

* symmetry operation

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 | $\{2_{100} 00\frac{1}{2}\}$ | $\begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{bmatrix}$ | 1 | 1 |
| 3 | $\{2_{010} \frac{1}{2}00\}$ | $\begin{bmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{bmatrix}$ | 1 | 1 |
| 4 | $\{2_{001} 0\frac{1}{2}0\}$ | $\begin{bmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{bmatrix}$ | 1 | 1 |
| 5 | $\{3_{111}^+ 0\}$ | $\begin{bmatrix} 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{bmatrix}$ | 1 | 1 |
| 6 | $\{3_{111}^- 0\}$ | $\begin{bmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \end{bmatrix}$ | 1 | 1 |
| 7 | $\{3_{1-1-1}^- \frac{1}{2}00\}$ | $\begin{bmatrix} 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 \end{bmatrix}$ | 1 | 1 |
| 8 | $\{3_{1-1-1}^+ 0\frac{1}{2}0\}$ | $\begin{bmatrix} 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & 0 \end{bmatrix}$ | 1 | 1 |
| 9 | $\{3_{-11-1}^- 0\frac{1}{2}0\}$ | $\begin{bmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \\ 1 & 0 & 0 & 0 \end{bmatrix}$ | 1 | 1 |
| 10 | $\{3_{-11-1}^+ 00\frac{1}{2}\}$ | $\begin{bmatrix} 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & \frac{1}{2} \end{bmatrix}$ | 1 | 1 |
| 11 | $\{3_{-1-11}^- 00\frac{1}{2}\}$ | $\begin{bmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & \frac{1}{2} \end{bmatrix}$ | 1 | 1 |
| 12 | $\{3_{-1-11}^+ \frac{1}{2}00\}$ | $\begin{bmatrix} 0 & 0 & -1 & \frac{1}{2} \\ 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{bmatrix}$ | 1 | 1 |
| 13 | $\{-4_{100}^+ \frac{1}{4}\frac{1}{4}\frac{3}{4}\}$ | $\begin{bmatrix} -1 & 0 & 0 & \frac{1}{4} \\ 0 & 0 & 1 & \frac{1}{4} \\ 0 & -1 & 0 & \frac{3}{4} \end{bmatrix}$ | -1 | 1 |

continued ...

Table 1

| No. | tag | matrix (polar) | det | TR |
|-----|--|---|-----|----|
| 14 | $\{-4_{100}^- \frac{3}{4}\frac{1}{4}\frac{1}{4}\}$ | $\begin{bmatrix} -1 & 0 & 0 & \frac{3}{4} \\ 0 & 0 & -1 & \frac{1}{4} \\ 0 & 1 & 0 & \frac{1}{4} \end{bmatrix}$ | -1 | 1 |
| 15 | $\{-4_{010}^+ \frac{3}{4}\frac{1}{4}\frac{1}{4}\}$ | $\begin{bmatrix} 0 & 0 & -1 & \frac{3}{4} \\ 0 & -1 & 0 & \frac{1}{4} \\ 1 & 0 & 0 & \frac{1}{4} \end{bmatrix}$ | -1 | 1 |
| 16 | $\{-4_{010}^- \frac{1}{4}\frac{3}{4}\frac{1}{4}\}$ | $\begin{bmatrix} 0 & 0 & 1 & \frac{1}{4} \\ 0 & -1 & 0 & \frac{3}{4} \\ -1 & 0 & 0 & \frac{1}{4} \end{bmatrix}$ | -1 | 1 |
| 17 | $\{-4_{001}^+ \frac{1}{4}\frac{3}{4}\frac{1}{4}\}$ | $\begin{bmatrix} 0 & 1 & 0 & \frac{1}{4} \\ -1 & 0 & 0 & \frac{3}{4} \\ 0 & 0 & -1 & \frac{1}{4} \end{bmatrix}$ | -1 | 1 |
| 18 | $\{-4_{001}^- \frac{1}{4}\frac{1}{4}\frac{3}{4}\}$ | $\begin{bmatrix} 0 & -1 & 0 & \frac{1}{4} \\ 1 & 0 & 0 & \frac{1}{4} \\ 0 & 0 & -1 & \frac{3}{4} \end{bmatrix}$ | -1 | 1 |
| 19 | $\{m_{110} \frac{3}{4}\frac{1}{4}\frac{1}{4}\}$ | $\begin{bmatrix} 0 & -1 & 0 & \frac{3}{4} \\ -1 & 0 & 0 & \frac{1}{4} \\ 0 & 0 & 1 & \frac{1}{4} \end{bmatrix}$ | -1 | 1 |
| 20 | $\{m_{1-10} \frac{1}{4}\frac{1}{4}\frac{1}{4}\}$ | $\begin{bmatrix} 0 & 1 & 0 & \frac{1}{4} \\ 1 & 0 & 0 & \frac{1}{4} \\ 0 & 0 & 1 & \frac{1}{4} \end{bmatrix}$ | -1 | 1 |
| 21 | $\{m_{011} \frac{1}{4}\frac{3}{4}\frac{1}{4}\}$ | $\begin{bmatrix} 1 & 0 & 0 & \frac{1}{4} \\ 0 & 0 & -1 & \frac{3}{4} \\ 0 & -1 & 0 & \frac{1}{4} \end{bmatrix}$ | -1 | 1 |
| 22 | $\{m_{01-1} \frac{1}{4}\frac{1}{4}\frac{1}{4}\}$ | $\begin{bmatrix} 1 & 0 & 0 & \frac{1}{4} \\ 0 & 0 & 1 & \frac{1}{4} \\ 0 & 1 & 0 & \frac{1}{4} \end{bmatrix}$ | -1 | 1 |
| 23 | $\{m_{101} \frac{1}{4}\frac{1}{4}\frac{3}{4}\}$ | $\begin{bmatrix} 0 & 0 & -1 & \frac{1}{4} \\ 0 & 1 & 0 & \frac{1}{4} \\ -1 & 0 & 0 & \frac{3}{4} \end{bmatrix}$ | -1 | 1 |
| 24 | $\{m_{-101} \frac{1}{4}\frac{1}{4}\frac{1}{4}\}$ | $\begin{bmatrix} 0 & 0 & 1 & \frac{1}{4} \\ 0 & 1 & 0 & \frac{1}{4} \\ 1 & 0 & 0 & \frac{1}{4} \end{bmatrix}$ | -1 | 1 |
| 25 | $\{1 \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$ | $\begin{bmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{bmatrix}$ | 1 | 1 |
| 26 | $\{2_{100} \frac{1}{2}\frac{1}{2}0\}$ | $\begin{bmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{bmatrix}$ | 1 | 1 |
| 27 | $\{2_{010} 0\frac{1}{2}\frac{1}{2}\}$ | $\begin{bmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{bmatrix}$ | 1 | 1 |

continued ...

Table 1

| No. | tag | matrix (polar) | det | TR |
|-----|--|---|-----|----|
| 28 | $\{2_{001} \frac{1}{2}0\frac{1}{2}\}$ | $\begin{bmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{bmatrix}$ | 1 | 1 |
| 29 | $\{3_{111}^+ \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$ | $\begin{bmatrix} 0 & 0 & 1 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \end{bmatrix}$ | 1 | 1 |
| 30 | $\{3_{111}^- \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$ | $\begin{bmatrix} 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \end{bmatrix}$ | 1 | 1 |
| 31 | $\{3_{1-1-1}^- 0\frac{1}{2}\frac{1}{2}\}$ | $\begin{bmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \end{bmatrix}$ | 1 | 1 |
| 32 | $\{3_{1-1-1}^+ \frac{1}{2}0\frac{1}{2}\}$ | $\begin{bmatrix} 0 & 0 & -1 & \frac{1}{2} \\ -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \end{bmatrix}$ | 1 | 1 |
| 33 | $\{3_{-11-1}^- \frac{1}{2}0\frac{1}{2}\}$ | $\begin{bmatrix} 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & \frac{1}{2} \end{bmatrix}$ | 1 | 1 |
| 34 | $\{3_{-11-1}^+ \frac{1}{2}\frac{1}{2}0\}$ | $\begin{bmatrix} 0 & 0 & 1 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \end{bmatrix}$ | 1 | 1 |
| 35 | $\{3_{-1-11}^- \frac{1}{2}\frac{1}{2}0\}$ | $\begin{bmatrix} 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \\ -1 & 0 & 0 & 0 \end{bmatrix}$ | 1 | 1 |
| 36 | $\{3_{-1-11}^+ 0\frac{1}{2}\frac{1}{2}\}$ | $\begin{bmatrix} 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \end{bmatrix}$ | 1 | 1 |
| 37 | $\{-4_{100}^+ \frac{3}{4}\frac{3}{4}\frac{1}{4}\}$ | $\begin{bmatrix} -1 & 0 & 0 & \frac{3}{4} \\ 0 & 0 & 1 & \frac{3}{4} \\ 0 & -1 & 0 & \frac{1}{4} \end{bmatrix}$ | -1 | 1 |
| 38 | $\{-4_{100}^- \frac{1}{4}\frac{3}{4}\frac{3}{4}\}$ | $\begin{bmatrix} -1 & 0 & 0 & \frac{1}{4} \\ 0 & 0 & -1 & \frac{3}{4} \\ 0 & 1 & 0 & \frac{3}{4} \end{bmatrix}$ | -1 | 1 |
| 39 | $\{-4_{010}^+ \frac{1}{4}\frac{3}{4}\frac{3}{4}\}$ | $\begin{bmatrix} 0 & 0 & -1 & \frac{1}{4} \\ 0 & -1 & 0 & \frac{3}{4} \\ 1 & 0 & 0 & \frac{3}{4} \end{bmatrix}$ | -1 | 1 |
| 40 | $\{-4_{010}^- \frac{3}{4}\frac{1}{4}\frac{3}{4}\}$ | $\begin{bmatrix} 0 & 0 & 1 & \frac{3}{4} \\ 0 & -1 & 0 & \frac{1}{4} \\ -1 & 0 & 0 & \frac{3}{4} \end{bmatrix}$ | -1 | 1 |
| 41 | $\{-4_{001}^+ \frac{3}{4}\frac{1}{4}\frac{3}{4}\}$ | $\begin{bmatrix} 0 & 1 & 0 & \frac{3}{4} \\ -1 & 0 & 0 & \frac{1}{4} \\ 0 & 0 & -1 & \frac{3}{4} \end{bmatrix}$ | -1 | 1 |

continued ...

Table 1

| No. | tag | matrix (polar) | det | TR |
|-----|--|---|-----|----|
| 42 | $\{-4_{001}^- \frac{3}{4}\frac{3}{4}\frac{1}{4}\}$ | $\begin{bmatrix} 0 & -1 & 0 & \frac{3}{4} \\ 1 & 0 & 0 & \frac{3}{4} \\ 0 & 0 & -1 & \frac{1}{4} \end{bmatrix}$ | -1 | 1 |
| 43 | $\{m_{110} \frac{1}{4}\frac{3}{4}\frac{3}{4}\}$ | $\begin{bmatrix} 0 & -1 & 0 & \frac{1}{4} \\ -1 & 0 & 0 & \frac{3}{4} \\ 0 & 0 & 1 & \frac{3}{4} \end{bmatrix}$ | -1 | 1 |
| 44 | $\{m_{1-10} \frac{3}{4}\frac{3}{4}\frac{3}{4}\}$ | $\begin{bmatrix} 0 & 1 & 0 & \frac{3}{4} \\ 1 & 0 & 0 & \frac{3}{4} \\ 0 & 0 & 1 & \frac{3}{4} \end{bmatrix}$ | -1 | 1 |
| 45 | $\{m_{011} \frac{3}{4}\frac{1}{4}\frac{3}{4}\}$ | $\begin{bmatrix} 1 & 0 & 0 & \frac{3}{4} \\ 0 & 0 & -1 & \frac{1}{4} \\ 0 & -1 & 0 & \frac{3}{4} \end{bmatrix}$ | -1 | 1 |
| 46 | $\{m_{01-1} \frac{3}{4}\frac{3}{4}\frac{3}{4}\}$ | $\begin{bmatrix} 1 & 0 & 0 & \frac{3}{4} \\ 0 & 0 & 1 & \frac{3}{4} \\ 0 & 1 & 0 & \frac{3}{4} \end{bmatrix}$ | -1 | 1 |
| 47 | $\{m_{101} \frac{3}{4}\frac{3}{4}\frac{1}{4}\}$ | $\begin{bmatrix} 0 & 0 & -1 & \frac{3}{4} \\ 0 & 1 & 0 & \frac{3}{4} \\ -1 & 0 & 0 & \frac{1}{4} \end{bmatrix}$ | -1 | 1 |
| 48 | $\{m_{-101} \frac{3}{4}\frac{3}{4}\frac{3}{4}\}$ | $\begin{bmatrix} 0 & 0 & 1 & \frac{3}{4} \\ 0 & 1 & 0 & \frac{3}{4} \\ 1 & 0 & 0 & \frac{3}{4} \end{bmatrix}$ | -1 | 1 |
| 49 | $\{1' 0\}$ | $\begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{bmatrix}$ | 1 | -1 |
| 50 | $\{2_{100}' 00\frac{1}{2}\}$ | $\begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \end{bmatrix}$ | 1 | -1 |
| 51 | $\{2_{010}' \frac{1}{2}00\}$ | $\begin{bmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \end{bmatrix}$ | 1 | -1 |
| 52 | $\{2_{001}' 0\frac{1}{2}0\}$ | $\begin{bmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \end{bmatrix}$ | 1 | -1 |
| 53 | $\{3_{111}^+ 0\}$ | $\begin{bmatrix} 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{bmatrix}$ | 1 | -1 |
| 54 | $\{3_{111}^- 0\}$ | $\begin{bmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \end{bmatrix}$ | 1 | -1 |
| 55 | $\{3_{1-1-1}^- \frac{1}{2}00\}$ | $\begin{bmatrix} 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 \end{bmatrix}$ | 1 | -1 |

continued ...

Table 1

| No. | tag | matrix (polar) | det | TR |
|-----|--|---|-----|----|
| 56 | $\{3_{-1-1}^+ 0\frac{1}{2}0\}$ | $\begin{bmatrix} 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & 0 \end{bmatrix}$ | 1 | -1 |
| 57 | $\{3_{-11-1}^- 0\frac{1}{2}0\}$ | $\begin{bmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & \frac{1}{2} \\ 1 & 0 & 0 & 0 \end{bmatrix}$ | 1 | -1 |
| 58 | $\{3_{-11-1}^+ 00\frac{1}{2}\}$ | $\begin{bmatrix} 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & \frac{1}{2} \end{bmatrix}$ | 1 | -1 |
| 59 | $\{3_{-1-11}^- 00\frac{1}{2}\}$ | $\begin{bmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ -1 & 0 & 0 & \frac{1}{2} \end{bmatrix}$ | 1 | -1 |
| 60 | $\{3_{-1-11}^+ \frac{1}{2}00\}$ | $\begin{bmatrix} 0 & 0 & -1 & \frac{1}{2} \\ 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \end{bmatrix}$ | 1 | -1 |
| 61 | $\{-4_{100}^+ \frac{1}{4}\frac{1}{4}\frac{3}{4}\}$ | $\begin{bmatrix} -1 & 0 & 0 & \frac{1}{4} \\ 0 & 0 & 1 & \frac{1}{4} \\ 0 & -1 & 0 & \frac{3}{4} \end{bmatrix}$ | -1 | -1 |
| 62 | $\{-4_{100}^- \frac{3}{4}\frac{1}{4}\frac{1}{4}\}$ | $\begin{bmatrix} -1 & 0 & 0 & \frac{3}{4} \\ 0 & 0 & -1 & \frac{1}{4} \\ 0 & 1 & 0 & \frac{1}{4} \end{bmatrix}$ | -1 | -1 |
| 63 | $\{-4_{010}^+ \frac{3}{4}\frac{1}{4}\frac{1}{4}\}$ | $\begin{bmatrix} 0 & 0 & -1 & \frac{3}{4} \\ 0 & -1 & 0 & \frac{1}{4} \\ 1 & 0 & 0 & \frac{1}{4} \end{bmatrix}$ | -1 | -1 |
| 64 | $\{-4_{010}^- \frac{1}{4}\frac{3}{4}\frac{1}{4}\}$ | $\begin{bmatrix} 0 & 0 & 1 & \frac{1}{4} \\ 0 & -1 & 0 & \frac{3}{4} \\ -1 & 0 & 0 & \frac{1}{4} \end{bmatrix}$ | -1 | -1 |
| 65 | $\{-4_{001}^+ \frac{1}{4}\frac{3}{4}\frac{1}{4}\}$ | $\begin{bmatrix} 0 & 1 & 0 & \frac{1}{4} \\ -1 & 0 & 0 & \frac{3}{4} \\ 0 & 0 & -1 & \frac{1}{4} \end{bmatrix}$ | -1 | -1 |
| 66 | $\{-4_{001}^- \frac{1}{4}\frac{1}{4}\frac{3}{4}\}$ | $\begin{bmatrix} 0 & -1 & 0 & \frac{1}{4} \\ 1 & 0 & 0 & \frac{1}{4} \\ 0 & 0 & -1 & \frac{3}{4} \end{bmatrix}$ | -1 | -1 |
| 67 | $\{m_{110} \frac{3}{4}\frac{1}{4}\frac{1}{4}\}$ | $\begin{bmatrix} 0 & -1 & 0 & \frac{3}{4} \\ -1 & 0 & 0 & \frac{1}{4} \\ 0 & 0 & 1 & \frac{1}{4} \end{bmatrix}$ | -1 | -1 |
| 68 | $\{m_{1-10} \frac{1}{4}\frac{1}{4}\frac{1}{4}\}$ | $\begin{bmatrix} 0 & 1 & 0 & \frac{1}{4} \\ 1 & 0 & 0 & \frac{1}{4} \\ 0 & 0 & 1 & \frac{1}{4} \end{bmatrix}$ | -1 | -1 |
| 69 | $\{m_{011} \frac{1}{4}\frac{3}{4}\frac{1}{4}\}$ | $\begin{bmatrix} 1 & 0 & 0 & \frac{1}{4} \\ 0 & 0 & -1 & \frac{3}{4} \\ 0 & -1 & 0 & \frac{1}{4} \end{bmatrix}$ | -1 | -1 |

continued ...

Table 1

| No. | tag | matrix (polar) | det | TR |
|-----|--|---|-----|----|
| 70 | $\{m_{01-1}' \frac{1}{4}\frac{1}{4}\frac{1}{4}\}$ | $\begin{bmatrix} 1 & 0 & 0 & \frac{1}{4} \\ 0 & 0 & 1 & \frac{1}{4} \\ 0 & 1 & 0 & \frac{1}{4} \end{bmatrix}$ | -1 | -1 |
| 71 | $\{m_{101}' \frac{1}{4}\frac{1}{4}\frac{3}{4}\}$ | $\begin{bmatrix} 0 & 0 & -1 & \frac{1}{4} \\ 0 & 1 & 0 & \frac{1}{4} \\ -1 & 0 & 0 & \frac{3}{4} \end{bmatrix}$ | -1 | -1 |
| 72 | $\{m_{-101}' \frac{1}{4}\frac{1}{4}\frac{1}{4}\}$ | $\begin{bmatrix} 0 & 0 & 1 & \frac{1}{4} \\ 0 & 1 & 0 & \frac{1}{4} \\ 1 & 0 & 0 & \frac{1}{4} \end{bmatrix}$ | -1 | -1 |
| 73 | $\{1' \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$ | $\begin{bmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \end{bmatrix}$ | 1 | -1 |
| 74 | $\{2_{100}' \frac{1}{2}\frac{1}{2}0\}$ | $\begin{bmatrix} 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \end{bmatrix}$ | 1 | -1 |
| 75 | $\{2_{010}' 0\frac{1}{2}\frac{1}{2}\}$ | $\begin{bmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \end{bmatrix}$ | 1 | -1 |
| 76 | $\{2_{001}' \frac{1}{2}0\frac{1}{2}\}$ | $\begin{bmatrix} -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \end{bmatrix}$ | 1 | -1 |
| 77 | $\{3_{111}^+' \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$ | $\begin{bmatrix} 0 & 0 & 1 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & 1 & 0 & \frac{1}{2} \end{bmatrix}$ | 1 | -1 |
| 78 | $\{3_{111}^- \frac{1}{2}\frac{1}{2}\frac{1}{2}\}$ | $\begin{bmatrix} 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} \\ 1 & 0 & 0 & \frac{1}{2} \end{bmatrix}$ | 1 | -1 |
| 79 | $\{3_{1-1-1}^- 0\frac{1}{2}\frac{1}{2}\}$ | $\begin{bmatrix} 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \end{bmatrix}$ | 1 | -1 |
| 80 | $\{3_{1-1-1}^+ \frac{1}{2}0\frac{1}{2}\}$ | $\begin{bmatrix} 0 & 0 & -1 & \frac{1}{2} \\ -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \frac{1}{2} \end{bmatrix}$ | 1 | -1 |
| 81 | $\{3_{-11-1}^- \frac{1}{2}0\frac{1}{2}\}$ | $\begin{bmatrix} 0 & -1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & \frac{1}{2} \end{bmatrix}$ | 1 | -1 |
| 82 | $\{3_{-11-1}^+ \frac{1}{2}\frac{1}{2}0\}$ | $\begin{bmatrix} 0 & 0 & 1 & \frac{1}{2} \\ -1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & 0 \end{bmatrix}$ | 1 | -1 |
| 83 | $\{3_{-1-11}^- \frac{1}{2}\frac{1}{2}0\}$ | $\begin{bmatrix} 0 & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -1 & \frac{1}{2} \\ -1 & 0 & 0 & 0 \end{bmatrix}$ | 1 | -1 |

continued ...

Table 1

| No. | tag | matrix (polar) | det | TR |
|-----|---|---|-----|----|
| 84 | $\{3^+_{-1-11}' 0\frac{1}{2}\frac{1}{2}\}$ | $\begin{bmatrix} 0 & 0 & -1 & 0 \\ 1 & 0 & 0 & \frac{1}{2} \\ 0 & -1 & 0 & \frac{1}{2} \end{bmatrix}$ | 1 | -1 |
| 85 | $\{-4^+_{100}' \frac{3}{4}\frac{3}{4}\frac{1}{4}\}$ | $\begin{bmatrix} -1 & 0 & 0 & \frac{3}{4} \\ 0 & 0 & 1 & \frac{3}{4} \\ 0 & -1 & 0 & \frac{1}{4} \end{bmatrix}$ | -1 | -1 |
| 86 | $\{-4^-_{100}' \frac{1}{4}\frac{3}{4}\frac{3}{4}\}$ | $\begin{bmatrix} -1 & 0 & 0 & \frac{1}{4} \\ 0 & 0 & -1 & \frac{3}{4} \\ 0 & 1 & 0 & \frac{3}{4} \end{bmatrix}$ | -1 | -1 |
| 87 | $\{-4^+_{010}' \frac{1}{4}\frac{3}{4}\frac{3}{4}\}$ | $\begin{bmatrix} 0 & 0 & -1 & \frac{1}{4} \\ 0 & -1 & 0 & \frac{3}{4} \\ 1 & 0 & 0 & \frac{3}{4} \end{bmatrix}$ | -1 | -1 |
| 88 | $\{-4^-_{010}' \frac{3}{4}\frac{1}{4}\frac{3}{4}\}$ | $\begin{bmatrix} 0 & 0 & 1 & \frac{3}{4} \\ 0 & -1 & 0 & \frac{1}{4} \\ -1 & 0 & 0 & \frac{3}{4} \end{bmatrix}$ | -1 | -1 |
| 89 | $\{-4^+_{001}' \frac{3}{4}\frac{1}{4}\frac{3}{4}\}$ | $\begin{bmatrix} 0 & 1 & 0 & \frac{3}{4} \\ -1 & 0 & 0 & \frac{1}{4} \\ 0 & 0 & -1 & \frac{3}{4} \end{bmatrix}$ | -1 | -1 |
| 90 | $\{-4^-_{001}' \frac{3}{4}\frac{3}{4}\frac{1}{4}\}$ | $\begin{bmatrix} 0 & -1 & 0 & \frac{3}{4} \\ 1 & 0 & 0 & \frac{3}{4} \\ 0 & 0 & -1 & \frac{1}{4} \end{bmatrix}$ | -1 | -1 |
| 91 | $\{m_{110}' \frac{1}{4}\frac{3}{4}\frac{3}{4}\}$ | $\begin{bmatrix} 0 & -1 & 0 & \frac{1}{4} \\ -1 & 0 & 0 & \frac{3}{4} \\ 0 & 0 & 1 & \frac{3}{4} \end{bmatrix}$ | -1 | -1 |
| 92 | $\{m_{1-10}' \frac{3}{4}\frac{3}{4}\frac{3}{4}\}$ | $\begin{bmatrix} 0 & 1 & 0 & \frac{3}{4} \\ 1 & 0 & 0 & \frac{3}{4} \\ 0 & 0 & 1 & \frac{3}{4} \end{bmatrix}$ | -1 | -1 |
| 93 | $\{m_{011}' \frac{3}{4}\frac{1}{4}\frac{3}{4}\}$ | $\begin{bmatrix} 1 & 0 & 0 & \frac{3}{4} \\ 0 & 0 & -1 & \frac{1}{4} \\ 0 & -1 & 0 & \frac{3}{4} \end{bmatrix}$ | -1 | -1 |
| 94 | $\{m_{01-1}' \frac{3}{4}\frac{3}{4}\frac{3}{4}\}$ | $\begin{bmatrix} 1 & 0 & 0 & \frac{3}{4} \\ 0 & 0 & 1 & \frac{3}{4} \\ 0 & 1 & 0 & \frac{3}{4} \end{bmatrix}$ | -1 | -1 |
| 95 | $\{m_{101}' \frac{3}{4}\frac{3}{4}\frac{1}{4}\}$ | $\begin{bmatrix} 0 & 0 & -1 & \frac{3}{4} \\ 0 & 1 & 0 & \frac{3}{4} \\ -1 & 0 & 0 & \frac{1}{4} \end{bmatrix}$ | -1 | -1 |
| 96 | $\{m_{-101}' \frac{3}{4}\frac{3}{4}\frac{3}{4}\}$ | $\begin{bmatrix} 0 & 0 & 1 & \frac{3}{4} \\ 0 & 1 & 0 & \frac{3}{4} \\ 1 & 0 & 0 & \frac{3}{4} \end{bmatrix}$ | -1 | -1 |