$ 0 $\frac{\sqrt{165}i}{66}$ 0 0 0 $\frac{3\sqrt{11}}{88}$ 0 0 0 0														
	0 $\frac{\sqrt{11}i}{44}$ $\frac{\sqrt{165}}{88}$ 0 $\frac{\sqrt{165}i}{66}$ 0 0 0 $-\frac{3\sqrt{11}i}{88}$ 0 0 0 0 0														
	0 $\frac{\sqrt{11}}{44}$ $\frac{\sqrt{165}i}{88}$ 0 0 0 0 $-\frac{\sqrt{165}i}{66}$ $\frac{3\sqrt{11}i}{88}$ 0 0 0 0 0														
	$-\frac{\sqrt{11}}{44}$ 0 0 $-\frac{\sqrt{165}i}{88}$ 0 0 $-\frac{\sqrt{165}i}{66}$ 0 0 $-\frac{3\sqrt{11}i}{88}$ 0 0 0 0														
$\frac{3\sqrt{7}xz(x-z)(x+z)(x^2-10y^2+z^2)}{4}$															
876	symmetry														

continued ...

Table 10

No.	multipole	matrix
$\mathbb{Q}_{6,1}^{(1,-1;a)}(T_g, 1)$	0 0 $\frac{\sqrt{165}i}{132}$ 0 0 0 0 $\frac{\sqrt{165}i}{132}$ $-\frac{\sqrt{11}i}{44}$ 0 0 0 0 $\frac{\sqrt{11}i}{44}$	
	0 0 0 $-\frac{\sqrt{165}i}{132}$ 0 0 $\frac{\sqrt{165}i}{132}$ 0 0 $\frac{\sqrt{11}i}{44}$ 0 0 0 $\frac{\sqrt{11}i}{44}$ 0	
	$-\frac{\sqrt{165}i}{132}$ 0 0 0 0 0 $\frac{5\sqrt{11}i}{88}$ 0 0 0 $\frac{\sqrt{165}}{66}$ 0 0 $-\frac{\sqrt{165}i}{264}$ 0 0	
	0 $\frac{\sqrt{165}i}{132}$ 0 0 $\frac{5\sqrt{11}i}{88}$ 0 0 0 $-\frac{\sqrt{165}}{66}$ 0 0 $-\frac{\sqrt{165}i}{264}$ 0 0 0	
	0 0 0 $-\frac{5\sqrt{11}i}{88}$ 0 0 $-\frac{5\sqrt{11}i}{88}$ 0 0 $-\frac{\sqrt{165}i}{88}$ 0 0 0 $\frac{\sqrt{165}i}{88}$ 0	
	0 0 $-\frac{5\sqrt{11}i}{88}$ 0 0 0 0 $\frac{5\sqrt{11}i}{88}$ $-\frac{\sqrt{165}i}{88}$ 0 0 0 0 $-\frac{\sqrt{165}i}{88}$	
	0 $-\frac{\sqrt{165}i}{132}$ 0 0 $\frac{5\sqrt{11}i}{88}$ 0 0 0 0 0 $\frac{\sqrt{165}i}{264}$ 0 0 $-\frac{\sqrt{165}}{66}$	
	$-\frac{\sqrt{165}i}{132}$ 0 0 0 0 $-\frac{5\sqrt{11}i}{88}$ 0 0 0 0 0 $-\frac{\sqrt{165}i}{264}$ $\frac{\sqrt{165}}{66}$ 0	
	$\frac{\sqrt{11}i}{44}$ 0 0 $-\frac{\sqrt{165}}{66}$ 0 $\frac{\sqrt{165}i}{88}$ 0 0 0 0 0 $\frac{3\sqrt{11}i}{88}$ 0 0	
	0 $-\frac{\sqrt{11}i}{44}$ $\frac{\sqrt{165}}{66}$ 0 $\frac{\sqrt{165}i}{88}$ 0 0 0 0 0 $\frac{3\sqrt{11}i}{88}$ 0 0 0	
	0 0 0 $\frac{\sqrt{165}i}{264}$ 0 0 $-\frac{\sqrt{165}i}{264}$ 0 0 $-\frac{3\sqrt{11}i}{88}$ 0 0 0 $-\frac{3\sqrt{11}i}{88}$ 0	
	0 0 $\frac{\sqrt{165}i}{264}$ 0 0 0 0 $\frac{\sqrt{165}i}{264}$ $-\frac{3\sqrt{11}i}{88}$ 0 0 0 0 $\frac{3\sqrt{11}i}{88}$	
	0 $-\frac{\sqrt{11}i}{44}$ 0 0 $-\frac{\sqrt{165}i}{88}$ 0 0 $\frac{\sqrt{165}}{66}$ 0 0 0 $\frac{3\sqrt{11}i}{88}$ 0 0 0	
	$-\frac{\sqrt{11}i}{44}$ 0 0 0 0 $\frac{\sqrt{165}i}{88}$ $-\frac{\sqrt{165}}{66}$ 0 0 0 0 $-\frac{3\sqrt{11}i}{88}$ 0 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 $\frac{\sqrt{165}}{132}$ 0 $\frac{\sqrt{165}i}{132}$ 0 0 0 0 $\frac{\sqrt{11}}{44}$ 0 $-\frac{\sqrt{11}i}{44}$ 0 0	
	0 0 $-\frac{\sqrt{165}}{132}$ 0 $\frac{\sqrt{165}i}{132}$ 0 0 0 $-\frac{\sqrt{11}}{44}$ 0 $-\frac{\sqrt{11}i}{44}$ 0 0 0	
	0 $-\frac{\sqrt{165}}{132}$ 0 0 0 0 0 $\frac{5\sqrt{11}i}{88}$ $-\frac{\sqrt{165}i}{66}$ 0 0 0 0 $\frac{\sqrt{165}i}{264}$	
	$\frac{\sqrt{165}}{132}$ 0 0 0 0 0 $\frac{5\sqrt{11}i}{88}$ 0 0 $\frac{\sqrt{165}i}{66}$ 0 0 $\frac{\sqrt{165}i}{264}$ 0	
	0 $-\frac{\sqrt{165}i}{132}$ 0 0 0 0 0 $\frac{5\sqrt{11}}{88}$ 0 0 $\frac{\sqrt{165}i}{66}$ 0 0 $-\frac{\sqrt{165}}{264}$	
	$-\frac{\sqrt{165}i}{132}$ 0 0 0 0 0 $-\frac{5\sqrt{11}}{88}$ 0 0 0 0 $-\frac{\sqrt{165}i}{66}$ $\frac{\sqrt{165}}{264}$ 0	
	0 0 0 $-\frac{5\sqrt{11}i}{88}$ 0 $-\frac{5\sqrt{11}}{88}$ 0 0 0 $\frac{\sqrt{165}i}{88}$ 0 $-\frac{\sqrt{165}}{88}$ 0 0	
	0 0 $-\frac{5\sqrt{11}i}{88}$ 0 $\frac{5\sqrt{11}}{88}$ 0 0 0 $\frac{\sqrt{165}i}{88}$ 0 $\frac{\sqrt{165}}{88}$ 0 0 0	
	0 $-\frac{\sqrt{11}}{44}$ $\frac{\sqrt{165}i}{66}$ 0 0 0 0 $-\frac{\sqrt{165}i}{88}$ 0 0 0 0 0 $\frac{3\sqrt{11}i}{88}$	
	$\frac{\sqrt{11}}{44}$ 0 0 $-\frac{\sqrt{165}i}{66}$ 0 0 $-\frac{\sqrt{165}i}{88}$ 0 0 0 0 0 $\frac{3\sqrt{11}i}{88}$ 0	
	0 $\frac{\sqrt{11}i}{44}$ 0 0 $-\frac{\sqrt{165}i}{66}$ 0 0 $\frac{\sqrt{165}i}{88}$ 0 0 0 0 0 $\frac{3\sqrt{11}}{88}$	
	$\frac{\sqrt{11}i}{44}$ 0 0 0 0 $\frac{\sqrt{165}i}{66}$ $-\frac{\sqrt{165}}{88}$ 0 0 0 0 0 $-\frac{3\sqrt{11}i}{88}$ 0	
	0 0 0 $-\frac{\sqrt{165}i}{264}$ 0 $\frac{\sqrt{165}}{264}$ 0 0 0 $-\frac{3\sqrt{11}i}{88}$ 0 $-\frac{3\sqrt{11}}{88}$ 0 0	
	0 0 $-\frac{\sqrt{165}i}{264}$ 0 $-\frac{\sqrt{165}}{264}$ 0 0 0 $-\frac{3\sqrt{11}i}{88}$ 0 $\frac{3\sqrt{11}}{88}$ 0 0 0	
$\frac{\sqrt{462}yz(y^2-3z^2)(3y^2-z^2)}{16}$		
878	symmetry	

continued ...

Table 10

No.	multipole	matrix
$\mathbb{Q}_{6,0}^{(1,-1;a)}(T_g, 2)$	0	0 0 0 0 $\frac{\sqrt{10}i}{16}$ 0 0 $-\frac{\sqrt{10}}{16}$ 0 0 $-\frac{\sqrt{6}i}{16}$ 0 0 $-\frac{\sqrt{6}}{16}$
	0	0 0 0 0 0 $-\frac{\sqrt{10}i}{16}$ $\frac{\sqrt{10}}{16}$ 0 0 0 0 $\frac{\sqrt{6}i}{16}$ $\frac{\sqrt{6}}{16}$ 0
	0	0 0 0 0 0 0 0 0 0 0 0 0 0 0
	0	0 0 0 0 0 0 0 0 0 0 0 0 0 0
	$-\frac{\sqrt{10}i}{16}$	0 0 0 0 0 0 0 0 0 $\frac{\sqrt{10}}{16}$ 0 0 0 0
	0	$\frac{\sqrt{10}i}{16}$ 0 0 0 0 0 0 0 $-\frac{\sqrt{10}}{16}$ 0 0 0 0 0
	0	$\frac{\sqrt{10}}{16}$ 0 0 0 0 0 0 0 $\frac{\sqrt{10}i}{16}$ 0 0 0 0 0
	$-\frac{\sqrt{10}}{16}$	0 0 0 0 0 0 0 0 0 $-\frac{\sqrt{10}i}{16}$ 0 0 0 0
	0	0 0 0 0 0 $-\frac{\sqrt{10}}{16}$ $-\frac{\sqrt{10}i}{16}$ 0 0 0 0 $\frac{\sqrt{6}}{16}$ $-\frac{\sqrt{6}i}{16}$ 0
	0	0 0 0 0 $\frac{\sqrt{10}}{16}$ 0 0 $\frac{\sqrt{10}i}{16}$ 0 0 $-\frac{\sqrt{6}}{16}$ 0 0 $\frac{\sqrt{6}i}{16}$
	$\frac{\sqrt{6}i}{16}$	0 0 0 0 0 0 0 0 0 $-\frac{\sqrt{6}}{16}$ 0 0 0 0
	0	$-\frac{\sqrt{6}i}{16}$ 0 0 0 0 0 0 0 $\frac{\sqrt{6}}{16}$ 0 0 0 0 0
	0	$\frac{\sqrt{6}}{16}$ 0 0 0 0 0 0 0 $\frac{\sqrt{6}i}{16}$ 0 0 0 0 0
	$-\frac{\sqrt{6}}{16}$	0 0 0 0 0 0 0 0 0 $-\frac{\sqrt{6}i}{16}$ 0 0 0 0
879	symmetry	$\frac{\sqrt{462xz(x^2-3z^2)(3x^2-z^2)}}{16}$

continued ...

Table 10

No.	multipole	matrix												
$\mathbb{Q}_{6,1}^{(1,-1;a)}(T_g, 2)$	0	0	$-\frac{\sqrt{10}i}{16}$	0	0	0	0	$\frac{\sqrt{10}i}{16}$	$-\frac{\sqrt{6}i}{16}$	0	0	0	0	$-\frac{\sqrt{6}i}{16}$
	0	0	0	$\frac{\sqrt{10}i}{16}$	0	0	$\frac{\sqrt{10}i}{16}$	0	0	$\frac{\sqrt{6}i}{16}$	0	0	$-\frac{\sqrt{6}i}{16}$	0
	$\frac{\sqrt{10}i}{16}$	0	0	0	0	0	0	0	0	0	$\frac{\sqrt{10}i}{16}$	0	0	0
	0	$-\frac{\sqrt{10}i}{16}$	0	0	0	0	0	0	0	$\frac{\sqrt{10}i}{16}$	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	$-\frac{\sqrt{10}i}{16}$	0	0	0	0	0	0	0	$\frac{\sqrt{10}i}{16}$	0	0	0	0
	$-\frac{\sqrt{10}i}{16}$	0	0	0	0	0	0	0	0	0	$-\frac{\sqrt{10}i}{16}$	0	0	0
	$\frac{\sqrt{6}i}{16}$	0	0	0	0	0	0	0	0	0	$\frac{\sqrt{6}i}{16}$	0	0	0
	0	$-\frac{\sqrt{6}i}{16}$	0	0	0	0	0	0	0	$\frac{\sqrt{6}i}{16}$	0	0	0	0
	0	0	0	$-\frac{\sqrt{10}i}{16}$	0	0	$-\frac{\sqrt{10}i}{16}$	0	0	$-\frac{\sqrt{6}i}{16}$	0	0	$\frac{\sqrt{6}i}{16}$	0
	0	0	$-\frac{\sqrt{10}i}{16}$	0	0	0	0	$\frac{\sqrt{10}i}{16}$	$-\frac{\sqrt{6}i}{16}$	0	0	0	0	$-\frac{\sqrt{6}i}{16}$
	0	$\frac{\sqrt{6}i}{16}$	0	0	0	0	0	0	0	0	$-\frac{\sqrt{6}i}{16}$	0	0	0
	$\frac{\sqrt{6}i}{16}$	0	0	0	0	0	0	0	0	0	$\frac{\sqrt{6}i}{16}$	0	0	0
$\frac{\sqrt{462}xy(x^2-3y^2)(3x^2-y^2)}{16}$														

880 symmetry

continued ...

Table 10

No.	multipole	matrix
		$\begin{pmatrix} 0 & 0 & 0 & \frac{\sqrt{10}}{16} & 0 & -\frac{\sqrt{10}i}{16} & 0 & 0 & 0 & -\frac{\sqrt{6}}{16} & 0 & -\frac{\sqrt{6}i}{16} & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{10}}{16} & 0 & -\frac{\sqrt{10}i}{16} & 0 & 0 & 0 & \frac{\sqrt{6}}{16} & 0 & -\frac{\sqrt{6}i}{16} & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{10}}{16} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}i}{16} \\ \frac{\sqrt{10}}{16} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}i}{16} & 0 & 0 \\ 0 & \frac{\sqrt{10}i}{16} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{10}}{16} \\ \frac{\sqrt{10}i}{16} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{10}}{16} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{6}}{16} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{16} \\ -\frac{\sqrt{6}}{16} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{16} & 0 & 0 \\ 0 & \frac{\sqrt{6}i}{16} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{16} \\ \frac{\sqrt{6}i}{16} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}}{16} & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{10}i}{16} & 0 & -\frac{\sqrt{10}}{16} & 0 & 0 & 0 & \frac{\sqrt{6}i}{16} & 0 & -\frac{\sqrt{6}}{16} & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{10}i}{16} & 0 & \frac{\sqrt{10}}{16} & 0 & 0 & 0 & \frac{\sqrt{6}i}{16} & 0 & \frac{\sqrt{6}}{16} & 0 & 0 & 0 \end{pmatrix}$
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 $-\frac{\sqrt{22}i}{48}$ 0 0 $\frac{\sqrt{22}}{48}$ 0 0 $-\frac{\sqrt{330}i}{528}$ 0 0 $-\frac{\sqrt{330}}{528}$
	0	0 0 0 0 0 $\frac{\sqrt{22}i}{48}$ $-\frac{\sqrt{22}}{48}$ 0 0 0 0 $\frac{\sqrt{330}i}{528}$ $\frac{\sqrt{330}}{528}$ 0
	0	0 0 0 0 0 $\frac{\sqrt{330}}{132}$ $-\frac{\sqrt{330}i}{132}$ 0 0 0 $-\frac{2\sqrt{22}i}{33}$ 0 $\frac{\sqrt{22}}{132}$ $\frac{\sqrt{22}i}{132}$ 0
	0	0 0 0 0 $-\frac{\sqrt{330}}{132}$ 0 0 $\frac{\sqrt{330}i}{132}$ $-\frac{2\sqrt{22}i}{33}$ 0 $-\frac{\sqrt{22}}{132}$ 0 0 $-\frac{\sqrt{22}i}{132}$
	$\frac{\sqrt{22}i}{48}$	0 0 $-\frac{\sqrt{330}}{132}$ 0 0 0 0 0 0 $-\frac{7\sqrt{22}}{528}$ 0 $\frac{\sqrt{22}i}{33}$ 0 0
	0	$-\frac{\sqrt{22}i}{48}$ $\frac{\sqrt{330}}{132}$ 0 0 0 0 0 0 $\frac{7\sqrt{22}}{528}$ 0 $\frac{\sqrt{22}i}{33}$ 0 0 0
	0	$-\frac{\sqrt{22}}{48}$ $\frac{\sqrt{330}i}{132}$ 0 0 0 0 0 0 $-\frac{7\sqrt{22}i}{528}$ 0 0 0 0 $\frac{\sqrt{22}i}{33}$
	$\frac{\sqrt{22}}{48}$	0 0 $-\frac{\sqrt{330}i}{132}$ 0 0 0 0 0 0 $\frac{7\sqrt{22}i}{528}$ 0 0 0 $\frac{\sqrt{22}i}{33}$
	0	0 0 $\frac{2\sqrt{22}i}{33}$ 0 $\frac{7\sqrt{22}}{528}$ $\frac{7\sqrt{22}i}{528}$ 0 0 0 0 $\frac{5\sqrt{330}}{528}$ $-\frac{5\sqrt{330}i}{528}$ 0
	0	0 $\frac{2\sqrt{22}i}{33}$ 0 $-\frac{7\sqrt{22}}{528}$ 0 0 0 $-\frac{7\sqrt{22}i}{528}$ 0 0 $-\frac{5\sqrt{330}}{528}$ 0 0 $\frac{5\sqrt{330}i}{528}$
	$\frac{\sqrt{330}i}{528}$	0 0 $-\frac{\sqrt{22}}{132}$ 0 $-\frac{\sqrt{22}i}{33}$ 0 0 0 0 $-\frac{5\sqrt{330}}{528}$ 0 0 0 0
	0	$-\frac{\sqrt{330}i}{528}$ $\frac{\sqrt{22}}{132}$ 0 $-\frac{\sqrt{22}i}{33}$ 0 0 0 $\frac{5\sqrt{330}}{528}$ 0 0 0 0 0
	0	$\frac{\sqrt{330}}{528}$ $-\frac{\sqrt{22}i}{132}$ 0 0 0 0 $-\frac{\sqrt{22}i}{33}$ $\frac{5\sqrt{330}i}{528}$ 0 0 0 0 0
	$-\frac{\sqrt{330}}{528}$	0 0 $\frac{\sqrt{22}i}{132}$ 0 0 $-\frac{\sqrt{22}i}{33}$ 0 0 0 $-\frac{5\sqrt{330}i}{528}$ 0 0 0 0
$\frac{\sqrt{210}xz(x^4 - 16x^2y^2 + 2x^2z^2 + 16y^4 - 16y^2z^2 + z^4)}{16}$		
882	symmetry	

continued ...

Table 10

No.	multipole	matrix													
$\mathbb{Q}_{6,1}^{(1,-1;a)}(T_g, 3)$	0	0	$\frac{\sqrt{22}i}{48}$	0	0	0	0	$-\frac{\sqrt{22}i}{48}$	$-\frac{\sqrt{330}i}{528}$	0	0	0	0	$-\frac{\sqrt{330}i}{528}$	
	0	0	0	$-\frac{\sqrt{22}i}{48}$	0	0	$-\frac{\sqrt{22}i}{48}$	0	0	$\frac{\sqrt{330}i}{528}$	0	0	$-\frac{\sqrt{330}i}{528}$	0	
	$-\frac{\sqrt{22}i}{48}$	0	0	0	0	$\frac{\sqrt{330}i}{132}$	0	0	0	$\frac{\sqrt{22}}{33}$	0	$-\frac{7\sqrt{22}i}{528}$	0	0	
	0	$\frac{\sqrt{22}i}{48}$	0	0	$\frac{\sqrt{330}i}{132}$	0	0	0	$-\frac{\sqrt{22}}{33}$	0	$-\frac{7\sqrt{22}i}{528}$	0	0	0	
	0	0	0	$-\frac{\sqrt{330}i}{132}$	0	0	$\frac{\sqrt{330}i}{132}$	0	0	$\frac{\sqrt{22}i}{132}$	0	$-\frac{2\sqrt{22}}{33}$	$\frac{\sqrt{22}i}{132}$	0	
	0	0	$-\frac{\sqrt{330}i}{132}$	0	0	0	0	$-\frac{\sqrt{330}i}{132}$	$\frac{\sqrt{22}i}{132}$	0	$\frac{2\sqrt{22}}{33}$	0	0	$-\frac{\sqrt{22}i}{132}$	
	0	$\frac{\sqrt{22}i}{48}$	0	0	$-\frac{\sqrt{330}i}{132}$	0	0	0	0	$-\frac{7\sqrt{22}i}{528}$	0	0	$\frac{\sqrt{22}}{33}$		
	$\frac{\sqrt{22}i}{48}$	0	0	0	0	$\frac{\sqrt{330}i}{132}$	0	0	0	0	$\frac{7\sqrt{22}i}{528}$	$-\frac{\sqrt{22}}{33}$	0		
	$\frac{\sqrt{330}i}{528}$	0	0	$-\frac{\sqrt{22}}{33}$	0	$-\frac{\sqrt{22}i}{132}$	0	0	0	0	$\frac{5\sqrt{330}i}{528}$	0	0		
	0	$-\frac{\sqrt{330}i}{528}$	$\frac{\sqrt{22}}{33}$	0	$-\frac{\sqrt{22}i}{132}$	0	0	0	0	$\frac{5\sqrt{330}i}{528}$	0	0	0		
	0	0	0	$\frac{7\sqrt{22}i}{528}$	0	$\frac{2\sqrt{22}}{33}$	$\frac{7\sqrt{22}i}{528}$	0	0	$-\frac{5\sqrt{330}i}{528}$	0	0	$\frac{5\sqrt{330}i}{528}$	0	
	0	0	$\frac{7\sqrt{22}i}{528}$	0	$-\frac{2\sqrt{22}}{33}$	0	0	$-\frac{7\sqrt{22}i}{528}$	$-\frac{5\sqrt{330}i}{528}$	0	0	0	0	$-\frac{5\sqrt{330}i}{528}$	
	0	$\frac{\sqrt{330}i}{528}$	0	0	$-\frac{\sqrt{22}i}{132}$	0	0	$-\frac{\sqrt{22}}{33}$	0	0	$-\frac{5\sqrt{330}i}{528}$	0	0	0	
	$\frac{\sqrt{330}i}{528}$	0	0	0	0	$\frac{\sqrt{22}i}{132}$	$\frac{\sqrt{22}}{33}$	0	0	0	0	$\frac{5\sqrt{330}i}{528}$	0	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 $-\frac{\sqrt{22}}{48}$ 0 $\frac{\sqrt{22}i}{48}$ 0 0 0 $-\frac{\sqrt{330}}{528}$ 0 $-\frac{\sqrt{330}i}{528}$ 0 0	
	0 0 $\frac{\sqrt{22}}{48}$ 0 $\frac{\sqrt{22}i}{48}$ 0 0 0 $\frac{\sqrt{330}}{528}$ 0 $-\frac{\sqrt{330}i}{528}$ 0 0 0	
	0 $\frac{\sqrt{22}}{48}$ 0 0 0 0 0 $-\frac{\sqrt{330}i}{132}$ $\frac{\sqrt{22}i}{33}$ 0 0 0 0 $-\frac{7\sqrt{22}i}{528}$	
	$-\frac{\sqrt{22}}{48}$ 0 0 0 0 0 $-\frac{\sqrt{330}i}{132}$ 0 0 $-\frac{\sqrt{22}i}{33}$ 0 0 $-\frac{7\sqrt{22}i}{528}$ 0	
	0 $-\frac{\sqrt{22}i}{48}$ 0 0 0 0 0 $\frac{\sqrt{330}}{132}$ 0 0 $\frac{\sqrt{22}i}{33}$ 0 0 $-\frac{7\sqrt{22}}{528}$	
	$-\frac{\sqrt{22}i}{48}$ 0 0 0 0 0 $-\frac{\sqrt{330}}{132}$ 0 0 0 0 $-\frac{\sqrt{22}i}{33}$ $\frac{7\sqrt{22}}{528}$ 0	
	0 0 0 $\frac{\sqrt{330}i}{132}$ 0 $-\frac{\sqrt{330}}{132}$ 0 0 0 $\frac{\sqrt{22}i}{132}$ 0 $\frac{\sqrt{22}}{132}$ $-\frac{2\sqrt{22}i}{33}$ 0	
	0 0 $\frac{\sqrt{330}i}{132}$ 0 $\frac{\sqrt{330}}{132}$ 0 0 0 $\frac{\sqrt{22}i}{132}$ 0 $-\frac{\sqrt{22}}{132}$ 0 0 $\frac{2\sqrt{22}i}{33}$	
	0 $\frac{\sqrt{330}}{528}$ $-\frac{\sqrt{22}i}{33}$ 0 0 0 0 $-\frac{\sqrt{22}i}{132}$ 0 0 0 0 0 $-\frac{5\sqrt{330}i}{528}$	
	$-\frac{\sqrt{330}}{528}$ 0 0 $\frac{\sqrt{22}i}{33}$ 0 0 $-\frac{\sqrt{22}i}{132}$ 0 0 0 0 0 $-\frac{5\sqrt{330}i}{528}$ 0	
	0 $\frac{\sqrt{330}i}{528}$ 0 0 $-\frac{\sqrt{22}i}{33}$ 0 0 $-\frac{\sqrt{22}}{132}$ 0 0 0 0 0 $\frac{5\sqrt{330}}{528}$	
	$\frac{\sqrt{330}i}{528}$ 0 0 0 0 $\frac{\sqrt{22}i}{33}$ $\frac{\sqrt{22}}{132}$ 0 0 0 0 0 $-\frac{5\sqrt{330}}{528}$ 0	
	0 0 0 $\frac{7\sqrt{22}i}{528}$ 0 $\frac{7\sqrt{22}}{528}$ $\frac{2\sqrt{22}i}{33}$ 0 0 $\frac{5\sqrt{330}i}{528}$ 0 $-\frac{5\sqrt{330}}{528}$ 0 0	
	0 0 $\frac{7\sqrt{22}i}{528}$ 0 $-\frac{7\sqrt{22}}{528}$ 0 0 $-\frac{2\sqrt{22}i}{33}$ $\frac{5\sqrt{330}i}{528}$ 0 $\frac{5\sqrt{330}}{528}$ 0 0 0	

884 symmetry

1

continued ...

Table 10

No.	multipole	matrix													
$\mathbb{Q}_0^{(1,1;a)}(A_g)$	0	0	0	0	0	0	0	0	$\frac{\sqrt{42}i}{42}$	0	$\frac{\sqrt{42}}{42}$	$\frac{\sqrt{42}i}{42}$	0	0	
	0	0	0	0	0	0	0	0	$\frac{\sqrt{42}i}{42}$	0	$-\frac{\sqrt{42}}{42}$	0	0	$-\frac{\sqrt{42}i}{42}$	
	0	0	0	0	$\frac{\sqrt{42}i}{56}$	0	0	$-\frac{\sqrt{42}}{56}$	0	0	$\frac{\sqrt{70}i}{56}$	0	0	$\frac{\sqrt{70}}{56}$	
	0	0	0	0	0	$-\frac{\sqrt{42}i}{56}$	$\frac{\sqrt{42}}{56}$	0	0	0	$-\frac{\sqrt{70}i}{56}$	$-\frac{\sqrt{70}}{56}$	0	0	
	0	0	$-\frac{\sqrt{42}i}{56}$	0	0	0	0	$\frac{\sqrt{42}i}{56}$	$\frac{\sqrt{70}i}{56}$	0	0	0	0	$\frac{\sqrt{70}i}{56}$	
	0	0	0	$\frac{\sqrt{42}i}{56}$	0	0	$\frac{\sqrt{42}i}{56}$	0	0	$-\frac{\sqrt{70}i}{56}$	0	0	$\frac{\sqrt{70}i}{56}$	0	
	0	0	0	$\frac{\sqrt{42}}{56}$	0	$-\frac{\sqrt{42}i}{56}$	0	0	0	$\frac{\sqrt{70}}{56}$	0	$\frac{\sqrt{70}i}{56}$	0	0	
	0	0	$-\frac{\sqrt{42}}{56}$	0	$-\frac{\sqrt{42}i}{56}$	0	0	0	$-\frac{\sqrt{70}}{56}$	0	$\frac{\sqrt{70}i}{56}$	0	0	0	
	0	$-\frac{\sqrt{42}i}{42}$	0	0	$-\frac{\sqrt{70}i}{56}$	0	0	$-\frac{\sqrt{70}}{56}$	0	0	$-\frac{\sqrt{42}i}{168}$	0	0	$\frac{\sqrt{42}}{168}$	
	$-\frac{\sqrt{42}i}{42}$	0	0	0	0	$\frac{\sqrt{70}i}{56}$	$\frac{\sqrt{70}}{56}$	0	0	0	0	$\frac{\sqrt{42}i}{168}$	$-\frac{\sqrt{42}}{168}$	0	
	0	$-\frac{\sqrt{42}}{42}$	$-\frac{\sqrt{70}i}{56}$	0	0	0	0	$-\frac{\sqrt{70}i}{56}$	$\frac{\sqrt{42}i}{168}$	0	0	0	0	$-\frac{\sqrt{42}i}{168}$	
	$\frac{\sqrt{42}}{42}$	0	0	$\frac{\sqrt{70}i}{56}$	0	0	$-\frac{\sqrt{70}i}{56}$	0	0	$-\frac{\sqrt{42}i}{168}$	0	0	$-\frac{\sqrt{42}i}{168}$	0	
	$-\frac{\sqrt{42}i}{42}$	0	0	$-\frac{\sqrt{70}}{56}$	0	$-\frac{\sqrt{70}i}{56}$	0	0	0	$-\frac{\sqrt{42}}{168}$	0	$\frac{\sqrt{42}i}{168}$	0	0	
	0	$\frac{\sqrt{42}i}{42}$	$\frac{\sqrt{70}}{56}$	0	$-\frac{\sqrt{70}i}{56}$	0	0	0	$\frac{\sqrt{42}}{168}$	0	$\frac{\sqrt{42}i}{168}$	0	0	0	

885 symmetry

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

continued ...

Table 10

No.	multipole	matrix
$\mathbb{Q}_{2,0}^{(1,1;a)}(E_g)$	0	0 0 0 $\frac{\sqrt{105}i}{84}$ 0 $-\frac{\sqrt{105}}{84}$ 0 0 0 $-\frac{\sqrt{7}i}{28}$ 0 $-\frac{\sqrt{7}}{28}$ $\frac{\sqrt{7}i}{14}$ 0
	0	0 0 $\frac{\sqrt{105}i}{84}$ 0 $\frac{\sqrt{105}}{84}$ 0 0 0 $-\frac{\sqrt{7}i}{28}$ 0 $\frac{\sqrt{7}}{28}$ 0 0 $-\frac{\sqrt{7}i}{14}$
	0	$-\frac{\sqrt{105}i}{84}$ 0 0 0 $-\frac{\sqrt{7}i}{14}$ 0 0 $-\frac{\sqrt{7}}{28}$ 0 0 0 0 0 $-\frac{\sqrt{105}}{84}$
	$-\frac{\sqrt{105}i}{84}$	0 0 0 0 $\frac{\sqrt{7}i}{14}$ $\frac{\sqrt{7}}{28}$ 0 0 0 0 0 $\frac{\sqrt{105}}{84}$ 0
	0	$\frac{\sqrt{105}}{84}$ $\frac{\sqrt{7}i}{14}$ 0 0 0 0 $\frac{\sqrt{7}i}{28}$ 0 0 0 0 0 $-\frac{\sqrt{105}i}{84}$
	$-\frac{\sqrt{105}}{84}$	0 0 $-\frac{\sqrt{7}i}{14}$ 0 0 $\frac{\sqrt{7}i}{28}$ 0 0 0 0 0 $-\frac{\sqrt{105}i}{84}$ 0
	0	0 0 0 $\frac{\sqrt{7}}{28}$ 0 $-\frac{\sqrt{7}i}{28}$ 0 0 0 $\frac{\sqrt{105}}{84}$ 0 $\frac{\sqrt{105}i}{84}$ 0 0
	0	0 0 $-\frac{\sqrt{7}}{28}$ 0 $-\frac{\sqrt{7}i}{28}$ 0 0 0 $-\frac{\sqrt{105}}{84}$ 0 $\frac{\sqrt{105}i}{84}$ 0 0
	0	$\frac{\sqrt{7}i}{28}$ 0 0 0 0 0 $-\frac{\sqrt{105}}{84}$ 0 0 $\frac{\sqrt{7}i}{14}$ 0 0 $\frac{\sqrt{7}}{28}$
	$\frac{\sqrt{7}i}{28}$	0 0 0 0 0 $\frac{\sqrt{105}}{84}$ 0 0 0 0 $-\frac{\sqrt{7}i}{14}$ $-\frac{\sqrt{7}}{28}$ 0
	0	$\frac{\sqrt{7}}{28}$ 0 0 0 0 0 $-\frac{\sqrt{105}i}{84}$ $-\frac{\sqrt{7}i}{14}$ 0 0 0 $-\frac{\sqrt{7}i}{28}$
	$-\frac{\sqrt{7}}{28}$	0 0 0 0 0 $-\frac{\sqrt{105}i}{84}$ 0 0 $\frac{\sqrt{7}i}{14}$ 0 0 $-\frac{\sqrt{7}i}{28}$ 0
	$-\frac{\sqrt{7}i}{14}$	0 0 $\frac{\sqrt{105}}{84}$ 0 $\frac{\sqrt{105}i}{84}$ 0 0 0 $-\frac{\sqrt{7}}{28}$ 0 $\frac{\sqrt{7}i}{28}$ 0 0
	0	$\frac{\sqrt{7}i}{14}$ $-\frac{\sqrt{105}}{84}$ 0 $\frac{\sqrt{105}i}{84}$ 0 0 0 $\frac{\sqrt{7}}{28}$ 0 $\frac{\sqrt{7}i}{28}$ 0 0 0

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 0 $\frac{\sqrt{35}i}{84}$ 0 $\frac{\sqrt{35}}{84}$ $-\frac{\sqrt{35}i}{42}$ 0 0 $\frac{\sqrt{21}i}{28}$ 0 $-\frac{\sqrt{21}}{28}$ 0 0	
	0 0 $\frac{\sqrt{35}i}{84}$ 0 $-\frac{\sqrt{35}}{84}$ 0 0 $\frac{\sqrt{35}i}{42}$ $\frac{\sqrt{21}i}{28}$ 0 $\frac{\sqrt{21}}{28}$ 0 0 0	
	0 $-\frac{\sqrt{35}i}{84}$ 0 0 0 0 0 $-\frac{\sqrt{21}}{28}$ 0 0 $\frac{\sqrt{35}i}{42}$ 0 0 $\frac{\sqrt{35}}{84}$	
	$-\frac{\sqrt{35}i}{84}$ 0 0 0 0 0 $\frac{\sqrt{21}}{28}$ 0 0 0 0 $-\frac{\sqrt{35}i}{42}$ $-\frac{\sqrt{35}}{84}$ 0	
	0 $-\frac{\sqrt{35}}{84}$ 0 0 0 0 0 $-\frac{\sqrt{21}i}{28}$ $-\frac{\sqrt{35}i}{42}$ 0 0 0 0 $-\frac{\sqrt{35}i}{84}$	
	$\frac{\sqrt{35}}{84}$ 0 0 0 0 0 $-\frac{\sqrt{21}i}{28}$ 0 0 $\frac{\sqrt{35}i}{42}$ 0 0 0 $-\frac{\sqrt{35}i}{84}$ 0	
	$\frac{\sqrt{35}i}{42}$ 0 0 $\frac{\sqrt{21}}{28}$ 0 $\frac{\sqrt{21}i}{28}$ 0 0 0 $-\frac{\sqrt{35}}{84}$ 0 $\frac{\sqrt{35}i}{84}$ 0 0	
	0 $-\frac{\sqrt{35}i}{42}$ $-\frac{\sqrt{21}}{28}$ 0 $\frac{\sqrt{21}i}{28}$ 0 0 0 $\frac{\sqrt{35}}{84}$ 0 $\frac{\sqrt{35}i}{84}$ 0 0 0	
	0 $-\frac{\sqrt{21}i}{28}$ 0 0 $\frac{\sqrt{35}i}{42}$ 0 0 $\frac{\sqrt{35}}{84}$ 0 0 0 0 0 $\frac{\sqrt{21}}{28}$	
	$-\frac{\sqrt{21}i}{28}$ 0 0 0 0 $-\frac{\sqrt{35}i}{42}$ $-\frac{\sqrt{35}}{84}$ 0 0 0 0 0 $-\frac{\sqrt{21}}{28}$ 0	
	0 $\frac{\sqrt{21}}{28}$ $-\frac{\sqrt{35}i}{42}$ 0 0 0 0 $-\frac{\sqrt{35}i}{84}$ 0 0 0 0 0 $\frac{\sqrt{21}i}{28}$	
	$-\frac{\sqrt{21}}{28}$ 0 0 $\frac{\sqrt{35}i}{42}$ 0 0 $-\frac{\sqrt{35}i}{84}$ 0 0 0 0 0 $\frac{\sqrt{21}i}{28}$ 0	
	0 0 0 $-\frac{\sqrt{35}}{84}$ 0 $\frac{\sqrt{35}i}{84}$ 0 0 0 $-\frac{\sqrt{21}}{28}$ 0 $-\frac{\sqrt{21}i}{28}$ 0 0 0	
	0 0 $\frac{\sqrt{35}}{84}$ 0 $\frac{\sqrt{35}i}{84}$ 0 0 0 $\frac{\sqrt{21}}{28}$ 0 $-\frac{\sqrt{21}i}{28}$ 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 0 0 0 $-\frac{\sqrt{35}i}{42}$ 0 0 $\frac{\sqrt{35}}{42}$ 0 0 $-\frac{\sqrt{21}i}{42}$ 0 0 $-\frac{\sqrt{21}}{42}$	
	0 0 0 0 0 $\frac{\sqrt{35}i}{42}$ $-\frac{\sqrt{35}}{42}$ 0 0 0 0 $\frac{\sqrt{21}i}{42}$ $\frac{\sqrt{21}}{42}$ 0	
	0 0 0 0 0 $\frac{\sqrt{21}}{42}$ $-\frac{\sqrt{21}i}{42}$ 0 0 $-\frac{\sqrt{35}i}{42}$ 0 $-\frac{\sqrt{35}}{42}$ $-\frac{\sqrt{35}i}{42}$ 0	
	0 0 0 0 $-\frac{\sqrt{21}}{42}$ 0 0 $\frac{\sqrt{21}i}{42}$ $-\frac{\sqrt{35}i}{42}$ 0 $\frac{\sqrt{35}}{42}$ 0 0 $\frac{\sqrt{35}i}{42}$	
	$\frac{\sqrt{35}i}{42}$ 0 0 $-\frac{\sqrt{21}}{42}$ 0 0 0 0 $\frac{\sqrt{35}}{42}$ 0 $-\frac{\sqrt{35}i}{42}$ 0 0	
	0 $-\frac{\sqrt{35}i}{42}$ $\frac{\sqrt{21}}{42}$ 0 0 0 0 0 $-\frac{\sqrt{35}}{42}$ 0 $-\frac{\sqrt{35}i}{42}$ 0 0 0	
	0 $-\frac{\sqrt{35}}{42}$ $\frac{\sqrt{21}i}{42}$ 0 0 0 0 0 $\frac{\sqrt{35}i}{42}$ 0 0 0 0 $-\frac{\sqrt{35}i}{42}$	
	$\frac{\sqrt{35}}{42}$ 0 0 $-\frac{\sqrt{21}i}{42}$ 0 0 0 0 $-\frac{\sqrt{35}i}{42}$ 0 0 0 $-\frac{\sqrt{35}i}{42}$ 0	
	0 0 0 $\frac{\sqrt{35}i}{42}$ 0 $-\frac{\sqrt{35}}{42}$ $-\frac{\sqrt{35}i}{42}$ 0 0 0 0 $-\frac{\sqrt{21}}{42}$ $\frac{\sqrt{21}i}{42}$ 0	
	$\frac{\sqrt{21}i}{42}$ 0 0 $\frac{\sqrt{35}}{42}$ 0 0 $\frac{\sqrt{35}i}{42}$ 0 0 0 $\frac{\sqrt{21}}{42}$ 0 0 0	
	0 $-\frac{\sqrt{21}i}{42}$ $-\frac{\sqrt{35}}{42}$ 0 $\frac{\sqrt{35}i}{42}$ 0 0 0 $-\frac{\sqrt{21}}{42}$ 0 0 0 0 0	
	0 $\frac{\sqrt{21}}{42}$ $\frac{\sqrt{35}i}{42}$ 0 0 0 0 $\frac{\sqrt{35}i}{42}$ $-\frac{\sqrt{21}i}{42}$ 0 0 0 0 0	
	$-\frac{\sqrt{21}}{42}$ 0 0 $-\frac{\sqrt{35}i}{42}$ 0 0 $\frac{\sqrt{35}i}{42}$ 0 0 $\frac{\sqrt{21}i}{42}$ 0 0 0 0	

888 symmetry

 $\sqrt{3}xz$

continued ...

Table 10

No.	multipole	matrix													
$\mathbb{Q}_{2,1}^{(1,1;a)}(T_g)$	0	0	$\frac{\sqrt{35}i}{42}$	0	0	0	0	$-\frac{\sqrt{35}i}{42}$	$-\frac{\sqrt{21}i}{42}$	0	0	0	0	$-\frac{\sqrt{21}i}{42}$	
	0	0	0	$-\frac{\sqrt{35}i}{42}$	0	0	$-\frac{\sqrt{35}i}{42}$	0	0	$\frac{\sqrt{21}i}{42}$	0	0	$-\frac{\sqrt{21}i}{42}$	0	
	$-\frac{\sqrt{35}i}{42}$	0	0	0	0	$\frac{\sqrt{21}i}{42}$	0	0	0	$-\frac{\sqrt{35}}{42}$	0	$\frac{\sqrt{35}i}{42}$	0	0	
	0	$\frac{\sqrt{35}i}{42}$	0	0	$\frac{\sqrt{21}i}{42}$	0	0	0	$\frac{\sqrt{35}}{42}$	0	$\frac{\sqrt{35}i}{42}$	0	0	0	
	0	0	0	$-\frac{\sqrt{21}i}{42}$	0	0	$\frac{\sqrt{21}i}{42}$	0	0	$-\frac{\sqrt{35}i}{42}$	0	$-\frac{\sqrt{35}}{42}$	$-\frac{\sqrt{35}i}{42}$	0	
	0	0	$-\frac{\sqrt{21}i}{42}$	0	0	0	0	$-\frac{\sqrt{21}i}{42}$	$-\frac{\sqrt{35}i}{42}$	0	$\frac{\sqrt{35}}{42}$	0	0	$\frac{\sqrt{35}i}{42}$	
	0	$\frac{\sqrt{21}i}{42}$	0	0	$-\frac{\sqrt{21}i}{42}$	0	0	0	0	$\frac{\sqrt{35}i}{42}$	0	0	$-\frac{\sqrt{35}}{42}$	0	
	$\frac{\sqrt{35}i}{42}$	0	0	0	0	$\frac{\sqrt{21}i}{42}$	0	0	0	0	0	$-\frac{\sqrt{35}i}{42}$	$\frac{\sqrt{35}}{42}$	0	
	$\frac{\sqrt{21}i}{42}$	0	0	$\frac{\sqrt{35}}{42}$	0	$\frac{\sqrt{35}i}{42}$	0	0	0	0	0	$-\frac{\sqrt{21}i}{42}$	0	0	
	0	$-\frac{\sqrt{21}i}{42}$	$-\frac{\sqrt{35}}{42}$	0	$\frac{\sqrt{35}i}{42}$	0	0	0	0	$-\frac{\sqrt{21}i}{42}$	0	0	0	0	
	0	0	0	$-\frac{\sqrt{35}i}{42}$	0	$\frac{\sqrt{35}}{42}$	$-\frac{\sqrt{35}i}{42}$	0	0	$\frac{\sqrt{21}i}{42}$	0	0	$-\frac{\sqrt{21}i}{42}$	0	
	0	0	$-\frac{\sqrt{35}i}{42}$	0	$-\frac{\sqrt{35}}{42}$	0	0	$\frac{\sqrt{35}i}{42}$	$\frac{\sqrt{21}i}{42}$	0	0	0	0	$\frac{\sqrt{21}i}{42}$	
	0	$\frac{\sqrt{21}i}{42}$	0	0	$\frac{\sqrt{35}i}{42}$	0	0	$\frac{\sqrt{35}}{42}$	0	0	$\frac{\sqrt{21}i}{42}$	0	0	0	
	$\frac{\sqrt{21}i}{42}$	0	0	0	0	$-\frac{\sqrt{35}i}{42}$	$-\frac{\sqrt{35}}{42}$	0	0	0	$-\frac{\sqrt{21}i}{42}$	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 0 $-\frac{\sqrt{35}}{42}$ 0 $\frac{\sqrt{35}i}{42}$ 0 0 0 $-\frac{\sqrt{21}}{42}$ 0 $-\frac{\sqrt{21}i}{42}$ 0 0 0	
	0 0 $\frac{\sqrt{35}}{42}$ 0 $\frac{\sqrt{35}i}{42}$ 0 0 0 $\frac{\sqrt{21}}{42}$ 0 $-\frac{\sqrt{21}i}{42}$ 0 0 0 0	
	0 $\frac{\sqrt{35}}{42}$ 0 0 0 0 0 $-\frac{\sqrt{21}i}{42}$ $-\frac{\sqrt{35}i}{42}$ 0 0 0 0 $\frac{\sqrt{35}i}{42}$	
	$-\frac{\sqrt{35}}{42}$ 0 0 0 0 0 $-\frac{\sqrt{21}i}{42}$ 0 0 $\frac{\sqrt{35}i}{42}$ 0 0 $\frac{\sqrt{35}i}{42}$ 0	
	0 $-\frac{\sqrt{35}i}{42}$ 0 0 0 0 0 $\frac{\sqrt{21}}{42}$ 0 0 $-\frac{\sqrt{35}i}{42}$ 0 0 $\frac{\sqrt{35}}{42}$	
	$-\frac{\sqrt{35}i}{42}$ 0 0 0 0 0 $-\frac{\sqrt{21}}{42}$ 0 0 0 0 $\frac{\sqrt{35}i}{42}$ $-\frac{\sqrt{35}}{42}$ 0	
	0 0 0 $\frac{\sqrt{21}i}{42}$ 0 $-\frac{\sqrt{21}}{42}$ 0 0 0 $-\frac{\sqrt{35}i}{42}$ 0 $-\frac{\sqrt{35}}{42}$ $-\frac{\sqrt{35}i}{42}$ 0	
	0 0 $\frac{\sqrt{21}i}{42}$ 0 $\frac{\sqrt{21}}{42}$ 0 0 0 $-\frac{\sqrt{35}i}{42}$ 0 $\frac{\sqrt{35}}{42}$ 0 0 $\frac{\sqrt{35}i}{42}$	
	0 $\frac{\sqrt{21}}{42}$ $\frac{\sqrt{35}i}{42}$ 0 0 0 0 $\frac{\sqrt{35}i}{42}$ 0 0 0 0 0 $\frac{\sqrt{21}i}{42}$	
	$-\frac{\sqrt{21}}{42}$ 0 0 $-\frac{\sqrt{35}i}{42}$ 0 0 $\frac{\sqrt{35}i}{42}$ 0 0 0 0 0 $\frac{\sqrt{21}i}{42}$ 0	
	0 $\frac{\sqrt{21}i}{42}$ 0 0 $\frac{\sqrt{35}i}{42}$ 0 0 $\frac{\sqrt{35}}{42}$ 0 0 0 0 0 $-\frac{\sqrt{21}}{42}$	
	$\frac{\sqrt{21}i}{42}$ 0 0 0 0 $-\frac{\sqrt{35}i}{42}$ $-\frac{\sqrt{35}}{42}$ 0 0 0 0 0 $\frac{\sqrt{21}}{42}$ 0	
	0 0 0 $-\frac{\sqrt{35}i}{42}$ 0 $-\frac{\sqrt{35}}{42}$ $\frac{\sqrt{35}i}{42}$ 0 0 $-\frac{\sqrt{21}i}{42}$ 0 $\frac{\sqrt{21}}{42}$ 0 0	
	0 0 $-\frac{\sqrt{35}i}{42}$ 0 $\frac{\sqrt{35}}{42}$ 0 0 $-\frac{\sqrt{35}i}{42}$ $-\frac{\sqrt{21}i}{42}$ 0 $-\frac{\sqrt{21}}{42}$ 0 0 0	

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

890 symmetry

continued ...

Table 10

No.	multipole	matrix													
$\mathbb{Q}_4^{(1,1;a)}(A_g)$	0	0	0	0	0	0	0	0	$-\frac{\sqrt{110}i}{66}$	0	$-\frac{\sqrt{110}}{66}$	$-\frac{\sqrt{110}i}{66}$	0	0	
	0	0	0	0	0	0	0	$-\frac{\sqrt{110}i}{66}$	0	$\frac{\sqrt{110}}{66}$	0	0	$\frac{\sqrt{110}i}{66}$	0	
	0	0	0	0	$\frac{\sqrt{110}i}{264}$	0	0	$-\frac{\sqrt{110}}{264}$	0	0	$\frac{\sqrt{66}i}{88}$	0	0	$\frac{\sqrt{66}}{88}$	
	0	0	0	0	0	$-\frac{\sqrt{110}i}{264}$	$\frac{\sqrt{110}}{264}$	0	0	0	0	$-\frac{\sqrt{66}i}{88}$	$-\frac{\sqrt{66}}{88}$	0	
	0	0	$-\frac{\sqrt{110}i}{264}$	0	0	0	0	$\frac{\sqrt{110}i}{264}$	$\frac{\sqrt{66}i}{88}$	0	0	0	0	$\frac{\sqrt{66}i}{88}$	
	0	0	0	$\frac{\sqrt{110}i}{264}$	0	0	$\frac{\sqrt{110}i}{264}$	0	0	$-\frac{\sqrt{66}i}{88}$	0	0	$\frac{\sqrt{66}i}{88}$	0	
	0	0	0	$\frac{\sqrt{110}}{264}$	0	$-\frac{\sqrt{110}i}{264}$	0	0	0	$\frac{\sqrt{66}}{88}$	0	$\frac{\sqrt{66}i}{88}$	0	0	
	0	0	$-\frac{\sqrt{110}}{264}$	0	$-\frac{\sqrt{110}i}{264}$	0	0	0	$-\frac{\sqrt{66}}{88}$	0	$\frac{\sqrt{66}i}{88}$	0	0	0	
	0	$\frac{\sqrt{110}i}{66}$	0	0	$-\frac{\sqrt{66}i}{88}$	0	0	$-\frac{\sqrt{66}}{88}$	0	0	$\frac{5\sqrt{110}i}{264}$	0	0	$-\frac{5\sqrt{110}}{264}$	
	$\frac{\sqrt{110}i}{66}$	0	0	0	0	$\frac{\sqrt{66}i}{88}$	$\frac{\sqrt{66}}{88}$	0	0	0	0	$-\frac{5\sqrt{110}i}{264}$	$\frac{5\sqrt{110}}{264}$	0	
	0	$\frac{\sqrt{110}}{66}$	$-\frac{\sqrt{66}i}{88}$	0	0	0	0	$-\frac{\sqrt{66}i}{88}$	$-\frac{5\sqrt{110}i}{264}$	0	0	0	0	$\frac{5\sqrt{110}i}{264}$	
	$-\frac{\sqrt{110}}{66}$	0	0	$\frac{\sqrt{66}i}{88}$	0	0	$-\frac{\sqrt{66}i}{88}$	0	0	$\frac{5\sqrt{110}i}{264}$	0	0	$\frac{5\sqrt{110}i}{264}$	0	
	$\frac{\sqrt{110}i}{66}$	0	0	$-\frac{\sqrt{66}}{88}$	0	$-\frac{\sqrt{66}i}{88}$	0	0	0	$\frac{5\sqrt{110}}{264}$	0	$-\frac{5\sqrt{110}i}{264}$	0	0	
	0	$-\frac{\sqrt{110}i}{66}$	$\frac{\sqrt{66}}{88}$	0	$-\frac{\sqrt{66}i}{88}$	0	0	0	$-\frac{5\sqrt{110}}{264}$	0	$-\frac{5\sqrt{110}i}{264}$	0	0	0	

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														
$\mathbb{Q}_{4,0}^{(1,1;a)}(E_g)$	0	0	0	$-\frac{\sqrt{2310}i}{220}$	0	$\frac{\sqrt{2310}}{220}$	0	0	0	$\frac{5\sqrt{154}i}{924}$	0	$\frac{5\sqrt{154}}{924}$	$-\frac{5\sqrt{154}i}{462}$	0		
	0	0	$-\frac{\sqrt{2310}i}{220}$	0	$-\frac{\sqrt{2310}}{220}$	0	0	0	$\frac{5\sqrt{154}i}{924}$	0	$-\frac{5\sqrt{154}}{924}$	0	0	$\frac{5\sqrt{154}i}{462}$		
	0	$\frac{\sqrt{2310}i}{220}$	0	0	$-\frac{\sqrt{154}i}{84}$	0	0	$-\frac{\sqrt{154}}{168}$	0	0	$\frac{\sqrt{2310}i}{385}$	0	0	$-\frac{\sqrt{2310}}{280}$		
	$\frac{\sqrt{2310}i}{220}$	0	0	0	0	$\frac{\sqrt{154}i}{84}$	$\frac{\sqrt{154}}{168}$	0	0	0	$-\frac{\sqrt{2310}i}{385}$	$\frac{\sqrt{2310}}{280}$	0			
	0	$-\frac{\sqrt{2310}}{220}$	$\frac{\sqrt{154}i}{84}$	0	0	0	0	$\frac{\sqrt{154}i}{168}$	$\frac{\sqrt{2310}i}{385}$	0	0	0	0	$-\frac{\sqrt{2310}i}{280}$		
	$\frac{\sqrt{2310}}{220}$	0	0	$-\frac{\sqrt{154}i}{84}$	0	0	$\frac{\sqrt{154}i}{168}$	0	0	$-\frac{\sqrt{2310}i}{385}$	0	0	$-\frac{\sqrt{2310}i}{280}$	0		
	0	0	0	$\frac{\sqrt{154}}{168}$	0	$-\frac{\sqrt{154}i}{168}$	0	0	0	$\frac{3\sqrt{2310}}{3080}$	0	$\frac{3\sqrt{2310}i}{3080}$	0	0		
	0	0	$-\frac{\sqrt{154}}{168}$	0	$-\frac{\sqrt{154}i}{168}$	0	0	0	$-\frac{3\sqrt{2310}}{3080}$	0	$\frac{3\sqrt{2310}i}{3080}$	0	0	0		
	0	$-\frac{5\sqrt{154}i}{924}$	0	0	$-\frac{\sqrt{2310}i}{385}$	0	0	$-\frac{3\sqrt{2310}}{3080}$	0	0	$-\frac{\sqrt{154}i}{924}$	0	0	$-\frac{\sqrt{154}}{1848}$		
	$-\frac{5\sqrt{154}i}{924}$	0	0	0	0	$\frac{\sqrt{2310}i}{385}$	$\frac{3\sqrt{2310}}{3080}$	0	0	0	$\frac{\sqrt{154}i}{924}$	$\frac{\sqrt{154}}{1848}$	0			
	0	$-\frac{5\sqrt{154}}{924}$	$-\frac{\sqrt{2310}i}{385}$	0	0	0	0	$-\frac{3\sqrt{2310}i}{3080}$	$\frac{\sqrt{154}i}{924}$	0	0	0	0	$\frac{\sqrt{154}i}{1848}$		
	$\frac{5\sqrt{154}}{924}$	0	0	$\frac{\sqrt{2310}i}{385}$	0	0	$-\frac{3\sqrt{2310}i}{3080}$	0	0	$-\frac{\sqrt{154}i}{924}$	0	0	$\frac{\sqrt{154}i}{1848}$	0		
	$\frac{5\sqrt{154}i}{462}$	0	0	$\frac{\sqrt{2310}}{280}$	0	$\frac{\sqrt{2310}i}{280}$	0	0	0	$\frac{\sqrt{154}}{1848}$	0	$-\frac{\sqrt{154}i}{1848}$	0	0		
	0	$-\frac{5\sqrt{154}i}{462}$	$-\frac{\sqrt{2310}}{280}$	0	$\frac{\sqrt{2310}i}{280}$	0	0	0	$-\frac{\sqrt{154}}{1848}$	0	$-\frac{\sqrt{154}i}{1848}$	0	0	0		
$\frac{\sqrt{5}(x-y)(x+y)(x^2+y^2-6z^2)}{4}$																

892 symmetry

continued ...

Table 10

No.	multipole	matrix														
$\mathbb{Q}_{4,1}^{(1,1;a)}(E_g)$	0	0	0	$-\frac{\sqrt{770}i}{220}$	0	$-\frac{\sqrt{770}}{220}$	$\frac{\sqrt{770}i}{110}$	0	0	$-\frac{5\sqrt{462}i}{924}$	0	$\frac{5\sqrt{462}}{924}$	0	0	0	
	0	0	$-\frac{\sqrt{770}i}{220}$	0	$\frac{\sqrt{770}}{220}$	0	0	$-\frac{\sqrt{770}i}{110}$	$-\frac{5\sqrt{462}i}{924}$	0	$-\frac{5\sqrt{462}}{924}$	0	0	0	0	
	0	$\frac{\sqrt{770}i}{220}$	0	0	0	0	0	$-\frac{\sqrt{462}}{168}$	0	0	$\frac{\sqrt{770}i}{220}$	0	0	$-\frac{\sqrt{770}}{616}$	0	
	$\frac{\sqrt{770}i}{220}$	0	0	0	0	0	$\frac{\sqrt{462}}{168}$	0	0	0	0	$-\frac{\sqrt{770}i}{220}$	$\frac{\sqrt{770}}{616}$	0	0	
	0	$\frac{\sqrt{770}}{220}$	0	0	0	0	0	$-\frac{\sqrt{462}i}{168}$	$-\frac{\sqrt{770}i}{220}$	0	0	0	0	$\frac{\sqrt{770}i}{616}$	0	
	$-\frac{\sqrt{770}}{220}$	0	0	0	0	0	$-\frac{\sqrt{462}i}{168}$	0	0	$\frac{\sqrt{770}i}{220}$	0	0	$\frac{\sqrt{770}i}{616}$	0	0	
	$-\frac{\sqrt{770}i}{110}$	0	0	$\frac{\sqrt{462}}{168}$	0	$\frac{\sqrt{462}i}{168}$	0	0	0	$-\frac{19\sqrt{770}}{3080}$	0	$\frac{19\sqrt{770}i}{3080}$	0	0	0	
	0	$\frac{\sqrt{770}i}{110}$	$-\frac{\sqrt{462}}{168}$	0	$\frac{\sqrt{462}i}{168}$	0	0	0	$\frac{19\sqrt{770}}{3080}$	0	$\frac{19\sqrt{770}i}{3080}$	0	0	0	0	
	0	$\frac{5\sqrt{462}i}{924}$	0	0	$\frac{\sqrt{770}i}{220}$	0	0	$\frac{19\sqrt{770}}{3080}$	0	0	0	0	0	$-\frac{\sqrt{462}}{1848}$	0	
	$\frac{5\sqrt{462}i}{924}$	0	0	0	0	$-\frac{\sqrt{770}i}{220}$	$-\frac{19\sqrt{770}}{3080}$	0	0	0	0	0	$\frac{\sqrt{462}}{1848}$	0	0	
	0	$-\frac{5\sqrt{462}}{924}$	$-\frac{\sqrt{770}i}{220}$	0	0	0	0	$-\frac{19\sqrt{770}i}{3080}$	0	0	0	0	0	$-\frac{\sqrt{462}i}{1848}$	0	
	$\frac{5\sqrt{462}}{924}$	0	0	$\frac{\sqrt{770}i}{220}$	0	0	$-\frac{19\sqrt{770}i}{3080}$	0	0	0	0	0	0	$-\frac{\sqrt{462}i}{1848}$	0	
	0	0	0	$\frac{\sqrt{770}}{616}$	0	$-\frac{\sqrt{770}i}{616}$	0	0	0	$\frac{\sqrt{462}}{1848}$	0	$\frac{\sqrt{462}i}{1848}$	0	0	0	
	0	0	$-\frac{\sqrt{770}}{616}$	0	$-\frac{\sqrt{770}i}{616}$	0	0	0	$-\frac{\sqrt{462}}{1848}$	0	$\frac{\sqrt{462}i}{1848}$	0	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	0	0	0	$-\frac{\sqrt{110}i}{55}$	0	0	$-\frac{\sqrt{110}}{55}$	0	0	$\frac{\sqrt{66}i}{66}$	0	0	$-\frac{\sqrt{66}}{66}$	
	0	0	0	0	0	$\frac{\sqrt{110}i}{55}$	$\frac{\sqrt{110}}{55}$	0	0	0	0	$-\frac{\sqrt{66}i}{66}$	$\frac{\sqrt{66}}{66}$	0	
	0	0	0	0	0	$\frac{\sqrt{66}}{264}$	$\frac{\sqrt{66}i}{264}$	0	0	0	0	$-\frac{\sqrt{110}}{440}$	$\frac{\sqrt{110}i}{440}$	0	
	0	0	0	0	$-\frac{\sqrt{66}}{264}$	0	0	$-\frac{\sqrt{66}i}{264}$	0	0	$\frac{\sqrt{110}}{440}$	0	0	$-\frac{\sqrt{110}i}{440}$	
	$\frac{\sqrt{110}i}{55}$	0	0	$-\frac{\sqrt{66}}{264}$	0	0	0	0	0	$\frac{7\sqrt{110}}{440}$	0	$-\frac{3\sqrt{110}i}{220}$	0	0	
	0	$-\frac{\sqrt{110}i}{55}$	$\frac{\sqrt{66}}{264}$	0	0	0	0	0	$-\frac{7\sqrt{110}}{440}$	0	$-\frac{3\sqrt{110}i}{220}$	0	0	0	
	0	$\frac{\sqrt{110}}{55}$	$-\frac{\sqrt{66}i}{264}$	0	0	0	0	0	$-\frac{7\sqrt{110}i}{440}$	0	0	0	0	$\frac{3\sqrt{110}i}{220}$	
	$-\frac{\sqrt{110}}{55}$	0	0	$\frac{\sqrt{66}i}{264}$	0	0	0	0	0	$\frac{7\sqrt{110}i}{440}$	0	0	$\frac{3\sqrt{110}i}{220}$	0	
	0	0	0	0	$-\frac{7\sqrt{110}}{440}$	$\frac{7\sqrt{110}i}{440}$	0	0	0	0	$\frac{5\sqrt{66}}{264}$	$\frac{5\sqrt{66}i}{264}$	0		
	0	0	0	0	$\frac{7\sqrt{110}}{440}$	0	0	$-\frac{7\sqrt{110}i}{440}$	0	0	$-\frac{5\sqrt{66}}{264}$	0	0	$-\frac{5\sqrt{66}i}{264}$	
	$-\frac{\sqrt{66}i}{66}$	0	0	$\frac{\sqrt{110}}{440}$	0	$\frac{3\sqrt{110}i}{220}$	0	0	0	$-\frac{5\sqrt{66}}{264}$	0	0	0	0	
	0	$\frac{\sqrt{66}i}{66}$	$-\frac{\sqrt{110}}{440}$	0	$\frac{3\sqrt{110}i}{220}$	0	0	0	$\frac{5\sqrt{66}}{264}$	0	0	0	0	0	
	0	$\frac{\sqrt{66}}{66}$	$-\frac{\sqrt{110}i}{440}$	0	0	0	0	$-\frac{3\sqrt{110}i}{220}$	$-\frac{5\sqrt{66}i}{264}$	0	0	0	0	0	
	$-\frac{\sqrt{66}}{66}$	0	0	$\frac{\sqrt{110}i}{440}$	0	0	$-\frac{3\sqrt{110}i}{220}$	0	0	$\frac{5\sqrt{66}i}{264}$	0	0	0	0	
$-\frac{\sqrt{35}xz(x-z)(x+z)}{2}$															

894 symmetry

continued ...

Table 10

No.	multipole	matrix													
$\mathbb{Q}_{4,1}^{(1,1;a)}(T_g, 1)$	0	0	$-\frac{\sqrt{110}i}{55}$	0	0	0	0	$-\frac{\sqrt{110}i}{55}$	$-\frac{\sqrt{66}i}{66}$	0	0	0	0	$\frac{\sqrt{66}i}{66}$	
	0	0	0	$\frac{\sqrt{110}i}{55}$	0	0	$-\frac{\sqrt{110}i}{55}$	0	0	$\frac{\sqrt{66}i}{66}$	0	0	$\frac{\sqrt{66}i}{66}$	0	
	$\frac{\sqrt{110}i}{55}$	0	0	0	0	$-\frac{\sqrt{66}i}{264}$	0	0	0	$\frac{3\sqrt{110}}{220}$	0	$-\frac{7\sqrt{110}i}{440}$	0	0	
	0	$-\frac{\sqrt{110}i}{55}$	0	0	$-\frac{\sqrt{66}i}{264}$	0	0	0	$-\frac{3\sqrt{110}}{220}$	0	$-\frac{7\sqrt{110}i}{440}$	0	0	0	
	0	0	0	$\frac{\sqrt{66}i}{264}$	0	0	$\frac{\sqrt{66}i}{264}$	0	0	$\frac{\sqrt{110}i}{440}$	0	0	$-\frac{\sqrt{110}i}{440}$	0	
	0	0	$\frac{\sqrt{66}i}{264}$	0	0	0	0	$-\frac{\sqrt{66}i}{264}$	$\frac{\sqrt{110}i}{440}$	0	0	0	0	$\frac{\sqrt{110}i}{440}$	
	0	$\frac{\sqrt{110}i}{55}$	0	0	$-\frac{\sqrt{66}i}{264}$	0	0	0	0	$\frac{7\sqrt{110}i}{440}$	0	0	$-\frac{3\sqrt{110}}{220}$		
	$\frac{\sqrt{110}i}{55}$	0	0	0	0	$\frac{\sqrt{66}i}{264}$	0	0	0	0	$-\frac{7\sqrt{110}i}{440}$	$\frac{3\sqrt{110}}{220}$	0		
	$\frac{\sqrt{66}i}{66}$	0	0	$-\frac{3\sqrt{110}}{220}$	0	$-\frac{\sqrt{110}i}{440}$	0	0	0	0	$-\frac{5\sqrt{66}i}{264}$	0	0		
	0	$-\frac{\sqrt{66}i}{66}$	$\frac{3\sqrt{110}}{220}$	0	$-\frac{\sqrt{110}i}{440}$	0	0	0	0	$-\frac{5\sqrt{66}i}{264}$	0	0	0		
	0	0	0	$\frac{7\sqrt{110}i}{440}$	0	0	$-\frac{7\sqrt{110}i}{440}$	0	0	$\frac{5\sqrt{66}i}{264}$	0	0	$\frac{5\sqrt{66}i}{264}$	0	
	0	0	$\frac{7\sqrt{110}i}{440}$	0	0	0	0	$\frac{7\sqrt{110}i}{440}$	$\frac{5\sqrt{66}i}{264}$	0	0	0	0	$-\frac{5\sqrt{66}i}{264}$	
	0	$-\frac{\sqrt{66}i}{66}$	0	0	$\frac{\sqrt{110}i}{440}$	0	0	$\frac{3\sqrt{110}}{220}$	0	0	$-\frac{5\sqrt{66}i}{264}$	0	0	0	
	$-\frac{\sqrt{66}i}{66}$	0	0	0	0	$-\frac{\sqrt{110}i}{440}$	$-\frac{3\sqrt{110}}{220}$	0	0	0	$-\frac{5\sqrt{66}i}{264}$	0	$\frac{5\sqrt{66}i}{264}$	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	$-\frac{\sqrt{110}}{55}$	0	$-\frac{\sqrt{110}i}{55}$	0	0	0	$\frac{\sqrt{66}}{66}$	0	$-\frac{\sqrt{66}i}{66}$	0	0	
	0	0	$\frac{\sqrt{110}}{55}$	0	$-\frac{\sqrt{110}i}{55}$	0	0	0	$-\frac{\sqrt{66}}{66}$	0	$-\frac{\sqrt{66}i}{66}$	0	0	0	
	0	$\frac{\sqrt{110}}{55}$	0	0	0	0	0	$-\frac{\sqrt{66}i}{264}$	$-\frac{3\sqrt{110}i}{220}$	0	0	0	0	$\frac{7\sqrt{110}i}{440}$	
	$-\frac{\sqrt{110}}{55}$	0	0	0	0	0	$-\frac{\sqrt{66}i}{264}$	0	0	$\frac{3\sqrt{110}i}{220}$	0	0	$\frac{7\sqrt{110}i}{440}$	0	
	0	$\frac{\sqrt{110}i}{55}$	0	0	0	0	0	$-\frac{\sqrt{66}}{264}$	0	0	$\frac{3\sqrt{110}i}{220}$	0	0	$-\frac{7\sqrt{110}}{440}$	
	$\frac{\sqrt{110}i}{55}$	0	0	0	0	0	$\frac{\sqrt{66}}{264}$	0	0	0	0	$-\frac{3\sqrt{110}i}{220}$	$\frac{7\sqrt{110}}{440}$	0	
	0	0	0	$\frac{\sqrt{66}i}{264}$	0	$\frac{\sqrt{66}}{264}$	0	0	0	$-\frac{\sqrt{110}i}{440}$	0	$\frac{\sqrt{110}}{440}$	0	0	
	0	0	$\frac{\sqrt{66}i}{264}$	0	$-\frac{\sqrt{66}}{264}$	0	0	0	$-\frac{\sqrt{110}i}{440}$	0	$-\frac{\sqrt{110}}{440}$	0	0	0	
	0	$-\frac{\sqrt{66}}{66}$	$\frac{3\sqrt{110}i}{220}$	0	0	0	0	$\frac{\sqrt{110}i}{440}$	0	0	0	0	0	$-\frac{5\sqrt{66}i}{264}$	
	$\frac{\sqrt{66}}{66}$	0	0	$-\frac{3\sqrt{110}i}{220}$	0	0	$\frac{\sqrt{110}i}{440}$	0	0	0	0	0	$-\frac{5\sqrt{66}i}{264}$	0	
	0	$\frac{\sqrt{66}i}{66}$	0	0	$-\frac{3\sqrt{110}i}{220}$	0	0	$-\frac{\sqrt{110}i}{440}$	0	0	0	0	0	$-\frac{5\sqrt{66}}{264}$	
	$\frac{\sqrt{66}i}{66}$	0	0	0	0	$\frac{3\sqrt{110}i}{220}$	$\frac{\sqrt{110}}{440}$	0	0	0	0	0	$\frac{5\sqrt{66}}{264}$	0	
	0	0	0	$-\frac{7\sqrt{110}i}{440}$	0	$\frac{7\sqrt{110}}{440}$	0	0	0	$\frac{5\sqrt{66}i}{264}$	0	$\frac{5\sqrt{66}}{264}$	0	0	
	0	0	$-\frac{7\sqrt{110}i}{440}$	0	$-\frac{7\sqrt{110}}{440}$	0	0	0	$\frac{5\sqrt{66}i}{264}$	0	$-\frac{5\sqrt{66}}{264}$	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 0 0 0 0 0 0 0 0 0 $-\frac{\sqrt{462}i}{462}$ 0 0 $-\frac{\sqrt{462}}{462}$	0 0 0 0 0 0 0 0 0 0 $\frac{\sqrt{462}i}{462}$ $\frac{\sqrt{462}}{462}$ 0													
	0 0 0 0 0 $-\frac{17\sqrt{462}}{1848}$ $\frac{17\sqrt{462}i}{1848}$ 0 0 $-\frac{\sqrt{770}i}{110}$ 0 $\frac{9\sqrt{770}}{3080}$ $\frac{9\sqrt{770}i}{3080}$ 0	0 0 0 0 0 $-\frac{17\sqrt{462}i}{1848}$ $-\frac{\sqrt{770}i}{110}$ 0 $-\frac{9\sqrt{770}}{3080}$ 0 0 $-\frac{9\sqrt{770}i}{3080}$													
	0 0 0 $\frac{17\sqrt{462}}{1848}$ 0 0 0 0 0 $\frac{9\sqrt{770}}{3080}$ 0 $\frac{\sqrt{770}i}{220}$ 0 0	0 0 0 0 0 0 0 0 0 $\frac{9\sqrt{770}i}{3080}$ 0 0 $\frac{\sqrt{770}i}{220}$													
	0 0 $-\frac{17\sqrt{462}}{1848}$ 0 0 0 0 0 0 $-\frac{9\sqrt{770}}{3080}$ 0 $\frac{\sqrt{770}i}{220}$ 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0													
	0 0 $-\frac{17\sqrt{462}i}{1848}$ 0 0 0 0 0 0 $\frac{9\sqrt{770}i}{3080}$ 0 0 0 0 $\frac{\sqrt{770}i}{220}$	0 0 0 0 0 0 0 0 0 0 0 0 0 0													
	0 0 0 $\frac{17\sqrt{462}i}{1848}$ 0 0 0 0 0 0 $-\frac{9\sqrt{770}i}{3080}$ 0 0 0 $\frac{\sqrt{770}i}{220}$	0 0 0 0 0 0 0 0 0 0 0 0 0 0													
	0 0 0 $\frac{\sqrt{770}i}{110}$ 0 $-\frac{9\sqrt{770}}{3080}$ $-\frac{9\sqrt{770}i}{3080}$ 0 0 0 0 $-\frac{13\sqrt{462}}{1848}$ $\frac{13\sqrt{462}i}{1848}$ 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0													
	0 0 $\frac{\sqrt{770}i}{110}$ 0 $\frac{9\sqrt{770}}{3080}$ 0 0 0 $\frac{9\sqrt{770}i}{3080}$ 0 0 0 $\frac{13\sqrt{462}}{1848}$ 0 0 $-\frac{13\sqrt{462}i}{1848}$	0 0 0 0 0 0 0 0 0 0 0 0 0 0													
	$\frac{\sqrt{462}i}{462}$ 0 0 $-\frac{9\sqrt{770}}{3080}$ 0 $-\frac{\sqrt{770}i}{220}$ 0 0 0 0 $\frac{13\sqrt{462}}{1848}$ 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0													
	0 $-\frac{\sqrt{462}i}{462}$ $\frac{9\sqrt{770}}{3080}$ 0 $-\frac{\sqrt{770}i}{220}$ 0 0 0 0 $-\frac{13\sqrt{462}}{1848}$ 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0													
	0 $\frac{\sqrt{462}}{462}$ $-\frac{9\sqrt{770}i}{3080}$ 0 0 0 0 0 $-\frac{\sqrt{770}i}{220}$ $-\frac{13\sqrt{462}i}{1848}$ 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0													
	$-\frac{\sqrt{462}}{462}$ 0 0 $\frac{9\sqrt{770}i}{3080}$ 0 0 $-\frac{\sqrt{770}i}{220}$ 0 0 $\frac{13\sqrt{462}i}{1848}$ 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 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 0 0 0 0 0 0 0 $-\frac{\sqrt{462}i}{462}$ 0 0 0 0 $-\frac{\sqrt{462}i}{462}$														
	0 0 0 0 0 0 0 0 $\frac{\sqrt{462}i}{462}$ 0 0 0 $-\frac{\sqrt{462}i}{462}$ 0														
	0 0 0 0 0 $-\frac{17\sqrt{462}i}{1848}$ 0 0 0 $\frac{\sqrt{770}}{220}$ 0 $\frac{9\sqrt{770}i}{3080}$ 0 0														
	0 0 0 0 $-\frac{17\sqrt{462}i}{1848}$ 0 0 0 $-\frac{\sqrt{770}}{220}$ 0 $\frac{9\sqrt{770}i}{3080}$ 0 0 0														
	0 0 0 $\frac{17\sqrt{462}i}{1848}$ 0 0 $-\frac{17\sqrt{462}i}{1848}$ 0 0 $\frac{9\sqrt{770}i}{3080}$ 0 $-\frac{\sqrt{770}}{110}$ $\frac{9\sqrt{770}i}{3080}$ 0														
	0 0 $\frac{17\sqrt{462}i}{1848}$ 0 0 0 $\frac{17\sqrt{462}i}{1848}$ $\frac{9\sqrt{770}i}{3080}$ 0 $\frac{\sqrt{770}}{110}$ 0 0 $-\frac{9\sqrt{770}i}{3080}$														
	0 0 0 0 $-\frac{17\sqrt{462}i}{1848}$ 0 0 0 0 0 0 $-\frac{9\sqrt{770}i}{3080}$ $-\frac{\sqrt{770}}{220}$ 0														
	$\frac{\sqrt{462}i}{462}$ 0 0 $-\frac{\sqrt{770}}{220}$ 0 $-\frac{9\sqrt{770}i}{3080}$ 0 0 0 0 0 $-\frac{13\sqrt{462}i}{1848}$ 0 0														
	0 $-\frac{\sqrt{462}i}{462}$ $\frac{\sqrt{770}}{220}$ 0 $-\frac{9\sqrt{770}i}{3080}$ 0 0 0 0 0 $-\frac{13\sqrt{462}i}{1848}$ 0 0 0														
	0 0 0 $-\frac{9\sqrt{770}i}{3080}$ 0 $\frac{\sqrt{770}}{110}$ $-\frac{9\sqrt{770}i}{3080}$ 0 0 $\frac{13\sqrt{462}i}{1848}$ 0 0 $-\frac{13\sqrt{462}i}{1848}$ 0														
	0 0 $-\frac{9\sqrt{770}i}{3080}$ 0 $-\frac{\sqrt{770}}{110}$ 0 0 $\frac{9\sqrt{770}i}{3080}$ $\frac{13\sqrt{462}i}{1848}$ 0 0 0 0 $\frac{13\sqrt{462}i}{1848}$														
	0 $\frac{\sqrt{462}i}{462}$ 0 0 $-\frac{9\sqrt{770}i}{3080}$ 0 0 $-\frac{\sqrt{770}}{220}$ 0 0 $\frac{13\sqrt{462}i}{1848}$ 0 0 0														
	$\frac{\sqrt{462}i}{462}$ 0 0 0 0 $\frac{9\sqrt{770}i}{3080}$ $\frac{\sqrt{770}}{220}$ 0 0 0 0 $-\frac{13\sqrt{462}i}{1848}$ 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 0 0 0 0 0 0 0 $-\frac{\sqrt{462}}{462}$ 0 $-\frac{\sqrt{462}i}{462}$ 0 0														
	0 0 0 0 0 0 0 0 $\frac{\sqrt{462}}{462}$ 0 $-\frac{\sqrt{462}i}{462}$ 0 0 0 0														
	0 0 0 0 0 0 0 $\frac{17\sqrt{462}i}{1848}$ $\frac{\sqrt{770}i}{220}$ 0 0 0 0 $\frac{9\sqrt{770}i}{3080}$														
	0 0 0 0 0 0 $\frac{17\sqrt{462}i}{1848}$ 0 0 $-\frac{\sqrt{770}i}{220}$ 0 0 $\frac{9\sqrt{770}i}{3080}$ 0														
	0 0 0 0 0 0 0 $-\frac{17\sqrt{462}}{1848}$ 0 $\frac{\sqrt{770}i}{220}$ 0 0 0 $\frac{9\sqrt{770}}{3080}$														
	0 0 0 0 0 0 $\frac{17\sqrt{462}}{1848}$ 0 0 0 0 $-\frac{\sqrt{770}i}{220}$ $-\frac{9\sqrt{770}}{3080}$ 0														
	0 0 0 $-\frac{17\sqrt{462}i}{1848}$ 0 $\frac{17\sqrt{462}}{1848}$ 0 0 0 $\frac{9\sqrt{770}i}{3080}$ 0 $\frac{9\sqrt{770}}{3080}$ $-\frac{\sqrt{770}i}{110}$ 0														
	0 0 $-\frac{17\sqrt{462}i}{1848}$ 0 $-\frac{17\sqrt{462}}{1848}$ 0 0 0 $\frac{9\sqrt{770}i}{3080}$ 0 $-\frac{9\sqrt{770}}{3080}$ 0 0 $\frac{\sqrt{770}i}{110}$														
	0 $\frac{\sqrt{462}}{462}$ $-\frac{\sqrt{770}i}{220}$ 0 0 0 0 $-\frac{9\sqrt{770}i}{3080}$ 0 0 0 0 0 $\frac{13\sqrt{462}i}{1848}$														
	$-\frac{\sqrt{462}}{462}$ 0 0 $\frac{\sqrt{770}i}{220}$ 0 0 $-\frac{9\sqrt{770}i}{3080}$ 0 0 0 0 0 $\frac{13\sqrt{462}i}{1848}$ 0														
	0 $\frac{\sqrt{462}i}{462}$ 0 0 $-\frac{\sqrt{770}i}{220}$ 0 0 $-\frac{9\sqrt{770}}{3080}$ 0 0 0 0 0 $-\frac{13\sqrt{462}}{1848}$														
	$\frac{\sqrt{462}i}{462}$ 0 0 0 0 $\frac{\sqrt{770}i}{220}$ $\frac{9\sqrt{770}}{3080}$ 0 0 0 0 0 $\frac{13\sqrt{462}}{1848}$ 0														
	0 0 0 $-\frac{9\sqrt{770}i}{3080}$ 0 $-\frac{9\sqrt{770}}{3080}$ $\frac{\sqrt{770}i}{110}$ 0 0 $-\frac{13\sqrt{462}i}{1848}$ 0 $\frac{13\sqrt{462}}{1848}$ 0 0														
	0 0 $-\frac{9\sqrt{770}i}{3080}$ 0 $\frac{9\sqrt{770}}{3080}$ 0 0 $-\frac{\sqrt{770}i}{110}$ $-\frac{13\sqrt{462}i}{1848}$ 0 $-\frac{13\sqrt{462}}{1848}$ 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 0 0 0 0 0 0 0 0	$-\frac{\sqrt{7}i}{14}$	0	0	$\frac{\sqrt{7}}{14}$										
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	$\frac{\sqrt{7}i}{14}$	$-\frac{\sqrt{7}}{14}$	0	0										
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	$\frac{3\sqrt{7}}{56}$	$\frac{3\sqrt{7}i}{56}$	0	0										
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	$-\frac{3\sqrt{7}}{56}$	0	0	$-\frac{3\sqrt{7}i}{56}$	0	0	$-\frac{\sqrt{105}}{56}$	0	0	0	$\frac{\sqrt{105}i}{56}$			
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	$-\frac{3\sqrt{7}}{56}$	0	0	0	0	0	$\frac{\sqrt{105}}{56}$	0	0	0	0	0		
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	$\frac{3\sqrt{7}}{56}$	0	0	0	0	0	$-\frac{\sqrt{105}}{56}$	0	0	0	0	0		
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	$-\frac{3\sqrt{7}i}{56}$	0	0	0	0	0	$-\frac{\sqrt{105}i}{56}$	0	0	0	0	0		
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	$\frac{3\sqrt{7}i}{56}$	0	0	0	0	0	0	$\frac{\sqrt{105}i}{56}$	0	0	0	0		
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0	$-\frac{\sqrt{105}}{56}$	$\frac{\sqrt{105}i}{56}$	0	0	0	0	0	0	$-\frac{\sqrt{7}}{56}$	$-\frac{\sqrt{7}i}{56}$	0		
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0	$\frac{\sqrt{105}}{56}$	0	0	0	0	$-\frac{\sqrt{105}i}{56}$	0	0	$\frac{\sqrt{7}}{56}$	0	0	$\frac{\sqrt{7}i}{56}$	
	$\frac{\sqrt{7}i}{14}$ 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0	$-\frac{\sqrt{105}}{56}$	0	0	0	0	0	$\frac{\sqrt{7}}{56}$	0	0	0	0		
	0 $-\frac{\sqrt{7}i}{14}$ $\frac{\sqrt{105}}{56}$ 0 0 0 0 0 0 0 0 0 0 0 0 0	0	0	0	0	0	0	$-\frac{\sqrt{7}}{56}$	0	0	0	0	0		
	0 $-\frac{\sqrt{7}}{14}$ $\frac{\sqrt{105}i}{56}$ 0 0 0 0 0 0 0 0 0 0 0 0 0	0	0	0	0	0	0	$\frac{\sqrt{7}i}{56}$	0	0	0	0	0		
	$\frac{\sqrt{7}}{14}$ 0 0 $-\frac{\sqrt{105}i}{56}$ 0 0 0 0 0 0 0 0 0 0 0 0	0	0	0	$-\frac{\sqrt{105}i}{56}$	0	0	0	$-\frac{\sqrt{7}i}{56}$	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 0 0 $\frac{\sqrt{7}i}{14}$ 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 $-\frac{3\sqrt{7}i}{56}$ 0 0 0 0 $-\frac{\sqrt{105}i}{56}$ 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0													
	0 0 0 0 0 $-\frac{3\sqrt{7}i}{56}$ 0 0 0 0 0 0 $-\frac{\sqrt{105}i}{56}$ 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0													
	0 0 0 $\frac{3\sqrt{7}i}{56}$ 0 0 $\frac{3\sqrt{7}i}{56}$ 0 0 0 $-\frac{\sqrt{105}i}{56}$ 0 0 0 $\frac{\sqrt{105}i}{56}$ 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0													
	0 0 $\frac{3\sqrt{7}i}{56}$ 0 0 0 $-\frac{3\sqrt{7}i}{56}$ 0 0 0 0 0 0 0 0 $-\frac{\sqrt{105}i}{56}$	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0													
	0 0 0 0 0 0 $\frac{3\sqrt{7}i}{56}$ 0 0 0 0 0 0 $-\frac{\sqrt{105}i}{56}$ 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 $\frac{\sqrt{105}i}{56}$ 0 0 0 0 0 0 0 $\frac{\sqrt{7}i}{56}$ 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 $\frac{\sqrt{105}i}{56}$ 0 0 0 0 0 0 $\frac{\sqrt{7}i}{56}$ 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0													
	0 0 0 $\frac{\sqrt{105}i}{56}$ 0 0 $-\frac{\sqrt{105}i}{56}$ 0 0 0 0 $-\frac{\sqrt{7}i}{56}$ 0 0 0 $-\frac{\sqrt{7}i}{56}$	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0													
	0 0 $\frac{\sqrt{105}i}{56}$ 0 0 0 0 $\frac{\sqrt{105}i}{56}$ 0 0 0 0 0 0 0 $\frac{\sqrt{7}i}{56}$	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0													
	0 $\frac{\sqrt{7}i}{14}$ 0 0 $-\frac{\sqrt{105}i}{56}$ 0 0 0 0 0 0 $\frac{\sqrt{7}i}{56}$ 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 $\frac{\sqrt{105}i}{56}$ 0 0 0 0 0 0 $-\frac{\sqrt{7}i}{56}$ 0 0 0 0	0 0 0 0 0 0 0 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 0 $-\frac{\sqrt{7}}{14}$ 0 $\frac{\sqrt{7}i}{14}$ 0 0	
	0 0 0 0 0 0 0 0 $\frac{\sqrt{7}}{14}$ 0 $\frac{\sqrt{7}i}{14}$ 0 0 0	
	0 0 0 0 0 0 0 $-\frac{3\sqrt{7}i}{56}$ 0 0 0 0 0 $\frac{\sqrt{105}i}{56}$	
	0 0 0 0 0 0 $-\frac{3\sqrt{7}i}{56}$ 0 0 0 0 0 $\frac{\sqrt{105}i}{56}$ 0	
	0 0 0 0 0 0 0 $-\frac{3\sqrt{7}}{56}$ 0 0 0 0 0 $-\frac{\sqrt{105}}{56}$	
	0 0 0 0 0 0 $\frac{3\sqrt{7}}{56}$ 0 0 0 0 0 $\frac{\sqrt{105}}{56}$ 0	
	0 0 0 $\frac{3\sqrt{7}i}{56}$ 0 $\frac{3\sqrt{7}}{56}$ 0 0 0 $\frac{\sqrt{105}i}{56}$ 0 $-\frac{\sqrt{105}}{56}$ 0 0	
	0 $\frac{3\sqrt{7}i}{56}$ 0 $-\frac{3\sqrt{7}}{56}$ 0 0 0 $\frac{\sqrt{105}i}{56}$ 0 $\frac{\sqrt{105}}{56}$ 0 0 0	
	0 $\frac{\sqrt{7}}{14}$ 0 0 0 0 0 $-\frac{\sqrt{105}i}{56}$ 0 0 0 0 0 $\frac{\sqrt{7}i}{56}$	
	$-\frac{\sqrt{7}}{14}$ 0 0 0 0 0 $-\frac{\sqrt{105}i}{56}$ 0 0 0 0 0 $\frac{\sqrt{7}i}{56}$ 0	
	0 $-\frac{\sqrt{7}i}{14}$ 0 0 0 0 0 $\frac{\sqrt{105}}{56}$ 0 0 0 0 0 $\frac{\sqrt{7}}{56}$	
	$-\frac{\sqrt{7}i}{14}$ 0 0 0 0 0 $-\frac{\sqrt{105}}{56}$ 0 0 0 0 0 $-\frac{\sqrt{7}}{56}$ 0	
	0 0 0 $-\frac{\sqrt{105}i}{56}$ 0 $\frac{\sqrt{105}}{56}$ 0 0 0 $-\frac{\sqrt{7}i}{56}$ 0 $-\frac{\sqrt{7}}{56}$ 0 0	
	0 0 $-\frac{\sqrt{105}i}{56}$ 0 $-\frac{\sqrt{105}}{56}$ 0 0 0 $-\frac{\sqrt{7}i}{56}$ 0 $\frac{\sqrt{7}}{56}$ 0 0 0	

902 symmetry

 $\sqrt{15}xyz$

continued ...

Table 10

No.	multipole	matrix
		$\begin{pmatrix} 0 & 0 & 0 & -\frac{i}{6} & 0 & -\frac{1}{6} & -\frac{i}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{i}{6} & 0 & \frac{1}{6} & 0 & 0 & \frac{i}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{i}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{i}{6} & 0 & 0 & -\frac{1}{6} \\ \frac{i}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{i}{6} & \frac{1}{6} & 0 \\ 0 & \frac{1}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{i}{6} & 0 & 0 & 0 & 0 & \frac{i}{6} \\ -\frac{1}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{i}{6} & 0 & 0 & \frac{i}{6} & 0 \\ \frac{i}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{1}{6} & 0 & -\frac{i}{6} & 0 & 0 \\ 0 & -\frac{i}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{1}{6} & 0 & -\frac{i}{6} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{i}{6} & 0 & 0 & -\frac{1}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{i}{6} & \frac{1}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{i}{6} & 0 & 0 & 0 & 0 & \frac{i}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{i}{6} & 0 & 0 & \frac{i}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{1}{6} & 0 & -\frac{i}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{1}{6} & 0 & -\frac{i}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{pmatrix}$
903	symmetry	$\frac{x(2x^2-3y^2-3z^2)}{2}$

continued ...

Table 10

No.	multipole	matrix
$\mathbb{G}_{3,0}^{(1,0;a)}(T_g, 1)$	0	0 0 0 0 $-\frac{\sqrt{15}i}{24}$ 0 0 $-\frac{\sqrt{15}}{24}$ 0 0 $\frac{i}{8}$ 0 0 $-\frac{1}{8}$
	0	0 0 0 0 0 $\frac{\sqrt{15}i}{24}$ $\frac{\sqrt{15}}{24}$ 0 0 0 0 $-\frac{i}{8}$ $\frac{1}{8}$ 0 0 0
	0	0 0 0 0 0 $\frac{1}{8}$ $\frac{i}{8}$ 0 0 0 0 0 $\frac{\sqrt{15}}{24}$ $-\frac{\sqrt{15}i}{24}$ 0
	0	0 0 0 0 $-\frac{1}{8}$ 0 0 0 $-\frac{i}{8}$ 0 0 $-\frac{\sqrt{15}}{24}$ 0 0 $\frac{\sqrt{15}i}{24}$
	$\frac{\sqrt{15}i}{24}$	0 0 $-\frac{1}{8}$ 0 0 0 0 0 0 $-\frac{\sqrt{15}}{24}$ 0 0 0 0 0
	0	$-\frac{\sqrt{15}i}{24}$ $\frac{1}{8}$ 0 0 0 0 0 $\frac{\sqrt{15}}{24}$ 0 0 0 0 0 0 0
	0	$\frac{\sqrt{15}}{24}$ $-\frac{i}{8}$ 0 0 0 0 0 0 $\frac{\sqrt{15}i}{24}$ 0 0 0 0 0 0
	$-\frac{\sqrt{15}}{24}$	0 0 $\frac{i}{8}$ 0 0 0 0 0 0 $-\frac{\sqrt{15}i}{24}$ 0 0 0 0 0
	0	0 0 0 0 0 $\frac{\sqrt{15}}{24}$ $-\frac{\sqrt{15}i}{24}$ 0 0 0 0 $-\frac{1}{8}$ $-\frac{i}{8}$ 0
	0	0 0 0 0 $-\frac{\sqrt{15}}{24}$ 0 0 0 $\frac{\sqrt{15}i}{24}$ 0 0 $\frac{1}{8}$ 0 0 $\frac{i}{8}$
	$-\frac{i}{8}$	0 0 $-\frac{\sqrt{15}}{24}$ 0 0 0 0 0 0 $\frac{1}{8}$ 0 0 0 0 0
	0	$\frac{i}{8}$ $\frac{\sqrt{15}}{24}$ 0 0 0 0 0 $-\frac{1}{8}$ 0 0 0 0 0 0 0
	0	$\frac{1}{8}$ $\frac{\sqrt{15}i}{24}$ 0 0 0 0 0 $\frac{i}{8}$ 0 0 0 0 0 0 0
	$-\frac{1}{8}$	0 0 $-\frac{\sqrt{15}i}{24}$ 0 0 0 0 0 0 $-\frac{i}{8}$ 0 0 0 0 0
$-\frac{y(3x^2 - 2y^2 + 3z^2)}{2}$		

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 $-\frac{\sqrt{15}i}{24}$ 0 0 0 0 $-\frac{\sqrt{15}i}{24}$ $-\frac{i}{8}$ 0 0 0 0 $\frac{i}{8}$
	0	0 0 0 $\frac{\sqrt{15}i}{24}$ 0 0 $-\frac{\sqrt{15}i}{24}$ 0 0 $\frac{i}{8}$ 0 0 $\frac{i}{8}$ 0
	$\frac{\sqrt{15}i}{24}$	0 0 0 0 0 $-\frac{i}{8}$ 0 0 0 0 0 0 $\frac{\sqrt{15}i}{24}$ 0 0
	0	$-\frac{\sqrt{15}i}{24}$ 0 0 $-\frac{i}{8}$ 0 0 0 0 0 $\frac{\sqrt{15}i}{24}$ 0 0 0
	0	0 0 0 $\frac{i}{8}$ 0 0 $\frac{i}{8}$ 0 0 $-\frac{\sqrt{15}i}{24}$ 0 0 $\frac{\sqrt{15}i}{24}$ 0
	0	0 0 $\frac{i}{8}$ 0 0 0 0 $-\frac{i}{8}$ $-\frac{\sqrt{15}i}{24}$ 0 0 0 $-\frac{\sqrt{15}i}{24}$
	0	$\frac{\sqrt{15}i}{24}$ 0 0 0 $-\frac{i}{8}$ 0 0 0 0 0 $-\frac{\sqrt{15}i}{24}$ 0 0 0
	$\frac{\sqrt{15}i}{24}$	0 0 0 0 0 $\frac{i}{8}$ 0 0 0 0 0 0 $\frac{\sqrt{15}i}{24}$ 0 0
	$\frac{i}{8}$	0 0 0 0 $\frac{\sqrt{15}i}{24}$ 0 0 0 0 0 0 $\frac{i}{8}$ 0 0
	0	$-\frac{i}{8}$ 0 0 $\frac{\sqrt{15}i}{24}$ 0 0 0 0 0 $\frac{i}{8}$ 0 0 0
	0	0 0 0 $-\frac{\sqrt{15}i}{24}$ 0 0 $\frac{\sqrt{15}i}{24}$ 0 0 $-\frac{i}{8}$ 0 0 $-\frac{i}{8}$ 0
	0	0 0 $-\frac{\sqrt{15}i}{24}$ 0 0 0 0 $-\frac{\sqrt{15}i}{24}$ $-\frac{i}{8}$ 0 0 0 0 $\frac{i}{8}$
	0	$-\frac{i}{8}$ 0 0 $-\frac{\sqrt{15}i}{24}$ 0 0 0 0 0 0 $\frac{i}{8}$ 0 0 0
	$-\frac{i}{8}$	0 0 0 0 0 $\frac{\sqrt{15}i}{24}$ 0 0 0 0 0 0 $-\frac{i}{8}$ 0 0
905	symmetry	$-\frac{z(3x^2+3y^2-2z^2)}{2}$

continued ...

Table 10

No.	multipole	matrix
$\mathbb{G}_{3,2}^{(1,0;a)}(T_g, 1)$	0	0 0 0 $-\frac{\sqrt{15}}{24}$ 0 $-\frac{\sqrt{15}i}{24}$ 0 0 0 $\frac{1}{8}$ 0 $-\frac{i}{8}$ 0 0
	0	0 0 $\frac{\sqrt{15}}{24}$ 0 $-\frac{\sqrt{15}i}{24}$ 0 0 0 $-\frac{1}{8}$ 0 $-\frac{i}{8}$ 0 0 0
	0	$\frac{\sqrt{15}}{24}$ 0 0 0 0 0 0 $-\frac{i}{8}$ 0 0 0 0 0 $-\frac{\sqrt{15}i}{24}$
	$-\frac{\sqrt{15}}{24}$	0 0 0 0 0 0 $-\frac{i}{8}$ 0 0 0 0 0 $-\frac{\sqrt{15}i}{24}$ 0
	0	$\frac{\sqrt{15}i}{24}$ 0 0 0 0 0 0 $-\frac{1}{8}$ 0 0 0 0 0 $\frac{\sqrt{15}}{24}$
	$\frac{\sqrt{15}i}{24}$	0 0 0 0 0 0 $\frac{1}{8}$ 0 0 0 0 0 $-\frac{\sqrt{15}}{24}$ 0
	0	0 0 0 $\frac{i}{8}$ 0 $\frac{1}{8}$ 0 0 0 $\frac{\sqrt{15}i}{24}$ 0 $-\frac{\sqrt{15}}{24}$ 0 0
	0	0 $\frac{i}{8}$ 0 $-\frac{1}{8}$ 0 0 0 0 $\frac{\sqrt{15}i}{24}$ 0 $\frac{\sqrt{15}}{24}$ 0 0 0
	0	$-\frac{1}{8}$ 0 0 0 0 0 0 $-\frac{\sqrt{15}i}{24}$ 0 0 0 0 0 $\frac{i}{8}$
	$\frac{1}{8}$	0 0 0 0 0 0 $-\frac{\sqrt{15}i}{24}$ 0 0 0 0 0 $\frac{i}{8}$ 0
	0	$\frac{i}{8}$ 0 0 0 0 0 0 $\frac{\sqrt{15}}{24}$ 0 0 0 0 0 $\frac{1}{8}$
	$\frac{i}{8}$	0 0 0 0 0 0 $-\frac{\sqrt{15}}{24}$ 0 0 0 0 0 $-\frac{1}{8}$ 0
	0	0 0 0 $\frac{\sqrt{15}i}{24}$ 0 $-\frac{\sqrt{15}}{24}$ 0 0 0 $-\frac{i}{8}$ 0 $-\frac{1}{8}$ 0 0
	0	0 0 $\frac{\sqrt{15}i}{24}$ 0 $\frac{\sqrt{15}}{24}$ 0 0 0 $-\frac{i}{8}$ 0 $\frac{1}{8}$ 0 0 0

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 $\frac{i}{24}$ 0 0 $-\frac{1}{24}$ 0 0 $-\frac{\sqrt{15}i}{24}$ 0 0 $-\frac{\sqrt{15}}{24}$
	0	0 0 0 0 0 $-\frac{i}{24}$ $\frac{1}{24}$ 0 0 0 0 $\frac{\sqrt{15}i}{24}$ $\frac{\sqrt{15}}{24}$ 0
	0	0 0 0 0 0 $\frac{\sqrt{15}}{24}$ $-\frac{\sqrt{15}i}{24}$ 0 0 $\frac{i}{6}$ 0 $\frac{1}{24}$ $\frac{i}{24}$ 0
	0	0 0 0 0 $-\frac{\sqrt{15}}{24}$ 0 0 $\frac{\sqrt{15}i}{24}$ $\frac{i}{6}$ 0 $-\frac{1}{24}$ 0 0 $-\frac{i}{24}$
	$-\frac{i}{24}$	0 0 0 $-\frac{\sqrt{15}}{24}$ 0 0 0 0 $-\frac{1}{24}$ 0 $\frac{i}{6}$ 0 0 0
	0	$\frac{i}{24}$ $\frac{\sqrt{15}}{24}$ 0 0 0 0 0 $\frac{1}{24}$ 0 $\frac{i}{6}$ 0 0 0 0
	0	$\frac{1}{24}$ $\frac{\sqrt{15}i}{24}$ 0 0 0 0 0 $-\frac{i}{24}$ 0 0 0 0 $\frac{i}{6}$
	$-\frac{1}{24}$	0 0 0 $-\frac{\sqrt{15}i}{24}$ 0 0 0 0 $\frac{i}{24}$ 0 0 0 $\frac{i}{6}$ 0
	0	0 0 0 $-\frac{i}{6}$ 0 $\frac{1}{24}$ $\frac{i}{24}$ 0 0 0 0 $-\frac{\sqrt{15}}{24}$ $\frac{\sqrt{15}i}{24}$ 0
	0	$\frac{\sqrt{15}i}{24}$ 0 0 $-\frac{1}{24}$ 0 $-\frac{i}{6}$ 0 0 0 $\frac{\sqrt{15}}{24}$ 0 0 0 $-\frac{\sqrt{15}i}{24}$
	0	$-\frac{\sqrt{15}i}{24}$ $\frac{1}{24}$ 0 $-\frac{i}{6}$ 0 0 0 $-\frac{\sqrt{15}}{24}$ 0 0 0 0 0 0
	0	$\frac{\sqrt{15}}{24}$ $-\frac{i}{24}$ 0 0 0 0 $-\frac{i}{6}$ $-\frac{\sqrt{15}i}{24}$ 0 0 0 0 0 0
	$-\frac{\sqrt{15}}{24}$	0 0 0 $\frac{i}{24}$ 0 0 $-\frac{i}{6}$ 0 0 $\frac{\sqrt{15}i}{24}$ 0 0 0 0 0
$-\frac{\sqrt{15}y(x-z)(x+z)}{2}$		

907 symmetry

continued ...

Table 10

No.	multipole	matrix
$\mathbb{G}_{3,1}^{(1,0;a)}(T_g, 2)$	0	0 $-\frac{i}{24}$ 0 0 0 0 $\frac{i}{24}$ $-\frac{\sqrt{15}i}{24}$ 0 0 0 0 $-\frac{\sqrt{15}i}{24}$
	0	0 0 0 $\frac{i}{24}$ 0 0 $\frac{i}{24}$ 0 0 $\frac{\sqrt{15}i}{24}$ 0 0 0 $-\frac{\sqrt{15}i}{24}$ 0
	$\frac{i}{24}$	0 0 0 0 0 $\frac{\sqrt{15}i}{24}$ 0 0 0 $\frac{1}{6}$ 0 0 $-\frac{i}{24}$ 0 0
	0	$-\frac{i}{24}$ 0 0 0 $\frac{\sqrt{15}i}{24}$ 0 0 0 $-\frac{1}{6}$ 0 0 $-\frac{i}{24}$ 0 0 0
	0	0 0 0 $-\frac{\sqrt{15}i}{24}$ 0 0 $\frac{\sqrt{15}i}{24}$ 0 0 $\frac{i}{24}$ 0 $\frac{1}{6}$ $\frac{i}{24}$ 0
	0	0 0 $-\frac{\sqrt{15}i}{24}$ 0 0 0 0 $-\frac{\sqrt{15}i}{24}$ $\frac{i}{24}$ 0 $-\frac{1}{6}$ 0 0 $-\frac{i}{24}$
	0	$-\frac{i}{24}$ 0 0 0 $-\frac{\sqrt{15}i}{24}$ 0 0 0 0 0 $-\frac{i}{24}$ 0 0 0 $\frac{1}{6}$
	$-\frac{i}{24}$	0 0 0 0 0 $\frac{\sqrt{15}i}{24}$ 0 0 0 0 0 $\frac{i}{24}$ $-\frac{1}{6}$ 0
	$\frac{\sqrt{15}i}{24}$	0 0 $-\frac{1}{6}$ 0 $-\frac{i}{24}$ 0 0 0 0 0 $-\frac{\sqrt{15}i}{24}$ 0 0
	0	$-\frac{\sqrt{15}i}{24}$ $\frac{1}{6}$ 0 $-\frac{i}{24}$ 0 0 0 0 0 $-\frac{\sqrt{15}i}{24}$ 0 0 0
	0	0 0 0 $\frac{i}{24}$ 0 $-\frac{1}{6}$ $\frac{i}{24}$ 0 0 $\frac{\sqrt{15}i}{24}$ 0 0 0 $-\frac{\sqrt{15}i}{24}$
	0	0 0 $\frac{i}{24}$ 0 $\frac{1}{6}$ 0 0 $-\frac{i}{24}$ $\frac{\sqrt{15}i}{24}$ 0 0 0 0 $\frac{\sqrt{15}i}{24}$
	0	$\frac{\sqrt{15}i}{24}$ 0 0 $-\frac{i}{24}$ 0 0 $-\frac{1}{6}$ 0 0 $\frac{\sqrt{15}i}{24}$ 0 0 0
	$\frac{\sqrt{15}i}{24}$	0 0 0 0 0 $\frac{i}{24}$ $\frac{1}{6}$ 0 0 0 0 $-\frac{\sqrt{15}i}{24}$ 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 $\frac{1}{24}$ 0 $-\frac{i}{24}$ 0 0 0 $-\frac{\sqrt{15}}{24}$ 0 $-\frac{\sqrt{15}i}{24}$ 0 0 0
	0	0 0 $-\frac{1}{24}$ 0 $-\frac{i}{24}$ 0 0 0 $\frac{\sqrt{15}}{24}$ 0 $-\frac{\sqrt{15}i}{24}$ 0 0 0 0
	0	$-\frac{1}{24}$ 0 0 0 0 0 0 $-\frac{\sqrt{15}i}{24}$ $\frac{i}{6}$ 0 0 0 0 0 $-\frac{i}{24}$
	$\frac{1}{24}$	0 0 0 0 0 0 $-\frac{\sqrt{15}i}{24}$ 0 0 $-\frac{i}{6}$ 0 0 $-\frac{i}{24}$ 0
	0	$\frac{i}{24}$ 0 0 0 0 0 0 $\frac{\sqrt{15}}{24}$ 0 0 $\frac{i}{6}$ 0 0 $-\frac{1}{24}$
	$\frac{i}{24}$	0 0 0 0 0 0 $-\frac{\sqrt{15}}{24}$ 0 0 0 0 $-\frac{i}{6}$ $\frac{1}{24}$ 0
	0	0 0 0 $\frac{\sqrt{15}i}{24}$ 0 $-\frac{\sqrt{15}}{24}$ 0 0 0 $\frac{i}{24}$ 0 $\frac{1}{24}$ $\frac{i}{6}$ 0
	0	0 0 $\frac{\sqrt{15}i}{24}$ 0 $\frac{\sqrt{15}}{24}$ 0 0 0 $\frac{i}{24}$ 0 $-\frac{1}{24}$ 0 0 $-\frac{i}{6}$
	0	$\frac{\sqrt{15}}{24}$ $-\frac{i}{6}$ 0 0 0 0 $-\frac{i}{24}$ 0 0 0 0 0 $-\frac{\sqrt{15}i}{24}$
	$-\frac{\sqrt{15}}{24}$	0 0 $\frac{i}{6}$ 0 0 $-\frac{i}{24}$ 0 0 0 0 0 $-\frac{\sqrt{15}i}{24}$ 0
	0	$\frac{\sqrt{15}i}{24}$ 0 0 $-\frac{i}{6}$ 0 0 $-\frac{1}{24}$ 0 0 0 0 0 $-\frac{\sqrt{15}}{24}$
	$\frac{\sqrt{15}i}{24}$	0 0 0 0 $\frac{i}{6}$ $\frac{1}{24}$ 0 0 0 0 0 $-\frac{\sqrt{15}}{24}$ 0
	0	0 0 0 $\frac{i}{24}$ 0 $\frac{1}{24}$ $-\frac{i}{6}$ 0 0 $-\frac{\sqrt{15}i}{24}$ 0 $\frac{\sqrt{15}}{24}$ 0 0
	0	0 0 $\frac{i}{24}$ 0 $-\frac{1}{24}$ 0 0 0 $-\frac{\sqrt{15}i}{24}$ 0 $-\frac{\sqrt{15}}{24}$ 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 $-\frac{\sqrt{15}i}{30}$ 0 $\frac{\sqrt{15}}{30}$ 0 0 0 0 0 0 0 0 0
	0	0 0 $-\frac{\sqrt{15}i}{30}$ 0 $-\frac{\sqrt{15}}{30}$ 0 0 0 0 0 0 0 0 0 0
	0	$\frac{\sqrt{15}i}{30}$ 0 0 0 $\frac{i}{4}$ 0 0 $\frac{1}{8}$ 0 0 0 $-\frac{\sqrt{15}i}{60}$ 0 0 0 $-\frac{\sqrt{15}}{120}$
	$\frac{\sqrt{15}i}{30}$	0 0 0 0 0 $-\frac{i}{4}$ $-\frac{1}{8}$ 0 0 0 0 $\frac{\sqrt{15}i}{60}$ $\frac{\sqrt{15}}{120}$ 0 0
	0	$-\frac{\sqrt{15}}{30}$ $-\frac{i}{4}$ 0 0 0 0 0 $-\frac{i}{8}$ $-\frac{\sqrt{15}i}{60}$ 0 0 0 0 $-\frac{\sqrt{15}i}{120}$
	$\frac{\sqrt{15}}{30}$	0 0 $\frac{i}{4}$ 0 0 0 $-\frac{i}{8}$ 0 0 $\frac{\sqrt{15}i}{60}$ 0 0 $-\frac{\sqrt{15}i}{120}$ 0 0
	0	0 0 0 $-\frac{1}{8}$ 0 $\frac{i}{8}$ 0 0 0 $\frac{\sqrt{15}}{40}$ 0 $\frac{\sqrt{15}i}{40}$ 0 0 0
	0	0 $\frac{1}{8}$ 0 $\frac{i}{8}$ 0 0 0 0 $-\frac{\sqrt{15}}{40}$ 0 $\frac{\sqrt{15}i}{40}$ 0 0 0
	0	0 0 0 0 $\frac{\sqrt{15}i}{60}$ 0 0 $-\frac{\sqrt{15}}{40}$ 0 0 $\frac{i}{4}$ 0 0 0 $\frac{1}{8}$
	0	0 0 0 0 0 $-\frac{\sqrt{15}i}{60}$ $\frac{\sqrt{15}}{40}$ 0 0 0 0 $-\frac{i}{4}$ $-\frac{1}{8}$ 0
	0	0 0 $\frac{\sqrt{15}i}{60}$ 0 0 0 0 $-\frac{\sqrt{15}i}{40}$ $-\frac{i}{4}$ 0 0 0 0 $-\frac{i}{8}$
	0	0 0 0 $-\frac{\sqrt{15}i}{60}$ 0 0 $-\frac{\sqrt{15}i}{40}$ 0 0 $\frac{i}{4}$ 0 0 $-\frac{i}{8}$ 0
	0	0 0 0 $\frac{\sqrt{15}}{120}$ 0 $\frac{\sqrt{15}i}{120}$ 0 0 0 $-\frac{1}{8}$ 0 $\frac{i}{8}$ 0 0 0
	0	0 0 $-\frac{\sqrt{15}}{120}$ 0 $\frac{\sqrt{15}i}{120}$ 0 0 0 $\frac{1}{8}$ 0 $\frac{i}{8}$ 0 0 0
$\frac{\sqrt{105}xyz(x^2+y^2-2z^2)}{2}$		
910	symmetry	

continued ...

Table 10

No.	multipole	matrix
$\mathbb{G}_{5,1}^{(1,0;a)}(E_g)$	0	0 0 0 $-\frac{\sqrt{5}i}{30}$ 0 $-\frac{\sqrt{5}}{30}$ $\frac{\sqrt{5}i}{15}$ 0 0 0 0 0 0 0 0
	0	0 0 $-\frac{\sqrt{5}i}{30}$ 0 $\frac{\sqrt{5}}{30}$ 0 0 $-\frac{\sqrt{5}i}{15}$ 0 0 0 0 0 0 0
	0	$\frac{\sqrt{5}i}{30}$ 0 0 0 0 0 $-\frac{\sqrt{3}}{8}$ 0 0 0 0 $-\frac{\sqrt{5}i}{30}$ $-\frac{\sqrt{5}}{24}$ 0
	$\frac{\sqrt{5}i}{30}$	0 0 0 0 0 0 $\frac{\sqrt{3}i}{8}$ $-\frac{\sqrt{5}i}{30}$ 0 0 0 0 $-\frac{\sqrt{5}i}{30}$ $-\frac{\sqrt{5}}{24}$ 0
	0	$\frac{\sqrt{5}}{30}$ 0 0 0 0 0 $\frac{\sqrt{3}i}{8}$ 0 0 $\frac{\sqrt{5}i}{30}$ 0 0 0 0 $-\frac{\sqrt{5}i}{24}$
	$-\frac{\sqrt{5}}{30}$	0 0 0 0 0 0 $\frac{\sqrt{3}i}{8}$ 0 0 $\frac{\sqrt{5}i}{30}$ 0 0 0 0 $-\frac{\sqrt{5}i}{24}$ 0
	$-\frac{\sqrt{5}i}{15}$	0 0 $-\frac{\sqrt{3}}{8}$ 0 $-\frac{\sqrt{3}i}{8}$ 0 0 0 $\frac{\sqrt{5}}{120}$ 0 $-\frac{\sqrt{5}i}{120}$ 0 0 0 0
	0	$\frac{\sqrt{5}i}{15}$ $\frac{\sqrt{3}}{8}$ 0 $-\frac{\sqrt{3}i}{8}$ 0 0 0 $-\frac{\sqrt{5}}{120}$ 0 $-\frac{\sqrt{5}i}{120}$ 0 0 0 0
	0	0 0 0 0 $\frac{\sqrt{5}i}{30}$ 0 0 $-\frac{\sqrt{5}}{120}$ 0 0 0 0 0 $\frac{\sqrt{3}}{8}$
	0	0 0 0 0 0 $-\frac{\sqrt{5}i}{30}$ $\frac{\sqrt{5}}{120}$ 0 0 0 0 0 $-\frac{\sqrt{3}}{8}$ 0
	0	0 0 $-\frac{\sqrt{5}i}{30}$ 0 0 0 $\frac{\sqrt{5}i}{120}$ 0 0 0 0 0 0 $\frac{\sqrt{3}i}{8}$
	0	0 0 0 $\frac{\sqrt{5}i}{30}$ 0 0 $\frac{\sqrt{5}i}{120}$ 0 0 0 0 0 $\frac{\sqrt{3}i}{8}$ 0
	0	0 0 0 $-\frac{\sqrt{5}}{24}$ 0 $\frac{\sqrt{5}i}{24}$ 0 0 0 $-\frac{\sqrt{3}}{8}$ 0 $-\frac{\sqrt{3}i}{8}$ 0 0 0
	0	0 0 $\frac{\sqrt{5}}{24}$ 0 $\frac{\sqrt{5}i}{24}$ 0 0 0 $\frac{\sqrt{3}}{8}$ 0 $-\frac{\sqrt{3}i}{8}$ 0 0 0 0

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

911 symmetry

continued ...

Table 10

No.	multipole	matrix
$\mathbb{G}_{5,0}^{(1,0;a)}(T_g, 1)$	0 0 0 0 $\frac{\sqrt{21}i}{24}$ 0 0 $\frac{\sqrt{21}}{24}$ 0 0 $\frac{\sqrt{35}i}{56}$ 0 0 $-\frac{\sqrt{35}}{56}$	
	0 0 0 0 0 $-\frac{\sqrt{21}i}{24}$ $-\frac{\sqrt{21}}{24}$ 0 0 0 0 $-\frac{\sqrt{35}i}{56}$ $\frac{\sqrt{35}}{56}$ 0 0 $-\frac{\sqrt{35}i}{56}$ $\frac{\sqrt{35}}{56}$ 0	
	0 0 0 0 0 $\frac{\sqrt{35}}{56}$ $\frac{\sqrt{35}i}{56}$ 0 0 0 0 0 $\frac{5\sqrt{21}}{168}$ $-\frac{5\sqrt{21}i}{168}$ 0 0 0	
	0 0 0 0 0 $-\frac{\sqrt{35}}{56}$ 0 0 $-\frac{\sqrt{35}i}{56}$ 0 0 $-\frac{5\sqrt{21}}{168}$ 0 0 $-\frac{5\sqrt{21}i}{168}$ 0	
	$-\frac{\sqrt{21}i}{24}$ 0 0 $-\frac{\sqrt{35}}{56}$ 0 0 0 0 0 $-\frac{\sqrt{21}}{84}$ 0 0 0 0 0	
	0 $\frac{\sqrt{21}i}{24}$ $\frac{\sqrt{35}}{56}$ 0 0 0 0 0 $\frac{\sqrt{21}}{84}$ 0 0 0 0 0 0	
	0 $-\frac{\sqrt{21}}{24}$ $-\frac{\sqrt{35}i}{56}$ 0 0 0 0 0 $\frac{\sqrt{21}i}{84}$ 0 0 0 0 0 0	
	$\frac{\sqrt{21}}{24}$ 0 0 $\frac{\sqrt{35}i}{56}$ 0 0 0 0 0 $-\frac{\sqrt{21}i}{84}$ 0 0 0 0 0	
	0 0 0 0 0 $\frac{\sqrt{21}}{84}$ $-\frac{\sqrt{21}i}{84}$ 0 0 0 0 $\frac{\sqrt{35}}{28}$ $\frac{\sqrt{35}i}{28}$ 0	
	0 0 0 0 0 $-\frac{\sqrt{21}}{84}$ 0 0 $\frac{\sqrt{21}i}{84}$ 0 0 $-\frac{\sqrt{35}}{28}$ 0 0 $-\frac{\sqrt{35}i}{28}$ 0	
	$-\frac{\sqrt{35}i}{56}$ 0 0 $-\frac{5\sqrt{21}}{168}$ 0 0 0 0 0 $-\frac{\sqrt{35}}{28}$ 0 0 0 0 0	
	0 $\frac{\sqrt{35}i}{56}$ $\frac{5\sqrt{21}}{168}$ 0 0 0 0 0 $\frac{\sqrt{35}}{28}$ 0 0 0 0 0 0	
	0 $\frac{\sqrt{35}}{56}$ $\frac{5\sqrt{21}i}{168}$ 0 0 0 0 0 $-\frac{\sqrt{35}i}{28}$ 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 $\frac{\sqrt{21}i}{24}$ 0 0 0 0 $\frac{\sqrt{21}i}{24}$ $-\frac{\sqrt{35}i}{56}$ 0 0 0 0 $\frac{\sqrt{35}i}{56}$	
	0 0 0 $-\frac{\sqrt{21}i}{24}$ 0 0 $\frac{\sqrt{21}i}{24}$ 0 0 $\frac{\sqrt{35}i}{56}$ 0 0 $\frac{\sqrt{35}i}{56}$ 0 0 0	
	$-\frac{\sqrt{21}i}{24}$ 0 0 0 0 $-\frac{\sqrt{35}i}{56}$ 0 0 0 0 0 0 $\frac{\sqrt{21}i}{84}$ 0 0 0	
	0 $\frac{\sqrt{21}i}{24}$ 0 0 $-\frac{\sqrt{35}i}{56}$ 0 0 0 0 0 $\frac{\sqrt{21}i}{84}$ 0 0 0 0	
	0 0 0 $\frac{\sqrt{35}i}{56}$ 0 0 $\frac{\sqrt{35}i}{56}$ 0 0 $-\frac{5\sqrt{21}i}{168}$ 0 0 0 $\frac{5\sqrt{21}i}{168}$ 0	
	0 0 $\frac{\sqrt{35}i}{56}$ 0 0 0 0 $-\frac{\sqrt{35}i}{56}$ $-\frac{5\sqrt{21}i}{168}$ 0 0 0 0 $-\frac{5\sqrt{21}i}{168}$	
	0 $-\frac{\sqrt{21}i}{24}$ 0 0 $-\frac{\sqrt{35}i}{56}$ 0 0 0 0 0 $-\frac{\sqrt{21}i}{84}$ 0 0 0 0	
	$-\frac{\sqrt{21}i}{24}$ 0 0 0 0 $\frac{\sqrt{35}i}{56}$ 0 0 0 0 0 $\frac{\sqrt{21}i}{84}$ 0 0 0	
	$\frac{\sqrt{35}i}{56}$ 0 0 0 0 $\frac{5\sqrt{21}i}{168}$ 0 0 0 0 0 $-\frac{\sqrt{35}i}{28}$ 0 0 0	
	0 $-\frac{\sqrt{35}i}{56}$ 0 0 $\frac{5\sqrt{21}i}{168}$ 0 0 0 0 0 $-\frac{\sqrt{35}i}{28}$ 0 0 0	
	0 0 0 $-\frac{\sqrt{21}i}{84}$ 0 0 $\frac{\sqrt{21}i}{84}$ 0 0 $\frac{\sqrt{35}i}{28}$ 0 0 $\frac{\sqrt{35}i}{28}$ 0	
	0 0 $-\frac{\sqrt{21}i}{84}$ 0 0 0 0 $-\frac{\sqrt{21}i}{84}$ $\frac{\sqrt{35}i}{28}$ 0 0 0 0 $-\frac{\sqrt{35}i}{28}$	
	0 $-\frac{\sqrt{35}i}{56}$ 0 0 $-\frac{5\sqrt{21}i}{168}$ 0 0 0 0 0 $-\frac{\sqrt{35}i}{28}$ 0 0 0	
	$-\frac{\sqrt{35}i}{56}$ 0 0 0 0 $\frac{5\sqrt{21}i}{168}$ 0 0 0 0 0 $\frac{\sqrt{35}i}{28}$ 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	$\frac{\sqrt{21}}{24}$	0	$\frac{\sqrt{21}i}{24}$	0	0	0	$\frac{\sqrt{35}}{56}$	0	$-\frac{\sqrt{35}i}{56}$	0	0	0
	0	0	$-\frac{\sqrt{21}}{24}$	0	$\frac{\sqrt{21}i}{24}$	0	0	0	$-\frac{\sqrt{35}}{56}$	0	$-\frac{\sqrt{35}i}{56}$	0	0	0	0
	0	$-\frac{\sqrt{21}}{24}$	0	0	0	0	0	$-\frac{\sqrt{35}i}{56}$	0	0	0	0	0	0	$-\frac{\sqrt{21}i}{84}$
	$\frac{\sqrt{21}}{24}$	0	0	0	0	0	$-\frac{\sqrt{35}i}{56}$	0	0	0	0	0	$-\frac{\sqrt{21}i}{84}$	0	0
	0	$-\frac{\sqrt{21}i}{24}$	0	0	0	0	0	$-\frac{\sqrt{35}}{56}$	0	0	0	0	0	0	$\frac{\sqrt{21}}{84}$
	$-\frac{\sqrt{21}i}{24}$	0	0	0	0	0	$\frac{\sqrt{35}}{56}$	0	0	0	0	0	$-\frac{\sqrt{21}}{84}$	0	0
	0	0	0	$\frac{\sqrt{35}i}{56}$	0	$\frac{\sqrt{35}}{56}$	0	0	0	$\frac{5\sqrt{21}i}{168}$	0	$-\frac{5\sqrt{21}}{168}$	0	0	0
	0	0	$\frac{\sqrt{35}i}{56}$	0	$-\frac{\sqrt{35}}{56}$	0	0	0	$\frac{5\sqrt{21}i}{168}$	0	$\frac{5\sqrt{21}}{168}$	0	0	0	0
	0	$-\frac{\sqrt{35}}{56}$	0	0	0	0	0	$-\frac{5\sqrt{21}i}{168}$	0	0	0	0	0	0	$-\frac{\sqrt{35}i}{28}$
	$\frac{\sqrt{35}}{56}$	0	0	0	0	0	$-\frac{5\sqrt{21}i}{168}$	0	0	0	0	0	$-\frac{\sqrt{35}i}{28}$	0	0
	0	$\frac{\sqrt{35}i}{56}$	0	0	0	0	0	$\frac{5\sqrt{21}}{168}$	0	0	0	0	0	0	$-\frac{\sqrt{35}}{28}$
	$\frac{\sqrt{35}i}{56}$	0	0	0	0	0	$-\frac{5\sqrt{21}}{168}$	0	0	0	0	0	0	$\frac{\sqrt{35}}{28}$	0
	0	0	0	$\frac{\sqrt{21}i}{84}$	0	$-\frac{\sqrt{21}}{84}$	0	0	0	$\frac{\sqrt{35}i}{28}$	0	$\frac{\sqrt{35}}{28}$	0	0	0
	0	0	$\frac{\sqrt{21}i}{84}$	0	$\frac{\sqrt{21}}{84}$	0	0	0	$\frac{\sqrt{35}i}{28}$	0	$-\frac{\sqrt{35}}{28}$	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 $-\frac{\sqrt{15}i}{120}$ 0 0 $-\frac{\sqrt{15}}{120}$ 0 0 $\frac{i}{8}$ 0 0 $-\frac{1}{8}$
	0	0 0 0 0 0 $\frac{\sqrt{15}i}{120}$ $\frac{\sqrt{15}}{120}$ 0 0 0 0 $-\frac{i}{8}$ $\frac{1}{8}$ 0
	0	0 0 0 0 0 $-\frac{1}{8}$ $-\frac{i}{8}$ 0 0 0 0 $\frac{\sqrt{15}}{40}$ $-\frac{\sqrt{15}i}{40}$ 0
	0	0 0 0 0 $\frac{1}{8}$ 0 0 $\frac{i}{8}$ 0 0 $-\frac{\sqrt{15}}{40}$ 0 0 $\frac{\sqrt{15}i}{40}$
	$\frac{\sqrt{15}i}{120}$	0 0 $\frac{1}{8}$ 0 0 0 0 0 $\frac{\sqrt{15}}{30}$ 0 $\frac{\sqrt{15}i}{15}$ 0 0 0
	0	$-\frac{\sqrt{15}i}{120}$ $-\frac{1}{8}$ 0 0 0 0 0 $-\frac{\sqrt{15}}{30}$ 0 $\frac{\sqrt{15}i}{15}$ 0 0 0
	0	$\frac{\sqrt{15}}{120}$ $\frac{i}{8}$ 0 0 0 0 0 $-\frac{\sqrt{15}i}{30}$ 0 0 0 0 $-\frac{\sqrt{15}i}{15}$
	$-\frac{\sqrt{15}}{120}$	0 0 $-\frac{i}{8}$ 0 0 0 0 0 $\frac{\sqrt{15}i}{30}$ 0 0 $-\frac{\sqrt{15}i}{15}$ 0
	0	0 0 0 0 0 $-\frac{\sqrt{15}}{30}$ $\frac{\sqrt{15}i}{30}$ 0 0 0 0 0 0 0
	0	0 0 0 0 $\frac{\sqrt{15}}{30}$ 0 0 $-\frac{\sqrt{15}i}{30}$ 0 0 0 0 0 0
	$-\frac{i}{8}$	0 0 $-\frac{\sqrt{15}}{40}$ 0 $-\frac{\sqrt{15}i}{15}$ 0 0 0 0 0 0 0 0
	0	$\frac{i}{8}$ $\frac{\sqrt{15}}{40}$ 0 $-\frac{\sqrt{15}i}{15}$ 0 0 0 0 0 0 0 0 0
	0	$\frac{1}{8}$ $\frac{\sqrt{15}i}{40}$ 0 0 0 0 $\frac{\sqrt{15}i}{15}$ 0 0 0 0 0 0 0
	$-\frac{1}{8}$	0 0 $-\frac{\sqrt{15}i}{40}$ 0 0 0 $\frac{\sqrt{15}i}{15}$ 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 $-\frac{\sqrt{15}i}{120}$ 0 0 0 0 $-\frac{\sqrt{15}i}{120}$ $-\frac{i}{8}$ 0 0 0 0 $\frac{i}{8}$	
	0 0 0 $\frac{\sqrt{15}i}{120}$ 0 0 $-\frac{\sqrt{15}i}{120}$ 0 0 $\frac{i}{8}$ 0 0 $\frac{i}{8}$ 0	
	$\frac{\sqrt{15}i}{120}$ 0 0 0 0 $\frac{i}{8}$ 0 0 0 $-\frac{\sqrt{15}}{15}$ 0 $-\frac{\sqrt{15}i}{30}$ 0 0	
	0 $-\frac{\sqrt{15}i}{120}$ 0 0 $\frac{i}{8}$ 0 0 0 $\frac{\sqrt{15}}{15}$ 0 $-\frac{\sqrt{15}i}{30}$ 0 0 0	
	0 0 0 $-\frac{i}{8}$ 0 0 $-\frac{i}{8}$ 0 0 $-\frac{\sqrt{15}i}{40}$ 0 0 $\frac{\sqrt{15}i}{40}$ 0	
	0 0 $-\frac{i}{8}$ 0 0 0 0 $\frac{i}{8}$ $-\frac{\sqrt{15}i}{40}$ 0 0 0 0 $-\frac{\sqrt{15}i}{40}$	
	0 $\frac{\sqrt{15}i}{120}$ 0 0 $\frac{i}{8}$ 0 0 0 0 0 $\frac{\sqrt{15}i}{30}$ 0 0 $\frac{\sqrt{15}}{15}$	
	$\frac{\sqrt{15}i}{120}$ 0 0 0 $-\frac{i}{8}$ 0 0 0 0 0 $-\frac{\sqrt{15}i}{30}$ $-\frac{\sqrt{15}}{15}$ 0	
	$\frac{i}{8}$ 0 0 $\frac{\sqrt{15}}{15}$ 0 $\frac{\sqrt{15}i}{40}$ 0 0 0 0 0 0 0 0	
	0 $-\frac{i}{8}$ $-\frac{\sqrt{15}}{15}$ 0 $\frac{\sqrt{15}i}{40}$ 0 0 0 0 0 0 0 0 0	
	0 0 0 $\frac{\sqrt{15}i}{30}$ 0 0 $-\frac{\sqrt{15}i}{30}$ 0 0 0 0 0 0 0	
	0 0 $\frac{\sqrt{15}i}{30}$ 0 0 0 0 $\frac{\sqrt{15}i}{30}$ 0 0 0 0 0 0	
	0 $-\frac{i}{8}$ 0 0 $-\frac{\sqrt{15}i}{40}$ 0 0 $-\frac{\sqrt{15}}{15}$ 0 0 0 0 0 0	
	$-\frac{i}{8}$ 0 0 0 0 $\frac{\sqrt{15}i}{40}$ $\frac{\sqrt{15}}{15}$ 0 0 0 0 0 0	
$\frac{3\sqrt{35}z(x^2 - 2xy - y^2)(x^2 + 2xy - y^2)}{8}$		

916 symmetry

continued ...

Table 10

No.	multipole	matrix
$\mathbb{G}_{5,2}^{(1,0;a)}(T_g, 2)$	0 0 0 $-\frac{\sqrt{15}}{120}$ 0 $-\frac{\sqrt{15}i}{120}$ 0 0 0 $\frac{1}{8}$ 0 $-\frac{i}{8}$ 0 0	
	0 0 $\frac{\sqrt{15}}{120}$ 0 $-\frac{\sqrt{15}i}{120}$ 0 0 0 $-\frac{1}{8}$ 0 $-\frac{i}{8}$ 0 0 0	
	0 $\frac{\sqrt{15}}{120}$ 0 0 0 0 0 $\frac{i}{8}$ $\frac{\sqrt{15}i}{15}$ 0 0 0 0 $\frac{\sqrt{15}i}{30}$	
	$-\frac{\sqrt{15}}{120}$ 0 0 0 0 0 $\frac{i}{8}$ 0 0 $-\frac{\sqrt{15}i}{15}$ 0 0 $\frac{\sqrt{15}i}{30}$ 0	
	0 $\frac{\sqrt{15}i}{120}$ 0 0 0 0 0 $\frac{1}{8}$ 0 0 $-\frac{\sqrt{15}i}{15}$ 0 0 $-\frac{\sqrt{15}}{30}$	
	$\frac{\sqrt{15}i}{120}$ 0 0 0 0 0 $-\frac{1}{8}$ 0 0 0 0 $\frac{\sqrt{15}i}{15}$ $\frac{\sqrt{15}}{30}$ 0	
	0 0 0 $-\frac{i}{8}$ 0 $-\frac{1}{8}$ 0 0 0 $\frac{\sqrt{15}i}{40}$ 0 $-\frac{\sqrt{15}}{40}$ 0 0	
	0 0 $-\frac{i}{8}$ 0 $\frac{1}{8}$ 0 0 0 $\frac{\sqrt{15}i}{40}$ 0 $\frac{\sqrt{15}}{40}$ 0 0 0	
	0 $-\frac{1}{8}$ $-\frac{\sqrt{15}i}{15}$ 0 0 0 0 $-\frac{\sqrt{15}i}{40}$ 0 0 0 0 0 0	
	$\frac{1}{8}$ 0 0 $\frac{\sqrt{15}i}{15}$ 0 0 $-\frac{\sqrt{15}i}{40}$ 0 0 0 0 0 0 0	
	0 $\frac{i}{8}$ 0 0 $\frac{\sqrt{15}i}{15}$ 0 0 $\frac{\sqrt{15}}{40}$ 0 0 0 0 0 0	
	$\frac{i}{8}$ 0 0 0 0 $-\frac{\sqrt{15}i}{15}$ $-\frac{\sqrt{15}}{40}$ 0 0 0 0 0 0	
	0 0 0 $-\frac{\sqrt{15}i}{30}$ 0 $\frac{\sqrt{15}}{30}$ 0 0 0 0 0 0 0 0	
	0 0 $-\frac{\sqrt{15}i}{30}$ 0 $-\frac{\sqrt{15}}{30}$ 0 0 0 0 0 0 0 0 0	

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

917 symmetry

continued ...

Table 10

No.	multipole	matrix													
$\mathbb{G}_{5,0}^{(1,0;a)}(T_g, 3)$	0	0	0	0	$-\frac{\sqrt{5}i}{12}$	0	0	$\frac{\sqrt{5}}{12}$	0	0	$-\frac{\sqrt{3}i}{12}$	0	0	$-\frac{\sqrt{3}}{12}$	
	0	0	0	0	0	$\frac{\sqrt{5}i}{12}$	$-\frac{\sqrt{5}}{12}$	0	0	0	0	$\frac{\sqrt{3}i}{12}$	$\frac{\sqrt{3}}{12}$	0	
	0	0	0	0	0	$-\frac{\sqrt{3}}{24}$	$\frac{\sqrt{3}i}{24}$	0	0	$\frac{\sqrt{5}i}{15}$	0	$\frac{11\sqrt{5}}{120}$	$\frac{11\sqrt{5}i}{120}$	0	
	0	0	0	0	$\frac{\sqrt{3}}{24}$	0	0	$-\frac{\sqrt{3}i}{24}$	$\frac{\sqrt{5}i}{15}$	0	$-\frac{11\sqrt{5}}{120}$	0	0	$-\frac{11\sqrt{5}i}{120}$	
	$\frac{\sqrt{5}i}{12}$	0	0	$\frac{\sqrt{3}}{24}$	0	0	0	0	$\frac{\sqrt{5}}{120}$	0	$-\frac{\sqrt{5}i}{30}$	0	0	0	
	0	$-\frac{\sqrt{5}i}{12}$	$-\frac{\sqrt{3}}{24}$	0	0	0	0	0	$-\frac{\sqrt{5}}{120}$	0	$-\frac{\sqrt{5}i}{30}$	0	0	0	
	0	$-\frac{\sqrt{5}}{12}$	$-\frac{\sqrt{3}i}{24}$	0	0	0	0	0	$\frac{\sqrt{5}i}{120}$	0	0	0	0	$-\frac{\sqrt{5}i}{30}$	
	$\frac{\sqrt{5}}{12}$	0	0	$\frac{\sqrt{3}i}{24}$	0	0	0	0	0	$-\frac{\sqrt{5}i}{120}$	0	0	$-\frac{\sqrt{5}i}{30}$	0	
	0	0	0	$-\frac{\sqrt{5}i}{15}$	0	$-\frac{\sqrt{5}}{120}$	$-\frac{\sqrt{5}i}{120}$	0	0	0	0	$\frac{\sqrt{3}}{24}$	$-\frac{\sqrt{3}i}{24}$	0	
	0	0	$-\frac{\sqrt{5}i}{15}$	0	$\frac{\sqrt{5}}{120}$	0	0	$\frac{\sqrt{5}i}{120}$	0	0	$-\frac{\sqrt{3}}{24}$	0	0	$\frac{\sqrt{3}i}{24}$	
	$\frac{\sqrt{3}i}{12}$	0	0	$-\frac{11\sqrt{5}}{120}$	0	$\frac{\sqrt{5}i}{30}$	0	0	0	$-\frac{\sqrt{3}}{24}$	0	0	0	0	
	0	$-\frac{\sqrt{3}i}{12}$	$\frac{11\sqrt{5}}{120}$	0	$\frac{\sqrt{5}i}{30}$	0	0	0	$\frac{\sqrt{3}}{24}$	0	0	0	0	0	
	0	$\frac{\sqrt{3}}{12}$	$-\frac{11\sqrt{5}i}{120}$	0	0	0	0	$\frac{\sqrt{5}i}{30}$	$\frac{\sqrt{3}i}{24}$	0	0	0	0	0	
	$-\frac{\sqrt{3}}{12}$	0	0	$\frac{11\sqrt{5}i}{120}$	0	0	$\frac{\sqrt{5}i}{30}$	0	0	$-\frac{\sqrt{3}i}{24}$	0	0	0	0	
$\frac{\sqrt{105}y(x-z)(x+z)(x^2-2y^2+z^2)}{4}$															

918 symmetry

continued ...

Table 10

No.	multipole	matrix														
$\mathbb{G}_{5,1}^{(1,0;a)}(T_g, 3)$	0	0	$\frac{\sqrt{5}i}{12}$	0	0	0	0	$-\frac{\sqrt{5}i}{12}$	$-\frac{\sqrt{3}i}{12}$	0	0	0	0	$-\frac{\sqrt{3}i}{12}$		
	0	0	0	$-\frac{\sqrt{5}i}{12}$	0	0	$-\frac{\sqrt{5}i}{12}$	0	0	$\frac{\sqrt{3}i}{12}$	0	0	$-\frac{\sqrt{3}i}{12}$	0		
	$-\frac{\sqrt{5}i}{12}$	0	0	0	0	$-\frac{\sqrt{3}i}{24}$	0	0	0	$-\frac{\sqrt{5}}{30}$	0	$\frac{\sqrt{5}i}{120}$	0	0	0	
	0	$\frac{\sqrt{5}i}{12}$	0	0	$-\frac{\sqrt{3}i}{24}$	0	0	0	$\frac{\sqrt{5}}{30}$	0	$\frac{\sqrt{5}i}{120}$	0	0	0		
	0	0	0	$\frac{\sqrt{3}i}{24}$	0	0	$-\frac{\sqrt{3}i}{24}$	0	0	$\frac{11\sqrt{5}i}{120}$	0	$\frac{\sqrt{5}}{15}$	$\frac{11\sqrt{5}i}{120}$	0		
	0	0	$\frac{\sqrt{3}i}{24}$	0	0	0	0	$\frac{\sqrt{3}i}{24}$	$\frac{11\sqrt{5}i}{120}$	0	$-\frac{\sqrt{5}}{15}$	0	0	$-\frac{11\sqrt{5}i}{120}$		
	0	$\frac{\sqrt{5}i}{12}$	0	0	$\frac{\sqrt{3}i}{24}$	0	0	0	0	$\frac{\sqrt{5}i}{120}$	0	0	$-\frac{\sqrt{5}}{30}$			
	$\frac{\sqrt{5}i}{12}$	0	0	0	0	$-\frac{\sqrt{3}i}{24}$	0	0	0	0	0	$-\frac{\sqrt{5}i}{120}$	$\frac{\sqrt{5}}{30}$	0		
	$\frac{\sqrt{3}i}{12}$	0	0	$\frac{\sqrt{5}}{30}$	0	$-\frac{11\sqrt{5}i}{120}$	0	0	0	0	0	$\frac{\sqrt{3}i}{24}$	0	0		
	0	$-\frac{\sqrt{3}i}{12}$	$-\frac{\sqrt{5}}{30}$	0	$-\frac{11\sqrt{5}i}{120}$	0	0	0	0	0	$\frac{\sqrt{3}i}{24}$	0	0	0		
	0	0	0	$-\frac{\sqrt{5}i}{120}$	0	$-\frac{\sqrt{5}}{15}$	$-\frac{\sqrt{5}i}{120}$	0	0	$-\frac{\sqrt{3}i}{24}$	0	0	$\frac{\sqrt{3}i}{24}$	0		
	0	0	$-\frac{\sqrt{5}i}{120}$	0	$\frac{\sqrt{5}}{15}$	0	0	$\frac{\sqrt{5}i}{120}$	$-\frac{\sqrt{3}i}{24}$	0	0	0	0	$-\frac{\sqrt{3}i}{24}$		
	0	$\frac{\sqrt{3}i}{12}$	0	0	$-\frac{11\sqrt{5}i}{120}$	0	0	$\frac{\sqrt{5}}{30}$	0	0	$-\frac{\sqrt{3}i}{24}$	0	0	0		
	$\frac{\sqrt{3}i}{12}$	0	0	0	0	$\frac{11\sqrt{5}i}{120}$	$-\frac{\sqrt{5}}{30}$	0	0	0	0	$\frac{\sqrt{3}i}{24}$	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 $-\frac{\sqrt{5}}{12}$ 0 $\frac{\sqrt{5}i}{12}$ 0 0 0 $-\frac{\sqrt{3}}{12}$ 0 $-\frac{\sqrt{3}i}{12}$ 0 0	
	0 0 $\frac{\sqrt{5}}{12}$ 0 $\frac{\sqrt{5}i}{12}$ 0 0 0 $\frac{\sqrt{3}}{12}$ 0 $-\frac{\sqrt{3}i}{12}$ 0 0 0	
	0 $\frac{\sqrt{5}}{12}$ 0 0 0 0 0 $\frac{\sqrt{3}i}{24}$ $-\frac{\sqrt{5}i}{30}$ 0 0 0 0 $\frac{\sqrt{5}i}{120}$	
	$-\frac{\sqrt{5}}{12}$ 0 0 0 0 0 $\frac{\sqrt{3}i}{24}$ 0 0 $\frac{\sqrt{5}i}{30}$ 0 0 $\frac{\sqrt{5}i}{120}$ 0	
	0 $-\frac{\sqrt{5}i}{12}$ 0 0 0 0 0 $-\frac{\sqrt{3}}{24}$ 0 0 $-\frac{\sqrt{5}i}{30}$ 0 0 $\frac{\sqrt{5}i}{120}$	
	$-\frac{\sqrt{5}i}{12}$ 0 0 0 0 0 $\frac{\sqrt{3}}{24}$ 0 0 0 0 $\frac{\sqrt{5}i}{30}$ $-\frac{\sqrt{5}}{120}$ 0	
	0 0 0 $-\frac{\sqrt{3}i}{24}$ 0 $\frac{\sqrt{3}}{24}$ 0 0 0 $\frac{11\sqrt{5}i}{120}$ 0 $\frac{11\sqrt{5}}{120}$ $\frac{\sqrt{5}i}{15}$ 0	
	0 0 $-\frac{\sqrt{3}i}{24}$ 0 $-\frac{\sqrt{3}}{24}$ 0 0 0 $\frac{11\sqrt{5}i}{120}$ 0 $-\frac{11\sqrt{5}}{120}$ 0 0 $-\frac{\sqrt{5}i}{15}$	
	0 $\frac{\sqrt{3}}{12}$ $\frac{\sqrt{5}i}{30}$ 0 0 0 0 $-\frac{11\sqrt{5}i}{120}$ 0 0 0 0 0 $-\frac{\sqrt{3}i}{24}$	
	$-\frac{\sqrt{3}}{12}$ 0 0 $-\frac{\sqrt{5}i}{30}$ 0 0 $-\frac{11\sqrt{5}i}{120}$ 0 0 0 0 0 $-\frac{\sqrt{3}i}{24}$ 0	
	0 $\frac{\sqrt{3}i}{12}$ 0 0 $\frac{\sqrt{5}i}{30}$ 0 0 $-\frac{11\sqrt{5}}{120}$ 0 0 0 0 0 $\frac{\sqrt{3}}{24}$	
	$\frac{\sqrt{3}i}{12}$ 0 0 0 0 $-\frac{\sqrt{5}i}{30}$ $\frac{11\sqrt{5}}{120}$ 0 0 0 0 0 $-\frac{\sqrt{3}}{24}$ 0	
	0 0 0 $-\frac{\sqrt{5}i}{120}$ 0 $-\frac{\sqrt{5}}{120}$ $-\frac{\sqrt{5}i}{15}$ 0 0 $\frac{\sqrt{3}i}{24}$ 0 $-\frac{\sqrt{3}}{24}$ 0 0	
	0 0 $-\frac{\sqrt{5}i}{120}$ 0 $\frac{\sqrt{5}}{120}$ 0 0 $\frac{\sqrt{5}i}{15}$ $\frac{\sqrt{3}i}{24}$ 0 $\frac{\sqrt{3}}{24}$ 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	$-\frac{\sqrt{105}}{42}$	0	$-\frac{\sqrt{105}i}{42}$	0	0	0	0	0	0	0	0	0
	0	0	$-\frac{\sqrt{105}}{42}$	0	$\frac{\sqrt{105}i}{42}$	0	0	0	0	0	0	0	0	0	0
	0	$-\frac{\sqrt{105}}{42}$	0	0	0	0	0	$-\frac{\sqrt{7}i}{56}$	0	0	0	0	0	$\frac{\sqrt{105}i}{168}$	
	$-\frac{\sqrt{105}}{42}$	0	0	0	0	0	$\frac{\sqrt{7}i}{56}$	0	0	0	0	0	$-\frac{\sqrt{105}i}{168}$	0	
	0	$-\frac{\sqrt{105}i}{42}$	0	0	0	0	0	$-\frac{\sqrt{7}}{56}$	0	0	0	0	0	$-\frac{\sqrt{105}}{168}$	
	$\frac{\sqrt{105}i}{42}$	0	0	0	0	0	$-\frac{\sqrt{7}}{56}$	0	0	0	0	0	$-\frac{\sqrt{105}}{168}$	0	
	0	0	0	$-\frac{\sqrt{7}i}{56}$	0	$-\frac{\sqrt{7}}{56}$	0	0	0	$-\frac{\sqrt{105}i}{168}$	0	$\frac{\sqrt{105}}{168}$	0	0	0
	0	0	$\frac{\sqrt{7}i}{56}$	0	$-\frac{\sqrt{7}}{56}$	0	0	0	$\frac{\sqrt{105}i}{168}$	0	$\frac{\sqrt{105}}{168}$	0	0	0	
	0	0	0	0	0	0	$-\frac{\sqrt{105}i}{168}$	0	0	0	0	0	$-\frac{5\sqrt{7}i}{56}$		
	0	0	0	0	0	0	$\frac{\sqrt{105}i}{168}$	0	0	0	0	0	$\frac{5\sqrt{7}i}{56}$	0	
	0	0	0	0	0	0	$\frac{\sqrt{105}}{168}$	0	0	0	0	0	$-\frac{5\sqrt{7}}{56}$	0	
	0	0	0	$\frac{\sqrt{105}i}{168}$	0	$-\frac{\sqrt{105}}{168}$	0	0	0	$-\frac{5\sqrt{7}i}{56}$	0	$-\frac{5\sqrt{7}}{56}$	0	0	
	0	0	$-\frac{\sqrt{105}i}{168}$	0	$-\frac{\sqrt{105}}{168}$	0	0	0	$\frac{5\sqrt{7}i}{56}$	0	$-\frac{5\sqrt{7}}{56}$	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 $-\frac{\sqrt{35}}{42}$ 0 $\frac{\sqrt{35}i}{42}$ $\frac{\sqrt{35}}{21}$ 0 0 0 0 0 0 0	
	0 0 $-\frac{\sqrt{35}}{42}$ 0 $-\frac{\sqrt{35}i}{42}$ 0 0 $-\frac{\sqrt{35}}{21}$ 0 0 0 0 0 0	
	0 $-\frac{\sqrt{35}}{42}$ 0 0 $\frac{\sqrt{21}}{84}$ 0 0 $\frac{\sqrt{21}i}{168}$ 0 0 $\frac{\sqrt{35}}{84}$ 0 0 $-\frac{\sqrt{35}i}{168}$	
	$-\frac{\sqrt{35}}{42}$ 0 0 0 0 $-\frac{\sqrt{21}}{84}$ $-\frac{\sqrt{21}i}{168}$ 0 0 0 0 $-\frac{\sqrt{35}}{84}$ $\frac{\sqrt{35}i}{168}$ 0	
	0 $\frac{\sqrt{35}i}{42}$ $\frac{\sqrt{21}}{84}$ 0 0 0 0 $-\frac{\sqrt{21}}{168}$ $-\frac{\sqrt{35}}{84}$ 0 0 0 0 $-\frac{\sqrt{35}}{168}$	
	$-\frac{\sqrt{35}i}{42}$ 0 0 $-\frac{\sqrt{21}}{84}$ 0 0 $-\frac{\sqrt{21}}{168}$ 0 0 $\frac{\sqrt{35}}{84}$ 0 0 $-\frac{\sqrt{35}}{168}$ 0	
	$\frac{\sqrt{35}}{21}$ 0 0 $\frac{\sqrt{21}i}{168}$ 0 $-\frac{\sqrt{21}}{168}$ 0 0 0 $\frac{\sqrt{35}i}{168}$ 0 $\frac{\sqrt{35}}{168}$ 0 0	
	0 $-\frac{\sqrt{35}}{21}$ $-\frac{\sqrt{21}i}{168}$ 0 $-\frac{\sqrt{21}}{168}$ 0 0 0 $-\frac{\sqrt{35}i}{168}$ 0 $\frac{\sqrt{35}}{168}$ 0 0 0	
	0 0 0 0 $-\frac{\sqrt{35}}{84}$ 0 0 $\frac{\sqrt{35}i}{168}$ 0 0 $\frac{5\sqrt{21}}{84}$ 0 0 $\frac{5\sqrt{21}i}{168}$	
	0 0 0 0 0 $\frac{\sqrt{35}}{84}$ $-\frac{\sqrt{35}i}{168}$ 0 0 0 0 $-\frac{5\sqrt{21}}{84}$ $-\frac{5\sqrt{21}i}{168}$ 0	
	0 0 $\frac{\sqrt{35}}{84}$ 0 0 0 0 $\frac{\sqrt{35}}{168}$ $\frac{5\sqrt{21}}{84}$ 0 0 0 0 $-\frac{5\sqrt{21}}{168}$	
	0 0 0 $-\frac{\sqrt{35}}{84}$ 0 0 $\frac{\sqrt{35}}{168}$ 0 0 $-\frac{5\sqrt{21}}{84}$ 0 0 $-\frac{5\sqrt{21}}{168}$ 0	
	0 0 0 $-\frac{\sqrt{35}i}{168}$ 0 $-\frac{\sqrt{35}}{168}$ 0 0 0 $\frac{5\sqrt{21}i}{168}$ 0 $-\frac{5\sqrt{21}}{168}$ 0 0	
	0 0 $\frac{\sqrt{35}i}{168}$ 0 $-\frac{\sqrt{35}}{168}$ 0 0 0 $-\frac{5\sqrt{21}i}{168}$ 0 $-\frac{5\sqrt{21}}{168}$ 0 0 0	
$\sqrt{3}yz$		

922 symmetry

continued ...

Table 10

No.	multipole	matrix
$T_{2,0}^{(1,0;a)}(T_g)$	0 0 0 0 $-\frac{\sqrt{35}}{42}$ 0 0 $-\frac{\sqrt{35}i}{42}$ 0 0 0 0 0 0 0	
	0 0 0 0 0 $\frac{\sqrt{35}}{42}$ $\frac{\sqrt{35}i}{42}$ 0 0 0 0 0 0 0 0	
	0 0 0 0 0 $-\frac{\sqrt{21}i}{168}$ $-\frac{\sqrt{21}}{168}$ 0 0 0 $-\frac{\sqrt{35}}{21}$ 0 $-\frac{\sqrt{35}i}{168}$ $\frac{\sqrt{35}}{168}$ 0	
	0 0 0 0 $\frac{\sqrt{21}i}{168}$ 0 0 $\frac{\sqrt{21}}{168}$ $-\frac{\sqrt{35}}{21}$ 0 $\frac{\sqrt{35}i}{168}$ 0 0 $-\frac{\sqrt{35}}{168}$	
	$-\frac{\sqrt{35}}{42}$ 0 0 $-\frac{\sqrt{21}i}{168}$ 0 $\frac{\sqrt{21}}{21}$ 0 0 0 $\frac{\sqrt{35}i}{168}$ 0 $\frac{\sqrt{35}}{42}$ 0 0	
	0 $\frac{\sqrt{35}}{42}$ $\frac{\sqrt{21}i}{168}$ 0 $\frac{\sqrt{21}}{21}$ 0 0 0 $-\frac{\sqrt{35}i}{168}$ 0 $\frac{\sqrt{35}}{42}$ 0 0 0	
	0 $-\frac{\sqrt{35}i}{42}$ $-\frac{\sqrt{21}}{168}$ 0 0 0 0 $-\frac{\sqrt{21}}{21}$ $-\frac{\sqrt{35}}{168}$ 0 0 0 0 $\frac{\sqrt{35}}{42}$	
	$\frac{\sqrt{35}i}{42}$ 0 0 $\frac{\sqrt{21}}{168}$ 0 0 $-\frac{\sqrt{21}}{21}$ 0 0 $\frac{\sqrt{35}}{168}$ 0 0 $\frac{\sqrt{35}}{42}$ 0	
	0 0 0 $-\frac{\sqrt{35}}{21}$ 0 $\frac{\sqrt{35}i}{168}$ $-\frac{\sqrt{35}}{168}$ 0 0 0 0 $-\frac{5\sqrt{21}i}{168}$ $-\frac{5\sqrt{21}}{168}$ 0	
	0 0 $-\frac{\sqrt{35}}{21}$ 0 $-\frac{\sqrt{35}i}{168}$ 0 0 $\frac{\sqrt{35}}{168}$ 0 0 $\frac{5\sqrt{21}i}{168}$ 0 0 $\frac{5\sqrt{21}}{168}$	
	0 0 0 $-\frac{\sqrt{35}i}{168}$ 0 $\frac{\sqrt{35}}{42}$ 0 0 0 $-\frac{5\sqrt{21}i}{168}$ 0 0 0 0	
	0 0 $\frac{\sqrt{35}i}{168}$ 0 $\frac{\sqrt{35}}{42}$ 0 0 0 $\frac{5\sqrt{21}i}{168}$ 0 0 0 0	
	0 0 0 $-\frac{\sqrt{35}}{168}$ 0 0 $\frac{\sqrt{35}}{42}$ 0 0 $\frac{5\sqrt{21}}{168}$ 0 0 0 0	

923 symmetry

 $\sqrt{3}xz$

continued ...

Table 10

No.	multipole	matrix														
$T_{2,1}^{(1,0;a)}(T_g)$	0 0 $\frac{\sqrt{35}}{42}$ 0 0 0 0 0 $-\frac{\sqrt{35}}{42}$ 0 0 0 0 0 0 0															
	0 0 0 $-\frac{\sqrt{35}}{42}$ 0 0 $-\frac{\sqrt{35}}{42}$ 0 0 0 0 0 0 0 0 0															
	$\frac{\sqrt{35}}{42}$ 0 0 $\frac{\sqrt{21}i}{21}$ 0 $-\frac{\sqrt{21}}{168}$ 0 0 0 $-\frac{\sqrt{35}i}{42}$ 0 $-\frac{\sqrt{35}i}{168}$ 0 0 0															
	0 $-\frac{\sqrt{35}}{42}$ $-\frac{\sqrt{21}i}{21}$ 0 $-\frac{\sqrt{21}}{168}$ 0 0 0 $\frac{\sqrt{35}i}{42}$ 0 $-\frac{\sqrt{35}}{168}$ 0 0 0 0															
	0 0 0 $-\frac{\sqrt{21}}{168}$ 0 0 $\frac{\sqrt{21}}{168}$ 0 0 0 $\frac{\sqrt{35}}{168}$ 0 0 $\frac{\sqrt{35}i}{21}$ $\frac{\sqrt{35}}{168}$ 0															
	0 0 $-\frac{\sqrt{21}}{168}$ 0 0 0 0 $-\frac{\sqrt{21}}{168}$ $\frac{\sqrt{35}}{168}$ 0 $-\frac{\sqrt{35}i}{21}$ 0 0 0 $-\frac{\sqrt{35}}{168}$															
	0 $-\frac{\sqrt{35}}{42}$ 0 0 $\frac{\sqrt{21}}{168}$ 0 0 0 $-\frac{\sqrt{21}i}{21}$ 0 0 $-\frac{\sqrt{35}i}{168}$ 0 0 $-\frac{\sqrt{35}i}{42}$ 0															
	$-\frac{\sqrt{35}}{42}$ 0 0 0 0 $-\frac{\sqrt{21}}{168}$ $\frac{\sqrt{21}i}{21}$ 0 0 0 0 0 $\frac{\sqrt{35}}{168}$ $\frac{\sqrt{35}i}{42}$ 0															
	0 0 0 $-\frac{\sqrt{35}i}{42}$ 0 $\frac{\sqrt{35}}{168}$ 0 0 0 0 0 0 $-\frac{5\sqrt{21}}{168}$ 0 0 0															
	0 0 $\frac{\sqrt{35}i}{42}$ 0 $\frac{\sqrt{35}}{168}$ 0 0 0 0 0 0 $-\frac{5\sqrt{21}}{168}$ 0 0 0 0															
	0 0 0 $-\frac{\sqrt{35}}{168}$ 0 $\frac{\sqrt{35}i}{21}$ $-\frac{\sqrt{35}}{168}$ 0 0 0 $-\frac{5\sqrt{21}}{168}$ 0 0 0 $\frac{5\sqrt{21}}{168}$ 0															
	0 0 $-\frac{\sqrt{35}}{168}$ 0 $-\frac{\sqrt{35}i}{21}$ 0 0 $\frac{\sqrt{35}}{168}$ $-\frac{5\sqrt{21}}{168}$ 0 0 0 0 $-\frac{5\sqrt{21}}{168}$ 0															
	0 0 0 0 $\frac{\sqrt{35}}{168}$ 0 0 $-\frac{\sqrt{35}i}{42}$ 0 0 0 $\frac{5\sqrt{21}}{168}$ 0 0 0 0															
	0 0 0 0 0 $-\frac{\sqrt{35}}{168}$ $\frac{\sqrt{35}i}{42}$ 0 0 0 0 $-\frac{5\sqrt{21}}{168}$ 0 0 0 0															

924 symmetry

 $\sqrt{3}xy$

continued ...

Table 10

No.	multipole	matrix														
$T_{2,2}^{(1,0;a)}(T_g)$	0 0 0 $\frac{\sqrt{35}i}{42}$ 0 $\frac{\sqrt{35}}{42}$ 0 0 0 0 0 0 0 0 0 0															
	0 0 $-\frac{\sqrt{35}i}{42}$ 0 $\frac{\sqrt{35}}{42}$ 0 0 0 0 0 0 0 0 0 0 0															
	0 $\frac{\sqrt{35}i}{42}$ $\frac{\sqrt{21}}{21}$ 0 0 0 0 0 $\frac{\sqrt{21}}{168}$ $\frac{\sqrt{35}}{42}$ 0 0 0 0 $-\frac{\sqrt{35}}{168}$															
	$-\frac{\sqrt{35}i}{42}$ 0 0 $-\frac{\sqrt{21}}{21}$ 0 0 $\frac{\sqrt{21}}{168}$ 0 0 $-\frac{\sqrt{35}}{42}$ 0 0 $-\frac{\sqrt{35}}{168}$ 0															
	0 $\frac{\sqrt{35}}{42}$ 0 0 $-\frac{\sqrt{21}}{21}$ 0 0 $\frac{\sqrt{21}i}{168}$ 0 0 $\frac{\sqrt{35}}{42}$ 0 0 $\frac{\sqrt{35}i}{168}$															
	$\frac{\sqrt{35}}{42}$ 0 0 0 0 $\frac{\sqrt{21}}{21}$ $-\frac{\sqrt{21}i}{168}$ 0 0 0 0 $-\frac{\sqrt{35}}{42}$ $-\frac{\sqrt{35}i}{168}$ 0															
	0 0 0 $\frac{\sqrt{21}}{168}$ 0 $\frac{\sqrt{21}i}{168}$ 0 0 0 $\frac{\sqrt{35}}{168}$ 0 $-\frac{\sqrt{35}i}{168}$ $-\frac{\sqrt{35}}{21}$ 0															
	0 0 $\frac{\sqrt{21}}{168}$ 0 $-\frac{\sqrt{21}i}{168}$ 0 0 0 $\frac{\sqrt{35}}{168}$ 0 $\frac{\sqrt{35}i}{168}$ 0 0 $\frac{\sqrt{35}}{21}$															
	0 0 $\frac{\sqrt{35}}{42}$ 0 0 0 0 $\frac{\sqrt{35}}{168}$ 0 0 0 0 0 0 $\frac{5\sqrt{21}}{168}$															
	0 0 0 $-\frac{\sqrt{35}}{42}$ 0 0 $\frac{\sqrt{35}}{168}$ 0 0 0 0 0 0 $\frac{5\sqrt{21}}{168}$ 0															
	0 0 0 0 $\frac{\sqrt{35}}{42}$ 0 0 $-\frac{\sqrt{35}i}{168}$ $\frac{\sqrt{35}i}{168}$ 0 0 0 0 0 $-\frac{5\sqrt{21}i}{168}$ 0															
	0 0 0 $-\frac{\sqrt{35}}{168}$ 0 $\frac{\sqrt{35}i}{168}$ $-\frac{\sqrt{35}}{21}$ 0 0 $\frac{5\sqrt{21}}{168}$ 0 $\frac{5\sqrt{21}i}{168}$ 0 0 0															
	0 0 $-\frac{\sqrt{35}}{168}$ 0 $-\frac{\sqrt{35}i}{168}$ 0 0 $\frac{\sqrt{35}}{21}$ $\frac{5\sqrt{21}}{168}$ 0 $-\frac{5\sqrt{21}i}{168}$ 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 0 0 0 $-\frac{\sqrt{165}}{66}$ 0 $\frac{\sqrt{165}i}{66}$ $-\frac{\sqrt{165}}{66}$ 0
	0	0 0 0 0 0 0 0 0 $-\frac{\sqrt{165}}{66}$ 0 $-\frac{\sqrt{165}i}{66}$ 0 0 $\frac{\sqrt{165}}{66}$
	0	0 0 0 0 0 0 0 0 0 $\frac{\sqrt{11}}{22}$ 0 0 0 $-\frac{\sqrt{11}i}{22}$
	0	0 0 0 0 0 0 0 0 0 0 $-\frac{\sqrt{11}}{22}$ $\frac{\sqrt{11}i}{22}$ 0
	0	0 0 0 0 0 0 0 0 $\frac{\sqrt{11}}{22}$ 0 0 0 0 $\frac{\sqrt{11}}{22}$
	0	0 0 0 0 0 0 0 0 0 $-\frac{\sqrt{11}}{22}$ 0 0 $\frac{\sqrt{11}}{22}$ 0
	0	0 0 0 0 0 0 0 0 0 $-\frac{\sqrt{11}i}{22}$ 0 $\frac{\sqrt{11}}{22}$ 0 0
	0	0 0 0 0 0 0 0 0 0 $\frac{\sqrt{11}i}{22}$ 0 $\frac{\sqrt{11}}{22}$ 0 0
	0	$-\frac{\sqrt{165}}{66}$ 0 0 $\frac{\sqrt{11}}{22}$ 0 0 $-\frac{\sqrt{11}i}{22}$ 0 0 0 0 0 0
	$-\frac{\sqrt{165}}{66}$	0 0 0 0 $-\frac{\sqrt{11}}{22}$ $\frac{\sqrt{11}i}{22}$ 0 0 0 0 0 0 0
	0	$\frac{\sqrt{165}i}{66}$ $\frac{\sqrt{11}}{22}$ 0 0 0 0 $\frac{\sqrt{11}}{22}$ 0 0 0 0 0 0
	$-\frac{\sqrt{165}i}{66}$	0 0 $-\frac{\sqrt{11}}{22}$ 0 0 $\frac{\sqrt{11}}{22}$ 0 0 0 0 0 0 0
	$-\frac{\sqrt{165}}{66}$	0 0 $-\frac{\sqrt{11}i}{22}$ 0 $\frac{\sqrt{11}}{22}$ 0 0 0 0 0 0 0 0
	0	$\frac{\sqrt{165}}{66}$ $\frac{\sqrt{11}i}{22}$ 0 $\frac{\sqrt{11}}{22}$ 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	$\frac{3\sqrt{385}}{1540}$	0	$\frac{3\sqrt{385}i}{1540}$	0	0	0	$-\frac{\sqrt{231}}{132}$	0	$\frac{\sqrt{231}i}{132}$	$\frac{\sqrt{231}}{66}$	0	
	0	0	$\frac{3\sqrt{385}}{1540}$	0	$-\frac{3\sqrt{385}i}{1540}$	0	0	0	$-\frac{\sqrt{231}}{132}$	0	$-\frac{\sqrt{231}i}{132}$	0	0	$-\frac{\sqrt{231}}{66}$	
	0	$\frac{3\sqrt{385}}{1540}$	0	0	0	0	0	$-\frac{3\sqrt{231}i}{308}$	0	0	$-\frac{\sqrt{385}}{110}$	0	0	$-\frac{13\sqrt{385}i}{1540}$	
	$\frac{3\sqrt{385}}{1540}$	0	0	0	0	0	$\frac{3\sqrt{231}i}{308}$	0	0	0	0	$\frac{\sqrt{385}}{110}$	$\frac{13\sqrt{385}i}{1540}$	0	
	0	$\frac{3\sqrt{385}i}{1540}$	0	0	0	0	0	$-\frac{3\sqrt{231}}{308}$	$-\frac{\sqrt{385}}{110}$	0	0	0	0	$\frac{13\sqrt{385}}{1540}$	
	$-\frac{3\sqrt{385}i}{1540}$	0	0	0	0	0	$-\frac{3\sqrt{231}}{308}$	0	0	$\frac{\sqrt{385}}{110}$	0	0	$\frac{13\sqrt{385}}{1540}$	0	
	0	0	0	$-\frac{3\sqrt{231}i}{308}$	0	$-\frac{3\sqrt{231}}{308}$	0	0	0	$-\frac{\sqrt{385}i}{1540}$	0	$\frac{\sqrt{385}}{1540}$	0	0	
	0	0	$\frac{3\sqrt{231}i}{308}$	0	$-\frac{3\sqrt{231}}{308}$	0	0	0	$\frac{\sqrt{385}i}{1540}$	0	$\frac{\sqrt{385}}{1540}$	0	0	0	
	0	$-\frac{\sqrt{231}}{132}$	0	0	$-\frac{\sqrt{385}}{110}$	0	0	$-\frac{\sqrt{385}i}{1540}$	0	0	0	0	0	$-\frac{\sqrt{231}i}{308}$	
	$-\frac{\sqrt{231}}{132}$	0	0	0	0	$\frac{\sqrt{385}}{110}$	$\frac{\sqrt{385}i}{1540}$	0	0	0	0	0	$\frac{\sqrt{231}i}{308}$	0	
	0	$\frac{\sqrt{231}i}{132}$	$-\frac{\sqrt{385}}{110}$	0	0	0	0	$\frac{\sqrt{385}}{1540}$	0	0	0	0	0	$-\frac{\sqrt{231}}{308}$	
	$-\frac{\sqrt{231}i}{132}$	0	0	$\frac{\sqrt{385}}{110}$	0	0	$\frac{\sqrt{385}}{1540}$	0	0	0	0	0	$-\frac{\sqrt{231}}{308}$	0	
	$\frac{\sqrt{231}}{66}$	0	0	$-\frac{13\sqrt{385}i}{1540}$	0	$\frac{13\sqrt{385}}{1540}$	0	0	0	$-\frac{\sqrt{231}i}{308}$	0	$-\frac{\sqrt{231}}{308}$	0	0	
	0	$-\frac{\sqrt{231}}{66}$	$\frac{13\sqrt{385}i}{1540}$	0	$\frac{13\sqrt{385}}{1540}$	0	0	0	$\frac{\sqrt{231}i}{308}$	0	$-\frac{\sqrt{231}}{308}$	0	0	0	

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

927 symmetry

continued ...

Table 10

No.	multipole	matrix														
$\mathbb{T}_{4,1}^{(1,0;a)}(E_g)$	0	0	0	$\frac{\sqrt{1155}}{1540}$	0	$-\frac{\sqrt{1155}i}{1540}$	$-\frac{\sqrt{1155}}{770}$	0	0	$\frac{\sqrt{77}}{44}$	0	$\frac{\sqrt{77}i}{44}$	0	0	0	
	0	0	$\frac{\sqrt{1155}}{1540}$	0	$\frac{\sqrt{1155}i}{1540}$	0	0	$\frac{\sqrt{1155}}{770}$	$\frac{\sqrt{77}}{44}$	0	$-\frac{\sqrt{77}i}{44}$	0	0	0	0	
	0	$\frac{\sqrt{1155}}{1540}$	0	0	$\frac{3\sqrt{77}}{154}$	0	0	$\frac{3\sqrt{77}i}{308}$	0	0	$-\frac{\sqrt{1155}}{385}$	0	0	$-\frac{\sqrt{1155}i}{308}$		
	$\frac{\sqrt{1155}}{1540}$	0	0	0	0	$-\frac{3\sqrt{77}}{154}$	$-\frac{3\sqrt{77}i}{308}$	0	0	0	$\frac{\sqrt{1155}}{385}$	$\frac{\sqrt{1155}i}{308}$	0			
	0	$-\frac{\sqrt{1155}i}{1540}$	$\frac{3\sqrt{77}}{154}$	0	0	0	0	$-\frac{3\sqrt{77}}{308}$	$\frac{\sqrt{1155}}{385}$	0	0	0	0	$-\frac{\sqrt{1155}}{308}$		
	$\frac{\sqrt{1155}i}{1540}$	0	0	$-\frac{3\sqrt{77}}{154}$	0	0	$-\frac{3\sqrt{77}}{308}$	0	0	$-\frac{\sqrt{1155}}{385}$	0	0	$-\frac{\sqrt{1155}}{308}$	0		
	$-\frac{\sqrt{1155}}{770}$	0	0	$\frac{3\sqrt{77}i}{308}$	0	$-\frac{3\sqrt{77}}{308}$	0	0	0	$-\frac{9\sqrt{1155}i}{1540}$	0	$-\frac{9\sqrt{1155}}{1540}$	0	0	0	
	0	$\frac{\sqrt{1155}}{770}$	$-\frac{3\sqrt{77}i}{308}$	0	$-\frac{3\sqrt{77}}{308}$	0	0	0	$\frac{9\sqrt{1155}i}{1540}$	0	$-\frac{9\sqrt{1155}}{1540}$	0	0	0		
	0	$\frac{\sqrt{77}}{44}$	0	0	$\frac{\sqrt{1155}}{385}$	0	0	$-\frac{9\sqrt{1155}i}{1540}$	0	0	$\frac{\sqrt{77}}{154}$	0	0	$\frac{\sqrt{77}i}{308}$		
	$\frac{\sqrt{77}}{44}$	0	0	0	0	$-\frac{\sqrt{1155}}{385}$	$\frac{9\sqrt{1155}i}{1540}$	0	0	0	0	$-\frac{\sqrt{77}}{154}$	$-\frac{\sqrt{77}i}{308}$	0		
	0	$\frac{\sqrt{77}i}{44}$	$-\frac{\sqrt{1155}}{385}$	0	0	0	0	$-\frac{9\sqrt{1155}}{1540}$	$\frac{\sqrt{77}}{154}$	0	0	0	0	$-\frac{\sqrt{77}}{308}$		
	$-\frac{\sqrt{77}i}{44}$	0	0	$\frac{\sqrt{1155}}{385}$	0	0	$-\frac{9\sqrt{1155}}{1540}$	0	0	$-\frac{\sqrt{77}}{154}$	0	0	$-\frac{\sqrt{77}}{308}$	0		
	0	0	0	$-\frac{\sqrt{1155}i}{308}$	0	$-\frac{\sqrt{1155}}{308}$	0	0	0	$\frac{\sqrt{77}i}{308}$	0	$-\frac{\sqrt{77}}{308}$	0	0	0	
	0	0	$\frac{\sqrt{1155}i}{308}$	0	$-\frac{\sqrt{1155}}{308}$	0	0	0	$-\frac{\sqrt{77}i}{308}$	0	$-\frac{\sqrt{77}}{308}$	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	$-\frac{\sqrt{11}}{11}$
	0	0
	0	$-\frac{\sqrt{165}}{440}$
	$-\frac{\sqrt{11}}{11}$	0
	0	0
	0	$\frac{\sqrt{165}}{440}$
	0	$-\frac{3\sqrt{11}i}{88}$
	$-\frac{\sqrt{165}}{440}$	0
	0	$-\frac{3\sqrt{11}i}{88}$
	0	$\frac{3\sqrt{11}i}{88}$
	$-\frac{\sqrt{165}i}{440}$	0
	0	$-\frac{3\sqrt{11}i}{88}$
	$\frac{\sqrt{11}i}{88}$	0
$-\frac{\sqrt{35}xz(x-z)(x+z)}{2}$		

929 symmetry

continued ...

Table 10

No.	multipole	matrix
$\mathbb{T}_{4,1}^{(1,0;a)}(T_g, 1)$	$0 \quad \frac{\sqrt{11}i}{11} \quad -\frac{\sqrt{165}}{440} \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{165}}{440} \quad \frac{\sqrt{11}}{88} \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{11}}{88}$	
	$-\frac{\sqrt{11}i}{11} \quad 0 \quad 0 \quad \frac{\sqrt{165}}{440} \quad 0 \quad 0 \quad -\frac{\sqrt{165}}{440} \quad 0 \quad 0 \quad -\frac{\sqrt{11}}{88} \quad 0 \quad 0 \quad -\frac{\sqrt{11}}{88} \quad 0$	
	$-\frac{\sqrt{165}}{440} \quad 0 \quad 0 \quad -\frac{3\sqrt{11}i}{44} \quad 0 \quad \frac{3\sqrt{11}}{88} \quad 0 \quad 0 \quad 0 \quad \frac{\sqrt{165}i}{220} \quad 0 \quad -\frac{\sqrt{165}}{440} \quad 0 \quad 0$	
	$0 \quad \frac{\sqrt{165}}{440} \quad \frac{3\sqrt{11}i}{44} \quad 0 \quad \frac{3\sqrt{11}}{88} \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{165}i}{220} \quad 0 \quad -\frac{\sqrt{165}}{440} \quad 0 \quad 0 \quad 0$	
	$0 \quad 0 \quad 0 \quad \frac{3\sqrt{11}}{88} \quad 0 \quad 0 \quad \frac{3\sqrt{11}}{88} \quad 0 \quad 0 \quad \frac{3\sqrt{165}}{440} \quad 0 \quad 0 \quad -\frac{3\sqrt{165}}{440} \quad 0$	
	$0 \quad 0 \quad \frac{3\sqrt{11}}{88} \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{3\sqrt{11}}{88} \quad \frac{3\sqrt{165}}{440} \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{3\sqrt{165}}{440}$	
	$0 \quad -\frac{\sqrt{165}}{440} \quad 0 \quad 0 \quad \frac{3\sqrt{11}}{88} \quad 0 \quad 0 \quad -\frac{3\sqrt{11}i}{44} \quad 0 \quad 0 \quad \frac{\sqrt{165}}{440} \quad 0 \quad 0 \quad -\frac{\sqrt{165}i}{220}$	
	$-\frac{\sqrt{165}}{440} \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{3\sqrt{11}}{88} \quad \frac{3\sqrt{11}i}{44} \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{165}}{440} \quad \frac{\sqrt{165}i}{220} \quad 0$	
	$\frac{\sqrt{11}}{88} \quad 0 \quad 0 \quad \frac{\sqrt{165}i}{220} \quad 0 \quad \frac{3\sqrt{165}}{440} \quad 0 \quad 0 \quad 0 \quad \frac{3\sqrt{11}i}{44} \quad 0 \quad \frac{\sqrt{11}}{88} \quad 0 \quad 0$	
	$0 \quad -\frac{\sqrt{11}}{88} \quad -\frac{\sqrt{165}i}{220} \quad 0 \quad \frac{3\sqrt{165}}{440} \quad 0 \quad 0 \quad 0 \quad -\frac{3\sqrt{11}i}{44} \quad 0 \quad \frac{\sqrt{11}}{88} \quad 0 \quad 0 \quad 0$	
	$0 \quad 0 \quad 0 \quad -\frac{\sqrt{165}}{440} \quad 0 \quad 0 \quad \frac{\sqrt{165}}{440} \quad 0 \quad 0 \quad \frac{\sqrt{11}}{88} \quad 0 \quad -\frac{\sqrt{11}i}{11} \quad \frac{\sqrt{11}}{88} \quad 0$	
	$0 \quad 0 \quad -\frac{\sqrt{165}}{440} \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{165}}{440} \quad \frac{\sqrt{11}}{88} \quad 0 \quad \frac{\sqrt{11}i}{11} \quad 0 \quad 0 \quad -\frac{\sqrt{11}}{88}$	
	$0 \quad -\frac{\sqrt{11}}{88} \quad 0 \quad 0 \quad -\frac{3\sqrt{165}}{440} \quad 0 \quad 0 \quad -\frac{\sqrt{165}i}{220} \quad 0 \quad 0 \quad \frac{\sqrt{11}}{88} \quad 0 \quad 0 \quad \frac{3\sqrt{11}i}{44}$	
	$-\frac{\sqrt{11}}{88} \quad 0 \quad 0 \quad 0 \quad 0 \quad \frac{3\sqrt{165}}{440} \quad \frac{\sqrt{165}i}{220} \quad 0 \quad 0 \quad 0 \quad 0 \quad -\frac{\sqrt{11}}{88} \quad -\frac{3\sqrt{11}i}{44} \quad 0$	

930 symmetry

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

continued ...

Table 10

No.	multipole	matrix													
$\mathbb{T}_{4,2}^{(1,0;a)}(T_g, 1)$	$-\frac{\sqrt{11}}{11}$	0	0	$\frac{\sqrt{165}i}{440}$	0	$-\frac{\sqrt{165}}{440}$	0	0	0	$\frac{\sqrt{11}i}{88}$	0	$\frac{\sqrt{11}}{88}$	0	0	0
	0	$\frac{\sqrt{11}}{11}$	$-\frac{\sqrt{165}i}{440}$	0	$-\frac{\sqrt{165}}{440}$	0	0	0	$-\frac{\sqrt{11}i}{88}$	0	$\frac{\sqrt{11}}{88}$	0	0	0	0
	0	$\frac{\sqrt{165}i}{440}$	$\frac{3\sqrt{11}}{44}$	0	0	0	0	$\frac{3\sqrt{11}}{88}$	$\frac{\sqrt{165}}{220}$	0	0	0	0	$\frac{\sqrt{165}}{440}$	
	$-\frac{\sqrt{165}i}{440}$	0	0	$-\frac{3\sqrt{11}}{44}$	0	0	$\frac{3\sqrt{11}}{88}$	0	0	$-\frac{\sqrt{165}}{220}$	0	0	$\frac{\sqrt{165}}{440}$	0	
	0	$-\frac{\sqrt{165}}{440}$	0	0	$\frac{3\sqrt{11}}{44}$	0	0	$-\frac{3\sqrt{11}i}{88}$	0	0	$-\frac{\sqrt{165}}{220}$	0	0	$\frac{\sqrt{165}i}{440}$	
	$-\frac{\sqrt{165}}{440}$	0	0	0	0	$-\frac{3\sqrt{11}}{44}$	$\frac{3\sqrt{11}i}{88}$	0	0	0	0	$\frac{\sqrt{165}}{220}$	$-\frac{\sqrt{165}i}{440}$	0	
	0	0	0	$\frac{3\sqrt{11}}{88}$	0	$-\frac{3\sqrt{11}i}{88}$	0	0	0	$-\frac{3\sqrt{165}}{440}$	0	$-\frac{3\sqrt{165}i}{440}$	0	0	
	0	0	$\frac{3\sqrt{11}}{88}$	0	$\frac{3\sqrt{11}i}{88}$	0	0	0	$-\frac{3\sqrt{165}}{440}$	0	$\frac{3\sqrt{165}i}{440}$	0	0	0	
	0	$\frac{\sqrt{11}i}{88}$	$\frac{\sqrt{165}}{220}$	0	0	0	0	$-\frac{3\sqrt{165}}{440}$	$-\frac{3\sqrt{11}}{44}$	0	0	0	0	$\frac{\sqrt{11}}{88}$	
	$-\frac{\sqrt{11}i}{88}$	0	0	$-\frac{\sqrt{165}}{220}$	0	0	$-\frac{3\sqrt{165}}{440}$	0	0	$\frac{3\sqrt{11}}{44}$	0	0	$\frac{\sqrt{11}}{88}$	0	
	0	$\frac{\sqrt{11}}{88}$	0	0	$-\frac{\sqrt{165}}{220}$	0	0	$-\frac{3\sqrt{165}i}{440}$	0	0	$-\frac{3\sqrt{11}}{44}$	0	0	$-\frac{\sqrt{11}i}{88}$	
	$\frac{\sqrt{11}}{88}$	0	0	0	0	$\frac{\sqrt{165}}{220}$	$\frac{3\sqrt{165}i}{440}$	0	0	0	0	$\frac{3\sqrt{11}}{44}$	$\frac{\sqrt{11}i}{88}$	0	
	0	0	0	$\frac{\sqrt{165}}{440}$	0	$\frac{\sqrt{165}i}{440}$	0	0	0	$\frac{\sqrt{11}}{88}$	0	$-\frac{\sqrt{11}i}{88}$	$\frac{\sqrt{11}}{11}$	0	
	0	0	$\frac{\sqrt{165}}{440}$	0	$-\frac{\sqrt{165}i}{440}$	0	0	0	$\frac{\sqrt{11}}{88}$	0	$\frac{\sqrt{11}i}{88}$	0	0	$-\frac{\sqrt{11}}{11}$	
$\frac{\sqrt{5}yz(6x^2-y^2-z^2)}{2}$															
931	symmetry														

continued ...

Table 10

No.	multipole	matrix														
$\mathbb{T}_{4,0}^{(1,0;a)}(T_g, 2)$	0 0 0 0 $\frac{\sqrt{1155}}{616}$ 0 0 $\frac{\sqrt{1155}i}{616}$ 0 0 - $\frac{\sqrt{77}}{88}$ 0 0 $\frac{\sqrt{77}i}{88}$															
	0 0 0 0 0 - $\frac{\sqrt{1155}}{616}$ - $\frac{\sqrt{1155}i}{616}$ 0 0 0 0 $\frac{\sqrt{77}}{88}$ - $\frac{\sqrt{77}i}{88}$ 0															
	0 0 0 0 0 - $\frac{15\sqrt{77}i}{616}$ - $\frac{15\sqrt{77}}{616}$ 0 0 - $\frac{\sqrt{1155}}{770}$ 0 $\frac{3\sqrt{1155}i}{3080}$ - $\frac{3\sqrt{1155}}{3080}$ 0															
	0 0 0 0 $\frac{15\sqrt{77}i}{616}$ 0 0 $\frac{15\sqrt{77}}{616}$ - $\frac{\sqrt{1155}}{770}$ 0 - $\frac{3\sqrt{1155}i}{3080}$ 0 0 $\frac{3\sqrt{1155}}{3080}$															
	$\frac{\sqrt{1155}}{616}$ 0 0 - $\frac{15\sqrt{77}i}{616}$ 0 - $\frac{3\sqrt{77}}{308}$ 0 0 0 - $\frac{17\sqrt{1155}i}{3080}$ 0 $\frac{\sqrt{1155}}{1540}$ 0 0															
	0 - $\frac{\sqrt{1155}}{616}$ $\frac{15\sqrt{77}i}{616}$ 0 - $\frac{3\sqrt{77}}{308}$ 0 0 0 $\frac{17\sqrt{1155}i}{3080}$ 0 $\frac{\sqrt{1155}}{1540}$ 0 0 0															
	0 $\frac{\sqrt{1155}i}{616}$ - $\frac{15\sqrt{77}}{616}$ 0 0 0 0 $\frac{3\sqrt{77}}{308}$ $\frac{17\sqrt{1155}}{3080}$ 0 0 0 0 $\frac{\sqrt{1155}}{1540}$															
	- $\frac{\sqrt{1155}i}{616}$ 0 0 $\frac{15\sqrt{77}}{616}$ 0 0 $\frac{3\sqrt{77}}{308}$ 0 0 - $\frac{17\sqrt{1155}}{3080}$ 0 0 0 $\frac{\sqrt{1155}}{1540}$															
	0 0 0 - $\frac{\sqrt{1155}}{770}$ 0 - $\frac{17\sqrt{1155}i}{3080}$ $\frac{17\sqrt{1155}}{3080}$ 0 0 0 0 - $\frac{5\sqrt{77}i}{616}$ - $\frac{5\sqrt{77}}{616}$ 0															
	0 0 - $\frac{\sqrt{1155}}{770}$ 0 $\frac{17\sqrt{1155}i}{3080}$ 0 0 - $\frac{17\sqrt{1155}}{3080}$ 0 0 0 0 0 $\frac{5\sqrt{77}}{616}$															
	- $\frac{\sqrt{77}}{88}$ 0 0 $\frac{3\sqrt{1155}i}{3080}$ 0 $\frac{\sqrt{1155}}{1540}$ 0 0 0 - $\frac{5\sqrt{77}i}{616}$ 0 $\frac{\sqrt{77}}{44}$ 0 0															
	0 $\frac{\sqrt{77}}{88}$ - $\frac{3\sqrt{1155}i}{3080}$ 0 $\frac{\sqrt{1155}}{1540}$ 0 0 0 $\frac{5\sqrt{77}i}{616}$ 0 $\frac{\sqrt{77}}{44}$ 0 0 0															
	0 $\frac{\sqrt{77}i}{88}$ - $\frac{3\sqrt{1155}}{3080}$ 0 0 0 0 $\frac{\sqrt{1155}}{1540}$ - $\frac{5\sqrt{77}}{616}$ 0 0 0 0 - $\frac{\sqrt{77}}{44}$															
	- $\frac{\sqrt{77}i}{88}$ 0 0 $\frac{3\sqrt{1155}}{3080}$ 0 0 $\frac{\sqrt{1155}}{1540}$ 0 0 $\frac{5\sqrt{77}}{616}$ 0 0 0 - $\frac{\sqrt{77}}{44}$ 0															
$\frac{\sqrt{5}xz(x^2 - 6y^2 + z^2)}{2}$																

932 symmetry

continued ...

Table 10

No.	multipole	matrix													
$\mathbb{T}_{4,1}^{(1,0;a)}(T_g, 2)$	0 0 $-\frac{\sqrt{1155}}{616}$ 0 0 0 0 $\frac{\sqrt{1155}}{616}$ $-\frac{\sqrt{77}}{88}$ 0 0 0 0 $-\frac{\sqrt{77}}{88}$														
	0 0 0 $\frac{\sqrt{1155}}{616}$ 0 0 $\frac{\sqrt{1155}}{616}$ 0 0 $\frac{\sqrt{77}}{88}$ 0 0 $-\frac{\sqrt{77}}{88}$ 0 0														
	$-\frac{\sqrt{1155}}{616}$ 0 0 $-\frac{3\sqrt{77}i}{308}$ 0 $-\frac{15\sqrt{77}}{616}$ 0 0 0 $-\frac{\sqrt{1155}i}{1540}$ 0 $\frac{17\sqrt{1155}}{3080}$ 0 0														
	0 $\frac{\sqrt{1155}}{616}$ $\frac{3\sqrt{77}i}{308}$ 0 $-\frac{15\sqrt{77}}{616}$ 0 0 0 $\frac{\sqrt{1155}i}{1540}$ 0 $\frac{17\sqrt{1155}}{3080}$ 0 0 0														
	0 0 0 $-\frac{15\sqrt{77}}{616}$ 0 0 $\frac{15\sqrt{77}}{616}$ 0 0 $-\frac{3\sqrt{1155}}{3080}$ 0 $\frac{\sqrt{1155}i}{770}$ $-\frac{3\sqrt{1155}}{3080}$ 0														
	0 0 $-\frac{15\sqrt{77}}{616}$ 0 0 0 $-\frac{15\sqrt{77}}{616}$ $-\frac{3\sqrt{1155}}{3080}$ 0 $-\frac{\sqrt{1155}i}{770}$ 0 0 $\frac{3\sqrt{1155}}{3080}$														
	0 $\frac{\sqrt{1155}}{616}$ 0 0 $\frac{15\sqrt{77}}{616}$ 0 0 $\frac{3\sqrt{77}i}{308}$ 0 0 $\frac{17\sqrt{1155}}{3080}$ 0 0 $-\frac{\sqrt{1155}i}{1540}$														
	$\frac{\sqrt{1155}}{616}$ 0 0 0 $-\frac{15\sqrt{77}}{616}$ $-\frac{3\sqrt{77}i}{308}$ 0 0 0 0 $-\frac{17\sqrt{1155}}{3080}$ $\frac{\sqrt{1155}i}{1540}$ 0														
	$-\frac{\sqrt{77}}{88}$ 0 0 $-\frac{\sqrt{1155}i}{1540}$ 0 $-\frac{3\sqrt{1155}}{3080}$ 0 0 0 $\frac{\sqrt{77}i}{44}$ 0 $-\frac{5\sqrt{77}}{616}$ 0 0														
	0 $\frac{\sqrt{77}}{88}$ $\frac{\sqrt{1155}i}{1540}$ 0 $-\frac{3\sqrt{1155}}{3080}$ 0 0 0 $-\frac{\sqrt{77}i}{44}$ 0 $-\frac{5\sqrt{77}}{616}$ 0 0 0														
	0 0 0 $\frac{17\sqrt{1155}}{3080}$ 0 $\frac{\sqrt{1155}i}{770}$ $\frac{17\sqrt{1155}}{3080}$ 0 0 $-\frac{5\sqrt{77}}{616}$ 0 0 $\frac{5\sqrt{77}}{616}$ 0														
	0 0 $\frac{17\sqrt{1155}}{3080}$ 0 $-\frac{\sqrt{1155}i}{770}$ 0 0 $-\frac{17\sqrt{1155}}{3080}$ $-\frac{5\sqrt{77}}{616}$ 0 0 0 0 $-\frac{5\sqrt{77}}{616}$														
	0 $-\frac{\sqrt{77}}{88}$ 0 0 $-\frac{3\sqrt{1155}}{3080}$ 0 0 $-\frac{\sqrt{1155}i}{1540}$ 0 0 $\frac{5\sqrt{77}}{616}$ 0 0 $-\frac{\sqrt{77}i}{44}$														
	$-\frac{\sqrt{77}}{88}$ 0 0 0 0 $\frac{3\sqrt{1155}}{3080}$ $\frac{\sqrt{1155}i}{1540}$ 0 0 0 0 $-\frac{5\sqrt{77}}{616}$ $\frac{\sqrt{77}i}{44}$ 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	$-\frac{\sqrt{1155}i}{616}$	0	$-\frac{\sqrt{1155}}{616}$	0	0	0	$\frac{\sqrt{77}i}{88}$	0	$-\frac{\sqrt{77}}{88}$	0	0	0	
	0	0	$\frac{\sqrt{1155}i}{616}$	0	$-\frac{\sqrt{1155}}{616}$	0	0	0	$-\frac{\sqrt{77}i}{88}$	0	$-\frac{\sqrt{77}}{88}$	0	0	0	0	
	0	$-\frac{\sqrt{1155}i}{616}$	$-\frac{3\sqrt{77}}{308}$	0	0	0	0	$\frac{15\sqrt{77}}{616}$	$\frac{\sqrt{1155}}{1540}$	0	0	0	0	$\frac{17\sqrt{1155}}{3080}$		
	$\frac{\sqrt{1155}i}{616}$	0	0	$\frac{3\sqrt{77}}{308}$	0	0	$\frac{15\sqrt{77}}{616}$	0	0	$-\frac{\sqrt{1155}}{1540}$	0	0	$\frac{17\sqrt{1155}}{3080}$	0		
	0	$-\frac{\sqrt{1155}}{616}$	0	0	$\frac{3\sqrt{77}}{308}$	0	0	$\frac{15\sqrt{77}i}{616}$	0	0	$\frac{\sqrt{1155}}{1540}$	0	0	$-\frac{17\sqrt{1155}i}{3080}$		
	$-\frac{\sqrt{1155}}{616}$	0	0	0	0	$-\frac{3\sqrt{77}}{308}$	$-\frac{15\sqrt{77}i}{616}$	0	0	0	0	$-\frac{\sqrt{1155}}{1540}$	$\frac{17\sqrt{1155}i}{3080}$	0		
	0	0	0	$\frac{15\sqrt{77}}{616}$	0	$\frac{15\sqrt{77}i}{616}$	0	0	0	$-\frac{3\sqrt{1155}}{3080}$	0	$\frac{3\sqrt{1155}i}{3080}$	$-\frac{\sqrt{1155}}{770}$	0		
	0	0	$\frac{15\sqrt{77}}{616}$	0	$-\frac{15\sqrt{77}i}{616}$	0	0	0	$-\frac{3\sqrt{1155}}{3080}$	0	$-\frac{3\sqrt{1155}i}{3080}$	0	0	$\frac{\sqrt{1155}}{770}$		
	0	$\frac{\sqrt{77}i}{88}$	$\frac{\sqrt{1155}}{1540}$	0	0	0	0	$-\frac{3\sqrt{1155}}{3080}$	$\frac{\sqrt{77}}{44}$	0	0	0	0	$\frac{5\sqrt{77}}{616}$		
	$-\frac{\sqrt{77}i}{88}$	0	0	$-\frac{\sqrt{1155}}{1540}$	0	0	$-\frac{3\sqrt{1155}}{3080}$	0	0	$-\frac{\sqrt{77}}{44}$	0	0	$\frac{5\sqrt{77}}{616}$	0		
	0	$-\frac{\sqrt{77}}{88}$	0	0	$\frac{\sqrt{1155}}{1540}$	0	0	$\frac{3\sqrt{1155}i}{3080}$	0	0	$-\frac{\sqrt{77}}{44}$	0	0	$\frac{5\sqrt{77}}{616}$		
	$-\frac{\sqrt{77}}{88}$	0	0	0	0	$-\frac{\sqrt{1155}}{1540}$	$-\frac{3\sqrt{1155}i}{3080}$	0	0	0	$\frac{\sqrt{77}}{44}$	$-\frac{5\sqrt{77}i}{616}$	0			
	0	0	0	$\frac{17\sqrt{1155}}{3080}$	0	$-\frac{17\sqrt{1155}i}{3080}$	$-\frac{\sqrt{1155}}{770}$	0	0	$\frac{5\sqrt{77}}{616}$	0	$\frac{5\sqrt{77}i}{616}$	0	0		
	0	0	$\frac{17\sqrt{1155}}{3080}$	0	$\frac{17\sqrt{1155}i}{3080}$	0	0	$\frac{\sqrt{1155}}{770}$	$\frac{5\sqrt{77}}{616}$	0	$-\frac{5\sqrt{77}i}{616}$	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 0 0 $\frac{\sqrt{22}}{22}$ 0 $-\frac{\sqrt{22}i}{22}$ $\frac{\sqrt{22}}{22}$ 0	
	0 0 0 0 0 0 0 0 $\frac{\sqrt{22}}{22}$ 0 $\frac{\sqrt{22}i}{22}$ 0 0 $-\frac{\sqrt{22}}{22}$	
	0 0 0 0 0 0 0 0 0 0 $\frac{\sqrt{330}}{132}$ 0 0 $-\frac{\sqrt{330}i}{132}$	
	0 0 0 0 0 0 0 0 0 0 0 $-\frac{\sqrt{330}}{132}$ $\frac{\sqrt{330}i}{132}$ 0	
	0 0 0 0 0 0 0 0 0 $\frac{\sqrt{330}}{132}$ 0 0 0 $\frac{\sqrt{330}}{132}$	
	0 0 0 0 0 0 0 0 0 0 $-\frac{\sqrt{330}}{132}$ 0 0 $\frac{\sqrt{330}}{132}$	
	0 0 0 0 0 0 0 0 0 0 $-\frac{\sqrt{330}i}{132}$ 0 $\frac{\sqrt{330}}{132}$ 0 0	
	0 0 0 0 0 0 0 0 0 $\frac{\sqrt{330}i}{132}$ 0 $\frac{\sqrt{330}}{132}$ 0 0 0	
	0 $\frac{\sqrt{22}}{22}$ 0 0 $\frac{\sqrt{330}}{132}$ 0 0 $-\frac{\sqrt{330}i}{132}$ 0 0 0 0 0 0	
	$\frac{\sqrt{22}}{22}$ 0 0 0 0 $-\frac{\sqrt{330}}{132}$ $\frac{\sqrt{330}i}{132}$ 0 0 0 0 0 0 0	
	0 $-\frac{\sqrt{22}i}{22}$ $\frac{\sqrt{330}}{132}$ 0 0 0 0 $\frac{\sqrt{330}}{132}$ 0 0 0 0 0 0	
	$\frac{\sqrt{22}i}{22}$ 0 0 $-\frac{\sqrt{330}}{132}$ 0 0 $\frac{\sqrt{330}}{132}$ 0 0 0 0 0 0 0	
	$\frac{\sqrt{22}}{22}$ 0 0 $-\frac{\sqrt{330}i}{132}$ 0 $\frac{\sqrt{330}}{132}$ 0 0 0 0 0 0 0 0	
	0 $-\frac{\sqrt{22}}{22}$ $\frac{\sqrt{330}i}{132}$ 0 0 $\frac{\sqrt{330}}{132}$ 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 $\frac{\sqrt{14}}{42}$ 0 $-\frac{\sqrt{14}i}{42}$ $\frac{\sqrt{14}}{42}$ 0 0 0 0 0 0 0	
	0 0 $\frac{\sqrt{14}}{42}$ 0 $\frac{\sqrt{14}i}{42}$ 0 0 $-\frac{\sqrt{14}}{42}$ 0 0 0 0 0 0	
	0 $\frac{\sqrt{14}}{42}$ 0 0 $\frac{\sqrt{210}}{84}$ 0 0 $-\frac{\sqrt{210}i}{84}$ 0 0 $\frac{\sqrt{14}}{42}$ 0 0 $\frac{\sqrt{14}i}{42}$	
	$\frac{\sqrt{14}}{42}$ 0 0 0 0 $-\frac{\sqrt{210}}{84}$ $\frac{\sqrt{210}i}{84}$ 0 0 0 0 $-\frac{\sqrt{14}}{42}$ $-\frac{\sqrt{14}i}{42}$ 0	
	0 $-\frac{\sqrt{14}i}{42}$ $\frac{\sqrt{210}}{84}$ 0 0 0 0 $\frac{\sqrt{210}}{84}$ $-\frac{\sqrt{14}}{42}$ 0 0 0 0 $\frac{\sqrt{14}}{42}$	
	$\frac{\sqrt{14}i}{42}$ 0 0 $-\frac{\sqrt{210}}{84}$ 0 0 $\frac{\sqrt{210}}{84}$ 0 0 0 $\frac{\sqrt{14}}{42}$ 0 0 $\frac{\sqrt{14}i}{42}$ 0	
	$\frac{\sqrt{14}}{42}$ 0 0 $-\frac{\sqrt{210}i}{84}$ 0 $\frac{\sqrt{210}}{84}$ 0 0 0 $-\frac{\sqrt{14}i}{42}$ 0 $-\frac{\sqrt{14}}{42}$ 0 0 0	
	0 $-\frac{\sqrt{14}}{42}$ $\frac{\sqrt{210}i}{84}$ 0 $\frac{\sqrt{210}}{84}$ 0 0 0 $\frac{\sqrt{14}i}{42}$ 0 $-\frac{\sqrt{14}}{42}$ 0 0 0 0	
	0 0 0 0 $-\frac{\sqrt{14}}{42}$ 0 0 $-\frac{\sqrt{14}i}{42}$ 0 0 $-\frac{\sqrt{210}}{84}$ 0 0 $\frac{\sqrt{210}i}{84}$ 0 0 $\frac{\sqrt{210}i}{84}$	
	0 0 0 0 0 $\frac{\sqrt{14}}{42}$ $\frac{\sqrt{14}i}{42}$ 0 0 0 0 0 $\frac{\sqrt{210}}{84}$ $-\frac{\sqrt{210}i}{84}$ 0	
	0 0 $\frac{\sqrt{14}}{42}$ 0 0 0 0 $-\frac{\sqrt{14}}{42}$ $-\frac{\sqrt{210}}{84}$ 0 0 0 0 0 $-\frac{\sqrt{210}}{84}$	
	0 0 0 $-\frac{\sqrt{14}}{42}$ 0 0 $-\frac{\sqrt{14}}{42}$ 0 0 $\frac{\sqrt{210}}{84}$ 0 0 0 $-\frac{\sqrt{210}}{84}$ 0 0 0	
	0 0 0 $\frac{\sqrt{14}i}{42}$ 0 $\frac{\sqrt{14}}{42}$ 0 0 0 $\frac{\sqrt{210}i}{84}$ 0 $-\frac{\sqrt{210}}{84}$ 0 0 $-\frac{\sqrt{210}}{84}$ 0 0 0	
	0 0 $-\frac{\sqrt{14}i}{42}$ 0 0 $\frac{\sqrt{14}}{42}$ 0 0 0 $-\frac{\sqrt{210}i}{84}$ 0 $-\frac{\sqrt{210}}{84}$ 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	$\frac{\sqrt{2310}}{924}$	0	$\frac{\sqrt{2310}i}{924}$	0	0	0	$\frac{\sqrt{154}}{308}$	0	$-\frac{\sqrt{154}i}{308}$	$-\frac{\sqrt{154}}{154}$	0		
	0	0	$\frac{\sqrt{2310}}{924}$	0	$-\frac{\sqrt{2310}i}{924}$	0	0	0	$\frac{\sqrt{154}}{308}$	0	$\frac{\sqrt{154}i}{308}$	0	0	$\frac{\sqrt{154}}{154}$		
	0	$\frac{\sqrt{2310}}{924}$	0	0	0	0	0	$-\frac{5\sqrt{154}i}{308}$	0	0	$-\frac{\sqrt{2310}}{924}$	0	0	$\frac{\sqrt{2310}i}{308}$		
	$\frac{\sqrt{2310}}{924}$	0	0	0	0	0	$\frac{5\sqrt{154}i}{308}$	0	0	0	0	$\frac{\sqrt{2310}}{924}$	$-\frac{\sqrt{2310}i}{308}$	0		
	0	$\frac{\sqrt{2310}i}{924}$	0	0	0	0	0	$-\frac{5\sqrt{154}}{308}$	$-\frac{\sqrt{2310}}{924}$	0	0	0	0	$-\frac{\sqrt{2310}}{308}$		
	$-\frac{\sqrt{2310}i}{924}$	0	0	0	0	0	$-\frac{5\sqrt{154}}{308}$	0	0	$\frac{\sqrt{2310}}{924}$	0	0	$-\frac{\sqrt{2310}}{308}$	0		
	0	0	0	$-\frac{5\sqrt{154}i}{308}$	0	$-\frac{5\sqrt{154}}{308}$	0	0	0	$-\frac{\sqrt{2310}i}{231}$	0	$\frac{\sqrt{2310}}{231}$	0	$\frac{\sqrt{2310}}{231}$	0	0
	0	0	$\frac{5\sqrt{154}i}{308}$	0	$-\frac{5\sqrt{154}}{308}$	0	0	0	$\frac{\sqrt{2310}i}{231}$	0	$\frac{\sqrt{2310}}{231}$	0	0	0	0	
	0	$\frac{\sqrt{154}}{308}$	0	0	$-\frac{\sqrt{2310}}{924}$	0	0	$-\frac{\sqrt{2310}i}{231}$	0	0	0	0	0	$\frac{\sqrt{154}i}{154}$		
	$\frac{\sqrt{154}}{308}$	0	0	0	0	$\frac{\sqrt{2310}}{924}$	$\frac{\sqrt{2310}i}{231}$	0	0	0	0	0	0	$-\frac{\sqrt{154}i}{154}$	0	
	0	$-\frac{\sqrt{154}i}{308}$	$-\frac{\sqrt{2310}}{924}$	0	0	0	0	$\frac{\sqrt{2310}}{231}$	0	0	0	0	0	0	$\frac{\sqrt{154}}{154}$	
	$\frac{\sqrt{154}i}{308}$	0	0	$\frac{\sqrt{2310}}{924}$	0	0	$\frac{\sqrt{2310}}{231}$	0	0	0	0	0	0	$\frac{\sqrt{154}}{154}$	0	
	$-\frac{\sqrt{154}}{154}$	0	0	$\frac{\sqrt{2310}i}{308}$	0	$-\frac{\sqrt{2310}}{308}$	0	0	0	$\frac{\sqrt{154}i}{154}$	0	$\frac{\sqrt{154}}{154}$	0	0	0	
	0	$\frac{\sqrt{154}}{154}$	$-\frac{\sqrt{2310}i}{308}$	0	$-\frac{\sqrt{2310}}{308}$	0	0	0	$-\frac{\sqrt{154}i}{154}$	0	$\frac{\sqrt{154}}{154}$	0	0	0	0	

$$\frac{\sqrt{42}(x-y)(x+y)(x^4 - 9x^2y^2 - 5x^2z^2 + y^4 - 5y^2z^2 + 5z^4)}{8}$$

937 symmetry

continued ...

Table 10

No.	multipole	matrix													
$\mathbb{T}_{6,1}^{(1,0;a)}(E_g)$	0	0	0	$\frac{\sqrt{770}}{924}$	0	$-\frac{\sqrt{770}i}{924}$	$-\frac{\sqrt{770}}{462}$	0	0	$-\frac{\sqrt{462}}{308}$	0	$-\frac{\sqrt{462}i}{308}$	0	0	
	0	0	$\frac{\sqrt{770}}{924}$	0	$\frac{\sqrt{770}i}{924}$	0	0	$\frac{\sqrt{770}}{462}$	$-\frac{\sqrt{462}}{308}$	0	$\frac{\sqrt{462}i}{308}$	0	0	0	
	0	$\frac{\sqrt{770}}{924}$	0	0	$\frac{5\sqrt{462}}{462}$	0	0	$\frac{5\sqrt{462}i}{924}$	0	0	$\frac{\sqrt{770}}{132}$	0	0	$-\frac{5\sqrt{770}i}{924}$	
	$\frac{\sqrt{770}}{924}$	0	0	0	0	$-\frac{5\sqrt{462}}{462}$	$-\frac{5\sqrt{462}i}{924}$	0	0	0	0	$-\frac{\sqrt{770}}{132}$	$\frac{5\sqrt{770}i}{924}$	0	
	0	$-\frac{\sqrt{770}i}{924}$	$\frac{5\sqrt{462}}{462}$	0	0	0	0	$-\frac{5\sqrt{462}}{924}$	$-\frac{\sqrt{770}}{132}$	0	0	0	0	$-\frac{5\sqrt{770}}{924}$	
	$\frac{\sqrt{770}i}{924}$	0	0	$-\frac{5\sqrt{462}}{462}$	0	0	$-\frac{5\sqrt{462}}{924}$	0	0	$\frac{\sqrt{770}}{132}$	0	0	$-\frac{5\sqrt{770}}{924}$	0	
	$-\frac{\sqrt{770}}{462}$	0	0	$\frac{5\sqrt{462}i}{924}$	0	$-\frac{5\sqrt{462}}{924}$	0	0	0	$\frac{\sqrt{770}i}{462}$	0	$\frac{\sqrt{770}}{462}$	0	0	
	0	$\frac{\sqrt{770}}{462}$	$-\frac{5\sqrt{462}i}{924}$	0	$-\frac{5\sqrt{462}}{924}$	0	0	0	$-\frac{\sqrt{770}i}{462}$	0	$\frac{\sqrt{770}}{462}$	0	0	0	
	0	$-\frac{\sqrt{462}}{308}$	0	0	$-\frac{\sqrt{770}}{132}$	0	0	$\frac{\sqrt{770}i}{462}$	0	0	$-\frac{\sqrt{462}}{231}$	0	0	$-\frac{\sqrt{462}i}{462}$	
	$-\frac{\sqrt{462}}{308}$	0	0	0	0	$\frac{\sqrt{770}}{132}$	$-\frac{\sqrt{770}i}{462}$	0	0	0	0	$\frac{\sqrt{462}}{231}$	$\frac{\sqrt{462}i}{462}$	0	
	0	$-\frac{\sqrt{462}i}{308}$	$\frac{\sqrt{770}}{132}$	0	0	0	0	$\frac{\sqrt{770}}{462}$	$-\frac{\sqrt{462}}{231}$	0	0	0	0	$\frac{\sqrt{462}}{462}$	
	$\frac{\sqrt{462}i}{308}$	0	0	$-\frac{\sqrt{770}}{132}$	0	0	$\frac{\sqrt{770}}{462}$	0	0	$\frac{\sqrt{462}}{231}$	0	0	$\frac{\sqrt{462}}{462}$	0	
	0	0	0	$-\frac{5\sqrt{770}i}{924}$	0	$-\frac{5\sqrt{770}}{924}$	0	0	0	$-\frac{\sqrt{462}i}{462}$	0	$\frac{\sqrt{462}}{462}$	0	0	
	0	0	$\frac{5\sqrt{770}i}{924}$	0	$-\frac{5\sqrt{770}}{924}$	0	0	0	$\frac{\sqrt{462}i}{462}$	0	$\frac{\sqrt{462}}{462}$	0	0	0	

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

938 symmetry

continued ...

Table 10

No.	multipole	matrix													
$\mathbb{T}_{6,0}^{(1,0;a)}(T_g, 1)$	0	$-\frac{2\sqrt{77}}{77}$	0	0	$-\frac{5\sqrt{1155}}{924}$	0	0	$\frac{5\sqrt{1155}i}{924}$	0	0	$-\frac{\sqrt{77}}{308}$	0	0	$-\frac{\sqrt{77}i}{308}$	
	$-\frac{2\sqrt{77}}{77}$	0	0	0	0	$\frac{5\sqrt{1155}}{924}$	$-\frac{5\sqrt{1155}i}{924}$	0	0	0	$\frac{\sqrt{77}}{308}$	$\frac{\sqrt{77}i}{308}$	0	0	
	0	0	0	0	0	$\frac{5\sqrt{77}i}{616}$	$-\frac{5\sqrt{77}}{616}$	0	0	0	$-\frac{\sqrt{1155}i}{616}$	$-\frac{\sqrt{1155}}{616}$	0	0	
	0	0	0	0	$-\frac{5\sqrt{77}i}{616}$	0	0	$\frac{5\sqrt{77}}{616}$	0	0	$\frac{\sqrt{1155}i}{616}$	0	0	$\frac{\sqrt{1155}}{616}$	
	$-\frac{5\sqrt{1155}}{924}$	0	0	$\frac{5\sqrt{77}i}{616}$	0	$-\frac{5\sqrt{77}}{308}$	0	0	0	$\frac{\sqrt{1155}i}{1848}$	0	$-\frac{\sqrt{1155}}{924}$	0	0	
	0	$\frac{5\sqrt{1155}}{924}$	$-\frac{5\sqrt{77}i}{616}$	0	$-\frac{5\sqrt{77}}{308}$	0	0	0	$-\frac{\sqrt{1155}i}{1848}$	0	$-\frac{\sqrt{1155}}{924}$	0	0	0	
	0	$\frac{5\sqrt{1155}i}{924}$	$-\frac{5\sqrt{77}}{616}$	0	0	0	0	$-\frac{5\sqrt{77}}{308}$	$\frac{\sqrt{1155}}{1848}$	0	0	0	0	$\frac{\sqrt{1155}}{924}$	
	$-\frac{5\sqrt{1155}i}{924}$	0	0	$\frac{5\sqrt{77}}{616}$	0	0	$-\frac{5\sqrt{77}}{308}$	0	0	$-\frac{\sqrt{1155}}{1848}$	0	0	$\frac{\sqrt{1155}}{924}$	0	
	0	0	0	0	0	$\frac{\sqrt{1155}i}{1848}$	$\frac{\sqrt{1155}}{1848}$	0	0	$\frac{2\sqrt{77}}{77}$	0	$-\frac{13\sqrt{77}i}{616}$	$\frac{13\sqrt{77}}{616}$	0	
	0	0	0	0	$-\frac{\sqrt{1155}i}{1848}$	0	0	$-\frac{\sqrt{1155}}{1848}$	$\frac{2\sqrt{77}}{77}$	0	$\frac{13\sqrt{77}i}{616}$	0	0	$-\frac{13\sqrt{77}}{616}$	
	$-\frac{\sqrt{77}}{308}$	0	0	$-\frac{\sqrt{1155}i}{616}$	0	$-\frac{\sqrt{1155}}{924}$	0	0	0	$-\frac{13\sqrt{77}i}{616}$	0	$\frac{5\sqrt{77}}{308}$	0	0	
	0	$\frac{\sqrt{77}}{308}$	$\frac{\sqrt{1155}i}{616}$	0	$-\frac{\sqrt{1155}}{924}$	0	0	0	$\frac{13\sqrt{77}i}{616}$	0	$\frac{5\sqrt{77}}{308}$	0	0	0	
	0	$-\frac{\sqrt{77}i}{308}$	$-\frac{\sqrt{1155}}{616}$	0	0	0	0	$\frac{\sqrt{1155}}{924}$	$\frac{13\sqrt{77}}{616}$	0	0	0	0	$\frac{5\sqrt{77}}{308}$	
	$\frac{\sqrt{77}i}{308}$	0	0	$\frac{\sqrt{1155}}{616}$	0	0	$\frac{\sqrt{1155}}{924}$	0	0	$-\frac{13\sqrt{77}}{616}$	0	0	$\frac{5\sqrt{77}}{308}$	0	

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

939 symmetry

continued ...

Table 10

No.	multipole	matrix													
$\mathbb{T}_{6,1}^{(1,0;a)}(T_g, 1)$	0	$\frac{2\sqrt{77}i}{77}$	$-\frac{5\sqrt{1155}}{924}$	0	0	0	0	$-\frac{5\sqrt{1155}}{924}$	$\frac{\sqrt{77}}{308}$	0	0	0	0	$-\frac{\sqrt{77}}{308}$	
	$-\frac{2\sqrt{77}i}{77}$	0	0	$\frac{5\sqrt{1155}}{924}$	0	0	$-\frac{5\sqrt{1155}}{924}$	0	0	$-\frac{\sqrt{77}}{308}$	0	0	$-\frac{\sqrt{77}}{308}$	0	
	$-\frac{5\sqrt{1155}}{924}$	0	0	$\frac{5\sqrt{77}i}{308}$	0	$-\frac{5\sqrt{77}}{616}$	0	0	0	$-\frac{\sqrt{1155}i}{924}$	0	$\frac{\sqrt{1155}}{1848}$	0	0	
	0	$\frac{5\sqrt{1155}}{924}$	$-\frac{5\sqrt{77}i}{308}$	0	$-\frac{5\sqrt{77}}{616}$	0	0	0	$\frac{\sqrt{1155}i}{924}$	0	$\frac{\sqrt{1155}}{1848}$	0	0	0	
	0	0	0	$-\frac{5\sqrt{77}}{616}$	0	0	$-\frac{5\sqrt{77}}{616}$	0	0	$-\frac{\sqrt{1155}}{616}$	0	0	$\frac{\sqrt{1155}}{616}$	0	
	0	0	$-\frac{5\sqrt{77}}{616}$	0	0	0	0	$\frac{5\sqrt{77}}{616}$	$-\frac{\sqrt{1155}}{616}$	0	0	0	0	$-\frac{\sqrt{1155}}{616}$	
	0	$-\frac{5\sqrt{1155}}{924}$	0	0	$-\frac{5\sqrt{77}}{616}$	0	0	$\frac{5\sqrt{77}i}{308}$	0	0	$-\frac{\sqrt{1155}}{1848}$	0	0	$\frac{\sqrt{1155}i}{924}$	
	$-\frac{5\sqrt{1155}}{924}$	0	0	0	0	$\frac{5\sqrt{77}}{616}$	$-\frac{5\sqrt{77}i}{308}$	0	0	0	0	$\frac{\sqrt{1155}}{1848}$	$-\frac{\sqrt{1155}i}{924}$	0	
	$\frac{\sqrt{77}}{308}$	0	0	$-\frac{\sqrt{1155}i}{924}$	0	$-\frac{\sqrt{1155}}{616}$	0	0	0	$-\frac{5\sqrt{77}i}{308}$	0	$\frac{13\sqrt{77}}{616}$	0	0	
	0	$-\frac{\sqrt{77}}{308}$	$\frac{\sqrt{1155}i}{924}$	0	$-\frac{\sqrt{1155}}{616}$	0	0	0	$\frac{5\sqrt{77}i}{308}$	0	$\frac{13\sqrt{77}}{616}$	0	0	0	
	0	0	0	$\frac{\sqrt{1155}}{1848}$	0	0	$-\frac{\sqrt{1155}}{1848}$	0	0	$\frac{13\sqrt{77}}{616}$	0	$-\frac{2\sqrt{77}i}{77}$	$\frac{13\sqrt{77}}{616}$	0	
	0	0	$\frac{\sqrt{1155}}{1848}$	0	0	0	0	$\frac{\sqrt{1155}}{1848}$	$\frac{13\sqrt{77}}{616}$	0	$\frac{2\sqrt{77}i}{77}$	0	0	$-\frac{13\sqrt{77}}{616}$	
	0	$-\frac{\sqrt{77}}{308}$	0	0	$\frac{\sqrt{1155}}{616}$	0	0	$\frac{\sqrt{1155}i}{924}$	0	0	$\frac{13\sqrt{77}}{616}$	0	0	$-\frac{5\sqrt{77}i}{308}$	
	$-\frac{\sqrt{77}}{308}$	0	0	0	0	$-\frac{\sqrt{1155}}{616}$	$-\frac{\sqrt{1155}i}{924}$	0	0	0	$-\frac{13\sqrt{77}}{616}$	$\frac{5\sqrt{77}i}{308}$	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													
$\mathbb{T}_{6,2}^{(1,0;a)}(T_g, 1)$	$-\frac{2\sqrt{77}}{77}$	0	0	$\frac{5\sqrt{1155}i}{924}$	0	$-\frac{5\sqrt{1155}}{924}$	0	0	0	$\frac{\sqrt{77}i}{308}$	0	$\frac{\sqrt{77}}{308}$	0	0	0
	0	$\frac{2\sqrt{77}}{77}$	$-\frac{5\sqrt{1155}i}{924}$	0	$-\frac{5\sqrt{1155}}{924}$	0	0	0	$-\frac{\sqrt{77}i}{308}$	0	$\frac{\sqrt{77}}{308}$	0	0	0	0
	0	$\frac{5\sqrt{1155}i}{924}$	$-\frac{5\sqrt{77}}{308}$	0	0	0	0	$-\frac{5\sqrt{77}}{616}$	$-\frac{\sqrt{1155}}{924}$	0	0	0	0	$-\frac{\sqrt{1155}}{1848}$	
	$-\frac{5\sqrt{1155}i}{924}$	0	0	$\frac{5\sqrt{77}}{308}$	0	0	$-\frac{5\sqrt{77}}{616}$	0	0	$\frac{\sqrt{1155}}{924}$	0	0	$-\frac{\sqrt{1155}}{1848}$	0	
	0	$-\frac{5\sqrt{1155}}{924}$	0	0	$-\frac{5\sqrt{77}}{308}$	0	0	$\frac{5\sqrt{77}i}{616}$	0	0	$\frac{\sqrt{1155}}{924}$	0	0	$-\frac{\sqrt{1155}i}{1848}$	
	$-\frac{5\sqrt{1155}}{924}$	0	0	0	0	$\frac{5\sqrt{77}}{308}$	$-\frac{5\sqrt{77}i}{616}$	0	0	0	0	$-\frac{\sqrt{1155}}{924}$	$\frac{\sqrt{1155}i}{1848}$	0	
	0	0	0	$-\frac{5\sqrt{77}}{616}$	0	$\frac{5\sqrt{77}i}{616}$	0	0	0	$\frac{\sqrt{1155}}{616}$	0	$\frac{\sqrt{1155}i}{616}$	0	0	
	0	$\frac{\sqrt{77}i}{308}$	$-\frac{\sqrt{1155}}{924}$	0	0	0	0	$\frac{\sqrt{1155}}{616}$	$\frac{5\sqrt{77}}{308}$	0	0	0	0	$\frac{13\sqrt{77}}{616}$	
	$-\frac{\sqrt{77}i}{308}$	0	0	$\frac{\sqrt{1155}}{924}$	0	0	$\frac{\sqrt{1155}}{616}$	0	0	$-\frac{5\sqrt{77}}{308}$	0	0	$\frac{13\sqrt{77}}{616}$	0	
	0	$\frac{\sqrt{77}}{308}$	0	0	$\frac{\sqrt{1155}}{924}$	0	0	$\frac{\sqrt{1155}i}{616}$	0	0	$\frac{5\sqrt{77}}{308}$	0	0	$-\frac{13\sqrt{77}i}{616}$	
	$\frac{\sqrt{77}}{308}$	0	0	0	0	$-\frac{\sqrt{1155}}{924}$	$-\frac{\sqrt{1155}i}{616}$	0	0	0	0	$-\frac{5\sqrt{77}}{308}$	$\frac{13\sqrt{77}i}{616}$	0	
	0	0	0	$-\frac{\sqrt{1155}}{1848}$	0	$-\frac{\sqrt{1155}i}{1848}$	0	0	0	$\frac{13\sqrt{77}}{616}$	0	$-\frac{13\sqrt{77}i}{616}$	$\frac{2\sqrt{77}}{77}$	0	
	0	0	$-\frac{\sqrt{1155}}{1848}$	0	$\frac{\sqrt{1155}i}{1848}$	0	0	0	$\frac{13\sqrt{77}}{616}$	0	$\frac{13\sqrt{77}i}{616}$	0	0	$-\frac{2\sqrt{77}}{77}$	

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 $\frac{\sqrt{70}}{112}$ 0 0 $\frac{\sqrt{70}i}{112}$ 0 0 $-\frac{\sqrt{42}}{112}$ 0 0 $\frac{\sqrt{42}i}{112}$	
	0 0 0 0 0 $-\frac{\sqrt{70}}{112}$ $-\frac{\sqrt{70}i}{112}$ 0 0 0 0 $\frac{\sqrt{42}}{112}$ $-\frac{\sqrt{42}i}{112}$ 0	
	0 0 0 0 0 0 0 0 0 0 0 0 0	
	0 0 0 0 0 0 0 0 0 0 0 0 0	
	$\frac{\sqrt{70}}{112}$ 0 0 0 0 $\frac{5\sqrt{42}}{112}$ 0 0 0 $\frac{\sqrt{70}i}{112}$ 0 $-\frac{3\sqrt{70}}{112}$ 0 0	
	0 $-\frac{\sqrt{70}}{112}$ 0 0 $\frac{5\sqrt{42}}{112}$ 0 0 0 $-\frac{\sqrt{70}i}{112}$ 0 $-\frac{3\sqrt{70}}{112}$ 0 0 0	
	0 $\frac{\sqrt{70}i}{112}$ 0 0 0 0 0 $-\frac{5\sqrt{42}}{112}$ $-\frac{\sqrt{70}}{112}$ 0 0 0 0 $-\frac{3\sqrt{70}}{112}$	
	$-\frac{\sqrt{70}i}{112}$ 0 0 0 0 0 $-\frac{5\sqrt{42}}{112}$ 0 0 $\frac{\sqrt{70}}{112}$ 0 0 $-\frac{3\sqrt{70}}{112}$ 0	
	0 0 0 0 0 $\frac{\sqrt{70}i}{112}$ $-\frac{\sqrt{70}}{112}$ 0 0 0 0 $-\frac{\sqrt{42}i}{112}$ $-\frac{\sqrt{42}}{112}$ 0	
	0 0 0 0 $-\frac{\sqrt{70}i}{112}$ 0 0 $\frac{\sqrt{70}}{112}$ 0 0 0 0 $\frac{\sqrt{42}i}{112}$ 0 0 $\frac{\sqrt{42}}{112}$	
	$-\frac{\sqrt{42}}{112}$ 0 0 0 0 $-\frac{3\sqrt{70}}{112}$ 0 0 0 $-\frac{\sqrt{42}i}{112}$ 0 $\frac{3\sqrt{42}}{112}$ 0 0	
	0 $\frac{\sqrt{42}}{112}$ 0 0 $-\frac{3\sqrt{70}}{112}$ 0 0 0 $\frac{\sqrt{42}i}{112}$ 0 $\frac{3\sqrt{42}}{112}$ 0 0 0	
	0 $\frac{\sqrt{42}i}{112}$ 0 0 0 0 0 $-\frac{3\sqrt{70}}{112}$ $-\frac{\sqrt{42}}{112}$ 0 0 0 0 $-\frac{3\sqrt{42}}{112}$ 0	
	$-\frac{\sqrt{42}i}{112}$ 0 0 0 0 0 $-\frac{3\sqrt{70}}{112}$ 0 0 $\frac{\sqrt{42}}{112}$ 0 0 $-\frac{3\sqrt{42}}{112}$ 0	
$\frac{\sqrt{462}xz(x^2-3z^2)(3x^2-z^2)}{16}$		
942	symmetry	

continued ...

Table 10

No.	multipole	matrix
$\mathbb{T}_{6,1}^{(1,0;a)}(T_g, 2)$	0	0 $-\frac{\sqrt{70}}{112}$ 0 0 0 0 $\frac{\sqrt{70}}{112}$ $-\frac{\sqrt{42}}{112}$ 0 0 0 0 $-\frac{\sqrt{42}}{112}$
	0	0 0 0 $\frac{\sqrt{70}}{112}$ 0 0 $\frac{\sqrt{70}}{112}$ 0 0 $\frac{\sqrt{42}}{112}$ 0 0 $-\frac{\sqrt{42}}{112}$ 0
	$-\frac{\sqrt{70}}{112}$	0 0 0 $\frac{5\sqrt{42}i}{112}$ 0 0 0 0 0 $\frac{3\sqrt{70}i}{112}$ 0 $-\frac{\sqrt{70}}{112}$ 0 0
	0	$\frac{\sqrt{70}}{112}$ $-\frac{5\sqrt{42}i}{112}$ 0 0 0 0 0 $-\frac{3\sqrt{70}i}{112}$ 0 $-\frac{\sqrt{70}}{112}$ 0 0 0
	0	0 0 0 0 0 0 0 0 0 0 0 0 0
	0	0 0 0 0 0 0 0 0 0 0 0 0 0
	0	$\frac{\sqrt{70}}{112}$ 0 0 0 0 0 $-\frac{5\sqrt{42}i}{112}$ 0 0 $-\frac{\sqrt{70}}{112}$ 0 0 $\frac{3\sqrt{70}i}{112}$
	$\frac{\sqrt{70}}{112}$	0 0 0 0 0 $\frac{5\sqrt{42}i}{112}$ 0 0 0 0 $\frac{\sqrt{70}}{112}$ $-\frac{3\sqrt{70}i}{112}$ 0
	$-\frac{\sqrt{42}}{112}$	0 0 $\frac{3\sqrt{70}i}{112}$ 0 0 0 0 0 $\frac{3\sqrt{42}i}{112}$ 0 $-\frac{\sqrt{42}}{112}$ 0 0
	0	$\frac{\sqrt{42}}{112}$ $-\frac{3\sqrt{70}i}{112}$ 0 0 0 0 0 $-\frac{3\sqrt{42}i}{112}$ 0 $-\frac{\sqrt{42}}{112}$ 0 0 0
	0	0 0 0 $-\frac{\sqrt{70}}{112}$ 0 0 $-\frac{\sqrt{70}}{112}$ 0 0 $-\frac{\sqrt{42}}{112}$ 0 0 $\frac{\sqrt{42}}{112}$ 0
	0	0 0 $-\frac{\sqrt{70}}{112}$ 0 0 0 0 $\frac{\sqrt{70}}{112}$ $-\frac{\sqrt{42}}{112}$ 0 0 0 0 $-\frac{\sqrt{42}}{112}$
	$-\frac{\sqrt{42}}{112}$	0 0 0 0 0 0 $\frac{3\sqrt{70}i}{112}$ 0 0 $\frac{\sqrt{42}}{112}$ 0 0 $-\frac{3\sqrt{42}i}{112}$ 0
943 symmetry		$\frac{\sqrt{462}xy(x^2-3y^2)(3x^2-y^2)}{16}$

continued ...

Table 10

No.	multipole	matrix
$\mathbb{T}_{6,2}^{(1,0;a)}(T_g, 2)$		$\begin{bmatrix} 0 & 0 & 0 & -\frac{\sqrt{70}i}{112} & 0 & -\frac{\sqrt{70}}{112} & 0 & 0 & 0 & \frac{\sqrt{42}i}{112} & 0 & -\frac{\sqrt{42}}{112} & 0 & 0 \\ 0 & 0 & \frac{\sqrt{70}i}{112} & 0 & -\frac{\sqrt{70}}{112} & 0 & 0 & 0 & -\frac{\sqrt{42}i}{112} & 0 & -\frac{\sqrt{42}}{112} & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{70}i}{112} & \frac{5\sqrt{42}}{112} & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{70}}{112} & 0 & 0 & 0 & 0 & -\frac{\sqrt{70}}{112} \\ \frac{\sqrt{70}i}{112} & 0 & 0 & -\frac{5\sqrt{42}}{112} & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{70}}{112} & 0 & 0 & -\frac{\sqrt{70}}{112} & 0 \\ 0 & -\frac{\sqrt{70}}{112} & 0 & 0 & -\frac{5\sqrt{42}}{112} & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{70}}{112} & 0 & 0 & \frac{\sqrt{70}i}{112} \\ -\frac{\sqrt{70}}{112} & 0 & 0 & 0 & 0 & \frac{5\sqrt{42}}{112} & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{70}}{112} & -\frac{\sqrt{70}i}{112} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{42}i}{112} & -\frac{3\sqrt{70}}{112} & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{42}}{112} & 0 & 0 & 0 & 0 & \frac{\sqrt{42}}{112} \\ -\frac{\sqrt{42}i}{112} & 0 & 0 & \frac{3\sqrt{70}}{112} & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{42}}{112} & 0 & 0 & \frac{\sqrt{42}}{112} & 0 \\ 0 & -\frac{\sqrt{42}}{112} & 0 & 0 & -\frac{3\sqrt{70}}{112} & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{42}}{112} & 0 & 0 & \frac{\sqrt{42}i}{112} \\ -\frac{\sqrt{42}}{112} & 0 & 0 & 0 & 0 & \frac{3\sqrt{70}}{112} & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{42}}{112} & -\frac{\sqrt{42}i}{112} & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{70}}{112} & 0 & \frac{\sqrt{70}i}{112} & 0 & 0 & 0 & \frac{\sqrt{42}}{112} & 0 & \frac{\sqrt{42}i}{112} & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{70}}{112} & 0 & -\frac{\sqrt{70}i}{112} & 0 & 0 & 0 & \frac{\sqrt{42}}{112} & 0 & -\frac{\sqrt{42}i}{112} & 0 & 0 & 0 \end{bmatrix}$
944	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														
$\mathbb{T}_{6,0}^{(1,0;a)}(T_g, 3)$	0	0	0	0	$\frac{37\sqrt{154}}{3696}$	0	0	$\frac{37\sqrt{154}i}{3696}$	0	0	$\frac{5\sqrt{2310}}{1232}$	0	0	$-\frac{5\sqrt{2310}i}{1232}$		
	0	0	0	0	0	$-\frac{37\sqrt{154}}{3696}$	$-\frac{37\sqrt{154}i}{3696}$	0	0	0	$-\frac{5\sqrt{2310}}{1232}$	$\frac{5\sqrt{2310}i}{1232}$	0	0	0	
	0	0	0	0	0	$-\frac{\sqrt{2310}i}{924}$	$-\frac{\sqrt{2310}}{924}$	0	0	$\frac{2\sqrt{154}}{231}$	0	$-\frac{17\sqrt{154}i}{924}$	$\frac{17\sqrt{154}}{924}$	$\frac{17\sqrt{154}}{924}$	0	0
	0	0	0	0	$\frac{\sqrt{2310}i}{924}$	0	0	$\frac{\sqrt{2310}}{924}$	$\frac{2\sqrt{154}}{231}$	0	$\frac{17\sqrt{154}i}{924}$	0	0	$-\frac{17\sqrt{154}}{924}$		
	$\frac{37\sqrt{154}}{3696}$	0	0	$-\frac{\sqrt{2310}i}{924}$	0	$\frac{5\sqrt{2310}}{3696}$	0	0	0	$-\frac{\sqrt{154}i}{528}$	0	$\frac{17\sqrt{154}}{3696}$	0	0	0	
	0	$-\frac{37\sqrt{154}}{3696}$	$\frac{\sqrt{2310}i}{924}$	0	$\frac{5\sqrt{2310}}{3696}$	0	0	0	$\frac{\sqrt{154}i}{528}$	0	$\frac{17\sqrt{154}}{3696}$	0	0	0	0	
	0	$\frac{37\sqrt{154}i}{3696}$	$-\frac{\sqrt{2310}}{924}$	0	0	0	0	$-\frac{5\sqrt{2310}}{3696}$	$\frac{\sqrt{154}}{528}$	0	0	0	0	$\frac{17\sqrt{154}}{3696}$		
	$-\frac{37\sqrt{154}i}{3696}$	0	0	$\frac{\sqrt{2310}}{924}$	0	0	$-\frac{5\sqrt{2310}}{3696}$	0	0	$-\frac{\sqrt{154}}{528}$	0	0	$\frac{17\sqrt{154}}{3696}$	0		
	0	0	0	$\frac{2\sqrt{154}}{231}$	0	$-\frac{\sqrt{154}i}{528}$	$\frac{\sqrt{154}}{528}$	0	0	0	0	$-\frac{5\sqrt{2310}i}{3696}$	$-\frac{5\sqrt{2310}}{3696}$	0	0	
	0	0	$\frac{2\sqrt{154}}{231}$	0	$\frac{\sqrt{154}i}{528}$	0	0	$-\frac{\sqrt{154}}{528}$	0	0	$\frac{5\sqrt{2310}i}{3696}$	0	0	$\frac{5\sqrt{2310}}{3696}$		
	$\frac{5\sqrt{2310}}{1232}$	0	0	$-\frac{17\sqrt{154}i}{924}$	0	$\frac{17\sqrt{154}}{3696}$	0	0	0	$-\frac{5\sqrt{2310}i}{3696}$	0	$\frac{\sqrt{2310}}{1232}$	0	0	0	
	0	$-\frac{5\sqrt{2310}}{1232}$	$\frac{17\sqrt{154}i}{924}$	0	$\frac{17\sqrt{154}}{3696}$	0	0	0	$\frac{5\sqrt{2310}i}{3696}$	0	$\frac{\sqrt{2310}}{1232}$	0	0	0	0	
	0	$-\frac{5\sqrt{2310}i}{1232}$	$\frac{17\sqrt{154}}{924}$	0	0	0	0	$\frac{17\sqrt{154}}{3696}$	$-\frac{5\sqrt{2310}}{3696}$	0	0	0	0	$-\frac{\sqrt{2310}}{1232}$		
	$\frac{5\sqrt{2310}i}{1232}$	0	0	$-\frac{17\sqrt{154}}{924}$	0	0	$\frac{17\sqrt{154}}{3696}$	0	0	$\frac{5\sqrt{2310}}{3696}$	0	0	0	$-\frac{\sqrt{2310}}{1232}$	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	$-\frac{37\sqrt{154}}{3696}$	0	0	0	0	$\frac{37\sqrt{154}}{3696}$	$\frac{5\sqrt{2310}}{1232}$	0	0	0	0	$\frac{5\sqrt{2310}}{1232}$		
	0	0	0	$\frac{37\sqrt{154}}{3696}$	0	0	$\frac{37\sqrt{154}}{3696}$	0	0	$-\frac{5\sqrt{2310}}{1232}$	0	0	$\frac{5\sqrt{2310}}{1232}$	0		
	$-\frac{37\sqrt{154}}{3696}$	0	0	$\frac{5\sqrt{2310}i}{3696}$	0	$-\frac{\sqrt{2310}}{924}$	0	0	0	$-\frac{17\sqrt{154}i}{3696}$	0	$\frac{\sqrt{154}}{528}$	0	0		
	0	$\frac{37\sqrt{154}}{3696}$	$-\frac{5\sqrt{2310}i}{3696}$	0	$-\frac{\sqrt{2310}}{924}$	0	0	0	$\frac{17\sqrt{154}i}{3696}$	0	$\frac{\sqrt{154}}{528}$	0	0	0		
	0	0	0	$-\frac{\sqrt{2310}}{924}$	0	0	$\frac{\sqrt{2310}}{924}$	0	0	$\frac{17\sqrt{154}}{924}$	0	$-\frac{2\sqrt{154}i}{231}$	$\frac{17\sqrt{154}}{924}$	0		
	0	0	$-\frac{\sqrt{2310}}{924}$	0	0	0	0	$-\frac{\sqrt{2310}}{924}$	$\frac{17\sqrt{154}}{924}$	0	$\frac{2\sqrt{154}i}{231}$	0	0	$-\frac{17\sqrt{154}}{924}$		
	0	$\frac{37\sqrt{154}}{3696}$	0	0	$\frac{\sqrt{2310}}{924}$	0	0	$-\frac{5\sqrt{2310}i}{3696}$	0	0	$\frac{\sqrt{154}}{528}$	0	0	$-\frac{17\sqrt{154}i}{3696}$		
	$\frac{37\sqrt{154}}{3696}$	0	0	0	0	$-\frac{\sqrt{2310}}{924}$	$\frac{5\sqrt{2310}i}{3696}$	0	0	0	0	$-\frac{\sqrt{154}}{528}$	$\frac{17\sqrt{154}i}{3696}$	0		
	$\frac{5\sqrt{2310}}{1232}$	0	0	$-\frac{17\sqrt{154}i}{3696}$	0	$\frac{17\sqrt{154}}{924}$	0	0	0	$\frac{\sqrt{2310}i}{1232}$	0	$-\frac{5\sqrt{2310}}{3696}$	0	0		
	0	$-\frac{5\sqrt{2310}}{1232}$	$\frac{17\sqrt{154}i}{3696}$	0	$\frac{17\sqrt{154}}{924}$	0	0	0	$-\frac{\sqrt{2310}i}{1232}$	0	$-\frac{5\sqrt{2310}}{3696}$	0	0	0		
	0	0	0	$\frac{\sqrt{154}}{528}$	0	$-\frac{2\sqrt{154}i}{231}$	$\frac{\sqrt{154}}{528}$	0	0	$-\frac{5\sqrt{2310}}{3696}$	0	0	$\frac{5\sqrt{2310}}{3696}$	0		
	0	0	$\frac{\sqrt{154}}{528}$	0	$\frac{2\sqrt{154}i}{231}$	0	0	$-\frac{\sqrt{154}}{528}$	$-\frac{5\sqrt{2310}}{3696}$	0	0	0	0	$-\frac{5\sqrt{2310}}{3696}$		
	0	$\frac{5\sqrt{2310}}{1232}$	0	0	$\frac{17\sqrt{154}}{924}$	0	0	$-\frac{17\sqrt{154}i}{3696}$	0	0	$\frac{5\sqrt{2310}}{3696}$	0	0	$-\frac{\sqrt{2310}i}{1232}$		
	$\frac{5\sqrt{2310}}{1232}$	0	0	0	0	$-\frac{17\sqrt{154}}{924}$	$\frac{17\sqrt{154}i}{3696}$	0	0	0	0	$-\frac{5\sqrt{2310}}{3696}$	$\frac{\sqrt{2310}i}{1232}$	0		

946 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														
$\mathbb{T}_{6,2}^{(1,0;a)}(T_g, 3)$	0 0 0 $-\frac{37\sqrt{154}i}{3696}$ 0 $-\frac{37\sqrt{154}}{3696}$ 0 0 0 $-\frac{5\sqrt{2310}i}{1232}$ 0 $\frac{5\sqrt{2310}}{1232}$ 0 0 0															
	0 0 $\frac{37\sqrt{154}i}{3696}$ 0 $-\frac{37\sqrt{154}}{3696}$ 0 0 0 $\frac{5\sqrt{2310}i}{1232}$ 0 $\frac{5\sqrt{2310}}{1232}$ 0 0 0															
	0 $-\frac{37\sqrt{154}i}{3696}$ $\frac{5\sqrt{2310}}{3696}$ 0 0 0 0 $\frac{\sqrt{2310}}{924}$ $\frac{17\sqrt{154}}{3696}$ 0 0 0 0 $\frac{\sqrt{154}}{528}$															
	$\frac{37\sqrt{154}i}{3696}$ 0 0 $-\frac{5\sqrt{2310}}{3696}$ 0 0 $\frac{\sqrt{2310}}{924}$ 0 0 $-\frac{17\sqrt{154}}{3696}$ 0 0 $\frac{\sqrt{154}}{528}$ 0															
	0 $-\frac{37\sqrt{154}}{3696}$ 0 0 $-\frac{5\sqrt{2310}}{3696}$ 0 0 $\frac{\sqrt{2310}i}{924}$ 0 0 $\frac{17\sqrt{154}}{3696}$ 0 0 $-\frac{\sqrt{154}i}{528}$															
	$-\frac{37\sqrt{154}}{3696}$ 0 0 0 0 $\frac{5\sqrt{2310}}{3696}$ $-\frac{\sqrt{2310}i}{924}$ 0 0 0 0 $-\frac{17\sqrt{154}}{3696}$ $\frac{\sqrt{154}i}{528}$ 0															
	0 0 0 $\frac{\sqrt{2310}}{924}$ 0 $\frac{\sqrt{2310}i}{924}$ 0 0 0 $\frac{17\sqrt{154}}{924}$ 0 $-\frac{17\sqrt{154}i}{924}$ $\frac{2\sqrt{154}}{231}$ 0															
	0 0 $\frac{\sqrt{2310}}{924}$ 0 $-\frac{\sqrt{2310}i}{924}$ 0 0 0 $\frac{17\sqrt{154}}{924}$ 0 $\frac{17\sqrt{154}i}{924}$ 0 0 $-\frac{2\sqrt{154}}{231}$															
	0 $-\frac{5\sqrt{2310}i}{1232}$ $\frac{17\sqrt{154}}{3696}$ 0 0 0 0 $\frac{17\sqrt{154}}{924}$ $\frac{\sqrt{2310}}{1232}$ 0 0 0 0 $\frac{5\sqrt{2310}}{3696}$															
	$\frac{5\sqrt{2310}i}{1232}$ 0 0 $-\frac{17\sqrt{154}}{3696}$ 0 0 $\frac{17\sqrt{154}}{924}$ 0 0 $-\frac{\sqrt{2310}}{1232}$ 0 0 $\frac{5\sqrt{2310}}{3696}$ 0															
	0 $\frac{5\sqrt{2310}}{1232}$ 0 0 $\frac{17\sqrt{154}}{3696}$ 0 0 $-\frac{17\sqrt{154}i}{924}$ 0 0 $-\frac{\sqrt{2310}}{1232}$ 0 0 $\frac{5\sqrt{2310}i}{3696}$															
	$\frac{5\sqrt{2310}}{1232}$ 0 0 0 0 $-\frac{17\sqrt{154}}{3696}$ $\frac{17\sqrt{154}i}{924}$ 0 0 0 0 $\frac{\sqrt{2310}}{1232}$ $-\frac{5\sqrt{2310}i}{3696}$ 0															
	0 0 0 $\frac{\sqrt{154}}{528}$ 0 $\frac{\sqrt{154}i}{528}$ 0 0 0 $-\frac{2\sqrt{154}}{231}$ $\frac{5\sqrt{2310}}{3696}$ 0 $\frac{5\sqrt{2310}i}{3696}$ 0 0															
	0 0 $\frac{\sqrt{154}}{528}$ 0 $\frac{\sqrt{154}i}{528}$ 0 0 0 $-\frac{2\sqrt{154}}{231}$ $\frac{5\sqrt{2310}}{3696}$ 0 $-\frac{5\sqrt{2310}i}{3696}$ 0 0 0															

947 symmetry

x

continued ...

Table 10

No.	multipole	matrix
$\mathbb{M}_{1,0}^{(a)}(T_g)$	0 0 0 0 0 0 0 0 $\frac{\sqrt{14}i}{14}$ 0 0 0 0 0	
	0 0 0 0 0 0 0 0 0 $\frac{\sqrt{14}i}{14}$ 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 $\frac{3\sqrt{14}i}{56}$ 0 0 0 0 0 0 $\frac{\sqrt{210}i}{56}$ 0	
	0 0 0 0 0 0 0 $\frac{3\sqrt{14}i}{56}$ 0 0 0 0 0 0 $\frac{\sqrt{210}i}{56}$	
	0 0 0 0 $-\frac{3\sqrt{14}i}{56}$ 0 0 0 0 0 $\frac{\sqrt{210}i}{56}$ 0 0 0	
	0 0 0 0 0 $-\frac{3\sqrt{14}i}{56}$ 0 0 0 0 0 0 $\frac{\sqrt{210}i}{56}$ 0 0	
	$-\frac{\sqrt{14}i}{14}$ 0 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 0 0 0 0 0 0 0	
	0 0 0 0 0 0 $-\frac{\sqrt{210}i}{56}$ 0 0 0 0 0 0 $-\frac{\sqrt{14}i}{56}$ 0	
	0 0 0 0 0 0 0 $-\frac{\sqrt{210}i}{56}$ 0 0 0 0 0 0 $-\frac{\sqrt{14}i}{56}$	
	0 0 0 0 $-\frac{\sqrt{210}i}{56}$ 0 0 0 0 0 $\frac{\sqrt{14}i}{56}$ 0 0 0	
	0 0 0 0 0 $-\frac{\sqrt{210}i}{56}$ 0 0 0 0 0 0 $\frac{\sqrt{14}i}{56}$ 0 0	

948 symmetry

y

continued ...

Table 10

No.	multipole	matrix
$\mathbb{M}_{1,1}^{(a)}(T_g)$	0 0 0 0 0 0 0 0 0 0 $\frac{\sqrt{14}i}{14}$ 0 0 0	
	0 0 0 0 0 0 0 0 0 0 $\frac{\sqrt{14}i}{14}$ 0 0 0	
	0 0 0 0 0 0 $-\frac{3\sqrt{14}i}{56}$ 0 0 0 0 0 $\frac{\sqrt{210}i}{56}$ 0	
	0 0 0 0 0 0 0 $-\frac{3\sqrt{14}i}{56}$ 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 0 0 0 0 0 0 0 0 0 0 0 0	
	0 0 $\frac{3\sqrt{14}i}{56}$ 0 0 0 0 0 $\frac{\sqrt{210}i}{56}$ 0 0 0 0 0 0	
	0 0 0 $\frac{3\sqrt{14}i}{56}$ 0 0 0 0 0 $\frac{\sqrt{210}i}{56}$ 0 0 0 0 0 0	
	0 0 0 0 0 0 $-\frac{\sqrt{210}i}{56}$ 0 0 0 0 0 $\frac{\sqrt{14}i}{56}$ 0	
	0 0 0 0 0 0 0 $-\frac{\sqrt{210}i}{56}$ 0 0 0 0 0 $\frac{\sqrt{14}i}{56}$	
	$-\frac{\sqrt{14}i}{14}$ 0 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 0 0 0 0 0 0 0	
	0 0 $-\frac{\sqrt{210}i}{56}$ 0 0 0 0 0 $-\frac{\sqrt{14}i}{56}$ 0 0 0 0 0 0	
	0 0 0 $-\frac{\sqrt{210}i}{56}$ 0 0 0 0 0 $-\frac{\sqrt{14}i}{56}$ 0 0 0 0 0 0	

949 symmetry

z

continued ...

Table 10

No.	multipole	matrix
$\mathbb{M}_{1,2}^{(a)}(T_g)$	0 0 0 0 0 0 0 0 0 0 0 0 $\frac{\sqrt{14}i}{14}$ 0	
	0 0 0 0 0 0 0 0 0 0 0 0 0 $\frac{\sqrt{14}i}{14}$	
	0 0 0 0 $\frac{3\sqrt{14}i}{56}$ 0 0 0 0 0 $\frac{\sqrt{210}i}{56}$ 0 0 0	
	0 0 0 0 0 $\frac{3\sqrt{14}i}{56}$ 0 0 0 0 0 $\frac{\sqrt{210}i}{56}$ 0 0 0	
	0 0 $-\frac{3\sqrt{14}i}{56}$ 0 0 0 0 0 $\frac{\sqrt{210}i}{56}$ 0 0 0 0 0	
	0 0 0 $-\frac{3\sqrt{14}i}{56}$ 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	
	0 0 0 0 $-\frac{\sqrt{210}i}{56}$ 0 0 0 0 0 0 $-\frac{\sqrt{14}i}{56}$ 0 0 0	
	0 0 0 0 0 $-\frac{\sqrt{210}i}{56}$ 0 0 0 0 0 0 $-\frac{\sqrt{14}i}{56}$ 0 0 0	
	0 0 $-\frac{\sqrt{210}i}{56}$ 0 0 0 0 0 $\frac{\sqrt{14}i}{56}$ 0 0 0 0 0	
	0 0 0 $-\frac{\sqrt{210}i}{56}$ 0 0 0 0 0 $\frac{\sqrt{14}i}{56}$ 0 0 0 0	
	$-\frac{\sqrt{14}i}{14}$ 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 0 0 0 0 0 0	
		$\sqrt{15}xyz$

950 symmetry

 $\sqrt{15}xyz$

continued ...

Table 10

No.	multipole	matrix
$\mathbb{M}_3^{(a)}(A_g)$	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{6} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{6} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{6} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{6} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{6} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{6} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{6} \\ 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
	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	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 $\frac{\sqrt{3}i}{6}$ 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 $-\frac{\sqrt{3}i}{6}$ 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 $\frac{\sqrt{3}i}{6}$ 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
	$-\frac{\sqrt{3}i}{6}$	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 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 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 $-\frac{\sqrt{3}i}{6}$ 0 0
952	symmetry	$-\frac{y(3x^2 - 2y^2 + 3z^2)}{2}$

continued ...

Table 10

No.	multipole	matrix
$\mathbb{M}_{3,1}^{(a)}(T_g, 1)$	0 0 0 0 0 0 0 0 0 0 $\frac{\sqrt{3}i}{6}$ 0 0 0	
	0 0 0 0 0 0 0 0 0 0 $\frac{\sqrt{3}i}{6}$ 0 0 0	
	0 0 0 0 0 0 $\frac{\sqrt{3}i}{6}$ 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 $-\frac{\sqrt{3}i}{6}$ 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 $-\frac{\sqrt{3}i}{6}$ 0	
	0 0 0 0 0 0 0 0 0 0 0 0 0 $-\frac{\sqrt{3}i}{6}$	
	$-\frac{\sqrt{3}i}{6}$ 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 $\frac{\sqrt{3}i}{6}$ 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	
953	symmetry	$-\frac{z(3x^2+3y^2-2z^2)}{2}$

continued ...

Table 10

No.	multipole	matrix
		$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{6} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{6} \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{3}i}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{3}i}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ -\frac{\sqrt{3}i}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{3}i}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
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	0 $-\frac{\sqrt{3}i}{6}$ 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
	$\frac{\sqrt{3}i}{6}$	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 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 $-\frac{\sqrt{3}i}{6}$ 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 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 $-\frac{\sqrt{3}i}{6}$ 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
955	symmetry	$-\frac{\sqrt{15}y(x-z)(x+z)}{2}$

continued ...

Table 10

No.	multipole	matrix
		$\begin{bmatrix} 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{6} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{6} \\ \frac{\sqrt{3}i}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{3}i}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{6} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{6} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{3}i}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{3}i}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
956	symmetry	$\frac{\sqrt{15}z(x-y)(x+y)}{2}$

continued ...

Table 10

No.	multipole	matrix
$\mathbb{M}_{3,2}^{(a)}(T_g, 2)$	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 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 $-\frac{\sqrt{3}i}{6}$ 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
	$\frac{\sqrt{3}i}{6}$	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
	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 $\frac{\sqrt{3}i}{6}$ 0 0 0 0 0 0 0 0 0
	0	0 0 0 $-\frac{\sqrt{3}i}{6}$ 0 0 0 0 0 0 0 0 0 0 0
	0	0 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
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 0 0 0 0 0 0 0 0 0 0 0 0	
	0 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 $-\frac{\sqrt{2}i}{4}$ 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 $\frac{\sqrt{2}i}{4}$ 0 0 0 0 0 0	
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 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 $\frac{\sqrt{2}i}{4}$ 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 0 0 $-\frac{\sqrt{2}i}{4}$ 0 0 0 0 0 0 0 0 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 0 0 0 0 0 0 0 0 0 0 0 0 0 0	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{12} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{12} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{12} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{12} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{12} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}i}{6} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}i}{6} \\ 0 & 0 & 0 & \frac{\sqrt{6}i}{12} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{6}i}{12} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}i}{12} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
	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 0 0 0 0 0 0 0 $-\frac{\sqrt{42}i}{21}$ 0 0 0 0 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 0 0 0 0 0 0 0 0 0 0	
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	
	0 0 0 0 0 0 $-\frac{5\sqrt{42}i}{336}$ 0 0 0 0 0 $\frac{3\sqrt{70}i}{112}$ 0	
	0 0 0 0 0 0 0 $-\frac{5\sqrt{42}i}{336}$ 0 0 0 0 0 $\frac{3\sqrt{70}i}{112}$	
	0 0 0 0 $\frac{5\sqrt{42}i}{336}$ 0 0 0 0 0 $\frac{3\sqrt{70}i}{112}$ 0 0 0	
	0 0 0 0 0 $\frac{5\sqrt{42}i}{336}$ 0 0 0 0 0 $\frac{3\sqrt{70}i}{112}$ 0 0 0	
	$\frac{\sqrt{42}i}{21}$ 0 0 0 0 0 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 0 0 0	
	0 0 0 0 0 0 $-\frac{3\sqrt{70}i}{112}$ 0 0 0 0 0 $\frac{11\sqrt{42}i}{336}$ 0	
	0 0 0 0 0 0 0 $-\frac{3\sqrt{70}i}{112}$ 0 0 0 0 0 $\frac{11\sqrt{42}i}{336}$	
	0 0 0 0 $-\frac{3\sqrt{70}i}{112}$ 0 0 0 0 0 $-\frac{11\sqrt{42}i}{336}$ 0 0 0	
	0 0 0 0 0 $-\frac{3\sqrt{70}i}{112}$ 0 0 0 0 0 $-\frac{11\sqrt{42}i}{336}$ 0 0 0	
$\frac{y(15x^4 - 40x^2y^2 + 30x^2z^2 + 8y^4 - 40y^2z^2 + 15z^4)}{8}$		
960	symmetry	

continued ...

Table 10

No.	multipole	matrix											
$\mathbb{M}_{5,1}^{(a)}(T_g, 1)$	0 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 0 0 0 0 $-\frac{\sqrt{42}i}{21}$ 0 0 0											
	0 0 0 0 0 0 0 $\frac{5\sqrt{42}i}{336}$ 0 0 0 0 0 $\frac{3\sqrt{70}i}{112}$ 0 0												
	0 0 0 0 0 0 0 0 $\frac{5\sqrt{42}i}{336}$ 0 0 0 0 0 $\frac{3\sqrt{70}i}{112}$ 0												
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0												
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0												
	0 0 $-\frac{5\sqrt{42}i}{336}$ 0 0 0 0 0 $\frac{3\sqrt{70}i}{112}$ 0 0 0 0 0 0												
	0 0 0 $-\frac{5\sqrt{42}i}{336}$ 0 0 0 0 0 $\frac{3\sqrt{70}i}{112}$ 0 0 0 0 0 0												
	0 0 0 0 0 0 $-\frac{3\sqrt{70}i}{112}$ 0 0 0 0 0 $-\frac{11\sqrt{42}i}{336}$ 0												
	$\frac{\sqrt{42}i}{21}$ 0 0 0 0 0 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 0 0 0												
	0 0 $-\frac{3\sqrt{70}i}{112}$ 0 0 0 0 0 0 $\frac{11\sqrt{42}i}{336}$ 0 0 0 0 0												
	0 0 0 $-\frac{3\sqrt{70}i}{112}$ 0 0 0 0 0 0 $\frac{11\sqrt{42}i}{336}$ 0 0 0 0												
961	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
$\mathbb{M}_{5,2}^{(a)}(T_g, 1)$	0 0 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 0 0 0 $-\frac{\sqrt{42}i}{21}$ 0	
	0 0 0 0 $-\frac{5\sqrt{42}i}{336}$ 0 0 0 0 0 $\frac{3\sqrt{70}i}{112}$ 0 0 0	
	0 0 0 0 0 $-\frac{5\sqrt{42}i}{336}$ 0 0 0 0 0 $\frac{3\sqrt{70}i}{112}$ 0 0	
	0 0 $\frac{5\sqrt{42}i}{336}$ 0 0 0 0 0 $\frac{3\sqrt{70}i}{112}$ 0 0 0 0	
	0 0 0 $\frac{5\sqrt{42}i}{336}$ 0 0 0 0 0 $\frac{3\sqrt{70}i}{112}$ 0 0 0 0	
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	
	0 0 0 0 $-\frac{3\sqrt{70}i}{112}$ 0 0 0 0 0 $\frac{11\sqrt{42}i}{336}$ 0 0 0	
	0 0 0 0 0 $-\frac{3\sqrt{70}i}{112}$ 0 0 0 0 0 $\frac{11\sqrt{42}i}{336}$ 0 0	
	0 0 $-\frac{3\sqrt{70}i}{112}$ 0 0 0 0 0 $-\frac{11\sqrt{42}i}{336}$ 0 0 0 0	
	0 0 0 $-\frac{3\sqrt{70}i}{112}$ 0 0 0 0 0 $-\frac{11\sqrt{42}i}{336}$ 0 0 0 0	
	$\frac{\sqrt{42}i}{21}$ 0 0 0 0 0 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 0 0 0	
$\frac{3\sqrt{35}x(y^2 - 2yz - z^2)(y^2 + 2yz - z^2)}{8}$		

962 symmetry

Table 10

No.	multipole	matrix
$\mathbb{M}_{5,0}^{(a)}(T_g, 2)$	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}i}{16} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}i}{16} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}i}{16} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}i}{16} \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{30}i}{16} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}i}{16} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}i}{16} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}i}{16} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2}i}{16} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}i}{16} \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2}i}{16} & 0 & 0 & 0 & 0 & \frac{\sqrt{30}i}{16} \\ 0 & 0 & 0 & 0 & \frac{\sqrt{2}i}{16} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}i}{16} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2}i}{16} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}i}{16} & 0 & 0 \end{bmatrix}$
	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 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}i}{16} & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}i}{16} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}i}{16} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}i}{16} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{30}i}{16} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}i}{16} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{30}i}{16} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}i}{16} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2}i}{16} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}i}{16} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2}i}{16} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}i}{16} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{2}i}{16} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}i}{16} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{2}i}{16} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}i}{16} & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
	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 0 0 0 0 0 0	
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	
964	symmetry	$\frac{3\sqrt{35}z(x^2 - 2xy - y^2)(x^2 + 2xy - y^2)}{8}$

continued ...

Table 10

No.	multipole	matrix
$\mathbb{M}_{5,2}^{(a)}(T_g, 2)$		$\begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{30}i}{16} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}i}{16} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}i}{16} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}i}{16} & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{30}i}{16} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}i}{16} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{30}i}{16} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}i}{16} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2}i}{16} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}i}{16} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2}i}{16} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{30}i}{16} & 0 \\ 0 & 0 & \frac{\sqrt{2}i}{16} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}i}{16} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{2}i}{16} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}i}{16} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
965	symmetry	$\frac{\sqrt{105}x(y-z)(y+z)(2x^2-y^2-z^2)}{4}$

continued ...

Table 10

No.	multipole	matrix
$\mathbb{M}_{5,0}^{(a)}(T_g, 3)$	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
	$\frac{\sqrt{6}i}{6}$	0 0 0 0 0 0 0 0 0 0 0 0 0 0
	0	$\frac{\sqrt{6}i}{6}$ 0 0 0 0 0 0 0 0 0 0 0 0 0
	0	0 0 0 0 0 0 0 0 0 0 0 $-\frac{\sqrt{6}i}{12}$ 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 $\frac{\sqrt{6}i}{12}$ 0 0 0
	0	0 0 0 0 0 0 0 0 0 0 $\frac{\sqrt{6}i}{12}$ 0 0
	0	0 0 0 0 0 0 0 0 0 0 0 0 0 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 $-\frac{\sqrt{6}i}{12}$ 0 0 0 0 0
	0	0 0 0 0 $\frac{\sqrt{6}i}{12}$ 0 0 0 0 0 0 0 0
	0	0 0 0 0 0 $\frac{\sqrt{6}i}{12}$ 0 0 0 0 0 0 0
966	symmetry	$\frac{\sqrt{105}y(x-z)(x+z)(x^2-2y^2+z^2)}{4}$

continued ...

Table 10

No.	multipole	matrix
		$\begin{bmatrix} 0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}i}{12} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}i}{12} \\ \frac{\sqrt{6}i}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{6}i}{6} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{12} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{12} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}i}{12} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}i}{12} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{6}i}{12} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{6}i}{12} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
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 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 $-\frac{\sqrt{6}i}{12}$ 0 0 0 0
	0	0 0 0 0 0 0 0 0 0 0 0 $-\frac{\sqrt{6}i}{12}$ 0 0 0
	0	0 0 0 0 0 0 0 0 0 $\frac{\sqrt{6}i}{12}$ 0 0 0 0 0
	0	0 0 0 0 0 0 0 0 0 0 $\frac{\sqrt{6}i}{12}$ 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	$\frac{\sqrt{6}i}{6}$ 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
	0	0 0 0 0 $-\frac{\sqrt{6}i}{12}$ 0 0 0 0 0 0 0 0 0 0 0 0
	0	0 0 0 0 0 $-\frac{\sqrt{6}i}{12}$ 0 0 0 0 0 0 0 0 0 0 0
	0	0 0 0 $\frac{\sqrt{6}i}{12}$ 0 0 0 0 0 0 0 0 0 0 0 0 0
	0	0 0 0 0 0 $\frac{\sqrt{6}i}{12}$ 0 0 0 0 0 0 0 0 0 0 0
	0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
	0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
<i>x</i>		
968	symmetry	

continued ...

Table 10

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

969 symmetry

y

continued ...

Table 10

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

970 symmetry

z

continued ...

Table 10

No.	multipole	matrix
$\mathbb{M}_{1,2}^{(1,-1;a)}(T_g)$	$\frac{\sqrt{14}}{14}$	0 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	0 $\frac{\sqrt{14}}{14}$ 0 0 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 0 0 $\frac{\sqrt{14}}{14}$ 0 0 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 0 $\frac{\sqrt{14}}{14}$ 0 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 0 $\frac{\sqrt{14}}{14}$ 0 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 0 $\frac{\sqrt{14}}{14}$ 0 0 0 0
	0	0 0 0 0 0 0 0 0 0 0 0 $-\frac{\sqrt{14}}{14}$ 0 0 0
$\sqrt{15}xyz$		

971 symmetry

continued ...

Table 10

No.	multipole	matrix													
$\mathbb{M}_3^{(1,-1;a)}(A_g)$	0 0 0 $-\frac{\sqrt{70}}{42}$ 0 $\frac{\sqrt{70}i}{42}$ $-\frac{\sqrt{70}}{42}$ 0 0 0 0 0 0 0 0														
	0 0 $-\frac{\sqrt{70}}{42}$ 0 $-\frac{\sqrt{70}i}{42}$ 0 0 $\frac{\sqrt{70}}{42}$ 0 0 0 0 0 0 0														
	0 $-\frac{\sqrt{70}}{42}$ 0 0 $-\frac{\sqrt{42}}{168}$ 0 0 $\frac{\sqrt{42}i}{168}$ 0 0 $-\frac{\sqrt{70}}{168}$ 0 0 $-\frac{\sqrt{70}i}{168}$														
	$-\frac{\sqrt{70}}{42}$ 0 0 0 0 $\frac{\sqrt{42}}{168}$ $-\frac{\sqrt{42}i}{168}$ 0 0 0 0 $\frac{\sqrt{70}}{168}$ $\frac{\sqrt{70}i}{168}$ 0														
	0 $\frac{\sqrt{70}i}{42}$ $-\frac{\sqrt{42}}{168}$ 0 0 0 0 $-\frac{\sqrt{42}}{168}$ $\frac{\sqrt{70}}{168}$ 0 0 0 0 $-\frac{\sqrt{70}}{168}$														
	$-\frac{\sqrt{70}i}{42}$ 0 0 $\frac{\sqrt{42}}{168}$ 0 0 $-\frac{\sqrt{42}}{168}$ 0 0 0 $-\frac{\sqrt{70}}{168}$ 0 0 $-\frac{\sqrt{70}}{168}$ 0														
	$-\frac{\sqrt{70}}{42}$ 0 0 $\frac{\sqrt{42}i}{168}$ 0 $-\frac{\sqrt{42}}{168}$ 0 0 0 $\frac{\sqrt{70}i}{168}$ 0 $\frac{\sqrt{70}}{168}$ 0 0 0														
	0 $\frac{\sqrt{70}}{42}$ $-\frac{\sqrt{42}i}{168}$ 0 $-\frac{\sqrt{42}}{168}$ 0 0 0 $-\frac{\sqrt{70}i}{168}$ 0 $\frac{\sqrt{70}}{168}$ 0 0 0 0														
	0 0 0 0 $\frac{\sqrt{70}}{168}$ 0 0 $\frac{\sqrt{70}i}{168}$ 0 0 $-\frac{5\sqrt{42}}{168}$ 0 0 $\frac{5\sqrt{42}i}{168}$														
	0 0 0 0 0 $-\frac{\sqrt{70}}{168}$ $-\frac{\sqrt{70}i}{168}$ 0 0 0 0 $\frac{5\sqrt{42}}{168}$ $-\frac{5\sqrt{42}i}{168}$ 0														
	0 0 $-\frac{\sqrt{70}}{168}$ 0 0 0 0 $\frac{\sqrt{70}}{168}$ $-\frac{5\sqrt{42}}{168}$ 0 0 0 0 $-\frac{5\sqrt{42}}{168}$														
	0 0 0 0 $\frac{\sqrt{70}}{168}$ 0 0 $\frac{\sqrt{70}}{168}$ 0 0 0 0 $-\frac{5\sqrt{42}}{168}$ 0 0 0														
	0 0 $-\frac{\sqrt{70}i}{168}$ 0 $-\frac{\sqrt{70}}{168}$ 0 0 0 $-\frac{5\sqrt{42}i}{168}$ 0 $-\frac{5\sqrt{42}}{168}$ 0 0 0 0														
	0 0 $\frac{\sqrt{70}i}{168}$ 0 $-\frac{\sqrt{70}}{168}$ 0 0 0 $-\frac{5\sqrt{42}i}{168}$ 0 $-\frac{5\sqrt{42}}{168}$ 0 0 0 0														
$\frac{x(2x^2 - 3y^2 - 3z^2)}{2}$															
972	symmetry														

continued ...

Table 10

No.	multipole	matrix													
$\mathbb{M}_{3,0}^{(1,-1;a)}(T_g, 1)$	0	0	0	0	$\frac{\sqrt{42}}{42}$	0	0	$-\frac{\sqrt{42}i}{42}$	0	0	0	0	0	0	0
	0	0	0	0	0	$-\frac{\sqrt{42}}{42}$	$\frac{\sqrt{42}i}{42}$	0	0	0	0	0	0	0	0
	0	0	0	$\frac{\sqrt{70}}{35}$	0	$-\frac{\sqrt{70}i}{280}$	$\frac{\sqrt{70}}{280}$	0	0	0	0	$-\frac{\sqrt{42}i}{168}$	$-\frac{\sqrt{42}}{168}$	0	0
	0	0	$\frac{\sqrt{70}}{35}$	0	$\frac{\sqrt{70}i}{280}$	0	0	$-\frac{\sqrt{70}}{280}$	0	0	$\frac{\sqrt{42}i}{168}$	0	0	$\frac{\sqrt{42}}{168}$	0
	$\frac{\sqrt{42}}{42}$	0	0	$-\frac{\sqrt{70}i}{280}$	0	$-\frac{\sqrt{70}}{70}$	0	0	0	$\frac{\sqrt{42}i}{168}$	0	$\frac{\sqrt{42}}{28}$	0	0	0
	0	$-\frac{\sqrt{42}}{42}$	$\frac{\sqrt{70}i}{280}$	0	$-\frac{\sqrt{70}}{70}$	0	0	0	$-\frac{\sqrt{42}i}{168}$	0	$\frac{\sqrt{42}}{28}$	0	0	0	0
	0	$-\frac{\sqrt{42}i}{42}$	$\frac{\sqrt{70}}{280}$	0	0	0	0	$-\frac{\sqrt{70}}{70}$	$\frac{\sqrt{42}}{168}$	0	0	0	0	$-\frac{\sqrt{42}}{28}$	0
	$\frac{\sqrt{42}i}{42}$	0	0	$-\frac{\sqrt{70}}{280}$	0	0	$-\frac{\sqrt{70}}{70}$	0	0	$-\frac{\sqrt{42}}{168}$	0	0	$-\frac{\sqrt{42}}{28}$	0	0
	0	0	0	0	0	$\frac{\sqrt{42}i}{168}$	$\frac{\sqrt{42}}{168}$	0	0	0	0	$-\frac{\sqrt{70}i}{56}$	$\frac{\sqrt{70}}{56}$	0	0
	0	0	0	0	$-\frac{\sqrt{42}i}{168}$	0	$\frac{\sqrt{42}}{28}$	0	0	0	$-\frac{\sqrt{70}i}{56}$	0	0	0	0
	0	0	$\frac{\sqrt{42}i}{168}$	0	$\frac{\sqrt{42}}{28}$	0	0	0	$\frac{\sqrt{70}i}{56}$	0	0	0	0	0	0
	0	0	$-\frac{\sqrt{42}}{168}$	0	0	0	$-\frac{\sqrt{42}}{28}$	$\frac{\sqrt{70}}{56}$	0	0	0	0	0	0	0
	0	0	0	$\frac{\sqrt{42}}{168}$	0	0	$-\frac{\sqrt{42}}{28}$	0	0	$-\frac{\sqrt{70}}{56}$	0	0	0	0	0

973 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 0 $\frac{\sqrt{42}}{42}$ 0 0 0 0 $\frac{\sqrt{42}}{42}$ 0 0 0 0 0 0 0	
	0 0 0 $-\frac{\sqrt{42}}{42}$ 0 0 $\frac{\sqrt{42}}{42}$ 0 0 0 0 0 0 0 0	
	$\frac{\sqrt{42}}{42}$ 0 0 $\frac{\sqrt{70}i}{70}$ 0 $\frac{\sqrt{70}}{280}$ 0 0 0 $\frac{\sqrt{42}i}{28}$ 0 $\frac{\sqrt{42}}{168}$ 0 0	
	0 $-\frac{\sqrt{42}}{42}$ $-\frac{\sqrt{70}i}{70}$ 0 $\frac{\sqrt{70}}{280}$ 0 0 0 $-\frac{\sqrt{42}i}{28}$ 0 $\frac{\sqrt{42}}{168}$ 0 0 0	
	0 0 0 $\frac{\sqrt{70}}{280}$ 0 $-\frac{\sqrt{70}i}{35}$ $\frac{\sqrt{70}}{280}$ 0 0 0 $-\frac{\sqrt{42}}{168}$ 0 0 $\frac{\sqrt{42}}{168}$ 0	
	0 0 $\frac{\sqrt{70}}{280}$ 0 $\frac{\sqrt{70}i}{35}$ 0 0 $-\frac{\sqrt{70}}{280}$ $-\frac{\sqrt{42}}{168}$ 0 0 0 0 $-\frac{\sqrt{42}}{168}$	
	0 $\frac{\sqrt{42}}{42}$ 0 0 $\frac{\sqrt{70}}{280}$ 0 0 $\frac{\sqrt{70}i}{70}$ 0 0 $-\frac{\sqrt{42}}{168}$ 0 0 $-\frac{\sqrt{42}i}{28}$	
	$\frac{\sqrt{42}}{42}$ 0 0 0 0 $-\frac{\sqrt{70}}{280}$ $-\frac{\sqrt{70}i}{70}$ 0 0 0 0 $\frac{\sqrt{42}}{168}$ $\frac{\sqrt{42}i}{28}$ 0	
	0 0 0 $\frac{\sqrt{42}i}{28}$ 0 $-\frac{\sqrt{42}}{168}$ 0 0 0 0 0 $\frac{\sqrt{70}}{56}$ 0 0 0	
	0 0 $-\frac{\sqrt{42}i}{28}$ 0 $-\frac{\sqrt{42}}{168}$ 0 0 0 0 0 $\frac{\sqrt{70}}{56}$ 0 0 0	
	0 0 0 $\frac{\sqrt{42}}{168}$ 0 0 $-\frac{\sqrt{42}}{168}$ 0 0 $\frac{\sqrt{70}}{56}$ 0 0 $\frac{\sqrt{70}}{56}$ 0	
	0 0 $\frac{\sqrt{42}}{168}$ 0 0 0 0 $\frac{\sqrt{42}}{168}$ $\frac{\sqrt{70}}{56}$ 0 0 0 0 $-\frac{\sqrt{70}}{56}$	
	0 0 0 0 0 $-\frac{\sqrt{42}}{168}$ $\frac{\sqrt{42}i}{28}$ 0 0 0 0 0 $-\frac{\sqrt{70}}{56}$ 0 0	
$-\frac{z(3x^2+3y^2-2z^2)}{2}$		

974 symmetry

continued ...

Table 10

No.	multipole	matrix													
$\mathbb{M}_{3,2}^{(1,-1;a)}(T_g, 1)$	0	0	0	$-\frac{\sqrt{42}i}{42}$	0	$\frac{\sqrt{42}}{42}$	0	0	0	0	0	0	0	0	0
	0	0	$\frac{\sqrt{42}i}{42}$	0	$\frac{\sqrt{42}}{42}$	0	0	0	0	0	0	0	0	0	0
	0	$-\frac{\sqrt{42}i}{42}$	$-\frac{\sqrt{70}}{70}$	0	0	0	0	$\frac{\sqrt{70}}{280}$	$\frac{\sqrt{42}}{28}$	0	0	0	0	$-\frac{\sqrt{42}}{168}$	
	$\frac{\sqrt{42}i}{42}$	0	0	$\frac{\sqrt{70}}{70}$	0	0	$\frac{\sqrt{70}}{280}$	0	0	$-\frac{\sqrt{42}}{28}$	0	0	$-\frac{\sqrt{42}}{168}$	0	
	0	$\frac{\sqrt{42}}{42}$	0	0	$-\frac{\sqrt{70}}{70}$	0	0	$-\frac{\sqrt{70}i}{280}$	0	0	$-\frac{\sqrt{42}}{28}$	0	0	$-\frac{\sqrt{42}i}{168}$	
	$\frac{\sqrt{42}}{42}$	0	0	0	0	$\frac{\sqrt{70}}{70}$	$\frac{\sqrt{70}i}{280}$	0	0	0	0	$\frac{\sqrt{42}}{28}$	$\frac{\sqrt{42}i}{168}$	0	
	0	0	0	$\frac{\sqrt{70}}{280}$	0	$-\frac{\sqrt{70}i}{280}$	$\frac{\sqrt{70}}{35}$	0	0	$\frac{\sqrt{42}}{168}$	0	$\frac{\sqrt{42}i}{168}$	0	0	
	0	0	$\frac{\sqrt{70}}{280}$	0	$\frac{\sqrt{70}i}{280}$	0	0	$-\frac{\sqrt{70}}{35}$	$\frac{\sqrt{42}}{168}$	0	$-\frac{\sqrt{42}i}{168}$	0	0	0	
	0	0	$\frac{\sqrt{42}}{28}$	0	0	0	$\frac{\sqrt{42}}{168}$	0	0	0	0	0	0	$\frac{\sqrt{70}}{56}$	
	0	0	0	$-\frac{\sqrt{42}}{28}$	0	0	$\frac{\sqrt{42}}{168}$	0	0	0	0	0	$\frac{\sqrt{70}}{56}$	0	
	0	0	0	0	$-\frac{\sqrt{42}}{28}$	0	0	$\frac{\sqrt{42}i}{168}$	0	0	0	0	0	$-\frac{\sqrt{70}i}{56}$	
	0	0	0	0	0	$\frac{\sqrt{42}}{28}$	$-\frac{\sqrt{42}i}{168}$	0	0	0	0	0	$\frac{\sqrt{70}i}{56}$	0	
	0	0	0	$-\frac{\sqrt{42}}{168}$	0	$-\frac{\sqrt{42}i}{168}$	0	0	0	$\frac{\sqrt{70}}{56}$	0	$-\frac{\sqrt{70}i}{56}$	0	0	
	0	0	$-\frac{\sqrt{42}}{168}$	0	$\frac{\sqrt{42}i}{168}$	0	0	0	$\frac{\sqrt{70}}{56}$	0	$\frac{\sqrt{70}i}{56}$	0	0	0	

975 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	0	0	0	$\frac{\sqrt{70}}{42}$	0	0	$\frac{\sqrt{70}i}{42}$	0	0	0	0	0	0	0	0
	0	0	0	0	0	$-\frac{\sqrt{70}}{42}$	$-\frac{\sqrt{70}i}{42}$	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	$\frac{\sqrt{42}i}{168}$	$\frac{\sqrt{42}}{168}$	0	0	$-\frac{\sqrt{70}}{42}$	0	$\frac{\sqrt{70}i}{168}$	$-\frac{\sqrt{70}}{168}$	0	0	0
	0	0	0	0	$-\frac{\sqrt{42}i}{168}$	0	0	$-\frac{\sqrt{42}}{168}$	$-\frac{\sqrt{70}}{42}$	0	$-\frac{\sqrt{70}i}{168}$	0	0	0	$\frac{\sqrt{70}}{168}$	
	$\frac{\sqrt{70}}{42}$	0	0	$\frac{\sqrt{42}i}{168}$	0	$\frac{\sqrt{42}}{42}$	0	0	0	$-\frac{\sqrt{70}i}{168}$	0	$\frac{\sqrt{70}}{84}$	0	0	0	
	0	$-\frac{\sqrt{70}}{42}$	$-\frac{\sqrt{42}i}{168}$	0	$\frac{\sqrt{42}}{42}$	0	0	0	$\frac{\sqrt{70}i}{168}$	0	$\frac{\sqrt{70}}{84}$	0	0	0	0	
	0	$\frac{\sqrt{70}i}{42}$	$\frac{\sqrt{42}}{168}$	0	0	0	0	$-\frac{\sqrt{42}}{42}$	$\frac{\sqrt{70}}{168}$	0	0	0	0	$\frac{\sqrt{70}}{84}$		
	$-\frac{\sqrt{70}i}{42}$	0	0	$-\frac{\sqrt{42}}{168}$	0	0	$-\frac{\sqrt{42}}{42}$	0	0	$-\frac{\sqrt{70}}{168}$	0	0	$\frac{\sqrt{70}}{84}$	0	0	
	0	0	0	$-\frac{\sqrt{70}}{42}$	0	$-\frac{\sqrt{70}i}{168}$	$\frac{\sqrt{70}}{168}$	0	0	0	0	$\frac{5\sqrt{42}i}{168}$	$\frac{5\sqrt{42}}{168}$	0		
	0	0	$-\frac{\sqrt{70}}{42}$	0	$\frac{\sqrt{70}i}{168}$	0	0	$-\frac{\sqrt{70}}{168}$	0	0	$-\frac{5\sqrt{42}i}{168}$	0	0	$-\frac{5\sqrt{42}}{168}$		
	0	0	0	$\frac{\sqrt{70}i}{168}$	0	$\frac{\sqrt{70}}{84}$	0	0	0	$\frac{5\sqrt{42}i}{168}$	0	0	0	0		
	0	0	$-\frac{\sqrt{70}i}{168}$	0	$\frac{\sqrt{70}}{84}$	0	0	0	$-\frac{5\sqrt{42}i}{168}$	0	0	0	0	0		
	0	0	$-\frac{\sqrt{70}}{168}$	0	0	0	0	$\frac{\sqrt{70}}{84}$	$\frac{5\sqrt{42}}{168}$	0	0	0	0	0	0	
	0	0	0	$\frac{\sqrt{70}}{168}$	0	0	$\frac{\sqrt{70}}{84}$	0	0	$-\frac{5\sqrt{42}}{168}$	0	0	0	0	0	

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	0	$-\frac{\sqrt{70}}{42}$	0	0	0	0	$\frac{\sqrt{70}}{42}$	0	0	0	0	0	0	0
	0	0	0	$\frac{\sqrt{70}}{42}$	0	0	$\frac{\sqrt{70}}{42}$	0	0	0	0	0	0	0	0
	$-\frac{\sqrt{70}}{42}$	0	0	$\frac{\sqrt{42}i}{42}$	0	$\frac{\sqrt{42}}{168}$	0	0	0	$-\frac{\sqrt{70}i}{84}$	0	$\frac{\sqrt{70}}{168}$	0	0	0
	0	$\frac{\sqrt{70}}{42}$	$-\frac{\sqrt{42}i}{42}$	0	$\frac{\sqrt{42}}{168}$	0	0	0	$\frac{\sqrt{70}i}{84}$	0	$\frac{\sqrt{70}}{168}$	0	0	0	0
	0	0	0	$\frac{\sqrt{42}}{168}$	0	0	$-\frac{\sqrt{42}}{168}$	0	0	$-\frac{\sqrt{70}}{168}$	0	$\frac{\sqrt{70}i}{42}$	$-\frac{\sqrt{70}}{168}$	0	0
	0	0	$\frac{\sqrt{42}}{168}$	0	0	0	0	$\frac{\sqrt{42}}{168}$	$-\frac{\sqrt{70}}{168}$	0	$-\frac{\sqrt{70}i}{42}$	0	0	$\frac{\sqrt{70}}{168}$	
	0	$\frac{\sqrt{70}}{42}$	0	0	$-\frac{\sqrt{42}}{168}$	0	0	$-\frac{\sqrt{42}i}{42}$	0	0	$\frac{\sqrt{70}}{168}$	0	0	$-\frac{\sqrt{70}i}{84}$	
	$\frac{\sqrt{70}}{42}$	0	0	0	0	$\frac{\sqrt{42}}{168}$	$\frac{\sqrt{42}i}{42}$	0	0	0	0	$-\frac{\sqrt{70}}{168}$	$\frac{\sqrt{70}i}{84}$	0	
	0	0	0	$-\frac{\sqrt{70}i}{84}$	0	$-\frac{\sqrt{70}}{168}$	0	0	0	0	0	$\frac{5\sqrt{42}}{168}$	0	0	
	0	0	$\frac{\sqrt{70}i}{84}$	0	$-\frac{\sqrt{70}}{168}$	0	0	0	0	0	0	$\frac{5\sqrt{42}}{168}$	0	0	
	0	0	0	$\frac{\sqrt{70}}{168}$	0	$\frac{\sqrt{70}i}{42}$	$\frac{\sqrt{70}}{168}$	0	0	$\frac{5\sqrt{42}}{168}$	0	0	$-\frac{5\sqrt{42}}{168}$	0	
	0	0	$\frac{\sqrt{70}}{168}$	0	$-\frac{\sqrt{70}i}{42}$	0	0	$-\frac{\sqrt{70}}{168}$	$\frac{5\sqrt{42}}{168}$	0	0	0	0	$\frac{5\sqrt{42}}{168}$	
	0	0	0	0	$-\frac{\sqrt{70}}{168}$	0	0	$-\frac{\sqrt{70}i}{84}$	0	0	$-\frac{5\sqrt{42}}{168}$	0	0	0	
	0	0	0	0	0	$\frac{\sqrt{70}}{168}$	$\frac{\sqrt{70}i}{84}$	0	0	0	0	$\frac{5\sqrt{42}}{168}$	0	0	

977 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 0 $-\frac{\sqrt{70}i}{42}$ 0 $-\frac{\sqrt{70}}{42}$ 0 0 0 0 0 0 0 0 0 0															
	0 0 $\frac{\sqrt{70}i}{42}$ 0 $-\frac{\sqrt{70}}{42}$ 0 0 0 0 0 0 0 0 0 0 0															
	0 $-\frac{\sqrt{70}i}{42}$ $\frac{\sqrt{42}}{42}$ 0 0 0 0 $-\frac{\sqrt{42}}{168}$ $\frac{\sqrt{70}}{84}$ 0 0 0 0 0 $\frac{\sqrt{70}}{168}$															
	$\frac{\sqrt{70}i}{42}$ 0 0 $-\frac{\sqrt{42}}{42}$ 0 0 $-\frac{\sqrt{42}}{168}$ 0 0 $-\frac{\sqrt{70}}{84}$ 0 0 $\frac{\sqrt{70}}{168}$ 0 0															
	0 $-\frac{\sqrt{70}}{42}$ 0 0 $-\frac{\sqrt{42}}{42}$ 0 0 $-\frac{\sqrt{42}i}{168}$ 0 0 $\frac{\sqrt{70}}{84}$ 0 0 $-\frac{\sqrt{70}i}{168}$ 0 0															
	$-\frac{\sqrt{70}}{42}$ 0 0 0 0 $\frac{\sqrt{42}}{42}$ $\frac{\sqrt{42}i}{168}$ 0 0 0 0 $-\frac{\sqrt{70}}{84}$ $\frac{\sqrt{70}i}{168}$ 0 0															
	0 0 0 $-\frac{\sqrt{42}}{168}$ 0 $-\frac{\sqrt{42}i}{168}$ 0 0 0 0 $-\frac{\sqrt{70}}{168}$ 0 $\frac{\sqrt{70}i}{168}$ $-\frac{\sqrt{70}}{42}$ 0															
	0 0 $-\frac{\sqrt{42}}{168}$ 0 $\frac{\sqrt{42}i}{168}$ 0 0 0 $-\frac{\sqrt{70}}{168}$ 0 0 $-\frac{\sqrt{70}i}{168}$ 0 0 $\frac{\sqrt{70}}{42}$ 0															
	0 0 $\frac{\sqrt{70}}{84}$ 0 0 0 $-\frac{\sqrt{70}}{168}$ 0 0 0 0 0 0 0 $-\frac{5\sqrt{42}}{168}$ 0															
	0 0 0 $-\frac{\sqrt{70}}{84}$ 0 0 $-\frac{\sqrt{70}}{168}$ 0 0 0 0 0 0 0 $-\frac{5\sqrt{42}}{168}$ 0															
	0 0 0 0 $\frac{\sqrt{70}}{84}$ 0 0 $-\frac{\sqrt{70}i}{168}$ 0 0 0 0 0 0 0 $-\frac{5\sqrt{42}i}{168}$ 0															
	0 0 0 0 0 $-\frac{\sqrt{70}}{84}$ $-\frac{\sqrt{70}i}{168}$ 0 0 0 0 0 0 0 $-\frac{5\sqrt{42}i}{168}$ 0 0															
	0 0 $\frac{\sqrt{70}}{168}$ 0 $\frac{\sqrt{70}i}{168}$ 0 0 0 $\frac{\sqrt{70}}{42}$ $-\frac{5\sqrt{42}}{168}$ 0 $\frac{5\sqrt{42}i}{168}$ 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 $-\frac{\sqrt{165}}{220}$ 0 $-\frac{\sqrt{165}i}{220}$ 0 0 0 0 $-\frac{\sqrt{11}}{44}$ 0 $\frac{\sqrt{11}i}{44}$ $\frac{\sqrt{11}}{22}$ 0															
	0 0 $-\frac{\sqrt{165}}{220}$ 0 $\frac{\sqrt{165}i}{220}$ 0 0 0 $-\frac{\sqrt{11}}{44}$ 0 $-\frac{\sqrt{11}i}{44}$ 0 0 $-\frac{\sqrt{11}}{22}$															
	0 $-\frac{\sqrt{165}}{220}$ 0 0 0 0 0 $\frac{3\sqrt{11}i}{44}$ 0 0 $-\frac{\sqrt{165}}{110}$ 0 0 $\frac{\sqrt{165}i}{220}$															
	$-\frac{\sqrt{165}}{220}$ 0 0 0 0 0 $-\frac{3\sqrt{11}i}{44}$ 0 0 0 0 $\frac{\sqrt{165}}{110}$ $-\frac{\sqrt{165}i}{220}$ 0															
	0 $-\frac{\sqrt{165}i}{220}$ 0 0 0 0 0 $\frac{3\sqrt{11}}{44}$ $-\frac{\sqrt{165}}{110}$ 0 0 0 0 $-\frac{\sqrt{165}}{220}$															
	$\frac{\sqrt{165}i}{220}$ 0 0 0 0 0 $\frac{3\sqrt{11}}{44}$ 0 0 $\frac{\sqrt{165}}{110}$ 0 0 $-\frac{\sqrt{165}}{220}$ 0															
	0 0 0 $\frac{3\sqrt{11}i}{44}$ 0 $\frac{3\sqrt{11}}{44}$ 0 0 0 $-\frac{3\sqrt{165}i}{220}$ 0 $\frac{3\sqrt{165}}{220}$ 0 0															
	0 0 $-\frac{3\sqrt{11}i}{44}$ 0 $\frac{3\sqrt{11}}{44}$ 0 0 0 $\frac{3\sqrt{165}i}{220}$ 0 $\frac{3\sqrt{165}}{220}$ 0 0 0															
	0 $-\frac{\sqrt{11}}{44}$ 0 0 $-\frac{\sqrt{165}}{110}$ 0 0 $-\frac{3\sqrt{165}i}{220}$ 0 0 0 0 0 $\frac{\sqrt{11}i}{44}$															
	$-\frac{\sqrt{11}}{44}$ 0 0 0 0 $\frac{\sqrt{165}}{110}$ $\frac{3\sqrt{165}i}{220}$ 0 0 0 0 0 $-\frac{\sqrt{11}i}{44}$ 0															
	0 $\frac{\sqrt{11}i}{44}$ $-\frac{\sqrt{165}}{110}$ 0 0 0 0 $\frac{3\sqrt{165}}{220}$ 0 0 0 0 0 $\frac{\sqrt{11}}{44}$															
	$-\frac{\sqrt{11}i}{44}$ 0 0 $\frac{\sqrt{165}}{110}$ 0 0 $\frac{3\sqrt{165}}{220}$ 0 0 0 0 0 $\frac{\sqrt{11}}{44}$ 0															
	$\frac{\sqrt{11}}{22}$ 0 0 $\frac{\sqrt{165}i}{220}$ 0 $-\frac{\sqrt{165}}{220}$ 0 0 0 $\frac{\sqrt{11}i}{44}$ 0 $\frac{\sqrt{11}}{44}$ 0 0															
	0 $-\frac{\sqrt{11}}{22}$ $-\frac{\sqrt{165}i}{220}$ 0 $-\frac{\sqrt{165}}{220}$ 0 0 0 $-\frac{\sqrt{11}i}{44}$ 0 $\frac{\sqrt{11}}{44}$ 0 0 0															
$\frac{\sqrt{105}xyz(x^2+y^2-2z^2)}{2}$																
979	symmetry															

continued ...

Table 10

No.	multipole	matrix
$\mathbb{M}_{5,1}^{(1,-1;a)}(E_g)$	0	0 0 0 $-\frac{\sqrt{55}}{220}$ 0 $\frac{\sqrt{55}i}{220}$ $\frac{\sqrt{55}}{110}$ 0 0 $\frac{\sqrt{33}}{44}$ 0 $\frac{\sqrt{33}i}{44}$ 0 0
	0	0 0 $-\frac{\sqrt{55}}{220}$ 0 $-\frac{\sqrt{55}i}{220}$ 0 0 $-\frac{\sqrt{55}}{110}$ $\frac{\sqrt{33}}{44}$ 0 $-\frac{\sqrt{33}i}{44}$ 0 0 0
	0	$-\frac{\sqrt{55}}{220}$ 0 0 0 $-\frac{\sqrt{33}}{22}$ 0 0 $-\frac{\sqrt{33}i}{44}$ 0 0 $\frac{\sqrt{55}}{55}$ 0 0 $-\frac{\sqrt{55}i}{44}$
	$-\frac{\sqrt{55}}{220}$	0 0 0 0 0 $\frac{\sqrt{33}}{22}$ $\frac{\sqrt{33}i}{44}$ 0 0 0 0 $-\frac{\sqrt{55}}{55}$ $\frac{\sqrt{55}i}{44}$ 0
	0	$\frac{\sqrt{55}i}{220}$ $-\frac{\sqrt{33}}{22}$ 0 0 0 0 $\frac{\sqrt{33}}{44}$ $-\frac{\sqrt{55}}{55}$ 0 0 0 0 $-\frac{\sqrt{55}}{44}$
	$-\frac{\sqrt{55}i}{220}$	0 0 $\frac{\sqrt{33}}{22}$ 0 0 0 $\frac{\sqrt{33}}{44}$ 0 0 $\frac{\sqrt{55}}{55}$ 0 0 $-\frac{\sqrt{55}}{44}$ 0
	$\frac{\sqrt{55}}{110}$	0 0 $-\frac{\sqrt{33}i}{44}$ 0 $\frac{\sqrt{33}}{44}$ 0 0 0 $-\frac{\sqrt{55}i}{220}$ 0 $-\frac{\sqrt{55}}{220}$ 0 0 0
	0	$-\frac{\sqrt{55}}{110}$ $\frac{\sqrt{33}i}{44}$ 0 $\frac{\sqrt{33}}{44}$ 0 0 0 $\frac{\sqrt{55}i}{220}$ 0 $-\frac{\sqrt{55}}{220}$ 0 0 0 0
	0	$\frac{\sqrt{33}}{44}$ 0 0 $-\frac{\sqrt{55}}{55}$ 0 0 0 $-\frac{\sqrt{55}i}{220}$ 0 0 $-\frac{\sqrt{33}}{66}$ 0 0 $-\frac{\sqrt{33}i}{132}$
	$\frac{\sqrt{33}}{44}$	0 0 0 0 $\frac{\sqrt{55}}{55}$ $\frac{\sqrt{55}i}{220}$ 0 0 0 0 $\frac{\sqrt{33}}{66}$ $\frac{\sqrt{33}i}{132}$ 0
	0	$\frac{\sqrt{33}i}{44}$ $\frac{\sqrt{55}}{55}$ 0 0 0 0 $-\frac{\sqrt{55}}{220}$ $-\frac{\sqrt{33}}{66}$ 0 0 0 0 $\frac{\sqrt{33}}{132}$
	$-\frac{\sqrt{33}i}{44}$	0 0 $-\frac{\sqrt{55}}{55}$ 0 0 $-\frac{\sqrt{55}}{44}$ 0 0 0 $-\frac{\sqrt{33}i}{132}$ 0 $\frac{\sqrt{33}}{132}$ 0 0
	0	0 0 0 $-\frac{\sqrt{55}i}{44}$ 0 $-\frac{\sqrt{55}}{44}$ 0 0 0 $-\frac{\sqrt{33}i}{132}$ 0 $\frac{\sqrt{33}}{132}$ 0 0 0
	0	0 0 $\frac{\sqrt{55}i}{44}$ 0 $-\frac{\sqrt{55}}{44}$ 0 0 0 $\frac{\sqrt{33}i}{132}$ 0 $\frac{\sqrt{33}}{132}$ 0 0 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															
$\mathbb{M}_{5,0}^{(1,-1;a)}(T_g, 1)$	0	$-\frac{\sqrt{385}}{66}$	0	0	$-\frac{\sqrt{231}}{924}$	0	0	$\frac{\sqrt{231}i}{924}$	0	0	$\frac{\sqrt{385}}{132}$	0	0	$\frac{\sqrt{385}i}{132}$			
	$-\frac{\sqrt{385}}{66}$	0	0	0	0	$\frac{\sqrt{231}}{924}$	$-\frac{\sqrt{231}i}{924}$	0	0	0	$-\frac{\sqrt{385}}{132}$	$-\frac{\sqrt{385}i}{132}$	0				
	0	0	0	$\frac{\sqrt{385}}{77}$	0	$-\frac{\sqrt{385}i}{308}$	$\frac{\sqrt{385}}{308}$	0	0	0	$-\frac{5\sqrt{231}i}{924}$	$-\frac{5\sqrt{231}}{924}$	0				
	0	0	$\frac{\sqrt{385}}{77}$	0	$\frac{\sqrt{385}i}{308}$	0	0	$-\frac{\sqrt{385}}{308}$	0	0	$\frac{5\sqrt{231}i}{924}$	0	0	$\frac{5\sqrt{231}}{924}$			
	$-\frac{\sqrt{231}}{924}$	0	0	$-\frac{\sqrt{385}i}{308}$	0	$\frac{3\sqrt{385}}{616}$	0	0	0	$-\frac{3\sqrt{231}i}{308}$	0	$-\frac{5\sqrt{231}}{1848}$	0	0	0		
	0	$\frac{\sqrt{231}}{924}$	$\frac{\sqrt{385}i}{308}$	0	$\frac{3\sqrt{385}}{616}$	0	0	$\frac{3\sqrt{231}i}{308}$	0	$-\frac{5\sqrt{231}}{1848}$	0	0	0	0			
	0	$\frac{\sqrt{231}i}{924}$	$\frac{\sqrt{385}}{308}$	0	0	0	0	$\frac{3\sqrt{385}}{616}$	$-\frac{3\sqrt{231}}{308}$	0	0	0	0	$\frac{5\sqrt{231}}{1848}$			
	$-\frac{\sqrt{231}i}{924}$	0	0	$-\frac{\sqrt{385}}{308}$	0	0	$\frac{3\sqrt{385}}{616}$	0	0	$\frac{3\sqrt{231}}{308}$	0	0	$\frac{5\sqrt{231}}{1848}$	0			
	0	0	0	0	$-\frac{3\sqrt{231}i}{308}$	$-\frac{3\sqrt{231}}{308}$	0	0	$-\frac{\sqrt{385}}{66}$	0	$-\frac{\sqrt{385}i}{924}$	$\frac{\sqrt{385}}{924}$	0	$\frac{\sqrt{385}}{924}$	0		
	0	0	0	0	$\frac{3\sqrt{231}i}{308}$	0	0	$\frac{3\sqrt{231}}{308}$	$-\frac{\sqrt{385}}{66}$	0	$\frac{\sqrt{385}i}{924}$	0	0	$-\frac{\sqrt{385}}{924}$			
	$\frac{\sqrt{385}}{132}$	0	0	$-\frac{5\sqrt{231}i}{924}$	0	$-\frac{5\sqrt{231}}{1848}$	0	0	0	$-\frac{\sqrt{385}i}{924}$	0	$\frac{\sqrt{385}}{264}$	0	0	0		
	0	$-\frac{\sqrt{385}}{132}$	$\frac{5\sqrt{231}i}{924}$	0	$-\frac{5\sqrt{231}}{1848}$	0	0	0	$\frac{\sqrt{385}i}{924}$	0	$\frac{\sqrt{385}}{264}$	0	0	0	0		
	0	$\frac{\sqrt{385}i}{132}$	$-\frac{5\sqrt{231}}{924}$	0	0	0	0	$\frac{5\sqrt{231}}{1848}$	$\frac{\sqrt{385}}{924}$	0	0	0	0	$\frac{\sqrt{385}}{264}$			
	$-\frac{\sqrt{385}i}{132}$	0	0	$\frac{5\sqrt{231}}{924}$	0	0	$\frac{5\sqrt{231}}{1848}$	0	0	$-\frac{\sqrt{385}}{924}$	0	0	$\frac{\sqrt{385}}{264}$	0			
981	symmetry	$\frac{y(15x^4 - 40x^2y^2 + 30x^2z^2 + 8y^4 - 40y^2z^2 + 15z^4)}{8}$															

continued ...

Table 10

No.	multipole	matrix													
$\mathbb{M}_{5,1}^{(1,-1;a)}(T_g, 1)$	0	$\frac{\sqrt{385}i}{66}$	$-\frac{\sqrt{231}}{924}$	0	0	0	0	$-\frac{\sqrt{231}}{924}$	$-\frac{\sqrt{385}}{132}$	0	0	0	0	$\frac{\sqrt{385}}{132}$	
	$-\frac{\sqrt{385}i}{66}$	0	0	$\frac{\sqrt{231}}{924}$	0	0	$-\frac{\sqrt{231}}{924}$	0	0	$\frac{\sqrt{385}}{132}$	0	0	$\frac{\sqrt{385}}{132}$	0	
	$-\frac{\sqrt{231}}{924}$	0	0	$-\frac{3\sqrt{385}i}{616}$	0	$\frac{\sqrt{385}}{308}$	0	0	0	$-\frac{5\sqrt{231}i}{1848}$	0	$-\frac{3\sqrt{231}}{308}$	0	0	
	0	$\frac{\sqrt{231}}{924}$	$\frac{3\sqrt{385}i}{616}$	0	$\frac{\sqrt{385}}{308}$	0	0	0	$\frac{5\sqrt{231}i}{1848}$	0	$-\frac{3\sqrt{231}}{308}$	0	0	0	
	0	0	0	$\frac{\sqrt{385}}{308}$	0	$-\frac{\sqrt{385}i}{77}$	$\frac{\sqrt{385}}{308}$	0	0	$-\frac{5\sqrt{231}}{924}$	0	0	$\frac{5\sqrt{231}}{924}$	0	
	0	0	$\frac{\sqrt{385}}{308}$	0	$\frac{\sqrt{385}i}{77}$	0	0	$-\frac{\sqrt{385}}{308}$	$-\frac{5\sqrt{231}}{924}$	0	0	0	0	$-\frac{5\sqrt{231}}{924}$	
	0	$-\frac{\sqrt{231}}{924}$	0	0	$\frac{\sqrt{385}}{308}$	0	0	$-\frac{3\sqrt{385}i}{616}$	0	0	$\frac{3\sqrt{231}}{308}$	0	0	$\frac{5\sqrt{231}i}{1848}$	
	$-\frac{\sqrt{231}}{924}$	0	0	0	0	$-\frac{\sqrt{385}}{308}$	$\frac{3\sqrt{385}i}{616}$	0	0	0	0	$-\frac{3\sqrt{231}}{308}$	$-\frac{5\sqrt{231}i}{1848}$	0	
	$-\frac{\sqrt{385}}{132}$	0	0	$-\frac{5\sqrt{231}i}{1848}$	0	$-\frac{5\sqrt{231}}{924}$	0	0	0	$-\frac{\sqrt{385}i}{264}$	0	$\frac{\sqrt{385}}{924}$	0	0	
	0	$\frac{\sqrt{385}}{132}$	$\frac{5\sqrt{231}i}{1848}$	0	$-\frac{5\sqrt{231}}{924}$	0	0	0	$\frac{\sqrt{385}i}{264}$	0	$\frac{\sqrt{385}}{924}$	0	0	0	
	0	0	0	$-\frac{3\sqrt{231}}{308}$	0	0	$\frac{3\sqrt{231}}{308}$	0	0	$\frac{\sqrt{385}}{924}$	0	$\frac{\sqrt{385}i}{66}$	$\frac{\sqrt{385}}{924}$	0	
	0	0	$-\frac{3\sqrt{231}}{308}$	0	0	0	0	$-\frac{3\sqrt{231}}{308}$	$\frac{\sqrt{385}}{924}$	0	$-\frac{\sqrt{385}i}{66}$	0	0	$-\frac{\sqrt{385}}{924}$	
	0	$\frac{\sqrt{385}}{132}$	0	0	$\frac{5\sqrt{231}}{924}$	0	0	$\frac{5\sqrt{231}i}{1848}$	0	0	$\frac{\sqrt{385}}{924}$	0	0	$-\frac{\sqrt{385}i}{264}$	
	$\frac{\sqrt{385}}{132}$	0	0	0	0	$-\frac{5\sqrt{231}}{924}$	$-\frac{5\sqrt{231}i}{1848}$	0	0	0	0	$-\frac{\sqrt{385}}{924}$	$\frac{\sqrt{385}i}{264}$	0	
982	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
$\mathbb{M}_{5,2}^{(1,-1;a)}(T_g, 1)$	$-\frac{\sqrt{385}}{66}$	0 0 $\frac{\sqrt{231}i}{924}$ 0 $-\frac{\sqrt{231}}{924}$ 0 0 0 $-\frac{\sqrt{385}i}{132}$ 0 $-\frac{\sqrt{385}}{132}$ 0 0
	0 $\frac{\sqrt{385}}{66}$	- $\frac{\sqrt{231}i}{924}$ 0 $-\frac{\sqrt{231}}{924}$ 0 0 0 $\frac{\sqrt{385}i}{132}$ 0 $-\frac{\sqrt{385}}{132}$ 0 0 0
	0 $\frac{\sqrt{231}i}{924}$	$\frac{3\sqrt{385}}{616}$ 0 0 0 0 $\frac{\sqrt{385}}{308}$ $-\frac{5\sqrt{231}}{1848}$ 0 0 0 0 $\frac{3\sqrt{231}}{308}$
	$-\frac{\sqrt{231}i}{924}$	0 0 $-\frac{3\sqrt{385}}{616}$ 0 0 $\frac{\sqrt{385}}{308}$ 0 0 $\frac{5\sqrt{231}}{1848}$ 0 0 $\frac{3\sqrt{231}}{308}$ 0
	0 $-\frac{\sqrt{231}}{924}$	0 0 0 $\frac{3\sqrt{385}}{616}$ 0 0 $-\frac{\sqrt{385}i}{308}$ 0 0 $\frac{5\sqrt{231}}{1848}$ 0 0 $\frac{3\sqrt{231}i}{308}$
	$-\frac{\sqrt{231}}{924}$	0 0 0 0 0 $-\frac{3\sqrt{385}}{616}$ $\frac{\sqrt{385}i}{308}$ 0 0 0 0 $-\frac{5\sqrt{231}}{1848}$ $-\frac{3\sqrt{231}i}{308}$ 0
	0 0 0	$\frac{\sqrt{385}}{308}$ 0 $-\frac{\sqrt{385}i}{308}$ $\frac{\sqrt{385}}{77}$ 0 0 $\frac{5\sqrt{231}}{924}$ 0 $\frac{5\sqrt{231}i}{924}$ 0 0
	0 0	$\frac{\sqrt{385}}{308}$ 0 $\frac{\sqrt{385}i}{308}$ 0 0 $-\frac{\sqrt{385}}{77}$ $\frac{5\sqrt{231}}{924}$ 0 $-\frac{5\sqrt{231}i}{924}$ 0 0
	0 $-\frac{\sqrt{385}i}{132}$	$-\frac{5\sqrt{231}}{1848}$ 0 0 0 0 $\frac{5\sqrt{231}}{924}$ $\frac{\sqrt{385}}{264}$ 0 0 0 0 $\frac{\sqrt{385}}{924}$
	$\frac{\sqrt{385}i}{132}$	0 0 $\frac{5\sqrt{231}}{1848}$ 0 0 $\frac{5\sqrt{231}}{924}$ 0 0 $-\frac{\sqrt{385}}{264}$ 0 0 $\frac{\sqrt{385}}{924}$ 0
	0 $-\frac{\sqrt{385}}{132}$	0 0 0 $\frac{5\sqrt{231}}{1848}$ 0 0 $\frac{5\sqrt{231}i}{924}$ 0 0 $\frac{\sqrt{385}}{264}$ 0 0 $-\frac{\sqrt{385}i}{924}$
	$-\frac{\sqrt{385}}{132}$	0 0 0 0 0 $-\frac{5\sqrt{231}}{1848}$ $-\frac{5\sqrt{231}i}{924}$ 0 0 0 0 $-\frac{\sqrt{385}}{264}$ $\frac{\sqrt{385}i}{924}$ 0
	0 0 0	$\frac{3\sqrt{231}}{308}$ 0 $\frac{3\sqrt{231}i}{308}$ 0 0 0 $\frac{\sqrt{385}}{924}$ 0 $-\frac{\sqrt{385}i}{924}$ $-\frac{\sqrt{385}}{66}$ 0
	0 0	$\frac{3\sqrt{231}}{308}$ 0 $-\frac{3\sqrt{231}i}{308}$ 0 0 0 $\frac{\sqrt{385}}{924}$ 0 $\frac{\sqrt{385}i}{924}$ 0 0 $\frac{\sqrt{385}}{66}$
983	symmetry	$\frac{3\sqrt{35}x(y^2 - 2yz - z^2)(y^2 + 2yz - z^2)}{8}$

continued ...

Table 10

No.	multipole	matrix
$\mathbb{M}_{5,0}^{(1,-1;a)}(T_g, 2)$	0	$-\frac{\sqrt{11}}{22}$
	$-\frac{\sqrt{11}}{22}$	0
	0	0
	0	$\frac{\sqrt{165}}{220}$
	$\frac{\sqrt{165}}{220}$	0
	0	$-\frac{3\sqrt{11}i}{44}$
	$\frac{\sqrt{165}i}{220}$	0
	0	$-\frac{3\sqrt{11}i}{44}$
	$-\frac{\sqrt{165}i}{220}$	0
	0	$-\frac{3\sqrt{11}i}{44}$
	$\frac{\sqrt{165}i}{220}$	0
	0	$-\frac{3\sqrt{11}i}{44}$
	$-\frac{\sqrt{11}i}{44}$	0
$\frac{3\sqrt{35}y(x^2 - 2xz - z^2)(x^2 + 2xz - z^2)}{8}$		

984 symmetry

continued ...

Table 10

No.	multipole	matrix													
$\mathbb{M}_{5,1}^{(1,-1;a)}(T_g, 2)$	0	$\frac{\sqrt{11}i}{22}$	$\frac{\sqrt{165}}{220}$	0	0	0	0	$\frac{\sqrt{165}}{220}$	$-\frac{\sqrt{11}}{44}$	0	0	0	0	$\frac{\sqrt{11}}{44}$	
	$-\frac{\sqrt{11}i}{22}$	0	0	$-\frac{\sqrt{165}}{220}$	0	0	$\frac{\sqrt{165}}{220}$	0	0	$\frac{\sqrt{11}}{44}$	0	0	$\frac{\sqrt{11}}{44}$	0	
	$\frac{\sqrt{165}}{220}$	0	0	$-\frac{3\sqrt{11}i}{88}$	0	$-\frac{3\sqrt{11}}{44}$	0	0	0	$\frac{\sqrt{165}i}{440}$	0	$\frac{\sqrt{165}}{220}$	0	0	
	0	$-\frac{\sqrt{165}}{220}$	$\frac{3\sqrt{11}i}{88}$	0	$-\frac{3\sqrt{11}}{44}$	0	0	0	$-\frac{\sqrt{165}i}{440}$	0	$\frac{\sqrt{165}}{220}$	0	0	0	
	0	0	0	$-\frac{3\sqrt{11}}{44}$	0	0	$-\frac{3\sqrt{11}}{44}$	0	0	$-\frac{3\sqrt{165}}{220}$	0	0	$\frac{3\sqrt{165}}{220}$	0	
	0	0	$-\frac{3\sqrt{11}}{44}$	0	0	0	0	$\frac{3\sqrt{11}}{44}$	$-\frac{3\sqrt{165}}{220}$	0	0	0	0	$-\frac{3\sqrt{165}}{220}$	
	0	$\frac{\sqrt{165}}{220}$	0	0	$-\frac{3\sqrt{11}}{44}$	0	0	$-\frac{3\sqrt{11}i}{88}$	0	0	$-\frac{\sqrt{165}}{220}$	0	0	$-\frac{\sqrt{165}i}{440}$	
	$\frac{\sqrt{165}}{220}$	0	0	0	0	$\frac{3\sqrt{11}}{44}$	$\frac{3\sqrt{11}i}{88}$	0	0	0	0	$\frac{\sqrt{165}}{220}$	$\frac{\sqrt{165}i}{440}$	0	
	$-\frac{\sqrt{11}}{44}$	0	0	$\frac{\sqrt{165}i}{440}$	0	$-\frac{3\sqrt{165}}{220}$	0	0	0	$\frac{3\sqrt{11}i}{88}$	0	$-\frac{\sqrt{11}}{44}$	0	0	
	0	$\frac{\sqrt{11}}{44}$	$-\frac{\sqrt{165}i}{440}$	0	$-\frac{3\sqrt{165}}{220}$	0	0	0	$-\frac{3\sqrt{11}i}{88}$	0	$-\frac{\sqrt{11}}{44}$	0	0	0	
	0	0	0	$\frac{\sqrt{165}}{220}$	0	0	$-\frac{\sqrt{165}}{220}$	0	0	$-\frac{\sqrt{11}}{44}$	0	$-\frac{\sqrt{11}i}{22}$	$-\frac{\sqrt{11}}{44}$	0	
	0	0	$\frac{\sqrt{165}}{220}$	0	0	0	0	$\frac{\sqrt{165}}{220}$	$-\frac{\sqrt{11}}{44}$	0	$\frac{\sqrt{11}i}{22}$	0	0	$\frac{\sqrt{11}}{44}$	
	0	$\frac{\sqrt{11}}{44}$	0	0	$\frac{3\sqrt{165}}{220}$	0	0	$-\frac{\sqrt{165}i}{440}$	0	0	$-\frac{\sqrt{11}}{44}$	0	0	$\frac{3\sqrt{11}i}{88}$	
	$\frac{\sqrt{11}}{44}$	0	0	0	0	$-\frac{3\sqrt{165}}{220}$	$\frac{\sqrt{165}i}{440}$	0	0	0	0	$\frac{\sqrt{11}}{44}$	$-\frac{3\sqrt{11}i}{88}$	0	
985	symmetry	$\frac{3\sqrt{35}z(x^2 - 2xy - y^2)(x^2 + 2xy - y^2)}{8}$													

continued ...

Table 10

No.	multipole	matrix
$\mathbb{M}_{5,2}^{(1,-1;a)}(T_g, 2)$	$-\frac{\sqrt{11}}{22}$	0 0 $-\frac{\sqrt{165}i}{220}$ 0 $\frac{\sqrt{165}}{220}$ 0 0 0 $-\frac{\sqrt{11}i}{44}$ 0 $-\frac{\sqrt{11}}{44}$ 0 0 0
	0	$\frac{\sqrt{11}}{22}$ 0 $\frac{\sqrt{165}i}{220}$ 0 $\frac{\sqrt{165}}{220}$ 0 0 0 $\frac{\sqrt{11}i}{44}$ 0 $-\frac{\sqrt{11}}{44}$ 0 0 0 0
	0	$-\frac{\sqrt{165}i}{220}$ $\frac{3\sqrt{11}}{88}$ 0 0 0 0 0 $-\frac{3\sqrt{11}}{44}$ $\frac{\sqrt{165}}{440}$ 0 0 0 0 $-\frac{\sqrt{165}}{220}$
	$\frac{\sqrt{165}i}{220}$	0 0 $-\frac{3\sqrt{11}}{88}$ 0 0 $-\frac{3\sqrt{11}}{44}$ 0 0 $-\frac{\sqrt{165}}{440}$ 0 0 $-\frac{\sqrt{165}}{220}$ 0
	0	$\frac{\sqrt{165}}{220}$ 0 0 0 $\frac{3\sqrt{11}}{88}$ 0 0 $\frac{3\sqrt{11}i}{44}$ 0 0 $-\frac{\sqrt{165}}{440}$ 0 0 $-\frac{\sqrt{165}i}{220}$
	$\frac{\sqrt{165}}{220}$	0 0 0 0 $-\frac{3\sqrt{11}}{88}$ $-\frac{3\sqrt{11}i}{44}$ 0 0 0 0 $\frac{\sqrt{165}}{440}$ $\frac{\sqrt{165}i}{220}$ 0
	0	0 0 0 $-\frac{3\sqrt{11}}{44}$ 0 $\frac{3\sqrt{11}i}{44}$ 0 0 0 $\frac{3\sqrt{165}}{220}$ 0 $\frac{3\sqrt{165}i}{220}$ 0 0 0
	0	0 $-\frac{3\sqrt{11}}{44}$ 0 $-\frac{3\sqrt{11}i}{44}$ 0 0 0 $\frac{3\sqrt{165}}{220}$ 0 $-\frac{3\sqrt{165}i}{220}$ 0 0 0 0
	0	$-\frac{\sqrt{11}i}{44}$ $\frac{\sqrt{165}}{440}$ 0 0 0 0 $\frac{3\sqrt{165}}{220}$ $-\frac{3\sqrt{11}}{88}$ 0 0 0 0 $-\frac{\sqrt{11}}{44}$
	$\frac{\sqrt{11}i}{44}$	0 0 $-\frac{\sqrt{165}}{440}$ 0 0 $\frac{3\sqrt{165}}{220}$ 0 0 $\frac{3\sqrt{11}}{88}$ 0 0 $-\frac{\sqrt{11}}{44}$ 0
	0	$-\frac{\sqrt{11}}{44}$ 0 0 0 $-\frac{\sqrt{165}}{440}$ 0 0 $\frac{3\sqrt{165}i}{220}$ 0 0 $-\frac{3\sqrt{11}}{88}$ 0 0 $\frac{\sqrt{11}i}{44}$
	$-\frac{\sqrt{11}}{44}$	0 0 0 0 0 $\frac{\sqrt{165}}{440}$ $-\frac{3\sqrt{165}i}{220}$ 0 0 0 0 $\frac{3\sqrt{11}}{88}$ $-\frac{\sqrt{11}i}{44}$ 0
	0	0 0 0 $-\frac{\sqrt{165}}{220}$ 0 $-\frac{\sqrt{165}i}{220}$ 0 0 0 $-\frac{\sqrt{11}}{44}$ 0 $\frac{\sqrt{11}i}{44}$ $\frac{\sqrt{11}}{22}$ 0
	0	0 $-\frac{\sqrt{165}}{220}$ 0 0 $\frac{\sqrt{165}i}{220}$ 0 0 0 $-\frac{\sqrt{11}}{44}$ 0 $-\frac{\sqrt{11}i}{44}$ 0 0 $-\frac{\sqrt{11}}{22}$
$\frac{\sqrt{105}x(y-z)(y+z)(2x^2-y^2-z^2)}{4}$		
986	symmetry	

continued ...

Table 10

No.	multipole	matrix													
$\mathbb{M}_{5,0}^{(1,-1;a)}(T_g, 3)$	0 0 0 0 0 0 0 0 0 0 $\frac{\sqrt{33}}{33}$ 0 0 $-\frac{\sqrt{33}i}{33}$	0 0 0 0 0 0 0 0 0 0 0 $-\frac{\sqrt{33}}{33}$ $\frac{\sqrt{33}i}{33}$ 0	0 0 0 0 0 0 0 0 0 $-\frac{\sqrt{55}}{110}$ 0 $\frac{\sqrt{55}i}{55}$ $-\frac{\sqrt{55}}{55}$ 0	0 0 0 0 0 0 0 0 $-\frac{\sqrt{55}}{110}$ 0 $-\frac{\sqrt{55}i}{55}$ 0 0 $\frac{\sqrt{55}}{55}$	0 0 0 0 0 $-\frac{\sqrt{33}}{44}$ 0 0 0 $\frac{\sqrt{55}i}{55}$ 0 $\frac{\sqrt{55}}{220}$ 0 0	0 0 0 0 $-\frac{\sqrt{33}}{44}$ 0 0 0 $-\frac{\sqrt{55}i}{55}$ 0 $\frac{\sqrt{55}}{220}$ 0 0 0	0 0 0 0 0 0 0 $\frac{\sqrt{33}}{44}$ $-\frac{\sqrt{55}}{55}$ 0 0 0 0 $\frac{\sqrt{55}}{220}$	0 0 0 0 $-\frac{\sqrt{55}}{110}$ 0 $\frac{\sqrt{55}i}{55}$ $-\frac{\sqrt{55}}{55}$ 0 0 0 0 0 0	0 0 $-\frac{\sqrt{55}}{110}$ 0 $-\frac{\sqrt{55}i}{55}$ 0 0 $\frac{\sqrt{55}}{55}$ 0 0 0 0 0 0 0	$\frac{\sqrt{33}}{33}$ 0 0 $\frac{\sqrt{55}i}{55}$ 0 $\frac{\sqrt{55}}{220}$ 0 0 0 0 0 $\frac{7\sqrt{33}}{132}$ 0 0	0 $-\frac{\sqrt{33}}{33}$ $-\frac{\sqrt{55}i}{55}$ 0 $\frac{\sqrt{55}}{220}$ 0 0 0 0 0 $\frac{7\sqrt{33}}{132}$ 0 0 0	0 $-\frac{\sqrt{33}i}{33}$ $-\frac{\sqrt{55}}{55}$ 0 0 0 0 $\frac{\sqrt{55}}{220}$ 0 0 0 0 0 $-\frac{7\sqrt{33}}{132}$	$\frac{\sqrt{33}i}{33}$ 0 0 $\frac{\sqrt{55}}{55}$ 0 0 $\frac{\sqrt{55}}{220}$ 0 0 0 0 0 $-\frac{7\sqrt{33}}{132}$ 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 0 0 0 0 0 0 0 $\frac{\sqrt{33}}{33}$ 0 0 0 0 0 $\frac{\sqrt{33}}{33}$															
	0 0 0 0 0 0 0 0 0 $-\frac{\sqrt{33}i}{33}$ 0 0 0 0 $\frac{\sqrt{33}}{33}$ 0															
	0 0 0 $-\frac{\sqrt{33}i}{44}$ 0 0 0 0 0 0 $-\frac{\sqrt{55}i}{220}$ 0 0 $-\frac{\sqrt{55}i}{55}$ 0 0															
	0 0 $\frac{\sqrt{33}i}{44}$ 0 0 0 0 0 0 $\frac{\sqrt{55}i}{220}$ 0 0 $-\frac{\sqrt{55}i}{55}$ 0 0 0															
	0 0 0 0 0 0 0 0 0 0 $-\frac{\sqrt{55}i}{55}$ 0 0 $\frac{\sqrt{55}i}{110}$ $-\frac{\sqrt{55}i}{55}$ 0															
	0 0 0 0 0 0 0 0 0 $-\frac{\sqrt{55}i}{55}$ 0 0 $-\frac{\sqrt{55}i}{110}$ 0 0 $\frac{\sqrt{55}i}{55}$															
	0 0 0 0 0 0 0 0 $\frac{\sqrt{33}i}{44}$ 0 0 0 0 $-\frac{\sqrt{55}i}{55}$ 0 0 $-\frac{\sqrt{55}i}{220}$															
	0 0 0 0 0 0 0 $-\frac{\sqrt{33}i}{44}$ 0 0 0 0 0 $\frac{\sqrt{55}i}{55}$ $\frac{\sqrt{55}i}{220}$ 0															
	$\frac{\sqrt{33}}{33}$ 0 0 $-\frac{\sqrt{55}i}{220}$ 0 $-\frac{\sqrt{55}i}{55}$ 0 0 0 $\frac{7\sqrt{33}i}{132}$ 0 0 0 0 0															
	0 $-\frac{\sqrt{33}}{33}$ $\frac{\sqrt{55}i}{220}$ 0 $-\frac{\sqrt{55}i}{55}$ 0 0 0 $-\frac{7\sqrt{33}i}{132}$ 0 0 0 0 0 0															
	0 0 0 $-\frac{\sqrt{55}i}{55}$ 0 $\frac{\sqrt{55}i}{110}$ $-\frac{\sqrt{55}i}{55}$ 0 0 0 0 0 0 0 0															
	0 0 $-\frac{\sqrt{55}i}{55}$ 0 $-\frac{\sqrt{55}i}{110}$ 0 0 $\frac{\sqrt{55}i}{55}$ 0 0 0 0 0 0 0															
	0 $\frac{\sqrt{33}}{33}$ 0 0 $-\frac{\sqrt{55}i}{55}$ 0 0 $-\frac{\sqrt{55}i}{220}$ 0 0 0 0 0 0 $-\frac{7\sqrt{33}i}{132}$															
	$\frac{\sqrt{33}}{33}$ 0 0 0 0 $\frac{\sqrt{55}i}{55}$ $\frac{\sqrt{55}i}{220}$ 0 0 0 0 0 0 $\frac{7\sqrt{33}i}{132}$ 0															
988	symmetry	$-\frac{\sqrt{105}z(x-y)(x+y)(x^2+y^2-2z^2)}{4}$														

continued ...

Table 10

No.	multipole	matrix
$\mathbb{M}_{3,2}^{(1,-1;a)}(T_g, 3)$	0 0 0 0 0 0 0 0 0 $-\frac{\sqrt{33}i}{33}$ 0 $\frac{\sqrt{33}}{33}$ 0 0	
	0 0 0 0 0 0 0 0 $\frac{\sqrt{33}i}{33}$ 0 $\frac{\sqrt{33}}{33}$ 0 0 0	
	0 0 $-\frac{\sqrt{33}}{44}$ 0 0 0 0 0 $\frac{\sqrt{55}}{220}$ 0 0 0 0 $-\frac{\sqrt{55}}{55}$	
	0 0 0 $\frac{\sqrt{33}}{44}$ 0 0 0 0 0 $-\frac{\sqrt{55}}{220}$ 0 0 $-\frac{\sqrt{55}}{55}$ 0	
	0 0 0 0 $\frac{\sqrt{33}}{44}$ 0 0 0 0 0 $\frac{\sqrt{55}}{220}$ 0 0 $\frac{\sqrt{55}i}{55}$	
	0 0 0 0 0 $-\frac{\sqrt{33}}{44}$ 0 0 0 0 0 $-\frac{\sqrt{55}}{220}$ $-\frac{\sqrt{55}i}{55}$ 0	
	0 0 0 0 0 0 0 0 0 $-\frac{\sqrt{55}}{55}$ 0 $\frac{\sqrt{55}i}{55}$ $-\frac{\sqrt{55}}{110}$ 0	
	0 0 0 0 0 0 0 0 0 $-\frac{\sqrt{55}}{55}$ 0 $-\frac{\sqrt{55}i}{55}$ 0 0 $\frac{\sqrt{55}}{110}$	
	0 $-\frac{\sqrt{33}i}{33}$ $\frac{\sqrt{55}}{220}$ 0 0 0 0 0 $-\frac{\sqrt{55}}{55}$ $\frac{7\sqrt{33}}{132}$ 0 0 0 0	
	$\frac{\sqrt{33}i}{33}$ 0 0 $-\frac{\sqrt{55}}{220}$ 0 0 $-\frac{\sqrt{55}}{55}$ 0 0 $-\frac{7\sqrt{33}}{132}$ 0 0 0 0	
	0 $\frac{\sqrt{33}}{33}$ 0 0 $\frac{\sqrt{55}}{220}$ 0 0 $\frac{\sqrt{55}i}{55}$ 0 0 $-\frac{7\sqrt{33}}{132}$ 0 0 0 0	
	$\frac{\sqrt{33}}{33}$ 0 0 0 0 $-\frac{\sqrt{55}}{220}$ $-\frac{\sqrt{55}i}{55}$ 0 0 0 0 $\frac{7\sqrt{33}}{132}$ 0 0	
	0 0 0 $-\frac{\sqrt{55}}{55}$ 0 $\frac{\sqrt{55}i}{55}$ $-\frac{\sqrt{55}}{110}$ 0 0 0 0 0 0 0 0	
	0 0 $-\frac{\sqrt{55}}{55}$ 0 $-\frac{\sqrt{55}i}{55}$ 0 0 $\frac{\sqrt{55}}{110}$ 0 0 0 0 0 0 0	
989	symmetry	$\frac{\sqrt{91}xyz(3x^4 - 5x^2y^2 - 5x^2z^2 + 3y^4 - 5y^2z^2 + 3z^4)}{2}$

continued ...

Table 10

No.	multipole	matrix													
$\mathbb{M}_7^{(1,-1;a)}(A_g)$	0	0	0	$\frac{\sqrt{770}}{154}$	0	$-\frac{\sqrt{770}i}{154}$	$\frac{\sqrt{770}}{154}$	0	0	0	0	0	0	0	0
	0	0	$\frac{\sqrt{770}}{154}$	0	$\frac{\sqrt{770}i}{154}$	0	0	$-\frac{\sqrt{770}}{154}$	0	0	0	0	0	0	0
	0	$\frac{\sqrt{770}}{154}$	0	0	$-\frac{5\sqrt{462}}{1848}$	0	0	$\frac{5\sqrt{462}i}{1848}$	0	0	$-\frac{3\sqrt{770}}{616}$	0	0	$-\frac{3\sqrt{770}i}{616}$	
	$\frac{\sqrt{770}}{154}$	0	0	0	0	$\frac{5\sqrt{462}}{1848}$	$-\frac{5\sqrt{462}i}{1848}$	0	0	0	$\frac{3\sqrt{770}}{616}$	$\frac{3\sqrt{770}i}{616}$	0	0	
	0	$-\frac{\sqrt{770}i}{154}$	$-\frac{5\sqrt{462}}{1848}$	0	0	0	0	$-\frac{5\sqrt{462}}{1848}$	$\frac{3\sqrt{770}}{616}$	0	0	0	0	$-\frac{3\sqrt{770}}{616}$	
	$\frac{\sqrt{770}i}{154}$	0	0	$\frac{5\sqrt{462}}{1848}$	0	0	$-\frac{5\sqrt{462}}{1848}$	0	0	$-\frac{3\sqrt{770}}{616}$	0	0	$-\frac{3\sqrt{770}}{616}$	0	
	$\frac{\sqrt{770}}{154}$	0	0	$\frac{5\sqrt{462}i}{1848}$	0	$-\frac{5\sqrt{462}}{1848}$	0	0	0	$\frac{3\sqrt{770}i}{616}$	0	$\frac{3\sqrt{770}}{616}$	0	0	
	0	$-\frac{\sqrt{770}}{154}$	$-\frac{5\sqrt{462}i}{1848}$	0	$-\frac{5\sqrt{462}}{1848}$	0	0	0	$-\frac{3\sqrt{770}i}{616}$	0	$\frac{3\sqrt{770}}{616}$	0	0	0	
	0	0	0	0	$\frac{3\sqrt{770}}{616}$	0	0	$\frac{3\sqrt{770}i}{616}$	0	0	$-\frac{3\sqrt{462}}{616}$	0	0	$\frac{3\sqrt{462}i}{616}$	
	0	0	0	0	0	$-\frac{3\sqrt{770}}{616}$	$-\frac{3\sqrt{770}i}{616}$	0	0	0	$\frac{3\sqrt{462}}{616}$	$-\frac{3\sqrt{462}i}{616}$	0		
	0	0	$-\frac{3\sqrt{770}}{616}$	0	0	0	0	$\frac{3\sqrt{770}}{616}$	$-\frac{3\sqrt{462}}{616}$	0	0	0	0	$-\frac{3\sqrt{462}}{616}$	
	0	0	0	$\frac{3\sqrt{770}}{616}$	0	$-\frac{3\sqrt{770}}{616}$	0	0	0	$\frac{3\sqrt{462}i}{616}$	0	$-\frac{3\sqrt{462}}{616}$	0	0	
	0	0	$\frac{3\sqrt{770}i}{616}$	0	$-\frac{3\sqrt{770}}{616}$	0	0	0	$-\frac{3\sqrt{462}i}{616}$	0	$-\frac{3\sqrt{462}}{616}$	0	0	0	

990 symmetry

$$-\frac{\sqrt{231}xyz(x-y)(x+y)(3x^2+3y^2-10z^2)}{4}$$

continued ...

Table 10

No.	multipole	matrix														
$\mathbb{M}_{7,0}^{(1,-1;a)}(E_g)$	0 0 0 $-\frac{\sqrt{2730}}{364}$ 0 $-\frac{\sqrt{2730}i}{364}$ 0 0 0 $-\frac{3\sqrt{182}}{364}$ 0 $\frac{3\sqrt{182}i}{364}$ $\frac{3\sqrt{182}}{182}$ 0															
	0 0 $-\frac{\sqrt{2730}}{364}$ 0 $\frac{\sqrt{2730}i}{364}$ 0 0 0 $-\frac{3\sqrt{182}}{364}$ 0 $-\frac{3\sqrt{182}i}{364}$ 0 0 $-\frac{3\sqrt{182}}{182}$															
	0 $-\frac{\sqrt{2730}}{364}$ 0 0 0 0 0 $-\frac{5\sqrt{182}i}{728}$ 0 0 $\frac{\sqrt{2730}}{364}$ 0 0 $\frac{\sqrt{2730}i}{728}$															
	$-\frac{\sqrt{2730}}{364}$ 0 0 0 0 0 $\frac{5\sqrt{182}i}{728}$ 0 0 0 0 $-\frac{\sqrt{2730}}{364}$ $-\frac{\sqrt{2730}i}{728}$ 0															
	0 $-\frac{\sqrt{2730}i}{364}$ 0 0 0 0 0 $-\frac{5\sqrt{182}}{728}$ $\frac{\sqrt{2730}}{364}$ 0 0 0 0 $-\frac{\sqrt{2730}}{728}$															
	$\frac{\sqrt{2730}i}{364}$ 0 0 0 0 0 $-\frac{5\sqrt{182}}{728}$ 0 0 $-\frac{\sqrt{2730}}{364}$ 0 0 0 $-\frac{\sqrt{2730}}{728}$ 0															
	0 0 0 $-\frac{5\sqrt{182}i}{728}$ 0 $-\frac{5\sqrt{182}}{728}$ 0 0 0 $\frac{\sqrt{2730}i}{728}$ 0 $-\frac{\sqrt{2730}}{728}$ 0 0 0															
	0 0 $\frac{5\sqrt{182}i}{728}$ 0 $-\frac{5\sqrt{182}}{728}$ 0 0 0 $-\frac{\sqrt{2730}i}{728}$ 0 $-\frac{\sqrt{2730}}{728}$ 0 0 0 0															
	0 $-\frac{3\sqrt{182}}{364}$ 0 0 $\frac{\sqrt{2730}}{364}$ 0 0 0 $\frac{\sqrt{2730}i}{728}$ 0 0 0 0 0 0 $\frac{9\sqrt{182}i}{728}$															
	$-\frac{3\sqrt{182}}{364}$ 0 0 0 0 $-\frac{\sqrt{2730}}{364}$ $-\frac{\sqrt{2730}i}{728}$ 0 0 0 0 0 0 $-\frac{9\sqrt{182}i}{728}$ 0															
	0 $\frac{3\sqrt{182}i}{364}$ $\frac{\sqrt{2730}}{364}$ 0 0 0 0 0 $-\frac{\sqrt{2730}}{728}$ 0 0 0 0 0 $\frac{9\sqrt{182}}{728}$															
	$-\frac{3\sqrt{182}i}{364}$ 0 0 $-\frac{\sqrt{2730}}{364}$ 0 0 $-\frac{\sqrt{2730}}{728}$ 0 0 0 0 0 $\frac{9\sqrt{182}}{728}$ 0															
	$\frac{3\sqrt{182}}{182}$ 0 0 $\frac{\sqrt{2730}i}{728}$ 0 $-\frac{\sqrt{2730}}{728}$ 0 0 0 $\frac{9\sqrt{182}i}{728}$ 0 $\frac{9\sqrt{182}}{728}$ 0 0															
	0 $-\frac{3\sqrt{182}}{182}$ $-\frac{\sqrt{2730}i}{728}$ 0 $-\frac{\sqrt{2730}}{728}$ 0 0 0 $-\frac{9\sqrt{182}i}{728}$ 0 $\frac{9\sqrt{182}}{728}$ 0 0 0															

$$-\frac{\sqrt{77}xyz(3x^4 - 20x^2y^2 + 10x^2z^2 + 3y^4 + 10y^2z^2 - 6z^4)}{4}$$

991 symmetry

continued ...

Table 10

No.	multipole	matrix
$\mathbb{M}_{7,1}^{(1,-1;a)}(E_g)$	0	0 0 0 $-\frac{\sqrt{910}}{364}$ 0 $\frac{\sqrt{910}i}{364}$ $\frac{\sqrt{910}}{182}$ 0 0 $\frac{3\sqrt{546}}{364}$ 0 $\frac{3\sqrt{546}i}{364}$ 0 0
	0	0 0 $-\frac{\sqrt{910}}{364}$ 0 $-\frac{\sqrt{910}i}{364}$ 0 0 $-\frac{\sqrt{910}}{182}$ $\frac{3\sqrt{546}}{364}$ 0 $-\frac{3\sqrt{546}i}{364}$ 0 0 0
	0	$-\frac{\sqrt{910}}{364}$ 0 0 $\frac{5\sqrt{546}}{1092}$ 0 0 $\frac{5\sqrt{546}i}{2184}$ 0 0 0 0 0 0 $\frac{3\sqrt{910}i}{728}$
	$-\frac{\sqrt{910}}{364}$	0 0 0 0 $-\frac{5\sqrt{546}}{1092}$ $-\frac{5\sqrt{546}i}{2184}$ 0 0 0 0 0 0 $-\frac{3\sqrt{910}i}{728}$ 0
	0	$\frac{\sqrt{910}i}{364}$ $\frac{5\sqrt{546}}{1092}$ 0 0 0 0 $-\frac{5\sqrt{546}}{2184}$ 0 0 0 0 0 0 $\frac{3\sqrt{910}}{728}$
	$-\frac{\sqrt{910}i}{364}$	0 0 $-\frac{5\sqrt{546}}{1092}$ 0 0 $-\frac{5\sqrt{546}}{2184}$ 0 0 0 0 0 0 $\frac{3\sqrt{910}}{728}$ 0
	$\frac{\sqrt{910}}{182}$	0 0 $\frac{5\sqrt{546}i}{2184}$ 0 $-\frac{5\sqrt{546}}{2184}$ 0 0 0 $\frac{3\sqrt{910}i}{728}$ 0 $\frac{3\sqrt{910}}{728}$ 0 0
	0	$-\frac{\sqrt{910}}{182}$ $-\frac{5\sqrt{546}i}{2184}$ 0 $-\frac{5\sqrt{546}}{2184}$ 0 0 0 $-\frac{3\sqrt{910}i}{728}$ 0 $\frac{3\sqrt{910}}{728}$ 0 0
	0	$\frac{3\sqrt{546}}{364}$ 0 0 0 0 0 $\frac{3\sqrt{910}i}{728}$ 0 0 $-\frac{3\sqrt{546}}{364}$ 0 0 $-\frac{3\sqrt{546}i}{728}$
	$\frac{3\sqrt{546}}{364}$	0 0 0 0 0 0 $-\frac{3\sqrt{910}i}{728}$ 0 0 0 0 $\frac{3\sqrt{546}}{364}$ $\frac{3\sqrt{546}i}{728}$ 0
	0	$\frac{3\sqrt{546}i}{364}$ 0 0 0 0 0 0 $\frac{3\sqrt{910}}{728}$ $-\frac{3\sqrt{546}}{364}$ 0 0 0 0 $\frac{3\sqrt{546}}{728}$
	$-\frac{3\sqrt{546}i}{364}$	0 0 0 0 0 0 $\frac{3\sqrt{910}}{728}$ 0 0 $\frac{3\sqrt{546}}{364}$ 0 0 $\frac{3\sqrt{546}}{728}$ 0
	0	0 0 0 $\frac{3\sqrt{910}i}{728}$ 0 $\frac{3\sqrt{910}}{728}$ 0 0 0 $-\frac{3\sqrt{546}i}{728}$ 0 $\frac{3\sqrt{546}}{728}$ 0 0
	0	0 0 $-\frac{3\sqrt{910}i}{728}$ 0 $\frac{3\sqrt{910}}{728}$ 0 0 0 $\frac{3\sqrt{546}i}{728}$ 0 $\frac{3\sqrt{546}}{728}$ 0 0
$\frac{x(16x^6 - 168x^4y^2 - 168x^4z^2 + 210x^2y^4 + 420x^2y^2z^2 + 210x^2z^4 - 35y^6 - 105y^4z^2 - 105y^2z^4 - 35z^6)}{16}$		

992 symmetry

$$\frac{x(16x^6 - 168x^4y^2 - 168x^4z^2 + 210x^2y^4 + 420x^2y^2z^2 + 210x^2z^4 - 35y^6 - 105y^4z^2 - 105y^2z^4 - 35z^6)}{16}$$

continued ...

Table 10

No.	multipole	matrix														
$\mathbb{M}_{7,0}^{(1,-1;a)}(T_g, 1)$	0	$\frac{\sqrt{858}}{286}$	0	0	$-\frac{\sqrt{1430}}{1144}$	0	0	$\frac{\sqrt{1430}i}{1144}$	0	0	$-\frac{3\sqrt{858}}{1144}$	0	0	$-\frac{3\sqrt{858}i}{1144}$		
	$\frac{\sqrt{858}}{286}$	0	0	0	0	$\frac{\sqrt{1430}}{1144}$	$-\frac{\sqrt{1430}i}{1144}$	0	0	0	0	$\frac{3\sqrt{858}}{1144}$	$\frac{3\sqrt{858}i}{1144}$	0		
	0	0	0	$\frac{5\sqrt{858}}{429}$	0	$-\frac{5\sqrt{858}i}{1144}$	$\frac{5\sqrt{858}}{1144}$	0	0	0	0	$-\frac{5\sqrt{1430}i}{1144}$	$-\frac{5\sqrt{1430}}{1144}$	0		
	0	0	$\frac{5\sqrt{858}}{429}$	0	$\frac{5\sqrt{858}i}{1144}$	0	0	$-\frac{5\sqrt{858}}{1144}$	0	0	$\frac{5\sqrt{1430}i}{1144}$	0	0	$\frac{5\sqrt{1430}}{1144}$		
	$-\frac{\sqrt{1430}}{1144}$	0	0	$-\frac{5\sqrt{858}i}{1144}$	0	$-\frac{25\sqrt{858}}{6864}$	0	0	0	$\frac{\sqrt{1430}i}{572}$	0	$-\frac{7\sqrt{1430}}{2288}$	0	0	0	
	0	$\frac{\sqrt{1430}}{1144}$	$\frac{5\sqrt{858}i}{1144}$	0	$-\frac{25\sqrt{858}}{6864}$	0	0	0	$-\frac{\sqrt{1430}i}{572}$	0	$-\frac{7\sqrt{1430}}{2288}$	0	0	0	0	
	0	$\frac{\sqrt{1430}i}{1144}$	$\frac{5\sqrt{858}}{1144}$	0	0	0	0	$-\frac{25\sqrt{858}}{6864}$	$\frac{\sqrt{1430}}{572}$	0	0	0	0	$\frac{7\sqrt{1430}}{2288}$		
	$-\frac{\sqrt{1430}i}{1144}$	0	0	$-\frac{5\sqrt{858}}{1144}$	0	0	$-\frac{25\sqrt{858}}{6864}$	0	0	$-\frac{\sqrt{1430}}{572}$	0	0	$\frac{7\sqrt{1430}}{2288}$	0		
	0	0	0	0	0	$\frac{\sqrt{1430}i}{572}$	$\frac{\sqrt{1430}}{572}$	0	0	$\frac{\sqrt{858}}{286}$	0	$\frac{\sqrt{858}i}{572}$	$-\frac{\sqrt{858}}{572}$	0		
	0	0	0	0	$-\frac{\sqrt{1430}i}{572}$	0	0	$-\frac{\sqrt{1430}}{572}$	$\frac{\sqrt{858}}{286}$	0	$-\frac{\sqrt{858}i}{572}$	0	0	$\frac{\sqrt{858}}{572}$		
	$-\frac{3\sqrt{858}}{1144}$	0	0	$-\frac{5\sqrt{1430}i}{1144}$	0	$-\frac{7\sqrt{1430}}{2288}$	0	0	0	$\frac{\sqrt{858}i}{572}$	0	$-\frac{\sqrt{858}}{176}$	0	0	0	
	0	$\frac{3\sqrt{858}}{1144}$	$\frac{5\sqrt{1430}i}{1144}$	0	$-\frac{7\sqrt{1430}}{2288}$	0	0	0	$-\frac{\sqrt{858}i}{572}$	0	$-\frac{\sqrt{858}}{176}$	0	0	0	0	
	0	$-\frac{3\sqrt{858}i}{1144}$	$-\frac{5\sqrt{1430}}{1144}$	0	0	0	0	$\frac{7\sqrt{1430}}{2288}$	$-\frac{\sqrt{858}}{572}$	0	0	0	0	$-\frac{\sqrt{858}}{176}$		
	$\frac{3\sqrt{858}i}{1144}$	0	0	$\frac{5\sqrt{1430}}{1144}$	0	0	$\frac{7\sqrt{1430}}{2288}$	0	0	$\frac{\sqrt{858}}{572}$	0	0	0	$-\frac{\sqrt{858}}{176}$	0	

$$\frac{y(35x^6 - 210x^4y^2 + 105x^4z^2 + 168x^2y^4 - 420x^2y^2z^2 + 105x^2z^4 - 16y^6 + 168y^4z^2 - 210y^2z^4 + 35z^6)}{16}$$

993 symmetry

continued ...

Table 10

No.	multipole	matrix													
$\mathbb{M}_{7,1}^{(1,-1;a)}(T_g, 1)$	0	$-\frac{\sqrt{858}i}{286}$	$-\frac{\sqrt{1430}}{1144}$	0	0	0	0	$-\frac{\sqrt{1430}}{1144}$	$\frac{3\sqrt{858}}{1144}$	0	0	0	0	$-\frac{3\sqrt{858}}{1144}$	
	$\frac{\sqrt{858}i}{286}$	0	0	$\frac{\sqrt{1430}}{1144}$	0	0	$-\frac{\sqrt{1430}}{1144}$	0	0	$-\frac{3\sqrt{858}}{1144}$	0	0	$-\frac{3\sqrt{858}}{1144}$	0	
	$-\frac{\sqrt{1430}}{1144}$	0	0	$\frac{25\sqrt{858}i}{6864}$	0	$\frac{5\sqrt{858}}{1144}$	0	0	0	$-\frac{7\sqrt{1430}i}{2288}$	0	$\frac{\sqrt{1430}}{572}$	0	0	
	0	$\frac{\sqrt{1430}}{1144}$	$-\frac{25\sqrt{858}i}{6864}$	0	$\frac{5\sqrt{858}}{1144}$	0	0	0	$\frac{7\sqrt{1430}i}{2288}$	0	$\frac{\sqrt{1430}}{572}$	0	0	0	
	0	0	0	$\frac{5\sqrt{858}}{1144}$	0	$-\frac{5\sqrt{858}i}{429}$	$\frac{5\sqrt{858}}{1144}$	0	0	$-\frac{5\sqrt{1430}}{1144}$	0	0	$\frac{5\sqrt{1430}}{1144}$	0	
	0	0	$\frac{5\sqrt{858}}{1144}$	0	$\frac{5\sqrt{858}i}{429}$	0	0	$-\frac{5\sqrt{858}}{1144}$	$-\frac{5\sqrt{1430}}{1144}$	0	0	0	0	$-\frac{5\sqrt{1430}}{1144}$	
	0	$-\frac{\sqrt{1430}}{1144}$	0	0	$\frac{5\sqrt{858}}{1144}$	0	0	$\frac{25\sqrt{858}i}{6864}$	0	0	$-\frac{\sqrt{1430}}{572}$	0	0	$\frac{7\sqrt{1430}i}{2288}$	
	$-\frac{\sqrt{1430}}{1144}$	0	0	0	0	$-\frac{5\sqrt{858}}{1144}$	$-\frac{25\sqrt{858}i}{6864}$	0	0	0	0	$\frac{\sqrt{1430}}{572}$	$-\frac{7\sqrt{1430}i}{2288}$	0	
	$\frac{3\sqrt{858}}{1144}$	0	0	$-\frac{7\sqrt{1430}i}{2288}$	0	$-\frac{5\sqrt{1430}}{1144}$	0	0	0	$\frac{\sqrt{858}i}{176}$	0	$-\frac{\sqrt{858}}{572}$	0	0	
	0	$-\frac{3\sqrt{858}}{1144}$	$\frac{7\sqrt{1430}i}{2288}$	0	$-\frac{5\sqrt{1430}}{1144}$	0	0	0	$-\frac{\sqrt{858}i}{176}$	0	$-\frac{\sqrt{858}}{572}$	0	0	0	
	0	0	0	$\frac{\sqrt{1430}}{572}$	0	0	$-\frac{\sqrt{1430}}{572}$	0	0	$-\frac{\sqrt{858}}{572}$	0	$-\frac{\sqrt{858}i}{286}$	$-\frac{\sqrt{858}}{572}$	0	
	0	0	$\frac{\sqrt{1430}}{572}$	0	0	0	0	$\frac{\sqrt{1430}}{572}$	$-\frac{\sqrt{858}}{572}$	0	$\frac{\sqrt{858}i}{286}$	0	0	$\frac{\sqrt{858}}{572}$	
	0	$-\frac{3\sqrt{858}}{1144}$	0	0	$\frac{5\sqrt{1430}}{1144}$	0	0	$\frac{7\sqrt{1430}i}{2288}$	0	0	$-\frac{\sqrt{858}}{572}$	0	0	$\frac{\sqrt{858}i}{176}$	
	$-\frac{3\sqrt{858}}{1144}$	0	0	0	$-\frac{5\sqrt{1430}}{1144}$	$-\frac{7\sqrt{1430}i}{2288}$	0	0	0	0	$\frac{\sqrt{858}}{572}$	$-\frac{\sqrt{858}i}{176}$	0	0	
994	symmetry	$\frac{z(35x^6 + 105x^4y^2 - 210x^4z^2 + 105x^2y^4 - 420x^2y^2z^2 + 168x^2z^4 + 35y^6 - 210y^4z^2 + 168y^2z^4 - 16z^6)}{16}$													

continued ...

Table 10

No.	multipole	matrix													
$\mathbb{M}_{7,2}^{(1,-1;a)}(T_g, 1)$	$\frac{\sqrt{858}}{286}$	0	0	$\frac{\sqrt{1430}i}{1144}$	0	$-\frac{\sqrt{1430}}{1144}$	0	0	0	$\frac{3\sqrt{858}i}{1144}$	0	$\frac{3\sqrt{858}}{1144}$	0	0	
	0	$-\frac{\sqrt{858}}{286}$	$-\frac{\sqrt{1430}i}{1144}$	0	$-\frac{\sqrt{1430}}{1144}$	0	0	0	$-\frac{3\sqrt{858}i}{1144}$	0	$\frac{3\sqrt{858}}{1144}$	0	0	0	
	0	$\frac{\sqrt{1430}i}{1144}$	$-\frac{25\sqrt{858}}{6864}$	0	0	0	0	$\frac{5\sqrt{858}}{1144}$	$-\frac{7\sqrt{1430}}{2288}$	0	0	0	0	$-\frac{\sqrt{1430}}{572}$	
	$-\frac{\sqrt{1430}i}{1144}$	0	0	$\frac{25\sqrt{858}}{6864}$	0	0	$\frac{5\sqrt{858}}{1144}$	0	0	$\frac{7\sqrt{1430}}{2288}$	0	0	$-\frac{\sqrt{1430}}{572}$	0	
	0	$-\frac{\sqrt{1430}}{1144}$	0	0	$-\frac{25\sqrt{858}}{6864}$	0	0	$-\frac{5\sqrt{858}i}{1144}$	0	0	$\frac{7\sqrt{1430}}{2288}$	0	0	$-\frac{\sqrt{1430}i}{572}$	
	$-\frac{\sqrt{1430}}{1144}$	0	0	0	0	$\frac{25\sqrt{858}}{6864}$	$\frac{5\sqrt{858}i}{1144}$	0	0	0	0	$-\frac{7\sqrt{1430}}{2288}$	$\frac{\sqrt{1430}i}{572}$	0	
	0	0	0	$\frac{5\sqrt{858}}{1144}$	0	$-\frac{5\sqrt{858}i}{1144}$	$\frac{5\sqrt{858}}{429}$	0	0	$\frac{5\sqrt{1430}}{1144}$	0	$\frac{5\sqrt{1430}i}{1144}$	0	0	
	0	$\frac{5\sqrt{858}}{1144}$	0	$\frac{5\sqrt{858}i}{1144}$	0	0	$-\frac{5\sqrt{858}}{429}$	$\frac{5\sqrt{1430}}{1144}$	0	$-\frac{5\sqrt{1430}i}{1144}$	0	0	0		
	0	$\frac{3\sqrt{858}i}{1144}$	$-\frac{7\sqrt{1430}}{2288}$	0	0	0	0	$\frac{5\sqrt{1430}}{1144}$	$-\frac{\sqrt{858}}{176}$	0	0	0	0	$-\frac{\sqrt{858}}{572}$	
	$-\frac{3\sqrt{858}i}{1144}$	0	0	$\frac{7\sqrt{1430}}{2288}$	0	0	$\frac{5\sqrt{1430}}{1144}$	0	0	$\frac{\sqrt{858}}{176}$	0	0	$-\frac{\sqrt{858}}{572}$	0	
	0	$\frac{3\sqrt{858}}{1144}$	0	0	$\frac{7\sqrt{1430}}{2288}$	0	0	$\frac{5\sqrt{1430}i}{1144}$	0	0	$-\frac{\sqrt{858}}{176}$	0	0	$\frac{\sqrt{858}i}{572}$	
	$\frac{3\sqrt{858}}{1144}$	0	0	0	0	$-\frac{7\sqrt{1430}}{2288}$	$-\frac{5\sqrt{1430}i}{1144}$	0	0	0	0	$\frac{\sqrt{858}}{176}$	$-\frac{\sqrt{858}i}{572}$	0	
	0	0	0	$-\frac{\sqrt{1430}}{572}$	0	$-\frac{\sqrt{1430}i}{572}$	0	0	0	$-\frac{\sqrt{858}}{572}$	0	$\frac{\sqrt{858}i}{572}$	$\frac{\sqrt{858}}{286}$	0	
	0	0	$-\frac{\sqrt{1430}}{572}$	0	$\frac{\sqrt{1430}i}{572}$	0	0	0	$-\frac{\sqrt{858}}{572}$	0	$-\frac{\sqrt{858}i}{572}$	0	0	$-\frac{\sqrt{858}}{286}$	
995	symmetry	$\frac{\sqrt{231}x(10x^2-3y^2-3z^2)(y^2-2yz-z^2)(y^2+2yz-z^2)}{16}$													

continued ...

Table 10

No.	multipole	matrix													
$\mathbb{M}_{7,0}^{(1,-1;a)}(T_g, 2)$	0	$-\frac{3\sqrt{182}}{182}$	0	0	$\frac{\sqrt{2730}}{728}$	0	0	$-\frac{\sqrt{2730}i}{728}$	0	0	$\frac{9\sqrt{182}}{728}$	0	0	$\frac{9\sqrt{182}i}{728}$	
	$-\frac{3\sqrt{182}}{182}$	0	0	0	0	$-\frac{\sqrt{2730}}{728}$	$\frac{\sqrt{2730}i}{728}$	0	0	0	$-\frac{9\sqrt{182}}{728}$	$-\frac{9\sqrt{182}i}{728}$	0		
	0	0	0	0	0	$-\frac{5\sqrt{182}i}{728}$	$\frac{5\sqrt{182}}{728}$	0	0	0	$\frac{\sqrt{2730}i}{728}$	$\frac{\sqrt{2730}}{728}$	0		
	0	0	0	0	$\frac{5\sqrt{182}i}{728}$	0	0	$-\frac{5\sqrt{182}}{728}$	0	0	$-\frac{\sqrt{2730}i}{728}$	0	0	$-\frac{\sqrt{2730}}{728}$	
	$\frac{\sqrt{2730}}{728}$	0	0	$-\frac{5\sqrt{182}i}{728}$	0	$-\frac{15\sqrt{182}}{1456}$	0	0	0	$\frac{\sqrt{2730}i}{364}$	0	$-\frac{\sqrt{2730}}{1456}$	0	0	
	0	$-\frac{\sqrt{2730}}{728}$	$\frac{5\sqrt{182}i}{728}$	0	$-\frac{15\sqrt{182}}{1456}$	0	0	0	$-\frac{\sqrt{2730}i}{364}$	0	$-\frac{\sqrt{2730}}{1456}$	0	0	0	
	0	$-\frac{\sqrt{2730}i}{728}$	$\frac{5\sqrt{182}}{728}$	0	0	0	0	$-\frac{15\sqrt{182}}{1456}$	$\frac{\sqrt{2730}}{364}$	0	0	0	0	$\frac{\sqrt{2730}}{1456}$	
	$\frac{\sqrt{2730}i}{728}$	0	0	$-\frac{5\sqrt{182}}{728}$	0	0	$-\frac{15\sqrt{182}}{1456}$	0	0	$-\frac{\sqrt{2730}}{364}$	0	0	$\frac{\sqrt{2730}}{1456}$	0	
	0	0	0	0	0	$\frac{\sqrt{2730}i}{364}$	$\frac{\sqrt{2730}}{364}$	0	0	$\frac{3\sqrt{182}}{182}$	0	$\frac{3\sqrt{182}i}{364}$	$-\frac{3\sqrt{182}}{364}$	0	
	0	0	0	0	$-\frac{\sqrt{2730}i}{364}$	0	0	$-\frac{\sqrt{2730}}{364}$	$\frac{3\sqrt{182}}{182}$	0	$-\frac{3\sqrt{182}i}{364}$	0	0	$\frac{3\sqrt{182}}{364}$	
996	$\frac{9\sqrt{182}}{728}$	0	0	$\frac{\sqrt{2730}i}{728}$	0	$-\frac{\sqrt{2730}}{1456}$	0	0	0	$\frac{3\sqrt{182}i}{364}$	0	$\frac{15\sqrt{182}}{1456}$	0	0	
	0	$-\frac{9\sqrt{182}}{728}$	$-\frac{\sqrt{2730}i}{728}$	0	$-\frac{\sqrt{2730}}{1456}$	0	0	0	$-\frac{3\sqrt{182}i}{364}$	0	$\frac{15\sqrt{182}}{1456}$	0	0	0	
	0	$\frac{9\sqrt{182}i}{728}$	$\frac{\sqrt{2730}}{728}$	0	0	0	0	$\frac{\sqrt{2730}}{1456}$	$-\frac{3\sqrt{182}}{364}$	0	0	0	0	$\frac{15\sqrt{182}}{1456}$	
	$-\frac{9\sqrt{182}i}{728}$	0	0	$-\frac{\sqrt{2730}}{728}$	0	0	$\frac{\sqrt{2730}}{1456}$	0	0	$\frac{3\sqrt{182}}{364}$	0	0	$\frac{15\sqrt{182}}{1456}$	0	
$-\frac{\sqrt{231}y(x^2 - 2xz - z^2)(x^2 + 2xz - z^2)(3x^2 - 10y^2 + 3z^2)}{16}$															
symmetry															

continued ...

Table 10

No.	multipole	matrix													
$\mathbb{M}_{7,1}^{(1,-1;a)}(T_g, 2)$	0	$\frac{3\sqrt{182}i}{182}$	$\frac{\sqrt{2730}}{728}$	0	0	0	0	$\frac{\sqrt{2730}}{728}$	$-\frac{9\sqrt{182}}{728}$	0	0	0	0	$\frac{9\sqrt{182}}{728}$	
	$-\frac{3\sqrt{182}i}{182}$	0	0	$-\frac{\sqrt{2730}}{728}$	0	0	$\frac{\sqrt{2730}}{728}$	0	0	$\frac{9\sqrt{182}}{728}$	0	0	$\frac{9\sqrt{182}}{728}$	0	
	$\frac{\sqrt{2730}}{728}$	0	0	$\frac{15\sqrt{182}i}{1456}$	0	$\frac{5\sqrt{182}}{728}$	0	0	0	$-\frac{\sqrt{2730}i}{1456}$	0	$\frac{\sqrt{2730}}{364}$	0	0	
	0	$-\frac{\sqrt{2730}}{728}$	$-\frac{15\sqrt{182}i}{1456}$	0	$\frac{5\sqrt{182}}{728}$	0	0	0	$\frac{\sqrt{2730}i}{1456}$	0	$\frac{\sqrt{2730}}{364}$	0	0	0	
	0	0	0	$\frac{5\sqrt{182}}{728}$	0	0	$\frac{5\sqrt{182}}{728}$	0	0	$\frac{\sqrt{2730}}{728}$	0	0	$-\frac{\sqrt{2730}}{728}$	0	
	0	0	$\frac{5\sqrt{182}}{728}$	0	0	0	0	$-\frac{5\sqrt{182}}{728}$	$\frac{\sqrt{2730}}{728}$	0	0	0	0	$\frac{\sqrt{2730}}{728}$	
	0	$\frac{\sqrt{2730}}{728}$	0	0	$\frac{5\sqrt{182}}{728}$	0	0	$\frac{15\sqrt{182}i}{1456}$	0	0	$-\frac{\sqrt{2730}}{364}$	0	0	$\frac{\sqrt{2730}i}{1456}$	
	$\frac{\sqrt{2730}}{728}$	0	0	0	0	$-\frac{5\sqrt{182}}{728}$	$-\frac{15\sqrt{182}i}{1456}$	0	0	0	$\frac{\sqrt{2730}}{364}$	$-\frac{\sqrt{2730}i}{1456}$	0		
	$-\frac{9\sqrt{182}}{728}$	0	0	$-\frac{\sqrt{2730}i}{1456}$	0	$\frac{\sqrt{2730}}{728}$	0	0	0	$-\frac{15\sqrt{182}i}{1456}$	0	$-\frac{3\sqrt{182}}{364}$	0	0	
	0	$\frac{9\sqrt{182}}{728}$	$\frac{\sqrt{2730}i}{1456}$	0	$\frac{\sqrt{2730}}{728}$	0	0	0	$\frac{15\sqrt{182}i}{1456}$	0	$-\frac{3\sqrt{182}}{364}$	0	0	0	
	0	0	0	$\frac{\sqrt{2730}}{364}$	0	0	$-\frac{\sqrt{2730}}{364}$	0	0	$-\frac{3\sqrt{182}}{364}$	0	$-\frac{3\sqrt{182}i}{182}$	$-\frac{3\sqrt{182}}{364}$	0	
	0	0	$\frac{\sqrt{2730}}{364}$	0	0	0	0	$\frac{\sqrt{2730}}{364}$	$-\frac{3\sqrt{182}}{364}$	0	$\frac{3\sqrt{182}i}{182}$	0	0	$\frac{3\sqrt{182}}{364}$	
	0	$\frac{9\sqrt{182}}{728}$	0	0	$-\frac{\sqrt{2730}}{728}$	0	0	$\frac{\sqrt{2730}i}{1456}$	0	0	$-\frac{3\sqrt{182}}{364}$	0	0	$-\frac{15\sqrt{182}i}{1456}$	
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													
$\mathbb{M}_{7,2}^{(1,-1;a)}(T_g, 2)$	$-\frac{3\sqrt{182}}{182}$	0	0	$-\frac{\sqrt{2730}i}{728}$	0	$\frac{\sqrt{2730}}{728}$	0	0	0	$-\frac{9\sqrt{182}i}{728}$	0	$-\frac{9\sqrt{182}}{728}$	0	0	
	0	$\frac{3\sqrt{182}}{182}$	$\frac{\sqrt{2730}i}{728}$	0	$\frac{\sqrt{2730}}{728}$	0	0	0	$\frac{9\sqrt{182}i}{728}$	0	$-\frac{9\sqrt{182}}{728}$	0	0	0	
	0	$-\frac{\sqrt{2730}i}{728}$	$-\frac{15\sqrt{182}}{1456}$	0	0	0	0	$\frac{5\sqrt{182}}{728}$	$-\frac{\sqrt{2730}}{1456}$	0	0	0	0	$-\frac{\sqrt{2730}}{364}$	
	$\frac{\sqrt{2730}i}{728}$	0	0	$\frac{15\sqrt{182}}{1456}$	0	0	$\frac{5\sqrt{182}}{728}$	0	0	$\frac{\sqrt{2730}}{1456}$	0	0	$-\frac{\sqrt{2730}}{364}$	0	
	0	$\frac{\sqrt{2730}}{728}$	0	0	$-\frac{15\sqrt{182}}{1456}$	0	0	$-\frac{5\sqrt{182}i}{728}$	0	0	$\frac{\sqrt{2730}}{1456}$	0	0	$-\frac{\sqrt{2730}i}{364}$	
	$\frac{\sqrt{2730}}{728}$	0	0	0	0	$\frac{15\sqrt{182}}{1456}$	$\frac{5\sqrt{182}i}{728}$	0	0	0	0	$-\frac{\sqrt{2730}}{1456}$	$\frac{\sqrt{2730}i}{364}$	0	
	0	0	0	$\frac{5\sqrt{182}}{728}$	0	$-\frac{5\sqrt{182}i}{728}$	0	0	0	$-\frac{\sqrt{2730}}{728}$	0	$-\frac{\sqrt{2730}i}{728}$	0	0	
	0	0	$\frac{5\sqrt{182}}{728}$	0	$\frac{5\sqrt{182}i}{728}$	0	0	0	$-\frac{\sqrt{2730}}{728}$	0	$\frac{\sqrt{2730}i}{728}$	0	0	0	
	0	$-\frac{9\sqrt{182}i}{728}$	$-\frac{\sqrt{2730}}{1456}$	0	0	0	$-\frac{\sqrt{2730}}{728}$	$\frac{15\sqrt{182}}{1456}$	0	0	0	0	$-\frac{3\sqrt{182}}{364}$		
	$\frac{9\sqrt{182}i}{728}$	0	0	$\frac{\sqrt{2730}}{1456}$	0	0	$-\frac{\sqrt{2730}}{728}$	0	0	$-\frac{15\sqrt{182}}{1456}$	0	0	$-\frac{3\sqrt{182}}{364}$	0	
	0	$-\frac{9\sqrt{182}}{728}$	0	0	$\frac{\sqrt{2730}}{1456}$	0	0	$-\frac{\sqrt{2730}i}{728}$	0	0	$\frac{15\sqrt{182}}{1456}$	0	0	$\frac{3\sqrt{182}i}{364}$	
	$-\frac{9\sqrt{182}}{728}$	0	0	0	0	$-\frac{\sqrt{2730}}{1456}$	$\frac{\sqrt{2730}i}{728}$	0	0	0	0	$-\frac{15\sqrt{182}}{1456}$	$-\frac{3\sqrt{182}i}{364}$	0	
	0	0	0	$-\frac{\sqrt{2730}}{364}$	0	$-\frac{\sqrt{2730}i}{364}$	0	0	0	$-\frac{3\sqrt{182}}{364}$	0	$\frac{3\sqrt{182}i}{364}$	$\frac{3\sqrt{182}}{182}$	0	
	0	0	$-\frac{\sqrt{2730}}{364}$	0	$\frac{\sqrt{2730}i}{364}$	0	0	0	$-\frac{3\sqrt{182}}{364}$	0	$-\frac{3\sqrt{182}i}{364}$	0	0	$-\frac{3\sqrt{182}}{182}$	

$$\frac{\sqrt{6006}x(y-z)(y+z)(y^2-4yz+z^2)(y^2+4yz+z^2)}{32}$$

998 symmetry

continued ...

Table 10

No.	multipole	matrix													
$\mathbb{M}_{7,0}^{(1,-1;a)}(T_g, 3)$	0	0	0	0	$-\frac{\sqrt{105}}{56}$	0	0	$-\frac{\sqrt{105}i}{56}$	0	0	$\frac{3\sqrt{7}}{56}$	0	0	$-\frac{3\sqrt{7}i}{56}$	
	0	0	0	0	0	$\frac{\sqrt{105}}{56}$	$\frac{\sqrt{105}i}{56}$	0	0	0	0	$-\frac{3\sqrt{7}}{56}$	$\frac{3\sqrt{7}i}{56}$	0	
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	$-\frac{\sqrt{105}}{56}$	0	0	0	0	$\frac{5\sqrt{7}}{112}$	0	0	0	$-\frac{\sqrt{105}i}{56}$	0	$-\frac{\sqrt{105}}{112}$	0	0	
	0	$\frac{\sqrt{105}}{56}$	0	0	$\frac{5\sqrt{7}}{112}$	0	0	0	$\frac{\sqrt{105}i}{56}$	0	$-\frac{\sqrt{105}}{112}$	0	0	0	
	0	$-\frac{\sqrt{105}i}{56}$	0	0	0	0	0	$-\frac{5\sqrt{7}}{112}$	$\frac{\sqrt{105}}{56}$	0	0	0	0	$-\frac{\sqrt{105}}{112}$	
	$\frac{\sqrt{105}i}{56}$	0	0	0	0	0	$-\frac{5\sqrt{7}}{112}$	0	0	$-\frac{\sqrt{105}}{56}$	0	0	$-\frac{\sqrt{105}}{112}$	0	
	0	0	0	0	0	$-\frac{\sqrt{105}i}{56}$	$\frac{\sqrt{105}}{56}$	0	0	0	0	$\frac{3\sqrt{7}i}{56}$	$\frac{3\sqrt{7}}{56}$	0	
	0	0	0	0	$\frac{\sqrt{105}i}{56}$	0	0	$-\frac{\sqrt{105}}{56}$	0	0	$-\frac{3\sqrt{7}i}{56}$	0	0	$-\frac{3\sqrt{7}}{56}$	
	$\frac{3\sqrt{7}}{56}$	0	0	0	0	$-\frac{\sqrt{105}}{112}$	0	0	0	$\frac{3\sqrt{7}i}{56}$	0	$\frac{3\sqrt{7}}{112}$	0	0	
	0	$-\frac{3\sqrt{7}}{56}$	0	0	$-\frac{\sqrt{105}}{112}$	0	0	0	$-\frac{3\sqrt{7}i}{56}$	0	$\frac{3\sqrt{7}}{112}$	0	0	0	
	0	$-\frac{3\sqrt{7}i}{56}$	0	0	0	0	0	$-\frac{\sqrt{105}}{112}$	$\frac{3\sqrt{7}}{56}$	0	0	0	0	$-\frac{3\sqrt{7}}{112}$	
	$\frac{3\sqrt{7}i}{56}$	0	0	0	0	0	$-\frac{\sqrt{105}}{112}$	0	0	$-\frac{3\sqrt{7}}{56}$	0	0	$-\frac{3\sqrt{7}}{112}$	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	$\frac{\sqrt{105}}{56}$	0	0	0	0	$-\frac{\sqrt{105}}{56}$	$\frac{3\sqrt{7}}{56}$	0	0	0	0	$\frac{3\sqrt{7}}{56}$
	0	0	0	$-\frac{\sqrt{105}}{56}$	0	0	$-\frac{\sqrt{105}}{56}$	0	0	$-\frac{3\sqrt{7}}{56}$	0	0	$\frac{3\sqrt{7}}{56}$	0
	$\frac{\sqrt{105}}{56}$	0	0	$\frac{5\sqrt{7}i}{112}$	0	0	0	0	$\frac{\sqrt{105}i}{112}$	0	$\frac{\sqrt{105}}{56}$	0	0	0
	0	$-\frac{\sqrt{105}}{56}$	$-\frac{5\sqrt{7}i}{112}$	0	0	0	0	0	$-\frac{\sqrt{105}i}{112}$	0	$\frac{\sqrt{105}}{56}$	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	$-\frac{\sqrt{105}}{56}$	0	0	0	0	0	$-\frac{5\sqrt{7}i}{112}$	0	0	$\frac{\sqrt{105}}{56}$	0	0	$\frac{\sqrt{105}i}{112}$
	$-\frac{\sqrt{105}}{56}$	0	0	0	0	0	$\frac{5\sqrt{7}i}{112}$	0	0	0	$-\frac{\sqrt{105}}{56}$	$-\frac{\sqrt{105}i}{112}$	0	0
	$\frac{3\sqrt{7}}{56}$	0	0	$\frac{\sqrt{105}i}{112}$	0	0	0	0	$\frac{3\sqrt{7}i}{112}$	0	$\frac{3\sqrt{7}}{56}$	0	0	0
	0	$-\frac{3\sqrt{7}}{56}$	$-\frac{\sqrt{105}i}{112}$	0	0	0	0	0	$-\frac{3\sqrt{7}i}{112}$	0	$\frac{3\sqrt{7}}{56}$	0	0	0
	0	0	0	$\frac{\sqrt{105}}{56}$	0	0	$\frac{\sqrt{105}}{56}$	0	0	$\frac{3\sqrt{7}}{56}$	0	0	$-\frac{3\sqrt{7}}{56}$	0
	0	0	$\frac{\sqrt{105}}{56}$	0	0	0	0	$-\frac{\sqrt{105}}{56}$	$\frac{3\sqrt{7}}{56}$	0	0	0	0	$\frac{3\sqrt{7}}{56}$
	0	$\frac{3\sqrt{7}}{56}$	0	0	0	0	$\frac{\sqrt{105}i}{112}$	0	0	$-\frac{3\sqrt{7}}{56}$	0	0	$-\frac{3\sqrt{7}i}{112}$	0
	$\frac{3\sqrt{7}}{56}$	0	0	0	0	0	$-\frac{\sqrt{105}i}{112}$	0	0	0	$\frac{3\sqrt{7}}{56}$	$\frac{3\sqrt{7}i}{112}$	0	0
1000	symmetry	$\frac{\sqrt{6006z(x-y)(x+y)(x^2-4xy+y^2)(x^2+4xy+y^2)}}{32}$												

continued ...

Table 10

No.	multipole	matrix
		$\begin{bmatrix} 0 & 0 & 0 & \frac{\sqrt{105}i}{56} & 0 & \frac{\sqrt{105}}{56} & 0 & 0 & 0 & -\frac{3\sqrt{7}i}{56} & 0 & \frac{3\sqrt{7}}{56} & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{105}i}{56} & 0 & \frac{\sqrt{105}}{56} & 0 & 0 & 0 & \frac{3\sqrt{7}i}{56} & 0 & \frac{3\sqrt{7}}{56} & 0 & 0 & 0 \\ 0 & \frac{\sqrt{105}i}{56} & \frac{5\sqrt{7}}{112} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{105}}{112} & 0 & 0 & 0 & 0 & \frac{\sqrt{105}}{56} \\ -\frac{\sqrt{105}i}{56} & 0 & 0 & -\frac{5\sqrt{7}}{112} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{105}}{112} & 0 & 0 & \frac{\sqrt{105}}{56} & 0 \\ 0 & \frac{\sqrt{105}}{56} & 0 & 0 & -\frac{5\sqrt{7}}{112} & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{105}}{112} & 0 & 0 & -\frac{\sqrt{105}i}{56} \\ \frac{\sqrt{105}}{56} & 0 & 0 & 0 & 0 & \frac{5\sqrt{7}}{112} & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{105}}{112} & \frac{\sqrt{105}i}{56} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{3\sqrt{7}i}{56} & -\frac{\sqrt{105}}{112} & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{7}}{112} & 0 & 0 & 0 & 0 & -\frac{3\sqrt{7}}{56} \\ \frac{3\sqrt{7}i}{56} & 0 & 0 & \frac{\sqrt{105}}{112} & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{7}}{112} & 0 & 0 & -\frac{3\sqrt{7}}{56} & 0 \\ 0 & \frac{3\sqrt{7}}{56} & 0 & 0 & -\frac{\sqrt{105}}{112} & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{7}}{112} & 0 & 0 & -\frac{3\sqrt{7}i}{56} \\ \frac{3\sqrt{7}}{56} & 0 & 0 & 0 & 0 & \frac{\sqrt{105}}{112} & 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{7}}{112} & \frac{3\sqrt{7}i}{56} & 0 \\ 0 & 0 & 0 & \frac{\sqrt{105}}{56} & 0 & -\frac{\sqrt{105}i}{56} & 0 & 0 & 0 & -\frac{3\sqrt{7}}{56} & 0 & -\frac{3\sqrt{7}i}{56} & 0 & 0 \\ 0 & 0 & \frac{\sqrt{105}}{56} & 0 & \frac{\sqrt{105}i}{56} & 0 & 0 & 0 & -\frac{3\sqrt{7}}{56} & 0 & \frac{3\sqrt{7}i}{56} & 0 & 0 & 0 \end{bmatrix}$
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	$\frac{\sqrt{15015}}{8008}$	0	0	$\frac{\sqrt{15015}i}{8008}$	0	0	$-\frac{3\sqrt{1001}}{8008}$	0	0	$\frac{3\sqrt{1001}i}{8008}$		
	0	0	0	0	0	$-\frac{\sqrt{15015}}{8008}$	$-\frac{\sqrt{15015}i}{8008}$	0	0	0	0	$\frac{3\sqrt{1001}}{8008}$	$-\frac{3\sqrt{1001}i}{8008}$	0		
	0	0	0	0	0	$\frac{5\sqrt{1001}i}{1001}$	$\frac{5\sqrt{1001}}{1001}$	0	0	$\frac{2\sqrt{15015}}{1001}$	0	$\frac{\sqrt{15015}i}{1001}$	$-\frac{\sqrt{15015}}{1001}$	0		
	0	0	0	0	$-\frac{5\sqrt{1001}i}{1001}$	0	0	$-\frac{5\sqrt{1001}}{1001}$	$\frac{2\sqrt{15015}}{1001}$	0	$-\frac{\sqrt{15015}i}{1001}$	0	0	$\frac{\sqrt{15015}}{1001}$		
	$\frac{\sqrt{15015}}{8008}$	0	0	$\frac{5\sqrt{1001}i}{1001}$	0	$\frac{75\sqrt{1001}}{16016}$	0	0	0	$-\frac{\sqrt{15015}i}{1144}$	0	$\frac{17\sqrt{15015}}{16016}$	0	0	0	
	0	$-\frac{\sqrt{15015}}{8008}$	$-\frac{5\sqrt{1001}i}{1001}$	0	$\frac{75\sqrt{1001}}{16016}$	0	0	0	$\frac{\sqrt{15015}i}{1144}$	0	$\frac{17\sqrt{15015}}{16016}$	0	0	0	0	
	0	$\frac{\sqrt{15015}i}{8008}$	$\frac{5\sqrt{1001}}{1001}$	0	0	0	0	$-\frac{75\sqrt{1001}}{16016}$	$\frac{\sqrt{15015}}{1144}$	0	0	0	0	$\frac{17\sqrt{15015}}{16016}$		
	$-\frac{\sqrt{15015}i}{8008}$	0	0	$-\frac{5\sqrt{1001}}{1001}$	0	0	$-\frac{75\sqrt{1001}}{16016}$	0	0	$-\frac{\sqrt{15015}}{1144}$	0	0	$\frac{17\sqrt{15015}}{16016}$	0		
	0	0	0	$\frac{2\sqrt{15015}}{1001}$	0	$-\frac{\sqrt{15015}i}{1144}$	$\frac{\sqrt{15015}}{1144}$	0	0	0	0	$-\frac{27\sqrt{1001}i}{8008}$	$-\frac{27\sqrt{1001}}{8008}$	0		
	0	0	$\frac{2\sqrt{15015}}{1001}$	0	$\frac{\sqrt{15015}i}{1144}$	0	0	$-\frac{\sqrt{15015}}{1144}$	0	0	$\frac{27\sqrt{1001}i}{8008}$	0	0	$\frac{27\sqrt{1001}}{8008}$		
	$-\frac{3\sqrt{1001}}{8008}$	0	0	$\frac{\sqrt{15015}i}{1001}$	0	$\frac{17\sqrt{15015}}{16016}$	0	0	0	$-\frac{27\sqrt{1001}i}{8008}$	0	$\frac{45\sqrt{1001}}{16016}$	0	0	0	
	0	$\frac{3\sqrt{1001}}{8008}$	$-\frac{\sqrt{15015}i}{1001}$	0	$\frac{17\sqrt{15015}}{16016}$	0	0	0	$\frac{27\sqrt{1001}i}{8008}$	0	$\frac{45\sqrt{1001}}{16016}$	0	0	0	0	
	0	$\frac{3\sqrt{1001}i}{8008}$	$-\frac{\sqrt{15015}}{1001}$	0	0	0	0	$\frac{17\sqrt{15015}}{16016}$	$-\frac{27\sqrt{1001}}{8008}$	0	0	0	0	$-\frac{45\sqrt{1001}}{16016}$		
	$-\frac{3\sqrt{1001}i}{8008}$	0	0	$\frac{\sqrt{15015}}{1001}$	0	0	$\frac{17\sqrt{15015}}{16016}$	0	0	$\frac{27\sqrt{1001}}{8008}$	0	0	0	$-\frac{45\sqrt{1001}}{16016}$	0	
1002	symmetry	$\frac{\sqrt{42y(x-z)(x+z)(15x^4 - 80x^2y^2 + 30x^2z^2 + 48y^4 - 80y^2z^2 + 15z^4)}}{32}$														

continued ...

Table 10

No.	multipole	matrix													
$\mathbb{M}_{7,1}^{(1,-1;a)}(T_g, 4)$	0	0	$-\frac{\sqrt{15015}}{8008}$	0	0	0	$\frac{\sqrt{15015}}{8008}$	$-\frac{3\sqrt{1001}}{8008}$	0	0	0	0	0	$-\frac{3\sqrt{1001}}{8008}$	
	0	0	0	$\frac{\sqrt{15015}}{8008}$	0	0	$\frac{\sqrt{15015}}{8008}$	0	0	$\frac{3\sqrt{1001}}{8008}$	0	0	$-\frac{3\sqrt{1001}}{8008}$	0	
	$-\frac{\sqrt{15015}}{8008}$	0	0	$\frac{75\sqrt{1001}i}{16016}$	0	$\frac{5\sqrt{1001}}{1001}$	0	0	$-\frac{17\sqrt{15015}i}{16016}$	0	$\frac{\sqrt{15015}}{1144}$	0	$\frac{\sqrt{15015}}{1144}$	0	
	0	$\frac{\sqrt{15015}}{8008}$	$-\frac{75\sqrt{1001}i}{16016}$	0	$\frac{5\sqrt{1001}}{1001}$	0	0	$\frac{17\sqrt{15015}i}{16016}$	0	$\frac{\sqrt{15015}}{1144}$	0	0	0	0	
	0	0	0	$\frac{5\sqrt{1001}}{1001}$	0	0	$-\frac{5\sqrt{1001}}{1001}$	0	0	$-\frac{\sqrt{15015}}{1001}$	0	$-\frac{2\sqrt{15015}i}{1001}$	$-\frac{\sqrt{15015}}{1001}$	0	
	0	0	$\frac{5\sqrt{1001}}{1001}$	0	0	0	$\frac{5\sqrt{1001}}{1001}$	$-\frac{\sqrt{15015}}{1001}$	0	$\frac{2\sqrt{15015}i}{1001}$	0	0	$\frac{\sqrt{15015}}{1001}$	0	
	0	$\frac{\sqrt{15015}}{8008}$	0	0	$-\frac{5\sqrt{1001}}{1001}$	0	0	$-\frac{75\sqrt{1001}i}{16016}$	0	0	$\frac{\sqrt{15015}}{1144}$	0	0	$-\frac{17\sqrt{15015}i}{16016}$	
	$\frac{\sqrt{15015}}{8008}$	0	0	0	$\frac{5\sqrt{1001}}{1001}$	$\frac{75\sqrt{1001}i}{16016}$	0	0	0	0	$-\frac{\sqrt{15015}}{1144}$	$\frac{17\sqrt{15015}i}{16016}$	0		
	$-\frac{3\sqrt{1001}}{8008}$	0	0	$-\frac{17\sqrt{15015}i}{16016}$	0	$-\frac{\sqrt{15015}}{1001}$	0	0	$\frac{45\sqrt{1001}i}{16016}$	0	$-\frac{27\sqrt{1001}}{8008}$	0	0	0	
	0	$\frac{3\sqrt{1001}}{8008}$	$\frac{17\sqrt{15015}i}{16016}$	0	$-\frac{\sqrt{15015}}{1001}$	0	0	$-\frac{45\sqrt{1001}i}{16016}$	0	$-\frac{27\sqrt{1001}}{8008}$	0	0	0	0	
	0	0	0	$\frac{\sqrt{15015}}{1144}$	0	$-\frac{2\sqrt{15015}i}{1001}$	$\frac{\sqrt{15015}}{1144}$	0	0	$-\frac{27\sqrt{1001}}{8008}$	0	0	$\frac{27\sqrt{1001}}{8008}$	0	
	0	0	$\frac{\sqrt{15015}}{1144}$	0	$\frac{2\sqrt{15015}i}{1001}$	0	0	$-\frac{\sqrt{15015}}{1144}$	$-\frac{27\sqrt{1001}}{8008}$	0	0	0	0	$-\frac{27\sqrt{1001}}{8008}$	
	0	$-\frac{3\sqrt{1001}}{8008}$	0	0	$-\frac{\sqrt{15015}}{1001}$	0	0	$-\frac{17\sqrt{15015}i}{16016}$	0	0	$\frac{27\sqrt{1001}}{8008}$	0	0	$-\frac{45\sqrt{1001}i}{16016}$	
	$-\frac{3\sqrt{1001}}{8008}$	0	0	0	$\frac{\sqrt{15015}}{1001}$	$\frac{17\sqrt{15015}i}{16016}$	0	0	0	0	$-\frac{27\sqrt{1001}}{8008}$	$\frac{45\sqrt{1001}i}{16016}$	0		

1003 symmetry

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

continued ...

Table 10

No.	multipole	matrix														
$\mathbb{M}_{7,2}^{(1,-1;a)}(T_g, 4)$	0	0	0	$-\frac{\sqrt{15015}i}{8008}$	0	$-\frac{\sqrt{15015}}{8008}$	0	0	0	$\frac{3\sqrt{1001}i}{8008}$	0	$-\frac{3\sqrt{1001}}{8008}$	0	0	0	
	0	0	$\frac{\sqrt{15015}i}{8008}$	0	$-\frac{\sqrt{15015}}{8008}$	0	0	0	$-\frac{3\sqrt{1001}i}{8008}$	0	$-\frac{3\sqrt{1001}}{8008}$	0	0	0	0	
	0	$-\frac{\sqrt{15015}i}{8008}$	$\frac{75\sqrt{1001}}{16016}$	0	0	0	0	$-\frac{5\sqrt{1001}}{1001}$	$\frac{17\sqrt{15015}}{16016}$	0	0	0	0	0	$\frac{\sqrt{15015}}{1144}$	
	$\frac{\sqrt{15015}i}{8008}$	0	0	$-\frac{75\sqrt{1001}}{16016}$	0	0	$-\frac{5\sqrt{1001}}{1001}$	0	0	$-\frac{17\sqrt{15015}}{16016}$	0	0	$\frac{\sqrt{15015}}{1144}$	0	0	
	0	$-\frac{\sqrt{15015}}{8008}$	0	0	$-\frac{75\sqrt{1001}}{16016}$	0	0	$-\frac{5\sqrt{1001}i}{1001}$	0	0	$\frac{17\sqrt{15015}}{16016}$	0	0	0	$-\frac{\sqrt{15015}i}{1144}$	
	$-\frac{\sqrt{15015}}{8008}$	0	0	0	0	$\frac{75\sqrt{1001}}{16016}$	$\frac{5\sqrt{1001}i}{1001}$	0	0	0	0	$-\frac{17\sqrt{15015}}{16016}$	$\frac{\sqrt{15015}i}{1144}$	0	0	
	0	0	0	$-\frac{5\sqrt{1001}}{1001}$	0	$-\frac{5\sqrt{1001}i}{1001}$	0	0	0	$-\frac{\sqrt{15015}}{1001}$	0	$\frac{\sqrt{15015}i}{1001}$	$\frac{2\sqrt{15015}}{1001}$	0	0	
	0	$-\frac{5\sqrt{1001}}{1001}$	0	$\frac{5\sqrt{1001}i}{1001}$	0	0	0	$-\frac{\sqrt{15015}}{1001}$	0	$-\frac{\sqrt{15015}i}{1001}$	0	0	0	$-\frac{2\sqrt{15015}}{1001}$		
	0	$\frac{3\sqrt{1001}i}{8008}$	$\frac{17\sqrt{15015}}{16016}$	0	0	0	0	$-\frac{\sqrt{15015}}{1001}$	$\frac{45\sqrt{1001}}{16016}$	0	0	0	0	$\frac{27\sqrt{1001}}{8008}$		
	$-\frac{3\sqrt{1001}i}{8008}$	0	0	$-\frac{17\sqrt{15015}}{16016}$	0	0	$-\frac{\sqrt{15015}}{1001}$	0	0	$-\frac{45\sqrt{1001}}{16016}$	0	0	$\frac{27\sqrt{1001}}{8008}$	0		
	0	$-\frac{3\sqrt{1001}}{8008}$	0	0	$\frac{17\sqrt{15015}}{16016}$	0	0	$\frac{\sqrt{15015}i}{1001}$	0	0	$-\frac{45\sqrt{1001}}{16016}$	0	0	$\frac{27\sqrt{1001}i}{8008}$		
	$-\frac{3\sqrt{1001}}{8008}$	0	0	0	0	$-\frac{17\sqrt{15015}}{16016}$	$-\frac{\sqrt{15015}i}{1001}$	0	0	0	0	$\frac{45\sqrt{1001}}{16016}$	$-\frac{27\sqrt{1001}i}{8008}$	0		
	0	0	0	$\frac{\sqrt{15015}}{1144}$	0	$-\frac{\sqrt{15015}i}{1144}$	$\frac{2\sqrt{15015}}{1001}$	0	0	$\frac{27\sqrt{1001}}{8008}$	0	$\frac{27\sqrt{1001}i}{8008}$	0	0		
	0	0	$\frac{\sqrt{15015}}{1144}$	0	$\frac{\sqrt{15015}i}{1144}$	0	0	$-\frac{2\sqrt{15015}}{1001}$	$\frac{27\sqrt{1001}}{8008}$	0	$-\frac{27\sqrt{1001}i}{8008}$	0	0	0		

1004 symmetry

x

continued ...

Table 10

No.	multipole	matrix
$\mathbb{M}_{1,0}^{(1,1;a)}(T_g)$	0 0 0 0 $-\frac{\sqrt{7}}{14}$ 0 0 $\frac{\sqrt{7}i}{14}$ 0 0 0 0 0 0 0	
	0 0 0 0 0 $\frac{\sqrt{7}}{14}$ $-\frac{\sqrt{7}i}{14}$ 0 0 0 0 0 0 0 0	
	0 0 0 $\frac{2\sqrt{105}}{105}$ 0 $\frac{\sqrt{105}i}{280}$ $-\frac{\sqrt{105}}{280}$ 0 0 0 0 0 $\frac{\sqrt{7}i}{56}$ $\frac{\sqrt{7}}{56}$ 0	
	0 0 $\frac{2\sqrt{105}}{105}$ 0 $-\frac{\sqrt{105}i}{280}$ 0 0 $\frac{\sqrt{105}}{280}$ 0 0 $-\frac{\sqrt{7}i}{56}$ 0 0 $-\frac{\sqrt{7}}{56}$	
	$-\frac{\sqrt{7}}{14}$ 0 0 $\frac{\sqrt{105}i}{280}$ 0 $-\frac{\sqrt{105}}{105}$ 0 0 0 $-\frac{\sqrt{7}i}{56}$ 0 $\frac{\sqrt{7}}{14}$ 0 0	
	0 $\frac{\sqrt{7}}{14}$ $-\frac{\sqrt{105}i}{280}$ 0 $-\frac{\sqrt{105}}{105}$ 0 0 0 $\frac{\sqrt{7}i}{56}$ 0 $\frac{\sqrt{7}}{14}$ 0 0 0	
	0 $\frac{\sqrt{7}i}{14}$ $-\frac{\sqrt{105}}{280}$ 0 0 0 0 $-\frac{\sqrt{105}}{105}$ $-\frac{\sqrt{7}}{56}$ 0 0 0 0 $-\frac{\sqrt{7}}{14}$	
	$-\frac{\sqrt{7}i}{14}$ 0 0 $\frac{\sqrt{105}}{280}$ 0 0 $-\frac{\sqrt{105}}{105}$ 0 0 $\frac{\sqrt{7}}{56}$ 0 0 $-\frac{\sqrt{7}}{14}$ 0	
	0 0 0 0 0 $-\frac{\sqrt{7}i}{56}$ $-\frac{\sqrt{7}}{56}$ 0 0 0 0 $\frac{\sqrt{105}i}{56}$ $-\frac{\sqrt{105}}{56}$ 0	
	0 0 0 0 $\frac{\sqrt{7}i}{56}$ 0 $\frac{\sqrt{7}}{14}$ 0 0 0 $\frac{\sqrt{105}i}{56}$ 0 0 0 $\frac{\sqrt{105}}{56}$	
	0 0 0 $-\frac{\sqrt{7}i}{56}$ 0 $\frac{\sqrt{7}}{14}$ 0 0 0 $-\frac{\sqrt{105}i}{56}$ 0 0 0 0	
	0 0 $\frac{\sqrt{7}}{56}$ 0 0 0 0 $-\frac{\sqrt{7}}{14}$ $-\frac{\sqrt{105}}{56}$ 0 0 0 0	
	0 0 0 $-\frac{\sqrt{7}}{56}$ 0 0 $-\frac{\sqrt{7}}{14}$ 0 0 $\frac{\sqrt{105}}{56}$ 0 0 0 0	

1005 symmetry

y

continued ...

Table 10

No.	multipole	matrix														
$\mathbb{M}_{1,1}^{(1,1;a)}(T_g)$	0 0 $-\frac{\sqrt{7}}{14}$ 0 0 0 0 0 $-\frac{\sqrt{7}}{14}$ 0 0 0 0 0 0 0															
	0 0 0 $\frac{\sqrt{7}}{14}$ 0 0 $-\frac{\sqrt{7}}{14}$ 0 0 0 0 0 0 0 0 0															
	$-\frac{\sqrt{7}}{14}$ 0 0 $\frac{\sqrt{105}i}{105}$ 0 $-\frac{\sqrt{105}}{280}$ 0 0 0 $\frac{\sqrt{7}i}{14}$ 0 $-\frac{\sqrt{7}}{56}$ 0 0 0															
	0 $\frac{\sqrt{7}}{14}$ $-\frac{\sqrt{105}i}{105}$ 0 $-\frac{\sqrt{105}}{280}$ 0 0 0 $-\frac{\sqrt{7}i}{14}$ 0 $-\frac{\sqrt{7}}{56}$ 0 0 0															
	0 0 0 $-\frac{\sqrt{105}}{280}$ 0 $-\frac{2\sqrt{105}i}{105}$ $-\frac{\sqrt{105}}{280}$ 0 0 $\frac{\sqrt{7}}{56}$ 0 0 0 $-\frac{\sqrt{7}}{56}$ 0															
	0 0 $-\frac{\sqrt{105}}{280}$ 0 $\frac{2\sqrt{105}i}{105}$ 0 0 $\frac{\sqrt{105}}{280}$ $\frac{\sqrt{7}}{56}$ 0 0 0 0 0 $\frac{\sqrt{7}}{56}$															
	0 $-\frac{\sqrt{7}}{14}$ 0 0 $-\frac{\sqrt{105}}{280}$ 0 0 $\frac{\sqrt{105}i}{105}$ 0 0 $\frac{\sqrt{7}}{56}$ 0 0 0 $-\frac{\sqrt{7}i}{14}$															
	$-\frac{\sqrt{7}}{14}$ 0 0 0 0 $\frac{\sqrt{105}}{280}$ $-\frac{\sqrt{105}i}{105}$ 0 0 0 0 $-\frac{\sqrt{7}}{56}$ $\frac{\sqrt{7}i}{14}$ 0															
	0 0 0 $\frac{\sqrt{7}i}{14}$ 0 $\frac{\sqrt{7}}{56}$ 0 0 0 0 0 $-\frac{\sqrt{105}}{56}$ 0 0 0															
	0 0 $-\frac{\sqrt{7}i}{14}$ 0 $\frac{\sqrt{7}}{56}$ 0 0 0 0 0 $-\frac{\sqrt{105}}{56}$ 0 0 0															
	0 0 0 $-\frac{\sqrt{7}}{56}$ 0 0 0 0 0 $-\frac{\sqrt{105}}{56}$ 0 0 0 $-\frac{\sqrt{105}}{56}$ 0															
	0 0 $-\frac{\sqrt{7}}{56}$ 0 0 0 0 0 $-\frac{\sqrt{105}}{56}$ 0 0 0 0 0 $\frac{\sqrt{105}}{56}$															
	0 0 0 0 $-\frac{\sqrt{7}}{56}$ 0 0 0 $-\frac{\sqrt{7}i}{14}$ 0 0 $-\frac{\sqrt{105}}{56}$ 0 0 0															
	0 0 0 0 0 $\frac{\sqrt{7}}{56}$ $\frac{\sqrt{7}i}{14}$ 0 0 0 0 0 $-\frac{\sqrt{105}}{56}$ 0 0 0															

1006 symmetry

z

continued ...

Table 10

No.	multipole	matrix													
$\mathbb{M}_{1,2}^{(1,1;a)}(T_g)$	0 0 0 $\frac{\sqrt{7}i}{14}$ 0 $-\frac{\sqrt{7}}{14}$ 0 0 0 0 0 0 0 0 0														
	0 0 $-\frac{\sqrt{7}i}{14}$ 0 $-\frac{\sqrt{7}}{14}$ 0 0 0 0 0 0 0 0 0 0														
	0 $\frac{\sqrt{7}i}{14}$ $-\frac{\sqrt{105}}{105}$ 0 0 0 0 $-\frac{\sqrt{105}}{280}$ $\frac{\sqrt{7}}{14}$ 0 0 0 0 $\frac{\sqrt{7}}{56}$														
	$-\frac{\sqrt{7}i}{14}$ 0 0 $\frac{\sqrt{105}}{105}$ 0 0 $-\frac{\sqrt{105}}{280}$ 0 0 $-\frac{\sqrt{7}}{14}$ 0 0 $\frac{\sqrt{7}}{56}$ 0														
	0 $-\frac{\sqrt{7}}{14}$ 0 0 $-\frac{\sqrt{105}}{105}$ 0 0 $\frac{\sqrt{105}i}{280}$ 0 0 $-\frac{\sqrt{7}}{14}$ 0 0 $\frac{\sqrt{7}}{56}$														
	$-\frac{\sqrt{7}}{14}$ 0 0 0 0 $\frac{\sqrt{105}}{105}$ $-\frac{\sqrt{105}i}{280}$ 0 0 0 0 $\frac{\sqrt{7}}{14}$ $-\frac{\sqrt{7}i}{56}$ 0														
	0 0 0 $-\frac{\sqrt{105}}{280}$ 0 $\frac{\sqrt{105}i}{280}$ $\frac{2\sqrt{105}}{105}$ 0 0 $-\frac{\sqrt{7}}{56}$ 0 $-\frac{\sqrt{7}i}{56}$ 0 0														
	0 0 $-\frac{\sqrt{105}}{280}$ 0 $-\frac{\sqrt{105}i}{280}$ 0 0 $-\frac{2\sqrt{105}}{105}$ $-\frac{\sqrt{7}}{56}$ 0 $\frac{\sqrt{7}i}{56}$ 0 0 0 0														
	0 0 $\frac{\sqrt{7}}{14}$ 0 0 0 0 $-\frac{\sqrt{7}}{56}$ 0 0 0 0 0 0 $-\frac{\sqrt{105}}{56}$														
	0 0 0 $-\frac{\sqrt{7}}{14}$ 0 0 $-\frac{\sqrt{7}}{56}$ 0 0 0 0 0 0 $-\frac{\sqrt{105}}{56}$ 0														
	0 0 0 0 $-\frac{\sqrt{7}}{14}$ 0 0 $-\frac{\sqrt{7}i}{56}$ 0 0 0 0 0 0 $\frac{\sqrt{105}i}{56}$														
	0 0 0 0 0 $\frac{\sqrt{7}}{14}$ $\frac{\sqrt{7}i}{56}$ 0 0 0 0 0 0 $-\frac{\sqrt{105}}{56}$ 0 $\frac{\sqrt{105}i}{56}$														
	0 0 0 $\frac{\sqrt{7}}{56}$ 0 $\frac{\sqrt{7}i}{56}$ 0 0 0 0 $-\frac{\sqrt{105}}{56}$ 0 $-\frac{\sqrt{105}i}{56}$ 0 0 0														
	0 0 $\frac{\sqrt{7}}{56}$ 0 $-\frac{\sqrt{7}i}{56}$ 0 0 0 $-\frac{\sqrt{105}}{56}$ 0 $-\frac{\sqrt{105}i}{56}$ 0 0 0 0														

1007 symmetry

 $\sqrt{15}xyz$

continued ...

Table 10

No.	multipole	matrix														
$\mathbb{M}_3^{(1,1;a)}(A_g)$	0 0 0 $-\frac{\sqrt{77}}{154}$ 0 $\frac{\sqrt{77}i}{154}$ $-\frac{\sqrt{77}}{154}$ 0 0 0 0 0 0 0 0															
	0 0 $-\frac{\sqrt{77}}{154}$ 0 $-\frac{\sqrt{77}i}{154}$ 0 0 $\frac{\sqrt{77}}{154}$ 0 0 0 0 0 0 0 0															
	0 $-\frac{\sqrt{77}}{154}$ 0 0 $\frac{\sqrt{1155}}{154}$ 0 0 $-\frac{\sqrt{1155}i}{154}$ 0 0 $-\frac{\sqrt{77}}{77}$ 0 0 $-\frac{\sqrt{77}i}{77}$															
	$-\frac{\sqrt{77}}{154}$ 0 0 0 0 $-\frac{\sqrt{1155}}{154}$ $\frac{\sqrt{1155}i}{154}$ 0 0 0 0 $\frac{\sqrt{77}}{77}$ $\frac{\sqrt{77}i}{77}$ 0															
	0 $\frac{\sqrt{77}i}{154}$ $\frac{\sqrt{1155}}{154}$ 0 0 0 0 $\frac{\sqrt{1155}}{154}$ $\frac{\sqrt{77}}{77}$ 0 0 0 0 $-\frac{\sqrt{77}}{77}$															
	$-\frac{\sqrt{77}i}{154}$ 0 0 $-\frac{\sqrt{1155}}{154}$ 0 0 $\frac{\sqrt{1155}}{154}$ 0 0 0 $-\frac{\sqrt{77}}{77}$ 0 0 $-\frac{\sqrt{77}}{77}$ 0															
	$-\frac{\sqrt{77}}{154}$ 0 0 $-\frac{\sqrt{1155}i}{154}$ 0 $\frac{\sqrt{1155}}{154}$ 0 0 0 $\frac{\sqrt{77}i}{77}$ 0 $\frac{\sqrt{77}}{77}$ 0 0 0															
	0 $\frac{\sqrt{77}}{154}$ $\frac{\sqrt{1155}i}{154}$ 0 $\frac{\sqrt{1155}}{154}$ 0 0 0 $-\frac{\sqrt{77}i}{77}$ 0 $\frac{\sqrt{77}}{77}$ 0 0 0 0															
	0 0 0 0 $\frac{\sqrt{77}}{77}$ 0 0 $\frac{\sqrt{77}i}{77}$ 0 0 $\frac{\sqrt{1155}}{462}$ 0 0 $-\frac{\sqrt{1155}i}{462}$															
	0 0 0 0 0 $-\frac{\sqrt{77}}{77}$ $-\frac{\sqrt{77}i}{77}$ 0 0 0 0 $-\frac{\sqrt{1155}}{462}$ $\frac{\sqrt{1155}i}{462}$ 0															
	0 0 $-\frac{\sqrt{77}}{77}$ 0 0 0 0 $\frac{\sqrt{77}}{77}$ $\frac{\sqrt{1155}}{462}$ 0 0 0 0 $-\frac{\sqrt{1155}}{462}$ $\frac{\sqrt{1155}i}{462}$ 0															
	0 0 0 $\frac{\sqrt{77}}{77}$ 0 0 0 $\frac{\sqrt{77}i}{77}$ 0 0 $-\frac{\sqrt{1155}}{462}$ 0 0 $\frac{\sqrt{1155}}{462}$ 0 0 0															
	0 0 0 $-\frac{\sqrt{77}i}{77}$ 0 $-\frac{\sqrt{77}}{77}$ 0 0 0 $-\frac{\sqrt{1155}i}{462}$ 0 $\frac{\sqrt{1155}}{462}$ 0 0 0 0															
	0 0 $\frac{\sqrt{77}i}{77}$ 0 $-\frac{\sqrt{77}}{77}$ 0 0 0 0 $\frac{\sqrt{1155}i}{462}$ 0 $\frac{\sqrt{1155}}{462}$ 0 0 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	$-\frac{\sqrt{77}}{33}$	0	0	$\frac{\sqrt{1155}}{1848}$	0	0	$-\frac{\sqrt{1155}i}{1848}$	0	0	$-\frac{5\sqrt{77}}{264}$	0	0	$-\frac{5\sqrt{77}i}{264}$	
	$-\frac{\sqrt{77}}{33}$	0	0	0	0	$-\frac{\sqrt{1155}}{1848}$	$\frac{\sqrt{1155}i}{1848}$	0	0	0	0	$\frac{5\sqrt{77}}{264}$	$\frac{5\sqrt{77}i}{264}$	0	
	0	0	0	$\frac{2\sqrt{77}}{77}$	0	$\frac{5\sqrt{77}i}{616}$	$-\frac{5\sqrt{77}}{616}$	0	0	0	0	$\frac{5\sqrt{1155}i}{1848}$	$\frac{5\sqrt{1155}}{1848}$	0	
	0	0	$\frac{2\sqrt{77}}{77}$	0	$-\frac{5\sqrt{77}i}{616}$	0	0	$\frac{5\sqrt{77}}{616}$	0	0	$-\frac{5\sqrt{1155}i}{1848}$	0	0	$-\frac{5\sqrt{1155}}{1848}$	
	$\frac{\sqrt{1155}}{1848}$	0	0	$\frac{5\sqrt{77}i}{616}$	0	$\frac{3\sqrt{77}}{308}$	0	0	0	$\frac{3\sqrt{1155}i}{616}$	0	$-\frac{\sqrt{1155}}{924}$	0	0	
	0	$-\frac{\sqrt{1155}}{1848}$	$-\frac{5\sqrt{77}i}{616}$	0	$\frac{3\sqrt{77}}{308}$	0	0	0	$-\frac{3\sqrt{1155}i}{616}$	0	$-\frac{\sqrt{1155}}{924}$	0	0	0	
	0	$-\frac{\sqrt{1155}i}{1848}$	$-\frac{5\sqrt{77}}{616}$	0	0	0	0	$\frac{3\sqrt{77}}{308}$	$\frac{3\sqrt{1155}}{616}$	0	0	0	0	$\frac{\sqrt{1155}}{924}$	
	$\frac{\sqrt{1155}i}{1848}$	0	0	$\frac{5\sqrt{77}}{616}$	0	0	$\frac{3\sqrt{77}}{308}$	0	0	$-\frac{3\sqrt{1155}}{616}$	0	0	$\frac{\sqrt{1155}}{924}$	0	
	0	0	0	0	0	$\frac{3\sqrt{1155}i}{616}$	$\frac{3\sqrt{1155}}{616}$	0	0	$-\frac{\sqrt{77}}{33}$	0	$\frac{5\sqrt{77}i}{1848}$	$-\frac{5\sqrt{77}}{1848}$	0	
	0	0	0	0	$-\frac{3\sqrt{1155}i}{616}$	0	0	$-\frac{3\sqrt{1155}}{616}$	$-\frac{\sqrt{77}}{33}$	0	$-\frac{5\sqrt{77}i}{1848}$	0	0	$\frac{5\sqrt{77}}{1848}$	
1009 symmetry	$-\frac{5\sqrt{77}}{264}$	0	0	$\frac{5\sqrt{1155}i}{1848}$	0	$-\frac{\sqrt{1155}}{924}$	0	0	0	$\frac{5\sqrt{77}i}{1848}$	0	$\frac{\sqrt{77}}{132}$	0	0	
	0	$\frac{5\sqrt{77}}{264}$	$-\frac{5\sqrt{1155}i}{1848}$	0	$-\frac{\sqrt{1155}}{924}$	0	0	0	$-\frac{5\sqrt{77}i}{1848}$	0	$\frac{\sqrt{77}}{132}$	0	0	0	
	0	$-\frac{5\sqrt{77}i}{264}$	$\frac{5\sqrt{1155}}{1848}$	0	0	0	$\frac{\sqrt{1155}}{924}$	$-\frac{5\sqrt{77}}{1848}$	0	0	0	0	$\frac{\sqrt{77}}{132}$		
	$\frac{5\sqrt{77}i}{264}$	0	0	$-\frac{5\sqrt{1155}}{1848}$	0	0	$\frac{\sqrt{1155}}{924}$	0	0	$\frac{5\sqrt{77}}{1848}$	0	0	$\frac{\sqrt{77}}{132}$	0	
$-\frac{y(3x^2 - 2y^2 + 3z^2)}{2}$															

continued ...

Table 10

No.	multipole	matrix													
$\mathbb{M}_{3,1}^{(1,1;a)}(T_g, 1)$	0	$\frac{\sqrt{77}i}{33}$	$\frac{\sqrt{1155}}{1848}$	0	0	0	0	$\frac{\sqrt{1155}}{1848}$	$\frac{5\sqrt{77}}{264}$	0	0	0	0	$-\frac{5\sqrt{77}}{264}$	
	$-\frac{\sqrt{77}i}{33}$	0	0	$-\frac{\sqrt{1155}}{1848}$	0	0	$\frac{\sqrt{1155}}{1848}$	0	0	$-\frac{5\sqrt{77}}{264}$	0	0	$-\frac{5\sqrt{77}}{264}$	0	
	$\frac{\sqrt{1155}}{1848}$	0	0	$-\frac{3\sqrt{77}i}{308}$	0	$-\frac{5\sqrt{77}}{616}$	0	0	0	$-\frac{\sqrt{1155}i}{924}$	0	$\frac{3\sqrt{1155}}{616}$	0	0	
	0	$-\frac{\sqrt{1155}}{1848}$	$\frac{3\sqrt{77}i}{308}$	0	$-\frac{5\sqrt{77}}{616}$	0	0	0	$\frac{\sqrt{1155}i}{924}$	0	$\frac{3\sqrt{1155}}{616}$	0	0	0	
	0	0	0	$-\frac{5\sqrt{77}}{616}$	0	$-\frac{2\sqrt{77}i}{77}$	$-\frac{5\sqrt{77}}{616}$	0	0	$\frac{5\sqrt{1155}}{1848}$	0	0	$-\frac{5\sqrt{1155}}{1848}$	0	
	0	0	$-\frac{5\sqrt{77}}{616}$	0	$\frac{2\sqrt{77}i}{77}$	0	0	$\frac{5\sqrt{77}}{616}$	$\frac{5\sqrt{1155}}{1848}$	0	0	0	0	$\frac{5\sqrt{1155}}{1848}$	
	0	$\frac{\sqrt{1155}}{1848}$	0	0	$-\frac{5\sqrt{77}}{616}$	0	0	$-\frac{3\sqrt{77}i}{308}$	0	0	$-\frac{3\sqrt{1155}}{616}$	0	0	$\frac{\sqrt{1155}i}{924}$	
	$\frac{\sqrt{1155}}{1848}$	0	0	0	0	$\frac{5\sqrt{77}}{616}$	$\frac{3\sqrt{77}i}{308}$	0	0	0	0	$\frac{3\sqrt{1155}}{616}$	$-\frac{\sqrt{1155}i}{924}$	0	
	$\frac{5\sqrt{77}}{264}$	0	0	$-\frac{\sqrt{1155}i}{924}$	0	$\frac{5\sqrt{1155}}{1848}$	0	0	0	$-\frac{\sqrt{77}i}{132}$	0	$-\frac{5\sqrt{77}}{1848}$	0	0	
	0	$-\frac{5\sqrt{77}}{264}$	$\frac{\sqrt{1155}i}{924}$	0	$\frac{5\sqrt{1155}}{1848}$	0	0	0	$\frac{\sqrt{77}i}{132}$	0	$-\frac{5\sqrt{77}}{1848}$	0	0	0	
	0	0	0	$\frac{3\sqrt{1155}}{616}$	0	0	$-\frac{3\sqrt{1155}}{616}$	0	0	$-\frac{5\sqrt{77}}{1848}$	0	$\frac{\sqrt{77}i}{33}$	$-\frac{5\sqrt{77}}{1848}$	0	
	0	0	$\frac{3\sqrt{1155}}{616}$	0	0	0	0	$\frac{3\sqrt{1155}}{616}$	$-\frac{5\sqrt{77}}{1848}$	0	$-\frac{\sqrt{77}i}{33}$	0	0	$\frac{5\sqrt{77}}{1848}$	
	0	$-\frac{5\sqrt{77}}{264}$	0	0	$-\frac{5\sqrt{1155}}{1848}$	0	0	$\frac{\sqrt{1155}i}{924}$	0	0	$-\frac{5\sqrt{77}}{1848}$	0	0	$-\frac{\sqrt{77}i}{132}$	
	$-\frac{5\sqrt{77}}{264}$	0	0	0	0	$\frac{5\sqrt{1155}}{1848}$	$-\frac{\sqrt{1155}i}{924}$	0	0	0	0	$\frac{5\sqrt{77}}{1848}$	$\frac{\sqrt{77}i}{132}$	0	

1010 symmetry

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

continued ...

Table 10

No.	multipole	matrix													
$\mathbb{M}_{3,2}^{(1,1;a)}(T_g, 1)$	$-\frac{\sqrt{77}}{33}$	0	0	$-\frac{\sqrt{1155}i}{1848}$	0	$\frac{\sqrt{1155}}{1848}$	0	0	0	$\frac{5\sqrt{77}i}{264}$	0	$\frac{5\sqrt{77}}{264}$	0	0	
	0	$\frac{\sqrt{77}}{33}$	$\frac{\sqrt{1155}i}{1848}$	0	$\frac{\sqrt{1155}}{1848}$	0	0	0	$-\frac{5\sqrt{77}i}{264}$	0	$\frac{5\sqrt{77}}{264}$	0	0	0	
	0	$-\frac{\sqrt{1155}i}{1848}$	$\frac{3\sqrt{77}}{308}$	0	0	0	0	$-\frac{5\sqrt{77}}{616}$	$-\frac{\sqrt{1155}}{924}$	0	0	0	0	$-\frac{3\sqrt{1155}}{616}$	
	$\frac{\sqrt{1155}i}{1848}$	0	0	$-\frac{3\sqrt{77}}{308}$	0	0	$-\frac{5\sqrt{77}}{616}$	0	0	$\frac{\sqrt{1155}}{924}$	0	0	$-\frac{3\sqrt{1155}}{616}$	0	
	0	$\frac{\sqrt{1155}}{1848}$	0	0	$\frac{3\sqrt{77}}{308}$	0	0	$\frac{5\sqrt{77}i}{616}$	0	0	$\frac{\sqrt{1155}}{924}$	0	0	$-\frac{3\sqrt{1155}}{616}$	
	$\frac{\sqrt{1155}}{1848}$	0	0	0	0	$-\frac{3\sqrt{77}}{308}$	$-\frac{5\sqrt{77}i}{616}$	0	0	0	0	$-\frac{\sqrt{1155}}{924}$	$\frac{3\sqrt{1155}i}{616}$	0	
	0	0	0	$-\frac{5\sqrt{77}}{616}$	0	$\frac{5\sqrt{77}i}{616}$	$\frac{2\sqrt{77}}{77}$	0	0	$-\frac{5\sqrt{1155}}{1848}$	0	$-\frac{5\sqrt{1155}i}{1848}$	0	0	
	0	$-\frac{5\sqrt{77}}{616}$	0	$-\frac{5\sqrt{77}i}{616}$	0	0	$-\frac{2\sqrt{77}}{77}$	$-\frac{5\sqrt{1155}}{1848}$	0	$\frac{5\sqrt{1155}i}{1848}$	0	0	0		
	0	$\frac{5\sqrt{77}i}{264}$	$-\frac{\sqrt{1155}}{924}$	0	0	0	$-\frac{5\sqrt{1155}}{1848}$	$\frac{\sqrt{77}}{132}$	0	0	0	0	$-\frac{5\sqrt{77}}{1848}$		
	$-\frac{5\sqrt{77}i}{264}$	0	0	$\frac{\sqrt{1155}}{924}$	0	0	$-\frac{5\sqrt{1155}}{1848}$	0	0	$-\frac{\sqrt{77}}{132}$	0	0	$-\frac{5\sqrt{77}}{1848}$	0	
	0	$\frac{5\sqrt{77}}{264}$	0	0	$\frac{\sqrt{1155}}{924}$	0	0	$-\frac{5\sqrt{1155}i}{1848}$	0	0	$\frac{\sqrt{77}}{132}$	0	0	$\frac{5\sqrt{77}i}{1848}$	
	$\frac{5\sqrt{77}}{264}$	0	0	0	0	$-\frac{\sqrt{1155}}{924}$	$\frac{5\sqrt{1155}i}{1848}$	0	0	0	0	$-\frac{\sqrt{77}}{132}$	$-\frac{5\sqrt{77}i}{1848}$	0	
	0	0	0	$-\frac{3\sqrt{1155}}{616}$	0	$-\frac{3\sqrt{1155}i}{616}$	0	0	0	$-\frac{5\sqrt{77}}{1848}$	0	$\frac{5\sqrt{77}i}{1848}$	$-\frac{\sqrt{77}}{33}$	0	
	0	0	$-\frac{3\sqrt{1155}}{616}$	0	$\frac{3\sqrt{1155}i}{616}$	0	0	0	$-\frac{5\sqrt{77}}{1848}$	0	$-\frac{5\sqrt{77}i}{1848}$	0	0	$\frac{\sqrt{77}}{33}$	
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	0	0	0	$-\frac{3\sqrt{77}}{616}$	0	0	$-\frac{3\sqrt{77}i}{616}$	0	0	$-\frac{\sqrt{1155}}{264}$	0	0	$\frac{\sqrt{1155}i}{264}$		
	0	0	0	0	0	$\frac{3\sqrt{77}}{616}$	$\frac{3\sqrt{77}i}{616}$	0	0	0	0	$\frac{\sqrt{1155}}{264}$	$-\frac{\sqrt{1155}i}{264}$	0		
	0	0	0	0	0	$\frac{3\sqrt{1155}i}{616}$	$\frac{3\sqrt{1155}}{616}$	0	0	$-\frac{\sqrt{77}}{154}$	0	$-\frac{13\sqrt{77}i}{616}$	$\frac{13\sqrt{77}}{616}$	$\frac{13\sqrt{77}}{616}$	0	
	0	0	0	0	$-\frac{3\sqrt{1155}i}{616}$	0	0	$-\frac{3\sqrt{1155}}{616}$	$-\frac{\sqrt{77}}{154}$	0	$\frac{13\sqrt{77}i}{616}$	0	0	$-\frac{13\sqrt{77}}{616}$		
	$-\frac{3\sqrt{77}}{616}$	0	0	$\frac{3\sqrt{1155}i}{616}$	0	$-\frac{\sqrt{1155}}{308}$	0	0	0	$-\frac{\sqrt{77}i}{616}$	0	$\frac{\sqrt{77}}{308}$	0	0	0	
	0	$\frac{3\sqrt{77}}{616}$	$-\frac{3\sqrt{1155}i}{616}$	0	$-\frac{\sqrt{1155}}{308}$	0	0	0	$\frac{\sqrt{77}i}{616}$	0	$\frac{\sqrt{77}}{308}$	0	0	0	0	
	0	$-\frac{3\sqrt{77}i}{616}$	$\frac{3\sqrt{1155}}{616}$	0	0	0	0	$\frac{\sqrt{1155}}{308}$	$\frac{\sqrt{77}}{616}$	0	0	0	0	$\frac{\sqrt{77}}{308}$		
	$\frac{3\sqrt{77}i}{616}$	0	0	$-\frac{3\sqrt{1155}}{616}$	0	0	$\frac{\sqrt{1155}}{308}$	0	0	$-\frac{\sqrt{77}}{616}$	0	0	$\frac{\sqrt{77}}{308}$	0		
	0	0	0	$-\frac{\sqrt{77}}{154}$	0	$-\frac{\sqrt{77}i}{616}$	$\frac{\sqrt{77}}{616}$	0	0	0	0	$\frac{\sqrt{1155}i}{616}$	$\frac{\sqrt{1155}}{616}$	0		
	0	0	$-\frac{\sqrt{77}}{154}$	0	$\frac{\sqrt{77}i}{616}$	0	0	$-\frac{\sqrt{77}}{616}$	0	0	$-\frac{\sqrt{1155}i}{616}$	0	0	$-\frac{\sqrt{1155}}{616}$		
	$-\frac{\sqrt{1155}}{264}$	0	0	$-\frac{13\sqrt{77}i}{616}$	0	$\frac{\sqrt{77}}{308}$	0	0	0	$\frac{\sqrt{1155}i}{616}$	0	$\frac{\sqrt{1155}}{132}$	0	0	0	
	0	$\frac{\sqrt{1155}}{264}$	$\frac{13\sqrt{77}i}{616}$	0	$\frac{\sqrt{77}}{308}$	0	0	0	$-\frac{\sqrt{1155}i}{616}$	0	$\frac{\sqrt{1155}}{132}$	0	0	0	0	
	0	$\frac{\sqrt{1155}i}{264}$	$\frac{13\sqrt{77}}{616}$	0	0	0	$\frac{\sqrt{77}}{308}$	$\frac{\sqrt{1155}}{616}$	0	0	0	0	0	$-\frac{\sqrt{1155}}{132}$		
	$-\frac{\sqrt{1155}i}{264}$	0	0	$-\frac{13\sqrt{77}}{616}$	0	0	$\frac{\sqrt{77}}{308}$	0	0	$-\frac{\sqrt{1155}}{616}$	0	0	0	$-\frac{\sqrt{1155}}{132}$	0	

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	0	$\frac{3\sqrt{77}}{616}$	0	0	0	0	$-\frac{3\sqrt{77}}{616}$	$-\frac{\sqrt{1155}}{264}$	0	0	0	0	$-\frac{\sqrt{1155}}{264}$		
	0	0	0	$-\frac{3\sqrt{77}}{616}$	0	0	$-\frac{3\sqrt{77}}{616}$	0	0	$\frac{\sqrt{1155}}{264}$	0	0	$-\frac{\sqrt{1155}}{264}$	0		
	$\frac{3\sqrt{77}}{616}$	0	0	$-\frac{\sqrt{1155}i}{308}$	0	$\frac{3\sqrt{1155}}{616}$	0	0	0	$-\frac{\sqrt{77}i}{308}$	0	$\frac{\sqrt{77}}{616}$	0	0	0	
	0	$-\frac{3\sqrt{77}}{616}$	$\frac{\sqrt{1155}i}{308}$	0	$\frac{3\sqrt{1155}}{616}$	0	0	0	$\frac{\sqrt{77}i}{308}$	0	$\frac{\sqrt{77}}{616}$	0	0	0		
	0	0	0	$\frac{3\sqrt{1155}}{616}$	0	0	$-\frac{3\sqrt{1155}}{616}$	0	0	$\frac{13\sqrt{77}}{616}$	0	$\frac{\sqrt{77}i}{154}$	$\frac{13\sqrt{77}}{616}$	0		
	0	0	$\frac{3\sqrt{1155}}{616}$	0	0	0	0	$\frac{3\sqrt{1155}}{616}$	$\frac{13\sqrt{77}}{616}$	0	$-\frac{\sqrt{77}i}{154}$	0	0	$-\frac{13\sqrt{77}}{616}$		
	0	$-\frac{3\sqrt{77}}{616}$	0	0	$-\frac{3\sqrt{1155}}{616}$	0	0	$\frac{\sqrt{1155}i}{308}$	0	0	$\frac{\sqrt{77}}{616}$	0	0	$-\frac{\sqrt{77}i}{308}$		
	$-\frac{3\sqrt{77}}{616}$	0	0	0	0	$\frac{3\sqrt{1155}}{616}$	$-\frac{\sqrt{1155}i}{308}$	0	0	0	0	$-\frac{\sqrt{77}}{616}$	$\frac{\sqrt{77}i}{308}$	0		
	$-\frac{\sqrt{1155}}{264}$	0	0	$-\frac{\sqrt{77}i}{308}$	0	$\frac{13\sqrt{77}}{616}$	0	0	0	$\frac{\sqrt{1155}i}{132}$	0	$\frac{\sqrt{1155}}{616}$	0	0		
	0	$\frac{\sqrt{1155}}{264}$	$\frac{\sqrt{77}i}{308}$	0	$\frac{13\sqrt{77}}{616}$	0	0	0	$-\frac{\sqrt{1155}i}{132}$	0	$\frac{\sqrt{1155}}{616}$	0	0	0		
	0	0	0	$\frac{\sqrt{77}}{616}$	0	$\frac{\sqrt{77}i}{154}$	$\frac{\sqrt{77}}{616}$	0	0	$\frac{\sqrt{1155}}{616}$	0	0	$-\frac{\sqrt{1155}}{616}$	0		
	0	0	$\frac{\sqrt{77}}{616}$	0	$-\frac{\sqrt{77}i}{154}$	0	0	$-\frac{\sqrt{77}}{616}$	$\frac{\sqrt{1155}}{616}$	0	0	0	0	$\frac{\sqrt{1155}}{616}$		
	0	$-\frac{\sqrt{1155}}{264}$	0	0	$\frac{13\sqrt{77}}{616}$	0	0	$-\frac{\sqrt{77}i}{308}$	0	0	$-\frac{\sqrt{1155}}{616}$	0	0	$-\frac{\sqrt{1155}i}{132}$		
	$-\frac{\sqrt{1155}}{264}$	0	0	0	0	$-\frac{13\sqrt{77}}{616}$	$\frac{\sqrt{77}i}{308}$	0	0	0	0	$\frac{\sqrt{1155}}{616}$	$\frac{\sqrt{1155}i}{132}$	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 0 $\frac{3\sqrt{77}i}{616}$ 0 $\frac{3\sqrt{77}}{616}$ 0 0 0 $\frac{\sqrt{1155}i}{264}$ 0 $-\frac{\sqrt{1155}}{264}$ 0 0 0														
	0 0 $-\frac{3\sqrt{77}i}{616}$ 0 $\frac{3\sqrt{77}}{616}$ 0 0 0 $-\frac{\sqrt{1155}i}{264}$ 0 $-\frac{\sqrt{1155}}{264}$ 0 0 0 0														
	0 $\frac{3\sqrt{77}i}{616}$ $-\frac{\sqrt{1155}}{308}$ 0 0 0 0 $-\frac{3\sqrt{1155}}{616}$ $\frac{\sqrt{77}}{308}$ 0 0 0 0 $\frac{\sqrt{77}}{616}$														
	$-\frac{3\sqrt{77}i}{616}$ 0 0 $\frac{\sqrt{1155}}{308}$ 0 0 $-\frac{3\sqrt{1155}}{616}$ 0 0 $-\frac{\sqrt{77}}{308}$ 0 0 $\frac{\sqrt{77}}{616}$ 0														
	0 $\frac{3\sqrt{77}}{616}$ 0 0 $\frac{\sqrt{1155}}{308}$ 0 0 $-\frac{3\sqrt{1155}i}{616}$ 0 0 $\frac{\sqrt{77}}{308}$ 0 0 $-\frac{\sqrt{77}i}{616}$ 0														
	$\frac{3\sqrt{77}}{616}$ 0 0 0 0 $-\frac{\sqrt{1155}}{308}$ $\frac{3\sqrt{1155}i}{616}$ 0 0 0 0 $-\frac{\sqrt{77}}{308}$ $\frac{\sqrt{77}i}{616}$ 0														
	0 0 0 $-\frac{3\sqrt{1155}}{616}$ 0 $-\frac{3\sqrt{1155}i}{616}$ 0 0 0 $\frac{13\sqrt{77}}{616}$ 0 $-\frac{13\sqrt{77}i}{616}$ $-\frac{\sqrt{77}}{154}$ 0														
	0 0 $-\frac{3\sqrt{1155}}{616}$ 0 $\frac{3\sqrt{1155}i}{616}$ 0 0 0 $\frac{13\sqrt{77}}{616}$ 0 $\frac{13\sqrt{77}i}{616}$ 0 0 $\frac{\sqrt{77}}{154}$														
	0 $\frac{\sqrt{1155}i}{264}$ $\frac{\sqrt{77}}{308}$ 0 0 0 0 $\frac{13\sqrt{77}}{616}$ $\frac{\sqrt{1155}}{132}$ 0 0 0 0 $-\frac{\sqrt{1155}}{616}$														
	$-\frac{\sqrt{1155}i}{264}$ 0 0 $-\frac{\sqrt{77}}{308}$ 0 0 $\frac{13\sqrt{77}}{616}$ 0 0 $-\frac{\sqrt{1155}}{132}$ 0 0 $-\frac{\sqrt{1155}}{616}$ 0														
	0 $-\frac{\sqrt{1155}}{264}$ 0 0 $\frac{\sqrt{77}}{308}$ 0 0 $-\frac{13\sqrt{77}i}{616}$ 0 0 $-\frac{\sqrt{1155}}{132}$ 0 0 $-\frac{\sqrt{1155}i}{616}$														
	$-\frac{\sqrt{1155}}{264}$ 0 0 0 0 $-\frac{\sqrt{77}}{308}$ $\frac{13\sqrt{77}i}{616}$ 0 0 0 0 $\frac{\sqrt{1155}}{132}$ $\frac{\sqrt{1155}i}{616}$ 0														
	0 0 0 $\frac{\sqrt{77}}{616}$ 0 $-\frac{\sqrt{77}i}{616}$ $-\frac{\sqrt{77}}{154}$ 0 0 $-\frac{\sqrt{1155}}{616}$ 0 $-\frac{\sqrt{1155}i}{616}$ 0 0														
	0 0 $\frac{\sqrt{77}}{616}$ 0 $\frac{\sqrt{77}i}{616}$ 0 0 $\frac{\sqrt{77}}{154}$ $-\frac{\sqrt{1155}}{616}$ 0 $\frac{\sqrt{1155}i}{616}$ 0 0 0														
$\frac{3\sqrt{35}xyz(x-y)(x+y)}{2}$															

1014 symmetry

continued ...

Table 10

No.	multipole	matrix														
$\mathbb{M}_{5,0}^{(1,1;a)}(E_g)$	0	0	0	$\frac{4\sqrt{429}}{429}$	0	$\frac{4\sqrt{429}i}{429}$	0	0	0	$-\frac{\sqrt{715}}{286}$	0	$\frac{\sqrt{715}i}{286}$	$\frac{\sqrt{715}}{143}$	0	0	
	0	0	$\frac{4\sqrt{429}}{429}$	0	$-\frac{4\sqrt{429}i}{429}$	0	0	0	$-\frac{\sqrt{715}}{286}$	0	$-\frac{\sqrt{715}i}{286}$	0	0	$-\frac{\sqrt{715}}{143}$		
	0	$\frac{4\sqrt{429}}{429}$	0	0	0	0	0	$\frac{\sqrt{715}i}{1144}$	0	0	$\frac{5\sqrt{429}}{858}$	0	0	$\frac{23\sqrt{429}i}{3432}$		
	$\frac{4\sqrt{429}}{429}$	0	0	0	0	0	$-\frac{\sqrt{715}i}{1144}$	0	0	0	$-\frac{5\sqrt{429}}{858}$	$-\frac{23\sqrt{429}i}{3432}$	0			
	0	$\frac{4\sqrt{429}i}{429}$	0	0	0	0	0	$\frac{\sqrt{715}}{1144}$	$\frac{5\sqrt{429}}{858}$	0	0	0	0	$-\frac{23\sqrt{429}}{3432}$		
	$-\frac{4\sqrt{429}i}{429}$	0	0	0	0	0	$\frac{\sqrt{715}}{1144}$	0	0	$-\frac{5\sqrt{429}}{858}$	0	0	$-\frac{23\sqrt{429}}{3432}$	0		
	0	0	0	$\frac{\sqrt{715}i}{1144}$	0	$\frac{\sqrt{715}}{1144}$	0	0	0	$-\frac{\sqrt{429}i}{1144}$	0	$\frac{\sqrt{429}}{1144}$	0	0	0	
	0	0	$-\frac{\sqrt{715}i}{1144}$	0	$\frac{\sqrt{715}}{1144}$	0	0	0	$\frac{\sqrt{429}i}{1144}$	0	$\frac{\sqrt{429}}{1144}$	0	0	0		
	0	$-\frac{\sqrt{715}}{286}$	0	0	$\frac{5\sqrt{429}}{858}$	0	0	$-\frac{\sqrt{429}i}{1144}$	0	0	0	0	0	$-\frac{7\sqrt{715}i}{1144}$		
	$-\frac{\sqrt{715}}{286}$	0	0	0	0	$-\frac{5\sqrt{429}}{858}$	$\frac{\sqrt{429}i}{1144}$	0	0	0	0	0	$\frac{7\sqrt{715}i}{1144}$	0		
	0	$\frac{\sqrt{715}i}{286}$	$\frac{5\sqrt{429}}{858}$	0	0	0	0	$\frac{\sqrt{429}}{1144}$	0	0	0	0	0	$-\frac{7\sqrt{715}}{1144}$		
	$-\frac{\sqrt{715}i}{286}$	0	0	$-\frac{5\sqrt{429}}{858}$	0	0	$\frac{\sqrt{429}}{1144}$	0	0	0	0	0	$-\frac{7\sqrt{715}}{1144}$	0		
	$\frac{\sqrt{715}}{143}$	0	0	$\frac{23\sqrt{429}i}{3432}$	0	$-\frac{23\sqrt{429}}{3432}$	0	0	0	$-\frac{7\sqrt{715}i}{1144}$	0	$-\frac{7\sqrt{715}}{1144}$	0	0		
	0	$-\frac{\sqrt{715}}{143}$	$-\frac{23\sqrt{429}i}{3432}$	0	$-\frac{23\sqrt{429}}{3432}$	0	0	0	$\frac{7\sqrt{715}i}{1144}$	0	$-\frac{7\sqrt{715}}{1144}$	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 0 $\frac{4\sqrt{143}}{429}$ 0 $-\frac{4\sqrt{143}i}{429}$ $-\frac{8\sqrt{143}}{429}$ 0 0 $\frac{\sqrt{2145}}{286}$ 0 $\frac{\sqrt{2145}i}{286}$ 0 0	
	0 0 $\frac{4\sqrt{143}}{429}$ 0 $\frac{4\sqrt{143}i}{429}$ 0 0 $\frac{8\sqrt{143}}{429}$ $\frac{\sqrt{2145}}{286}$ 0 $-\frac{\sqrt{2145}i}{286}$ 0 0 0	
	0 $\frac{4\sqrt{143}}{429}$ 0 0 $-\frac{\sqrt{2145}}{1716}$ 0 0 $-\frac{\sqrt{2145}i}{3432}$ 0 0 $\frac{\sqrt{143}}{132}$ 0 0 $\frac{17\sqrt{143}i}{3432}$	
	$\frac{4\sqrt{143}}{429}$ 0 0 0 $\frac{\sqrt{2145}}{1716}$ $\frac{\sqrt{2145}i}{3432}$ 0 0 0 0 $-\frac{\sqrt{143}}{132}$ $-\frac{17\sqrt{143}i}{3432}$ 0	
	0 $-\frac{4\sqrt{143}i}{429}$ $-\frac{\sqrt{2145}}{1716}$ 0 0 0 0 $\frac{\sqrt{2145}}{3432}$ $-\frac{\sqrt{143}}{132}$ 0 0 0 0 $\frac{17\sqrt{143}i}{3432}$	
	$\frac{4\sqrt{143}i}{429}$ 0 0 $\frac{\sqrt{2145}}{1716}$ 0 0 $\frac{\sqrt{2145}}{3432}$ 0 0 0 $\frac{\sqrt{143}}{132}$ 0 0 $\frac{17\sqrt{143}}{3432}$ 0	
	$-\frac{8\sqrt{143}}{429}$ 0 0 $-\frac{\sqrt{2145}i}{3432}$ 0 $\frac{\sqrt{2145}}{3432}$ 0 0 0 $\frac{43\sqrt{143}i}{3432}$ 0 $\frac{43\sqrt{143}}{3432}$ 0 0	
	0 $\frac{8\sqrt{143}}{429}$ $\frac{\sqrt{2145}i}{3432}$ 0 $\frac{\sqrt{2145}}{3432}$ 0 0 0 $-\frac{43\sqrt{143}i}{3432}$ 0 $\frac{43\sqrt{143}}{3432}$ 0 0 0	
	0 $\frac{\sqrt{2145}}{286}$ 0 0 $-\frac{\sqrt{143}}{132}$ 0 0 $\frac{43\sqrt{143}i}{3432}$ 0 0 $\frac{7\sqrt{2145}}{1716}$ 0 0 $\frac{7\sqrt{2145}i}{3432}$	
	$\frac{\sqrt{2145}}{286}$ 0 0 0 $\frac{\sqrt{143}}{132}$ $-\frac{43\sqrt{143}i}{3432}$ 0 0 0 0 $-\frac{7\sqrt{2145}}{1716}$ $-\frac{7\sqrt{2145}i}{3432}$ 0	
	0 $\frac{\sqrt{2145}i}{286}$ $\frac{\sqrt{143}}{132}$ 0 0 0 0 $\frac{43\sqrt{143}}{3432}$ $\frac{7\sqrt{2145}}{1716}$ 0 0 0 0 $-\frac{7\sqrt{2145}}{3432}$	
	$-\frac{\sqrt{2145}i}{286}$ 0 0 $-\frac{\sqrt{143}}{132}$ 0 0 $\frac{43\sqrt{143}}{3432}$ 0 0 $-\frac{7\sqrt{2145}}{1716}$ 0 0 0 $-\frac{7\sqrt{2145}}{3432}$	
	0 0 0 $\frac{17\sqrt{143}i}{3432}$ 0 $\frac{17\sqrt{143}}{3432}$ 0 0 0 $-\frac{7\sqrt{2145}i}{3432}$ 0 $-\frac{7\sqrt{2145}}{3432}$ 0 0 0	
	0 0 $-\frac{17\sqrt{143}i}{3432}$ 0 $\frac{17\sqrt{143}}{3432}$ 0 0 0 $-\frac{7\sqrt{2145}i}{3432}$ 0 $-\frac{7\sqrt{2145}}{3432}$ 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	$\frac{3\sqrt{1001}}{1001}$	0	0	$\frac{\sqrt{15015}}{3432}$	0	0	$-\frac{\sqrt{15015}i}{3432}$	0	0	$\frac{3\sqrt{1001}}{1144}$	0	0	$\frac{3\sqrt{1001}i}{1144}$		
	$\frac{3\sqrt{1001}}{1001}$	0	0	0	0	$-\frac{\sqrt{15015}}{3432}$	$\frac{\sqrt{15015}i}{3432}$	0	0	0	$-\frac{3\sqrt{1001}}{1144}$	$-\frac{3\sqrt{1001}i}{1144}$	0			
	0	0	0	$\frac{10\sqrt{1001}}{1001}$	0	$\frac{5\sqrt{1001}i}{1144}$	$-\frac{5\sqrt{1001}}{1144}$	0	0	0	$\frac{5\sqrt{15015}i}{3432}$	$\frac{5\sqrt{15015}}{3432}$	0			
	0	0	$\frac{10\sqrt{1001}}{1001}$	0	$-\frac{5\sqrt{1001}i}{1144}$	0	0	$\frac{5\sqrt{1001}}{1144}$	0	0	$-\frac{5\sqrt{15015}i}{3432}$	0	0	$-\frac{5\sqrt{15015}}{3432}$		
	$\frac{\sqrt{15015}}{3432}$	0	0	$\frac{5\sqrt{1001}i}{1144}$	0	$-\frac{25\sqrt{1001}}{8008}$	0	0	0	$-\frac{\sqrt{15015}i}{1716}$	0	$-\frac{\sqrt{15015}}{1144}$	0	0		
	0	$-\frac{\sqrt{15015}}{3432}$	$-\frac{5\sqrt{1001}i}{1144}$	0	$-\frac{25\sqrt{1001}}{8008}$	0	0	0	$\frac{\sqrt{15015}i}{1716}$	0	$-\frac{\sqrt{15015}}{1144}$	0	0	0		
	0	$-\frac{\sqrt{15015}i}{3432}$	$-\frac{5\sqrt{1001}}{1144}$	0	0	0	0	$-\frac{25\sqrt{1001}}{8008}$	$-\frac{\sqrt{15015}}{1716}$	0	0	0	0	$\frac{\sqrt{15015}}{1144}$		
	$\frac{\sqrt{15015}i}{3432}$	0	0	$\frac{5\sqrt{1001}}{1144}$	0	0	$-\frac{25\sqrt{1001}}{8008}$	0	0	$\frac{\sqrt{15015}}{1716}$	0	0	$\frac{\sqrt{15015}}{1144}$	0		
	0	0	0	0	$-\frac{\sqrt{15015}i}{1716}$	$-\frac{\sqrt{15015}}{1716}$	0	0	$\frac{3\sqrt{1001}}{1001}$	0	$-\frac{\sqrt{1001}i}{572}$	$\frac{\sqrt{1001}}{572}$	0			
	0	0	0	0	$\frac{\sqrt{15015}i}{1716}$	0	0	$\frac{\sqrt{15015}}{1716}$	$\frac{3\sqrt{1001}}{1001}$	0	$\frac{\sqrt{1001}i}{572}$	0	0	$-\frac{\sqrt{1001}}{572}$		
	$\frac{3\sqrt{1001}}{1144}$	0	0	$\frac{5\sqrt{15015}i}{3432}$	0	$-\frac{\sqrt{15015}}{1144}$	0	0	0	$-\frac{\sqrt{1001}i}{572}$	0	$-\frac{3\sqrt{1001}}{616}$	0	0		
	0	$-\frac{3\sqrt{1001}}{1144}$	$-\frac{5\sqrt{15015}i}{3432}$	0	$-\frac{\sqrt{15015}}{1144}$	0	0	0	$\frac{\sqrt{1001}i}{572}$	0	$-\frac{3\sqrt{1001}}{616}$	0	0	0		
	0	$\frac{3\sqrt{1001}i}{1144}$	$\frac{5\sqrt{15015}}{3432}$	0	0	0	0	$\frac{\sqrt{15015}}{1144}$	$\frac{\sqrt{1001}}{572}$	0	0	0	0	$-\frac{3\sqrt{1001}}{616}$		
	$-\frac{3\sqrt{1001}i}{1144}$	0	0	$-\frac{5\sqrt{15015}}{3432}$	0	0	$\frac{\sqrt{15015}}{1144}$	0	0	$-\frac{\sqrt{1001}}{572}$	0	0	0	$-\frac{3\sqrt{1001}}{616}$	0	
1017	symmetry	$\frac{y(15x^4 - 40x^2y^2 + 30x^2z^2 + 8y^4 - 40y^2z^2 + 15z^4)}{8}$														

continued ...

Table 10

No.	multipole	matrix														
$\mathbb{M}_{5,1}^{(1,1;a)}(T_g, 1)$	0	$-\frac{3\sqrt{1001}i}{1001}$	$\frac{\sqrt{15015}}{3432}$	0	0	0	0	$\frac{\sqrt{15015}}{3432}$	$-\frac{3\sqrt{1001}}{1144}$	0	0	0	0	0	$\frac{3\sqrt{1001}}{1144}$	
	$\frac{3\sqrt{1001}i}{1001}$	0	0	$-\frac{\sqrt{15015}}{3432}$	0	0	$\frac{\sqrt{15015}}{3432}$	0	0	$\frac{3\sqrt{1001}}{1144}$	0	0	$\frac{3\sqrt{1001}}{1144}$	0	0	
	$\frac{\sqrt{15015}}{3432}$	0	0	$\frac{25\sqrt{1001}i}{8008}$	0	$-\frac{5\sqrt{1001}}{1144}$	0	0	0	$-\frac{\sqrt{15015}i}{1144}$	0	$-\frac{\sqrt{15015}}{1716}$	0	0	0	
	0	$-\frac{\sqrt{15015}}{3432}$	$-\frac{25\sqrt{1001}i}{8008}$	0	$-\frac{5\sqrt{1001}}{1144}$	0	0	0	$\frac{\sqrt{15015}i}{1144}$	0	$-\frac{\sqrt{15015}}{1716}$	0	0	0	0	
	0	0	0	$-\frac{5\sqrt{1001}}{1144}$	0	$-\frac{10\sqrt{1001}i}{1001}$	$-\frac{5\sqrt{1001}}{1144}$	0	0	$\frac{5\sqrt{15015}}{3432}$	0	0	$-\frac{5\sqrt{15015}}{3432}$	0	0	
	0	0	$-\frac{5\sqrt{1001}}{1144}$	0	$\frac{10\sqrt{1001}i}{1001}$	0	0	$\frac{5\sqrt{1001}}{1144}$	$\frac{5\sqrt{15015}}{3432}$	0	0	0	0	$\frac{5\sqrt{15015}}{3432}$	0	
	0	$\frac{\sqrt{15015}}{3432}$	0	0	$-\frac{5\sqrt{1001}}{1144}$	0	0	$\frac{25\sqrt{1001}i}{8008}$	0	0	$\frac{\sqrt{15015}}{1716}$	0	0	$\frac{\sqrt{15015}i}{1144}$	0	
	$\frac{\sqrt{15015}}{3432}$	0	0	0	0	$\frac{5\sqrt{1001}}{1144}$	$-\frac{25\sqrt{1001}i}{8008}$	0	0	0	0	$-\frac{\sqrt{15015}}{1716}$	$-\frac{\sqrt{15015}i}{1144}$	0		
	$-\frac{3\sqrt{1001}}{1144}$	0	0	$-\frac{\sqrt{15015}i}{1144}$	0	$\frac{5\sqrt{15015}}{3432}$	0	0	0	$\frac{3\sqrt{1001}i}{616}$	0	$\frac{\sqrt{1001}}{572}$	0	0	0	
	0	$\frac{3\sqrt{1001}}{1144}$	$\frac{\sqrt{15015}i}{1144}$	0	$\frac{5\sqrt{15015}}{3432}$	0	0	0	$-\frac{3\sqrt{1001}i}{616}$	0	$\frac{\sqrt{1001}}{572}$	0	0	0	0	
	0	0	0	$-\frac{\sqrt{15015}}{1716}$	0	0	$\frac{\sqrt{15015}}{1716}$	0	0	$\frac{\sqrt{1001}}{572}$	0	$-\frac{3\sqrt{1001}i}{1001}$	$\frac{\sqrt{1001}}{572}$	0	0	
	0	0	$-\frac{\sqrt{15015}}{1716}$	0	0	0	0	$-\frac{\sqrt{15015}}{1716}$	$\frac{\sqrt{1001}}{572}$	0	$\frac{3\sqrt{1001}i}{1001}$	0	0	$-\frac{\sqrt{1001}}{572}$	0	
	0	$\frac{3\sqrt{1001}}{1144}$	0	0	$-\frac{5\sqrt{15015}}{3432}$	0	0	$\frac{\sqrt{15015}i}{1144}$	0	0	$\frac{\sqrt{1001}}{572}$	0	0	$\frac{3\sqrt{1001}i}{616}$	0	
	$\frac{3\sqrt{1001}}{1144}$	0	0	0	0	$\frac{5\sqrt{15015}}{3432}$	$-\frac{\sqrt{15015}i}{1144}$	0	0	0	0	$-\frac{\sqrt{1001}}{572}$	$-\frac{3\sqrt{1001}i}{616}$	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													
$\mathbb{M}_{5,2}^{(1,1;a)}(T_g, 1)$	$\frac{3\sqrt{1001}}{1001}$	0	0	$-\frac{\sqrt{15015}i}{3432}$	0	$\frac{\sqrt{15015}}{3432}$	0	0	0	$-\frac{3\sqrt{1001}i}{1144}$	0	$-\frac{3\sqrt{1001}}{1144}$	0	0	
	0	$-\frac{3\sqrt{1001}}{1001}$	$\frac{\sqrt{15015}i}{3432}$	0	$\frac{\sqrt{15015}}{3432}$	0	0	0	$\frac{3\sqrt{1001}i}{1144}$	0	$-\frac{3\sqrt{1001}}{1144}$	0	0	0	
	0	$-\frac{\sqrt{15015}i}{3432}$	$-\frac{25\sqrt{1001}}{8008}$	0	0	0	0	$-\frac{5\sqrt{1001}}{1144}$	$-\frac{\sqrt{15015}}{1144}$	0	0	0	0	$\frac{\sqrt{15015}}{1716}$	
	$\frac{\sqrt{15015}i}{3432}$	0	0	$\frac{25\sqrt{1001}}{8008}$	0	0	$-\frac{5\sqrt{1001}}{1144}$	0	0	$\frac{\sqrt{15015}}{1144}$	0	0	$\frac{\sqrt{15015}}{1716}$	0	
	0	$\frac{\sqrt{15015}}{3432}$	0	0	$-\frac{25\sqrt{1001}}{8008}$	0	0	$\frac{5\sqrt{1001}i}{1144}$	0	0	$\frac{\sqrt{15015}}{1144}$	0	0	$\frac{\sqrt{15015}i}{1716}$	
	$\frac{\sqrt{15015}}{3432}$	0	0	0	0	$\frac{25\sqrt{1001}}{8008}$	$-\frac{5\sqrt{1001}i}{1144}$	0	0	0	$-\frac{\sqrt{15015}}{1144}$	$-\frac{\sqrt{15015}i}{1716}$	0		
	0	0	0	$-\frac{5\sqrt{1001}}{1144}$	0	$\frac{5\sqrt{1001}i}{1144}$	$\frac{10\sqrt{1001}}{1001}$	0	0	$-\frac{5\sqrt{15015}}{3432}$	0	$-\frac{5\sqrt{15015}i}{3432}$	0	0	
	0	0	$-\frac{5\sqrt{1001}}{1144}$	0	$-\frac{5\sqrt{1001}i}{1144}$	0	0	$-\frac{10\sqrt{1001}}{1001}$	$-\frac{5\sqrt{15015}}{3432}$	0	$\frac{5\sqrt{15015}i}{3432}$	0	0	0	
	0	$-\frac{3\sqrt{1001}i}{1144}$	$-\frac{\sqrt{15015}}{1144}$	0	0	0	$-\frac{5\sqrt{15015}}{3432}$	$-\frac{3\sqrt{1001}}{616}$	0	0	0	0	0	$\frac{\sqrt{1001}}{572}$	
	$\frac{3\sqrt{1001}i}{1144}$	0	0	$\frac{\sqrt{15015}}{1144}$	0	0	$-\frac{5\sqrt{15015}}{3432}$	0	0	$\frac{3\sqrt{1001}}{616}$	0	0	$\frac{\sqrt{1001}}{572}$	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	$-\frac{\sqrt{715}}{143}$	0	0	$\frac{23\sqrt{429}}{3432}$	0	0	$-\frac{23\sqrt{429}i}{3432}$	0	0	$-\frac{7\sqrt{715}}{1144}$	0	0	$-\frac{7\sqrt{715}i}{1144}$		
	$-\frac{\sqrt{715}}{143}$	0	0	0	0	$-\frac{23\sqrt{429}}{3432}$	$\frac{23\sqrt{429}i}{3432}$	0	0	0	0	$\frac{7\sqrt{715}}{1144}$	$\frac{7\sqrt{715}i}{1144}$	0		
	0	0	0	0	0	$\frac{\sqrt{715}i}{1144}$	$-\frac{\sqrt{715}}{1144}$	0	0	0	0	$-\frac{\sqrt{429}i}{1144}$	$-\frac{\sqrt{429}}{1144}$	0		
	0	0	0	0	$-\frac{\sqrt{715}i}{1144}$	0	0	$\frac{\sqrt{715}}{1144}$	0	0	$\frac{\sqrt{429}i}{1144}$	0	0	$\frac{\sqrt{429}}{1144}$		
	$\frac{23\sqrt{429}}{3432}$	0	0	$\frac{\sqrt{715}i}{1144}$	0	$-\frac{5\sqrt{715}}{1144}$	0	0	0	$-\frac{4\sqrt{429}i}{429}$	0	$-\frac{5\sqrt{429}}{3432}$	0	0		
	0	$-\frac{23\sqrt{429}}{3432}$	$-\frac{\sqrt{715}i}{1144}$	0	$-\frac{5\sqrt{715}}{1144}$	0	0	0	$\frac{4\sqrt{429}i}{429}$	0	$-\frac{5\sqrt{429}}{3432}$	0	0	0		
	0	$-\frac{23\sqrt{429}i}{3432}$	$-\frac{\sqrt{715}}{1144}$	0	0	0	0	$-\frac{5\sqrt{715}}{1144}$	$-\frac{4\sqrt{429}}{429}$	0	0	0	0	$\frac{5\sqrt{429}}{3432}$		
	$\frac{23\sqrt{429}i}{3432}$	0	0	$\frac{\sqrt{715}}{1144}$	0	0	$-\frac{5\sqrt{715}}{1144}$	0	0	$\frac{4\sqrt{429}}{429}$	0	0	0	$\frac{5\sqrt{429}}{3432}$		
	0	0	0	0	$-\frac{4\sqrt{429}i}{429}$	$-\frac{4\sqrt{429}}{429}$	0	0	$\frac{\sqrt{715}}{143}$	0	$\frac{\sqrt{715}i}{286}$	$-\frac{\sqrt{715}}{286}$	0	$\frac{\sqrt{715}}{286}$		
	0	$-\frac{7\sqrt{715}}{1144}$	0	$-\frac{\sqrt{429}i}{1144}$	0	$-\frac{5\sqrt{429}}{3432}$	0	0	0	$\frac{\sqrt{715}i}{286}$	0	$\frac{5\sqrt{715}}{1144}$	0	0		
	0	$\frac{7\sqrt{715}}{1144}$	$\frac{\sqrt{429}i}{1144}$	0	$-\frac{5\sqrt{429}}{3432}$	0	0	0	$-\frac{\sqrt{715}i}{286}$	0	$\frac{5\sqrt{715}}{1144}$	0	0	0		
	0	$-\frac{7\sqrt{715}i}{1144}$	$-\frac{\sqrt{429}}{1144}$	0	0	0	0	$\frac{5\sqrt{429}}{3432}$	$-\frac{\sqrt{715}}{286}$	0	0	0	0	$\frac{5\sqrt{715}}{1144}$		
	$\frac{7\sqrt{715}i}{1144}$	0	0	$\frac{\sqrt{429}}{1144}$	0	0	$\frac{5\sqrt{429}}{3432}$	0	0	$\frac{\sqrt{715}}{286}$	0	0	$\frac{5\sqrt{715}}{1144}$	0		

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

1020 symmetry

continued ...

Table 10

No.	multipole	matrix													
$\mathbb{M}_{5,1}^{(1,1;a)}(T_g, 2)$	0	$\frac{\sqrt{715}i}{143}$	$\frac{23\sqrt{429}}{3432}$	0	0	0	0	$\frac{23\sqrt{429}}{3432}$	$\frac{7\sqrt{715}}{1144}$	0	0	0	0	$-\frac{7\sqrt{715}}{1144}$	
	$-\frac{\sqrt{715}i}{143}$	0	0	$-\frac{23\sqrt{429}}{3432}$	0	0	$\frac{23\sqrt{429}}{3432}$	0	0	$-\frac{7\sqrt{715}}{1144}$	0	0	$-\frac{7\sqrt{715}}{1144}$	0	
	$\frac{23\sqrt{429}}{3432}$	0	0	$\frac{5\sqrt{715}i}{1144}$	0	$-\frac{\sqrt{715}}{1144}$	0	0	0	$-\frac{5\sqrt{429}i}{3432}$	0	$-\frac{4\sqrt{429}}{429}$	0	0	
	0	$-\frac{23\sqrt{429}}{3432}$	$-\frac{5\sqrt{715}i}{1144}$	0	$-\frac{\sqrt{715}}{1144}$	0	0	0	$\frac{5\sqrt{429}i}{3432}$	0	$-\frac{4\sqrt{429}}{429}$	0	0	0	
	0	0	0	$-\frac{\sqrt{715}}{1144}$	0	0	$-\frac{\sqrt{715}}{1144}$	0	0	$-\frac{\sqrt{429}}{1144}$	0	0	$\frac{\sqrt{429}}{1144}$	0	
	0	0	$-\frac{\sqrt{715}}{1144}$	0	0	0	0	$\frac{\sqrt{715}}{1144}$	$-\frac{\sqrt{429}}{1144}$	0	0	0	0	$-\frac{\sqrt{429}}{1144}$	
	0	$\frac{23\sqrt{429}}{3432}$	0	0	$-\frac{\sqrt{715}}{1144}$	0	0	$\frac{5\sqrt{715}i}{1144}$	0	0	$\frac{4\sqrt{429}}{429}$	0	0	$\frac{5\sqrt{429}i}{3432}$	
	$\frac{23\sqrt{429}}{3432}$	0	0	0	0	$\frac{\sqrt{715}}{1144}$	$-\frac{5\sqrt{715}i}{1144}$	0	0	0	$-\frac{4\sqrt{429}}{429}$	$-\frac{5\sqrt{429}i}{3432}$	0		
	$\frac{7\sqrt{715}}{1144}$	0	0	$-\frac{5\sqrt{429}i}{3432}$	0	$-\frac{\sqrt{429}}{1144}$	0	0	0	$-\frac{5\sqrt{715}i}{1144}$	0	$-\frac{\sqrt{715}}{286}$	0	0	
	0	$-\frac{7\sqrt{715}}{1144}$	$\frac{5\sqrt{429}i}{3432}$	0	$-\frac{\sqrt{429}}{1144}$	0	0	0	$\frac{5\sqrt{715}i}{1144}$	0	$-\frac{\sqrt{715}}{286}$	0	0	0	
	0	0	0	$-\frac{4\sqrt{429}}{429}$	0	0	$\frac{4\sqrt{429}}{429}$	0	0	$-\frac{\sqrt{715}}{286}$	0	$-\frac{\sqrt{715}i}{143}$	$-\frac{\sqrt{715}}{286}$	0	
	0	0	$-\frac{4\sqrt{429}}{429}$	0	0	0	0	$-\frac{4\sqrt{429}}{429}$	$-\frac{\sqrt{715}}{286}$	0	$\frac{\sqrt{715}i}{143}$	0	0	$\frac{\sqrt{715}}{286}$	
	0	$-\frac{7\sqrt{715}}{1144}$	0	0	$\frac{\sqrt{429}}{1144}$	0	0	$\frac{5\sqrt{429}i}{3432}$	0	0	$-\frac{\sqrt{715}}{286}$	0	0	$-\frac{5\sqrt{715}i}{1144}$	
	$-\frac{7\sqrt{715}}{1144}$	0	0	0	0	$-\frac{\sqrt{429}}{1144}$	$-\frac{5\sqrt{429}i}{3432}$	0	0	0	0	$\frac{\sqrt{715}}{286}$	$\frac{5\sqrt{715}i}{1144}$	0	
1021	symmetry	$\frac{3\sqrt{35}z(x^2 - 2xy - y^2)(x^2 + 2xy - y^2)}{8}$													

continued ...

Table 10

No.	multipole	matrix													
$\mathbb{M}_{5,2}^{(1,1;a)}(T_g, 2)$	$-\frac{\sqrt{715}}{143}$	0	0	$-\frac{23\sqrt{429}i}{3432}$	0	$\frac{23\sqrt{429}}{3432}$	0	0	0	$\frac{7\sqrt{715}i}{1144}$	0	$\frac{7\sqrt{715}}{1144}$	0	0	
	0	$\frac{\sqrt{715}}{143}$	$\frac{23\sqrt{429}i}{3432}$	0	$\frac{23\sqrt{429}}{3432}$	0	0	0	$-\frac{7\sqrt{715}i}{1144}$	0	$\frac{7\sqrt{715}}{1144}$	0	0	0	
	0	$-\frac{23\sqrt{429}i}{3432}$	$-\frac{5\sqrt{715}}{1144}$	0	0	0	0	$-\frac{\sqrt{715}}{1144}$	$-\frac{5\sqrt{429}}{3432}$	0	0	0	0	$\frac{4\sqrt{429}}{429}$	
	$\frac{23\sqrt{429}i}{3432}$	0	0	$\frac{5\sqrt{715}}{1144}$	0	0	$-\frac{\sqrt{715}}{1144}$	0	0	$\frac{5\sqrt{429}}{3432}$	0	0	$\frac{4\sqrt{429}}{429}$	0	
	0	$\frac{23\sqrt{429}}{3432}$	0	0	$-\frac{5\sqrt{715}}{1144}$	0	0	$\frac{\sqrt{715}i}{1144}$	0	0	$\frac{5\sqrt{429}}{3432}$	0	0	$\frac{4\sqrt{429}i}{429}$	
	$\frac{23\sqrt{429}}{3432}$	0	0	0	0	$\frac{5\sqrt{715}}{1144}$	$-\frac{\sqrt{715}i}{1144}$	0	0	0	0	$-\frac{5\sqrt{429}}{3432}$	$-\frac{4\sqrt{429}i}{429}$	0	
	0	0	0	$-\frac{\sqrt{715}}{1144}$	0	$\frac{\sqrt{715}i}{1144}$	0	0	0	$\frac{\sqrt{429}}{1144}$	0	$\frac{\sqrt{429}i}{1144}$	0	0	
	0	0	$-\frac{\sqrt{715}}{1144}$	0	$-\frac{\sqrt{715}i}{1144}$	0	0	0	$\frac{\sqrt{429}}{1144}$	0	$-\frac{\sqrt{429}i}{1144}$	0	0	0	
	0	$\frac{7\sqrt{715}i}{1144}$	$-\frac{5\sqrt{429}}{3432}$	0	0	0	$\frac{\sqrt{429}}{1144}$	$\frac{5\sqrt{715}}{1144}$	0	0	0	0	$-\frac{\sqrt{715}}{286}$		
	$-\frac{7\sqrt{715}i}{1144}$	0	0	$\frac{5\sqrt{429}}{3432}$	0	0	$\frac{\sqrt{429}}{1144}$	0	0	$-\frac{5\sqrt{715}}{1144}$	0	0	$-\frac{\sqrt{715}}{286}$	0	
	0	$\frac{7\sqrt{715}}{1144}$	0	0	$\frac{5\sqrt{429}}{3432}$	0	0	$\frac{\sqrt{429}i}{1144}$	0	0	$\frac{5\sqrt{715}}{1144}$	0	0	$\frac{\sqrt{715}i}{286}$	
	$\frac{7\sqrt{715}}{1144}$	0	0	0	0	$-\frac{5\sqrt{429}}{3432}$	$-\frac{\sqrt{429}i}{1144}$	0	0	0	0	$-\frac{5\sqrt{715}}{1144}$	$-\frac{\sqrt{715}i}{286}$	0	
	0	0	0	$\frac{4\sqrt{429}}{429}$	0	$\frac{4\sqrt{429}i}{429}$	0	0	0	$-\frac{\sqrt{715}}{286}$	0	$\frac{\sqrt{715}i}{286}$	$\frac{\sqrt{715}}{143}$	0	
	0	0	$\frac{4\sqrt{429}}{429}$	0	$-\frac{4\sqrt{429}i}{429}$	0	0	0	$-\frac{\sqrt{715}}{286}$	0	$-\frac{\sqrt{715}i}{286}$	0	0	$-\frac{\sqrt{715}}{143}$	
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	0	0	0	$-\frac{\sqrt{143}}{156}$	0	0	$-\frac{\sqrt{143}i}{156}$	0	0	$-\frac{\sqrt{2145}}{572}$	0	0	$\frac{\sqrt{2145}i}{572}$		
	0	0	0	0	0	$\frac{\sqrt{143}}{156}$	$\frac{\sqrt{143}i}{156}$	0	0	0	0	$\frac{\sqrt{2145}}{572}$	$-\frac{\sqrt{2145}i}{572}$	0		
	0	0	0	0	0	$-\frac{\sqrt{2145}i}{312}$	$-\frac{\sqrt{2145}}{312}$	0	0	$\frac{8\sqrt{143}}{429}$	0	$-\frac{7\sqrt{143}i}{3432}$	$\frac{7\sqrt{143}}{3432}$	0		
	0	0	0	0	$\frac{\sqrt{2145}i}{312}$	0	0	$\frac{\sqrt{2145}}{312}$	$\frac{8\sqrt{143}}{429}$	0	$\frac{7\sqrt{143}i}{3432}$	0	0	$-\frac{7\sqrt{143}}{3432}$		
	$-\frac{\sqrt{143}}{156}$	0	0	$-\frac{\sqrt{2145}i}{312}$	0	$\frac{5\sqrt{2145}}{1716}$	0	0	0	$\frac{37\sqrt{143}i}{3432}$	0	$\frac{17\sqrt{143}}{1716}$	0	0		
	0	$\frac{\sqrt{143}}{156}$	$\frac{\sqrt{2145}i}{312}$	0	$\frac{5\sqrt{2145}}{1716}$	0	0	0	$-\frac{37\sqrt{143}i}{3432}$	0	$\frac{17\sqrt{143}}{1716}$	0	0	0		
	0	$-\frac{\sqrt{143}i}{156}$	$-\frac{\sqrt{2145}}{312}$	0	0	0	0	$-\frac{5\sqrt{2145}}{1716}$	$-\frac{37\sqrt{143}}{3432}$	0	0	0	0	$\frac{17\sqrt{143}}{1716}$		
	$\frac{\sqrt{143}i}{156}$	0	0	$\frac{\sqrt{2145}}{312}$	0	0	$-\frac{5\sqrt{2145}}{1716}$	0	0	$\frac{37\sqrt{143}}{3432}$	0	0	$\frac{17\sqrt{143}}{1716}$	0		
	0	0	0	$\frac{8\sqrt{143}}{429}$	0	$\frac{37\sqrt{143}i}{3432}$	$-\frac{37\sqrt{143}}{3432}$	0	0	0	0	$\frac{\sqrt{2145}i}{312}$	$\frac{\sqrt{2145}}{312}$	0		
	0	0	$\frac{8\sqrt{143}}{429}$	0	$-\frac{37\sqrt{143}i}{3432}$	0	0	$\frac{37\sqrt{143}}{3432}$	0	0	0	$-\frac{\sqrt{2145}i}{312}$	0	0	$-\frac{\sqrt{2145}}{312}$	
	$-\frac{\sqrt{2145}}{572}$	0	0	$-\frac{7\sqrt{143}i}{3432}$	0	$\frac{17\sqrt{143}}{1716}$	0	0	0	$\frac{\sqrt{2145}i}{312}$	0	$\frac{\sqrt{2145}}{572}$	0	0	0	
	0	$\frac{\sqrt{2145}}{572}$	$\frac{7\sqrt{143}i}{3432}$	0	$\frac{17\sqrt{143}}{1716}$	0	0	0	$-\frac{\sqrt{2145}i}{312}$	0	$\frac{\sqrt{2145}}{572}$	0	0	0		
	0	$\frac{\sqrt{2145}i}{572}$	$\frac{7\sqrt{143}}{3432}$	0	0	0	0	$\frac{17\sqrt{143}}{1716}$	$\frac{\sqrt{2145}}{312}$	0	0	0	0	$-\frac{\sqrt{2145}}{572}$		
	$-\frac{\sqrt{2145}i}{572}$	0	0	$-\frac{7\sqrt{143}}{3432}$	0	0	$\frac{17\sqrt{143}}{1716}$	0	0	$-\frac{\sqrt{2145}}{312}$	0	0	$-\frac{\sqrt{2145}}{572}$	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 0 $\frac{\sqrt{143}}{156}$ 0 0 0 0 $-\frac{\sqrt{143}}{156}$ $-\frac{\sqrt{2145}}{572}$ 0 0 0 0 $-\frac{\sqrt{2145}}{572}$														
	0 0 0 $-\frac{\sqrt{143}}{156}$ 0 0 $-\frac{\sqrt{143}}{156}$ 0 0 $\frac{\sqrt{2145}}{572}$ 0 0 0 $-\frac{\sqrt{2145}}{572}$ 0														
	$\frac{\sqrt{143}}{156}$ 0 0 $\frac{5\sqrt{2145}i}{1716}$ 0 $-\frac{\sqrt{2145}}{312}$ 0 0 0 $-\frac{17\sqrt{143}i}{1716}$ 0 $-\frac{37\sqrt{143}}{3432}$ 0 0														
	0 $-\frac{\sqrt{143}}{156}$ $-\frac{5\sqrt{2145}i}{1716}$ 0 $-\frac{\sqrt{2145}}{312}$ 0 0 0 $\frac{17\sqrt{143}i}{1716}$ 0 $-\frac{37\sqrt{143}}{3432}$ 0 0 0														
	0 0 0 $-\frac{\sqrt{2145}}{312}$ 0 0 $\frac{\sqrt{2145}}{312}$ 0 0 $\frac{7\sqrt{143}}{3432}$ 0 $-\frac{8\sqrt{143}i}{429}$ $\frac{7\sqrt{143}}{3432}$ 0														
	0 0 $-\frac{\sqrt{2145}}{312}$ 0 0 0 0 $-\frac{\sqrt{2145}}{312}$ $\frac{7\sqrt{143}}{3432}$ 0 $\frac{8\sqrt{143}i}{429}$ 0 0 $-\frac{7\sqrt{143}}{3432}$														
	0 $-\frac{\sqrt{143}}{156}$ 0 0 $\frac{\sqrt{2145}}{312}$ 0 0 $-\frac{5\sqrt{2145}i}{1716}$ 0 0 $-\frac{37\sqrt{143}}{3432}$ 0 0 $-\frac{17\sqrt{143}i}{1716}$														
	$-\frac{\sqrt{143}}{156}$ 0 0 0 0 $-\frac{\sqrt{2145}}{312}$ $\frac{5\sqrt{2145}i}{1716}$ 0 0 0 0 $\frac{37\sqrt{143}}{3432}$ $\frac{17\sqrt{143}i}{1716}$ 0														
	$-\frac{\sqrt{2145}}{572}$ 0 0 $-\frac{17\sqrt{143}i}{1716}$ 0 $\frac{7\sqrt{143}}{3432}$ 0 0 0 $\frac{\sqrt{2145}i}{572}$ 0 $\frac{\sqrt{2145}}{312}$ 0 0														
	0 $\frac{\sqrt{2145}}{572}$ $\frac{17\sqrt{143}i}{1716}$ 0 $\frac{7\sqrt{143}}{3432}$ 0 0 0 $-\frac{\sqrt{2145}i}{572}$ 0 $\frac{\sqrt{2145}}{312}$ 0 0 0														
	0 0 0 $-\frac{37\sqrt{143}}{3432}$ 0 $-\frac{8\sqrt{143}i}{429}$ $-\frac{37\sqrt{143}}{3432}$ 0 0 $\frac{\sqrt{2145}}{312}$ 0 0 $-\frac{\sqrt{2145}}{312}$ 0														
	0 0 $-\frac{37\sqrt{143}}{3432}$ 0 $\frac{8\sqrt{143}i}{429}$ 0 0 $\frac{37\sqrt{143}}{3432}$ $\frac{\sqrt{2145}}{312}$ 0 0 0 0 $\frac{\sqrt{2145}}{312}$														
	0 $-\frac{\sqrt{2145}}{572}$ 0 0 $\frac{7\sqrt{143}}{3432}$ 0 0 $-\frac{17\sqrt{143}i}{1716}$ 0 0 0 $-\frac{\sqrt{2145}}{312}$ 0 0 $-\frac{\sqrt{2145}i}{572}$														
	$-\frac{\sqrt{2145}}{572}$ 0 0 0 0 $-\frac{7\sqrt{143}}{3432}$ $\frac{17\sqrt{143}i}{1716}$ 0 0 0 0 $\frac{\sqrt{2145}}{312}$ $\frac{\sqrt{2145}i}{572}$ 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	0	$\frac{\sqrt{143}i}{156}$	0	$\frac{\sqrt{143}}{156}$	0	0	0	$\frac{\sqrt{2145}i}{572}$	0	$-\frac{\sqrt{2145}}{572}$	0	0	0
	0	0	$-\frac{\sqrt{143}i}{156}$	0	$\frac{\sqrt{143}}{156}$	0	0	0	$-\frac{\sqrt{2145}i}{572}$	0	$-\frac{\sqrt{2145}}{572}$	0	0	0	
	0	$\frac{\sqrt{143}i}{156}$	$\frac{5\sqrt{2145}}{1716}$	0	0	0	0	$\frac{\sqrt{2145}}{312}$	$\frac{17\sqrt{143}}{1716}$	0	0	0	0	$-\frac{37\sqrt{143}}{3432}$	
	$-\frac{\sqrt{143}i}{156}$	0	0	$-\frac{5\sqrt{2145}}{1716}$	0	0	$\frac{\sqrt{2145}}{312}$	0	0	$-\frac{17\sqrt{143}}{1716}$	0	0	$-\frac{37\sqrt{143}}{3432}$	0	
	0	$\frac{\sqrt{143}}{156}$	0	0	$-\frac{5\sqrt{2145}}{1716}$	0	0	$\frac{\sqrt{2145}i}{312}$	0	0	$\frac{17\sqrt{143}}{1716}$	0	0	$\frac{37\sqrt{143}i}{3432}$	
	$\frac{\sqrt{143}}{156}$	0	0	0	0	$\frac{5\sqrt{2145}}{1716}$	$-\frac{\sqrt{2145}i}{312}$	0	0	0	0	$-\frac{17\sqrt{143}}{1716}$	$-\frac{37\sqrt{143}i}{3432}$	0	
	0	0	0	$\frac{\sqrt{2145}}{312}$	0	$\frac{\sqrt{2145}i}{312}$	0	0	0	$\frac{7\sqrt{143}}{3432}$	0	$-\frac{7\sqrt{143}i}{3432}$	$\frac{8\sqrt{143}}{429}$	0	
	0	$\frac{\sqrt{2145}i}{312}$	0	$-\frac{\sqrt{2145}i}{312}$	0	0	0	$\frac{7\sqrt{143}}{3432}$	$\frac{\sqrt{2145}}{572}$	0	0	0	$-\frac{8\sqrt{143}}{429}$		
	0	$\frac{\sqrt{2145}i}{572}$	$\frac{17\sqrt{143}}{1716}$	0	0	0	0	$\frac{7\sqrt{143}}{3432}$	$\frac{\sqrt{2145}}{572}$	0	0	0	$-\frac{\sqrt{2145}}{312}$		
	$-\frac{\sqrt{2145}i}{572}$	0	0	$-\frac{17\sqrt{143}}{1716}$	0	0	$\frac{7\sqrt{143}}{3432}$	0	0	$-\frac{\sqrt{2145}}{572}$	0	0	$-\frac{\sqrt{2145}}{312}$		
	0	$-\frac{\sqrt{2145}}{572}$	0	0	$\frac{17\sqrt{143}}{1716}$	0	0	$-\frac{7\sqrt{143}i}{3432}$	0	0	$-\frac{\sqrt{2145}}{572}$	0	0	$-\frac{\sqrt{2145}i}{312}$	
	$-\frac{\sqrt{2145}}{572}$	0	0	0	0	$-\frac{17\sqrt{143}}{1716}$	$\frac{7\sqrt{143}i}{3432}$	0	0	0	0	$\frac{\sqrt{2145}}{572}$	$\frac{\sqrt{2145}i}{312}$	0	
	0	0	0	$-\frac{37\sqrt{143}}{3432}$	0	$\frac{37\sqrt{143}i}{3432}$	$\frac{8\sqrt{143}}{429}$	0	0	$-\frac{\sqrt{2145}}{312}$	0	$-\frac{\sqrt{2145}i}{312}$	0	0	
	0	0	$-\frac{37\sqrt{143}}{3432}$	0	$-\frac{37\sqrt{143}i}{3432}$	0	0	$-\frac{8\sqrt{143}}{429}$	$-\frac{\sqrt{2145}}{312}$	0	$\frac{\sqrt{2145}i}{312}$	0	0	0	