## SAMB for "Th"

Generated on 2023-09-27 01:28 by MultiPie 1.1.14

• Generation condition

model type: tight\_bindingtime-reversal type: electric

irrep: [Ag]spinful

• Kets: dimension = 64

Table 1: Hilbert space for full matrix.

No.	ket								
1	$(s,\uparrow)$ @A <sub>1</sub>	2	$(s,\downarrow)$ @A <sub>1</sub>	3	$(p_x,\uparrow)$ @A <sub>1</sub>	4	$(p_x,\downarrow)$ @A <sub>1</sub>	5	$(p_y,\uparrow)$ @A <sub>1</sub>
6	$(p_y,\downarrow)$ @A <sub>1</sub>	7	$(p_z,\uparrow)$ @A <sub>1</sub>	8	$(p_z,\downarrow)$ @A <sub>1</sub>	9	$(s,\uparrow)$ @A <sub>2</sub>	10	$(s,\downarrow)$ @A <sub>2</sub>
11	$(p_x,\uparrow)$ @A <sub>2</sub>	12	$(p_x,\downarrow)$ @A <sub>2</sub>	13	$(p_y,\uparrow)$ @A <sub>2</sub>	14	$(p_y,\downarrow)$ @A <sub>2</sub>	15	$(p_z,\uparrow)$ @ $A_2$
16	$(p_z,\downarrow)$ @A <sub>2</sub>	17	$(s,\uparrow)$ @A <sub>3</sub>	18	$(s,\downarrow)$ @A <sub>3</sub>	19	$(p_x,\uparrow)$ @A <sub>3</sub>	20	$(p_x,\downarrow)$ @A <sub>3</sub>
21	$(p_y,\uparrow)$ @A <sub>3</sub>	22	$(p_y,\downarrow)$ @A <sub>3</sub>	23	$(p_z,\uparrow)$ @A <sub>3</sub>	24	$(p_z,\downarrow)$ @A <sub>3</sub>	25	$(s,\uparrow)$ @A <sub>4</sub>
26	$(s,\downarrow)$ @A <sub>4</sub>	27	$(p_x,\uparrow)$ @A <sub>4</sub>	28	$(p_x,\downarrow)$ @A <sub>4</sub>	29	$(p_y,\uparrow)$ @A <sub>4</sub>	30	$(p_y,\downarrow)$ @A <sub>4</sub>
31	$(p_z,\uparrow)$ @ $A_4$	32	$(p_z,\downarrow)$ @A <sub>4</sub>	33	$(s,\uparrow)$ @A <sub>5</sub>	34	$(s,\downarrow)$ @A <sub>5</sub>	35	$(p_x,\uparrow)$ @A <sub>5</sub>
36	$(p_x,\downarrow)$ @A <sub>5</sub>	37	$(p_y,\uparrow)$ @A <sub>5</sub>	38	$(p_y,\downarrow)$ @A <sub>5</sub>	39	$(p_z,\uparrow)$ @A <sub>5</sub>	40	$(p_z,\downarrow)$ @A <sub>5</sub>
41	$(s,\uparrow)$ @A <sub>6</sub>	42	$(s,\downarrow)$ @A <sub>6</sub>	43	$(p_x,\uparrow)$ @A <sub>6</sub>	44	$(p_x,\downarrow)$ @A <sub>6</sub>	45	$(p_y,\uparrow)$ @A <sub>6</sub>
46	$(p_y,\downarrow)$ @A <sub>6</sub>	47	$(p_z,\uparrow)$ @A <sub>6</sub>	48	$(p_z,\downarrow)$ @A <sub>6</sub>	49	$(s,\uparrow)$ @A <sub>7</sub>	50	$(s,\downarrow)$ @A <sub>7</sub>
51	$(p_x,\uparrow)$ @A <sub>7</sub>	52	$(p_x,\downarrow)$ @A <sub>7</sub>	53	$(p_y,\uparrow)$ @A <sub>7</sub>	54	$(p_y,\downarrow)$ @A <sub>7</sub>	55	$(p_z,\uparrow)$ @A <sub>7</sub>
56	$(p_z,\downarrow)$ @A <sub>7</sub>	57	$(s,\uparrow)$ @A <sub>8</sub>	58	$(s,\downarrow)$ @A <sub>8</sub>	59	$(p_x,\uparrow)$ @A <sub>8</sub>	60	$(p_x,\downarrow)$ @A <sub>8</sub>
61	$(p_y,\uparrow)$ @A <sub>8</sub>	62	$(p_y,\downarrow)$ @A <sub>8</sub>	63	$(p_z,\uparrow)$ @A <sub>8</sub>	64	$(p_z,\downarrow)$ @A <sub>8</sub>		

• Sites in (primitive) unit cell:

Table 2: Site-clusters.

oing
,,,,,
]
.1]
2]
.0]
7,21]
8,23]
9,24]
0,22]

• Bonds in (primitive) unit cell:

Table 3: Bond-clusters.

	bond	tail	head	n	#	b@c	mapping
B <sub>1</sub> [12c: m]	$b_1$	$A_6$	$A_1$	1	1	$\begin{pmatrix} 0 & 0 & -2 \end{pmatrix} @ \begin{pmatrix} 1 & 1 & 0 \end{pmatrix}$	[1,-14]
	$b_2$	$A_5$	$A_2$	1	1	$ \left[ \begin{array}{cccc} 0 & 0 & -2 \end{array} \right] @ \left( \begin{array}{cccc} -1 & -1 & 0 \end{array} \right) $	[2,-13]
	$b_3$	$A_8$	$A_3$	1	1	$\begin{pmatrix} 0 & 0 & 2 \end{pmatrix} @ \begin{pmatrix} 1 & -1 & 0 \end{pmatrix}$	[3,-16]
	$b_4$	$A_7$	$A_4$	1	1	$\begin{pmatrix} 0 & 0 & 2 \end{pmatrix} @ \begin{pmatrix} -1 & 1 & 0 \end{pmatrix}$	[4,-15]
	$b_5$	A <sub>7</sub>	$A_1$	1	1	$\begin{pmatrix} -2 & 0 & 0 \end{pmatrix} $ $ \begin{pmatrix} 0 & 1 & 1 \end{pmatrix} $	[5,-19]
	$b_6$	$A_8$	$A_2$	1	1	$\begin{pmatrix} 2 & 0 & 0 \end{pmatrix} @ \begin{pmatrix} 0 & -1 & 1 \end{pmatrix}$	[6,-20]
	$b_7$	$A_5$	$A_3$	1	1	$\begin{pmatrix} -2 & 0 & 0 \end{pmatrix} @ \begin{pmatrix} 0 & -1 & -1 \end{pmatrix}$	[7,-17]
	$b_8$	$A_6$	$A_4$	1	1	$\begin{pmatrix} 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 $	[8,-18]
	$b_9$	A <sub>8</sub>	$A_1$	1	1	$\begin{pmatrix} 0 & -2 & 0 \end{pmatrix} $ $ \begin{pmatrix} 1 & 0 & 1 \end{pmatrix} $	[9,-22]
	$b_{10}$	$A_5$	$A_4$	1	1	$\begin{pmatrix} 0 & -2 & 0 \end{pmatrix} @ \begin{pmatrix} -1 & 0 & -1 \end{pmatrix}$	[10,-21]
	$b_{11}$	$A_7$	$A_2$	1	1	$\begin{pmatrix} 0 & 2 & 0 \end{pmatrix} @ \begin{pmatrix} -1 & 0 & 1 \end{pmatrix}$	[11,-24]

Table 3

bond	tail	head	n	#	b@c	mapping
$b_{12}$	A <sub>6</sub>	$A_3$	1	1	$\begin{pmatrix} 0 & 2 & 0 \end{pmatrix} $ $ \begin{pmatrix} 1 & 0 & -1 \end{pmatrix} $	[12,-23]

## • SAMB:

No. 1 
$$\hat{\mathbb{Q}}_0^{(A_g)}$$
 [M<sub>1</sub>, S<sub>1</sub>]

$$\hat{\mathbb{Z}}_1 = \mathbb{X}_1[\mathbb{Q}_0^{(a,A_g)}] \otimes \mathbb{U}_1[\mathbb{Q}_0^{(s,A_g)}]$$

No. 2 
$$\hat{\mathbb{Q}}_0^{(A_g)}$$
 [M<sub>2</sub>, S<sub>1</sub>]

$$\hat{\mathbb{Z}}_2 = \frac{\sqrt{3}\mathbb{X}_5[\mathbb{Q}_{1,0}^{(a,T_u)}] \otimes \mathbb{U}_2[\mathbb{Q}_{1,0}^{(s,T_u)}]}{3} + \frac{\sqrt{3}\mathbb{X}_6[\mathbb{Q}_{1,1}^{(a,T_u)}] \otimes \mathbb{U}_3[\mathbb{Q}_{1,1}^{(s,T_u)}]}{3} + \frac{\sqrt{3}\mathbb{X}_7[\mathbb{Q}_{1,2}^{(a,T_u)}] \otimes \mathbb{U}_4[\mathbb{Q}_{1,2}^{(s,T_u)}]}{3}$$

No. 3 
$$\hat{\mathbb{Q}}_0^{(A_g)}(1,0)$$
 [M<sub>2</sub>, S<sub>1</sub>]

$$\hat{\mathbb{Z}}_{3} = \frac{\sqrt{3}\mathbb{X}_{10}[\mathbb{Q}_{1,2}^{(a,T_{u})}(1,0)] \otimes \mathbb{U}_{4}[\mathbb{Q}_{1,2}^{(s,T_{u})}]}{3} + \frac{\sqrt{3}\mathbb{X}_{8}[\mathbb{Q}_{1,0}^{(a,T_{u})}(1,0)] \otimes \mathbb{U}_{2}[\mathbb{Q}_{1,0}^{(s,T_{u})}]}{3} + \frac{\sqrt{3}\mathbb{X}_{9}[\mathbb{Q}_{1,1}^{(a,T_{u})}(1,0)] \otimes \mathbb{U}_{3}[\mathbb{Q}_{1,1}^{(s,T_{u})}]}{3} + \frac{\sqrt{3}\mathbb{Q}_{1,1}^{(a,T_{u})}(1,0)}{3} + \frac{\sqrt{3}\mathbb{Q}_{1,$$

No. 4 
$$\hat{\mathbb{G}}_{3}^{(A_g)}(1,-1)$$
 [M<sub>2</sub>, S<sub>1</sub>]

$$\hat{\mathbb{Z}}_{4} = \frac{\sqrt{3}\mathbb{X}_{11}[\mathbb{G}_{2,0}^{(a,T_{u})}(1,-1)] \otimes \mathbb{U}_{2}[\mathbb{Q}_{1,0}^{(s,T_{u})}]}{3} + \frac{\sqrt{3}\mathbb{X}_{12}[\mathbb{G}_{2,1}^{(a,T_{u})}(1,-1)] \otimes \mathbb{U}_{3}[\mathbb{Q}_{1,1}^{(s,T_{u})}]}{3} + \frac{\sqrt{3}\mathbb{X}_{13}[\mathbb{G}_{2,2}^{(a,T_{u})}(1,-1)] \otimes \mathbb{U}_{4}[\mathbb{Q}_{1,2}^{(s,T_{u})}]}{3} + \frac{\sqrt{3}\mathbb{X}_{13}[\mathbb{Q}_{2,2}^{(a,T_{u})}(1,-1)] \otimes \mathbb{U}_{4}[\mathbb{Q}_{1,2}^{(s,T_{u})}]}{3} + \frac{\sqrt{3}\mathbb{X}_{13}[\mathbb{Q}_{2,2}^{(a,T_{u})}(1,-1)] \otimes \mathbb{Q}_{4}[\mathbb{Q}_{1,2}^{(s,T_{u})}]}{3} + \frac{\sqrt{3}\mathbb{X}_{13}[\mathbb{Q}_{2,2}^{(a,T_{u})}(1,-1)] \otimes \mathbb{Q}_{4}[\mathbb{Q}_{2,2}^{(s,T_{u})}]}{3} + \frac{\sqrt{3}\mathbb{X}_{13}[\mathbb{Q}_{2,2}^{(a,T_{u})}(1,-1)] \otimes \mathbb{Q}_{4}[\mathbb{Q}_{2,2}^{(s,T_{u})}]}{3} + \frac{\sqrt{3}\mathbb{X}_{13}[\mathbb{Q}_{2,2}^{(a,T_{u})}(1,-1)] \otimes \mathbb{Q}_{4}[\mathbb{Q}_{2,2}^{(s,T_{u})}]}{3} + \frac{\sqrt{3}\mathbb{X}_{13}[\mathbb{Q}_{2,2}^{(s,T_{u})}(1,-1)] \otimes \mathbb{Q}_{4}[\mathbb{Q}_{2,2}^{(s,T_{u})}(1,-1)]}{3} + \frac{\sqrt{3}\mathbb{X}_{13}[\mathbb{Q}_{2,2}^{(s,T_{u})}(1,-1)]}{3} + \frac{\sqrt{3}\mathbb{X}_{13}[\mathbb{Q}_{2,2}^{(s,T_{$$

No. 5 
$$\hat{\mathbb{G}}_{3}^{(A_g)}(1,1)$$
 [M<sub>2</sub>, S<sub>1</sub>]

$$\hat{\mathbb{Z}}_5 = \mathbb{X}_{26}[\mathbb{G}_0^{(a,A_u)}(1,1)] \otimes \mathbb{U}_8[\mathbb{Q}_3^{(s,A_u)}]$$

No. 6 
$$\hat{\mathbb{Q}}_0^{(A_g)}$$
 [M<sub>3</sub>, S<sub>1</sub>]

$$\hat{\mathbb{Z}}_6 = \mathbb{X}_{27}[\mathbb{Q}_0^{(a,A_g)}] \otimes \mathbb{U}_1[\mathbb{Q}_0^{(s,A_g)}]$$

No. 7 
$$\hat{\mathbb{Q}}_0^{(A_g)}(1,1)$$
 [M<sub>3</sub>, S<sub>1</sub>]

$$\hat{\mathbb{Z}}_7 = \mathbb{X}_{28}[\mathbb{Q}_0^{(a,A_g)}(1,1)] \otimes \mathbb{U}_1[\mathbb{Q}_0^{(s,A_g)}]$$

No. 8 
$$\hat{\mathbb{Q}}_0^{(A_g)}$$
 [M<sub>3</sub>, S<sub>1</sub>]

$$\hat{\mathbb{Z}}_8 = \frac{\sqrt{3}\mathbb{X}_{31}[\mathbb{Q}_{2,0}^{(a,T_g)}] \otimes \mathbb{U}_5[\mathbb{Q}_{2,0}^{(s,T_g)}]}{3} + \frac{\sqrt{3}\mathbb{X}_{32}[\mathbb{Q}_{2,1}^{(a,T_g)}] \otimes \mathbb{U}_6[\mathbb{Q}_{2,1}^{(s,T_g)}]}{3} + \frac{\sqrt{3}\mathbb{X}_{33}[\mathbb{Q}_{2,2}^{(a,T_g)}] \otimes \mathbb{U}_7[\mathbb{Q}_{2,2}^{(s,T_g)}]}{3} + \frac{\sqrt{3}\mathbb{X}_{33}[\mathbb{Q}_{2,2}^{(a,T_g)}]}{3} + \frac{\sqrt{3}\mathbb{X}_{33}[\mathbb{Q}_{2,2}^{(a,T_g)}]}{3$$

No. 9 
$$\hat{\mathbb{Q}}_0^{(A_g)}(1,-1)$$
 [M<sub>3</sub>, S<sub>1</sub>]

$$\hat{\mathbb{Z}}_9 = \frac{\sqrt{3}\mathbb{X}_{36}[\mathbb{Q}_{2,0}^{(a,T_g)}(1,-1)] \otimes \mathbb{U}_5[\mathbb{Q}_{2,0}^{(s,T_g)}]}{3} + \frac{\sqrt{3}\mathbb{X}_{37}[\mathbb{Q}_{2,1}^{(a,T_g)}(1,-1)] \otimes \mathbb{U}_6[\mathbb{Q}_{2,1}^{(s,T_g)}]}{3} + \frac{\sqrt{3}\mathbb{X}_{38}[\mathbb{Q}_{2,2}^{(a,T_g)}(1,-1)] \otimes \mathbb{U}_7[\mathbb{Q}_{2,2}^{(s,T_g)}]}{3} + \frac{\sqrt{3}\mathbb{X}_{38}[\mathbb{Q}_{2,2}^{(a,T_g)}(1,-1)] \otimes \mathbb{U}_7[\mathbb{Q}_{2,2}^{(a,T_g)}]}{3} + \frac{\sqrt{3}\mathbb{X}_{38}[\mathbb{Q}_{2,2}^{(a,T_g)}(1,-1)] \otimes \mathbb{U}_7[\mathbb{Q}_2,\mathbb{Q}]}{3} + \frac{\sqrt{3}\mathbb{X}_{38}[\mathbb{Q}_2,\mathbb{Q}]}{3} + \frac$$

No. 10 
$$\hat{\mathbb{G}}_{3}^{(A_g)}(1,0)$$
 [M<sub>3</sub>, S<sub>1</sub>]

$$\hat{\mathbb{Z}}_{10} = \frac{\sqrt{3}\mathbb{X}_{39}[\mathbb{G}_{1,0}^{(a,T_g)}(1,0)] \otimes \mathbb{U}_{5}[\mathbb{Q}_{2,0}^{(s,T_g)}]}{3} + \frac{\sqrt{3}\mathbb{X}_{40}[\mathbb{G}_{1,1}^{(a,T_g)}(1,0)] \otimes \mathbb{U}_{6}[\mathbb{Q}_{2,1}^{(s,T_g)}]}{3} + \frac{\sqrt{3}\mathbb{X}_{41}[\mathbb{G}_{1,2}^{(a,T_g)}(1,0)] \otimes \mathbb{U}_{7}[\mathbb{Q}_{2,2}^{(s,T_g)}]}{3} + \frac{\sqrt{3}\mathbb{X}_{41}[\mathbb{Q}_{1,2}^{(a,T_g)}(1,0)] \otimes \mathbb{U}_{7}[\mathbb{Q}_{1,2}^{(a,T_g)}(1,0)]}{3} + \frac{\sqrt{3}\mathbb{X}_{41}[\mathbb{Q}_{1,2}^{(a,T_g)}(1,0)] \otimes \mathbb{U}_{7}[\mathbb{Q}_{1,2}^{(a,T_g)}(1,0)]}{3} + \frac{\sqrt{3}\mathbb{X}_{41}[\mathbb{Q}_{1,2}^{(a,T_g)}(1,0)] \otimes \mathbb{U}_{7}[\mathbb{Q}_{1,2}^{(a,T_g)}(1,0)]}{3} + \frac{\sqrt{3}\mathbb{X}_{41}[\mathbb{Q}_{1,2}^{(a,T_g)}(1,0)] \otimes \mathbb{U}_{7}[\mathbb{Q}_{1,2}^{(a,T_g)}(1,0)]}{3} + \frac{\sqrt{3}\mathbb{X}_{41}[\mathbb{Q}_{1,2}^{(a,T_g)}(1,0)] \otimes \mathbb{Q}_{7}[\mathbb{Q}_{1,2}^{(a,T_g)}(1,0)]}{3} + \frac{\sqrt{3}\mathbb{X}_{41}[\mathbb{Q}_{1,2}^{(a,T_g)}(1,0)] \otimes \mathbb{Q}_{7}[\mathbb{Q}_{1,2}^{(a,T_g)}(1,0)]}{3} + \frac{\sqrt{3}\mathbb{Q}_{1,2}[\mathbb{Q}_{1,2}^{(a,T_g)}(1,0)] \otimes \mathbb{Q}_{7}[\mathbb{Q}_{1,2}^{(a,T_g)}(1,0)]}{3} + \frac{\sqrt{3}\mathbb{Q}_{1,2}[\mathbb{Q}_{1,2}^{(a,T_g)}(1,0)] \otimes \mathbb{Q}_{7}[\mathbb{Q}_{1,2}^{(a,T_g)}(1,0)]}{3} + \frac{\sqrt{3}\mathbb{Q}_{1,2}[\mathbb{Q}_{1,2}^{(a,T_g)}(1,0)] \otimes \mathbb{Q}_{1,2}[\mathbb{Q}_{1,2}^{(a,T_g)}(1,0)]}{3} + \frac{\sqrt{3}\mathbb{Q}_$$

No. 11 
$$\hat{\mathbb{Q}}_0^{(A_g)}$$
 [M<sub>1</sub>, B<sub>1</sub>]

$$\hat{\mathbb{Z}}_{11} = \mathbb{X}_1[\mathbb{Q}_0^{(a,A_g)}] \otimes \mathbb{U}_9[\mathbb{Q}_0^{(u,A_g)}]$$

No. 12 
$$\hat{\mathbb{G}}_{3}^{(A_g)}(1,-1)$$
 [M<sub>1</sub>, B<sub>1</sub>]

$$\hat{\mathbb{Z}}_{12} = \frac{\sqrt{3}\mathbb{X}_2[\mathbb{M}_{1,0}^{(a,T_g)}(1,-1)] \otimes \mathbb{U}_{24}[\mathbb{T}_{2,0}^{(u,T_g)}]}{3} + \frac{\sqrt{3}\mathbb{X}_3[\mathbb{M}_{1,1}^{(a,T_g)}(1,-1)] \otimes \mathbb{U}_{25}[\mathbb{T}_{2,1}^{(u,T_g)}]}{3} + \frac{\sqrt{3}\mathbb{X}_4[\mathbb{M}_{1,2}^{(a,T_g)}(1,-1)] \otimes \mathbb{U}_{26}[\mathbb{T}_{2,2}^{(u,T_g)}]}{3} + \frac{\sqrt{3}\mathbb{X}_4[\mathbb{M}_{1,2}^{(a,T_g)}(1,-1)] \otimes \mathbb{U}_{26}[\mathbb{T}_{2,2}^{(u,T_g)}]}{3} + \frac{\sqrt{3}\mathbb{X}_4[\mathbb{M}_{1,2}^{(a,T_g)}(1,-1)] \otimes \mathbb{U}_{26}[\mathbb{T}_{2,2}^{(u,T_g)}]}{3} + \frac{\sqrt{3}\mathbb{X}_4[\mathbb{M}_{1,2}^{(a,T_g)}(1,-1)] \otimes \mathbb{U}_{26}[\mathbb{T}_{2,2}^{(u,T_g)}]}{3} + \frac{\sqrt{3}\mathbb{X}_4[\mathbb{M}_{1,2}^{(u,T_g)}(1,-1)] \otimes \mathbb{U}_{26}[\mathbb{T}_{2,2}^{(u,T_g)}(1,-1)]}{3} + \frac{\sqrt{3}\mathbb{X}_4[\mathbb{M}_{1,2}^{(u,T_g)}(1,-1)] \otimes \mathbb{U}_{26}[\mathbb{M}_{1,2}^{(u,T_g)}(1,-1)]}{3} + \frac{\sqrt{3}\mathbb{X}_4[\mathbb{M}_{1,2}^{(u,T_g)}(1,-1)] \otimes \mathbb{U}_{26}[\mathbb{M}_{1,2}^{(u,T_g)}(1,-1)]}{3} + \frac{\sqrt{3}\mathbb{X}_4[\mathbb{M}_{1,2}^{(u,T_g)}(1,-$$

No. 13 
$$\hat{\mathbb{Q}}_{4}^{(A_g)}(1,-1)$$
 [M<sub>1</sub>, B<sub>1</sub>]

$$\hat{\mathbb{Z}}_{13} = -\frac{\sqrt{3}\mathbb{X}_{2}[\mathbb{M}_{1,0}^{(a,T_{g})}(1,-1)] \otimes \mathbb{U}_{28}[\mathbb{T}_{4,0}^{(u,T_{g},1)}]}{3} - \frac{\sqrt{3}\mathbb{X}_{3}[\mathbb{M}_{1,1}^{(a,T_{g})}(1,-1)] \otimes \mathbb{U}_{29}[\mathbb{T}_{4,1}^{(u,T_{g},1)}]}{3} - \frac{\sqrt{3}\mathbb{X}_{4}[\mathbb{M}_{1,2}^{(a,T_{g})}(1,-1)] \otimes \mathbb{U}_{30}[\mathbb{T}_{4,2}^{(u,T_{g},1)}]}{3} - \frac{\sqrt{3}\mathbb{X}_{4}[\mathbb{M}_{1,2}^{(a,T_{g})}(1,-1)] \otimes \mathbb{U}_{30}[\mathbb{T}_{4,2}^{(u,T_{g},1)}]}{3} - \frac{\sqrt{3}\mathbb{X}_{4}[\mathbb{M}_{1,2}^{(a,T_{g})}(1,-1)] \otimes \mathbb{U}_{30}[\mathbb{T}_{4,2}^{(u,T_{g},1)}]}{3} - \frac{\sqrt{3}\mathbb{X}_{4}[\mathbb{M}_{1,2}^{(u,T_{g},1)}(1,-1)] \otimes \mathbb{U}_{30}[\mathbb{M}_{1,2}^{(u,T_{g},1)}]}{3} - \frac{\sqrt{3}\mathbb{X}_{4}[\mathbb{M}_{1,2}^{(u,T_{g},$$

No. 14 
$$\hat{\mathbb{Q}}_0^{(A_g)}$$
 [M<sub>2</sub>, B<sub>1</sub>]

$$\hat{\mathbb{Z}}_{14} = \frac{\sqrt{3}\mathbb{X}_{5}[\mathbb{Q}_{1,0}^{(a,T_{u})}] \otimes \mathbb{U}_{10}[\mathbb{Q}_{1,0}^{(u,T_{u})}]}{3} + \frac{\sqrt{3}\mathbb{X}_{6}[\mathbb{Q}_{1,1}^{(a,T_{u})}] \otimes \mathbb{U}_{11}[\mathbb{Q}_{1,1}^{(u,T_{u})}]}{3} + \frac{\sqrt{3}\mathbb{X}_{7}[\mathbb{Q}_{1,2}^{(a,T_{u})}] \otimes \mathbb{U}_{12}[\mathbb{Q}_{1,2}^{(u,T_{u})}]}{3}$$

No. 15 
$$\hat{\mathbb{Q}}_{4}^{(A_g)}$$
 [M<sub>2</sub>, B<sub>1</sub>]

$$\hat{\mathbb{Z}}_{15} = \frac{\sqrt{3}\mathbb{X}_{5}[\mathbb{Q}_{1,0}^{(a,T_{u})}] \otimes \mathbb{U}_{18}[\mathbb{Q}_{3,0}^{(u,T_{u},1)}]}{3} + \frac{\sqrt{3}\mathbb{X}_{6}[\mathbb{Q}_{1,1}^{(a,T_{u})}] \otimes \mathbb{U}_{19}[\mathbb{Q}_{3,1}^{(u,T_{u},1)}]}{3} + \frac{\sqrt{3}\mathbb{X}_{7}[\mathbb{Q}_{1,2}^{(a,T_{u})}] \otimes \mathbb{U}_{20}[\mathbb{Q}_{3,2}^{(u,T_{u},1)}]}{3}$$

No. 16 
$$\hat{\mathbb{Q}}_0^{(A_g)}(1,0)$$
 [M<sub>2</sub>, B<sub>1</sub>]

$$\hat{\mathbb{Z}}_{16} = \frac{\sqrt{3}\mathbb{X}_{10}[\mathbb{Q}_{1,2}^{(a,T_u)}(1,0)] \otimes \mathbb{U}_{12}[\mathbb{Q}_{1,2}^{(u,T_u)}]}{3} + \frac{\sqrt{3}\mathbb{X}_{8}[\mathbb{Q}_{1,0}^{(a,T_u)}(1,0)] \otimes \mathbb{U}_{10}[\mathbb{Q}_{1,0}^{(u,T_u)}]}{3} + \frac{\sqrt{3}\mathbb{X}_{9}[\mathbb{Q}_{1,1}^{(a,T_u)}(1,0)] \otimes \mathbb{U}_{11}[\mathbb{Q}_{1,1}^{(u,T_u)}]}{3} + \frac{\sqrt{3}\mathbb{X}_{9}[\mathbb{Q}_{1,1}^{(a,T_u)}(1,0)] \otimes \mathbb{U}_{11}[\mathbb{Q}_{1,1}^{(u,T_u)}]}{3} + \frac{\sqrt{3}\mathbb{X}_{9}[\mathbb{Q}_{1,1}^{(a,T_u)}(1,0)] \otimes \mathbb{U}_{11}[\mathbb{Q}_{1,1}^{(u,T_u)}]}{3} + \frac{\sqrt{3}\mathbb{X}_{9}[\mathbb{Q}_{1,1}^{(u,T_u)}(1,0)] \otimes \mathbb{Q}_{11}[\mathbb{Q}_{1,1}^{(u,T_u)}]}{3} + \frac{\sqrt{3}\mathbb{X}_{9}[\mathbb{Q}_{1,1}^{(u,T_u)}(1,0)] \otimes \mathbb{Q}_{11}[\mathbb{Q}_{1,1}^{(u,T_u)}(1,0)]}{3} + \frac{\sqrt{3}\mathbb{Q}_{1,1}^{(u,T_u)}(1,0)}{3} + \frac{\sqrt{3}\mathbb{Q}_{1,1}^$$

No. 17 
$$\hat{\mathbb{Q}}_{4}^{(A_g)}(1,0)$$
 [M<sub>2</sub>, B<sub>1</sub>]

$$\hat{\mathbb{Z}}_{17} = \frac{\sqrt{3}\mathbb{X}_{10}[\mathbb{Q}_{1,2}^{(a,T_u)}(1,0)] \otimes \mathbb{U}_{20}[\mathbb{Q}_{3,2}^{(u,T_u,1)}]}{3} + \frac{\sqrt{3}\mathbb{X}_{8}[\mathbb{Q}_{1,0}^{(a,T_u)}(1,0)] \otimes \mathbb{U}_{18}[\mathbb{Q}_{3,0}^{(u,T_u,1)}]}{3} + \frac{\sqrt{3}\mathbb{X}_{9}[\mathbb{Q}_{1,1}^{(a,T_u)}(1,0)] \otimes \mathbb{U}_{19}[\mathbb{Q}_{3,1}^{(u,T_u,1)}]}{3} + \frac{\sqrt{3}\mathbb{X}_{9}[\mathbb{Q}_{1,1}^{(a,T_u)}(1,0)] \otimes \mathbb{U}_{19}[\mathbb{Q}_{3,1}^{(u,T_u,1)}]}{3} + \frac{\sqrt{3}\mathbb{X}_{9}[\mathbb{Q}_{1,1}^{(u,T_u,1)}(1,0)] \otimes \mathbb{U}_{19}[\mathbb{Q}_{1,1}^{(u,T_u,1)}]}{3} + \frac{\sqrt{3}\mathbb{X}_{9}[\mathbb{Q}_{1,1}^{(u,T_u,1)}(1,0)] \otimes \mathbb{U}_{19}[\mathbb{Q}_{1,1}^{(u,T_u,1)}(1,0)]}{3} + \frac{\sqrt{3}\mathbb{X}_{9}[\mathbb{Q}_{1,1}^{(u,T_u,1)}(1,0)] \otimes \mathbb{U}_{9$$

No. 18 
$$\hat{\mathbb{G}}_{3}^{(A_g)}(1,-1)$$
 [M<sub>2</sub>, B<sub>1</sub>]

$$\hat{\mathbb{Z}}_{18} = \frac{\sqrt{3}\mathbb{X}_{11}[\mathbb{G}_{2,0}^{(a,T_u)}(1,-1)]\otimes\mathbb{U}_{10}[\mathbb{Q}_{1,0}^{(u,T_u)}]}{3} + \frac{\sqrt{3}\mathbb{X}_{12}[\mathbb{G}_{2,1}^{(a,T_u)}(1,-1)]\otimes\mathbb{U}_{11}[\mathbb{Q}_{1,1}^{(u,T_u)}]}{3} + \frac{\sqrt{3}\mathbb{X}_{13}[\mathbb{G}_{2,2}^{(a,T_u)}(1,-1)]\otimes\mathbb{U}_{12}[\mathbb{Q}_{1,2}^{(u,T_u)}]}{3} + \frac{\sqrt{3}\mathbb{X}_{13}[\mathbb{Q}_{2,2}^{(a,T_u)}(1,-1)]\otimes\mathbb{U}_{12}[\mathbb{Q}_{1,2}^{(u,T_u)}]}{3} + \frac{\sqrt{3}\mathbb{X}_{13}[\mathbb{Q}_{2,2}^{(a,T_u)}(1,-1)]\otimes\mathbb{U}_{12}[\mathbb{Q}_{1,2}^{(u,T_u)}]}{3} + \frac{\sqrt{3}\mathbb{X}_{13}[\mathbb{Q}_{2,2}^{(u,T_u)}(1,-1)]\otimes\mathbb{U}_{12}[\mathbb{Q}_{1,2}^{(u,T_u)}]}{3} + \frac{\sqrt{3}\mathbb{X}_{13}[\mathbb{Q}_{2,2}^{(u,T_u)}(1,-1)]\otimes\mathbb{U}_{12}[\mathbb{Q}_{1,2}^{(u,T_u)}]}{3} + \frac{\sqrt{3}\mathbb{X}_{13}[\mathbb{Q}_{2,2}^{(u,T_u)}(1,-1)]\otimes\mathbb{U}_{12}[\mathbb{Q}_{1,2}^{(u,T_u)}]}{3} + \frac{\sqrt{3}\mathbb{X}_{13}[\mathbb{Q}_{2,2}^{(u,T_u)}(1,-1)]\otimes\mathbb{U}_{12}[\mathbb{Q}_{2,2}^{(u,T_u)}]}{3} + \frac{\sqrt{3}\mathbb{X}_{13}[\mathbb{Q}_{2,2}^{(u,T_u)}(1,-1)]\otimes\mathbb{Q}_{2,2}}{3} + \frac{\sqrt{$$

No. 19 
$$\hat{\mathbb{G}}_{3}^{(A_g)}(1,-1)$$
 [M<sub>2</sub>, B<sub>1</sub>]

$$\hat{\mathbb{Z}}_{19} = -\frac{\sqrt{3}\mathbb{X}_{11}[\mathbb{G}_{2,0}^{(a,T_u)}(1,-1)]\otimes\mathbb{U}_{18}[\mathbb{Q}_{3,0}^{(u,T_u,1)}]}{3} - \frac{\sqrt{3}\mathbb{X}_{12}[\mathbb{G}_{2,1}^{(a,T_u)}(1,-1)]\otimes\mathbb{U}_{19}[\mathbb{Q}_{3,1}^{(u,T_u,1)}]}{3} - \frac{\sqrt{3}\mathbb{X}_{13}[\mathbb{G}_{2,2}^{(a,T_u)}(1,-1)]\otimes\mathbb{U}_{20}[\mathbb{Q}_{3,2}^{(u,T_u,1)}]}{3} - \frac{\sqrt{3}\mathbb{X}_{13}[\mathbb{Q}_{2,2}^{(a,T_u)}(1,-1)]\otimes\mathbb{U}_{20}[\mathbb{Q}_{3,2}^{(u,T_u,1)}]}{3} - \frac{\sqrt{3}\mathbb{X}_{13}[\mathbb{Q}_{2,2}^{(u,T_u,1)}(1,-1)]\otimes\mathbb{Q}_{20}[\mathbb{Q}_{3,2}^{(u,T_u,1)}]}{3} - \frac{\sqrt{3}\mathbb{X}_{13}[\mathbb{Q}_{2,2}^{(u,T_u,1)}(1,-1)]\otimes\mathbb{Q}_{20}[\mathbb{Q}_{3,2}^{(u,T_u,1)}]}{3} - \frac{\sqrt{3}\mathbb{X}_{13}[\mathbb{Q}_{2,2}^{(u,T_u,1)}(1,-1)]\otimes\mathbb{Q}_{20}[\mathbb{Q}_{3,2}^{(u,T_u,1)}]}{3} - \frac{\mathbb{Q}_{20}[\mathbb{Q}_{3,2}^{(u,T_u,1)}(1,-1)]\otimes\mathbb{Q}_{20}[\mathbb{Q}_{3,2}^{(u,T_u,1)}]}{3} - \frac{\mathbb{Q}_{20}[\mathbb{Q}_{3,2}^{(u,T_u,1)}(1,-1)]\otimes\mathbb{Q}_{20}[\mathbb{Q}_{3,2}^{(u,T_u,1)}]}{3} - \frac{\mathbb{Q}_{20}[\mathbb{Q}_{3,2}^{(u,T_u,1)}(1,-1)]\otimes\mathbb{Q}_{20}[\mathbb{Q}_{3,2}^{(u,T_u,1)}(1,-1)]}{3} - \frac{\mathbb{Q}_{20}[\mathbb{Q}_{3,2}^{(u,T_u,1)}(1,-$$

No. 20 
$$\hat{\mathbb{G}}_{3}^{(A_g)}(1,1)$$
 [M<sub>2</sub>, B<sub>1</sub>]

$$\hat{\mathbb{Z}}_{20} = \mathbb{X}_{14}[\mathbb{M}_0^{(a,A_u)}(1,1)] \otimes \mathbb{U}_{27}[\mathbb{T}_3^{(u,A_u)}]$$

No. 21 
$$\hat{\mathbb{G}}_3^{(A_g)}(1,-1)$$
 [M<sub>2</sub>, B<sub>1</sub>]

$$\hat{\mathbb{Z}}_{21} = \frac{\sqrt{3}\mathbb{X}_{17}[\mathbb{M}_{2,0}^{(a,T_u)}(1,-1)] \otimes \mathbb{U}_{21}[\mathbb{T}_{1,0}^{(u,T_u)}]}{3} + \frac{\sqrt{3}\mathbb{X}_{18}[\mathbb{M}_{2,1}^{(a,T_u)}(1,-1)] \otimes \mathbb{U}_{22}[\mathbb{T}_{1,1}^{(u,T_u)}]}{3} + \frac{\sqrt{3}\mathbb{X}_{19}[\mathbb{M}_{2,2}^{(a,T_u)}(1,-1)] \otimes \mathbb{U}_{23}[\mathbb{T}_{1,2}^{(u,T_u)}]}{3} + \frac{\sqrt{3}\mathbb{X}_{19}[\mathbb{M}_{2,2}^{(u,T_u)}(1,-1)] \otimes \mathbb{U}_{23}[\mathbb{T}_{1,2}^{(u,T_u)}(1,-1)]}{3} + \frac{\sqrt{3}\mathbb{X}_{19}[\mathbb{M}_{2,2}^{(u,T_u)}(1,-1)] \otimes \mathbb{U}_{23}[\mathbb{T}_{1,2}^{(u,T_u)}(1,-1)]}{3} + \frac{\sqrt{3}\mathbb{X}_{19}[\mathbb{M}_{2,2}^{(u,T_u)}(1,-1)] \otimes \mathbb{U}_{23}[\mathbb{T}_{1,2}^{(u,T_u)}(1,-1)]}{3} + \frac{\sqrt{3}\mathbb{X}_{19}[\mathbb{M}_{2,2}^{(u,T_u)}(1,-1)]}{3} + \frac$$

No. 22 
$$\hat{\mathbb{G}}_{3}^{(A_g)}(1,-1)$$
 [M<sub>2</sub>, B<sub>1</sub>]

$$\hat{\mathbb{Z}}_{22} = -\frac{\sqrt{2}\mathbb{X}_{15}[\mathbb{M}_{2,0}^{(a,E_{u})}(1,-1)]\otimes\mathbb{U}_{32}[\mathbb{T}_{5,1}^{(u,E_{u})}]}{2} + \frac{\sqrt{2}\mathbb{X}_{16}[\mathbb{M}_{2,1}^{(a,E_{u})}(1,-1)]\otimes\mathbb{U}_{31}[\mathbb{T}_{5,0}^{(u,E_{u})}]}{2}$$

No. 23 
$$\hat{\mathbb{Q}}_4^{(A_g)}(1,-1)$$
 [M<sub>2</sub>, B<sub>1</sub>]

$$\hat{\mathbb{Z}}_{23} = -\frac{\sqrt{2}\mathbb{X}_{15}[\mathbb{M}_{2,0}^{(a,E_u)}(1,-1)]\otimes \mathbb{U}_{31}[\mathbb{T}_{5,0}^{(u,E_u)}]}{2} - \frac{\sqrt{2}\mathbb{X}_{16}[\mathbb{M}_{2,1}^{(a,E_u)}(1,-1)]\otimes \mathbb{U}_{32}[\mathbb{T}_{5,1}^{(u,E_u)}]}{2}$$

No. 24 
$$\hat{\mathbb{Q}}_0^{(A_g)}(1,0)$$
 [M<sub>2</sub>, B<sub>1</sub>]

$$\hat{\mathbb{Z}}_{24} = \frac{\sqrt{3}\mathbb{X}_{20}[\mathbb{T}_{1,0}^{(a,T_u)}(1,0)] \otimes \mathbb{U}_{21}[\mathbb{T}_{1,0}^{(u,T_u)}]}{3} + \frac{\sqrt{3}\mathbb{X}_{21}[\mathbb{T}_{1,1}^{(a,T_u)}(1,0)] \otimes \mathbb{U}_{22}[\mathbb{T}_{1,1}^{(u,T_u)}]}{3} + \frac{\sqrt{3}\mathbb{X}_{22}[\mathbb{T}_{1,2}^{(a,T_u)}(1,0)] \otimes \mathbb{U}_{23}[\mathbb{T}_{1,2}^{(u,T_u)}]}{3} + \frac{\sqrt{3}\mathbb{X}_{22}[\mathbb{T}_{1,2}^{(a,T_u)}(1,0)] \otimes \mathbb{U}_{23}[\mathbb{T}_{1,2}^{(u,T_u)}]}{3} + \frac{\sqrt{3}\mathbb{X}_{22}[\mathbb{T}_{1,2}^{(a,T_u)}(1,0)] \otimes \mathbb{U}_{23}[\mathbb{T}_{1,2}^{(u,T_u)}]}{3} + \frac{\sqrt{3}\mathbb{X}_{22}[\mathbb{T}_{1,2}^{(u,T_u)}(1,0)] \otimes \mathbb{U}_{23}[\mathbb{T}_{1,2}^{(u,T_u)}]}{3} + \frac{\sqrt{3}\mathbb{X}_{22}[\mathbb{T}_{1,2}^{(u,T_u)}]}{3} + \frac{\sqrt{3}\mathbb{X}_{22}[$$

No. 25 
$$\hat{\mathbb{Q}}_0^{(A_g)}$$
 [M<sub>2</sub>, B<sub>1</sub>]

$$\hat{\mathbb{Z}}_{25} = \frac{\sqrt{3}\mathbb{X}_{23}[\mathbb{T}_{1,0}^{(a,T_u)}] \otimes \mathbb{U}_{21}[\mathbb{T}_{1,0}^{(u,T_u)}]}{3} + \frac{\sqrt{3}\mathbb{X}_{24}[\mathbb{T}_{1,1}^{(a,T_u)}] \otimes \mathbb{U}_{22}[\mathbb{T}_{1,1}^{(u,T_u)}]}{3} + \frac{\sqrt{3}\mathbb{X}_{25}[\mathbb{T}_{1,2}^{(a,T_u)}] \otimes \mathbb{U}_{23}[\mathbb{T}_{1,2}^{(u,T_u)}]}{3}$$

No. 26 
$$\hat{\mathbb{Q}}_0^{(A_g)}$$
 [M<sub>3</sub>, B<sub>1</sub>]

$$\hat{\mathbb{Z}}_{26} = \mathbb{X}_{27}[\mathbb{Q}_0^{(a,A_g)}] \otimes \mathbb{U}_9[\mathbb{Q}_0^{(u,A_g)}]$$

No. 27 
$$\hat{\mathbb{Q}}_0^{(A_g)}(1,1)$$
 [M<sub>3</sub>, B<sub>1</sub>]

$$\hat{\mathbb{Z}}_{27} = \mathbb{X}_{28}[\mathbb{Q}_0^{(a,A_g)}(1,1)] \otimes \mathbb{U}_9[\mathbb{Q}_0^{(u,A_g)}]$$

No. 28 
$$\hat{\mathbb{Q}}_0^{(A_g)}$$
 [M<sub>3</sub>, B<sub>1</sub>]

$$\begin{split} \hat{\mathbb{Z}}_{28} &= \frac{\sqrt{5}\mathbb{X}_{29}[\mathbb{Q}_{2,0}^{(a,E_g)}] \otimes \mathbb{U}_{13}[\mathbb{Q}_{2,0}^{(u,E_g)}]}{5} + \frac{\sqrt{5}\mathbb{X}_{30}[\mathbb{Q}_{2,1}^{(a,E_g)}] \otimes \mathbb{U}_{14}[\mathbb{Q}_{2,1}^{(u,E_g)}]}{5} + \frac{\sqrt{5}\mathbb{X}_{31}[\mathbb{Q}_{2,0}^{(a,T_g)}] \otimes \mathbb{U}_{15}[\mathbb{Q}_{2,0}^{(u,T_g)}]}{5} \\ &+ \frac{\sqrt{5}\mathbb{X}_{32}[\mathbb{Q}_{2,1}^{(a,T_g)}] \otimes \mathbb{U}_{16}[\mathbb{Q}_{2,1}^{(u,T_g)}]}{5} + \frac{\sqrt{5}\mathbb{X}_{33}[\mathbb{Q}_{2,2}^{(a,T_g)}] \otimes \mathbb{U}_{17}[\mathbb{Q}_{2,2}^{(u,T_g)}]}{5} \end{split}$$

No. 29 
$$\hat{\mathbb{G}}_{3}^{(A_g)}$$
 [M<sub>3</sub>, B<sub>1</sub>]

$$\hat{\mathbb{Z}}_{29} = \frac{\sqrt{2}\mathbb{X}_{29}[\mathbb{Q}_{2,0}^{(a,E_g)}] \otimes \mathbb{U}_{14}[\mathbb{Q}_{2,1}^{(u,E_g)}]}{2} - \frac{\sqrt{2}\mathbb{X}_{30}[\mathbb{Q}_{2,1}^{(a,E_g)}] \otimes \mathbb{U}_{13}[\mathbb{Q}_{2,0}^{(u,E_g)}]}{2}$$

No. 30 
$$\hat{\mathbb{Q}}_{4}^{(A_g)}$$
 [M<sub>3</sub>, B<sub>1</sub>]

$$\hat{\mathbb{Z}}_{30} = \frac{\sqrt{30}\mathbb{X}_{29}[\mathbb{Q}_{2,0}^{(a,E_g)}] \otimes \mathbb{U}_{13}[\mathbb{Q}_{2,0}^{(u,E_g)}]}{10} + \frac{\sqrt{30}\mathbb{X}_{30}[\mathbb{Q}_{2,1}^{(a,E_g)}] \otimes \mathbb{U}_{14}[\mathbb{Q}_{2,1}^{(u,E_g)}]}{10} - \frac{\sqrt{30}\mathbb{X}_{31}[\mathbb{Q}_{2,0}^{(a,T_g)}] \otimes \mathbb{U}_{15}[\mathbb{Q}_{2,0}^{(u,T_g)}]}{15} - \frac{\sqrt{30}\mathbb{X}_{33}[\mathbb{Q}_{2,2}^{(a,T_g)}] \otimes \mathbb{U}_{17}[\mathbb{Q}_{2,2}^{(u,T_g)}]}{15} - \frac{\sqrt{30}\mathbb{X}_{31}[\mathbb{Q}_{2,0}^{(u,T_g)}]}{15} - \frac{\sqrt{30}\mathbb{X}_{31}[\mathbb{Q}_{2,2}^{(u,T_g)}]}{15} - \frac{\sqrt{30$$

No. 31 
$$\hat{\mathbb{Q}}_0^{(A_g)}(1,-1)$$
 [M<sub>3</sub>, B<sub>1</sub>]

$$\begin{split} \hat{\mathbb{Z}}_{31} &= \frac{\sqrt{5}\mathbb{X}_{34}[\mathbb{Q}_{2,0}^{(a,E_g)}(1,-1)] \otimes \mathbb{U}_{13}[\mathbb{Q}_{2,0}^{(u,E_g)}]}{5} + \frac{\sqrt{5}\mathbb{X}_{35}[\mathbb{Q}_{2,1}^{(a,E_g)}(1,-1)] \otimes \mathbb{U}_{14}[\mathbb{Q}_{2,1}^{(u,E_g)}]}{5} + \frac{\sqrt{5}\mathbb{X}_{36}[\mathbb{Q}_{2,0}^{(a,T_g)}(1,-1)] \otimes \mathbb{U}_{15}[\mathbb{Q}_{2,0}^{(u,T_g)}]}{5} \\ &+ \frac{\sqrt{5}\mathbb{X}_{37}[\mathbb{Q}_{2,1}^{(a,T_g)}(1,-1)] \otimes \mathbb{U}_{16}[\mathbb{Q}_{2,1}^{(u,T_g)}]}{5} + \frac{\sqrt{5}\mathbb{X}_{38}[\mathbb{Q}_{2,2}^{(a,T_g)}(1,-1)] \otimes \mathbb{U}_{17}[\mathbb{Q}_{2,2}^{(u,T_g)}]}{5} \end{split}$$

No. 32 
$$\hat{\mathbb{G}}_3^{(A_g)}(1,-1)$$
 [M<sub>3</sub>, B<sub>1</sub>]

$$\hat{\mathbb{Z}}_{32} = \frac{\sqrt{2}\mathbb{X}_{34}[\mathbb{Q}_{2,0}^{(a,E_g)}(1,-1)] \otimes \mathbb{U}_{14}[\mathbb{Q}_{2,1}^{(u,E_g)}]}{2} - \frac{\sqrt{2}\mathbb{X}_{35}[\mathbb{Q}_{2,1}^{(a,E_g)}(1,-1)] \otimes \mathbb{U}_{13}[\mathbb{Q}_{2,0}^{(u,E_g)}]}{2}$$

No. 33 
$$\hat{\mathbb{Q}}_4^{(A_g)}(1,-1)$$
 [M<sub>3</sub>, B<sub>1</sub>]

$$\hat{\mathbb{Z}}_{33} = \frac{\sqrt{30}\mathbb{X}_{34}[\mathbb{Q}_{2,0}^{(a,E_g)}(1,-1)] \otimes \mathbb{U}_{13}[\mathbb{Q}_{2,0}^{(u,E_g)}]}{10} + \frac{\sqrt{30}\mathbb{X}_{35}[\mathbb{Q}_{2,1}^{(a,E_g)}(1,-1)] \otimes \mathbb{U}_{14}[\mathbb{Q}_{2,1}^{(u,E_g)}]}{10} - \frac{\sqrt{30}\mathbb{X}_{36}[\mathbb{Q}_{2,0}^{(a,T_g)}(1,-1)] \otimes \mathbb{U}_{15}[\mathbb{Q}_{2,0}^{(u,T_g)}]}{15} - \frac{\sqrt{30}\mathbb{X}_{38}[\mathbb{Q}_{2,2}^{(a,T_g)}(1,-1)] \otimes \mathbb{U}_{17}[\mathbb{Q}_{2,2}^{(u,T_g)}]}{15} - \frac{\sqrt{30}\mathbb{X}_{36}[\mathbb{Q}_{2,0}^{(a,T_g)}(1,-1)] \otimes \mathbb{U}_{15}[\mathbb{Q}_{2,0}^{(u,T_g)}]}{15} - \frac{\sqrt{30}\mathbb{X}_{36}[\mathbb{Q}_{2,0}^{(a,T_g)}(1,-1)] \otimes \mathbb{U}_{17}[\mathbb{Q}_{2,2}^{(u,T_g)}]}{15} - \frac{\sqrt{30}\mathbb{X}_{36}[\mathbb{Q}_{2,0}^{(a,T_g)}(1,-1)] \otimes \mathbb{U}_{17}[\mathbb{Q}_{2,2}^{(u,T_g)}]}{15} - \frac{\sqrt{30}\mathbb{X}_{36}[\mathbb{Q}_{2,0}^{(a,T_g)}(1,-1)] \otimes \mathbb{U}_{17}[\mathbb{Q}_{2,0}^{(u,T_g)}]}{15} - \frac{\sqrt{30}\mathbb{X}_{36}[\mathbb{Q}_{2,0}^{(a,T_g)}(1,-1)] \otimes \mathbb{U}_{17}[\mathbb{Q}_{2,0}^{(u,T_g)}]}{15} - \frac{\sqrt{30}\mathbb{X}_{36}[\mathbb{Q}_{2,0}^{(u,T_g)}(1,-1)] \otimes \mathbb{Q}_{17}[\mathbb{Q}_{2,0}^{(u,T_g)}]}{15} - \frac{\sqrt{30}\mathbb{X}_{36}[\mathbb{Q}_{2,0}^{(u,T_g)}(1,-1)] \otimes \mathbb{Q}_{17}[\mathbb{Q}_{2,0}^{(u,T_g)}]}{15} - \frac{\sqrt{30}\mathbb{X}_{36}[\mathbb{Q}_{2,0}^{(u,T_g)}]}{15} - \frac{\sqrt{30}\mathbb{X}_{36}[\mathbb{Q}_{2,0}^{(u,T_g)}]}{15} - \frac{\sqrt{30}\mathbb{X}_{36}[\mathbb{Q}_{2,0}^{(u,T_g)}]}{15} - \frac{\sqrt{30}\mathbb{X}_{36}[\mathbb{Q}_{2,0}^{(u,T_g)}]}{15} - \frac{\sqrt{30}\mathbb{X}_{36}[\mathbb{Q}_{2,0}^{(u,T_g)}]$$

No. 34 
$$\hat{\mathbb{G}}_3^{(A_g)}(1,0)$$
 [M<sub>3</sub>, B<sub>1</sub>]

$$\hat{\mathbb{Z}}_{34} = \frac{\sqrt{3}\mathbb{X}_{39}[\mathbb{G}_{1,0}^{(a,T_g)}(1,0)] \otimes \mathbb{U}_{15}[\mathbb{Q}_{2,0}^{(u,T_g)}]}{3} + \frac{\sqrt{3}\mathbb{X}_{40}[\mathbb{G}_{1,1}^{(a,T_g)}(1,0)] \otimes \mathbb{U}_{16}[\mathbb{Q}_{2,1}^{(u,T_g)}]}{3} + \frac{\sqrt{3}\mathbb{X}_{41}[\mathbb{G}_{1,2}^{(a,T_g)}(1,0)] \otimes \mathbb{U}_{17}[\mathbb{Q}_{2,2}^{(u,T_g)}]}{3} + \frac{\sqrt{3}\mathbb{X}_{41}[\mathbb{Q}_{1,2}^{(a,T_g)}(1,0)] \otimes \mathbb{U}_{17}[\mathbb{Q}_{2,2}^{(u,T_g)}]}{3} + \frac{\sqrt{3}\mathbb{X}_{41}[\mathbb{Q}_{1,2}^{(u,T_g)}(1,0)] \otimes \mathbb{U}_{17}[\mathbb{Q}_{2,2}^{(u,T_g)}(1,0)]}{3} + \frac{\sqrt{3}\mathbb{X}_{41}[\mathbb{Q}_{1,2}^{(u,T_g)}(1,0)] \otimes \mathbb{U}_{17}[\mathbb{Q}_{1,2}^{(u,T_g)}(1,0)]}{3} + \frac{\sqrt{3}\mathbb{X}_{41}[\mathbb{Q}_{1,2}^{(u,T_g)}(1,0)] \otimes \mathbb{Q}_{17}[\mathbb{Q}_{1,2}^{(u,T_g)}(1,0)]}{3} + \frac{\sqrt{3}\mathbb{X}_{41}[\mathbb{Q}_{1,2}^{(u,T_g)}(1,0)] \otimes \mathbb{Q}_{17}[\mathbb{Q}_{1,2}^{(u,T_g)}(1,0)]}{3} + \frac{\sqrt{3}\mathbb{Z}_{17}[\mathbb{Q}_{1,2}^{(u,T_g)}(1,0)] \otimes \mathbb{Q}_{17}[\mathbb{Q}_{1,2}^{(u,T_g)}(1,0)]}{3} + \frac{\sqrt{3}\mathbb{Z}_{17}[\mathbb{Q}_{1,2$$

No. 35 
$$\hat{\mathbb{G}}_{3}^{(A_g)}$$
 [M<sub>3</sub>, B<sub>1</sub>]

$$\hat{\mathbb{Z}}_{35} = \frac{\sqrt{3}\mathbb{X}_{42}[\mathbb{M}_{1,0}^{(a,T_g)}] \otimes \mathbb{U}_{24}[\mathbb{T}_{2,0}^{(u,T_g)}]}{3} + \frac{\sqrt{3}\mathbb{X}_{43}[\mathbb{M}_{1,1}^{(a,T_g)}] \otimes \mathbb{U}_{25}[\mathbb{T}_{2,1}^{(u,T_g)}]}{3} + \frac{\sqrt{3}\mathbb{X}_{44}[\mathbb{M}_{1,2}^{(a,T_g)}] \otimes \mathbb{U}_{26}[\mathbb{T}_{2,2}^{(u,T_g)}]}{3} + \frac{\sqrt{3}\mathbb{X}_{44}[\mathbb{M}_{1,2}^{(u,T_g)}] \otimes \mathbb{U}_{26}[\mathbb{T}_{2,2}^{(u,T_g)}]}{3} + \frac{\sqrt{3}\mathbb{X}_{44}[\mathbb{M}_{1,2}^{(u,T_g)}]}{3} + \frac{\sqrt{3}\mathbb{X}_{44}[\mathbb{M}_{1,2}^{(u,T_$$

No. 36 
$$\hat{\mathbb{Q}}_4^{(A_g)}$$
 [M<sub>3</sub>, B<sub>1</sub>]

$$\hat{\mathbb{Z}}_{36} = -\frac{\sqrt{3}\mathbb{X}_{42}[\mathbb{M}_{1,0}^{(a,T_g)}] \otimes \mathbb{U}_{28}[\mathbb{T}_{4,0}^{(u,T_g,1)}]}{3} - \frac{\sqrt{3}\mathbb{X}_{43}[\mathbb{M}_{1,1}^{(a,T_g)}] \otimes \mathbb{U}_{29}[\mathbb{T}_{4,1}^{(u,T_g,1)}]}{3} - \frac{\sqrt{3}\mathbb{X}_{44}[\mathbb{M}_{1,2}^{(a,T_g)}] \otimes \mathbb{U}_{30}[\mathbb{T}_{4,2}^{(u,T_g,1)}]}{3}$$

No. 37 
$$\hat{\mathbb{G}}_{3}^{(A_g)}(1,1)$$
 [M<sub>3</sub>, B<sub>1</sub>]

$$\hat{\mathbb{Z}}_{37} = \frac{\sqrt{3}\mathbb{X}_{45}[\mathbb{M}_{1,0}^{(a,T_g)}(1,1)] \otimes \mathbb{U}_{24}[\mathbb{T}_{2,0}^{(u,T_g)}]}{3} + \frac{\sqrt{3}\mathbb{X}_{46}[\mathbb{M}_{1,1}^{(a,T_g)}(1,1)] \otimes \mathbb{U}_{25}[\mathbb{T}_{2,1}^{(u,T_g)}]}{3} + \frac{\sqrt{3}\mathbb{X}_{47}[\mathbb{M}_{1,2}^{(a,T_g)}(1,1)] \otimes \mathbb{U}_{26}[\mathbb{T}_{2,2}^{(u,T_g)}]}{3} + \frac{\sqrt{3}\mathbb{X}_{47}[\mathbb{M}_{1,2}^{(u,T_g)}(1,1)] \otimes \mathbb{U}_{26}[\mathbb{M}_{1,2}^{(u,T_g)}]}{3} + \frac{\sqrt{3}\mathbb{X}_{47}[\mathbb{M}_{1,2}^{(u,T_g)}(1,1)] \otimes \mathbb{U}_{26}[\mathbb{M}_{1,2}^{(u,T_g)}(1,1)]}{3} + \frac{\sqrt{3}\mathbb{M}_{1,2}[\mathbb{M}_{1,2}^{(u,$$

No. 38 
$$\hat{\mathbb{Q}}_{4}^{(A_g)}(1,1)$$
 [M<sub>3</sub>, B<sub>1</sub>]

$$\hat{\mathbb{Z}}_{38} = -\frac{\sqrt{3}\mathbb{X}_{45}[\mathbb{M}_{1,0}^{(a,T_g)}(1,1)]\otimes\mathbb{U}_{28}[\mathbb{T}_{4,0}^{(u,T_g,1)}]}{3} - \frac{\sqrt{3}\mathbb{X}_{46}[\mathbb{M}_{1,1}^{(a,T_g)}(1,1)]\otimes\mathbb{U}_{29}[\mathbb{T}_{4,1}^{(u,T_g,1)}]}{3} - \frac{\sqrt{3}\mathbb{X}_{47}[\mathbb{M}_{1,2}^{(a,T_g)}(1,1)]\otimes\mathbb{U}_{30}[\mathbb{T}_{4,2}^{(u,T_g,1)}]}{3} - \frac{\sqrt{3}\mathbb{X}_{47}[\mathbb{M}_{1,2}^{(a,T_g)}(1,1)]\otimes\mathbb{U}_{39}[\mathbb{T}_{4,2}^{(u,T_g,1)}]}{3} - \frac{\sqrt{3}\mathbb{X}_{47}[\mathbb{M}_{1,2}^{(a,T_g)}(1,1)]\otimes\mathbb{U}_{39}[\mathbb{T}_{4,2}^{(u,T_g,1)}]}{3} - \frac{\sqrt{3}\mathbb{X}_{47}[\mathbb{M}_{1,2}^{(u,T_g,1)}(1,1)]\otimes\mathbb{U}_{39}[\mathbb{T}_{4,2}^{(u,T_g,1)}]}{3} - \frac{\sqrt{3}\mathbb{X}_{47}[\mathbb{M}_{1,2}^{(u,T_g,1)}(1,1)]\otimes\mathbb{U}_{39}[\mathbb{T}_{4,2}^{(u,T_g,1)}]}{3} - \frac{\sqrt{3}\mathbb{X}_{47}[\mathbb{M}_{1,2}^{(u,T_g,1)}(1,1)]\otimes\mathbb{U}_{39}[\mathbb{T}_{4,2}^{(u,T_g,1)}]}{3} - \frac{\sqrt{3}\mathbb{X}_{47}[\mathbb{M}_{1,2}^{(u,T_g,1)}(1,1)]\otimes\mathbb{U}_{39}[\mathbb{T}_{4,2}^{(u,T_g,1)}]}{3} - \frac{\sqrt{3}\mathbb{X}_{47}[\mathbb{M}_{1,2}^{(u,T_g,1)}(1,1)]\otimes\mathbb{U}_{39}[\mathbb{T}_{4,2$$

No. 39 
$$\hat{\mathbb{G}}_3^{(A_g)}(1,-1)$$
 [M<sub>3</sub>, B<sub>1</sub>]

$$\hat{\mathbb{Z}}_{39} = \frac{\sqrt{3}\mathbb{X}_{48}[\mathbb{M}_{1,0}^{(a,T_g)}(1,-1)] \otimes \mathbb{U}_{24}[\mathbb{T}_{2,0}^{(u,T_g)}]}{3} + \frac{\sqrt{3}\mathbb{X}_{49}[\mathbb{M}_{1,1}^{(a,T_g)}(1,-1)] \otimes \mathbb{U}_{25}[\mathbb{T}_{2,1}^{(u,T_g)}]}{3} + \frac{\sqrt{3}\mathbb{X}_{50}[\mathbb{M}_{1,2}^{(a,T_g)}(1,-1)] \otimes \mathbb{U}_{26}[\mathbb{T}_{2,2}^{(u,T_g)}]}{3} + \frac{\sqrt{3}\mathbb{X}_{50}[\mathbb{M}_{1,2}^{(a,T_g)}(1,-1)] \otimes \mathbb{U}_{26}[\mathbb{T}_{2,2}^{(u,T_g)}]}{3} + \frac{\sqrt{3}\mathbb{X}_{50}[\mathbb{M}_{1,2}^{(u,T_g)}(1,-1)] \otimes \mathbb{U}_{26}[\mathbb{T}_{2,2}^{(u,T_g)}(1,-1)]}{3} + \frac{\sqrt{3}\mathbb{X}_{50}[\mathbb{M}_{1,2}^{(u,T_g)}(1,-1)]}{3} + \frac{\sqrt$$

No. 40 
$$\hat{\mathbb{Q}}_4^{(A_g)}(1,-1)$$
 [M<sub>3</sub>, B<sub>1</sub>]

$$\hat{\mathbb{Z}}_{40} = -\frac{\sqrt{3}\mathbb{X}_{48}[\mathbb{M}_{1,0}^{(a,T_g)}(1,-1)] \otimes \mathbb{U}_{28}[\mathbb{T}_{4,0}^{(u,T_g,1)}]}{3} - \frac{\sqrt{3}\mathbb{X}_{49}[\mathbb{M}_{1,1}^{(a,T_g)}(1,-1)] \otimes \mathbb{U}_{29}[\mathbb{T}_{4,1}^{(u,T_g,1)}]}{3} - \frac{\sqrt{3}\mathbb{X}_{50}[\mathbb{M}_{1,2}^{(a,T_g)}(1,-1)] \otimes \mathbb{U}_{30}[\mathbb{T}_{4,2}^{(u,T_g,1)}]}{3} - \frac{\sqrt{3}\mathbb{X}_{50}[\mathbb{M}_{1,2}^{(a,T_g)}(1,-1)] \otimes \mathbb{U}_{30}[\mathbb{T}_{4,2}^{(u,T_g,1)}]}{3} - \frac{\sqrt{3}\mathbb{X}_{50}[\mathbb{M}_{1,2}^{(a,T_g)}(1,-1)] \otimes \mathbb{U}_{30}[\mathbb{T}_{4,2}^{(u,T_g,1)}]}{3} - \frac{\sqrt{3}\mathbb{X}_{50}[\mathbb{M}_{1,2}^{(a,T_g)}(1,-1)] \otimes \mathbb{U}_{30}[\mathbb{T}_{4,2}^{(u,T_g,1)}]}{3} - \frac{\sqrt{3}\mathbb{X}_{50}[\mathbb{M}_{1,2}^{(u,T_g,1)}(1,-1)] \otimes \mathbb{U}_{30}[\mathbb{T}_{4,2}^{(u,T_g,1)}]}{3} - \frac{\sqrt{3}\mathbb{X}_{50}[\mathbb{M}_{1,2}^{(u,T_g,1)}(1,-1)] \otimes \mathbb{U}_{30}[\mathbb{T}_{4,2}^{(u,T_g,1)}]}{3} - \frac{\mathbb{X}_{50}[\mathbb{M}_{1,2}^{(u,T_g,1)}(1,-1)] \otimes \mathbb{U}_{30}[\mathbb{T}_{4,2}^{(u,T_g,1)}(1,-1)]}{3} - \frac{\mathbb{X}_{50}[\mathbb{M}_{1,2}^{(u,T_g,1)}(1,-1)] \otimes \mathbb{U}_{30}[\mathbb{M}_{1,2}^{(u,T_g,1)}(1,-1)]}{3} - \frac{\mathbb{X}_{50}[\mathbb{M}_{1,2}^{(u,T_g,1)}(1,-1)] \otimes \mathbb{U}_{30}[\mathbb{M}_{1,2}^{(u,T_g,1)}(1,-1)]}{3} - \frac{\mathbb{X}_{50}[\mathbb{M}_{1,2}^{(u,T_g,1)}(1,-1)] \otimes \mathbb{X}_{30}[\mathbb{M}_{1,2}^{(u,T_g,1)}(1,-1)]}{3} - \frac{\mathbb{X}_{50}[\mathbb{M}_{1,2}^{(u,T_g,1)}(1,-1)] \otimes \mathbb{X}_{30}[\mathbb{M}_{1,2}^{(u,T_g,1)}$$

No. 41 
$$\hat{\mathbb{G}}_{3}^{(A_g)}(1,-1)$$
 [M<sub>3</sub>, B<sub>1</sub>]

$$\hat{\mathbb{Z}}_{41} = -\frac{\sqrt{3}\mathbb{X}_{51}[\mathbb{M}_{3,0}^{(a,T_g,1)}(1,-1)] \otimes \mathbb{U}_{24}[\mathbb{T}_{2,0}^{(u,T_g)}]}{3} - \frac{\sqrt{3}\mathbb{X}_{52}[\mathbb{M}_{3,1}^{(a,T_g,1)}(1,-1)] \otimes \mathbb{U}_{25}[\mathbb{T}_{2,1}^{(u,T_g)}]}{3} - \frac{\sqrt{3}\mathbb{X}_{53}[\mathbb{M}_{3,2}^{(a,T_g,1)}(1,-1)] \otimes \mathbb{U}_{26}[\mathbb{T}_{2,2}^{(u,T_g)}]}{3} - \frac{\sqrt{3}\mathbb{X}_{53}[\mathbb{M}_{3,2}^{(u,T_g,1)}(1,-1)] \otimes \mathbb{U}_{26}[\mathbb{T}_{2,2}^{(u,T_g)}]}{3} - \frac{\sqrt{3}\mathbb{X}_{53}[\mathbb{M}_{3,2}^{(u,T_g,1)}(1,-1)] \otimes \mathbb{U}_{26}[\mathbb{T}_{2,2}^{(u,T_g)}]}{3} - \frac{\mathbb{X}_{33}[\mathbb{M}_{3,2}^{(u,T_g,1)}(1,-1)] \otimes \mathbb{U}_{26}[\mathbb{T}_{2,2}^{(u,T_g)}]}{3} - \frac{\mathbb{X}_{33}[\mathbb{M}_{3,2}^{(u,T_g,1)}(1,-1)] \otimes \mathbb{U}_{26}[\mathbb{T}_{2,2}^{(u,T_g)}]}{3} - \frac{\mathbb{X}_{33}[\mathbb{M}_{3,2}^{(u,T_g,1)}(1,-1)] \otimes \mathbb{U}_{26}[\mathbb{T}_{2,2}^{(u,T_g)}]}{3} - \frac{\mathbb{X}_{33}[\mathbb{M}_{3,2}^{(u,T_g,1)}(1,-1)] \otimes \mathbb{U}_{26}[\mathbb{T}_{2,2}^{(u,T_g,1)}(1,-1)]}{3} - \frac{\mathbb{X}_{33}[\mathbb{M}_{3,2}^{(u,T_g,1)}(1,-1)] \otimes \mathbb{U}_{26}[\mathbb{T}_{2,2}^{(u,T_g,1)}(1,-1)]}{3} - \frac{\mathbb{X}_{33}[\mathbb{M}_{3,2}^{(u,T_g,1)}(1,-1)] \otimes \mathbb{U}_{26}[\mathbb{T}_{2,2}^{(u,T_g,1)}(1,-1)]}{3} - \frac{\mathbb{X}_{33}[\mathbb{M}_{3,2}^{(u,T_g,1)}(1,-1)] \otimes \mathbb{U}_{26}[\mathbb{T}_{2,2}^{(u,T_g,1)}(1,-1)]}{3} - \frac{\mathbb{X}_{33}[\mathbb{M}_{3,2}^{(u,T_g,1)}(1,-1)] \otimes \mathbb{X}_{33}[\mathbb{M}_{3,2}^{(u,T_g,1)}(1,-1)]}{3} - \frac{\mathbb{X}_{33}[\mathbb{M}_{3,2}^{(u,T_g,1)}(1,-1)] \otimes \mathbb{X}_{33}[\mathbb{M}_{3,2}^{(u,T_g,1)}(1,-1)]}{3} - \frac{\mathbb{X}_{33}[\mathbb{M}_{3,2}^{(u,T_g,1)}(1,-1)] \otimes \mathbb{X}_{33}[\mathbb{M}_{33}[\mathbb{M}_{3,2}^{(u,T_g,1)}(1,-1)]}{3} - \frac{\mathbb{X}_{33}[\mathbb{M}_{$$

No. 42 
$$\hat{\mathbb{Q}}_{4}^{(A_g)}(1,-1)$$
 [M<sub>3</sub>, B<sub>1</sub>]

$$\hat{\mathbb{Z}}_{42} = -\frac{\sqrt{3}\mathbb{X}_{54}[\mathbb{M}_{3,0}^{(a,T_g,2)}(1,-1)]\otimes\mathbb{U}_{24}[\mathbb{T}_{2,0}^{(u,T_g)}]}{3} - \frac{\sqrt{3}\mathbb{X}_{55}[\mathbb{M}_{3,1}^{(a,T_g,2)}(1,-1)]\otimes\mathbb{U}_{25}[\mathbb{T}_{2,1}^{(u,T_g)}]}{3} - \frac{\sqrt{3}\mathbb{X}_{56}[\mathbb{M}_{3,2}^{(a,T_g,2)}(1,-1)]\otimes\mathbb{U}_{26}[\mathbb{T}_{2,2}^{(u,T_g)}]}{3} - \frac{\sqrt{3}\mathbb{X}_{56}[\mathbb{M}_{3,2}^{(a,T_g,2)}(1,-1)]\otimes\mathbb{U}_{26}[\mathbb{T}_{2,2}^{(u,T_g)}]}{3} - \frac{\sqrt{3}\mathbb{X}_{56}[\mathbb{M}_{3,2}^{(a,T_g,2)}(1,-1)]\otimes\mathbb{U}_{26}[\mathbb{T}_{2,2}^{(u,T_g)}]}{3} - \frac{\sqrt{3}\mathbb{X}_{56}[\mathbb{M}_{3,2}^{(a,T_g,2)}(1,-1)]\otimes\mathbb{U}_{26}[\mathbb{T}_{2,2}^{(u,T_g)}]}{3} - \frac{\sqrt{3}\mathbb{X}_{56}[\mathbb{M}_{3,2}^{(u,T_g,2)}(1,-1)]\otimes\mathbb{U}_{26}[\mathbb{T}_{2,2}^{(u,T_g)}]}{3} - \frac{\sqrt{3}\mathbb{X}_{56}[\mathbb{M}_{3,2}^{(u,T_g,2)}(1,-1)]\otimes\mathbb{U}_{26}[\mathbb{T}_{2,2}^{(u,T_g)}]}{3} - \frac{\sqrt{3}\mathbb{X}_{56}[\mathbb{M}_{3,2}^{(u,T_g,2)}(1,-1)]\otimes\mathbb{U}_{26}[\mathbb{T}_{2,2}^{(u,T_g)}]}{3} - \frac{\sqrt{3}\mathbb{X}_{56}[\mathbb{M}_{3,2}^{(u,T_g,2)}(1,-1)]\otimes\mathbb{U}_{26}[\mathbb{T}_{2,2}^{(u,T_g)}]}{3} - \frac{\mathbb{X}_{56}[\mathbb{M}_{3,2}^{(u,T_g,2)}(1,-1)]\otimes\mathbb{U}_{26}[\mathbb{T}_{2,2}^{(u,T_g)}]}{3} - \frac{\mathbb{X}_{56}[\mathbb{M}_{3,2}^{(u,T_g,2)}(1,-1)]\otimes\mathbb{U}_{26}[\mathbb{T}_{2,2}^{(u,T_g,2)}]}{3} - \frac{\mathbb{X}_{56}[\mathbb{M}_{3,2}^{(u,T_g,2)}(1,-1)]\otimes\mathbb{U}_{26}[\mathbb{M}_{3,2}^{(u,T_g,2)}(1,-1)]\otimes\mathbb{U}_{26}[\mathbb{T}_{2,2}^{(u,T_g,2)}]}{3} - \frac{\mathbb{X}_{56}[\mathbb{M}_{3,2}^{(u,T_g,2)}(1,-1)]\otimes\mathbb{U}_{26}[\mathbb{M}_{3,2}^{(u,T_g,2)}(1,-1)]\otimes\mathbb{U}_{26}[\mathbb{M}_{3,2}^{(u,T_g,2)}(1,-1)]\otimes\mathbb{U}_{26}[\mathbb{M}_{3,2}^{(u,T_g,2)}(1,-1)]\otimes\mathbb{U}_{26}[\mathbb{M}_{3,2}^{(u,T_g,2)}(1,-1)]\otimes\mathbb{U}_{26}[\mathbb{M}_{3,2}^{(u,T_g,2)}(1,-1)]\otimes\mathbb{U}_{26}[\mathbb{M}_{3,2}^{(u,T_g,2)}(1,-1)]\otimes\mathbb{U}_{26}[\mathbb{M}_{3,2}^{(u,T_g,2)}(1,-1)]\otimes\mathbb{U}_{26}[\mathbb{M}_{3,2}^{(u,T_g,2)}(1,-1)]\otimes\mathbb{U}_{26}[\mathbb{M}_{3,2}^{(u,T_g,2)}(1,-1)]\otimes\mathbb{U}_{26}[$$

No. 43 
$$\hat{\mathbb{G}}_3^{(A_g)}(1,-1)$$
 [M<sub>3</sub>, B<sub>1</sub>]

$$\hat{\mathbb{Z}}_{43} = \frac{\sqrt{3}\mathbb{X}_{54}[\mathbb{M}_{3,0}^{(a,T_g,2)}(1,-1)] \otimes \mathbb{U}_{28}[\mathbb{T}_{4,0}^{(u,T_g,1)}]}{3} + \frac{\sqrt{3}\mathbb{X}_{55}[\mathbb{M}_{3,1}^{(a,T_g,2)}(1,-1)] \otimes \mathbb{U}_{29}[\mathbb{T}_{4,1}^{(u,T_g,1)}]}{3} + \frac{\sqrt{3}\mathbb{X}_{56}[\mathbb{M}_{3,2}^{(a,T_g,2)}(1,-1)] \otimes \mathbb{U}_{30}[\mathbb{T}_{4,2}^{(u,T_g,1)}]}{3} + \frac{\sqrt{3}\mathbb{X}_{56}[\mathbb{M}_{3,2}^{(a,T_g,2)}(1,-1)] \otimes \mathbb{U}_{30}[\mathbb{T}_{4,2}^{(u,T_g,1)}]}{3} + \frac{\sqrt{3}\mathbb{X}_{56}[\mathbb{M}_{3,2}^{(a,T_g,2)}(1,-1)] \otimes \mathbb{U}_{30}[\mathbb{T}_{4,2}^{(u,T_g,1)}]}{3} + \frac{\sqrt{3}\mathbb{X}_{56}[\mathbb{M}_{3,2}^{(u,T_g,2)}(1,-1)] \otimes \mathbb{U}_{30}[\mathbb{T}_{4,2}^{(u,T_g,2)}(1,-1)]}{3} + \frac{\sqrt{3}\mathbb{X}_{56}[\mathbb{M}_{3,2}^{(u,T_g,2)}(1,-1)] \otimes \mathbb{U}_{30}[\mathbb{T}_{4,2}^{(u,T_g,2)}(1,-1)]}{3} + \frac{\sqrt{3}\mathbb{X}_{56}[\mathbb{M}_{3,2}^{(u,T_g,2)}(1,-1)] \otimes \mathbb{U}_{30}[\mathbb{T}_{4,2}^{(u,T_g,2)}(1,-1)]}{3} + \frac{\sqrt{3}\mathbb{X}_{56}[\mathbb{M}_{3,2}^{(u,T_g,2)}(1,-1)]}{3} + \frac{\sqrt{3}\mathbb{X}_{56}[\mathbb{M}_{3,2}^{(u,T_g,2)}(1,-1)]}{$$

$$\begin{split} & \boxed{ \begin{aligned} & \boxed{ No. } \ 44 \ ] \ \hat{\mathbb{Q}}_{4}^{(A_g)}(1,-1) \ [M_3,B_1] \\ & \hat{\mathbb{Z}}_{44} = \frac{\sqrt{3}\mathbb{X}_{51} [\mathbb{M}_{3,0}^{(a,T_g,1)}(1,-1)] \otimes \mathbb{U}_{28} [\mathbb{T}_{4,0}^{(u,T_g,1)}]}{3} + \frac{\sqrt{3}\mathbb{X}_{52} [\mathbb{M}_{3,1}^{(a,T_g,1)}(1,-1)] \otimes \mathbb{U}_{29} [\mathbb{T}_{4,1}^{(u,T_g,1)}]}{3} + \frac{\sqrt{3}\mathbb{X}_{53} [\mathbb{M}_{3,2}^{(a,T_g,1)}(1,-1)] \otimes \mathbb{U}_{30} [\mathbb{T}_{4,2}^{(u,T_g,1)}]}{3} \\ & \boxed{ No. } \ 45 \ ] \ \hat{\mathbb{Q}}_{0}^{(A_g)}(1,0) \ [M_3,B_1] \\ & \hat{\mathbb{Z}}_{45} = \frac{\sqrt{3}\mathbb{X}_{57} [\mathbb{T}_{2,0}^{(a,T_g)}(1,0)] \otimes \mathbb{U}_{24} [\mathbb{T}_{2,0}^{(u,T_g)}]}{3} + \frac{\sqrt{3}\mathbb{X}_{58} [\mathbb{T}_{2,1}^{(a,T_g)}(1,0)] \otimes \mathbb{U}_{25} [\mathbb{T}_{2,1}^{(u,T_g)}]}{3} + \frac{\sqrt{3}\mathbb{X}_{59} [\mathbb{T}_{2,2}^{(a,T_g)}(1,0)] \otimes \mathbb{U}_{26} [\mathbb{T}_{2,2}^{(u,T_g)}]}{3} \\ & \\ \end{aligned}$$

No. 46 
$$\hat{\mathbb{G}}_3^{(A_g)}(1,0)$$
 [M<sub>3</sub>,B<sub>1</sub>]

$$\hat{\mathbb{Z}}_{46} = -\frac{\sqrt{3}\mathbb{X}_{57}[\mathbb{T}_{2,0}^{(a,T_g)}(1,0)]\otimes\mathbb{U}_{28}[\mathbb{T}_{4,0}^{(u,T_g,1)}]}{3} - \frac{\sqrt{3}\mathbb{X}_{58}[\mathbb{T}_{2,1}^{(a,T_g)}(1,0)]\otimes\mathbb{U}_{29}[\mathbb{T}_{4,1}^{(u,T_g,1)}]}{3} - \frac{\sqrt{3}\mathbb{X}_{59}[\mathbb{T}_{2,2}^{(a,T_g)}(1,0)]\otimes\mathbb{U}_{30}[\mathbb{T}_{4,2}^{(u,T_g,1)}]}{3} - \frac{\sqrt{3}\mathbb{X}_{59}[\mathbb{T}_{2,2}^{(a,T_g)}(1,0)]\otimes\mathbb{U}_{30}[\mathbb{T}_{4,2}^{(u,T_g,1)}]}{3} - \frac{\sqrt{3}\mathbb{X}_{59}[\mathbb{T}_{2,2}^{(a,T_g)}(1,0)]\otimes\mathbb{U}_{39}[\mathbb{T}_{4,2}^{(u,T_g,1)}]}{3} - \frac{\sqrt{3}\mathbb{X}_{59}[\mathbb{T}_{2,2}^{(u,T_g,1)}(1,0)]\otimes\mathbb{U}_{39}[\mathbb{T}_{4,2}^{(u,T_g,1)}]}{3} - \frac{\sqrt{3}\mathbb{X}_{59}[\mathbb{T}_{2,2}^{(u,T_g,1)}(1,0)]\otimes\mathbb{U}_{39}[\mathbb{T}_{4,2}^{(u,T_g,1)}]}{3} - \frac{\sqrt{3}\mathbb{X}_{59}[\mathbb{T}_{2,2}^{(u,T_g,1)}(1,0)]\otimes\mathbb{U}_{39}[\mathbb{T}_{4,2}^{(u,T_g,1)}]}{3} - \frac{\sqrt{3}\mathbb{X}_{59}[\mathbb{T}_{2,2}^{(u,T_g,1)}(1,0)]\otimes\mathbb{U}_{39}[\mathbb{T}_{4,2}^{(u,T_g,1)}]}{3} - \frac{\sqrt{3}\mathbb{X}_{59}[\mathbb{T}_{2,2}^{(u,T_g,1)}(1,0)]\otimes\mathbb{U}_{39}[\mathbb{T}_{4,2}^{(u,T_g,1)}]}{3} - \frac{\sqrt{3}\mathbb{X}_{59}[\mathbb{T}_{2,2}^{(u,T_g,1)}(1,0)]\otimes\mathbb{U}_{39}[\mathbb{T}_{4,2}^{(u,T_g,1)}]}{3} - \frac{\sqrt{3}\mathbb{X}_{59}[\mathbb{T}_{2,2}^{(u,T_g,1)}(1,0)]\otimes\mathbb{U}_{39}[\mathbb{T}_{2,2}^{(u,T_g,1)}]}{3} - \frac{\sqrt{3}\mathbb{X}_{59}[\mathbb{T}_{2,2}^{(u,T_g,1)}(1,0)]\otimes\mathbb{U}_{39}[\mathbb{T}_{2,2}^{(u,T_g,1)}]}{3} - \frac{\sqrt{3}\mathbb{X}_{59}[\mathbb{T}_{2,2}^{(u,T_g,1)}(1,0)]\otimes\mathbb{U}_{39}[\mathbb{T}_{2,2}^{(u,T_g,1)}]}{3} - \frac{\mathbb{X}_{39}[\mathbb{T}_{2,2}^{(u,T_g,1)}(1,0)]\otimes\mathbb{U}_{39}[\mathbb{T}_{2,2}^{(u,T_g,1)}]}{3} - \frac{\mathbb{X}_{39}[\mathbb{T}_{2,2}^{(u,T_g,1)}(1,0)]\otimes\mathbb{U}_{39}[\mathbb{T}_{2,2}^{(u,T_g,1)}]}{3} - \frac{\mathbb{X}_{39}[\mathbb{T}_{2,2}^{(u,T_g,1)}(1,0)]\otimes\mathbb{U}_{39}[\mathbb{T}_{2,2}^{(u,T_g,1)}]}{3} - \frac{\mathbb{X}_{39}[\mathbb{T}_{2,2}^{(u,T_g,1)}(1,0)]\otimes\mathbb{U}_{39}[\mathbb{T}_{2,2}^{(u,T_g,1)}(1,0)]}{3} - \frac{\mathbb{X}_{39}[\mathbb{T}_{2,2}^{(u,T_g,1)}(1,0)]\otimes\mathbb{T}_{39}[\mathbb{T}_{2,2}^{(u,T_g,1)}(1,0)]}{3} - \frac{\mathbb{X}_{39}[\mathbb{T}_{2,2}^{(u,T_g,1)}(1,0)]\otimes\mathbb{T}_{39}[\mathbb{T}_{2,2}^{(u,T_g,1)}(1,0)]}{3} - \frac{\mathbb{X}_{39}[\mathbb{T}_{2,2}^{(u,T_g,1)}(1,0)]\otimes\mathbb{T}_{39}[\mathbb{T}_{2,2}^{(u,T_g,1)}(1,0)]}{3} - \frac{\mathbb{X}_{39}[\mathbb{T}_{2,2}^{(u,T_g,1)}(1,0)]\otimes\mathbb{T}_{39}[\mathbb{T}_{2,2}^{(u,T_g,1)}(1,0)]}{3} - \frac{\mathbb{X}_{39}[\mathbb{T}_{2,2}^{(u,T_g,1)}(1,0)]\otimes\mathbb{T}_{39}[\mathbb{T}_{2,2}^{(u,T_g,1)}(1,0)]}{3} - \frac{\mathbb{X}_{39}[\mathbb{T}_{2,2}^{(u,T_g,1)}(1,0)]\otimes\mathbb{T}_{39}[\mathbb{T}_{39}[\mathbb{T}_{39}[\mathbb{T}_{39}[\mathbb{T}_{39$$

Table 4: Atomic SAMB group.

group	bra	ket
$M_1$	$(s,\uparrow),(s,\downarrow)$	$(s,\uparrow),(s,\downarrow)$
$M_2$	$(s,\uparrow),(s,\downarrow)$	$(p_x,\uparrow),(p_x,\downarrow),(p_y,\uparrow),(p_y,\downarrow),(p_z,\uparrow),(p_z,\downarrow)$
$M_3$	$(p_x,\uparrow),(p_x,\downarrow),(p_y,\uparrow),(p_y,\downarrow),(p_z,\uparrow),(p_z,\downarrow)$	$(p_x,\uparrow),(p_x,\downarrow),(p_y,\uparrow),(p_y,\downarrow),(p_z,\uparrow),(p_z,\downarrow)$

Table 5: Atomic SAMB.

symbol	type	group	form
$\mathbb{X}_1$	$\mathbb{Q}_0^{(a,A_g)}$	$M_1$	$\begin{pmatrix} \frac{\sqrt{2}}{2} & 0\\ 0 & \frac{\sqrt{2}}{2} \end{pmatrix}$ $\begin{pmatrix} 0 & \frac{\sqrt{2}}{2} \end{pmatrix}$
$\mathbb{X}_2$	$\mathbb{M}_{1,0}^{(a,T_g)}(1,-1)$	$M_1$	$\left(\frac{\sqrt{2}}{2}  0\right)$
$\mathbb{X}_3$	$\mathbb{M}_{1,1}^{(a,T_g)}(1,-1)$	$M_1$	$\begin{pmatrix} 0 & -\frac{\sqrt{2}i}{2} \\ \frac{\sqrt{2}i}{2} & 0 \end{pmatrix}$

Table 5

		ī	
symbol	type	group	form
$\mathbb{X}_4$	$\mathbb{M}_{1,2}^{(a,T_g)}(1,-1)$	$M_1$	$\begin{pmatrix} \frac{\sqrt{2}}{2} & 0 \\ 0 & -\frac{\sqrt{2}}{2} \end{pmatrix}$
$\mathbb{X}_5$	$\mathbb{Q}_{1,0}^{(a,T_u)}$	$M_2$	$\begin{pmatrix} \frac{\sqrt{2}}{2} & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{2}}{2} & 0 & 0 & 0 & 0 \end{pmatrix} \begin{pmatrix} 0 & 0 & \frac{\sqrt{2}}{2} & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{2}}{2} & 0 & 0 & 0 \end{pmatrix}$
$\mathbb{X}_6$	$\mathbb{Q}_{1,1}^{(a,T_u)}$	$M_2$	$\begin{pmatrix} 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 $
$\mathbb{X}_7$	$\mathbb{Q}_{1,2}^{(a,T_u)}$	$M_2$	$\begin{pmatrix} 0 & 0 & 0 & 0 & \frac{\sqrt{2}}{2} & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2}}{2} \end{pmatrix}$
$\mathbb{X}_8$	$\mathbb{Q}_{1,0}^{(a,T_u)}(1,0)$	$M_2$	$\begin{pmatrix} 0 & 0 & -\frac{i}{2} & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 0 & \frac{i}{2} & -\frac{1}{2} & 0 \end{pmatrix}$
$\mathbb{X}_9$	$\mathbb{Q}_{1,1}^{(a,T_u)}(1,0)$	$M_2$	$egin{pmatrix} rac{i}{2} & 0 & 0 & 0 & 0 & -rac{i}{2} \ 0 & -rac{i}{2} & 0 & 0 & -rac{i}{2} & 0 \end{pmatrix}$
$\mathbb{X}_{10}$	$\mathbb{Q}_{1,2}^{(a,T_u)}(1,0)$	$M_2$	$\begin{pmatrix} 0 & -\frac{1}{2} & 0 & \frac{i}{2} & 0 & 0 \\ 1 & 1 & 1 & 1 & 1 \end{pmatrix}$
$\mathbb{X}_{11}$	$\mathbb{G}_{2,0}^{(a,T_u)}(1,-1)$	$M_2$	$\begin{pmatrix} 0 & 0 & \frac{i}{2} & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 0 & -\frac{i}{2} & -\frac{1}{2} & 0 \end{pmatrix}$
$\mathbb{X}_{12}$	$\mathbb{G}_{2,1}^{(a,T_u)}(1,-1)$	$M_2$	$\left( egin{array}{cccccccccccccccccccccccccccccccccccc$
$\mathbb{X}_{13}$	$\mathbb{G}_{2,2}^{(a,T_u)}(1,-1)$	$M_2$	$\begin{pmatrix} 0 & \frac{1}{2} & 0 & \frac{i}{2} & 0 & 0 \\ -\frac{1}{2} & 0 & \frac{i}{2} & 0 & 0 & 0 \end{pmatrix}$
$\mathbb{X}_{14}$	$\mathbb{M}_0^{(a,A_u)}(1,1)$	$M_2$	$\begin{pmatrix} \frac{1}{2} & 0 & \frac{i}{2} & 0 & 0 & 0 \end{pmatrix}$ $\begin{pmatrix} 0 & 0 & \frac{i}{2} & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 0 & -\frac{i}{2} & -\frac{1}{2} & 0 \end{pmatrix}$ $\begin{pmatrix} \frac{i}{2} & 0 & 0 & 0 & 0 & \frac{i}{2} \\ 0 & -\frac{i}{2} & 0 & 0 & \frac{i}{2} & 0 \end{pmatrix}$ $\begin{pmatrix} 0 & \frac{1}{2} & 0 & \frac{i}{2} & 0 & 0 \\ -\frac{1}{2} & 0 & \frac{i}{2} & 0 & 0 & 0 \end{pmatrix}$ $\begin{pmatrix} 0 & \frac{\sqrt{6}}{6} & 0 & -\frac{\sqrt{6}i}{6} & \frac{\sqrt{6}}{6} & 0 \\ \frac{\sqrt{6}}{6} & 0 & \frac{\sqrt{6}i}{6} & 0 & 0 & -\frac{\sqrt{6}}{6} \end{pmatrix}$
$\mathbb{X}_{15}$	$\mathbb{M}_{2,0}^{(a,E_u)}(1,-1)$	$M_2$	$\begin{pmatrix} 0 & -\frac{7}{6} & 0 & \frac{7}{6} & \frac{3}{3} & 0 \\ -\frac{\sqrt{3}}{3} & 0 & -\frac{\sqrt{3}i}{3} & 0 & 0 & -\frac{\sqrt{3}}{3} \end{pmatrix}$
$\mathbb{X}_{16}$	$\mathbb{M}_{2,1}^{(a,E_u)}(1,-1)$	$M_2$	$\begin{pmatrix} 6 & 6 & 6 & 3 & 3 \\ 0 & \frac{1}{2} & 0 & \frac{i}{2} & 0 & 0 \\ \frac{1}{2} & 0 & -\frac{i}{2} & 0 & 0 & 0 \end{pmatrix}$
$\mathbb{X}_{17}$	$\mathbb{M}_{2,0}^{(a,T_u)}(1,-1)$	$M_2$	$ \begin{pmatrix} 0 & 0 & \frac{1}{2} & 0 & 0 & -\frac{i}{2} \\ 0 & 0 & 0 & -\frac{1}{2} & \frac{i}{2} & 0 \end{pmatrix} $
$\mathbb{X}_{18}$	$\mathbb{M}_{2,1}^{(a,T_u)}(1,-1)$	$M_2$	$\begin{pmatrix} \frac{1}{2} & 0 & 0 & 0 & 0 & \frac{1}{2} \\ 0 & -\frac{1}{2} & 0 & 0 & \frac{1}{2} & 0 \end{pmatrix}$ $\begin{pmatrix} 0 & -\frac{i}{2} & 0 & \frac{1}{2} & 0 & 0 \\ \vdots & \vdots & \vdots & \vdots & \vdots & \vdots \end{pmatrix}$
$\mathbb{X}_{19}$	$\mathbb{M}_{2,2}^{(a,T_u)}(1,-1)$	$M_2$	$ \begin{pmatrix} 0 & -\frac{i}{2} & 0 & \frac{1}{2} & 0 & 0 \\ \frac{i}{2} & 0 & \frac{1}{2} & 0 & 0 & 0 \end{pmatrix} $

Table 5

Table 5			
symbol	type	group	form
$\mathbb{X}_{20}$	$\mathbb{T}_{1,0}^{(a,T_u)}(1,0)$	$M_2$	$egin{pmatrix} 0 & 0 & -rac{1}{2} & 0 & 0 & -rac{i}{2} \ 0 & 0 & 0 & rac{1}{2} & rac{i}{2} & 0 \end{pmatrix}$
$\mathbb{X}_{21}$	$\mathbb{T}_{1,1}^{(a,T_u)}(1,0)$	$M_2$	$\begin{pmatrix} \frac{1}{2} & 0 & 0 & 0 & 0 & -\frac{1}{2} \\ 0 & -\frac{1}{2} & 0 & 0 & -\frac{1}{2} & 0 \end{pmatrix}$
$\mathbb{X}_{22}$	$\mathbb{T}_{1,2}^{(a,T_u)}(1,0)$	$M_2$	$\begin{pmatrix} 0 & \frac{i}{2} & 0 & \frac{1}{2} & 0 & 0 \\ -\frac{i}{2} & 0 & \frac{1}{2} & 0 & 0 & 0 \end{pmatrix}$
$\mathbb{X}_{23}$	$\mathbb{T}_{1,0}^{(a,T_u)}$	$M_2$	$egin{pmatrix} rac{\sqrt{2}i}{2} & 0 & 0 & 0 & 0 & 0 \ 0 & rac{\sqrt{2}i}{2} & 0 & 0 & 0 & 0 \end{pmatrix}$
$\mathbb{X}_{24}$	$\mathbb{T}_{1,1}^{(a,T_u)}$	$M_2$	$egin{pmatrix} 0 & 0 & rac{\sqrt{2}i}{2} & 0 & 0 & 0 \ 0 & 0 & 0 & rac{\sqrt{2}i}{2} & 0 & 0 \end{pmatrix}$
$\mathbb{X}_{25}$	$\mathbb{T}_{1,2}^{(a,T_u)}$	$M_2$	$\begin{pmatrix} 0 & 0 & 0 & 0 & \frac{\sqrt{2}i}{2} & 0 \\ 0 & 0 & 0 & 0 & 0 & \sqrt{2}i \end{pmatrix}$
$\mathbb{X}_{26}$	$\mathbb{G}_0^{(a,A_u)}(1,1)$	$M_2$	$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$
$\mathbb{X}_{27}$	$\mathbb{Q}_0^{(a,A_g)}$	$ m M_3$	$\begin{pmatrix} 0 & \frac{\sqrt{6}}{6} & 0 & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{6}}{6} & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{6}}{6} & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{6} & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{6} \end{pmatrix}$
$\mathbb{X}_{28}$	$\mathbb{Q}_0^{(a,A_g)}(1,1)$	$ m M_3$	$\begin{pmatrix} 0 & 0 & -\frac{\sqrt{3}i}{6} & 0 & 0 & \frac{\sqrt{3}}{6} \\ 0 & 0 & 0 & \frac{\sqrt{3}i}{6} & -\frac{\sqrt{3}}{6} & 0 \\ \frac{\sqrt{3}i}{6} & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{6} \\ 0 & -\frac{\sqrt{3}i}{6} & 0 & 0 & -\frac{\sqrt{3}i}{6} & 0 \\ 0 & -\frac{\sqrt{3}}{6} & 0 & \frac{\sqrt{3}i}{6} & 0 & 0 \\ \frac{\sqrt{3}}{6} & 0 & \frac{\sqrt{3}i}{6} & 0 & 0 & 0 \end{pmatrix}$
$\mathbb{X}_{29}$	$\mathbb{Q}_{2,0}^{(a,E_g)}$	$ m M_3$	$\begin{pmatrix} -\frac{\sqrt{3}}{6} & 0 & 0 & 0 & 0 & 0\\ 0 & -\frac{\sqrt{3}}{6} & 0 & 0 & 0 & 0\\ 0 & 0 & -\frac{\sqrt{3}}{6} & 0 & 0 & 0\\ 0 & 0 & 0 & -\frac{\sqrt{3}}{6} & 0 & 0\\ 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{3} & 0\\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{3} \end{pmatrix}$

Table 5

Table 5			
symbol	type	group	form
<b></b>	$\mathbb{Q}_{2,1}^{(a,E_g)}$	$ m M_3$	$\begin{pmatrix} \frac{1}{2} & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{1}{2} & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{1}{2} & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{1}{2} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 &$
$\mathbb{X}_{31}$	$\mathbb{Q}_{2,0}^{(a,T_g)}$	$ m M_3$	$\begin{pmatrix} 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 &$
$\mathbb{X}_{32}$	$\mathbb{Q}_{2,1}^{(a,T_g)}$	$ m M_3$	$\begin{pmatrix} 0 & 0 & 0 & 0 & \frac{1}{2} & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0$
$\mathbb{X}_{33}$	$\mathbb{Q}_{2,2}^{(a,T_g)}$	$ m M_3$	$\begin{pmatrix} 0 & 0 & \frac{1}{2} & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{1}{2} & 0 & 0 \\ \frac{1}{2} & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{1}{2} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0$
$\mathbb{X}_{34}$	$\mathbb{Q}_{2,0}^{(a,E_g)}(1,-1)$	$ m M_3$	$\begin{pmatrix} 0 & 0 & -\frac{\sqrt{6}i}{6} & 0 & 0 & -\frac{\sqrt{6}}{12} \\ 0 & 0 & 0 & \frac{\sqrt{6}i}{6} & \frac{\sqrt{6}}{12} & 0 \\ \frac{\sqrt{6}i}{6} & 0 & 0 & 0 & 0 & \frac{\sqrt{6}i}{12} \\ 0 & -\frac{\sqrt{6}i}{6} & 0 & 0 & \frac{\sqrt{6}i}{12} & 0 \\ 0 & \frac{\sqrt{6}}{12} & 0 & -\frac{\sqrt{6}i}{12} & 0 & 0 \\ -\frac{\sqrt{6}}{12} & 0 & -\frac{\sqrt{6}i}{12} & 0 & 0 & 0 \end{pmatrix}$

Table 5

Table 5			
symbol	type	group	form
X35	$\mathbb{Q}_{2,1}^{(a,E_g)}(1,-1)$	$ m M_3$	$\begin{pmatrix} 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}}{4} \\ 0 & 0 & 0 & 0 & \frac{\sqrt{2}}{4} & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}i}{4} \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{2}i}{4} & 0 \\ 0 & \frac{\sqrt{2}}{4} & 0 & \frac{\sqrt{2}i}{4} & 0 & 0 \\ -\frac{\sqrt{2}}{4} & 0 & \frac{\sqrt{2}i}{4} & 0 & 0 \end{pmatrix}$
$\mathbb{X}_{36}$	$\mathbb{Q}_{2,0}^{(a,T_g)}(1,-1)$	$ m M_3$	$\begin{pmatrix} 0 & 0 & 0 & -\frac{\sqrt{2}}{4} & \frac{\sqrt{2}i}{4} & 0\\ 0 & 0 & \frac{\sqrt{2}}{4} & 0 & 0 & -\frac{\sqrt{2}i}{4}\\ 0 & \frac{\sqrt{2}}{4} & 0 & 0 & 0 & 0\\ -\frac{\sqrt{2}}{4} & 0 & 0 & 0 & 0\\ -\frac{\sqrt{2}i}{4} & 0 & 0 & 0 & 0\\ 0 & \frac{\sqrt{2}i}{4} & 0 & 0 & 0 & 0 \end{pmatrix}$
$\mathbb{X}_{37}$	$\mathbb{Q}_{2,1}^{(a,T_g)}(1,-1)$	$ m M_3$	$ \begin{pmatrix} 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 & \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{pmatrix} $
$\mathbb{X}_{38}$	$\mathbb{Q}_{2,2}^{(a,T_g)}(1,-1)$	$M_3$	$\begin{pmatrix} 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2}i}{4} \\ 0 & 0 & 0 & 0 & \frac{\sqrt{2}i}{4} & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}}{4} \\ 0 & 0 & 0 & 0 & \frac{\sqrt{2}}{4} & 0 \\ 0 & -\frac{\sqrt{2}i}{4} & 0 & \frac{\sqrt{2}}{4} & 0 & 0 \\ -\frac{\sqrt{2}i}{4} & 0 & -\frac{\sqrt{2}}{4} & 0 & 0 & 0 \end{pmatrix}$
$\mathbb{X}_{39}$	$\mathbb{G}_{1,0}^{(a,T_g)}(1,0)$	$ m M_3$	$\begin{pmatrix} 0 & 0 & 0 & -\frac{\sqrt{2}}{4} & -\frac{\sqrt{2}i}{4} & 0\\ 0 & 0 & \frac{\sqrt{2}}{4} & 0 & 0 & \frac{\sqrt{2}i}{4}\\ 0 & \frac{\sqrt{2}}{4} & 0 & 0 & 0 & 0\\ -\frac{\sqrt{2}}{4} & 0 & 0 & 0 & 0 & 0\\ \frac{\sqrt{2}i}{4} & 0 & 0 & 0 & 0 & 0\\ 0 & -\frac{\sqrt{2}i}{4} & 0 & 0 & 0 & 0 & 0 \end{pmatrix}$

Table 5

symbol	type	group	form
Symbol	туре	group	$ \begin{pmatrix} 0 & 0 & 0 & \frac{\sqrt{2}i}{4} & 0 & 0 \end{pmatrix} $
$\mathbb{X}_{40}$	$\mathbb{G}_{1,1}^{(a,T_g)}(1,0)$	M <sub>3</sub>	$ \begin{pmatrix} 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{pmatrix} $
$\mathbb{X}_{41}$	$\mathbb{G}_{1,2}^{(a,T_g)}(1,0)$	$ m M_3$	$\begin{pmatrix} 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2}i}{4} \\ 0 & 0 & 0 & 0 & \frac{\sqrt{2}i}{4} & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2}}{4} \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{2}}{4} & 0 \\ 0 & -\frac{\sqrt{2}i}{4} & 0 & -\frac{\sqrt{2}}{4} & 0 & 0 \\ -\frac{\sqrt{2}i}{4} & 0 & \frac{\sqrt{2}}{4} & 0 & 0 & 0 \end{pmatrix}$
$\mathbb{X}_{42}$	$\mathbb{M}_{1,0}^{(a,T_g)}$	$ m M_3$	$\begin{pmatrix} 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 &$
$\mathbb{X}_{43}$	$\mathbb{M}_{1,1}^{(a,T_g)}$	$ m M_3$	$\begin{pmatrix} 0 & 0 & 0 & 0 & \frac{i}{2} & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{i}{2} \\ 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0$
$\mathbb{X}_{44}$	$\mathbb{M}_{1,2}^{(a,T_g)}$	$ m M_3$	$\begin{pmatrix} 0 & 0 & -\frac{i}{2} & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{i}{2} & 0 & 0 \\ \frac{i}{2} & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{i}{2} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0$

Table 5

	1		
symbol	type	group	form
$\mathbb{X}_{45}$	$\mathbb{M}_{1,0}^{(a,T_g)}(1,1)$	$M_3$	$ \begin{pmatrix} 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 & 0 & -\frac{\sqrt{30}}{30} & 0 \end{pmatrix} $
$\mathbb{X}_{46}$	$\mathbb{M}_{1,1}^{(a,T_g)}(1,1)$	$M_3$	$\begin{bmatrix} 0 & \frac{\sqrt{30}i}{30} & 0 & \frac{\sqrt{30}}{20} & 0 & 0\\ -\frac{\sqrt{30}i}{30} & 0 & \frac{\sqrt{30}}{20} & 0 & 0 & 0\\ 0 & \frac{\sqrt{30}}{20} & 0 & -\frac{\sqrt{30}i}{15} & \frac{\sqrt{30}}{20} & 0\\ \frac{\sqrt{30}}{20} & 0 & \frac{\sqrt{30}i}{15} & 0 & 0 & -\frac{\sqrt{30}}{20}\\ 0 & 0 & \frac{\sqrt{30}}{20} & 0 & 0 & \frac{\sqrt{30}i}{30}\\ 0 & 0 & 0 & -\frac{\sqrt{30}}{20} & -\frac{\sqrt{30}i}{30} & 0 \end{bmatrix}$
$\mathbb{X}_{47}$	$\mathbb{M}_{1,2}^{(a,T_g)}(1,1)$	$ m M_3$	$ \begin{pmatrix} -\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{pmatrix} $
$\mathbb{X}_{48}$	$\mathbb{M}_{1,0}^{(a,T_g)}(1,-1)$	$ m M_3$	$\begin{pmatrix} 0 & \frac{\sqrt{6}}{6} & 0 & 0 & 0 & 0\\ \frac{\sqrt{6}}{6} & 0 & 0 & 0 & 0 & 0\\ 0 & 0 & 0 & \frac{\sqrt{6}}{6} & 0 & 0\\ 0 & 0 & \frac{\sqrt{6}}{6} & 0 & 0 & 0\\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{6}\\ 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{6} & 0 \end{pmatrix}$
$\mathbb{X}_{49}$	$\mathbb{M}_{1,1}^{(a,T_g)}(1,-1)$	$ m M_3$	$\begin{pmatrix} 0 & -\frac{\sqrt{6}i}{6} & 0 & 0 & 0 & 0\\ \frac{\sqrt{6}i}{6} & 0 & 0 & 0 & 0 & 0\\ 0 & 0 & 0 & -\frac{\sqrt{6}i}{6} & 0 & 0\\ 0 & 0 & \frac{\sqrt{6}i}{6} & 0 & 0 & 0\\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{6}\\ 0 & 0 & 0 & 0 & \frac{\sqrt{6}i}{6} & 0 \end{pmatrix}$

symbol	type	group	form
X50	$\mathbb{M}_{1,2}^{(a,T_g)}(1,-1)$	М3	$\begin{pmatrix} \frac{\sqrt{6}}{6} & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{6}}{6} & 0 & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{6}}{6} & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{6}}{6} & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{6} & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}}{6} \end{pmatrix}$
$\mathbb{X}_{51}$	$\mathbb{M}_{3,0}^{(a,T_g,1)}(1,-1)$	$ m M_3$	$\begin{pmatrix} 0 & \frac{\sqrt{5}}{5} & 0 & \frac{\sqrt{5i}}{10} & -\frac{\sqrt{5}}{10} & 0\\ \frac{\sqrt{5}}{5} & 0 & -\frac{\sqrt{5}i}{10} & 0 & 0 & \frac{\sqrt{5}}{10}\\ 0 & \frac{\sqrt{5}i}{10} & 0 & -\frac{\sqrt{5}}{10} & 0 & 0\\ -\frac{\sqrt{5}i}{10} & 0 & -\frac{\sqrt{5}}{10} & 0 & 0 & 0\\ -\frac{\sqrt{5}}{10} & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}}{10}\\ 0 & \frac{\sqrt{5}}{5} & 0 & 0 & -\frac{\sqrt{5}}{5} & 0 \end{pmatrix}$
$\mathbb{X}_{52}$	$\mathbb{M}_{3,1}^{(a,T_g,1)}(1,-1)$	$ m M_3$	$ \begin{pmatrix} -\frac{10}{10} & 0 & 0 & 0 & -\frac{\sqrt{5}}{10} \\ 0 & \frac{\sqrt{5}}{10} & 0 & 0 & -\frac{\sqrt{5}}{10} & 0 \end{pmatrix} $ $ \begin{pmatrix} 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{pmatrix} $
$\mathbb{X}_{53}$	$\mathbb{M}_{3,2}^{(a,T_g,1)}(1,-1)$	$ m M_3$	$\begin{pmatrix} -\frac{\sqrt{5}}{10} & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}}{10} \\ 0 & \frac{\sqrt{5}}{10} & 0 & 0 & -\frac{\sqrt{5}}{10} & 0 \\ 0 & 0 & -\frac{\sqrt{5}}{10} & 0 & 0 & \frac{\sqrt{5}i}{10} \\ 0 & 0 & 0 & \frac{\sqrt{5}}{10} & -\frac{\sqrt{5}i}{10} & 0 \\ 0 & -\frac{\sqrt{5}}{10} & 0 & \frac{\sqrt{5}i}{10} & \frac{\sqrt{5}}{5} & 0 \\ -\frac{\sqrt{5}}{10} & 0 & -\frac{\sqrt{5}i}{10} & 0 & 0 & -\frac{\sqrt{5}}{5} \end{pmatrix}$
$\mathbb{X}_{54}$	$\mathbb{M}_{3,0}^{(a,T_g,2)}(1,-1)$	$M_3$	$ \begin{pmatrix} 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} \end{pmatrix} $

Table 5

		<u> </u>	
symbol	type	group	form
$\mathbb{X}_{55}$	$\mathbb{M}_{3,1}^{(a,T_g,2)}(1,-1)$	$ m M_3$	$\begin{pmatrix} 0 & \frac{\sqrt{3}i}{6} & 0 & -\frac{\sqrt{3}}{6} & 0 & 0\\ -\frac{\sqrt{3}i}{6} & 0 & -\frac{\sqrt{3}}{6} & 0 & 0 & 0\\ 0 & -\frac{\sqrt{3}}{6} & 0 & 0 & \frac{\sqrt{3}}{6} & 0\\ -\frac{\sqrt{3}}{6} & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{6}\\ 0 & 0 & \frac{\sqrt{3}}{6} & 0 & 0 & -\frac{\sqrt{3}i}{6}\\ 0 & 0 & 0 & -\frac{\sqrt{3}}{6} & \frac{\sqrt{3}i}{6} & 0 \end{pmatrix}$
$\mathbb{X}_{56}$	$\mathbb{M}_{3,2}^{(a,T_g,2)}(1,-1)$	$ m M_3$	$\begin{pmatrix} \frac{\sqrt{3}}{6} & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{6} \\ 0 & -\frac{\sqrt{3}}{6} & 0 & 0 & \frac{\sqrt{3}}{6} & 0 \\ 0 & 0 & -\frac{\sqrt{3}}{6} & 0 & 0 & \frac{\sqrt{3}i}{6} \\ 0 & 0 & 0 & \frac{\sqrt{3}}{6} & -\frac{\sqrt{3}i}{6} & 0 \\ 0 & \frac{\sqrt{3}}{6} & 0 & \frac{\sqrt{3}i}{6} & 0 & 0 \\ \frac{\sqrt{3}}{6} & 0 & -\frac{\sqrt{3}i}{6} & 0 & 0 & 0 \end{pmatrix}$
$\mathbb{X}_{57}$	$\mathbb{T}_{2,0}^{(a,T_g)}(1,0)$	$ m M_3$	$ \begin{bmatrix} 0 & 0 & 0 & \frac{\sqrt{6}i}{12} & \frac{\sqrt{6}i}{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} \end{bmatrix} $
$\mathbb{X}_{58}$	$\mathbb{T}_{2,1}^{(a,T_g)}(1,0)$	$ m M_3$	$\begin{pmatrix} 0 & \frac{\sqrt{6}i}{6} & 0 & \frac{\sqrt{6}}{12} & 0 & 0\\ -\frac{\sqrt{6}i}{6} & 0 & \frac{\sqrt{6}}{12} & 0 & 0 & 0\\ 0 & \frac{\sqrt{6}}{12} & 0 & 0 & -\frac{\sqrt{6}}{12} & 0\\ \frac{\sqrt{6}}{12} & 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{12}\\ 0 & 0 & -\frac{\sqrt{6}}{12} & 0 & 0 & -\frac{\sqrt{6}i}{6}\\ 0 & 0 & 0 & \frac{\sqrt{6}}{12} & \frac{\sqrt{6}i}{6} & 0 \end{pmatrix}$
$\mathbb{X}_{59}$	$\mathbb{T}_{2,2}^{(a,T_g)}(1,0)$	$ m M_3$	$\begin{pmatrix} \frac{\sqrt{6}}{6} & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}}{12} \\ 0 & -\frac{\sqrt{6}}{6} & 0 & 0 & -\frac{\sqrt{6}}{12} & 0 \\ 0 & 0 & -\frac{\sqrt{6}}{6} & 0 & 0 & -\frac{\sqrt{6}i}{12} \\ 0 & 0 & 0 & \frac{\sqrt{6}}{6} & \frac{\sqrt{6}i}{12} & 0 \\ 0 & -\frac{\sqrt{6}}{12} & 0 & -\frac{\sqrt{6}i}{12} & 0 & 0 \\ -\frac{\sqrt{6}}{12} & 0 & \frac{\sqrt{6}i}{12} & 0 & 0 & 0 \end{pmatrix}$

Table 6: Uniform SAMB.

symbol	type	cluster	form
$\mathbb{U}_1$	$\mathbb{Q}_0^{(s,A_g)}$	$S_1$	$\begin{pmatrix} \frac{\sqrt{2}}{4} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{2}}{4} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{2}}{4} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{2}}{4} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{2}}{4} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2}}{4} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2}}{4} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2}}{4} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2}}{4} \end{pmatrix}$
$\mathbb{U}_2$	$\mathbb{Q}_{1,0}^{(s,T_u)}$	$S_1$	$\begin{pmatrix} \frac{\sqrt{2}}{4} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{2}}{4} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{2}}{4} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{2}}{4} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{2}}{4} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2}}{4} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}}{4} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2}}{4} \end{pmatrix}$
$\mathbb{U}_3$	$\mathbb{Q}_{1,1}^{(s,T_u)}$	$S_1$	$\begin{pmatrix} \frac{\sqrt{2}}{4} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{2}}{4} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{2}}{4} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{2}}{4} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{2}}{4} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2}}{4} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2}}{4} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}}{4} \end{pmatrix}$
$\mathbb{U}_4$	$\mathbb{Q}_{1,2}^{(s,T_u)}$	$S_1$	$\begin{pmatrix} \frac{\sqrt{2}}{4} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{2}}{4} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{2}}{4} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{2}}{4} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{2}}{4} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}}{4} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2}}{4} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2}}{4} \end{pmatrix}$

Table 6

Table 6			
symbol	type	cluster	form
$\mathbb{U}_5$	$\mathbb{Q}_{2,0}^{(s,T_g)}$	$S_1$	$\begin{pmatrix} \frac{\sqrt{2}}{4} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{2}}{4} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{2}}{4} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{2}}{4} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{2}}{4} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}}{4} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2}}{4} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}}{4} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}}{4} \end{pmatrix}$
$\mathbb{U}_6$	$\mathbb{Q}_{2,1}^{(s,T_g)}$	$\mathrm{S}_1$	$\begin{pmatrix} \frac{1}{4} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{2}}{4} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{2}}{4} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{2}}{4} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{2}}{4} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}}{4} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}}{4} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2}}{4} \end{pmatrix}$
$\mathbb{U}_7$	$\mathbb{Q}_{2,2}^{(s,T_g)}$	$S_1$	$\begin{pmatrix} \frac{\sqrt{2}}{4} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{2}}{4} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{2}}{4} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{2}}{4} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{2}}{4} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2}}{4} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}}{4} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}}{4} \end{pmatrix}$
$\mathbb{U}_8$	$\mathbb{Q}_3^{(s,A_u)}$	$S_1$	$\begin{pmatrix} \frac{\sqrt{2}}{4} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{2}}{4} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{2}}{4} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{2}}{4} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{2}}{4} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}}{4} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}}{4} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}}{4} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}}{4} \end{pmatrix}$

Table 6

Table 6			
symbol	type	cluster	form
$\mathbb{U}_9$	$\mathbb{Q}_0^{(u,A_g)}$	В1	$\begin{pmatrix} 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{12} & \frac{\sqrt{6}}{12} & \frac{\sqrt{6}}{12} \\ 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{12} & 0 & \frac{\sqrt{6}}{12} & \frac{\sqrt{6}}{12} \\ 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{12} & 0 & \frac{\sqrt{6}}{12} & \frac{\sqrt{6}}{12} \\ 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{12} & \frac{\sqrt{6}}{12} & 0 & \frac{\sqrt{6}}{12} \\ 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{12} & \frac{\sqrt{6}}{12} & 0 & \frac{\sqrt{6}}{12} & 0 \\ 0 & \frac{\sqrt{6}}{12} & \frac{\sqrt{6}}{12} & \frac{\sqrt{6}}{12} & 0 & 0 & 0 & 0 \\ \frac{\sqrt{6}}{12} & 0 & \frac{\sqrt{6}}{12} & \frac{\sqrt{6}}{12} & 0 & 0 & 0 & 0 \\ \frac{\sqrt{6}}{12} & \frac{\sqrt{6}}{12} & 0 & \frac{\sqrt{6}}{12} & 0 & 0 & 0 & 0 \\ \frac{\sqrt{6}}{12} & \frac{\sqrt{6}}{12} & 0 & \frac{\sqrt{6}}{12} & 0 & 0 & 0 & 0 \end{pmatrix}$
$\mathbb{U}_{10}$	$\mathbb{Q}_{1,0}^{(u,T_u)}$	В1	$\begin{pmatrix} 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{26}}{52} & 0 & \frac{\sqrt{26}}{26} \\ 0 & 0 & 0 & 0 & -\frac{3\sqrt{26}}{52} & 0 & -\frac{\sqrt{26}}{26} & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{26}}{26} & 0 & \frac{3\sqrt{26}}{52} \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{26}}{26} & 0 & -\frac{3\sqrt{26}}{52} & 0 \\ 0 & -\frac{3\sqrt{26}}{52} & 0 & -\frac{\sqrt{26}}{26} & 0 & 0 & 0 & 0 \\ \frac{3\sqrt{26}}{52} & 0 & \frac{\sqrt{26}}{26} & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{26}}{26} & 0 & -\frac{3\sqrt{26}}{52} & 0 & 0 & 0 & 0 & 0 \\ \frac{\sqrt{26}}{26} & 0 & \frac{3\sqrt{26}}{52} & 0 & 0 & 0 & 0 & 0 \end{pmatrix}$
$\mathbb{U}_{11}$	$\mathbb{Q}_{1,1}^{(u,T_u)}$	В1	$\begin{pmatrix} 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{26}}{26} & \frac{3\sqrt{26}}{52} & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{26}}{26} & 0 & 0 & -\frac{3\sqrt{26}}{52} \\ 0 & 0 & 0 & 0 & -\frac{3\sqrt{26}}{52} & 0 & 0 & -\frac{\sqrt{26}}{26} \\ 0 & 0 & 0 & 0 & 0 & \frac{3\sqrt{26}}{52} & \frac{\sqrt{26}}{26} & 0 \\ 0 & -\frac{\sqrt{26}}{26} & -\frac{3\sqrt{26}}{52} & 0 & 0 & 0 & 0 \\ \frac{\sqrt{26}}{26} & 0 & 0 & \frac{3\sqrt{26}}{52} & 0 & 0 & 0 & 0 \\ \frac{\sqrt{26}}{26} & 0 & 0 & \frac{3\sqrt{26}}{52} & 0 & 0 & 0 & 0 \\ 0 & -\frac{3\sqrt{26}}{52} & -\frac{\sqrt{26}}{26} & 0 & 0 & 0 & 0 & 0 \end{pmatrix}$
$\mathbb{U}_{12}$	$\mathbb{Q}_{1,2}^{(u,T_u)}$	В1	$\begin{pmatrix} 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{26}}{26} & \frac{3\sqrt{26}}{52} \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{26}}{26} & \frac{3\sqrt{26}}{52} & \frac{\sqrt{26}}{26} \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{26}}{26} & -\frac{3\sqrt{26}}{52} & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{3\sqrt{26}}{26} & -\frac{\sqrt{26}}{26} & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{26}}{26} & -\frac{3\sqrt{26}}{52} & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{3\sqrt{26}}{26} & -\frac{3\sqrt{26}}{52} & 0 & 0 & 0 & 0 \\ \frac{\sqrt{26}}{26} & \frac{3\sqrt{26}}{52} & 0 & 0 & 0 & 0 & 0 \\ \frac{\sqrt{26}}{26} & \frac{3\sqrt{26}}{52} & 0 & 0 & 0 & 0 & 0 \end{pmatrix}$

Table 6

	ı	1	
symbol	type	cluster	form
$\mathbb{U}_{13}$	$\mathbb{Q}_{2,0}^{(u,E_g)}$	В1	$\begin{pmatrix} 0 & 0 & 0 & 0 & 0 & -\frac{11\sqrt{3}}{84} & -\frac{\sqrt{3}}{42} & \frac{13\sqrt{3}}{84} \\ 0 & 0 & 0 & 0 & -\frac{11\sqrt{3}}{84} & 0 & \frac{13\sqrt{3}}{84} & -\frac{\sqrt{3}}{42} \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{84} & \frac{13\sqrt{3}}{84} & 0 & -\frac{11\sqrt{3}}{84} \\ 0 & 0 & 0 & 0 & \frac{13\sqrt{3}}{84} & -\frac{\sqrt{3}}{42} & -\frac{11\sqrt{3}}{84} & 0 \\ 0 & -\frac{11\sqrt{3}}{84} & -\frac{\sqrt{3}}{42} & \frac{13\sqrt{3}}{84} & 0 & 0 & 0 & 0 \\ -\frac{11\sqrt{3}}{84} & 0 & \frac{13\sqrt{3}}{84} & -\frac{\sqrt{3}}{42} & 0 & 0 & 0 & 0 \\ -\frac{\sqrt{3}}{42} & \frac{13\sqrt{3}}{84} & 0 & -\frac{11\sqrt{3}}{84} & 0 & 0 & 0 & 0 \\ \frac{13\sqrt{3}}{84} & -\frac{\sqrt{3}}{42} & -\frac{11\sqrt{3}}{84} & 0 & 0 & 0 & 0 & 0 \\ \frac{13\sqrt{3}}{84} & -\frac{\sqrt{3}}{42} & -\frac{11\sqrt{3}}{84} & 0 & 0 & 0 & 0 & 0 \end{pmatrix}$
$\mathbb{U}_{14}$	$\mathbb{Q}_{2,1}^{(u,E_g)}$	В1	$\begin{pmatrix} 0 & 0 & 0 & 0 & 0 & \frac{3}{28} & -\frac{2}{7} & \frac{3}{28} \\ 0 & 0 & 0 & 0 & \frac{5}{28} & 0 & \frac{3}{28} & -\frac{2}{7} \\ 0 & 0 & 0 & 0 & -\frac{2}{7} & \frac{3}{28} & 0 & \frac{5}{28} \\ 0 & 0 & 0 & 0 & \frac{3}{28} & -\frac{2}{7} & \frac{5}{28} & 0 \\ 0 & \frac{5}{28} & -\frac{2}{7} & \frac{3}{28} & 0 & 0 & 0 & 0 \\ \frac{5}{28} & 0 & \frac{3}{28} & -\frac{2}{7} & 0 & 0 & 0 & 0 \\ -\frac{2}{7} & \frac{3}{28} & 0 & \frac{5}{28} & 0 & 0 & 0 & 0 \\ \frac{3}{28} & -\frac{2}{7} & \frac{5}{28} & 0 & 0 & 0 & 0 \end{pmatrix}$
$\mathbb{U}_{15}$	$\mathbb{Q}_{2,0}^{(u,T_g)}$	В1	$\begin{pmatrix} 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2}}{4} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}}{4} \\ 0 & 0 & 0 & 0 & \frac{\sqrt{2}}{4} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}}{4} & 0 & 0 \\ 0 & 0 & \frac{\sqrt{2}}{4} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{2}}{4} & 0 & 0 & 0 & 0 & 0 \\ \frac{\sqrt{2}}{4} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{2}}{4} & 0 & 0 & 0 & 0 & 0 & 0 \end{pmatrix}$
$\mathbb{U}_{16}$	$\mathbb{Q}_{2,1}^{(u,T_g)}$	В1	$\begin{pmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2}}{4} \\ 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}}{4} & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}}{4} & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{2}}{4} & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{2}}{4} & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{2}}{4} & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{2}}{4} & 0 & 0 & 0 & 0 & 0 & 0 \\ \frac{\sqrt{2}}{4} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{pmatrix}$

Table 6

	1	I	
symbol	type	cluster	form
$\mathbb{U}_{17}$	$\mathbb{Q}_{2,2}^{(u,T_g)}$	В1	$\begin{pmatrix} 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2}}{4} & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{2}}{4} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0$
$\mathbb{U}_{18}$	$\mathbb{Q}_{3,0}^{(u,T_u,1)}$	В1	$\begin{pmatrix} 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{26}}{26} & 0 & -\frac{3\sqrt{26}}{52} \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{26}}{26} & 0 & \frac{3\sqrt{26}}{52} & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{26}}{52} & 0 & \frac{\sqrt{26}}{26} \\ 0 & 0 & 0 & 0 & \frac{3\sqrt{26}}{52} & 0 & -\frac{\sqrt{26}}{26} & 0 \\ 0 & -\frac{\sqrt{26}}{26} & 0 & \frac{3\sqrt{26}}{52} & 0 & 0 & 0 & 0 \\ \frac{\sqrt{26}}{26} & 0 & -\frac{3\sqrt{26}}{52} & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{3\sqrt{26}}{52} & 0 & -\frac{\sqrt{26}}{26} & 0 & 0 & 0 & 0 \\ -\frac{3\sqrt{26}}{52} & 0 & \frac{\sqrt{26}}{26} & 0 & 0 & 0 & 0 \end{pmatrix}$
$\mathbb{U}_{19}$	$\mathbb{Q}_{3,1}^{(u,T_u,1)}$	В1	$\begin{pmatrix} 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{26}}{52} & \frac{\sqrt{26}}{26} & 0\\ 0 & 0 & 0 & 0 & \frac{3\sqrt{26}}{52} & 0 & 0 & -\frac{\sqrt{26}}{26}\\ 0 & 0 & 0 & 0 & -\frac{\sqrt{26}}{52} & 0 & 0 & \frac{3\sqrt{26}}{52}\\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{26}}{26} & -\frac{3\sqrt{26}}{52} & 0\\ 0 & \frac{3\sqrt{26}}{52} & -\frac{\sqrt{26}}{26} & 0 & 0 & 0 & 0\\ -\frac{3\sqrt{26}}{52} & 0 & 0 & \frac{\sqrt{26}}{26} & 0 & 0 & 0 & 0\\ -\frac{3\sqrt{26}}{52} & 0 & 0 & -\frac{3\sqrt{26}}{52} & 0 & 0 & 0 & 0\\ 0 & -\frac{\sqrt{26}}{26} & \frac{3\sqrt{26}}{26} & 0 & 0 & 0 & 0 \end{pmatrix}$
$\mathbb{U}_{20}$	$\mathbb{Q}_{3,2}^{(u,T_u,1)}$	В1	$\begin{pmatrix} 0 & 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{26}}{52} & \frac{\sqrt{26}}{26} \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{26}}{52} & -\frac{\sqrt{26}}{26} \\ 0 & 0 & 0 & 0 & \frac{3\sqrt{26}}{52} & -\frac{\sqrt{26}}{26} & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{26}}{52} & \frac{3\sqrt{26}}{26} & 0 & 0 \\ 0 & 0 & \frac{3\sqrt{26}}{52} & -\frac{\sqrt{26}}{26} & 0 & 0 & 0 \\ 0 & 0 & \frac{3\sqrt{26}}{52} & -\frac{\sqrt{26}}{26} & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{26}}{26} & \frac{3\sqrt{26}}{52} & 0 & 0 & 0 & 0 \\ -\frac{3\sqrt{26}}{52} & \frac{\sqrt{26}}{26} & 0 & 0 & 0 & 0 & 0 \\ \frac{\sqrt{26}}{26} & -\frac{3\sqrt{26}}{52} & 0 & 0 & 0 & 0 & 0 \end{pmatrix}$

Table 6

		T -	
symbol	type	cluster	form
$\mathbb{U}_{21}$	$\mathbb{T}_{1,0}^{(u,T_u)}$	В1	$\begin{pmatrix} 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}i}{4} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2}i}{4} & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{2}i}{4} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2}i}{4} & 0 & 0 \\ 0 & 0 & \frac{\sqrt{2}i}{4} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{2}i}{4} & 0 & 0 & 0 & 0 & 0 \\ \frac{\sqrt{2}i}{4} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{2}i}{4} & 0 & 0 & 0 & 0 & 0 & 0 \end{pmatrix}$
$\mathbb{U}_{22}$	$\mathbb{T}_{1,1}^{(u,T_u)}$	В1	$\begin{pmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}i}{4} \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2}i}{4} & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2}i}{4} & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{2}i}{4} & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{2}i}{4} & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{2}i}{4} & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{2}i}{4} & 0 & 0 & 0 & 0 & 0 & 0 \\ \frac{\sqrt{2}i}{4} & 0 & 0 & 0 & 0 & 0 & 0 \end{pmatrix}$
$\mathbb{U}_{23}$	$\mathbb{T}_{1,2}^{(u,T_u)}$	В1	$\begin{pmatrix} 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}i}{4} & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{2}i}{4} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0$
$\mathbb{U}_{24}$	$\mathbb{T}_{2,0}^{(u,T_g)}$	В1	$\begin{pmatrix} 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{26}i}{26} & 0 & -\frac{3\sqrt{26}i}{52} \\ 0 & 0 & 0 & 0 & \frac{\sqrt{26}i}{26} & 0 & \frac{3\sqrt{26}i}{52} & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{26}i}{26} & 0 & -\frac{\sqrt{26}i}{26} \\ 0 & 0 & 0 & 0 & \frac{3\sqrt{26}i}{52} & 0 & \frac{\sqrt{26}i}{26} & 0 \\ 0 & -\frac{\sqrt{26}i}{26} & 0 & -\frac{3\sqrt{26}i}{52} & 0 & 0 & 0 & 0 \\ \frac{\sqrt{26}i}{26} & 0 & \frac{3\sqrt{26}i}{52} & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{3\sqrt{26}i}{52} & 0 & -\frac{\sqrt{26}i}{26} & 0 & 0 & 0 & 0 & 0 \\ \frac{3\sqrt{26}i}{52} & 0 & \frac{\sqrt{26}i}{26} & 0 & 0 & 0 & 0 & 0 \end{pmatrix}$

Table 6

Table 6			
symbol	type	cluster	form
			$\begin{pmatrix} 0 & 0 & 0 & 0 & -\frac{3\sqrt{26}i}{52} & -\frac{\sqrt{26}i}{26} & 0 \end{pmatrix}$
			$ \begin{bmatrix} 0 & 0 & 0 & 0 & \frac{3\sqrt{26}i}{52} & 0 & 0 & \frac{\sqrt{26}i}{26} \\ 0 & 0 & 0 & 0 & \frac{\sqrt{26}i}{26} & 0 & 0 & \frac{3\sqrt{26}i}{52} \end{bmatrix} $
			$\begin{array}{c ccccccccccccccccccccccccccccccccccc$
$\mathbb{U}_{25}$	$\mathbb{T}_{2,1}^{(u,T_g)}$	$B_1$	$\begin{bmatrix} 0 & 0 & 0 & 0 & -\frac{\sqrt{26}i}{26} & -\frac{3\sqrt{26}i}{52} & 0 \end{bmatrix}$
- 20	2,1		$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$
			$\begin{bmatrix} \frac{3\sqrt{26}i}{52} & 0 & 0 & \frac{\sqrt{26}i}{26} & 0 & 0 & 0 \\ \sqrt{26}i & 0 & 0 & \frac{3\sqrt{26}i}{26} & 0 & 0 & 0 \\ \end{bmatrix}$
			26 0 52 0 0
			$-\frac{1}{26}$
			$\frac{1}{1}$
			52 26
$\mathbb{U}_{26}$	$\mathbb{T}_{2,2}^{(u,T_g)}$	$B_1$	26 52
			$\frac{52}{6}$ $\frac{52}{6}$ $\frac{26}{6}$ 0 0 0
			$\frac{52}{6}$ $\frac{26}{6}$
			1 $1$ $1$ $1$ $1$ $1$ $1$ $1$ $1$ $1$
			$\begin{pmatrix} 0 & 0 & 0 & 0 & -\frac{1}{12} & -\frac{1}{12} & -\frac{1}{12} \\ 0 & 0 & 0 & 0 & \sqrt{6}i & 0 & \sqrt{6}i \end{pmatrix}$
			$ \begin{vmatrix} 0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{12} & 0 & -\frac{\sqrt{6}i}{12} & -\frac{\sqrt{6}i}{12} \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{12} & -\frac{\sqrt{6}i}{12} & 0 & -\frac{\sqrt{6}i}{12} \end{vmatrix} $
	$\mathbb{T}_3^{(u,A_u)}$	$B_1$	$ \begin{bmatrix} 0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{12} & 0 & -\frac{\sqrt{6}i}{12} & -\frac{\sqrt{6}i}{12} \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{12} & -\frac{\sqrt{6}i}{12} & 0 & -\frac{\sqrt{6}i}{12} \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{12} & -\frac{\sqrt{6}i}{12} & -\frac{\sqrt{6}i}{12} & 0 \end{bmatrix} $
$\mathbb{U}_{27}$			$ \begin{bmatrix} 0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{12} & -\frac{\sqrt{6}i}{12} & -\frac{\sqrt{6}i}{12} & 0 \ 0 & \frac{\sqrt{6}i}{12} & \frac{\sqrt{6}i}{12} & 0 & 0 & 0 \end{bmatrix} $
			$\begin{bmatrix} 0 & \frac{\sqrt{6}i}{12} & \frac{\sqrt{6}i}{12} & \frac{\sqrt{6}i}{12} & 0 & 0 & 0 & 0 \\ \frac{\sqrt{6}i}{12} & 0 & \frac{\sqrt{6}i}{12} & \frac{\sqrt{6}i}{12} & 0 & 0 & 0 & 0 \\ \frac{\sqrt{6}i}{12} & \frac{\sqrt{6}i}{12} & 0 & \frac{\sqrt{6}i}{12} & 0 & 0 & 0 & 0 \\ \frac{\sqrt{6}i}{12} & \frac{\sqrt{6}i}{12} & 0 & \frac{\sqrt{6}i}{12} & 0 & 0 & 0 & 0 \end{bmatrix}$
			$\left[ egin{array}{c ccccccccccccccccccccccccccccccccccc$
			$\begin{pmatrix} \frac{\sqrt{6}i}{12} & 0 & \frac{\sqrt{6}i}{12} & \frac{\sqrt{6}i}{12} & 0 & 0 & 0 & 0\\ \frac{\sqrt{6}i}{12} & \frac{\sqrt{6}i}{12} & 0 & \frac{\sqrt{6}i}{12} & 0 & 0 & 0 & 0\\ \frac{\sqrt{6}i}{12} & \frac{\sqrt{6}i}{12} & \frac{\sqrt{6}i}{12} & 0 & 0 & 0 & 0 & 0 \end{pmatrix}$
			$ \begin{pmatrix} 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{26}i}{52} & 0 & \frac{\sqrt{26}i}{26} \end{pmatrix} $
			$ \begin{bmatrix} 0 & 0 & 0 & 0 & \frac{3\sqrt{26}i}{52} & 0 & -\frac{\sqrt{26}i}{26} & 0 \\ 0 & 0 & 0 & \frac{3\sqrt{26}i}{52} & 0 & -\frac{\sqrt{26}i}{26} & 0 \end{bmatrix} $
			$\begin{bmatrix} 1 & 0 & 0 & 0 & 0 & \sqrt{26}i & 0 & 3\sqrt{26}i \end{bmatrix}$
	( T 1)		$\begin{bmatrix} 1 & 0 & 0 & 0 & -\sqrt{26}i & 0 & 3\sqrt{26}i & 0 \end{bmatrix}$
$\mathbb{U}_{28}$	$\mathbb{T}_{4,0}^{(u,T_g,1)}$	$B_1$	$ \begin{vmatrix} 0 & 0 & 0 & 0 & -\frac{26}{26} & 0 & -\frac{52}{52} & 0 \\ 0 & -\frac{3\sqrt{26}i}{52} & 0 & \frac{\sqrt{26}i}{26} & 0 & 0 & 0 \\ \frac{3\sqrt{26}i}{52} & 0 & \frac{\sqrt{26}i}{52} & 0 & 0 & 0 \end{vmatrix} $
			$\begin{bmatrix} 32 & 26i & 0 & 3\sqrt{26}i & 0 & 0 & 0 & 0 \end{bmatrix}$
			-1 $1$ $1$ $1$ $1$ $1$ $1$ $1$ $1$ $1$
			$\begin{array}{cccccccccccccccccccccccccccccccccccc$

Table 6

Table 6	I .		
symbol	type	cluster	form
			$\begin{pmatrix} 0 & 0 & 0 & 0 & \frac{\sqrt{26}i}{26} & -\frac{3\sqrt{26}i}{52} & 0 \end{pmatrix}$
			$\begin{bmatrix} 0 & 0 & 0 & 0 & -\frac{\sqrt{26}i}{26} & 0 & 0 & \frac{3\sqrt{26}i}{52} \\ 0 & 0 & 0 & \frac{3\sqrt{26}i}{26} & 0 & 0 & -\frac{\sqrt{26}i}{26} \end{bmatrix}$
			52 0 26 1
$\mathbb{U}_{29}$	$\mathbb{T}_{4,1}^{(u,T_g,1)}$	$B_1$	$\begin{array}{cccccccccccccccccccccccccccccccccccc$
€29	<sup>11</sup> 4,1	DI	$0  \frac{\sqrt{26}i}{26}  -\frac{3\sqrt{26}i}{52}  0  0  0$
			$-\frac{\sqrt{26}i}{26}$ 0 0 $\frac{3\sqrt{26}i}{52}$ 0 0 0
			$\begin{bmatrix} -\frac{\sqrt{26}i}{26} & 0 & 0 & \frac{3\sqrt{26}i}{52} & 0 & 0 & 0 & 0\\ \frac{3\sqrt{26}i}{52} & 0 & 0 & -\frac{\sqrt{26}i}{26} & 0 & 0 & 0 & 0\\ \frac{3\sqrt{26}i}{52} & \frac{3\sqrt{26}i}{52} & \frac{\sqrt{26}i}{52} & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$
			$\sqrt{26}i$ $\sqrt{26}i$ $\sqrt{26}i$
			$ \begin{pmatrix} 0 & 0 & 0 & 0 & 0 & \frac{1}{26} & -\frac{5}{52} \\ 0 & 0 & 0 & 0 & 0 & -\frac{3\sqrt{26}i}{52} & \frac{\sqrt{26}i}{26} \end{pmatrix} $
			$\sqrt{26}i$ $3\sqrt{26}i$
	$=(u,T_a,1)$	_	$ \begin{vmatrix} 0 & 0 & 0 & 0 & -\frac{\sqrt{26}}{26} & \frac{520}{52} & 0 & 0 \\ 0 & 0 & 0 & \frac{3\sqrt{26}i}{52} & -\frac{\sqrt{26}i}{26} & 0 & 0 \end{vmatrix} $
$\mathbb{U}_{30}$	$\mathbb{T}_{4,2}^{(u,T_g,1)}$	B <sub>1</sub>	$\sqrt{26}i$ $3\sqrt{26}i$ 0 0 0
			$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$
			$1  1  \sqrt{26}i  3\sqrt{26}i  0  0  0  0$
			$\left[\begin{array}{cccccccccccccccccccccccccccccccccccc$
			$ \begin{pmatrix} 52 & 26 & \\ 0 & 0 & 0 & 0 & -\frac{5i}{28} & \frac{2i}{7} & -\frac{3i}{28} \end{pmatrix} $
			$ \begin{bmatrix} 0 & 0 & 0 & 0 & -\frac{5i}{28} & 0 & -\frac{3i}{28} & \frac{2i}{7} \\ 0 & 0 & 0 & 0 & \frac{2i}{7} & -\frac{3i}{28} & 0 & -\frac{5i}{28} \end{bmatrix} $
	$m(u, E_{\alpha})$		$ \begin{bmatrix} 0 & 0 & 0 & 0 & -\frac{5i}{28} & 0 & -\frac{3i}{28} & \frac{2i}{7} \\ 0 & 0 & 0 & 0 & \frac{2i}{7} & -\frac{3i}{28} & 0 & -\frac{5i}{28} \\ 0 & 0 & 0 & 0 & -\frac{3i}{28} & \frac{2i}{7} & -\frac{5i}{28} & 0 \end{bmatrix} $
$\mathbb{U}_{31}$	$\mathbb{T}_{5,0}^{(u,E_u)}$	$B_1$	$ \begin{bmatrix} 0 & \frac{5i}{28} & -\frac{2i}{7} & \frac{3i}{28} & 0 & 0 & 0 \end{bmatrix} $
			$ \begin{bmatrix} \frac{5i}{28} & 0 & \frac{3i}{28} & -\frac{2i}{7} & 0 & 0 & 0 \end{bmatrix} $
			$\begin{bmatrix} 28 & 28 & 7 \\ -\frac{2i}{7} & \frac{3i}{28} & 0 & \frac{5i}{28} & 0 & 0 & 0 \end{bmatrix}$
			$\begin{array}{cccccccccccccccccccccccccccccccccccc$
			$\begin{bmatrix} 1 & 0 & 0 & 0 & 0 & -\frac{11\sqrt{3}i}{3} & -\frac{\sqrt{3}i}{3} & \frac{13\sqrt{3}i}{3} \end{bmatrix}$
			$ \begin{bmatrix} 0 & 0 & 0 & 0 & 0 & -\frac{11\sqrt{3}i}{84} & -\frac{\sqrt{3}i}{42} & \frac{13\sqrt{3}i}{84} \\ 0 & 0 & 0 & 0 & -\frac{11\sqrt{3}i}{84} & 0 & \frac{13\sqrt{3}i}{84} & -\frac{\sqrt{3}i}{42} \\ 0 & 0 & 0 & 0 & \sqrt{3}i & 13\sqrt{3}i & 0 & 11\sqrt{3}i \end{bmatrix} $
			$\begin{bmatrix} 0 & 0 & 0 & 0 & -\frac{11\sqrt{3}i}{84} & 0 & \frac{13\sqrt{3}i}{84} & -\frac{\sqrt{3}i}{42} \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{42} & \frac{13\sqrt{3}i}{84} & 0 & -\frac{11\sqrt{3}i}{84} \\ 0 & 0 & 0 & 0 & \frac{13\sqrt{3}i}{84} & -\frac{\sqrt{3}i}{42} & -\frac{11\sqrt{3}i}{84} & 0 \end{bmatrix}$
	( = )		$\begin{bmatrix} 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{42} & \frac{13\sqrt{3}i}{84} & 0 & -\frac{11\sqrt{3}i}{84} \\ 0 & 0 & 0 & 0 & \frac{13\sqrt{3}i}{84} & -\frac{\sqrt{3}i}{42} & -\frac{11\sqrt{3}i}{84} & 0 \end{bmatrix}$
$\mathbb{U}_{32}$	$\mathbb{T}_{5,1}^{(u,E_u)}$	$B_1$	$\begin{array}{cccccccccccccccccccccccccccccccccccc$
			$\begin{bmatrix} 0 & \frac{11\sqrt{3}i}{84} & \frac{3\sqrt{3}i}{42} & -\frac{13\sqrt{3}i}{84} & 0 & 0 & 0 & 0 \\ \frac{11\sqrt{3}i}{84} & 0 & -\frac{13\sqrt{3}i}{84} & \frac{\sqrt{3}i}{42} & 0 & 0 & 0 & 0 \end{bmatrix}$
			$\begin{bmatrix} \frac{-84}{84} & 0 & -\frac{84}{84} & \frac{42}{42} & 0 & 0 & 0 \\ \frac{\sqrt{3}i}{42} & -\frac{13\sqrt{3}i}{84} & 0 & \frac{11\sqrt{3}i}{84} & 0 & 0 & 0 \end{bmatrix}$
			$\begin{bmatrix} \frac{1}{42} & -\frac{84}{84} & 0 & -\frac{84}{84} \\ \frac{1}{84} & \frac{1}{84} & 0 & 0 \end{bmatrix}$
			$-\frac{13\sqrt{3}i}{84}$ $\frac{\sqrt{3}i}{42}$ $\frac{11\sqrt{3}i}{84}$ 0 0 0 0 0 /

Table 7: Polar harmonics.

No.	symbol	rank	irrep.	mul.	comp.	form
1	$\mathbb{Q}_0^{(A_g)}$	0	$A_g$	_	_	1
2	$\mathbb{Q}_{1,0}^{(T_u)}$	1	$T_u$	_	0	x
3	$\mathbb{Q}_{1,1}^{(I_u)}$	1	$T_u$	_	1	y
4	$\mathbb{Q}_{1,2}^{(T_u)}$	1	$T_u$	_	2	z
5	$\mathbb{Q}_{2,0}^{(E_g)}$	2	$E_g$	_	0	$-\frac{x^2}{2} - \frac{y^2}{2} + z^2$
6	$\mathbb{Q}_{2,1}^{(E_g)}$	2	$E_g$	_	1	$\frac{\sqrt{3}(x^2-y^2)}{2}$
7	$\mathbb{Q}_{2,0}^{(T_g)}$	2	$T_g$	_	0	$\sqrt{3}yz$
8	$\mathbb{Q}_{2,1}^{(T_g)}$	2	$T_g$	_	1	$\sqrt{3}xz$
9	$\mathbb{Q}_{2,2}^{(T_g)}$	2	$T_g$	_	2	$\sqrt{3}xy$
10	$\mathbb{Q}_3^{(A_u)}$	3	$A_u$	_	_	$\sqrt{15}xyz$
11	$\mathbb{Q}_{3,0}^{(T_u,1)}$	3	$T_u$	1	0	$\frac{x(2x^2-3y^2-3z^2)}{2}$
12	$\mathbb{Q}_{3,1}^{(T_u,1)}$	3	$T_u$	1	1	$-\frac{x(2x^2-3y^2-3z^2)}{2(3x^2-2y^2+3z^2)}$
13	$\mathbb{Q}_{3,2}^{(T_u,1)}$	3	$T_u$	1	2	$-\frac{z(3x^2+3y^2-2z^2)}{2}$
14	$\mathbb{Q}_{4,0}^{(T_g,1)}$	4	$T_g$	1	0	$\frac{\sqrt{35}yz(y-z)(y+z)}{2}$
15	$\mathbb{Q}_{4,1}^{(T_g,1)}$	4	$T_g$	1	1	$-\frac{\sqrt{35}xz(x-z)(x+z)}{2}$
16	$\mathbb{Q}_{4,2}^{(T_g,1)}$	4	$T_g$	1	2	$\frac{\sqrt{35}xy(x-y)(x+y)}{2}$
17	$\mathbb{Q}_{5,0}^{(E_u)}$	5	$E_u$	_	0	$\frac{3\sqrt{35}xyz(x^2-y^2)}{2}$
18	$\mathbb{Q}_{5,1}^{(E_u)}$	5	$E_u$	_	1	$\frac{\sqrt{105}xyz(x^2+y^2-2z^2)}{2}$

Table 8: Axial harmonics.

No.	symbol	rank	irrep.	mul.	comp.	form
1	$\mathbb{G}_0^{(A_u)}$	0	$A_u$	_	_	1

Table 8

No.	symbol	rank	irrep.	mul.	comp.	form
2	$\mathbb{G}_{1,0}^{(T_g)}$	1	$T_g$	_	0	X
3	$\mathbb{G}_{1,1}^{(T_g)}$	1	$T_g$	_	1	Y
4	$\mathbb{G}_{1,2}^{(T_g)}$	1	$T_g$	_	2	Z
5	$\mathbb{G}_{2,0}^{(E_u)}$	2	$E_u$	_	0	$-\frac{X^2}{2} - \frac{Y^2}{2} + Z^2$
6	$\mathbb{G}_{2,1}^{(E_u)}$	2	$E_u$	_	1	$\frac{\sqrt[2]{3}(X^2-Y^2)}{2}$
7	$\mathbb{G}_{2,0}^{(T_u)}$	2	$T_u$	_	0	$\sqrt{3}YZ$
8	$\mathbb{G}_{2,1}^{(T_u)}$	2	$T_u$	_	1	$\sqrt{3}XZ$
9	$\mathbb{G}_{2,2}^{(T_u)}$	2	$T_u$	_	2	$\sqrt{3}XY$
10	$\mathbb{G}_{3,0}^{(T_g,1)}$	3	$T_g$	1	0	$\frac{X(2X^2-3Y^2-3Z^2)}{2}$
11	$\mathbb{G}_{3,1}^{(T_g,1)}$	3	$T_g$	1	1	$-\frac{Y(3X^2-2Y^2+3Z^2)}{Z(3X^2+3Y^2-2Z^2)}$
12	$\mathbb{G}_{3,2}^{(T_g,1)}$	3	$T_g$	1	2	$-\frac{Z(3X^2+3Y^2-2Z^2)}{2}$
13	$\mathbb{G}_{3,0}^{(T_g,2)}$	3	$T_g$	2	0	$\frac{\sqrt{15}X(Y-Z)(Y+Z)}{2}$
14	$\mathbb{G}_{3,1}^{(T_g,2)}$	3	$T_g$	2	1	$-\frac{\sqrt{15}Y(X-Z)(X+Z)}{2}$
15	$\mathbb{G}_{3,2}^{(T_g,2)}$	3	$T_g$	2	2	$\frac{\sqrt{15}Z(X-Y)(X+Y)}{2}$

 $\bullet$  Group info.: Generator = 2001, 2010,  $3^+_{\ 111},\ -1$ 

Table 9: Conjugacy class.

rep. SO	symmetry operations
1	1
2001	$2_{001}, 2_{100}, 2_{010}$
3 <sup>+</sup> <sub>111</sub>	$3_{111}^+, 3_{1-1-1}^+, 3_{-11-1}^+, 3_{-1-11}^+$
3-111	$3^{-}_{111}, \ 3^{-}_{1-1-1}, \ 3^{-}_{-11-1}, \ 3^{-}_{-1-11}$
-1	-1
m <sub>001</sub>	$m_{001}, m_{100}, m_{010}$
$-3^{+}_{111}$	$-3^{+}_{111}$ , $-3^{+}_{1-1-1}$ , $-3^{+}_{-11-1}$ , $-3^{+}_{-1-11}$

Table 9

rep. SO	symmetry operations
$-3^{-}_{111}$	$\begin{bmatrix} -3^{111}, & -3^{1-1-1}, & -3^{-11-1}, & -3^{-1-11} \end{bmatrix}$

Table 10: Symmetry operations.

No.	SO	No.	SO	No.	SO	No.	SO	No.	SO
1	1	2	$2_{001}$	3	$2_{100}$	4	$2_{010}$	5	$3^{+}_{111}$
6	$3^{+}_{1-1-1}$	7	$3^{+}_{-11-1}$	8	$3^{+}_{-1-11}$	9	$3^{-}_{\ 111}$	10	$3^{-}_{1-1-1}$
11	$3^{-}_{\ -11-1}$	12	$3^{-}_{-1-11}$	13	-1	14	$m_{001}$	15	$m_{100}$
16	$m_{010}$	17	$-3^{+}_{111}$	18	$-3^{+}_{1-1-1}$	19	$-3^{+}_{-11-1}$	20	$-3^{+}_{-1-11}$
21	$-3^{-}_{111}$	22	$-3^{-}_{1-1-1}$	23	$-3^{-}_{-11-1}$	24	$-3^{-}_{-1-11}$		

Table 11: Character table.

	1	$2_{001}$	$3^{+}_{111}$	$3^{-}_{111}$	-1	$m_{001}$	$-3^{+}_{111}$	$-3^{-}_{111}$
$A_g$	1	1	1	1	1	1	1	1
$E_g^{(a)}$	1	1	$\omega^*$	$\omega$	1	1	$\omega^*$	$\omega$
$E_g^{(b)}$	1	1	$\omega$	$\omega^*$	1	1	$\omega$	$\omega^*$
$T_g$	3	-1	0	0	3	-1	0	0
$A_u$	1	1	1	1	-1	-1	-1	-1
$E_u^{(a)}$	1	1	$\omega^*$	$\omega$	-1	-1	$-\omega^*$	$-\omega$
$E_u^{(b)}$	1	1	$\omega$	$\omega^*$	-1	-1	$-\omega$	$-\omega^*$
$T_u$	3	-1	0	0	-3	1	0	0

Table 12: Parity conversion.

$\leftrightarrow$	$\leftrightarrow$	$\leftrightarrow$	$\leftrightarrow$	$\leftrightarrow$
$A_g (A_u)$	$E_g^{(a)} (E_u^{(a)})$	$E_g^{(b)} (E_u^{(b)})$	$T_g (T_u)$	$A_u (A_g)$
$E_u^{(a)} (E_g^{(a)})$	$E_u^{(b)} (E_g^{(b)})$	$T_u (T_g)$		

Table 13: Symmetric product,  $[\Gamma \otimes \Gamma']_+$ .

	$A_g$	$E_g^{(a)}$	$E_g^{(b)}$	$T_g$	$A_u$	$E_u^{(a)}$	$E_u^{(b)}$	$T_u$
$A_g$	$A_g$	$E_g^{(a)}$ $E_g^{(b)}$	$E_g^{(b)}$	$T_g$	$A_u$	$E_u^{(a)}$	$E_u^{(b)}$	$T_u$
$E_g^{(a)}$		$E_g^{(b)}$	$A_g$	$T_g$	$E_u^{(a)} \\ E_u^{(b)}$	$E_u^{(b)}$	$A_u$	$T_u$
$E_g^{(b)}$			$E_g^{(a)}$	$T_g$	$E_u^{(b)}$	$A_u$	$E_u^{(a)}$	$T_u$
$E_g^{(a)}$ $E_g^{(b)}$ $T_g$				$A_g + E_g^{(a)} + E_g^{(b)} + T_g$	$T_u$	$T_u$	$T_u$	$A_u + E_u^{(a)} + E_u^{(b)} + 2T_u$
$E_u^{(a)}$ $E_u^{(b)}$					$A_g$	$E_g^{(a)}$ $E_g^{(b)}$	$E_g^{(b)}$	$T_g$
$E_u^{(a)}$						$E_g^{(b)}$	$A_g$	$T_g$
$E_u^{(b)}$							$E_g^{(a)}$	$T_g$
$T_u$								$A_g + E_g^{(a)} + E_g^{(b)} + T_g$

Table 14: Anti-symmetric product,  $[\Gamma \otimes \Gamma]_-$ .

_	$A_a$	$E_a^{(a)}$	$E_a^{(b)}$	$T_a$	$A_u$	$E_u^{(a)}$	$E_u^{(b)}$	$T_u$
_	_			$T_g$	_	_	_	$T_g$

Table 15: Virtual-cluster sites.

No.	position	No.	position	No.	position	No.	position
1	$\begin{pmatrix} 3 & 2 & 1 \end{pmatrix}$	2	$\begin{pmatrix} -3 & -2 & 1 \end{pmatrix}$	3	$\begin{pmatrix} 3 & -2 & -1 \end{pmatrix}$	4	$\begin{pmatrix} -3 & 2 & -1 \end{pmatrix}$
5	$\begin{pmatrix} 1 & 3 & 2 \end{pmatrix}$	6	$\begin{pmatrix} -1 & -3 & 2 \end{pmatrix}$	7	$\begin{pmatrix} 1 & -3 & -2 \end{pmatrix}$	8	$\begin{pmatrix} -1 & 3 & -2 \end{pmatrix}$
9	$\begin{pmatrix} 2 & 1 & 3 \end{pmatrix}$	10	$\begin{pmatrix} -2 & 1 & -3 \end{pmatrix}$	11	$\begin{pmatrix} -2 & -1 & 3 \end{pmatrix}$	12	$\begin{pmatrix} 2 & -1 & -3 \end{pmatrix}$
13	$\begin{pmatrix} -3 & -2 & -1 \end{pmatrix}$	14	$\begin{pmatrix} 3 & 2 & -1 \end{pmatrix}$	15	$\begin{pmatrix} -3 & 2 & 1 \end{pmatrix}$	16	$\begin{pmatrix} 3 & -2 & 1 \end{pmatrix}$
17	$\begin{pmatrix} -1 & -3 & -2 \end{pmatrix}$	18	$\begin{pmatrix} 1 & 3 & -2 \end{pmatrix}$	19	$\begin{pmatrix} -1 & 3 & 2 \end{pmatrix}$	20	$\begin{pmatrix} 1 & -3 & 2 \end{pmatrix}$
21	$\begin{pmatrix} -2 & -1 & -3 \end{pmatrix}$	22	$\begin{pmatrix} 2 & -1 & 3 \end{pmatrix}$	23	$\begin{pmatrix} 2 & 1 & -3 \end{pmatrix}$	24	$\begin{pmatrix} -2 & 1 & 3 \end{pmatrix}$

Table 16: Virtual-cluster basis.

symbol	1	2	3	4	5	6	7	8	9	10
$\mathbb{Q}_0^{(A_g)}$	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$
	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$
	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$						
$\mathbb{Q}_{1,0}^{(T_u)}$	$\frac{3\sqrt{7}}{28}$	$-\frac{3\sqrt{7}}{28}$ $\frac{\sqrt{7}}{14}$	$\frac{3\sqrt{7}}{28}$	$-\frac{3\sqrt{7}}{28}$ $\frac{3\sqrt{7}}{28}$	$\frac{\sqrt{7}}{28}$	$-\frac{\sqrt{7}}{28}$	$\frac{\sqrt{7}}{28}$	$-\frac{\sqrt{7}}{28}$	$\frac{\sqrt{7}}{14}$	$-\frac{\sqrt{7}}{14}$
	$-\frac{\sqrt{7}}{14}$	$\frac{\sqrt{7}}{14}$	$-\frac{3\sqrt{7}}{28}$	$\frac{3\sqrt{7}}{28}$	$-\frac{3\sqrt{7}}{28}$	$\frac{3\sqrt{7}}{28}$	$-\frac{\sqrt{7}}{28}$	$\frac{\sqrt{7}}{28}$	$-\frac{\sqrt{7}}{28}$	$\frac{\sqrt{7}}{28}$
	$-\frac{\sqrt{7}}{14}$	$\frac{\sqrt{7}}{14}$	$\frac{\sqrt{7}}{14}$	$-\frac{\sqrt{7}}{14}$						
$\mathbb{Q}_{1,1}^{(T_u)}$	$\frac{\sqrt{7}}{14}$	$-\frac{\sqrt{7}}{14}$	$-\frac{\sqrt{7}}{14}$	$\frac{\sqrt{7}}{14}$	$\frac{3\sqrt{7}}{28}$	$-\frac{3\sqrt{7}}{28}$	$-\frac{3\sqrt{7}}{28}$	$\frac{3\sqrt{7}}{28}$	$\frac{\sqrt{7}}{28}$	$\frac{\sqrt{7}}{28}$
	$-\frac{\sqrt{7}}{28}$ $-\frac{\sqrt{7}}{28}$	$-\frac{\sqrt{7}}{28}$	$-\frac{\sqrt{7}}{14}$	$\frac{\sqrt{7}}{14}$	$\frac{\sqrt{7}}{14}$	$-\frac{\sqrt{7}}{14}$	$-\frac{3\sqrt{7}}{28}$	$\frac{3\sqrt{7}}{28}$	$\frac{3\sqrt{7}}{28}$	$-\frac{3\sqrt{7}}{28}$
	$-\frac{\sqrt{7}}{28}$	$-\frac{\sqrt{7}}{28}$	$\frac{\sqrt{7}}{28}$	$\frac{\sqrt{7}}{28}$						
$\mathbb{Q}_{1,2}^{(T_u)}$	$\frac{\sqrt{7}}{28}$	$-\frac{\sqrt{7}}{28}$ $-\frac{\sqrt{7}}{28}$ $\frac{\sqrt{7}}{28}$	$-\frac{\sqrt{7}}{28}$ $-\frac{\sqrt{7}}{28}$	$-\frac{\sqrt{7}}{28}$	$\frac{\sqrt{7}}{14}$	$\frac{\sqrt{7}}{14}$	$-\frac{\sqrt{7}}{14}$	$-\frac{\sqrt{7}}{14}$	$\frac{3\sqrt{7}}{28}$	$-\frac{3\sqrt{7}}{28}$ $\frac{\sqrt{7}}{14}$
	$\frac{3\sqrt{7}}{28}$	$-\frac{3\sqrt{7}}{28}$	$-\frac{\sqrt{7}}{28}$	$-\frac{\sqrt{7}}{28}$	$\frac{\sqrt{7}}{28}$	$\frac{\sqrt{7}}{28}$	$-\frac{\sqrt{7}}{14}$	$-\frac{\sqrt{7}}{14}$	$\frac{\sqrt{7}}{14}$	$\frac{\sqrt{7}}{14}$
	$-\frac{3\sqrt{7}}{28}$	$\frac{3\sqrt{7}}{28}$	$-\frac{3\sqrt{7}}{28}$	$\frac{3\sqrt{7}}{28}$						
$\mathbb{Q}_{2,0}^{(E_g)}$	$-\frac{11\sqrt{3}}{84}$	$-\frac{11\sqrt{3}}{84}$	$-\frac{11\sqrt{3}}{84}$	$-\frac{11\sqrt{3}}{84}$	$-\frac{\sqrt{3}}{42}$	$-\frac{\sqrt{3}}{42}$	$-\frac{\sqrt{3}}{42}$	$-\frac{\sqrt{3}}{42}$	$\frac{13\sqrt{3}}{84}$	$\frac{13\sqrt{3}}{84}$
	$\frac{13\sqrt{3}}{84}$	$\frac{13\sqrt{3}}{84}$	$-\frac{11\sqrt{3}}{84}$	$-\frac{11\sqrt{3}}{84}$	$-\frac{11\sqrt{3}}{84}$	$-\frac{11\sqrt{3}}{84}$	$-\frac{\sqrt{3}}{42}$	$-\frac{\sqrt{3}}{42}$	$-\frac{\sqrt{3}}{42}$	$-\frac{\sqrt{3}}{42}$
	$\frac{13\sqrt{3}}{84}$	$\frac{13\sqrt{3}}{84}$	$\frac{13\sqrt{3}}{84}$	$\frac{13\sqrt{3}}{84}$						
$\mathbb{Q}_{2,1}^{(E_g)}$	$\frac{5}{28}$	$\frac{5}{28}$	$\frac{5}{28}$	$\frac{5}{28}$	$-\frac{2}{7}$	$-\frac{2}{7}$	$-\frac{2}{7}$	$-\frac{2}{7}$	$\frac{3}{28}$	$\frac{3}{28}$

symbol	1	2	3	4	5	6	7	8	9	10
	$\frac{3}{28}$	$\frac{3}{28}$	$\frac{5}{28}$	$\frac{5}{28}$	$\frac{5}{28}$	$\frac{5}{28}$	$-\frac{2}{7}$	$-\frac{2}{7}$	$-\frac{2}{7}$	$-\frac{2}{7}$
	$\frac{3}{28}$	$\frac{3}{28}$	$\frac{3}{28}$	$\frac{3}{28}$						
$\mathbb{Q}_{2,0}^{(T_g)}$	$\frac{\sqrt{2}}{14}$	$-\frac{\sqrt{2}}{14}$	$\frac{\frac{3}{28}}{\frac{\sqrt{2}}{14}}$	$-\frac{\sqrt{2}}{14}$	$\frac{3\sqrt{2}}{14}$	$-\frac{3\sqrt{2}}{14}$	$\frac{3\sqrt{2}}{14}$	$-\frac{3\sqrt{2}}{14}$	$\frac{3\sqrt{2}}{28}$	$-\frac{3\sqrt{2}}{28}$
	$-\frac{3\sqrt{2}}{28}$	$\frac{3\sqrt{2}}{28}$	$\frac{\sqrt{2}}{14}$	$-\frac{\sqrt{2}}{14}$	$\frac{\sqrt{2}}{14}$	$-\frac{\sqrt{2}}{14}$	$\frac{3\sqrt{2}}{14}$	$-\frac{3\sqrt{2}}{14}$	$\frac{3\sqrt{2}}{14}$	$-\frac{3\sqrt{2}}{14}$
	$\frac{3\sqrt{2}}{28}$	$-\frac{3\sqrt{2}}{28}$	$-\frac{3\sqrt{2}}{28}$	$\frac{3\sqrt{2}}{28}$						
$\mathbb{Q}_{2,1}^{(T_g)}$	$\frac{3\sqrt{2}}{28}$	$-\frac{3\sqrt{2}}{28}$	$-\frac{3\sqrt{2}}{28}$	$\frac{3\sqrt{2}}{28}$	$\frac{\sqrt{2}}{14}$	$-\frac{\sqrt{2}}{14}$	$-\frac{\sqrt{2}}{14}$	$\frac{\sqrt{2}}{14}$	$\frac{3\sqrt{2}}{14}$	$\frac{3\sqrt{2}}{14}$
	$-\frac{3\sqrt{2}}{14}$	$-\frac{3\sqrt{2}}{14}$	$\frac{3\sqrt{2}}{28}$	$-\frac{3\sqrt{2}}{28}$	$-\frac{3\sqrt{2}}{28}$	$\frac{3\sqrt{2}}{28}$	$\frac{\sqrt{2}}{14}$	$-\frac{\sqrt{2}}{14}$	$-\frac{\sqrt{2}}{14}$	$\frac{\sqrt{2}}{14}$
	$\frac{3\sqrt{2}}{14}$	$\frac{3\sqrt{2}}{14}$	$-\frac{3\sqrt{2}}{14}$	$-\frac{3\sqrt{2}}{14}$						
$\mathbb{Q}_{2,2}^{(T_g)}$	$\frac{3\sqrt{2}}{14}$	$\frac{3\sqrt{2}}{14}$	$-\frac{3\sqrt{2}}{14}$	$-\frac{3\sqrt{2}}{14}$	$\frac{3\sqrt{2}}{28}$	$\frac{3\sqrt{2}}{28}$	$-\frac{3\sqrt{2}}{28}$	$-\frac{3\sqrt{2}}{28}$	$\frac{\sqrt{2}}{14}$	$-\frac{\sqrt{2}}{14}$
	$\frac{\sqrt{2}}{14}$	$-\frac{\sqrt{2}}{14}$	$\frac{3\sqrt{2}}{14}$	$\frac{3\sqrt{2}}{14}$	$-\frac{3\sqrt{2}}{14}$	$-\frac{3\sqrt{2}}{14}$	$\frac{3\sqrt{2}}{28}$	$\frac{3\sqrt{2}}{28}$	$-\frac{3\sqrt{2}}{28}$	$-\frac{3\sqrt{2}}{28}$
	$\frac{\sqrt{2}}{14}$	$-\frac{\sqrt{2}}{14}$	$\frac{\sqrt{2}}{14}$	$-\frac{\sqrt{2}}{14}$						
$\mathbb{Q}_3^{(A_u)}$	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$
	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$
	$-\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$						
$\mathbb{Q}_{3,0}^{(T_u,1)}$	$\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$
	$\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$
	$\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$						
$\mathbb{Q}_{3,1}^{(T_u,1)}$	$-\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$
	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$
	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$						
$\mathbb{Q}_{3,2}^{(T_u,1)}$	$-\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$
	$\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$
	$-\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$						
$\mathbb{Q}_{3,0}^{(T_u,2)}$	$\frac{\sqrt{21}}{84}$	$-\frac{\sqrt{21}}{84}$	$\frac{\sqrt{21}}{84}$	$-\frac{\sqrt{21}}{84}$	$\frac{5\sqrt{21}}{84}$	$-\frac{5\sqrt{21}}{84}$	$\frac{5\sqrt{21}}{84}$	$-\frac{5\sqrt{21}}{84}$	$-\frac{\sqrt{21}}{21}$	$\frac{\sqrt{21}}{21}$
	$\frac{\sqrt{21}}{21}$	$-\frac{\sqrt{21}}{21}$	$-\frac{\sqrt{21}}{84}$	$\frac{\sqrt{21}}{84}$	$-\frac{\sqrt{21}}{84}$	$\frac{\sqrt{21}}{84}$	$-\frac{5\sqrt{21}}{84}$	$\frac{5\sqrt{21}}{84}$	$-\frac{5\sqrt{21}}{84}$	$\frac{5\sqrt{21}}{84}$
	$\frac{\sqrt{21}}{21}$	$-\frac{\sqrt{21}}{21}$	$-\frac{\sqrt{21}}{21}$	$\frac{\sqrt{21}}{21}$						
$\mathbb{Q}_{3,1}^{(T_u,2)}$	$-\frac{\sqrt{21}}{21}$	$\frac{\sqrt{21}}{21}$	$\frac{\sqrt{21}}{21}$	$-\frac{\sqrt{21}}{21}$	$\frac{\sqrt{21}}{84}$	$-\frac{\sqrt{21}}{84}$	$-\frac{\sqrt{21}}{84}$	$\frac{\sqrt{21}}{84}$	$\frac{5\sqrt{21}}{84}$	$\frac{5\sqrt{21}}{84}$
	$-\frac{5\sqrt{21}}{84}$	$-\frac{5\sqrt{21}}{84}$	$\frac{\sqrt{21}}{21}$	$-\frac{\sqrt{21}}{21}$	$-\frac{\sqrt{21}}{21}$	$\frac{\sqrt{21}}{21}$	$-\frac{\sqrt{21}}{84}$	$\frac{\sqrt{21}}{84}$	$\frac{\sqrt{21}}{84}$	$-\frac{\sqrt{21}}{84}$
	$-\frac{5\sqrt{21}}{84}$	$-\frac{5\sqrt{21}}{84}$	$\frac{5\sqrt{21}}{84}$	$\frac{5\sqrt{21}}{84}$						

Table 16

symbol	1	2	3	4	5	6	7	8	9	10
$\mathbb{Q}_{3,2}^{(T_u,2)}$	$\frac{5\sqrt{21}}{84}$	$\frac{5\sqrt{21}}{84}$	$-\frac{5\sqrt{21}}{84}$	$-\frac{5\sqrt{21}}{84}$	$-\frac{\sqrt{21}}{21}$	$-\frac{\sqrt{21}}{21}$	$\frac{\sqrt{21}}{21}$	$\frac{\sqrt{21}}{21}$	$\frac{\sqrt{21}}{84}$	$-\frac{\sqrt{21}}{84}$
	$\frac{\sqrt{21}}{84}$	$-\frac{\sqrt{21}}{84}$	$-\frac{5\sqrt{21}}{84}$	$-\frac{5\sqrt{21}}{84}$	$\frac{5\sqrt{21}}{84}$	$\frac{5\sqrt{21}}{84}$	$\frac{\sqrt{21}}{21}$	$\frac{\sqrt{21}}{21}$	$-\frac{\sqrt{21}}{21}$	$-\frac{\sqrt{21}}{21}$
	$-\frac{\sqrt{21}}{84}$	$\frac{\sqrt{21}}{84}$	$-\frac{\sqrt{21}}{84}$	$\frac{\sqrt{21}}{84}$						
$\mathbb{Q}_{4,0}^{(T_g,1)}$	$\frac{9\sqrt{829}}{23212}$	$-\frac{9\sqrt{829}}{23212}$	$\frac{9\sqrt{829}}{23212}$	$-\frac{9\sqrt{829}}{23212}$	$\frac{125\sqrt{829}}{23212}$	$-\frac{125\sqrt{829}}{23212}$	$\frac{125\sqrt{829}}{23212}$	$-\frac{125\sqrt{829}}{23212}$	$-\frac{64\sqrt{829}}{5803}$	$\frac{64\sqrt{829}}{5803}$
	$\frac{64\sqrt{829}}{5803}$	$-\frac{64\sqrt{829}}{5803}$	$\frac{9\sqrt{829}}{23212}$	$-\frac{9\sqrt{829}}{23212}$	$\frac{9\sqrt{829}}{23212}$	$-\frac{9\sqrt{829}}{23212}$	$\frac{125\sqrt{829}}{23212}$	$-\frac{125\sqrt{829}}{23212}$	$\frac{125\sqrt{829}}{23212}$	$-\frac{125\sqrt{829}}{23212}$
	$-\frac{64\sqrt{829}}{5803}$	$\frac{64\sqrt{829}}{5803}$	$\frac{64\sqrt{829}}{5803}$	$-\frac{64\sqrt{829}}{5803}$						
$\mathbb{Q}_{4,1}^{(T_g,1)}$	$-\frac{64\sqrt{829}}{5803}$	$\frac{64\sqrt{829}}{5803}$	$\frac{64\sqrt{829}}{5803}$	$-\frac{64\sqrt{829}}{5803}$	$\frac{9\sqrt{829}}{23212}$	$-\frac{9\sqrt{829}}{23212}$	$-\frac{9\sqrt{829}}{23212}$	$\frac{9\sqrt{829}}{23212}$	$\frac{125\sqrt{829}}{23212}$	$\frac{125\sqrt{829}}{23212}$
	$-\frac{125\sqrt{829}}{23212}$	$-\frac{125\sqrt{829}}{23212}$	$-\frac{64\sqrt{829}}{5803}$	$\frac{64\sqrt{829}}{5803}$	$\frac{64\sqrt{829}}{5803}$	$-\frac{64\sqrt{829}}{5803}$	$\frac{9\sqrt{829}}{23212}$	$-\frac{9\sqrt{829}}{23212}$	$-\frac{9\sqrt{829}}{23212}$	$\frac{9\sqrt{829}}{23212}$
	$\frac{125\sqrt{829}}{23212}$	$\frac{125\sqrt{829}}{23212}$	$-\frac{125\sqrt{829}}{23212}$	$-\frac{125\sqrt{829}}{23212}$						
$\mathbb{Q}_{4,2}^{(T_g,1)}$	$\frac{125\sqrt{829}}{23212}$	$\frac{125\sqrt{829}}{23212}$	$-\frac{125\sqrt{829}}{23212}$	$-\frac{125\sqrt{829}}{23212}$	$-\frac{64\sqrt{829}}{5803}$	$-\frac{64\sqrt{829}}{5803}$	$\frac{64\sqrt{829}}{5803}$	$\frac{64\sqrt{829}}{5803}$	$\frac{9\sqrt{829}}{23212}$	$-\frac{9\sqrt{829}}{23212}$
	$\frac{9\sqrt{829}}{23212}$	$-\frac{9\sqrt{829}}{23212}$	$\frac{125\sqrt{829}}{23212}$	$\frac{125\sqrt{829}}{23212}$	$-\frac{125\sqrt{829}}{23212}$	$-\frac{125\sqrt{829}}{23212}$	$-\frac{64\sqrt{829}}{5803}$	$-\frac{64\sqrt{829}}{5803}$	$\frac{64\sqrt{829}}{5803}$	$\frac{64\sqrt{829}}{5803}$
	$\frac{9\sqrt{829}}{23212}$	$-\frac{9\sqrt{829}}{23212}$	$\frac{9\sqrt{829}}{23212}$	$-\frac{9\sqrt{829}}{23212}$						
$\mathbb{Q}_{4,0}^{(T_g,2)}$	$\frac{39\sqrt{829}}{3316}$	$-\frac{39\sqrt{829}}{3316}$	$\frac{39\sqrt{829}}{3316}$	$-\frac{39\sqrt{829}}{3316}$	$-\frac{11\sqrt{829}}{3316}$	$\frac{11\sqrt{829}}{3316}$	$-\frac{11\sqrt{829}}{3316}$	$\frac{11\sqrt{829}}{3316}$	$-\frac{\sqrt{829}}{829}$	$\frac{\sqrt{829}}{829}$
	$\frac{\sqrt{829}}{829}$	$-\frac{\sqrt{829}}{829}$	$\frac{39\sqrt{829}}{3316}$	$-\frac{39\sqrt{829}}{3316}$	$\frac{39\sqrt{829}}{3316}$	$-\frac{39\sqrt{829}}{3316}$	$-\frac{11\sqrt{829}}{3316}$	$\frac{11\sqrt{829}}{3316}$	$-\frac{11\sqrt{829}}{3316}$	$\frac{11\sqrt{829}}{3316}$
	$-\frac{\sqrt{829}}{829}$	$\frac{\sqrt{829}}{829}$	$\frac{\sqrt{829}}{829}$	$-\frac{\sqrt{829}}{829}$						
$\mathbb{Q}_{4,1}^{(T_g,2)}$	$-\frac{\sqrt{829}}{829}$	$\frac{\sqrt{829}}{829}$	$\frac{\sqrt{829}}{829}$	$-\frac{\sqrt{829}}{829}$	$\frac{39\sqrt{829}}{3316}$	$-\frac{39\sqrt{829}}{3316}$	$-\frac{39\sqrt{829}}{3316}$	$\frac{39\sqrt{829}}{3316}$	$-\frac{11\sqrt{829}}{3316}$	$-\frac{11\sqrt{829}}{3316}$
	$\frac{11\sqrt{829}}{3316}$	$\frac{11\sqrt{829}}{3316}$	$-\frac{\sqrt{829}}{829}$	$\frac{\sqrt{829}}{829}$	$\frac{\sqrt{829}}{829}$	$-\frac{\sqrt{829}}{829}$	$\frac{39\sqrt{829}}{3316}$	$-\frac{39\sqrt{829}}{3316}$	$-\frac{39\sqrt{829}}{3316}$	$\frac{39\sqrt{829}}{3316}$
(T. a)	$-\frac{11\sqrt{829}}{3316}$	$-\frac{11\sqrt{829}}{3316}$	$\frac{11\sqrt{829}}{3316}$	$\frac{11\sqrt{829}}{3316}$						
$\mathbb{Q}_{4,2}^{(T_g,2)}$	$-\frac{11\sqrt{829}}{3316}$	$-\frac{11\sqrt{829}}{3316}$	$\frac{11\sqrt{829}}{3316}$	$\frac{11\sqrt{829}}{3316}$	$-\frac{\sqrt{829}}{829}$	$-\frac{\sqrt{829}}{829}$	$\frac{\sqrt{829}}{829}$	$\frac{\sqrt{829}}{829}$	$\frac{39\sqrt{829}}{3316}$	$-\frac{39\sqrt{829}}{3316}$
	$\frac{39\sqrt{829}}{3316}$	$-\frac{39\sqrt{829}}{3316}$	$-\frac{11\sqrt{829}}{3316}$	$-\frac{11\sqrt{829}}{3316}$	$\frac{11\sqrt{829}}{3316}$	$\frac{11\sqrt{829}}{3316}$	$-\frac{\sqrt{829}}{829}$	$-\frac{\sqrt{829}}{829}$	$\frac{\sqrt{829}}{829}$	$\frac{\sqrt{829}}{829}$
	$\frac{39\sqrt{829}}{3316}$	$-\frac{39\sqrt{829}}{3316}$	$\frac{39\sqrt{829}}{3316}$	$-\frac{39\sqrt{829}}{3316}$						
$\mathbb{Q}_{5,0}^{(E_{u})}$	$\frac{5}{28}$	$\frac{5}{28}$	$\frac{5}{28}$	$\frac{5}{28}$	$-\frac{2}{7}$	$-\frac{2}{7}$	$-\frac{2}{7}$	$-\frac{2}{7}$	$\frac{3}{28}$	$\frac{3}{28}$
	$\frac{3}{28}$	$\frac{3}{28}$	$-\frac{5}{28}$	$-\frac{5}{28}$	$-\frac{5}{28}$	$-\frac{5}{28}$	$\frac{2}{7}$	$\frac{2}{7}$	$\frac{2}{7}$	$\frac{2}{7}$
	$-\frac{3}{28}$	$-\frac{3}{28}$	$-\frac{3}{28}$	$-\frac{3}{28}$						
$\mathbb{Q}_{5,1}^{(E_u)}$	$\frac{11\sqrt{3}}{84}$	$\frac{11\sqrt{3}}{84}$	$\frac{11\sqrt{3}}{84}$	$\frac{11\sqrt{3}}{84}$	$\frac{\sqrt{3}}{42}$	$\frac{\sqrt{3}}{42}$	$\frac{\sqrt{3}}{42}$	$\frac{\sqrt{3}}{42}$	$-\frac{13\sqrt{3}}{84}$	$-\frac{13\sqrt{3}}{84}$
	$-\frac{13\sqrt{3}}{84}$	$-\frac{13\sqrt{3}}{84}$	$-\frac{11\sqrt{3}}{84}$	$-\frac{11\sqrt{3}}{84}$	$-\frac{11\sqrt{3}}{84}$	$-\frac{11\sqrt{3}}{84}$	$-\frac{\sqrt{3}}{42}$	$-\frac{\sqrt{3}}{42}$	$-\frac{\sqrt{3}}{42}$	$-\frac{\sqrt{3}}{42}$
	$\frac{13\sqrt{3}}{84}$	$\frac{13\sqrt{3}}{84}$	$\frac{13\sqrt{3}}{84}$	$\frac{13\sqrt{3}}{84}$						