MSG No. 167.104 $R\bar{3}c1'$ [Type II, trigonal]

Table 1: Symmetry operations for 3d polar vector.

No.	tag	matrix (polar)	det	TR
1	$\{1\|0\}$	$\begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{bmatrix}$	1	1
2	$\{3^{+}_{001}\|0\}$	$\begin{bmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{bmatrix}$	1	1
3	$\{3^{-}_{001}\|0\}$	$\begin{bmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{bmatrix}$	1	1
4	$\{2_{100}\|00\frac{1}{2}\}$	$\begin{bmatrix} 1 & -1 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{bmatrix}$	1	1
5	$\{2_{110}\|00\frac{1}{2}\}$	$\begin{bmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{bmatrix}$	1	1
6	$\{2_{010}\|00\frac{1}{2}\}$	$\begin{bmatrix} -1 & 0 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{bmatrix}$	1	1
7	$\{-1\|0\}$	$\begin{bmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{bmatrix}$	-1	1
8	$\{-3^{+}_{001}\|0\}$	$\begin{bmatrix} 0 & 1 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{bmatrix}$	-1	1
9	$\{-3^{-}_{001}\|0\}$	$\begin{bmatrix} 1 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{bmatrix}$	-1	1
10	$\{m_{100}\|00\frac{1}{2}\}$	$\begin{bmatrix} -1 & 1 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{bmatrix}$	-1	1
11	$\{m_{110}\|00\frac{1}{2}\}$	$\begin{bmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{bmatrix}$	-1	1
12	$\{m_{010}\|00\frac{1}{2}\}$	$\begin{bmatrix} 1 & 0 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{bmatrix}$	-1	1
13	$\{1\|\frac{2}{3}\frac{1}{3}\frac{1}{3}\}$	$\begin{bmatrix} 1 & 0 & 0 & \frac{2}{3} \\ 0 & 1 & 0 & \frac{1}{3} \\ 0 & 0 & 1 & \frac{1}{3} \end{bmatrix}$	1	1

Table 1

No.	tag	matrix (polar)	det	TR
14	$\{3^+_{001}\|\frac{2}{3}\frac{1}{3}\frac{1}{3}\}$	$\begin{bmatrix} 0 & -1 & 0 & \frac{2}{3} \\ 1 & -1 & 0 & \frac{1}{3} \\ 0 & 0 & 1 & \frac{1}{3} \end{bmatrix}$	1	1
15	$\{3^-_{001}\|\frac{2}{3}\frac{1}{3}\frac{1}{3}\}$	$\begin{bmatrix} -1 & 1 & 0 & \frac{2}{3} \\ -1 & 0 & 0 & \frac{1}{3} \\ 0 & 0 & 1 & \frac{1}{3} \end{bmatrix}$	1	1
16	$\{2_{100}\|\frac{2}{3}\frac{1}{3}\frac{5}{6}\}$	$\begin{bmatrix} 1 & -1 & 0 & \frac{2}{3} \\ 0 & -1 & 0 & \frac{1}{3} \\ 0 & 0 & -1 & \frac{5}{6} \end{bmatrix}$	1	1
17	$\{2_{110}\|\frac{2}{3}\frac{1}{3}\frac{5}{6}\}$	$\begin{bmatrix} 0 & 1 & 0 & \frac{2}{3} \\ 1 & 0 & 0 & \frac{1}{3} \\ 0 & 0 & -1 & \frac{5}{6} \end{bmatrix}$	1	1
18	$\{2_{010}\|\frac{2}{3}\frac{1}{3}\frac{5}{6}\}$	$\begin{bmatrix} -1 & 0 & 0 & \frac{2}{3} \\ -1 & 1 & 0 & \frac{1}{3} \\ 0 & 0 & -1 & \frac{5}{6} \end{bmatrix}$	1	1
19	$\{-1\|\frac{2}{3}\frac{1}{3}\frac{1}{3}\}$	$\begin{bmatrix} -1 & 0 & 0 & \frac{2}{3} \\ 0 & -1 & 0 & \frac{1}{3} \\ 0 & 0 & -1 & \frac{1}{3} \end{bmatrix}$	-1	1
20	$\{-3^+_{001}\|\frac{2}{3}\frac{1}{3}\frac{1}{3}\}$	$\begin{bmatrix} 0 & 1 & 0 & \frac{2}{3} \\ -1 & 1 & 0 & \frac{1}{3} \\ 0 & 0 & -1 & \frac{1}{3} \end{bmatrix}$	-1	1
21	$\{-3^-_{001}\|\frac{2}{3}\frac{1}{3}\frac{1}{3}\}$	$\begin{bmatrix} 1 & -1 & 0 & \frac{2}{3} \\ 1 & 0 & 0 & \frac{1}{3} \\ 0 & 0 & -1 & \frac{1}{3} \end{bmatrix}$	-1	1
22	$\{m_{100}\|\frac{2}{3}\frac{1}{3}\frac{5}{6}\}$	$\begin{bmatrix} -1 & 1 & 0 & \frac{2}{3} \\ 0 & 1 & 0 & \frac{1}{3} \\ 0 & 0 & 1 & \frac{5}{6} \end{bmatrix}$	-1	1
23	$\{m_{110}\|\frac{2}{3}\frac{1}{3}\frac{5}{6}\}$	$\begin{bmatrix} 0 & -1 & 0 & \frac{2}{3} \\ -1 & 0 & 0 & \frac{1}{3} \\ 0 & 0 & 1 & \frac{5}{6} \end{bmatrix}$	-1	1
24	$\{m_{010}\|\frac{2}{3}\frac{1}{3}\frac{5}{6}\}$	$\begin{bmatrix} 1 & 0 & 0 & \frac{2}{3} \\ 1 & -1 & 0 & \frac{1}{3} \\ 0 & 0 & 1 & \frac{5}{6} \end{bmatrix}$	-1	1
25	$\{1\|\frac{1}{3}\frac{2}{3}\frac{2}{3}\}$	$\begin{bmatrix} 1 & 0 & 0 & \frac{1}{3} \\ 0 & 1 & 0 & \frac{2}{3} \\ 0 & 0 & 1 & \frac{2}{3} \end{bmatrix}$	1	1
26	$\{3^+_{001}\|\frac{1}{3}\frac{2}{3}\frac{2}{3}\}$	$\begin{bmatrix} 0 & -1 & 0 & \frac{1}{3} \\ 1 & -1 & 0 & \frac{2}{3} \\ 0 & 0 & 1 & \frac{2}{3} \end{bmatrix}$	1	1
27	$\{3^-_{001}\|\frac{1}{3}\frac{2}{3}\frac{2}{3}\}$	$\begin{bmatrix} -1 & 1 & 0 & \frac{1}{3} \\ -1 & 0 & 0 & \frac{2}{3} \\ 0 & 0 & 1 & \frac{2}{3} \end{bmatrix}$	1	1

Table 1

No.	tag	matrix (polar)				det	TR
28	$\{2_{100}\|\frac{1}{3}\frac{2}{3}\frac{1}{6}\}$	$\begin{bmatrix} 1 & -1 & 0 & \frac{1}{3} \\ 0 & -1 & 0 & \frac{2}{3} \\ 0 & 0 & -1 & \frac{1}{6} \end{bmatrix}$				1	1
29	$\{2_{110}\|\frac{1}{3}\frac{2}{3}\frac{1}{6}\}$	$\begin{bmatrix} 0 & 1 & 0 & \frac{1}{3} \\ 1 & 0 & 0 & \frac{2}{3} \\ 0 & 0 & -1 & \frac{1}{6} \end{bmatrix}$				1	1
30	$\{2_{010}\|\frac{1}{3}\frac{2}{3}\frac{1}{6}\}$	$\begin{bmatrix} -1 & 0 & 0 & \frac{1}{3} \\ -1 & 1 & 0 & \frac{2}{3} \\ 0 & 0 & -1 & \frac{1}{6} \end{bmatrix}$				1	1
31	$\{-1\|\frac{1}{3}\frac{2}{3}\frac{2}{3}\}$	$\begin{bmatrix} -1 & 0 & 0 & \frac{1}{3} \\ 0 & -1 & 0 & \frac{2}{3} \\ 0 & 0 & -1 & \frac{2}{3} \end{bmatrix}$				-1	1
32	$\{-3^{+}_{001}\|\frac{1}{3}\frac{2}{3}\frac{2}{3}\}$	$\begin{bmatrix} 0 & 1 & 0 & \frac{1}{3} \\ -1 & 1 & 0 & \frac{2}{3} \\ 0 & 0 & -1 & \frac{2}{3} \end{bmatrix}$				-1	1
33	$\{-3^{-}_{001}\|\frac{1}{3}\frac{2}{3}\frac{2}{3}\}$	$\begin{bmatrix} 1 & -1 & 0 & \frac{1}{3} \\ 1 & 0 & 0 & \frac{2}{3} \\ 0 & 0 & -1 & \frac{2}{3} \end{bmatrix}$				-1	1
34	$\{m_{100}\|\frac{1}{3}\frac{2}{3}\frac{1}{6}\}$	$\begin{bmatrix} -1 & 1 & 0 & \frac{1}{3} \\ 0 & 1 & 0 & \frac{2}{3} \\ 0 & 0 & 1 & \frac{1}{6} \end{bmatrix}$				-1	1
35	$\{m_{110}\|\frac{1}{3}\frac{2}{3}\frac{1}{6}\}$	$\begin{bmatrix} 0 & -1 & 0 & \frac{1}{3} \\ -1 & 0 & 0 & \frac{2}{3} \\ 0 & 0 & 1 & \frac{1}{6} \end{bmatrix}$				-1	1
36	$\{m_{010}\|\frac{1}{3}\frac{2}{3}\frac{1}{6}\}$	$\begin{bmatrix} 1 & 0 & 0 & \frac{1}{3} \\ 1 & -1 & 0 & \frac{2}{3} \\ 0 & 0 & 1 & \frac{1}{6} \end{bmatrix}$				-1	1
37	$\{1'\|0\}$	$\begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{bmatrix}$				1	-1
38	$\{3^{+}_{001}{}'\|0\}$	$\begin{bmatrix} 0 & -1 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{bmatrix}$				1	-1
39	$\{3^{-}_{001}{}'\|0\}$	$\begin{bmatrix} -1 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{bmatrix}$				1	-1
40	$\{2_{100}{}'\|00\frac{1}{2}\}$	$\begin{bmatrix} 1 & -1 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{bmatrix}$				1	-1
41	$\{2_{110}{}'\|00\frac{1}{2}\}$	$\begin{bmatrix} 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{bmatrix}$				1	-1

Table 1

No.	tag	matrix (polar)	det	TR
42	$\{2_{010}{}'\|00\tfrac{1}{2}\}$	$\begin{bmatrix} -1 & 0 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & -1 & \tfrac{1}{2} \end{bmatrix}$	1	-1
43	$\{-1'\|0\}$	$\begin{bmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{bmatrix}$	-1	-1
44	$\{-3_{001}^{+}{}'\|0\}$	$\begin{bmatrix} 0 & 1 & 0 & 0 \\ -1 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{bmatrix}$	-1	-1
45	$\{-3_{001}^{-}{}'\|0\}$	$\begin{bmatrix} 1 & -1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{bmatrix}$	-1	-1
46	$\{m_{100}{}'\|00\tfrac{1}{2}\}$	$\begin{bmatrix} -1 & 1 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & \tfrac{1}{2} \end{bmatrix}$	-1	-1
47	$\{m_{110}{}'\|00\tfrac{1}{2}\}$	$\begin{bmatrix} 0 & -1 & 0 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & \tfrac{1}{2} \end{bmatrix}$	-1	-1
48	$\{m_{010}{}'\|00\tfrac{1}{2}\}$	$\begin{bmatrix} 1 & 0 & 0 & 0 \\ 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & \tfrac{1}{2} \end{bmatrix}$	-1	-1
49	$\{1'\|\tfrac{2}{3}\tfrac{1}{3}\tfrac{1}{3}\}$	$\begin{bmatrix} 1 & 0 & 0 & \tfrac{2}{3} \\ 0 & 1 & 0 & \tfrac{1}{3} \\ 0 & 0 & 1 & \tfrac{1}{3} \end{bmatrix}$	1	-1
50	$\{3_{001}^{+}{}'\|\tfrac{2}{3}\tfrac{1}{3}\tfrac{1}{3}\}$	$\begin{bmatrix} 0 & -1 & 0 & \tfrac{2}{3} \\ 1 & -1 & 0 & \tfrac{1}{3} \\ 0 & 0 & 1 & \tfrac{1}{3} \end{bmatrix}$	1	-1
51	$\{3_{001}^{-}{}'\|\tfrac{2}{3}\tfrac{1}{3}\tfrac{1}{3}\}$	$\begin{bmatrix} -1 & 1 & 0 & \tfrac{2}{3} \\ -1 & 0 & 0 & \tfrac{1}{3} \\ 0 & 0 & 1 & \tfrac{1}{3} \end{bmatrix}$	1	-1
52	$\{2_{100}{}'\|\tfrac{2}{3}\tfrac{1}{3}\tfrac{5}{6}\}$	$\begin{bmatrix} 1 & -1 & 0 & \tfrac{2}{3} \\ 0 & -1 & 0 & \tfrac{1}{3} \\ 0 & 0 & -1 & \tfrac{5}{6} \end{bmatrix}$	1	-1
53	$\{2_{110}{}'\|\tfrac{2}{3}\tfrac{1}{3}\tfrac{5}{6}\}$	$\begin{bmatrix} 0 & 1 & 0 & \tfrac{2}{3} \\ 1 & 0 & 0 & \tfrac{1}{3} \\ 0 & 0 & -1 & \tfrac{5}{6} \end{bmatrix}$	1	-1
54	$\{2_{010}{}'\|\tfrac{2}{3}\tfrac{1}{3}\tfrac{5}{6}\}$	$\begin{bmatrix} -1 & 0 & 0 & \tfrac{2}{3} \\ -1 & 1 & 0 & \tfrac{1}{3} \\ 0 & 0 & -1 & \tfrac{5}{6} \end{bmatrix}$	1	-1
55	$\{-1'\|\tfrac{2}{3}\tfrac{1}{3}\tfrac{1}{3}\}$	$\begin{bmatrix} -1 & 0 & 0 & \tfrac{2}{3} \\ 0 & -1 & 0 & \tfrac{1}{3} \\ 0 & 0 & -1 & \tfrac{1}{3} \end{bmatrix}$	-1	-1

continued ...

Table 1

No.	tag	matrix (polar)				det	TR
56	$\{-3^+_{001}{}'\|\tfrac{2}{3}\tfrac{1}{3}\tfrac{1}{3}\}$	$\begin{bmatrix} 0 & 1 & 0 & \tfrac{2}{3} \\ -1 & 1 & 0 & \tfrac{1}{3} \\ 0 & 0 & -1 & \tfrac{1}{3} \end{bmatrix}$				-1	-1
57	$\{-3^-_{001}{}'\|\tfrac{2}{3}\tfrac{1}{3}\tfrac{1}{3}\}$	$\begin{bmatrix} 1 & -1 & 0 & \tfrac{2}{3} \\ 1 & 0 & 0 & \tfrac{1}{3} \\ 0 & 0 & -1 & \tfrac{1}{3} \end{bmatrix}$				-1	-1
58	$\{m_{100}{}'\|\tfrac{2}{3}\tfrac{1}{3}\tfrac{5}{6}\}$	$\begin{bmatrix} -1 & 1 & 0 & \tfrac{2}{3} \\ 0 & 1 & 0 & \tfrac{1}{3} \\ 0 & 0 & 1 & \tfrac{5}{6} \end{bmatrix}$				-1	-1
59	$\{m_{110}{}'\|\tfrac{2}{3}\tfrac{1}{3}\tfrac{5}{6}\}$	$\begin{bmatrix} 0 & -1 & 0 & \tfrac{2}{3} \\ -1 & 0 & 0 & \tfrac{1}{3} \\ 0 & 0 & 1 & \tfrac{5}{6} \end{bmatrix}$				-1	-1
60	$\{m_{010}{}'\|\tfrac{2}{3}\tfrac{1}{3}\tfrac{5}{6}\}$	$\begin{bmatrix} 1 & 0 & 0 & \tfrac{2}{3} \\ 1 & -1 & 0 & \tfrac{1}{3} \\ 0 & 0 & 1 & \tfrac{5}{6} \end{bmatrix}$				-1	-1
61	$\{1'\|\tfrac{1}{3}\tfrac{2}{3}\tfrac{2}{3}\}$	$\begin{bmatrix} 1 & 0 & 0 & \tfrac{1}{3} \\ 0 & 1 & 0 & \tfrac{2}{3} \\ 0 & 0 & 1 & \tfrac{2}{3} \end{bmatrix}$				1	-1
62	$\{3^+_{001}{}'\|\tfrac{1}{3}\tfrac{2}{3}\tfrac{2}{3}\}$	$\begin{bmatrix} 0 & -1 & 0 & \tfrac{1}{3} \\ 1 & -1 & 0 & \tfrac{2}{3} \\ 0 & 0 & 1 & \tfrac{2}{3} \end{bmatrix}$				1	-1
63	$\{3^-_{001}{}'\|\tfrac{1}{3}\tfrac{2}{3}\tfrac{2}{3}\}$	$\begin{bmatrix} -1 & 1 & 0 & \tfrac{1}{3} \\ -1 & 0 & 0 & \tfrac{2}{3} \\ 0 & 0 & 1 & \tfrac{2}{3} \end{bmatrix}$				1	-1
64	$\{2_{100}{}'\|\tfrac{1}{3}\tfrac{2}{3}\tfrac{1}{6}\}$	$\begin{bmatrix} 1 & -1 & 0 & \tfrac{1}{3} \\ 0 & -1 & 0 & \tfrac{2}{3} \\ 0 & 0 & -1 & \tfrac{1}{6} \end{bmatrix}$				1	-1
65	$\{2_{110}{}'\|\tfrac{1}{3}\tfrac{2}{3}\tfrac{1}{6}\}$	$\begin{bmatrix} 0 & 1 & 0 & \tfrac{1}{3} \\ 1 & 0 & 0 & \tfrac{2}{3} \\ 0 & 0 & -1 & \tfrac{1}{6} \end{bmatrix}$				1	-1
66	$\{2_{010}{}'\|\tfrac{1}{3}\tfrac{2}{3}\tfrac{1}{6}\}$	$\begin{bmatrix} -1 & 0 & 0 & \tfrac{1}{3} \\ -1 & 1 & 0 & \tfrac{2}{3} \\ 0 & 0 & -1 & \tfrac{1}{6} \end{bmatrix}$				1	-1
67	$\{-1'\|\tfrac{1}{3}\tfrac{2}{3}\tfrac{2}{3}\}$	$\begin{bmatrix} -1 & 0 & 0 & \tfrac{1}{3} \\ 0 & -1 & 0 & \tfrac{2}{3} \\ 0 & 0 & -1 & \tfrac{2}{3} \end{bmatrix}$				-1	-1
68	$\{-3^+_{001}{}'\|\tfrac{1}{3}\tfrac{2}{3}\tfrac{2}{3}\}$	$\begin{bmatrix} 0 & 1 & 0 & \tfrac{1}{3} \\ -1 & 1 & 0 & \tfrac{2}{3} \\ 0 & 0 & -1 & \tfrac{2}{3} \end{bmatrix}$				-1	-1
69	$\{-3^-_{001}{}'\|\tfrac{1}{3}\tfrac{2}{3}\tfrac{2}{3}\}$	$\begin{bmatrix} 1 & -1 & 0 & \tfrac{1}{3} \\ 1 & 0 & 0 & \tfrac{2}{3} \\ 0 & 0 & -1 & \tfrac{2}{3} \end{bmatrix}$				-1	-1

continued ...

Table 1

No.	tag	matrix (polar)				det	TR
70	$\{m_{100}'\|\frac{1}{3}\frac{2}{3}\frac{1}{6}\}$	$\begin{bmatrix} -1 & 1 & 0 & \frac{1}{3} \\ 0 & 1 & 0 & \frac{2}{3} \\ 0 & 0 & 1 & \frac{1}{6} \end{bmatrix}$				-1	-1
71	$\{m_{110}'\|\frac{1}{3}\frac{2}{3}\frac{1}{6}\}$	$\begin{bmatrix} 0 & -1 & 0 & \frac{1}{3} \\ -1 & 0 & 0 & \frac{2}{3} \\ 0 & 0 & 1 & \frac{1}{6} \end{bmatrix}$				-1	-1
72	$\{m_{010}'\|\frac{1}{3}\frac{2}{3}\frac{1}{6}\}$	$\begin{bmatrix} 1 & 0 & 0 & \frac{1}{3} \\ 1 & -1 & 0 & \frac{2}{3} \\ 0 & 0 & 1 & \frac{1}{6} \end{bmatrix}$				-1	-1