Supporting Information for: MOLSYM: A Python Package for Handling Symmetry in Molecular Quantum Chemistry

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Irreducible Representation Matrices

Define ε accordingly.

$$\varepsilon_n = e^{\frac{2\pi i}{n}} \tag{1}$$

C1	$\hat{E}$
A	1

Cs	$\hat{E}$	$\hat{\sigma}_h$
A'	1	1
A''	1	-1

Ci	$\hat{E}$	$\hat{i}$
Ag	1	1
Au	1	-1

C2	$\hat{E}$	$\hat{C}_2$
A	1	1
B	1	-1

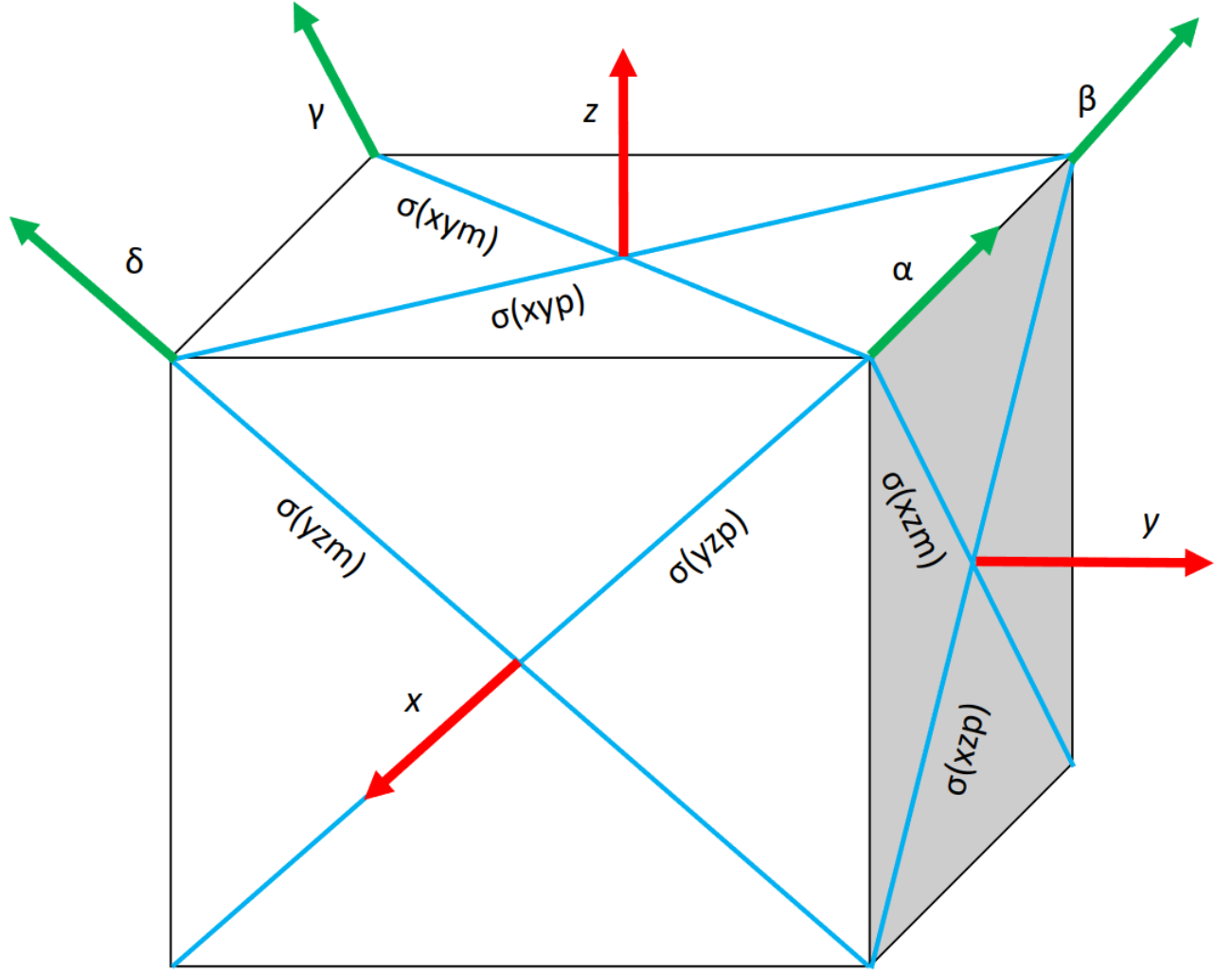| C3	$\hat{E}$	$\hat{C}_3$	$\hat{C}_3^2$
A	1	1	1
E_1	1	ε_3	ε_3^*
E_2	1	ε_3^*	ε_3

Figure 1: Definitions of vectors x, y, z, $\alpha, \beta, \gamma, \delta$ (typically $\hat{C}_3$ axes), and reflection planes $\sigma xyp, \sigma xym, \sigma xzp, \sigma xzm, \sigma yzp, \sigma yzm$. $\hat{C}_2$ opertaions with $xyp, xym, xzp, xzm, yzp, yzm$ are defined as rotations about the bisector, for example $xyp = |1\vec{x} + 1\vec{y}|$ and $yzm = |1\vec{y} - 1\vec{z}|$.

C4	$\hat{E}$	$\hat{C}_4$	$\hat{C}_2$	$\hat{C}_4^3$
A	1	1	1	1
B	1	-1	1	-1
E_1	1	i	-1	$-i$
E_2	1	$-i$	-1	i

C5	$\hat{E}$	$\hat{C}_5$	$\hat{C}_5^2$	$\hat{C}_5^3$	$\hat{C}_5^4$
A	1	1	1	1	1
$E1_1$	1	ε_5	ε_5^2	ε_5^{2*}	ε_5^*
$E1_2$	1	ε_5^*	ε_5^{2*}	ε_5^2	ε_5
$E2_1$	1	ε_5^2	ε_5^*	ε_5	ε_5^{2*}
$E2_2$	1	ε_5^{2*}	ε_5	ε_5^*	ε_5^2

C6	$\hat{E}$	$\hat{C}_6$	$\hat{C}_3$	$\hat{C}_2$	$\hat{C}_3^2$	$\hat{C}_6^5$
A	1	1	1	1	1	1
B	1	-1	1	-1	1	-1
$E1_1$	1	ε_6	ε_3	-1	ε_3^*	ε_6^*
$E1_2$	1	ε_6^*	ε_3^*	-1	ε_3	ε_6
$E2_1$	1	ε_3	ε_3^*	1	ε_3	ε_3^*
$E2_2$	1	ε_3^*	ε_3	1	ε_3^*	ε_3

C7	$\hat{E}$	$\hat{C}_7$	$\hat{C}_7^2$	$\hat{C}_7^3$	$\hat{C}_7^4$	$\hat{C}_7^5$	$\hat{C}_7^6$
A	1	1	1	1	1	1	1
$E1_1$	1	ε_7	ε_7^2	ε_7^3	ε_7^{3*}	ε_7^{2*}	ε_7^*
$E1_2$	1	ε_7^*	ε_7^{2*}	ε_7^{3*}	ε_7^3	ε_7^2	ε_7
$E2_1$	1	ε_7^2	ε_7^{3*}	ε_7^*	ε_7	ε_7^3	ε_7^{2*}
$E2_2$	1	ε_7^{2*}	ε_7^3	ε_7	ε_7^*	ε_7^{3*}	ε_7^2
$E3_1$	1	ε_7^3	ε_7^*	ε_7^2	ε_7^{2*}	ε_7	ε_7^{3*}
$E3_2$	1	ε_7^{3*}	ε_7	ε_7^{2*}	ε_7^2	ε_7^*	ε_7^3

C8	$\hat{E}$	$\hat{C}_8$	$\hat{C}_4$	$\hat{C}_8^3$	$\hat{C}_2$	$\hat{C}_8^5$	$\hat{C}_4^3$	$\hat{C}_8^7$
A	1	1	1	1	1	1	1	1
B	1	-1	1	-1	1	-1	1	-1
$E1_1$	1	ε_8	i	ε_8^3	-1	ε_8^{3*}	$-i$	ε_8^*
$E1_2$	1	ε_8^*	$-i$	ε_8^{3*}	-1	ε_8^3	i	ε_8
$E2_1$	1	i	-1	$-i$	1	i	-1	$-i$
$E2_2$	1	$-i$	-1	i	1	$-i$	-1	i
$E3_1$	1	ε_8^{3*}	i	ε_8^*	-1	ε_8	$-i$	ε_8^3
$E3_2$	1	ε_8^3	$-i$	ε_8	-1	ε_8^*	i	ε_8^{3*}

C2h	$\hat{E}$	$\hat{\sigma}_h$	$\hat{i}$	$\hat{C}_2$
Ag	1	1	1	1
Bg	1	-1	1	-1
Au	1	-1	-1	1
Bu	1	1	-1	-1

C3h	$\hat{E}$	$\hat{\sigma}_h$	$\hat{C}_3$	$\hat{C}_3^2$	$\hat{S}_3$	$\hat{S}_3^5$
A'	1	1	1	1	1	1
E_1'	1	1	ε_3	ε_3^*	ε_3	ε_3^*
E_2'	1	1	ε_3^*	ε_3	ε_3^*	ε_3
A''	1	-1	1	1	-1	-1
E_1''	1	-1	ε_3	ε_3^*	ε_6^*	ε_6
E_2''	1	-1	ε_3^*	ε_3	ε_6	ε_6^*

C4h	$\hat{E}$	$\hat{\sigma}_h$	$\hat{i}$	$\hat{C}_4$	$\hat{C}_2$	$\hat{C}_4^3$	$\hat{S}_4$	$\hat{S}_4^3$
Ag	1	1	1	1	1	1	1	1
Bg	1	1	1	-1	1	-1	-1	-1
E_1g	1	-1	1	i	-1	$-i$	$-i$	i
E_2g	1	-1	1	$-i$	-1	i	i	$-i$
Au	1	-1	-1	1	1	1	-1	-1
Bu	1	-1	-1	-1	1	-1	1	1
E_1u	1	1	-1	i	-1	$-i$	i	$-i$
E_2u	1	1	-1	$-i$	-1	i	$-i$	i

C5h	$\hat{E}$	$\hat{\sigma}_h$	$\hat{C}_5$	$\hat{C}_5^2$	$\hat{C}_5^3$	$\hat{C}_5^4$	$\hat{S}_5$	$\hat{S}_5^7$	$\hat{S}_5^3$	$\hat{S}_5^9$
A'	1	1	1	1	1	1	1	1	1	1
$E1_1'$	1	1	ε_5	ε_5^2	ε_5^{2*}	ε_5^*	ε_5	ε_5^2	ε_5^{2*}	ε_5^*
$E1_2'$	1	1	ε_5^*	ε_5^{2*}	ε_5^2	ε_5	ε_5^*	ε_5^{2*}	ε_5^2	ε_5
$E2_1'$	1	1	ε_5^2	ε_5^*	ε_5	ε_5^{2*}	ε_5^2	ε_5^*	ε_5	ε_5^{2*}
$E2_2'$	1	1	ε_5^{2*}	ε_5	ε_5^*	ε_5^2	ε_5^{2*}	ε_5	ε_5^*	ε_5^2
A''	1	-1	1	1	1	1	-1	-1	-1	-1
$E1_1''$	1	-1	ε_5	ε_5^2	ε_5^{2*}	ε_5^*	$-\varepsilon_5$	$-\varepsilon_5^2$	$-\varepsilon_5^{2*}$	$-\varepsilon_5^*$
$E1_2''$	1	-1	ε_5^*	ε_5^{2*}	ε_5^2	ε_5	$-\varepsilon_5^*$	$-\varepsilon_5^{2*}$	$-\varepsilon_5^2$	$-\varepsilon_5$
$E2_1''$	1	-1	ε_5^2	ε_5^*	ε_5	ε_5^{2*}	$-\varepsilon_5^2$	$-\varepsilon_5^*$	$-\varepsilon_5$	$-\varepsilon_5^{2*}$
$E2_2''$	1	-1	ε_5^{2*}	ε_5	ε_5^*	ε_5^2	$-\varepsilon_5^{2*}$	$-\varepsilon_5$	$-\varepsilon_5^*$	$-\varepsilon_5^2$

C6h	$\hat{E}$	$\hat{\sigma}_h$	$\hat{i}$	$\hat{C}_6$	$\hat{C}_3$	$\hat{C}_2$	$\hat{C}_3^2$	$\hat{C}_6^5$	$\hat{S}_6$	$\hat{S}_3$	$\hat{S}_3^5$	$\hat{S}_6^5$
Ag	1	1	1	1	1	1	1	1	1	1	1	1
Bg	1	-1	1	-1	1	-1	1	-1	1	-1	-1	1
$E1_1g$	1	-1	1	ε_6	ε_3	-1	ε_3^*	ε_6^*	ε_3^*	ε_6^*	ε_6	ε_3
$E1_2g$	1	-1	1	ε_6^*	ε_3^*	-1	ε_3	ε_6	ε_3	ε_6	ε_6^*	ε_3^*
$E2_1g$	1	1	1	ε_3	ε_3^*	1	ε_3	ε_3^*	ε_3	ε_3^*	ε_3	ε_3^*
$E2_2g$	1	1	1	ε_3^*	ε_3	1	ε_3^*	ε_3	ε_3^*	ε_3	ε_3^*	ε_3
Au	1	-1	-1	1	1	1	1	1	-1	-1	-1	-1
Bu	1	1	-1	-1	1	-1	1	-1	-1	1	1	-1
$E1_1u$	1	1	-1	ε_6	ε_3	-1	ε_3^*	ε_6^*	ε_6	ε_3	ε_3^*	ε_6^*
$E1_2u$	1	1	-1	ε_6^*	ε_3^*	-1	ε_3	ε_6	ε_6^*	ε_3^*	ε_3	ε_6
$E2_1u$	1	-1	-1	ε_3	ε_3^*	1	ε_3	ε_3^*	ε_6^*	ε_6	ε_6^*	ε_6
$E2_2u$	1	-1	-1	ε_3^*	ε_3	1	ε_3^*	ε_3	ε_6	ε_6^*	ε_6	ε_6^*

C2v	$\hat{E}$	$\hat{C}_2$	$\hat{\sigma}_v(1)$	$\hat{\sigma}_d(1)$
$A1$	1	1	1	1
$A2$	1	1	-1	-1
$B1$	1	-1	1	-1
$B2$	1	-1	-1	1

C3v	$\hat{E}$	$\hat{C}_3$	$\hat{C}_3^2$	$\hat{\sigma}_v(1)$
$A1$	1	1	1	1
$A2$	1	1	1	-1
E	$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & -\frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & \frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$

C3v	$\hat{\sigma}_v(2)$	$\hat{\sigma}_v(3)$
$A1$	1	1
$A2$	-1	-1
E	$\begin{pmatrix} \frac{1}{2} & -\frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & \frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$

C4v	$\hat{E}$	$\hat{C}_4$	$\hat{C}_2$	$\hat{C}_4^3$
$A1$	1	1	1	1
$A2$	1	1	1	1
$B1$	1	-1	1	-1
$B2$	1	-1	1	-1
E	$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 \\ 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 \\ -1 & 0 \end{pmatrix}$

C4v	$\hat{\sigma}_v(1)$	$\hat{\sigma}_v(2)$	$\hat{\sigma}_d(1)$	$\hat{\sigma}_d(2)$
$A1$	1	1	1	1
$A2$	-1	-1	-1	-1
$B1$	1	1	-1	-1
$B2$	-1	-1	1	1
E	$\begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 \\ -1 & 0 \end{pmatrix}$

C5v	$\hat{E}$	$\hat{C}_5$	$\hat{C}_5^2$	$\hat{C}_5^3$
$A1$	1	1	1	1
$A2$	1	1	1	1
$E1$	$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} \cos\frac{2\pi}{5} & -\sin\frac{2\pi}{5} \\ \sin\frac{2\pi}{5} & \cos\frac{2\pi}{5} \end{pmatrix}$	$\begin{pmatrix} -\cos\frac{\pi}{5} & -\sin\frac{\pi}{5} \\ \sin\frac{\pi}{5} & -\cos\frac{\pi}{5} \end{pmatrix}$	$\begin{pmatrix} -\cos\frac{\pi}{5} & \sin\frac{\pi}{5} \\ -\sin\frac{\pi}{5} & -\cos\frac{\pi}{5} \end{pmatrix}$
$E2$	$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} -\cos\frac{\pi}{5} & -\sin\frac{\pi}{5} \\ \sin\frac{\pi}{5} & -\cos\frac{\pi}{5} \end{pmatrix}$	$\begin{pmatrix} \cos\frac{2\pi}{5} & \sin\frac{2\pi}{5} \\ -\sin\frac{2\pi}{5} & \cos\frac{2\pi}{5} \end{pmatrix}$	$\begin{pmatrix} \cos\frac{2\pi}{5} & -\sin\frac{2\pi}{5} \\ \sin\frac{2\pi}{5} & \cos\frac{2\pi}{5} \end{pmatrix}$

C5v	$\hat{C}_5^4$	$\hat{\sigma}_v(1)$	$\hat{\sigma}_v(2)$	$\hat{\sigma}_v(3)$
$A1$	1	1	1	1
$A2$	1	-1	-1	-1
$E1$	$\begin{pmatrix} \cos\frac{2\pi}{5} & \sin\frac{2\pi}{5} \\ -\sin\frac{2\pi}{5} & \cos\frac{2\pi}{5} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} -\cos\frac{\pi}{5} & \sin\frac{\pi}{5} \\ \sin\frac{\pi}{5} & \cos\frac{\pi}{5} \end{pmatrix}$	$\begin{pmatrix} \cos\frac{2\pi}{5} & -\sin\frac{2\pi}{5} \\ -\sin\frac{2\pi}{5} & -\cos\frac{2\pi}{5} \end{pmatrix}$
$E2$	$\begin{pmatrix} -\cos\frac{\pi}{5} & \sin\frac{\pi}{5} \\ -\sin\frac{\pi}{5} & -\cos\frac{\pi}{5} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} \cos\frac{2\pi}{5} & -\sin\frac{2\pi}{5} \\ -\sin\frac{2\pi}{5} & -\cos\frac{2\pi}{5} \end{pmatrix}$	$\begin{pmatrix} -\cos\frac{\pi}{5} & -\sin\frac{\pi}{5} \\ -\sin\frac{\pi}{5} & \cos\frac{\pi}{5} \end{pmatrix}$

C5v	$\hat{\sigma}_v(4)$	$\hat{\sigma}_v(5)$
$A1$	1	1
$A2$	-1	-1
$E1$	$\begin{pmatrix} \cos\frac{2\pi}{5} & \sin\frac{2\pi}{5} \\ \sin\frac{2\pi}{5} & -\cos\frac{2\pi}{5} \end{pmatrix}$	$\begin{pmatrix} -\cos\frac{\pi}{5} & -\sin\frac{\pi}{5} \\ -\sin\frac{\pi}{5} & \cos\frac{\pi}{5} \end{pmatrix}$
$E2$	$\begin{pmatrix} -\cos\frac{\pi}{5} & \sin\frac{\pi}{5} \\ \sin\frac{\pi}{5} & \cos\frac{\pi}{5} \end{pmatrix}$	$\begin{pmatrix} \cos\frac{2\pi}{5} & \sin\frac{2\pi}{5} \\ \sin\frac{2\pi}{5} & -\cos\frac{2\pi}{5} \end{pmatrix}$

C6v	$\hat{E}$	$\hat{C}_6$	$\hat{C}_3$	$\hat{C}_2$
$A1$	1	1	1	1
$A2$	1	1	1	1
$B1$	1	-1	1	-1
$B2$	1	-1	1	-1
$E1$	$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} -\frac{1}{2} & -\frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & -\frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 \\ 0 & -1 \end{pmatrix}$
$E2$	$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & \frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & -\frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$

C6v	$\hat{C}_3^2$		$\hat{C}_6^5$		$\hat{\sigma}_v(1)$		$\hat{\sigma}_v(2)$	
$A1$	1		1		1		1	
$A2$	1		1		-1		-1	
$B1$	1		-1		1		1	
$B2$	1		-1		-1		-1	
$E1$	$\begin{pmatrix} \frac{1}{2} & \frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$		$\begin{pmatrix} -\frac{1}{2} & \frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$		$\begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$		$\begin{pmatrix} \frac{1}{2} & \frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$	
$E2$	$\begin{pmatrix} \frac{1}{2} & \frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$		$\begin{pmatrix} \frac{1}{2} & -\frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$		$\begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$		$\begin{pmatrix} \frac{1}{2} & \frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$	

C6v	$\hat{\sigma}_v(3)$		$\hat{\sigma}_d(1)$		$\hat{\sigma}_d(2)$		$\hat{\sigma}_d(3)$	
$A1$	1		1		1		1	
$A2$	-1		-1		-1		-1	
$B1$	1		-1		-1		-1	
$B2$	-1		1		1		1	
$E1$	$\begin{pmatrix} \frac{1}{2} & -\frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$		$\begin{pmatrix} -\frac{1}{2} & \frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$		$\begin{pmatrix} -1 & 0 \\ 0 & 1 \end{pmatrix}$		$\begin{pmatrix} -\frac{1}{2} & -\frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	
$E2$	$\begin{pmatrix} \frac{1}{2} & -\frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$		$\begin{pmatrix} \frac{1}{2} & -\frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$		$\begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$		$\begin{pmatrix} \frac{1}{2} & \frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$	

D2	$\hat{E}$	$\hat{C}_2$	$\hat{C}_2'(1)$	$\hat{C}_2''(1)$
A	1	1	1	1
$B1$	1	1	-1	-1
$B2$	1	-1	-1	1
$B3$	1	-1	1	-1

D3	$\hat{E}$		$\hat{C}_3$		$\hat{C}_3^2$		$\hat{C}_2'(1)$	
$A1$	1		1		1		1	
$A2$	1		1		1		-1	
E	$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$		$\begin{pmatrix} \frac{1}{2} & -\frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$		$\begin{pmatrix} \frac{1}{2} & \frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$		$\begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$	

D3	$\hat{C}_2'(2)$		$\hat{C}_2'(3)$	
$A1$	1		1	
$A2$	-1		-1	
E	$\begin{pmatrix} \frac{1}{2} & -\frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$		$\begin{pmatrix} \frac{1}{2} & \frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$	

D4	$\hat{E}$	$\hat{C}_4$	$\hat{C}_2$	$\hat{C}_4^3$
$A1$	1	1	1	1
$A2$	1	1	1	1
$B1$	1	-1	1	-1
$B2$	1	-1	1	-1
E	$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 \\ 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 \\ -1 & 0 \end{pmatrix}$

D4	$\hat{C}_2'(1)$	$\hat{C}_2'(2)$	$\hat{C}_2''(1)$	$\hat{C}_2''(2)$
$A1$	1	1	1	1
$A2$	-1	-1	-1	-1
$B1$	1	1	-1	-1
$B2$	-1	-1	1	1
E	$\begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 \\ -1 & 0 \end{pmatrix}$

D5	$\hat{E}$	$\hat{C}_5$	$\hat{C}_5^2$	$\hat{C}_5^3$
$A1$	1	1	1	1
$A2$	1	1	1	1
$E1$	$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} \cos\frac{2\pi}{5} & -\sin\frac{2\pi}{5} \\ \sin\frac{2\pi}{5} & \cos\frac{2\pi}{5} \end{pmatrix}$	$\begin{pmatrix} -\cos\frac{\pi}{5} & -\sin\frac{\pi}{5} \\ \sin\frac{\pi}{5} & -\cos\frac{\pi}{5} \end{pmatrix}$	$\begin{pmatrix} -\cos\frac{\pi}{5} & \sin\frac{\pi}{5} \\ -\sin\frac{\pi}{5} & -\cos\frac{\pi}{5} \end{pmatrix}$
$E2$	$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} -\cos\frac{\pi}{5} & -\sin\frac{\pi}{5} \\ \sin\frac{\pi}{5} & -\cos\frac{\pi}{5} \end{pmatrix}$	$\begin{pmatrix} \cos\frac{2\pi}{5} & \sin\frac{2\pi}{5} \\ -\sin\frac{2\pi}{5} & \cos\frac{2\pi}{5} \end{pmatrix}$	$\begin{pmatrix} \cos\frac{2\pi}{5} & -\sin\frac{2\pi}{5} \\ \sin\frac{2\pi}{5} & \cos\frac{2\pi}{5} \end{pmatrix}$

D5	$\hat{C}_5^4$	$\hat{C}_2'(1)$	$\hat{C}_2'(2)$	$\hat{C}_2'(3)$
$A1$	1	1	1	1
$A2$	1	-1	-1	-1
$E1$	$\begin{pmatrix} \cos\frac{2\pi}{5} & \sin\frac{2\pi}{5} \\ -\sin\frac{2\pi}{5} & \cos\frac{2\pi}{5} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} -\cos\frac{\pi}{5} & \sin\frac{\pi}{5} \\ \sin\frac{\pi}{5} & \cos\frac{\pi}{5} \end{pmatrix}$	$\begin{pmatrix} \cos\frac{2\pi}{5} & -\sin\frac{2\pi}{5} \\ -\sin\frac{2\pi}{5} & -\cos\frac{2\pi}{5} \end{pmatrix}$
$E2$	$\begin{pmatrix} -\cos\frac{\pi}{5} & \sin\frac{\pi}{5} \\ -\sin\frac{\pi}{5} & -\cos\frac{\pi}{5} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} \cos\frac{2\pi}{5} & -\sin\frac{2\pi}{5} \\ -\sin\frac{2\pi}{5} & -\cos\frac{2\pi}{5} \end{pmatrix}$	$\begin{pmatrix} -\cos\frac{\pi}{5} & -\sin\frac{\pi}{5} \\ -\sin\frac{\pi}{5} & \cos\frac{\pi}{5} \end{pmatrix}$

D5	$\hat{C}_2'(4)$	$\hat{C}_2'(5)$
$A1$	1	1
$A2$	-1	-1
$E1$	$\begin{pmatrix} \cos\frac{2\pi}{5} & \sin\frac{2\pi}{5} \\ \sin\frac{2\pi}{5} & -\cos\frac{2\pi}{5} \end{pmatrix}$	$\begin{pmatrix} -\cos\frac{\pi}{5} & -\sin\frac{\pi}{5} \\ -\sin\frac{\pi}{5} & \cos\frac{\pi}{5} \end{pmatrix}$
$E2$	$\begin{pmatrix} -\cos\frac{\pi}{5} & \sin\frac{\pi}{5} \\ \sin\frac{\pi}{5} & \cos\frac{\pi}{5} \end{pmatrix}$	$\begin{pmatrix} \cos\frac{2\pi}{5} & \sin\frac{2\pi}{5} \\ \sin\frac{2\pi}{5} & -\cos\frac{2\pi}{5} \end{pmatrix}$

D6 Character Table

D6	$\hat{E}$	$\hat{C}_6$	$\hat{C}_3$	$\hat{C}_2$
$A1$	1	1	1	1
$A2$	1	1	1	1
$B1$	1	-1	1	-1
$B2$	1	-1	1	-1
$E1$	$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} -\frac{1}{2} & -\frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & -\frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 \\ 0 & -1 \end{pmatrix}$
$E2$	$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & \frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & -\frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$

D6	$\hat{C}_3^2$	$\hat{C}_6^5$	$\hat{C}_2'(1)$	$\hat{C}_2'(2)$
$A1$	1	1	1	1
$A2$	1	1	-1	-1
$B1$	1	-1	1	1
$B2$	1	-1	-1	-1
$E1$	$\begin{pmatrix} \frac{1}{2} & \frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -\frac{1}{2} & \frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & \frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$
$E2$	$\begin{pmatrix} \frac{1}{2} & \frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & -\frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} -\frac{1}{2} & -\frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$

D6	$\hat{C}_2'(3)$	$\hat{C}_2''(1)$	$\hat{C}_2''(2)$	$\hat{C}_2''(3)$
$A1$	1	1	1	1
$A2$	-1	-1	-1	-1
$B1$	1	-1	-1	-1
$B2$	-1	1	1	1
$E1$	$\begin{pmatrix} \frac{1}{2} & -\frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -\frac{1}{2} & \frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} -\frac{1}{2} & -\frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$
$E2$	$\begin{pmatrix} -\frac{1}{2} & \frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -\frac{1}{2} & \frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} -\frac{1}{2} & -\frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$

D8	$\hat{E}$	$\hat{C}_8$	$\hat{C}_4$	$\hat{C}_8^3$
A1	1	1	1	1
A2	1	1	1	1
B1	1	−1	1	−1
B2	1	−1	1	−1
E1	$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} \frac{\sqrt{2}}{2} & -\frac{\sqrt{2}}{2} \\ \frac{\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 \\ 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -\frac{\sqrt{2}}{2} & -\frac{\sqrt{2}}{2} \\ \frac{\sqrt{2}}{2} & -\frac{\sqrt{2}}{2} \end{pmatrix}$
E2	$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 \\ 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 \\ -1 & 0 \end{pmatrix}$
E3	$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} -\frac{\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \\ -\frac{\sqrt{2}}{2} & -\frac{\sqrt{2}}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 \\ 1 & 0 \end{pmatrix}$	$\begin{pmatrix} \frac{\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \\ -\frac{\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \end{pmatrix}$

D8	$\hat{C}_2$	$\hat{C}_8^5$	$\hat{C}_4^3$	$\hat{C}_8^7$
A1	1	1	1	1
A2	1	1	1	1
B1	1	−1	1	−1
B2	1	−1	1	−1
E1	$\begin{pmatrix} -1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} -\frac{\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \\ -\frac{\sqrt{2}}{2} & -\frac{\sqrt{2}}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 \\ -1 & 0 \end{pmatrix}$	$\begin{pmatrix} \frac{\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \\ -\frac{\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \end{pmatrix}$
E2	$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 \\ 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 \\ -1 & 0 \end{pmatrix}$
E3	$\begin{pmatrix} -1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} \frac{\sqrt{2}}{2} & -\frac{\sqrt{2}}{2} \\ \frac{\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 \\ -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -\frac{\sqrt{2}}{2} & -\frac{\sqrt{2}}{2} \\ \frac{\sqrt{2}}{2} & -\frac{\sqrt{2}}{2} \end{pmatrix}$

D8	$\hat{C}_2'(1)$	$\hat{C}_2'(2)$	$\hat{C}_2'(3)$	$\hat{C}_2'(4)$
A1	1	1	1	1
A2	−1	−1	−1	−1
B1	1	1	1	1
B2	−1	−1	−1	−1
E1	$\begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 \\ -1 & 0 \end{pmatrix}$
E2	$\begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 \\ 0 & 1 \end{pmatrix}$
E3	$\begin{pmatrix} -1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 \\ -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix}$

D8	$\hat{C}_2''(1)$	$\hat{C}_2''(2)$	$\hat{C}_2''(3)$	$\hat{C}_2''(4)$
$A1$	1	1	1	1
$A2$	-1	-1	-1	-1
$B1$	-1	-1	-1	-1
$B2$	1	1	1	1
$E1$	$\begin{pmatrix} \frac{\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \\ \frac{\sqrt{2}}{2} & -\frac{\sqrt{2}}{2} \end{pmatrix}$	$\begin{pmatrix} -\frac{\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \\ \frac{\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \end{pmatrix}$	$\begin{pmatrix} -\frac{\sqrt{2}}{2} & -\frac{\sqrt{2}}{2} \\ -\frac{\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{\sqrt{2}}{2} & -\frac{\sqrt{2}}{2} \\ -\frac{\sqrt{2}}{2} & -\frac{\sqrt{2}}{2} \end{pmatrix}$
$E2$	$\begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 \\ -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 \\ -1 & 0 \end{pmatrix}$
$E3$	$\begin{pmatrix} \frac{\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \\ \frac{\sqrt{2}}{2} & -\frac{\sqrt{2}}{2} \end{pmatrix}$	$\begin{pmatrix} -\frac{\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \\ \frac{\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \end{pmatrix}$	$\begin{pmatrix} -\frac{\sqrt{2}}{2} & -\frac{\sqrt{2}}{2} \\ -\frac{\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{\sqrt{2}}{2} & -\frac{\sqrt{2}}{2} \\ -\frac{\sqrt{2}}{2} & -\frac{\sqrt{2}}{2} \end{pmatrix}$

D2d	$\hat{E}$	$\hat{C}_2$	$\hat{S}_4$	$\hat{S}_4^3$
$A1$	1	1	1	1
$A2$	1	1	1	1
$B1$	1	1	-1	-1
$B2$	1	1	-1	-1
E	$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 \\ 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 \\ -1 & 0 \end{pmatrix}$

D2d	$\hat{C}_2'(1)$	$\hat{C}_2''(1)$	$\hat{\sigma}_d(1)$	$\hat{\sigma}_d(2)$
$A1$	1	1	1	1
$A2$	-1	-1	-1	-1
$B1$	1	1	-1	-1
$B2$	-1	-1	1	1
E	$\begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 \\ -1 & 0 \end{pmatrix}$

D3d	$\hat{E}$	$\hat{i}$	$\hat{C}_3$	$\hat{C}_3^2$
$A1g$	1	1	1	1
$A2g$	1	1	1	1
Eg	$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & -\frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & \frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$
$A1u$	1	-1	1	1
$A2u$	1	-1	1	1
Eu	$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & -\frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & \frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$

D3d	$\hat{S}_6$	$\hat{S}_6^5$	$\hat{C}_2'(1)$	$\hat{C}_2'(2)$
$A1g$	1	1	1	1
$A2g$	1	1	-1	-1
Eg	$\begin{pmatrix} \frac{1}{2} & \frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & -\frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & -\frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$
$A1u$	-1	-1	1	1
$A2u$	-1	-1	-1	-1
Eu	$\begin{pmatrix} -\frac{1}{2} & -\frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -\frac{1}{2} & \frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & -\frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$

D3d	$\hat{C}_2'(3)$	$\hat{\sigma}_d(1)$	$\hat{\sigma}_d(2)$	$\hat{\sigma}_d(3)$
$A1g$	1	1	1	1
$A2g$	-1	-1	-1	-1
Eg	$\begin{pmatrix} \frac{1}{2} & \frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & -\frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & \frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$
$A1u$	1	-1	-1	-1
$A2u$	-1	1	1	1
Eu	$\begin{pmatrix} \frac{1}{2} & \frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -\frac{1}{2} & \frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} -\frac{1}{2} & -\frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$

D4d	$\hat{E}$	$\hat{C}_4$	$\hat{C}_2$	$\hat{C}_4^3$
$A1$	1	1	1	1
$A2$	1	1	1	1
$B1$	1	1	1	1
$B2$	1	1	1	1
$E1$	$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 \\ 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 \\ -1 & 0 \end{pmatrix}$
$E2$	$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 \\ 0 & -1 \end{pmatrix}$
$E3$	$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 \\ 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 \\ -1 & 0 \end{pmatrix}$

D4d	$\hat{S}_8$	$\hat{S}_8^3$	$\hat{S}_8^5$	$\hat{S}_8^7$
$A1$	1	1	1	1
$A2$	1	1	1	1
$B1$	-1	-1	-1	-1
$B2$	-1	-1	-1	-1
$E1$	$\begin{pmatrix} \frac{\sqrt{2}}{2} & -\frac{\sqrt{2}}{2} \\ \frac{\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \end{pmatrix}$	$\begin{pmatrix} -\frac{\sqrt{2}}{2} & -\frac{\sqrt{2}}{2} \\ \frac{\sqrt{2}}{2} & -\frac{\sqrt{2}}{2} \end{pmatrix}$	$\begin{pmatrix} -\frac{\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \\ -\frac{\sqrt{2}}{2} & -\frac{\sqrt{2}}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \\ -\frac{\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \end{pmatrix}$
$E2$	$\begin{pmatrix} 0 & -1 \\ 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 \\ -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 \\ 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 \\ -1 & 0 \end{pmatrix}$
$E3$	$\begin{pmatrix} -\frac{\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \\ -\frac{\sqrt{2}}{2} & -\frac{\sqrt{2}}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \\ -\frac{\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{\sqrt{2}}{2} & -\frac{\sqrt{2}}{2} \\ \frac{\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \end{pmatrix}$	$\begin{pmatrix} -\frac{\sqrt{2}}{2} & -\frac{\sqrt{2}}{2} \\ \frac{\sqrt{2}}{2} & -\frac{\sqrt{2}}{2} \end{pmatrix}$

D4d	$\hat{C}_2'(1)$	$\hat{C}_2'(2)$	$\hat{C}_2''(1)$	$\hat{C}_2''(2)$
$A1$	1	1	1	1
$A2$	-1	-1	-1	-1
$B1$	1	1	1	1
$B2$	-1	-1	-1	-1
$E1$	$\begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 \\ -1 & 0 \end{pmatrix}$
$E2$	$\begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 \\ 0 & 1 \end{pmatrix}$
$E3$	$\begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 \\ -1 & 0 \end{pmatrix}$

D4d	$\hat{\sigma}_d(1)$	$\hat{\sigma}_d(2)$	$\hat{\sigma}_d(3)$	$\hat{\sigma}_d(4)$
$A1$	1	1	1	1
$A2$	-1	-1	-1	-1
$B1$	-1	-1	-1	-1
$B2$	1	1	1	1
$E1$	$\begin{pmatrix} \frac{\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \\ \frac{\sqrt{2}}{2} & -\frac{\sqrt{2}}{2} \end{pmatrix}$	$\begin{pmatrix} -\frac{\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \\ \frac{\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \end{pmatrix}$	$\begin{pmatrix} -\frac{\sqrt{2}}{2} & -\frac{\sqrt{2}}{2} \\ -\frac{\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{\sqrt{2}}{2} & -\frac{\sqrt{2}}{2} \\ -\frac{\sqrt{2}}{2} & -\frac{\sqrt{2}}{2} \end{pmatrix}$
$E2$	$\begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 \\ -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 \\ -1 & 0 \end{pmatrix}$
$E3$	$\begin{pmatrix} -\frac{\sqrt{2}}{2} & -\frac{\sqrt{2}}{2} \\ -\frac{\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{\sqrt{2}}{2} & -\frac{\sqrt{2}}{2} \\ -\frac{\sqrt{2}}{2} & -\frac{\sqrt{2}}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \\ \frac{\sqrt{2}}{2} & -\frac{\sqrt{2}}{2} \end{pmatrix}$	$\begin{pmatrix} -\frac{\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \\ \frac{\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \end{pmatrix}$

D5d Character Table

D5d	$\hat{E}$	$\hat{i}$	$\hat{C}_5$	$\hat{C}_5^2$
$A1g$	1	1	1	1
$A2g$	1	1	1	1
$E1g$	$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} \cos\frac{2\pi}{5} & -\sin\frac{2\pi}{5} \\ \sin\frac{2\pi}{5} & \cos\frac{2\pi}{5} \end{pmatrix}$	$\begin{pmatrix} -\cos\frac{\pi}{5} & -\sin\frac{\pi}{5} \\ \sin\frac{\pi}{5} & -\cos\frac{\pi}{5} \end{pmatrix}$
$E2g$	$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} -\cos\frac{\pi}{5} & -\sin\frac{\pi}{5} \\ \sin\frac{\pi}{5} & -\cos\frac{\pi}{5} \end{pmatrix}$	$\begin{pmatrix} \cos\frac{2\pi}{5} & \sin\frac{2\pi}{5} \\ -\sin\frac{2\pi}{5} & \cos\frac{2\pi}{5} \end{pmatrix}$
$A1u$	1	-1	1	1
$A2u$	1	-1	1	1
$E1u$	$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} \cos\frac{2\pi}{5} & -\sin\frac{2\pi}{5} \\ \sin\frac{2\pi}{5} & \cos\frac{2\pi}{5} \end{pmatrix}$	$\begin{pmatrix} -\cos\frac{\pi}{5} & -\sin\frac{\pi}{5} \\ \sin\frac{\pi}{5} & -\cos\frac{\pi}{5} \end{pmatrix}$
$E2u$	$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} -\cos\frac{\pi}{5} & -\sin\frac{\pi}{5} \\ \sin\frac{\pi}{5} & -\cos\frac{\pi}{5} \end{pmatrix}$	$\begin{pmatrix} \cos\frac{2\pi}{5} & \sin\frac{2\pi}{5} \\ -\sin\frac{2\pi}{5} & \cos\frac{2\pi}{5} \end{pmatrix}$

D5d	$\hat{C}_5^3$	$\hat{C}_5^4$	$\hat{S}_10$	$\hat{S}_10^3$
$A1g$	1	1	1	1
$A2g$	1	1	1	1
$E1g$	$\begin{pmatrix} -\cos\frac{\pi}{5} & \sin\frac{\pi}{5} \\ -\sin\frac{\pi}{5} & -\cos\frac{\pi}{5} \end{pmatrix}$	$\begin{pmatrix} \cos\frac{2\pi}{5} & \sin\frac{2\pi}{5} \\ -\sin\frac{2\pi}{5} & \cos\frac{2\pi}{5} \end{pmatrix}$	$\begin{pmatrix} -\cos\frac{\pi}{5} & \sin\frac{\pi}{5} \\ -\sin\frac{\pi}{5} & -\cos\frac{\pi}{5} \end{pmatrix}$	$\begin{pmatrix} \cos\frac{2\pi}{5} & \sin\frac{2\pi}{5} \\ -\sin\frac{2\pi}{5} & \cos\frac{2\pi}{5} \end{pmatrix}$
$E2g$	$\begin{pmatrix} \cos\frac{2\pi}{5} & -\sin\frac{2\pi}{5} \\ \sin\frac{2\pi}{5} & \cos\frac{2\pi}{5} \end{pmatrix}$	$\begin{pmatrix} -\cos\frac{\pi}{5} & \sin\frac{\pi}{5} \\ -\sin\frac{\pi}{5} & -\cos\frac{\pi}{5} \end{pmatrix}$	$\begin{pmatrix} \cos\frac{2\pi}{5} & -\sin\frac{2\pi}{5} \\ \sin\frac{2\pi}{5} & \cos\frac{2\pi}{5} \end{pmatrix}$	$\begin{pmatrix} -\cos\frac{\pi}{5} & \sin\frac{\pi}{5} \\ -\sin\frac{\pi}{5} & -\cos\frac{\pi}{5} \end{pmatrix}$
$A1u$	1	1	-1	-1
$A2u$	1	1	-1	-1
$E1u$	$\begin{pmatrix} -\cos\frac{\pi}{5} & \sin\frac{\pi}{5} \\ -\sin\frac{\pi}{5} & -\cos\frac{\pi}{5} \end{pmatrix}$	$\begin{pmatrix} \cos\frac{2\pi}{5} & \sin\frac{2\pi}{5} \\ -\sin\frac{2\pi}{5} & \cos\frac{2\pi}{5} \end{pmatrix}$	$\begin{pmatrix} \cos\frac{\pi}{5} & -\sin\frac{\pi}{5} \\ \sin\frac{\pi}{5} & \cos\frac{\pi}{5} \end{pmatrix}$	$\begin{pmatrix} -\cos\frac{2\pi}{5} & -\sin\frac{2\pi}{5} \\ \sin\frac{2\pi}{5} & -\cos\frac{2\pi}{5} \end{pmatrix}$
$E2u$	$\begin{pmatrix} \cos\frac{2\pi}{5} & -\sin\frac{2\pi}{5} \\ \sin\frac{2\pi}{5} & \cos\frac{2\pi}{5} \end{pmatrix}$	$\begin{pmatrix} -\cos\frac{\pi}{5} & \sin\frac{\pi}{5} \\ -\sin\frac{\pi}{5} & -\cos\frac{\pi}{5} \end{pmatrix}$	$\begin{pmatrix} -\cos\frac{2\pi}{5} & \sin\frac{2\pi}{5} \\ -\sin\frac{2\pi}{5} & -\cos\frac{2\pi}{5} \end{pmatrix}$	$\begin{pmatrix} \cos\frac{\pi}{5} & -\sin\frac{\pi}{5} \\ \sin\frac{\pi}{5} & \cos\frac{\pi}{5} \end{pmatrix}$

D5d	$\hat{S}_10^7$	$\hat{S}_10^9$	$\hat{C}_2'(1)$	$\hat{C}_2'(2)$
$A1g$	1	1	1	1
$A2g$	1	1	-1	-1
$E1g$	$\begin{pmatrix} \cos\frac{2\pi}{5} & -\sin\frac{2\pi}{5} \\ \sin\frac{2\pi}{5} & \cos\frac{2\pi}{5} \end{pmatrix}$	$\begin{pmatrix} -\cos\frac{\pi}{5} & -\sin\frac{\pi}{5} \\ \sin\frac{\pi}{5} & -\cos\frac{\pi}{5} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} -\cos\frac{\pi}{5} & \sin\frac{\pi}{5} \\ \sin\frac{\pi}{5} & \cos\frac{\pi}{5} \end{pmatrix}$
$E2g$	$\begin{pmatrix} -\cos\frac{\pi}{5} & -\sin\frac{\pi}{5} \\ \sin\frac{\pi}{5} & -\cos\frac{\pi}{5} \end{pmatrix}$	$\begin{pmatrix} \cos\frac{2\pi}{5} & \sin\frac{2\pi}{5} \\ -\sin\frac{2\pi}{5} & \cos\frac{2\pi}{5} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} \cos\frac{2\pi}{5} & -\sin\frac{2\pi}{5} \\ -\sin\frac{2\pi}{5} & -\cos\frac{2\pi}{5} \end{pmatrix}$
$A1u$	-1	-1	1	1
$A2u$	-1	-1	-1	-1
$E1u$	$\begin{pmatrix} -\cos\frac{2\pi}{5} & \sin\frac{2\pi}{5} \\ -\sin\frac{2\pi}{5} & -\cos\frac{2\pi}{5} \end{pmatrix}$	$\begin{pmatrix} \cos\frac{\pi}{5} & \sin\frac{\pi}{5} \\ -\sin\frac{\pi}{5} & \cos\frac{\pi}{5} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} -\cos\frac{\pi}{5} & \sin\frac{\pi}{5} \\ \sin\frac{\pi}{5} & \cos\frac{\pi}{5} \end{pmatrix}$
$E2u$	$\begin{pmatrix} \cos\frac{\pi}{5} & \sin\frac{\pi}{5} \\ -\sin\frac{\pi}{5} & \cos\frac{\pi}{5} \end{pmatrix}$	$\begin{pmatrix} -\cos\frac{2\pi}{5} & -\sin\frac{2\pi}{5} \\ \sin\frac{2\pi}{5} & -\cos\frac{2\pi}{5} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} \cos\frac{2\pi}{5} & -\sin\frac{2\pi}{5} \\ -\sin\frac{2\pi}{5} & -\cos\frac{2\pi}{5} \end{pmatrix}$

D5d	$\hat{C}_2'(3)$	$\hat{C}_2'(4)$	$\hat{C}_2'(5)$	$\hat{\sigma}_d(1)$
$A1g$	1	1	1	1
$A2g$	-1	-1	-1	-1
$E1g$	$\begin{pmatrix} \cos\frac{2\pi}{5} & -\sin\frac{2\pi}{5} \\ -\sin\frac{2\pi}{5} & -\cos\frac{2\pi}{5} \end{pmatrix}$	$\begin{pmatrix} \cos\frac{2\pi}{5} & \sin\frac{2\pi}{5} \\ \sin\frac{2\pi}{5} & -\cos\frac{2\pi}{5} \end{pmatrix}$	$\begin{pmatrix} -\cos\frac{\pi}{5} & -\sin\frac{\pi}{5} \\ -\sin\frac{\pi}{5} & \cos\frac{\pi}{5} \end{pmatrix}$	$\begin{pmatrix} -\cos\frac{\pi}{5} & -\sin\frac{\pi}{5} \\ -\sin\frac{\pi}{5} & \cos\frac{\pi}{5} \end{pmatrix}$
$E2g$	$\begin{pmatrix} -\cos\frac{\pi}{5} & -\sin\frac{\pi}{5} \\ -\sin\frac{\pi}{5} & \cos\frac{\pi}{5} \end{pmatrix}$	$\begin{pmatrix} -\cos\frac{\pi}{5} & \sin\frac{\pi}{5} \\ \sin\frac{\pi}{5} & \cos\frac{\pi}{5} \end{pmatrix}$	$\begin{pmatrix} \cos\frac{2\pi}{5} & \sin\frac{2\pi}{5} \\ \sin\frac{2\pi}{5} & -\cos\frac{2\pi}{5} \end{pmatrix}$	$\begin{pmatrix} \cos\frac{2\pi}{5} & \sin\frac{2\pi}{5} \\ \sin\frac{2\pi}{5} & -\cos\frac{2\pi}{5} \end{pmatrix}$
$A1u$	1	1	1	-1
$A2u$	-1	-1	-1	1
$E1u$	$\begin{pmatrix} \cos\frac{2\pi}{5} & -\sin\frac{2\pi}{5} \\ -\sin\frac{2\pi}{5} & -\cos\frac{2\pi}{5} \end{pmatrix}$	$\begin{pmatrix} \cos\frac{2\pi}{5} & \sin\frac{2\pi}{5} \\ \sin\frac{2\pi}{5} & -\cos\frac{2\pi}{5} \end{pmatrix}$	$\begin{pmatrix} -\cos\frac{\pi}{5} & -\sin\frac{\pi}{5} \\ -\sin\frac{\pi}{5} & \cos\frac{\pi}{5} \end{pmatrix}$	$\begin{pmatrix} \cos\frac{\pi}{5} & \sin\frac{\pi}{5} \\ \sin\frac{\pi}{5} & -\cos\frac{\pi}{5} \end{pmatrix}$
$E2u$	$\begin{pmatrix} -\cos\frac{\pi}{5} & -\sin\frac{\pi}{5} \\ -\sin\frac{\pi}{5} & \cos\frac{\pi}{5} \end{pmatrix}$	$\begin{pmatrix} -\cos\frac{\pi}{5} & \sin\frac{\pi}{5} \\ \sin\frac{\pi}{5} & \cos\frac{\pi}{5} \end{pmatrix}$	$\begin{pmatrix} \cos\frac{2\pi}{5} & \sin\frac{2\pi}{5} \\ \sin\frac{2\pi}{5} & -\cos\frac{2\pi}{5} \end{pmatrix}$	$\begin{pmatrix} -\cos\frac{2\pi}{5} & -\sin\frac{2\pi}{5} \\ -\sin\frac{2\pi}{5} & \cos\frac{2\pi}{5} \end{pmatrix}$

D5d	$\hat{\sigma}_d(2)$	$\hat{\sigma}_d(3)$	$\hat{\sigma}_d(4)$	$\hat{\sigma}_d(5)$
$A1g$	1	1	1	1
$A2g$	-1	-1	-1	-1
$E1g$	$\begin{pmatrix} \cos\frac{2\pi}{5} & -\sin\frac{2\pi}{5} \\ -\sin\frac{2\pi}{5} & -\cos\frac{2\pi}{5} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} \cos\frac{2\pi}{5} & \sin\frac{2\pi}{5} \\ \sin\frac{2\pi}{5} & -\cos\frac{2\pi}{5} \end{pmatrix}$	$\begin{pmatrix} -\cos\frac{\pi}{5} & \sin\frac{\pi}{5} \\ \sin\frac{\pi}{5} & \cos\frac{\pi}{5} \end{pmatrix}$
$E2g$	$\begin{pmatrix} -\cos\frac{\pi}{5} & -\sin\frac{\pi}{5} \\ -\sin\frac{\pi}{5} & \cos\frac{\pi}{5} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} -\cos\frac{\pi}{5} & \sin\frac{\pi}{5} \\ \sin\frac{\pi}{5} & \cos\frac{\pi}{5} \end{pmatrix}$	$\begin{pmatrix} \cos\frac{2\pi}{5} & -\sin\frac{2\pi}{5} \\ -\sin\frac{2\pi}{5} & -\cos\frac{2\pi}{5} \end{pmatrix}$
$A1u$	-1	-1	-1	-1
$A2u$	1	1	1	1
$E1u$	$\begin{pmatrix} -\cos\frac{2\pi}{5} & \sin\frac{2\pi}{5} \\ \sin\frac{2\pi}{5} & \cos\frac{2\pi}{5} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} -\cos\frac{2\pi}{5} & -\sin\frac{2\pi}{5} \\ -\sin\frac{2\pi}{5} & \cos\frac{2\pi}{5} \end{pmatrix}$	$\begin{pmatrix} \cos\frac{\pi}{5} & -\sin\frac{\pi}{5} \\ -\sin\frac{\pi}{5} & -\cos\frac{\pi}{5} \end{pmatrix}$
$E2u$	$\begin{pmatrix} \cos\frac{\pi}{5} & \sin\frac{\pi}{5} \\ \sin\frac{\pi}{5} & -\cos\frac{\pi}{5} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} \cos\frac{\pi}{5} & -\sin\frac{\pi}{5} \\ -\sin\frac{\pi}{5} & -\cos\frac{\pi}{5} \end{pmatrix}$	$\begin{pmatrix} -\cos\frac{2\pi}{5} & \sin\frac{2\pi}{5} \\ \sin\frac{2\pi}{5} & \cos\frac{2\pi}{5} \end{pmatrix}$

D6d	$\hat{E}$	$\hat{C}_6$	$\hat{C}_3$	$\hat{C}_2$
$A1$	1	1	1	1
$A2$	1	1	1	1
$B1$	1	1	1	1
$B2$	1	1	1	1
$E1$	$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} -\frac{1}{2} & -\frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & -\frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 \\ 0 & -1 \end{pmatrix}$
$E2$	$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & -\frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & \frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$
$E3$	$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 \\ 0 & -1 \end{pmatrix}$
$E4$	$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & -\frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & \frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$
$E5$	$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} -\frac{1}{2} & -\frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & -\frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 \\ 0 & -1 \end{pmatrix}$

D6d	$\hat{C}_3^2$	$\hat{C}_6^5$	$\hat{S}_12$	$\hat{S}_4$
$A1$	1	1	1	1
$A2$	1	1	1	1
$B1$	1	1	-1	-1
$B2$	1	1	-1	-1
$E1$	$\begin{pmatrix} \frac{1}{2} & \frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -\frac{1}{2} & \frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{\sqrt{3}}{2} & \frac{1}{2} \\ -\frac{1}{2} & \frac{\sqrt{3}}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 \\ 1 & 0 \end{pmatrix}$
$E2$	$\begin{pmatrix} \frac{1}{2} & -\frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & \frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -\frac{1}{2} & -\frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 \\ 0 & -1 \end{pmatrix}$
$E3$	$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 \\ -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 \\ 1 & 0 \end{pmatrix}$
$E4$	$\begin{pmatrix} \frac{1}{2} & -\frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & \frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & \frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$
$E5$	$\begin{pmatrix} \frac{1}{2} & \frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -\frac{1}{2} & \frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -\frac{\sqrt{3}}{2} & -\frac{1}{2} \\ \frac{1}{2} & -\frac{\sqrt{3}}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 \\ -1 & 0 \end{pmatrix}$

D6d	$\hat{S}_1 2^5$	$\hat{S}_1 2^7$	$\hat{S}_4^3$	$\hat{S}_1 21$
$A1$	1	1	1	1
$A2$	1	1	1	1
$B1$	-1	-1	-1	-1
$B2$	-1	-1	-1	-1
$E1$	$\begin{pmatrix} -\frac{\sqrt{3}}{2} & \frac{1}{2} \\ -\frac{1}{2} & -\frac{\sqrt{3}}{2} \end{pmatrix}$	$\begin{pmatrix} -\frac{\sqrt{3}}{2} & -\frac{1}{2} \\ \frac{1}{2} & -\frac{\sqrt{3}}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 \\ -1 & 0 \end{pmatrix}$	$\begin{pmatrix} \frac{\sqrt{3}}{2} & -\frac{1}{2} \\ \frac{1}{2} & \frac{\sqrt{3}}{2} \end{pmatrix}$
$E2$	$\begin{pmatrix} -\frac{1}{2} & \frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -\frac{1}{2} & -\frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} -\frac{1}{2} & \frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$
$E3$	$\begin{pmatrix} 0 & 1 \\ -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 \\ 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 \\ -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 \\ 1 & 0 \end{pmatrix}$
$E4$	$\begin{pmatrix} \frac{1}{2} & -\frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & \frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & -\frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$
$E5$	$\begin{pmatrix} \frac{\sqrt{3}}{2} & -\frac{1}{2} \\ \frac{1}{2} & \frac{\sqrt{3}}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{\sqrt{3}}{2} & \frac{1}{2} \\ -\frac{1}{2} & \frac{\sqrt{3}}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 \\ 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -\frac{\sqrt{3}}{2} & \frac{1}{2} \\ -\frac{1}{2} & -\frac{\sqrt{3}}{2} \end{pmatrix}$

D6d	$\hat{C}_2'(1)$	$\hat{C}_2'(2)$	$\hat{C}_2'(3)$	$\hat{C}_2''(1)$
$A1$	1	1	1	1
$A2$	-1	-1	-1	-1
$B1$	1	1	1	1
$B2$	-1	-1	-1	-1
$E1$	$\begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & \frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & -\frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -\frac{1}{2} & \frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$
$E2$	$\begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & -\frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & \frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & \frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$
$E3$	$\begin{pmatrix} -1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$
$E4$	$\begin{pmatrix} -1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} -\frac{1}{2} & \frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -\frac{1}{2} & -\frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -\frac{1}{2} & -\frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$
$E5$	$\begin{pmatrix} -1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} -\frac{1}{2} & -\frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -\frac{1}{2} & \frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & -\frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$

D6d	$\hat{C}_2''(2)$	$\hat{C}_2''(3)$	$\hat{\sigma}_d(1)$	$\hat{\sigma}_d(2)$
$A1$	1	1	1	1
$A2$	-1	-1	-1	-1
$B1$	1	1	-1	-1
$B2$	-1	-1	1	1
$E1$	$\begin{pmatrix} -1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} -\frac{1}{2} & -\frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{\sqrt{3}}{2} & -\frac{1}{2} \\ -\frac{1}{2} & -\frac{\sqrt{3}}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix}$
$E2$	$\begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & -\frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -\frac{1}{2} & \frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 \\ 0 & 1 \end{pmatrix}$
$E3$	$\begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 \\ -1 & 0 \end{pmatrix}$
$E4$	$\begin{pmatrix} -1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} -\frac{1}{2} & \frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -\frac{1}{2} & \frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 \\ 0 & 1 \end{pmatrix}$
$E5$	$\begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & \frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{\sqrt{3}}{2} & -\frac{1}{2} \\ -\frac{1}{2} & -\frac{\sqrt{3}}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix}$

D6d	$\hat{\sigma}_d(3)$	$\hat{\sigma}_d(4)$	$\hat{\sigma}_d(5)$	$\hat{\sigma}_d(6)$
$A1$	1	1	1	1
$A2$	-1	-1	-1	-1
$B1$	-1	-1	-1	-1
$B2$	1	1	1	1
$E1$	$\begin{pmatrix} -\frac{\sqrt{3}}{2} & -\frac{1}{2} \\ -\frac{1}{2} & \frac{\sqrt{3}}{2} \end{pmatrix}$	$\begin{pmatrix} -\frac{\sqrt{3}}{2} & \frac{1}{2} \\ \frac{1}{2} & \frac{\sqrt{3}}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 \\ -1 & 0 \end{pmatrix}$	$\begin{pmatrix} \frac{\sqrt{3}}{2} & \frac{1}{2} \\ \frac{1}{2} & -\frac{\sqrt{3}}{2} \end{pmatrix}$
$E2$	$\begin{pmatrix} -\frac{1}{2} & -\frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -\frac{1}{2} & \frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} -\frac{1}{2} & -\frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$
$E3$	$\begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 \\ -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 \\ -1 & 0 \end{pmatrix}$
$E4$	$\begin{pmatrix} -\frac{1}{2} & -\frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -\frac{1}{2} & \frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} -\frac{1}{2} & -\frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$
$E5$	$\begin{pmatrix} -\frac{\sqrt{3}}{2} & -\frac{1}{2} \\ -\frac{1}{2} & \frac{\sqrt{3}}{2} \end{pmatrix}$	$\begin{pmatrix} -\frac{\sqrt{3}}{2} & \frac{1}{2} \\ \frac{1}{2} & \frac{\sqrt{3}}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 \\ -1 & 0 \end{pmatrix}$	$\begin{pmatrix} \frac{\sqrt{3}}{2} & \frac{1}{2} \\ \frac{1}{2} & -\frac{\sqrt{3}}{2} \end{pmatrix}$

D2h	$\hat{E}$	$\hat{\sigma}_h$	$\hat{i}$	$\hat{C}_2$	$\hat{C}_2'(1)$	$\hat{C}_2''(1)$	$\hat{\sigma}_v(1)$	$\hat{\sigma}_d(1)$
Ag	1	1	1	1	1	1	1	1
$B1g$	1	1	1	1	-1	-1	-1	-1
$B2g$	1	-1	1	-1	-1	1	1	-1
$B3g$	1	-1	1	-1	1	-1	-1	1
Au	1	-1	-1	1	1	1	-1	-1
$B1u$	1	-1	-1	1	-1	-1	1	1
$B2u$	1	1	-1	-1	-1	1	-1	1
$B3u$	1	1	-1	-1	1	-1	1	-1

D3h	$\hat{E}$	$\hat{\sigma}_h$	$\hat{C}_3$	$\hat{C}_3^2$
$A1'$	1	1	1	1
$A2'$	1	1	1	1
E'	$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & -\frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & \frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$
$A1''$	1	-1	1	1
$A2''$	1	-1	1	1
E''	$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & -\frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & \frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$

D3h	$\hat{C}_2'(1)$	$\hat{C}_2'(2)$	$\hat{C}_2'(3)$	$\hat{S}_3$
$A1'$	1	1	1	1
$A2'$	-1	-1	-1	1
E'	$\begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & -\frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & \frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & -\frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$
$A1''$	1	1	1	-1
$A2''$	-1	-1	-1	-1
E''	$\begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & -\frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & \frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -\frac{1}{2} & \frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$

D3h	$\hat{S}_3^5$	$\hat{\sigma}_v(1)$	$\hat{\sigma}_v(2)$	$\hat{\sigma}_v(3)$
$A1'$	1	1	1	1
$A2'$	1	-1	-1	-1
E'	$\begin{pmatrix} \frac{1}{2} & \frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & -\frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & \frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$
$A1''$	-1	-1	-1	-1
$A2''$	-1	1	1	1
E''	$\begin{pmatrix} -\frac{1}{2} & -\frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} -\frac{1}{2} & \frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -\frac{1}{2} & -\frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$

D4h	$\hat{E}$	$\hat{\sigma}_h$	$\hat{i}$	$\hat{C}_4$
$A1g$	1	1	1	1
$A2g$	1	1	1	1
$B1g$	1	1	1	-1
$B2g$	1	1	1	-1
Eg	$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 \\ 1 & 0 \end{pmatrix}$
$A1u$	1	-1	-1	1
$A2u$	1	-1	-1	1
$B1u$	1	-1	-1	-1
$B2u$	1	-1	-1	-1
Eu	$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 \\ 1 & 0 \end{pmatrix}$

D4h	$\hat{C}_2$	$\hat{C}_4^3$	$\hat{C}_2'(1)$	$\hat{C}_2'(2)$
$A1g$	1	1	1	1
$A2g$	1	1	-1	-1
$B1g$	1	-1	1	1
$B2g$	1	-1	-1	-1
Eg	$\begin{pmatrix} -1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 \\ -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 \\ 0 & 1 \end{pmatrix}$
$A1u$	1	1	1	1
$A2u$	1	1	-1	-1
$B1u$	1	-1	1	1
$B2u$	1	-1	-1	-1
Eu	$\begin{pmatrix} -1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 \\ -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 \\ 0 & 1 \end{pmatrix}$

D4h	$\hat{C}_2''(1)$	$\hat{C}_2''(2)$	$\hat{S}_4$	$\hat{S}_4^3$
$A1g$	1	1	1	1
$A2g$	-1	-1	1	1
$B1g$	-1	-1	-1	-1
$B2g$	1	1	-1	-1
Eg	$\begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 \\ -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 \\ -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 \\ 1 & 0 \end{pmatrix}$
$A1u$	1	1	-1	-1
$A2u$	-1	-1	-1	-1
$B1u$	-1	-1	1	1
$B2u$	1	1	1	1
Eu	$\begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 \\ -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 \\ 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 \\ -1 & 0 \end{pmatrix}$

D4h	$\hat{\sigma}_v(1)$	$\hat{\sigma}_v(2)$	$\hat{\sigma}_d(1)$	$\hat{\sigma}_d(2)$
$A1g$	1	1	1	1
$A2g$	-1	-1	-1	-1
$B1g$	1	1	-1	-1
$B2g$	-1	-1	1	1
Eg	$\begin{pmatrix} -1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 \\ -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix}$
$A1u$	-1	-1	-1	-1
$A2u$	1	1	1	1
$B1u$	-1	-1	1	1
$B2u$	1	1	-1	-1
Eu	$\begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 \\ -1 & 0 \end{pmatrix}$

D5h	$\hat{E}$	$\hat{\sigma}_h$	$\hat{C}_5$	$\hat{C}_5^2$
$A1'$	1	1	1	1
$A2'$	1	1	1	1
$E1'$	$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} \cos\frac{2\pi}{5} & -\sin\frac{2\pi}{5} \\ \sin\frac{2\pi}{5} & \cos\frac{2\pi}{5} \end{pmatrix}$	$\begin{pmatrix} -\cos\frac{\pi}{5} & -\sin\frac{\pi}{5} \\ \sin\frac{\pi}{5} & -\cos\frac{\pi}{5} \end{pmatrix}$
$E2'$	$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} -\cos\frac{\pi}{5} & -\sin\frac{\pi}{5} \\ \sin\frac{\pi}{5} & -\cos\frac{\pi}{5} \end{pmatrix}$	$\begin{pmatrix} \cos\frac{2\pi}{5} & \sin\frac{2\pi}{5} \\ -\sin\frac{2\pi}{5} & \cos\frac{2\pi}{5} \end{pmatrix}$
$A1''$	1	-1	1	1
$A2''$	1	-1	1	1
$E1''$	$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} \cos\frac{2\pi}{5} & -\sin\frac{2\pi}{5} \\ \sin\frac{2\pi}{5} & \cos\frac{2\pi}{5} \end{pmatrix}$	$\begin{pmatrix} -\cos\frac{\pi}{5} & -\sin\frac{\pi}{5} \\ \sin\frac{\pi}{5} & -\cos\frac{\pi}{5} \end{pmatrix}$
$E2''$	$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} -\cos\frac{\pi}{5} & -\sin\frac{\pi}{5} \\ \sin\frac{\pi}{5} & -\cos\frac{\pi}{5} \end{pmatrix}$	$\begin{pmatrix} \cos\frac{2\pi}{5} & \sin\frac{2\pi}{5} \\ -\sin\frac{2\pi}{5} & \cos\frac{2\pi}{5} \end{pmatrix}$

D5h	$\hat{C}_5^3$	$\hat{C}_5^4$	$\hat{C}_2'(1)$	$\hat{C}_2'(2)$
$A1'$	1	1	1	1
$A2'$	1	1	-1	-1
$E1'$	$\begin{pmatrix} -\cos\frac{\pi}{5} & \sin\frac{\pi}{5} \\ -\sin\frac{\pi}{5} & -\cos\frac{\pi}{5} \end{pmatrix}$	$\begin{pmatrix} \cos\frac{2\pi}{5} & \sin\frac{2\pi}{5} \\ -\sin\frac{2\pi}{5} & \cos\frac{2\pi}{5} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} -\cos\frac{\pi}{5} & \sin\frac{\pi}{5} \\ \sin\frac{\pi}{5} & \cos\frac{\pi}{5} \end{pmatrix}$
$E2'$	$\begin{pmatrix} \cos\frac{2\pi}{5} & -\sin\frac{2\pi}{5} \\ \sin\frac{2\pi}{5} & \cos\frac{2\pi}{5} \end{pmatrix}$	$\begin{pmatrix} -\cos\frac{\pi}{5} & \sin\frac{\pi}{5} \\ -\sin\frac{\pi}{5} & -\cos\frac{\pi}{5} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} \cos\frac{2\pi}{5} & -\sin\frac{2\pi}{5} \\ -\sin\frac{2\pi}{5} & -\cos\frac{2\pi}{5} \end{pmatrix}$
$A1''$	1	1	1	1
$A2''$	1	1	-1	-1
$E1''$	$\begin{pmatrix} -\cos\frac{\pi}{5} & \sin\frac{\pi}{5} \\ -\sin\frac{\pi}{5} & -\cos\frac{\pi}{5} \end{pmatrix}$	$\begin{pmatrix} \cos\frac{2\pi}{5} & \sin\frac{2\pi}{5} \\ -\sin\frac{2\pi}{5} & \cos\frac{2\pi}{5} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} -\cos\frac{\pi}{5} & \sin\frac{\pi}{5} \\ \sin\frac{\pi}{5} & \cos\frac{\pi}{5} \end{pmatrix}$
$E2''$	$\begin{pmatrix} \cos\frac{2\pi}{5} & -\sin\frac{2\pi}{5} \\ \sin\frac{2\pi}{5} & \cos\frac{2\pi}{5} \end{pmatrix}$	$\begin{pmatrix} -\cos\frac{\pi}{5} & \sin\frac{\pi}{5} \\ -\sin\frac{\pi}{5} & -\cos\frac{\pi}{5} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} \cos\frac{2\pi}{5} & -\sin\frac{2\pi}{5} \\ -\sin\frac{2\pi}{5} & -\cos\frac{2\pi}{5} \end{pmatrix}$

D5h	$\hat{C}_2'(3)$	$\hat{C}_2'(4)$	$\hat{C}_2'(5)$	$\hat{S}_5$
$A1'$	1	1	1	1
$A2'$	-1	-1	-1	1
$E1'$	$\begin{pmatrix}\cos\frac{2\pi}{5} & -\sin\frac{2\pi}{5}\\ -\sin\frac{2\pi}{5} & -\cos\frac{2\pi}{5}\end{pmatrix}$	$\begin{pmatrix}\cos\frac{2\pi}{5} & \sin\frac{2\pi}{5}\\ \sin\frac{2\pi}{5} & -\cos\frac{2\pi}{5}\end{pmatrix}$	$\begin{pmatrix}-\cos\frac{\pi}{5} & -\sin\frac{\pi}{5}\\ -\sin\frac{\pi}{5} & \cos\frac{\pi}{5}\end{pmatrix}$	$\begin{pmatrix}\cos\frac{2\pi}{5} & -\sin\frac{2\pi}{5}\\ \sin\frac{2\pi}{5} & \cos\frac{2\pi}{5}\end{pmatrix}$
$E2'$	$\begin{pmatrix}-\cos\frac{\pi}{5} & -\sin\frac{\pi}{5}\\ -\sin\frac{\pi}{5} & \cos\frac{\pi}{5}\end{pmatrix}$	$\begin{pmatrix}-\cos\frac{\pi}{5} & \sin\frac{\pi}{5}\\ \sin\frac{\pi}{5} & \cos\frac{\pi}{5}\end{pmatrix}$	$\begin{pmatrix}\cos\frac{2\pi}{5} & \sin\frac{2\pi}{5}\\ \sin\frac{2\pi}{5} & -\cos\frac{2\pi}{5}\end{pmatrix}$	$\begin{pmatrix}-\cos\frac{\pi}{5} & -\sin\frac{\pi}{5}\\ \sin\frac{\pi}{5} & -\cos\frac{\pi}{5}\end{pmatrix}$
$A1''$	1	1	1	-1
$A2''$	-1	-1	-1	-1
$E1''$	$\begin{pmatrix}\cos\frac{2\pi}{5} & -\sin\frac{2\pi}{5}\\ -\sin\frac{2\pi}{5} & -\cos\frac{2\pi}{5}\end{pmatrix}$	$\begin{pmatrix}\cos\frac{2\pi}{5} & \sin\frac{2\pi}{5}\\ \sin\frac{2\pi}{5} & -\cos\frac{2\pi}{5}\end{pmatrix}$	$\begin{pmatrix}-\cos\frac{\pi}{5} & -\sin\frac{\pi}{5}\\ -\sin\frac{\pi}{5} & \cos\frac{\pi}{5}\end{pmatrix}$	$\begin{pmatrix}-\cos\frac{2\pi}{5} & \sin\frac{2\pi}{5}\\ -\sin\frac{2\pi}{5} & -\cos\frac{2\pi}{5}\end{pmatrix}$
$E2''$	$\begin{pmatrix}-\cos\frac{\pi}{5} & -\sin\frac{\pi}{5}\\ -\sin\frac{\pi}{5} & \cos\frac{\pi}{5}\end{pmatrix}$	$\begin{pmatrix}-\cos\frac{\pi}{5} & \sin\frac{\pi}{5}\\ \sin\frac{\pi}{5} & \cos\frac{\pi}{5}\end{pmatrix}$	$\begin{pmatrix}\cos\frac{2\pi}{5} & \sin\frac{2\pi}{5}\\ \sin\frac{2\pi}{5} & -\cos\frac{2\pi}{5}\end{pmatrix}$	$\begin{pmatrix}\cos\frac{\pi}{5} & \sin\frac{\pi}{5}\\ -\sin\frac{\pi}{5} & \cos\frac{\pi}{5}\end{pmatrix}$

D5h	$\hat{S}_5^7$	$\hat{S}_5^3$	$\hat{S}_5^9$	$\hat{\sigma}_v(1)$
$A1'$	1	1	1	1
$A2'$	1	1	1	-1
$E1'$	$\begin{pmatrix}-\cos\frac{\pi}{5} & -\sin\frac{\pi}{5}\\ \sin\frac{\pi}{5} & -\cos\frac{\pi}{5}\end{pmatrix}$	$\begin{pmatrix}-\cos\frac{\pi}{5} & \sin\frac{\pi}{5}\\ -\sin\frac{\pi}{5} & -\cos\frac{\pi}{5}\end{pmatrix}$	$\begin{pmatrix}\cos\frac{2\pi}{5} & \sin\frac{2\pi}{5}\\ -\sin\frac{2\pi}{5} & \cos\frac{2\pi}{5}\end{pmatrix}$	$\begin{pmatrix}1 & 0\\ 0 & -1\end{pmatrix}$
$E2'$	$\begin{pmatrix}\cos\frac{2\pi}{5} & \sin\frac{2\pi}{5}\\ -\sin\frac{2\pi}{5} & \cos\frac{2\pi}{5}\end{pmatrix}$	$\begin{pmatrix}\cos\frac{2\pi}{5} & -\sin\frac{2\pi}{5}\\ \sin\frac{2\pi}{5} & \cos\frac{2\pi}{5}\end{pmatrix}$	$\begin{pmatrix}-\cos\frac{\pi}{5} & \sin\frac{\pi}{5}\\ -\sin\frac{\pi}{5} & -\cos\frac{\pi}{5}\end{pmatrix}$	$\begin{pmatrix}1 & 0\\ 0 & -1\end{pmatrix}$
$A1''$	-1	-1	-1	-1
$A2''$	-1	-1	-1	1
$E1''$	$\begin{pmatrix}\cos\frac{\pi}{5} & \sin\frac{\pi}{5}\\ -\sin\frac{\pi}{5} & \cos\frac{\pi}{5}\end{pmatrix}$	$\begin{pmatrix}\cos\frac{\pi}{5} & -\sin\frac{\pi}{5}\\ \sin\frac{\pi}{5} & \cos\frac{\pi}{5}\end{pmatrix}$	$\begin{pmatrix}-\cos\frac{2\pi}{5} & -\sin\frac{2\pi}{5}\\ \sin\frac{2\pi}{5} & -\cos\frac{2\pi}{5}\end{pmatrix}$	$\begin{pmatrix}-1 & 0\\ 0 & 1\end{pmatrix}$
$E2''$	$\begin{pmatrix}-\cos\frac{2\pi}{5} & -\sin\frac{2\pi}{5}\\ \sin\frac{2\pi}{5} & -\cos\frac{2\pi}{5}\end{pmatrix}$	$\begin{pmatrix}-\cos\frac{2\pi}{5} & \sin\frac{2\pi}{5}\\ -\sin\frac{2\pi}{5} & -\cos\frac{2\pi}{5}\end{pmatrix}$	$\begin{pmatrix}\cos\frac{\pi}{5} & -\sin\frac{\pi}{5}\\ \sin\frac{\pi}{5} & \cos\frac{\pi}{5}\end{pmatrix}$	$\begin{pmatrix}-1 & 0\\ 0 & 1\end{pmatrix}$

D5h	$\hat{\sigma}_v(2)$	$\hat{\sigma}_v(3)$	$\hat{\sigma}_v(4)$	$\hat{\sigma}_v(5)$
$A1'$	1	1	1	1
$A2'$	-1	-1	-1	-1
$E1'$	$\begin{pmatrix}-\cos\frac{\pi}{5} & \sin\frac{\pi}{5}\\ \sin\frac{\pi}{5} & \cos\frac{\pi}{5}\end{pmatrix}$	$\begin{pmatrix}\cos\frac{2\pi}{5} & -\sin\frac{2\pi}{5}\\ -\sin\frac{2\pi}{5} & -\cos\frac{2\pi}{5}\end{pmatrix}$	$\begin{pmatrix}\cos\frac{2\pi}{5} & \sin\frac{2\pi}{5}\\ \sin\frac{2\pi}{5} & -\cos\frac{2\pi}{5}\end{pmatrix}$	$\begin{pmatrix}-\cos\frac{\pi}{5} & -\sin\frac{\pi}{5}\\ -\sin\frac{\pi}{5} & \cos\frac{\pi}{5}\end{pmatrix}$
$E2'$	$\begin{pmatrix}\cos\frac{2\pi}{5} & -\sin\frac{2\pi}{5}\\ -\sin\frac{2\pi}{5} & -\cos\frac{2\pi}{5}\end{pmatrix}$	$\begin{pmatrix}-\cos\frac{\pi}{5} & -\sin\frac{\pi}{5}\\ -\sin\frac{\pi}{5} & \cos\frac{\pi}{5}\end{pmatrix}$	$\begin{pmatrix}-\cos\frac{\pi}{5} & \sin\frac{\pi}{5}\\ \sin\frac{\pi}{5} & \cos\frac{\pi}{5}\end{pmatrix}$	$\begin{pmatrix}\cos\frac{2\pi}{5} & \sin\frac{2\pi}{5}\\ \sin\frac{2\pi}{5} & -\cos\frac{2\pi}{5}\end{pmatrix}$
$A1''$	-1	-1	-1	-1
$A2''$	1	1	1	1
$E1''$	$\begin{pmatrix}\cos\frac{\pi}{5} & -\sin\frac{\pi}{5}\\ -\sin\frac{\pi}{5} & -\cos\frac{\pi}{5}\end{pmatrix}$	$\begin{pmatrix}-\cos\frac{2\pi}{5} & \sin\frac{2\pi}{5}\\ \sin\frac{2\pi}{5} & \cos\frac{2\pi}{5}\end{pmatrix}$	$\begin{pmatrix}-\cos\frac{2\pi}{5} & -\sin\frac{2\pi}{5}\\ -\sin\frac{2\pi}{5} & \cos\frac{2\pi}{5}\end{pmatrix}$	$\begin{pmatrix}\cos\frac{\pi}{5} & \sin\frac{\pi}{5}\\ \sin\frac{\pi}{5} & -\cos\frac{\pi}{5}\end{pmatrix}$
$E2''$	$\begin{pmatrix}-\cos\frac{2\pi}{5} & \sin\frac{2\pi}{5}\\ \sin\frac{2\pi}{5} & \cos\frac{2\pi}{5}\end{pmatrix}$	$\begin{pmatrix}\cos\frac{\pi}{5} & \sin\frac{\pi}{5}\\ \sin\frac{\pi}{5} & -\cos\frac{\pi}{5}\end{pmatrix}$	$\begin{pmatrix}\cos\frac{\pi}{5} & -\sin\frac{\pi}{5}\\ -\sin\frac{\pi}{5} & -\cos\frac{\pi}{5}\end{pmatrix}$	$\begin{pmatrix}-\cos\frac{2\pi}{5} & -\sin\frac{2\pi}{5}\\ -\sin\frac{2\pi}{5} & \cos\frac{2\pi}{5}\end{pmatrix}$

D6h	$\hat{E}$	$\hat{\sigma}_h$	$\hat{i}$	$\hat{C}_6$
$A1g$	1	1	1	1
$A2g$	1	1	1	1
$B1g$	1	-1	1	-1
$B2g$	1	-1	1	-1
$E1g$	$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} -\frac{1}{2} & -\frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$
$E2g$	$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & \frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$
$A1u$	1	-1	-1	1
$A2u$	1	-1	-1	1
$B1u$	1	1	-1	-1
$B2u$	1	1	-1	-1
$E1u$	$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} -\frac{1}{2} & -\frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$
$E2u$	$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & \frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$

D6h	$\hat{C}_3$	$\hat{C}_2$	$\hat{C}_3^2$	$\hat{C}_6^5$
$A1g$	1	1	1	1
$A2g$	1	1	1	1
$B1g$	1	-1	1	-1
$B2g$	1	-1	1	-1
$E1g$	$\begin{pmatrix} \frac{1}{2} & -\frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & \frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -\frac{1}{2} & \frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$
$E2g$	$\begin{pmatrix} \frac{1}{2} & -\frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & \frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & -\frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$
$A1u$	1	1	1	1
$A2u$	1	1	1	1
$B1u$	1	-1	1	-1
$B2u$	1	-1	1	-1
$E1u$	$\begin{pmatrix} \frac{1}{2} & -\frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & \frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -\frac{1}{2} & \frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$
$E2u$	$\begin{pmatrix} \frac{1}{2} & -\frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & \frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & -\frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$

D6h	$\hat{C}_2'(1)$	$\hat{C}_2'(2)$	$\hat{C}_2'(3)$	$\hat{C}_2''(1)$
$A1g$	1	1	1	1
$A2g$	-1	-1	-1	-1
$B1g$	1	1	1	-1
$B2g$	-1	-1	-1	1
$E1g$	$\begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & \frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & -\frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -\frac{1}{2} & \frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$
$E2g$	$\begin{pmatrix} -1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} -\frac{1}{2} & -\frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -\frac{1}{2} & \frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -\frac{1}{2} & \frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$
$A1u$	1	1	1	1
$A2u$	-1	-1	-1	-1
$B1u$	1	1	1	-1
$B2u$	-1	-1	-1	1
$E1u$	$\begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & \frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & -\frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -\frac{1}{2} & \frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$
$E2u$	$\begin{pmatrix} -1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} -\frac{1}{2} & -\frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -\frac{1}{2} & \frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -\frac{1}{2} & \frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$

D6h	$\hat{C}_2''(2)$	$\hat{C}_2''(3)$	$\hat{S}_6$	$\hat{S}_3$
$A1g$	1	1	1	1
$A2g$	-1	-1	1	1
$B1g$	-1	-1	1	-1
$B2g$	1	1	1	-1
$E1g$	$\begin{pmatrix} -1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} -\frac{1}{2} & -\frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & \frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -\frac{1}{2} & \frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$
$E2g$	$\begin{pmatrix} -1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} -\frac{1}{2} & -\frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & \frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & -\frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$
$A1u$	1	1	-1	-1
$A2u$	-1	-1	-1	-1
$B1u$	-1	-1	-1	1
$B2u$	1	1	-1	1
$E1u$	$\begin{pmatrix} -1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} -\frac{1}{2} & -\frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -\frac{1}{2} & -\frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & -\frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$
$E2u$	$\begin{pmatrix} -1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} -\frac{1}{2} & -\frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -\frac{1}{2} & -\frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -\frac{1}{2} & \frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$

D6h	$\hat{S}_3^5$	$\hat{S}_6^5$	$\hat{\sigma}_v(1)$	$\hat{\sigma}_v(2)$
$A1g$	1	1	1	1
$A2g$	1	1	-1	-1
$B1g$	-1	1	-1	-1
$B2g$	-1	1	1	1
$E1g$	$\begin{pmatrix} -\frac{1}{2} & -\frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & -\frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} -\frac{1}{2} & -\frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$
$E2g$	$\begin{pmatrix} \frac{1}{2} & \frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & -\frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} -\frac{1}{2} & -\frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$
$A1u$	-1	-1	-1	-1
$A2u$	-1	-1	1	1
$B1u$	1	-1	1	1
$B2u$	1	-1	-1	-1
$E1u$	$\begin{pmatrix} \frac{1}{2} & \frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -\frac{1}{2} & \frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & \frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$
$E2u$	$\begin{pmatrix} -\frac{1}{2} & -\frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -\frac{1}{2} & \frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & \frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$

D6h	$\hat{\sigma}_v(3)$	$\hat{\sigma}_d(1)$	$\hat{\sigma}_d(2)$	$\hat{\sigma}_d(3)$
$A1g$	1	1	1	1
$A2g$	-1	-1	-1	-1
$B1g$	-1	1	1	1
$B2g$	1	-1	-1	-1
$E1g$	$\begin{pmatrix} -\frac{1}{2} & \frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & -\frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & \frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$
$E2g$	$\begin{pmatrix} -\frac{1}{2} & \frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -\frac{1}{2} & \frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} -\frac{1}{2} & -\frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$
$A1u$	-1	-1	-1	-1
$A2u$	1	1	1	1
$B1u$	1	-1	-1	-1
$B2u$	-1	1	1	1
$E1u$	$\begin{pmatrix} \frac{1}{2} & -\frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -\frac{1}{2} & \frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} -\frac{1}{2} & -\frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$
$E2u$	$\begin{pmatrix} \frac{1}{2} & -\frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & -\frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & \frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$

D8h	$\hat{E}$	$\hat{\sigma}_h$	$\hat{i}$	$\hat{C}_8$
$A1g$	1	1	1	1
$A2g$	1	1	1	1
$B1g$	1	1	1	-1
$B2g$	1	1	1	-1
$E1g$	$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} \frac{\sqrt{2}}{2} & -\frac{\sqrt{2}}{2} \\ \frac{\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \end{pmatrix}$
$E2g$	$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 \\ 1 & 0 \end{pmatrix}$
$E3g$	$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} -\frac{\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \\ -\frac{\sqrt{2}}{2} & -\frac{\sqrt{2}}{2} \end{pmatrix}$
$A1u$	1	-1	-1	1
$A2u$	1	-1	-1	1
$B1u$	1	-1	-1	-1
$B2u$	1	-1	-1	-1
$E1u$	$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} \frac{\sqrt{2}}{2} & -\frac{\sqrt{2}}{2} \\ \frac{\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \end{pmatrix}$
$E2u$	$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 \\ 1 & 0 \end{pmatrix}$
$E3u$	$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} -\frac{\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \\ -\frac{\sqrt{2}}{2} & -\frac{\sqrt{2}}{2} \end{pmatrix}$

D8h	$\hat{C}_4$	$\hat{C}_8^3$	$\hat{C}_2$	$\hat{C}_8^5$
$A1g$	1	1	1	1
$A2g$	1	1	1	1
$B1g$	1	-1	1	-1
$B2g$	1	-1	1	-1
$E1g$	$\begin{pmatrix} 0 & -1 \\ 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -\frac{\sqrt{2}}{2} & -\frac{\sqrt{2}}{2} \\ \frac{\sqrt{2}}{2} & -\frac{\sqrt{2}}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} -\frac{\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \\ -\frac{\sqrt{2}}{2} & -\frac{\sqrt{2}}{2} \end{pmatrix}$
$E2g$	$\begin{pmatrix} -1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 \\ -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 \\ 1 & 0 \end{pmatrix}$
$E3g$	$\begin{pmatrix} 0 & -1 \\ 1 & 0 \end{pmatrix}$	$\begin{pmatrix} \frac{\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \\ -\frac{\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} \frac{\sqrt{2}}{2} & -\frac{\sqrt{2}}{2} \\ \frac{\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \end{pmatrix}$
$A1u$	1	1	1	1
$A2u$	1	1	1	1
$B1u$	1	-1	1	-1
$B2u$	1	-1	1	-1
$E1u$	$\begin{pmatrix} 0 & -1 \\ 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -\frac{\sqrt{2}}{2} & -\frac{\sqrt{2}}{2} \\ \frac{\sqrt{2}}{2} & -\frac{\sqrt{2}}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} -\frac{\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \\ -\frac{\sqrt{2}}{2} & -\frac{\sqrt{2}}{2} \end{pmatrix}$
$E2u$	$\begin{pmatrix} -1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 \\ -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 \\ 1 & 0 \end{pmatrix}$
$E3u$	$\begin{pmatrix} 0 & -1 \\ 1 & 0 \end{pmatrix}$	$\begin{pmatrix} \frac{\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \\ -\frac{\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} \frac{\sqrt{2}}{2} & -\frac{\sqrt{2}}{2} \\ \frac{\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \end{pmatrix}$

D8h	$\hat{C}_4^3$	$\hat{C}_8^7$	$\hat{C}_2'(1)$	$\hat{C}_2'(2)$
$A1g$	1	1	1	1
$A2g$	1	1	-1	-1
$B1g$	1	-1	1	1
$B2g$	1	-1	-1	-1
$E1g$	$\begin{pmatrix} 0 & 1 \\ -1 & 0 \end{pmatrix}$	$\begin{pmatrix} \frac{\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \\ -\frac{\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix}$
$E2g$	$\begin{pmatrix} -1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 \\ -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 \\ 0 & 1 \end{pmatrix}$
$E3g$	$\begin{pmatrix} 0 & 1 \\ -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -\frac{\sqrt{2}}{2} & -\frac{\sqrt{2}}{2} \\ \frac{\sqrt{2}}{2} & -\frac{\sqrt{2}}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 \\ -1 & 0 \end{pmatrix}$
$A1u$	1	1	1	1
$A2u$	1	1	-1	-1
$B1u$	1	-1	1	1
$B2u$	1	-1	-1	-1
$E1u$	$\begin{pmatrix} 0 & 1 \\ -1 & 0 \end{pmatrix}$	$\begin{pmatrix} \frac{\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \\ -\frac{\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix}$
$E2u$	$\begin{pmatrix} -1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 \\ -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 \\ 0 & 1 \end{pmatrix}$
$E3u$	$\begin{pmatrix} 0 & 1 \\ -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -\frac{\sqrt{2}}{2} & -\frac{\sqrt{2}}{2} \\ \frac{\sqrt{2}}{2} & -\frac{\sqrt{2}}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 \\ -1 & 0 \end{pmatrix}$

D8h	$\hat{C}_2'(3)$	$\hat{C}_2'(4)$	$\hat{C}_2''(1)$	$\hat{C}_2''(2)$
$A1g$	1	1	1	1
$A2g$	-1	-1	-1	-1
$B1g$	1	1	-1	-1
$B2g$	-1	-1	1	1
$E1g$	$\begin{pmatrix} -1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 \\ -1 & 0 \end{pmatrix}$	$\begin{pmatrix} \frac{\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \\ \frac{\sqrt{2}}{2} & -\frac{\sqrt{2}}{2} \end{pmatrix}$	$\begin{pmatrix} -\frac{\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \\ \frac{\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \end{pmatrix}$
$E2g$	$\begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 \\ -1 & 0 \end{pmatrix}$
$E3g$	$\begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix}$	$\begin{pmatrix} \frac{\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \\ \frac{\sqrt{2}}{2} & -\frac{\sqrt{2}}{2} \end{pmatrix}$	$\begin{pmatrix} -\frac{\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \\ \frac{\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \end{pmatrix}$
$A1u$	1	1	1	1
$A2u$	-1	-1	-1	-1
$B1u$	1	1	-1	-1
$B2u$	-1	-1	1	1
$E1u$	$\begin{pmatrix} -1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 \\ -1 & 0 \end{pmatrix}$	$\begin{pmatrix} \frac{\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \\ \frac{\sqrt{2}}{2} & -\frac{\sqrt{2}}{2} \end{pmatrix}$	$\begin{pmatrix} -\frac{\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \\ \frac{\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \end{pmatrix}$
$E2u$	$\begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 \\ -1 & 0 \end{pmatrix}$
$E3u$	$\begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix}$	$\begin{pmatrix} \frac{\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \\ \frac{\sqrt{2}}{2} & -\frac{\sqrt{2}}{2} \end{pmatrix}$	$\begin{pmatrix} -\frac{\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \\ \frac{\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \end{pmatrix}$

D8h	$\hat{C}_2''(3)$	$\hat{C}_2''(4)$	$\hat{S}_8$	$\hat{S}_4$
$A1g$	1	1	1	1
$A2g$	-1	-1	1	1
$B1g$	-1	-1	-1	1
$B2g$	1	1	-1	1
$E1g$	$\begin{pmatrix} -\frac{\sqrt{2}}{2} & -\frac{\sqrt{2}}{2} \\ -\frac{\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{\sqrt{2}}{2} & -\frac{\sqrt{2}}{2} \\ -\frac{\sqrt{2}}{2} & -\frac{\sqrt{2}}{2} \end{pmatrix}$	$\begin{pmatrix} -\frac{\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \\ -\frac{\sqrt{2}}{2} & -\frac{\sqrt{2}}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 \\ -1 & 0 \end{pmatrix}$
$E2g$	$\begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 \\ -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 \\ 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 \\ 0 & -1 \end{pmatrix}$
$E3g$	$\begin{pmatrix} -\frac{\sqrt{2}}{2} & -\frac{\sqrt{2}}{2} \\ -\frac{\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{\sqrt{2}}{2} & -\frac{\sqrt{2}}{2} \\ -\frac{\sqrt{2}}{2} & -\frac{\sqrt{2}}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{\sqrt{2}}{2} & -\frac{\sqrt{2}}{2} \\ \frac{\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 \\ -1 & 0 \end{pmatrix}$
$A1u$	1	1	-1	-1
$A2u$	-1	-1	-1	-1
$B1u$	-1	-1	1	-1
$B2u$	1	1	1	-1
$E1u$	$\begin{pmatrix} -\frac{\sqrt{2}}{2} & -\frac{\sqrt{2}}{2} \\ -\frac{\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{\sqrt{2}}{2} & -\frac{\sqrt{2}}{2} \\ -\frac{\sqrt{2}}{2} & -\frac{\sqrt{2}}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{\sqrt{2}}{2} & -\frac{\sqrt{2}}{2} \\ \frac{\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 \\ 1 & 0 \end{pmatrix}$
$E2u$	$\begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 \\ -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 \\ -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$
$E3u$	$\begin{pmatrix} -\frac{\sqrt{2}}{2} & -\frac{\sqrt{2}}{2} \\ -\frac{\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{\sqrt{2}}{2} & -\frac{\sqrt{2}}{2} \\ -\frac{\sqrt{2}}{2} & -\frac{\sqrt{2}}{2} \end{pmatrix}$	$\begin{pmatrix} -\frac{\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \\ -\frac{\sqrt{2}}{2} & -\frac{\sqrt{2}}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 \\ 1 & 0 \end{pmatrix}$

D8h	$\hat{S}_8^3$	$\hat{S}_8^5$	$\hat{S}_4^3$	$\hat{S}_8^7$
$A1g$	1	1	1	1
$A2g$	1	1	1	1
$B1g$	-1	-1	1	-1
$B2g$	-1	-1	1	-1
$E1g$	$\begin{pmatrix} \frac{\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \\ -\frac{\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{\sqrt{2}}{2} & -\frac{\sqrt{2}}{2} \\ \frac{\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 \\ 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -\frac{\sqrt{2}}{2} & -\frac{\sqrt{2}}{2} \\ \frac{\sqrt{2}}{2} & -\frac{\sqrt{2}}{2} \end{pmatrix}$
$E2g$	$\begin{pmatrix} 0 & 1 \\ -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 \\ 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 \\ -1 & 0 \end{pmatrix}$
$E3g$	$\begin{pmatrix} -\frac{\sqrt{2}}{2} & -\frac{\sqrt{2}}{2} \\ \frac{\sqrt{2}}{2} & -\frac{\sqrt{2}}{2} \end{pmatrix}$	$\begin{pmatrix} -\frac{\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \\ -\frac{\sqrt{2}}{2} & -\frac{\sqrt{2}}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & -1 \\ 1 & 0 \end{pmatrix}$	$\begin{pmatrix} \frac{\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \\ -\frac{\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \end{pmatrix}$
$A1u$	-1	-1	-1	-1
$A2u$	-1	-1	-1	-1
$B1u$	1	1	-1	1
$B2u$	1	1	-1	1
$E1u$	$\begin{pmatrix} -\frac{\sqrt{2}}{2} & -\frac{\sqrt{2}}{2} \\ \frac{\sqrt{2}}{2} & -\frac{\sqrt{2}}{2} \end{pmatrix}$	$\begin{pmatrix} -\frac{\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \\ -\frac{\sqrt{2}}{2} & -\frac{\sqrt{2}}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 \\ -1 & 0 \end{pmatrix}$	$\begin{pmatrix} \frac{\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \\ -\frac{\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \end{pmatrix}$
$E2u$	$\begin{pmatrix} 0 & -1 \\ 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 \\ -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 \\ 1 & 0 \end{pmatrix}$
$E3u$	$\begin{pmatrix} \frac{\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \\ -\frac{\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{\sqrt{2}}{2} & -\frac{\sqrt{2}}{2} \\ \frac{\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \end{pmatrix}$	$\begin{pmatrix} 0 & 1 \\ -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -\frac{\sqrt{2}}{2} & -\frac{\sqrt{2}}{2} \\ \frac{\sqrt{2}}{2} & -\frac{\sqrt{2}}{2} \end{pmatrix}$

D8h	$\hat{\sigma}_v(1)$	$\hat{\sigma}_v(2)$	$\hat{\sigma}_v(3)$	$\hat{\sigma}_v(4)$
$A1g$	1	1	1	1
$A2g$	-1	-1	-1	-1
$B1g$	1	1	1	1
$B2g$	-1	-1	-1	-1
$E1g$	$\begin{pmatrix} -1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 \\ -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix}$
$E2g$	$\begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 \\ 0 & 1 \end{pmatrix}$
$E3g$	$\begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 \\ -1 & 0 \end{pmatrix}$
$A1u$	-1	-1	-1	-1
$A2u$	1	1	1	1
$B1u$	-1	-1	-1	-1
$B2u$	1	1	1	1
$E1u$	$\begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 \\ -1 & 0 \end{pmatrix}$
$E2u$	$\begin{pmatrix} -1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$
$E3u$	$\begin{pmatrix} -1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 \\ -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix}$

D8h	$\hat{\sigma}_d(1)$	$\hat{\sigma}_d(2)$	$\hat{\sigma}_d(3)$	$\hat{\sigma}_d(4)$
$A1g$	1	1	1	1
$A2g$	-1	-1	-1	-1
$B1g$	-1	-1	-1	-1
$B2g$	1	1	1	1
$E1g$	$\begin{pmatrix} -\frac{\sqrt{2}}{2} & -\frac{\sqrt{2}}{2} \\ -\frac{\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{\sqrt{2}}{2} & -\frac{\sqrt{2}}{2} \\ -\frac{\sqrt{2}}{2} & -\frac{\sqrt{2}}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \\ \frac{\sqrt{2}}{2} & -\frac{\sqrt{2}}{2} \end{pmatrix}$	$\begin{pmatrix} -\frac{\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \\ \frac{\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \end{pmatrix}$
$E2g$	$\begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 \\ -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 \\ -1 & 0 \end{pmatrix}$
$E3g$	$\begin{pmatrix} -\frac{\sqrt{2}}{2} & -\frac{\sqrt{2}}{2} \\ -\frac{\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{\sqrt{2}}{2} & -\frac{\sqrt{2}}{2} \\ -\frac{\sqrt{2}}{2} & -\frac{\sqrt{2}}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \\ \frac{\sqrt{2}}{2} & -\frac{\sqrt{2}}{2} \end{pmatrix}$	$\begin{pmatrix} -\frac{\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \\ \frac{\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \end{pmatrix}$
$A1u$	-1	-1	-1	-1
$A2u$	1	1	1	1
$B1u$	1	1	1	1
$B2u$	-1	-1	-1	-1
$E1u$	$\begin{pmatrix} \frac{\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \\ \frac{\sqrt{2}}{2} & -\frac{\sqrt{2}}{2} \end{pmatrix}$	$\begin{pmatrix} -\frac{\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \\ \frac{\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \end{pmatrix}$	$\begin{pmatrix} -\frac{\sqrt{2}}{2} & -\frac{\sqrt{2}}{2} \\ -\frac{\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{\sqrt{2}}{2} & -\frac{\sqrt{2}}{2} \\ -\frac{\sqrt{2}}{2} & -\frac{\sqrt{2}}{2} \end{pmatrix}$
$E2u$	$\begin{pmatrix} 0 & -1 \\ -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 \\ -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix}$
$E3u$	$\begin{pmatrix} \frac{\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \\ \frac{\sqrt{2}}{2} & -\frac{\sqrt{2}}{2} \end{pmatrix}$	$\begin{pmatrix} -\frac{\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \\ \frac{\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \end{pmatrix}$	$\begin{pmatrix} -\frac{\sqrt{2}}{2} & -\frac{\sqrt{2}}{2} \\ -\frac{\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{\sqrt{2}}{2} & -\frac{\sqrt{2}}{2} \\ -\frac{\sqrt{2}}{2} & -\frac{\sqrt{2}}{2} \end{pmatrix}$

T	$\hat{E}$	$\hat{C}_3(\alpha)$	$\hat{C}_3^2(\alpha)$	$\hat{C}_3(\beta)$	$\hat{C}_3^2(\beta)$
A	1	1	1	1	1
E_1	1	ε_3	ε_3^*	ε_3	ε_3^*
E_2	1	ε_3^*	ε_3	ε_3^*	ε_3
T	$\begin{pmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 \\ 1 & 0 & 0 \\ 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 \\ 0 & 0 & 1 \\ 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 \\ -1 & 0 & 0 \\ 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 \\ 0 & 0 & -1 \\ 1 & 0 & 0 \end{pmatrix}$

T	$\hat{C}_3(\gamma)$	$\hat{C}_3^2(\gamma)$	$\hat{C}_3(\delta)$	$\hat{C}_3^2(\delta)$	$\hat{C}_2(x)$
A	1	1	1	1	1
E_1	ε_3	ε_3^*	ε_3	ε_3^*	1
E_2	ε_3^*	ε_3	ε_3^*	ε_3	1
T	$\begin{pmatrix} 0 & 0 & -1 \\ 1 & 0 & 0 \\ 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 \\ 0 & 0 & -1 \\ -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 \\ -1 & 0 & 0 \\ 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 \\ 0 & 0 & 1 \\ -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 \\ 0 & -1 & 0 \\ 0 & 0 & -1 \end{pmatrix}$

$\mathbf{T}$	$\hat{C}_2(y)$	$\hat{C}_2(z)$
A	1	1
E_1	1	1
E_2	1	1
T	$\begin{pmatrix} -1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & -1 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 \\ 0 & -1 & 0 \\ 0 & 0 & 1 \end{pmatrix}$

$\mathbf{Th}$	$\hat{E}$	$\hat{C}_3(\alpha)$	$\hat{C}_3^2(\alpha)$	$\hat{C}_3(\beta)$	$\hat{C}_3^2(\beta)$
Ag	1	1	1	1	1
$Eg1$	1	ε_3	ε_3^*	ε_3	ε_3^*
$Eg2$	1	ε_3^*	ε_3	ε_3^*	ε_3
Tg	$\begin{pmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 \\ 1 & 0 & 0 \\ 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 \\ 0 & 0 & 1 \\ 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 \\ -1 & 0 & 0 \\ 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 \\ 0 & 0 & -1 \\ 1 & 0 & 0 \end{pmatrix}$
Au	1	1	1	1	1
$Eu1$	1	ε_3	ε_3^*	ε_3	ε_3^*
$Eu2$	1	ε_3^*	ε_3	ε_3^*	ε_3
Tu	$\begin{pmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 \\ 1 & 0 & 0 \\ 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 \\ 0 & 0 & 1 \\ 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 \\ -1 & 0 & 0 \\ 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 \\ 0 & 0 & -1 \\ 1 & 0 & 0 \end{pmatrix}$

$\mathbf{Th}$	$\hat{C}_3(\gamma)$	$\hat{C}_3^2(\gamma)$	$\hat{C}_3(\delta)$	$\hat{C}_3^2(\delta)$	$\hat{C}_2(x)$
Ag	1	1	1	1	1
$Eg1$	ε_3	ε_3^*	ε_3	ε_3^*	1
$Eg2$	ε_3^*	ε_3	ε_3^*	ε_3	1
Tg	$\begin{pmatrix} 0 & 0 & -1 \\ 1 & 0 & 0 \\ 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 \\ 0 & 0 & -1 \\ -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 \\ -1 & 0 & 0 \\ 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 \\ 0 & 0 & 1 \\ -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 \\ 0 & -1 & 0 \\ 0 & 0 & -1 \end{pmatrix}$
Au	1	1	1	1	1
$Eu1$	ε_3	ε_3^*	ε_3	ε_3^*	1
$Eu2$	ε_3^*	ε_3	ε_3^*	ε_3	1
Tu	$\begin{pmatrix} 0 & 0 & -1 \\ 1 & 0 & 0 \\ 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 \\ 0 & 0 & -1 \\ -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 \\ -1 & 0 & 0 \\ 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 \\ 0 & 0 & 1 \\ -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 \\ 0 & -1 & 0 \\ 0 & 0 & -1 \end{pmatrix}$

Th	$\hat{C}_2(y)$	$\hat{C}_2(z)$	$\hat{i}$	$\hat{S}_6(\alpha)$	$\hat{S}_6^5(\alpha)$
Ag	1	1	1	1	1
$Eg1$	1	1	1	ε_3^*	ε_3
$Eg2$	1	1	1	ε_3	ε_3^*
Tg	$\begin{pmatrix} -1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & -1 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 \\ 0 & -1 & 0 \\ 0 & 0 & 1 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 \\ 0 & 0 & 1 \\ 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 \\ 1 & 0 & 0 \\ 0 & 1 & 0 \end{pmatrix}$
Au	1	1	-1	-1	-1
$Eu1$	1	1	-1	ε_6	ε_6^*
$Eu2$	1	1	-1	ε_6^*	ε_6
Tu	$\begin{pmatrix} -1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & -1 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 \\ 0 & -1 & 0 \\ 0 & 0 & 1 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 \\ 0 & -1 & 0 \\ 0 & 0 & -1 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 \\ 0 & 0 & -1 \\ -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 \\ -1 & 0 & 0 \\ 0 & -1 & 0 \end{pmatrix}$

Th	$\hat{S}_6(\beta)$	$\hat{S}_6^5(\beta)$	$\hat{S}_6(\gamma)$	$\hat{S}_6^5(\gamma)$	$\hat{S}_6(\delta)$
Ag	1	1	1	1	1
$Eg1$	ε_3^*	ε_3	ε_3^*	ε_3	ε_3^*
$Eg2$	ε_3	ε_3^*	ε_3	ε_3^*	ε_3
Tg	$\begin{pmatrix} 0 & -1 & 0 \\ 0 & 0 & -1 \\ 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 \\ -1 & 0 & 0 \\ 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 \\ 0 & 0 & -1 \\ -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 \\ 1 & 0 & 0 \\ 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 \\ 0 & 0 & 1 \\ -1 & 0 & 0 \end{pmatrix}$
Au	-1	-1	-1	-1	-1
$Eu1$	ε_6	ε_6^*	ε_6	ε_6^*	ε_6
$Eu2$	ε_6^*	ε_6	ε_6^*	ε_6	ε_6^*
Tu	$\begin{pmatrix} 0 & 1 & 0 \\ 0 & 0 & 1 \\ -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 \\ 1 & 0 & 0 \\ 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 \\ 0 & 0 & 1 \\ 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 \\ -1 & 0 & 0 \\ 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 \\ 0 & 0 & -1 \\ 1 & 0 & 0 \end{pmatrix}$

Th	$\hat{S}_6^5(\delta)$	$\hat{\sigma}_h(x)$	$\hat{\sigma}_h(y)$	$\hat{\sigma}_h(z)$
Ag	1	1	1	1
$Eg1$	ε_3	1	1	1
$Eg2$	ε_3^*	1	1	1
Tg	$\begin{pmatrix} 0 & 0 & -1 \\ -1 & 0 & 0 \\ 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 \\ 0 & -1 & 0 \\ 0 & 0 & -1 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & -1 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 \\ 0 & -1 & 0 \\ 0 & 0 & 1 \end{pmatrix}$
Au	-1	-1	-1	-1
$Eu1$	ε_6^*	-1	-1	-1
$Eu2$	ε_6	-1	-1	-1
Tu	$\begin{pmatrix} 0 & 0 & 1 \\ 1 & 0 & 0 \\ 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 \\ 0 & -1 & 0 \\ 0 & 0 & 1 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & -1 \end{pmatrix}$

Table 1

Td	$\hat{E}$	$\hat{C}_3(\alpha)$	$\hat{C}_3^2(\alpha)$	$\hat{C}_3(\beta)$	$\hat{C}_3^2(\beta)$
$A1$	1	1	1	1	1
$A2$	1	1	1	1	1
E	$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & -\frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & \frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & -\frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & \frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$
$T1$	$\begin{pmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 \\ 1 & 0 & 0 \\ 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 \\ 0 & 0 & 1 \\ 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 \\ -1 & 0 & 0 \\ 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 \\ 0 & 0 & -1 \\ 1 & 0 & 0 \end{pmatrix}$
$T2$	$\begin{pmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 \\ 1 & 0 & 0 \\ 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 \\ 0 & 0 & 1 \\ 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 \\ -1 & 0 & 0 \\ 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 \\ 0 & 0 & -1 \\ 1 & 0 & 0 \end{pmatrix}$

Table 2

Td	$\hat{C}_3(\gamma)$	$\hat{C}_3^2(\gamma)$	$\hat{C}_3(\delta)$	$\hat{C}_3^2(\delta)$	$\hat{C}_2(x)$
$A1$	1	1	1	1	1
$A2$	1	1	1	1	1
E	$\begin{pmatrix} \frac{1}{2} & -\frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & \frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & -\frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & \frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$
$T1$	$\begin{pmatrix} 0 & 0 & -1 \\ 1 & 0 & 0 \\ 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 \\ 0 & 0 & -1 \\ -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 \\ -1 & 0 & 0 \\ 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 \\ 0 & 0 & 1 \\ -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 \\ 0 & -1 & 0 \\ 0 & 0 & -1 \end{pmatrix}$
$T2$	$\begin{pmatrix} 0 & 0 & -1 \\ 1 & 0 & 0 \\ 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 \\ 0 & 0 & -1 \\ -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 \\ -1 & 0 & 0 \\ 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 \\ 0 & 0 & 1 \\ -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 \\ 0 & -1 & 0 \\ 0 & 0 & -1 \end{pmatrix}$

Table 3

Td	$\hat{C}_2(y)$	$\hat{C}_2(z)$	$\hat{\sigma}_d(xyp)$	$\hat{\sigma}_d(xym)$	$\hat{\sigma}_d(xzp)$
$A1$	1	1	1	1	1
$A2$	1	1	-1	-1	-1
E	$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & \frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$
$T1$	$\begin{pmatrix} -1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & -1 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 \\ 0 & -1 & 0 \\ 0 & 0 & 1 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 \\ 1 & 0 & 0 \\ 0 & 0 & -1 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 \\ -1 & 0 & 0 \\ 0 & 0 & -1 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 \\ 0 & -1 & 0 \\ 1 & 0 & 0 \end{pmatrix}$
$T2$	$\begin{pmatrix} -1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & -1 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 \\ 0 & -1 & 0 \\ 0 & 0 & 1 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 \\ -1 & 0 & 0 \\ 0 & 0 & 1 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 \\ 1 & 0 & 0 \\ 0 & 0 & 1 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 \\ 0 & 1 & 0 \\ -1 & 0 & 0 \end{pmatrix}$

Td	$\hat{\sigma}_d(xzm)$	$\hat{\sigma}_d(yzp)$	$\hat{\sigma}_d(yzm)$	$\hat{S}_4(x)$	$\hat{S}_4^3(x)$
$A1$	1	1	1	1	1
$A2$	-1	-1	-1	-1	-1
E	$\begin{pmatrix} \frac{1}{2} & \frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & -\frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & -\frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & -\frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & -\frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$
$T1$	$\begin{pmatrix} 0 & 0 & -1 \\ 0 & -1 & 0 \\ -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 \\ 0 & 0 & 1 \\ 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 \\ 0 & 0 & -1 \\ 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 \\ 0 & 0 & 1 \\ 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 \\ 0 & 0 & -1 \\ 0 & 1 & 0 \end{pmatrix}$
$T2$	$\begin{pmatrix} 0 & 0 & 1 \\ 0 & 1 & 0 \\ 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 \\ 0 & 0 & -1 \\ 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 \\ 0 & 0 & 1 \\ 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 \\ 0 & 0 & -1 \\ 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 \\ 0 & 0 & 1 \\ 0 & -1 & 0 \end{pmatrix}$

Td	$\hat{S}_4(y)$	$\hat{S}_4^3(y)$	$\hat{S}_4(z)$	$\hat{S}_4^3(z)$
$A1$	1	1	1	1
$A2$	-1	-1	-1	-1
E	$\begin{pmatrix} \frac{1}{2} & \frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & \frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$
$T1$	$\begin{pmatrix} 0 & 0 & -1 \\ 0 & 1 & 0 \\ 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 \\ 0 & 1 & 0 \\ -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 \\ -1 & 0 & 0 \\ 0 & 0 & 1 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 \\ 1 & 0 & 0 \\ 0 & 0 & 1 \end{pmatrix}$
$T2$	$\begin{pmatrix} 0 & 0 & 1 \\ 0 & -1 & 0 \\ -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 \\ 0 & -1 & 0 \\ 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 \\ 1 & 0 & 0 \\ 0 & 0 & -1 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 \\ -1 & 0 & 0 \\ 0 & 0 & -1 \end{pmatrix}$

O	$\hat{E}$	$\hat{C}_4(x)$	$\hat{C}_2(x)$	$\hat{C}_4^3(x)$	$\hat{C}_4(y)$
$A1$	1	1	1	1	1
$A2$	1	-1	1	-1	-1
E	$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & -\frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & -\frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & \frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$
$T1$	$\begin{pmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 \\ 0 & 0 & -1 \\ 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 \\ 0 & -1 & 0 \\ 0 & 0 & -1 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 \\ 0 & 0 & 1 \\ 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 \\ 0 & 1 & 0 \\ -1 & 0 & 0 \end{pmatrix}$
$T2$	$\begin{pmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 \\ 0 & 0 & 1 \\ 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 \\ 0 & -1 & 0 \\ 0 & 0 & -1 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 \\ 0 & 0 & -1 \\ 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 \\ 0 & -1 & 0 \\ 1 & 0 & 0 \end{pmatrix}$

$\mathbf{O}$	$\hat{C}_2(y)$	$\hat{C}_4^3(y)$	$\hat{C}_4(z)$	$\hat{C}_2(z)$	$\hat{C}_4^3(z)$
$A1$	1	1	1	1	1
$A2$	1	-1	-1	1	-1
E	$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & \frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$
$T1$	$\begin{pmatrix} -1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & -1 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 \\ 0 & 1 & 0 \\ 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 \\ 1 & 0 & 0 \\ 0 & 0 & 1 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 \\ 0 & -1 & 0 \\ 0 & 0 & 1 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 \\ -1 & 0 & 0 \\ 0 & 0 & 1 \end{pmatrix}$
$T2$	$\begin{pmatrix} -1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & -1 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 \\ 0 & -1 & 0 \\ -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 \\ -1 & 0 & 0 \\ 0 & 0 & -1 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 \\ 0 & -1 & 0 \\ 0 & 0 & 1 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 \\ 1 & 0 & 0 \\ 0 & 0 & -1 \end{pmatrix}$

$\mathbf{O}$	$\hat{C}_3(\alpha)$	$\hat{C}_3^2(\alpha)$	$\hat{C}_3(\beta)$	$\hat{C}_3^2(\beta)$	$\hat{C}_3(\gamma)$
$A1$	1	1	1	1	1
$A2$	1	1	1	1	1
E	$\begin{pmatrix} \frac{1}{2} & -\frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & \frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & \frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & -\frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & \frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$
$T1$	$\begin{pmatrix} 0 & 0 & 1 \\ 1 & 0 & 0 \\ 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 \\ 0 & 0 & 1 \\ 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 \\ 0 & 0 & -1 \\ 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 \\ -1 & 0 & 0 \\ 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 \\ 0 & 0 & -1 \\ -1 & 0 & 0 \end{pmatrix}$
$T2$	$\begin{pmatrix} 0 & 0 & 1 \\ 1 & 0 & 0 \\ 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 \\ 0 & 0 & 1 \\ 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 \\ 0 & 0 & -1 \\ 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 \\ -1 & 0 & 0 \\ 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 \\ 0 & 0 & -1 \\ -1 & 0 & 0 \end{pmatrix}$

$\mathbf{O}$	$\hat{C}_3^2(\gamma)$	$\hat{C}_3(\delta)$	$\hat{C}_3^2(\delta)$	$\hat{C}_2(xzp)$	$\hat{C}_2(xzm)$
$A1$	1	1	1	1	1
$A2$	1	1	1	-1	-1
E	$\begin{pmatrix} \frac{1}{2} & -\frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & -\frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & \frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & \frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & \frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$
$T1$	$\begin{pmatrix} 0 & 0 & -1 \\ 1 & 0 & 0 \\ 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 \\ -1 & 0 & 0 \\ 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 \\ 0 & 0 & 1 \\ -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 \\ 0 & -1 & 0 \\ 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 \\ 0 & -1 & 0 \\ -1 & 0 & 0 \end{pmatrix}$
$T2$	$\begin{pmatrix} 0 & 0 & -1 \\ 1 & 0 & 0 \\ 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 \\ -1 & 0 & 0 \\ 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 \\ 0 & 0 & 1 \\ -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 \\ 0 & 1 & 0 \\ -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 \\ 0 & 1 & 0 \\ 1 & 0 & 0 \end{pmatrix}$

O	$\hat{C}_2(xyp)$	$\hat{C}_2(xym)$	$\hat{C}_2(yzp)$	$\hat{C}_2(yzm)$
$A1$	1	1	1	1
$A2$	-1	-1	-1	-1
E	$\begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & -\frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & -\frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$
$T1$	$\begin{pmatrix} 0 & 1 & 0 \\ 1 & 0 & 0 \\ 0 & 0 & -1 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 \\ -1 & 0 & 0 \\ 0 & 0 & -1 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 \\ 0 & 0 & 1 \\ 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 \\ 0 & 0 & -1 \\ 0 & -1 & 0 \end{pmatrix}$
$T2$	$\begin{pmatrix} 0 & -1 & 0 \\ -1 & 0 & 0 \\ 0 & 0 & 1 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 \\ 1 & 0 & 0 \\ 0 & 0 & 1 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 \\ 0 & 0 & -1 \\ 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 \\ 0 & 0 & 1 \\ 0 & 1 & 0 \end{pmatrix}$

Oh	$\hat{E}$	$\hat{C}_4(x)$	$\hat{C}_2(x)$	$\hat{C}_4^3(x)$	$\hat{C}_4(y)$
$A1g$	1	1	1	1	1
$A2g$	1	-1	1	-1	-1
Eg	$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & -\frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & -\frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & \frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$
$T1g$	$\begin{pmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 \\ 0 & 0 & -1 \\ 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 \\ 0 & -1 & 0 \\ 0 & 0 & -1 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 \\ 0 & 0 & 1 \\ 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 \\ 0 & 1 & 0 \\ -1 & 0 & 0 \end{pmatrix}$
$T2g$	$\begin{pmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 \\ 0 & 0 & 1 \\ 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 \\ 0 & -1 & 0 \\ 0 & 0 & -1 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 \\ 0 & 0 & -1 \\ 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 \\ 0 & -1 & 0 \\ 1 & 0 & 0 \end{pmatrix}$
$A1u$	1	1	1	1	1
$A2u$	1	-1	1	-1	-1
Eu	$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & -\frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & -\frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & \frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$
$T1u$	$\begin{pmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 \\ 0 & 0 & -1 \\ 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 \\ 0 & -1 & 0 \\ 0 & 0 & -1 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 \\ 0 & 0 & 1 \\ 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 \\ 0 & 1 & 0 \\ -1 & 0 & 0 \end{pmatrix}$
$T2u$	$\begin{pmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 \\ 0 & 0 & 1 \\ 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 \\ 0 & -1 & 0 \\ 0 & 0 & -1 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 \\ 0 & 0 & -1 \\ 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 \\ 0 & -1 & 0 \\ 1 & 0 & 0 \end{pmatrix}$

Oh	$\hat{C}_2(y)$	$\hat{C}_4^3(y)$	$\hat{C}_4(z)$	$\hat{C}_2(z)$	$\hat{C}_4^3(z)$
$A1g$	1	1	1	1	1
$A2g$	1	-1	-1	1	-1
Eg	$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & \frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$
$T1g$	$\begin{pmatrix} -1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & -1 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 \\ 0 & 1 & 0 \\ 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 \\ 1 & 0 & 0 \\ 0 & 0 & 1 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 \\ 0 & -1 & 0 \\ 0 & 0 & 1 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 \\ -1 & 0 & 0 \\ 0 & 0 & 1 \end{pmatrix}$
$T2g$	$\begin{pmatrix} -1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & -1 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 \\ 0 & -1 & 0 \\ -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 \\ -1 & 0 & 0 \\ 0 & 0 & -1 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 \\ 0 & -1 & 0 \\ 0 & 0 & 1 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 \\ 1 & 0 & 0 \\ 0 & 0 & -1 \end{pmatrix}$
$A1u$	1	1	1	1	1
$A2u$	1	-1	-1	1	-1
Eu	$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & \frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$
$T1u$	$\begin{pmatrix} -1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & -1 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 \\ 0 & 1 & 0 \\ 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 \\ 1 & 0 & 0 \\ 0 & 0 & 1 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 \\ 0 & -1 & 0 \\ 0 & 0 & 1 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 \\ -1 & 0 & 0 \\ 0 & 0 & 1 \end{pmatrix}$
$T2u$	$\begin{pmatrix} -1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & -1 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 \\ 0 & -1 & 0 \\ -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 \\ -1 & 0 & 0 \\ 0 & 0 & -1 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 \\ 0 & -1 & 0 \\ 0 & 0 & 1 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 \\ 1 & 0 & 0 \\ 0 & 0 & -1 \end{pmatrix}$

Oh	$\hat{C}_3(\alpha)$	$\hat{C}_3^2(\alpha)$	$\hat{C}_3(\beta)$	$\hat{C}_3^2(\beta)$	$\hat{C}_3(\gamma)$
$A1g$	1	1	1	1	1
$A2g$	1	1	1	1	1
Eg	$\begin{pmatrix} \frac{1}{2} & -\frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & \frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & \frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & -\frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & \frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$
$T1g$	$\begin{pmatrix} 0 & 0 & 1 \\ 1 & 0 & 0 \\ 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 \\ 0 & 0 & 1 \\ 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 \\ 0 & 0 & -1 \\ 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 \\ -1 & 0 & 0 \\ 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 \\ 0 & 0 & -1 \\ -1 & 0 & 0 \end{pmatrix}$
$T2g$	$\begin{pmatrix} 0 & 0 & 1 \\ 1 & 0 & 0 \\ 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 \\ 0 & 0 & 1 \\ 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 \\ 0 & 0 & -1 \\ 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 \\ -1 & 0 & 0 \\ 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 \\ 0 & 0 & -1 \\ -1 & 0 & 0 \end{pmatrix}$
$A1u$	1	1	1	1	1
$A2u$	1	1	1	1	1
Eu	$\begin{pmatrix} \frac{1}{2} & -\frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & \frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & \frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & -\frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & \frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$
$T1u$	$\begin{pmatrix} 0 & 0 & 1 \\ 1 & 0 & 0 \\ 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 \\ 0 & 0 & 1 \\ 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 \\ 0 & 0 & -1 \\ 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 \\ -1 & 0 & 0 \\ 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 \\ 0 & 0 & -1 \\ -1 & 0 & 0 \end{pmatrix}$
$T2u$	$\begin{pmatrix} 0 & 0 & 1 \\ 1 & 0 & 0 \\ 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 \\ 0 & 0 & 1 \\ 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 \\ 0 & 0 & -1 \\ 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 \\ -1 & 0 & 0 \\ 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 \\ 0 & 0 & -1 \\ -1 & 0 & 0 \end{pmatrix}$

Oh	$\hat{C}_3^2(\gamma)$	$\hat{C}_3(\delta)$	$\hat{C}_3^2(\delta)$	$\hat{C}_2(xzp)$	$\hat{C}_2(xzm)$
$A1g$	1	1	1	1	1
$A2g$	1	1	1	-1	-1
Eg	$\begin{pmatrix} \frac{1}{2} & -\frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & -\frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & \frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & \frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & \frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$
$T1g$	$\begin{pmatrix} 0 & 0 & -1 \\ 1 & 0 & 0 \\ 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 \\ -1 & 0 & 0 \\ 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 \\ 0 & 0 & 1 \\ -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 \\ 0 & -1 & 0 \\ 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 \\ 0 & -1 & 0 \\ -1 & 0 & 0 \end{pmatrix}$
$T2g$	$\begin{pmatrix} 0 & 0 & -1 \\ 1 & 0 & 0 \\ 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 \\ -1 & 0 & 0 \\ 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 \\ 0 & 0 & 1 \\ -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 \\ 0 & 1 & 0 \\ -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 \\ 0 & 1 & 0 \\ 1 & 0 & 0 \end{pmatrix}$
$A1u$	1	1	1	1	1
$A2u$	1	1	1	-1	-1
Eu	$\begin{pmatrix} \frac{1}{2} & -\frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & -\frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & \frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & \frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & \frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$
$T1u$	$\begin{pmatrix} 0 & 0 & -1 \\ 1 & 0 & 0 \\ 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 \\ -1 & 0 & 0 \\ 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 \\ 0 & 0 & 1 \\ -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 \\ 0 & -1 & 0 \\ 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 \\ 0 & -1 & 0 \\ -1 & 0 & 0 \end{pmatrix}$
$T2u$	$\begin{pmatrix} 0 & 0 & -1 \\ 1 & 0 & 0 \\ 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 \\ -1 & 0 & 0 \\ 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 \\ 0 & 0 & 1 \\ -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 \\ 0 & 1 & 0 \\ -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 \\ 0 & 1 & 0 \\ 1 & 0 & 0 \end{pmatrix}$

Oh	$\hat{C}_2(xyp)$	$\hat{C}_2(xym)$	$\hat{C}_2(yzp)$	$\hat{C}_2(yzm)$	$\hat{i}$
$A1g$	1	1	1	1	1
$A2g$	-1	-1	-1	-1	1
Eg	$\begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & -\frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & -\frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$
$T1g$	$\begin{pmatrix} 0 & 1 & 0 \\ 1 & 0 & 0 \\ 0 & 0 & -1 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 \\ -1 & 0 & 0 \\ 0 & 0 & -1 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 \\ 0 & 0 & 1 \\ 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 \\ 0 & 0 & -1 \\ 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{pmatrix}$
$T2g$	$\begin{pmatrix} 0 & -1 & 0 \\ -1 & 0 & 0 \\ 0 & 0 & 1 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 \\ 1 & 0 & 0 \\ 0 & 0 & 1 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 \\ 0 & 0 & -1 \\ 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 \\ 0 & 0 & 1 \\ 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{pmatrix}$
$A1u$	1	1	1	1	-1
$A2u$	-1	-1	-1	-1	-1
Eu	$\begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & -\frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & -\frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 \\ 0 & -1 \end{pmatrix}$
$T1u$	$\begin{pmatrix} 0 & 1 & 0 \\ 1 & 0 & 0 \\ 0 & 0 & -1 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 \\ -1 & 0 & 0 \\ 0 & 0 & -1 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 \\ 0 & 0 & 1 \\ 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 \\ 0 & 0 & -1 \\ 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 \\ 0 & -1 & 0 \\ 0 & 0 & -1 \end{pmatrix}$
$T2u$	$\begin{pmatrix} 0 & -1 & 0 \\ -1 & 0 & 0 \\ 0 & 0 & 1 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 \\ 1 & 0 & 0 \\ 0 & 0 & 1 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 \\ 0 & 0 & -1 \\ 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 \\ 0 & 0 & 1 \\ 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 \\ 0 & -1 & 0 \\ 0 & 0 & -1 \end{pmatrix}$

Oh	$\hat{S}_4(x)$	$\hat{\sigma}_h(x)$	$\hat{S}_4^3(x)$	$\hat{S}_4(y)$	$\hat{\sigma}_h(y)$
$A1g$	1	1	1	1	1
$A2g$	-1	1	-1	-1	1
Eg	$\begin{pmatrix} \frac{1}{2} & -\frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & -\frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & \frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$
$T1g$	$\begin{pmatrix} 1 & 0 & 0 \\ 0 & 0 & 1 \\ 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 \\ 0 & -1 & 0 \\ 0 & 0 & -1 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 \\ 0 & 0 & -1 \\ 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 \\ 0 & 1 & 0 \\ 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & -1 \end{pmatrix}$
$T2g$	$\begin{pmatrix} -1 & 0 & 0 \\ 0 & 0 & -1 \\ 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 \\ 0 & -1 & 0 \\ 0 & 0 & -1 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 \\ 0 & 0 & 1 \\ 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 \\ 0 & -1 & 0 \\ -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & -1 \end{pmatrix}$
$A1u$	-1	-1	-1	-1	-1
$A2u$	1	-1	1	1	-1
Eu	$\begin{pmatrix} -\frac{1}{2} & \frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} -\frac{1}{2} & \frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -\frac{1}{2} & -\frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 \\ 0 & -1 \end{pmatrix}$
$T1u$	$\begin{pmatrix} -1 & 0 & 0 \\ 0 & 0 & -1 \\ 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 \\ 0 & 0 & 1 \\ 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 \\ 0 & -1 & 0 \\ -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 \\ 0 & -1 & 0 \\ 0 & 0 & 1 \end{pmatrix}$
$T2u$	$\begin{pmatrix} 1 & 0 & 0 \\ 0 & 0 & 1 \\ 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 \\ 0 & 0 & -1 \\ 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 \\ 0 & 1 & 0 \\ 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 \\ 0 & -1 & 0 \\ 0 & 0 & 1 \end{pmatrix}$

Oh	$\hat{S}_4^3(y)$	$\hat{S}_4(z)$	$\hat{\sigma}_h(z)$	$\hat{S}_4^3(z)$	$\hat{S}_6(\alpha)$
$A1g$	1	1	1	1	1
$A2g$	-1	-1	1	-1	1
Eg	$\begin{pmatrix} \frac{1}{2} & \frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & \frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$
$T1g$	$\begin{pmatrix} 0 & 0 & 1 \\ 0 & 1 & 0 \\ -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 \\ -1 & 0 & 0 \\ 0 & 0 & 1 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 \\ 0 & -1 & 0 \\ 0 & 0 & 1 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 \\ 1 & 0 & 0 \\ 0 & 0 & 1 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 \\ 0 & 0 & 1 \\ 1 & 0 & 0 \end{pmatrix}$
$T2g$	$\begin{pmatrix} 0 & 0 & -1 \\ 0 & -1 & 0 \\ 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 \\ 1 & 0 & 0 \\ 0 & 0 & -1 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 \\ 0 & -1 & 0 \\ 0 & 0 & 1 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 \\ -1 & 0 & 0 \\ 0 & 0 & -1 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 \\ 0 & 0 & 1 \\ 1 & 0 & 0 \end{pmatrix}$
$A1u$	-1	-1	-1	-1	-1
$A2u$	1	1	-1	1	-1
Eu	$\begin{pmatrix} -\frac{1}{2} & -\frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} -\frac{1}{2} & -\frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$
$T1u$	$\begin{pmatrix} 0 & 0 & -1 \\ 0 & -1 & 0 \\ 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 \\ 1 & 0 & 0 \\ 0 & 0 & -1 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & -1 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 \\ -1 & 0 & 0 \\ 0 & 0 & -1 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 \\ 0 & 0 & -1 \\ -1 & 0 & 0 \end{pmatrix}$
$T2u$	$\begin{pmatrix} 0 & 0 & 1 \\ 0 & 1 & 0 \\ -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 \\ -1 & 0 & 0 \\ 0 & 0 & 1 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & -1 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 \\ 1 & 0 & 0 \\ 0 & 0 & 1 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 \\ 0 & 0 & -1 \\ -1 & 0 & 0 \end{pmatrix}$

Oh	$\hat{S}_6^5(\alpha)$	$\hat{S}_6(\beta)$	$\hat{S}_6^5(\beta)$	$\hat{S}_6(\gamma)$	$\hat{S}_6^5(\gamma)$
$A1g$	1	1	1	1	1
$A2g$	1	1	1	1	1
Eg	$\begin{pmatrix} \frac{1}{2} & -\frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & -\frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & \frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & -\frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & \frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$
$T1g$	$\begin{pmatrix} 0 & 0 & 1 \\ 1 & 0 & 0 \\ 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 \\ -1 & 0 & 0 \\ 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 \\ 0 & 0 & -1 \\ 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 \\ 1 & 0 & 0 \\ 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 \\ 0 & 0 & -1 \\ -1 & 0 & 0 \end{pmatrix}$
$T2g$	$\begin{pmatrix} 0 & 0 & 1 \\ 1 & 0 & 0 \\ 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 \\ -1 & 0 & 0 \\ 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 \\ 0 & 0 & -1 \\ 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 \\ 1 & 0 & 0 \\ 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 \\ 0 & 0 & -1 \\ -1 & 0 & 0 \end{pmatrix}$
$A1u$	-1	-1	-1	-1	-1
$A2u$	-1	-1	-1	-1	-1
Eu	$\begin{pmatrix} -\frac{1}{2} & \frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -\frac{1}{2} & \frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -\frac{1}{2} & -\frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -\frac{1}{2} & \frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -\frac{1}{2} & -\frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$
$T1u$	$\begin{pmatrix} 0 & 0 & -1 \\ -1 & 0 & 0 \\ 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 \\ 1 & 0 & 0 \\ 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 \\ 0 & 0 & 1 \\ -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 \\ -1 & 0 & 0 \\ 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 \\ 0 & 0 & 1 \\ 1 & 0 & 0 \end{pmatrix}$
$T2u$	$\begin{pmatrix} 0 & 0 & -1 \\ -1 & 0 & 0 \\ 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 \\ 1 & 0 & 0 \\ 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 \\ 0 & 0 & 1 \\ -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 \\ -1 & 0 & 0 \\ 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 \\ 0 & 0 & 1 \\ 1 & 0 & 0 \end{pmatrix}$

Oh	$\hat{S}_6(\delta)$	$\hat{S}_6^5(\delta)$	$\hat{\sigma}_d(xzp)$	$\hat{\sigma}_d(xzm)$	$\hat{\sigma}_d(xyp)$
$A1g$	1	1	1	1	1
$A2g$	1	1	-1	-1	-1
Eg	$\begin{pmatrix} \frac{1}{2} & \frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & -\frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & \frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & \frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$
$T1g$	$\begin{pmatrix} 0 & -1 & 0 \\ 0 & 0 & 1 \\ -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 \\ -1 & 0 & 0 \\ 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 \\ 0 & -1 & 0 \\ 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 \\ 0 & -1 & 0 \\ -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 \\ 1 & 0 & 0 \\ 0 & 0 & -1 \end{pmatrix}$
$T2g$	$\begin{pmatrix} 0 & -1 & 0 \\ 0 & 0 & 1 \\ -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 \\ -1 & 0 & 0 \\ 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 \\ 0 & 1 & 0 \\ -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 \\ 0 & 1 & 0 \\ 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 \\ -1 & 0 & 0 \\ 0 & 0 & 1 \end{pmatrix}$
$A1u$	-1	-1	-1	-1	-1
$A2u$	-1	-1	1	1	1
Eu	$\begin{pmatrix} -\frac{1}{2} & -\frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -\frac{1}{2} & \frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -\frac{1}{2} & -\frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -\frac{1}{2} & -\frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -1 & 0 \\ 0 & 1 \end{pmatrix}$
$T1u$	$\begin{pmatrix} 0 & 1 & 0 \\ 0 & 0 & -1 \\ 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 \\ 1 & 0 & 0 \\ 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 \\ 0 & 1 & 0 \\ -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 \\ 0 & 1 & 0 \\ 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & -1 & 0 \\ -1 & 0 & 0 \\ 0 & 0 & 1 \end{pmatrix}$
$T2u$	$\begin{pmatrix} 0 & 1 & 0 \\ 0 & 0 & -1 \\ 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 \\ 1 & 0 & 0 \\ 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 \\ 0 & -1 & 0 \\ 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & -1 \\ 0 & -1 & 0 \\ -1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 \\ 1 & 0 & 0 \\ 0 & 0 & -1 \end{pmatrix}$

Oh	$\hat{\sigma}_d(xym)$	$\hat{\sigma}_d(yzp)$	$\hat{\sigma}_d(yzm)$
$A1g$	1	1	1
$A2g$	-1	-1	-1
Eg	$\begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & -\frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} \frac{1}{2} & -\frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & -\frac{1}{2} \end{pmatrix}$
$T1g$	$\begin{pmatrix} 0 & -1 & 0 \\ -1 & 0 & 0 \\ 0 & 0 & -1 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 \\ 0 & 0 & 1 \\ 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 \\ 0 & 0 & -1 \\ 0 & -1 & 0 \end{pmatrix}$
$T2g$	$\begin{pmatrix} 0 & 1 & 0 \\ 1 & 0 & 0 \\ 0 & 0 & 1 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 \\ 0 & 0 & -1 \\ 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 \\ 0 & 0 & 1 \\ 0 & 1 & 0 \end{pmatrix}$
$A1u$	-1	-1	-1
$A2u$	1	1	1
Eu	$\begin{pmatrix} -1 & 0 \\ 0 & 1 \end{pmatrix}$	$\begin{pmatrix} -\frac{1}{2} & \frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$	$\begin{pmatrix} -\frac{1}{2} & \frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$
$T1u$	$\begin{pmatrix} 0 & 1 & 0 \\ 1 & 0 & 0 \\ 0 & 0 & 1 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 \\ 0 & 0 & -1 \\ 0 & -1 & 0 \end{pmatrix}$	$\begin{pmatrix} 1 & 0 & 0 \\ 0 & 0 & 1 \\ 0 & 1 & 0 \end{pmatrix}$
$T2u$	$\begin{pmatrix} 0 & -1 & 0 \\ -1 & 0 & 0 \\ 0 & 0 & -1 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 \\ 0 & 0 & 1 \\ 0 & 1 & 0 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 & 0 \\ 0 & 0 & -1 \\ 0 & -1 & 0 \end{pmatrix}$

I	$\hat{E}$
A	1
$T1$	$\begin{pmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{pmatrix}$
$T2$	$\begin{pmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{pmatrix}$
G	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{pmatrix}$
H	$\begin{pmatrix} 1 & 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 1 \end{pmatrix}$

I	$\hat{C}_5(0)$
A	1
$T1$	$\begin{pmatrix} 0.5 & 0.5\sqrt{\frac{2\sqrt5}{5}+1} & \sqrt{0.5-0.1\sqrt5} \\ -0.5\sqrt{1-\frac{2\sqrt5}{5}} & 0.3\sqrt5 & -0.5-0.1\sqrt5 \\ -\sqrt{0.1\sqrt5+0.5} & 0.5-0.1\sqrt5 & \frac{\sqrt5}{5} \end{pmatrix}$
$T2$	$\begin{pmatrix} -\frac{\sqrt5}{5} & -\sqrt{0.5-0.1\sqrt5} & 0.1\sqrt5+0.5 \\ -\sqrt{0.1\sqrt5+0.5} & 0.5 & -0.5\sqrt{1-\frac{2\sqrt5}{5}} \\ -0.5+0.1\sqrt5 & -0.5\sqrt{\frac{2\sqrt5}{5}+1} & -0.3\sqrt5 \end{pmatrix}$
G	$\begin{pmatrix} -0.5 & 0.5\sqrt{1-\frac{2\sqrt5}{5}} & -0.25\sqrt5-0.25 & 0.5\sqrt{0.5-0.1\sqrt5} \\ 0.5\sqrt{\frac{2\sqrt5}{5}+1} & -0.1\sqrt5 & -0.5\sqrt{0.5-0.1\sqrt5} & 0.75-0.05\sqrt5 \\ -0.25+0.25\sqrt5 & -0.5\sqrt{0.1\sqrt5+0.5} & -0.5 & -0.5\sqrt{\frac{2\sqrt5}{5}+1} \\ -0.5\sqrt{0.1\sqrt5+0.5} & -0.75-0.05\sqrt5 & 0.5\sqrt{1-\frac{2\sqrt5}{5}} & 0.1\sqrt5 \end{pmatrix}$
H	$\begin{pmatrix} -0.2 & 0.04\sqrt5\left(\sqrt5+5\right) & -0.2\sqrt{7.5-1.5\sqrt5} & -0.04\sqrt5\left(-5+\sqrt5\right) & -0.2\sqrt{1.5\sqrt5+7.5} \\ 0.04\sqrt5\left(-5+\sqrt5\right) & 0.1 & 0.1\sqrt{25-2\sqrt5} & 0.4+\frac{\sqrt5}{5} & 0.2\sqrt{5-2\sqrt5} \\ -0.2\sqrt{1.5\sqrt5+7.5} & -0.1\sqrt{2\sqrt5+25} & 0.1\sqrt5 & -0.2\sqrt{5-2\sqrt5} & -\frac{\sqrt5}{5} \\ -0.04\sqrt5\left(\sqrt5+5\right) & 0.4-\frac{\sqrt5}{5} & -0.2\sqrt{2\sqrt5+5} & 0.1 & 0.1\sqrt{2\sqrt5+25} \\ \sqrt{0.3-0.06\sqrt5} & -0.2\sqrt{2\sqrt5+5} & -\frac{\sqrt5}{5} & 0.1\sqrt{25-2\sqrt5} & -0.1\sqrt5 \end{pmatrix}$

I	$\hat{C}_5^2(0)$
A	1
$T1$	$\begin{pmatrix} 0.25-0.25\sqrt5 & 0.5\sqrt{0.5\sqrt5+2.5} & 0 \\ 0.5\sqrt{0.1\sqrt5+0.5} & 0.25-0.05\sqrt5 & -\frac{2\sqrt5}{5} \\ -\sqrt{0.1\sqrt5+0.5} & -0.5+0.1\sqrt5 & -\frac{\sqrt5}{5} \end{pmatrix}$
$T2$	$\begin{pmatrix} \frac{\sqrt5}{5} & -\sqrt{0.5-0.1\sqrt5} & -0.5-0.1\sqrt5 \\ 0 & 0.25+0.25\sqrt5 & -0.5\sqrt{2.5-0.5\sqrt5} \\ \frac{2\sqrt5}{5} & 0.5\sqrt{0.5-0.1\sqrt5} & 0.05\sqrt5+0.25 \end{pmatrix}$
G	$\begin{pmatrix} 0 & 0 & 0.25+0.25\sqrt5 & 0.5\sqrt{2.5-0.5\sqrt5} \\ -\sqrt{0.1\sqrt5+0.5} & -0.5+0.1\sqrt5 & -0.5\sqrt{0.5-0.1\sqrt5} & 0.05\sqrt5+0.25 \\ 0.25-0.25\sqrt5 & 0.5\sqrt{0.5\sqrt5+2.5} & 0 & 0 \\ -0.5\sqrt{0.1\sqrt5+0.5} & -0.25+0.05\sqrt5 & \sqrt{0.5-0.1\sqrt5} & -0.5-0.1\sqrt5 \end{pmatrix}$
H	$\begin{pmatrix} -0.2 & 0.04\sqrt5\left(\sqrt5+5\right) & \sqrt{0.3-0.06\sqrt5} & -0.04\sqrt5\left(-5+\sqrt5\right) & \sqrt{0.06\sqrt5+0.3} \\ -0.4\sqrt3 & -0.15\sqrt5-0.15 & -0.3\sqrt{2.5-0.5\sqrt5} & -0.1+0.1\sqrt5 & \sqrt{0.02\sqrt5+0.1} \\ 0 & -0.5\sqrt{0.5-0.1\sqrt5} & 0.05\sqrt5+0.25 & -\sqrt{0.1\sqrt5+0.5} & 0.5-0.1\sqrt5 \\ 0.4\sqrt3 & -0.1\sqrt5-0.1 & -0.2\sqrt{2.5-0.5\sqrt5} & -0.15+0.15\sqrt5 & 0.3\sqrt{0.5\sqrt5+2.5} \\ 0 & \sqrt{0.5-0.1\sqrt5} & -0.5-0.1\sqrt5 & -0.5\sqrt{0.1\sqrt5+0.5} & 0.25-0.05\sqrt5 \end{pmatrix}$

I	$\hat{C}_5^3(0)$
A	1

$T1$
$$\begin{pmatrix} 0.25 - 0.25\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} & -\sqrt{0.1\sqrt{5}+0.5} \\ 0.5\sqrt{0.5\sqrt{5}+2.5} & 0.25 - 0.05\sqrt{5} & -0.5 + 0.1\sqrt{5} \\ 0 & -\frac{2\sqrt{5}}{5} & -\frac{\sqrt{5}}{5} \end{pmatrix}$$

$T2$
$$\begin{pmatrix} \frac{\sqrt{5}}{5} & 0 & \frac{2\sqrt{5}}{5} \\ -\sqrt{0.5-0.1\sqrt{5}} & 0.25 + 0.25\sqrt{5} & 0.5\sqrt{0.5-0.1\sqrt{5}} \\ -0.5 - 0.1\sqrt{5} & -0.5\sqrt{2.5-0.5\sqrt{5}} & 0.05\sqrt{5}+0.25 \end{pmatrix}$$

G
$$\begin{pmatrix} 0 & -\sqrt{0.1\sqrt{5}+0.5} & 0.25 - 0.25\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} \\ 0 & -0.5 + 0.1\sqrt{5} & 0.5\sqrt{0.5\sqrt{5}+2.5} & -0.25 + 0.05\sqrt{5} \\ 0.25 + 0.25\sqrt{5} & -0.5\sqrt{0.5-0.1\sqrt{5}} & 0 & \sqrt{0.5-0.1\sqrt{5}} \\ 0.5\sqrt{2.5-0.5\sqrt{5}} & 0.05\sqrt{5}+0.25 & 0 & -0.5 - 0.1\sqrt{5} \end{pmatrix}$$

H
$$\begin{pmatrix} -0.2 & -0.4\sqrt{3} & 0 & 0.4\sqrt{3} & 0 \\ 0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.15\sqrt{5}-0.15 & -0.5\sqrt{0.5-0.1\sqrt{5}} & -0.1\sqrt{5}-0.1 & \sqrt{0.5-0.1\sqrt{5}} \\ \sqrt{0.3-0.06\sqrt{5}} & -0.3\sqrt{2.5-0.5\sqrt{5}} & 0.05\sqrt{5}+0.25 & -0.2\sqrt{2.5-0.5\sqrt{5}} & -0.5-0.1\sqrt{5} \\ -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.1+0.1\sqrt{5} & -\sqrt{0.1\sqrt{5}+0.5} & -0.15+0.15\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} \\ \sqrt{0.06\sqrt{5}+0.3} & \sqrt{0.02\sqrt{5}+0.1} & 0.5-0.1\sqrt{5} & 0.3\sqrt{0.5\sqrt{5}+2.5} & 0.25-0.05\sqrt{5} \end{pmatrix}$$

I	$\hat{C}_5^4(0)$
A	1

$T1$
$$\begin{pmatrix} 0.5 & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -\sqrt{0.1\sqrt{5}+0.5} \\ 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & 0.3\sqrt{5} & 0.5-0.1\sqrt{5} \\ \sqrt{0.5-0.1\sqrt{5}} & -0.5-0.1\sqrt{5} & \frac{\sqrt{5}}{5} \end{pmatrix}$$

$T2$
$$\begin{pmatrix} -\frac{\sqrt{5}}{5} & -\sqrt{0.1\sqrt{5}+0.5} & -0.5+0.1\sqrt{5} \\ -\sqrt{0.5-0.1\sqrt{5}} & 0.5 & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} \\ 0.1\sqrt{5}+0.5 & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -0.3\sqrt{5} \end{pmatrix}$$

G
$$\begin{pmatrix} -0.5 & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.25+0.25\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} \\ 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -0.1\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} & -0.75-0.05\sqrt{5} \\ -0.25\sqrt{5}-0.25 & -0.5\sqrt{0.5-0.1\sqrt{5}} & -0.5 & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} \\ 0.5\sqrt{0.5-0.1\sqrt{5}} & 0.75-0.05\sqrt{5} & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & 0.1\sqrt{5} \end{pmatrix}$$

H
$$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.2\sqrt{1.5\sqrt{5}+7.5} & -0.04\sqrt{5}\left(\sqrt{5}+5\right) & \sqrt{0.3-0.06\sqrt{5}} \\ 0.04\sqrt{5}\left(\sqrt{5}+5\right) & 0.1 & -0.1\sqrt{2\sqrt{5}+25} & 0.4-\frac{\sqrt{5}}{5} & -0.2\sqrt{2\sqrt{5}+5} \\ -0.2\sqrt{7.5-1.5\sqrt{5}} & 0.1\sqrt{25-2\sqrt{5}} & 0.1\sqrt{5} & -0.2\sqrt{2\sqrt{5}+5} & -\frac{\sqrt{5}}{5} \\ -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & 0.4+\frac{\sqrt{5}}{5} & -0.2\sqrt{5-2\sqrt{5}} & 0.1 & 0.1\sqrt{25-2\sqrt{5}} \\ -0.2\sqrt{1.5\sqrt{5}+7.5} & 0.2\sqrt{5-2\sqrt{5}} & -\frac{\sqrt{5}}{5} & 0.1\sqrt{2\sqrt{5}+25} & -0.1\sqrt{5} \end{pmatrix}$$

I	$\hat{C}_5(1)$
A	1

$T1$:
$$\begin{pmatrix} 0.5 & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -\sqrt{0.5-0.1\sqrt{5}} \\ 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & 0.3\sqrt{5} & -0.5-0.1\sqrt{5} \\ \sqrt{0.1\sqrt{5}+0.5} & 0.5-0.1\sqrt{5} & \frac{\sqrt{5}}{5} \end{pmatrix}$$

$T2$:
$$\begin{pmatrix} -\frac{\sqrt{5}}{5} & \sqrt{0.5-0.1\sqrt{5}} & 0.1\sqrt{5}+0.5 \\ \sqrt{0.1\sqrt{5}+0.5} & 0.5 & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} \\ -0.5+0.1\sqrt{5} & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.3\sqrt{5} \end{pmatrix}$$

G:
$$\begin{pmatrix} -0.5 & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -0.25\sqrt{5}-0.25 & -0.5\sqrt{0.5-0.1\sqrt{5}} \\ -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.1\sqrt{5} & 0.5\sqrt{0.5-0.1\sqrt{5}} & 0.75-0.05\sqrt{5} \\ -0.25+0.25\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} & -0.5 & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} \\ 0.5\sqrt{0.1\sqrt{5}+0.5} & -0.75-0.05\sqrt{5} & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & 0.1\sqrt{5} \end{pmatrix}$$

H:
$$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(\sqrt{5}+5\right) & \sqrt{0.3-0.06\sqrt{5}} & -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & \sqrt{0.06\sqrt{5}+0.3} \\ 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & 0.1 & -0.1\sqrt{25-2\sqrt{5}} & 0.4+\frac{\sqrt{5}}{5} & -0.2\sqrt{5-2\sqrt{5}} \\ \sqrt{0.06\sqrt{5}+0.3} & 0.1\sqrt{2\sqrt{5}+25} & 0.1\sqrt{5} & 0.2\sqrt{5-2\sqrt{5}} & -\frac{\sqrt{5}}{5} \\ -0.04\sqrt{5}\left(\sqrt{5}+5\right) & 0.4-\frac{\sqrt{5}}{5} & 0.2\sqrt{2\sqrt{5}+5} & 0.1 & -0.1\sqrt{2\sqrt{5}+25} \\ -0.2\sqrt{7.5-1.5\sqrt{5}} & 0.2\sqrt{2\sqrt{5}+5} & -\frac{\sqrt{5}}{5} & -0.1\sqrt{25-2\sqrt{5}} & -0.1\sqrt{5} \end{pmatrix}$$

I	$\hat{C}_5^2(1)$
A	1

$T1$:
$$\begin{pmatrix} 0.25-0.25\sqrt{5} & -0.5\sqrt{0.5\sqrt{5}+2.5} & 0 \\ -0.5\sqrt{0.1\sqrt{5}+0.5} & 0.25-0.05\sqrt{5} & -\frac{2\sqrt{5}}{5} \\ \sqrt{0.1\sqrt{5}+0.5} & -0.5+0.1\sqrt{5} & -\frac{\sqrt{5}}{5} \end{pmatrix}$$

$T2$:
$$\begin{pmatrix} \frac{\sqrt{5}}{5} & \sqrt{0.5-0.1\sqrt{5}} & -0.5-0.1\sqrt{5} \\ 0 & 0.25+0.25\sqrt{5} & 0.5\sqrt{2.5-0.5\sqrt{5}} \\ \frac{2\sqrt{5}}{5} & -0.5\sqrt{0.5-0.1\sqrt{5}} & 0.05\sqrt{5}+0.25 \end{pmatrix}$$

G:
$$\begin{pmatrix} 0 & 0 & 0.25+0.25\sqrt{5} & -0.5\sqrt{2.5-0.5\sqrt{5}} \\ \sqrt{0.1\sqrt{5}+0.5} & -0.5+0.1\sqrt{5} & 0.5\sqrt{0.5-0.1\sqrt{5}} & 0.05\sqrt{5}+0.25 \\ 0.25-0.25\sqrt{5} & -0.5\sqrt{0.5\sqrt{5}+2.5} & 0 & 0 \\ 0.5\sqrt{0.1\sqrt{5}+0.5} & -0.25+0.05\sqrt{5} & -\sqrt{0.5-0.1\sqrt{5}} & -0.5-0.1\sqrt{5} \end{pmatrix}$$

H:
$$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.2\sqrt{7.5-1.5\sqrt{5}} & -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.2\sqrt{1.5\sqrt{5}+7.5} \\ -0.4\sqrt{3} & -0.15\sqrt{5}-0.15 & 0.3\sqrt{2.5-0.5\sqrt{5}} & -0.1+0.1\sqrt{5} & -0.2\sqrt{0.5\sqrt{5}+2.5} \\ 0 & 0.5\sqrt{0.5-0.1\sqrt{5}} & 0.05\sqrt{5}+0.25 & \sqrt{0.1\sqrt{5}+0.5} & 0.5-0.1\sqrt{5} \\ 0.4\sqrt{3} & -0.1\sqrt{5}-0.1 & \sqrt{0.1-0.02\sqrt{5}} & -0.15+0.15\sqrt{5} & -0.3\sqrt{0.5\sqrt{5}+2.5} \\ 0 & -\sqrt{0.5-0.1\sqrt{5}} & -0.5-0.1\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} & 0.25-0.05\sqrt{5} \end{pmatrix}$$

$$
\begin{array}{c|c}
\mathbf{I} & \hat{C}_5^3(1) \\
\hline
A & 1 \\[4pt]
T1 & \begin{pmatrix} 0.25-0.25\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} & \sqrt{0.1\sqrt{5}+0.5} \\ -0.5\sqrt{0.5\sqrt{5}+2.5} & 0.25-0.05\sqrt{5} & -0.5+0.1\sqrt{5} \\ 0 & -\frac{2\sqrt{5}}{5} & -\frac{\sqrt{5}}{5} \end{pmatrix} \\[20pt]
T2 & \begin{pmatrix} \frac{\sqrt{5}}{5} & 0 & \frac{2\sqrt{5}}{5} \\ \sqrt{0.5-0.1\sqrt{5}} & 0.25+0.25\sqrt{5} & -0.5\sqrt{0.5-0.1\sqrt{5}} \\ -0.5-0.1\sqrt{5} & 0.5\sqrt{2.5-0.5\sqrt{5}} & 0.05\sqrt{5}+0.25 \end{pmatrix} \\[20pt]
G & \begin{pmatrix} 0 & \sqrt{0.1\sqrt{5}+0.5} & 0.25-0.25\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} \\ 0 & -0.5+0.1\sqrt{5} & -0.5\sqrt{0.5\sqrt{5}+2.5} & -0.25+0.05\sqrt{5} \\ 0.25+0.25\sqrt{5} & 0.5\sqrt{0.5-0.1\sqrt{5}} & 0 & -\sqrt{0.5-0.1\sqrt{5}} \\ -0.5\sqrt{2.5-0.5\sqrt{5}} & 0.05\sqrt{5}+0.25 & 0 & -0.5-0.1\sqrt{5} \end{pmatrix} \\[26pt]
H & \begin{pmatrix} -0.2 & -0.4\sqrt{3} & 0 & 0.4\sqrt{3} & 0 \\ 0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.15\sqrt{5}-0.15 & 0.5\sqrt{0.5-0.1\sqrt{5}} & -0.1\sqrt{5}-0.1 & -\sqrt{0.5-0.1\sqrt{5}} \\ -0.2\sqrt{7.5-1.5\sqrt{5}} & 0.3\sqrt{2.5-0.5\sqrt{5}} & 0.05\sqrt{5}+0.25 & \sqrt{0.1-0.02\sqrt{5}} & -0.5-0.1\sqrt{5} \\ -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.1+0.1\sqrt{5} & \sqrt{0.1\sqrt{5}+0.5} & -0.15+0.15\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} \\ -0.2\sqrt{1.5\sqrt{5}+7.5} & -0.2\sqrt{0.5\sqrt{5}+2.5} & 0.5-0.1\sqrt{5} & -0.3\sqrt{0.5\sqrt{5}+2.5} & 0.25-0.05\sqrt{5} \end{pmatrix}
\end{array}
$$

$$
\begin{array}{c|c}
\mathbf{I} & \hat{C}_5^4(1) \\
\hline
A & 1 \\[4pt]
T1 & \begin{pmatrix} 0.5 & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & \sqrt{0.1\sqrt{5}+0.5} \\ -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & 0.3\sqrt{5} & 0.5-0.1\sqrt{5} \\ -\sqrt{0.5-0.1\sqrt{5}} & -0.5-0.1\sqrt{5} & \frac{\sqrt{5}}{5} \end{pmatrix} \\[22pt]
T2 & \begin{pmatrix} -\frac{\sqrt{5}}{5} & \sqrt{0.1\sqrt{5}+0.5} & -0.5+0.1\sqrt{5} \\ \sqrt{0.5-0.1\sqrt{5}} & 0.5 & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} \\ 0.1\sqrt{5}+0.5 & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -0.3\sqrt{5} \end{pmatrix} \\[22pt]
G & \begin{pmatrix} -0.5 & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.25+0.25\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} \\ -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -0.1\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} & -0.75-0.05\sqrt{5} \\ -0.25\sqrt{5}-0.25 & 0.5\sqrt{0.5-0.1\sqrt{5}} & -0.5 & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} \\ -0.5\sqrt{0.5-0.1\sqrt{5}} & 0.75-0.05\sqrt{5} & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & 0.1\sqrt{5} \end{pmatrix} \\[28pt]
H & \begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & \sqrt{0.06\sqrt{5}+0.3} & -0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.2\sqrt{7.5-1.5\sqrt{5}} \\ 0.04\sqrt{5}\left(\sqrt{5}+5\right) & 0.1 & 0.1\sqrt{2\sqrt{5}+25} & 0.4-\frac{\sqrt{5}}{5} & 0.2\sqrt{2\sqrt{5}+5} \\ \sqrt{0.3-0.06\sqrt{5}} & -0.1\sqrt{25-2\sqrt{5}} & 0.1\sqrt{5} & 0.2\sqrt{2\sqrt{5}+5} & -\frac{\sqrt{5}}{5} \\ -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & 0.4+\frac{\sqrt{5}}{5} & 0.2\sqrt{5-2\sqrt{5}} & 0.1 & -0.1\sqrt{25-2\sqrt{5}} \\ \sqrt{0.06\sqrt{5}+0.3} & -0.2\sqrt{5-2\sqrt{5}} & -\frac{\sqrt{5}}{5} & -0.1\sqrt{2\sqrt{5}+25} & -0.1\sqrt{5} \end{pmatrix}
\end{array}
$$

I	$\hat{C}_5(2)$
A	1

$$T1 \quad \begin{pmatrix} -0.25+0.25\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} & \sqrt{0.1\sqrt{5}+0.5} \\ 0.5\sqrt{0.1\sqrt{5}+0.5} & 0.05\sqrt{5}+0.75 & 0.5-0.1\sqrt{5} \\ -\sqrt{0.1\sqrt{5}+0.5} & 0.5-0.1\sqrt{5} & \frac{\sqrt{5}}{5} \end{pmatrix}$$

$$T2 \quad \begin{pmatrix} -\frac{\sqrt{5}}{5} & -\sqrt{0.5-0.1\sqrt{5}} & 0.1\sqrt{5}+0.5 \\ \sqrt{0.5-0.1\sqrt{5}} & -0.25\sqrt{5}-0.25 & -0.5\sqrt{0.5-0.1\sqrt{5}} \\ 0.1\sqrt{5}+0.5 & 0.5\sqrt{0.5-0.1\sqrt{5}} & 0.75-0.05\sqrt{5} \end{pmatrix}$$

$$G \quad \begin{pmatrix} -0.25\sqrt{5}-0.25 & 0.5\sqrt{0.5-0.1\sqrt{5}} & 0 & -\sqrt{0.5-0.1\sqrt{5}} \\ -0.5\sqrt{0.5-0.1\sqrt{5}} & -0.25+0.15\sqrt{5} & -\sqrt{0.1\sqrt{5}+0.5} & \frac{\sqrt{5}}{5} \\ 0 & \sqrt{0.1\sqrt{5}+0.5} & -0.25+0.25\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} \\ \sqrt{0.5-0.1\sqrt{5}} & \frac{\sqrt{5}}{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} & -0.15\sqrt{5}-0.25 \end{pmatrix}$$

$$H \quad \begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.2\sqrt{7.5-1.5\sqrt{5}} & -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.2\sqrt{1.5\sqrt{5}+7.5} \\ 0.04\sqrt{5}\left(\sqrt{5}+5\right) & 0.35-0.05\sqrt{5} & -0.1\sqrt{5.5\sqrt{5}+12.5} & -\frac{4}{5} & 0.2\sqrt{5-2\sqrt{5}} \\ \sqrt{0.3-0.06\sqrt{5}} & 0.1\sqrt{5.5\sqrt{5}+12.5} & -0.25+0.15\sqrt{5} & 0.2\sqrt{2\sqrt{5}+5} & \frac{\sqrt{5}}{5} \\ -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -\frac{4}{5} & -0.2\sqrt{2\sqrt{5}+5} & 0.05\sqrt{5}+0.35 & -0.1\sqrt{12.5-5.5\sqrt{5}} \\ \sqrt{0.06\sqrt{5}+0.3} & -0.2\sqrt{5-2\sqrt{5}} & \frac{\sqrt{5}}{5} & 0.1\sqrt{12.5-5.5\sqrt{5}} & -0.15\sqrt{5}-0.25 \end{pmatrix}$$

I	$\hat{C}_5^2(2)$
A	1

$$T1 \quad \begin{pmatrix} -0.25\sqrt{5}-0.25 & -0.5\sqrt{0.5-0.1\sqrt{5}} & \sqrt{0.5-0.1\sqrt{5}} \\ 0.5\sqrt{0.5-0.1\sqrt{5}} & 0.75-0.05\sqrt{5} & 0.1\sqrt{5}+0.5 \\ -\sqrt{0.5-0.1\sqrt{5}} & 0.1\sqrt{5}+0.5 & -\frac{\sqrt{5}}{5} \end{pmatrix}$$

$$T2 \quad \begin{pmatrix} \frac{\sqrt{5}}{5} & \sqrt{0.1\sqrt{5}+0.5} & 0.5-0.1\sqrt{5} \\ -\sqrt{0.1\sqrt{5}+0.5} & -0.25+0.25\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} \\ 0.5-0.1\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} & 0.05\sqrt{5}+0.75 \end{pmatrix}$$

$$G \quad \begin{pmatrix} -0.25+0.25\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} & 0 & \sqrt{0.1\sqrt{5}+0.5} \\ 0.5\sqrt{0.1\sqrt{5}+0.5} & -0.15\sqrt{5}-0.25 & -\sqrt{0.5-0.1\sqrt{5}} & -\frac{\sqrt{5}}{5} \\ 0 & \sqrt{0.5-0.1\sqrt{5}} & -0.25\sqrt{5}-0.25 & 0.5\sqrt{0.5-0.1\sqrt{5}} \\ -\sqrt{0.1\sqrt{5}+0.5} & -\frac{\sqrt{5}}{5} & -0.5\sqrt{0.5-0.1\sqrt{5}} & -0.25+0.15\sqrt{5} \end{pmatrix}$$

$$H \quad \begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.2\sqrt{1.5\sqrt{5}+7.5} & -0.04\sqrt{5}\left(\sqrt{5}+5\right) & \sqrt{0.3-0.06\sqrt{5}} \\ 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & 0.05\sqrt{5}+0.35 & 0.1\sqrt{12.5-5.5\sqrt{5}} & -\frac{4}{5} & -0.2\sqrt{2\sqrt{5}+5} \\ \sqrt{0.06\sqrt{5}+0.3} & -0.1\sqrt{12.5-5.5\sqrt{5}} & -0.15\sqrt{5}-0.25 & 0.2\sqrt{5-2\sqrt{5}} & -\frac{\sqrt{5}}{5} \\ -0.04\sqrt{5}\left(\sqrt{5}+5\right) & -\frac{4}{5} & -0.2\sqrt{5-2\sqrt{5}} & 0.35-0.05\sqrt{5} & -0.1\sqrt{5.5\sqrt{5}+12.5} \\ -0.2\sqrt{7.5-1.5\sqrt{5}} & 0.2\sqrt{2\sqrt{5}+5} & -\frac{\sqrt{5}}{5} & 0.1\sqrt{5.5\sqrt{5}+12.5} & -0.25+0.15\sqrt{5} \end{pmatrix}$$

I	$\hat{C}_5^3(2)$
A	1
$T1$	$\begin{pmatrix} -0.25\sqrt{5}-0.25 & 0.5\sqrt{0.5-0.1\sqrt{5}} & -\sqrt{0.5-0.1\sqrt{5}} \\ -0.5\sqrt{0.5-0.1\sqrt{5}} & 0.75-0.05\sqrt{5} & 0.1\sqrt{5}+0.5 \\ \sqrt{0.5-0.1\sqrt{5}} & 0.1\sqrt{5}+0.5 & -\frac{\sqrt{5}}{5} \end{pmatrix}$
$T2$	$\begin{pmatrix} \frac{\sqrt{5}}{5} & -\sqrt{0.1\sqrt{5}+0.5} & 0.5-0.1\sqrt{5} \\ \sqrt{0.1\sqrt{5}+0.5} & -0.25+0.25\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} \\ 0.5-0.1\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} & 0.05\sqrt{5}+0.75 \end{pmatrix}$
G	$\begin{pmatrix} -0.25+0.25\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} & 0 & -\sqrt{0.1\sqrt{5}+0.5} \\ -0.5\sqrt{0.1\sqrt{5}+0.5} & -0.15\sqrt{5}-0.25 & \sqrt{0.5-0.1\sqrt{5}} & -\frac{\sqrt{5}}{5} \\ 0 & -\sqrt{0.5-0.1\sqrt{5}} & -0.25\sqrt{5}-0.25 & -0.5\sqrt{0.5-0.1\sqrt{5}} \\ \sqrt{0.1\sqrt{5}+0.5} & -\frac{\sqrt{5}}{5} & 0.5\sqrt{0.5-0.1\sqrt{5}} & -0.25+0.15\sqrt{5} \end{pmatrix}$
H	$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & \sqrt{0.06\sqrt{5}+0.3} & -0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.2\sqrt{7.5-1.5\sqrt{5}} \\ 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & 0.05\sqrt{5}+0.35 & -0.1\sqrt{12.5-5.5\sqrt{5}} & -\frac{4}{5} & 0.2\sqrt{2\sqrt{5}+5} \\ -0.2\sqrt{1.5\sqrt{5}+7.5} & 0.1\sqrt{12.5-5.5\sqrt{5}} & -0.15\sqrt{5}-0.25 & -0.2\sqrt{5-2\sqrt{5}} & -\frac{\sqrt{5}}{5} \\ -0.04\sqrt{5}\left(\sqrt{5}+5\right) & -\frac{4}{5} & 0.2\sqrt{5-2\sqrt{5}} & 0.35-0.05\sqrt{5} & 0.1\sqrt{5.5\sqrt{5}+12.5} \\ \sqrt{0.3-0.06\sqrt{5}} & -0.2\sqrt{2\sqrt{5}+5} & -\frac{\sqrt{5}}{5} & -0.1\sqrt{5.5\sqrt{5}+12.5} & -0.25+0.15\sqrt{5} \end{pmatrix}$

I	$\hat{C}_5^4(2)$
A	1
$T1$	$\begin{pmatrix} -0.25+0.25\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} & -\sqrt{0.1\sqrt{5}+0.5} \\ -0.5\sqrt{0.1\sqrt{5}+0.5} & 0.05\sqrt{5}+0.75 & 0.5-0.1\sqrt{5} \\ \sqrt{0.1\sqrt{5}+0.5} & 0.5-0.1\sqrt{5} & \frac{\sqrt{5}}{5} \end{pmatrix}$
$T2$	$\begin{pmatrix} -\frac{\sqrt{5}}{5} & \sqrt{0.5-0.1\sqrt{5}} & 0.1\sqrt{5}+0.5 \\ -\sqrt{0.5-0.1\sqrt{5}} & -0.25\sqrt{5}-0.25 & 0.5\sqrt{0.5-0.1\sqrt{5}} \\ 0.1\sqrt{5}+0.5 & -0.5\sqrt{0.5-0.1\sqrt{5}} & 0.75-0.05\sqrt{5} \end{pmatrix}$
G	$\begin{pmatrix} -0.25\sqrt{5}-0.25 & -0.5\sqrt{0.5-0.1\sqrt{5}} & 0 & \sqrt{0.5-0.1\sqrt{5}} \\ 0.5\sqrt{0.5-0.1\sqrt{5}} & -0.25+0.15\sqrt{5} & \sqrt{0.1\sqrt{5}+0.5} & \frac{\sqrt{5}}{5} \\ 0 & -\sqrt{0.1\sqrt{5}+0.5} & -0.25+0.25\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} \\ -\sqrt{0.5-0.1\sqrt{5}} & \frac{\sqrt{5}}{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} & -0.15\sqrt{5}-0.25 \end{pmatrix}$
H	$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(\sqrt{5}+5\right) & \sqrt{0.3-0.06\sqrt{5}} & -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & \sqrt{0.06\sqrt{5}+0.3} \\ 0.04\sqrt{5}\left(\sqrt{5}+5\right) & 0.35-0.05\sqrt{5} & 0.1\sqrt{5.5\sqrt{5}+12.5} & -\frac{4}{5} & -0.2\sqrt{5-2\sqrt{5}} \\ -0.2\sqrt{7.5-1.5\sqrt{5}} & -0.1\sqrt{5.5\sqrt{5}+12.5} & -0.25+0.15\sqrt{5} & -0.2\sqrt{2\sqrt{5}+5} & \frac{\sqrt{5}}{5} \\ -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -\frac{4}{5} & 0.2\sqrt{2\sqrt{5}+5} & 0.05\sqrt{5}+0.35 & 0.1\sqrt{12.5-5.5\sqrt{5}} \\ -0.2\sqrt{1.5\sqrt{5}+7.5} & 0.2\sqrt{5-2\sqrt{5}} & \frac{\sqrt{5}}{5} & -0.1\sqrt{12.5-5.5\sqrt{5}} & -0.15\sqrt{5}-0.25 \end{pmatrix}$

	$\hat{C}_5(3)$
I	
A	1
$T1$	$\begin{pmatrix} -0.25+0.25\sqrt{5} & 0.5\sqrt{0.5\sqrt{5}+2.5} & 0 \\ -0.5\sqrt{0.5\sqrt{5}+2.5} & -0.25+0.25\sqrt{5} & 0 \\ 0 & 0 & 1 \end{pmatrix}$
$T2$	$\begin{pmatrix} 1 & 0 & 0 \\ 0 & -0.25\sqrt{5}-0.25 & -0.5\sqrt{2.5-0.5\sqrt{5}} \\ 0 & 0.5\sqrt{2.5-0.5\sqrt{5}} & -0.25\sqrt{5}-0.25 \end{pmatrix}$
G	$\begin{pmatrix} -0.25+0.25\sqrt{5} & 0.5\sqrt{0.5\sqrt{5}+2.5} & 0 & 0 \\ -0.5\sqrt{0.5\sqrt{5}+2.5} & -0.25+0.25\sqrt{5} & 0 & 0 \\ 0 & 0 & -0.25\sqrt{5}-0.25 & 0.5\sqrt{2.5-0.5\sqrt{5}} \\ 0 & 0 & -0.5\sqrt{2.5-0.5\sqrt{5}} & -0.25\sqrt{5}-0.25 \end{pmatrix}$
H	$\begin{pmatrix} 1 & 0 & 0 & 0 & 0 \\ 0 & -0.25\sqrt{5}-0.25 & 0.5\sqrt{2.5-0.5\sqrt{5}} & 0 & 0 \\ 0 & -0.5\sqrt{2.5-0.5\sqrt{5}} & -0.25\sqrt{5}-0.25 & 0 & 0 \\ 0 & 0 & 0 & -0.25+0.25\sqrt{5} & -0.5\sqrt{0.5\sqrt{5}+2.5} \\ 0 & 0 & 0 & 0.5\sqrt{0.5\sqrt{5}+2.5} & -0.25+0.25\sqrt{5} \end{pmatrix}$

	$\hat{C}_5^2(3)$
I	
A	1
$T1$	$\begin{pmatrix} -0.25\sqrt{5}-0.25 & 0.5\sqrt{2.5-0.5\sqrt{5}} & 0 \\ -0.5\sqrt{2.5-0.5\sqrt{5}} & -0.25\sqrt{5}-0.25 & 0 \\ 0 & 0 & 1 \end{pmatrix}$
$T2$	$\begin{pmatrix} 1 & 0 & 0 \\ 0 & -0.25+0.25\sqrt{5} & 0.5\sqrt{0.5\sqrt{5}+2.5} \\ 0 & -0.5\sqrt{0.5\sqrt{5}+2.5} & -0.25+0.25\sqrt{5} \end{pmatrix}$
G	$\begin{pmatrix} -0.25\sqrt{5}-0.25 & 0.5\sqrt{2.5-0.5\sqrt{5}} & 0 & 0 \\ -0.5\sqrt{2.5-0.5\sqrt{5}} & -0.25\sqrt{5}-0.25 & 0 & 0 \\ 0 & 0 & -0.25+0.25\sqrt{5} & -0.5\sqrt{0.5\sqrt{5}+2.5} \\ 0 & 0 & 0.5\sqrt{0.5\sqrt{5}+2.5} & -0.25+0.25\sqrt{5} \end{pmatrix}$
H	$\begin{pmatrix} 1 & 0 & 0 & 0 & 0 \\ 0 & -0.25+0.25\sqrt{5} & -0.5\sqrt{0.5\sqrt{5}+2.5} & 0 & 0 \\ 0 & 0.5\sqrt{0.5\sqrt{5}+2.5} & -0.25+0.25\sqrt{5} & 0 & 0 \\ 0 & 0 & 0 & -0.25\sqrt{5}-0.25 & -0.5\sqrt{2.5-0.5\sqrt{5}} \\ 0 & 0 & 0 & 0.5\sqrt{2.5-0.5\sqrt{5}} & -0.25\sqrt{5}-0.25 \end{pmatrix}$

I		$\hat{C}_5^3(3)$
A		1

$T1$

$$\begin{pmatrix} -0.25\sqrt{5}-0.25 & -0.5\sqrt{2.5-0.5\sqrt{5}} & 0 \\ 0.5\sqrt{2.5-0.5\sqrt{5}} & -0.25\sqrt{5}-0.25 & 0 \\ 0 & 0 & 1 \end{pmatrix}$$

$T2$

$$\begin{pmatrix} 1 & 0 & 0 \\ 0 & -0.25+0.25\sqrt{5} & -0.5\sqrt{0.5\sqrt{5}+2.5} \\ 0 & 0.5\sqrt{0.5\sqrt{5}+2.5} & -0.25+0.25\sqrt{5} \end{pmatrix}$$

G

$$\begin{pmatrix} -0.25\sqrt{5}-0.25 & -0.5\sqrt{2.5-0.5\sqrt{5}} & 0 & 0 \\ 0.5\sqrt{2.5-0.5\sqrt{5}} & -0.25\sqrt{5}-0.25 & 0 & 0 \\ 0 & 0 & -0.25+0.25\sqrt{5} & 0.5\sqrt{0.5\sqrt{5}+2.5} \\ 0 & 0 & -0.5\sqrt{0.5\sqrt{5}+2.5} & -0.25+0.25\sqrt{5} \end{pmatrix}$$

H

$$\begin{pmatrix} 1 & 0 & 0 & 0 & 0 \\ 0 & -0.25+0.25\sqrt{5} & 0.5\sqrt{0.5\sqrt{5}+2.5} & 0 & 0 \\ 0 & -0.5\sqrt{0.5\sqrt{5}+2.5} & -0.25+0.25\sqrt{5} & 0 & 0 \\ 0 & 0 & 0 & -0.25\sqrt{5}-0.25 & 0.5\sqrt{2.5-0.5\sqrt{5}} \\ 0 & 0 & 0 & -0.5\sqrt{2.5-0.5\sqrt{5}} & -0.25\sqrt{5}-0.25 \end{pmatrix}$$

I		$\hat{C}_5^4(3)$
A		1

$T1$

$$\begin{pmatrix} -0.25+0.25\sqrt{5} & -0.5\sqrt{0.5\sqrt{5}+2.5} & 0 \\ 0.5\sqrt{0.5\sqrt{5}+2.5} & -0.25+0.25\sqrt{5} & 0 \\ 0 & 0 & 1 \end{pmatrix}$$

$T2$

$$\begin{pmatrix} 1 & 0 & 0 \\ 0 & -0.25\sqrt{5}-0.25 & 0.5\sqrt{2.5-0.5\sqrt{5}} \\ 0 & -0.5\sqrt{2.5-0.5\sqrt{5}} & -0.25\sqrt{5}-0.25 \end{pmatrix}$$

G

$$\begin{pmatrix} -0.25+0.25\sqrt{5} & -0.5\sqrt{0.5\sqrt{5}+2.5} & 0 & 0 \\ 0.5\sqrt{0.5\sqrt{5}+2.5} & -0.25+0.25\sqrt{5} & 0 & 0 \\ 0 & 0 & -0.25\sqrt{5}-0.25 & -0.5\sqrt{2.5-0.5\sqrt{5}} \\ 0 & 0 & 0.5\sqrt{2.5-0.5\sqrt{5}} & -0.25\sqrt{5}-0.25 \end{pmatrix}$$

H

$$\begin{pmatrix} 1 & 0 & 0 & 0 & 0 \\ 0 & -0.25\sqrt{5}-0.25 & -0.5\sqrt{2.5-0.5\sqrt{5}} & 0 & 0 \\ 0 & 0.5\sqrt{2.5-0.5\sqrt{5}} & -0.25\sqrt{5}-0.25 & 0 & 0 \\ 0 & 0 & 0 & -0.25+0.25\sqrt{5} & 0.5\sqrt{0.5\sqrt{5}+2.5} \\ 0 & 0 & 0 & -0.5\sqrt{0.5\sqrt{5}+2.5} & -0.25+0.25\sqrt{5} \end{pmatrix}$$

$$
\begin{array}{c|c}
\mathbf{I} & \hat{C}_5(4) \\
\hline
A & 1 \\
\end{array}
$$

$$
T1 \quad
\begin{pmatrix}
0.25 + 0.25\sqrt{5} & -0.5\sqrt{0.5 - 0.1\sqrt{5}} & \sqrt{0.5 - 0.1\sqrt{5}} \\
0.5\sqrt{2.5 - 0.5\sqrt{5}} & 0.05\sqrt{5} + 0.25 & -0.5 - 0.1\sqrt{5} \\
0 & \frac{2\sqrt{5}}{5} & \frac{\sqrt{5}}{5}
\end{pmatrix}
$$

$$
T2 \quad
\begin{pmatrix}
-\frac{\sqrt{5}}{5} & 0 & -\frac{2\sqrt{5}}{5} \\
-\sqrt{0.1\sqrt{5} + 0.5} & 0.25 - 0.25\sqrt{5} & 0.5\sqrt{0.1\sqrt{5} + 0.5} \\
-0.5 + 0.1\sqrt{5} & 0.5\sqrt{0.5\sqrt{5} + 2.5} & 0.25 - 0.05\sqrt{5}
\end{pmatrix}
$$

$$
G \quad
\begin{pmatrix}
0 & \sqrt{0.5 - 0.1\sqrt{5}} & 0.25 + 0.25\sqrt{5} & 0.5\sqrt{0.5 - 0.1\sqrt{5}} \\
0 & -0.5 - 0.1\sqrt{5} & 0.5\sqrt{2.5 - 0.5\sqrt{5}} & -0.25 - 0.05\sqrt{5} \\
0.25 - 0.25\sqrt{5} & -0.5\sqrt{0.1\sqrt{5} + 0.5} & 0 & \sqrt{0.1\sqrt{5} + 0.5} \\
-0.5\sqrt{0.5\sqrt{5} + 2.5} & 0.25 - 0.05\sqrt{5} & 0 & -0.5 + 0.1\sqrt{5}
\end{pmatrix}
$$

$$
H \quad
\begin{pmatrix}
-0.2 & -0.4\sqrt{3} & 0 & 0.4\sqrt{3} & 0 \\
0.04\sqrt{5}\left(-5 + \sqrt{5}\right) & -0.15 + 0.15\sqrt{5} & -0.5\sqrt{0.1\sqrt{5} + 0.5} & -0.1 + 0.1\sqrt{5} & \sqrt{0.1\sqrt{5} + 0.5} \\
-0.2\sqrt{1.5\sqrt{5} + 7.5} & 0.3\sqrt{0.5\sqrt{5} + 2.5} & 0.25 - 0.05\sqrt{5} & \sqrt{0.02\sqrt{5} + 0.1} & -0.5 + 0.1\sqrt{5} \\
-0.04\sqrt{5}\left(\sqrt{5} + 5\right) & -0.1\sqrt{5} - 0.1 & \sqrt{0.5 - 0.1\sqrt{5}} & -0.15\sqrt{5} - 0.15 & 0.5\sqrt{0.5 - 0.1\sqrt{5}} \\
\sqrt{0.3 - 0.06\sqrt{5}} & \sqrt{0.1 - 0.02\sqrt{5}} & 0.1\sqrt{5} + 0.5 & 0.3\sqrt{2.5 - 0.5\sqrt{5}} & 0.05\sqrt{5} + 0.25
\end{pmatrix}
$$

$$
\begin{array}{c|c}
\mathbf{I} & \hat{C}_5^2(4) \\
\hline
A & 1 \\
\end{array}
$$

$$
T1 \quad
\begin{pmatrix}
0.5 & 0.5\sqrt{1 - \frac{2\sqrt{5}}{5}} & \sqrt{0.1\sqrt{5} + 0.5} \\
0.5\sqrt{\frac{2\sqrt{5}}{5} + 1} & -0.3\sqrt{5} & -0.5 + 0.1\sqrt{5} \\
\sqrt{0.5 - 0.1\sqrt{5}} & 0.1\sqrt{5} + 0.5 & -\frac{\sqrt{5}}{5}
\end{pmatrix}
$$

$$
T2 \quad
\begin{pmatrix}
\frac{\sqrt{5}}{5} & -\sqrt{0.1\sqrt{5} + 0.5} & 0.5 - 0.1\sqrt{5} \\
\sqrt{0.5 - 0.1\sqrt{5}} & 0.5 & 0.5\sqrt{\frac{2\sqrt{5}}{5} + 1} \\
-0.5 - 0.1\sqrt{5} & -0.5\sqrt{1 - \frac{2\sqrt{5}}{5}} & 0.3\sqrt{5}
\end{pmatrix}
$$

$$
G \quad
\begin{pmatrix}
-0.5 & -0.5\sqrt{\frac{2\sqrt{5}}{5} + 1} & -0.25 + 0.25\sqrt{5} & 0.5\sqrt{0.1\sqrt{5} + 0.5} \\
0.5\sqrt{1 - \frac{2\sqrt{5}}{5}} & 0.1\sqrt{5} & -0.5\sqrt{0.1\sqrt{5} + 0.5} & 0.05\sqrt{5} + 0.75 \\
-0.25\sqrt{5} - 0.25 & 0.5\sqrt{0.5 - 0.1\sqrt{5}} & -0.5 & -0.5\sqrt{1 - \frac{2\sqrt{5}}{5}} \\
0.5\sqrt{0.5 - 0.1\sqrt{5}} & -0.75 + 0.05\sqrt{5} & -0.5\sqrt{\frac{2\sqrt{5}}{5} + 1} & -0.1\sqrt{5}
\end{pmatrix}
$$

$$
H \quad
\begin{pmatrix}
-0.2 & 0.04\sqrt{5}\left(-5 + \sqrt{5}\right) & \sqrt{0.06\sqrt{5} + 0.3} & -0.04\sqrt{5}\left(\sqrt{5} + 5\right) & -0.2\sqrt{7.5 - 1.5\sqrt{5}} \\
0.04\sqrt{5}\left(\sqrt{5} + 5\right) & 0.1 & 0.1\sqrt{2\sqrt{5} + 25} & 0.4 - \frac{\sqrt{5}}{5} & 0.2\sqrt{2\sqrt{5} + 5} \\
-0.2\sqrt{7.5 - 1.5\sqrt{5}} & 0.1\sqrt{25 - 2\sqrt{5}} & -0.1\sqrt{5} & -0.2\sqrt{2\sqrt{5} + 5} & \frac{\sqrt{5}}{5} \\
-0.04\sqrt{5}\left(-5 + \sqrt{5}\right) & 0.4 + \frac{\sqrt{5}}{5} & 0.2\sqrt{5 - 2\sqrt{5}} & 0.1 & -0.1\sqrt{25 - 2\sqrt{5}} \\
-0.2\sqrt{1.5\sqrt{5} + 7.5} & 0.2\sqrt{5 - 2\sqrt{5}} & \frac{\sqrt{5}}{5} & 0.1\sqrt{2\sqrt{5} + 25} & 0.1\sqrt{5}
\end{pmatrix}
$$

I	$\hat{C}_5^3(4)$
A	1

$T1$:
$$\begin{pmatrix} 0.5 & 0.5\sqrt{\tfrac{2\sqrt{5}}{5}+1} & \sqrt{0.5-0.1\sqrt{5}} \\ 0.5\sqrt{1-\tfrac{2\sqrt{5}}{5}} & -0.3\sqrt{5} & 0.1\sqrt{5}+0.5 \\ \sqrt{0.1\sqrt{5}+0.5} & -0.5+0.1\sqrt{5} & -\tfrac{\sqrt{5}}{5} \end{pmatrix}$$

$T2$:
$$\begin{pmatrix} \tfrac{\sqrt{5}}{5} & \sqrt{0.5-0.1\sqrt{5}} & -0.5-0.1\sqrt{5} \\ -\sqrt{0.1\sqrt{5}+0.5} & 0.5 & -0.5\sqrt{1-\tfrac{2\sqrt{5}}{5}} \\ 0.5-0.1\sqrt{5} & 0.5\sqrt{\tfrac{2\sqrt{5}}{5}+1} & 0.3\sqrt{5} \end{pmatrix}$$

G:
$$\begin{pmatrix} -0.5 & 0.5\sqrt{1-\tfrac{2\sqrt{5}}{5}} & -0.25\sqrt{5}-0.25 & 0.5\sqrt{0.5-0.1\sqrt{5}} \\ -0.5\sqrt{\tfrac{2\sqrt{5}}{5}+1} & 0.1\sqrt{5} & 0.5\sqrt{0.5-0.1\sqrt{5}} & -0.75+0.05\sqrt{5} \\ -0.25+0.25\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} & -0.5 & -0.5\sqrt{\tfrac{2\sqrt{5}}{5}+1} \\ 0.5\sqrt{0.1\sqrt{5}+0.5} & 0.05\sqrt{5}+0.75 & -0.5\sqrt{1-\tfrac{2\sqrt{5}}{5}} & -0.1\sqrt{5} \end{pmatrix}$$

H:
$$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.2\sqrt{7.5-1.5\sqrt{5}} & -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.2\sqrt{1.5\sqrt{5}+7.5} \\ 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & 0.1 & 0.1\sqrt{25-2\sqrt{5}} & 0.4+\tfrac{\sqrt{5}}{5} & 0.2\sqrt{5-2\sqrt{5}} \\ \sqrt{0.06\sqrt{5}+0.3} & 0.1\sqrt{2\sqrt{5}+25} & -0.1\sqrt{5} & 0.2\sqrt{5-2\sqrt{5}} & \tfrac{\sqrt{5}}{5} \\ -0.04\sqrt{5}\left(\sqrt{5}+5\right) & 0.4-\tfrac{\sqrt{5}}{5} & -0.2\sqrt{2\sqrt{5}+5} & 0.1 & 0.1\sqrt{2\sqrt{5}+25} \\ -0.2\sqrt{7.5-1.5\sqrt{5}} & 0.2\sqrt{2\sqrt{5}+5} & \tfrac{\sqrt{5}}{5} & -0.1\sqrt{25-2\sqrt{5}} & 0.1\sqrt{5} \end{pmatrix}$$

I	$\hat{C}_5^4(4)$
A	1

$T1$:
$$\begin{pmatrix} 0.25+0.25\sqrt{5} & 0.5\sqrt{2.5-0.5\sqrt{5}} & 0 \\ -0.5\sqrt{0.5-0.1\sqrt{5}} & 0.05\sqrt{5}+0.25 & \tfrac{2\sqrt{5}}{5} \\ \sqrt{0.5-0.1\sqrt{5}} & -0.5-0.1\sqrt{5} & \tfrac{\sqrt{5}}{5} \end{pmatrix}$$

$T2$:
$$\begin{pmatrix} -\tfrac{\sqrt{5}}{5} & -\sqrt{0.1\sqrt{5}+0.5} & -0.5+0.1\sqrt{5} \\ 0 & 0.25-0.25\sqrt{5} & 0.5\sqrt{0.5\sqrt{5}+2.5} \\ -\tfrac{2\sqrt{5}}{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} & 0.25-0.05\sqrt{5} \end{pmatrix}$$

G:
$$\begin{pmatrix} 0 & 0 & 0.25-0.25\sqrt{5} & -0.5\sqrt{0.5\sqrt{5}+2.5} \\ \sqrt{0.5-0.1\sqrt{5}} & -0.5-0.1\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} & 0.25-0.05\sqrt{5} \\ 0.25+0.25\sqrt{5} & 0.5\sqrt{2.5-0.5\sqrt{5}} & 0 & 0 \\ 0.5\sqrt{0.5-0.1\sqrt{5}} & -0.25-0.05\sqrt{5} & \sqrt{0.1\sqrt{5}+0.5} & -0.5+0.1\sqrt{5} \end{pmatrix}$$

H:
$$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.2\sqrt{1.5\sqrt{5}+7.5} & -0.04\sqrt{5}\left(\sqrt{5}+5\right) & \sqrt{0.3-0.06\sqrt{5}} \\ -0.4\sqrt{3} & -0.15+0.15\sqrt{5} & 0.3\sqrt{0.5\sqrt{5}+2.5} & -0.1\sqrt{5}-0.1 & \sqrt{0.1-0.02\sqrt{5}} \\ 0 & -0.5\sqrt{0.1\sqrt{5}+0.5} & 0.25-0.05\sqrt{5} & \sqrt{0.5-0.1\sqrt{5}} & 0.1\sqrt{5}+0.5 \\ 0.4\sqrt{3} & -0.1+0.1\sqrt{5} & \sqrt{0.02\sqrt{5}+0.1} & -0.15\sqrt{5}-0.15 & 0.3\sqrt{2.5-0.5\sqrt{5}} \\ 0 & \sqrt{0.1\sqrt{5}+0.5} & -0.5+0.1\sqrt{5} & 0.5\sqrt{0.5-0.1\sqrt{5}} & 0.05\sqrt{5}+0.25 \end{pmatrix}$$

I	$\hat{C}_5(5)$
A	1

$$T1: \begin{pmatrix} 0.25 + 0.25\sqrt{5} & -0.5\sqrt{2.5 - 0.5\sqrt{5}} & 0 \\ 0.5\sqrt{0.5 - 0.1\sqrt{5}} & 0.05\sqrt{5} + 0.25 & \frac{2\sqrt{5}}{5} \\ -\sqrt{0.5 - 0.1\sqrt{5}} & -0.5 - 0.1\sqrt{5} & \frac{\sqrt{5}}{5} \end{pmatrix}$$

$$T2: \begin{pmatrix} -\frac{\sqrt{5}}{5} & \sqrt{0.1\sqrt{5} + 0.5} & -0.5 + 0.1\sqrt{5} \\ 0 & 0.25 - 0.25\sqrt{5} & -0.5\sqrt{0.5\sqrt{5} + 2.5} \\ -\frac{2\sqrt{5}}{5} & -0.5\sqrt{0.1\sqrt{5} + 0.5} & 0.25 - 0.05\sqrt{5} \end{pmatrix}$$

$$G: \begin{pmatrix} 0 & 0 & 0.25 - 0.25\sqrt{5} & 0.5\sqrt{0.5\sqrt{5} + 2.5} \\ -\sqrt{0.5 - 0.1\sqrt{5}} & -0.5 - 0.1\sqrt{5} & 0.5\sqrt{0.1\sqrt{5} + 0.5} & 0.25 - 0.05\sqrt{5} \\ 0.25 + 0.25\sqrt{5} & -0.5\sqrt{2.5 - 0.5\sqrt{5}} & 0 & 0 \\ -0.5\sqrt{0.5 - 0.1\sqrt{5}} & -0.25 - 0.05\sqrt{5} & -\sqrt{0.1\sqrt{5} + 0.5} & -0.5 + 0.1\sqrt{5} \end{pmatrix}$$

$$H: \begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(-5 + \sqrt{5}\right) & \sqrt{0.06\sqrt{5} + 0.3} & -0.04\sqrt{5}\left(\sqrt{5} + 5\right) & -0.2\sqrt{7.5 - 1.5\sqrt{5}} \\ -0.4\sqrt{3} & -0.15 + 0.15\sqrt{5} & -0.3\sqrt{0.5\sqrt{5} + 2.5} & -0.1\sqrt{5} - 0.1 & -0.2\sqrt{2.5 - 0.5\sqrt{5}} \\ 0 & 0.5\sqrt{0.1\sqrt{5} + 0.5} & 0.25 - 0.05\sqrt{5} & -\sqrt{0.5 - 0.1\sqrt{5}} & 0.1\sqrt{5} + 0.5 \\ 0.4\sqrt{3} & -0.1 + 0.1\sqrt{5} & -0.2\sqrt{0.5\sqrt{5} + 2.5} & -0.15\sqrt{5} - 0.15 & -0.3\sqrt{2.5 - 0.5\sqrt{5}} \\ 0 & -\sqrt{0.1\sqrt{5} + 0.5} & -0.5 + 0.1\sqrt{5} & -0.5\sqrt{0.5 - 0.1\sqrt{5}} & 0.05\sqrt{5} + 0.25 \end{pmatrix}$$

I	$\hat{C}_5^2(5)$
A	1

$$T1: \begin{pmatrix} 0.5 & -0.5\sqrt{\frac{2\sqrt{5}}{5} + 1} & -\sqrt{0.5 - 0.1\sqrt{5}} \\ -0.5\sqrt{1 - \frac{2\sqrt{5}}{5}} & -0.3\sqrt{5} & 0.1\sqrt{5} + 0.5 \\ -\sqrt{0.1\sqrt{5} + 0.5} & -0.5 + 0.1\sqrt{5} & -\frac{\sqrt{5}}{5} \end{pmatrix}$$

$$T2: \begin{pmatrix} \frac{\sqrt{5}}{5} & -\sqrt{0.5 - 0.1\sqrt{5}} & -0.5 - 0.1\sqrt{5} \\ \sqrt{0.1\sqrt{5} + 0.5} & 0.5 & 0.5\sqrt{1 - \frac{2\sqrt{5}}{5}} \\ 0.5 - 0.1\sqrt{5} & -0.5\sqrt{\frac{2\sqrt{5}}{5} + 1} & 0.3\sqrt{5} \end{pmatrix}$$

$$G: \begin{pmatrix} -0.5 & -0.5\sqrt{1 - \frac{2\sqrt{5}}{5}} & -0.25\sqrt{5} - 0.25 & -0.5\sqrt{0.5 - 0.1\sqrt{5}} \\ 0.5\sqrt{\frac{2\sqrt{5}}{5} + 1} & 0.1\sqrt{5} & -0.5\sqrt{0.5 - 0.1\sqrt{5}} & -0.75 + 0.05\sqrt{5} \\ -0.25 + 0.25\sqrt{5} & 0.5\sqrt{0.1\sqrt{5} + 0.5} & -0.5 & 0.5\sqrt{\frac{2\sqrt{5}}{5} + 1} \\ -0.5\sqrt{0.1\sqrt{5} + 0.5} & 0.05\sqrt{5} + 0.75 & 0.5\sqrt{1 - \frac{2\sqrt{5}}{5}} & -0.1\sqrt{5} \end{pmatrix}$$

$$H: \begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(\sqrt{5} + 5\right) & \sqrt{0.3 - 0.06\sqrt{5}} & -0.04\sqrt{5}\left(-5 + \sqrt{5}\right) & \sqrt{0.06\sqrt{5} + 0.3} \\ 0.04\sqrt{5}\left(-5 + \sqrt{5}\right) & 0.1 & -0.1\sqrt{25 - 2\sqrt{5}} & 0.4 + \frac{\sqrt{5}}{5} & -0.2\sqrt{5 - 2\sqrt{5}} \\ -0.2\sqrt{1.5\sqrt{5} + 7.5} & -0.1\sqrt{2\sqrt{5} + 25} & -0.1\sqrt{5} & -0.2\sqrt{5 - 2\sqrt{5}} & \frac{\sqrt{5}}{5} \\ -0.04\sqrt{5}\left(\sqrt{5} + 5\right) & 0.4 - \frac{\sqrt{5}}{5} & 0.2\sqrt{2\sqrt{5} + 5} & 0.1 & -0.1\sqrt{2\sqrt{5} + 25} \\ \sqrt{0.3 - 0.06\sqrt{5}} & -0.2\sqrt{2\sqrt{5} + 5} & \frac{\sqrt{5}}{5} & 0.1\sqrt{25 - 2\sqrt{5}} & 0.1\sqrt{5} \end{pmatrix}$$

I	$\hat{C}_5^3(5)$
A	1
$T1$	$\begin{pmatrix} 0.5 & -0.5\sqrt{1-\frac{2\sqrt5}{5}} & -\sqrt{0.1\sqrt5+0.5} \\ -0.5\sqrt{\frac{2\sqrt5}{5}+1} & -0.3\sqrt5 & -0.5+0.1\sqrt5 \\ -\sqrt{0.5-0.1\sqrt5} & 0.1\sqrt5+0.5 & -\frac{\sqrt5}{5} \end{pmatrix}$
$T2$	$\begin{pmatrix} \frac{\sqrt5}{5} & \sqrt{0.1\sqrt5+0.5} & 0.5-0.1\sqrt5 \\ -\sqrt{0.5-0.1\sqrt5} & 0.5 & -0.5\sqrt{\frac{2\sqrt5}{5}+1} \\ -0.5-0.1\sqrt5 & 0.5\sqrt{1-\frac{2\sqrt5}{5}} & 0.3\sqrt5 \end{pmatrix}$
G	$\begin{pmatrix} -0.5 & 0.5\sqrt{\frac{2\sqrt5}{5}+1} & -0.25+0.25\sqrt5 & -0.5\sqrt{0.1\sqrt5+0.5} \\ -0.5\sqrt{1-\frac{2\sqrt5}{5}} & 0.1\sqrt5 & 0.5\sqrt{0.1\sqrt5+0.5} & 0.05\sqrt5+0.75 \\ -0.25\sqrt5-0.25 & -0.5\sqrt{0.5-0.1\sqrt5} & -0.5 & 0.5\sqrt{1-\frac{2\sqrt5}{5}} \\ -0.5\sqrt{0.5-0.1\sqrt5} & -0.75+0.05\sqrt5 & 0.5\sqrt{\frac{2\sqrt5}{5}+1} & -0.1\sqrt5 \end{pmatrix}$
H	$\begin{pmatrix} -0.2 & 0.04\sqrt5\left(-5+\sqrt5\right) & -0.2\sqrt{1.5\sqrt5+7.5} & -0.04\sqrt5\left(\sqrt5+5\right) & \sqrt{0.3-0.06\sqrt5} \\ 0.04\sqrt5\left(\sqrt5+5\right) & 0.1 & -0.1\sqrt{2\sqrt5+25} & 0.4-\frac{\sqrt5}{5} & -0.2\sqrt{2\sqrt5+5} \\ \sqrt{0.3-0.06\sqrt5} & -0.1\sqrt{25-2\sqrt5} & -0.1\sqrt5 & 0.2\sqrt{2\sqrt5+5} & \frac{\sqrt5}{5} \\ -0.04\sqrt5\left(-5+\sqrt5\right) & 0.4+\frac{\sqrt5}{5} & -0.2\sqrt{5-2\sqrt5} & 0.1 & 0.1\sqrt{25-2\sqrt5} \\ \sqrt{0.06\sqrt5+0.3} & -0.2\sqrt{5-2\sqrt5} & \frac{\sqrt5}{5} & -0.1\sqrt{2\sqrt5+25} & 0.1\sqrt5 \end{pmatrix}$

I	$\hat{C}_5^4(5)$
A	1
$T1$	$\begin{pmatrix} 0.25+0.25\sqrt5 & 0.5\sqrt{0.5-0.1\sqrt5} & -\sqrt{0.5-0.1\sqrt5} \\ -0.5\sqrt{2.5-0.5\sqrt5} & 0.05\sqrt5+0.25 & -0.5-0.1\sqrt5 \\ 0 & \frac{2\sqrt5}{5} & \frac{\sqrt5}{5} \end{pmatrix}$
$T2$	$\begin{pmatrix} -\frac{\sqrt5}{5} & 0 & -\frac{2\sqrt5}{5} \\ \sqrt{0.1\sqrt5+0.5} & 0.25-0.25\sqrt5 & -0.5\sqrt{0.1\sqrt5+0.5} \\ -0.5+0.1\sqrt5 & -0.5\sqrt{0.5\sqrt5+2.5} & 0.25-0.05\sqrt5 \end{pmatrix}$
G	$\begin{pmatrix} 0 & -\sqrt{0.5-0.1\sqrt5} & 0.25+0.25\sqrt5 & -0.5\sqrt{0.5-0.1\sqrt5} \\ 0 & -0.5-0.1\sqrt5 & -0.5\sqrt{2.5-0.5\sqrt5} & -0.25-0.05\sqrt5 \\ 0.25-0.25\sqrt5 & 0.5\sqrt{0.1\sqrt5+0.5} & 0 & -\sqrt{0.1\sqrt5+0.5} \\ 0.5\sqrt{0.5\sqrt5+2.5} & 0.25-0.05\sqrt5 & 0 & -0.5+0.1\sqrt5 \end{pmatrix}$
H	$\begin{pmatrix} -0.2 & -0.4\sqrt3 & 0 & 0.4\sqrt3 & 0 \\ 0.04\sqrt5\left(-5+\sqrt5\right) & -0.15+0.15\sqrt5 & 0.5\sqrt{0.1\sqrt5+0.5} & -0.1+0.1\sqrt5 & -\sqrt{0.1\sqrt5+0.5} \\ \sqrt{0.06\sqrt5+0.3} & -0.3\sqrt{0.5\sqrt5+2.5} & 0.25-0.05\sqrt5 & -0.2\sqrt{0.5\sqrt5+2.5} & -0.5+0.1\sqrt5 \\ -0.04\sqrt5\left(\sqrt5+5\right) & -0.1\sqrt5-0.1 & -\sqrt{0.5-0.1\sqrt5} & -0.15\sqrt5-0.15 & -0.5\sqrt{0.5-0.1\sqrt5} \\ -0.2\sqrt{7.5-1.5\sqrt5} & -0.2\sqrt{2.5-0.5\sqrt5} & 0.1\sqrt5+0.5 & -0.3\sqrt{2.5-0.5\sqrt5} & 0.05\sqrt5+0.25 \end{pmatrix}$

I	$\hat{C}_3(0)$
A	1
$T1$	$\begin{pmatrix} 0 & \sqrt{0.5-0.1\sqrt{5}} & \sqrt{0.1\sqrt{5}+0.5} \\ \sqrt{0.1\sqrt{5}+0.5} & \frac{\sqrt{5}}{5} & -0.5+0.1\sqrt{5} \\ -\sqrt{0.5-0.1\sqrt{5}} & 0.1\sqrt{5}+0.5 & -\frac{\sqrt{5}}{5} \end{pmatrix}$
$T2$	$\begin{pmatrix} \frac{\sqrt{5}}{5} & \sqrt{0.1\sqrt{5}+0.5} & 0.5-0.1\sqrt{5} \\ \sqrt{0.5-0.1\sqrt{5}} & 0 & -\sqrt{0.1\sqrt{5}+0.5} \\ -0.5-0.1\sqrt{5} & \sqrt{0.5-0.1\sqrt{5}} & -\frac{\sqrt{5}}{5} \end{pmatrix}$
G	$\begin{pmatrix} 0.5 & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.5 & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} \\ -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & 0.1\sqrt{5} & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -0.5-\frac{\sqrt{5}}{5} \\ -0.5 & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & 0.5 & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} \\ 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & 0.5-\frac{\sqrt{5}}{5} & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.1\sqrt{5} \end{pmatrix}$
H	$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.2\sqrt{1.5\sqrt{5}+7.5} & -0.04\sqrt{5}\left(\sqrt{5}+5\right) & \sqrt{0.3-0.06\sqrt{5}} \\ 0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.4 & -0.2\sqrt{0.5\sqrt{5}+2.5} & -0.1+0.3\sqrt{5} & \sqrt{0.1-0.02\sqrt{5}} \\ -0.2\sqrt{7.5-1.5\sqrt{5}} & -0.2\sqrt{2.5-0.5\sqrt{5}} & \frac{\sqrt{5}}{5} & \sqrt{0.1-0.02\sqrt{5}} & 0.1\sqrt{5}+0.5 \\ -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.3\sqrt{5}-0.1 & \sqrt{0.02\sqrt{5}+0.1} & -0.4 & -0.2\sqrt{2.5-0.5\sqrt{5}} \\ -0.2\sqrt{1.5\sqrt{5}+7.5} & -0.2\sqrt{0.5\sqrt{5}+2.5} & -0.5+0.1\sqrt{5} & \sqrt{0.02\sqrt{5}+0.1} & -\frac{\sqrt{5}}{5} \end{pmatrix}$

I	$\hat{C}_3^2(0)$
A	1
$T1$	$\begin{pmatrix} 0 & \sqrt{0.1\sqrt{5}+0.5} & -\sqrt{0.5-0.1\sqrt{5}} \\ \sqrt{0.5-0.1\sqrt{5}} & \frac{\sqrt{5}}{5} & 0.1\sqrt{5}+0.5 \\ \sqrt{0.1\sqrt{5}+0.5} & -0.5+0.1\sqrt{5} & -\frac{\sqrt{5}}{5} \end{pmatrix}$
$T2$	$\begin{pmatrix} \frac{\sqrt{5}}{5} & \sqrt{0.5-0.1\sqrt{5}} & -0.5-0.1\sqrt{5} \\ \sqrt{0.1\sqrt{5}+0.5} & 0 & \sqrt{0.5-0.1\sqrt{5}} \\ 0.5-0.1\sqrt{5} & -\sqrt{0.1\sqrt{5}+0.5} & -\frac{\sqrt{5}}{5} \end{pmatrix}$
G	$\begin{pmatrix} 0.5 & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -0.5 & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} \\ -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & 0.1\sqrt{5} & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & 0.5-\frac{\sqrt{5}}{5} \\ -0.5 & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & 0.5 & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} \\ -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -0.5-\frac{\sqrt{5}}{5} & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -0.1\sqrt{5} \end{pmatrix}$
H	$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.2\sqrt{7.5-1.5\sqrt{5}} & -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.2\sqrt{1.5\sqrt{5}+7.5} \\ 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.4 & -0.2\sqrt{2.5-0.5\sqrt{5}} & -0.3\sqrt{5}-0.1 & -0.2\sqrt{0.5\sqrt{5}+2.5} \\ -0.2\sqrt{1.5\sqrt{5}+7.5} & -0.2\sqrt{0.5\sqrt{5}+2.5} & \frac{\sqrt{5}}{5} & \sqrt{0.02\sqrt{5}+0.1} & -0.5+0.1\sqrt{5} \\ -0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.1+0.3\sqrt{5} & \sqrt{0.1-0.02\sqrt{5}} & -0.4 & \sqrt{0.02\sqrt{5}+0.1} \\ \sqrt{0.3-0.06\sqrt{5}} & \sqrt{0.1-0.02\sqrt{5}} & 0.1\sqrt{5}+0.5 & -0.2\sqrt{2.5-0.5\sqrt{5}} & -\frac{\sqrt{5}}{5} \end{pmatrix}$

I					$\hat{C}_3(1)$
A					1
$T1$			$\begin{pmatrix} 0 & \sqrt{0.1\sqrt{5}+0.5} & -\sqrt{0.5-0.1\sqrt{5}} \\ -\sqrt{0.5-0.1\sqrt{5}} & -\frac{\sqrt{5}}{5} & -0.5-0.1\sqrt{5} \\ -\sqrt{0.1\sqrt{5}+0.5} & 0.5-0.1\sqrt{5} & \frac{\sqrt{5}}{5} \end{pmatrix}$		
$T2$			$\begin{pmatrix} -\frac{\sqrt{5}}{5} & -\sqrt{0.5-0.1\sqrt{5}} & 0.1\sqrt{5}+0.5 \\ \sqrt{0.1\sqrt{5}+0.5} & 0 & \sqrt{0.5-0.1\sqrt{5}} \\ -0.5+0.1\sqrt{5} & \sqrt{0.1\sqrt{5}+0.5} & \frac{\sqrt{5}}{5} \end{pmatrix}$		
G			$\begin{pmatrix} 0.5 & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -0.5 & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} \\ 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.1\sqrt{5} & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.5+\frac{\sqrt{5}}{5} \\ -0.5 & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & 0.5 & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} \\ 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & \frac{\sqrt{5}}{5}+0.5 & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & 0.1\sqrt{5} \end{pmatrix}$		
H	$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.2\sqrt{7.5-1.5\sqrt{5}} & -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.2\sqrt{1.5\sqrt{5}+7.5} \\ 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.4 & -0.2\sqrt{2.5-0.5\sqrt{5}} & -0.3\sqrt{5}-0.1 & -0.2\sqrt{0.5\sqrt{5}+2.5} \\ \sqrt{0.06\sqrt{5}+0.3} & \sqrt{0.02\sqrt{5}+0.1} & -\frac{\sqrt{5}}{5} & -0.2\sqrt{0.5\sqrt{5}+2.5} & 0.5-0.1\sqrt{5} \\ -0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.1+0.3\sqrt{5} & \sqrt{0.1-0.02\sqrt{5}} & -0.4 & \sqrt{0.02\sqrt{5}+0.1} \\ -0.2\sqrt{7.5-1.5\sqrt{5}} & -0.2\sqrt{2.5-0.5\sqrt{5}} & -0.5-0.1\sqrt{5} & \sqrt{0.1-0.02\sqrt{5}} & \frac{\sqrt{5}}{5} \end{pmatrix}$				

I					$\hat{C}_3^2(1)$
A					1
$T1$			$\begin{pmatrix} 0 & -\sqrt{0.5-0.1\sqrt{5}} & -\sqrt{0.1\sqrt{5}+0.5} \\ \sqrt{0.1\sqrt{5}+0.5} & -\frac{\sqrt{5}}{5} & 0.5-0.1\sqrt{5} \\ -\sqrt{0.5-0.1\sqrt{5}} & -0.5-0.1\sqrt{5} & \frac{\sqrt{5}}{5} \end{pmatrix}$		
$T2$			$\begin{pmatrix} -\frac{\sqrt{5}}{5} & \sqrt{0.1\sqrt{5}+0.5} & -0.5+0.1\sqrt{5} \\ -\sqrt{0.5-0.1\sqrt{5}} & 0 & \sqrt{0.1\sqrt{5}+0.5} \\ 0.1\sqrt{5}+0.5 & \sqrt{0.5-0.1\sqrt{5}} & \frac{\sqrt{5}}{5} \end{pmatrix}$		
G			$\begin{pmatrix} 0.5 & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.5 & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} \\ -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -0.1\sqrt{5} & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & \frac{\sqrt{5}}{5}+0.5 \\ -0.5 & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & 0.5 & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} \\ 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.5+\frac{\sqrt{5}}{5} & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & 0.1\sqrt{5} \end{pmatrix}$		
H	$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & \sqrt{0.06\sqrt{5}+0.3} & -0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.2\sqrt{7.5-1.5\sqrt{5}} \\ 0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.4 & \sqrt{0.02\sqrt{5}+0.1} & -0.1+0.3\sqrt{5} & -0.2\sqrt{2.5-0.5\sqrt{5}} \\ -0.2\sqrt{7.5-1.5\sqrt{5}} & -0.2\sqrt{2.5-0.5\sqrt{5}} & -\frac{\sqrt{5}}{5} & \sqrt{0.1-0.02\sqrt{5}} & -0.5-0.1\sqrt{5} \\ -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.3\sqrt{5}-0.1 & -0.2\sqrt{0.5\sqrt{5}+2.5} & -0.4 & \sqrt{0.1-0.02\sqrt{5}} \\ -0.2\sqrt{1.5\sqrt{5}+7.5} & -0.2\sqrt{0.5\sqrt{5}+2.5} & 0.5-0.1\sqrt{5} & \sqrt{0.02\sqrt{5}+0.1} & \frac{\sqrt{5}}{5} \end{pmatrix}$				

$\mathbf{I}$	$\hat{C}_3(2)$
A	1

$T1$
$$\begin{pmatrix} 0 & -\sqrt{0.1\sqrt{5}+0.5} & \sqrt{0.5-0.1\sqrt{5}} \\ \sqrt{0.5-0.1\sqrt{5}} & -\frac{\sqrt{5}}{5} & -0.5-0.1\sqrt{5} \\ \sqrt{0.1\sqrt{5}+0.5} & 0.5-0.1\sqrt{5} & \frac{\sqrt{5}}{5} \end{pmatrix}$$

$T2$
$$\begin{pmatrix} -\frac{\sqrt{5}}{5} & \sqrt{0.5-0.1\sqrt{5}} & 0.1\sqrt{5}+0.5 \\ -\sqrt{0.1\sqrt{5}+0.5} & 0 & -\sqrt{0.5-0.1\sqrt{5}} \\ -0.5+0.1\sqrt{5} & -\sqrt{0.1\sqrt{5}+0.5} & \frac{\sqrt{5}}{5} \end{pmatrix}$$

G
$$\begin{pmatrix} 0.5 & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -0.5 & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} \\ -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.1\sqrt{5} & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.5+\frac{\sqrt{5}}{5} \\ -0.5 & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & 0.5 & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} \\ -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & \frac{\sqrt{5}}{5}+0.5 & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & 0.1\sqrt{5} \end{pmatrix}$$

H
$$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(\sqrt{5}+5\right) & \sqrt{0.3-0.06\sqrt{5}} & -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & \sqrt{0.06\sqrt{5}+0.3} \\ 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.4 & \sqrt{0.1-0.02\sqrt{5}} & -0.3\sqrt{5}-0.1 & \sqrt{0.02\sqrt{5}+0.1} \\ -0.2\sqrt{1.5\sqrt{5}+7.5} & -0.2\sqrt{0.5\sqrt{5}+2.5} & -\frac{\sqrt{5}}{5} & \sqrt{0.02\sqrt{5}+0.1} & 0.5-0.1\sqrt{5} \\ -0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.1+0.3\sqrt{5} & -0.2\sqrt{2.5-0.5\sqrt{5}} & -0.4 & -0.2\sqrt{0.5\sqrt{5}+2.5} \\ \sqrt{0.3-0.06\sqrt{5}} & \sqrt{0.1-0.02\sqrt{5}} & -0.5-0.1\sqrt{5} & -0.2\sqrt{2.5-0.5\sqrt{5}} & \frac{\sqrt{5}}{5} \end{pmatrix}$$

$\mathbf{I}$	$\hat{C}_3^2(2)$
A	1

$T1$
$$\begin{pmatrix} 0 & \sqrt{0.5-0.1\sqrt{5}} & \sqrt{0.1\sqrt{5}+0.5} \\ -\sqrt{0.1\sqrt{5}+0.5} & -\frac{\sqrt{5}}{5} & 0.5-0.1\sqrt{5} \\ \sqrt{0.5-0.1\sqrt{5}} & -0.5-0.1\sqrt{5} & \frac{\sqrt{5}}{5} \end{pmatrix}$$

$T2$
$$\begin{pmatrix} -\frac{\sqrt{5}}{5} & -\sqrt{0.1\sqrt{5}+0.5} & -0.5+0.1\sqrt{5} \\ \sqrt{0.5-0.1\sqrt{5}} & 0 & -\sqrt{0.1\sqrt{5}+0.5} \\ 0.1\sqrt{5}+0.5 & -\sqrt{0.5-0.1\sqrt{5}} & \frac{\sqrt{5}}{5} \end{pmatrix}$$

G
$$\begin{pmatrix} 0.5 & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.5 & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} \\ 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -0.1\sqrt{5} & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & \frac{\sqrt{5}}{5}+0.5 \\ -0.5 & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & 0.5 & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} \\ -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.5+\frac{\sqrt{5}}{5} & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & 0.1\sqrt{5} \end{pmatrix}$$

H
$$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.2\sqrt{1.5\sqrt{5}+7.5} & -0.04\sqrt{5}\left(\sqrt{5}+5\right) & \sqrt{0.3-0.06\sqrt{5}} \\ 0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.4 & -0.2\sqrt{0.5\sqrt{5}+2.5} & -0.1+0.3\sqrt{5} & \sqrt{0.1-0.02\sqrt{5}} \\ \sqrt{0.3-0.06\sqrt{5}} & \sqrt{0.1-0.02\sqrt{5}} & -\frac{\sqrt{5}}{5} & -0.2\sqrt{2.5-0.5\sqrt{5}} & -0.5-0.1\sqrt{5} \\ -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.3\sqrt{5}-0.1 & \sqrt{0.02\sqrt{5}+0.1} & -0.4 & -0.2\sqrt{2.5-0.5\sqrt{5}} \\ \sqrt{0.06\sqrt{5}+0.3} & \sqrt{0.02\sqrt{5}+0.1} & 0.5-0.1\sqrt{5} & -0.2\sqrt{0.5\sqrt{5}+2.5} & \frac{\sqrt{5}}{5} \end{pmatrix}$$

I	$\hat{C}_3(3)$
A	1
$T1$	$\begin{pmatrix} 0 & -\sqrt{0.1\sqrt{5}+0.5} & \sqrt{0.5-0.1\sqrt{5}} \\ -\sqrt{0.5-0.1\sqrt{5}} & \frac{\sqrt{5}}{5} & 0.1\sqrt{5}+0.5 \\ -\sqrt{0.1\sqrt{5}+0.5} & -0.5+0.1\sqrt{5} & -\frac{\sqrt{5}}{5} \end{pmatrix}$
$T2$	$\begin{pmatrix} \frac{\sqrt{5}}{5} & -\sqrt{0.5-0.1\sqrt{5}} & -0.5-0.1\sqrt{5} \\ -\sqrt{0.1\sqrt{5}+0.5} & 0 & -\sqrt{0.5-0.1\sqrt{5}} \\ 0.5-0.1\sqrt{5} & \sqrt{0.1\sqrt{5}+0.5} & -\frac{\sqrt{5}}{5} \end{pmatrix}$
G	$\begin{pmatrix} 0.5 & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -0.5 & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} \\ 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & 0.1\sqrt{5} & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & 0.5-\frac{\sqrt{5}}{5} \\ -0.5 & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & 0.5 & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} \\ 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -0.5-\frac{\sqrt{5}}{5} & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -0.1\sqrt{5} \end{pmatrix}$
H	$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(\sqrt{5}+5\right) & \sqrt{0.3-0.06\sqrt{5}} & -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & \sqrt{0.06\sqrt{5}+0.3} \\ 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.4 & \sqrt{0.1-0.02\sqrt{5}} & -0.3\sqrt{5}-0.1 & \sqrt{0.02\sqrt{5}+0.1} \\ \sqrt{0.06\sqrt{5}+0.3} & \sqrt{0.02\sqrt{5}+0.1} & \frac{\sqrt{5}}{5} & -0.2\sqrt{0.5\sqrt{5}+2.5} & -0.5+0.1\sqrt{5} \\ -0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.1+0.3\sqrt{5} & -0.2\sqrt{2.5-0.5\sqrt{5}} & -0.4 & -0.2\sqrt{0.5\sqrt{5}+2.5} \\ -0.2\sqrt{7.5-1.5\sqrt{5}} & -0.2\sqrt{2.5-0.5\sqrt{5}} & 0.1\sqrt{5}+0.5 & \sqrt{0.1-0.02\sqrt{5}} & -\frac{\sqrt{5}}{5} \end{pmatrix}$

I	$\hat{C}_3^2(3)$
A	1
$T1$	$\begin{pmatrix} 0 & -\sqrt{0.5-0.1\sqrt{5}} & -\sqrt{0.1\sqrt{5}+0.5} \\ -\sqrt{0.1\sqrt{5}+0.5} & \frac{\sqrt{5}}{5} & -0.5+0.1\sqrt{5} \\ \sqrt{0.5-0.1\sqrt{5}} & 0.1\sqrt{5}+0.5 & -\frac{\sqrt{5}}{5} \end{pmatrix}$
$T2$	$\begin{pmatrix} \frac{\sqrt{5}}{5} & -\sqrt{0.1\sqrt{5}+0.5} & 0.5-0.1\sqrt{5} \\ -\sqrt{0.5-0.1\sqrt{5}} & 0 & \sqrt{0.1\sqrt{5}+0.5} \\ -0.5-0.1\sqrt{5} & -\sqrt{0.5-0.1\sqrt{5}} & -\frac{\sqrt{5}}{5} \end{pmatrix}$
G	$\begin{pmatrix} 0.5 & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.5 & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} \\ 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & 0.1\sqrt{5} & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -0.5-\frac{\sqrt{5}}{5} \\ -0.5 & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & 0.5 & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} \\ -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & 0.5-\frac{\sqrt{5}}{5} & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.1\sqrt{5} \end{pmatrix}$
H	$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & \sqrt{0.06\sqrt{5}+0.3} & -0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.2\sqrt{7.5-1.5\sqrt{5}} \\ 0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.4 & \sqrt{0.02\sqrt{5}+0.1} & -0.1+0.3\sqrt{5} & -0.2\sqrt{2.5-0.5\sqrt{5}} \\ \sqrt{0.3-0.06\sqrt{5}} & \sqrt{0.1-0.02\sqrt{5}} & \frac{\sqrt{5}}{5} & -0.2\sqrt{2.5-0.5\sqrt{5}} & 0.1\sqrt{5}+0.5 \\ -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.3\sqrt{5}-0.1 & -0.2\sqrt{0.5\sqrt{5}+2.5} & -0.4 & \sqrt{0.1-0.02\sqrt{5}} \\ \sqrt{0.06\sqrt{5}+0.3} & \sqrt{0.02\sqrt{5}+0.1} & -0.5+0.1\sqrt{5} & -0.2\sqrt{0.5\sqrt{5}+2.5} & -\frac{\sqrt{5}}{5} \end{pmatrix}$

$A \quad \Big| \qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad 1$

$$T1 \quad \begin{pmatrix} -0.5 & 0.5\sqrt{1-\tfrac{2\sqrt{5}}{5}} & \sqrt{0.1\sqrt{5}+0.5} \\ -0.5\sqrt{1-\tfrac{2\sqrt{5}}{5}} & \tfrac{\sqrt{5}}{5}+0.5 & -0.5+0.1\sqrt{5} \\ -\sqrt{0.1\sqrt{5}+0.5} & -0.5+0.1\sqrt{5} & -\tfrac{\sqrt{5}}{5} \end{pmatrix}$$

$$T2 \quad \begin{pmatrix} \tfrac{\sqrt{5}}{5} & -\sqrt{0.5-0.1\sqrt{5}} & -0.5-0.1\sqrt{5} \\ \sqrt{0.5-0.1\sqrt{5}} & -0.5 & 0.5\sqrt{\tfrac{2\sqrt{5}}{5}+1} \\ -0.5-0.1\sqrt{5} & -0.5\sqrt{\tfrac{2\sqrt{5}}{5}+1} & 0.5-\tfrac{\sqrt{5}}{5} \end{pmatrix}$$

$$G \quad \begin{pmatrix} 0.25+0.25\sqrt{5} & 0.5\sqrt{0.5-0.1\sqrt{5}} & 0.5 & -0.5\sqrt{1-\tfrac{2\sqrt{5}}{5}} \\ -0.5\sqrt{0.5-0.1\sqrt{5}} & 0.25-0.15\sqrt{5} & 0.5\sqrt{\tfrac{2\sqrt{5}}{5}+1} & 0.3\sqrt{5} \\ 0.5 & -0.5\sqrt{\tfrac{2\sqrt{5}}{5}+1} & 0.25-0.25\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} \\ 0.5\sqrt{1-\tfrac{2\sqrt{5}}{5}} & 0.3\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} & 0.25+0.15\sqrt{5} \end{pmatrix}$$

$$H \quad \begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(\sqrt{5}+5\right) & \sqrt{0.3-0.06\sqrt{5}} & -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & \sqrt{0.06\sqrt{5}+0.3} \\ 0.04\sqrt{5}\left(\sqrt{5}+5\right) & 0.1+\tfrac{\sqrt{5}}{5} & 0.1\sqrt{5-2\sqrt{5}} & 0.4 & -0.2\sqrt{10-2\sqrt{5}} \\ -0.2\sqrt{7.5-1.5\sqrt{5}} & -0.1\sqrt{5-2\sqrt{5}} & -0.5 & \sqrt{0.08\sqrt{5}+0.4} & 0 \\ -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & 0.4 & -0.2\sqrt{2\sqrt{5}+10} & 0.1-\tfrac{\sqrt{5}}{5} & 0.1\sqrt{2\sqrt{5}+5} \\ -0.2\sqrt{1.5\sqrt{5}+7.5} & \sqrt{0.4-0.08\sqrt{5}} & 0 & -0.1\sqrt{2\sqrt{5}+5} & -0.5 \end{pmatrix}$$

$A \quad \Big| \qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad 1$

$$T1 \quad \begin{pmatrix} -0.5 & -0.5\sqrt{1-\tfrac{2\sqrt{5}}{5}} & -\sqrt{0.1\sqrt{5}+0.5} \\ 0.5\sqrt{1-\tfrac{2\sqrt{5}}{5}} & \tfrac{\sqrt{5}}{5}+0.5 & -0.5+0.1\sqrt{5} \\ \sqrt{0.1\sqrt{5}+0.5} & -0.5+0.1\sqrt{5} & -\tfrac{\sqrt{5}}{5} \end{pmatrix}$$

$$T2 \quad \begin{pmatrix} \tfrac{\sqrt{5}}{5} & \sqrt{0.5-0.1\sqrt{5}} & -0.5-0.1\sqrt{5} \\ -\sqrt{0.5-0.1\sqrt{5}} & -0.5 & -0.5\sqrt{\tfrac{2\sqrt{5}}{5}+1} \\ -0.5-0.1\sqrt{5} & 0.5\sqrt{\tfrac{2\sqrt{5}}{5}+1} & 0.5-\tfrac{\sqrt{5}}{5} \end{pmatrix}$$

$$G \quad \begin{pmatrix} 0.25+0.25\sqrt{5} & -0.5\sqrt{0.5-0.1\sqrt{5}} & 0.5 & 0.5\sqrt{1-\tfrac{2\sqrt{5}}{5}} \\ 0.5\sqrt{0.5-0.1\sqrt{5}} & 0.25-0.15\sqrt{5} & -0.5\sqrt{\tfrac{2\sqrt{5}}{5}+1} & 0.3\sqrt{5} \\ 0.5 & 0.5\sqrt{\tfrac{2\sqrt{5}}{5}+1} & 0.25-0.25\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} \\ -0.5\sqrt{1-\tfrac{2\sqrt{5}}{5}} & 0.3\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} & 0.25+0.15\sqrt{5} \end{pmatrix}$$

$$H \quad \begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.2\sqrt{7.5-1.5\sqrt{5}} & -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.2\sqrt{1.5\sqrt{5}+7.5} \\ 0.04\sqrt{5}\left(\sqrt{5}+5\right) & 0.1+\tfrac{\sqrt{5}}{5} & -0.1\sqrt{5-2\sqrt{5}} & 0.4 & \sqrt{0.4-0.08\sqrt{5}} \\ \sqrt{0.3-0.06\sqrt{5}} & 0.1\sqrt{5-2\sqrt{5}} & -0.5 & -0.2\sqrt{2\sqrt{5}+10} & 0 \\ -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & 0.4 & \sqrt{0.08\sqrt{5}+0.4} & 0.1-\tfrac{\sqrt{5}}{5} & -0.1\sqrt{2\sqrt{5}+5} \\ \sqrt{0.06\sqrt{5}+0.3} & -0.2\sqrt{10-2\sqrt{5}} & 0 & 0.1\sqrt{2\sqrt{5}+5} & -0.5 \end{pmatrix}$$

I	$\hat{C}_3(5)$
A	1
$T1$	$\begin{pmatrix} -0.5 & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & \sqrt{0.5-0.1\sqrt{5}} \\ -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & 0.5-\frac{\sqrt{5}}{5} & -0.5-0.1\sqrt{5} \\ -\sqrt{0.5-0.1\sqrt{5}} & -0.5-0.1\sqrt{5} & \frac{\sqrt{5}}{5} \end{pmatrix}$
$T2$	$\begin{pmatrix} -\frac{\sqrt{5}}{5} & \sqrt{0.1\sqrt{5}+0.5} & -0.5+0.1\sqrt{5} \\ -\sqrt{0.1\sqrt{5}+0.5} & -0.5 & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} \\ -0.5+0.1\sqrt{5} & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & \frac{\sqrt{5}}{5}+0.5 \end{pmatrix}$
G	$\begin{pmatrix} 0.25-0.25\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} & 0.5 & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} \\ 0.5\sqrt{0.1\sqrt{5}+0.5} & 0.25+0.15\sqrt{5} & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -0.3\sqrt{5} \\ 0.5 & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & 0.25+0.25\sqrt{5} & 0.5\sqrt{0.5-0.1\sqrt{5}} \\ 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.3\sqrt{5} & -0.5\sqrt{0.5-0.1\sqrt{5}} & 0.25-0.15\sqrt{5} \end{pmatrix}$
H	$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & \sqrt{0.06\sqrt{5}+0.3} & -0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.2\sqrt{7.5-1.5\sqrt{5}} \\ 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & 0.1-\frac{\sqrt{5}}{5} & -0.1\sqrt{2\sqrt{5}+5} & 0.4 & -0.2\sqrt{2\sqrt{5}+10} \\ -0.2\sqrt{1.5\sqrt{5}+7.5} & 0.1\sqrt{2\sqrt{5}+5} & -0.5 & -0.2\sqrt{10-2\sqrt{5}} & 0 \\ -0.04\sqrt{5}\left(\sqrt{5}+5\right) & 0.4 & \sqrt{0.4-0.08\sqrt{5}} & 0.1+\frac{\sqrt{5}}{5} & 0.1\sqrt{5-2\sqrt{5}} \\ \sqrt{0.3-0.06\sqrt{5}} & \sqrt{0.08\sqrt{5}+0.4} & 0 & -0.1\sqrt{5-2\sqrt{5}} & -0.5 \end{pmatrix}$

I	$\hat{C}_3^2(5)$
A	1
$T1$	$\begin{pmatrix} -0.5 & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -\sqrt{0.5-0.1\sqrt{5}} \\ 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & 0.5-\frac{\sqrt{5}}{5} & -0.5-0.1\sqrt{5} \\ \sqrt{0.5-0.1\sqrt{5}} & -0.5-0.1\sqrt{5} & \frac{\sqrt{5}}{5} \end{pmatrix}$
$T2$	$\begin{pmatrix} -\frac{\sqrt{5}}{5} & -\sqrt{0.1\sqrt{5}+0.5} & -0.5+0.1\sqrt{5} \\ \sqrt{0.1\sqrt{5}+0.5} & -0.5 & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} \\ -0.5+0.1\sqrt{5} & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & \frac{\sqrt{5}}{5}+0.5 \end{pmatrix}$
G	$\begin{pmatrix} 0.25-0.25\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} & 0.5 & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} \\ -0.5\sqrt{0.1\sqrt{5}+0.5} & 0.25+0.15\sqrt{5} & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -0.3\sqrt{5} \\ 0.5 & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & 0.25+0.25\sqrt{5} & -0.5\sqrt{0.5-0.1\sqrt{5}} \\ -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.3\sqrt{5} & 0.5\sqrt{0.5-0.1\sqrt{5}} & 0.25-0.15\sqrt{5} \end{pmatrix}$
H	$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.2\sqrt{1.5\sqrt{5}+7.5} & -0.04\sqrt{5}\left(\sqrt{5}+5\right) & \sqrt{0.3-0.06\sqrt{5}} \\ 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & 0.1-\frac{\sqrt{5}}{5} & 0.1\sqrt{2\sqrt{5}+5} & 0.4 & \sqrt{0.08\sqrt{5}+0.4} \\ \sqrt{0.06\sqrt{5}+0.3} & -0.1\sqrt{2\sqrt{5}+5} & -0.5 & \sqrt{0.4-0.08\sqrt{5}} & 0 \\ -0.04\sqrt{5}\left(\sqrt{5}+5\right) & 0.4 & -0.2\sqrt{10-2\sqrt{5}} & 0.1+\frac{\sqrt{5}}{5} & -0.1\sqrt{5-2\sqrt{5}} \\ -0.2\sqrt{7.5-1.5\sqrt{5}} & -0.2\sqrt{2\sqrt{5}+10} & 0 & 0.1\sqrt{5-2\sqrt{5}} & -0.5 \end{pmatrix}$

I	$\hat{C}_3(6)$
A	1
$T1$	$\begin{pmatrix} 0.25 - 0.25\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} & \sqrt{0.1\sqrt{5}+0.5} \\ 0.5\sqrt{0.5\sqrt{5}+2.5} & -0.25+0.05\sqrt{5} & 0.5-0.1\sqrt{5} \\ 0 & \frac{2\sqrt{5}}{5} & \frac{\sqrt{5}}{5} \end{pmatrix}$
$T2$	$\begin{pmatrix} -\frac{\sqrt{5}}{5} & 0 & -\frac{2\sqrt{5}}{5} \\ \sqrt{0.5-0.1\sqrt{5}} & 0.25+0.25\sqrt{5} & -0.5\sqrt{0.5-0.1\sqrt{5}} \\ 0.1\sqrt{5}+0.5 & -0.5\sqrt{2.5-0.5\sqrt{5}} & -0.25-0.05\sqrt{5} \end{pmatrix}$
G	$\begin{pmatrix} 0 & \sqrt{0.1\sqrt{5}+0.5} & 0.25-0.25\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} \\ 0 & 0.5-0.1\sqrt{5} & 0.5\sqrt{0.5\sqrt{5}+2.5} & 0.25-0.05\sqrt{5} \\ 0.25+0.25\sqrt{5} & 0.5\sqrt{0.5-0.1\sqrt{5}} & 0 & -\sqrt{0.5-0.1\sqrt{5}} \\ 0.5\sqrt{2.5-0.5\sqrt{5}} & -0.25-0.05\sqrt{5} & 0 & 0.1\sqrt{5}+0.5 \end{pmatrix}$
H	$\begin{pmatrix} -0.2 & -0.4\sqrt{3} & 0 & 0.4\sqrt{3} & 0 \\ 0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.15\sqrt{5}-0.15 & 0.5\sqrt{0.5-0.1\sqrt{5}} & -0.1\sqrt{5}-0.1 & -\sqrt{0.5-0.1\sqrt{5}} \\ \sqrt{0.3-0.06\sqrt{5}} & -0.3\sqrt{2.5-0.5\sqrt{5}} & -0.25-0.05\sqrt{5} & -0.2\sqrt{2.5-0.5\sqrt{5}} & 0.1\sqrt{5}+0.5 \\ -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.1+0.1\sqrt{5} & \sqrt{0.1\sqrt{5}+0.5} & -0.15+0.15\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} \\ \sqrt{0.06\sqrt{5}+0.3} & \sqrt{0.02\sqrt{5}+0.1} & -0.5+0.1\sqrt{5} & 0.3\sqrt{0.5\sqrt{5}+2.5} & -0.25+0.05\sqrt{5} \end{pmatrix}$

I	$\hat{C}_3^2(6)$
A	1
$T1$	$\begin{pmatrix} 0.25-0.25\sqrt{5} & 0.5\sqrt{0.5\sqrt{5}+2.5} & 0 \\ -0.5\sqrt{0.1\sqrt{5}+0.5} & -0.25+0.05\sqrt{5} & \frac{2\sqrt{5}}{5} \\ \sqrt{0.1\sqrt{5}+0.5} & 0.5-0.1\sqrt{5} & \frac{\sqrt{5}}{5} \end{pmatrix}$
$T2$	$\begin{pmatrix} -\frac{\sqrt{5}}{5} & \sqrt{0.5-0.1\sqrt{5}} & 0.1\sqrt{5}+0.5 \\ 0 & 0.25+0.25\sqrt{5} & -0.5\sqrt{2.5-0.5\sqrt{5}} \\ -\frac{2\sqrt{5}}{5} & -0.5\sqrt{0.5-0.1\sqrt{5}} & -0.25-0.05\sqrt{5} \end{pmatrix}$
G	$\begin{pmatrix} 0 & 0 & 0.25+0.25\sqrt{5} & 0.5\sqrt{2.5-0.5\sqrt{5}} \\ \sqrt{0.1\sqrt{5}+0.5} & 0.5-0.1\sqrt{5} & 0.5\sqrt{0.5-0.1\sqrt{5}} & -0.25-0.05\sqrt{5} \\ 0.25-0.25\sqrt{5} & 0.5\sqrt{0.5\sqrt{5}+2.5} & 0 & 0 \\ 0.5\sqrt{0.1\sqrt{5}+0.5} & 0.25-0.05\sqrt{5} & -\sqrt{0.5-0.1\sqrt{5}} & 0.1\sqrt{5}+0.5 \end{pmatrix}$
H	$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(\sqrt{5}+5\right) & \sqrt{0.3-0.06\sqrt{5}} & -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & \sqrt{0.06\sqrt{5}+0.3} \\ -0.4\sqrt{3} & -0.15\sqrt{5}-0.15 & -0.3\sqrt{2.5-0.5\sqrt{5}} & -0.1+0.1\sqrt{5} & \sqrt{0.02\sqrt{5}+0.1} \\ 0 & 0.5\sqrt{0.5-0.1\sqrt{5}} & -0.25-0.05\sqrt{5} & \sqrt{0.1\sqrt{5}+0.5} & -0.5+0.1\sqrt{5} \\ 0.4\sqrt{3} & -0.1\sqrt{5}-0.1 & -0.2\sqrt{2.5-0.5\sqrt{5}} & -0.15+0.15\sqrt{5} & 0.3\sqrt{0.5\sqrt{5}+2.5} \\ 0 & -\sqrt{0.5-0.1\sqrt{5}} & 0.1\sqrt{5}+0.5 & 0.5\sqrt{0.1\sqrt{5}+0.5} & -0.25+0.05\sqrt{5} \end{pmatrix}$

I	$\hat{C}_3(7)$
A	1

$T1$
$$\begin{pmatrix} 0.25 - 0.25\sqrt{5} & -0.5\sqrt{0.5\sqrt{5}+2.5} & 0 \\ 0.5\sqrt{0.1\sqrt{5}+0.5} & -0.25+0.05\sqrt{5} & \frac{2\sqrt{5}}{5} \\ -\sqrt{0.1\sqrt{5}+0.5} & 0.5-0.1\sqrt{5} & \frac{\sqrt{5}}{5} \end{pmatrix}$$

$T2$
$$\begin{pmatrix} -\frac{\sqrt{5}}{5} & -\sqrt{0.5-0.1\sqrt{5}} & 0.1\sqrt{5}+0.5 \\ 0 & 0.25+0.25\sqrt{5} & 0.5\sqrt{2.5-0.5\sqrt{5}} \\ -\frac{2\sqrt{5}}{5} & 0.5\sqrt{0.5-0.1\sqrt{5}} & -0.25-0.05\sqrt{5} \end{pmatrix}$$

G
$$\begin{pmatrix} 0 & 0 & 0.25+0.25\sqrt{5} & -0.5\sqrt{2.5-0.5\sqrt{5}} \\ -\sqrt{0.1\sqrt{5}+0.5} & 0.5-0.1\sqrt{5} & -0.5\sqrt{0.5-0.1\sqrt{5}} & -0.25-0.05\sqrt{5} \\ 0.25-0.25\sqrt{5} & -0.5\sqrt{0.5\sqrt{5}+2.5} & 0 & 0 \\ -0.5\sqrt{0.1\sqrt{5}+0.5} & 0.25-0.05\sqrt{5} & \sqrt{0.5-0.1\sqrt{5}} & 0.1\sqrt{5}+0.5 \end{pmatrix}$$

H
$$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.2\sqrt{7.5-1.5\sqrt{5}} & -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.2\sqrt{1.5\sqrt{5}+7.5} \\ -0.4\sqrt{3} & -0.15\sqrt{5}-0.15 & 0.3\sqrt{2.5-0.5\sqrt{5}} & -0.1+0.1\sqrt{5} & -0.2\sqrt{0.5\sqrt{5}+2.5} \\ 0 & -0.5\sqrt{0.5-0.1\sqrt{5}} & -0.25-0.05\sqrt{5} & -\sqrt{0.1\sqrt{5}+0.5} & -0.5+0.1\sqrt{5} \\ 0.4\sqrt{3} & -0.1\sqrt{5}-0.1 & \sqrt{0.1-0.02\sqrt{5}} & -0.15+0.15\sqrt{5} & -0.3\sqrt{0.5\sqrt{5}+2.5} \\ 0 & \sqrt{0.5-0.1\sqrt{5}} & 0.1\sqrt{5}+0.5 & -0.5\sqrt{0.1\sqrt{5}+0.5} & -0.25+0.05\sqrt{5} \end{pmatrix}$$

I	$\hat{C}_3^2(7)$
A	1

$T1$
$$\begin{pmatrix} 0.25 - 0.25\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} & -\sqrt{0.1\sqrt{5}+0.5} \\ -0.5\sqrt{0.5\sqrt{5}+2.5} & -0.25+0.05\sqrt{5} & 0.5-0.1\sqrt{5} \\ 0 & \frac{2\sqrt{5}}{5} & \frac{\sqrt{5}}{5} \end{pmatrix}$$

$T2$
$$\begin{pmatrix} -\frac{\sqrt{5}}{5} & 0 & -\frac{2\sqrt{5}}{5} \\ -\sqrt{0.5-0.1\sqrt{5}} & 0.25+0.25\sqrt{5} & 0.5\sqrt{0.5-0.1\sqrt{5}} \\ 0.1\sqrt{5}+0.5 & 0.5\sqrt{2.5-0.5\sqrt{5}} & -0.25-0.05\sqrt{5} \end{pmatrix}$$

G
$$\begin{pmatrix} 0 & -\sqrt{0.1\sqrt{5}+0.5} & 0.25-0.25\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} \\ 0 & 0.5-0.1\sqrt{5} & -0.5\sqrt{0.5\sqrt{5}+2.5} & 0.25-0.05\sqrt{5} \\ 0.25+0.25\sqrt{5} & -0.5\sqrt{0.5-0.1\sqrt{5}} & 0 & \sqrt{0.5-0.1\sqrt{5}} \\ -0.5\sqrt{2.5-0.5\sqrt{5}} & -0.25-0.05\sqrt{5} & 0 & 0.1\sqrt{5}+0.5 \end{pmatrix}$$

H
$$\begin{pmatrix} -0.2 & -0.4\sqrt{3} & 0 & 0.4\sqrt{3} & 0 \\ 0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.15\sqrt{5}-0.15 & -0.5\sqrt{0.5-0.1\sqrt{5}} & -0.1\sqrt{5}-0.1 & \sqrt{0.5-0.1\sqrt{5}} \\ -0.2\sqrt{7.5-1.5\sqrt{5}} & 0.3\sqrt{2.5-0.5\sqrt{5}} & -0.25-0.05\sqrt{5} & \sqrt{0.1-0.02\sqrt{5}} & 0.1\sqrt{5}+0.5 \\ -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.1+0.1\sqrt{5} & -\sqrt{0.1\sqrt{5}+0.5} & -0.15+0.15\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} \\ -0.2\sqrt{1.5\sqrt{5}+7.5} & -0.2\sqrt{0.5\sqrt{5}+2.5} & -0.5+0.1\sqrt{5} & -0.3\sqrt{0.5\sqrt{5}+2.5} & -0.25+0.05\sqrt{5} \end{pmatrix}$$

I					$\hat{C}_3(8)$

A : 1

$T1$:
$$\begin{pmatrix} 0.25+0.25\sqrt{5} & 0.5\sqrt{2.5-0.5\sqrt{5}} & 0 \\ 0.5\sqrt{0.5-0.1\sqrt{5}} & -0.25-0.05\sqrt{5} & -\frac{2\sqrt{5}}{5} \\ -\sqrt{0.5-0.1\sqrt{5}} & 0.1\sqrt{5}+0.5 & -\frac{\sqrt{5}}{5} \end{pmatrix}$$

$T2$:
$$\begin{pmatrix} \frac{\sqrt{5}}{5} & \sqrt{0.1\sqrt{5}+0.5} & 0.5-0.1\sqrt{5} \\ 0 & 0.25-0.25\sqrt{5} & 0.5\sqrt{0.5\sqrt{5}+2.5} \\ \frac{2\sqrt{5}}{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} & -0.25+0.05\sqrt{5} \end{pmatrix}$$

G:
$$\begin{pmatrix} 0 & 0 & 0.25-0.25\sqrt{5} & -0.5\sqrt{0.5\sqrt{5}+2.5} \\ -\sqrt{0.5-0.1\sqrt{5}} & 0.1\sqrt{5}+0.5 & 0.5\sqrt{0.1\sqrt{5}+0.5} & -0.25+0.05\sqrt{5} \\ 0.25+0.25\sqrt{5} & 0.5\sqrt{2.5-0.5\sqrt{5}} & 0 & 0 \\ -0.5\sqrt{0.5-0.1\sqrt{5}} & 0.05\sqrt{5}+0.25 & -\sqrt{0.1\sqrt{5}+0.5} & 0.5-0.1\sqrt{5} \end{pmatrix}$$

H:
$$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.2\sqrt{1.5\sqrt{5}+7.5} & -0.04\sqrt{5}\left(\sqrt{5}+5\right) & \sqrt{0.3-0.06\sqrt{5}} \\ -0.4\sqrt{3} & -0.15+0.15\sqrt{5} & 0.3\sqrt{0.5\sqrt{5}+2.5} & -0.1\sqrt{5}-0.1 & \sqrt{0.1-0.02\sqrt{5}} \\ 0 & 0.5\sqrt{0.1\sqrt{5}+0.5} & -0.25+0.05\sqrt{5} & -\sqrt{0.5-0.1\sqrt{5}} & -0.5-0.1\sqrt{5} \\ 0.4\sqrt{3} & -0.1+0.1\sqrt{5} & \sqrt{0.02\sqrt{5}+0.1} & -0.15\sqrt{5}-0.15 & 0.3\sqrt{2.5-0.5\sqrt{5}} \\ 0 & -\sqrt{0.1\sqrt{5}+0.5} & 0.5-0.1\sqrt{5} & -0.5\sqrt{0.5-0.1\sqrt{5}} & -0.25-0.05\sqrt{5} \end{pmatrix}$$

I					$\hat{C}_3^2(8)$

A : 1

$T1$:
$$\begin{pmatrix} 0.25+0.25\sqrt{5} & 0.5\sqrt{0.5-0.1\sqrt{5}} & -\sqrt{0.5-0.1\sqrt{5}} \\ 0.5\sqrt{2.5-0.5\sqrt{5}} & -0.25-0.05\sqrt{5} & 0.1\sqrt{5}+0.5 \\ 0 & -\frac{2\sqrt{5}}{5} & -\frac{\sqrt{5}}{5} \end{pmatrix}$$

$T2$:
$$\begin{pmatrix} \frac{\sqrt{5}}{5} & 0 & \frac{2\sqrt{5}}{5} \\ \sqrt{0.1\sqrt{5}+0.5} & 0.25-0.25\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} \\ 0.5-0.1\sqrt{5} & 0.5\sqrt{0.5\sqrt{5}+2.5} & -0.25+0.05\sqrt{5} \end{pmatrix}$$

G:
$$\begin{pmatrix} 0 & -\sqrt{0.5-0.1\sqrt{5}} & 0.25+0.25\sqrt{5} & -0.5\sqrt{0.5-0.1\sqrt{5}} \\ 0 & 0.1\sqrt{5}+0.5 & 0.5\sqrt{2.5-0.5\sqrt{5}} & 0.05\sqrt{5}+0.25 \\ 0.25-0.25\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} & 0 & -\sqrt{0.1\sqrt{5}+0.5} \\ -0.5\sqrt{0.5\sqrt{5}+2.5} & -0.25+0.05\sqrt{5} & 0 & 0.5-0.1\sqrt{5} \end{pmatrix}$$

H:
$$\begin{pmatrix} -0.2 & -0.4\sqrt{3} & 0 & 0.4\sqrt{3} & 0 \\ 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.15+0.15\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} & -0.1+0.1\sqrt{5} & -\sqrt{0.1\sqrt{5}+0.5} \\ -0.2\sqrt{1.5\sqrt{5}+7.5} & 0.3\sqrt{0.5\sqrt{5}+2.5} & -0.25+0.05\sqrt{5} & \sqrt{0.02\sqrt{5}+0.1} & 0.5-0.1\sqrt{5} \\ -0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.1\sqrt{5}-0.1 & -\sqrt{0.5-0.1\sqrt{5}} & -0.15\sqrt{5}-0.15 & -0.5\sqrt{0.5-0.1\sqrt{5}} \\ \sqrt{0.3-0.06\sqrt{5}} & \sqrt{0.1-0.02\sqrt{5}} & -0.5-0.1\sqrt{5} & 0.3\sqrt{2.5-0.5\sqrt{5}} & -0.25-0.05\sqrt{5} \end{pmatrix}$$

I	$\hat{C}_3(9)$
A	1
$T1$	$\begin{pmatrix} 0.25+0.25\sqrt{5} & -0.5\sqrt{2.5-0.5\sqrt{5}} & 0 \\ -0.5\sqrt{0.5-0.1\sqrt{5}} & -0.25-0.05\sqrt{5} & -\frac{2\sqrt{5}}{5} \\ \sqrt{0.5-0.1\sqrt{5}} & 0.1\sqrt{5}+0.5 & -\frac{\sqrt{5}}{5} \end{pmatrix}$
$T2$	$\begin{pmatrix} \frac{\sqrt{5}}{5} & -\sqrt{0.1\sqrt{5}+0.5} & 0.5-0.1\sqrt{5} \\ 0 & 0.25-0.25\sqrt{5} & -0.5\sqrt{0.5\sqrt{5}+2.5} \\ \frac{2\sqrt{5}}{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} & -0.25+0.05\sqrt{5} \end{pmatrix}$
G	$\begin{pmatrix} 0 & 0 & 0.25-0.25\sqrt{5} & 0.5\sqrt{0.5\sqrt{5}+2.5} \\ \sqrt{0.5-0.1\sqrt{5}} & 0.1\sqrt{5}+0.5 & -0.5\sqrt{0.1\sqrt{5}+0.5} & -0.25+0.05\sqrt{5} \\ 0.25+0.25\sqrt{5} & -0.5\sqrt{2.5-0.5\sqrt{5}} & 0 & 0 \\ 0.5\sqrt{0.5-0.1\sqrt{5}} & 0.05\sqrt{5}+0.25 & \sqrt{0.1\sqrt{5}+0.5} & 0.5-0.1\sqrt{5} \end{pmatrix}$
H	$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & \sqrt{0.06\sqrt{5}+0.3} & -0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.2\sqrt{7.5-1.5\sqrt{5}} \\ -0.4\sqrt{3} & -0.15+0.15\sqrt{5} & -0.3\sqrt{0.5\sqrt{5}+2.5} & -0.1\sqrt{5}-0.1 & -0.2\sqrt{2.5-0.5\sqrt{5}} \\ 0 & -0.5\sqrt{0.1\sqrt{5}+0.5} & -0.25+0.05\sqrt{5} & \sqrt{0.5-0.1\sqrt{5}} & -0.5-0.1\sqrt{5} \\ 0.4\sqrt{3} & -0.1+0.1\sqrt{5} & -0.2\sqrt{0.5\sqrt{5}+2.5} & -0.15\sqrt{5}-0.15 & -0.3\sqrt{2.5-0.5\sqrt{5}} \\ 0 & \sqrt{0.1\sqrt{5}+0.5} & 0.5-0.1\sqrt{5} & 0.5\sqrt{0.5-0.1\sqrt{5}} & -0.25-0.05\sqrt{5} \end{pmatrix}$

I	$\hat{C}_3^2(9)$
A	1
$T1$	$\begin{pmatrix} 0.25+0.25\sqrt{5} & -0.5\sqrt{0.5-0.1\sqrt{5}} & \sqrt{0.5-0.1\sqrt{5}} \\ -0.5\sqrt{2.5-0.5\sqrt{5}} & -0.25-0.05\sqrt{5} & 0.1\sqrt{5}+0.5 \\ 0 & -\frac{2\sqrt{5}}{5} & -\frac{\sqrt{5}}{5} \end{pmatrix}$
$T2$	$\begin{pmatrix} \frac{\sqrt{5}}{5} & 0 & \frac{2\sqrt{5}}{5} \\ -\sqrt{0.1\sqrt{5}+0.5} & 0.25-0.25\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} \\ 0.5-0.1\sqrt{5} & -0.5\sqrt{0.5\sqrt{5}+2.5} & -0.25+0.05\sqrt{5} \end{pmatrix}$
G	$\begin{pmatrix} 0 & \sqrt{0.5-0.1\sqrt{5}} & 0.25+0.25\sqrt{5} & 0.5\sqrt{0.5-0.1\sqrt{5}} \\ 0 & 0.1\sqrt{5}+0.5 & -0.5\sqrt{2.5-0.5\sqrt{5}} & 0.05\sqrt{5}+0.25 \\ 0.25-0.25\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} & 0 & \sqrt{0.1\sqrt{5}+0.5} \\ 0.5\sqrt{0.5\sqrt{5}+2.5} & -0.25+0.05\sqrt{5} & 0 & 0.5-0.1\sqrt{5} \end{pmatrix}$
H	$\begin{pmatrix} -0.2 & -0.4\sqrt{3} & 0 & 0.4\sqrt{3} & 0 \\ 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.15+0.15\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} & -0.1+0.1\sqrt{5} & \sqrt{0.1\sqrt{5}+0.5} \\ \sqrt{0.06\sqrt{5}+0.3} & -0.3\sqrt{0.5\sqrt{5}+2.5} & -0.25+0.05\sqrt{5} & -0.2\sqrt{0.5\sqrt{5}+2.5} & 0.5-0.1\sqrt{5} \\ -0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.1\sqrt{5}-0.1 & \sqrt{0.5-0.1\sqrt{5}} & -0.15\sqrt{5}-0.15 & 0.5\sqrt{0.5-0.1\sqrt{5}} \\ -0.2\sqrt{7.5-1.5\sqrt{5}} & -0.2\sqrt{2.5-0.5\sqrt{5}} & -0.5-0.1\sqrt{5} & -0.3\sqrt{2.5-0.5\sqrt{5}} & -0.25-0.05\sqrt{5} \end{pmatrix}$

I		$\hat{C}_2(0)$
A		1
$T1$		$\begin{pmatrix} -0.25\sqrt{5}-0.25 & 0.5\sqrt{2.5-0.5\sqrt{5}} & 0 \\ 0.5\sqrt{2.5-0.5\sqrt{5}} & 0.25+0.25\sqrt{5} & 0 \\ 0 & 0 & -1 \end{pmatrix}$
$T2$		$\begin{pmatrix} -1 & 0 & 0 \\ 0 & -0.25+0.25\sqrt{5} & 0.5\sqrt{0.5\sqrt{5}+2.5} \\ 0 & 0.5\sqrt{0.5\sqrt{5}+2.5} & 0.25-0.25\sqrt{5} \end{pmatrix}$
G		$\begin{pmatrix} -0.25\sqrt{5}-0.25 & 0.5\sqrt{2.5-0.5\sqrt{5}} & 0 & 0 \\ 0.5\sqrt{2.5-0.5\sqrt{5}} & 0.25+0.25\sqrt{5} & 0 & 0 \\ 0 & 0 & -0.25+0.25\sqrt{5} & -0.5\sqrt{0.5\sqrt{5}+2.5} \\ 0 & 0 & -0.5\sqrt{0.5\sqrt{5}+2.5} & 0.25-0.25\sqrt{5} \end{pmatrix}$
H		$\begin{pmatrix} 1 & 0 & 0 & 0 & 0 \\ 0 & -0.25+0.25\sqrt{5} & -0.5\sqrt{0.5\sqrt{5}+2.5} & 0 & 0 \\ 0 & -0.5\sqrt{0.5\sqrt{5}+2.5} & 0.25-0.25\sqrt{5} & 0 & 0 \\ 0 & 0 & 0 & -0.25\sqrt{5}-0.25 & -0.5\sqrt{2.5-0.5\sqrt{5}} \\ 0 & 0 & 0 & -0.5\sqrt{2.5-0.5\sqrt{5}} & 0.25+0.25\sqrt{5} \end{pmatrix}$

I		$\hat{C}_2(1)$
A		1
$T1$		$\begin{pmatrix} -0.5 & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & \sqrt{0.5-0.1\sqrt{5}} \\ 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.5+\frac{\sqrt{5}}{5} & 0.1\sqrt{5}+0.5 \\ \sqrt{0.5-0.1\sqrt{5}} & 0.1\sqrt{5}+0.5 & -\frac{\sqrt{5}}{5} \end{pmatrix}$
$T2$		$\begin{pmatrix} \frac{\sqrt{5}}{5} & -\sqrt{0.1\sqrt{5}+0.5} & 0.5-0.1\sqrt{5} \\ -\sqrt{0.1\sqrt{5}+0.5} & -0.5 & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} \\ 0.5-0.1\sqrt{5} & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -0.5-\frac{\sqrt{5}}{5} \end{pmatrix}$
G		$\begin{pmatrix} 0.25-0.25\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} & 0.5 & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} \\ -0.5\sqrt{0.1\sqrt{5}+0.5} & -0.15\sqrt{5}-0.25 & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & 0.3\sqrt{5} \\ 0.5 & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & 0.25+0.25\sqrt{5} & 0.5\sqrt{0.5-0.1\sqrt{5}} \\ -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & 0.3\sqrt{5} & 0.5\sqrt{0.5-0.1\sqrt{5}} & -0.25+0.15\sqrt{5} \end{pmatrix}$
H		$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & \sqrt{0.06\sqrt{5}+0.3} & -0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.2\sqrt{7.5-1.5\sqrt{5}} \\ 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & 0.1-\frac{\sqrt{5}}{5} & -0.1\sqrt{2\sqrt{5}+5} & 0.4 & -0.2\sqrt{2\sqrt{5}+10} \\ \sqrt{0.06\sqrt{5}+0.3} & -0.1\sqrt{2\sqrt{5}+5} & 0.5 & \sqrt{0.4-0.08\sqrt{5}} & 0 \\ -0.04\sqrt{5}\left(\sqrt{5}+5\right) & 0.4 & \sqrt{0.4-0.08\sqrt{5}} & 0.1+\frac{\sqrt{5}}{5} & 0.1\sqrt{5-2\sqrt{5}} \\ -0.2\sqrt{7.5-1.5\sqrt{5}} & -0.2\sqrt{2\sqrt{5}+10} & 0 & 0.1\sqrt{5-2\sqrt{5}} & 0.5 \end{pmatrix}$

$$
\begin{array}{c|c}
\mathbf{I} & \hat{C}_2(2) \\
\hline
A & 1 \\[4pt]
T1 & \begin{pmatrix} -0.25+0.25\sqrt{5} & 0.5\sqrt{0.5\sqrt{5}+2.5} & 0 \\ 0.5\sqrt{0.5\sqrt{5}+2.5} & 0.25-0.25\sqrt{5} & 0 \\ 0 & 0 & -1 \end{pmatrix} \\[20pt]
T2 & \begin{pmatrix} -1 & 0 & 0 \\ 0 & -0.25\sqrt{5}-0.25 & -0.5\sqrt{2.5-0.5\sqrt{5}} \\ 0 & -0.5\sqrt{2.5-0.5\sqrt{5}} & 0.25+0.25\sqrt{5} \end{pmatrix} \\[20pt]
G & \begin{pmatrix} -0.25+0.25\sqrt{5} & 0.5\sqrt{0.5\sqrt{5}+2.5} & 0 & 0 \\ 0.5\sqrt{0.5\sqrt{5}+2.5} & 0.25-0.25\sqrt{5} & 0 & 0 \\ 0 & 0 & -0.25\sqrt{5}-0.25 & 0.5\sqrt{2.5-0.5\sqrt{5}} \\ 0 & 0 & 0.5\sqrt{2.5-0.5\sqrt{5}} & 0.25+0.25\sqrt{5} \end{pmatrix} \\[28pt]
H & \begin{pmatrix} 1 & 0 & 0 & 0 & 0 \\ 0 & -0.25\sqrt{5}-0.25 & 0.5\sqrt{2.5-0.5\sqrt{5}} & 0 & 0 \\ 0 & 0.5\sqrt{2.5-0.5\sqrt{5}} & 0.25+0.25\sqrt{5} & 0 & 0 \\ 0 & 0 & 0 & -0.25+0.25\sqrt{5} & -0.5\sqrt{0.5\sqrt{5}+2.5} \\ 0 & 0 & 0 & -0.5\sqrt{0.5\sqrt{5}+2.5} & 0.25-0.25\sqrt{5} \end{pmatrix}
\end{array}
$$

$$
\begin{array}{c|c}
\mathbf{I} & \hat{C}_2(3) \\
\hline
A & 1 \\[4pt]
T1 & \begin{pmatrix} -0.25\sqrt{5}-0.25 & 0.5\sqrt{0.5-0.1\sqrt{5}} & -\sqrt{0.5-0.1\sqrt{5}} \\ 0.5\sqrt{0.5-0.1\sqrt{5}} & -0.75+0.05\sqrt{5} & -0.5-0.1\sqrt{5} \\ -\sqrt{0.5-0.1\sqrt{5}} & -0.5-0.1\sqrt{5} & \frac{\sqrt{5}}{5} \end{pmatrix} \\[20pt]
T2 & \begin{pmatrix} -\frac{\sqrt{5}}{5} & \sqrt{0.1\sqrt{5}+0.5} & -0.5+0.1\sqrt{5} \\ \sqrt{0.1\sqrt{5}+0.5} & -0.25+0.25\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} \\ -0.5+0.1\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} & -0.75-0.05\sqrt{5} \end{pmatrix} \\[20pt]
G & \begin{pmatrix} -0.25+0.25\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} & 0 & -\sqrt{0.1\sqrt{5}+0.5} \\ 0.5\sqrt{0.1\sqrt{5}+0.5} & 0.25+0.15\sqrt{5} & -\sqrt{0.5-0.1\sqrt{5}} & \frac{\sqrt{5}}{5} \\ 0 & -\sqrt{0.5-0.1\sqrt{5}} & -0.25\sqrt{5}-0.25 & -0.5\sqrt{0.5-0.1\sqrt{5}} \\ -\sqrt{0.1\sqrt{5}+0.5} & \frac{\sqrt{5}}{5} & -0.5\sqrt{0.5-0.1\sqrt{5}} & 0.25-0.15\sqrt{5} \end{pmatrix} \\[28pt]
H & \begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & \sqrt{0.06\sqrt{5}+0.3} & -0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.2\sqrt{7.5-1.5\sqrt{5}} \\ 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & 0.05\sqrt{5}+0.35 & -0.1\sqrt{12.5-5.5\sqrt{5}} & -\frac{4}{5} & 0.2\sqrt{2\sqrt{5}+5} \\ \sqrt{0.06\sqrt{5}+0.3} & -0.1\sqrt{12.5-5.5\sqrt{5}} & 0.25+0.15\sqrt{5} & 0.2\sqrt{5-2\sqrt{5}} & \frac{\sqrt{5}}{5} \\ -0.04\sqrt{5}\left(\sqrt{5}+5\right) & -\frac{4}{5} & 0.2\sqrt{5-2\sqrt{5}} & 0.35-0.05\sqrt{5} & 0.1\sqrt{5.5\sqrt{5}+12.5} \\ -0.2\sqrt{7.5-1.5\sqrt{5}} & 0.2\sqrt{2\sqrt{5}+5} & \frac{\sqrt{5}}{5} & 0.1\sqrt{5.5\sqrt{5}+12.5} & 0.25-0.15\sqrt{5} \end{pmatrix}
\end{array}
$$

A: 1

$T1$:
$$\begin{pmatrix} -0.5 & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -\sqrt{0.1\sqrt{5}+0.5} \\ -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -0.5-\frac{\sqrt{5}}{5} & 0.5-0.1\sqrt{5} \\ -\sqrt{0.1\sqrt{5}+0.5} & 0.5-0.1\sqrt{5} & \frac{\sqrt{5}}{5} \end{pmatrix}$$

$T2$:
$$\begin{pmatrix} -\frac{\sqrt{5}}{5} & -\sqrt{0.5-0.1\sqrt{5}} & 0.1\sqrt{5}+0.5 \\ -\sqrt{0.5-0.1\sqrt{5}} & -0.5 & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} \\ 0.1\sqrt{5}+0.5 & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.5+\frac{\sqrt{5}}{5} \end{pmatrix}$$

G:
$$\begin{pmatrix} 0.25+0.25\sqrt{5} & -0.5\sqrt{0.5-0.1\sqrt{5}} & 0.5 & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} \\ -0.5\sqrt{0.5-0.1\sqrt{5}} & -0.25+0.15\sqrt{5} & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.3\sqrt{5} \\ 0.5 & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & 0.25-0.25\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} \\ 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -0.3\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} & -0.15\sqrt{5}-0.25 \end{pmatrix}$$

H:
$$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.2\sqrt{7.5-1.5\sqrt{5}} & -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.2\sqrt{1.5\sqrt{5}+7.5} \\ 0.04\sqrt{5}\left(\sqrt{5}+5\right) & 0.1+\frac{\sqrt{5}}{5} & -0.1\sqrt{5-2\sqrt{5}} & 0.4 & \sqrt{0.4-0.08\sqrt{5}} \\ -0.2\sqrt{7.5-1.5\sqrt{5}} & -0.1\sqrt{5-2\sqrt{5}} & 0.5 & \sqrt{0.08\sqrt{5}+0.4} & 0 \\ -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & 0.4 & \sqrt{0.08\sqrt{5}+0.4} & 0.1-\frac{\sqrt{5}}{5} & -0.1\sqrt{2\sqrt{5}+5} \\ -0.2\sqrt{1.5\sqrt{5}+7.5} & \sqrt{0.4-0.08\sqrt{5}} & 0 & -0.1\sqrt{2\sqrt{5}+5} & 0.5 \end{pmatrix}$$

A: 1

$T1$:
$$\begin{pmatrix} -0.25+0.25\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} & -\sqrt{0.1\sqrt{5}+0.5} \\ 0.5\sqrt{0.1\sqrt{5}+0.5} & -0.75-0.05\sqrt{5} & -0.5+0.1\sqrt{5} \\ -\sqrt{0.1\sqrt{5}+0.5} & -0.5+0.1\sqrt{5} & -\frac{\sqrt{5}}{5} \end{pmatrix}$$

$T2$:
$$\begin{pmatrix} \frac{\sqrt{5}}{5} & -\sqrt{0.5-0.1\sqrt{5}} & -0.5-0.1\sqrt{5} \\ -\sqrt{0.5-0.1\sqrt{5}} & -0.25\sqrt{5}-0.25 & 0.5\sqrt{0.5-0.1\sqrt{5}} \\ -0.5-0.1\sqrt{5} & 0.5\sqrt{0.5-0.1\sqrt{5}} & -0.75+0.05\sqrt{5} \end{pmatrix}$$

G:
$$\begin{pmatrix} -0.25\sqrt{5}-0.25 & -0.5\sqrt{0.5-0.1\sqrt{5}} & 0 & \sqrt{0.5-0.1\sqrt{5}} \\ -0.5\sqrt{0.5-0.1\sqrt{5}} & 0.25-0.15\sqrt{5} & -\sqrt{0.1\sqrt{5}+0.5} & -\frac{\sqrt{5}}{5} \\ 0 & -\sqrt{0.1\sqrt{5}+0.5} & -0.25+0.25\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} \\ \sqrt{0.5-0.1\sqrt{5}} & -\frac{\sqrt{5}}{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} & 0.25+0.15\sqrt{5} \end{pmatrix}$$

H:
$$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(\sqrt{5}+5\right) & \sqrt{0.3-0.06\sqrt{5}} & -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & \sqrt{0.06\sqrt{5}+0.3} \\ 0.04\sqrt{5}\left(\sqrt{5}+5\right) & 0.35-0.05\sqrt{5} & 0.1\sqrt{5.5\sqrt{5}+12.5} & -\frac{4}{5} & -0.2\sqrt{5-2\sqrt{5}} \\ \sqrt{0.3-0.06\sqrt{5}} & 0.1\sqrt{5.5\sqrt{5}+12.5} & 0.25-0.15\sqrt{5} & 0.2\sqrt{2\sqrt{5}+5} & -\frac{\sqrt{5}}{5} \\ -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -\frac{4}{5} & 0.2\sqrt{2\sqrt{5}+5} & 0.05\sqrt{5}+0.35 & 0.1\sqrt{12.5-5.5\sqrt{5}} \\ \sqrt{0.06\sqrt{5}+0.3} & -0.2\sqrt{5-2\sqrt{5}} & -\frac{\sqrt{5}}{5} & 0.1\sqrt{12.5-5.5\sqrt{5}} & 0.25+0.15\sqrt{5} \end{pmatrix}$$

I	$\hat{C}_2(6)$
A	1

$$T1 \quad \begin{pmatrix} -0.25\sqrt{5}-0.25 & -0.5\sqrt{0.5-0.1\sqrt{5}} & \sqrt{0.5-0.1\sqrt{5}} \\ -0.5\sqrt{0.5-0.1\sqrt{5}} & -0.75+0.05\sqrt{5} & -0.5-0.1\sqrt{5} \\ \sqrt{0.5-0.1\sqrt{5}} & -0.5-0.1\sqrt{5} & \frac{\sqrt{5}}{5} \end{pmatrix}$$

$$T2 \quad \begin{pmatrix} -\frac{\sqrt{5}}{5} & -\sqrt{0.1\sqrt{5}+0.5} & -0.5+0.1\sqrt{5} \\ -\sqrt{0.1\sqrt{5}+0.5} & -0.25+0.25\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} \\ -0.5+0.1\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} & -0.75-0.05\sqrt{5} \end{pmatrix}$$

$$G \quad \begin{pmatrix} -0.25+0.25\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} & 0 & \sqrt{0.1\sqrt{5}+0.5} \\ -0.5\sqrt{0.1\sqrt{5}+0.5} & 0.25+0.15\sqrt{5} & \sqrt{0.5-0.1\sqrt{5}} & \frac{\sqrt{5}}{5} \\ 0 & \sqrt{0.5-0.1\sqrt{5}} & -0.25\sqrt{5}-0.25 & 0.5\sqrt{0.5-0.1\sqrt{5}} \\ \sqrt{0.1\sqrt{5}+0.5} & \frac{\sqrt{5}}{5} & 0.5\sqrt{0.5-0.1\sqrt{5}} & 0.25-0.15\sqrt{5} \end{pmatrix}$$

$$H \quad \begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.2\sqrt{1.5\sqrt{5}+7.5} & -0.04\sqrt{5}\left(\sqrt{5}+5\right) & \sqrt{0.3-0.06\sqrt{5}} \\ 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & 0.05\sqrt{5}+0.35 & 0.1\sqrt{12.5-5.5\sqrt{5}} & -\frac{4}{5} & -0.2\sqrt{2\sqrt{5}+5} \\ -0.2\sqrt{1.5\sqrt{5}+7.5} & 0.1\sqrt{12.5-5.5\sqrt{5}} & 0.25+0.15\sqrt{5} & -0.2\sqrt{5-2\sqrt{5}} & \frac{\sqrt{5}}{5} \\ -0.04\sqrt{5}\left(\sqrt{5}+5\right) & -\frac{4}{5} & -0.2\sqrt{5-2\sqrt{5}} & 0.35-0.05\sqrt{5} & -0.1\sqrt{5.5\sqrt{5}+12.5} \\ \sqrt{0.3-0.06\sqrt{5}} & -0.2\sqrt{2\sqrt{5}+5} & \frac{\sqrt{5}}{5} & -0.1\sqrt{5.5\sqrt{5}+12.5} & 0.25-0.15\sqrt{5} \end{pmatrix}$$

I	$\hat{C}_2(7)$
A	1

$$T1 \quad \begin{pmatrix} -0.5 & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & \sqrt{0.1\sqrt{5}+0.5} \\ 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -0.5-\frac{\sqrt{5}}{5} & 0.5-0.1\sqrt{5} \\ \sqrt{0.1\sqrt{5}+0.5} & 0.5-0.1\sqrt{5} & \frac{\sqrt{5}}{5} \end{pmatrix}$$

$$T2 \quad \begin{pmatrix} -\frac{\sqrt{5}}{5} & \sqrt{0.5-0.1\sqrt{5}} & 0.1\sqrt{5}+0.5 \\ \sqrt{0.5-0.1\sqrt{5}} & -0.5 & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} \\ 0.1\sqrt{5}+0.5 & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.5+\frac{\sqrt{5}}{5} \end{pmatrix}$$

$$G \quad \begin{pmatrix} 0.25+0.25\sqrt{5} & 0.5\sqrt{0.5-0.1\sqrt{5}} & 0.5 & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} \\ 0.5\sqrt{0.5-0.1\sqrt{5}} & -0.25+0.15\sqrt{5} & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.3\sqrt{5} \\ 0.5 & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & 0.25-0.25\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} \\ -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -0.3\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} & -0.15\sqrt{5}-0.25 \end{pmatrix}$$

$$H \quad \begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(\sqrt{5}+5\right) & \sqrt{0.3-0.06\sqrt{5}} & -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & \sqrt{0.06\sqrt{5}+0.3} \\ 0.04\sqrt{5}\left(\sqrt{5}+5\right) & 0.1+\frac{\sqrt{5}}{5} & 0.1\sqrt{5-2\sqrt{5}} & 0.4 & -0.2\sqrt{10-2\sqrt{5}} \\ \sqrt{0.3-0.06\sqrt{5}} & 0.1\sqrt{5-2\sqrt{5}} & 0.5 & -0.2\sqrt{2\sqrt{5}+10} & 0 \\ -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & 0.4 & -0.2\sqrt{2\sqrt{5}+10} & 0.1-\frac{\sqrt{5}}{5} & 0.1\sqrt{2\sqrt{5}+5} \\ \sqrt{0.06\sqrt{5}+0.3} & -0.2\sqrt{10-2\sqrt{5}} & 0 & 0.1\sqrt{2\sqrt{5}+5} & 0.5 \end{pmatrix}$$

I	$\hat{C}_2(8)$
A	1

$T1$:
$$\begin{pmatrix} -0.25 + 0.25\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} & \sqrt{0.1\sqrt{5}+0.5} \\ -0.5\sqrt{0.1\sqrt{5}+0.5} & -0.75 - 0.05\sqrt{5} & -0.5 + 0.1\sqrt{5} \\ \sqrt{0.1\sqrt{5}+0.5} & -0.5 + 0.1\sqrt{5} & -\frac{\sqrt{5}}{5} \end{pmatrix}$$

$T2$:
$$\begin{pmatrix} \frac{\sqrt{5}}{5} & \sqrt{0.5 - 0.1\sqrt{5}} & -0.5 - 0.1\sqrt{5} \\ \sqrt{0.5 - 0.1\sqrt{5}} & -0.25\sqrt{5} - 0.25 & -0.5\sqrt{0.5 - 0.1\sqrt{5}} \\ -0.5 - 0.1\sqrt{5} & -0.5\sqrt{0.5 - 0.1\sqrt{5}} & -0.75 + 0.05\sqrt{5} \end{pmatrix}$$

G:
$$\begin{pmatrix} -0.25\sqrt{5} - 0.25 & 0.5\sqrt{0.5 - 0.1\sqrt{5}} & 0 & -\sqrt{0.5 - 0.1\sqrt{5}} \\ 0.5\sqrt{0.5 - 0.1\sqrt{5}} & 0.25 - 0.15\sqrt{5} & \sqrt{0.1\sqrt{5}+0.5} & -\frac{\sqrt{5}}{5} \\ 0 & \sqrt{0.1\sqrt{5}+0.5} & -0.25 + 0.25\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} \\ -\sqrt{0.5 - 0.1\sqrt{5}} & -\frac{\sqrt{5}}{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} & 0.25 + 0.15\sqrt{5} \end{pmatrix}$$

H:
$$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.2\sqrt{7.5 - 1.5\sqrt{5}} & -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.2\sqrt{1.5\sqrt{5}+7.5} \\ 0.04\sqrt{5}\left(\sqrt{5}+5\right) & 0.35 - 0.05\sqrt{5} & -0.1\sqrt{5.5\sqrt{5}+12.5} & -\frac{4}{5} & 0.2\sqrt{5 - 2\sqrt{5}} \\ -0.2\sqrt{7.5 - 1.5\sqrt{5}} & -0.1\sqrt{5.5\sqrt{5}+12.5} & 0.25 - 0.15\sqrt{5} & -0.2\sqrt{2\sqrt{5}+5} & -\frac{\sqrt{5}}{5} \\ -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -\frac{4}{5} & -0.2\sqrt{2\sqrt{5}+5} & 0.05\sqrt{5} + 0.35 & -0.1\sqrt{12.5 - 5.5\sqrt{5}} \\ -0.2\sqrt{1.5\sqrt{5}+7.5} & 0.2\sqrt{5 - 2\sqrt{5}} & -\frac{\sqrt{5}}{5} & -0.1\sqrt{12.5 - 5.5\sqrt{5}} & 0.25 + 0.15\sqrt{5} \end{pmatrix}$$

I	$\hat{C}_2(9)$
A	1

$T1$:
$$\begin{pmatrix} -0.25\sqrt{5} - 0.25 & -0.5\sqrt{2.5 - 0.5\sqrt{5}} & 0 \\ -0.5\sqrt{2.5 - 0.5\sqrt{5}} & 0.25 + 0.25\sqrt{5} & 0 \\ 0 & 0 & -1 \end{pmatrix}$$

$T2$:
$$\begin{pmatrix} -1 & 0 & 0 \\ 0 & -0.25 + 0.25\sqrt{5} & -0.5\sqrt{0.5\sqrt{5}+2.5} \\ 0 & -0.5\sqrt{0.5\sqrt{5}+2.5} & 0.25 - 0.25\sqrt{5} \end{pmatrix}$$

G:
$$\begin{pmatrix} -0.25\sqrt{5} - 0.25 & -0.5\sqrt{2.5 - 0.5\sqrt{5}} & 0 & 0 \\ -0.5\sqrt{2.5 - 0.5\sqrt{5}} & 0.25 + 0.25\sqrt{5} & 0 & 0 \\ 0 & 0 & -0.25 + 0.25\sqrt{5} & 0.5\sqrt{0.5\sqrt{5}+2.5} \\ 0 & 0 & 0.5\sqrt{0.5\sqrt{5}+2.5} & 0.25 - 0.25\sqrt{5} \end{pmatrix}$$

H:
$$\begin{pmatrix} 1 & 0 & 0 & 0 & 0 \\ 0 & -0.25 + 0.25\sqrt{5} & 0.5\sqrt{0.5\sqrt{5}+2.5} & 0 & 0 \\ 0 & 0.5\sqrt{0.5\sqrt{5}+2.5} & 0.25 - 0.25\sqrt{5} & 0 & 0 \\ 0 & 0 & 0 & -0.25\sqrt{5} - 0.25 & 0.5\sqrt{2.5 - 0.5\sqrt{5}} \\ 0 & 0 & 0 & 0.5\sqrt{2.5 - 0.5\sqrt{5}} & 0.25 + 0.25\sqrt{5} \end{pmatrix}$$

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$$\mathbf{I} \quad\bigg|\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad \hat{C}_2(10)$$

$A \quad\bigg|\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad 1$

$T1 \quad\begin{pmatrix} -0.5 & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -\sqrt{0.5-0.1\sqrt{5}} \\ -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.5+\frac{\sqrt{5}}{5} & 0.1\sqrt{5}+0.5 \\ -\sqrt{0.5-0.1\sqrt{5}} & 0.1\sqrt{5}+0.5 & -\frac{\sqrt{5}}{5} \end{pmatrix}$

$T2 \quad\begin{pmatrix} \frac{\sqrt{5}}{5} & \sqrt{0.1\sqrt{5}+0.5} & 0.5-0.1\sqrt{5} \\ \sqrt{0.1\sqrt{5}+0.5} & -0.5 & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} \\ 0.5-0.1\sqrt{5} & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -0.5-\frac{\sqrt{5}}{5} \end{pmatrix}$

$G \quad\begin{pmatrix} 0.25-0.25\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} & 0.5 & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} \\ 0.5\sqrt{0.1\sqrt{5}+0.5} & -0.15\sqrt{5}-0.25 & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & 0.3\sqrt{5} \\ 0.5 & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & 0.25+0.25\sqrt{5} & -0.5\sqrt{0.5-0.1\sqrt{5}} \\ 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & 0.3\sqrt{5} & -0.5\sqrt{0.5-0.1\sqrt{5}} & -0.25+0.15\sqrt{5} \end{pmatrix}$

$H \quad\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.2\sqrt{1.5\sqrt{5}+7.5} & -0.04\sqrt{5}\left(\sqrt{5}+5\right) & \sqrt{0.3-0.06\sqrt{5}} \\ 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & 0.1-\frac{\sqrt{5}}{5} & 0.1\sqrt{2\sqrt{5}+5} & 0.4 & \sqrt{0.08\sqrt{5}+0.4} \\ -0.2\sqrt{1.5\sqrt{5}+7.5} & 0.1\sqrt{2\sqrt{5}+5} & 0.5 & -0.2\sqrt{10-2\sqrt{5}} & 0 \\ -0.04\sqrt{5}\left(\sqrt{5}+5\right) & 0.4 & -0.2\sqrt{10-2\sqrt{5}} & 0.1+\frac{\sqrt{5}}{5} & -0.1\sqrt{5-2\sqrt{5}} \\ \sqrt{0.3-0.06\sqrt{5}} & \sqrt{0.08\sqrt{5}+0.4} & 0 & -0.1\sqrt{5-2\sqrt{5}} & 0.5 \end{pmatrix}$

$$\mathbf{I} \quad\bigg|\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad \hat{C}_2(11)$$

$A \quad\bigg|\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad 1$

$T1 \quad\begin{pmatrix} -0.25+0.25\sqrt{5} & -0.5\sqrt{0.5\sqrt{5}+2.5} & 0 \\ -0.5\sqrt{0.5\sqrt{5}+2.5} & 0.25-0.25\sqrt{5} & 0 \\ 0 & 0 & -1 \end{pmatrix}$

$T2 \quad\begin{pmatrix} -1 & 0 & 0 \\ 0 & -0.25\sqrt{5}-0.25 & 0.5\sqrt{2.5-0.5\sqrt{5}} \\ 0 & 0.5\sqrt{2.5-0.5\sqrt{5}} & 0.25+0.25\sqrt{5} \end{pmatrix}$

$G \quad\begin{pmatrix} -0.25+0.25\sqrt{5} & -0.5\sqrt{0.5\sqrt{5}+2.5} & 0 & 0 \\ -0.5\sqrt{0.5\sqrt{5}+2.5} & 0.25-0.25\sqrt{5} & 0 & 0 \\ 0 & 0 & -0.25\sqrt{5}-0.25 & -0.5\sqrt{2.5-0.5\sqrt{5}} \\ 0 & 0 & -0.5\sqrt{2.5-0.5\sqrt{5}} & 0.25+0.25\sqrt{5} \end{pmatrix}$

$H \quad\begin{pmatrix} 1 & 0 & 0 & 0 & 0 \\ 0 & -0.25\sqrt{5}-0.25 & -0.5\sqrt{2.5-0.5\sqrt{5}} & 0 & 0 \\ 0 & -0.5\sqrt{2.5-0.5\sqrt{5}} & 0.25+0.25\sqrt{5} & 0 & 0 \\ 0 & 0 & 0 & -0.25+0.25\sqrt{5} & 0.5\sqrt{0.5\sqrt{5}+2.5} \\ 0 & 0 & 0 & 0.5\sqrt{0.5\sqrt{5}+2.5} & 0.25-0.25\sqrt{5} \end{pmatrix}$

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I	$\hat{C}_2(12)$
A	1
$T1$	$\begin{pmatrix} -1 & 0 & 0 \\ 0 & \frac{\sqrt{5}}{5} & -\frac{2\sqrt{5}}{5} \\ 0 & -\frac{2\sqrt{5}}{5} & -\frac{\sqrt{5}}{5} \end{pmatrix}$
$T2$	$\begin{pmatrix} \frac{\sqrt{5}}{5} & 0 & \frac{2\sqrt{5}}{5} \\ 0 & -1 & 0 \\ \frac{2\sqrt{5}}{5} & 0 & -\frac{\sqrt{5}}{5} \end{pmatrix}$
G	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 0 & -\frac{2\sqrt{5}}{5} & 0 & -\frac{\sqrt{5}}{5} \\ -1 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{5}}{5} & 0 & \frac{2\sqrt{5}}{5} \end{pmatrix}$
H	$\begin{pmatrix} -0.2 & -0.4\sqrt{3} & 0 & 0.4\sqrt{3} & 0 \\ -0.4\sqrt{3} & \frac{4}{5} & 0 & 0.4 & 0 \\ 0 & 0 & -\frac{\sqrt{5}}{5} & 0 & \frac{2\sqrt{5}}{5} \\ 0.4\sqrt{3} & 0.4 & 0 & \frac{4}{5} & 0 \\ 0 & 0 & \frac{2\sqrt{5}}{5} & 0 & \frac{\sqrt{5}}{5} \end{pmatrix}$

I	$\hat{C}_2(13)$
A	1
$T1$	$\begin{pmatrix} -1 & 0 & 0 \\ 0 & -\frac{\sqrt{5}}{5} & \frac{2\sqrt{5}}{5} \\ 0 & \frac{2\sqrt{5}}{5} & \frac{\sqrt{5}}{5} \end{pmatrix}$
$T2$	$\begin{pmatrix} -\frac{\sqrt{5}}{5} & 0 & -\frac{2\sqrt{5}}{5} \\ 0 & -1 & 0 \\ -\frac{2\sqrt{5}}{5} & 0 & \frac{\sqrt{5}}{5} \end{pmatrix}$
G	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 0 & \frac{2\sqrt{5}}{5} & 0 & \frac{\sqrt{5}}{5} \\ -1 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{5}}{5} & 0 & -\frac{2\sqrt{5}}{5} \end{pmatrix}$
H	$\begin{pmatrix} -0.2 & -0.4\sqrt{3} & 0 & 0.4\sqrt{3} & 0 \\ -0.4\sqrt{3} & \frac{4}{5} & 0 & 0.4 & 0 \\ 0 & 0 & \frac{\sqrt{5}}{5} & 0 & -\frac{2\sqrt{5}}{5} \\ 0.4\sqrt{3} & 0.4 & 0 & \frac{4}{5} & 0 \\ 0 & 0 & -\frac{2\sqrt{5}}{5} & 0 & -\frac{\sqrt{5}}{5} \end{pmatrix}$

I	$\hat{C}_2(14)$
A	1
$T1$	$\begin{pmatrix} 1 & 0 & 0 \\ 0 & -1 & 0 \\ 0 & 0 & -1 \end{pmatrix}$
$T2$	$\begin{pmatrix} -1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & -1 \end{pmatrix}$
G	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & -1 \end{pmatrix}$
H	$\begin{pmatrix} 1 & 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 & 0 \\ 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & -1 \end{pmatrix}$

Ih	$\hat{E}$
Ag	1
$T1g$	$\begin{pmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{pmatrix}$
$T2g$	$\begin{pmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{pmatrix}$
Gg	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{pmatrix}$
Hg	$\begin{pmatrix} 1 & 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 1 \end{pmatrix}$
Au	1
$T1u$	$\begin{pmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{pmatrix}$
$T2u$	$\begin{pmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{pmatrix}$
Gu	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{pmatrix}$
Hu	$\begin{pmatrix} 1 & 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 1 \end{pmatrix}$

Ih	$\hat{C}_5(0)$
Ag	1
$T1g$	$\begin{pmatrix} 0.5 & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & \sqrt{0.5-0.1\sqrt{5}} \\ -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & 0.3\sqrt{5} & -0.5-0.1\sqrt{5} \\ -\sqrt{0.1\sqrt{5}+0.5} & 0.5-0.1\sqrt{5} & \frac{\sqrt{5}}{5} \end{pmatrix}$
$T2g$	$\begin{pmatrix} -\frac{\sqrt{5}}{5} & -\sqrt{0.5-0.1\sqrt{5}} & 0.1\sqrt{5}+0.5 \\ -\sqrt{0.1\sqrt{5}+0.5} & 0.5 & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} \\ -0.5+0.1\sqrt{5} & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.3\sqrt{5} \end{pmatrix}$
Gg	$\begin{pmatrix} -0.5 & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -0.25\sqrt{5}-0.25 & 0.5\sqrt{0.5-0.1\sqrt{5}} \\ 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.1\sqrt{5} & -0.5\sqrt{0.5-0.1\sqrt{5}} & 0.75-0.05\sqrt{5} \\ -0.25+0.25\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} & -0.5 & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} \\ -0.5\sqrt{0.1\sqrt{5}+0.5} & -0.75-0.05\sqrt{5} & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & 0.1\sqrt{5} \end{pmatrix}$
Hg	$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.2\sqrt{7.5-1.5\sqrt{5}} & -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.2\sqrt{1.5\sqrt{5}+7.5} \\ 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & 0.1 & 0.1\sqrt{25-2\sqrt{5}} & 0.4+\frac{\sqrt{5}}{5} & 0.2\sqrt{5-2\sqrt{5}} \\ -0.2\sqrt{1.5\sqrt{5}+7.5} & -0.1\sqrt{2\sqrt{5}+25} & 0.1\sqrt{5} & -0.2\sqrt{5-2\sqrt{5}} & -\frac{\sqrt{5}}{5} \\ -0.04\sqrt{5}\left(\sqrt{5}+5\right) & 0.4-\frac{\sqrt{5}}{5} & -0.2\sqrt{2\sqrt{5}+5} & 0.1 & 0.1\sqrt{2\sqrt{5}+25} \\ \sqrt{0.3-0.06\sqrt{5}} & -0.2\sqrt{2\sqrt{5}+5} & -\frac{\sqrt{5}}{5} & 0.1\sqrt{25-2\sqrt{5}} & -0.1\sqrt{5} \end{pmatrix}$
Au	1
$T1u$	$\begin{pmatrix} 0.5 & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & \sqrt{0.5-0.1\sqrt{5}} \\ -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & 0.3\sqrt{5} & -0.5-0.1\sqrt{5} \\ -\sqrt{0.1\sqrt{5}+0.5} & 0.5-0.1\sqrt{5} & \frac{\sqrt{5}}{5} \end{pmatrix}$
$T2u$	$\begin{pmatrix} -\frac{\sqrt{5}}{5} & -\sqrt{0.5-0.1\sqrt{5}} & 0.1\sqrt{5}+0.5 \\ -\sqrt{0.1\sqrt{5}+0.5} & 0.5 & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} \\ -0.5+0.1\sqrt{5} & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.3\sqrt{5} \end{pmatrix}$
Gu	$\begin{pmatrix} -0.5 & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -0.25\sqrt{5}-0.25 & 0.5\sqrt{0.5-0.1\sqrt{5}} \\ 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.1\sqrt{5} & -0.5\sqrt{0.5-0.1\sqrt{5}} & 0.75-0.05\sqrt{5} \\ -0.25+0.25\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} & -0.5 & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} \\ -0.5\sqrt{0.1\sqrt{5}+0.5} & -0.75-0.05\sqrt{5} & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & 0.1\sqrt{5} \end{pmatrix}$
Hu	$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.2\sqrt{7.5-1.5\sqrt{5}} & -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.2\sqrt{1.5\sqrt{5}+7.5} \\ 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & 0.1 & 0.1\sqrt{25-2\sqrt{5}} & 0.4+\frac{\sqrt{5}}{5} & 0.2\sqrt{5-2\sqrt{5}} \\ -0.2\sqrt{1.5\sqrt{5}+7.5} & -0.1\sqrt{2\sqrt{5}+25} & 0.1\sqrt{5} & -0.2\sqrt{5-2\sqrt{5}} & -\frac{\sqrt{5}}{5} \\ -0.04\sqrt{5}\left(\sqrt{5}+5\right) & 0.4-\frac{\sqrt{5}}{5} & -0.2\sqrt{2\sqrt{5}+5} & 0.1 & 0.1\sqrt{2\sqrt{5}+25} \\ \sqrt{0.3-0.06\sqrt{5}} & -0.2\sqrt{2\sqrt{5}+5} & -\frac{\sqrt{5}}{5} & 0.1\sqrt{25-2\sqrt{5}} & -0.1\sqrt{5} \end{pmatrix}$

Ih	$\hat{C}_5^2(0)$
Ag	1
$T1g$	$\begin{pmatrix} 0.25-0.25\sqrt{5} & 0.5\sqrt{0.5\sqrt{5}+2.5} & 0 \\ 0.5\sqrt{0.1\sqrt{5}+0.5} & 0.25-0.05\sqrt{5} & -\frac{2\sqrt{5}}{5} \\ -\sqrt{0.1\sqrt{5}+0.5} & -0.5+0.1\sqrt{5} & -\frac{\sqrt{5}}{5} \end{pmatrix}$
$T2g$	$\begin{pmatrix} \frac{\sqrt{5}}{5} & -\sqrt{0.5-0.1\sqrt{5}} & -0.5-0.1\sqrt{5} \\ 0 & 0.25+0.25\sqrt{5} & -0.5\sqrt{2.5-0.5\sqrt{5}} \\ \frac{2\sqrt{5}}{5} & 0.5\sqrt{0.5-0.1\sqrt{5}} & 0.05\sqrt{5}+0.25 \end{pmatrix}$
Gg	$\begin{pmatrix} 0 & 0 & 0.25+0.25\sqrt{5} & 0.5\sqrt{2.5-0.5\sqrt{5}} \\ -\sqrt{0.1\sqrt{5}+0.5} & -0.5+0.1\sqrt{5} & -0.5\sqrt{0.5-0.1\sqrt{5}} & 0.05\sqrt{5}+0.25 \\ 0.25-0.25\sqrt{5} & 0.5\sqrt{0.5\sqrt{5}+2.5} & 0 & 0 \\ -0.5\sqrt{0.1\sqrt{5}+0.5} & -0.25+0.05\sqrt{5} & \sqrt{0.5-0.1\sqrt{5}} & -0.5-0.1\sqrt{5} \end{pmatrix}$
Hg	$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(\sqrt{5}+5\right) & \sqrt{0.3-0.06\sqrt{5}} & -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & \sqrt{0.06\sqrt{5}+0.3} \\ -0.4\sqrt{3} & -0.15\sqrt{5}-0.15 & -0.3\sqrt{2.5-0.5\sqrt{5}} & -0.1+0.1\sqrt{5} & \sqrt{0.02\sqrt{5}+0.1} \\ 0 & -0.5\sqrt{0.5-0.1\sqrt{5}} & 0.05\sqrt{5}+0.25 & -\sqrt{0.1\sqrt{5}+0.5} & 0.5-0.1\sqrt{5} \\ 0.4\sqrt{3} & -0.1\sqrt{5}-0.1 & -0.2\sqrt{2.5-0.5\sqrt{5}} & -0.15+0.15\sqrt{5} & 0.3\sqrt{0.5\sqrt{5}+2.5} \\ 0 & \sqrt{0.5-0.1\sqrt{5}} & -0.5-0.1\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} & 0.25-0.05\sqrt{5} \end{pmatrix}$
Au	1
$T1u$	$\begin{pmatrix} 0.25-0.25\sqrt{5} & 0.5\sqrt{0.5\sqrt{5}+2.5} & 0 \\ 0.5\sqrt{0.1\sqrt{5}+0.5} & 0.25-0.05\sqrt{5} & -\frac{2\sqrt{5}}{5} \\ -\sqrt{0.1\sqrt{5}+0.5} & -0.5+0.1\sqrt{5} & -\frac{\sqrt{5}}{5} \end{pmatrix}$
$T2u$	$\begin{pmatrix} \frac{\sqrt{5}}{5} & -\sqrt{0.5-0.1\sqrt{5}} & -0.5-0.1\sqrt{5} \\ 0 & 0.25+0.25\sqrt{5} & -0.5\sqrt{2.5-0.5\sqrt{5}} \\ \frac{2\sqrt{5}}{5} & 0.5\sqrt{0.5-0.1\sqrt{5}} & 0.05\sqrt{5}+0.25 \end{pmatrix}$
Gu	$\begin{pmatrix} 0 & 0 & 0.25+0.25\sqrt{5} & 0.5\sqrt{2.5-0.5\sqrt{5}} \\ -\sqrt{0.1\sqrt{5}+0.5} & -0.5+0.1\sqrt{5} & -0.5\sqrt{0.5-0.1\sqrt{5}} & 0.05\sqrt{5}+0.25 \\ 0.25-0.25\sqrt{5} & 0.5\sqrt{0.5\sqrt{5}+2.5} & 0 & 0 \\ -0.5\sqrt{0.1\sqrt{5}+0.5} & -0.25+0.05\sqrt{5} & \sqrt{0.5-0.1\sqrt{5}} & -0.5-0.1\sqrt{5} \end{pmatrix}$
Hu	$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(\sqrt{5}+5\right) & \sqrt{0.3-0.06\sqrt{5}} & -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & \sqrt{0.06\sqrt{5}+0.3} \\ -0.4\sqrt{3} & -0.15\sqrt{5}-0.15 & -0.3\sqrt{2.5-0.5\sqrt{5}} & -0.1+0.1\sqrt{5} & \sqrt{0.02\sqrt{5}+0.1} \\ 0 & -0.5\sqrt{0.5-0.1\sqrt{5}} & 0.05\sqrt{5}+0.25 & -\sqrt{0.1\sqrt{5}+0.5} & 0.5-0.1\sqrt{5} \\ 0.4\sqrt{3} & -0.1\sqrt{5}-0.1 & -0.2\sqrt{2.5-0.5\sqrt{5}} & -0.15+0.15\sqrt{5} & 0.3\sqrt{0.5\sqrt{5}+2.5} \\ 0 & \sqrt{0.5-0.1\sqrt{5}} & -0.5-0.1\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} & 0.25-0.05\sqrt{5} \end{pmatrix}$

Ih	$\hat{C}_5^3(0)$

Ag : 1

$T1g$:
$$\begin{pmatrix} 0.25 - 0.25\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} & -\sqrt{0.1\sqrt{5}+0.5} \\ 0.5\sqrt{0.5\sqrt{5}+2.5} & 0.25 - 0.05\sqrt{5} & -0.5 + 0.1\sqrt{5} \\ 0 & -\frac{2\sqrt{5}}{5} & -\frac{\sqrt{5}}{5} \end{pmatrix}$$

$T2g$:
$$\begin{pmatrix} \frac{\sqrt{5}}{5} & 0 & \frac{2\sqrt{5}}{5} \\ -\sqrt{0.5-0.1\sqrt{5}} & 0.25 + 0.25\sqrt{5} & 0.5\sqrt{0.5-0.1\sqrt{5}} \\ -0.5 - 0.1\sqrt{5} & -0.5\sqrt{2.5-0.5\sqrt{5}} & 0.05\sqrt{5}+0.25 \end{pmatrix}$$

Gg :
$$\begin{pmatrix} 0 & -\sqrt{0.1\sqrt{5}+0.5} & 0.25 - 0.25\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} \\ 0 & -0.5 + 0.1\sqrt{5} & 0.5\sqrt{0.5\sqrt{5}+2.5} & -0.25 + 0.05\sqrt{5} \\ 0.25 + 0.25\sqrt{5} & -0.5\sqrt{0.5-0.1\sqrt{5}} & 0 & \sqrt{0.5-0.1\sqrt{5}} \\ 0.5\sqrt{2.5-0.5\sqrt{5}} & 0.05\sqrt{5}+0.25 & 0 & -0.5-0.1\sqrt{5} \end{pmatrix}$$

Hg :
$$\begin{pmatrix} -0.2 & -0.4\sqrt{3} & 0 & 0.4\sqrt{3} & 0 \\ \frac{0.04\sqrt{5}\left(\sqrt{5}+5\right)}{\sqrt{0.3-0.06\sqrt{5}}} & -0.15\sqrt{5}-0.15 & -0.5\sqrt{0.5-0.1\sqrt{5}} & -0.1\sqrt{5}-0.1 & \sqrt{0.5-0.1\sqrt{5}} \\ & -0.3\sqrt{2.5-0.5\sqrt{5}} & 0.05\sqrt{5}+0.25 & -0.2\sqrt{2.5-0.5\sqrt{5}} & -0.5-0.1\sqrt{5} \\ \frac{-0.04\sqrt{5}\left(-5+\sqrt{5}\right)}{\sqrt{0.06\sqrt{5}+0.3}} & -0.1+0.1\sqrt{5} & -\sqrt{0.1\sqrt{5}+0.5} & -0.15+0.15\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} \\ & \sqrt{0.02\sqrt{5}+0.1} & 0.5-0.1\sqrt{5} & 0.3\sqrt{0.5\sqrt{5}+2.5} & 0.25-0.05\sqrt{5} \end{pmatrix}$$

Au : 1

$T1u$:
$$\begin{pmatrix} 0.25 - 0.25\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} & -\sqrt{0.1\sqrt{5}+0.5} \\ 0.5\sqrt{0.5\sqrt{5}+2.5} & 0.25 - 0.05\sqrt{5} & -0.5 + 0.1\sqrt{5} \\ 0 & -\frac{2\sqrt{5}}{5} & -\frac{\sqrt{5}}{5} \end{pmatrix}$$

$T2u$:
$$\begin{pmatrix} \frac{\sqrt{5}}{5} & 0 & \frac{2\sqrt{5}}{5} \\ -\sqrt{0.5-0.1\sqrt{5}} & 0.25 + 0.25\sqrt{5} & 0.5\sqrt{0.5-0.1\sqrt{5}} \\ -0.5 - 0.1\sqrt{5} & -0.5\sqrt{2.5-0.5\sqrt{5}} & 0.05\sqrt{5}+0.25 \end{pmatrix}$$

Gu :
$$\begin{pmatrix} 0 & -\sqrt{0.1\sqrt{5}+0.5} & 0.25 - 0.25\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} \\ 0 & -0.5 + 0.1\sqrt{5} & 0.5\sqrt{0.5\sqrt{5}+2.5} & -0.25 + 0.05\sqrt{5} \\ 0.25 + 0.25\sqrt{5} & -0.5\sqrt{0.5-0.1\sqrt{5}} & 0 & \sqrt{0.5-0.1\sqrt{5}} \\ 0.5\sqrt{2.5-0.5\sqrt{5}} & 0.05\sqrt{5}+0.25 & 0 & -0.5-0.1\sqrt{5} \end{pmatrix}$$

Hu :
$$\begin{pmatrix} -0.2 & -0.4\sqrt{3} & 0 & 0.4\sqrt{3} & 0 \\ \frac{0.04\sqrt{5}\left(\sqrt{5}+5\right)}{\sqrt{0.3-0.06\sqrt{5}}} & -0.15\sqrt{5}-0.15 & -0.5\sqrt{0.5-0.1\sqrt{5}} & -0.1\sqrt{5}-0.1 & \sqrt{0.5-0.1\sqrt{5}} \\ & -0.3\sqrt{2.5-0.5\sqrt{5}} & 0.05\sqrt{5}+0.25 & -0.2\sqrt{2.5-0.5\sqrt{5}} & -0.5-0.1\sqrt{5} \\ \frac{-0.04\sqrt{5}\left(-5+\sqrt{5}\right)}{\sqrt{0.06\sqrt{5}+0.3}} & -0.1+0.1\sqrt{5} & -\sqrt{0.1\sqrt{5}+0.5} & -0.15+0.15\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} \\ & \sqrt{0.02\sqrt{5}+0.1} & 0.5-0.1\sqrt{5} & 0.3\sqrt{0.5\sqrt{5}+2.5} & 0.25-0.05\sqrt{5} \end{pmatrix}$$

Ih	$\hat{C}_5^4(0)$

Ag : 1

$T1g$:
$$\begin{pmatrix} 0.5 & -0.5\sqrt{1-\frac{2\sqrt5}{5}} & -\sqrt{0.1\sqrt5+0.5} \\ 0.5\sqrt{\frac{2\sqrt5}{5}+1} & 0.3\sqrt5 & 0.5-0.1\sqrt5 \\ \sqrt{0.5-0.1\sqrt5} & -0.5-0.1\sqrt5 & \frac{\sqrt5}{5} \end{pmatrix}$$

$T2g$:
$$\begin{pmatrix} -\frac{\sqrt5}{5} & -\sqrt{0.1\sqrt5+0.5} & -0.5+0.1\sqrt5 \\ -\sqrt{0.5-0.1\sqrt5} & 0.5 & -0.5\sqrt{\frac{2\sqrt5}{5}+1} \\ 0.1\sqrt5+0.5 & -0.5\sqrt{1-\frac{2\sqrt5}{5}} & -0.3\sqrt5 \end{pmatrix}$$

Gg :
$$\begin{pmatrix} -0.5 & 0.5\sqrt{\frac{2\sqrt5}{5}+1} & -0.25+0.25\sqrt5 & -0.5\sqrt{0.1\sqrt5+0.5} \\ 0.5\sqrt{1-\frac{2\sqrt5}{5}} & -0.1\sqrt5 & -0.5\sqrt{0.1\sqrt5+0.5} & -0.75-0.05\sqrt5 \\ -0.25\sqrt5-0.25 & -0.5\sqrt{0.5-0.1\sqrt5} & -0.5 & 0.5\sqrt{1-\frac{2\sqrt5}{5}} \\ 0.5\sqrt{0.5-0.1\sqrt5} & 0.75-0.05\sqrt5 & -0.5\sqrt{\frac{2\sqrt5}{5}+1} & 0.1\sqrt5 \end{pmatrix}$$

Hg :
$$\begin{pmatrix} -0.2 & 0.04\sqrt5\left(-5+\sqrt5\right) & -0.2\sqrt{1.5\sqrt5+7.5} & -0.04\sqrt5\left(\sqrt5+5\right) & \sqrt{0.3-0.06\sqrt5} \\ 0.04\sqrt5\left(\sqrt5+5\right) & 0.1 & -0.1\sqrt{2\sqrt5+25} & 0.4-\frac{\sqrt5}{5} & -0.2\sqrt{2\sqrt5+5} \\ -0.2\sqrt{7.5-1.5\sqrt5} & 0.1\sqrt{25-2\sqrt5} & 0.1\sqrt5 & -0.2\sqrt{2\sqrt5+5} & -\frac{\sqrt5}{5} \\ -0.04\sqrt5\left(-5+\sqrt5\right) & 0.4+\frac{\sqrt5}{5} & -0.2\sqrt{5-2\sqrt5} & 0.1 & 0.1\sqrt{25-2\sqrt5} \\ -0.2\sqrt{1.5\sqrt5+7.5} & 0.2\sqrt{5-2\sqrt5} & -\frac{\sqrt5}{5} & 0.1\sqrt{2\sqrt5+25} & -0.1\sqrt5 \end{pmatrix}$$

Au : 1

$T1u$:
$$\begin{pmatrix} 0.5 & -0.5\sqrt{1-\frac{2\sqrt5}{5}} & -\sqrt{0.1\sqrt5+0.5} \\ 0.5\sqrt{\frac{2\sqrt5}{5}+1} & 0.3\sqrt5 & 0.5-0.1\sqrt5 \\ \sqrt{0.5-0.1\sqrt5} & -0.5-0.1\sqrt5 & \frac{\sqrt5}{5} \end{pmatrix}$$

$T2u$:
$$\begin{pmatrix} -\frac{\sqrt5}{5} & -\sqrt{0.1\sqrt5+0.5} & -0.5+0.1\sqrt5 \\ -\sqrt{0.5-0.1\sqrt5} & 0.5 & -0.5\sqrt{\frac{2\sqrt5}{5}+1} \\ 0.1\sqrt5+0.5 & -0.5\sqrt{1-\frac{2\sqrt5}{5}} & -0.3\sqrt5 \end{pmatrix}$$

Gu :
$$\begin{pmatrix} -0.5 & 0.5\sqrt{\frac{2\sqrt5}{5}+1} & -0.25+0.25\sqrt5 & -0.5\sqrt{0.1\sqrt5+0.5} \\ 0.5\sqrt{1-\frac{2\sqrt5}{5}} & -0.1\sqrt5 & -0.5\sqrt{0.1\sqrt5+0.5} & -0.75-0.05\sqrt5 \\ -0.25\sqrt5-0.25 & -0.5\sqrt{0.5-0.1\sqrt5} & -0.5 & 0.5\sqrt{1-\frac{2\sqrt5}{5}} \\ 0.5\sqrt{0.5-0.1\sqrt5} & 0.75-0.05\sqrt5 & -0.5\sqrt{\frac{2\sqrt5}{5}+1} & 0.1\sqrt5 \end{pmatrix}$$

Hu :
$$\begin{pmatrix} -0.2 & 0.04\sqrt5\left(-5+\sqrt5\right) & -0.2\sqrt{1.5\sqrt5+7.5} & -0.04\sqrt5\left(\sqrt5+5\right) & \sqrt{0.3-0.06\sqrt5} \\ 0.04\sqrt5\left(\sqrt5+5\right) & 0.1 & -0.1\sqrt{2\sqrt5+25} & 0.4-\frac{\sqrt5}{5} & -0.2\sqrt{2\sqrt5+5} \\ -0.2\sqrt{7.5-1.5\sqrt5} & 0.1\sqrt{25-2\sqrt5} & 0.1\sqrt5 & -0.2\sqrt{2\sqrt5+5} & -\frac{\sqrt5}{5} \\ -0.04\sqrt5\left(-5+\sqrt5\right) & 0.4+\frac{\sqrt5}{5} & -0.2\sqrt{5-2\sqrt5} & 0.1 & 0.1\sqrt{25-2\sqrt5} \\ -0.2\sqrt{1.5\sqrt5+7.5} & 0.2\sqrt{5-2\sqrt5} & -\frac{\sqrt5}{5} & 0.1\sqrt{2\sqrt5+25} & -0.1\sqrt5 \end{pmatrix}$$

Ih	$\hat{C}_5(1)$
Ag	1
$T1g$	$\begin{pmatrix} 0.5 & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -\sqrt{0.5-0.1\sqrt{5}} \\ 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & 0.3\sqrt{5} & -0.5-0.1\sqrt{5} \\ \sqrt{0.1\sqrt{5}+0.5} & 0.5-0.1\sqrt{5} & \frac{\sqrt{5}}{5} \end{pmatrix}$
$T2g$	$\begin{pmatrix} -\frac{\sqrt{5}}{5} & \sqrt{0.5-0.1\sqrt{5}} & 0.1\sqrt{5}+0.5 \\ \sqrt{0.1\sqrt{5}+0.5} & 0.5 & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} \\ -0.5+0.1\sqrt{5} & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.3\sqrt{5} \end{pmatrix}$
Gg	$\begin{pmatrix} -0.5 & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -0.25\sqrt{5}-0.25 & -0.5\sqrt{0.5-0.1\sqrt{5}} \\ -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.1\sqrt{5} & 0.5\sqrt{0.5-0.1\sqrt{5}} & 0.75-0.05\sqrt{5} \\ -0.25+0.25\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} & -0.5 & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} \\ 0.5\sqrt{0.1\sqrt{5}+0.5} & -0.75-0.05\sqrt{5} & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & 0.1\sqrt{5} \end{pmatrix}$
Hg	$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(\sqrt{5}+5\right) & \sqrt{0.3-0.06\sqrt{5}} & -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & \sqrt{0.06\sqrt{5}+0.3} \\ 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & 0.1 & -0.1\sqrt{25-2\sqrt{5}} & 0.4+\frac{\sqrt{5}}{5} & -0.2\sqrt{5-2\sqrt{5}} \\ \sqrt{0.06\sqrt{5}+0.3} & 0.1\sqrt{2\sqrt{5}+25} & 0.1\sqrt{5} & 0.2\sqrt{5-2\sqrt{5}} & -\frac{\sqrt{5}}{5} \\ -0.04\sqrt{5}\left(\sqrt{5}+5\right) & 0.4-\frac{\sqrt{5}}{5} & 0.2\sqrt{2\sqrt{5}+5} & 0.1 & -0.1\sqrt{2\sqrt{5}+25} \\ -0.2\sqrt{7.5-1.5\sqrt{5}} & 0.2\sqrt{2\sqrt{5}+5} & -\frac{\sqrt{5}}{5} & -0.1\sqrt{25-2\sqrt{5}} & -0.1\sqrt{5} \end{pmatrix}$
Au	1
$T1u$	$\begin{pmatrix} 0.5 & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -\sqrt{0.5-0.1\sqrt{5}} \\ 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & 0.3\sqrt{5} & -0.5-0.1\sqrt{5} \\ \sqrt{0.1\sqrt{5}+0.5} & 0.5-0.1\sqrt{5} & \frac{\sqrt{5}}{5} \end{pmatrix}$
$T2u$	$\begin{pmatrix} -\frac{\sqrt{5}}{5} & \sqrt{0.5-0.1\sqrt{5}} & 0.1\sqrt{5}+0.5 \\ \sqrt{0.1\sqrt{5}+0.5} & 0.5 & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} \\ -0.5+0.1\sqrt{5} & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.3\sqrt{5} \end{pmatrix}$
Gu	$\begin{pmatrix} -0.5 & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -0.25\sqrt{5}-0.25 & -0.5\sqrt{0.5-0.1\sqrt{5}} \\ -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.1\sqrt{5} & 0.5\sqrt{0.5-0.1\sqrt{5}} & 0.75-0.05\sqrt{5} \\ -0.25+0.25\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} & -0.5 & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} \\ 0.5\sqrt{0.1\sqrt{5}+0.5} & -0.75-0.05\sqrt{5} & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & 0.1\sqrt{5} \end{pmatrix}$
Hu	$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(\sqrt{5}+5\right) & \sqrt{0.3-0.06\sqrt{5}} & -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & \sqrt{0.06\sqrt{5}+0.3} \\ 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & 0.1 & -0.1\sqrt{25-2\sqrt{5}} & 0.4+\frac{\sqrt{5}}{5} & -0.2\sqrt{5-2\sqrt{5}} \\ \sqrt{0.06\sqrt{5}+0.3} & 0.1\sqrt{2\sqrt{5}+25} & 0.1\sqrt{5} & 0.2\sqrt{5-2\sqrt{5}} & -\frac{\sqrt{5}}{5} \\ -0.04\sqrt{5}\left(\sqrt{5}+5\right) & 0.4-\frac{\sqrt{5}}{5} & 0.2\sqrt{2\sqrt{5}+5} & 0.1 & -0.1\sqrt{2\sqrt{5}+25} \\ -0.2\sqrt{7.5-1.5\sqrt{5}} & 0.2\sqrt{2\sqrt{5}+5} & -\frac{\sqrt{5}}{5} & -0.1\sqrt{25-2\sqrt{5}} & -0.1\sqrt{5} \end{pmatrix}$

Ih	$\hat{C}_5^2(1)$
Ag	1
$T1g$	$\begin{pmatrix} 0.25 - 0.25\sqrt{5} & -0.5\sqrt{0.5\sqrt{5}+2.5} & 0 \\ -0.5\sqrt{0.1\sqrt{5}+0.5} & 0.25 - 0.05\sqrt{5} & -\frac{2\sqrt{5}}{5} \\ \sqrt{0.1\sqrt{5}+0.5} & -0.5 + 0.1\sqrt{5} & -\frac{\sqrt{5}}{5} \end{pmatrix}$
$T2g$	$\begin{pmatrix} \frac{\sqrt{5}}{5} & \sqrt{0.5 - 0.1\sqrt{5}} & -0.5 - 0.1\sqrt{5} \\ 0 & 0.25 + 0.25\sqrt{5} & 0.5\sqrt{2.5 - 0.5\sqrt{5}} \\ \frac{2\sqrt{5}}{5} & -0.5\sqrt{0.5 - 0.1\sqrt{5}} & 0.05\sqrt{5} + 0.25 \end{pmatrix}$
Gg	$\begin{pmatrix} 0 & 0 & 0.25 + 0.25\sqrt{5} & -0.5\sqrt{2.5 - 0.5\sqrt{5}} \\ \sqrt{0.1\sqrt{5}+0.5} & -0.5 + 0.1\sqrt{5} & 0.5\sqrt{0.5 - 0.1\sqrt{5}} & 0.05\sqrt{5} + 0.25 \\ 0.25 - 0.25\sqrt{5} & -0.5\sqrt{0.5\sqrt{5}+2.5} & 0 & 0 \\ 0.5\sqrt{0.1\sqrt{5}+0.5} & -0.25 + 0.05\sqrt{5} & -\sqrt{0.5 - 0.1\sqrt{5}} & -0.5 - 0.1\sqrt{5} \end{pmatrix}$
Hg	$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.2\sqrt{7.5 - 1.5\sqrt{5}} & -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.2\sqrt{1.5\sqrt{5}+7.5} \\ -0.4\sqrt{3} & -0.15\sqrt{5} - 0.15 & 0.3\sqrt{2.5 - 0.5\sqrt{5}} & -0.1 + 0.1\sqrt{5} & -0.2\sqrt{0.5\sqrt{5}+2.5} \\ 0 & 0.5\sqrt{0.5 - 0.1\sqrt{5}} & 0.05\sqrt{5} + 0.25 & \sqrt{0.1\sqrt{5}+0.5} & 0.5 - 0.1\sqrt{5} \\ 0.4\sqrt{3} & -0.1\sqrt{5} - 0.1 & \sqrt{0.1 - 0.02\sqrt{5}} & -0.15 + 0.15\sqrt{5} & -0.3\sqrt{0.5\sqrt{5}+2.5} \\ 0 & -\sqrt{0.5 - 0.1\sqrt{5}} & -0.5 - 0.1\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} & 0.25 - 0.05\sqrt{5} \end{pmatrix}$
Au	1
$T1u$	$\begin{pmatrix} 0.25 - 0.25\sqrt{5} & -0.5\sqrt{0.5\sqrt{5}+2.5} & 0 \\ -0.5\sqrt{0.1\sqrt{5}+0.5} & 0.25 - 0.05\sqrt{5} & -\frac{2\sqrt{5}}{5} \\ \sqrt{0.1\sqrt{5}+0.5} & -0.5 + 0.1\sqrt{5} & -\frac{\sqrt{5}}{5} \end{pmatrix}$
$T2u$	$\begin{pmatrix} \frac{\sqrt{5}}{5} & \sqrt{0.5 - 0.1\sqrt{5}} & -0.5 - 0.1\sqrt{5} \\ 0 & 0.25 + 0.25\sqrt{5} & 0.5\sqrt{2.5 - 0.5\sqrt{5}} \\ \frac{2\sqrt{5}}{5} & -0.5\sqrt{0.5 - 0.1\sqrt{5}} & 0.05\sqrt{5} + 0.25 \end{pmatrix}$
Gu	$\begin{pmatrix} 0 & 0 & 0.25 + 0.25\sqrt{5} & -0.5\sqrt{2.5 - 0.5\sqrt{5}} \\ \sqrt{0.1\sqrt{5}+0.5} & -0.5 + 0.1\sqrt{5} & 0.5\sqrt{0.5 - 0.1\sqrt{5}} & 0.05\sqrt{5} + 0.25 \\ 0.25 - 0.25\sqrt{5} & -0.5\sqrt{0.5\sqrt{5}+2.5} & 0 & 0 \\ 0.5\sqrt{0.1\sqrt{5}+0.5} & -0.25 + 0.05\sqrt{5} & -\sqrt{0.5 - 0.1\sqrt{5}} & -0.5 - 0.1\sqrt{5} \end{pmatrix}$
Hu	$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.2\sqrt{7.5 - 1.5\sqrt{5}} & -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.2\sqrt{1.5\sqrt{5}+7.5} \\ -0.4\sqrt{3} & -0.15\sqrt{5} - 0.15 & 0.3\sqrt{2.5 - 0.5\sqrt{5}} & -0.1 + 0.1\sqrt{5} & -0.2\sqrt{0.5\sqrt{5}+2.5} \\ 0 & 0.5\sqrt{0.5 - 0.1\sqrt{5}} & 0.05\sqrt{5} + 0.25 & \sqrt{0.1\sqrt{5}+0.5} & 0.5 - 0.1\sqrt{5} \\ 0.4\sqrt{3} & -0.1\sqrt{5} - 0.1 & \sqrt{0.1 - 0.02\sqrt{5}} & -0.15 + 0.15\sqrt{5} & -0.3\sqrt{0.5\sqrt{5}+2.5} \\ 0 & -\sqrt{0.5 - 0.1\sqrt{5}} & -0.5 - 0.1\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} & 0.25 - 0.05\sqrt{5} \end{pmatrix}$

Ih	$\hat{C}_5^3(1)$

Ag : 1

$T1g$:
$$\begin{pmatrix} 0.25 - 0.25\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} & \sqrt{0.1\sqrt{5}+0.5} \\ -0.5\sqrt{0.5\sqrt{5}+2.5} & 0.25 - 0.05\sqrt{5} & -0.5 + 0.1\sqrt{5} \\ 0 & -\frac{2\sqrt{5}}{5} & -\frac{\sqrt{5}}{5} \end{pmatrix}$$

$T2g$:
$$\begin{pmatrix} \frac{\sqrt{5}}{5} & 0 & \frac{2\sqrt{5}}{5} \\ \sqrt{0.5 - 0.1\sqrt{5}} & 0.25 + 0.25\sqrt{5} & -0.5\sqrt{0.5 - 0.1\sqrt{5}} \\ -0.5 - 0.1\sqrt{5} & 0.5\sqrt{2.5 - 0.5\sqrt{5}} & 0.05\sqrt{5} + 0.25 \end{pmatrix}$$

Gg:
$$\begin{pmatrix} 0 & \sqrt{0.1\sqrt{5}+0.5} & 0.25 - 0.25\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} \\ 0 & -0.5 + 0.1\sqrt{5} & -0.5\sqrt{0.5\sqrt{5}+2.5} & -0.25 + 0.05\sqrt{5} \\ 0.25 + 0.25\sqrt{5} & 0.5\sqrt{0.5 - 0.1\sqrt{5}} & 0 & -\sqrt{0.5 - 0.1\sqrt{5}} \\ -0.5\sqrt{2.5 - 0.5\sqrt{5}} & 0.05\sqrt{5} + 0.25 & 0 & -0.5 - 0.1\sqrt{5} \end{pmatrix}$$

Hg:
$$\begin{pmatrix} -0.2 & -0.4\sqrt{3} & 0 & 0.4\sqrt{3} & 0 \\ 0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.15\sqrt{5} - 0.15 & 0.5\sqrt{0.5 - 0.1\sqrt{5}} & -0.1\sqrt{5} - 0.1 & -\sqrt{0.5 - 0.1\sqrt{5}} \\ -0.2\sqrt{7.5 - 1.5\sqrt{5}} & 0.3\sqrt{2.5 - 0.5\sqrt{5}} & 0.05\sqrt{5} + 0.25 & \sqrt{0.1 - 0.02\sqrt{5}} & -0.5 - 0.1\sqrt{5} \\ -0.04\sqrt{5}\left(-5 + \sqrt{5}\right) & -0.1 + 0.1\sqrt{5} & \sqrt{0.1\sqrt{5}+0.5} & -0.15 + 0.15\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} \\ -0.2\sqrt{1.5\sqrt{5}+7.5} & -0.2\sqrt{0.5\sqrt{5}+2.5} & 0.5 - 0.1\sqrt{5} & -0.3\sqrt{0.5\sqrt{5}+2.5} & 0.25 - 0.05\sqrt{5} \end{pmatrix}$$

Au : 1

$T1u$:
$$\begin{pmatrix} 0.25 - 0.25\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} & \sqrt{0.1\sqrt{5}+0.5} \\ -0.5\sqrt{0.5\sqrt{5}+2.5} & 0.25 - 0.05\sqrt{5} & -0.5 + 0.1\sqrt{5} \\ 0 & -\frac{2\sqrt{5}}{5} & -\frac{\sqrt{5}}{5} \end{pmatrix}$$

$T2u$:
$$\begin{pmatrix} \frac{\sqrt{5}}{5} & 0 & \frac{2\sqrt{5}}{5} \\ \sqrt{0.5 - 0.1\sqrt{5}} & 0.25 + 0.25\sqrt{5} & -0.5\sqrt{0.5 - 0.1\sqrt{5}} \\ -0.5 - 0.1\sqrt{5} & 0.5\sqrt{2.5 - 0.5\sqrt{5}} & 0.05\sqrt{5} + 0.25 \end{pmatrix}$$

Gu:
$$\begin{pmatrix} 0 & \sqrt{0.1\sqrt{5}+0.5} & 0.25 - 0.25\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} \\ 0 & -0.5 + 0.1\sqrt{5} & -0.5\sqrt{0.5\sqrt{5}+2.5} & -0.25 + 0.05\sqrt{5} \\ 0.25 + 0.25\sqrt{5} & 0.5\sqrt{0.5 - 0.1\sqrt{5}} & 0 & -\sqrt{0.5 - 0.1\sqrt{5}} \\ -0.5\sqrt{2.5 - 0.5\sqrt{5}} & 0.05\sqrt{5} + 0.25 & 0 & -0.5 - 0.1\sqrt{5} \end{pmatrix}$$

Hu:
$$\begin{pmatrix} -0.2 & -0.4\sqrt{3} & 0 & 0.4\sqrt{3} & 0 \\ 0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.15\sqrt{5} - 0.15 & 0.5\sqrt{0.5 - 0.1\sqrt{5}} & -0.1\sqrt{5} - 0.1 & -\sqrt{0.5 - 0.1\sqrt{5}} \\ -0.2\sqrt{7.5 - 1.5\sqrt{5}} & 0.3\sqrt{2.5 - 0.5\sqrt{5}} & 0.05\sqrt{5} + 0.25 & \sqrt{0.1 - 0.02\sqrt{5}} & -0.5 - 0.1\sqrt{5} \\ -0.04\sqrt{5}\left(-5 + \sqrt{5}\right) & -0.1 + 0.1\sqrt{5} & \sqrt{0.1\sqrt{5}+0.5} & -0.15 + 0.15\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} \\ -0.2\sqrt{1.5\sqrt{5}+7.5} & -0.2\sqrt{0.5\sqrt{5}+2.5} & 0.5 - 0.1\sqrt{5} & -0.3\sqrt{0.5\sqrt{5}+2.5} & 0.25 - 0.05\sqrt{5} \end{pmatrix}$$

Ih	$\hat{C}_5^4(1)$
Ag	1
$T1g$	$\begin{pmatrix} 0.5 & 0.5\sqrt{1-\frac{2\sqrt5}{5}} & \sqrt{0.1\sqrt5+0.5} \\ -0.5\sqrt{\frac{2\sqrt5}{5}+1} & 0.3\sqrt5 & 0.5-0.1\sqrt5 \\ -\sqrt{0.5-0.1\sqrt5} & -0.5-0.1\sqrt5 & \frac{\sqrt5}{5} \end{pmatrix}$
$T2g$	$\begin{pmatrix} -\frac{\sqrt5}{5} & \sqrt{0.1\sqrt5+0.5} & -0.5+0.1\sqrt5 \\ \sqrt{0.5-0.1\sqrt5} & 0.5 & 0.5\sqrt{\frac{2\sqrt5}{5}+1} \\ 0.1\sqrt5+0.5 & 0.5\sqrt{1-\frac{2\sqrt5}{5}} & -0.3\sqrt5 \end{pmatrix}$
Gg	$\begin{pmatrix} -0.5 & -0.5\sqrt{\frac{2\sqrt5}{5}+1} & -0.25+0.25\sqrt5 & 0.5\sqrt{0.1\sqrt5+0.5} \\ -0.5\sqrt{1-\frac{2\sqrt5}{5}} & -0.1\sqrt5 & 0.5\sqrt{0.1\sqrt5+0.5} & -0.75-0.05\sqrt5 \\ -0.25\sqrt5-0.25 & 0.5\sqrt{0.5-0.1\sqrt5} & -0.5 & -0.5\sqrt{1-\frac{2\sqrt5}{5}} \\ -0.5\sqrt{0.5-0.1\sqrt5} & 0.75-0.05\sqrt5 & 0.5\sqrt{\frac{2\sqrt5}{5}+1} & 0.1\sqrt5 \end{pmatrix}$
Hg	$\begin{pmatrix} -0.2 & 0.04\sqrt5\left(-5+\sqrt5\right) & \sqrt{0.06\sqrt5+0.3} & -0.04\sqrt5\left(\sqrt5+5\right) & -0.2\sqrt{7.5-1.5\sqrt5} \\ 0.04\sqrt5\left(\sqrt5+5\right) & 0.1 & 0.1\sqrt{2\sqrt5+25} & 0.4-\frac{\sqrt5}{5} & 0.2\sqrt{2\sqrt5+5} \\ \sqrt{0.3-0.06\sqrt5} & -0.1\sqrt{25-2\sqrt5} & 0.1\sqrt5 & 0.2\sqrt{2\sqrt5+5} & -\frac{\sqrt5}{5} \\ -0.04\sqrt5\left(-5+\sqrt5\right) & 0.4+\frac{\sqrt5}{5} & 0.2\sqrt{5-2\sqrt5} & 0.1 & -0.1\sqrt{25-2\sqrt5} \\ \sqrt{0.06\sqrt5+0.3} & -0.2\sqrt{5-2\sqrt5} & -\frac{\sqrt5}{5} & -0.1\sqrt{2\sqrt5+25} & -0.1\sqrt5 \end{pmatrix}$
Au	1
$T1u$	$\begin{pmatrix} 0.5 & 0.5\sqrt{1-\frac{2\sqrt5}{5}} & \sqrt{0.1\sqrt5+0.5} \\ -0.5\sqrt{\frac{2\sqrt5}{5}+1} & 0.3\sqrt5 & 0.5-0.1\sqrt5 \\ -\sqrt{0.5-0.1\sqrt5} & -0.5-0.1\sqrt5 & \frac{\sqrt5}{5} \end{pmatrix}$
$T2u$	$\begin{pmatrix} -\frac{\sqrt5}{5} & \sqrt{0.1\sqrt5+0.5} & -0.5+0.1\sqrt5 \\ \sqrt{0.5-0.1\sqrt5} & 0.5 & 0.5\sqrt{\frac{2\sqrt5}{5}+1} \\ 0.1\sqrt5+0.5 & 0.5\sqrt{1-\frac{2\sqrt5}{5}} & -0.3\sqrt5 \end{pmatrix}$
Gu	$\begin{pmatrix} -0.5 & -0.5\sqrt{\frac{2\sqrt5}{5}+1} & -0.25+0.25\sqrt5 & 0.5\sqrt{0.1\sqrt5+0.5} \\ -0.5\sqrt{1-\frac{2\sqrt5}{5}} & -0.1\sqrt5 & 0.5\sqrt{0.1\sqrt5+0.5} & -0.75-0.05\sqrt5 \\ -0.25\sqrt5-0.25 & 0.5\sqrt{0.5-0.1\sqrt5} & -0.5 & -0.5\sqrt{1-\frac{2\sqrt5}{5}} \\ -0.5\sqrt{0.5-0.1\sqrt5} & 0.75-0.05\sqrt5 & 0.5\sqrt{\frac{2\sqrt5}{5}+1} & 0.1\sqrt5 \end{pmatrix}$
Hu	$\begin{pmatrix} -0.2 & 0.04\sqrt5\left(-5+\sqrt5\right) & \sqrt{0.06\sqrt5+0.3} & -0.04\sqrt5\left(\sqrt5+5\right) & -0.2\sqrt{7.5-1.5\sqrt5} \\ 0.04\sqrt5\left(\sqrt5+5\right) & 0.1 & 0.1\sqrt{2\sqrt5+25} & 0.4-\frac{\sqrt5}{5} & 0.2\sqrt{2\sqrt5+5} \\ \sqrt{0.3-0.06\sqrt5} & -0.1\sqrt{25-2\sqrt5} & 0.1\sqrt5 & 0.2\sqrt{2\sqrt5+5} & -\frac{\sqrt5}{5} \\ -0.04\sqrt5\left(-5+\sqrt5\right) & 0.4+\frac{\sqrt5}{5} & 0.2\sqrt{5-2\sqrt5} & 0.1 & -0.1\sqrt{25-2\sqrt5} \\ \sqrt{0.06\sqrt5+0.3} & -0.2\sqrt{5-2\sqrt5} & -\frac{\sqrt5}{5} & -0.1\sqrt{2\sqrt5+25} & -0.1\sqrt5 \end{pmatrix}$

Ih	$\hat{C}_5(2)$
Ag	1
$T1g$	$\begin{pmatrix} -0.25+0.25\sqrt5 & -0.5\sqrt{0.1\sqrt5+0.5} & \sqrt{0.1\sqrt5+0.5} \\ 0.5\sqrt{0.1\sqrt5+0.5} & 0.05\sqrt5+0.75 & 0.5-0.1\sqrt5 \\ -\sqrt{0.1\sqrt5+0.5} & 0.5-0.1\sqrt5 & \frac{\sqrt5}{5} \end{pmatrix}$
$T2g$	$\begin{pmatrix} -\frac{\sqrt5}{5} & -\sqrt{0.5-0.1\sqrt5} & 0.1\sqrt5+0.5 \\ \sqrt{0.5-0.1\sqrt5} & -0.25\sqrt5-0.25 & -0.5\sqrt{0.5-0.1\sqrt5} \\ 0.1\sqrt5+0.5 & 0.5\sqrt{0.5-0.1\sqrt5} & 0.75-0.05\sqrt5 \end{pmatrix}$
Gg	$\begin{pmatrix} -0.25\sqrt5-0.25 & 0.5\sqrt{0.5-0.1\sqrt5} & 0 & -\sqrt{0.5-0.1\sqrt5} \\ -0.5\sqrt{0.5-0.1\sqrt5} & -0.25+0.15\sqrt5 & -\sqrt{0.1\sqrt5+0.5} & \frac{\sqrt5}{5} \\ 0 & \sqrt{0.1\sqrt5+0.5} & -0.25+0.25\sqrt5 & 0.5\sqrt{0.1\sqrt5+0.5} \\ \sqrt{0.5-0.1\sqrt5} & \frac{\sqrt5}{5} & -0.5\sqrt{0.1\sqrt5+0.5} & -0.15\sqrt5-0.25 \end{pmatrix}$
Hg	$\begin{pmatrix} -0.2 & 0.04\sqrt5\left(\sqrt5+5\right) & -0.2\sqrt{7.5-1.5\sqrt5} & -0.04\sqrt5\left(-5+\sqrt5\right) & -0.2\sqrt{1.5\sqrt5+7.5} \\ 0.04\sqrt5\left(\sqrt5+5\right) & 0.35-0.05\sqrt5 & -0.1\sqrt{5.5\sqrt5+12.5} & -\frac{4}{5} & 0.2\sqrt{5-2\sqrt5} \\ \sqrt{0.3-0.06\sqrt5} & 0.1\sqrt{5.5\sqrt5+12.5} & -0.25+0.15\sqrt5 & 0.2\sqrt{2\sqrt5+5} & \frac{\sqrt5}{5} \\ -0.04\sqrt5\left(-5+\sqrt5\right) & -\frac{4}{5} & -0.2\sqrt{2\sqrt5+5} & 0.05\sqrt5+0.35 & -0.1\sqrt{12.5-5.5\sqrt5} \\ \sqrt{0.06\sqrt5+0.3} & -0.2\sqrt{5-2\sqrt5} & \frac{\sqrt5}{5} & 0.1\sqrt{12.5-5.5\sqrt5} & -0.15\sqrt5-0.25 \end{pmatrix}$
Au	1
$T1u$	$\begin{pmatrix} -0.25+0.25\sqrt5 & -0.5\sqrt{0.1\sqrt5+0.5} & \sqrt{0.1\sqrt5+0.5} \\ 0.5\sqrt{0.1\sqrt5+0.5} & 0.05\sqrt5+0.75 & 0.5-0.1\sqrt5 \\ -\sqrt{0.1\sqrt5+0.5} & 0.5-0.1\sqrt5 & \frac{\sqrt5}{5} \end{pmatrix}$
$T2u$	$\begin{pmatrix} -\frac{\sqrt5}{5} & -\sqrt{0.5-0.1\sqrt5} & 0.1\sqrt5+0.5 \\ \sqrt{0.5-0.1\sqrt5} & -0.25\sqrt5-0.25 & -0.5\sqrt{0.5-0.1\sqrt5} \\ 0.1\sqrt5+0.5 & 0.5\sqrt{0.5-0.1\sqrt5} & 0.75-0.05\sqrt5 \end{pmatrix}$
Gu	$\begin{pmatrix} -0.25\sqrt5-0.25 & 0.5\sqrt{0.5-0.1\sqrt5} & 0 & -\sqrt{0.5-0.1\sqrt5} \\ -0.5\sqrt{0.5-0.1\sqrt5} & -0.25+0.15\sqrt5 & -\sqrt{0.1\sqrt5+0.5} & \frac{\sqrt5}{5} \\ 0 & \sqrt{0.1\sqrt5+0.5} & -0.25+0.25\sqrt5 & 0.5\sqrt{0.1\sqrt5+0.5} \\ \sqrt{0.5-0.1\sqrt5} & \frac{\sqrt5}{5} & -0.5\sqrt{0.1\sqrt5+0.5} & -0.15\sqrt5-0.25 \end{pmatrix}$
Hu	$\begin{pmatrix} -0.2 & 0.04\sqrt5\left(\sqrt5+5\right) & -0.2\sqrt{7.5-1.5\sqrt5} & -0.04\sqrt5\left(-5+\sqrt5\right) & -0.2\sqrt{1.5\sqrt5+7.5} \\ 0.04\sqrt5\left(\sqrt5+5\right) & 0.35-0.05\sqrt5 & -0.1\sqrt{5.5\sqrt5+12.5} & -\frac{4}{5} & 0.2\sqrt{5-2\sqrt5} \\ \sqrt{0.3-0.06\sqrt5} & 0.1\sqrt{5.5\sqrt5+12.5} & -0.25+0.15\sqrt5 & 0.2\sqrt{2\sqrt5+5} & \frac{\sqrt5}{5} \\ -0.04\sqrt5\left(-5+\sqrt5\right) & -\frac{4}{5} & -0.2\sqrt{2\sqrt5+5} & 0.05\sqrt5+0.35 & -0.1\sqrt{12.5-5.5\sqrt5} \\ \sqrt{0.06\sqrt5+0.3} & -0.2\sqrt{5-2\sqrt5} & \frac{\sqrt5}{5} & 0.1\sqrt{12.5-5.5\sqrt5} & -0.15\sqrt5-0.25 \end{pmatrix}$

Ih	$\hat{C}_5^2(2)$
Ag	1

$T1g$:
$$\begin{pmatrix} -0.25\sqrt{5}-0.25 & -0.5\sqrt{0.5-0.1\sqrt{5}} & \sqrt{0.5-0.1\sqrt{5}} \\ 0.5\sqrt{0.5-0.1\sqrt{5}} & 0.75-0.05\sqrt{5} & 0.1\sqrt{5}+0.5 \\ -\sqrt{0.5-0.1\sqrt{5}} & 0.1\sqrt{5}+0.5 & -\frac{\sqrt{5}}{5} \end{pmatrix}$$

$T2g$:
$$\begin{pmatrix} \frac{\sqrt{5}}{5} & \sqrt{0.1\sqrt{5}+0.5} & 0.5-0.1\sqrt{5} \\ -\sqrt{0.1\sqrt{5}+0.5} & -0.25+0.25\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} \\ 0.5-0.1\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} & 0.05\sqrt{5}+0.75 \end{pmatrix}$$

Gg:
$$\begin{pmatrix} -0.25+0.25\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} & 0 & \sqrt{0.1\sqrt{5}+0.5} \\ 0.5\sqrt{0.1\sqrt{5}+0.5} & -0.15\sqrt{5}-0.25 & -\sqrt{0.5-0.1\sqrt{5}} & -\frac{\sqrt{5}}{5} \\ 0 & \sqrt{0.5-0.1\sqrt{5}} & -0.25\sqrt{5}-0.25 & 0.5\sqrt{0.5-0.1\sqrt{5}} \\ -\sqrt{0.1\sqrt{5}+0.5} & -\frac{\sqrt{5}}{5} & -0.5\sqrt{0.5-0.1\sqrt{5}} & -0.25+0.15\sqrt{5} \end{pmatrix}$$

Hg:
$$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.2\sqrt{1.5\sqrt{5}+7.5} & -0.04\sqrt{5}\left(\sqrt{5}+5\right) & \sqrt{0.3-0.06\sqrt{5}} \\ 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & 0.05\sqrt{5}+0.35 & 0.1\sqrt{12.5-5.5\sqrt{5}} & -\frac{4}{5} & -0.2\sqrt{2\sqrt{5}+5} \\ \sqrt{0.06\sqrt{5}+0.3} & -0.1\sqrt{12.5-5.5\sqrt{5}} & -0.15\sqrt{5}-0.25 & 0.2\sqrt{5-2\sqrt{5}} & -\frac{\sqrt{5}}{5} \\ -0.04\sqrt{5}\left(\sqrt{5}+5\right) & -\frac{4}{5} & -0.2\sqrt{5-2\sqrt{5}} & 0.35-0.05\sqrt{5} & -0.1\sqrt{5.5\sqrt{5}+12.5} \\ -0.2\sqrt{7.5-1.5\sqrt{5}} & 0.2\sqrt{2\sqrt{5}+5} & -\frac{\sqrt{5}}{5} & 0.1\sqrt{5.5\sqrt{5}+12.5} & -0.25+0.15\sqrt{5} \end{pmatrix}$$

Au	1

$T1u$:
$$\begin{pmatrix} -0.25\sqrt{5}-0.25 & -0.5\sqrt{0.5-0.1\sqrt{5}} & \sqrt{0.5-0.1\sqrt{5}} \\ 0.5\sqrt{0.5-0.1\sqrt{5}} & 0.75-0.05\sqrt{5} & 0.1\sqrt{5}+0.5 \\ -\sqrt{0.5-0.1\sqrt{5}} & 0.1\sqrt{5}+0.5 & -\frac{\sqrt{5}}{5} \end{pmatrix}$$

$T2u$:
$$\begin{pmatrix} \frac{\sqrt{5}}{5} & \sqrt{0.1\sqrt{5}+0.5} & 0.5-0.1\sqrt{5} \\ -\sqrt{0.1\sqrt{5}+0.5} & -0.25+0.25\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} \\ 0.5-0.1\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} & 0.05\sqrt{5}+0.75 \end{pmatrix}$$

Gu:
$$\begin{pmatrix} -0.25+0.25\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} & 0 & \sqrt{0.1\sqrt{5}+0.5} \\ 0.5\sqrt{0.1\sqrt{5}+0.5} & -0.15\sqrt{5}-0.25 & -\sqrt{0.5-0.1\sqrt{5}} & -\frac{\sqrt{5}}{5} \\ 0 & \sqrt{0.5-0.1\sqrt{5}} & -0.25\sqrt{5}-0.25 & 0.5\sqrt{0.5-0.1\sqrt{5}} \\ -\sqrt{0.1\sqrt{5}+0.5} & -\frac{\sqrt{5}}{5} & -0.5\sqrt{0.5-0.1\sqrt{5}} & -0.25+0.15\sqrt{5} \end{pmatrix}$$

Hu:
$$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.2\sqrt{1.5\sqrt{5}+7.5} & -0.04\sqrt{5}\left(\sqrt{5}+5\right) & \sqrt{0.3-0.06\sqrt{5}} \\ 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & 0.05\sqrt{5}+0.35 & 0.1\sqrt{12.5-5.5\sqrt{5}} & -\frac{4}{5} & -0.2\sqrt{2\sqrt{5}+5} \\ \sqrt{0.06\sqrt{5}+0.3} & -0.1\sqrt{12.5-5.5\sqrt{5}} & -0.15\sqrt{5}-0.25 & 0.2\sqrt{5-2\sqrt{5}} & -\frac{\sqrt{5}}{5} \\ -0.04\sqrt{5}\left(\sqrt{5}+5\right) & -\frac{4}{5} & -0.2\sqrt{5-2\sqrt{5}} & 0.35-0.05\sqrt{5} & -0.1\sqrt{5.5\sqrt{5}+12.5} \\ -0.2\sqrt{7.5-1.5\sqrt{5}} & 0.2\sqrt{2\sqrt{5}+5} & -\frac{\sqrt{5}}{5} & 0.1\sqrt{5.5\sqrt{5}+12.5} & -0.25+0.15\sqrt{5} \end{pmatrix}$$

Ih	$\hat{C}_5^3(2)$
Ag	1
$T1g$	$\begin{pmatrix} -0.25\sqrt{5}-0.25 & 0.5\sqrt{0.5-0.1\sqrt{5}} & -\sqrt{0.5-0.1\sqrt{5}} \\ -0.5\sqrt{0.5-0.1\sqrt{5}} & 0.75-0.05\sqrt{5} & 0.1\sqrt{5}+0.5 \\ \sqrt{0.5-0.1\sqrt{5}} & 0.1\sqrt{5}+0.5 & -\frac{\sqrt{5}}{5} \end{pmatrix}$
$T2g$	$\begin{pmatrix} \frac{\sqrt{5}}{5} & -\sqrt{0.1\sqrt{5}+0.5} & 0.5-0.1\sqrt{5} \\ \sqrt{0.1\sqrt{5}+0.5} & -0.25+0.25\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} \\ 0.5-0.1\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} & 0.05\sqrt{5}+0.75 \end{pmatrix}$
Gg	$\begin{pmatrix} -0.25+0.25\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} & 0 & -\sqrt{0.1\sqrt{5}+0.5} \\ -0.5\sqrt{0.1\sqrt{5}+0.5} & -0.15\sqrt{5}-0.25 & \sqrt{0.5-0.1\sqrt{5}} & -\frac{\sqrt{5}}{5} \\ 0 & -\sqrt{0.5-0.1\sqrt{5}} & -0.25\sqrt{5}-0.25 & -0.5\sqrt{0.5-0.1\sqrt{5}} \\ \sqrt{0.1\sqrt{5}+0.5} & -\frac{\sqrt{5}}{5} & 0.5\sqrt{0.5-0.1\sqrt{5}} & -0.25+0.15\sqrt{5} \end{pmatrix}$
Hg	$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & \sqrt{0.06\sqrt{5}+0.3} & -0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.2\sqrt{7.5-1.5\sqrt{5}} \\ 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & 0.05\sqrt{5}+0.35 & -0.1\sqrt{12.5-5.5\sqrt{5}} & -\frac{4}{5} & 0.2\sqrt{2\sqrt{5}+5} \\ -0.2\sqrt{1.5\sqrt{5}+7.5} & 0.1\sqrt{12.5-5.5\sqrt{5}} & -0.15\sqrt{5}-0.25 & -0.2\sqrt{5-2\sqrt{5}} & -\frac{\sqrt{5}}{5} \\ -0.04\sqrt{5}\left(\sqrt{5}+5\right) & -\frac{4}{5} & 0.2\sqrt{5-2\sqrt{5}} & 0.35-0.05\sqrt{5} & 0.1\sqrt{5.5\sqrt{5}+12.5} \\ \sqrt{0.3-0.06\sqrt{5}} & -0.2\sqrt{2\sqrt{5}+5} & -\frac{\sqrt{5}}{5} & -0.1\sqrt{5.5\sqrt{5}+12.5} & -0.25+0.15\sqrt{5} \end{pmatrix}$
Au	1
$T1u$	$\begin{pmatrix} -0.25\sqrt{5}-0.25 & 0.5\sqrt{0.5-0.1\sqrt{5}} & -\sqrt{0.5-0.1\sqrt{5}} \\ -0.5\sqrt{0.5-0.1\sqrt{5}} & 0.75-0.05\sqrt{5} & 0.1\sqrt{5}+0.5 \\ \sqrt{0.5-0.1\sqrt{5}} & 0.1\sqrt{5}+0.5 & -\frac{\sqrt{5}}{5} \end{pmatrix}$
$T2u$	$\begin{pmatrix} \frac{\sqrt{5}}{5} & -\sqrt{0.1\sqrt{5}+0.5} & 0.5-0.1\sqrt{5} \\ \sqrt{0.1\sqrt{5}+0.5} & -0.25+0.25\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} \\ 0.5-0.1\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} & 0.05\sqrt{5}+0.75 \end{pmatrix}$
Gu	$\begin{pmatrix} -0.25+0.25\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} & 0 & -\sqrt{0.1\sqrt{5}+0.5} \\ -0.5\sqrt{0.1\sqrt{5}+0.5} & -0.15\sqrt{5}-0.25 & \sqrt{0.5-0.1\sqrt{5}} & -\frac{\sqrt{5}}{5} \\ 0 & -\sqrt{0.5-0.1\sqrt{5}} & -0.25\sqrt{5}-0.25 & -0.5\sqrt{0.5-0.1\sqrt{5}} \\ \sqrt{0.1\sqrt{5}+0.5} & -\frac{\sqrt{5}}{5} & 0.5\sqrt{0.5-0.1\sqrt{5}} & -0.25+0.15\sqrt{5} \end{pmatrix}$
Hu	$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & \sqrt{0.06\sqrt{5}+0.3} & -0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.2\sqrt{7.5-1.5\sqrt{5}} \\ 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & 0.05\sqrt{5}+0.35 & -0.1\sqrt{12.5-5.5\sqrt{5}} & -\frac{4}{5} & 0.2\sqrt{2\sqrt{5}+5} \\ -0.2\sqrt{1.5\sqrt{5}+7.5} & 0.1\sqrt{12.5-5.5\sqrt{5}} & -0.15\sqrt{5}-0.25 & -0.2\sqrt{5-2\sqrt{5}} & -\frac{\sqrt{5}}{5} \\ -0.04\sqrt{5}\left(\sqrt{5}+5\right) & -\frac{4}{5} & 0.2\sqrt{5-2\sqrt{5}} & 0.35-0.05\sqrt{5} & 0.1\sqrt{5.5\sqrt{5}+12.5} \\ \sqrt{0.3-0.06\sqrt{5}} & -0.2\sqrt{2\sqrt{5}+5} & -\frac{\sqrt{5}}{5} & -0.1\sqrt{5.5\sqrt{5}+12.5} & -0.25+0.15\sqrt{5} \end{pmatrix}$

Ih	$\hat{C}_5^4(2)$

Ag : 1

$T1g$:
$$\begin{pmatrix} -0.25+0.25\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} & -\sqrt{0.1\sqrt{5}+0.5} \\ -0.5\sqrt{0.1\sqrt{5}+0.5} & 0.05\sqrt{5}+0.75 & 0.5-0.1\sqrt{5} \\ \sqrt{0.1\sqrt{5}+0.5} & 0.5-0.1\sqrt{5} & \frac{\sqrt{5}}{5} \end{pmatrix}$$

$T2g$:
$$\begin{pmatrix} -\frac{\sqrt{5}}{5} & \sqrt{0.5-0.1\sqrt{5}} & 0.1\sqrt{5}+0.5 \\ -\sqrt{0.5-0.1\sqrt{5}} & -0.25\sqrt{5}-0.25 & 0.5\sqrt{0.5-0.1\sqrt{5}} \\ 0.1\sqrt{5}+0.5 & -0.5\sqrt{0.5-0.1\sqrt{5}} & 0.75-0.05\sqrt{5} \end{pmatrix}$$

Gg :
$$\begin{pmatrix} -0.25\sqrt{5}-0.25 & -0.5\sqrt{0.5-0.1\sqrt{5}} & 0 & \sqrt{0.5-0.1\sqrt{5}} \\ 0.5\sqrt{0.5-0.1\sqrt{5}} & -0.25+0.15\sqrt{5} & \sqrt{0.1\sqrt{5}+0.5} & \frac{\sqrt{5}}{5} \\ 0 & -\sqrt{0.1\sqrt{5}+0.5} & -0.25+0.25\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} \\ -\sqrt{0.5-0.1\sqrt{5}} & \frac{\sqrt{5}}{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} & -0.15\sqrt{5}-0.25 \end{pmatrix}$$

Hg :
$$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(\sqrt{5}+5\right) & \sqrt{0.3-0.06\sqrt{5}} & -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & \sqrt{0.06\sqrt{5}+0.3} \\ 0.04\sqrt{5}\left(\sqrt{5}+5\right) & 0.35-0.05\sqrt{5} & 0.1\sqrt{5.5\sqrt{5}+12.5} & -\frac{4}{5} & -0.2\sqrt{5-2\sqrt{5}} \\ -0.2\sqrt{7.5-1.5\sqrt{5}} & -0.1\sqrt{5.5\sqrt{5}+12.5} & -0.25+0.15\sqrt{5} & -0.2\sqrt{2\sqrt{5}+5} & \frac{\sqrt{5}}{5} \\ -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -\frac{4}{5} & 0.2\sqrt{2\sqrt{5}+5} & 0.05\sqrt{5}+0.35 & 0.1\sqrt{12.5-5.5\sqrt{5}} \\ -0.2\sqrt{1.5\sqrt{5}+7.5} & 0.2\sqrt{5-2\sqrt{5}} & \frac{\sqrt{5}}{5} & -0.1\sqrt{12.5-5.5\sqrt{5}} & -0.15\sqrt{5}-0.25 \end{pmatrix}$$

Au : 1

$T1u$:
$$\begin{pmatrix} -0.25+0.25\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} & -\sqrt{0.1\sqrt{5}+0.5} \\ -0.5\sqrt{0.1\sqrt{5}+0.5} & 0.05\sqrt{5}+0.75 & 0.5-0.1\sqrt{5} \\ \sqrt{0.1\sqrt{5}+0.5} & 0.5-0.1\sqrt{5} & \frac{\sqrt{5}}{5} \end{pmatrix}$$

$T2u$:
$$\begin{pmatrix} -\frac{\sqrt{5}}{5} & \sqrt{0.5-0.1\sqrt{5}} & 0.1\sqrt{5}+0.5 \\ -\sqrt{0.5-0.1\sqrt{5}} & -0.25\sqrt{5}-0.25 & 0.5\sqrt{0.5-0.1\sqrt{5}} \\ 0.1\sqrt{5}+0.5 & -0.5\sqrt{0.5-0.1\sqrt{5}} & 0.75-0.05\sqrt{5} \end{pmatrix}$$

Gu :
$$\begin{pmatrix} -0.25\sqrt{5}-0.25 & -0.5\sqrt{0.5-0.1\sqrt{5}} & 0 & \sqrt{0.5-0.1\sqrt{5}} \\ 0.5\sqrt{0.5-0.1\sqrt{5}} & -0.25+0.15\sqrt{5} & \sqrt{0.1\sqrt{5}+0.5} & \frac{\sqrt{5}}{5} \\ 0 & -\sqrt{0.1\sqrt{5}+0.5} & -0.25+0.25\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} \\ -\sqrt{0.5-0.1\sqrt{5}} & \frac{\sqrt{5}}{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} & -0.15\sqrt{5}-0.25 \end{pmatrix}$$

Hu :
$$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(\sqrt{5}+5\right) & \sqrt{0.3-0.06\sqrt{5}} & -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & \sqrt{0.06\sqrt{5}+0.3} \\ 0.04\sqrt{5}\left(\sqrt{5}+5\right) & 0.35-0.05\sqrt{5} & 0.1\sqrt{5.5\sqrt{5}+12.5} & -\frac{4}{5} & -0.2\sqrt{5-2\sqrt{5}} \\ -0.2\sqrt{7.5-1.5\sqrt{5}} & -0.1\sqrt{5.5\sqrt{5}+12.5} & -0.25+0.15\sqrt{5} & -0.2\sqrt{2\sqrt{5}+5} & \frac{\sqrt{5}}{5} \\ -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -\frac{4}{5} & 0.2\sqrt{2\sqrt{5}+5} & 0.05\sqrt{5}+0.35 & 0.1\sqrt{12.5-5.5\sqrt{5}} \\ -0.2\sqrt{1.5\sqrt{5}+7.5} & 0.2\sqrt{5-2\sqrt{5}} & \frac{\sqrt{5}}{5} & -0.1\sqrt{12.5-5.5\sqrt{5}} & -0.15\sqrt{5}-0.25 \end{pmatrix}$$

Ih	$\hat{C}_5(3)$
Ag	1

$$T1g \quad \begin{pmatrix} -0.25+0.25\sqrt{5} & 0.5\sqrt{0.5\sqrt{5}+2.5} & 0 \\ -0.5\sqrt{0.5\sqrt{5}+2.5} & -0.25+0.25\sqrt{5} & 0 \\ 0 & 0 & 1 \end{pmatrix}$$

$$T2g \quad \begin{pmatrix} 1 & 0 & 0 \\ 0 & -0.25\sqrt{5}-0.25 & -0.5\sqrt{2.5-0.5\sqrt{5}} \\ 0 & 0.5\sqrt{2.5-0.5\sqrt{5}} & -0.25\sqrt{5}-0.25 \end{pmatrix}$$

$$Gg \quad \begin{pmatrix} -0.25+0.25\sqrt{5} & 0.5\sqrt{0.5\sqrt{5}+2.5} & 0 & 0 \\ -0.5\sqrt{0.5\sqrt{5}+2.5} & -0.25+0.25\sqrt{5} & 0 & 0 \\ 0 & 0 & -0.25\sqrt{5}-0.25 & 0.5\sqrt{2.5-0.5\sqrt{5}} \\ 0 & 0 & -0.5\sqrt{2.5-0.5\sqrt{5}} & -0.25\sqrt{5}-0.25 \end{pmatrix}$$

$$Hg \quad \begin{pmatrix} 1 & 0 & 0 & 0 & 0 \\ 0 & -0.25\sqrt{5}-0.25 & 0.5\sqrt{2.5-0.5\sqrt{5}} & 0 & 0 \\ 0 & -0.5\sqrt{2.5-0.5\sqrt{5}} & -0.25\sqrt{5}-0.25 & 0 & 0 \\ 0 & 0 & 0 & -0.25+0.25\sqrt{5} & -0.5\sqrt{0.5\sqrt{5}+2.5} \\ 0 & 0 & 0 & 0.5\sqrt{0.5\sqrt{5}+2.5} & -0.25+0.25\sqrt{5} \end{pmatrix}$$

Au	1

$$T1u \quad \begin{pmatrix} -0.25+0.25\sqrt{5} & 0.5\sqrt{0.5\sqrt{5}+2.5} & 0 \\ -0.5\sqrt{0.5\sqrt{5}+2.5} & -0.25+0.25\sqrt{5} & 0 \\ 0 & 0 & 1 \end{pmatrix}$$

$$T2u \quad \begin{pmatrix} 1 & 0 & 0 \\ 0 & -0.25\sqrt{5}-0.25 & -0.5\sqrt{2.5-0.5\sqrt{5}} \\ 0 & 0.5\sqrt{2.5-0.5\sqrt{5}} & -0.25\sqrt{5}-0.25 \end{pmatrix}$$

$$Gu \quad \begin{pmatrix} -0.25+0.25\sqrt{5} & 0.5\sqrt{0.5\sqrt{5}+2.5} & 0 & 0 \\ -0.5\sqrt{0.5\sqrt{5}+2.5} & -0.25+0.25\sqrt{5} & 0 & 0 \\ 0 & 0 & -0.25\sqrt{5}-0.25 & 0.5\sqrt{2.5-0.5\sqrt{5}} \\ 0 & 0 & -0.5\sqrt{2.5-0.5\sqrt{5}} & -0.25\sqrt{5}-0.25 \end{pmatrix}$$

$$Hu \quad \begin{pmatrix} 1 & 0 & 0 & 0 & 0 \\ 0 & -0.25\sqrt{5}-0.25 & 0.5\sqrt{2.5-0.5\sqrt{5}} & 0 & 0 \\ 0 & -0.5\sqrt{2.5-0.5\sqrt{5}} & -0.25\sqrt{5}-0.25 & 0 & 0 \\ 0 & 0 & 0 & -0.25+0.25\sqrt{5} & -0.5\sqrt{0.5\sqrt{5}+2.5} \\ 0 & 0 & 0 & 0.5\sqrt{0.5\sqrt{5}+2.5} & -0.25+0.25\sqrt{5} \end{pmatrix}$$

Ih	$\hat{C}_5^2(3)$
Ag	1
$T1g$	$\begin{pmatrix} -0.25\sqrt{5}-0.25 & 0.5\sqrt{2.5-0.5\sqrt{5}} & 0 \\ -0.5\sqrt{2.5-0.5\sqrt{5}} & -0.25\sqrt{5}-0.25 & 0 \\ 0 & 0 & 1 \end{pmatrix}$
$T2g$	$\begin{pmatrix} 1 & 0 & 0 \\ 0 & -0.25+0.25\sqrt{5} & 0.5\sqrt{0.5\sqrt{5}+2.5} \\ 0 & -0.5\sqrt{0.5\sqrt{5}+2.5} & -0.25+0.25\sqrt{5} \end{pmatrix}$
Gg	$\begin{pmatrix} -0.25\sqrt{5}-0.25 & 0.5\sqrt{2.5-0.5\sqrt{5}} & 0 & 0 \\ -0.5\sqrt{2.5-0.5\sqrt{5}} & -0.25\sqrt{5}-0.25 & 0 & 0 \\ 0 & 0 & -0.25+0.25\sqrt{5} & -0.5\sqrt{0.5\sqrt{5}+2.5} \\ 0 & 0 & 0.5\sqrt{0.5\sqrt{5}+2.5} & -0.25+0.25\sqrt{5} \end{pmatrix}$
Hg	$\begin{pmatrix} 1 & 0 & 0 & 0 & 0 \\ 0 & -0.25+0.25\sqrt{5} & -0.5\sqrt{0.5\sqrt{5}+2.5} & 0 & 0 \\ 0 & 0.5\sqrt{0.5\sqrt{5}+2.5} & -0.25+0.25\sqrt{5} & 0 & 0 \\ 0 & 0 & 0 & -0.25\sqrt{5}-0.25 & -0.5\sqrt{2.5-0.5\sqrt{5}} \\ 0 & 0 & 0 & 0.5\sqrt{2.5-0.5\sqrt{5}} & -0.25\sqrt{5}-0.25 \end{pmatrix}$
Au	1
$T1u$	$\begin{pmatrix} -0.25\sqrt{5}-0.25 & 0.5\sqrt{2.5-0.5\sqrt{5}} & 0 \\ -0.5\sqrt{2.5-0.5\sqrt{5}} & -0.25\sqrt{5}-0.25 & 0 \\ 0 & 0 & 1 \end{pmatrix}$
$T2u$	$\begin{pmatrix} 1 & 0 & 0 \\ 0 & -0.25+0.25\sqrt{5} & 0.5\sqrt{0.5\sqrt{5}+2.5} \\ 0 & -0.5\sqrt{0.5\sqrt{5}+2.5} & -0.25+0.25\sqrt{5} \end{pmatrix}$
Gu	$\begin{pmatrix} -0.25\sqrt{5}-0.25 & 0.5\sqrt{2.5-0.5\sqrt{5}} & 0 & 0 \\ -0.5\sqrt{2.5-0.5\sqrt{5}} & -0.25\sqrt{5}-0.25 & 0 & 0 \\ 0 & 0 & -0.25+0.25\sqrt{5} & -0.5\sqrt{0.5\sqrt{5}+2.5} \\ 0 & 0 & 0.5\sqrt{0.5\sqrt{5}+2.5} & -0.25+0.25\sqrt{5} \end{pmatrix}$
Hu	$\begin{pmatrix} 1 & 0 & 0 & 0 & 0 \\ 0 & -0.25+0.25\sqrt{5} & -0.5\sqrt{0.5\sqrt{5}+2.5} & 0 & 0 \\ 0 & 0.5\sqrt{0.5\sqrt{5}+2.5} & -0.25+0.25\sqrt{5} & 0 & 0 \\ 0 & 0 & 0 & -0.25\sqrt{5}-0.25 & -0.5\sqrt{2.5-0.5\sqrt{5}} \\ 0 & 0 & 0 & 0.5\sqrt{2.5-0.5\sqrt{5}} & -0.25\sqrt{5}-0.25 \end{pmatrix}$

Ih	$\hat{C}_5^3(3)$
Ag	1
$T1g$	$\begin{pmatrix} -0.25\sqrt{5}-0.25 & -0.5\sqrt{2.5-0.5\sqrt{5}} & 0 \\ 0.5\sqrt{2.5-0.5\sqrt{5}} & -0.25\sqrt{5}-0.25 & 0 \\ 0 & 0 & 1 \end{pmatrix}$
$T2g$	$\begin{pmatrix} 1 & 0 & 0 \\ 0 & -0.25+0.25\sqrt{5} & -0.5\sqrt{0.5\sqrt{5}+2.5} \\ 0 & 0.5\sqrt{0.5\sqrt{5}+2.5} & -0.25+0.25\sqrt{5} \end{pmatrix}$
Gg	$\begin{pmatrix} -0.25\sqrt{5}-0.25 & -0.5\sqrt{2.5-0.5\sqrt{5}} & 0 & 0 \\ 0.5\sqrt{2.5-0.5\sqrt{5}} & -0.25\sqrt{5}-0.25 & 0 & 0 \\ 0 & 0 & -0.25+0.25\sqrt{5} & 0.5\sqrt{0.5\sqrt{5}+2.5} \\ 0 & 0 & -0.5\sqrt{0.5\sqrt{5}+2.5} & -0.25+0.25\sqrt{5} \end{pmatrix}$
Hg	$\begin{pmatrix} 1 & 0 & 0 & 0 & 0 \\ 0 & -0.25+0.25\sqrt{5} & 0.5\sqrt{0.5\sqrt{5}+2.5} & 0 & 0 \\ 0 & -0.5\sqrt{0.5\sqrt{5}+2.5} & -0.25+0.25\sqrt{5} & 0 & 0 \\ 0 & 0 & 0 & -0.25\sqrt{5}-0.25 & 0.5\sqrt{2.5-0.5\sqrt{5}} \\ 0 & 0 & 0 & -0.5\sqrt{2.5-0.5\sqrt{5}} & -0.25\sqrt{5}-0.25 \end{pmatrix}$
Au	1
$T1u$	$\begin{pmatrix} -0.25\sqrt{5}-0.25 & -0.5\sqrt{2.5-0.5\sqrt{5}} & 0 \\ 0.5\sqrt{2.5-0.5\sqrt{5}} & -0.25\sqrt{5}-0.25 & 0 \\ 0 & 0 & 1 \end{pmatrix}$
$T2u$	$\begin{pmatrix} 1 & 0 & 0 \\ 0 & -0.25+0.25\sqrt{5} & -0.5\sqrt{0.5\sqrt{5}+2.5} \\ 0 & 0.5\sqrt{0.5\sqrt{5}+2.5} & -0.25+0.25\sqrt{5} \end{pmatrix}$
Gu	$\begin{pmatrix} -0.25\sqrt{5}-0.25 & -0.5\sqrt{2.5-0.5\sqrt{5}} & 0 & 0 \\ 0.5\sqrt{2.5-0.5\sqrt{5}} & -0.25\sqrt{5}-0.25 & 0 & 0 \\ 0 & 0 & -0.25+0.25\sqrt{5} & 0.5\sqrt{0.5\sqrt{5}+2.5} \\ 0 & 0 & -0.5\sqrt{0.5\sqrt{5}+2.5} & -0.25+0.25\sqrt{5} \end{pmatrix}$
Hu	$\begin{pmatrix} 1 & 0 & 0 & 0 & 0 \\ 0 & -0.25+0.25\sqrt{5} & 0.5\sqrt{0.5\sqrt{5}+2.5} & 0 & 0 \\ 0 & -0.5\sqrt{0.5\sqrt{5}+2.5} & -0.25+0.25\sqrt{5} & 0 & 0 \\ 0 & 0 & 0 & -0.25\sqrt{5}-0.25 & 0.5\sqrt{2.5-0.5\sqrt{5}} \\ 0 & 0 & 0 & -0.5\sqrt{2.5-0.5\sqrt{5}} & -0.25\sqrt{5}-0.25 \end{pmatrix}$

Ih	$\hat{C}_5^4(3)$
Ag	1
$T1g$	$\begin{pmatrix} -0.25+0.25\sqrt{5} & -0.5\sqrt{0.5\sqrt{5}+2.5} & 0 \\ 0.5\sqrt{0.5\sqrt{5}+2.5} & -0.25+0.25\sqrt{5} & 0 \\ 0 & 0 & 1 \end{pmatrix}$
$T2g$	$\begin{pmatrix} 1 & 0 & 0 \\ 0 & -0.25\sqrt{5}-0.25 & 0.5\sqrt{2.5-0.5\sqrt{5}} \\ 0 & -0.5\sqrt{2.5-0.5\sqrt{5}} & -0.25\sqrt{5}-0.25 \end{pmatrix}$
Gg	$\begin{pmatrix} -0.25+0.25\sqrt{5} & -0.5\sqrt{0.5\sqrt{5}+2.5} & 0 & 0 \\ 0.5\sqrt{0.5\sqrt{5}+2.5} & -0.25+0.25\sqrt{5} & 0 & 0 \\ 0 & 0 & -0.25\sqrt{5}-0.25 & -0.5\sqrt{2.5-0.5\sqrt{5}} \\ 0 & 0 & 0.5\sqrt{2.5-0.5\sqrt{5}} & -0.25\sqrt{5}-0.25 \end{pmatrix}$
Hg	$\begin{pmatrix} 1 & 0 & 0 & 0 & 0 \\ 0 & -0.25\sqrt{5}-0.25 & -0.5\sqrt{2.5-0.5\sqrt{5}} & 0 & 0 \\ 0 & 0.5\sqrt{2.5-0.5\sqrt{5}} & -0.25\sqrt{5}-0.25 & 0 & 0 \\ 0 & 0 & 0 & -0.25+0.25\sqrt{5} & 0.5\sqrt{0.5\sqrt{5}+2.5} \\ 0 & 0 & 0 & -0.5\sqrt{0.5\sqrt{5}+2.5} & -0.25+0.25\sqrt{5} \end{pmatrix}$
Au	1
$T1u$	$\begin{pmatrix} -0.25+0.25\sqrt{5} & -0.5\sqrt{0.5\sqrt{5}+2.5} & 0 \\ 0.5\sqrt{0.5\sqrt{5}+2.5} & -0.25+0.25\sqrt{5} & 0 \\ 0 & 0 & 1 \end{pmatrix}$
$T2u$	$\begin{pmatrix} 1 & 0 & 0 \\ 0 & -0.25\sqrt{5}-0.25 & 0.5\sqrt{2.5-0.5\sqrt{5}} \\ 0 & -0.5\sqrt{2.5-0.5\sqrt{5}} & -0.25\sqrt{5}-0.25 \end{pmatrix}$
Gu	$\begin{pmatrix} -0.25+0.25\sqrt{5} & -0.5\sqrt{0.5\sqrt{5}+2.5} & 0 & 0 \\ 0.5\sqrt{0.5\sqrt{5}+2.5} & -0.25+0.25\sqrt{5} & 0 & 0 \\ 0 & 0 & -0.25\sqrt{5}-0.25 & -0.5\sqrt{2.5-0.5\sqrt{5}} \\ 0 & 0 & 0.5\sqrt{2.5-0.5\sqrt{5}} & -0.25\sqrt{5}-0.25 \end{pmatrix}$
Hu	$\begin{pmatrix} 1 & 0 & 0 & 0 & 0 \\ 0 & -0.25\sqrt{5}-0.25 & -0.5\sqrt{2.5-0.5\sqrt{5}} & 0 & 0 \\ 0 & 0.5\sqrt{2.5-0.5\sqrt{5}} & -0.25\sqrt{5}-0.25 & 0 & 0 \\ 0 & 0 & 0 & -0.25+0.25\sqrt{5} & 0.5\sqrt{0.5\sqrt{5}+2.5} \\ 0 & 0 & 0 & -0.5\sqrt{0.5\sqrt{5}+2.5} & -0.25+0.25\sqrt{5} \end{pmatrix}$

Ih	$\hat{C}_5(4)$
Ag	1
$T1g$	$\begin{pmatrix} 0.25+0.25\sqrt{5} & -0.5\sqrt{0.5-0.1\sqrt{5}} & \sqrt{0.5-0.1\sqrt{5}} \\ 0.5\sqrt{2.5-0.5\sqrt{5}} & 0.05\sqrt{5}+0.25 & -0.5-0.1\sqrt{5} \\ 0 & \frac{2\sqrt{5}}{5} & \frac{\sqrt{5}}{5} \end{pmatrix}$
$T2g$	$\begin{pmatrix} -\frac{\sqrt{5}}{5} & 0 & -\frac{2\sqrt{5}}{5} \\ -\sqrt{0.1\sqrt{5}+0.5} & 0.25-0.25\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} \\ -0.5+0.1\sqrt{5} & 0.5\sqrt{0.5\sqrt{5}+2.5} & 0.25-0.05\sqrt{5} \end{pmatrix}$
Gg	$\begin{pmatrix} 0 & \sqrt{0.5-0.1\sqrt{5}} & 0.25+0.25\sqrt{5} & 0.5\sqrt{0.5-0.1\sqrt{5}} \\ 0 & -0.5-0.1\sqrt{5} & 0.5\sqrt{2.5-0.5\sqrt{5}} & -0.25-0.05\sqrt{5} \\ 0.25-0.25\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} & 0 & \sqrt{0.1\sqrt{5}+0.5} \\ -0.5\sqrt{0.5\sqrt{5}+2.5} & 0.25-0.05\sqrt{5} & 0 & -0.5+0.1\sqrt{5} \end{pmatrix}$
Hg	$\begin{pmatrix} -0.2 & -0.4\sqrt{3} & 0 & 0.4\sqrt{3} & 0 \\ 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.15+0.15\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} & -0.1+0.1\sqrt{5} & \sqrt{0.1\sqrt{5}+0.5} \\ -0.2\sqrt{1.5\sqrt{5}+7.5} & 0.3\sqrt{0.5\sqrt{5}+2.5} & 0.25-0.05\sqrt{5} & \sqrt{0.02\sqrt{5}+0.1} & -0.5+0.1\sqrt{5} \\ -0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.1\sqrt{5}-0.1 & \sqrt{0.5-0.1\sqrt{5}} & -0.15\sqrt{5}-0.15 & 0.5\sqrt{0.5-0.1\sqrt{5}} \\ \sqrt{0.3-0.06\sqrt{5}} & \sqrt{0.1-0.02\sqrt{5}} & 0.1\sqrt{5}+0.5 & 0.3\sqrt{2.5-0.5\sqrt{5}} & 0.05\sqrt{5}+0.25 \end{pmatrix}$
Au	1
$T1u$	$\begin{pmatrix} 0.25+0.25\sqrt{5} & -0.5\sqrt{0.5-0.1\sqrt{5}} & \sqrt{0.5-0.1\sqrt{5}} \\ 0.5\sqrt{2.5-0.5\sqrt{5}} & 0.05\sqrt{5}+0.25 & -0.5-0.1\sqrt{5} \\ 0 & \frac{2\sqrt{5}}{5} & \frac{\sqrt{5}}{5} \end{pmatrix}$
$T2u$	$\begin{pmatrix} -\frac{\sqrt{5}}{5} & 0 & -\frac{2\sqrt{5}}{5} \\ -\sqrt{0.1\sqrt{5}+0.5} & 0.25-0.25\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} \\ -0.5+0.1\sqrt{5} & 0.5\sqrt{0.5\sqrt{5}+2.5} & 0.25-0.05\sqrt{5} \end{pmatrix}$
Gu	$\begin{pmatrix} 0 & \sqrt{0.5-0.1\sqrt{5}} & 0.25+0.25\sqrt{5} & 0.5\sqrt{0.5-0.1\sqrt{5}} \\ 0 & -0.5-0.1\sqrt{5} & 0.5\sqrt{2.5-0.5\sqrt{5}} & -0.25-0.05\sqrt{5} \\ 0.25-0.25\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} & 0 & \sqrt{0.1\sqrt{5}+0.5} \\ -0.5\sqrt{0.5\sqrt{5}+2.5} & 0.25-0.05\sqrt{5} & 0 & -0.5+0.1\sqrt{5} \end{pmatrix}$
Hu	$\begin{pmatrix} -0.2 & -0.4\sqrt{3} & 0 & 0.4\sqrt{3} & 0 \\ 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.15+0.15\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} & -0.1+0.1\sqrt{5} & \sqrt{0.1\sqrt{5}+0.5} \\ -0.2\sqrt{1.5\sqrt{5}+7.5} & 0.3\sqrt{0.5\sqrt{5}+2.5} & 0.25-0.05\sqrt{5} & \sqrt{0.02\sqrt{5}+0.1} & -0.5+0.1\sqrt{5} \\ -0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.1\sqrt{5}-0.1 & \sqrt{0.5-0.1\sqrt{5}} & -0.15\sqrt{5}-0.15 & 0.5\sqrt{0.5-0.1\sqrt{5}} \\ \sqrt{0.3-0.06\sqrt{5}} & \sqrt{0.1-0.02\sqrt{5}} & 0.1\sqrt{5}+0.5 & 0.3\sqrt{2.5-0.5\sqrt{5}} & 0.05\sqrt{5}+0.25 \end{pmatrix}$

Ih	$\hat{C}_5^2(4)$
Ag	1
$T1g$	$\begin{pmatrix} 0.5 & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & \sqrt{0.1\sqrt{5}+0.5} \\ 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.3\sqrt{5} & -0.5+0.1\sqrt{5} \\ \sqrt{0.5-0.1\sqrt{5}} & 0.1\sqrt{5}+0.5 & -\frac{\sqrt{5}}{5} \end{pmatrix}$
$T2g$	$\begin{pmatrix} \frac{\sqrt{5}}{5} & -\sqrt{0.1\sqrt{5}+0.5} & 0.5-0.1\sqrt{5} \\ \sqrt{0.5-0.1\sqrt{5}} & 0.5 & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} \\ -0.5-0.1\sqrt{5} & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & 0.3\sqrt{5} \end{pmatrix}$
Gg	$\begin{pmatrix} -0.5 & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.25+0.25\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} \\ 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & 0.1\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} & 0.05\sqrt{5}+0.75 \\ -0.25\sqrt{5}-0.25 & 0.5\sqrt{0.5-0.1\sqrt{5}} & -0.5 & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} \\ 0.5\sqrt{0.5-0.1\sqrt{5}} & -0.75+0.05\sqrt{5} & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.1\sqrt{5} \end{pmatrix}$
Hg	$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & \sqrt{0.06\sqrt{5}+0.3} & -0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.2\sqrt{7.5-1.5\sqrt{5}} \\ 0.04\sqrt{5}\left(\sqrt{5}+5\right) & 0.1 & 0.1\sqrt{2\sqrt{5}+25} & 0.4-\frac{\sqrt{5}}{5} & 0.2\sqrt{2\sqrt{5}+5} \\ -0.2\sqrt{7.5-1.5\sqrt{5}} & 0.1\sqrt{25-2\sqrt{5}} & -0.1\sqrt{5} & -0.2\sqrt{2\sqrt{5}+5} & \frac{\sqrt{5}}{5} \\ -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & 0.4+\frac{\sqrt{5}}{5} & 0.2\sqrt{5-2\sqrt{5}} & 0.1 & -0.1\sqrt{25-2\sqrt{5}} \\ -0.2\sqrt{1.5\sqrt{5}+7.5} & 0.2\sqrt{5-2\sqrt{5}} & \frac{\sqrt{5}}{5} & 0.1\sqrt{2\sqrt{5}+25} & 0.1\sqrt{5} \end{pmatrix}$
Au	1
$T1u$	$\begin{pmatrix} 0.5 & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & \sqrt{0.1\sqrt{5}+0.5} \\ 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.3\sqrt{5} & -0.5+0.1\sqrt{5} \\ \sqrt{0.5-0.1\sqrt{5}} & 0.1\sqrt{5}+0.5 & -\frac{\sqrt{5}}{5} \end{pmatrix}$
$T2u$	$\begin{pmatrix} \frac{\sqrt{5}}{5} & -\sqrt{0.1\sqrt{5}+0.5} & 0.5-0.1\sqrt{5} \\ \sqrt{0.5-0.1\sqrt{5}} & 0.5 & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} \\ -0.5-0.1\sqrt{5} & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & 0.3\sqrt{5} \end{pmatrix}$
Gu	$\begin{pmatrix} -0.5 & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.25+0.25\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} \\ 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & 0.1\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} & 0.05\sqrt{5}+0.75 \\ -0.25\sqrt{5}-0.25 & 0.5\sqrt{0.5-0.1\sqrt{5}} & -0.5 & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} \\ 0.5\sqrt{0.5-0.1\sqrt{5}} & -0.75+0.05\sqrt{5} & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.1\sqrt{5} \end{pmatrix}$
Hu	$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & \sqrt{0.06\sqrt{5}+0.3} & -0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.2\sqrt{7.5-1.5\sqrt{5}} \\ 0.04\sqrt{5}\left(\sqrt{5}+5\right) & 0.1 & 0.1\sqrt{2\sqrt{5}+25} & 0.4-\frac{\sqrt{5}}{5} & 0.2\sqrt{2\sqrt{5}+5} \\ -0.2\sqrt{7.5-1.5\sqrt{5}} & 0.1\sqrt{25-2\sqrt{5}} & -0.1\sqrt{5} & -0.2\sqrt{2\sqrt{5}+5} & \frac{\sqrt{5}}{5} \\ -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & 0.4+\frac{\sqrt{5}}{5} & 0.2\sqrt{5-2\sqrt{5}} & 0.1 & -0.1\sqrt{25-2\sqrt{5}} \\ -0.2\sqrt{1.5\sqrt{5}+7.5} & 0.2\sqrt{5-2\sqrt{5}} & \frac{\sqrt{5}}{5} & 0.1\sqrt{2\sqrt{5}+25} & 0.1\sqrt{5} \end{pmatrix}$

Ih	$\hat{C}_5^3(4)$
Ag	1
$T1g$	$\begin{pmatrix} 0.5 & 0.5\sqrt{\frac{2\sqrt5}{5}+1} & \sqrt{0.5-0.1\sqrt5} \\ 0.5\sqrt{1-\frac{2\sqrt5}{5}} & -0.3\sqrt5 & 0.1\sqrt5+0.5 \\ \sqrt{0.1\sqrt5+0.5} & -0.5+0.1\sqrt5 & -\frac{\sqrt5}{5} \end{pmatrix}$
$T2g$	$\begin{pmatrix} \frac{\sqrt5}{5} & \sqrt{0.5-0.1\sqrt5} & -0.5-0.1\sqrt5 \\ -\sqrt{0.1\sqrt5+0.5} & 0.5 & -0.5\sqrt{1-\frac{2\sqrt5}{5}} \\ 0.5-0.1\sqrt5 & 0.5\sqrt{\frac{2\sqrt5}{5}+1} & 0.3\sqrt5 \end{pmatrix}$
Gg	$\begin{pmatrix} -0.5 & 0.5\sqrt{1-\frac{2\sqrt5}{5}} & -0.25\sqrt5-0.25 & 0.5\sqrt{0.5-0.1\sqrt5} \\ -0.5\sqrt{\frac{2\sqrt5}{5}+1} & 0.1\sqrt5 & 0.5\sqrt{0.5-0.1\sqrt5} & -0.75+0.05\sqrt5 \\ -0.25+0.25\sqrt5 & -0.5\sqrt{0.1\sqrt5+0.5} & -0.5 & -0.5\sqrt{\frac{2\sqrt5}{5}+1} \\ 0.5\sqrt{0.1\sqrt5+0.5} & 0.05\sqrt5+0.75 & -0.5\sqrt{1-\frac{2\sqrt5}{5}} & -0.1\sqrt5 \end{pmatrix}$
Hg	$\begin{pmatrix} -0.2 & 0.04\sqrt5\left(\sqrt5+5\right) & -0.2\sqrt{7.5-1.5\sqrt5} & -0.04\sqrt5\left(-5+\sqrt5\right) & -0.2\sqrt{1.5\sqrt5+7.5} \\ 0.04\sqrt5\left(-5+\sqrt5\right) & 0.1 & 0.1\sqrt{25-2\sqrt5} & 0.4+\frac{\sqrt5}{5} & 0.2\sqrt{5-2\sqrt5} \\ \sqrt{0.06\sqrt5+0.3} & 0.1\sqrt{2\sqrt5+25} & -0.1\sqrt5 & 0.2\sqrt{5-2\sqrt5} & \frac{\sqrt5}{5} \\ -0.04\sqrt5\left(\sqrt5+5\right) & 0.4-\frac{\sqrt5}{5} & -0.2\sqrt{2\sqrt5+5} & 0.1 & 0.1\sqrt{2\sqrt5+25} \\ -0.2\sqrt{7.5-1.5\sqrt5} & 0.2\sqrt{2\sqrt5+5} & \frac{\sqrt5}{5} & -0.1\sqrt{25-2\sqrt5} & 0.1\sqrt5 \end{pmatrix}$
Au	1
$T1u$	$\begin{pmatrix} 0.5 & 0.5\sqrt{\frac{2\sqrt5}{5}+1} & \sqrt{0.5-0.1\sqrt5} \\ 0.5\sqrt{1-\frac{2\sqrt5}{5}} & -0.3\sqrt5 & 0.1\sqrt5+0.5 \\ \sqrt{0.1\sqrt5+0.5} & -0.5+0.1\sqrt5 & -\frac{\sqrt5}{5} \end{pmatrix}$
$T2u$	$\begin{pmatrix} \frac{\sqrt5}{5} & \sqrt{0.5-0.1\sqrt5} & -0.5-0.1\sqrt5 \\ -\sqrt{0.1\sqrt5+0.5} & 0.5 & -0.5\sqrt{1-\frac{2\sqrt5}{5}} \\ 0.5-0.1\sqrt5 & 0.5\sqrt{\frac{2\sqrt5}{5}+1} & 0.3\sqrt5 \end{pmatrix}$
Gu	$\begin{pmatrix} -0.5 & 0.5\sqrt{1-\frac{2\sqrt5}{5}} & -0.25\sqrt5-0.25 & 0.5\sqrt{0.5-0.1\sqrt5} \\ -0.5\sqrt{\frac{2\sqrt5}{5}+1} & 0.1\sqrt5 & 0.5\sqrt{0.5-0.1\sqrt5} & -0.75+0.05\sqrt5 \\ -0.25+0.25\sqrt5 & -0.5\sqrt{0.1\sqrt5+0.5} & -0.5 & -0.5\sqrt{\frac{2\sqrt5}{5}+1} \\ 0.5\sqrt{0.1\sqrt5+0.5} & 0.05\sqrt5+0.75 & -0.5\sqrt{1-\frac{2\sqrt5}{5}} & -0.1\sqrt5 \end{pmatrix}$
Hu	$\begin{pmatrix} -0.2 & 0.04\sqrt5\left(\sqrt5+5\right) & -0.2\sqrt{7.5-1.5\sqrt5} & -0.04\sqrt5\left(-5+\sqrt5\right) & -0.2\sqrt{1.5\sqrt5+7.5} \\ 0.04\sqrt5\left(-5+\sqrt5\right) & 0.1 & 0.1\sqrt{25-2\sqrt5} & 0.4+\frac{\sqrt5}{5} & 0.2\sqrt{5-2\sqrt5} \\ \sqrt{0.06\sqrt5+0.3} & 0.1\sqrt{2\sqrt5+25} & -0.1\sqrt5 & 0.2\sqrt{5-2\sqrt5} & \frac{\sqrt5}{5} \\ -0.04\sqrt5\left(\sqrt5+5\right) & 0.4-\frac{\sqrt5}{5} & -0.2\sqrt{2\sqrt5+5} & 0.1 & 0.1\sqrt{2\sqrt5+25} \\ -0.2\sqrt{7.5-1.5\sqrt5} & 0.2\sqrt{2\sqrt5+5} & \frac{\sqrt5}{5} & -0.1\sqrt{25-2\sqrt5} & 0.1\sqrt5 \end{pmatrix}$

Ih	$\hat{C}_5^4(4)$
Ag	1
$T1g$	$\begin{pmatrix} 0.25+0.25\sqrt{5} & 0.5\sqrt{2.5-0.5\sqrt{5}} & 0 \\ -0.5\sqrt{0.5-0.1\sqrt{5}} & 0.05\sqrt{5}+0.25 & \frac{2\sqrt{5}}{5} \\ \sqrt{0.5-0.1\sqrt{5}} & -0.5-0.1\sqrt{5} & \frac{\sqrt{5}}{5} \end{pmatrix}$
$T2g$	$\begin{pmatrix} -\frac{\sqrt{5}}{5} & -\sqrt{0.1\sqrt{5}+0.5} & -0.5+0.1\sqrt{5} \\ 0 & 0.25-0.25\sqrt{5} & 0.5\sqrt{0.5\sqrt{5}+2.5} \\ -\frac{2\sqrt{5}}{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} & 0.25-0.05\sqrt{5} \end{pmatrix}$
Gg	$\begin{pmatrix} 0 & 0 & 0.25-0.25\sqrt{5} & -0.5\sqrt{0.5\sqrt{5}+2.5} \\ \sqrt{0.5-0.1\sqrt{5}} & -0.5-0.1\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} & 0.25-0.05\sqrt{5} \\ 0.25+0.25\sqrt{5} & 0.5\sqrt{2.5-0.5\sqrt{5}} & 0 & 0 \\ 0.5\sqrt{0.5-0.1\sqrt{5}} & -0.25-0.05\sqrt{5} & \sqrt{0.1\sqrt{5}+0.5} & -0.5+0.1\sqrt{5} \end{pmatrix}$
Hg	$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.2\sqrt{1.5\sqrt{5}+7.5} & -0.04\sqrt{5}\left(\sqrt{5}+5\right) & \sqrt{0.3-0.06\sqrt{5}} \\ -0.4\sqrt{3} & -0.15+0.15\sqrt{5} & 0.3\sqrt{0.5\sqrt{5}+2.5} & -0.1\sqrt{5}-0.1 & \sqrt{0.1-0.02\sqrt{5}} \\ 0 & -0.5\sqrt{0.1\sqrt{5}+0.5} & 0.25-0.05\sqrt{5} & \sqrt{0.5-0.1\sqrt{5}} & 0.1\sqrt{5}+0.5 \\ 0.4\sqrt{3} & -0.1+0.1\sqrt{5} & \sqrt{0.02\sqrt{5}+0.1} & -0.15\sqrt{5}-0.15 & 0.3\sqrt{2.5-0.5\sqrt{5}} \\ 0 & \sqrt{0.1\sqrt{5}+0.5} & -0.5+0.1\sqrt{5} & 0.5\sqrt{0.5-0.1\sqrt{5}} & 0.05\sqrt{5}+0.25 \end{pmatrix}$
Au	1
$T1u$	$\begin{pmatrix} 0.25+0.25\sqrt{5} & 0.5\sqrt{2.5-0.5\sqrt{5}} & 0 \\ -0.5\sqrt{0.5-0.1\sqrt{5}} & 0.05\sqrt{5}+0.25 & \frac{2\sqrt{5}}{5} \\ \sqrt{0.5-0.1\sqrt{5}} & -0.5-0.1\sqrt{5} & \frac{\sqrt{5}}{5} \end{pmatrix}$
$T2u$	$\begin{pmatrix} -\frac{\sqrt{5}}{5} & -\sqrt{0.1\sqrt{5}+0.5} & -0.5+0.1\sqrt{5} \\ 0 & 0.25-0.25\sqrt{5} & 0.5\sqrt{0.5\sqrt{5}+2.5} \\ -\frac{2\sqrt{5}}{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} & 0.25-0.05\sqrt{5} \end{pmatrix}$
Gu	$\begin{pmatrix} 0 & 0 & 0.25-0.25\sqrt{5} & -0.5\sqrt{0.5\sqrt{5}+2.5} \\ \sqrt{0.5-0.1\sqrt{5}} & -0.5-0.1\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} & 0.25-0.05\sqrt{5} \\ 0.25+0.25\sqrt{5} & 0.5\sqrt{2.5-0.5\sqrt{5}} & 0 & 0 \\ 0.5\sqrt{0.5-0.1\sqrt{5}} & -0.25-0.05\sqrt{5} & \sqrt{0.1\sqrt{5}+0.5} & -0.5+0.1\sqrt{5} \end{pmatrix}$
Hu	$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.2\sqrt{1.5\sqrt{5}+7.5} & -0.04\sqrt{5}\left(\sqrt{5}+5\right) & \sqrt{0.3-0.06\sqrt{5}} \\ -0.4\sqrt{3} & -0.15+0.15\sqrt{5} & 0.3\sqrt{0.5\sqrt{5}+2.5} & -0.1\sqrt{5}-0.1 & \sqrt{0.1-0.02\sqrt{5}} \\ 0 & -0.5\sqrt{0.1\sqrt{5}+0.5} & 0.25-0.05\sqrt{5} & \sqrt{0.5-0.1\sqrt{5}} & 0.1\sqrt{5}+0.5 \\ 0.4\sqrt{3} & -0.1+0.1\sqrt{5} & \sqrt{0.02\sqrt{5}+0.1} & -0.15\sqrt{5}-0.15 & 0.3\sqrt{2.5-0.5\sqrt{5}} \\ 0 & \sqrt{0.1\sqrt{5}+0.5} & -0.5+0.1\sqrt{5} & 0.5\sqrt{0.5-0.1\sqrt{5}} & 0.05\sqrt{5}+0.25 \end{pmatrix}$

Ih	$\hat{C}_5(5)$
Ag	1
$T1g$	$\begin{pmatrix} 0.25+0.25\sqrt{5} & -0.5\sqrt{2.5-0.5\sqrt{5}} & 0 \\ 0.5\sqrt{0.5-0.1\sqrt{5}} & 0.05\sqrt{5}+0.25 & \frac{2\sqrt{5}}{5} \\ -\sqrt{0.5-0.1\sqrt{5}} & -0.5-0.1\sqrt{5} & \frac{\sqrt{5}}{5} \end{pmatrix}$
$T2g$	$\begin{pmatrix} -\frac{\sqrt{5}}{5} & \sqrt{0.1\sqrt{5}+0.5} & -0.5+0.1\sqrt{5} \\ 0 & 0.25-0.25\sqrt{5} & -0.5\sqrt{0.5\sqrt{5}+2.5} \\ -\frac{2\sqrt{5}}{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} & 0.25-0.05\sqrt{5} \end{pmatrix}$
Gg	$\begin{pmatrix} 0 & 0 & 0.25-0.25\sqrt{5} & 0.5\sqrt{0.5\sqrt{5}+2.5} \\ -\sqrt{0.5-0.1\sqrt{5}} & -0.5-0.1\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} & 0.25-0.05\sqrt{5} \\ 0.25+0.25\sqrt{5} & -0.5\sqrt{2.5-0.5\sqrt{5}} & 0 & 0 \\ -0.5\sqrt{0.5-0.1\sqrt{5}} & -0.25-0.05\sqrt{5} & -\sqrt{0.1\sqrt{5}+0.5} & -0.5+0.1\sqrt{5} \end{pmatrix}$
Hg	$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & \sqrt{0.06\sqrt{5}+0.3} & -0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.2\sqrt{7.5-1.5\sqrt{5}} \\ -0.4\sqrt{3} & -0.15+0.15\sqrt{5} & -0.3\sqrt{0.5\sqrt{5}+2.5} & -0.1\sqrt{5}-0.1 & -0.2\sqrt{2.5-0.5\sqrt{5}} \\ 0 & 0.5\sqrt{0.1\sqrt{5}+0.5} & 0.25-0.05\sqrt{5} & -\sqrt{0.5-0.1\sqrt{5}} & 0.1\sqrt{5}+0.5 \\ 0.4\sqrt{3} & -0.1+0.1\sqrt{5} & -0.2\sqrt{0.5\sqrt{5}+2.5} & -0.15\sqrt{5}-0.15 & -0.3\sqrt{2.5-0.5\sqrt{5}} \\ 0 & -\sqrt{0.1\sqrt{5}+0.5} & -0.5+0.1\sqrt{5} & -0.5\sqrt{0.5-0.1\sqrt{5}} & 0.05\sqrt{5}+0.25 \end{pmatrix}$
Au	1
$T1u$	$\begin{pmatrix} 0.25+0.25\sqrt{5} & -0.5\sqrt{2.5-0.5\sqrt{5}} & 0 \\ 0.5\sqrt{0.5-0.1\sqrt{5}} & 0.05\sqrt{5}+0.25 & \frac{2\sqrt{5}}{5} \\ -\sqrt{0.5-0.1\sqrt{5}} & -0.5-0.1\sqrt{5} & \frac{\sqrt{5}}{5} \end{pmatrix}$
$T2u$	$\begin{pmatrix} -\frac{\sqrt{5}}{5} & \sqrt{0.1\sqrt{5}+0.5} & -0.5+0.1\sqrt{5} \\ 0 & 0.25-0.25\sqrt{5} & -0.5\sqrt{0.5\sqrt{5}+2.5} \\ -\frac{2\sqrt{5}}{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} & 0.25-0.05\sqrt{5} \end{pmatrix}$
Gu	$\begin{pmatrix} 0 & 0 & 0.25-0.25\sqrt{5} & 0.5\sqrt{0.5\sqrt{5}+2.5} \\ -\sqrt{0.5-0.1\sqrt{5}} & -0.5-0.1\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} & 0.25-0.05\sqrt{5} \\ 0.25+0.25\sqrt{5} & -0.5\sqrt{2.5-0.5\sqrt{5}} & 0 & 0 \\ -0.5\sqrt{0.5-0.1\sqrt{5}} & -0.25-0.05\sqrt{5} & -\sqrt{0.1\sqrt{5}+0.5} & -0.5+0.1\sqrt{5} \end{pmatrix}$
Hu	$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & \sqrt{0.06\sqrt{5}+0.3} & -0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.2\sqrt{7.5-1.5\sqrt{5}} \\ -0.4\sqrt{3} & -0.15+0.15\sqrt{5} & -0.3\sqrt{0.5\sqrt{5}+2.5} & -0.1\sqrt{5}-0.1 & -0.2\sqrt{2.5-0.5\sqrt{5}} \\ 0 & 0.5\sqrt{0.1\sqrt{5}+0.5} & 0.25-0.05\sqrt{5} & -\sqrt{0.5-0.1\sqrt{5}} & 0.1\sqrt{5}+0.5 \\ 0.4\sqrt{3} & -0.1+0.1\sqrt{5} & -0.2\sqrt{0.5\sqrt{5}+2.5} & -0.15\sqrt{5}-0.15 & -0.3\sqrt{2.5-0.5\sqrt{5}} \\ 0 & -\sqrt{0.1\sqrt{5}+0.5} & -0.5+0.1\sqrt{5} & -0.5\sqrt{0.5-0.1\sqrt{5}} & 0.05\sqrt{5}+0.25 \end{pmatrix}$

Ih	$\hat{C}_5^2(5)$
Ag	1

$T1g$

$$\begin{pmatrix} 0.5 & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -\sqrt{0.5-0.1\sqrt{5}} \\ -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -0.3\sqrt{5} & 0.1\sqrt{5}+0.5 \\ -\sqrt{0.1\sqrt{5}+0.5} & -0.5+0.1\sqrt{5} & -\frac{\sqrt{5}}{5} \end{pmatrix}$$

$T2g$

$$\begin{pmatrix} \frac{\sqrt{5}}{5} & -\sqrt{0.5-0.1\sqrt{5}} & -0.5-0.1\sqrt{5} \\ \sqrt{0.1\sqrt{5}+0.5} & 0.5 & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} \\ 0.5-0.1\sqrt{5} & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & 0.3\sqrt{5} \end{pmatrix}$$

Gg

$$\begin{pmatrix} -0.5 & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -0.25\sqrt{5}-0.25 & -0.5\sqrt{0.5-0.1\sqrt{5}} \\ 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & 0.1\sqrt{5} & -0.5\sqrt{0.5-0.1\sqrt{5}} & -0.75+0.05\sqrt{5} \\ -0.25+0.25\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} & -0.5 & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} \\ -0.5\sqrt{0.1\sqrt{5}+0.5} & 0.05\sqrt{5}+0.75 & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -0.1\sqrt{5} \end{pmatrix}$$

Hg

$$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(\sqrt{5}+5\right) & \sqrt{0.3-0.06\sqrt{5}} & -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & \sqrt{0.06\sqrt{5}+0.3} \\ 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & 0.1 & -0.1\sqrt{25-2\sqrt{5}} & 0.4+\frac{\sqrt{5}}{5} & -0.2\sqrt{5-2\sqrt{5}} \\ -0.2\sqrt{1.5\sqrt{5}+7.5} & -0.1\sqrt{2\sqrt{5}+25} & -0.1\sqrt{5} & -0.2\sqrt{5-2\sqrt{5}} & \frac{\sqrt{5}}{5} \\ -0.04\sqrt{5}\left(\sqrt{5}+5\right) & 0.4-\frac{\sqrt{5}}{5} & 0.2\sqrt{2\sqrt{5}+5} & 0.1 & -0.1\sqrt{2\sqrt{5}+25} \\ \sqrt{0.3-0.06\sqrt{5}} & -0.2\sqrt{2\sqrt{5}+5} & \frac{\sqrt{5}}{5} & 0.1\sqrt{25-2\sqrt{5}} & 0.1\sqrt{5} \end{pmatrix}$$

Au	1

$T1u$

$$\begin{pmatrix} 0.5 & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -\sqrt{0.5-0.1\sqrt{5}} \\ -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -0.3\sqrt{5} & 0.1\sqrt{5}+0.5 \\ -\sqrt{0.1\sqrt{5}+0.5} & -0.5+0.1\sqrt{5} & -\frac{\sqrt{5}}{5} \end{pmatrix}$$

$T2u$

$$\begin{pmatrix} \frac{\sqrt{5}}{5} & -\sqrt{0.5-0.1\sqrt{5}} & -0.5-0.1\sqrt{5} \\ \sqrt{0.1\sqrt{5}+0.5} & 0.5 & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} \\ 0.5-0.1\sqrt{5} & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & 0.3\sqrt{5} \end{pmatrix}$$

Gu

$$\begin{pmatrix} -0.5 & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -0.25\sqrt{5}-0.25 & -0.5\sqrt{0.5-0.1\sqrt{5}} \\ 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & 0.1\sqrt{5} & -0.5\sqrt{0.5-0.1\sqrt{5}} & -0.75+0.05\sqrt{5} \\ -0.25+0.25\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} & -0.5 & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} \\ -0.5\sqrt{0.1\sqrt{5}+0.5} & 0.05\sqrt{5}+0.75 & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -0.1\sqrt{5} \end{pmatrix}$$

Hu

$$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(\sqrt{5}+5\right) & \sqrt{0.3-0.06\sqrt{5}} & -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & \sqrt{0.06\sqrt{5}+0.3} \\ 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & 0.1 & -0.1\sqrt{25-2\sqrt{5}} & 0.4+\frac{\sqrt{5}}{5} & -0.2\sqrt{5-2\sqrt{5}} \\ -0.2\sqrt{1.5\sqrt{5}+7.5} & -0.1\sqrt{2\sqrt{5}+25} & -0.1\sqrt{5} & -0.2\sqrt{5-2\sqrt{5}} & \frac{\sqrt{5}}{5} \\ -0.04\sqrt{5}\left(\sqrt{5}+5\right) & 0.4-\frac{\sqrt{5}}{5} & 0.2\sqrt{2\sqrt{5}+5} & 0.1 & -0.1\sqrt{2\sqrt{5}+25} \\ \sqrt{0.3-0.06\sqrt{5}} & -0.2\sqrt{2\sqrt{5}+5} & \frac{\sqrt{5}}{5} & 0.1\sqrt{25-2\sqrt{5}} & 0.1\sqrt{5} \end{pmatrix}$$

Ih	$\hat{C}_5^3(5)$

Ag: 1

$T1g$:
$$\begin{pmatrix} 0.5 & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -\sqrt{0.1\sqrt{5}+0.5} \\ -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.3\sqrt{5} & -0.5+0.1\sqrt{5} \\ -\sqrt{0.5-0.1\sqrt{5}} & 0.1\sqrt{5}+0.5 & -\frac{\sqrt{5}}{5} \end{pmatrix}$$

$T2g$:
$$\begin{pmatrix} \frac{\sqrt{5}}{5} & \sqrt{0.1\sqrt{5}+0.5} & 0.5-0.1\sqrt{5} \\ -\sqrt{0.5-0.1\sqrt{5}} & 0.5 & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} \\ -0.5-0.1\sqrt{5} & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & 0.3\sqrt{5} \end{pmatrix}$$

Gg:
$$\begin{pmatrix} -0.5 & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.25+0.25\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} \\ -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & 0.1\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} & 0.05\sqrt{5}+0.75 \\ -0.25\sqrt{5}-0.25 & -0.5\sqrt{0.5-0.1\sqrt{5}} & -0.5 & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} \\ -0.5\sqrt{0.5-0.1\sqrt{5}} & -0.75+0.05\sqrt{5} & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.1\sqrt{5} \end{pmatrix}$$

Hg:
$$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.2\sqrt{1.5\sqrt{5}+7.5} & -0.04\sqrt{5}\left(\sqrt{5}+5\right) & \sqrt{0.3-0.06\sqrt{5}} \\ 0.04\sqrt{5}\left(\sqrt{5}+5\right) & 0.1 & -0.1\sqrt{2\sqrt{5}+25} & 0.4-\frac{\sqrt{5}}{5} & -0.2\sqrt{2\sqrt{5}+5} \\ \sqrt{0.3-0.06\sqrt{5}} & -0.1\sqrt{25-2\sqrt{5}} & -0.1\sqrt{5} & 0.2\sqrt{2\sqrt{5}+5} & \frac{\sqrt{5}}{5} \\ -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & 0.4+\frac{\sqrt{5}}{5} & -0.2\sqrt{5-2\sqrt{5}} & 0.1 & 0.1\sqrt{25-2\sqrt{5}} \\ \sqrt{0.06\sqrt{5}+0.3} & -0.2\sqrt{5-2\sqrt{5}} & \frac{\sqrt{5}}{5} & -0.1\sqrt{2\sqrt{5}+25} & 0.1\sqrt{5} \end{pmatrix}$$

Au: 1

$T1u$:
$$\begin{pmatrix} 0.5 & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -\sqrt{0.1\sqrt{5}+0.5} \\ -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.3\sqrt{5} & -0.5+0.1\sqrt{5} \\ -\sqrt{0.5-0.1\sqrt{5}} & 0.1\sqrt{5}+0.5 & -\frac{\sqrt{5}}{5} \end{pmatrix}$$

$T2u$:
$$\begin{pmatrix} \frac{\sqrt{5}}{5} & \sqrt{0.1\sqrt{5}+0.5} & 0.5-0.1\sqrt{5} \\ -\sqrt{0.5-0.1\sqrt{5}} & 0.5 & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} \\ -0.5-0.1\sqrt{5} & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & 0.3\sqrt{5} \end{pmatrix}$$

Gu:
$$\begin{pmatrix} -0.5 & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.25+0.25\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} \\ -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & 0.1\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} & 0.05\sqrt{5}+0.75 \\ -0.25\sqrt{5}-0.25 & -0.5\sqrt{0.5-0.1\sqrt{5}} & -0.5 & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} \\ -0.5\sqrt{0.5-0.1\sqrt{5}} & -0.75+0.05\sqrt{5} & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.1\sqrt{5} \end{pmatrix}$$

Hu:
$$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.2\sqrt{1.5\sqrt{5}+7.5} & -0.04\sqrt{5}\left(\sqrt{5}+5\right) & \sqrt{0.3-0.06\sqrt{5}} \\ 0.04\sqrt{5}\left(\sqrt{5}+5\right) & 0.1 & -0.1\sqrt{2\sqrt{5}+25} & 0.4-\frac{\sqrt{5}}{5} & -0.2\sqrt{2\sqrt{5}+5} \\ \sqrt{0.3-0.06\sqrt{5}} & -0.1\sqrt{25-2\sqrt{5}} & -0.1\sqrt{5} & 0.2\sqrt{2\sqrt{5}+5} & \frac{\sqrt{5}}{5} \\ -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & 0.4+\frac{\sqrt{5}}{5} & -0.2\sqrt{5-2\sqrt{5}} & 0.1 & 0.1\sqrt{25-2\sqrt{5}} \\ \sqrt{0.06\sqrt{5}+0.3} & -0.2\sqrt{5-2\sqrt{5}} & \frac{\sqrt{5}}{5} & -0.1\sqrt{2\sqrt{5}+25} & 0.1\sqrt{5} \end{pmatrix}$$

Ih	$\hat{C}_5^4(5)$
Ag	1
$T1g$	$\begin{pmatrix} 0.25+0.25\sqrt{5} & 0.5\sqrt{0.5-0.1\sqrt{5}} & -\sqrt{0.5-0.1\sqrt{5}} \\ -0.5\sqrt{2.5-0.5\sqrt{5}} & 0.05\sqrt{5}+0.25 & -0.5-0.1\sqrt{5} \\ 0 & \frac{2\sqrt{5}}{5} & \frac{\sqrt{5}}{5} \end{pmatrix}$
$T2g$	$\begin{pmatrix} -\frac{\sqrt{5}}{5} & 0 & -\frac{2\sqrt{5}}{5} \\ \sqrt{0.1\sqrt{5}+0.5} & 0.25-0.25\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} \\ -0.5+0.1\sqrt{5} & -0.5\sqrt{0.5\sqrt{5}+2.5} & 0.25-0.05\sqrt{5} \end{pmatrix}$
Gg	$\begin{pmatrix} 0 & -\sqrt{0.5-0.1\sqrt{5}} & 0.25+0.25\sqrt{5} & -0.5\sqrt{0.5-0.1\sqrt{5}} \\ 0 & -0.5-0.1\sqrt{5} & -0.5\sqrt{2.5-0.5\sqrt{5}} & -0.25-0.05\sqrt{5} \\ 0.25-0.25\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} & 0 & -\sqrt{0.1\sqrt{5}+0.5} \\ 0.5\sqrt{0.5\sqrt{5}+2.5} & 0.25-0.05\sqrt{5} & 0 & -0.5+0.1\sqrt{5} \end{pmatrix}$
Hg	$\begin{pmatrix} -0.2 & -0.4\sqrt{3} & 0 & 0.4\sqrt{3} & 0 \\ 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.15+0.15\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} & -0.1+0.1\sqrt{5} & -\sqrt{0.1\sqrt{5}+0.5} \\ \sqrt{0.06\sqrt{5}+0.3} & -0.3\sqrt{0.5\sqrt{5}+2.5} & 0.25-0.05\sqrt{5} & -0.2\sqrt{0.5\sqrt{5}+2.5} & -0.5+0.1\sqrt{5} \\ -0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.1\sqrt{5}-0.1 & -\sqrt{0.5-0.1\sqrt{5}} & -0.15\sqrt{5}-0.15 & -0.5\sqrt{0.5-0.1\sqrt{5}} \\ -0.2\sqrt{7.5-1.5\sqrt{5}} & -0.2\sqrt{2.5-0.5\sqrt{5}} & 0.1\sqrt{5}+0.5 & -0.3\sqrt{2.5-0.5\sqrt{5}} & 0.05\sqrt{5}+0.25 \end{pmatrix}$
Au	1
$T1u$	$\begin{pmatrix} 0.25+0.25\sqrt{5} & 0.5\sqrt{0.5-0.1\sqrt{5}} & -\sqrt{0.5-0.1\sqrt{5}} \\ -0.5\sqrt{2.5-0.5\sqrt{5}} & 0.05\sqrt{5}+0.25 & -0.5-0.1\sqrt{5} \\ 0 & \frac{2\sqrt{5}}{5} & \frac{\sqrt{5}}{5} \end{pmatrix}$
$T2u$	$\begin{pmatrix} -\frac{\sqrt{5}}{5} & 0 & -\frac{2\sqrt{5}}{5} \\ \sqrt{0.1\sqrt{5}+0.5} & 0.25-0.25\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} \\ -0.5+0.1\sqrt{5} & -0.5\sqrt{0.5\sqrt{5}+2.5} & 0.25-0.05\sqrt{5} \end{pmatrix}$
Gu	$\begin{pmatrix} 0 & -\sqrt{0.5-0.1\sqrt{5}} & 0.25+0.25\sqrt{5} & -0.5\sqrt{0.5-0.1\sqrt{5}} \\ 0 & -0.5-0.1\sqrt{5} & -0.5\sqrt{2.5-0.5\sqrt{5}} & -0.25-0.05\sqrt{5} \\ 0.25-0.25\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} & 0 & -\sqrt{0.1\sqrt{5}+0.5} \\ 0.5\sqrt{0.5\sqrt{5}+2.5} & 0.25-0.05\sqrt{5} & 0 & -0.5+0.1\sqrt{5} \end{pmatrix}$
Hu	$\begin{pmatrix} -0.2 & -0.4\sqrt{3} & 0 & 0.4\sqrt{3} & 0 \\ 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.15+0.15\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} & -0.1+0.1\sqrt{5} & -\sqrt{0.1\sqrt{5}+0.5} \\ \sqrt{0.06\sqrt{5}+0.3} & -0.3\sqrt{0.5\sqrt{5}+2.5} & 0.25-0.05\sqrt{5} & -0.2\sqrt{0.5\sqrt{5}+2.5} & -0.5+0.1\sqrt{5} \\ -0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.1\sqrt{5}-0.1 & -\sqrt{0.5-0.1\sqrt{5}} & -0.15\sqrt{5}-0.15 & -0.5\sqrt{0.5-0.1\sqrt{5}} \\ -0.2\sqrt{7.5-1.5\sqrt{5}} & -0.2\sqrt{2.5-0.5\sqrt{5}} & 0.1\sqrt{5}+0.5 & -0.3\sqrt{2.5-0.5\sqrt{5}} & 0.05\sqrt{5}+0.25 \end{pmatrix}$

Ih	$\hat{C}_3(0)$

Ag : 1

$T1g$:
$$\begin{pmatrix} 0 & \sqrt{0.5-0.1\sqrt{5}} & \sqrt{0.1\sqrt{5}+0.5} \\ \sqrt{0.1\sqrt{5}+0.5} & \frac{\sqrt{5}}{5} & -0.5+0.1\sqrt{5} \\ -\sqrt{0.5-0.1\sqrt{5}} & 0.1\sqrt{5}+0.5 & -\frac{\sqrt{5}}{5} \end{pmatrix}$$

$T2g$:
$$\begin{pmatrix} \frac{\sqrt{5}}{5} & \sqrt{0.1\sqrt{5}+0.5} & 0.5-0.1\sqrt{5} \\ \sqrt{0.5-0.1\sqrt{5}} & 0 & -\sqrt{0.1\sqrt{5}+0.5} \\ -0.5-0.1\sqrt{5} & \sqrt{0.5-0.1\sqrt{5}} & -\frac{\sqrt{5}}{5} \end{pmatrix}$$

Gg :
$$\begin{pmatrix} 0.5 & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.5 & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} \\ -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & 0.1\sqrt{5} & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -0.5-\frac{\sqrt{5}}{5} \\ -0.5 & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & 0.5 & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} \\ 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & 0.5-\frac{\sqrt{5}}{5} & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.1\sqrt{5} \end{pmatrix}$$

Hg :
$$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.2\sqrt{1.5\sqrt{5}+7.5} & -0.04\sqrt{5}\left(\sqrt{5}+5\right) & \sqrt{0.3-0.06\sqrt{5}} \\ 0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.4 & -0.2\sqrt{0.5\sqrt{5}+2.5} & -0.1+0.3\sqrt{5} & \sqrt{0.1-0.02\sqrt{5}} \\ -0.2\sqrt{7.5-1.5\sqrt{5}} & -0.2\sqrt{2.5-0.5\sqrt{5}} & \frac{\sqrt{5}}{5} & \sqrt{0.1-0.02\sqrt{5}} & 0.1\sqrt{5}+0.5 \\ -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.3\sqrt{5}-0.1 & \sqrt{0.02\sqrt{5}+0.1} & -0.4 & -0.2\sqrt{2.5-0.5\sqrt{5}} \\ -0.2\sqrt{1.5\sqrt{5}+7.5} & -0.2\sqrt{0.5\sqrt{5}+2.5} & -0.5+0.1\sqrt{5} & \sqrt{0.02\sqrt{5}+0.1} & -\frac{\sqrt{5}}{5} \end{pmatrix}$$

Au : 1

$T1u$:
$$\begin{pmatrix} 0 & \sqrt{0.5-0.1\sqrt{5}} & \sqrt{0.1\sqrt{5}+0.5} \\ \sqrt{0.1\sqrt{5}+0.5} & \frac{\sqrt{5}}{5} & -0.5+0.1\sqrt{5} \\ -\sqrt{0.5-0.1\sqrt{5}} & 0.1\sqrt{5}+0.5 & -\frac{\sqrt{5}}{5} \end{pmatrix}$$

$T2u$:
$$\begin{pmatrix} \frac{\sqrt{5}}{5} & \sqrt{0.1\sqrt{5}+0.5} & 0.5-0.1\sqrt{5} \\ \sqrt{0.5-0.1\sqrt{5}} & 0 & -\sqrt{0.1\sqrt{5}+0.5} \\ -0.5-0.1\sqrt{5} & \sqrt{0.5-0.1\sqrt{5}} & -\frac{\sqrt{5}}{5} \end{pmatrix}$$

Gu :
$$\begin{pmatrix} 0.5 & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.5 & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} \\ -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & 0.1\sqrt{5} & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -0.5-\frac{\sqrt{5}}{5} \\ -0.5 & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & 0.5 & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} \\ 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & 0.5-\frac{\sqrt{5}}{5} & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.1\sqrt{5} \end{pmatrix}$$

Hu :
$$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.2\sqrt{1.5\sqrt{5}+7.5} & -0.04\sqrt{5}\left(\sqrt{5}+5\right) & \sqrt{0.3-0.06\sqrt{5}} \\ 0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.4 & -0.2\sqrt{0.5\sqrt{5}+2.5} & -0.1+0.3\sqrt{5} & \sqrt{0.1-0.02\sqrt{5}} \\ -0.2\sqrt{7.5-1.5\sqrt{5}} & -0.2\sqrt{2.5-0.5\sqrt{5}} & \frac{\sqrt{5}}{5} & \sqrt{0.1-0.02\sqrt{5}} & 0.1\sqrt{5}+0.5 \\ -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.3\sqrt{5}-0.1 & \sqrt{0.02\sqrt{5}+0.1} & -0.4 & -0.2\sqrt{2.5-0.5\sqrt{5}} \\ -0.2\sqrt{1.5\sqrt{5}+7.5} & -0.2\sqrt{0.5\sqrt{5}+2.5} & -0.5+0.1\sqrt{5} & \sqrt{0.02\sqrt{5}+0.1} & -\frac{\sqrt{5}}{5} \end{pmatrix}$$

Ih	$\hat{C}_3^2(0)$

Ag $\quad 1$

$T1g$
$$\begin{pmatrix} 0 & \sqrt{0.1\sqrt{5}+0.5} & -\sqrt{0.5-0.1\sqrt{5}} \\ \sqrt{0.5-0.1\sqrt{5}} & \frac{\sqrt{5}}{5} & 0.1\sqrt{5}+0.5 \\ \sqrt{0.1\sqrt{5}+0.5} & -0.5+0.1\sqrt{5} & -\frac{\sqrt{5}}{5} \end{pmatrix}$$

$T2g$
$$\begin{pmatrix} \frac{\sqrt{5}}{5} & \sqrt{0.5-0.1\sqrt{5}} & -0.5-0.1\sqrt{5} \\ \sqrt{0.1\sqrt{5}+0.5} & 0 & \sqrt{0.5-0.1\sqrt{5}} \\ 0.5-0.1\sqrt{5} & -\sqrt{0.1\sqrt{5}+0.5} & -\frac{\sqrt{5}}{5} \end{pmatrix}$$

Gg
$$\begin{pmatrix} 0.5 & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -0.5 & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} \\ -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & 0.1\sqrt{5} & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & 0.5-\frac{\sqrt{5}}{5} \\ -0.5 & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & 0.5 & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} \\ -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -0.5-\frac{\sqrt{5}}{5} & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -0.1\sqrt{5} \end{pmatrix}$$

Hg
$$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.2\sqrt{7.5-1.5\sqrt{5}} & -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.2\sqrt{1.5\sqrt{5}+7.5} \\ 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.4 & -0.2\sqrt{2.5-0.5\sqrt{5}} & -0.3\sqrt{5}-0.1 & -0.2\sqrt{0.5\sqrt{5}+2.5} \\ -0.2\sqrt{1.5\sqrt{5}+7.5} & -0.2\sqrt{0.5\sqrt{5}+2.5} & \frac{\sqrt{5}}{5} & \sqrt{0.02\sqrt{5}+0.1} & -0.5+0.1\sqrt{5} \\ -0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.1+0.3\sqrt{5} & \sqrt{0.1-0.02\sqrt{5}} & -0.4 & \sqrt{0.02\sqrt{5}+0.1} \\ \sqrt{0.3-0.06\sqrt{5}} & \sqrt{0.1-0.02\sqrt{5}} & 0.1\sqrt{5}+0.5 & -0.2\sqrt{2.5-0.5\sqrt{5}} & -\frac{\sqrt{5}}{5} \end{pmatrix}$$

Au $\quad 1$

$T1u$
$$\begin{pmatrix} 0 & \sqrt{0.1\sqrt{5}+0.5} & -\sqrt{0.5-0.1\sqrt{5}} \\ \sqrt{0.5-0.1\sqrt{5}} & \frac{\sqrt{5}}{5} & 0.1\sqrt{5}+0.5 \\ \sqrt{0.1\sqrt{5}+0.5} & -0.5+0.1\sqrt{5} & -\frac{\sqrt{5}}{5} \end{pmatrix}$$

$T2u$
$$\begin{pmatrix} \frac{\sqrt{5}}{5} & \sqrt{0.5-0.1\sqrt{5}} & -0.5-0.1\sqrt{5} \\ \sqrt{0.1\sqrt{5}+0.5} & 0 & \sqrt{0.5-0.1\sqrt{5}} \\ 0.5-0.1\sqrt{5} & -\sqrt{0.1\sqrt{5}+0.5} & -\frac{\sqrt{5}}{5} \end{pmatrix}$$

Gu
$$\begin{pmatrix} 0.5 & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -0.5 & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} \\ -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & 0.1\sqrt{5} & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & 0.5-\frac{\sqrt{5}}{5} \\ -0.5 & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & 0.5 & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} \\ -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -0.5-\frac{\sqrt{5}}{5} & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -0.1\sqrt{5} \end{pmatrix}$$

Hu
$$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.2\sqrt{7.5-1.5\sqrt{5}} & -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.2\sqrt{1.5\sqrt{5}+7.5} \\ 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.4 & -0.2\sqrt{2.5-0.5\sqrt{5}} & -0.3\sqrt{5}-0.1 & -0.2\sqrt{0.5\sqrt{5}+2.5} \\ -0.2\sqrt{1.5\sqrt{5}+7.5} & -0.2\sqrt{0.5\sqrt{5}+2.5} & \frac{\sqrt{5}}{5} & \sqrt{0.02\sqrt{5}+0.1} & -0.5+0.1\sqrt{5} \\ -0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.1+0.3\sqrt{5} & \sqrt{0.1-0.02\sqrt{5}} & -0.4 & \sqrt{0.02\sqrt{5}+0.1} \\ \sqrt{0.3-0.06\sqrt{5}} & \sqrt{0.1-0.02\sqrt{5}} & 0.1\sqrt{5}+0.5 & -0.2\sqrt{2.5-0.5\sqrt{5}} & -\frac{\sqrt{5}}{5} \end{pmatrix}$$

Ih	$\hat{C}_3(1)$

Ag : 1

$T1g$:
$$\begin{pmatrix} 0 & \sqrt{0.1\sqrt{5}+0.5} & -\sqrt{0.5-0.1\sqrt{5}} \\ -\sqrt{0.5-0.1\sqrt{5}} & -\frac{\sqrt{5}}{5} & -0.5-0.1\sqrt{5} \\ -\sqrt{0.1\sqrt{5}+0.5} & 0.5-0.1\sqrt{5} & \frac{\sqrt{5}}{5} \end{pmatrix}$$

$T2g$:
$$\begin{pmatrix} -\frac{\sqrt{5}}{5} & -\sqrt{0.5-0.1\sqrt{5}} & 0.1\sqrt{5}+0.5 \\ \sqrt{0.1\sqrt{5}+0.5} & 0 & \sqrt{0.5-0.1\sqrt{5}} \\ -0.5+0.1\sqrt{5} & \sqrt{0.1\sqrt{5}+0.5} & \frac{\sqrt{5}}{5} \end{pmatrix}$$

Gg :
$$\begin{pmatrix} 0.5 & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -0.5 & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} \\ 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.1\sqrt{5} & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.5+\frac{\sqrt{5}}{5} \\ -0.5 & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & 0.5 & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} \\ 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & \frac{\sqrt{5}}{5}+0.5 & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & 0.1\sqrt{5} \end{pmatrix}$$

Hg :
$$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.2\sqrt{7.5-1.5\sqrt{5}} & -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.2\sqrt{1.5\sqrt{5}+7.5} \\ 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.4 & -0.2\sqrt{2.5-0.5\sqrt{5}} & -0.3\sqrt{5}-0.1 & -0.2\sqrt{0.5\sqrt{5}+2.5} \\ \sqrt{0.06\sqrt{5}+0.3} & \sqrt{0.02\sqrt{5}+0.1} & -\frac{\sqrt{5}}{5} & -0.2\sqrt{0.5\sqrt{5}+2.5} & 0.5-0.1\sqrt{5} \\ -0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.1+0.3\sqrt{5} & \sqrt{0.1-0.02\sqrt{5}} & -0.4 & \sqrt{0.02\sqrt{5}+0.1} \\ -0.2\sqrt{7.5-1.5\sqrt{5}} & -0.2\sqrt{2.5-0.5\sqrt{5}} & -0.5-0.1\sqrt{5} & \sqrt{0.1-0.02\sqrt{5}} & \frac{\sqrt{5}}{5} \end{pmatrix}$$

Au : 1

$T1u$:
$$\begin{pmatrix} 0 & \sqrt{0.1\sqrt{5}+0.5} & -\sqrt{0.5-0.1\sqrt{5}} \\ -\sqrt{0.5-0.1\sqrt{5}} & -\frac{\sqrt{5}}{5} & -0.5-0.1\sqrt{5} \\ -\sqrt{0.1\sqrt{5}+0.5} & 0.5-0.1\sqrt{5} & \frac{\sqrt{5}}{5} \end{pmatrix}$$

$T2u$:
$$\begin{pmatrix} -\frac{\sqrt{5}}{5} & -\sqrt{0.5-0.1\sqrt{5}} & 0.1\sqrt{5}+0.5 \\ \sqrt{0.1\sqrt{5}+0.5} & 0 & \sqrt{0.5-0.1\sqrt{5}} \\ -0.5+0.1\sqrt{5} & \sqrt{0.1\sqrt{5}+0.5} & \frac{\sqrt{5}}{5} \end{pmatrix}$$

Gu :
$$\begin{pmatrix} 0.5 & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -0.5 & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} \\ 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.1\sqrt{5} & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.5+\frac{\sqrt{5}}{5} \\ -0.5 & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & 0.5 & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} \\ 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & \frac{\sqrt{5}}{5}+0.5 & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & 0.1\sqrt{5} \end{pmatrix}$$

Hu :
$$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.2\sqrt{7.5-1.5\sqrt{5}} & -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.2\sqrt{1.5\sqrt{5}+7.5} \\ 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.4 & -0.2\sqrt{2.5-0.5\sqrt{5}} & -0.3\sqrt{5}-0.1 & -0.2\sqrt{0.5\sqrt{5}+2.5} \\ \sqrt{0.06\sqrt{5}+0.3} & \sqrt{0.02\sqrt{5}+0.1} & -\frac{\sqrt{5}}{5} & -0.2\sqrt{0.5\sqrt{5}+2.5} & 0.5-0.1\sqrt{5} \\ -0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.1+0.3\sqrt{5} & \sqrt{0.1-0.02\sqrt{5}} & -0.4 & \sqrt{0.02\sqrt{5}+0.1} \\ -0.2\sqrt{7.5-1.5\sqrt{5}} & -0.2\sqrt{2.5-0.5\sqrt{5}} & -0.5-0.1\sqrt{5} & \sqrt{0.1-0.02\sqrt{5}} & \frac{\sqrt{5}}{5} \end{pmatrix}$$

Ih	$\hat{C}_3^2(1)$
Ag	1
$T1g$	$\begin{pmatrix} 0 & -\sqrt{0.5 - 0.1\sqrt{5}} & -\sqrt{0.1\sqrt{5} + 0.5} \\ \sqrt{0.1\sqrt{5} + 0.5} & -\frac{\sqrt{5}}{5} & 0.5 - 0.1\sqrt{5} \\ -\sqrt{0.5 - 0.1\sqrt{5}} & -0.5 - 0.1\sqrt{5} & \frac{\sqrt{5}}{5} \end{pmatrix}$
$T2g$	$\begin{pmatrix} -\frac{\sqrt{5}}{5} & \sqrt{0.1\sqrt{5} + 0.5} & -0.5 + 0.1\sqrt{5} \\ -\sqrt{0.5 - 0.1\sqrt{5}} & 0 & \sqrt{0.1\sqrt{5} + 0.5} \\ 0.1\sqrt{5} + 0.5 & \sqrt{0.5 - 0.1\sqrt{5}} & \frac{\sqrt{5}}{5} \end{pmatrix}$
Gg	$\begin{pmatrix} 0.5 & 0.5\sqrt{\frac{2\sqrt{5}}{5} + 1} & -0.5 & 0.5\sqrt{1 - \frac{2\sqrt{5}}{5}} \\ -0.5\sqrt{1 - \frac{2\sqrt{5}}{5}} & -0.1\sqrt{5} & -0.5\sqrt{1 - \frac{2\sqrt{5}}{5}} & \frac{\sqrt{5}}{5} + 0.5 \\ -0.5 & 0.5\sqrt{\frac{2\sqrt{5}}{5} + 1} & 0.5 & 0.5\sqrt{1 - \frac{2\sqrt{5}}{5}} \\ 0.5\sqrt{\frac{2\sqrt{5}}{5} + 1} & -0.5 + \frac{\sqrt{5}}{5} & 0.5\sqrt{\frac{2\sqrt{5}}{5} + 1} & 0.1\sqrt{5} \end{pmatrix}$
Hg	$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(-5 + \sqrt{5}\right) & \sqrt{0.06\sqrt{5} + 0.3} & -0.04\sqrt{5}\left(\sqrt{5} + 5\right) & -0.2\sqrt{7.5 - 1.5\sqrt{5}} \\ 0.04\sqrt{5}\left(\sqrt{5} + 5\right) & -0.4 & \sqrt{0.02\sqrt{5} + 0.1} & -0.1 + 0.3\sqrt{5} & -0.2\sqrt{2.5 - 0.5\sqrt{5}} \\ -0.2\sqrt{7.5 - 1.5\sqrt{5}} & -0.2\sqrt{2.5 - 0.5\sqrt{5}} & -\frac{\sqrt{5}}{5} & \sqrt{0.1 - 0.02\sqrt{5}} & -0.5 - 0.1\sqrt{5} \\ -0.04\sqrt{5}\left(-5 + \sqrt{5}\right) & -0.3\sqrt{5} - 0.1 & -0.2\sqrt{0.5\sqrt{5} + 2.5} & -0.4 & \sqrt{0.1 - 0.02\sqrt{5}} \\ -0.2\sqrt{1.5\sqrt{5} + 7.5} & -0.2\sqrt{0.5\sqrt{5} + 2.5} & 0.5 - 0.1\sqrt{5} & \sqrt{0.02\sqrt{5} + 0.1} & \frac{\sqrt{5}}{5} \end{pmatrix}$
Au	1
$T1u$	$\begin{pmatrix} 0 & -\sqrt{0.5 - 0.1\sqrt{5}} & -\sqrt{0.1\sqrt{5} + 0.5} \\ \sqrt{0.1\sqrt{5} + 0.5} & -\frac{\sqrt{5}}{5} & 0.5 - 0.1\sqrt{5} \\ -\sqrt{0.5 - 0.1\sqrt{5}} & -0.5 - 0.1\sqrt{5} & \frac{\sqrt{5}}{5} \end{pmatrix}$
$T2u$	$\begin{pmatrix} -\frac{\sqrt{5}}{5} & \sqrt{0.1\sqrt{5} + 0.5} & -0.5 + 0.1\sqrt{5} \\ -\sqrt{0.5 - 0.1\sqrt{5}} & 0 & \sqrt{0.1\sqrt{5} + 0.5} \\ 0.1\sqrt{5} + 0.5 & \sqrt{0.5 - 0.1\sqrt{5}} & \frac{\sqrt{5}}{5} \end{pmatrix}$
Gu	$\begin{pmatrix} 0.5 & 0.5\sqrt{\frac{2\sqrt{5}}{5} + 1} & -0.5 & 0.5\sqrt{1 - \frac{2\sqrt{5}}{5}} \\ -0.5\sqrt{1 - \frac{2\sqrt{5}}{5}} & -0.1\sqrt{5} & -0.5\sqrt{1 - \frac{2\sqrt{5}}{5}} & \frac{\sqrt{5}}{5} + 0.5 \\ -0.5 & 0.5\sqrt{\frac{2\sqrt{5}}{5} + 1} & 0.5 & 0.5\sqrt{1 - \frac{2\sqrt{5}}{5}} \\ 0.5\sqrt{\frac{2\sqrt{5}}{5} + 1} & -0.5 + \frac{\sqrt{5}}{5} & 0.5\sqrt{\frac{2\sqrt{5}}{5} + 1} & 0.1\sqrt{5} \end{pmatrix}$
Hu	$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(-5 + \sqrt{5}\right) & \sqrt{0.06\sqrt{5} + 0.3} & -0.04\sqrt{5}\left(\sqrt{5} + 5\right) & -0.2\sqrt{7.5 - 1.5\sqrt{5}} \\ 0.04\sqrt{5}\left(\sqrt{5} + 5\right) & -0.4 & \sqrt{0.02\sqrt{5} + 0.1} & -0.1 + 0.3\sqrt{5} & -0.2\sqrt{2.5 - 0.5\sqrt{5}} \\ -0.2\sqrt{7.5 - 1.5\sqrt{5}} & -0.2\sqrt{2.5 - 0.5\sqrt{5}} & -\frac{\sqrt{5}}{5} & \sqrt{0.1 - 0.02\sqrt{5}} & -0.5 - 0.1\sqrt{5} \\ -0.04\sqrt{5}\left(-5 + \sqrt{5}\right) & -0.3\sqrt{5} - 0.1 & -0.2\sqrt{0.5\sqrt{5} + 2.5} & -0.4 & \sqrt{0.1 - 0.02\sqrt{5}} \\ -0.2\sqrt{1.5\sqrt{5} + 7.5} & -0.2\sqrt{0.5\sqrt{5} + 2.5} & 0.5 - 0.1\sqrt{5} & \sqrt{0.02\sqrt{5} + 0.1} & \frac{\sqrt{5}}{5} \end{pmatrix}$

Ih	$\hat{C}_3(2)$
Ag	1
$T1g$	$\begin{pmatrix} 0 & -\sqrt{0.1\sqrt{5}+0.5} & \sqrt{0.5-0.1\sqrt{5}} \\ \sqrt{0.5-0.1\sqrt{5}} & -\frac{\sqrt{5}}{5} & -0.5-0.1\sqrt{5} \\ \sqrt{0.1\sqrt{5}+0.5} & 0.5-0.1\sqrt{5} & \frac{\sqrt{5}}{5} \end{pmatrix}$
$T2g$	$\begin{pmatrix} -\frac{\sqrt{5}}{5} & \sqrt{0.5-0.1\sqrt{5}} & 0.1\sqrt{5}+0.5 \\ -\sqrt{0.1\sqrt{5}+0.5} & 0 & -\sqrt{0.5-0.1\sqrt{5}} \\ -0.5+0.1\sqrt{5} & -\sqrt{0.1\sqrt{5}+0.5} & \frac{\sqrt{5}}{5} \end{pmatrix}$
Gg	$\begin{pmatrix} 0.5 & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -0.5 & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} \\ -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.1\sqrt{5} & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.5+\frac{\sqrt{5}}{5} \\ -0.5 & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & 0.5 & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} \\ -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & \frac{\sqrt{5}}{5}+0.5 & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & 0.1\sqrt{5} \end{pmatrix}$
Hg	$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(\sqrt{5}+5\right) & \sqrt{0.3-0.06\sqrt{5}} & -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & \sqrt{0.06\sqrt{5}+0.3} \\ 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.4 & \sqrt{0.1-0.02\sqrt{5}} & -0.3\sqrt{5}-0.1 & \sqrt{0.02\sqrt{5}+0.1} \\ -0.2\sqrt{1.5\sqrt{5}+7.5} & -0.2\sqrt{0.5\sqrt{5}+2.5} & -\frac{\sqrt{5}}{5} & \sqrt{0.02\sqrt{5}+0.1} & 0.5-0.1\sqrt{5} \\ -0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.1+0.3\sqrt{5} & -0.2\sqrt{2.5-0.5\sqrt{5}} & -0.4 & -0.2\sqrt{0.5\sqrt{5}+2.5} \\ \sqrt{0.3-0.06\sqrt{5}} & \sqrt{0.1-0.02\sqrt{5}} & -0.5-0.1\sqrt{5} & -0.2\sqrt{2.5-0.5\sqrt{5}} & \frac{\sqrt{5}}{5} \end{pmatrix}$
Au	1
$T1u$	$\begin{pmatrix} 0 & -\sqrt{0.1\sqrt{5}+0.5} & \sqrt{0.5-0.1\sqrt{5}} \\ \sqrt{0.5-0.1\sqrt{5}} & -\frac{\sqrt{5}}{5} & -0.5-0.1\sqrt{5} \\ \sqrt{0.1\sqrt{5}+0.5} & 0.5-0.1\sqrt{5} & \frac{\sqrt{5}}{5} \end{pmatrix}$
$T2u$	$\begin{pmatrix} -\frac{\sqrt{5}}{5} & \sqrt{0.5-0.1\sqrt{5}} & 0.1\sqrt{5}+0.5 \\ -\sqrt{0.1\sqrt{5}+0.5} & 0 & -\sqrt{0.5-0.1\sqrt{5}} \\ -0.5+0.1\sqrt{5} & -\sqrt{0.1\sqrt{5}+0.5} & \frac{\sqrt{5}}{5} \end{pmatrix}$
Gu	$\begin{pmatrix} 0.5 & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -0.5 & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} \\ -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.1\sqrt{5} & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.5+\frac{\sqrt{5}}{5} \\ -0.5 & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & 0.5 & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} \\ -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & \frac{\sqrt{5}}{5}+0.5 & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & 0.1\sqrt{5} \end{pmatrix}$
Hu	$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(\sqrt{5}+5\right) & \sqrt{0.3-0.06\sqrt{5}} & -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & \sqrt{0.06\sqrt{5}+0.3} \\ 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.4 & \sqrt{0.1-0.02\sqrt{5}} & -0.3\sqrt{5}-0.1 & \sqrt{0.02\sqrt{5}+0.1} \\ -0.2\sqrt{1.5\sqrt{5}+7.5} & -0.2\sqrt{0.5\sqrt{5}+2.5} & -\frac{\sqrt{5}}{5} & \sqrt{0.02\sqrt{5}+0.1} & 0.5-0.1\sqrt{5} \\ -0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.1+0.3\sqrt{5} & -0.2\sqrt{2.5-0.5\sqrt{5}} & -0.4 & -0.2\sqrt{0.5\sqrt{5}+2.5} \\ \sqrt{0.3-0.06\sqrt{5}} & \sqrt{0.1-0.02\sqrt{5}} & -0.5-0.1\sqrt{5} & -0.2\sqrt{2.5-0.5\sqrt{5}} & \frac{\sqrt{5}}{5} \end{pmatrix}$

Ih	$\hat{C}_3^2(2)$
Ag	1
$T1g$	$\begin{pmatrix} 0 & \sqrt{0.5-0.1\sqrt{5}} & \sqrt{0.1\sqrt{5}+0.5} \\ -\sqrt{0.1\sqrt{5}+0.5} & -\frac{\sqrt{5}}{5} & 0.5-0.1\sqrt{5} \\ \sqrt{0.5-0.1\sqrt{5}} & -0.5-0.1\sqrt{5} & \frac{\sqrt{5}}{5} \end{pmatrix}$
$T2g$	$\begin{pmatrix} -\frac{\sqrt{5}}{5} & -\sqrt{0.1\sqrt{5}+0.5} & -0.5+0.1\sqrt{5} \\ \sqrt{0.5-0.1\sqrt{5}} & 0 & -\sqrt{0.1\sqrt{5}+0.5} \\ 0.1\sqrt{5}+0.5 & -\sqrt{0.5-0.1\sqrt{5}} & \frac{\sqrt{5}}{5} \end{pmatrix}$
Gg	$\begin{pmatrix} 0.5 & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.5 & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} \\ 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -0.1\sqrt{5} & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & \frac{\sqrt{5}}{5}+0.5 \\ -0.5 & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & 0.5 & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} \\ -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.5+\frac{\sqrt{5}}{5} & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & 0.1\sqrt{5} \end{pmatrix}$
Hg	$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.2\sqrt{1.5\sqrt{5}+7.5} & -0.04\sqrt{5}\left(\sqrt{5}+5\right) & \sqrt{0.3-0.06\sqrt{5}} \\ 0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.4 & -0.2\sqrt{0.5\sqrt{5}+2.5} & -0.1+0.3\sqrt{5} & \sqrt{0.1-0.02\sqrt{5}} \\ \sqrt{0.3-0.06\sqrt{5}} & \sqrt{0.1-0.02\sqrt{5}} & -\frac{\sqrt{5}}{5} & -0.2\sqrt{2.5-0.5\sqrt{5}} & -0.5-0.1\sqrt{5} \\ -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.3\sqrt{5}-0.1 & \sqrt{0.02\sqrt{5}+0.1} & -0.4 & -0.2\sqrt{2.5-0.5\sqrt{5}} \\ \sqrt{0.06\sqrt{5}+0.3} & \sqrt{0.02\sqrt{5}+0.1} & 0.5-0.1\sqrt{5} & -0.2\sqrt{0.5\sqrt{5}+2.5} & \frac{\sqrt{5}}{5} \end{pmatrix}$
Au	1
$T1u$	$\begin{pmatrix} 0 & \sqrt{0.5-0.1\sqrt{5}} & \sqrt{0.1\sqrt{5}+0.5} \\ -\sqrt{0.1\sqrt{5}+0.5} & -\frac{\sqrt{5}}{5} & 0.5-0.1\sqrt{5} \\ \sqrt{0.5-0.1\sqrt{5}} & -0.5-0.1\sqrt{5} & \frac{\sqrt{5}}{5} \end{pmatrix}$
$T2u$	$\begin{pmatrix} -\frac{\sqrt{5}}{5} & -\sqrt{0.1\sqrt{5}+0.5} & -0.5+0.1\sqrt{5} \\ \sqrt{0.5-0.1\sqrt{5}} & 0 & -\sqrt{0.1\sqrt{5}+0.5} \\ 0.1\sqrt{5}+0.5 & -\sqrt{0.5-0.1\sqrt{5}} & \frac{\sqrt{5}}{5} \end{pmatrix}$
Gu	$\begin{pmatrix} 0.5 & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.5 & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} \\ 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -0.1\sqrt{5} & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & \frac{\sqrt{5}}{5}+0.5 \\ -0.5 & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & 0.5 & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} \\ -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.5+\frac{\sqrt{5}}{5} & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & 0.1\sqrt{5} \end{pmatrix}$
Hu	$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.2\sqrt{1.5\sqrt{5}+7.5} & -0.04\sqrt{5}\left(\sqrt{5}+5\right) & \sqrt{0.3-0.06\sqrt{5}} \\ 0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.4 & -0.2\sqrt{0.5\sqrt{5}+2.5} & -0.1+0.3\sqrt{5} & \sqrt{0.1-0.02\sqrt{5}} \\ \sqrt{0.3-0.06\sqrt{5}} & \sqrt{0.1-0.02\sqrt{5}} & -\frac{\sqrt{5}}{5} & -0.2\sqrt{2.5-0.5\sqrt{5}} & -0.5-0.1\sqrt{5} \\ -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.3\sqrt{5}-0.1 & \sqrt{0.02\sqrt{5}+0.1} & -0.4 & -0.2\sqrt{2.5-0.5\sqrt{5}} \\ \sqrt{0.06\sqrt{5}+0.3} & \sqrt{0.02\sqrt{5}+0.1} & 0.5-0.1\sqrt{5} & -0.2\sqrt{0.5\sqrt{5}+2.5} & \frac{\sqrt{5}}{5} \end{pmatrix}$

Ih	$\hat{C}_3(3)$
Ag	1

$T1g$
$$\begin{pmatrix} 0 & -\sqrt{0.1\sqrt{5}+0.5} & \sqrt{0.5-0.1\sqrt{5}} \\ -\sqrt{0.5-0.1\sqrt{5}} & \frac{\sqrt{5}}{5} & 0.1\sqrt{5}+0.5 \\ -\sqrt{0.1\sqrt{5}+0.5} & -0.5+0.1\sqrt{5} & -\frac{\sqrt{5}}{5} \end{pmatrix}$$

$T2g$
$$\begin{pmatrix} \frac{\sqrt{5}}{5} & -\sqrt{0.5-0.1\sqrt{5}} & -0.5-0.1\sqrt{5} \\ -\sqrt{0.1\sqrt{5}+0.5} & 0 & -\sqrt{0.5-0.1\sqrt{5}} \\ 0.5-0.1\sqrt{5} & \sqrt{0.1\sqrt{5}+0.5} & -\frac{\sqrt{5}}{5} \end{pmatrix}$$

Gg
$$\begin{pmatrix} 0.5 & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -0.5 & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} \\ 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & 0.1\sqrt{5} & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & 0.5-\frac{\sqrt{5}}{5} \\ -0.5 & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & 0.5 & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} \\ 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -0.5-\frac{\sqrt{5}}{5} & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -0.1\sqrt{5} \end{pmatrix}$$

Hg
$$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(\sqrt{5}+5\right) & \sqrt{0.3-0.06\sqrt{5}} & -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & \sqrt{0.06\sqrt{5}+0.3} \\ 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.4 & \sqrt{0.1-0.02\sqrt{5}} & -0.3\sqrt{5}-0.1 & \sqrt{0.02\sqrt{5}+0.1} \\ \sqrt{0.06\sqrt{5}+0.3} & \sqrt{0.02\sqrt{5}+0.1} & \frac{\sqrt{5}}{5} & -0.2\sqrt{0.5\sqrt{5}+2.5} & -0.5+0.1\sqrt{5} \\ -0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.1+0.3\sqrt{5} & -0.2\sqrt{2.5-0.5\sqrt{5}} & -0.4 & -0.2\sqrt{0.5\sqrt{5}+2.5} \\ -0.2\sqrt{7.5-1.5\sqrt{5}} & -0.2\sqrt{2.5-0.5\sqrt{5}} & 0.1\sqrt{5}+0.5 & \sqrt{0.1-0.02\sqrt{5}} & -\frac{\sqrt{5}}{5} \end{pmatrix}$$

Au	1

$T1u$
$$\begin{pmatrix} 0 & -\sqrt{0.1\sqrt{5}+0.5} & \sqrt{0.5-0.1\sqrt{5}} \\ -\sqrt{0.5-0.1\sqrt{5}} & \frac{\sqrt{5}}{5} & 0.1\sqrt{5}+0.5 \\ -\sqrt{0.1\sqrt{5}+0.5} & -0.5+0.1\sqrt{5} & -\frac{\sqrt{5}}{5} \end{pmatrix}$$

$T2u$
$$\begin{pmatrix} \frac{\sqrt{5}}{5} & -\sqrt{0.5-0.1\sqrt{5}} & -0.5-0.1\sqrt{5} \\ -\sqrt{0.1\sqrt{5}+0.5} & 0 & -\sqrt{0.5-0.1\sqrt{5}} \\ 0.5-0.1\sqrt{5} & \sqrt{0.1\sqrt{5}+0.5} & -\frac{\sqrt{5}}{5} \end{pmatrix}$$

Gu
$$\begin{pmatrix} 0.5 & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -0.5 & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} \\ 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & 0.1\sqrt{5} & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & 0.5-\frac{\sqrt{5}}{5} \\ -0.5 & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & 0.5 & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} \\ 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -0.5-\frac{\sqrt{5}}{5} & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -0.1\sqrt{5} \end{pmatrix}$$

Hu
$$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(\sqrt{5}+5\right) & \sqrt{0.3-0.06\sqrt{5}} & -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & \sqrt{0.06\sqrt{5}+0.3} \\ 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.4 & \sqrt{0.1-0.02\sqrt{5}} & -0.3\sqrt{5}-0.1 & \sqrt{0.02\sqrt{5}+0.1} \\ \sqrt{0.06\sqrt{5}+0.3} & \sqrt{0.02\sqrt{5}+0.1} & \frac{\sqrt{5}}{5} & -0.2\sqrt{0.5\sqrt{5}+2.5} & -0.5+0.1\sqrt{5} \\ -0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.1+0.3\sqrt{5} & -0.2\sqrt{2.5-0.5\sqrt{5}} & -0.4 & -0.2\sqrt{0.5\sqrt{5}+2.5} \\ -0.2\sqrt{7.5-1.5\sqrt{5}} & -0.2\sqrt{2.5-0.5\sqrt{5}} & 0.1\sqrt{5}+0.5 & \sqrt{0.1-0.02\sqrt{5}} & -\frac{\sqrt{5}}{5} \end{pmatrix}$$

Ih	$\hat{C}_3^2(3)$

Ag

$$1$$

$T1g$

$$\begin{pmatrix} 0 & -\sqrt{0.5-0.1\sqrt{5}} & -\sqrt{0.1\sqrt{5}+0.5} \\ -\sqrt{0.1\sqrt{5}+0.5} & \frac{\sqrt{5}}{5} & -0.5+0.1\sqrt{5} \\ \sqrt{0.5-0.1\sqrt{5}} & 0.1\sqrt{5}+0.5 & -\frac{\sqrt{5}}{5} \end{pmatrix}$$

$T2g$

$$\begin{pmatrix} \frac{\sqrt{5}}{5} & -\sqrt{0.1\sqrt{5}+0.5} & 0.5-0.1\sqrt{5} \\ -\sqrt{0.5-0.1\sqrt{5}} & 0 & \sqrt{0.1\sqrt{5}+0.5} \\ -0.5-0.1\sqrt{5} & -\sqrt{0.5-0.1\sqrt{5}} & -\frac{\sqrt{5}}{5} \end{pmatrix}$$

Gg

$$\begin{pmatrix} 0.5 & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.5 & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} \\ 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & 0.1\sqrt{5} & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -0.5-\frac{\sqrt{5}}{5} \\ -0.5 & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & 0.5 & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} \\ -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & 0.5-\frac{\sqrt{5}}{5} & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.1\sqrt{5} \end{pmatrix}$$

Hg

$$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & \sqrt{0.06\sqrt{5}+0.3} & -0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.2\sqrt{7.5-1.5\sqrt{5}} \\ 0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.4 & \sqrt{0.02\sqrt{5}+0.1} & -0.1+0.3\sqrt{5} & -0.2\sqrt{2.5-0.5\sqrt{5}} \\ \sqrt{0.3-0.06\sqrt{5}} & \sqrt{0.1-0.02\sqrt{5}} & \frac{\sqrt{5}}{5} & -0.2\sqrt{2.5-0.5\sqrt{5}} & 0.1\sqrt{5}+0.5 \\ -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.3\sqrt{5}-0.1 & -0.2\sqrt{0.5\sqrt{5}+2.5} & -0.4 & \sqrt{0.1-0.02\sqrt{5}} \\ \sqrt{0.06\sqrt{5}+0.3} & \sqrt{0.02\sqrt{5}+0.1} & -0.5+0.1\sqrt{5} & -0.2\sqrt{0.5\sqrt{5}+2.5} & -\frac{\sqrt{5}}{5} \end{pmatrix}$$

Au

$$1$$

$T1u$

$$\begin{pmatrix} 0 & -\sqrt{0.5-0.1\sqrt{5}} & -\sqrt{0.1\sqrt{5}+0.5} \\ -\sqrt{0.1\sqrt{5}+0.5} & \frac{\sqrt{5}}{5} & -0.5+0.1\sqrt{5} \\ \sqrt{0.5-0.1\sqrt{5}} & 0.1\sqrt{5}+0.5 & -\frac{\sqrt{5}}{5} \end{pmatrix}$$

$T2u$

$$\begin{pmatrix} \frac{\sqrt{5}}{5} & -\sqrt{0.1\sqrt{5}+0.5} & 0.5-0.1\sqrt{5} \\ -\sqrt{0.5-0.1\sqrt{5}} & 0 & \sqrt{0.1\sqrt{5}+0.5} \\ -0.5-0.1\sqrt{5} & -\sqrt{0.5-0.1\sqrt{5}} & -\frac{\sqrt{5}}{5} \end{pmatrix}$$

Gu

$$\begin{pmatrix} 0.5 & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.5 & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} \\ 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & 0.1\sqrt{5} & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -0.5-\frac{\sqrt{5}}{5} \\ -0.5 & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & 0.5 & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} \\ -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & 0.5-\frac{\sqrt{5}}{5} & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.1\sqrt{5} \end{pmatrix}$$

Hu

$$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & \sqrt{0.06\sqrt{5}+0.3} & -0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.2\sqrt{7.5-1.5\sqrt{5}} \\ 0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.4 & \sqrt{0.02\sqrt{5}+0.1} & -0.1+0.3\sqrt{5} & -0.2\sqrt{2.5-0.5\sqrt{5}} \\ \sqrt{0.3-0.06\sqrt{5}} & \sqrt{0.1-0.02\sqrt{5}} & \frac{\sqrt{5}}{5} & -0.2\sqrt{2.5-0.5\sqrt{5}} & 0.1\sqrt{5}+0.5 \\ -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.3\sqrt{5}-0.1 & -0.2\sqrt{0.5\sqrt{5}+2.5} & -0.4 & \sqrt{0.1-0.02\sqrt{5}} \\ \sqrt{0.06\sqrt{5}+0.3} & \sqrt{0.02\sqrt{5}+0.1} & -0.5+0.1\sqrt{5} & -0.2\sqrt{0.5\sqrt{5}+2.5} & -\frac{\sqrt{5}}{5} \end{pmatrix}$$

Ih	$\hat{C}_3(4)$
Ag	1
$T1g$	$\begin{pmatrix} -0.5 & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & \sqrt{0.1\sqrt{5}+0.5} \\ -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & \frac{\sqrt{5}}{5}+0.5 & -0.5+0.1\sqrt{5} \\ -\sqrt{0.1\sqrt{5}+0.5} & -0.5+0.1\sqrt{5} & -\frac{\sqrt{5}}{5} \end{pmatrix}$
$T2g$	$\begin{pmatrix} \frac{\sqrt{5}}{5} & -\sqrt{0.5-0.1\sqrt{5}} & -0.5-0.1\sqrt{5} \\ \sqrt{0.5-0.1\sqrt{5}} & -0.5 & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} \\ -0.5-0.1\sqrt{5} & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & 0.5-\frac{\sqrt{5}}{5} \end{pmatrix}$
Gg	$\begin{pmatrix} 0.25+0.25\sqrt{5} & 0.5\sqrt{0.5-0.1\sqrt{5}} & 0.5 & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} \\ -0.5\sqrt{0.5-0.1\sqrt{5}} & 0.25-0.15\sqrt{5} & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & 0.3\sqrt{5} \\ 0.5 & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & 0.25-0.25\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} \\ 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & 0.3\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} & 0.25+0.15\sqrt{5} \end{pmatrix}$
Hg	$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(\sqrt{5}+5\right) & \sqrt{0.3-0.06\sqrt{5}} & -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & \sqrt{0.06\sqrt{5}+0.3} \\ 0.04\sqrt{5}\left(\sqrt{5}+5\right) & 0.1+\frac{\sqrt{5}}{5} & 0.1\sqrt{5-2\sqrt{5}} & 0.4 & -0.2\sqrt{10-2\sqrt{5}} \\ -0.2\sqrt{7.5-1.5\sqrt{5}} & -0.1\sqrt{5-2\sqrt{5}} & -0.5 & \sqrt{0.08\sqrt{5}+0.4} & 0 \\ -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & 0.4 & -0.2\sqrt{2\sqrt{5}+10} & 0.1-\frac{\sqrt{5}}{5} & 0.1\sqrt{2\sqrt{5}+5} \\ -0.2\sqrt{1.5\sqrt{5}+7.5} & \sqrt{0.4-0.08\sqrt{5}} & 0 & -0.1\sqrt{2\sqrt{5}+5} & -0.5 \end{pmatrix}$
Au	1
$T1u$	$\begin{pmatrix} -0.5 & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & \sqrt{0.1\sqrt{5}+0.5} \\ -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & \frac{\sqrt{5}}{5}+0.5 & -0.5+0.1\sqrt{5} \\ -\sqrt{0.1\sqrt{5}+0.5} & -0.5+0.1\sqrt{5} & -\frac{\sqrt{5}}{5} \end{pmatrix}$
$T2u$	$\begin{pmatrix} \frac{\sqrt{5}}{5} & -\sqrt{0.5-0.1\sqrt{5}} & -0.5-0.1\sqrt{5} \\ \sqrt{0.5-0.1\sqrt{5}} & -0.5 & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} \\ -0.5-0.1\sqrt{5} & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & 0.5-\frac{\sqrt{5}}{5} \end{pmatrix}$
Gu	$\begin{pmatrix} 0.25+0.25\sqrt{5} & 0.5\sqrt{0.5-0.1\sqrt{5}} & 0.5 & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} \\ -0.5\sqrt{0.5-0.1\sqrt{5}} & 0.25-0.15\sqrt{5} & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & 0.3\sqrt{5} \\ 0.5 & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & 0.25-0.25\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} \\ 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & 0.3\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} & 0.25+0.15\sqrt{5} \end{pmatrix}$
Hu	$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(\sqrt{5}+5\right) & \sqrt{0.3-0.06\sqrt{5}} & -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & \sqrt{0.06\sqrt{5}+0.3} \\ 0.04\sqrt{5}\left(\sqrt{5}+5\right) & 0.1+\frac{\sqrt{5}}{5} & 0.1\sqrt{5-2\sqrt{5}} & 0.4 & -0.2\sqrt{10-2\sqrt{5}} \\ -0.2\sqrt{7.5-1.5\sqrt{5}} & -0.1\sqrt{5-2\sqrt{5}} & -0.5 & \sqrt{0.08\sqrt{5}+0.4} & 0 \\ -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & 0.4 & -0.2\sqrt{2\sqrt{5}+10} & 0.1-\frac{\sqrt{5}}{5} & 0.1\sqrt{2\sqrt{5}+5} \\ -0.2\sqrt{1.5\sqrt{5}+7.5} & \sqrt{0.4-0.08\sqrt{5}} & 0 & -0.1\sqrt{2\sqrt{5}+5} & -0.5 \end{pmatrix}$

Ih	$\hat{C}_3^2(4)$
Ag	1
$T1g$	$\begin{pmatrix} -0.5 & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -\sqrt{0.1\sqrt{5}+0.5} \\ 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & \frac{\sqrt{5}}{5}+0.5 & -0.5+0.1\sqrt{5} \\ \sqrt{0.1\sqrt{5}+0.5} & -0.5+0.1\sqrt{5} & -\frac{\sqrt{5}}{5} \end{pmatrix}$
$T2g$	$\begin{pmatrix} \frac{\sqrt{5}}{5} & \sqrt{0.5-0.1\sqrt{5}} & -0.5-0.1\sqrt{5} \\ -\sqrt{0.5-0.1\sqrt{5}} & -0.5 & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} \\ -0.5-0.1\sqrt{5} & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & 0.5-\frac{\sqrt{5}}{5} \end{pmatrix}$
Gg	$\begin{pmatrix} 0.25+0.25\sqrt{5} & -0.5\sqrt{0.5-0.1\sqrt{5}} & 0.5 & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} \\ 0.5\sqrt{0.5-0.1\sqrt{5}} & 0.25-0.15\sqrt{5} & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & 0.3\sqrt{5} \\ 0.5 & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & 0.25-0.25\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} \\ -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & 0.3\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} & 0.25+0.15\sqrt{5} \end{pmatrix}$
Hg	$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.2\sqrt{7.5-1.5\sqrt{5}} & -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.2\sqrt{1.5\sqrt{5}+7.5} \\ 0.04\sqrt{5}\left(\sqrt{5}+5\right) & 0.1+\frac{\sqrt{5}}{5} & -0.1\sqrt{5-2\sqrt{5}} & 0.4 & \sqrt{0.4-0.08\sqrt{5}} \\ \sqrt{0.3-0.06\sqrt{5}} & 0.1\sqrt{5-2\sqrt{5}} & -0.5 & -0.2\sqrt{2\sqrt{5}+10} & 0 \\ -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & 0.4 & \sqrt{0.08\sqrt{5}+0.4} & 0.1-\frac{\sqrt{5}}{5} & -0.1\sqrt{2\sqrt{5}+5} \\ \sqrt{0.06\sqrt{5}+0.3} & -0.2\sqrt{10-2\sqrt{5}} & 0 & 0.1\sqrt{2\sqrt{5}+5} & -0.5 \end{pmatrix}$
Au	1
$T1u$	$\begin{pmatrix} -0.5 & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -\sqrt{0.1\sqrt{5}+0.5} \\ 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & \frac{\sqrt{5}}{5}+0.5 & -0.5+0.1\sqrt{5} \\ \sqrt{0.1\sqrt{5}+0.5} & -0.5+0.1\sqrt{5} & -\frac{\sqrt{5}}{5} \end{pmatrix}$
$T2u$	$\begin{pmatrix} \frac{\sqrt{5}}{5} & \sqrt{0.5-0.1\sqrt{5}} & -0.5-0.1\sqrt{5} \\ -\sqrt{0.5-0.1\sqrt{5}} & -0.5 & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} \\ -0.5-0.1\sqrt{5} & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & 0.5-\frac{\sqrt{5}}{5} \end{pmatrix}$
Gu	$\begin{pmatrix} 0.25+0.25\sqrt{5} & -0.5\sqrt{0.5-0.1\sqrt{5}} & 0.5 & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} \\ 0.5\sqrt{0.5-0.1\sqrt{5}} & 0.25-0.15\sqrt{5} & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & 0.3\sqrt{5} \\ 0.5 & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & 0.25-0.25\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} \\ -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & 0.3\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} & 0.25+0.15\sqrt{5} \end{pmatrix}$
Hu	$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.2\sqrt{7.5-1.5\sqrt{5}} & -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.2\sqrt{1.5\sqrt{5}+7.5} \\ 0.04\sqrt{5}\left(\sqrt{5}+5\right) & 0.1+\frac{\sqrt{5}}{5} & -0.1\sqrt{5-2\sqrt{5}} & 0.4 & \sqrt{0.4-0.08\sqrt{5}} \\ \sqrt{0.3-0.06\sqrt{5}} & 0.1\sqrt{5-2\sqrt{5}} & -0.5 & -0.2\sqrt{2\sqrt{5}+10} & 0 \\ -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & 0.4 & \sqrt{0.08\sqrt{5}+0.4} & 0.1-\frac{\sqrt{5}}{5} & -0.1\sqrt{2\sqrt{5}+5} \\ \sqrt{0.06\sqrt{5}+0.3} & -0.2\sqrt{10-2\sqrt{5}} & 0 & 0.1\sqrt{2\sqrt{5}+5} & -0.5 \end{pmatrix}$

Ih	$\hat{C}_3(5)$

Ag: 1

$T1g$:
$$\begin{pmatrix} -0.5 & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & \sqrt{0.5-0.1\sqrt{5}} \\ -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & 0.5-\frac{\sqrt{5}}{5} & -0.5-0.1\sqrt{5} \\ -\sqrt{0.5-0.1\sqrt{5}} & -0.5-0.1\sqrt{5} & \frac{\sqrt{5}}{5} \end{pmatrix}$$

$T2g$:
$$\begin{pmatrix} -\frac{\sqrt{5}}{5} & \sqrt{0.1\sqrt{5}+0.5} & -0.5+0.1\sqrt{5} \\ -\sqrt{0.1\sqrt{5}+0.5} & -0.5 & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} \\ -0.5+0.1\sqrt{5} & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & \frac{\sqrt{5}}{5}+0.5 \end{pmatrix}$$

Gg:
$$\begin{pmatrix} 0.25-0.25\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} & 0.5 & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} \\ 0.5\sqrt{0.1\sqrt{5}+0.5} & 0.25+0.15\sqrt{5} & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -0.3\sqrt{5} \\ 0.5 & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & 0.25+0.25\sqrt{5} & 0.5\sqrt{0.5-0.1\sqrt{5}} \\ 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.3\sqrt{5} & -0.5\sqrt{0.5-0.1\sqrt{5}} & 0.25-0.15\sqrt{5} \end{pmatrix}$$

Hg:
$$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & \sqrt{0.06\sqrt{5}+0.3} & -0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.2\sqrt{7.5-1.5\sqrt{5}} \\ 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & 0.1-\frac{\sqrt{5}}{5} & -0.1\sqrt{2\sqrt{5}+5} & 0.4 & -0.2\sqrt{2\sqrt{5}+10} \\ -0.2\sqrt{1.5\sqrt{5}+7.5} & 0.1\sqrt{2\sqrt{5}+5} & -0.5 & -0.2\sqrt{10-2\sqrt{5}} & 0 \\ -0.04\sqrt{5}\left(\sqrt{5}+5\right) & 0.4 & \sqrt{0.4-0.08\sqrt{5}} & 0.1+\frac{\sqrt{5}}{5} & 0.1\sqrt{5-2\sqrt{5}} \\ \sqrt{0.3-0.06\sqrt{5}} & \sqrt{0.08\sqrt{5}+0.4} & 0 & -0.1\sqrt{5-2\sqrt{5}} & -0.5 \end{pmatrix}$$

Au: 1

$T1u$:
$$\begin{pmatrix} -0.5 & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & \sqrt{0.5-0.1\sqrt{5}} \\ -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & 0.5-\frac{\sqrt{5}}{5} & -0.5-0.1\sqrt{5} \\ -\sqrt{0.5-0.1\sqrt{5}} & -0.5-0.1\sqrt{5} & \frac{\sqrt{5}}{5} \end{pmatrix}$$

$T2u$:
$$\begin{pmatrix} -\frac{\sqrt{5}}{5} & \sqrt{0.1\sqrt{5}+0.5} & -0.5+0.1\sqrt{5} \\ -\sqrt{0.1\sqrt{5}+0.5} & -0.5 & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} \\ -0.5+0.1\sqrt{5} & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & \frac{\sqrt{5}}{5}+0.5 \end{pmatrix}$$

Gu:
$$\begin{pmatrix} 0.25-0.25\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} & 0.5 & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} \\ 0.5\sqrt{0.1\sqrt{5}+0.5} & 0.25+0.15\sqrt{5} & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -0.3\sqrt{5} \\ 0.5 & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & 0.25+0.25\sqrt{5} & 0.5\sqrt{0.5-0.1\sqrt{5}} \\ 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.3\sqrt{5} & -0.5\sqrt{0.5-0.1\sqrt{5}} & 0.25-0.15\sqrt{5} \end{pmatrix}$$

Hu:
$$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & \sqrt{0.06\sqrt{5}+0.3} & -0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.2\sqrt{7.5-1.5\sqrt{5}} \\ 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & 0.1-\frac{\sqrt{5}}{5} & -0.1\sqrt{2\sqrt{5}+5} & 0.4 & -0.2\sqrt{2\sqrt{5}+10} \\ -0.2\sqrt{1.5\sqrt{5}+7.5} & 0.1\sqrt{2\sqrt{5}+5} & -0.5 & -0.2\sqrt{10-2\sqrt{5}} & 0 \\ -0.04\sqrt{5}\left(\sqrt{5}+5\right) & 0.4 & \sqrt{0.4-0.08\sqrt{5}} & 0.1+\frac{\sqrt{5}}{5} & 0.1\sqrt{5-2\sqrt{5}} \\ \sqrt{0.3-0.06\sqrt{5}} & \sqrt{0.08\sqrt{5}+0.4} & 0 & -0.1\sqrt{5-2\sqrt{5}} & -0.5 \end{pmatrix}$$

Ih	$\hat{C}_3^2(5)$
Ag	1
$T1g$	$\begin{pmatrix} -0.5 & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -\sqrt{0.5-0.1\sqrt{5}} \\ 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & 0.5-\frac{\sqrt{5}}{5} & -0.5-0.1\sqrt{5} \\ \sqrt{0.5-0.1\sqrt{5}} & -0.5-0.1\sqrt{5} & \frac{\sqrt{5}}{5} \end{pmatrix}$
$T2g$	$\begin{pmatrix} -\frac{\sqrt{5}}{5} & -\sqrt{0.1\sqrt{5}+0.5} & -0.5+0.1\sqrt{5} \\ \sqrt{0.1\sqrt{5}+0.5} & -0.5 & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} \\ -0.5+0.1\sqrt{5} & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & \frac{\sqrt{5}}{5}+0.5 \end{pmatrix}$
Gg	$\begin{pmatrix} 0.25-0.25\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} & 0.5 & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} \\ -0.5\sqrt{0.1\sqrt{5}+0.5} & 0.25+0.15\sqrt{5} & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -0.3\sqrt{5} \\ 0.5 & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & 0.25+0.25\sqrt{5} & -0.5\sqrt{0.5-0.1\sqrt{5}} \\ -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.3\sqrt{5} & 0.5\sqrt{0.5-0.1\sqrt{5}} & 0.25-0.15\sqrt{5} \end{pmatrix}$
Hg	$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.2\sqrt{1.5\sqrt{5}+7.5} & -0.04\sqrt{5}\left(\sqrt{5}+5\right) & \sqrt{0.3-0.06\sqrt{5}} \\ 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & 0.1-\frac{\sqrt{5}}{5} & 0.1\sqrt{2\sqrt{5}+5} & 0.4 & \sqrt{0.08\sqrt{5}+0.4} \\ \sqrt{0.06\sqrt{5}+0.3} & -0.1\sqrt{2\sqrt{5}+5} & -0.5 & \sqrt{0.4-0.08\sqrt{5}} & 0 \\ -0.04\sqrt{5}\left(\sqrt{5}+5\right) & 0.4 & -0.2\sqrt{10-2\sqrt{5}} & 0.1+\frac{\sqrt{5}}{5} & -0.1\sqrt{5-2\sqrt{5}} \\ -0.2\sqrt{7.5-1.5\sqrt{5}} & -0.2\sqrt{2\sqrt{5}+10} & 0 & 0.1\sqrt{5-2\sqrt{5}} & -0.5 \end{pmatrix}$
Au	1
$T1u$	$\begin{pmatrix} -0.5 & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -\sqrt{0.5-0.1\sqrt{5}} \\ 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & 0.5-\frac{\sqrt{5}}{5} & -0.5-0.1\sqrt{5} \\ \sqrt{0.5-0.1\sqrt{5}} & -0.5-0.1\sqrt{5} & \frac{\sqrt{5}}{5} \end{pmatrix}$
$T2u$	$\begin{pmatrix} -\frac{\sqrt{5}}{5} & -\sqrt{0.1\sqrt{5}+0.5} & -0.5+0.1\sqrt{5} \\ \sqrt{0.1\sqrt{5}+0.5} & -0.5 & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} \\ -0.5+0.1\sqrt{5} & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & \frac{\sqrt{5}}{5}+0.5 \end{pmatrix}$
Gu	$\begin{pmatrix} 0.25-0.25\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} & 0.5 & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} \\ -0.5\sqrt{0.1\sqrt{5}+0.5} & 0.25+0.15\sqrt{5} & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -0.3\sqrt{5} \\ 0.5 & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & 0.25+0.25\sqrt{5} & -0.5\sqrt{0.5-0.1\sqrt{5}} \\ -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.3\sqrt{5} & 0.5\sqrt{0.5-0.1\sqrt{5}} & 0.25-0.15\sqrt{5} \end{pmatrix}$
Hu	$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.2\sqrt{1.5\sqrt{5}+7.5} & -0.04\sqrt{5}\left(\sqrt{5}+5\right) & \sqrt{0.3-0.06\sqrt{5}} \\ 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & 0.1-\frac{\sqrt{5}}{5} & 0.1\sqrt{2\sqrt{5}+5} & 0.4 & \sqrt{0.08\sqrt{5}+0.4} \\ \sqrt{0.06\sqrt{5}+0.3} & -0.1\sqrt{2\sqrt{5}+5} & -0.5 & \sqrt{0.4-0.08\sqrt{5}} & 0 \\ -0.04\sqrt{5}\left(\sqrt{5}+5\right) & 0.4 & -0.2\sqrt{10-2\sqrt{5}} & 0.1+\frac{\sqrt{5}}{5} & -0.1\sqrt{5-2\sqrt{5}} \\ -0.2\sqrt{7.5-1.5\sqrt{5}} & -0.2\sqrt{2\sqrt{5}+10} & 0 & 0.1\sqrt{5-2\sqrt{5}} & -0.5 \end{pmatrix}$

Ih	$\hat{C}_3(6)$
Ag	1
$T1g$	$\begin{pmatrix} 0.25 - 0.25\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} & \sqrt{0.1\sqrt{5}+0.5} \\ 0.5\sqrt{0.5\sqrt{5}+2.5} & -0.25+0.05\sqrt{5} & 0.5-0.1\sqrt{5} \\ 0 & \frac{2\sqrt{5}}{5} & \frac{\sqrt{5}}{5} \end{pmatrix}$
$T2g$	$\begin{pmatrix} -\frac{\sqrt{5}}{5} & 0 & -\frac{2\sqrt{5}}{5} \\ \sqrt{0.5-0.1\sqrt{5}} & 0.25+0.25\sqrt{5} & -0.5\sqrt{0.5-0.1\sqrt{5}} \\ 0.1\sqrt{5}+0.5 & -0.5\sqrt{2.5-0.5\sqrt{5}} & -0.25-0.05\sqrt{5} \end{pmatrix}$
Gg	$\begin{pmatrix} 0 & \sqrt{0.1\sqrt{5}+0.5} & 0.25-0.25\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} \\ 0 & 0.5-0.1\sqrt{5} & 0.5\sqrt{0.5\sqrt{5}+2.5} & 0.25-0.05\sqrt{5} \\ 0.25+0.25\sqrt{5} & 0.5\sqrt{0.5-0.1\sqrt{5}} & 0 & -\sqrt{0.5-0.1\sqrt{5}} \\ 0.5\sqrt{2.5-0.5\sqrt{5}} & -0.25-0.05\sqrt{5} & 0 & 0.1\sqrt{5}+0.5 \end{pmatrix}$
Hg	$\begin{pmatrix} -0.2 & -0.4\sqrt{3} & 0 & 0.4\sqrt{3} & 0 \\ 0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.15\sqrt{5}-0.15 & 0.5\sqrt{0.5-0.1\sqrt{5}} & -0.1\sqrt{5}-0.1 & -\sqrt{0.5-0.1\sqrt{5}} \\ \sqrt{0.3-0.06\sqrt{5}} & -0.3\sqrt{2.5-0.5\sqrt{5}} & -0.25-0.05\sqrt{5} & -0.2\sqrt{2.5-0.5\sqrt{5}} & 0.1\sqrt{5}+0.5 \\ -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.1+0.1\sqrt{5} & \sqrt{0.1\sqrt{5}+0.5} & -0.15+0.15\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} \\ \sqrt{0.06\sqrt{5}+0.3} & \sqrt{0.02\sqrt{5}+0.1} & -0.5+0.1\sqrt{5} & 0.3\sqrt{0.5\sqrt{5}+2.5} & -0.25+0.05\sqrt{5} \end{pmatrix}$
Au	1
$T1u$	$\begin{pmatrix} 0.25 - 0.25\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} & \sqrt{0.1\sqrt{5}+0.5} \\ 0.5\sqrt{0.5\sqrt{5}+2.5} & -0.25+0.05\sqrt{5} & 0.5-0.1\sqrt{5} \\ 0 & \frac{2\sqrt{5}}{5} & \frac{\sqrt{5}}{5} \end{pmatrix}$
$T2u$	$\begin{pmatrix} -\frac{\sqrt{5}}{5} & 0 & -\frac{2\sqrt{5}}{5} \\ \sqrt{0.5-0.1\sqrt{5}} & 0.25+0.25\sqrt{5} & -0.5\sqrt{0.5-0.1\sqrt{5}} \\ 0.1\sqrt{5}+0.5 & -0.5\sqrt{2.5-0.5\sqrt{5}} & -0.25-0.05\sqrt{5} \end{pmatrix}$
Gu	$\begin{pmatrix} 0 & \sqrt{0.1\sqrt{5}+0.5} & 0.25-0.25\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} \\ 0 & 0.5-0.1\sqrt{5} & 0.5\sqrt{0.5\sqrt{5}+2.5} & 0.25-0.05\sqrt{5} \\ 0.25+0.25\sqrt{5} & 0.5\sqrt{0.5-0.1\sqrt{5}} & 0 & -\sqrt{0.5-0.1\sqrt{5}} \\ 0.5\sqrt{2.5-0.5\sqrt{5}} & -0.25-0.05\sqrt{5} & 0 & 0.1\sqrt{5}+0.5 \end{pmatrix}$
Hu	$\begin{pmatrix} -0.2 & -0.4\sqrt{3} & 0 & 0.4\sqrt{3} & 0 \\ 0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.15\sqrt{5}-0.15 & 0.5\sqrt{0.5-0.1\sqrt{5}} & -0.1\sqrt{5}-0.1 & -\sqrt{0.5-0.1\sqrt{5}} \\ \sqrt{0.3-0.06\sqrt{5}} & -0.3\sqrt{2.5-0.5\sqrt{5}} & -0.25-0.05\sqrt{5} & -0.2\sqrt{2.5-0.5\sqrt{5}} & 0.1\sqrt{5}+0.5 \\ -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.1+0.1\sqrt{5} & \sqrt{0.1\sqrt{5}+0.5} & -0.15+0.15\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} \\ \sqrt{0.06\sqrt{5}+0.3} & \sqrt{0.02\sqrt{5}+0.1} & -0.5+0.1\sqrt{5} & 0.3\sqrt{0.5\sqrt{5}+2.5} & -0.25+0.05\sqrt{5} \end{pmatrix}$

I_h	$\hat{C}_3^2(6)$
A_g	1
$T1_g$	$\begin{pmatrix} 0.25 - 0.25\sqrt{5} & 0.5\sqrt{0.5\sqrt{5}+2.5} & 0 \\ -0.5\sqrt{0.1\sqrt{5}+0.5} & -0.25+0.05\sqrt{5} & \frac{2\sqrt{5}}{5} \\ \sqrt{0.1\sqrt{5}+0.5} & 0.5-0.1\sqrt{5} & \frac{\sqrt{5}}{5} \end{pmatrix}$
$T2_g$	$\begin{pmatrix} -\frac{\sqrt{5}}{5} & \sqrt{0.5-0.1\sqrt{5}} & 0.1\sqrt{5}+0.5 \\ 0 & 0.25+0.25\sqrt{5} & -0.5\sqrt{2.5-0.5\sqrt{5}} \\ -\frac{2\sqrt{5}}{5} & -0.5\sqrt{0.5-0.1\sqrt{5}} & -0.25-0.05\sqrt{5} \end{pmatrix}$
G_g	$\begin{pmatrix} 0 & 0 & 0.25+0.25\sqrt{5} & 0.5\sqrt{2.5-0.5\sqrt{5}} \\ \sqrt{0.1\sqrt{5}+0.5} & 0.5-0.1\sqrt{5} & 0.5\sqrt{0.5-0.1\sqrt{5}} & -0.25-0.05\sqrt{5} \\ 0.25-0.25\sqrt{5} & 0.5\sqrt{0.5\sqrt{5}+2.5} & 0 & 0 \\ 0.5\sqrt{0.1\sqrt{5}+0.5} & 0.25-0.05\sqrt{5} & -\sqrt{0.5-0.1\sqrt{5}} & 0.1\sqrt{5}+0.5 \end{pmatrix}$
H_g	$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(\sqrt{5}+5\right) & \sqrt{0.3-0.06\sqrt{5}} & -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & \sqrt{0.06\sqrt{5}+0.3} \\ -0.4\sqrt{3} & -0.15\sqrt{5}-0.15 & -0.3\sqrt{2.5-0.5\sqrt{5}} & -0.1+0.1\sqrt{5} & \sqrt{0.02\sqrt{5}+0.1} \\ 0 & 0.5\sqrt{0.5-0.1\sqrt{5}} & -0.25-0.05\sqrt{5} & \sqrt{0.1\sqrt{5}+0.5} & -0.5+0.1\sqrt{5} \\ 0.4\sqrt{3} & -0.1\sqrt{5}-0.1 & -0.2\sqrt{2.5-0.5\sqrt{5}} & -0.15+0.15\sqrt{5} & 0.3\sqrt{0.5\sqrt{5}+2.5} \\ 0 & -\sqrt{0.5-0.1\sqrt{5}} & 0.1\sqrt{5}+0.5 & 0.5\sqrt{0.1\sqrt{5}+0.5} & -0.25+0.05\sqrt{5} \end{pmatrix}$
A_u	1
$T1_u$	$\begin{pmatrix} 0.25 - 0.25\sqrt{5} & 0.5\sqrt{0.5\sqrt{5}+2.5} & 0 \\ -0.5\sqrt{0.1\sqrt{5}+0.5} & -0.25+0.05\sqrt{5} & \frac{2\sqrt{5}}{5} \\ \sqrt{0.1\sqrt{5}+0.5} & 0.5-0.1\sqrt{5} & \frac{\sqrt{5}}{5} \end{pmatrix}$
$T2_u$	$\begin{pmatrix} -\frac{\sqrt{5}}{5} & \sqrt{0.5-0.1\sqrt{5}} & 0.1\sqrt{5}+0.5 \\ 0 & 0.25+0.25\sqrt{5} & -0.5\sqrt{2.5-0.5\sqrt{5}} \\ -\frac{2\sqrt{5}}{5} & -0.5\sqrt{0.5-0.1\sqrt{5}} & -0.25-0.05\sqrt{5} \end{pmatrix}$
G_u	$\begin{pmatrix} 0 & 0 & 0.25+0.25\sqrt{5} & 0.5\sqrt{2.5-0.5\sqrt{5}} \\ \sqrt{0.1\sqrt{5}+0.5} & 0.5-0.1\sqrt{5} & 0.5\sqrt{0.5-0.1\sqrt{5}} & -0.25-0.05\sqrt{5} \\ 0.25-0.25\sqrt{5} & 0.5\sqrt{0.5\sqrt{5}+2.5} & 0 & 0 \\ 0.5\sqrt{0.1\sqrt{5}+0.5} & 0.25-0.05\sqrt{5} & -\sqrt{0.5-0.1\sqrt{5}} & 0.1\sqrt{5}+0.5 \end{pmatrix}$
H_u	$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(\sqrt{5}+5\right) & \sqrt{0.3-0.06\sqrt{5}} & -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & \sqrt{0.06\sqrt{5}+0.3} \\ -0.4\sqrt{3} & -0.15\sqrt{5}-0.15 & -0.3\sqrt{2.5-0.5\sqrt{5}} & -0.1+0.1\sqrt{5} & \sqrt{0.02\sqrt{5}+0.1} \\ 0 & 0.5\sqrt{0.5-0.1\sqrt{5}} & -0.25-0.05\sqrt{5} & \sqrt{0.1\sqrt{5}+0.5} & -0.5+0.1\sqrt{5} \\ 0.4\sqrt{3} & -0.1\sqrt{5}-0.1 & -0.2\sqrt{2.5-0.5\sqrt{5}} & -0.15+0.15\sqrt{5} & 0.3\sqrt{0.5\sqrt{5}+2.5} \\ 0 & -\sqrt{0.5-0.1\sqrt{5}} & 0.1\sqrt{5}+0.5 & 0.5\sqrt{0.1\sqrt{5}+0.5} & -0.25+0.05\sqrt{5} \end{pmatrix}$

Ih	$\hat{C}_3(7)$
Ag	1
$T1g$	$\begin{pmatrix} 0.25 - 0.25\sqrt{5} & -0.5\sqrt{0.5\sqrt{5}+2.5} & 0 \\ 0.5\sqrt{0.1\sqrt{5}+0.5} & -0.25+0.05\sqrt{5} & \frac{2\sqrt{5}}{5} \\ -\sqrt{0.1\sqrt{5}+0.5} & 0.5-0.1\sqrt{5} & \frac{\sqrt{5}}{5} \end{pmatrix}$
$T2g$	$\begin{pmatrix} -\frac{\sqrt{5}}{5} & -\sqrt{0.5-0.1\sqrt{5}} & 0.1\sqrt{5}+0.5 \\ 0 & 0.25+0.25\sqrt{5} & 0.5\sqrt{2.5-0.5\sqrt{5}} \\ -\frac{2\sqrt{5}}{5} & 0.5\sqrt{0.5-0.1\sqrt{5}} & -0.25-0.05\sqrt{5} \end{pmatrix}$
Gg	$\begin{pmatrix} 0 & 0 & 0.25+0.25\sqrt{5} & -0.5\sqrt{2.5-0.5\sqrt{5}} \\ -\sqrt{0.1\sqrt{5}+0.5} & 0.5-0.1\sqrt{5} & -0.5\sqrt{0.5-0.1\sqrt{5}} & -0.25-0.05\sqrt{5} \\ 0.25-0.25\sqrt{5} & -0.5\sqrt{0.5\sqrt{5}+2.5} & 0 & 0 \\ -0.5\sqrt{0.1\sqrt{5}+0.5} & 0.25-0.05\sqrt{5} & \sqrt{0.5-0.1\sqrt{5}} & 0.1\sqrt{5}+0.5 \end{pmatrix}$
Hg	$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.2\sqrt{7.5-1.5\sqrt{5}} & -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.2\sqrt{1.5\sqrt{5}+7.5} \\ -0.4\sqrt{3} & -0.15\sqrt{5}-0.15 & 0.3\sqrt{2.5-0.5\sqrt{5}} & -0.1+0.1\sqrt{5} & -0.2\sqrt{0.5\sqrt{5}+2.5} \\ 0 & -0.5\sqrt{0.5-0.1\sqrt{5}} & -0.25-0.05\sqrt{5} & -\sqrt{0.1\sqrt{5}+0.5} & -0.5+0.1\sqrt{5} \\ 0.4\sqrt{3} & -0.1\sqrt{5}-0.1 & \sqrt{0.1-0.02\sqrt{5}} & -0.15+0.15\sqrt{5} & -0.3\sqrt{0.5\sqrt{5}+2.5} \\ 0 & \sqrt{0.5-0.1\sqrt{5}} & 0.1\sqrt{5}+0.5 & -0.5\sqrt{0.1\sqrt{5}+0.5} & -0.25+0.05\sqrt{5} \end{pmatrix}$
Au	1
$T1u$	$\begin{pmatrix} 0.25 - 0.25\sqrt{5} & -0.5\sqrt{0.5\sqrt{5}+2.5} & 0 \\ 0.5\sqrt{0.1\sqrt{5}+0.5} & -0.25+0.05\sqrt{5} & \frac{2\sqrt{5}}{5} \\ -\sqrt{0.1\sqrt{5}+0.5} & 0.5-0.1\sqrt{5} & \frac{\sqrt{5}}{5} \end{pmatrix}$
$T2u$	$\begin{pmatrix} -\frac{\sqrt{5}}{5} & -\sqrt{0.5-0.1\sqrt{5}} & 0.1\sqrt{5}+0.5 \\ 0 & 0.25+0.25\sqrt{5} & 0.5\sqrt{2.5-0.5\sqrt{5}} \\ -\frac{2\sqrt{5}}{5} & 0.5\sqrt{0.5-0.1\sqrt{5}} & -0.25-0.05\sqrt{5} \end{pmatrix}$
Gu	$\begin{pmatrix} 0 & 0 & 0.25+0.25\sqrt{5} & -0.5\sqrt{2.5-0.5\sqrt{5}} \\ -\sqrt{0.1\sqrt{5}+0.5} & 0.5-0.1\sqrt{5} & -0.5\sqrt{0.5-0.1\sqrt{5}} & -0.25-0.05\sqrt{5} \\ 0.25-0.25\sqrt{5} & -0.5\sqrt{0.5\sqrt{5}+2.5} & 0 & 0 \\ -0.5\sqrt{0.1\sqrt{5}+0.5} & 0.25-0.05\sqrt{5} & \sqrt{0.5-0.1\sqrt{5}} & 0.1\sqrt{5}+0.5 \end{pmatrix}$
Hu	$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.2\sqrt{7.5-1.5\sqrt{5}} & -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.2\sqrt{1.5\sqrt{5}+7.5} \\ -0.4\sqrt{3} & -0.15\sqrt{5}-0.15 & 0.3\sqrt{2.5-0.5\sqrt{5}} & -0.1+0.1\sqrt{5} & -0.2\sqrt{0.5\sqrt{5}+2.5} \\ 0 & -0.5\sqrt{0.5-0.1\sqrt{5}} & -0.25-0.05\sqrt{5} & -\sqrt{0.1\sqrt{5}+0.5} & -0.5+0.1\sqrt{5} \\ 0.4\sqrt{3} & -0.1\sqrt{5}-0.1 & \sqrt{0.1-0.02\sqrt{5}} & -0.15+0.15\sqrt{5} & -0.3\sqrt{0.5\sqrt{5}+2.5} \\ 0 & \sqrt{0.5-0.1\sqrt{5}} & 0.1\sqrt{5}+0.5 & -0.5\sqrt{0.1\sqrt{5}+0.5} & -0.25+0.05\sqrt{5} \end{pmatrix}$

Ih	$\hat{C}_3^2(7)$
Ag	1
$T1g$	$\begin{pmatrix} 0.25-0.25\sqrt5 & 0.5\sqrt{0.1\sqrt5+0.5} & -\sqrt{0.1\sqrt5+0.5} \\ -0.5\sqrt{0.5\sqrt5+2.5} & -0.25+0.05\sqrt5 & 0.5-0.1\sqrt5 \\ 0 & \frac{2\sqrt5}{5} & \frac{\sqrt5}{5} \end{pmatrix}$
$T2g$	$\begin{pmatrix} -\frac{\sqrt5}{5} & 0 & -\frac{2\sqrt5}{5} \\ -\sqrt{0.5-0.1\sqrt5} & 0.25+0.25\sqrt5 & 0.5\sqrt{0.5-0.1\sqrt5} \\ 0.1\sqrt5+0.5 & 0.5\sqrt{2.5-0.5\sqrt5} & -0.25-0.05\sqrt5 \end{pmatrix}$
Gg	$\begin{pmatrix} 0 & -\sqrt{0.1\sqrt5+0.5} & 0.25-0.25\sqrt5 & -0.5\sqrt{0.1\sqrt5+0.5} \\ 0 & 0.5-0.1\sqrt5 & -0.5\sqrt{0.5\sqrt5+2.5} & 0.25-0.05\sqrt5 \\ 0.25+0.25\sqrt5 & -0.5\sqrt{0.5-0.1\sqrt5} & 0 & \sqrt{0.5-0.1\sqrt5} \\ -0.5\sqrt{2.5-0.5\sqrt5} & -0.25-0.05\sqrt5 & 0 & 0.1\sqrt5+0.5 \end{pmatrix}$
Hg	$\begin{pmatrix} -0.2 & -0.4\sqrt3 & 0 & 0.4\sqrt3 & 0 \\ 0.04\sqrt5\left(\sqrt5+5\right) & -0.15\sqrt5-0.15 & -0.5\sqrt{0.5-0.1\sqrt5} & -0.1\sqrt5-0.1 & \sqrt{0.5-0.1\sqrt5} \\ -0.2\sqrt{7.5-1.5\sqrt5} & 0.3\sqrt{2.5-0.5\sqrt5} & -0.25-0.05\sqrt5 & \sqrt{0.1-0.02\sqrt5} & 0.1\sqrt5+0.5 \\ -0.04\sqrt5\left(-5+\sqrt5\right) & -0.1+0.1\sqrt5 & -\sqrt{0.1\sqrt5+0.5} & -0.15+0.15\sqrt5 & -0.5\sqrt{0.1\sqrt5+0.5} \\ -0.2\sqrt{1.5\sqrt5+7.5} & -0.2\sqrt{0.5\sqrt5+2.5} & -0.5+0.1\sqrt5 & -0.3\sqrt{0.5\sqrt5+2.5} & -0.25+0.05\sqrt5 \end{pmatrix}$
Au	1
$T1u$	$\begin{pmatrix} 0.25-0.25\sqrt5 & 0.5\sqrt{0.1\sqrt5+0.5} & -\sqrt{0.1\sqrt5+0.5} \\ -0.5\sqrt{0.5\sqrt5+2.5} & -0.25+0.05\sqrt5 & 0.5-0.1\sqrt5 \\ 0 & \frac{2\sqrt5}{5} & \frac{\sqrt5}{5} \end{pmatrix}$
$T2u$	$\begin{pmatrix} -\frac{\sqrt5}{5} & 0 & -\frac{2\sqrt5}{5} \\ -\sqrt{0.5-0.1\sqrt5} & 0.25+0.25\sqrt5 & 0.5\sqrt{0.5-0.1\sqrt5} \\ 0.1\sqrt5+0.5 & 0.5\sqrt{2.5-0.5\sqrt5} & -0.25-0.05\sqrt5 \end{pmatrix}$
Gu	$\begin{pmatrix} 0 & -\sqrt{0.1\sqrt5+0.5} & 0.25-0.25\sqrt5 & -0.5\sqrt{0.1\sqrt5+0.5} \\ 0 & 0.5-0.1\sqrt5 & -0.5\sqrt{0.5\sqrt5+2.5} & 0.25-0.05\sqrt5 \\ 0.25+0.25\sqrt5 & -0.5\sqrt{0.5-0.1\sqrt5} & 0 & \sqrt{0.5-0.1\sqrt5} \\ -0.5\sqrt{2.5-0.5\sqrt5} & -0.25-0.05\sqrt5 & 0 & 0.1\sqrt5+0.5 \end{pmatrix}$
Hu	$\begin{pmatrix} -0.2 & -0.4\sqrt3 & 0 & 0.4\sqrt3 & 0 \\ 0.04\sqrt5\left(\sqrt5+5\right) & -0.15\sqrt5-0.15 & -0.5\sqrt{0.5-0.1\sqrt5} & -0.1\sqrt5-0.1 & \sqrt{0.5-0.1\sqrt5} \\ -0.2\sqrt{7.5-1.5\sqrt5} & 0.3\sqrt{2.5-0.5\sqrt5} & -0.25-0.05\sqrt5 & \sqrt{0.1-0.02\sqrt5} & 0.1\sqrt5+0.5 \\ -0.04\sqrt5\left(-5+\sqrt5\right) & -0.1+0.1\sqrt5 & -\sqrt{0.1\sqrt5+0.5} & -0.15+0.15\sqrt5 & -0.5\sqrt{0.1\sqrt5+0.5} \\ -0.2\sqrt{1.5\sqrt5+7.5} & -0.2\sqrt{0.5\sqrt5+2.5} & -0.5+0.1\sqrt5 & -0.3\sqrt{0.5\sqrt5+2.5} & -0.25+0.05\sqrt5 \end{pmatrix}$

Ih	$\hat{C}_3(8)$
Ag	1
$T1g$	$\begin{pmatrix} 0.25 + 0.25\sqrt{5} & 0.5\sqrt{2.5 - 0.5\sqrt{5}} & 0 \\ 0.5\sqrt{0.5 - 0.1\sqrt{5}} & -0.25 - 0.05\sqrt{5} & -\frac{2\sqrt{5}}{5} \\ -\sqrt{0.5 - 0.1\sqrt{5}} & 0.1\sqrt{5} + 0.5 & -\frac{\sqrt{5}}{5} \end{pmatrix}$
$T2g$	$\begin{pmatrix} \frac{\sqrt{5}}{5} & \sqrt{0.1\sqrt{5} + 0.5} & 0.5 - 0.1\sqrt{5} \\ 0 & 0.25 - 0.25\sqrt{5} & 0.5\sqrt{0.5\sqrt{5} + 2.5} \\ \frac{2\sqrt{5}}{5} & -0.5\sqrt{0.1\sqrt{5} + 0.5} & -0.25 + 0.05\sqrt{5} \end{pmatrix}$
Gg	$\begin{pmatrix} 0 & 0 & 0.25 - 0.25\sqrt{5} & -0.5\sqrt{0.5\sqrt{5} + 2.5} \\ -\sqrt{0.5 - 0.1\sqrt{5}} & 0.1\sqrt{5} + 0.5 & 0.5\sqrt{0.1\sqrt{5} + 0.5} & -0.25 + 0.05\sqrt{5} \\ 0.25 + 0.25\sqrt{5} & 0.5\sqrt{2.5 - 0.5\sqrt{5}} & 0 & 0 \\ -0.5\sqrt{0.5 - 0.1\sqrt{5}} & 0.05\sqrt{5} + 0.25 & -\sqrt{0.1\sqrt{5} + 0.5} & 0.5 - 0.1\sqrt{5} \end{pmatrix}$
Hg	$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(-5 + \sqrt{5}\right) & -0.2\sqrt{1.5\sqrt{5} + 7.5} & -0.04\sqrt{5}\left(\sqrt{5} + 5\right) & \sqrt{0.3 - 0.06\sqrt{5}} \\ -0.4\sqrt{3} & -0.15 + 0.15\sqrt{5} & 0.3\sqrt{0.5\sqrt{5} + 2.5} & -0.1\sqrt{5} - 0.1 & \sqrt{0.1 - 0.02\sqrt{5}} \\ 0 & 0.5\sqrt{0.1\sqrt{5} + 0.5} & -0.25 + 0.05\sqrt{5} & -\sqrt{0.5 - 0.1\sqrt{5}} & -0.5 - 0.1\sqrt{5} \\ 0.4\sqrt{3} & -0.1 + 0.1\sqrt{5} & \sqrt{0.02\sqrt{5} + 0.1} & -0.15\sqrt{5} - 0.15 & 0.3\sqrt{2.5 - 0.5\sqrt{5}} \\ 0 & -\sqrt{0.1\sqrt{5} + 0.5} & 0.5 - 0.1\sqrt{5} & -0.5\sqrt{0.5 - 0.1\sqrt{5}} & -0.25 - 0.05\sqrt{5} \end{pmatrix}$
Au	1
$T1u$	$\begin{pmatrix} 0.25 + 0.25\sqrt{5} & 0.5\sqrt{2.5 - 0.5\sqrt{5}} & 0 \\ 0.5\sqrt{0.5 - 0.1\sqrt{5}} & -0.25 - 0.05\sqrt{5} & -\frac{2\sqrt{5}}{5} \\ -\sqrt{0.5 - 0.1\sqrt{5}} & 0.1\sqrt{5} + 0.5 & -\frac{\sqrt{5}}{5} \end{pmatrix}$
$T2u$	$\begin{pmatrix} \frac{\sqrt{5}}{5} & \sqrt{0.1\sqrt{5} + 0.5} & 0.5 - 0.1\sqrt{5} \\ 0 & 0.25 - 0.25\sqrt{5} & 0.5\sqrt{0.5\sqrt{5} + 2.5} \\ \frac{2\sqrt{5}}{5} & -0.5\sqrt{0.1\sqrt{5} + 0.5} & -0.25 + 0.05\sqrt{5} \end{pmatrix}$
Gu	$\begin{pmatrix} 0 & 0 & 0.25 - 0.25\sqrt{5} & -0.5\sqrt{0.5\sqrt{5} + 2.5} \\ -\sqrt{0.5 - 0.1\sqrt{5}} & 0.1\sqrt{5} + 0.5 & 0.5\sqrt{0.1\sqrt{5} + 0.5} & -0.25 + 0.05\sqrt{5} \\ 0.25 + 0.25\sqrt{5} & 0.5\sqrt{2.5 - 0.5\sqrt{5}} & 0 & 0 \\ -0.5\sqrt{0.5 - 0.1\sqrt{5}} & 0.05\sqrt{5} + 0.25 & -\sqrt{0.1\sqrt{5} + 0.5} & 0.5 - 0.1\sqrt{5} \end{pmatrix}$
Hu	$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(-5 + \sqrt{5}\right) & -0.2\sqrt{1.5\sqrt{5} + 7.5} & -0.04\sqrt{5}\left(\sqrt{5} + 5\right) & \sqrt{0.3 - 0.06\sqrt{5}} \\ -0.4\sqrt{3} & -0.15 + 0.15\sqrt{5} & 0.3\sqrt{0.5\sqrt{5} + 2.5} & -0.1\sqrt{5} - 0.1 & \sqrt{0.1 - 0.02\sqrt{5}} \\ 0 & 0.5\sqrt{0.1\sqrt{5} + 0.5} & -0.25 + 0.05\sqrt{5} & -\sqrt{0.5 - 0.1\sqrt{5}} & -0.5 - 0.1\sqrt{5} \\ 0.4\sqrt{3} & -0.1 + 0.1\sqrt{5} & \sqrt{0.02\sqrt{5} + 0.1} & -0.15\sqrt{5} - 0.15 & 0.3\sqrt{2.5 - 0.5\sqrt{5}} \\ 0 & -\sqrt{0.1\sqrt{5} + 0.5} & 0.5 - 0.1\sqrt{5} & -0.5\sqrt{0.5 - 0.1\sqrt{5}} & -0.25 - 0.05\sqrt{5} \end{pmatrix}$

Ih	$\hat{C}_3^2(8)$

Ag : 1

$T1g$:
$$\begin{pmatrix} 0.25+0.25\sqrt{5} & 0.5\sqrt{0.5-0.1\sqrt{5}} & -\sqrt{0.5-0.1\sqrt{5}} \\ 0.5\sqrt{2.5-0.5\sqrt{5}} & -0.25-0.05\sqrt{5} & 0.1\sqrt{5}+0.5 \\ 0 & -\frac{2\sqrt{5}}{5} & -\frac{\sqrt{5}}{5} \end{pmatrix}$$

$T2g$:
$$\begin{pmatrix} \frac{\sqrt{5}}{5} & 0 & \frac{2\sqrt{5}}{5} \\ \sqrt{0.1\sqrt{5}+0.5} & 0.25-0.25\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} \\ 0.5-0.1\sqrt{5} & 0.5\sqrt{0.5\sqrt{5}+2.5} & -0.25+0.05\sqrt{5} \end{pmatrix}$$

Gg :
$$\begin{pmatrix} 0 & -\sqrt{0.5-0.1\sqrt{5}} & 0.25+0.25\sqrt{5} & -0.5\sqrt{0.5-0.1\sqrt{5}} \\ 0 & 0.1\sqrt{5}+0.5 & 0.5\sqrt{2.5-0.5\sqrt{5}} & 0.05\sqrt{5}+0.25 \\ 0.25-0.25\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} & 0 & -\sqrt{0.1\sqrt{5}+0.5} \\ -0.5\sqrt{0.5\sqrt{5}+2.5} & -0.25+0.05\sqrt{5} & 0 & 0.5-0.1\sqrt{5} \end{pmatrix}$$

Hg :
$$\begin{pmatrix} -0.2 & -0.4\sqrt{3} & 0 & 0.4\sqrt{3} & 0 \\ 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.15+0.15\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} & -0.1+0.1\sqrt{5} & -\sqrt{0.1\sqrt{5}+0.5} \\ -0.2\sqrt{1.5\sqrt{5}+7.5} & 0.3\sqrt{0.5\sqrt{5}+2.5} & -0.25+0.05\sqrt{5} & \sqrt{0.02\sqrt{5}+0.1} & 0.5-0.1\sqrt{5} \\ -0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.1\sqrt{5}-0.1 & -\sqrt{0.5-0.1\sqrt{5}} & -0.15\sqrt{5}-0.15 & -0.5\sqrt{0.5-0.1\sqrt{5}} \\ \sqrt{0.3-0.06\sqrt{5}} & \sqrt{0.1-0.02\sqrt{5}} & -0.5-0.1\sqrt{5} & 0.3\sqrt{2.5-0.5\sqrt{5}} & -0.25-0.05\sqrt{5} \end{pmatrix}$$

Au : 1

$T1u$:
$$\begin{pmatrix} 0.25+0.25\sqrt{5} & 0.5\sqrt{0.5-0.1\sqrt{5}} & -\sqrt{0.5-0.1\sqrt{5}} \\ 0.5\sqrt{2.5-0.5\sqrt{5}} & -0.25-0.05\sqrt{5} & 0.1\sqrt{5}+0.5 \\ 0 & -\frac{2\sqrt{5}}{5} & -\frac{\sqrt{5}}{5} \end{pmatrix}$$

$T2u$:
$$\begin{pmatrix} \frac{\sqrt{5}}{5} & 0 & \frac{2\sqrt{5}}{5} \\ \sqrt{0.1\sqrt{5}+0.5} & 0.25-0.25\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} \\ 0.5-0.1\sqrt{5} & 0.5\sqrt{0.5\sqrt{5}+2.5} & -0.25+0.05\sqrt{5} \end{pmatrix}$$

Gu :
$$\begin{pmatrix} 0 & -\sqrt{0.5-0.1\sqrt{5}} & 0.25+0.25\sqrt{5} & -0.5\sqrt{0.5-0.1\sqrt{5}} \\ 0 & 0.1\sqrt{5}+0.5 & 0.5\sqrt{2.5-0.5\sqrt{5}} & 0.05\sqrt{5}+0.25 \\ 0.25-0.25\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} & 0 & -\sqrt{0.1\sqrt{5}+0.5} \\ -0.5\sqrt{0.5\sqrt{5}+2.5} & -0.25+0.05\sqrt{5} & 0 & 0.5-0.1\sqrt{5} \end{pmatrix}$$

Hu :
$$\begin{pmatrix} -0.2 & -0.4\sqrt{3} & 0 & 0.4\sqrt{3} & 0 \\ 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.15+0.15\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} & -0.1+0.1\sqrt{5} & -\sqrt{0.1\sqrt{5}+0.5} \\ -0.2\sqrt{1.5\sqrt{5}+7.5} & 0.3\sqrt{0.5\sqrt{5}+2.5} & -0.25+0.05\sqrt{5} & \sqrt{0.02\sqrt{5}+0.1} & 0.5-0.1\sqrt{5} \\ -0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.1\sqrt{5}-0.1 & -\sqrt{0.5-0.1\sqrt{5}} & -0.15\sqrt{5}-0.15 & -0.5\sqrt{0.5-0.1\sqrt{5}} \\ \sqrt{0.3-0.06\sqrt{5}} & \sqrt{0.1-0.02\sqrt{5}} & -0.5-0.1\sqrt{5} & 0.3\sqrt{2.5-0.5\sqrt{5}} & -0.25-0.05\sqrt{5} \end{pmatrix}$$

Ih	$\hat{C}_3(9)$
Ag	1
$T1g$	$\begin{pmatrix} 0.25+0.25\sqrt{5} & -0.5\sqrt{2.5-0.5\sqrt{5}} & 0 \\ -0.5\sqrt{0.5-0.1\sqrt{5}} & -0.25-0.05\sqrt{5} & -\frac{2\sqrt{5}}{5} \\ \sqrt{0.5-0.1\sqrt{5}} & 0.1\sqrt{5}+0.5 & -\frac{\sqrt{5}}{5} \end{pmatrix}$
$T2g$	$\begin{pmatrix} \frac{\sqrt{5}}{5} & -\sqrt{0.1\sqrt{5}+0.5} & 0.5-0.1\sqrt{5} \\ 0 & 0.25-0.25\sqrt{5} & -0.5\sqrt{0.5\sqrt{5}+2.5} \\ \frac{2\sqrt{5}}{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} & -0.25+0.05\sqrt{5} \end{pmatrix}$
Gg	$\begin{pmatrix} 0 & 0 & 0.25-0.25\sqrt{5} & 0.5\sqrt{0.5\sqrt{5}+2.5} \\ \sqrt{0.5-0.1\sqrt{5}} & 0.1\sqrt{5}+0.5 & -0.5\sqrt{0.1\sqrt{5}+0.5} & -0.25+0.05\sqrt{5} \\ 0.25+0.25\sqrt{5} & -0.5\sqrt{2.5-0.5\sqrt{5}} & 0 & 0 \\ 0.5\sqrt{0.5-0.1\sqrt{5}} & 0.05\sqrt{5}+0.25 & \sqrt{0.1\sqrt{5}+0.5} & 0.5-0.1\sqrt{5} \end{pmatrix}$
Hg	$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & \sqrt{0.06\sqrt{5}+0.3} & -0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.2\sqrt{7.5-1.5\sqrt{5}} \\ -0.4\sqrt{3} & -0.15+0.15\sqrt{5} & -0.3\sqrt{0.5\sqrt{5}+2.5} & -0.1\sqrt{5}-0.1 & -0.2\sqrt{2.5-0.5\sqrt{5}} \\ 0 & -0.5\sqrt{0.1\sqrt{5}+0.5} & -0.25+0.05\sqrt{5} & \sqrt{0.5-0.1\sqrt{5}} & -0.5-0.1\sqrt{5} \\ 0.4\sqrt{3} & -0.1+0.1\sqrt{5} & -0.2\sqrt{0.5\sqrt{5}+2.5} & -0.15\sqrt{5}-0.15 & -0.3\sqrt{2.5-0.5\sqrt{5}} \\ 0 & \sqrt{0.1\sqrt{5}+0.5} & 0.5-0.1\sqrt{5} & 0.5\sqrt{0.5-0.1\sqrt{5}} & -0.25-0.05\sqrt{5} \end{pmatrix}$
Au	1
$T1u$	$\begin{pmatrix} 0.25+0.25\sqrt{5} & -0.5\sqrt{2.5-0.5\sqrt{5}} & 0 \\ -0.5\sqrt{0.5-0.1\sqrt{5}} & -0.25-0.05\sqrt{5} & -\frac{2\sqrt{5}}{5} \\ \sqrt{0.5-0.1\sqrt{5}} & 0.1\sqrt{5}+0.5 & -\frac{\sqrt{5}}{5} \end{pmatrix}$
$T2u$	$\begin{pmatrix} \frac{\sqrt{5}}{5} & -\sqrt{0.1\sqrt{5}+0.5} & 0.5-0.1\sqrt{5} \\ 0 & 0.25-0.25\sqrt{5} & -0.5\sqrt{0.5\sqrt{5}+2.5} \\ \frac{2\sqrt{5}}{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} & -0.25+0.05\sqrt{5} \end{pmatrix}$
Gu	$\begin{pmatrix} 0 & 0 & 0.25-0.25\sqrt{5} & 0.5\sqrt{0.5\sqrt{5}+2.5} \\ \sqrt{0.5-0.1\sqrt{5}} & 0.1\sqrt{5}+0.5 & -0.5\sqrt{0.1\sqrt{5}+0.5} & -0.25+0.05\sqrt{5} \\ 0.25+0.25\sqrt{5} & -0.5\sqrt{2.5-0.5\sqrt{5}} & 0 & 0 \\ 0.5\sqrt{0.5-0.1\sqrt{5}} & 0.05\sqrt{5}+0.25 & \sqrt{0.1\sqrt{5}+0.5} & 0.5-0.1\sqrt{5} \end{pmatrix}$
Hu	$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & \sqrt{0.06\sqrt{5}+0.3} & -0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.2\sqrt{7.5-1.5\sqrt{5}} \\ -0.4\sqrt{3} & -0.15+0.15\sqrt{5} & -0.3\sqrt{0.5\sqrt{5}+2.5} & -0.1\sqrt{5}-0.1 & -0.2\sqrt{2.5-0.5\sqrt{5}} \\ 0 & -0.5\sqrt{0.1\sqrt{5}+0.5} & -0.25+0.05\sqrt{5} & \sqrt{0.5-0.1\sqrt{5}} & -0.5-0.1\sqrt{5} \\ 0.4\sqrt{3} & -0.1+0.1\sqrt{5} & -0.2\sqrt{0.5\sqrt{5}+2.5} & -0.15\sqrt{5}-0.15 & -0.3\sqrt{2.5-0.5\sqrt{5}} \\ 0 & \sqrt{0.1\sqrt{5}+0.5} & 0.5-0.1\sqrt{5} & 0.5\sqrt{0.5-0.1\sqrt{5}} & -0.25-0.05\sqrt{5} \end{pmatrix}$

Ih	$\hat{C}_3^2(9)$
Ag	1
$T1g$	$\begin{pmatrix} 0.25+0.25\sqrt{5} & -0.5\sqrt{0.5-0.1\sqrt{5}} & \sqrt{0.5-0.1\sqrt{5}} \\ -0.5\sqrt{2.5-0.5\sqrt{5}} & -0.25-0.05\sqrt{5} & 0.1\sqrt{5}+0.5 \\ 0 & -\frac{2\sqrt{5}}{5} & -\frac{\sqrt{5}}{5} \end{pmatrix}$
$T2g$	$\begin{pmatrix} \frac{\sqrt{5}}{5} & 0 & \frac{2\sqrt{5}}{5} \\ -\sqrt{0.1\sqrt{5}+0.5} & 0.25-0.25\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} \\ 0.5-0.1\sqrt{5} & -0.5\sqrt{0.5\sqrt{5}+2.5} & -0.25+0.05\sqrt{5} \end{pmatrix}$
Gg	$\begin{pmatrix} 0 & \sqrt{0.5-0.1\sqrt{5}} & 0.25+0.25\sqrt{5} & 0.5\sqrt{0.5-0.1\sqrt{5}} \\ 0 & 0.1\sqrt{5}+0.5 & -0.5\sqrt{2.5-0.5\sqrt{5}} & 0.05\sqrt{5}+0.25 \\ 0.25-0.25\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} & 0 & \sqrt{0.1\sqrt{5}+0.5} \\ 0.5\sqrt{0.5\sqrt{5}+2.5} & -0.25+0.05\sqrt{5} & 0 & 0.5-0.1\sqrt{5} \end{pmatrix}$
Hg	$\begin{pmatrix} -0.2 & -0.4\sqrt{3} & 0 & 0.4\sqrt{3} & 0 \\ 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.15+0.15\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} & -0.1+0.1\sqrt{5} & \sqrt{0.1\sqrt{5}+0.5} \\ \sqrt{0.06\sqrt{5}+0.3} & -0.3\sqrt{0.5\sqrt{5}+2.5} & -0.25+0.05\sqrt{5} & -0.2\sqrt{0.5\sqrt{5}+2.5} & 0.5-0.1\sqrt{5} \\ -0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.1\sqrt{5}-0.1 & \sqrt{0.5-0.1\sqrt{5}} & -0.15\sqrt{5}-0.15 & 0.5\sqrt{0.5-0.1\sqrt{5}} \\ -0.2\sqrt{7.5-1.5\sqrt{5}} & -0.2\sqrt{2.5-0.5\sqrt{5}} & -0.5-0.1\sqrt{5} & -0.3\sqrt{2.5-0.5\sqrt{5}} & -0.25-0.05\sqrt{5} \end{pmatrix}$
Au	1
$T1u$	$\begin{pmatrix} 0.25+0.25\sqrt{5} & -0.5\sqrt{0.5-0.1\sqrt{5}} & \sqrt{0.5-0.1\sqrt{5}} \\ -0.5\sqrt{2.5-0.5\sqrt{5}} & -0.25-0.05\sqrt{5} & 0.1\sqrt{5}+0.5 \\ 0 & -\frac{2\sqrt{5}}{5} & -\frac{\sqrt{5}}{5} \end{pmatrix}$
$T2u$	$\begin{pmatrix} \frac{\sqrt{5}}{5} & 0 & \frac{2\sqrt{5}}{5} \\ -\sqrt{0.1\sqrt{5}+0.5} & 0.25-0.25\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} \\ 0.5-0.1\sqrt{5} & -0.5\sqrt{0.5\sqrt{5}+2.5} & -0.25+0.05\sqrt{5} \end{pmatrix}$
Gu	$\begin{pmatrix} 0 & \sqrt{0.5-0.1\sqrt{5}} & 0.25+0.25\sqrt{5} & 0.5\sqrt{0.5-0.1\sqrt{5}} \\ 0 & 0.1\sqrt{5}+0.5 & -0.5\sqrt{2.5-0.5\sqrt{5}} & 0.05\sqrt{5}+0.25 \\ 0.25-0.25\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} & 0 & \sqrt{0.1\sqrt{5}+0.5} \\ 0.5\sqrt{0.5\sqrt{5}+2.5} & -0.25+0.05\sqrt{5} & 0 & 0.5-0.1\sqrt{5} \end{pmatrix}$
Hu	$\begin{pmatrix} -0.2 & -0.4\sqrt{3} & 0 & 0.4\sqrt{3} & 0 \\ 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.15+0.15\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} & -0.1+0.1\sqrt{5} & \sqrt{0.1\sqrt{5}+0.5} \\ \sqrt{0.06\sqrt{5}+0.3} & -0.3\sqrt{0.5\sqrt{5}+2.5} & -0.25+0.05\sqrt{5} & -0.2\sqrt{0.5\sqrt{5}+2.5} & 0.5-0.1\sqrt{5} \\ -0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.1\sqrt{5}-0.1 & \sqrt{0.5-0.1\sqrt{5}} & -0.15\sqrt{5}-0.15 & 0.5\sqrt{0.5-0.1\sqrt{5}} \\ -0.2\sqrt{7.5-1.5\sqrt{5}} & -0.2\sqrt{2.5-0.5\sqrt{5}} & -0.5-0.1\sqrt{5} & -0.3\sqrt{2.5-0.5\sqrt{5}} & -0.25-0.05\sqrt{5} \end{pmatrix}$

Ih	$\hat{C}_2(0)$

| Ag | 1 |

| $T1g$ | $\begin{pmatrix} -0.25\sqrt{5}-0.25 & 0.5\sqrt{2.5-0.5\sqrt{5}} & 0 \\ 0.5\sqrt{2.5-0.5\sqrt{5}} & 0.25+0.25\sqrt{5} & 0 \\ 0 & 0 & -1 \end{pmatrix}$ |

| $T2g$ | $\begin{pmatrix} -1 & 0 & 0 \\ 0 & -0.25+0.25\sqrt{5} & 0.5\sqrt{0.5\sqrt{5}+2.5} \\ 0 & 0.5\sqrt{0.5\sqrt{5}+2.5} & 0.25-0.25\sqrt{5} \end{pmatrix}$ |

| Gg | $\begin{pmatrix} -0.25\sqrt{5}-0.25 & 0.5\sqrt{2.5-0.5\sqrt{5}} & 0 & 0 \\ 0.5\sqrt{2.5-0.5\sqrt{5}} & 0.25+0.25\sqrt{5} & 0 & 0 \\ 0 & 0 & -0.25+0.25\sqrt{5} & -0.5\sqrt{0.5\sqrt{5}+2.5} \\ 0 & 0 & -0.5\sqrt{0.5\sqrt{5}+2.5} & 0.25-0.25\sqrt{5} \end{pmatrix}$ |

| Hg | $\begin{pmatrix} 1 & 0 & 0 & 0 & 0 \\ 0 & -0.25+0.25\sqrt{5} & -0.5\sqrt{0.5\sqrt{5}+2.5} & 0 & 0 \\ 0 & -0.5\sqrt{0.5\sqrt{5}+2.5} & 0.25-0.25\sqrt{5} & 0 & 0 \\ 0 & 0 & 0 & -0.25\sqrt{5}-0.25 & -0.5\sqrt{2.5-0.5\sqrt{5}} \\ 0 & 0 & 0 & -0.5\sqrt{2.5-0.5\sqrt{5}} & 0.25+0.25\sqrt{5} \end{pmatrix}$ |

| Au | 1 |

| $T1u$ | $\begin{pmatrix} -0.25\sqrt{5}-0.25 & 0.5\sqrt{2.5-0.5\sqrt{5}} & 0 \\ 0.5\sqrt{2.5-0.5\sqrt{5}} & 0.25+0.25\sqrt{5} & 0 \\ 0 & 0 & -1 \end{pmatrix}$ |

| $T2u$ | $\begin{pmatrix} -1 & 0 & 0 \\ 0 & -0.25+0.25\sqrt{5} & 0.5\sqrt{0.5\sqrt{5}+2.5} \\ 0 & 0.5\sqrt{0.5\sqrt{5}+2.5} & 0.25-0.25\sqrt{5} \end{pmatrix}$ |

| Gu | $\begin{pmatrix} -0.25\sqrt{5}-0.25 & 0.5\sqrt{2.5-0.5\sqrt{5}} & 0 & 0 \\ 0.5\sqrt{2.5-0.5\sqrt{5}} & 0.25+0.25\sqrt{5} & 0 & 0 \\ 0 & 0 & -0.25+0.25\sqrt{5} & -0.5\sqrt{0.5\sqrt{5}+2.5} \\ 0 & 0 & -0.5\sqrt{0.5\sqrt{5}+2.5} & 0.25-0.25\sqrt{5} \end{pmatrix}$ |

| Hu | $\begin{pmatrix} 1 & 0 & 0 & 0 & 0 \\ 0 & -0.25+0.25\sqrt{5} & -0.5\sqrt{0.5\sqrt{5}+2.5} & 0 & 0 \\ 0 & -0.5\sqrt{0.5\sqrt{5}+2.5} & 0.25-0.25\sqrt{5} & 0 & 0 \\ 0 & 0 & 0 & -0.25\sqrt{5}-0.25 & -0.5\sqrt{2.5-0.5\sqrt{5}} \\ 0 & 0 & 0 & -0.5\sqrt{2.5-0.5\sqrt{5}} & 0.25+0.25\sqrt{5} \end{pmatrix}$ |

Ih	$\hat{C}_2(1)$
Ag	1
$T1g$	$\begin{pmatrix} -0.5 & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & \sqrt{0.5-0.1\sqrt{5}} \\ 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.5+\frac{\sqrt{5}}{5} & 0.1\sqrt{5}+0.5 \\ \sqrt{0.5-0.1\sqrt{5}} & 0.1\sqrt{5}+0.5 & -\frac{\sqrt{5}}{5} \end{pmatrix}$
$T2g$	$\begin{pmatrix} \frac{\sqrt{5}}{5} & -\sqrt{0.1\sqrt{5}+0.5} & 0.5-0.1\sqrt{5} \\ -\sqrt{0.1\sqrt{5}+0.5} & -0.5 & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} \\ 0.5-0.1\sqrt{5} & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -0.5-\frac{\sqrt{5}}{5} \end{pmatrix}$
Gg	$\begin{pmatrix} 0.25-0.25\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} & 0.5 & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} \\ -0.5\sqrt{0.1\sqrt{5}+0.5} & -0.15\sqrt{5}-0.25 & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & 0.3\sqrt{5} \\ 0.5 & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & 0.25+0.25\sqrt{5} & 0.5\sqrt{0.5-0.1\sqrt{5}} \\ -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & 0.3\sqrt{5} & 0.5\sqrt{0.5-0.1\sqrt{5}} & -0.25+0.15\sqrt{5} \end{pmatrix}$
Hg	$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & \sqrt{0.06\sqrt{5}+0.3} & -0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.2\sqrt{7.5-1.5\sqrt{5}} \\ 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & 0.1-\frac{\sqrt{5}}{5} & -0.1\sqrt{2\sqrt{5}+5} & 0.4 & -0.2\sqrt{2\sqrt{5}+10} \\ \sqrt{0.06\sqrt{5}+0.3} & -0.1\sqrt{2\sqrt{5}+5} & 0.5 & \sqrt{0.4-0.08\sqrt{5}} & 0 \\ -0.04\sqrt{5}\left(\sqrt{5}+5\right) & 0.4 & \sqrt{0.4-0.08\sqrt{5}} & 0.1+\frac{\sqrt{5}}{5} & 0.1\sqrt{5-2\sqrt{5}} \\ -0.2\sqrt{7.5-1.5\sqrt{5}} & -0.2\sqrt{2\sqrt{5}+10} & 0 & 0.1\sqrt{5-2\sqrt{5}} & 0.5 \end{pmatrix}$
Au	1
$T1u$	$\begin{pmatrix} -0.5 & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & \sqrt{0.5-0.1\sqrt{5}} \\ 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.5+\frac{\sqrt{5}}{5} & 0.1\sqrt{5}+0.5 \\ \sqrt{0.5-0.1\sqrt{5}} & 0.1\sqrt{5}+0.5 & -\frac{\sqrt{5}}{5} \end{pmatrix}$
$T2u$	$\begin{pmatrix} \frac{\sqrt{5}}{5} & -\sqrt{0.1\sqrt{5}+0.5} & 0.5-0.1\sqrt{5} \\ -\sqrt{0.1\sqrt{5}+0.5} & -0.5 & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} \\ 0.5-0.1\sqrt{5} & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -0.5-\frac{\sqrt{5}}{5} \end{pmatrix}$
Gu	$\begin{pmatrix} 0.25-0.25\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} & 0.5 & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} \\ -0.5\sqrt{0.1\sqrt{5}+0.5} & -0.15\sqrt{5}-0.25 & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & 0.3\sqrt{5} \\ 0.5 & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & 0.25+0.25\sqrt{5} & 0.5\sqrt{0.5-0.1\sqrt{5}} \\ -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & 0.3\sqrt{5} & 0.5\sqrt{0.5-0.1\sqrt{5}} & -0.25+0.15\sqrt{5} \end{pmatrix}$
Hu	$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & \sqrt{0.06\sqrt{5}+0.3} & -0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.2\sqrt{7.5-1.5\sqrt{5}} \\ 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & 0.1-\frac{\sqrt{5}}{5} & -0.1\sqrt{2\sqrt{5}+5} & 0.4 & -0.2\sqrt{2\sqrt{5}+10} \\ \sqrt{0.06\sqrt{5}+0.3} & -0.1\sqrt{2\sqrt{5}+5} & 0.5 & \sqrt{0.4-0.08\sqrt{5}} & 0 \\ -0.04\sqrt{5}\left(\sqrt{5}+5\right) & 0.4 & \sqrt{0.4-0.08\sqrt{5}} & 0.1+\frac{\sqrt{5}}{5} & 0.1\sqrt{5-2\sqrt{5}} \\ -0.2\sqrt{7.5-1.5\sqrt{5}} & -0.2\sqrt{2\sqrt{5}+10} & 0 & 0.1\sqrt{5-2\sqrt{5}} & 0.5 \end{pmatrix}$

Ih	$\hat{C}_2(2)$
Ag	1
$T1g$	$\begin{pmatrix} -0.25+0.25\sqrt{5} & 0.5\sqrt{0.5\sqrt{5}+2.5} & 0 \\ 0.5\sqrt{0.5\sqrt{5}+2.5} & 0.25-0.25\sqrt{5} & 0 \\ 0 & 0 & -1 \end{pmatrix}$
$T2g$	$\begin{pmatrix} -1 & 0 & 0 \\ 0 & -0.25\sqrt{5}-0.25 & -0.5\sqrt{2.5-0.5\sqrt{5}} \\ 0 & -0.5\sqrt{2.5-0.5\sqrt{5}} & 0.25+0.25\sqrt{5} \end{pmatrix}$
Gg	$\begin{pmatrix} -0.25+0.25\sqrt{5} & 0.5\sqrt{0.5\sqrt{5}+2.5} & 0 & 0 \\ 0.5\sqrt{0.5\sqrt{5}+2.5} & 0.25-0.25\sqrt{5} & 0 & 0 \\ 0 & 0 & -0.25\sqrt{5}-0.25 & 0.5\sqrt{2.5-0.5\sqrt{5}} \\ 0 & 0 & 0.5\sqrt{2.5-0.5\sqrt{5}} & 0.25+0.25\sqrt{5} \end{pmatrix}$
Hg	$\begin{pmatrix} 1 & 0 & 0 & 0 & 0 \\ 0 & -0.25\sqrt{5}-0.25 & 0.5\sqrt{2.5-0.5\sqrt{5}} & 0 & 0 \\ 0 & 0.5\sqrt{2.5-0.5\sqrt{5}} & 0.25+0.25\sqrt{5} & 0 & 0 \\ 0 & 0 & 0 & -0.25+0.25\sqrt{5} & -0.5\sqrt{0.5\sqrt{5}+2.5} \\ 0 & 0 & 0 & -0.5\sqrt{0.5\sqrt{5}+2.5} & 0.25-0.25\sqrt{5} \end{pmatrix}$
Au	1
$T1u$	$\begin{pmatrix} -0.25+0.25\sqrt{5} & 0.5\sqrt{0.5\sqrt{5}+2.5} & 0 \\ 0.5\sqrt{0.5\sqrt{5}+2.5} & 0.25-0.25\sqrt{5} & 0 \\ 0 & 0 & -1 \end{pmatrix}$
$T2u$	$\begin{pmatrix} -1 & 0 & 0 \\ 0 & -0.25\sqrt{5}-0.25 & -0.5\sqrt{2.5-0.5\sqrt{5}} \\ 0 & -0.5\sqrt{2.5-0.5\sqrt{5}} & 0.25+0.25\sqrt{5} \end{pmatrix}$
Gu	$\begin{pmatrix} -0.25+0.25\sqrt{5} & 0.5\sqrt{0.5\sqrt{5}+2.5} & 0 & 0 \\ 0.5\sqrt{0.5\sqrt{5}+2.5} & 0.25-0.25\sqrt{5} & 0 & 0 \\ 0 & 0 & -0.25\sqrt{5}-0.25 & 0.5\sqrt{2.5-0.5\sqrt{5}} \\ 0 & 0 & 0.5\sqrt{2.5-0.5\sqrt{5}} & 0.25+0.25\sqrt{5} \end{pmatrix}$
Hu	$\begin{pmatrix} 1 & 0 & 0 & 0 & 0 \\ 0 & -0.25\sqrt{5}-0.25 & 0.5\sqrt{2.5-0.5\sqrt{5}} & 0 & 0 \\ 0 & 0.5\sqrt{2.5-0.5\sqrt{5}} & 0.25+0.25\sqrt{5} & 0 & 0 \\ 0 & 0 & 0 & -0.25+0.25\sqrt{5} & -0.5\sqrt{0.5\sqrt{5}+2.5} \\ 0 & 0 & 0 & -0.5\sqrt{0.5\sqrt{5}+2.5} & 0.25-0.25\sqrt{5} \end{pmatrix}$

Ih	$\hat{C}_2(3)$
Ag	1
$T1g$	$\begin{pmatrix} -0.25\sqrt{5}-0.25 & 0.5\sqrt{0.5-0.1\sqrt{5}} & -\sqrt{0.5-0.1\sqrt{5}} \\ 0.5\sqrt{0.5-0.1\sqrt{5}} & -0.75+0.05\sqrt{5} & -0.5-0.1\sqrt{5} \\ -\sqrt{0.5-0.1\sqrt{5}} & -0.5-0.1\sqrt{5} & \frac{\sqrt{5}}{5} \end{pmatrix}$
$T2g$	$\begin{pmatrix} -\frac{\sqrt{5}}{5} & \sqrt{0.1\sqrt{5}+0.5} & -0.5+0.1\sqrt{5} \\ \sqrt{0.1\sqrt{5}+0.5} & -0.25+0.25\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} \\ -0.5+0.1\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} & -0.75-0.05\sqrt{5} \end{pmatrix}$
Gg	$\begin{pmatrix} -0.25+0.25\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} & 0 & -\sqrt{0.1\sqrt{5}+0.5} \\ 0.5\sqrt{0.1\sqrt{5}+0.5} & 0.25+0.15\sqrt{5} & -\sqrt{0.5-0.1\sqrt{5}} & \frac{\sqrt{5}}{5} \\ 0 & -\sqrt{0.5-0.1\sqrt{5}} & -0.25\sqrt{5}-0.25 & -0.5\sqrt{0.5-0.1\sqrt{5}} \\ -\sqrt{0.1\sqrt{5}+0.5} & \frac{\sqrt{5}}{5} & -0.5\sqrt{0.5-0.1\sqrt{5}} & 0.25-0.15\sqrt{5} \end{pmatrix}$
Hg	$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & \sqrt{0.06\sqrt{5}+0.3} & -0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.2\sqrt{7.5-1.5\sqrt{5}} \\ 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & 0.05\sqrt{5}+0.35 & -0.1\sqrt{12.5-5.5\sqrt{5}} & -\frac{4}{5} & 0.2\sqrt{2\sqrt{5}+5} \\ \sqrt{0.06\sqrt{5}+0.3} & -0.1\sqrt{12.5-5.5\sqrt{5}} & 0.25+0.15\sqrt{5} & 0.2\sqrt{5-2\sqrt{5}} & \frac{\sqrt{5}}{5} \\ -0.04\sqrt{5}\left(\sqrt{5}+5\right) & -\frac{4}{5} & 0.2\sqrt{5-2\sqrt{5}} & 0.35-0.05\sqrt{5} & 0.1\sqrt{5.5\sqrt{5}+12.5} \\ -0.2\sqrt{7.5-1.5\sqrt{5}} & 0.2\sqrt{2\sqrt{5}+5} & \frac{\sqrt{5}}{5} & 0.1\sqrt{5.5\sqrt{5}+12.5} & 0.25-0.15\sqrt{5} \end{pmatrix}$
Au	1
$T1u$	$\begin{pmatrix} -0.25\sqrt{5}-0.25 & 0.5\sqrt{0.5-0.1\sqrt{5}} & -\sqrt{0.5-0.1\sqrt{5}} \\ 0.5\sqrt{0.5-0.1\sqrt{5}} & -0.75+0.05\sqrt{5} & -0.5-0.1\sqrt{5} \\ -\sqrt{0.5-0.1\sqrt{5}} & -0.5-0.1\sqrt{5} & \frac{\sqrt{5}}{5} \end{pmatrix}$
$T2u$	$\begin{pmatrix} -\frac{\sqrt{5}}{5} & \sqrt{0.1\sqrt{5}+0.5} & -0.5+0.1\sqrt{5} \\ \sqrt{0.1\sqrt{5}+0.5} & -0.25+0.25\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} \\ -0.5+0.1\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} & -0.75-0.05\sqrt{5} \end{pmatrix}$
Gu	$\begin{pmatrix} -0.25+0.25\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} & 0 & -\sqrt{0.1\sqrt{5}+0.5} \\ 0.5\sqrt{0.1\sqrt{5}+0.5} & 0.25+0.15\sqrt{5} & -\sqrt{0.5-0.1\sqrt{5}} & \frac{\sqrt{5}}{5} \\ 0 & -\sqrt{0.5-0.1\sqrt{5}} & -0.25\sqrt{5}-0.25 & -0.5\sqrt{0.5-0.1\sqrt{5}} \\ -\sqrt{0.1\sqrt{5}+0.5} & \frac{\sqrt{5}}{5} & -0.5\sqrt{0.5-0.1\sqrt{5}} & 0.25-0.15\sqrt{5} \end{pmatrix}$
Hu	$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & \sqrt{0.06\sqrt{5}+0.3} & -0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.2\sqrt{7.5-1.5\sqrt{5}} \\ 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & 0.05\sqrt{5}+0.35 & -0.1\sqrt{12.5-5.5\sqrt{5}} & -\frac{4}{5} & 0.2\sqrt{2\sqrt{5}+5} \\ \sqrt{0.06\sqrt{5}+0.3} & -0.1\sqrt{12.5-5.5\sqrt{5}} & 0.25+0.15\sqrt{5} & 0.2\sqrt{5-2\sqrt{5}} & \frac{\sqrt{5}}{5} \\ -0.04\sqrt{5}\left(\sqrt{5}+5\right) & -\frac{4}{5} & 0.2\sqrt{5-2\sqrt{5}} & 0.35-0.05\sqrt{5} & 0.1\sqrt{5.5\sqrt{5}+12.5} \\ -0.2\sqrt{7.5-1.5\sqrt{5}} & 0.2\sqrt{2\sqrt{5}+5} & \frac{\sqrt{5}}{5} & 0.1\sqrt{5.5\sqrt{5}+12.5} & 0.25-0.15\sqrt{5} \end{pmatrix}$

Ih	$\hat{C}_2(4)$
Ag	1
$T1g$	$\begin{pmatrix} -0.5 & -0.5\sqrt{1-\frac{2\sqrt5}{5}} & -\sqrt{0.1\sqrt5+0.5} \\ -0.5\sqrt{1-\frac{2\sqrt5}{5}} & -0.5-\frac{\sqrt5}{5} & 0.5-0.1\sqrt5 \\ -\sqrt{0.1\sqrt5+0.5} & 0.5-0.1\sqrt5 & \frac{\sqrt5}{5} \end{pmatrix}$
$T2g$	$\begin{pmatrix} -\frac{\sqrt5}{5} & -\sqrt{0.5-0.1\sqrt5} & 0.1\sqrt5+0.5 \\ -\sqrt{0.5-0.1\sqrt5} & -0.5 & -0.5\sqrt{\frac{2\sqrt5}{5}+1} \\ 0.1\sqrt5+0.5 & -0.5\sqrt{\frac{2\sqrt5}{5}+1} & -0.5+\frac{\sqrt5}{5} \end{pmatrix}$
Gg	$\begin{pmatrix} 0.25+0.25\sqrt5 & -0.5\sqrt{0.5-0.1\sqrt5} & 0.5 & 0.5\sqrt{1-\frac{2\sqrt5}{5}} \\ -0.5\sqrt{0.5-0.1\sqrt5} & -0.25+0.15\sqrt5 & 0.5\sqrt{\frac{2\sqrt5}{5}+1} & -0.3\sqrt5 \\ 0.5 & 0.5\sqrt{\frac{2\sqrt5}{5}+1} & 0.25-0.25\sqrt5 & -0.5\sqrt{0.1\sqrt5+0.5} \\ 0.5\sqrt{1-\frac{2\sqrt5}{5}} & -0.3\sqrt5 & -0.5\sqrt{0.1\sqrt5+0.5} & -0.15\sqrt5-0.25 \end{pmatrix}$
Hg	$\begin{pmatrix} -0.2 & 0.04\sqrt5\left(\sqrt5+5\right) & -0.2\sqrt{7.5-1.5\sqrt5} & -0.04\sqrt5\left(-5+\sqrt5\right) & -0.2\sqrt{1.5\sqrt5+7.5} \\ 0.04\sqrt5\left(\sqrt5+5\right) & 0.1+\frac{\sqrt5}{5} & -0.1\sqrt{5-2\sqrt5} & 0.4 & \sqrt{0.4-0.08\sqrt5} \\ -0.2\sqrt{7.5-1.5\sqrt5} & -0.1\sqrt{5-2\sqrt5} & 0.5 & \sqrt{0.08\sqrt5+0.4} & 0 \\ -0.04\sqrt5\left(-5+\sqrt5\right) & 0.4 & \sqrt{0.08\sqrt5+0.4} & 0.1-\frac{\sqrt5}{5} & -0.1\sqrt{2\sqrt5+5} \\ -0.2\sqrt{1.5\sqrt5+7.5} & \sqrt{0.4-0.08\sqrt5} & 0 & -0.1\sqrt{2\sqrt5+5} & 0.5 \end{pmatrix}$
Au	1
$T1u$	$\begin{pmatrix} -0.5 & -0.5\sqrt{1-\frac{2\sqrt5}{5}} & -\sqrt{0.1\sqrt5+0.5} \\ -0.5\sqrt{1-\frac{2\sqrt5}{5}} & -0.5-\frac{\sqrt5}{5} & 0.5-0.1\sqrt5 \\ -\sqrt{0.1\sqrt5+0.5} & 0.5-0.1\sqrt5 & \frac{\sqrt5}{5} \end{pmatrix}$
$T2u$	$\begin{pmatrix} -\frac{\sqrt5}{5} & -\sqrt{0.5-0.1\sqrt5} & 0.1\sqrt5+0.5 \\ -\sqrt{0.5-0.1\sqrt5} & -0.5 & -0.5\sqrt{\frac{2\sqrt5}{5}+1} \\ 0.1\sqrt5+0.5 & -0.5\sqrt{\frac{2\sqrt5}{5}+1} & -0.5+\frac{\sqrt5}{5} \end{pmatrix}$
Gu	$\begin{pmatrix} 0.25+0.25\sqrt5 & -0.5\sqrt{0.5-0.1\sqrt5} & 0.5 & 0.5\sqrt{1-\frac{2\sqrt5}{5}} \\ -0.5\sqrt{0.5-0.1\sqrt5} & -0.25+0.15\sqrt5 & 0.5\sqrt{\frac{2\sqrt5}{5}+1} & -0.3\sqrt5 \\ 0.5 & 0.5\sqrt{\frac{2\sqrt5}{5}+1} & 0.25-0.25\sqrt5 & -0.5\sqrt{0.1\sqrt5+0.5} \\ 0.5\sqrt{1-\frac{2\sqrt5}{5}} & -0.3\sqrt5 & -0.5\sqrt{0.1\sqrt5+0.5} & -0.15\sqrt5-0.25 \end{pmatrix}$
Hu	$\begin{pmatrix} -0.2 & 0.04\sqrt5\left(\sqrt5+5\right) & -0.2\sqrt{7.5-1.5\sqrt5} & -0.04\sqrt5\left(-5+\sqrt5\right) & -0.2\sqrt{1.5\sqrt5+7.5} \\ 0.04\sqrt5\left(\sqrt5+5\right) & 0.1+\frac{\sqrt5}{5} & -0.1\sqrt{5-2\sqrt5} & 0.4 & \sqrt{0.4-0.08\sqrt5} \\ -0.2\sqrt{7.5-1.5\sqrt5} & -0.1\sqrt{5-2\sqrt5} & 0.5 & \sqrt{0.08\sqrt5+0.4} & 0 \\ -0.04\sqrt5\left(-5+\sqrt5\right) & 0.4 & \sqrt{0.08\sqrt5+0.4} & 0.1-\frac{\sqrt5}{5} & -0.1\sqrt{2\sqrt5+5} \\ -0.2\sqrt{1.5\sqrt5+7.5} & \sqrt{0.4-0.08\sqrt5} & 0 & -0.1\sqrt{2\sqrt5+5} & 0.5 \end{pmatrix}$

Ih	$\hat{C}_2(5)$
Ag	1
$T1g$	$\begin{pmatrix} -0.25+0.25\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} & -\sqrt{0.1\sqrt{5}+0.5} \\ 0.5\sqrt{0.1\sqrt{5}+0.5} & -0.75-0.05\sqrt{5} & -0.5+0.1\sqrt{5} \\ -\sqrt{0.1\sqrt{5}+0.5} & -0.5+0.1\sqrt{5} & -\frac{\sqrt{5}}{5} \end{pmatrix}$
$T2g$	$\begin{pmatrix} \frac{\sqrt{5}}{5} & -\sqrt{0.5-0.1\sqrt{5}} & -0.5-0.1\sqrt{5} \\ -\sqrt{0.5-0.1\sqrt{5}} & -0.25\sqrt{5}-0.25 & 0.5\sqrt{0.5-0.1\sqrt{5}} \\ -0.5-0.1\sqrt{5} & 0.5\sqrt{0.5-0.1\sqrt{5}} & -0.75+0.05\sqrt{5} \end{pmatrix}$
Gg	$\begin{pmatrix} -0.25\sqrt{5}-0.25 & -0.5\sqrt{0.5-0.1\sqrt{5}} & 0 & \sqrt{0.5-0.1\sqrt{5}} \\ -0.5\sqrt{0.5-0.1\sqrt{5}} & 0.25-0.15\sqrt{5} & -\sqrt{0.1\sqrt{5}+0.5} & -\frac{\sqrt{5}}{5} \\ 0 & -\sqrt{0.1\sqrt{5}+0.5} & -0.25+0.25\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} \\ \sqrt{0.5-0.1\sqrt{5}} & -\frac{\sqrt{5}}{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} & 0.25+0.15\sqrt{5} \end{pmatrix}$
Hg	$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(\sqrt{5}+5\right) & \sqrt{0.3-0.06\sqrt{5}} & -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & \sqrt{0.06\sqrt{5}+0.3} \\ 0.04\sqrt{5}\left(\sqrt{5}+5\right) & 0.35-0.05\sqrt{5} & 0.1\sqrt{5.5\sqrt{5}+12.5} & -\frac{4}{5} & -0.2\sqrt{5-2\sqrt{5}} \\ \sqrt{0.3-0.06\sqrt{5}} & 0.1\sqrt{5.5\sqrt{5}+12.5} & 0.25-0.15\sqrt{5} & 0.2\sqrt{2\sqrt{5}+5} & -\frac{\sqrt{5}}{5} \\ -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -\frac{4}{5} & 0.2\sqrt{2\sqrt{5}+5} & 0.05\sqrt{5}+0.35 & 0.1\sqrt{12.5-5.5\sqrt{5}} \\ \sqrt{0.06\sqrt{5}+0.3} & -0.2\sqrt{5-2\sqrt{5}} & -\frac{\sqrt{5}}{5} & 0.1\sqrt{12.5-5.5\sqrt{5}} & 0.25+0.15\sqrt{5} \end{pmatrix}$
Au	1
$T1u$	$\begin{pmatrix} -0.25+0.25\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} & -\sqrt{0.1\sqrt{5}+0.5} \\ 0.5\sqrt{0.1\sqrt{5}+0.5} & -0.75-0.05\sqrt{5} & -0.5+0.1\sqrt{5} \\ -\sqrt{0.1\sqrt{5}+0.5} & -0.5+0.1\sqrt{5} & -\frac{\sqrt{5}}{5} \end{pmatrix}$
$T2u$	$\begin{pmatrix} \frac{\sqrt{5}}{5} & -\sqrt{0.5-0.1\sqrt{5}} & -0.5-0.1\sqrt{5} \\ -\sqrt{0.5-0.1\sqrt{5}} & -0.25\sqrt{5}-0.25 & 0.5\sqrt{0.5-0.1\sqrt{5}} \\ -0.5-0.1\sqrt{5} & 0.5\sqrt{0.5-0.1\sqrt{5}} & -0.75+0.05\sqrt{5} \end{pmatrix}$
Gu	$\begin{pmatrix} -0.25\sqrt{5}-0.25 & -0.5\sqrt{0.5-0.1\sqrt{5}} & 0 & \sqrt{0.5-0.1\sqrt{5}} \\ -0.5\sqrt{0.5-0.1\sqrt{5}} & 0.25-0.15\sqrt{5} & -\sqrt{0.1\sqrt{5}+0.5} & -\frac{\sqrt{5}}{5} \\ 0 & -\sqrt{0.1\sqrt{5}+0.5} & -0.25+0.25\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} \\ \sqrt{0.5-0.1\sqrt{5}} & -\frac{\sqrt{5}}{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} & 0.25+0.15\sqrt{5} \end{pmatrix}$
Hu	$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(\sqrt{5}+5\right) & \sqrt{0.3-0.06\sqrt{5}} & -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & \sqrt{0.06\sqrt{5}+0.3} \\ 0.04\sqrt{5}\left(\sqrt{5}+5\right) & 0.35-0.05\sqrt{5} & 0.1\sqrt{5.5\sqrt{5}+12.5} & -\frac{4}{5} & -0.2\sqrt{5-2\sqrt{5}} \\ \sqrt{0.3-0.06\sqrt{5}} & 0.1\sqrt{5.5\sqrt{5}+12.5} & 0.25-0.15\sqrt{5} & 0.2\sqrt{2\sqrt{5}+5} & -\frac{\sqrt{5}}{5} \\ -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -\frac{4}{5} & 0.2\sqrt{2\sqrt{5}+5} & 0.05\sqrt{5}+0.35 & 0.1\sqrt{12.5-5.5\sqrt{5}} \\ \sqrt{0.06\sqrt{5}+0.3} & -0.2\sqrt{5-2\sqrt{5}} & -\frac{\sqrt{5}}{5} & 0.1\sqrt{12.5-5.5\sqrt{5}} & 0.25+0.15\sqrt{5} \end{pmatrix}$

Ih	$\hat{C}_2(6)$

Ag 1

$T1g$

$$\begin{pmatrix} -0.25\sqrt{5}-0.25 & -0.5\sqrt{0.5-0.1\sqrt{5}} & \sqrt{0.5-0.1\sqrt{5}} \\ -0.5\sqrt{0.5-0.1\sqrt{5}} & -0.75+0.05\sqrt{5} & -0.5-0.1\sqrt{5} \\ \sqrt{0.5-0.1\sqrt{5}} & -0.5-0.1\sqrt{5} & \frac{\sqrt{5}}{5} \end{pmatrix}$$

$T2g$

$$\begin{pmatrix} -\frac{\sqrt{5}}{5} & -\sqrt{0.1\sqrt{5}+0.5} & -0.5+0.1\sqrt{5} \\ -\sqrt{0.1\sqrt{5}+0.5} & -0.25+0.25\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} \\ -0.5+0.1\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} & -0.75-0.05\sqrt{5} \end{pmatrix}$$

Gg

$$\begin{pmatrix} -0.25+0.25\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} & 0 & \sqrt{0.1\sqrt{5}+0.5} \\ -0.5\sqrt{0.1\sqrt{5}+0.5} & 0.25+0.15\sqrt{5} & \sqrt{0.5-0.1\sqrt{5}} & \frac{\sqrt{5}}{5} \\ 0 & \sqrt{0.5-0.1\sqrt{5}} & -0.25\sqrt{5}-0.25 & 0.5\sqrt{0.5-0.1\sqrt{5}} \\ \sqrt{0.1\sqrt{5}+0.5} & \frac{\sqrt{5}}{5} & 0.5\sqrt{0.5-0.1\sqrt{5}} & 0.25-0.15\sqrt{5} \end{pmatrix}$$

Hg

$$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.2\sqrt{1.5\sqrt{5}+7.5} & -0.04\sqrt{5}\left(\sqrt{5}+5\right) & \sqrt{0.3-0.06\sqrt{5}} \\ 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & 0.05\sqrt{5}+0.35 & 0.1\sqrt{12.5-5.5\sqrt{5}} & -\frac{4}{5} & -0.2\sqrt{2\sqrt{5}+5} \\ -0.2\sqrt{1.5\sqrt{5}+7.5} & 0.1\sqrt{12.5-5.5\sqrt{5}} & 0.25+0.15\sqrt{5} & -0.2\sqrt{5-2\sqrt{5}} & \frac{\sqrt{5}}{5} \\ -0.04\sqrt{5}\left(\sqrt{5}+5\right) & -\frac{4}{5} & -0.2\sqrt{5-2\sqrt{5}} & 0.35-0.05\sqrt{5} & -0.1\sqrt{5.5\sqrt{5}+12.5} \\ \sqrt{0.3-0.06\sqrt{5}} & -0.2\sqrt{2\sqrt{5}+5} & \frac{\sqrt{5}}{5} & -0.1\sqrt{5.5\sqrt{5}+12.5} & 0.25-0.15\sqrt{5} \end{pmatrix}$$

Au 1

$T1u$

$$\begin{pmatrix} -0.25\sqrt{5}-0.25 & -0.5\sqrt{0.5-0.1\sqrt{5}} & \sqrt{0.5-0.1\sqrt{5}} \\ -0.5\sqrt{0.5-0.1\sqrt{5}} & -0.75+0.05\sqrt{5} & -0.5-0.1\sqrt{5} \\ \sqrt{0.5-0.1\sqrt{5}} & -0.5-0.1\sqrt{5} & \frac{\sqrt{5}}{5} \end{pmatrix}$$

$T2u$

$$\begin{pmatrix} -\frac{\sqrt{5}}{5} & -\sqrt{0.1\sqrt{5}+0.5} & -0.5+0.1\sqrt{5} \\ -\sqrt{0.1\sqrt{5}+0.5} & -0.25+0.25\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} \\ -0.5+0.1\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} & -0.75-0.05\sqrt{5} \end{pmatrix}$$

Gu

$$\begin{pmatrix} -0.25+0.25\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} & 0 & \sqrt{0.1\sqrt{5}+0.5} \\ -0.5\sqrt{0.1\sqrt{5}+0.5} & 0.25+0.15\sqrt{5} & \sqrt{0.5-0.1\sqrt{5}} & \frac{\sqrt{5}}{5} \\ 0 & \sqrt{0.5-0.1\sqrt{5}} & -0.25\sqrt{5}-0.25 & 0.5\sqrt{0.5-0.1\sqrt{5}} \\ \sqrt{0.1\sqrt{5}+0.5} & \frac{\sqrt{5}}{5} & 0.5\sqrt{0.5-0.1\sqrt{5}} & 0.25-0.15\sqrt{5} \end{pmatrix}$$

Hu

$$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.2\sqrt{1.5\sqrt{5}+7.5} & -0.04\sqrt{5}\left(\sqrt{5}+5\right) & \sqrt{0.3-0.06\sqrt{5}} \\ 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & 0.05\sqrt{5}+0.35 & 0.1\sqrt{12.5-5.5\sqrt{5}} & -\frac{4}{5} & -0.2\sqrt{2\sqrt{5}+5} \\ -0.2\sqrt{1.5\sqrt{5}+7.5} & 0.1\sqrt{12.5-5.5\sqrt{5}} & 0.25+0.15\sqrt{5} & -0.2\sqrt{5-2\sqrt{5}} & \frac{\sqrt{5}}{5} \\ -0.04\sqrt{5}\left(\sqrt{5}+5\right) & -\frac{4}{5} & -0.2\sqrt{5-2\sqrt{5}} & 0.35-0.05\sqrt{5} & -0.1\sqrt{5.5\sqrt{5}+12.5} \\ \sqrt{0.3-0.06\sqrt{5}} & -0.2\sqrt{2\sqrt{5}+5} & \frac{\sqrt{5}}{5} & -0.1\sqrt{5.5\sqrt{5}+12.5} & 0.25-0.15\sqrt{5} \end{pmatrix}$$

Ih	$\hat{C}_2(7)$

$Ag \qquad 1$

$T1g$

$$\begin{pmatrix} -0.5 & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & \sqrt{0.1\sqrt{5}+0.5} \\ 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -0.5-\frac{\sqrt{5}}{5} & 0.5-0.1\sqrt{5} \\ \sqrt{0.1\sqrt{5}+0.5} & 0.5-0.1\sqrt{5} & \frac{\sqrt{5}}{5} \end{pmatrix}$$

$T2g$

$$\begin{pmatrix} -\frac{\sqrt{5}}{5} & \sqrt{0.5-0.1\sqrt{5}} & 0.1\sqrt{5}+0.5 \\ \sqrt{0.5-0.1\sqrt{5}} & -0.5 & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} \\ 0.1\sqrt{5}+0.5 & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.5+\frac{\sqrt{5}}{5} \end{pmatrix}$$

Gg

$$\begin{pmatrix} 0.25+0.25\sqrt{5} & 0.5\sqrt{0.5-0.1\sqrt{5}} & 0.5 & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} \\ 0.5\sqrt{0.5-0.1\sqrt{5}} & -0.25+0.15\sqrt{5} & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.3\sqrt{5} \\ 0.5 & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & 0.25-0.25\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} \\ -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -0.3\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} & -0.15\sqrt{5}-0.25 \end{pmatrix}$$

Hg

$$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(\sqrt{5}+5\right) & \sqrt{0.3-0.06\sqrt{5}} & -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & \sqrt{0.06\sqrt{5}+0.3} \\ 0.04\sqrt{5}\left(\sqrt{5}+5\right) & 0.1+\frac{\sqrt{5}}{5} & 0.1\sqrt{5-2\sqrt{5}} & 0.4 & -0.2\sqrt{10-2\sqrt{5}} \\ \sqrt{0.3-0.06\sqrt{5}} & 0.1\sqrt{5-2\sqrt{5}} & 0.5 & -0.2\sqrt{2\sqrt{5}+10} & 0 \\ -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & 0.4 & -0.2\sqrt{2\sqrt{5}+10} & 0.1-\frac{\sqrt{5}}{5} & 0.1\sqrt{2\sqrt{5}+5} \\ \sqrt{0.06\sqrt{5}+0.3} & -0.2\sqrt{10-2\sqrt{5}} & 0 & 0.1\sqrt{2\sqrt{5}+5} & 0.5 \end{pmatrix}$$

$Au \qquad 1$

$T1u$

$$\begin{pmatrix} -0.5 & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & \sqrt{0.1\sqrt{5}+0.5} \\ 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -0.5-\frac{\sqrt{5}}{5} & 0.5-0.1\sqrt{5} \\ \sqrt{0.1\sqrt{5}+0.5} & 0.5-0.1\sqrt{5} & \frac{\sqrt{5}}{5} \end{pmatrix}$$

$T2u$

$$\begin{pmatrix} -\frac{\sqrt{5}}{5} & \sqrt{0.5-0.1\sqrt{5}} & 0.1\sqrt{5}+0.5 \\ \sqrt{0.5-0.1\sqrt{5}} & -0.5 & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} \\ 0.1\sqrt{5}+0.5 & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.5+\frac{\sqrt{5}}{5} \end{pmatrix}$$

Gu

$$\begin{pmatrix} 0.25+0.25\sqrt{5} & 0.5\sqrt{0.5-0.1\sqrt{5}} & 0.5 & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} \\ 0.5\sqrt{0.5-0.1\sqrt{5}} & -0.25+0.15\sqrt{5} & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.3\sqrt{5} \\ 0.5 & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & 0.25-0.25\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} \\ -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -0.3\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} & -0.15\sqrt{5}-0.25 \end{pmatrix}$$

Hu

$$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(\sqrt{5}+5\right) & \sqrt{0.3-0.06\sqrt{5}} & -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & \sqrt{0.06\sqrt{5}+0.3} \\ 0.04\sqrt{5}\left(\sqrt{5}+5\right) & 0.1+\frac{\sqrt{5}}{5} & 0.1\sqrt{5-2\sqrt{5}} & 0.4 & -0.2\sqrt{10-2\sqrt{5}} \\ \sqrt{0.3-0.06\sqrt{5}} & 0.1\sqrt{5-2\sqrt{5}} & 0.5 & -0.2\sqrt{2\sqrt{5}+10} & 0 \\ -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & 0.4 & -0.2\sqrt{2\sqrt{5}+10} & 0.1-\frac{\sqrt{5}}{5} & 0.1\sqrt{2\sqrt{5}+5} \\ \sqrt{0.06\sqrt{5}+0.3} & -0.2\sqrt{10-2\sqrt{5}} & 0 & 0.1\sqrt{2\sqrt{5}+5} & 0.5 \end{pmatrix}$$

$\mathbf{Ih}$	$\hat{C}_2(8)$
Ag	1
$T1g$	$\begin{pmatrix} -0.25 + 0.25\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} & \sqrt{0.1\sqrt{5}+0.5} \\ -0.5\sqrt{0.1\sqrt{5}+0.5} & -0.75 - 0.05\sqrt{5} & -0.5 + 0.1\sqrt{5} \\ \sqrt{0.1\sqrt{5}+0.5} & -0.5 + 0.1\sqrt{5} & -\frac{\sqrt{5}}{5} \end{pmatrix}$
$T2g$	$\begin{pmatrix} \frac{\sqrt{5}}{5} & \sqrt{0.5 - 0.1\sqrt{5}} & -0.5 - 0.1\sqrt{5} \\ \sqrt{0.5 - 0.1\sqrt{5}} & -0.25\sqrt{5} - 0.25 & -0.5\sqrt{0.5 - 0.1\sqrt{5}} \\ -0.5 - 0.1\sqrt{5} & -0.5\sqrt{0.5 - 0.1\sqrt{5}} & -0.75 + 0.05\sqrt{5} \end{pmatrix}$
Gg	$\begin{pmatrix} -0.25\sqrt{5} - 0.25 & 0.5\sqrt{0.5 - 0.1\sqrt{5}} & 0 & -\sqrt{0.5 - 0.1\sqrt{5}} \\ 0.5\sqrt{0.5 - 0.1\sqrt{5}} & 0.25 - 0.15\sqrt{5} & \sqrt{0.1\sqrt{5}+0.5} & -\frac{\sqrt{5}}{5} \\ 0 & \sqrt{0.1\sqrt{5}+0.5} & -0.25 + 0.25\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} \\ -\sqrt{0.5 - 0.1\sqrt{5}} & -\frac{\sqrt{5}}{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} & 0.25 + 0.15\sqrt{5} \end{pmatrix}$
Hg	$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.2\sqrt{7.5 - 1.5\sqrt{5}} & -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.2\sqrt{1.5\sqrt{5}+7.5} \\ 0.04\sqrt{5}\left(\sqrt{5}+5\right) & 0.35 - 0.05\sqrt{5} & -0.1\sqrt{5.5\sqrt{5}+12.5} & -\frac{4}{5} & 0.2\sqrt{5 - 2\sqrt{5}} \\ -0.2\sqrt{7.5 - 1.5\sqrt{5}} & -0.1\sqrt{5.5\sqrt{5}+12.5} & 0.25 - 0.15\sqrt{5} & -0.2\sqrt{2\sqrt{5}+5} & -\frac{\sqrt{5}}{5} \\ -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -\frac{4}{5} & -0.2\sqrt{2\sqrt{5}+5} & 0.05\sqrt{5} + 0.35 & -0.1\sqrt{12.5 - 5.5\sqrt{5}} \\ -0.2\sqrt{1.5\sqrt{5}+7.5} & 0.2\sqrt{5 - 2\sqrt{5}} & -\frac{\sqrt{5}}{5} & -0.1\sqrt{12.5 - 5.5\sqrt{5}} & 0.25 + 0.15\sqrt{5} \end{pmatrix}$
Au	1
$T1u$	$\begin{pmatrix} -0.25 + 0.25\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} & \sqrt{0.1\sqrt{5}+0.5} \\ -0.5\sqrt{0.1\sqrt{5}+0.5} & -0.75 - 0.05\sqrt{5} & -0.5 + 0.1\sqrt{5} \\ \sqrt{0.1\sqrt{5}+0.5} & -0.5 + 0.1\sqrt{5} & -\frac{\sqrt{5}}{5} \end{pmatrix}$
$T2u$	$\begin{pmatrix} \frac{\sqrt{5}}{5} & \sqrt{0.5 - 0.1\sqrt{5}} & -0.5 - 0.1\sqrt{5} \\ \sqrt{0.5 - 0.1\sqrt{5}} & -0.25\sqrt{5} - 0.25 & -0.5\sqrt{0.5 - 0.1\sqrt{5}} \\ -0.5 - 0.1\sqrt{5} & -0.5\sqrt{0.5 - 0.1\sqrt{5}} & -0.75 + 0.05\sqrt{5} \end{pmatrix}$
Gu	$\begin{pmatrix} -0.25\sqrt{5} - 0.25 & 0.5\sqrt{0.5 - 0.1\sqrt{5}} & 0 & -\sqrt{0.5 - 0.1\sqrt{5}} \\ 0.5\sqrt{0.5 - 0.1\sqrt{5}} & 0.25 - 0.15\sqrt{5} & \sqrt{0.1\sqrt{5}+0.5} & -\frac{\sqrt{5}}{5} \\ 0 & \sqrt{0.1\sqrt{5}+0.5} & -0.25 + 0.25\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} \\ -\sqrt{0.5 - 0.1\sqrt{5}} & -\frac{\sqrt{5}}{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} & 0.25 + 0.15\sqrt{5} \end{pmatrix}$
Hu	$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.2\sqrt{7.5 - 1.5\sqrt{5}} & -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.2\sqrt{1.5\sqrt{5}+7.5} \\ 0.04\sqrt{5}\left(\sqrt{5}+5\right) & 0.35 - 0.05\sqrt{5} & -0.1\sqrt{5.5\sqrt{5}+12.5} & -\frac{4}{5} & 0.2\sqrt{5 - 2\sqrt{5}} \\ -0.2\sqrt{7.5 - 1.5\sqrt{5}} & -0.1\sqrt{5.5\sqrt{5}+12.5} & 0.25 - 0.15\sqrt{5} & -0.2\sqrt{2\sqrt{5}+5} & -\frac{\sqrt{5}}{5} \\ -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -\frac{4}{5} & -0.2\sqrt{2\sqrt{5}+5} & 0.05\sqrt{5} + 0.35 & -0.1\sqrt{12.5 - 5.5\sqrt{5}} \\ -0.2\sqrt{1.5\sqrt{5}+7.5} & 0.2\sqrt{5 - 2\sqrt{5}} & -\frac{\sqrt{5}}{5} & -0.1\sqrt{12.5 - 5.5\sqrt{5}} & 0.25 + 0.15\sqrt{5} \end{pmatrix}$

Ih	$\hat{C}_2(9)$

Ag : 1

$T1g$:
$$\begin{pmatrix} -0.25\sqrt{5}-0.25 & -0.5\sqrt{2.5-0.5\sqrt{5}} & 0 \\ -0.5\sqrt{2.5-0.5\sqrt{5}} & 0.25+0.25\sqrt{5} & 0 \\ 0 & 0 & -1 \end{pmatrix}$$

$T2g$:
$$\begin{pmatrix} -1 & 0 & 0 \\ 0 & -0.25+0.25\sqrt{5} & -0.5\sqrt{0.5\sqrt{5}+2.5} \\ 0 & -0.5\sqrt{0.5\sqrt{5}+2.5} & 0.25-0.25\sqrt{5} \end{pmatrix}$$

Gg :
$$\begin{pmatrix} -0.25\sqrt{5}-0.25 & -0.5\sqrt{2.5-0.5\sqrt{5}} & 0 & 0 \\ -0.5\sqrt{2.5-0.5\sqrt{5}} & 0.25+0.25\sqrt{5} & 0 & 0 \\ 0 & 0 & -0.25+0.25\sqrt{5} & 0.5\sqrt{0.5\sqrt{5}+2.5} \\ 0 & 0 & 0.5\sqrt{0.5\sqrt{5}+2.5} & 0.25-0.25\sqrt{5} \end{pmatrix}$$

Hg :
$$\begin{pmatrix} 1 & 0 & 0 & 0 & 0 \\ 0 & -0.25+0.25\sqrt{5} & 0.5\sqrt{0.5\sqrt{5}+2.5} & 0 & 0 \\ 0 & 0.5\sqrt{0.5\sqrt{5}+2.5} & 0.25-0.25\sqrt{5} & 0 & 0 \\ 0 & 0 & 0 & -0.25\sqrt{5}-0.25 & 0.5\sqrt{2.5-0.5\sqrt{5}} \\ 0 & 0 & 0 & 0.5\sqrt{2.5-0.5\sqrt{5}} & 0.25+0.25\sqrt{5} \end{pmatrix}$$

Au : 1

$T1u$:
$$\begin{pmatrix} -0.25\sqrt{5}-0.25 & -0.5\sqrt{2.5-0.5\sqrt{5}} & 0 \\ -0.5\sqrt{2.5-0.5\sqrt{5}} & 0.25+0.25\sqrt{5} & 0 \\ 0 & 0 & -1 \end{pmatrix}$$

$T2u$:
$$\begin{pmatrix} -1 & 0 & 0 \\ 0 & -0.25+0.25\sqrt{5} & -0.5\sqrt{0.5\sqrt{5}+2.5} \\ 0 & -0.5\sqrt{0.5\sqrt{5}+2.5} & 0.25-0.25\sqrt{5} \end{pmatrix}$$

Gu :
$$\begin{pmatrix} -0.25\sqrt{5}-0.25 & -0.5\sqrt{2.5-0.5\sqrt{5}} & 0 & 0 \\ -0.5\sqrt{2.5-0.5\sqrt{5}} & 0.25+0.25\sqrt{5} & 0 & 0 \\ 0 & 0 & -0.25+0.25\sqrt{5} & 0.5\sqrt{0.5\sqrt{5}+2.5} \\ 0 & 0 & 0.5\sqrt{0.5\sqrt{5}+2.5} & 0.25-0.25\sqrt{5} \end{pmatrix}$$

Hu :
$$\begin{pmatrix} 1 & 0 & 0 & 0 & 0 \\ 0 & -0.25+0.25\sqrt{5} & 0.5\sqrt{0.5\sqrt{5}+2.5} & 0 & 0 \\ 0 & 0.5\sqrt{0.5\sqrt{5}+2.5} & 0.25-0.25\sqrt{5} & 0 & 0 \\ 0 & 0 & 0 & -0.25\sqrt{5}-0.25 & 0.5\sqrt{2.5-0.5\sqrt{5}} \\ 0 & 0 & 0 & 0.5\sqrt{2.5-0.5\sqrt{5}} & 0.25+0.25\sqrt{5} \end{pmatrix}$$

Ih	$\hat{C}_2(10)$
Ag	1
$T1g$	$\begin{pmatrix} -0.5 & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -\sqrt{0.5-0.1\sqrt{5}} \\ -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.5+\frac{\sqrt{5}}{5} & 0.1\sqrt{5}+0.5 \\ -\sqrt{0.5-0.1\sqrt{5}} & 0.1\sqrt{5}+0.5 & -\frac{\sqrt{5}}{5} \end{pmatrix}$
$T2g$	$\begin{pmatrix} \frac{\sqrt{5}}{5} & \sqrt{0.1\sqrt{5}+0.5} & 0.5-0.1\sqrt{5} \\ \sqrt{0.1\sqrt{5}+0.5} & -0.5 & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} \\ 0.5-0.1\sqrt{5} & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -0.5-\frac{\sqrt{5}}{5} \end{pmatrix}$
Gg	$\begin{pmatrix} 0.25-0.25\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} & 0.5 & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} \\ 0.5\sqrt{0.1\sqrt{5}+0.5} & -0.15\sqrt{5}-0.25 & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & 0.3\sqrt{5} \\ 0.5 & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & 0.25+0.25\sqrt{5} & -0.5\sqrt{0.5-0.1\sqrt{5}} \\ 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & 0.3\sqrt{5} & -0.5\sqrt{0.5-0.1\sqrt{5}} & -0.25+0.15\sqrt{5} \end{pmatrix}$
Hg	$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.2\sqrt{1.5\sqrt{5}+7.5} & -0.04\sqrt{5}\left(\sqrt{5}+5\right) & \sqrt{0.3-0.06\sqrt{5}} \\ 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & 0.1-\frac{\sqrt{5}}{5} & 0.1\sqrt{2\sqrt{5}+5} & 0.4 & \sqrt{0.08\sqrt{5}+0.4} \\ -0.2\sqrt{1.5\sqrt{5}+7.5} & 0.1\sqrt{2\sqrt{5}+5} & 0.5 & -0.2\sqrt{10-2\sqrt{5}} & 0 \\ -0.04\sqrt{5}\left(\sqrt{5}+5\right) & 0.4 & -0.2\sqrt{10-2\sqrt{5}} & 0.1+\frac{\sqrt{5}}{5} & -0.1\sqrt{5-2\sqrt{5}} \\ \sqrt{0.3-0.06\sqrt{5}} & \sqrt{0.08\sqrt{5}+0.4} & 0 & -0.1\sqrt{5-2\sqrt{5}} & 0.5 \end{pmatrix}$
Au	1
$T1u$	$\begin{pmatrix} -0.5 & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -\sqrt{0.5-0.1\sqrt{5}} \\ -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.5+\frac{\sqrt{5}}{5} & 0.1\sqrt{5}+0.5 \\ -\sqrt{0.5-0.1\sqrt{5}} & 0.1\sqrt{5}+0.5 & -\frac{\sqrt{5}}{5} \end{pmatrix}$
$T2u$	$\begin{pmatrix} \frac{\sqrt{5}}{5} & \sqrt{0.1\sqrt{5}+0.5} & 0.5-0.1\sqrt{5} \\ \sqrt{0.1\sqrt{5}+0.5} & -0.5 & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} \\ 0.5-0.1\sqrt{5} & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -0.5-\frac{\sqrt{5}}{5} \end{pmatrix}$
Gu	$\begin{pmatrix} 0.25-0.25\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} & 0.5 & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} \\ 0.5\sqrt{0.1\sqrt{5}+0.5} & -0.15\sqrt{5}-0.25 & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & 0.3\sqrt{5} \\ 0.5 & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & 0.25+0.25\sqrt{5} & -0.5\sqrt{0.5-0.1\sqrt{5}} \\ 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & 0.3\sqrt{5} & -0.5\sqrt{0.5-0.1\sqrt{5}} & -0.25+0.15\sqrt{5} \end{pmatrix}$
Hu	$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.2\sqrt{1.5\sqrt{5}+7.5} & -0.04\sqrt{5}\left(\sqrt{5}+5\right) & \sqrt{0.3-0.06\sqrt{5}} \\ 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & 0.1-\frac{\sqrt{5}}{5} & 0.1\sqrt{2\sqrt{5}+5} & 0.4 & \sqrt{0.08\sqrt{5}+0.4} \\ -0.2\sqrt{1.5\sqrt{5}+7.5} & 0.1\sqrt{2\sqrt{5}+5} & 0.5 & -0.2\sqrt{10-2\sqrt{5}} & 0 \\ -0.04\sqrt{5}\left(\sqrt{5}+5\right) & 0.4 & -0.2\sqrt{10-2\sqrt{5}} & 0.1+\frac{\sqrt{5}}{5} & -0.1\sqrt{5-2\sqrt{5}} \\ \sqrt{0.3-0.06\sqrt{5}} & \sqrt{0.08\sqrt{5}+0.4} & 0 & -0.1\sqrt{5-2\sqrt{5}} & 0.5 \end{pmatrix}$

Ih	$\hat{C}_2(11)$
Ag	1

$T1g$

$$\begin{pmatrix} -0.25+0.25\sqrt{5} & -0.5\sqrt{0.5\sqrt{5}+2.5} & 0 \\ -0.5\sqrt{0.5\sqrt{5}+2.5} & 0.25-0.25\sqrt{5} & 0 \\ 0 & 0 & -1 \end{pmatrix}$$

$T2g$

$$\begin{pmatrix} -1 & 0 & 0 \\ 0 & -0.25\sqrt{5}-0.25 & 0.5\sqrt{2.5-0.5\sqrt{5}} \\ 0 & 0.5\sqrt{2.5-0.5\sqrt{5}} & 0.25+0.25\sqrt{5} \end{pmatrix}$$

Gg

$$\begin{pmatrix} -0.25+0.25\sqrt{5} & -0.5\sqrt{0.5\sqrt{5}+2.5} & 0 & 0 \\ -0.5\sqrt{0.5\sqrt{5}+2.5} & 0.25-0.25\sqrt{5} & 0 & 0 \\ 0 & 0 & -0.25\sqrt{5}-0.25 & -0.5\sqrt{2.5-0.5\sqrt{5}} \\ 0 & 0 & -0.5\sqrt{2.5-0.5\sqrt{5}} & 0.25+0.25\sqrt{5} \end{pmatrix}$$

Hg

$$\begin{pmatrix} 1 & 0 & 0 & 0 & 0 \\ 0 & -0.25\sqrt{5}-0.25 & -0.5\sqrt{2.5-0.5\sqrt{5}} & 0 & 0 \\ 0 & -0.5\sqrt{2.5-0.5\sqrt{5}} & 0.25+0.25\sqrt{5} & 0 & 0 \\ 0 & 0 & 0 & -0.25+0.25\sqrt{5} & 0.5\sqrt{0.5\sqrt{5}+2.5} \\ 0 & 0 & 0 & 0.5\sqrt{0.5\sqrt{5}+2.5} & 0.25-0.25\sqrt{5} \end{pmatrix}$$

| Au | 1 |

$T1u$

$$\begin{pmatrix} -0.25+0.25\sqrt{5} & -0.5\sqrt{0.5\sqrt{5}+2.5} & 0 \\ -0.5\sqrt{0.5\sqrt{5}+2.5} & 0.25-0.25\sqrt{5} & 0 \\ 0 & 0 & -1 \end{pmatrix}$$

$T2u$

$$\begin{pmatrix} -1 & 0 & 0 \\ 0 & -0.25\sqrt{5}-0.25 & 0.5\sqrt{2.5-0.5\sqrt{5}} \\ 0 & 0.5\sqrt{2.5-0.5\sqrt{5}} & 0.25+0.25\sqrt{5} \end{pmatrix}$$

Gu

$$\begin{pmatrix} -0.25+0.25\sqrt{5} & -0.5\sqrt{0.5\sqrt{5}+2.5} & 0 & 0 \\ -0.5\sqrt{0.5\sqrt{5}+2.5} & 0.25-0.25\sqrt{5} & 0 & 0 \\ 0 & 0 & -0.25\sqrt{5}-0.25 & -0.5\sqrt{2.5-0.5\sqrt{5}} \\ 0 & 0 & -0.5\sqrt{2.5-0.5\sqrt{5}} & 0.25+0.25\sqrt{5} \end{pmatrix}$$

Hu

$$\begin{pmatrix} 1 & 0 & 0 & 0 & 0 \\ 0 & -0.25\sqrt{5}-0.25 & -0.5\sqrt{2.5-0.5\sqrt{5}} & 0 & 0 \\ 0 & -0.5\sqrt{2.5-0.5\sqrt{5}} & 0.25+0.25\sqrt{5} & 0 & 0 \\ 0 & 0 & 0 & -0.25+0.25\sqrt{5} & 0.5\sqrt{0.5\sqrt{5}+2.5} \\ 0 & 0 & 0 & 0.5\sqrt{0.5\sqrt{5}+2.5} & 0.25-0.25\sqrt{5} \end{pmatrix}$$

Ih	$\hat{C}_2(12)$
Ag	1
$T1g$	$\begin{pmatrix} -1 & 0 & 0 \\ 0 & \frac{\sqrt{5}}{5} & -\frac{2\sqrt{5}}{5} \\ 0 & -\frac{2\sqrt{5}}{5} & -\frac{\sqrt{5}}{5} \end{pmatrix}$
$T2g$	$\begin{pmatrix} \frac{\sqrt{5}}{5} & 0 & \frac{2\sqrt{5}}{5} \\ 0 & -1 & 0 \\ \frac{2\sqrt{5}}{5} & 0 & -\frac{\sqrt{5}}{5} \end{pmatrix}$
Gg	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 0 & -\frac{2\sqrt{5}}{5} & 0 & -\frac{\sqrt{5}}{5} \\ -1 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{5}}{5} & 0 & \frac{2\sqrt{5}}{5} \end{pmatrix}$
Hg	$\begin{pmatrix} -0.2 & -0.4\sqrt{3} & 0 & 0.4\sqrt{3} & 0 \\ -0.4\sqrt{3} & \frac{4}{5} & 0 & 0.4 & 0 \\ 0 & 0 & -\frac{\sqrt{5}}{5} & 0 & \frac{2\sqrt{5}}{5} \\ 0.4\sqrt{3} & 0.4 & 0 & \frac{4}{5} & 0 \\ 0 & 0 & \frac{2\sqrt{5}}{5} & 0 & \frac{\sqrt{5}}{5} \end{pmatrix}$
Au	1
$T1u$	$\begin{pmatrix} -1 & 0 & 0 \\ 0 & \frac{\sqrt{5}}{5} & -\frac{2\sqrt{5}}{5} \\ 0 & -\frac{2\sqrt{5}}{5} & -\frac{\sqrt{5}}{5} \end{pmatrix}$
$T2u$	$\begin{pmatrix} \frac{\sqrt{5}}{5} & 0 & \frac{2\sqrt{5}}{5} \\ 0 & -1 & 0 \\ \frac{2\sqrt{5}}{5} & 0 & -\frac{\sqrt{5}}{5} \end{pmatrix}$
Gu	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 0 & -\frac{2\sqrt{5}}{5} & 0 & -\frac{\sqrt{5}}{5} \\ -1 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{5}}{5} & 0 & \frac{2\sqrt{5}}{5} \end{pmatrix}$
Hu	$\begin{pmatrix} -0.2 & -0.4\sqrt{3} & 0 & 0.4\sqrt{3} & 0 \\ -0.4\sqrt{3} & \frac{4}{5} & 0 & 0.4 & 0 \\ 0 & 0 & -\frac{\sqrt{5}}{5} & 0 & \frac{2\sqrt{5}}{5} \\ 0.4\sqrt{3} & 0.4 & 0 & \frac{4}{5} & 0 \\ 0 & 0 & \frac{2\sqrt{5}}{5} & 0 & \frac{\sqrt{5}}{5} \end{pmatrix}$

Ih	$\hat{C}_2(13)$
Ag	1
$T1g$	$\begin{pmatrix} -1 & 0 & 0 \\ 0 & -\frac{\sqrt{5}}{5} & \frac{2\sqrt{5}}{5} \\ 0 & \frac{2\sqrt{5}}{5} & \frac{\sqrt{5}}{5} \end{pmatrix}$
$T2g$	$\begin{pmatrix} -\frac{\sqrt{5}}{5} & 0 & -\frac{2\sqrt{5}}{5} \\ 0 & -1 & 0 \\ -\frac{2\sqrt{5}}{5} & 0 & \frac{\sqrt{5}}{5} \end{pmatrix}$
Gg	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 0 & \frac{2\sqrt{5}}{5} & 0 & \frac{\sqrt{5}}{5} \\ -1 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{5}}{5} & 0 & -\frac{2\sqrt{5}}{5} \end{pmatrix}$
Hg	$\begin{pmatrix} -0.2 & -0.4\sqrt{3} & 0 & 0.4\sqrt{3} & 0 \\ -0.4\sqrt{3} & \frac{4}{5} & 0 & 0.4 & 0 \\ 0 & 0 & \frac{\sqrt{5}}{5} & 0 & -\frac{2\sqrt{5}}{5} \\ 0.4\sqrt{3} & 0.4 & 0 & \frac{4}{5} & 0 \\ 0 & 0 & -\frac{2\sqrt{5}}{5} & 0 & -\frac{\sqrt{5}}{5} \end{pmatrix}$
Au	1
$T1u$	$\begin{pmatrix} -1 & 0 & 0 \\ 0 & -\frac{\sqrt{5}}{5} & \frac{2\sqrt{5}}{5} \\ 0 & \frac{2\sqrt{5}}{5} & \frac{\sqrt{5}}{5} \end{pmatrix}$
$T2u$	$\begin{pmatrix} -\frac{\sqrt{5}}{5} & 0 & -\frac{2\sqrt{5}}{5} \\ 0 & -1 & 0 \\ -\frac{2\sqrt{5}}{5} & 0 & \frac{\sqrt{5}}{5} \end{pmatrix}$
Gu	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 0 & \frac{2\sqrt{5}}{5} & 0 & \frac{\sqrt{5}}{5} \\ -1 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{5}}{5} & 0 & -\frac{2\sqrt{5}}{5} \end{pmatrix}$
Hu	$\begin{pmatrix} -0.2 & -0.4\sqrt{3} & 0 & 0.4\sqrt{3} & 0 \\ -0.4\sqrt{3} & \frac{4}{5} & 0 & 0.4 & 0 \\ 0 & 0 & \frac{\sqrt{5}}{5} & 0 & -\frac{2\sqrt{5}}{5} \\ 0.4\sqrt{3} & 0.4 & 0 & \frac{4}{5} & 0 \\ 0 & 0 & -\frac{2\sqrt{5}}{5} & 0 & -\frac{\sqrt{5}}{5} \end{pmatrix}$

Ih	$\hat{C}_2(14)$
Ag	1
$T1g$	$\begin{pmatrix} 1 & 0 & 0 \\ 0 & -1 & 0 \\ 0 & 0 & -1 \end{pmatrix}$
$T2g$	$\begin{pmatrix} -1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & -1 \end{pmatrix}$
Gg	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & -1 \end{pmatrix}$
Hg	$\begin{pmatrix} 1 & 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 & 0 \\ 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & -1 \end{pmatrix}$
Au	1
$T1u$	$\begin{pmatrix} 1 & 0 & 0 \\ 0 & -1 & 0 \\ 0 & 0 & -1 \end{pmatrix}$
$T2u$	$\begin{pmatrix} -1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & -1 \end{pmatrix}$
Gu	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & -1 \end{pmatrix}$
Hu	$\begin{pmatrix} 1 & 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 & 0 \\ 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & -1 \end{pmatrix}$

Ih	$\hat{i}$
Ag	1
$T1g$	$\begin{pmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{pmatrix}$
$T2g$	$\begin{pmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{pmatrix}$
Gg	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 0 & 0 & 0 & -1 \end{pmatrix}$
Hg	$\begin{pmatrix} 1 & 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 1 \end{pmatrix}$
Au	-1
$T1u$	$\begin{pmatrix} -1 & 0 & 0 \\ 0 & -1 & 0 \\ 0 & 0 & -1 \end{pmatrix}$
$T2u$	$\begin{pmatrix} -1 & 0 & 0 \\ 0 & -1 & 0 \\ 0 & 0 & -1 \end{pmatrix}$
Gu	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{pmatrix}$
Hu	$\begin{pmatrix} -1 & 0 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 & 0 \\ 0 & 0 & 0 & -1 & 0 \\ 0 & 0 & 0 & 0 & -1 \end{pmatrix}$

Ih	$\hat{S}_10(0)$
Ag	1
$T1g$	$\begin{pmatrix} 0.25 - 0.25\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} & -\sqrt{0.1\sqrt{5}+0.5} \\ 0.5\sqrt{0.5\sqrt{5}+2.5} & 0.25 - 0.05\sqrt{5} & -0.5 + 0.1\sqrt{5} \\ 0 & -\frac{2\sqrt{5}}{5} & -\frac{\sqrt{5}}{5} \end{pmatrix}$
$T2g$	$\begin{pmatrix} \frac{\sqrt{5}}{5} & 0 & \frac{2\sqrt{5}}{5} \\ -\sqrt{0.5-0.1\sqrt{5}} & 0.25 + 0.25\sqrt{5} & 0.5\sqrt{0.5-0.1\sqrt{5}} \\ -0.5 - 0.1\sqrt{5} & -0.5\sqrt{2.5-0.5\sqrt{5}} & 0.05\sqrt{5}+0.25 \end{pmatrix}$
Gg	$\begin{pmatrix} 0 & \sqrt{0.1\sqrt{5}+0.5} & -0.25 + 0.25\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} \\ 0 & 0.5 - 0.1\sqrt{5} & -0.5\sqrt{0.5\sqrt{5}+2.5} & 0.25 - 0.05\sqrt{5} \\ -0.25\sqrt{5} - 0.25 & 0.5\sqrt{0.5-0.1\sqrt{5}} & 0 & -\sqrt{0.5-0.1\sqrt{5}} \\ -0.5\sqrt{2.5-0.5\sqrt{5}} & -0.25 - 0.05\sqrt{5} & 0 & 0.1\sqrt{5}+0.5 \end{pmatrix}$
Hg	$\begin{pmatrix} -0.2 & -0.4\sqrt{3} & 0 & 0.4\sqrt{3} & 0 \\ 0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.15\sqrt{5}-0.15 & -0.5\sqrt{0.5-0.1\sqrt{5}} & -0.1\sqrt{5}-0.1 & \sqrt{0.5-0.1\sqrt{5}} \\ \sqrt{0.3-0.06\sqrt{5}} & -0.3\sqrt{2.5-0.5\sqrt{5}} & 0.05\sqrt{5}+0.25 & -0.2\sqrt{2.5-0.5\sqrt{5}} & -0.5-0.1\sqrt{5} \\ -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.1+0.1\sqrt{5} & -\sqrt{0.1\sqrt{5}+0.5} & -0.15+0.15\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} \\ \sqrt{0.06\sqrt{5}+0.3} & \sqrt{0.02\sqrt{5}+0.1} & 0.5-0.1\sqrt{5} & 0.3\sqrt{0.5\sqrt{5}+2.5} & 0.25-0.05\sqrt{5} \end{pmatrix}$
Au	-1
$T1u$	$\begin{pmatrix} -0.25 + 0.25\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} & \sqrt{0.1\sqrt{5}+0.5} \\ -0.5\sqrt{0.5\sqrt{5}+2.5} & -0.25 + 0.05\sqrt{5} & 0.5 - 0.1\sqrt{5} \\ 0 & \frac{2\sqrt{5}}{5} & \frac{\sqrt{5}}{5} \end{pmatrix}$
$T2u$	$\begin{pmatrix} -\frac{\sqrt{5}}{5} & 0 & -\frac{2\sqrt{5}}{5} \\ \sqrt{0.5-0.1\sqrt{5}} & -0.25\sqrt{5}-0.25 & -0.5\sqrt{0.5-0.1\sqrt{5}} \\ 0.1\sqrt{5}+0.5 & 0.5\sqrt{2.5-0.5\sqrt{5}} & -0.25-0.05\sqrt{5} \end{pmatrix}$
Gu	$\begin{pmatrix} 0 & -\sqrt{0.1\sqrt{5}+0.5} & 0.25 - 0.25\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} \\ 0 & -0.5 + 0.1\sqrt{5} & 0.5\sqrt{0.5\sqrt{5}+2.5} & -0.25 + 0.05\sqrt{5} \\ 0.25 + 0.25\sqrt{5} & -0.5\sqrt{0.5-0.1\sqrt{5}} & 0 & \sqrt{0.5-0.1\sqrt{5}} \\ 0.5\sqrt{2.5-0.5\sqrt{5}} & 0.05\sqrt{5}+0.25 & 0 & -0.5-0.1\sqrt{5} \end{pmatrix}$
Hu	$\begin{pmatrix} 0.2 & 0.4\sqrt{3} & 0 & -0.4\sqrt{3} & 0 \\ -0.04\sqrt{5}\left(\sqrt{5}+5\right) & 0.15+0.15\sqrt{5} & 0.5\sqrt{0.5-0.1\sqrt{5}} & 0.1+0.1\sqrt{5} & -\sqrt{0.5-0.1\sqrt{5}} \\ -0.2\sqrt{7.5-1.5\sqrt{5}} & 0.3\sqrt{2.5-0.5\sqrt{5}} & -0.25-0.05\sqrt{5} & \sqrt{0.1-0.02\sqrt{5}} & 0.1\sqrt{5}+0.5 \\ 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & 0.1-0.1\sqrt{5} & \sqrt{0.1\sqrt{5}+0.5} & 0.15-0.15\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} \\ -0.2\sqrt{1.5\sqrt{5}+7.5} & -0.2\sqrt{0.5\sqrt{5}+2.5} & -0.5+0.1\sqrt{5} & -0.3\sqrt{0.5\sqrt{5}+2.5} & -0.25+0.05\sqrt{5} \end{pmatrix}$

Ih	$\hat{S}_10^3(0)$
Ag	1
$T1g$	$\begin{pmatrix} 0.5 & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -\sqrt{0.1\sqrt{5}+0.5} \\ 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & 0.3\sqrt{5} & 0.5-0.1\sqrt{5} \\ \sqrt{0.5-0.1\sqrt{5}} & -0.5-0.1\sqrt{5} & \frac{\sqrt{5}}{5} \end{pmatrix}$
$T2g$	$\begin{pmatrix} -\frac{\sqrt{5}}{5} & -\sqrt{0.1\sqrt{5}+0.5} & -0.5+0.1\sqrt{5} \\ -\sqrt{0.5-0.1\sqrt{5}} & 0.5 & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} \\ 0.1\sqrt{5}+0.5 & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -0.3\sqrt{5} \end{pmatrix}$
Gg	$\begin{pmatrix} 0.5 & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & 0.25-0.25\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} \\ -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & 0.1\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} & 0.05\sqrt{5}+0.75 \\ 0.25+0.25\sqrt{5} & 0.5\sqrt{0.5-0.1\sqrt{5}} & 0.5 & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} \\ -0.5\sqrt{0.5-0.1\sqrt{5}} & -0.75+0.05\sqrt{5} & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.1\sqrt{5} \end{pmatrix}$
Hg	$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.2\sqrt{1.5\sqrt{5}+7.5} & -0.04\sqrt{5}\left(\sqrt{5}+5\right) & \sqrt{0.3-0.06\sqrt{5}} \\ 0.04\sqrt{5}\left(\sqrt{5}+5\right) & 0.1 & -0.1\sqrt{2\sqrt{5}+25} & 0.4-\frac{\sqrt{5}}{5} & -0.2\sqrt{2\sqrt{5}+5} \\ -0.2\sqrt{7.5-1.5\sqrt{5}} & 0.1\sqrt{25-2\sqrt{5}} & 0.1\sqrt{5} & -0.2\sqrt{2\sqrt{5}+5} & -\frac{\sqrt{5}}{5} \\ -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & 0.4+\frac{\sqrt{5}}{5} & -0.2\sqrt{5-2\sqrt{5}} & 0.1 & 0.1\sqrt{25-2\sqrt{5}} \\ -0.2\sqrt{1.5\sqrt{5}+7.5} & 0.2\sqrt{5-2\sqrt{5}} & -\frac{\sqrt{5}}{5} & 0.1\sqrt{2\sqrt{5}+25} & -0.1\sqrt{5} \end{pmatrix}$
Au	-1
$T1u$	$\begin{pmatrix} -0.5 & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & \sqrt{0.1\sqrt{5}+0.5} \\ -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.3\sqrt{5} & -0.5+0.1\sqrt{5} \\ -\sqrt{0.5-0.1\sqrt{5}} & 0.1\sqrt{5}+0.5 & -\frac{\sqrt{5}}{5} \end{pmatrix}$
$T2u$	$\begin{pmatrix} \frac{\sqrt{5}}{5} & \sqrt{0.1\sqrt{5}+0.5} & 0.5-0.1\sqrt{5} \\ \sqrt{0.5-0.1\sqrt{5}} & -0.5 & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} \\ -0.5-0.1\sqrt{5} & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & 0.3\sqrt{5} \end{pmatrix}$
Gu	$\begin{pmatrix} -0.5 & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.25+0.25\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} \\ 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -0.1\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} & -0.75-0.05\sqrt{5} \\ -0.25\sqrt{5}-0.25 & -0.5\sqrt{0.5-0.1\sqrt{5}} & -0.5 & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} \\ 0.5\sqrt{0.5-0.1\sqrt{5}} & 0.75-0.05\sqrt{5} & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & 0.1\sqrt{5} \end{pmatrix}$
Hu	$\begin{pmatrix} 0.2 & -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & \sqrt{0.06\sqrt{5}+0.3} & 0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.2\sqrt{7.5-1.5\sqrt{5}} \\ -0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.1 & 0.1\sqrt{2\sqrt{5}+25} & -0.4+\frac{\sqrt{5}}{5} & 0.2\sqrt{2\sqrt{5}+5} \\ \sqrt{0.3-0.06\sqrt{5}} & -0.1\sqrt{25-2\sqrt{5}} & -0.1\sqrt{5} & 0.2\sqrt{2\sqrt{5}+5} & \frac{\sqrt{5}}{5} \\ 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -\frac{\sqrt{5}}{5}-0.4 & 0.2\sqrt{5-2\sqrt{5}} & -0.1 & -0.1\sqrt{25-2\sqrt{5}} \\ \sqrt{0.06\sqrt{5}+0.3} & -0.2\sqrt{5-2\sqrt{5}} & \frac{\sqrt{5}}{5} & -0.1\sqrt{2\sqrt{5}+25} & 0.1\sqrt{5} \end{pmatrix}$

Ih	$\hat{S}_1 0^7(0)$
Ag	1
$T1g$	$\begin{pmatrix} 0.5 & 0.5\sqrt{\frac{2\sqrt5}{5}+1} & \sqrt{0.5-0.1\sqrt5} \\ -0.5\sqrt{1-\frac{2\sqrt5}{5}} & 0.3\sqrt5 & -0.5-0.1\sqrt5 \\ -\sqrt{0.1\sqrt5+0.5} & 0.5-0.1\sqrt5 & \frac{\sqrt5}{5} \end{pmatrix}$
$T2g$	$\begin{pmatrix} -\frac{\sqrt5}{5} & -\sqrt{0.5-0.1\sqrt5} & 0.1\sqrt5+0.5 \\ -\sqrt{0.1\sqrt5+0.5} & 0.5 & -0.5\sqrt{1-\frac{2\sqrt5}{5}} \\ -0.5+0.1\sqrt5 & -0.5\sqrt{\frac{2\sqrt5}{5}+1} & -0.3\sqrt5 \end{pmatrix}$
Gg	$\begin{pmatrix} 0.5 & -0.5\sqrt{1-\frac{2\sqrt5}{5}} & 0.25+0.25\sqrt5 & -0.5\sqrt{0.5-0.1\sqrt5} \\ -0.5\sqrt{\frac{2\sqrt5}{5}+1} & 0.1\sqrt5 & 0.5\sqrt{0.5-0.1\sqrt5} & -0.75+0.05\sqrt5 \\ 0.25-0.25\sqrt5 & 0.5\sqrt{0.1\sqrt5+0.5} & 0.5 & 0.5\sqrt{\frac{2\sqrt5}{5}+1} \\ 0.5\sqrt{0.1\sqrt5+0.5} & 0.05\sqrt5+0.75 & -0.5\sqrt{1-\frac{2\sqrt5}{5}} & -0.1\sqrt5 \end{pmatrix}$
Hg	$\begin{pmatrix} -0.2 & 0.04\sqrt5\left(\sqrt5+5\right) & -0.2\sqrt{7.5-1.5\sqrt5} & -0.04\sqrt5\left(-5+\sqrt5\right) & -0.2\sqrt{1.5\sqrt5+7.5} \\ 0.04\sqrt5\left(-5+\sqrt5\right) & 0.1 & 0.1\sqrt{25-2\sqrt5} & 0.4+\frac{\sqrt5}{5} & 0.2\sqrt{5-2\sqrt5} \\ -0.2\sqrt{1.5\sqrt5+7.5} & -0.1\sqrt{2\sqrt5+25} & 0.1\sqrt5 & -0.2\sqrt{5-2\sqrt5} & -\frac{\sqrt5}{5} \\ -0.04\sqrt5\left(\sqrt5+5\right) & 0.4-\frac{\sqrt5}{5} & -0.2\sqrt{2\sqrt5+5} & 0.1 & 0.1\sqrt{2\sqrt5+25} \\ \sqrt{0.3-0.06\sqrt5} & -0.2\sqrt{2\sqrt5+5} & -\frac{\sqrt5}{5} & 0.1\sqrt{25-2\sqrt5} & -0.1\sqrt5 \end{pmatrix}$
Au	-1
$T1u$	$\begin{pmatrix} -0.5 & -0.5\sqrt{\frac{2\sqrt5}{5}+1} & -\sqrt{0.5-0.1\sqrt5} \\ 0.5\sqrt{1-\frac{2\sqrt5}{5}} & -0.3\sqrt5 & 0.1\sqrt5+0.5 \\ \sqrt{0.1\sqrt5+0.5} & -0.5+0.1\sqrt5 & -\frac{\sqrt5}{5} \end{pmatrix}$
$T2u$	$\begin{pmatrix} \frac{\sqrt5}{5} & \sqrt{0.5-0.1\sqrt5} & -0.5-0.1\sqrt5 \\ \sqrt{0.1\sqrt5+0.5} & -0.5 & 0.5\sqrt{1-\frac{2\sqrt5}{5}} \\ 0.5-0.1\sqrt5 & 0.5\sqrt{\frac{2\sqrt5}{5}+1} & 0.3\sqrt5 \end{pmatrix}$
Gu	$\begin{pmatrix} -0.5 & 0.5\sqrt{1-\frac{2\sqrt5}{5}} & -0.25\sqrt5-0.25 & 0.5\sqrt{0.5-0.1\sqrt5} \\ 0.5\sqrt{\frac{2\sqrt5}{5}+1} & -0.1\sqrt5 & -0.5\sqrt{0.5-0.1\sqrt5} & 0.75-0.05\sqrt5 \\ -0.25+0.25\sqrt5 & -0.5\sqrt{0.1\sqrt5+0.5} & -0.5 & -0.5\sqrt{\frac{2\sqrt5}{5}+1} \\ -0.5\sqrt{0.1\sqrt5+0.5} & -0.75-0.05\sqrt5 & 0.5\sqrt{1-\frac{2\sqrt5}{5}} & 0.1\sqrt5 \end{pmatrix}$
Hu	$\begin{pmatrix} 0.2 & -0.04\sqrt5\left(\sqrt5+5\right) & \sqrt{0.3-0.06\sqrt5} & 0.04\sqrt5\left(-5+\sqrt5\right) & \sqrt{0.06\sqrt5+0.3} \\ -0.04\sqrt5\left(-5+\sqrt5\right) & -0.1 & -0.1\sqrt{25-2\sqrt5} & -\frac{\sqrt5}{5}-0.4 & -0.2\sqrt{5-2\sqrt5} \\ \sqrt{0.06\sqrt5+0.3} & 0.1\sqrt{2\sqrt5+25} & -0.1\sqrt5 & 0.2\sqrt{5-2\sqrt5} & \frac{\sqrt5}{5} \\ 0.04\sqrt5\left(\sqrt5+5\right) & -0.4+\frac{\sqrt5}{5} & 0.2\sqrt{2\sqrt5+5} & -0.1 & -0.1\sqrt{2\sqrt5+25} \\ -0.2\sqrt{7.5-1.5\sqrt5} & 0.2\sqrt{2\sqrt5+5} & \frac{\sqrt5}{5} & -0.1\sqrt{25-2\sqrt5} & 0.1\sqrt5 \end{pmatrix}$

Ih	$\hat{S}_{10}^9(0)$
Ag	1
$T1g$	$\begin{pmatrix} 0.25 - 0.25\sqrt{5} & 0.5\sqrt{0.5\sqrt{5}+2.5} & 0 \\ 0.5\sqrt{0.1\sqrt{5}+0.5} & 0.25 - 0.05\sqrt{5} & -\frac{2\sqrt{5}}{5} \\ -\sqrt{0.1\sqrt{5}+0.5} & -0.5 + 0.1\sqrt{5} & -\frac{\sqrt{5}}{5} \end{pmatrix}$
$T2g$	$\begin{pmatrix} \frac{\sqrt{5}}{5} & -\sqrt{0.5-0.1\sqrt{5}} & -0.5 - 0.1\sqrt{5} \\ 0 & 0.25 + 0.25\sqrt{5} & -0.5\sqrt{2.5 - 0.5\sqrt{5}} \\ \frac{2\sqrt{5}}{5} & 0.5\sqrt{0.5 - 0.1\sqrt{5}} & 0.05\sqrt{5} + 0.25 \end{pmatrix}$
Gg	$\begin{pmatrix} 0 & 0 & -0.25\sqrt{5}-0.25 & -0.5\sqrt{2.5-0.5\sqrt{5}} \\ \sqrt{0.1\sqrt{5}+0.5} & 0.5 - 0.1\sqrt{5} & 0.5\sqrt{0.5-0.1\sqrt{5}} & -0.25 - 0.05\sqrt{5} \\ -0.25 + 0.25\sqrt{5} & -0.5\sqrt{0.5\sqrt{5}+2.5} & 0 & 0 \\ 0.5\sqrt{0.1\sqrt{5}+0.5} & 0.25 - 0.05\sqrt{5} & -\sqrt{0.5-0.1\sqrt{5}} & 0.1\sqrt{5}+0.5 \end{pmatrix}$
Hg	$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(\sqrt{5}+5\right) & \sqrt{0.3-0.06\sqrt{5}} & -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & \sqrt{0.06\sqrt{5}+0.3} \\ -0.4\sqrt{3} & -0.15\sqrt{5}-0.15 & -0.3\sqrt{2.5-0.5\sqrt{5}} & -0.1+0.1\sqrt{5} & \sqrt{0.02\sqrt{5}+0.1} \\ 0 & -0.5\sqrt{0.5-0.1\sqrt{5}} & 0.05\sqrt{5}+0.25 & -\sqrt{0.1\sqrt{5}+0.5} & 0.5-0.1\sqrt{5} \\ 0.4\sqrt{3} & -0.1\sqrt{5}-0.1 & -0.2\sqrt{2.5-0.5\sqrt{5}} & -0.15+0.15\sqrt{5} & 0.3\sqrt{0.5\sqrt{5}+2.5} \\ 0 & \sqrt{0.5-0.1\sqrt{5}} & -0.5-0.1\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} & 0.25-0.05\sqrt{5} \end{pmatrix}$
Au	-1
$T1u$	$\begin{pmatrix} -0.25+0.25\sqrt{5} & -0.5\sqrt{0.5\sqrt{5}+2.5} & 0 \\ -0.5\sqrt{0.1\sqrt{5}+0.5} & -0.25+0.05\sqrt{5} & \frac{2\sqrt{5}}{5} \\ \sqrt{0.1\sqrt{5}+0.5} & 0.5-0.1\sqrt{5} & \frac{\sqrt{5}}{5} \end{pmatrix}$
$T2u$	$\begin{pmatrix} -\frac{\sqrt{5}}{5} & \sqrt{0.5-0.1\sqrt{5}} & 0.1\sqrt{5}+0.5 \\ 0 & -0.25\sqrt{5}-0.25 & 0.5\sqrt{2.5-0.5\sqrt{5}} \\ -\frac{2\sqrt{5}}{5} & -0.5\sqrt{0.5-0.1\sqrt{5}} & -0.25-0.05\sqrt{5} \end{pmatrix}$
Gu	$\begin{pmatrix} 0 & 0 & 0.25+0.25\sqrt{5} & 0.5\sqrt{2.5-0.5\sqrt{5}} \\ -\sqrt{0.1\sqrt{5}+0.5} & -0.5+0.1\sqrt{5} & -0.5\sqrt{0.5-0.1\sqrt{5}} & 0.05\sqrt{5}+0.25 \\ 0.25-0.25\sqrt{5} & 0.5\sqrt{0.5\sqrt{5}+2.5} & 0 & 0 \\ -0.5\sqrt{0.1\sqrt{5}+0.5} & -0.25+0.05\sqrt{5} & \sqrt{0.5-0.1\sqrt{5}} & -0.5-0.1\sqrt{5} \end{pmatrix}$
Hu	$\begin{pmatrix} 0.2 & -0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.2\sqrt{7.5-1.5\sqrt{5}} & 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.2\sqrt{1.5\sqrt{5}+7.5} \\ 0.4\sqrt{3} & 0.15+0.15\sqrt{5} & 0.3\sqrt{2.5-0.5\sqrt{5}} & 0.1-0.1\sqrt{5} & -0.2\sqrt{0.5\sqrt{5}+2.5} \\ 0 & 0.5\sqrt{0.5-0.1\sqrt{5}} & -0.25-0.05\sqrt{5} & \sqrt{0.1\sqrt{5}+0.5} & -0.5+0.1\sqrt{5} \\ -0.4\sqrt{3} & 0.1+0.1\sqrt{5} & \sqrt{0.1-0.02\sqrt{5}} & 0.15-0.15\sqrt{5} & -0.3\sqrt{0.5\sqrt{5}+2.5} \\ 0 & -\sqrt{0.5-0.1\sqrt{5}} & 0.1\sqrt{5}+0.5 & 0.5\sqrt{0.1\sqrt{5}+0.5} & -0.25+0.05\sqrt{5} \end{pmatrix}$

Ih	$\hat{S}_10(1)$
Ag	1
$T1g$	$\begin{pmatrix} 0.25 - 0.25\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} & \sqrt{0.1\sqrt{5}+0.5} \\ -0.5\sqrt{0.5\sqrt{5}+2.5} & 0.25 - 0.05\sqrt{5} & -0.5 + 0.1\sqrt{5} \\ 0 & -\frac{2\sqrt{5}}{5} & -\frac{\sqrt{5}}{5} \end{pmatrix}$
$T2g$	$\begin{pmatrix} \frac{\sqrt{5}}{5} & 0 & \frac{2\sqrt{5}}{5} \\ \sqrt{0.5-0.1\sqrt{5}} & 0.25+0.25\sqrt{5} & -0.5\sqrt{0.5-0.1\sqrt{5}} \\ -0.5-0.1\sqrt{5} & 0.5\sqrt{2.5-0.5\sqrt{5}} & 0.05\sqrt{5}+0.25 \end{pmatrix}$
Gg	$\begin{pmatrix} 0 & -\sqrt{0.1\sqrt{5}+0.5} & -0.25+0.25\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} \\ 0 & 0.5-0.1\sqrt{5} & 0.5\sqrt{0.5\sqrt{5}+2.5} & 0.25-0.05\sqrt{5} \\ -0.25\sqrt{5}-0.25 & -0.5\sqrt{0.5-0.1\sqrt{5}} & 0 & \sqrt{0.5-0.1\sqrt{5}} \\ 0.5\sqrt{2.5-0.5\sqrt{5}} & -0.25-0.05\sqrt{5} & 0 & 0.1\sqrt{5}+0.5 \end{pmatrix}$
Hg	$\begin{pmatrix} -0.2 & -0.4\sqrt{3} & 0 & 0.4\sqrt{3} & 0 \\ 0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.15\sqrt{5}-0.15 & 0.5\sqrt{0.5-0.1\sqrt{5}} & -0.1\sqrt{5}-0.1 & -\sqrt{0.5-0.1\sqrt{5}} \\ -0.2\sqrt{7.5-1.5\sqrt{5}} & 0.3\sqrt{2.5-0.5\sqrt{5}} & 0.05\sqrt{5}+0.25 & \sqrt{0.1-0.02\sqrt{5}} & -0.5-0.1\sqrt{5} \\ -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.1+0.1\sqrt{5} & \sqrt{0.1\sqrt{5}+0.5} & -0.15+0.15\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} \\ -0.2\sqrt{1.5\sqrt{5}+7.5} & -0.2\sqrt{0.5\sqrt{5}+2.5} & 0.5-0.1\sqrt{5} & -0.3\sqrt{0.5\sqrt{5}+2.5} & 0.25-0.05\sqrt{5} \end{pmatrix}$
Au	-1
$T1u$	$\begin{pmatrix} -0.25+0.25\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} & -\sqrt{0.1\sqrt{5}+0.5} \\ 0.5\sqrt{0.5\sqrt{5}+2.5} & -0.25+0.05\sqrt{5} & 0.5-0.1\sqrt{5} \\ 0 & \frac{2\sqrt{5}}{5} & \frac{\sqrt{5}}{5} \end{pmatrix}$
$T2u$	$\begin{pmatrix} -\frac{\sqrt{5}}{5} & 0 & -\frac{2\sqrt{5}}{5} \\ -\sqrt{0.5-0.1\sqrt{5}} & -0.25\sqrt{5}-0.25 & 0.5\sqrt{0.5-0.1\sqrt{5}} \\ 0.1\sqrt{5}+0.5 & -0.5\sqrt{2.5-0.5\sqrt{5}} & -0.25-0.05\sqrt{5} \end{pmatrix}$
Gu	$\begin{pmatrix} 0 & \sqrt{0.1\sqrt{5}+0.5} & 0.25-0.25\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} \\ 0 & -0.5+0.1\sqrt{5} & -0.5\sqrt{0.5\sqrt{5}+2.5} & -0.25+0.05\sqrt{5} \\ 0.25+0.25\sqrt{5} & 0.5\sqrt{0.5-0.1\sqrt{5}} & 0 & -\sqrt{0.5-0.1\sqrt{5}} \\ -0.5\sqrt{2.5-0.5\sqrt{5}} & 0.05\sqrt{5}+0.25 & 0 & -0.5-0.1\sqrt{5} \end{pmatrix}$
Hu	$\begin{pmatrix} 0.2 & 0.4\sqrt{3} & 0 & -0.4\sqrt{3} & 0 \\ -0.04\sqrt{5}\left(\sqrt{5}+5\right) & 0.15+0.15\sqrt{5} & -0.5\sqrt{0.5-0.1\sqrt{5}} & 0.1+0.1\sqrt{5} & \sqrt{0.5-0.1\sqrt{5}} \\ \sqrt{0.3-0.06\sqrt{5}} & -0.3\sqrt{2.5-0.5\sqrt{5}} & -0.25-0.05\sqrt{5} & -0.2\sqrt{2.5-0.5\sqrt{5}} & 0.1\sqrt{5}+0.5 \\ 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & 0.1-0.1\sqrt{5} & -\sqrt{0.1\sqrt{5}+0.5} & 0.15-0.15\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} \\ \sqrt{0.06\sqrt{5}+0.3} & \sqrt{0.02\sqrt{5}+0.1} & -0.5+0.1\sqrt{5} & 0.3\sqrt{0.5\sqrt{5}+2.5} & -0.25+0.05\sqrt{5} \end{pmatrix}$

Ih	$\hat{S}_1 0^3(1)$

Ag : 1

$T1g$:
$$\begin{pmatrix} 0.5 & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & \sqrt{0.1\sqrt{5}+0.5} \\ -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & 0.3\sqrt{5} & 0.5-0.1\sqrt{5} \\ -\sqrt{0.5-0.1\sqrt{5}} & -0.5-0.1\sqrt{5} & \frac{\sqrt{5}}{5} \end{pmatrix}$$

$T2g$:
$$\begin{pmatrix} -\frac{\sqrt{5}}{5} & \sqrt{0.1\sqrt{5}+0.5} & -0.5+0.1\sqrt{5} \\ \sqrt{0.5-0.1\sqrt{5}} & 0.5 & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} \\ 0.1\sqrt{5}+0.5 & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -0.3\sqrt{5} \end{pmatrix}$$

Gg :
$$\begin{pmatrix} 0.5 & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & 0.25-0.25\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} \\ 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & 0.1\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} & 0.05\sqrt{5}+0.75 \\ 0.25+0.25\sqrt{5} & -0.5\sqrt{0.5-0.1\sqrt{5}} & 0.5 & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} \\ 0.5\sqrt{0.5-0.1\sqrt{5}} & -0.75+0.05\sqrt{5} & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.1\sqrt{5} \end{pmatrix}$$

Hg :
$$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & \sqrt{0.06\sqrt{5}+0.3} & -0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.2\sqrt{7.5-1.5\sqrt{5}} \\ 0.04\sqrt{5}\left(\sqrt{5}+5\right) & 0.1 & 0.1\sqrt{2\sqrt{5}+25} & 0.4-\frac{\sqrt{5}}{5} & 0.2\sqrt{2\sqrt{5}+5} \\ \sqrt{0.3-0.06\sqrt{5}} & -0.1\sqrt{25-2\sqrt{5}} & 0.1\sqrt{5} & 0.2\sqrt{2\sqrt{5}+5} & -\frac{\sqrt{5}}{5} \\ -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & 0.4+\frac{\sqrt{5}}{5} & 0.2\sqrt{5-2\sqrt{5}} & 0.1 & -0.1\sqrt{25-2\sqrt{5}} \\ \sqrt{0.06\sqrt{5}+0.3} & -0.2\sqrt{5-2\sqrt{5}} & -\frac{\sqrt{5}}{5} & -0.1\sqrt{2\sqrt{5}+25} & -0.1\sqrt{5} \end{pmatrix}$$

Au : -1

$T1u$:
$$\begin{pmatrix} -0.5 & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -\sqrt{0.1\sqrt{5}+0.5} \\ 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.3\sqrt{5} & -0.5+0.1\sqrt{5} \\ \sqrt{0.5-0.1\sqrt{5}} & 0.1\sqrt{5}+0.5 & -\frac{\sqrt{5}}{5} \end{pmatrix}$$

$T2u$:
$$\begin{pmatrix} \frac{\sqrt{5}}{5} & -\sqrt{0.1\sqrt{5}+0.5} & 0.5-0.1\sqrt{5} \\ -\sqrt{0.5-0.1\sqrt{5}} & -0.5 & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} \\ -0.5-0.1\sqrt{5} & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & 0.3\sqrt{5} \end{pmatrix}$$

Gu :
$$\begin{pmatrix} -0.5 & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.25+0.25\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} \\ -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -0.1\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} & -0.75-0.05\sqrt{5} \\ -0.25\sqrt{5}-0.25 & 0.5\sqrt{0.5-0.1\sqrt{5}} & -0.5 & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} \\ -0.5\sqrt{0.5-0.1\sqrt{5}} & 0.75-0.05\sqrt{5} & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & 0.1\sqrt{5} \end{pmatrix}$$

Hu :
$$\begin{pmatrix} 0.2 & -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.2\sqrt{1.5\sqrt{5}+7.5} & 0.04\sqrt{5}\left(\sqrt{5}+5\right) & \sqrt{0.3-0.06\sqrt{5}} \\ -0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.1 & -0.1\sqrt{2\sqrt{5}+25} & -0.4+\frac{\sqrt{5}}{5} & -0.2\sqrt{2\sqrt{5}+5} \\ -0.2\sqrt{7.5-1.5\sqrt{5}} & 0.1\sqrt{25-2\sqrt{5}} & -0.1\sqrt{5} & -0.2\sqrt{2\sqrt{5}+5} & \frac{\sqrt{5}}{5} \\ 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -\frac{\sqrt{5}}{5}-0.4 & -0.2\sqrt{5-2\sqrt{5}} & -0.1 & 0.1\sqrt{25-2\sqrt{5}} \\ -0.2\sqrt{1.5\sqrt{5}+7.5} & 0.2\sqrt{5-2\sqrt{5}} & \frac{\sqrt{5}}{5} & 0.1\sqrt{2\sqrt{5}+25} & 0.1\sqrt{5} \end{pmatrix}$$

Ih	$\hat{S}_10^7(1)$

Ag
$$1$$

$T1g$
$$\begin{pmatrix} 0.5 & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -\sqrt{0.5-0.1\sqrt{5}} \\ 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & 0.3\sqrt{5} & -0.5-0.1\sqrt{5} \\ \sqrt{0.1\sqrt{5}+0.5} & 0.5-0.1\sqrt{5} & \frac{\sqrt{5}}{5} \end{pmatrix}$$

$T2g$
$$\begin{pmatrix} -\frac{\sqrt{5}}{5} & \sqrt{0.5-0.1\sqrt{5}} & 0.1\sqrt{5}+0.5 \\ \sqrt{0.1\sqrt{5}+0.5} & 0.5 & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} \\ -0.5+0.1\sqrt{5} & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.3\sqrt{5} \end{pmatrix}$$

Gg
$$\begin{pmatrix} 0.5 & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & 0.25+0.25\sqrt{5} & 0.5\sqrt{0.5-0.1\sqrt{5}} \\ 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & 0.1\sqrt{5} & -0.5\sqrt{0.5-0.1\sqrt{5}} & -0.75+0.05\sqrt{5} \\ 0.25-0.25\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} & 0.5 & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} \\ -0.5\sqrt{0.1\sqrt{5}+0.5} & 0.05\sqrt{5}+0.75 & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -0.1\sqrt{5} \end{pmatrix}$$

Hg
$$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(\sqrt{5}+5\right) & \sqrt{0.3-0.06\sqrt{5}} & -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & \sqrt{0.06\sqrt{5}+0.3} \\ 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & 0.1 & -0.1\sqrt{25-2\sqrt{5}} & 0.4+\frac{\sqrt{5}}{5} & -0.2\sqrt{5-2\sqrt{5}} \\ \sqrt{0.06\sqrt{5}+0.3} & 0.1\sqrt{2\sqrt{5}+25} & 0.1\sqrt{5} & 0.2\sqrt{5-2\sqrt{5}} & -\frac{\sqrt{5}}{5} \\ -0.04\sqrt{5}\left(\sqrt{5}+5\right) & 0.4-\frac{\sqrt{5}}{5} & 0.2\sqrt{2\sqrt{5}+5} & 0.1 & -0.1\sqrt{2\sqrt{5}+25} \\ -0.2\sqrt{7.5-1.5\sqrt{5}} & 0.2\sqrt{2\sqrt{5}+5} & -\frac{\sqrt{5}}{5} & -0.1\sqrt{25-2\sqrt{5}} & -0.1\sqrt{5} \end{pmatrix}$$

Au
$$-1$$

$T1u$
$$\begin{pmatrix} -0.5 & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & \sqrt{0.5-0.1\sqrt{5}} \\ -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -0.3\sqrt{5} & 0.1\sqrt{5}+0.5 \\ -\sqrt{0.1\sqrt{5}+0.5} & -0.5+0.1\sqrt{5} & -\frac{\sqrt{5}}{5} \end{pmatrix}$$

$T2u$
$$\begin{pmatrix} \frac{\sqrt{5}}{5} & -\sqrt{0.5-0.1\sqrt{5}} & -0.5-0.1\sqrt{5} \\ -\sqrt{0.1\sqrt{5}+0.5} & -0.5 & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} \\ 0.5-0.1\sqrt{5} & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & 0.3\sqrt{5} \end{pmatrix}$$

Gu
$$\begin{pmatrix} -0.5 & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -0.25\sqrt{5}-0.25 & -0.5\sqrt{0.5-0.1\sqrt{5}} \\ -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.1\sqrt{5} & 0.5\sqrt{0.5-0.1\sqrt{5}} & 0.75-0.05\sqrt{5} \\ -0.25+0.25\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} & -0.5 & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} \\ 0.5\sqrt{0.1\sqrt{5}+0.5} & -0.75-0.05\sqrt{5} & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & 0.1\sqrt{5} \end{pmatrix}$$

Hu
$$\begin{pmatrix} 0.2 & -0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.2\sqrt{7.5-1.5\sqrt{5}} & 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.2\sqrt{1.5\sqrt{5}+7.5} \\ -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.1 & 0.1\sqrt{25-2\sqrt{5}} & -\frac{\sqrt{5}}{5}-0.4 & 0.2\sqrt{5-2\sqrt{5}} \\ -0.2\sqrt{1.5\sqrt{5}+7.5} & -0.1\sqrt{2\sqrt{5}+25} & -0.1\sqrt{5} & -0.2\sqrt{5-2\sqrt{5}} & \frac{\sqrt{5}}{5} \\ 0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.4+\frac{\sqrt{5}}{5} & -0.2\sqrt{2\sqrt{5}+5} & -0.1 & 0.1\sqrt{2\sqrt{5}+25} \\ \sqrt{0.3-0.06\sqrt{5}} & -0.2\sqrt{2\sqrt{5}+5} & \frac{\sqrt{5}}{5} & 0.1\sqrt{25-2\sqrt{5}} & 0.1\sqrt{5} \end{pmatrix}$$

Ih	$\hat{S}_{10}{}^9(1)$

Ag 1

$T1g$
$$\begin{pmatrix} 0.25 - 0.25\sqrt{5} & -0.5\sqrt{0.5\sqrt{5}+2.5} & 0 \\ -0.5\sqrt{0.1\sqrt{5}+0.5} & 0.25 - 0.05\sqrt{5} & -\frac{2\sqrt{5}}{5} \\ \sqrt{0.1\sqrt{5}+0.5} & -0.5+0.1\sqrt{5} & -\frac{\sqrt{5}}{5} \end{pmatrix}$$

$T2g$
$$\begin{pmatrix} \frac{\sqrt{5}}{5} & \sqrt{0.5-0.1\sqrt{5}} & -0.5-0.1\sqrt{5} \\ 0 & 0.25+0.25\sqrt{5} & 0.5\sqrt{2.5-0.5\sqrt{5}} \\ \frac{2\sqrt{5}}{5} & -0.5\sqrt{0.5-0.1\sqrt{5}} & 0.05\sqrt{5}+0.25 \end{pmatrix}$$

Gg
$$\begin{pmatrix} 0 & 0 & -0.25\sqrt{5}-0.25 & 0.5\sqrt{2.5-0.5\sqrt{5}} \\ -\sqrt{0.1\sqrt{5}+0.5} & 0.5-0.1\sqrt{5} & -0.5\sqrt{0.5-0.1\sqrt{5}} & -0.25-0.05\sqrt{5} \\ -0.25+0.25\sqrt{5} & 0.5\sqrt{0.5\sqrt{5}+2.5} & 0 & 0 \\ -0.5\sqrt{0.1\sqrt{5}+0.5} & 0.25-0.05\sqrt{5} & \sqrt{0.5-0.1\sqrt{5}} & 0.1\sqrt{5}+0.5 \end{pmatrix}$$

Hg
$$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.2\sqrt{7.5-1.5\sqrt{5}} & -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.2\sqrt{1.5\sqrt{5}+7.5} \\ -0.4\sqrt{3} & -0.15\sqrt{5}-0.15 & 0.3\sqrt{2.5-0.5\sqrt{5}} & -0.1+0.1\sqrt{5} & -0.2\sqrt{0.5\sqrt{5}+2.5} \\ 0 & 0.5\sqrt{0.5-0.1\sqrt{5}} & 0.05\sqrt{5}+0.25 & \sqrt{0.1\sqrt{5}+0.5} & 0.5-0.1\sqrt{5} \\ 0.4\sqrt{3} & -0.1\sqrt{5}-0.1 & \sqrt{0.1-0.02\sqrt{5}} & -0.15+0.15\sqrt{5} & -0.3\sqrt{0.5\sqrt{5}+2.5} \\ 0 & -\sqrt{0.5-0.1\sqrt{5}} & -0.5-0.1\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} & 0.25-0.05\sqrt{5} \end{pmatrix}$$

Au -1

$T1u$
$$\begin{pmatrix} -0.25+0.25\sqrt{5} & 0.5\sqrt{0.5\sqrt{5}+2.5} & 0 \\ 0.5\sqrt{0.1\sqrt{5}+0.5} & -0.25+0.05\sqrt{5} & \frac{2\sqrt{5}}{5} \\ -\sqrt{0.1\sqrt{5}+0.5} & 0.5-0.1\sqrt{5} & \frac{\sqrt{5}}{5} \end{pmatrix}$$

$T2u$
$$\begin{pmatrix} -\frac{\sqrt{5}}{5} & -\sqrt{0.5-0.1\sqrt{5}} & 0.1\sqrt{5}+0.5 \\ 0 & -0.25\sqrt{5}-0.25 & -0.5\sqrt{2.5-0.5\sqrt{5}} \\ -\frac{2\sqrt{5}}{5} & 0.5\sqrt{0.5-0.1\sqrt{5}} & -0.25-0.05\sqrt{5} \end{pmatrix}$$

Gu
$$\begin{pmatrix} 0 & 0 & 0.25+0.25\sqrt{5} & -0.5\sqrt{2.5-0.5\sqrt{5}} \\ \sqrt{0.1\sqrt{5}+0.5} & -0.5+0.1\sqrt{5} & 0.5\sqrt{0.5-0.1\sqrt{5}} & 0.05\sqrt{5}+0.25 \\ 0.25-0.25\sqrt{5} & -0.5\sqrt{0.5\sqrt{5}+2.5} & 0 & 0 \\ 0.5\sqrt{0.1\sqrt{5}+0.5} & -0.25+0.05\sqrt{5} & -\sqrt{0.5-0.1\sqrt{5}} & -0.5-0.1\sqrt{5} \end{pmatrix}$$

Hu
$$\begin{pmatrix} 0.2 & -0.04\sqrt{5}\left(\sqrt{5}+5\right) & \sqrt{0.3-0.06\sqrt{5}} & 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & \sqrt{0.06\sqrt{5}+0.3} \\ 0.4\sqrt{3} & 0.15+0.15\sqrt{5} & -0.3\sqrt{2.5-0.5\sqrt{5}} & 0.1-0.1\sqrt{5} & \sqrt{0.02\sqrt{5}+0.1} \\ 0 & -0.5\sqrt{0.5-0.1\sqrt{5}} & -0.25-0.05\sqrt{5} & -\sqrt{0.1\sqrt{5}+0.5} & -0.5+0.1\sqrt{5} \\ -0.4\sqrt{3} & 0.1+0.1\sqrt{5} & -0.2\sqrt{2.5-0.5\sqrt{5}} & 0.15-0.15\sqrt{5} & 0.3\sqrt{0.5\sqrt{5}+2.5} \\ 0 & \sqrt{0.5-0.1\sqrt{5}} & 0.1\sqrt{5}+0.5 & -0.5\sqrt{0.1\sqrt{5}+0.5} & -0.25+0.05\sqrt{5} \end{pmatrix}$$

Ih	$\hat{S}_10(2)$

Ag 1

$T1g$
$$\begin{pmatrix} -0.25\sqrt{5}-0.25 & 0.5\sqrt{0.5-0.1\sqrt{5}} & -\sqrt{0.5-0.1\sqrt{5}} \\ -0.5\sqrt{0.5-0.1\sqrt{5}} & 0.75-0.05\sqrt{5} & 0.1\sqrt{5}+0.5 \\ \sqrt{0.5-0.1\sqrt{5}} & 0.1\sqrt{5}+0.5 & -\frac{\sqrt{5}}{5} \end{pmatrix}$$

$T2g$
$$\begin{pmatrix} \frac{\sqrt{5}}{5} & -\sqrt{0.1\sqrt{5}+0.5} & 0.5-0.1\sqrt{5} \\ \sqrt{0.1\sqrt{5}+0.5} & -0.25+0.25\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} \\ 0.5-0.1\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} & 0.05\sqrt{5}+0.75 \end{pmatrix}$$

Gg
$$\begin{pmatrix} 0.25-0.25\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} & 0 & \sqrt{0.1\sqrt{5}+0.5} \\ 0.5\sqrt{0.1\sqrt{5}+0.5} & 0.25+0.15\sqrt{5} & -\sqrt{0.5-0.1\sqrt{5}} & \frac{\sqrt{5}}{5} \\ 0 & \sqrt{0.5-0.1\sqrt{5}} & 0.25+0.25\sqrt{5} & 0.5\sqrt{0.5-0.1\sqrt{5}} \\ -\sqrt{0.1\sqrt{5}+0.5} & \frac{\sqrt{5}}{5} & -0.5\sqrt{0.5-0.1\sqrt{5}} & 0.25-0.15\sqrt{5} \end{pmatrix}$$

Hg
$$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & \sqrt{0.06\sqrt{5}+0.3} & -0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.2\sqrt{7.5-1.5\sqrt{5}} \\ 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & 0.05\sqrt{5}+0.35 & -0.1\sqrt{12.5-5.5\sqrt{5}} & -\frac{4}{5} & 0.2\sqrt{2\sqrt{5}+5} \\ -0.2\sqrt{1.5\sqrt{5}+7.5} & 0.1\sqrt{12.5-5.5\sqrt{5}} & -0.15\sqrt{5}-0.25 & -0.2\sqrt{5-2\sqrt{5}} & -\frac{\sqrt{5}}{5} \\ -0.04\sqrt{5}\left(\sqrt{5}+5\right) & -\frac{4}{5} & 0.2\sqrt{5-2\sqrt{5}} & 0.35-0.05\sqrt{5} & 0.1\sqrt{5.5\sqrt{5}+12.5} \\ \sqrt{0.3-0.06\sqrt{5}} & -0.2\sqrt{2\sqrt{5}+5} & -\frac{\sqrt{5}}{5} & -0.1\sqrt{5.5\sqrt{5}+12.5} & -0.25+0.15\sqrt{5} \end{pmatrix}$$

Au -1

$T1u$
$$\begin{pmatrix} 0.25+0.25\sqrt{5} & -0.5\sqrt{0.5-0.1\sqrt{5}} & \sqrt{0.5-0.1\sqrt{5}} \\ 0.5\sqrt{0.5-0.1\sqrt{5}} & -0.75+0.05\sqrt{5} & -0.5-0.1\sqrt{5} \\ -\sqrt{0.5-0.1\sqrt{5}} & -0.5-0.1\sqrt{5} & \frac{\sqrt{5}}{5} \end{pmatrix}$$

$T2u$
$$\begin{pmatrix} -\frac{\sqrt{5}}{5} & \sqrt{0.1\sqrt{5}+0.5} & -0.5+0.1\sqrt{5} \\ -\sqrt{0.1\sqrt{5}+0.5} & 0.25-0.25\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} \\ -0.5+0.1\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} & -0.75-0.05\sqrt{5} \end{pmatrix}$$

Gu
$$\begin{pmatrix} -0.25+0.25\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} & 0 & -\sqrt{0.1\sqrt{5}+0.5} \\ -0.5\sqrt{0.1\sqrt{5}+0.5} & -0.15\sqrt{5}-0.25 & \sqrt{0.5-0.1\sqrt{5}} & -\frac{\sqrt{5}}{5} \\ 0 & -\sqrt{0.5-0.1\sqrt{5}} & -0.25\sqrt{5}-0.25 & -0.5\sqrt{0.5-0.1\sqrt{5}} \\ \sqrt{0.1\sqrt{5}+0.5} & -\frac{\sqrt{5}}{5} & 0.5\sqrt{0.5-0.1\sqrt{5}} & -0.25+0.15\sqrt{5} \end{pmatrix}$$

Hu
$$\begin{pmatrix} 0.2 & -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.2\sqrt{1.5\sqrt{5}+7.5} & 0.04\sqrt{5}\left(\sqrt{5}+5\right) & \sqrt{0.3-0.06\sqrt{5}} \\ -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.35-0.05\sqrt{5} & 0.1\sqrt{12.5-5.5\sqrt{5}} & \frac{4}{5} & -0.2\sqrt{2\sqrt{5}+5} \\ \sqrt{0.06\sqrt{5}+0.3} & -0.1\sqrt{12.5-5.5\sqrt{5}} & 0.25+0.15\sqrt{5} & 0.2\sqrt{5-2\sqrt{5}} & \frac{\sqrt{5}}{5} \\ 0.04\sqrt{5}\left(\sqrt{5}+5\right) & \frac{4}{5} & -0.2\sqrt{5-2\sqrt{5}} & -0.35+0.05\sqrt{5} & -0.1\sqrt{5.5\sqrt{5}+12.5} \\ -0.2\sqrt{7.5-1.5\sqrt{5}} & 0.2\sqrt{2\sqrt{5}+5} & \frac{\sqrt{5}}{5} & 0.1\sqrt{5.5\sqrt{5}+12.5} & 0.25-0.15\sqrt{5} \end{pmatrix}$$

Ih	$\hat{S}_10^3(2)$
Ag	1
$T1g$	$\begin{pmatrix} -0.25 + 0.25\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} & -\sqrt{0.1\sqrt{5}+0.5} \\ -0.5\sqrt{0.1\sqrt{5}+0.5} & 0.05\sqrt{5}+0.75 & 0.5-0.1\sqrt{5} \\ \sqrt{0.1\sqrt{5}+0.5} & 0.5-0.1\sqrt{5} & \frac{\sqrt{5}}{5} \end{pmatrix}$
$T2g$	$\begin{pmatrix} -\frac{\sqrt{5}}{5} & \sqrt{0.5-0.1\sqrt{5}} & 0.1\sqrt{5}+0.5 \\ -\sqrt{0.5-0.1\sqrt{5}} & -0.25\sqrt{5}-0.25 & 0.5\sqrt{0.5-0.1\sqrt{5}} \\ 0.1\sqrt{5}+0.5 & -0.5\sqrt{0.5-0.1\sqrt{5}} & 0.75-0.05\sqrt{5} \end{pmatrix}$
Gg	$\begin{pmatrix} 0.25+0.25\sqrt{5} & 0.5\sqrt{0.5-0.1\sqrt{5}} & 0 & -\sqrt{0.5-0.1\sqrt{5}} \\ -0.5\sqrt{0.5-0.1\sqrt{5}} & 0.25-0.15\sqrt{5} & -\sqrt{0.1\sqrt{5}+0.5} & -\frac{\sqrt{5}}{5} \\ 0 & \sqrt{0.1\sqrt{5}+0.5} & 0.25-0.25\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} \\ \sqrt{0.5-0.1\sqrt{5}} & -\frac{\sqrt{5}}{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} & 0.25+0.15\sqrt{5} \end{pmatrix}$
Hg	$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(\sqrt{5}+5\right) & \sqrt{0.3-0.06\sqrt{5}} & -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & \sqrt{0.06\sqrt{5}+0.3} \\ 0.04\sqrt{5}\left(\sqrt{5}+5\right) & 0.35-0.05\sqrt{5} & 0.1\sqrt{5.5\sqrt{5}+12.5} & -\frac{4}{5} & -0.2\sqrt{5-2\sqrt{5}} \\ -0.2\sqrt{7.5-1.5\sqrt{5}} & -0.1\sqrt{5.5\sqrt{5}+12.5} & -0.25+0.15\sqrt{5} & -0.2\sqrt{2\sqrt{5}+5} & \frac{\sqrt{5}}{5} \\ -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -\frac{4}{5} & 0.2\sqrt{2\sqrt{5}+5} & 0.05\sqrt{5}+0.35 & 0.1\sqrt{12.5-5.5\sqrt{5}} \\ -0.2\sqrt{1.5\sqrt{5}+7.5} & 0.2\sqrt{5-2\sqrt{5}} & \frac{\sqrt{5}}{5} & -0.1\sqrt{12.5-5.5\sqrt{5}} & -0.15\sqrt{5}-0.25 \end{pmatrix}$
Au	-1
$T1u$	$\begin{pmatrix} 0.25-0.25\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} & \sqrt{0.1\sqrt{5}+0.5} \\ 0.5\sqrt{0.1\sqrt{5}+0.5} & -0.75-0.05\sqrt{5} & -0.5+0.1\sqrt{5} \\ -\sqrt{0.1\sqrt{5}+0.5} & -0.5+0.1\sqrt{5} & -\frac{\sqrt{5}}{5} \end{pmatrix}$
$T2u$	$\begin{pmatrix} \frac{\sqrt{5}}{5} & -\sqrt{0.5-0.1\sqrt{5}} & -0.5-0.1\sqrt{5} \\ \sqrt{0.5-0.1\sqrt{5}} & 0.25+0.25\sqrt{5} & -0.5\sqrt{0.5-0.1\sqrt{5}} \\ -0.5-0.1\sqrt{5} & 0.5\sqrt{0.5-0.1\sqrt{5}} & -0.75+0.05\sqrt{5} \end{pmatrix}$
Gu	$\begin{pmatrix} -0.25\sqrt{5}-0.25 & -0.5\sqrt{0.5-0.1\sqrt{5}} & 0 & \sqrt{0.5-0.1\sqrt{5}} \\ 0.5\sqrt{0.5-0.1\sqrt{5}} & -0.25+0.15\sqrt{5} & \sqrt{0.1\sqrt{5}+0.5} & \frac{\sqrt{5}}{5} \\ 0 & -\sqrt{0.1\sqrt{5}+0.5} & -0.25+0.25\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} \\ -\sqrt{0.5-0.1\sqrt{5}} & \frac{\sqrt{5}}{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} & -0.15\sqrt{5}-0.25 \end{pmatrix}$
Hu	$\begin{pmatrix} 0.2 & -0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.2\sqrt{7.5-1.5\sqrt{5}} & 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.2\sqrt{1.5\sqrt{5}+7.5} \\ -0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.35+0.05\sqrt{5} & -0.1\sqrt{5.5\sqrt{5}+12.5} & \frac{4}{5} & 0.2\sqrt{5-2\sqrt{5}} \\ \sqrt{0.3-0.06\sqrt{5}} & 0.1\sqrt{5.5\sqrt{5}+12.5} & 0.25-0.15\sqrt{5} & 0.2\sqrt{2\sqrt{5}+5} & -\frac{\sqrt{5}}{5} \\ 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & \frac{4}{5} & -0.2\sqrt{2\sqrt{5}+5} & -0.35-0.05\sqrt{5} & -0.1\sqrt{12.5-5.5\sqrt{5}} \\ \sqrt{0.06\sqrt{5}+0.3} & -0.2\sqrt{5-2\sqrt{5}} & -\frac{\sqrt{5}}{5} & 0.1\sqrt{12.5-5.5\sqrt{5}} & 0.25+0.15\sqrt{5} \end{pmatrix}$

Ih	$\hat{S}_10^7(2)$
Ag	1

$T1g$
$$\begin{pmatrix} -0.25+0.25\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} & \sqrt{0.1\sqrt{5}+0.5} \\ 0.5\sqrt{0.1\sqrt{5}+0.5} & 0.05\sqrt{5}+0.75 & 0.5-0.1\sqrt{5} \\ -\sqrt{0.1\sqrt{5}+0.5} & 0.5-0.1\sqrt{5} & \frac{\sqrt{5}}{5} \end{pmatrix}$$

$T2g$
$$\begin{pmatrix} -\frac{\sqrt{5}}{5} & -\sqrt{0.5-0.1\sqrt{5}} & 0.1\sqrt{5}+0.5 \\ \sqrt{0.5-0.1\sqrt{5}} & -0.25\sqrt{5}-0.25 & -0.5\sqrt{0.5-0.1\sqrt{5}} \\ 0.1\sqrt{5}+0.5 & 0.5\sqrt{0.5-0.1\sqrt{5}} & 0.75-0.05\sqrt{5} \end{pmatrix}$$

Gg
$$\begin{pmatrix} 0.25+0.25\sqrt{5} & -0.5\sqrt{0.5-0.1\sqrt{5}} & 0 & \sqrt{0.5-0.1\sqrt{5}} \\ 0.5\sqrt{0.5-0.1\sqrt{5}} & 0.25-0.15\sqrt{5} & \sqrt{0.1\sqrt{5}+0.5} & -\frac{\sqrt{5}}{5} \\ 0 & -\sqrt{0.1\sqrt{5}+0.5} & 0.25-0.25\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} \\ -\sqrt{0.5-0.1\sqrt{5}} & -\frac{\sqrt{5}}{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} & 0.25+0.15\sqrt{5} \end{pmatrix}$$

Hg
$$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.2\sqrt{7.5-1.5\sqrt{5}} & -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.2\sqrt{1.5\sqrt{5}+7.5} \\ 0.04\sqrt{5}\left(\sqrt{5}+5\right) & 0.35-0.05\sqrt{5} & -0.1\sqrt{5.5\sqrt{5}+12.5} & -\frac{4}{5} & 0.2\sqrt{5-2\sqrt{5}} \\ \sqrt{0.3-0.06\sqrt{5}} & 0.1\sqrt{5.5\sqrt{5}+12.5} & -0.25+0.15\sqrt{5} & 0.2\sqrt{2\sqrt{5}+5} & \frac{\sqrt{5}}{5} \\ -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -\frac{4}{5} & -0.2\sqrt{2\sqrt{5}+5} & 0.05\sqrt{5}+0.35 & -0.1\sqrt{12.5-5.5\sqrt{5}} \\ \sqrt{0.06\sqrt{5}+0.3} & -0.2\sqrt{5-2\sqrt{5}} & \frac{\sqrt{5}}{5} & 0.1\sqrt{12.5-5.5\sqrt{5}} & -0.15\sqrt{5}-0.25 \end{pmatrix}$$

Au : -1

$T1u$
$$\begin{pmatrix} 0.25-0.25\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} & -\sqrt{0.1\sqrt{5}+0.5} \\ -0.5\sqrt{0.1\sqrt{5}+0.5} & -0.75-0.05\sqrt{5} & -0.5+0.1\sqrt{5} \\ \sqrt{0.1\sqrt{5}+0.5} & -0.5+0.1\sqrt{5} & -\frac{\sqrt{5}}{5} \end{pmatrix}$$

$T2u$
$$\begin{pmatrix} \frac{\sqrt{5}}{5} & \sqrt{0.5-0.1\sqrt{5}} & -0.5-0.1\sqrt{5} \\ -\sqrt{0.5-0.1\sqrt{5}} & 0.25+0.25\sqrt{5} & 0.5\sqrt{0.5-0.1\sqrt{5}} \\ -0.5-0.1\sqrt{5} & -0.5\sqrt{0.5-0.1\sqrt{5}} & -0.75+0.05\sqrt{5} \end{pmatrix}$$

Gu
$$\begin{pmatrix} -0.25\sqrt{5}-0.25 & 0.5\sqrt{0.5-0.1\sqrt{5}} & 0 & -\sqrt{0.5-0.1\sqrt{5}} \\ -0.5\sqrt{0.5-0.1\sqrt{5}} & -0.25+0.15\sqrt{5} & -\sqrt{0.1\sqrt{5}+0.5} & \frac{\sqrt{5}}{5} \\ 0 & \sqrt{0.1\sqrt{5}+0.5} & -0.25+0.25\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} \\ \sqrt{0.5-0.1\sqrt{5}} & \frac{\sqrt{5}}{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} & -0.15\sqrt{5}-0.25 \end{pmatrix}$$

Hu
$$\begin{pmatrix} 0.2 & -0.04\sqrt{5}\left(\sqrt{5}+5\right) & \sqrt{0.3-0.06\sqrt{5}} & 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & \sqrt{0.06\sqrt{5}+0.3} \\ -0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.35+0.05\sqrt{5} & 0.1\sqrt{5.5\sqrt{5}+12.5} & \frac{4}{5} & -0.2\sqrt{5-2\sqrt{5}} \\ -0.2\sqrt{7.5-1.5\sqrt{5}} & -0.1\sqrt{5.5\sqrt{5}+12.5} & 0.25-0.15\sqrt{5} & -0.2\sqrt{2\sqrt{5}+5} & -\frac{\sqrt{5}}{5} \\ 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & \frac{4}{5} & 0.2\sqrt{2\sqrt{5}+5} & -0.35-0.05\sqrt{5} & 0.1\sqrt{12.5-5.5\sqrt{5}} \\ -0.2\sqrt{1.5\sqrt{5}+7.5} & 0.2\sqrt{5-2\sqrt{5}} & -\frac{\sqrt{5}}{5} & -0.1\sqrt{12.5-5.5\sqrt{5}} & 0.25+0.15\sqrt{5} \end{pmatrix}$$

Ih	$\hat{S}_1 0^9(2)$
Ag	1
$T1g$	$\begin{pmatrix} -0.25\sqrt{5}-0.25 & -0.5\sqrt{0.5-0.1\sqrt{5}} & \sqrt{0.5-0.1\sqrt{5}} \\ 0.5\sqrt{0.5-0.1\sqrt{5}} & 0.75-0.05\sqrt{5} & 0.1\sqrt{5}+0.5 \\ -\sqrt{0.5-0.1\sqrt{5}} & 0.1\sqrt{5}+0.5 & -\frac{\sqrt{5}}{5} \end{pmatrix}$
$T2g$	$\begin{pmatrix} \frac{\sqrt{5}}{5} & \sqrt{0.1\sqrt{5}+0.5} & 0.5-0.1\sqrt{5} \\ -\sqrt{0.1\sqrt{5}+0.5} & -0.25+0.25\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} \\ 0.5-0.1\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} & 0.05\sqrt{5}+0.75 \end{pmatrix}$
Gg	$\begin{pmatrix} 0.25-0.25\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} & 0 & -\sqrt{0.1\sqrt{5}+0.5} \\ -0.5\sqrt{0.1\sqrt{5}+0.5} & 0.25+0.15\sqrt{5} & \sqrt{0.5-0.1\sqrt{5}} & \frac{\sqrt{5}}{5} \\ 0 & -\sqrt{0.5-0.1\sqrt{5}} & 0.25+0.25\sqrt{5} & -0.5\sqrt{0.5-0.1\sqrt{5}} \\ \sqrt{0.1\sqrt{5}+0.5} & \frac{\sqrt{5}}{5} & 0.5\sqrt{0.5-0.1\sqrt{5}} & 0.25-0.15\sqrt{5} \end{pmatrix}$
Hg	$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.2\sqrt{1.5\sqrt{5}+7.5} & -0.04\sqrt{5}\left(\sqrt{5}+5\right) & \sqrt{0.3-0.06\sqrt{5}} \\ 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & 0.05\sqrt{5}+0.35 & 0.1\sqrt{12.5-5.5\sqrt{5}} & -\frac{4}{5} & -0.2\sqrt{2\sqrt{5}+5} \\ \sqrt{0.06\sqrt{5}+0.3} & -0.1\sqrt{12.5-5.5\sqrt{5}} & -0.15\sqrt{5}-0.25 & 0.2\sqrt{5-2\sqrt{5}} & -\frac{\sqrt{5}}{5} \\ -0.04\sqrt{5}\left(\sqrt{5}+5\right) & -\frac{4}{5} & -0.2\sqrt{5-2\sqrt{5}} & 0.35-0.05\sqrt{5} & -0.1\sqrt{5.5\sqrt{5}+12.5} \\ -0.2\sqrt{7.5-1.5\sqrt{5}} & 0.2\sqrt{2\sqrt{5}+5} & -\frac{\sqrt{5}}{5} & 0.1\sqrt{5.5\sqrt{5}+12.5} & -0.25+0.15\sqrt{5} \end{pmatrix}$
Au	-1
$T1u$	$\begin{pmatrix} 0.25+0.25\sqrt{5} & 0.5\sqrt{0.5-0.1\sqrt{5}} & -\sqrt{0.5-0.1\sqrt{5}} \\ -0.5\sqrt{0.5-0.1\sqrt{5}} & -0.75+0.05\sqrt{5} & -0.5-0.1\sqrt{5} \\ \sqrt{0.5-0.1\sqrt{5}} & -0.5-0.1\sqrt{5} & \frac{\sqrt{5}}{5} \end{pmatrix}$
$T2u$	$\begin{pmatrix} -\frac{\sqrt{5}}{5} & -\sqrt{0.1\sqrt{5}+0.5} & -0.5+0.1\sqrt{5} \\ \sqrt{0.1\sqrt{5}+0.5} & 0.25-0.25\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} \\ -0.5+0.1\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} & -0.75-0.05\sqrt{5} \end{pmatrix}$
Gu	$\begin{pmatrix} -0.25+0.25\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} & 0 & \sqrt{0.1\sqrt{5}+0.5} \\ 0.5\sqrt{0.1\sqrt{5}+0.5} & -0.15\sqrt{5}-0.25 & -\sqrt{0.5-0.1\sqrt{5}} & -\frac{\sqrt{5}}{5} \\ 0 & \sqrt{0.5-0.1\sqrt{5}} & -0.25\sqrt{5}-0.25 & 0.5\sqrt{0.5-0.1\sqrt{5}} \\ -\sqrt{0.1\sqrt{5}+0.5} & -\frac{\sqrt{5}}{5} & -0.5\sqrt{0.5-0.1\sqrt{5}} & -0.25+0.15\sqrt{5} \end{pmatrix}$
Hu	$\begin{pmatrix} 0.2 & -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & \sqrt{0.06\sqrt{5}+0.3} & 0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.2\sqrt{7.5-1.5\sqrt{5}} \\ -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.35-0.05\sqrt{5} & -0.1\sqrt{12.5-5.5\sqrt{5}} & \frac{4}{5} & 0.2\sqrt{2\sqrt{5}+5} \\ -0.2\sqrt{1.5\sqrt{5}+7.5} & 0.1\sqrt{12.5-5.5\sqrt{5}} & 0.25+0.15\sqrt{5} & -0.2\sqrt{5-2\sqrt{5}} & \frac{\sqrt{5}}{5} \\ 0.04\sqrt{5}\left(\sqrt{5}+5\right) & \frac{4}{5} & 0.2\sqrt{5-2\sqrt{5}} & -0.35+0.05\sqrt{5} & 0.1\sqrt{5.5\sqrt{5}+12.5} \\ \sqrt{0.3-0.06\sqrt{5}} & -0.2\sqrt{2\sqrt{5}+5} & \frac{\sqrt{5}}{5} & -0.1\sqrt{5.5\sqrt{5}+12.5} & 0.25-0.15\sqrt{5} \end{pmatrix}$

Ih	$\hat{S}_10(3)$

<div>

Ag $\qquad$ 1

T1g
$$\begin{pmatrix} -0.25\sqrt{5}-0.25 & -0.5\sqrt{2.5-0.5\sqrt{5}} & 0 \\ 0.5\sqrt{2.5-0.5\sqrt{5}} & -0.25\sqrt{5}-0.25 & 0 \\ 0 & 0 & 1 \end{pmatrix}$$

T2g
$$\begin{pmatrix} 1 & 0 & 0 \\ 0 & -0.25+0.25\sqrt{5} & -0.5\sqrt{0.5\sqrt{5}+2.5} \\ 0 & 0.5\sqrt{0.5\sqrt{5}+2.5} & -0.25+0.25\sqrt{5} \end{pmatrix}$$

Gg
$$\begin{pmatrix} 0.25+0.25\sqrt{5} & 0.5\sqrt{2.5-0.5\sqrt{5}} & 0 & 0 \\ -0.5\sqrt{2.5-0.5\sqrt{5}} & 0.25+0.25\sqrt{5} & 0 & 0 \\ 0 & 0 & 0.25-0.25\sqrt{5} & -0.5\sqrt{0.5\sqrt{5}+2.5} \\ 0 & 0 & 0.5\sqrt{0.5\sqrt{5}+2.5} & 0.25-0.25\sqrt{5} \end{pmatrix}$$

Hg
$$\begin{pmatrix} 1 & 0 & 0 & 0 & 0 \\ 0 & -0.25+0.25\sqrt{5} & 0.5\sqrt{0.5\sqrt{5}+2.5} & 0 & 0 \\ 0 & -0.5\sqrt{0.5\sqrt{5}+2.5} & -0.25+0.25\sqrt{5} & 0 & 0 \\ 0 & 0 & 0 & -0.25\sqrt{5}-0.25 & 0.5\sqrt{2.5-0.5\sqrt{5}} \\ 0 & 0 & 0 & -0.5\sqrt{2.5-0.5\sqrt{5}} & -0.25\sqrt{5}-0.25 \end{pmatrix}$$

Au $\qquad$ -1

T1u
$$\begin{pmatrix} 0.25+0.25\sqrt{5} & 0.5\sqrt{2.5-0.5\sqrt{5}} & 0 \\ -0.5\sqrt{2.5-0.5\sqrt{5}} & 0.25+0.25\sqrt{5} & 0 \\ 0 & 0 & -1 \end{pmatrix}$$

T2u
$$\begin{pmatrix} -1 & 0 & 0 \\ 0 & 0.25-0.25\sqrt{5} & 0.5\sqrt{0.5\sqrt{5}+2.5} \\ 0 & -0.5\sqrt{0.5\sqrt{5}+2.5} & 0.25-0.25\sqrt{5} \end{pmatrix}$$

Gu
$$\begin{pmatrix} -0.25\sqrt{5}-0.25 & -0.5\sqrt{2.5-0.5\sqrt{5}} & 0 & 0 \\ 0.5\sqrt{2.5-0.5\sqrt{5}} & -0.25\sqrt{5}-0.25 & 0 & 0 \\ 0 & 0 & -0.25+0.25\sqrt{5} & 0.5\sqrt{0.5\sqrt{5}+2.5} \\ 0 & 0 & -0.5\sqrt{0.5\sqrt{5}+2.5} & -0.25+0.25\sqrt{5} \end{pmatrix}$$

Hu
$$\begin{pmatrix} -1 & 0 & 0 & 0 & 0 \\ 0 & 0.25-0.25\sqrt{5} & -0.5\sqrt{0.5\sqrt{5}+2.5} & 0 & 0 \\ 0 & 0.5\sqrt{0.5\sqrt{5}+2.5} & 0.25-0.25\sqrt{5} & 0 & 0 \\ 0 & 0 & 0 & 0.25+0.25\sqrt{5} & -0.5\sqrt{2.5-0.5\sqrt{5}} \\ 0 & 0 & 0 & 0.5\sqrt{2.5-0.5\sqrt{5}} & 0.25+0.25\sqrt{5} \end{pmatrix}$$

</div>

Ih	$\hat{S}_1 0^3(3)$
Ag	1
$T1g$	$\begin{pmatrix} -0.25+0.25\sqrt{5} & -0.5\sqrt{0.5\sqrt{5}+2.5} & 0 \\ 0.5\sqrt{0.5\sqrt{5}+2.5} & -0.25+0.25\sqrt{5} & 0 \\ 0 & 0 & 1 \end{pmatrix}$
$T2g$	$\begin{pmatrix} 1 & 0 & 0 \\ 0 & -0.25\sqrt{5}-0.25 & 0.5\sqrt{2.5-0.5\sqrt{5}} \\ 0 & -0.5\sqrt{2.5-0.5\sqrt{5}} & -0.25\sqrt{5}-0.25 \end{pmatrix}$
Gg	$\begin{pmatrix} 0.25-0.25\sqrt{5} & 0.5\sqrt{0.5\sqrt{5}+2.5} & 0 & 0 \\ -0.5\sqrt{0.5\sqrt{5}+2.5} & 0.25-0.25\sqrt{5} & 0 & 0 \\ 0 & 0 & 0.25+0.25\sqrt{5} & 0.5\sqrt{2.5-0.5\sqrt{5}} \\ 0 & 0 & -0.5\sqrt{2.5-0.5\sqrt{5}} & 0.25+0.25\sqrt{5} \end{pmatrix}$
Hg	$\begin{pmatrix} 1 & 0 & 0 & 0 & 0 \\ 0 & -0.25\sqrt{5}-0.25 & -0.5\sqrt{2.5-0.5\sqrt{5}} & 0 & 0 \\ 0 & 0.5\sqrt{2.5-0.5\sqrt{5}} & -0.25\sqrt{5}-0.25 & 0 & 0 \\ 0 & 0 & 0 & -0.25+0.25\sqrt{5} & 0.5\sqrt{0.5\sqrt{5}+2.5} \\ 0 & 0 & 0 & -0.5\sqrt{0.5\sqrt{5}+2.5} & -0.25+0.25\sqrt{5} \end{pmatrix}$
Au	-1
$T1u$	$\begin{pmatrix} 0.25-0.25\sqrt{5} & 0.5\sqrt{0.5\sqrt{5}+2.5} & 0 \\ -0.5\sqrt{0.5\sqrt{5}+2.5} & 0.25-0.25\sqrt{5} & 0 \\ 0 & 0 & -1 \end{pmatrix}$
$T2u$	$\begin{pmatrix} -1 & 0 & 0 \\ 0 & 0.25+0.25\sqrt{5} & -0.5\sqrt{2.5-0.5\sqrt{5}} \\ 0 & 0.5\sqrt{2.5-0.5\sqrt{5}} & 0.25+0.25\sqrt{5} \end{pmatrix}$
Gu	$\begin{pmatrix} -0.25+0.25\sqrt{5} & -0.5\sqrt{0.5\sqrt{5}+2.5} & 0 & 0 \\ 0.5\sqrt{0.5\sqrt{5}+2.5} & -0.25+0.25\sqrt{5} & 0 & 0 \\ 0 & 0 & -0.25\sqrt{5}-0.25 & -0.5\sqrt{2.5-0.5\sqrt{5}} \\ 0 & 0 & 0.5\sqrt{2.5-0.5\sqrt{5}} & -0.25\sqrt{5}-0.25 \end{pmatrix}$
Hu	$\begin{pmatrix} -1 & 0 & 0 & 0 & 0 \\ 0 & 0.25+0.25\sqrt{5} & 0.5\sqrt{2.5-0.5\sqrt{5}} & 0 & 0 \\ 0 & -0.5\sqrt{2.5-0.5\sqrt{5}} & 0.25+0.25\sqrt{5} & 0 & 0 \\ 0 & 0 & 0 & 0.25-0.25\sqrt{5} & -0.5\sqrt{0.5\sqrt{5}+2.5} \\ 0 & 0 & 0 & 0.5\sqrt{0.5\sqrt{5}+2.5} & 0.25-0.25\sqrt{5} \end{pmatrix}$

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Ih	$\hat{S}_10^7(3)$

Ag

$$1$$

$T1g$

$$\begin{pmatrix} -0.25+0.25\sqrt{5} & 0.5\sqrt{0.5\sqrt{5}+2.5} & 0 \\ -0.5\sqrt{0.5\sqrt{5}+2.5} & -0.25+0.25\sqrt{5} & 0 \\ 0 & 0 & 1 \end{pmatrix}$$

$T2g$

$$\begin{pmatrix} 1 & 0 & 0 \\ 0 & -0.25\sqrt{5}-0.25 & -0.5\sqrt{2.5-0.5\sqrt{5}} \\ 0 & 0.5\sqrt{2.5-0.5\sqrt{5}} & -0.25\sqrt{5}-0.25 \end{pmatrix}$$

Gg

$$\begin{pmatrix} 0.25-0.25\sqrt{5} & -0.5\sqrt{0.5\sqrt{5}+2.5} & 0 & 0 \\ 0.5\sqrt{0.5\sqrt{5}+2.5} & 0.25-0.25\sqrt{5} & 0 & 0 \\ 0 & 0 & 0.25+0.25\sqrt{5} & -0.5\sqrt{2.5-0.5\sqrt{5}} \\ 0 & 0 & 0.5\sqrt{2.5-0.5\sqrt{5}} & 0.25+0.25\sqrt{5} \end{pmatrix}$$

Hg

$$\begin{pmatrix} 1 & 0 & 0 & 0 & 0 \\ 0 & -0.25\sqrt{5}-0.25 & 0.5\sqrt{2.5-0.5\sqrt{5}} & 0 & 0 \\ 0 & -0.5\sqrt{2.5-0.5\sqrt{5}} & -0.25\sqrt{5}-0.25 & 0 & 0 \\ 0 & 0 & 0 & -0.25+0.25\sqrt{5} & -0.5\sqrt{0.5\sqrt{5}+2.5} \\ 0 & 0 & 0 & 0.5\sqrt{0.5\sqrt{5}+2.5} & -0.25+0.25\sqrt{5} \end{pmatrix}$$

Au

$$-1$$

$T1u$

$$\begin{pmatrix} 0.25-0.25\sqrt{5} & -0.5\sqrt{0.5\sqrt{5}+2.5} & 0 \\ 0.5\sqrt{0.5\sqrt{5}+2.5} & 0.25-0.25\sqrt{5} & 0 \\ 0 & 0 & -1 \end{pmatrix}$$

$T2u$

$$\begin{pmatrix} -1 & 0 & 0 \\ 0 & 0.25+0.25\sqrt{5} & 0.5\sqrt{2.5-0.5\sqrt{5}} \\ 0 & -0.5\sqrt{2.5-0.5\sqrt{5}} & 0.25+0.25\sqrt{5} \end{pmatrix}$$

Gu

$$\begin{pmatrix} -0.25+0.25\sqrt{5} & 0.5\sqrt{0.5\sqrt{5}+2.5} & 0 & 0 \\ -0.5\sqrt{0.5\sqrt{5}+2.5} & -0.25+0.25\sqrt{5} & 0 & 0 \\ 0 & 0 & -0.25\sqrt{5}-0.25 & 0.5\sqrt{2.5-0.5\sqrt{5}} \\ 0 & 0 & -0.5\sqrt{2.5-0.5\sqrt{5}} & -0.25\sqrt{5}-0.25 \end{pmatrix}$$

Hu

$$\begin{pmatrix} -1 & 0 & 0 & 0 & 0 \\ 0 & 0.25+0.25\sqrt{5} & -0.5\sqrt{2.5-0.5\sqrt{5}} & 0 & 0 \\ 0 & 0.5\sqrt{2.5-0.5\sqrt{5}} & 0.25+0.25\sqrt{5} & 0 & 0 \\ 0 & 0 & 0 & 0.25-0.25\sqrt{5} & 0.5\sqrt{0.5\sqrt{5}+2.5} \\ 0 & 0 & 0 & -0.5\sqrt{0.5\sqrt{5}+2.5} & 0.25-0.25\sqrt{5} \end{pmatrix}$$

Ih	$\hat{S}_1 0^9(3)$

Ag: 1

$T1g$:
$$\begin{pmatrix} -0.25\sqrt{5}-0.25 & 0.5\sqrt{2.5-0.5\sqrt{5}} & 0 \\ -0.5\sqrt{2.5-0.5\sqrt{5}} & -0.25\sqrt{5}-0.25 & 0 \\ 0 & 0 & 1 \end{pmatrix}$$

$T2g$:
$$\begin{pmatrix} 1 & 0 & 0 \\ 0 & -0.25+0.25\sqrt{5} & 0.5\sqrt{0.5\sqrt{5}+2.5} \\ 0 & -0.5\sqrt{0.5\sqrt{5}+2.5} & -0.25+0.25\sqrt{5} \end{pmatrix}$$

Gg:
$$\begin{pmatrix} 0.25+0.25\sqrt{5} & -0.5\sqrt{2.5-0.5\sqrt{5}} & 0 & 0 \\ 0.5\sqrt{2.5-0.5\sqrt{5}} & 0.25+0.25\sqrt{5} & 0 & 0 \\ 0 & 0 & 0.25-0.25\sqrt{5} & 0.5\sqrt{0.5\sqrt{5}+2.5} \\ 0 & 0 & -0.5\sqrt{0.5\sqrt{5}+2.5} & 0.25-0.25\sqrt{5} \end{pmatrix}$$

Hg:
$$\begin{pmatrix} 1 & 0 & 0 & 0 & 0 \\ 0 & -0.25+0.25\sqrt{5} & -0.5\sqrt{0.5\sqrt{5}+2.5} & 0 & 0 \\ 0 & 0.5\sqrt{0.5\sqrt{5}+2.5} & -0.25+0.25\sqrt{5} & 0 & 0 \\ 0 & 0 & 0 & -0.25\sqrt{5}-0.25 & -0.5\sqrt{2.5-0.5\sqrt{5}} \\ 0 & 0 & 0 & 0.5\sqrt{2.5-0.5\sqrt{5}} & -0.25\sqrt{5}-0.25 \end{pmatrix}$$

Au: -1

$T1u$:
$$\begin{pmatrix} 0.25+0.25\sqrt{5} & -0.5\sqrt{2.5-0.5\sqrt{5}} & 0 \\ 0.5\sqrt{2.5-0.5\sqrt{5}} & 0.25+0.25\sqrt{5} & 0 \\ 0 & 0 & -1 \end{pmatrix}$$

$T2u$:
$$\begin{pmatrix} -1 & 0 & 0 \\ 0 & 0.25-0.25\sqrt{5} & -0.5\sqrt{0.5\sqrt{5}+2.5} \\ 0 & 0.5\sqrt{0.5\sqrt{5}+2.5} & 0.25-0.25\sqrt{5} \end{pmatrix}$$

Gu:
$$\begin{pmatrix} -0.25\sqrt{5}-0.25 & 0.5\sqrt{2.5-0.5\sqrt{5}} & 0 & 0 \\ -0.5\sqrt{2.5-0.5\sqrt{5}} & -0.25\sqrt{5}-0.25 & 0 & 0 \\ 0 & 0 & -0.25+0.25\sqrt{5} & -0.5\sqrt{0.5\sqrt{5}+2.5} \\ 0 & 0 & 0.5\sqrt{0.5\sqrt{5}+2.5} & -0.25+0.25\sqrt{5} \end{pmatrix}$$

Hu:
$$\begin{pmatrix} -1 & 0 & 0 & 0 & 0 \\ 0 & 0.25-0.25\sqrt{5} & 0.5\sqrt{0.5\sqrt{5}+2.5} & 0 & 0 \\ 0 & -0.5\sqrt{0.5\sqrt{5}+2.5} & 0.25-0.25\sqrt{5} & 0 & 0 \\ 0 & 0 & 0 & 0.25+0.25\sqrt{5} & 0.5\sqrt{2.5-0.5\sqrt{5}} \\ 0 & 0 & 0 & -0.5\sqrt{2.5-0.5\sqrt{5}} & 0.25+0.25\sqrt{5} \end{pmatrix}$$

Ih	$\hat{S}_1 0(4)$
Ag	1
$T1g$	$\begin{pmatrix} 0.5 & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & \sqrt{0.5-0.1\sqrt{5}} \\ 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -0.3\sqrt{5} & 0.1\sqrt{5}+0.5 \\ \sqrt{0.1\sqrt{5}+0.5} & -0.5+0.1\sqrt{5} & -\frac{\sqrt{5}}{5} \end{pmatrix}$
$T2g$	$\begin{pmatrix} \frac{\sqrt{5}}{5} & \sqrt{0.5-0.1\sqrt{5}} & -0.5-0.1\sqrt{5} \\ -\sqrt{0.1\sqrt{5}+0.5} & 0.5 & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} \\ 0.5-0.1\sqrt{5} & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & 0.3\sqrt{5} \end{pmatrix}$
Gg	$\begin{pmatrix} 0.5 & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & 0.25+0.25\sqrt{5} & -0.5\sqrt{0.5-0.1\sqrt{5}} \\ 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.1\sqrt{5} & -0.5\sqrt{0.5-0.1\sqrt{5}} & 0.75-0.05\sqrt{5} \\ 0.25-0.25\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} & 0.5 & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} \\ -0.5\sqrt{0.1\sqrt{5}+0.5} & -0.75-0.05\sqrt{5} & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & 0.1\sqrt{5} \end{pmatrix}$
Hg	$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.2\sqrt{7.5-1.5\sqrt{5}} & -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.2\sqrt{1.5\sqrt{5}+7.5} \\ 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & 0.1 & 0.1\sqrt{25-2\sqrt{5}} & 0.4+\frac{\sqrt{5}}{5} & 0.2\sqrt{5-2\sqrt{5}} \\ \sqrt{0.06\sqrt{5}+0.3} & 0.1\sqrt{2\sqrt{5}+25} & -0.1\sqrt{5} & 0.2\sqrt{5-2\sqrt{5}} & \frac{\sqrt{5}}{5} \\ -0.04\sqrt{5}\left(\sqrt{5}+5\right) & 0.4-\frac{\sqrt{5}}{5} & -0.2\sqrt{2\sqrt{5}+5} & 0.1 & 0.1\sqrt{2\sqrt{5}+25} \\ -0.2\sqrt{7.5-1.5\sqrt{5}} & 0.2\sqrt{2\sqrt{5}+5} & \frac{\sqrt{5}}{5} & -0.1\sqrt{25-2\sqrt{5}} & 0.1\sqrt{5} \end{pmatrix}$
Au	-1
$T1u$	$\begin{pmatrix} -0.5 & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -\sqrt{0.5-0.1\sqrt{5}} \\ -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & 0.3\sqrt{5} & -0.5-0.1\sqrt{5} \\ -\sqrt{0.1\sqrt{5}+0.5} & 0.5-0.1\sqrt{5} & \frac{\sqrt{5}}{5} \end{pmatrix}$
$T2u$	$\begin{pmatrix} -\frac{\sqrt{5}}{5} & -\sqrt{0.5-0.1\sqrt{5}} & 0.1\sqrt{5}+0.5 \\ \sqrt{0.1\sqrt{5}+0.5} & -0.5 & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} \\ -0.5+0.1\sqrt{5} & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.3\sqrt{5} \end{pmatrix}$
Gu	$\begin{pmatrix} -0.5 & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -0.25\sqrt{5}-0.25 & 0.5\sqrt{0.5-0.1\sqrt{5}} \\ -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & 0.1\sqrt{5} & 0.5\sqrt{0.5-0.1\sqrt{5}} & -0.75+0.05\sqrt{5} \\ -0.25+0.25\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} & -0.5 & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} \\ 0.5\sqrt{0.1\sqrt{5}+0.5} & 0.05\sqrt{5}+0.75 & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -0.1\sqrt{5} \end{pmatrix}$
Hu	$\begin{pmatrix} 0.2 & -0.04\sqrt{5}\left(\sqrt{5}+5\right) & \sqrt{0.3-0.06\sqrt{5}} & 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & \sqrt{0.06\sqrt{5}+0.3} \\ -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.1 & -0.1\sqrt{25-2\sqrt{5}} & -\frac{\sqrt{5}}{5}-0.4 & -0.2\sqrt{5-2\sqrt{5}} \\ -0.2\sqrt{1.5\sqrt{5}+7.5} & -0.1\sqrt{2\sqrt{5}+25} & 0.1\sqrt{5} & -0.2\sqrt{5-2\sqrt{5}} & -\frac{\sqrt{5}}{5} \\ 0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.4+\frac{\sqrt{5}}{5} & 0.2\sqrt{2\sqrt{5}+5} & -0.1 & -0.1\sqrt{2\sqrt{5}+25} \\ \sqrt{0.3-0.06\sqrt{5}} & -0.2\sqrt{2\sqrt{5}+5} & -\frac{\sqrt{5}}{5} & 0.1\sqrt{25-2\sqrt{5}} & -0.1\sqrt{5} \end{pmatrix}$

Ih	$\hat{S}_10^3(4)$
Ag	1

$$T1g \quad \begin{pmatrix} 0.25+0.25\sqrt{5} & 0.5\sqrt{2.5-0.5\sqrt{5}} & 0 \\ -0.5\sqrt{0.5-0.1\sqrt{5}} & 0.05\sqrt{5}+0.25 & \frac{2\sqrt{5}}{5} \\ \sqrt{0.5-0.1\sqrt{5}} & -0.5-0.1\sqrt{5} & \frac{\sqrt{5}}{5} \end{pmatrix}$$

$$T2g \quad \begin{pmatrix} -\frac{\sqrt{5}}{5} & -\sqrt{0.1\sqrt{5}+0.5} & -0.5+0.1\sqrt{5} \\ 0 & 0.25-0.25\sqrt{5} & 0.5\sqrt{0.5\sqrt{5}+2.5} \\ -\frac{2\sqrt{5}}{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} & 0.25-0.05\sqrt{5} \end{pmatrix}$$

$$Gg \quad \begin{pmatrix} 0 & 0 & -0.25+0.25\sqrt{5} & 0.5\sqrt{0.5\sqrt{5}+2.5} \\ -\sqrt{0.5-0.1\sqrt{5}} & 0.1\sqrt{5}+0.5 & 0.5\sqrt{0.1\sqrt{5}+0.5} & -0.25+0.05\sqrt{5} \\ -0.25\sqrt{5}-0.25 & -0.5\sqrt{2.5-0.5\sqrt{5}} & 0 & 0 \\ -0.5\sqrt{0.5-0.1\sqrt{5}} & 0.05\sqrt{5}+0.25 & -\sqrt{0.1\sqrt{5}+0.5} & 0.5-0.1\sqrt{5} \end{pmatrix}$$

$$Hg \quad \begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.2\sqrt{1.5\sqrt{5}+7.5} & -0.04\sqrt{5}\left(\sqrt{5}+5\right) & \sqrt{0.3-0.06\sqrt{5}} \\ -0.4\sqrt{3} & -0.15+0.15\sqrt{5} & 0.3\sqrt{0.5\sqrt{5}+2.5} & -0.1\sqrt{5}-0.1 & \sqrt{0.1-0.02\sqrt{5}} \\ 0 & -0.5\sqrt{0.1\sqrt{5}+0.5} & 0.25-0.05\sqrt{5} & \sqrt{0.5-0.1\sqrt{5}} & 0.1\sqrt{5}+0.5 \\ 0.4\sqrt{3} & -0.1+0.1\sqrt{5} & \sqrt{0.02\sqrt{5}+0.1} & -0.15\sqrt{5}-0.15 & 0.3\sqrt{2.5-0.5\sqrt{5}} \\ 0 & \sqrt{0.1\sqrt{5}+0.5} & -0.5+0.1\sqrt{5} & 0.5\sqrt{0.5-0.1\sqrt{5}} & 0.05\sqrt{5}+0.25 \end{pmatrix}$$

Au	-1

$$T1u \quad \begin{pmatrix} -0.25\sqrt{5}-0.25 & -0.5\sqrt{2.5-0.5\sqrt{5}} & 0 \\ 0.5\sqrt{0.5-0.1\sqrt{5}} & -0.25-0.05\sqrt{5} & -\frac{2\sqrt{5}}{5} \\ -\sqrt{0.5-0.1\sqrt{5}} & 0.1\sqrt{5}+0.5 & -\frac{\sqrt{5}}{5} \end{pmatrix}$$

$$T2u \quad \begin{pmatrix} \frac{\sqrt{5}}{5} & \sqrt{0.1\sqrt{5}+0.5} & 0.5-0.1\sqrt{5} \\ 0 & -0.25+0.25\sqrt{5} & -0.5\sqrt{0.5\sqrt{5}+2.5} \\ \frac{2\sqrt{5}}{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} & -0.25+0.05\sqrt{5} \end{pmatrix}$$

$$Gu \quad \begin{pmatrix} 0 & 0 & 0.25-0.25\sqrt{5} & -0.5\sqrt{0.5\sqrt{5}+2.5} \\ \sqrt{0.5-0.1\sqrt{5}} & -0.5-0.1\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} & 0.25-0.05\sqrt{5} \\ 0.25+0.25\sqrt{5} & 0.5\sqrt{2.5-0.5\sqrt{5}} & 0 & 0 \\ 0.5\sqrt{0.5-0.1\sqrt{5}} & -0.25-0.05\sqrt{5} & \sqrt{0.1\sqrt{5}+0.5} & -0.5+0.1\sqrt{5} \end{pmatrix}$$

$$Hu \quad \begin{pmatrix} 0.2 & -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & \sqrt{0.06\sqrt{5}+0.3} & 0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.2\sqrt{7.5-1.5\sqrt{5}} \\ 0.4\sqrt{3} & 0.15-0.15\sqrt{5} & -0.3\sqrt{0.5\sqrt{5}+2.5} & 0.1+0.1\sqrt{5} & -0.2\sqrt{2.5-0.5\sqrt{5}} \\ 0 & 0.5\sqrt{0.1\sqrt{5}+0.5} & -0.25+0.05\sqrt{5} & -\sqrt{0.5-0.1\sqrt{5}} & -0.5-0.1\sqrt{5} \\ -0.4\sqrt{3} & 0.1-0.1\sqrt{5} & -0.2\sqrt{0.5\sqrt{5}+2.5} & 0.15+0.15\sqrt{5} & -0.3\sqrt{2.5-0.5\sqrt{5}} \\ 0 & -\sqrt{0.1\sqrt{5}+0.5} & 0.5-0.1\sqrt{5} & -0.5\sqrt{0.5-0.1\sqrt{5}} & -0.25-0.05\sqrt{5} \end{pmatrix}$$

Ag	1

$T1g$

$$\begin{pmatrix} 0.25+0.25\sqrt{5} & -0.5\sqrt{0.5-0.1\sqrt{5}} & \sqrt{0.5-0.1\sqrt{5}} \\ 0.5\sqrt{2.5-0.5\sqrt{5}} & 0.05\sqrt{5}+0.25 & -0.5-0.1\sqrt{5} \\ 0 & \frac{2\sqrt{5}}{5} & \frac{\sqrt{5}}{5} \end{pmatrix}$$

$T2g$

$$\begin{pmatrix} -\frac{\sqrt{5}}{5} & 0 & -\frac{2\sqrt{5}}{5} \\ -\sqrt{0.1\sqrt{5}+0.5} & 0.25-0.25\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} \\ -0.5+0.1\sqrt{5} & 0.5\sqrt{0.5\sqrt{5}+2.5} & 0.25-0.05\sqrt{5} \end{pmatrix}$$

Gg

$$\begin{pmatrix} 0 & -\sqrt{0.5-0.1\sqrt{5}} & -0.25\sqrt{5}-0.25 & -0.5\sqrt{0.5-0.1\sqrt{5}} \\ 0 & 0.1\sqrt{5}+0.5 & -0.5\sqrt{2.5-0.5\sqrt{5}} & 0.05\sqrt{5}+0.25 \\ -0.25+0.25\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} & 0 & -\sqrt{0.1\sqrt{5}+0.5} \\ 0.5\sqrt{0.5\sqrt{5}+2.5} & -0.25+0.05\sqrt{5} & 0 & 0.5-0.1\sqrt{5} \end{pmatrix}$$

Hg

$$\begin{pmatrix} -0.2 & -0.4\sqrt{3} & 0 & 0.4\sqrt{3} & 0 \\ 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.15+0.15\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} & -0.1+0.1\sqrt{5} & \sqrt{0.1\sqrt{5}+0.5} \\ -0.2\sqrt{1.5\sqrt{5}+7.5} & 0.3\sqrt{0.5\sqrt{5}+2.5} & 0.25-0.05\sqrt{5} & \sqrt{0.02\sqrt{5}+0.1} & -0.5+0.1\sqrt{5} \\ -0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.1\sqrt{5}-0.1 & \sqrt{0.5-0.1\sqrt{5}} & -0.15\sqrt{5}-0.15 & 0.5\sqrt{0.5-0.1\sqrt{5}} \\ \sqrt{0.3-0.06\sqrt{5}} & \sqrt{0.1-0.02\sqrt{5}} & 0.1\sqrt{5}+0.5 & 0.3\sqrt{2.5-0.5\sqrt{5}} & 0.05\sqrt{5}+0.25 \end{pmatrix}$$

Au	-1

$T1u$

$$\begin{pmatrix} -0.25\sqrt{5}-0.25 & 0.5\sqrt{0.5-0.1\sqrt{5}} & -\sqrt{0.5-0.1\sqrt{5}} \\ -0.5\sqrt{2.5-0.5\sqrt{5}} & -0.25-0.05\sqrt{5} & 0.1\sqrt{5}+0.5 \\ 0 & -\frac{2\sqrt{5}}{5} & -\frac{\sqrt{5}}{5} \end{pmatrix}$$

$T2u$

$$\begin{pmatrix} \frac{\sqrt{5}}{5} & 0 & \frac{2\sqrt{5}}{5} \\ \sqrt{0.1\sqrt{5}+0.5} & -0.25+0.25\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} \\ 0.5-0.1\sqrt{5} & -0.5\sqrt{0.5\sqrt{5}+2.5} & -0.25+0.05\sqrt{5} \end{pmatrix}$$

Gu

$$\begin{pmatrix} 0 & \sqrt{0.5-0.1\sqrt{5}} & 0.25+0.25\sqrt{5} & 0.5\sqrt{0.5-0.1\sqrt{5}} \\ 0 & -0.5-0.1\sqrt{5} & 0.5\sqrt{2.5-0.5\sqrt{5}} & -0.25-0.05\sqrt{5} \\ 0.25-0.25\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} & 0 & \sqrt{0.1\sqrt{5}+0.5} \\ -0.5\sqrt{0.5\sqrt{5}+2.5} & 0.25-0.05\sqrt{5} & 0 & -0.5+0.1\sqrt{5} \end{pmatrix}$$

Hu

$$\begin{pmatrix} 0.2 & 0.4\sqrt{3} & 0 & -0.4\sqrt{3} & 0 \\ -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & 0.15-0.15\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} & 0.1-0.1\sqrt{5} & -\sqrt{0.1\sqrt{5}+0.5} \\ \sqrt{0.06\sqrt{5}+0.3} & -0.3\sqrt{0.5\sqrt{5}+2.5} & -0.25+0.05\sqrt{5} & -0.2\sqrt{0.5\sqrt{5}+2.5} & 0.5-0.1\sqrt{5} \\ 0.04\sqrt{5}\left(\sqrt{5}+5\right) & 0.1+0.1\sqrt{5} & -\sqrt{0.5-0.1\sqrt{5}} & 0.15+0.15\sqrt{5} & -0.5\sqrt{0.5-0.1\sqrt{5}} \\ -0.2\sqrt{7.5-1.5\sqrt{5}} & -0.2\sqrt{2.5-0.5\sqrt{5}} & -0.5-0.1\sqrt{5} & -0.3\sqrt{2.5-0.5\sqrt{5}} & -0.25-0.05\sqrt{5} \end{pmatrix}$$

Ih	$\hat{S}_10^9(4)$
Ag	1
$T1g$	$\begin{pmatrix} 0.5 & 0.5\sqrt{1-\frac{2\sqrt5}{5}} & \sqrt{0.1\sqrt5+0.5} \\ 0.5\sqrt{\frac{2\sqrt5}{5}+1} & -0.3\sqrt5 & -0.5+0.1\sqrt5 \\ \sqrt{0.5-0.1\sqrt5} & 0.1\sqrt5+0.5 & -\frac{\sqrt5}{5} \end{pmatrix}$
$T2g$	$\begin{pmatrix} \frac{\sqrt5}{5} & -\sqrt{0.1\sqrt5+0.5} & 0.5-0.1\sqrt5 \\ \sqrt{0.5-0.1\sqrt5} & 0.5 & 0.5\sqrt{\frac{2\sqrt5}{5}+1} \\ -0.5-0.1\sqrt5 & -0.5\sqrt{1-\frac{2\sqrt5}{5}} & 0.3\sqrt5 \end{pmatrix}$
Gg	$\begin{pmatrix} 0.5 & 0.5\sqrt{\frac{2\sqrt5}{5}+1} & 0.25-0.25\sqrt5 & -0.5\sqrt{0.1\sqrt5+0.5} \\ -0.5\sqrt{1-\frac{2\sqrt5}{5}} & -0.1\sqrt5 & 0.5\sqrt{0.1\sqrt5+0.5} & -0.75-0.05\sqrt5 \\ 0.25+0.25\sqrt5 & -0.5\sqrt{0.5-0.1\sqrt5} & 0.5 & 0.5\sqrt{1-\frac{2\sqrt5}{5}} \\ -0.5\sqrt{0.5-0.1\sqrt5} & 0.75-0.05\sqrt5 & 0.5\sqrt{\frac{2\sqrt5}{5}+1} & 0.1\sqrt5 \end{pmatrix}$
Hg	$\begin{pmatrix} -0.2 & 0.04\sqrt5\left(-5+\sqrt5\right) & \sqrt{0.06\sqrt5+0.3} & -0.04\sqrt5\left(\sqrt5+5\right) & -0.2\sqrt{7.5-1.5\sqrt5} \\ 0.04\sqrt5\left(\sqrt5+5\right) & 0.1 & 0.1\sqrt{2\sqrt5+25} & 0.4-\frac{\sqrt5}{5} & 0.2\sqrt{2\sqrt5+5} \\ -0.2\sqrt{7.5-1.5\sqrt5} & 0.1\sqrt{25-2\sqrt5} & -0.1\sqrt5 & -0.2\sqrt{2\sqrt5+5} & \frac{\sqrt5}{5} \\ -0.04\sqrt5\left(-5+\sqrt5\right) & 0.4+\frac{\sqrt5}{5} & 0.2\sqrt{5-2\sqrt5} & 0.1 & -0.1\sqrt{25-2\sqrt5} \\ -0.2\sqrt{1.5\sqrt5+7.5} & 0.2\sqrt{5-2\sqrt5} & \frac{\sqrt5}{5} & 0.1\sqrt{2\sqrt5+25} & 0.1\sqrt5 \end{pmatrix}$
Au	-1
$T1u$	$\begin{pmatrix} -0.5 & -0.5\sqrt{1-\frac{2\sqrt5}{5}} & -\sqrt{0.1\sqrt5+0.5} \\ -0.5\sqrt{\frac{2\sqrt5}{5}+1} & 0.3\sqrt5 & 0.5-0.1\sqrt5 \\ -\sqrt{0.5-0.1\sqrt5} & -0.5-0.1\sqrt5 & \frac{\sqrt5}{5} \end{pmatrix}$
$T2u$	$\begin{pmatrix} -\frac{\sqrt5}{5} & \sqrt{0.1\sqrt5+0.5} & -0.5+0.1\sqrt5 \\ -\sqrt{0.5-0.1\sqrt5} & -0.5 & -0.5\sqrt{\frac{2\sqrt5}{5}+1} \\ 0.1\sqrt5+0.5 & 0.5\sqrt{1-\frac{2\sqrt5}{5}} & -0.3\sqrt5 \end{pmatrix}$
Gu	$\begin{pmatrix} -0.5 & -0.5\sqrt{\frac{2\sqrt5}{5}+1} & -0.25+0.25\sqrt5 & 0.5\sqrt{0.1\sqrt5+0.5} \\ 0.5\sqrt{1-\frac{2\sqrt5}{5}} & 0.1\sqrt5 & -0.5\sqrt{0.1\sqrt5+0.5} & 0.05\sqrt5+0.75 \\ -0.25\sqrt5-0.25 & 0.5\sqrt{0.5-0.1\sqrt5} & -0.5 & -0.5\sqrt{1-\frac{2\sqrt5}{5}} \\ 0.5\sqrt{0.5-0.1\sqrt5} & -0.75+0.05\sqrt5 & -0.5\sqrt{\frac{2\sqrt5}{5}+1} & -0.1\sqrt5 \end{pmatrix}$
Hu	$\begin{pmatrix} 0.2 & -0.04\sqrt5\left(-5+\sqrt5\right) & -0.2\sqrt{1.5\sqrt5+7.5} & 0.04\sqrt5\left(\sqrt5+5\right) & \sqrt{0.3-0.06\sqrt5} \\ -0.04\sqrt5\left(\sqrt5+5\right) & -0.1 & -0.1\sqrt{2\sqrt5+25} & -0.4+\frac{\sqrt5}{5} & -0.2\sqrt{2\sqrt5+5} \\ \sqrt{0.3-0.06\sqrt5} & -0.1\sqrt{25-2\sqrt5} & 0.1\sqrt5 & 0.2\sqrt{2\sqrt5+5} & -\frac{\sqrt5}{5} \\ 0.04\sqrt5\left(-5+\sqrt5\right) & -\frac{\sqrt5}{5}-0.4 & -0.2\sqrt{5-2\sqrt5} & -0.1 & 0.1\sqrt{25-2\sqrt5} \\ \sqrt{0.06\sqrt5+0.3} & -0.2\sqrt{5-2\sqrt5} & -\frac{\sqrt5}{5} & -0.1\sqrt{2\sqrt5+25} & -0.1\sqrt5 \end{pmatrix}$

Ih	$\hat{S}_10(5)$

Ag

$$1$$

$T1g$

$$\begin{pmatrix} 0.5 & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -\sqrt{0.1\sqrt{5}+0.5} \\ -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.3\sqrt{5} & -0.5+0.1\sqrt{5} \\ -\sqrt{0.5-0.1\sqrt{5}} & 0.1\sqrt{5}+0.5 & -\frac{\sqrt{5}}{5} \end{pmatrix}$$

$T2g$

$$\begin{pmatrix} \frac{\sqrt{5}}{5} & \sqrt{0.1\sqrt{5}+0.5} & 0.5-0.1\sqrt{5} \\ -\sqrt{0.5-0.1\sqrt{5}} & 0.5 & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} \\ -0.5-0.1\sqrt{5} & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & 0.3\sqrt{5} \end{pmatrix}$$

Gg

$$\begin{pmatrix} 0.5 & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & 0.25-0.25\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} \\ 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -0.1\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} & -0.75-0.05\sqrt{5} \\ 0.25+0.25\sqrt{5} & 0.5\sqrt{0.5-0.1\sqrt{5}} & 0.5 & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} \\ 0.5\sqrt{0.5-0.1\sqrt{5}} & 0.75-0.05\sqrt{5} & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & 0.1\sqrt{5} \end{pmatrix}$$

Hg

$$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.2\sqrt{1.5\sqrt{5}+7.5} & -0.04\sqrt{5}\left(\sqrt{5}+5\right) & \sqrt{0.3-0.06\sqrt{5}} \\ 0.04\sqrt{5}\left(\sqrt{5}+5\right) & 0.1 & -0.1\sqrt{2\sqrt{5}+25} & 0.4-\frac{\sqrt{5}}{5} & -0.2\sqrt{2\sqrt{5}+5} \\ \sqrt{0.3-0.06\sqrt{5}} & -0.1\sqrt{25-2\sqrt{5}} & -0.1\sqrt{5} & 0.2\sqrt{2\sqrt{5}+5} & \frac{\sqrt{5}}{5} \\ -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & 0.4+\frac{\sqrt{5}}{5} & -0.2\sqrt{5-2\sqrt{5}} & 0.1 & 0.1\sqrt{25-2\sqrt{5}} \\ \sqrt{0.06\sqrt{5}+0.3} & -0.2\sqrt{5-2\sqrt{5}} & \frac{\sqrt{5}}{5} & -0.1\sqrt{2\sqrt{5}+25} & 0.1\sqrt{5} \end{pmatrix}$$

Au

$$-1$$

$T1u$

$$\begin{pmatrix} -0.5 & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & \sqrt{0.1\sqrt{5}+0.5} \\ 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & 0.3\sqrt{5} & 0.5-0.1\sqrt{5} \\ \sqrt{0.5-0.1\sqrt{5}} & -0.5-0.1\sqrt{5} & \frac{\sqrt{5}}{5} \end{pmatrix}$$

$T2u$

$$\begin{pmatrix} -\frac{\sqrt{5}}{5} & -\sqrt{0.1\sqrt{5}+0.5} & -0.5+0.1\sqrt{5} \\ \sqrt{0.5-0.1\sqrt{5}} & -0.5 & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} \\ 0.1\sqrt{5}+0.5 & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -0.3\sqrt{5} \end{pmatrix}$$

Gu

$$\begin{pmatrix} -0.5 & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.25+0.25\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} \\ -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & 0.1\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} & 0.05\sqrt{5}+0.75 \\ -0.25\sqrt{5}-0.25 & -0.5\sqrt{0.5-0.1\sqrt{5}} & -0.5 & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} \\ -0.5\sqrt{0.5-0.1\sqrt{5}} & -0.75+0.05\sqrt{5} & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.1\sqrt{5} \end{pmatrix}$$

Hu

$$\begin{pmatrix} 0.2 & -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & \sqrt{0.06\sqrt{5}+0.3} & 0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.2\sqrt{7.5-1.5\sqrt{5}} \\ -0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.1 & 0.1\sqrt{2\sqrt{5}+25} & -0.4+\frac{\sqrt{5}}{5} & 0.2\sqrt{2\sqrt{5}+5} \\ -0.2\sqrt{7.5-1.5\sqrt{5}} & 0.1\sqrt{25-2\sqrt{5}} & 0.1\sqrt{5} & -0.2\sqrt{2\sqrt{5}+5} & -\frac{\sqrt{5}}{5} \\ 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -\frac{\sqrt{5}}{5}-0.4 & 0.2\sqrt{5-2\sqrt{5}} & -0.1 & -0.1\sqrt{25-2\sqrt{5}} \\ -0.2\sqrt{1.5\sqrt{5}+7.5} & 0.2\sqrt{5-2\sqrt{5}} & -\frac{\sqrt{5}}{5} & 0.1\sqrt{2\sqrt{5}+25} & -0.1\sqrt{5} \end{pmatrix}$$

Ih	$\hat{S}_10^3(5)$

$$Ag \quad 1$$

$$T1g \quad \begin{pmatrix} 0.25 + 0.25\sqrt{5} & 0.5\sqrt{0.5 - 0.1\sqrt{5}} & -\sqrt{0.5 - 0.1\sqrt{5}} \\ -0.5\sqrt{2.5 - 0.5\sqrt{5}} & 0.05\sqrt{5} + 0.25 & -0.5 - 0.1\sqrt{5} \\ 0 & \frac{2\sqrt{5}}{5} & \frac{\sqrt{5}}{5} \end{pmatrix}$$

$$T2g \quad \begin{pmatrix} -\frac{\sqrt{5}}{5} & 0 & -\frac{2\sqrt{5}}{5} \\ \sqrt{0.1\sqrt{5} + 0.5} & 0.25 - 0.25\sqrt{5} & -0.5\sqrt{0.1\sqrt{5} + 0.5} \\ -0.5 + 0.1\sqrt{5} & -0.5\sqrt{0.5\sqrt{5} + 2.5} & 0.25 - 0.05\sqrt{5} \end{pmatrix}$$

$$Gg \quad \begin{pmatrix} 0 & \sqrt{0.5 - 0.1\sqrt{5}} & -0.25\sqrt{5} - 0.25 & 0.5\sqrt{0.5 - 0.1\sqrt{5}} \\ 0 & 0.1\sqrt{5} + 0.5 & 0.5\sqrt{2.5 - 0.5\sqrt{5}} & 0.05\sqrt{5} + 0.25 \\ -0.25 + 0.25\sqrt{5} & -0.5\sqrt{0.1\sqrt{5} + 0.5} & 0 & \sqrt{0.1\sqrt{5} + 0.5} \\ -0.5\sqrt{0.5\sqrt{5} + 2.5} & -0.25 + 0.05\sqrt{5} & 0 & 0.5 - 0.1\sqrt{5} \end{pmatrix}$$

$$Hg \quad \begin{pmatrix} -0.2 & -0.4\sqrt{3} & 0 & 0.4\sqrt{3} & 0 \\ 0.04\sqrt{5}\left(-5 + \sqrt{5}\right) & -0.15 + 0.15\sqrt{5} & 0.5\sqrt{0.1\sqrt{5} + 0.5} & -0.1 + 0.1\sqrt{5} & -\sqrt{0.1\sqrt{5} + 0.5} \\ \sqrt{0.06\sqrt{5} + 0.3} & -0.3\sqrt{0.5\sqrt{5} + 2.5} & 0.25 - 0.05\sqrt{5} & -0.2\sqrt{0.5\sqrt{5} + 2.5} & -0.5 + 0.1\sqrt{5} \\ -0.04\sqrt{5}\left(\sqrt{5} + 5\right) & -0.1\sqrt{5} - 0.1 & -\sqrt{0.5 - 0.1\sqrt{5}} & -0.15\sqrt{5} - 0.15 & -0.5\sqrt{0.5 - 0.1\sqrt{5}} \\ -0.2\sqrt{7.5 - 1.5\sqrt{5}} & -0.2\sqrt{2.5 - 0.5\sqrt{5}} & 0.1\sqrt{5} + 0.5 & -0.3\sqrt{2.5 - 0.5\sqrt{5}} & 0.05\sqrt{5} + 0.25 \end{pmatrix}$$

$$Au \quad -1$$

$$T1u \quad \begin{pmatrix} -0.25\sqrt{5} - 0.25 & -0.5\sqrt{0.5 - 0.1\sqrt{5}} & \sqrt{0.5 - 0.1\sqrt{5}} \\ 0.5\sqrt{2.5 - 0.5\sqrt{5}} & -0.25 - 0.05\sqrt{5} & 0.1\sqrt{5} + 0.5 \\ 0 & -\frac{2\sqrt{5}}{5} & -\frac{\sqrt{5}}{5} \end{pmatrix}$$

$$T2u \quad \begin{pmatrix} \frac{\sqrt{5}}{5} & 0 & \frac{2\sqrt{5}}{5} \\ -\sqrt{0.1\sqrt{5} + 0.5} & -0.25 + 0.25\sqrt{5} & 0.5\sqrt{0.1\sqrt{5} + 0.5} \\ 0.5 - 0.1\sqrt{5} & 0.5\sqrt{0.5\sqrt{5} + 2.5} & -0.25 + 0.05\sqrt{5} \end{pmatrix}$$

$$Gu \quad \begin{pmatrix} 0 & -\sqrt{0.5 - 0.1\sqrt{5}} & 0.25 + 0.25\sqrt{5} & -0.5\sqrt{0.5 - 0.1\sqrt{5}} \\ 0 & -0.5 - 0.1\sqrt{5} & -0.5\sqrt{2.5 - 0.5\sqrt{5}} & -0.25 - 0.05\sqrt{5} \\ 0.25 - 0.25\sqrt{5} & 0.5\sqrt{0.1\sqrt{5} + 0.5} & 0 & -\sqrt{0.1\sqrt{5} + 0.5} \\ 0.5\sqrt{0.5\sqrt{5} + 2.5} & 0.25 - 0.05\sqrt{5} & 0 & -0.5 + 0.1\sqrt{5} \end{pmatrix}$$

$$Hu \quad \begin{pmatrix} 0.2 & 0.4\sqrt{3} & 0 & -0.4\sqrt{3} & 0 \\ -0.04\sqrt{5}\left(-5 + \sqrt{5}\right) & 0.15 - 0.15\sqrt{5} & -0.5\sqrt{0.1\sqrt{5} + 0.5} & 0.1 - 0.1\sqrt{5} & \sqrt{0.1\sqrt{5} + 0.5} \\ -0.2\sqrt{1.5\sqrt{5} + 7.5} & 0.3\sqrt{0.5\sqrt{5} + 2.5} & -0.25 + 0.05\sqrt{5} & \sqrt{0.02\sqrt{5} + 0.1} & 0.5 - 0.1\sqrt{5} \\ 0.04\sqrt{5}\left(\sqrt{5} + 5\right) & 0.1 + 0.1\sqrt{5} & \sqrt{0.5 - 0.1\sqrt{5}} & 0.15 + 0.15\sqrt{5} & 0.5\sqrt{0.5 - 0.1\sqrt{5}} \\ \sqrt{0.3 - 0.06\sqrt{5}} & \sqrt{0.1 - 0.02\sqrt{5}} & -0.5 - 0.1\sqrt{5} & 0.3\sqrt{2.5 - 0.5\sqrt{5}} & -0.25 - 0.05\sqrt{5} \end{pmatrix}$$

Ih	$\hat{S}_10^7(5)$
Ag	1
$T1g$	$\begin{pmatrix} 0.25+0.25\sqrt{5} & -0.5\sqrt{2.5-0.5\sqrt{5}} & 0 \\ 0.5\sqrt{0.5-0.1\sqrt{5}} & 0.05\sqrt{5}+0.25 & \frac{2\sqrt{5}}{5} \\ -\sqrt{0.5-0.1\sqrt{5}} & -0.5-0.1\sqrt{5} & \frac{\sqrt{5}}{5} \end{pmatrix}$
$T2g$	$\begin{pmatrix} -\frac{\sqrt{5}}{5} & \sqrt{0.1\sqrt{5}+0.5} & -0.5+0.1\sqrt{5} \\ 0 & 0.25-0.25\sqrt{5} & -0.5\sqrt{0.5\sqrt{5}+2.5} \\ -\frac{2\sqrt{5}}{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} & 0.25-0.05\sqrt{5} \end{pmatrix}$
Gg	$\begin{pmatrix} 0 & 0 & -0.25+0.25\sqrt{5} & -0.5\sqrt{0.5\sqrt{5}+2.5} \\ \sqrt{0.5-0.1\sqrt{5}} & 0.1\sqrt{5}+0.5 & -0.5\sqrt{0.1\sqrt{5}+0.5} & -0.25+0.05\sqrt{5} \\ -0.25\sqrt{5}-0.25 & 0.5\sqrt{2.5-0.5\sqrt{5}} & 0 & 0 \\ 0.5\sqrt{0.5-0.1\sqrt{5}} & 0.05\sqrt{5}+0.25 & \sqrt{0.1\sqrt{5}+0.5} & 0.5-0.1\sqrt{5} \end{pmatrix}$
Hg	$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & \sqrt{0.06\sqrt{5}+0.3} & -0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.2\sqrt{7.5-1.5\sqrt{5}} \\ -0.4\sqrt{3} & -0.15+0.15\sqrt{5} & -0.3\sqrt{0.5\sqrt{5}+2.5} & -0.1\sqrt{5}-0.1 & -0.2\sqrt{2.5-0.5\sqrt{5}} \\ 0 & 0.5\sqrt{0.1\sqrt{5}+0.5} & 0.25-0.05\sqrt{5} & -\sqrt{0.5-0.1\sqrt{5}} & 0.1\sqrt{5}+0.5 \\ 0.4\sqrt{3} & -0.1+0.1\sqrt{5} & -0.2\sqrt{0.5\sqrt{5}+2.5} & -0.15\sqrt{5}-0.15 & -0.3\sqrt{2.5-0.5\sqrt{5}} \\ 0 & -\sqrt{0.1\sqrt{5}+0.5} & -0.5+0.1\sqrt{5} & -0.5\sqrt{0.5-0.1\sqrt{5}} & 0.05\sqrt{5}+0.25 \end{pmatrix}$
Au	-1
$T1u$	$\begin{pmatrix} -0.25\sqrt{5}-0.25 & 0.5\sqrt{2.5-0.5\sqrt{5}} & 0 \\ -0.5\sqrt{0.5-0.1\sqrt{5}} & -0.25-0.05\sqrt{5} & -\frac{2\sqrt{5}}{5} \\ \sqrt{0.5-0.1\sqrt{5}} & 0.1\sqrt{5}+0.5 & -\frac{\sqrt{5}}{5} \end{pmatrix}$
$T2u$	$\begin{pmatrix} \frac{\sqrt{5}}{5} & -\sqrt{0.1\sqrt{5}+0.5} & 0.5-0.1\sqrt{5} \\ 0 & -0.25+0.25\sqrt{5} & 0.5\sqrt{0.5\sqrt{5}+2.5} \\ \frac{2\sqrt{5}}{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} & -0.25+0.05\sqrt{5} \end{pmatrix}$
Gu	$\begin{pmatrix} 0 & 0 & 0.25-0.25\sqrt{5} & 0.5\sqrt{0.5\sqrt{5}+2.5} \\ -\sqrt{0.5-0.1\sqrt{5}} & -0.5-0.1\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} & 0.25-0.05\sqrt{5} \\ 0.25+0.25\sqrt{5} & -0.5\sqrt{2.5-0.5\sqrt{5}} & 0 & 0 \\ -0.5\sqrt{0.5-0.1\sqrt{5}} & -0.25-0.05\sqrt{5} & -\sqrt{0.1\sqrt{5}+0.5} & -0.5+0.1\sqrt{5} \end{pmatrix}$
Hu	$\begin{pmatrix} 0.2 & -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.2\sqrt{1.5\sqrt{5}+7.5} & 0.04\sqrt{5}\left(\sqrt{5}+5\right) & \sqrt{0.3-0.06\sqrt{5}} \\ 0.4\sqrt{3} & 0.15-0.15\sqrt{5} & 0.3\sqrt{0.5\sqrt{5}+2.5} & 0.1+0.1\sqrt{5} & \sqrt{0.1-0.02\sqrt{5}} \\ 0 & -0.5\sqrt{0.1\sqrt{5}+0.5} & -0.25+0.05\sqrt{5} & \sqrt{0.5-0.1\sqrt{5}} & -0.5-0.1\sqrt{5} \\ -0.4\sqrt{3} & 0.1-0.1\sqrt{5} & \sqrt{0.02\sqrt{5}+0.1} & 0.15+0.15\sqrt{5} & 0.3\sqrt{2.5-0.5\sqrt{5}} \\ 0 & \sqrt{0.1\sqrt{5}+0.5} & 0.5-0.1\sqrt{5} & 0.5\sqrt{0.5-0.1\sqrt{5}} & -0.25-0.05\sqrt{5} \end{pmatrix}$

Ih	$\hat{S}_{10}^9(5)$

Ag
$$1$$

$T1g$
$$\begin{pmatrix} 0.5 & -0.5\sqrt{\tfrac{2\sqrt5}{5}+1} & -\sqrt{0.5-0.1\sqrt5} \\ -0.5\sqrt{1-\tfrac{2\sqrt5}{5}} & -0.3\sqrt5 & 0.1\sqrt5+0.5 \\ -\sqrt{0.1\sqrt5+0.5} & -0.5+0.1\sqrt5 & -\tfrac{\sqrt5}{5} \end{pmatrix}$$

$T2g$
$$\begin{pmatrix} \tfrac{\sqrt5}{5} & -\sqrt{0.5-0.1\sqrt5} & -0.5-0.1\sqrt5 \\ \sqrt{0.1\sqrt5+0.5} & 0.5 & 0.5\sqrt{1-\tfrac{2\sqrt5}{5}} \\ 0.5-0.1\sqrt5 & -0.5\sqrt{\tfrac{2\sqrt5}{5}+1} & 0.3\sqrt5 \end{pmatrix}$$

Gg
$$\begin{pmatrix} 0.5 & 0.5\sqrt{1-\tfrac{2\sqrt5}{5}} & 0.25+0.25\sqrt5 & 0.5\sqrt{0.5-0.1\sqrt5} \\ -0.5\sqrt{\tfrac{2\sqrt5}{5}+1} & -0.1\sqrt5 & 0.5\sqrt{0.5-0.1\sqrt5} & 0.75-0.05\sqrt5 \\ 0.25-0.25\sqrt5 & -0.5\sqrt{0.1\sqrt5+0.5} & 0.5 & -0.5\sqrt{\tfrac{2\sqrt5}{5}+1} \\ 0.5\sqrt{0.1\sqrt5+0.5} & -0.75-0.05\sqrt5 & -0.5\sqrt{1-\tfrac{2\sqrt5}{5}} & 0.1\sqrt5 \end{pmatrix}$$

Hg
$$\begin{pmatrix} -0.2 & 0.04\sqrt5\left(\sqrt5+5\right) & \sqrt{0.3-0.06\sqrt5} & -0.04\sqrt5\left(-5+\sqrt5\right) & \sqrt{0.06\sqrt5+0.3} \\ 0.04\sqrt5\left(-5+\sqrt5\right) & 0.1 & -0.1\sqrt{25-2\sqrt5} & 0.4+\tfrac{\sqrt5}{5} & -0.2\sqrt{5-2\sqrt5} \\ -0.2\sqrt{1.5\sqrt5+7.5} & -0.1\sqrt{2\sqrt5+25} & -0.1\sqrt5 & -0.2\sqrt{5-2\sqrt5} & \tfrac{\sqrt5}{5} \\ -0.04\sqrt5\left(\sqrt5+5\right) & 0.4-\tfrac{\sqrt5}{5} & 0.2\sqrt{2\sqrt5+5} & 0.1 & -0.1\sqrt{2\sqrt5+25} \\ \sqrt{0.3-0.06\sqrt5} & -0.2\sqrt{2\sqrt5+5} & \tfrac{\sqrt5}{5} & 0.1\sqrt{25-2\sqrt5} & 0.1\sqrt5 \end{pmatrix}$$

Au
$$-1$$

$T1u$
$$\begin{pmatrix} -0.5 & 0.5\sqrt{\tfrac{2\sqrt5}{5}+1} & \sqrt{0.5-0.1\sqrt5} \\ 0.5\sqrt{1-\tfrac{2\sqrt5}{5}} & 0.3\sqrt5 & -0.5-0.1\sqrt5 \\ \sqrt{0.1\sqrt5+0.5} & 0.5-0.1\sqrt5 & \tfrac{\sqrt5}{5} \end{pmatrix}$$

$T2u$
$$\begin{pmatrix} -\tfrac{\sqrt5}{5} & \sqrt{0.5-0.1\sqrt5} & 0.1\sqrt5+0.5 \\ -\sqrt{0.1\sqrt5+0.5} & -0.5 & -0.5\sqrt{1-\tfrac{2\sqrt5}{5}} \\ -0.5+0.1\sqrt5 & 0.5\sqrt{\tfrac{2\sqrt5}{5}+1} & -0.3\sqrt5 \end{pmatrix}$$

Gu
$$\begin{pmatrix} -0.5 & -0.5\sqrt{1-\tfrac{2\sqrt5}{5}} & -0.25\sqrt5-0.25 & -0.5\sqrt{0.5-0.1\sqrt5} \\ 0.5\sqrt{\tfrac{2\sqrt5}{5}+1} & 0.1\sqrt5 & -0.5\sqrt{0.5-0.1\sqrt5} & -0.75+0.05\sqrt5 \\ -0.25+0.25\sqrt5 & 0.5\sqrt{0.1\sqrt5+0.5} & -0.5 & 0.5\sqrt{\tfrac{2\sqrt5}{5}+1} \\ -0.5\sqrt{0.1\sqrt5+0.5} & 0.05\sqrt5+0.75 & 0.5\sqrt{1-\tfrac{2\sqrt5}{5}} & -0.1\sqrt5 \end{pmatrix}$$

Hu
$$\begin{pmatrix} 0.2 & -0.04\sqrt5\left(\sqrt5+5\right) & -0.2\sqrt{7.5-1.5\sqrt5} & 0.04\sqrt5\left(-5+\sqrt5\right) & -0.2\sqrt{1.5\sqrt5+7.5} \\ -0.04\sqrt5\left(-5+\sqrt5\right) & -0.1 & 0.1\sqrt{25-2\sqrt5} & -\tfrac{\sqrt5}{5}-0.4 & 0.2\sqrt{5-2\sqrt5} \\ \sqrt{0.06\sqrt5+0.3} & 0.1\sqrt{2\sqrt5+25} & 0.1\sqrt5 & 0.2\sqrt{5-2\sqrt5} & -\tfrac{\sqrt5}{5} \\ 0.04\sqrt5\left(\sqrt5+5\right) & -0.4+\tfrac{\sqrt5}{5} & -0.2\sqrt{2\sqrt5+5} & -0.1 & 0.1\sqrt{2\sqrt5+25} \\ -0.2\sqrt{7.5-1.5\sqrt5} & 0.2\sqrt{2\sqrt5+5} & -\tfrac{\sqrt5}{5} & -0.1\sqrt{25-2\sqrt5} & -0.1\sqrt5 \end{pmatrix}$$

Ih	$\hat{S}_6(0)$
Ag	1
$T1g$	$\begin{pmatrix} 0 & \sqrt{0.1\sqrt5+0.5} & -\sqrt{0.5-0.1\sqrt5} \\ \sqrt{0.5-0.1\sqrt5} & \frac{\sqrt5}{5} & 0.1\sqrt5+0.5 \\ \sqrt{0.1\sqrt5+0.5} & -0.5+0.1\sqrt5 & -\frac{\sqrt5}{5} \end{pmatrix}$
$T2g$	$\begin{pmatrix} \frac{\sqrt5}{5} & \sqrt{0.5-0.1\sqrt5} & -0.5-0.1\sqrt5 \\ \sqrt{0.1\sqrt5+0.5} & 0 & \sqrt{0.5-0.1\sqrt5} \\ 0.5-0.1\sqrt5 & -\sqrt{0.1\sqrt5+0.5} & -\frac{\sqrt5}{5} \end{pmatrix}$
Gg	$\begin{pmatrix} -0.5 & 0.5\sqrt{1-\frac{2\sqrt5}{5}} & 0.5 & -0.5\sqrt{\frac{2\sqrt5}{5}+1} \\ 0.5\sqrt{\frac{2\sqrt5}{5}+1} & -0.1\sqrt5 & 0.5\sqrt{\frac{2\sqrt5}{5}+1} & -0.5+\frac{\sqrt5}{5} \\ 0.5 & 0.5\sqrt{1-\frac{2\sqrt5}{5}} & -0.5 & -0.5\sqrt{\frac{2\sqrt5}{5}+1} \\ 0.5\sqrt{1-\frac{2\sqrt5}{5}} & \frac{\sqrt5}{5}+0.5 & 0.5\sqrt{1-\frac{2\sqrt5}{5}} & 0.1\sqrt5 \end{pmatrix}$
Hg	$\begin{pmatrix} -0.2 & 0.04\sqrt5\left(\sqrt5+5\right) & -0.2\sqrt{7.5-1.5\sqrt5} & -0.04\sqrt5\left(-5+\sqrt5\right) & -0.2\sqrt{1.5\sqrt5+7.5} \\ 0.04\sqrt5\left(-5+\sqrt5\right) & -0.4 & -0.2\sqrt{2.5-0.5\sqrt5} & -0.3\sqrt5-0.1 & -0.2\sqrt{0.5\sqrt5+2.5} \\ -0.2\sqrt{1.5\sqrt5+7.5} & -0.2\sqrt{0.5\sqrt5+2.5} & \frac{\sqrt5}{5} & \sqrt{0.02\sqrt5+0.1} & -0.5+0.1\sqrt5 \\ -0.04\sqrt5\left(\sqrt5+5\right) & -0.1+0.3\sqrt5 & \sqrt{0.1-0.02\sqrt5} & -0.4 & \sqrt{0.02\sqrt5+0.1} \\ \sqrt{0.3-0.06\sqrt5} & \sqrt{0.1-0.02\sqrt5} & 0.1\sqrt5+0.5 & -0.2\sqrt{2.5-0.5\sqrt5} & -\frac{\sqrt5}{5} \end{pmatrix}$
Au	-1
$T1u$	$\begin{pmatrix} 0 & -\sqrt{0.1\sqrt5+0.5} & \sqrt{0.5-0.1\sqrt5} \\ -\sqrt{0.5-0.1\sqrt5} & -\frac{\sqrt5}{5} & -0.5-0.1\sqrt5 \\ -\sqrt{0.1\sqrt5+0.5} & 0.5-0.1\sqrt5 & \frac{\sqrt5}{5} \end{pmatrix}$
$T2u$	$\begin{pmatrix} -\frac{\sqrt5}{5} & -\sqrt{0.5-0.1\sqrt5} & 0.1\sqrt5+0.5 \\ -\sqrt{0.1\sqrt5+0.5} & 0 & -\sqrt{0.5-0.1\sqrt5} \\ -0.5+0.1\sqrt5 & \sqrt{0.1\sqrt5+0.5} & \frac{\sqrt5}{5} \end{pmatrix}$
Gu	$\begin{pmatrix} 0.5 & -0.5\sqrt{1-\frac{2\sqrt5}{5}} & -0.5 & 0.5\sqrt{\frac{2\sqrt5}{5}+1} \\ -0.5\sqrt{\frac{2\sqrt5}{5}+1} & 0.1\sqrt5 & -0.5\sqrt{\frac{2\sqrt5}{5}+1} & 0.5-\frac{\sqrt5}{5} \\ -0.5 & -0.5\sqrt{1-\frac{2\sqrt5}{5}} & 0.5 & 0.5\sqrt{\frac{2\sqrt5}{5}+1} \\ -0.5\sqrt{1-\frac{2\sqrt5}{5}} & -0.5-\frac{\sqrt5}{5} & -0.5\sqrt{1-\frac{2\sqrt5}{5}} & -0.1\sqrt5 \end{pmatrix}$
Hu	$\begin{pmatrix} 0.2 & -0.04\sqrt5\left(\sqrt5+5\right) & \sqrt{0.3-0.06\sqrt5} & 0.04\sqrt5\left(-5+\sqrt5\right) & \sqrt{0.06\sqrt5+0.3} \\ -0.04\sqrt5\left(-5+\sqrt5\right) & 0.4 & \sqrt{0.1-0.02\sqrt5} & 0.1+0.3\sqrt5 & \sqrt{0.02\sqrt5+0.1} \\ \sqrt{0.06\sqrt5+0.3} & \sqrt{0.02\sqrt5+0.1} & -\frac{\sqrt5}{5} & -0.2\sqrt{0.5\sqrt5+2.5} & 0.5-0.1\sqrt5 \\ 0.04\sqrt5\left(\sqrt5+5\right) & 0.1-0.3\sqrt5 & -0.2\sqrt{2.5-0.5\sqrt5} & 0.4 & -0.2\sqrt{0.5\sqrt5+2.5} \\ -0.2\sqrt{7.5-1.5\sqrt5} & -0.2\sqrt{2.5-0.5\sqrt5} & -0.5-0.1\sqrt5 & \sqrt{0.1-0.02\sqrt5} & \frac{\sqrt5}{5} \end{pmatrix}$

Ih	$\hat{S}_6^5(0)$
Ag	1
$T1g$	$\begin{pmatrix} 0 & \sqrt{0.5-0.1\sqrt{5}} & \sqrt{0.1\sqrt{5}+0.5} \\ \sqrt{0.1\sqrt{5}+0.5} & \frac{\sqrt{5}}{5} & -0.5+0.1\sqrt{5} \\ -\sqrt{0.5-0.1\sqrt{5}} & 0.1\sqrt{5}+0.5 & -\frac{\sqrt{5}}{5} \end{pmatrix}$
$T2g$	$\begin{pmatrix} \frac{\sqrt{5}}{5} & \sqrt{0.1\sqrt{5}+0.5} & 0.5-0.1\sqrt{5} \\ \sqrt{0.5-0.1\sqrt{5}} & 0 & -\sqrt{0.1\sqrt{5}+0.5} \\ -0.5-0.1\sqrt{5} & \sqrt{0.5-0.1\sqrt{5}} & -\frac{\sqrt{5}}{5} \end{pmatrix}$
Gg	$\begin{pmatrix} -0.5 & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & 0.5 & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} \\ 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -0.1\sqrt{5} & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & \frac{\sqrt{5}}{5}+0.5 \\ 0.5 & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.5 & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} \\ -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.5+\frac{\sqrt{5}}{5} & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & 0.1\sqrt{5} \end{pmatrix}$
Hg	$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.2\sqrt{1.5\sqrt{5}+7.5} & -0.04\sqrt{5}\left(\sqrt{5}+5\right) & \sqrt{0.3-0.06\sqrt{5}} \\ 0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.4 & -0.2\sqrt{0.5\sqrt{5}+2.5} & -0.1+0.3\sqrt{5} & \sqrt{0.1-0.02\sqrt{5}} \\ -0.2\sqrt{7.5-1.5\sqrt{5}} & -0.2\sqrt{2.5-0.5\sqrt{5}} & \frac{\sqrt{5}}{5} & \sqrt{0.1-0.02\sqrt{5}} & 0.1\sqrt{5}+0.5 \\ -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.3\sqrt{5}-0.1 & \sqrt{0.02\sqrt{5}+0.1} & -0.4 & -0.2\sqrt{2.5-0.5\sqrt{5}} \\ -0.2\sqrt{1.5\sqrt{5}+7.5} & -0.2\sqrt{0.5\sqrt{5}+2.5} & -0.5+0.1\sqrt{5} & \sqrt{0.02\sqrt{5}+0.1} & -\frac{\sqrt{5}}{5} \end{pmatrix}$
Au	-1
$T1u$	$\begin{pmatrix} 0 & -\sqrt{0.5-0.1\sqrt{5}} & -\sqrt{0.1\sqrt{5}+0.5} \\ -\sqrt{0.1\sqrt{5}+0.5} & -\frac{\sqrt{5}}{5} & 0.5-0.1\sqrt{5} \\ \sqrt{0.5-0.1\sqrt{5}} & -0.5-0.1\sqrt{5} & \frac{\sqrt{5}}{5} \end{pmatrix}$
$T2u$	$\begin{pmatrix} -\frac{\sqrt{5}}{5} & -\sqrt{0.1\sqrt{5}+0.5} & -0.5+0.1\sqrt{5} \\ -\sqrt{0.5-0.1\sqrt{5}} & 0 & \sqrt{0.1\sqrt{5}+0.5} \\ 0.1\sqrt{5}+0.5 & -\sqrt{0.5-0.1\sqrt{5}} & \frac{\sqrt{5}}{5} \end{pmatrix}$
Gu	$\begin{pmatrix} 0.5 & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.5 & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} \\ -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & 0.1\sqrt{5} & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -0.5-\frac{\sqrt{5}}{5} \\ -0.5 & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & 0.5 & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} \\ 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & 0.5-\frac{\sqrt{5}}{5} & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.1\sqrt{5} \end{pmatrix}$
Hu	$\begin{pmatrix} 0.2 & -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & \sqrt{0.06\sqrt{5}+0.3} & 0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.2\sqrt{7.5-1.5\sqrt{5}} \\ -0.04\sqrt{5}\left(\sqrt{5}+5\right) & 0.4 & \sqrt{0.02\sqrt{5}+0.1} & 0.1-0.3\sqrt{5} & -0.2\sqrt{2.5-0.5\sqrt{5}} \\ \sqrt{0.3-0.06\sqrt{5}} & \sqrt{0.1-0.02\sqrt{5}} & -\frac{\sqrt{5}}{5} & -0.2\sqrt{2.5-0.5\sqrt{5}} & -0.5-0.1\sqrt{5} \\ 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & 0.1+0.3\sqrt{5} & -0.2\sqrt{0.5\sqrt{5}+2.5} & 0.4 & \sqrt{0.1-0.02\sqrt{5}} \\ \sqrt{0.06\sqrt{5}+0.3} & \sqrt{0.02\sqrt{5}+0.1} & 0.5-0.1\sqrt{5} & -0.2\sqrt{0.5\sqrt{5}+2.5} & \frac{\sqrt{5}}{5} \end{pmatrix}$

Ih	$\hat{S}_6(1)$
Ag	1

$$T1g \quad \begin{pmatrix} 0 & -\sqrt{0.5-0.1\sqrt{5}} & -\sqrt{0.1\sqrt{5}+0.5} \\ \sqrt{0.1\sqrt{5}+0.5} & -\frac{\sqrt{5}}{5} & 0.5-0.1\sqrt{5} \\ -\sqrt{0.5-0.1\sqrt{5}} & -0.5-0.1\sqrt{5} & \frac{\sqrt{5}}{5} \end{pmatrix}$$

$$T2g \quad \begin{pmatrix} -\frac{\sqrt{5}}{5} & \sqrt{0.1\sqrt{5}+0.5} & -0.5+0.1\sqrt{5} \\ -\sqrt{0.5-0.1\sqrt{5}} & 0 & \sqrt{0.1\sqrt{5}+0.5} \\ 0.1\sqrt{5}+0.5 & \sqrt{0.5-0.1\sqrt{5}} & \frac{\sqrt{5}}{5} \end{pmatrix}$$

$$Gg \quad \begin{pmatrix} -0.5 & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & 0.5 & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} \\ 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & 0.1\sqrt{5} & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -0.5-\frac{\sqrt{5}}{5} \\ 0.5 & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.5 & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} \\ -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & 0.5-\frac{\sqrt{5}}{5} & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.1\sqrt{5} \end{pmatrix}$$

$$Hg \quad \begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & \sqrt{0.06\sqrt{5}+0.3} & -0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.2\sqrt{7.5-1.5\sqrt{5}} \\ 0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.4 & \sqrt{0.02\sqrt{5}+0.1} & -0.1+0.3\sqrt{5} & -0.2\sqrt{2.5-0.5\sqrt{5}} \\ -0.2\sqrt{7.5-1.5\sqrt{5}} & -0.2\sqrt{2.5-0.5\sqrt{5}} & -\frac{\sqrt{5}}{5} & \sqrt{0.1-0.02\sqrt{5}} & -0.5-0.1\sqrt{5} \\ -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.3\sqrt{5}-0.1 & -0.2\sqrt{0.5\sqrt{5}+2.5} & -0.4 & \sqrt{0.1-0.02\sqrt{5}} \\ -0.2\sqrt{1.5\sqrt{5}+7.5} & -0.2\sqrt{0.5\sqrt{5}+2.5} & 0.5-0.1\sqrt{5} & \sqrt{0.02\sqrt{5}+0.1} & \frac{\sqrt{5}}{5} \end{pmatrix}$$

Au	-1

$$T1u \quad \begin{pmatrix} 0 & \sqrt{0.5-0.1\sqrt{5}} & \sqrt{0.1\sqrt{5}+0.5} \\ -\sqrt{0.1\sqrt{5}+0.5} & \frac{\sqrt{5}}{5} & -0.5+0.1\sqrt{5} \\ \sqrt{0.5-0.1\sqrt{5}} & 0.1\sqrt{5}+0.5 & -\frac{\sqrt{5}}{5} \end{pmatrix}$$

$$T2u \quad \begin{pmatrix} \frac{\sqrt{5}}{5} & -\sqrt{0.1\sqrt{5}+0.5} & 0.5-0.1\sqrt{5} \\ \sqrt{0.5-0.1\sqrt{5}} & 0 & -\sqrt{0.1\sqrt{5}+0.5} \\ -0.5-0.1\sqrt{5} & -\sqrt{0.5-0.1\sqrt{5}} & -\frac{\sqrt{5}}{5} \end{pmatrix}$$

$$Gu \quad \begin{pmatrix} 0.5 & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.5 & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} \\ -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -0.1\sqrt{5} & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & \frac{\sqrt{5}}{5}+0.5 \\ -0.5 & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & 0.5 & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} \\ 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.5+\frac{\sqrt{5}}{5} & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & 0.1\sqrt{5} \end{pmatrix}$$

$$Hu \quad \begin{pmatrix} 0.2 & -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.2\sqrt{1.5\sqrt{5}+7.5} & 0.04\sqrt{5}\left(\sqrt{5}+5\right) & \sqrt{0.3-0.06\sqrt{5}} \\ -0.04\sqrt{5}\left(\sqrt{5}+5\right) & 0.4 & -0.2\sqrt{0.5\sqrt{5}+2.5} & 0.1-0.3\sqrt{5} & \sqrt{0.1-0.02\sqrt{5}} \\ \sqrt{0.3-0.06\sqrt{5}} & \sqrt{0.1-0.02\sqrt{5}} & \frac{\sqrt{5}}{5} & -0.2\sqrt{2.5-0.5\sqrt{5}} & 0.1\sqrt{5}+0.5 \\ 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & 0.1+0.3\sqrt{5} & \sqrt{0.02\sqrt{5}+0.1} & 0.4 & -0.2\sqrt{2.5-0.5\sqrt{5}} \\ \sqrt{0.06\sqrt{5}+0.3} & \sqrt{0.02\sqrt{5}+0.1} & -0.5+0.1\sqrt{5} & -0.2\sqrt{0.5\sqrt{5}+2.5} & -\frac{\sqrt{5}}{5} \end{pmatrix}$$

Ih	$\hat{S}_6^5(1)$

Ag : 1

$T1g$:
$$\begin{pmatrix} 0 & \sqrt{0.1\sqrt{5}+0.5} & -\sqrt{0.5-0.1\sqrt{5}} \\ -\sqrt{0.5-0.1\sqrt{5}} & -\frac{\sqrt{5}}{5} & -0.5-0.1\sqrt{5} \\ -\sqrt{0.1\sqrt{5}+0.5} & 0.5-0.1\sqrt{5} & \frac{\sqrt{5}}{5} \end{pmatrix}$$

$T2g$:
$$\begin{pmatrix} -\frac{\sqrt{5}}{5} & -\sqrt{0.5-0.1\sqrt{5}} & 0.1\sqrt{5}+0.5 \\ \sqrt{0.1\sqrt{5}+0.5} & 0 & \sqrt{0.5-0.1\sqrt{5}} \\ -0.5+0.1\sqrt{5} & \sqrt{0.1\sqrt{5}+0.5} & \frac{\sqrt{5}}{5} \end{pmatrix}$$

Gg :
$$\begin{pmatrix} -0.5 & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & 0.5 & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} \\ -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & 0.1\sqrt{5} & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & 0.5-\frac{\sqrt{5}}{5} \\ 0.5 & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -0.5 & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} \\ -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -0.5-\frac{\sqrt{5}}{5} & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -0.1\sqrt{5} \end{pmatrix}$$

Hg :
$$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.2\sqrt{7.5-1.5\sqrt{5}} & -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.2\sqrt{1.5\sqrt{5}+7.5} \\ 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.4 & -0.2\sqrt{2.5-0.5\sqrt{5}} & -0.3\sqrt{5}-0.1 & -0.2\sqrt{0.5\sqrt{5}+2.5} \\ \sqrt{0.06\sqrt{5}+0.3} & \sqrt{0.02\sqrt{5}+0.1} & -\frac{\sqrt{5}}{5} & -0.2\sqrt{0.5\sqrt{5}+2.5} & 0.5-0.1\sqrt{5} \\ -0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.1+0.3\sqrt{5} & \sqrt{0.1-0.02\sqrt{5}} & -0.4 & \sqrt{0.02\sqrt{5}+0.1} \\ -0.2\sqrt{7.5-1.5\sqrt{5}} & -0.2\sqrt{2.5-0.5\sqrt{5}} & -0.5-0.1\sqrt{5} & \sqrt{0.1-0.02\sqrt{5}} & \frac{\sqrt{5}}{5} \end{pmatrix}$$

Au : -1

$T1u$:
$$\begin{pmatrix} 0 & -\sqrt{0.1\sqrt{5}+0.5} & \sqrt{0.5-0.1\sqrt{5}} \\ \sqrt{0.5-0.1\sqrt{5}} & \frac{\sqrt{5}}{5} & 0.1\sqrt{5}+0.5 \\ \sqrt{0.1\sqrt{5}+0.5} & -0.5+0.1\sqrt{5} & -\frac{\sqrt{5}}{5} \end{pmatrix}$$

$T2u$:
$$\begin{pmatrix} \frac{\sqrt{5}}{5} & \sqrt{0.5-0.1\sqrt{5}} & -0.5-0.1\sqrt{5} \\ -\sqrt{0.1\sqrt{5}+0.5} & 0 & -\sqrt{0.5-0.1\sqrt{5}} \\ 0.5-0.1\sqrt{5} & -\sqrt{0.1\sqrt{5}+0.5} & -\frac{\sqrt{5}}{5} \end{pmatrix}$$

Gu :
$$\begin{pmatrix} 0.5 & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -0.5 & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} \\ 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.1\sqrt{5} & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.5+\frac{\sqrt{5}}{5} \\ -0.5 & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & 0.5 & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} \\ 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & \frac{\sqrt{5}}{5}+0.5 & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & 0.1\sqrt{5} \end{pmatrix}$$

Hu :
$$\begin{pmatrix} 0.2 & -0.04\sqrt{5}\left(\sqrt{5}+5\right) & \sqrt{0.3-0.06\sqrt{5}} & 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & \sqrt{0.06\sqrt{5}+0.3} \\ -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & 0.4 & \sqrt{0.1-0.02\sqrt{5}} & 0.1+0.3\sqrt{5} & \sqrt{0.02\sqrt{5}+0.1} \\ -0.2\sqrt{1.5\sqrt{5}+7.5} & -0.2\sqrt{0.5\sqrt{5}+2.5} & \frac{\sqrt{5}}{5} & \sqrt{0.02\sqrt{5}+0.1} & -0.5+0.1\sqrt{5} \\ 0.04\sqrt{5}\left(\sqrt{5}+5\right) & 0.1-0.3\sqrt{5} & -0.2\sqrt{2.5-0.5\sqrt{5}} & 0.4 & -0.2\sqrt{0.5\sqrt{5}+2.5} \\ \sqrt{0.3-0.06\sqrt{5}} & \sqrt{0.1-0.02\sqrt{5}} & 0.1\sqrt{5}+0.5 & -0.2\sqrt{2.5-0.5\sqrt{5}} & -\frac{\sqrt{5}}{5} \end{pmatrix}$$

Ih	$\hat{S}_6(2)$
Ag	1
$T1g$	$\begin{pmatrix} 0 & \sqrt{0.5-0.1\sqrt{5}} & \sqrt{0.1\sqrt{5}+0.5} \\ -\sqrt{0.1\sqrt{5}+0.5} & -\frac{\sqrt{5}}{5} & 0.5-0.1\sqrt{5} \\ \sqrt{0.5-0.1\sqrt{5}} & -0.5-0.1\sqrt{5} & \frac{\sqrt{5}}{5} \end{pmatrix}$
$T2g$	$\begin{pmatrix} -\frac{\sqrt{5}}{5} & -\sqrt{0.1\sqrt{5}+0.5} & -0.5+0.1\sqrt{5} \\ \sqrt{0.5-0.1\sqrt{5}} & 0 & -\sqrt{0.1\sqrt{5}+0.5} \\ 0.1\sqrt{5}+0.5 & -\sqrt{0.5-0.1\sqrt{5}} & \frac{\sqrt{5}}{5} \end{pmatrix}$
Gg	$\begin{pmatrix} -0.5 & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & 0.5 & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} \\ -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & 0.1\sqrt{5} & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -0.5-\frac{\sqrt{5}}{5} \\ 0.5 & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.5 & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} \\ 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & 0.5-\frac{\sqrt{5}}{5} & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.1\sqrt{5} \end{pmatrix}$
Hg	$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.2\sqrt{1.5\sqrt{5}+7.5} & -0.04\sqrt{5}\left(\sqrt{5}+5\right) & \sqrt{0.3-0.06\sqrt{5}} \\ 0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.4 & -0.2\sqrt{0.5\sqrt{5}+2.5} & -0.1+0.3\sqrt{5} & \sqrt{0.1-0.02\sqrt{5}} \\ \sqrt{0.3-0.06\sqrt{5}} & \sqrt{0.1-0.02\sqrt{5}} & -\frac{\sqrt{5}}{5} & -0.2\sqrt{2.5-0.5\sqrt{5}} & -0.5-0.1\sqrt{5} \\ -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.3\sqrt{5}-0.1 & \sqrt{0.02\sqrt{5}+0.1} & -0.4 & -0.2\sqrt{2.5-0.5\sqrt{5}} \\ \sqrt{0.06\sqrt{5}+0.3} & \sqrt{0.02\sqrt{5}+0.1} & 0.5-0.1\sqrt{5} & -0.2\sqrt{0.5\sqrt{5}+2.5} & \frac{\sqrt{5}}{5} \end{pmatrix}$
Au	-1
$T1u$	$\begin{pmatrix} 0 & -\sqrt{0.5-0.1\sqrt{5}} & -\sqrt{0.1\sqrt{5}+0.5} \\ \sqrt{0.1\sqrt{5}+0.5} & \frac{\sqrt{5}}{5} & -0.5+0.1\sqrt{5} \\ -\sqrt{0.5-0.1\sqrt{5}} & 0.1\sqrt{5}+0.5 & -\frac{\sqrt{5}}{5} \end{pmatrix}$
$T2u$	$\begin{pmatrix} \frac{\sqrt{5}}{5} & \sqrt{0.1\sqrt{5}+0.5} & 0.5-0.1\sqrt{5} \\ -\sqrt{0.5-0.1\sqrt{5}} & 0 & \sqrt{0.1\sqrt{5}+0.5} \\ -0.5-0.1\sqrt{5} & \sqrt{0.5-0.1\sqrt{5}} & -\frac{\sqrt{5}}{5} \end{pmatrix}$
Gu	$\begin{pmatrix} 0.5 & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.5 & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} \\ 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -0.1\sqrt{5} & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & \frac{\sqrt{5}}{5}+0.5 \\ -0.5 & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & 0.5 & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} \\ -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.5+\frac{\sqrt{5}}{5} & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & 0.1\sqrt{5} \end{pmatrix}$
Hu	$\begin{pmatrix} 0.2 & -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & \sqrt{0.06\sqrt{5}+0.3} & 0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.2\sqrt{7.5-1.5\sqrt{5}} \\ -0.04\sqrt{5}\left(\sqrt{5}+5\right) & 0.4 & \sqrt{0.02\sqrt{5}+0.1} & 0.1-0.3\sqrt{5} & -0.2\sqrt{2.5-0.5\sqrt{5}} \\ -0.2\sqrt{7.5-1.5\sqrt{5}} & -0.2\sqrt{2.5-0.5\sqrt{5}} & \frac{\sqrt{5}}{5} & \sqrt{0.1-0.02\sqrt{5}} & 0.1\sqrt{5}+0.5 \\ 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & 0.1+0.3\sqrt{5} & -0.2\sqrt{0.5\sqrt{5}+2.5} & 0.4 & \sqrt{0.1-0.02\sqrt{5}} \\ -0.2\sqrt{1.5\sqrt{5}+7.5} & -0.2\sqrt{0.5\sqrt{5}+2.5} & -0.5+0.1\sqrt{5} & \sqrt{0.02\sqrt{5}+0.1} & -\frac{\sqrt{5}}{5} \end{pmatrix}$

Ih	$\hat{S}_6^5(2)$
Ag	1
$T1g$	$\begin{pmatrix} 0 & -\sqrt{0.1\sqrt{5}+0.5} & \sqrt{0.5-0.1\sqrt{5}} \\ \sqrt{0.5-0.1\sqrt{5}} & -\frac{\sqrt{5}}{5} & -0.5-0.1\sqrt{5} \\ \sqrt{0.1\sqrt{5}+0.5} & 0.5-0.1\sqrt{5} & \frac{\sqrt{5}}{5} \end{pmatrix}$
$T2g$	$\begin{pmatrix} -\frac{\sqrt{5}}{5} & \sqrt{0.5-0.1\sqrt{5}} & 0.1\sqrt{5}+0.5 \\ -\sqrt{0.1\sqrt{5}+0.5} & 0 & -\sqrt{0.5-0.1\sqrt{5}} \\ -0.5+0.1\sqrt{5} & -\sqrt{0.1\sqrt{5}+0.5} & \frac{\sqrt{5}}{5} \end{pmatrix}$
Gg	$\begin{pmatrix} -0.5 & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & 0.5 & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} \\ 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & 0.1\sqrt{5} & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & 0.5-\frac{\sqrt{5}}{5} \\ 0.5 & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -0.5 & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} \\ 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -0.5-\frac{\sqrt{5}}{5} & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -0.1\sqrt{5} \end{pmatrix}$
Hg	$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(\sqrt{5}+5\right) & \sqrt{0.3-0.06\sqrt{5}} & -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & \sqrt{0.06\sqrt{5}+0.3} \\ 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.4 & \sqrt{0.1-0.02\sqrt{5}} & -0.3\sqrt{5}-0.1 & \sqrt{0.02\sqrt{5}+0.1} \\ -0.2\sqrt{1.5\sqrt{5}+7.5} & -0.2\sqrt{0.5\sqrt{5}+2.5} & -\frac{\sqrt{5}}{5} & \sqrt{0.02\sqrt{5}+0.1} & 0.5-0.1\sqrt{5} \\ -0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.1+0.3\sqrt{5} & -0.2\sqrt{2.5-0.5\sqrt{5}} & -0.4 & -0.2\sqrt{0.5\sqrt{5}+2.5} \\ \sqrt{0.3-0.06\sqrt{5}} & \sqrt{0.1-0.02\sqrt{5}} & -0.5-0.1\sqrt{5} & -0.2\sqrt{2.5-0.5\sqrt{5}} & \frac{\sqrt{5}}{5} \end{pmatrix}$
Au	-1
$T1u$	$\begin{pmatrix} 0 & \sqrt{0.1\sqrt{5}+0.5} & -\sqrt{0.5-0.1\sqrt{5}} \\ -\sqrt{0.5-0.1\sqrt{5}} & \frac{\sqrt{5}}{5} & 0.1\sqrt{5}+0.5 \\ -\sqrt{0.1\sqrt{5}+0.5} & -0.5+0.1\sqrt{5} & -\frac{\sqrt{5}}{5} \end{pmatrix}$
$T2u$	$\begin{pmatrix} \frac{\sqrt{5}}{5} & -\sqrt{0.5-0.1\sqrt{5}} & -0.5-0.1\sqrt{5} \\ \sqrt{0.1\sqrt{5}+0.5} & 0 & \sqrt{0.5-0.1\sqrt{5}} \\ 0.5-0.1\sqrt{5} & \sqrt{0.1\sqrt{5}+0.5} & -\frac{\sqrt{5}}{5} \end{pmatrix}$
Gu	$\begin{pmatrix} 0.5 & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -0.5 & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} \\ -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.1\sqrt{5} & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.5+\frac{\sqrt{5}}{5} \\ -0.5 & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & 0.5 & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} \\ -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & \frac{\sqrt{5}}{5}+0.5 & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & 0.1\sqrt{5} \end{pmatrix}$
Hu	$\begin{pmatrix} 0.2 & -0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.2\sqrt{7.5-1.5\sqrt{5}} & 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.2\sqrt{1.5\sqrt{5}+7.5} \\ -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & 0.4 & -0.2\sqrt{2.5-0.5\sqrt{5}} & 0.1+0.3\sqrt{5} & -0.2\sqrt{0.5\sqrt{5}+2.5} \\ \sqrt{0.06\sqrt{5}+0.3} & \sqrt{0.02\sqrt{5}+0.1} & \frac{\sqrt{5}}{5} & -0.2\sqrt{0.5\sqrt{5}+2.5} & -0.5+0.1\sqrt{5} \\ 0.04\sqrt{5}\left(\sqrt{5}+5\right) & 0.1-0.3\sqrt{5} & \sqrt{0.1-0.02\sqrt{5}} & 0.4 & \sqrt{0.02\sqrt{5}+0.1} \\ -0.2\sqrt{7.5-1.5\sqrt{5}} & -0.2\sqrt{2.5-0.5\sqrt{5}} & 0.1\sqrt{5}+0.5 & \sqrt{0.1-0.02\sqrt{5}} & -\frac{\sqrt{5}}{5} \end{pmatrix}$

Ih	$\hat{S}_6(3)$
Ag	1
$T1g$	$\begin{pmatrix} 0 & -\sqrt{0.5-0.1\sqrt5} & -\sqrt{0.1\sqrt5+0.5} \\ -\sqrt{0.1\sqrt5+0.5} & \frac{\sqrt5}{5} & -0.5+0.1\sqrt5 \\ \sqrt{0.5-0.1\sqrt5} & 0.1\sqrt5+0.5 & -\frac{\sqrt5}{5} \end{pmatrix}$
$T2g$	$\begin{pmatrix} \frac{\sqrt5}{5} & -\sqrt{0.1\sqrt5+0.5} & 0.5-0.1\sqrt5 \\ -\sqrt{0.5-0.1\sqrt5} & 0 & \sqrt{0.1\sqrt5+0.5} \\ -0.5-0.1\sqrt5 & -\sqrt{0.5-0.1\sqrt5} & -\frac{\sqrt5}{5} \end{pmatrix}$
Gg	$\begin{pmatrix} -0.5 & -0.5\sqrt{\frac{2\sqrt5}{5}+1} & 0.5 & -0.5\sqrt{1-\frac{2\sqrt5}{5}} \\ -0.5\sqrt{1-\frac{2\sqrt5}{5}} & -0.1\sqrt5 & -0.5\sqrt{1-\frac{2\sqrt5}{5}} & \frac{\sqrt5}{5}+0.5 \\ 0.5 & -0.5\sqrt{\frac{2\sqrt5}{5}+1} & -0.5 & -0.5\sqrt{1-\frac{2\sqrt5}{5}} \\ 0.5\sqrt{\frac{2\sqrt5}{5}+1} & -0.5+\frac{\sqrt5}{5} & 0.5\sqrt{\frac{2\sqrt5}{5}+1} & 0.1\sqrt5 \end{pmatrix}$
Hg	$\begin{pmatrix} -0.2 & 0.04\sqrt5\left(-5+\sqrt5\right) & \sqrt{0.06\sqrt5+0.3} & -0.04\sqrt5\left(\sqrt5+5\right) & -0.2\sqrt{7.5-1.5\sqrt5} \\ 0.04\sqrt5\left(\sqrt5+5\right) & -0.4 & \sqrt{0.02\sqrt5+0.1} & -0.1+0.3\sqrt5 & -0.2\sqrt{2.5-0.5\sqrt5} \\ \sqrt{0.3-0.06\sqrt5} & \sqrt{0.1-0.02\sqrt5} & \frac{\sqrt5}{5} & -0.2\sqrt{2.5-0.5\sqrt5} & 0.1\sqrt5+0.5 \\ -0.04\sqrt5\left(-5+\sqrt5\right) & -0.3\sqrt5-0.1 & -0.2\sqrt{0.5\sqrt5+2.5} & -0.4 & \sqrt{0.1-0.02\sqrt5} \\ \sqrt{0.06\sqrt5+0.3} & \sqrt{0.02\sqrt5+0.1} & -0.5+0.1\sqrt5 & -0.2\sqrt{0.5\sqrt5+2.5} & -\frac{\sqrt5}{5} \end{pmatrix}$
Au	-1
$T1u$	$\begin{pmatrix} 0 & \sqrt{0.5-0.1\sqrt5} & \sqrt{0.1\sqrt5+0.5} \\ \sqrt{0.1\sqrt5+0.5} & -\frac{\sqrt5}{5} & 0.5-0.1\sqrt5 \\ -\sqrt{0.5-0.1\sqrt5} & -0.5-0.1\sqrt5 & \frac{\sqrt5}{5} \end{pmatrix}$
$T2u$	$\begin{pmatrix} -\frac{\sqrt5}{5} & \sqrt{0.1\sqrt5+0.5} & -0.5+0.1\sqrt5 \\ \sqrt{0.5-0.1\sqrt5} & 0 & -\sqrt{0.1\sqrt5+0.5} \\ 0.1\sqrt5+0.5 & \sqrt{0.5-0.1\sqrt5} & \frac{\sqrt5}{5} \end{pmatrix}$
Gu	$\begin{pmatrix} 0.5 & 0.5\sqrt{\frac{2\sqrt5}{5}+1} & -0.5 & 0.5\sqrt{1-\frac{2\sqrt5}{5}} \\ 0.5\sqrt{1-\frac{2\sqrt5}{5}} & 0.1\sqrt5 & 0.5\sqrt{1-\frac{2\sqrt5}{5}} & -0.5-\frac{\sqrt5}{5} \\ -0.5 & 0.5\sqrt{\frac{2\sqrt5}{5}+1} & 0.5 & 0.5\sqrt{1-\frac{2\sqrt5}{5}} \\ -0.5\sqrt{\frac{2\sqrt5}{5}+1} & 0.5-\frac{\sqrt5}{5} & -0.5\sqrt{\frac{2\sqrt5}{5}+1} & -0.1\sqrt5 \end{pmatrix}$
Hu	$\begin{pmatrix} 0.2 & -0.04\sqrt5\left(-5+\sqrt5\right) & -0.2\sqrt{1.5\sqrt5+7.5} & 0.04\sqrt5\left(\sqrt5+5\right) & \sqrt{0.3-0.06\sqrt5} \\ -0.04\sqrt5\left(\sqrt5+5\right) & 0.4 & -0.2\sqrt{0.5\sqrt5+2.5} & 0.1-0.3\sqrt5 & \sqrt{0.1-0.02\sqrt5} \\ -0.2\sqrt{7.5-1.5\sqrt5} & -0.2\sqrt{2.5-0.5\sqrt5} & -\frac{\sqrt5}{5} & \sqrt{0.1-0.02\sqrt5} & -0.5-0.1\sqrt5 \\ 0.04\sqrt5\left(-5+\sqrt5\right) & 0.1+0.3\sqrt5 & \sqrt{0.02\sqrt5+0.1} & 0.4 & -0.2\sqrt{2.5-0.5\sqrt5} \\ -0.2\sqrt{1.5\sqrt5+7.5} & -0.2\sqrt{0.5\sqrt5+2.5} & 0.5-0.1\sqrt5 & \sqrt{0.02\sqrt5+0.1} & \frac{\sqrt5}{5} \end{pmatrix}$

Ih	$\hat{S}_6^5(3)$
Ag	1

$T1g$

$$\begin{pmatrix} 0 & -\sqrt{0.1\sqrt5+0.5} & \sqrt{0.5-0.1\sqrt5} \\ -\sqrt{0.5-0.1\sqrt5} & \frac{\sqrt5}{5} & 0.1\sqrt5+0.5 \\ -\sqrt{0.1\sqrt5+0.5} & -0.5+0.1\sqrt5 & -\frac{\sqrt5}{5} \end{pmatrix}$$

$T2g$

$$\begin{pmatrix} \frac{\sqrt5}{5} & -\sqrt{0.5-0.1\sqrt5} & -0.5-0.1\sqrt5 \\ -\sqrt{0.1\sqrt5+0.5} & 0 & -\sqrt{0.5-0.1\sqrt5} \\ 0.5-0.1\sqrt5 & \sqrt{0.1\sqrt5+0.5} & -\frac{\sqrt5}{5} \end{pmatrix}$$

Gg

$$\begin{pmatrix} -0.5 & -0.5\sqrt{1-\frac{2\sqrt5}{5}} & 0.5 & 0.5\sqrt{\frac{2\sqrt5}{5}+1} \\ -0.5\sqrt{\frac{2\sqrt5}{5}+1} & -0.1\sqrt5 & -0.5\sqrt{\frac{2\sqrt5}{5}+1} & -0.5+\frac{\sqrt5}{5} \\ 0.5 & -0.5\sqrt{1-\frac{2\sqrt5}{5}} & -0.5 & 0.5\sqrt{\frac{2\sqrt5}{5}+1} \\ -0.5\sqrt{1-\frac{2\sqrt5}{5}} & \frac{\sqrt5}{5}+0.5 & -0.5\sqrt{1-\frac{2\sqrt5}{5}} & 0.1\sqrt5 \end{pmatrix}$$

Hg

$$\begin{pmatrix} -0.2 & 0.04\sqrt5\left(\sqrt5+5\right) & \sqrt{0.3-0.06\sqrt5} & -0.04\sqrt5\left(-5+\sqrt5\right) & \sqrt{0.06\sqrt5+0.3} \\ 0.04\sqrt5\left(-5+\sqrt5\right) & -0.4 & \sqrt{0.1-0.02\sqrt5} & -0.3\sqrt5-0.1 & \sqrt{0.02\sqrt5+0.1} \\ \sqrt{0.06\sqrt5+0.3} & \sqrt{0.02\sqrt5+0.1} & \frac{\sqrt5}{5} & -0.2\sqrt{0.5\sqrt5+2.5} & -0.5+0.1\sqrt5 \\ -0.04\sqrt5\left(\sqrt5+5\right) & -0.1+0.3\sqrt5 & -0.2\sqrt{2.5-0.5\sqrt5} & -0.4 & -0.2\sqrt{0.5\sqrt5+2.5} \\ -0.2\sqrt{7.5-1.5\sqrt5} & -0.2\sqrt{2.5-0.5\sqrt5} & 0.1\sqrt5+0.5 & \sqrt{0.1-0.02\sqrt5} & -\frac{\sqrt5}{5} \end{pmatrix}$$

Au	-1

$T1u$

$$\begin{pmatrix} 0 & \sqrt{0.1\sqrt5+0.5} & -\sqrt{0.5-0.1\sqrt5} \\ \sqrt{0.5-0.1\sqrt5} & -\frac{\sqrt5}{5} & -0.5-0.1\sqrt5 \\ \sqrt{0.1\sqrt5+0.5} & 0.5-0.1\sqrt5 & \frac{\sqrt5}{5} \end{pmatrix}$$

$T2u$

$$\begin{pmatrix} -\frac{\sqrt5}{5} & \sqrt{0.5-0.1\sqrt5} & 0.1\sqrt5+0.5 \\ \sqrt{0.1\sqrt5+0.5} & 0 & \sqrt{0.5-0.1\sqrt5} \\ -0.5+0.1\sqrt5 & -\sqrt{0.1\sqrt5+0.5} & \frac{\sqrt5}{5} \end{pmatrix}$$

Gu

$$\begin{pmatrix} 0.5 & 0.5\sqrt{1-\frac{2\sqrt5}{5}} & -0.5 & -0.5\sqrt{\frac{2\sqrt5}{5}+1} \\ 0.5\sqrt{\frac{2\sqrt5}{5}+1} & 0.1\sqrt5 & 0.5\sqrt{\frac{2\sqrt5}{5}+1} & 0.5-\frac{\sqrt5}{5} \\ -0.5 & 0.5\sqrt{1-\frac{2\sqrt5}{5}} & 0.5 & -0.5\sqrt{\frac{2\sqrt5}{5}+1} \\ 0.5\sqrt{1-\frac{2\sqrt5}{5}} & -0.5-\frac{\sqrt5}{5} & 0.5\sqrt{1-\frac{2\sqrt5}{5}} & -0.1\sqrt5 \end{pmatrix}$$

Hu

$$\begin{pmatrix} 0.2 & -0.04\sqrt5\left(\sqrt5+5\right) & -0.2\sqrt{7.5-1.5\sqrt5} & 0.04\sqrt5\left(-5+\sqrt5\right) & -0.2\sqrt{1.5\sqrt5+7.5} \\ -0.04\sqrt5\left(-5+\sqrt5\right) & 0.4 & -0.2\sqrt{2.5-0.5\sqrt5} & 0.1+0.3\sqrt5 & -0.2\sqrt{0.5\sqrt5+2.5} \\ -0.2\sqrt{1.5\sqrt5+7.5} & -0.2\sqrt{0.5\sqrt5+2.5} & -\frac{\sqrt5}{5} & \sqrt{0.02\sqrt5+0.1} & 0.5-0.1\sqrt5 \\ 0.04\sqrt5\left(\sqrt5+5\right) & 0.1-0.3\sqrt5 & \sqrt{0.1-0.02\sqrt5} & 0.4 & \sqrt{0.02\sqrt5+0.1} \\ \sqrt{0.3-0.06\sqrt5} & \sqrt{0.1-0.02\sqrt5} & -0.5-0.1\sqrt5 & -0.2\sqrt{2.5-0.5\sqrt5} & \frac{\sqrt5}{5} \end{pmatrix}$$

Ih	$\hat{S}_6(4)$
Ag	1

T1g:
$$\begin{pmatrix} -0.5 & -0.5\sqrt{1-\frac{2\sqrt5}{5}} & -\sqrt{0.1\sqrt5+0.5} \\ 0.5\sqrt{1-\frac{2\sqrt5}{5}} & \frac{\sqrt5}{5}+0.5 & -0.5+0.1\sqrt5 \\ \sqrt{0.1\sqrt5+0.5} & -0.5+0.1\sqrt5 & -\frac{\sqrt5}{5} \end{pmatrix}$$

T2g:
$$\begin{pmatrix} \frac{\sqrt5}{5} & \sqrt{0.5-0.1\sqrt5} & -0.5-0.1\sqrt5 \\ -\sqrt{0.5-0.1\sqrt5} & -0.5 & -0.5\sqrt{\frac{2\sqrt5}{5}+1} \\ -0.5-0.1\sqrt5 & 0.5\sqrt{\frac{2\sqrt5}{5}+1} & 0.5-\frac{\sqrt5}{5} \end{pmatrix}$$

Gg:
$$\begin{pmatrix} -0.25\sqrt5-0.25 & 0.5\sqrt{0.5-0.1\sqrt5} & -0.5 & -0.5\sqrt{1-\frac{2\sqrt5}{5}} \\ -0.5\sqrt{0.5-0.1\sqrt5} & -0.25+0.15\sqrt5 & 0.5\sqrt{\frac{2\sqrt5}{5}+1} & -0.3\sqrt5 \\ -0.5 & -0.5\sqrt{\frac{2\sqrt5}{5}+1} & -0.25+0.25\sqrt5 & 0.5\sqrt{0.1\sqrt5+0.5} \\ 0.5\sqrt{1-\frac{2\sqrt5}{5}} & -0.3\sqrt5 & -0.5\sqrt{0.1\sqrt5+0.5} & -0.15\sqrt5-0.25 \end{pmatrix}$$

Hg:
$$\begin{pmatrix} -0.2 & 0.04\sqrt5\left(\sqrt5+5\right) & -0.2\sqrt{7.5-1.5\sqrt5} & -0.04\sqrt5\left(-5+\sqrt5\right) & -0.2\sqrt{1.5\sqrt5+7.5} \\ 0.04\sqrt5\left(\sqrt5+5\right) & 0.1+\frac{\sqrt5}{5} & -0.1\sqrt{5-2\sqrt5} & 0.4 & \sqrt{0.4-0.08\sqrt5} \\ \sqrt{0.3-0.06\sqrt5} & 0.1\sqrt{5-2\sqrt5} & -0.5 & -0.2\sqrt{2\sqrt5+10} & 0 \\ -0.04\sqrt5\left(-5+\sqrt5\right) & 0.4 & \sqrt{0.08\sqrt5+0.4} & 0.1-\frac{\sqrt5}{5} & -0.1\sqrt{2\sqrt5+5} \\ \sqrt{0.06\sqrt5+0.3} & -0.2\sqrt{10-2\sqrt5} & 0 & 0.1\sqrt{2\sqrt5+5} & -0.5 \end{pmatrix}$$

Ih	$\hat{S}_6(4)$
Au	-1

T1u:
$$\begin{pmatrix} 0.5 & 0.5\sqrt{1-\frac{2\sqrt5}{5}} & \sqrt{0.1\sqrt5+0.5} \\ -0.5\sqrt{1-\frac{2\sqrt5}{5}} & -0.5-\frac{\sqrt5}{5} & 0.5-0.1\sqrt5 \\ -\sqrt{0.1\sqrt5+0.5} & 0.5-0.1\sqrt5 & \frac{\sqrt5}{5} \end{pmatrix}$$

T2u:
$$\begin{pmatrix} -\frac{\sqrt5}{5} & -\sqrt{0.5-0.1\sqrt5} & 0.1\sqrt5+0.5 \\ \sqrt{0.5-0.1\sqrt5} & 0.5 & 0.5\sqrt{\frac{2\sqrt5}{5}+1} \\ 0.1\sqrt5+0.5 & -0.5\sqrt{\frac{2\sqrt5}{5}+1} & -0.5+\frac{\sqrt5}{5} \end{pmatrix}$$

Gu:
$$\begin{pmatrix} 0.25+0.25\sqrt5 & -0.5\sqrt{0.5-0.1\sqrt5} & 0.5 & 0.5\sqrt{1-\frac{2\sqrt5}{5}} \\ 0.5\sqrt{0.5-0.1\sqrt5} & 0.25-0.15\sqrt5 & -0.5\sqrt{\frac{2\sqrt5}{5}+1} & 0.3\sqrt5 \\ 0.5 & 0.5\sqrt{\frac{2\sqrt5}{5}+1} & 0.25-0.25\sqrt5 & -0.5\sqrt{0.1\sqrt5+0.5} \\ -0.5\sqrt{1-\frac{2\sqrt5}{5}} & 0.3\sqrt5 & 0.5\sqrt{0.1\sqrt5+0.5} & 0.25+0.15\sqrt5 \end{pmatrix}$$

Hu:
$$\begin{pmatrix} 0.2 & -0.04\sqrt5\left(\sqrt5+5\right) & \sqrt{0.3-0.06\sqrt5} & 0.04\sqrt5\left(-5+\sqrt5\right) & \sqrt{0.06\sqrt5+0.3} \\ -0.04\sqrt5\left(\sqrt5+5\right) & -\frac{\sqrt5}{5}-0.1 & 0.1\sqrt{5-2\sqrt5} & -0.4 & -0.2\sqrt{10-2\sqrt5} \\ -0.2\sqrt{7.5-1.5\sqrt5} & -0.1\sqrt{5-2\sqrt5} & 0.5 & \sqrt{0.08\sqrt5+0.4} & 0 \\ 0.04\sqrt5\left(-5+\sqrt5\right) & -0.4 & -0.2\sqrt{2\sqrt5+10} & -0.1+\frac{\sqrt5}{5} & 0.1\sqrt{2\sqrt5+5} \\ -0.2\sqrt{1.5\sqrt5+7.5} & \sqrt{0.4-0.08\sqrt5} & 0 & -0.1\sqrt{2\sqrt5+5} & 0.5 \end{pmatrix}$$

$\mathbf{I_h}$	$\hat{S}_6^5(4)$
Ag	1
$T1g$	$\begin{pmatrix} -0.5 & 0.5\sqrt{1-\frac{2\sqrt5}{5}} & \sqrt{0.1\sqrt5+0.5} \\ -0.5\sqrt{1-\frac{2\sqrt5}{5}} & \frac{\sqrt5}{5}+0.5 & -0.5+0.1\sqrt5 \\ -\sqrt{0.1\sqrt5+0.5} & -0.5+0.1\sqrt5 & -\frac{\sqrt5}{5} \end{pmatrix}$
$T2g$	$\begin{pmatrix} \frac{\sqrt5}{5} & -\sqrt{0.5-0.1\sqrt5} & -0.5-0.1\sqrt5 \\ \sqrt{0.5-0.1\sqrt5} & -0.5 & 0.5\sqrt{\frac{2\sqrt5}{5}+1} \\ -0.5-0.1\sqrt5 & -0.5\sqrt{\frac{2\sqrt5}{5}+1} & 0.5-\frac{\sqrt5}{5} \end{pmatrix}$
Gg	$\begin{pmatrix} -0.25\sqrt5-0.25 & -0.5\sqrt{0.5-0.1\sqrt5} & -0.5 & 0.5\sqrt{1-\frac{2\sqrt5}{5}} \\ 0.5\sqrt{0.5-0.1\sqrt5} & -0.25+0.15\sqrt5 & -0.5\sqrt{\frac{2\sqrt5}{5}+1} & -0.3\sqrt5 \\ -0.5 & 0.5\sqrt{\frac{2\sqrt5}{5}+1} & -0.25+0.25\sqrt5 & -0.5\sqrt{0.1\sqrt5+0.5} \\ -0.5\sqrt{1-\frac{2\sqrt5}{5}} & -0.3\sqrt5 & 0.5\sqrt{0.1\sqrt5+0.5} & -0.15\sqrt5-0.25 \end{pmatrix}$
Hg	$\begin{pmatrix} -0.2 & 0.04\sqrt5\left(\sqrt5+5\right) & \sqrt{0.3-0.06\sqrt5} & -0.04\sqrt5\left(-5+\sqrt5\right) & \sqrt{0.06\sqrt5+0.3} \\ 0.04\sqrt5\left(\sqrt5+5\right) & 0.1+\frac{\sqrt5}{5} & 0.1\sqrt{5-2\sqrt5} & 0.4 & -0.2\sqrt{10-2\sqrt5} \\ -0.2\sqrt{7.5-1.5\sqrt5} & -0.1\sqrt{5-2\sqrt5} & -0.5 & \sqrt{0.08\sqrt5+0.4} & 0 \\ -0.04\sqrt5\left(-5+\sqrt5\right) & 0.4 & -0.2\sqrt{2\sqrt5+10} & 0.1-\frac{\sqrt5}{5} & 0.1\sqrt{2\sqrt5+5} \\ -0.2\sqrt{1.5\sqrt5+7.5} & \sqrt{0.4-0.08\sqrt5} & 0 & -0.1\sqrt{2\sqrt5+5} & -0.5 \end{pmatrix}$
Au	-1
$T1u$	$\begin{pmatrix} 0.5 & -0.5\sqrt{1-\frac{2\sqrt5}{5}} & -\sqrt{0.1\sqrt5+0.5} \\ 0.5\sqrt{1-\frac{2\sqrt5}{5}} & -0.5-\frac{\sqrt5}{5} & 0.5-0.1\sqrt5 \\ \sqrt{0.1\sqrt5+0.5} & 0.5-0.1\sqrt5 & \frac{\sqrt5}{5} \end{pmatrix}$
$T2u$	$\begin{pmatrix} -\frac{\sqrt5}{5} & \sqrt{0.5-0.1\sqrt5} & 0.1\sqrt5+0.5 \\ -\sqrt{0.5-0.1\sqrt5} & 0.5 & -0.5\sqrt{\frac{2\sqrt5}{5}+1} \\ 0.1\sqrt5+0.5 & 0.5\sqrt{\frac{2\sqrt5}{5}+1} & -0.5+\frac{\sqrt5}{5} \end{pmatrix}$
Gu	$\begin{pmatrix} 0.25+0.25\sqrt5 & 0.5\sqrt{0.5-0.1\sqrt5} & 0.5 & -0.5\sqrt{1-\frac{2\sqrt5}{5}} \\ -0.5\sqrt{0.5-0.1\sqrt5} & 0.25-0.15\sqrt5 & 0.5\sqrt{\frac{2\sqrt5}{5}+1} & 0.3\sqrt5 \\ 0.5 & -0.5\sqrt{\frac{2\sqrt5}{5}+1} & 0.25-0.25\sqrt5 & 0.5\sqrt{0.1\sqrt5+0.5} \\ 0.5\sqrt{1-\frac{2\sqrt5}{5}} & 0.3\sqrt5 & -0.5\sqrt{0.1\sqrt5+0.5} & 0.25+0.15\sqrt5 \end{pmatrix}$
Hu	$\begin{pmatrix} 0.2 & -0.04\sqrt5\left(\sqrt5+5\right) & -0.2\sqrt{7.5-1.5\sqrt5} & 0.04\sqrt5\left(-5+\sqrt5\right) & -0.2\sqrt{1.5\sqrt5+7.5} \\ -0.04\sqrt5\left(\sqrt5+5\right) & -\frac{\sqrt5}{5}-0.1 & -0.1\sqrt{5-2\sqrt5} & -0.4 & \sqrt{0.4-0.08\sqrt5} \\ \sqrt{0.3-0.06\sqrt5} & 0.1\sqrt{5-2\sqrt5} & 0.5 & -0.2\sqrt{2\sqrt5+10} & 0 \\ 0.04\sqrt5\left(-5+\sqrt5\right) & -0.4 & \sqrt{0.08\sqrt5+0.4} & -0.1+\frac{\sqrt5}{5} & -0.1\sqrt{2\sqrt5+5} \\ \sqrt{0.06\sqrt5+0.3} & -0.2\sqrt{10-2\sqrt5} & 0 & 0.1\sqrt{2\sqrt5+5} & 0.5 \end{pmatrix}$

Ih	$\hat{S}_6(5)$
Ag	1
$T1g$	$\begin{pmatrix} -0.5 & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -\sqrt{0.5-0.1\sqrt{5}} \\ 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & 0.5-\frac{\sqrt{5}}{5} & -0.5-0.1\sqrt{5} \\ \sqrt{0.5-0.1\sqrt{5}} & -0.5-0.1\sqrt{5} & \frac{\sqrt{5}}{5} \end{pmatrix}$
$T2g$	$\begin{pmatrix} -\frac{\sqrt{5}}{5} & -\sqrt{0.1\sqrt{5}+0.5} & -0.5+0.1\sqrt{5} \\ \sqrt{0.1\sqrt{5}+0.5} & -0.5 & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} \\ -0.5+0.1\sqrt{5} & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & \frac{\sqrt{5}}{5}+0.5 \end{pmatrix}$
Gg	$\begin{pmatrix} -0.25+0.25\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} & -0.5 & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} \\ 0.5\sqrt{0.1\sqrt{5}+0.5} & -0.15\sqrt{5}-0.25 & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & 0.3\sqrt{5} \\ -0.5 & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -0.25\sqrt{5}-0.25 & 0.5\sqrt{0.5-0.1\sqrt{5}} \\ 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & 0.3\sqrt{5} & -0.5\sqrt{0.5-0.1\sqrt{5}} & -0.25+0.15\sqrt{5} \end{pmatrix}$
Hg	$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.2\sqrt{1.5\sqrt{5}+7.5} & -0.04\sqrt{5}\left(\sqrt{5}+5\right) & \sqrt{0.3-0.06\sqrt{5}} \\ 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & 0.1-\frac{\sqrt{5}}{5} & 0.1\sqrt{2\sqrt{5}+5} & 0.4 & \sqrt{0.08\sqrt{5}+0.4} \\ \sqrt{0.06\sqrt{5}+0.3} & -0.1\sqrt{2\sqrt{5}+5} & -0.5 & \sqrt{0.4-0.08\sqrt{5}} & 0 \\ -0.04\sqrt{5}\left(\sqrt{5}+5\right) & 0.4 & -0.2\sqrt{10-2\sqrt{5}} & 0.1+\frac{\sqrt{5}}{5} & -0.1\sqrt{5-2\sqrt{5}} \\ -0.2\sqrt{7.5-1.5\sqrt{5}} & -0.2\sqrt{2\sqrt{5}+10} & 0 & 0.1\sqrt{5-2\sqrt{5}} & -0.5 \end{pmatrix}$
Au	-1
$T1u$	$\begin{pmatrix} 0.5 & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & \sqrt{0.5-0.1\sqrt{5}} \\ -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.5+\frac{\sqrt{5}}{5} & 0.1\sqrt{5}+0.5 \\ -\sqrt{0.5-0.1\sqrt{5}} & 0.1\sqrt{5}+0.5 & -\frac{\sqrt{5}}{5} \end{pmatrix}$
$T2u$	$\begin{pmatrix} \frac{\sqrt{5}}{5} & \sqrt{0.1\sqrt{5}+0.5} & 0.5-0.1\sqrt{5} \\ -\sqrt{0.1\sqrt{5}+0.5} & 0.5 & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} \\ 0.5-0.1\sqrt{5} & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -0.5-\frac{\sqrt{5}}{5} \end{pmatrix}$
Gu	$\begin{pmatrix} 0.25-0.25\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} & 0.5 & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} \\ -0.5\sqrt{0.1\sqrt{5}+0.5} & 0.25+0.15\sqrt{5} & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -0.3\sqrt{5} \\ 0.5 & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & 0.25+0.25\sqrt{5} & -0.5\sqrt{0.5-0.1\sqrt{5}} \\ -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.3\sqrt{5} & 0.5\sqrt{0.5-0.1\sqrt{5}} & 0.25-0.15\sqrt{5} \end{pmatrix}$
Hu	$\begin{pmatrix} 0.2 & -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & \sqrt{0.06\sqrt{5}+0.3} & 0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.2\sqrt{7.5-1.5\sqrt{5}} \\ -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.1+\frac{\sqrt{5}}{5} & -0.1\sqrt{2\sqrt{5}+5} & -0.4 & -0.2\sqrt{2\sqrt{5}+10} \\ -0.2\sqrt{1.5\sqrt{5}+7.5} & 0.1\sqrt{2\sqrt{5}+5} & 0.5 & -0.2\sqrt{10-2\sqrt{5}} & 0 \\ 0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.4 & \sqrt{0.4-0.08\sqrt{5}} & -\frac{\sqrt{5}}{5}-0.1 & 0.1\sqrt{5-2\sqrt{5}} \\ \sqrt{0.3-0.06\sqrt{5}} & \sqrt{0.08\sqrt{5}+0.4} & 0 & -0.1\sqrt{5-2\sqrt{5}} & 0.5 \end{pmatrix}$

Ih	$\hat{S}_6^5(5)$

Ag: 1

$T1g$:
$$\begin{pmatrix} -0.5 & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & \sqrt{0.5-0.1\sqrt{5}} \\ -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & 0.5-\frac{\sqrt{5}}{5} & -0.5-0.1\sqrt{5} \\ -\sqrt{0.5-0.1\sqrt{5}} & -0.5-0.1\sqrt{5} & \frac{\sqrt{5}}{5} \end{pmatrix}$$

$T2g$:
$$\begin{pmatrix} -\frac{\sqrt{5}}{5} & \sqrt{0.1\sqrt{5}+0.5} & -0.5+0.1\sqrt{5} \\ -\sqrt{0.1\sqrt{5}+0.5} & -0.5 & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} \\ -0.5+0.1\sqrt{5} & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & \frac{\sqrt{5}}{5}+0.5 \end{pmatrix}$$

Gg:
$$\begin{pmatrix} -0.25+0.25\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} & -0.5 & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} \\ -0.5\sqrt{0.1\sqrt{5}+0.5} & -0.15\sqrt{5}-0.25 & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & 0.3\sqrt{5} \\ -0.5 & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -0.25\sqrt{5}-0.25 & -0.5\sqrt{0.5-0.1\sqrt{5}} \\ -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & 0.3\sqrt{5} & 0.5\sqrt{0.5-0.1\sqrt{5}} & -0.25+0.15\sqrt{5} \end{pmatrix}$$

Hg:
$$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & \sqrt{0.06\sqrt{5}+0.3} & -0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.2\sqrt{7.5-1.5\sqrt{5}} \\ 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & 0.1-\frac{\sqrt{5}}{5} & -0.1\sqrt{2\sqrt{5}+5} & 0.4 & -0.2\sqrt{2\sqrt{5}+10} \\ -0.2\sqrt{1.5\sqrt{5}+7.5} & 0.1\sqrt{2\sqrt{5}+5} & -0.5 & -0.2\sqrt{10-2\sqrt{5}} & 0 \\ -0.04\sqrt{5}\left(\sqrt{5}+5\right) & 0.4 & \sqrt{0.4-0.08\sqrt{5}} & 0.1+\frac{\sqrt{5}}{5} & 0.1\sqrt{5-2\sqrt{5}} \\ \sqrt{0.3-0.06\sqrt{5}} & \sqrt{0.08\sqrt{5}+0.4} & 0 & -0.1\sqrt{5-2\sqrt{5}} & -0.5 \end{pmatrix}$$

Au: -1

$T1u$:
$$\begin{pmatrix} 0.5 & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -\sqrt{0.5-0.1\sqrt{5}} \\ 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.5+\frac{\sqrt{5}}{5} & 0.1\sqrt{5}+0.5 \\ \sqrt{0.5-0.1\sqrt{5}} & 0.1\sqrt{5}+0.5 & -\frac{\sqrt{5}}{5} \end{pmatrix}$$

$T2u$:
$$\begin{pmatrix} \frac{\sqrt{5}}{5} & -\sqrt{0.1\sqrt{5}+0.5} & 0.5-0.1\sqrt{5} \\ \sqrt{0.1\sqrt{5}+0.5} & 0.5 & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} \\ 0.5-0.1\sqrt{5} & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -0.5-\frac{\sqrt{5}}{5} \end{pmatrix}$$

Gu:
$$\begin{pmatrix} 0.25-0.25\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} & 0.5 & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} \\ 0.5\sqrt{0.1\sqrt{5}+0.5} & 0.25+0.15\sqrt{5} & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -0.3\sqrt{5} \\ 0.5 & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & 0.25+0.25\sqrt{5} & 0.5\sqrt{0.5-0.1\sqrt{5}} \\ 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.3\sqrt{5} & -0.5\sqrt{0.5-0.1\sqrt{5}} & 0.25-0.15\sqrt{5} \end{pmatrix}$$

Hu:
$$\begin{pmatrix} 0.2 & -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.2\sqrt{1.5\sqrt{5}+7.5} & 0.04\sqrt{5}\left(\sqrt{5}+5\right) & \sqrt{0.3-0.06\sqrt{5}} \\ -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.1+\frac{\sqrt{5}}{5} & 0.1\sqrt{2\sqrt{5}+5} & -0.4 & \sqrt{0.08\sqrt{5}+0.4} \\ \sqrt{0.06\sqrt{5}+0.3} & -0.1\sqrt{2\sqrt{5}+5} & 0.5 & \sqrt{0.4-0.08\sqrt{5}} & 0 \\ 0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.4 & -0.2\sqrt{10-2\sqrt{5}} & -\frac{\sqrt{5}}{5}-0.1 & -0.1\sqrt{5-2\sqrt{5}} \\ -0.2\sqrt{7.5-1.5\sqrt{5}} & -0.2\sqrt{2\sqrt{5}+10} & 0 & 0.1\sqrt{5-2\sqrt{5}} & 0.5 \end{pmatrix}$$

Ih	$\hat{S}_6(6)$
Ag	1

$T1g$

$$\begin{pmatrix} 0.25 - 0.25\sqrt{5} & 0.5\sqrt{0.5\sqrt{5}+2.5} & 0 \\ -0.5\sqrt{0.1\sqrt{5}+0.5} & -0.25 + 0.05\sqrt{5} & \frac{2\sqrt{5}}{5} \\ \sqrt{0.1\sqrt{5}+0.5} & 0.5 - 0.1\sqrt{5} & \frac{\sqrt{5}}{5} \end{pmatrix}$$

$T2g$

$$\begin{pmatrix} -\frac{\sqrt{5}}{5} & \sqrt{0.5-0.1\sqrt{5}} & 0.1\sqrt{5}+0.5 \\ 0 & 0.25 + 0.25\sqrt{5} & -0.5\sqrt{2.5-0.5\sqrt{5}} \\ -\frac{2\sqrt{5}}{5} & -0.5\sqrt{0.5-0.1\sqrt{5}} & -0.25 - 0.05\sqrt{5} \end{pmatrix}$$

Gg

$$\begin{pmatrix} 0 & 0 & -0.25\sqrt{5}-0.25 & -0.5\sqrt{2.5-0.5\sqrt{5}} \\ -\sqrt{0.1\sqrt{5}+0.5} & -0.5+0.1\sqrt{5} & -0.5\sqrt{0.5-0.1\sqrt{5}} & 0.05\sqrt{5}+0.25 \\ -0.25+0.25\sqrt{5} & -0.5\sqrt{0.5\sqrt{5}+2.5} & 0 & 0 \\ -0.5\sqrt{0.1\sqrt{5}+0.5} & -0.25+0.05\sqrt{5} & \sqrt{0.5-0.1\sqrt{5}} & -0.5-0.1\sqrt{5} \end{pmatrix}$$

Hg

$$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(\sqrt{5}+5\right) & \sqrt{0.3-0.06\sqrt{5}} & -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & \sqrt{0.06\sqrt{5}+0.3} \\ -0.4\sqrt{3} & -0.15\sqrt{5}-0.15 & -0.3\sqrt{2.5-0.5\sqrt{5}} & -0.1+0.1\sqrt{5} & \sqrt{0.02\sqrt{5}+0.1} \\ 0 & 0.5\sqrt{0.5-0.1\sqrt{5}} & -0.25-0.05\sqrt{5} & \sqrt{0.1\sqrt{5}+0.5} & -0.5+0.1\sqrt{5} \\ 0.4\sqrt{3} & -0.1\sqrt{5}-0.1 & -0.2\sqrt{2.5-0.5\sqrt{5}} & -0.15+0.15\sqrt{5} & 0.3\sqrt{0.5\sqrt{5}+2.5} \\ 0 & -\sqrt{0.5-0.1\sqrt{5}} & 0.1\sqrt{5}+0.5 & 0.5\sqrt{0.1\sqrt{5}+0.5} & -0.25+0.05\sqrt{5} \end{pmatrix}$$

Au	-1

$T1u$

$$\begin{pmatrix} -0.25+0.25\sqrt{5} & -0.5\sqrt{0.5\sqrt{5}+2.5} & 0 \\ 0.5\sqrt{0.1\sqrt{5}+0.5} & 0.25-0.05\sqrt{5} & -\frac{2\sqrt{5}}{5} \\ -\sqrt{0.1\sqrt{5}+0.5} & -0.5+0.1\sqrt{5} & -\frac{\sqrt{5}}{5} \end{pmatrix}$$

$T2u$

$$\begin{pmatrix} \frac{\sqrt{5}}{5} & -\sqrt{0.5-0.1\sqrt{5}} & -0.5-0.1\sqrt{5} \\ 0 & -0.25\sqrt{5}-0.25 & 0.5\sqrt{2.5-0.5\sqrt{5}} \\ \frac{2\sqrt{5}}{5} & 0.5\sqrt{0.5-0.1\sqrt{5}} & 0.05\sqrt{5}+0.25 \end{pmatrix}$$

Gu

$$\begin{pmatrix} 0 & 0 & 0.25+0.25\sqrt{5} & 0.5\sqrt{2.5-0.5\sqrt{5}} \\ \sqrt{0.1\sqrt{5}+0.5} & 0.5-0.1\sqrt{5} & 0.5\sqrt{0.5-0.1\sqrt{5}} & -0.25-0.05\sqrt{5} \\ 0.25-0.25\sqrt{5} & 0.5\sqrt{0.5\sqrt{5}+2.5} & 0 & 0 \\ 0.5\sqrt{0.1\sqrt{5}+0.5} & 0.25-0.05\sqrt{5} & -\sqrt{0.5-0.1\sqrt{5}} & 0.1\sqrt{5}+0.5 \end{pmatrix}$$

Hu

$$\begin{pmatrix} 0.2 & -0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.2\sqrt{7.5-1.5\sqrt{5}} & 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.2\sqrt{1.5\sqrt{5}+7.5} \\ 0.4\sqrt{3} & 0.15+0.15\sqrt{5} & 0.3\sqrt{2.5-0.5\sqrt{5}} & 0.1-0.1\sqrt{5} & -0.2\sqrt{0.5\sqrt{5}+2.5} \\ 0 & -0.5\sqrt{0.5-0.1\sqrt{5}} & 0.05\sqrt{5}+0.25 & -\sqrt{0.1\sqrt{5}+0.5} & 0.5-0.1\sqrt{5} \\ -0.4\sqrt{3} & 0.1+0.1\sqrt{5} & \sqrt{0.1-0.02\sqrt{5}} & 0.15-0.15\sqrt{5} & -0.3\sqrt{0.5\sqrt{5}+2.5} \\ 0 & \sqrt{0.5-0.1\sqrt{5}} & -0.5-0.1\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} & 0.25-0.05\sqrt{5} \end{pmatrix}$$

Ih	$\hat{S}_6^5(6)$
Ag	1
$T1g$	$\begin{pmatrix} 0.25 - 0.25\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} & \sqrt{0.1\sqrt{5}+0.5} \\ 0.5\sqrt{0.5\sqrt{5}+2.5} & -0.25+0.05\sqrt{5} & 0.5-0.1\sqrt{5} \\ 0 & \frac{2\sqrt{5}}{5} & \frac{\sqrt{5}}{5} \end{pmatrix}$
$T2g$	$\begin{pmatrix} -\frac{\sqrt{5}}{5} & 0 & -\frac{2\sqrt{5}}{5} \\ \sqrt{0.5-0.1\sqrt{5}} & 0.25+0.25\sqrt{5} & -0.5\sqrt{0.5-0.1\sqrt{5}} \\ 0.1\sqrt{5}+0.5 & -0.5\sqrt{2.5-0.5\sqrt{5}} & -0.25-0.05\sqrt{5} \end{pmatrix}$
Gg	$\begin{pmatrix} 0 & -\sqrt{0.1\sqrt{5}+0.5} & -0.25+0.25\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} \\ 0 & -0.5+0.1\sqrt{5} & -0.5\sqrt{0.5\sqrt{5}+2.5} & -0.25+0.05\sqrt{5} \\ -0.25\sqrt{5}-0.25 & -0.5\sqrt{0.5-0.1\sqrt{5}} & 0 & \sqrt{0.5-0.1\sqrt{5}} \\ -0.5\sqrt{2.5-0.5\sqrt{5}} & 0.05\sqrt{5}+0.25 & 0 & -0.5-0.1\sqrt{5} \end{pmatrix}$
Hg	$\begin{pmatrix} -0.2 & -0.4\sqrt{3} & 0 & 0.4\sqrt{3} & 0 \\ 0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.15\sqrt{5}-0.15 & 0.5\sqrt{0.5-0.1\sqrt{5}} & -0.1\sqrt{5}-0.1 & -\sqrt{0.5-0.1\sqrt{5}} \\ \sqrt{0.3-0.06\sqrt{5}} & -0.3\sqrt{2.5-0.5\sqrt{5}} & -0.25-0.05\sqrt{5} & -0.2\sqrt{2.5-0.5\sqrt{5}} & 0.1\sqrt{5}+0.5 \\ -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.1+0.1\sqrt{5} & \sqrt{0.1\sqrt{5}+0.5} & -0.15+0.15\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} \\ \sqrt{0.06\sqrt{5}+0.3} & \sqrt{0.02\sqrt{5}+0.1} & -0.5+0.1\sqrt{5} & 0.3\sqrt{0.5\sqrt{5}+2.5} & -0.25+0.05\sqrt{5} \end{pmatrix}$
Au	-1
$T1u$	$\begin{pmatrix} -0.25+0.25\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} & -\sqrt{0.1\sqrt{5}+0.5} \\ -0.5\sqrt{0.5\sqrt{5}+2.5} & 0.25-0.05\sqrt{5} & -0.5+0.1\sqrt{5} \\ 0 & -\frac{2\sqrt{5}}{5} & -\frac{\sqrt{5}}{5} \end{pmatrix}$
$T2u$	$\begin{pmatrix} \frac{\sqrt{5}}{5} & 0 & \frac{2\sqrt{5}}{5} \\ -\sqrt{0.5-0.1\sqrt{5}} & -0.25\sqrt{5}-0.25 & 0.5\sqrt{0.5-0.1\sqrt{5}} \\ -0.5-0.1\sqrt{5} & 0.5\sqrt{2.5-0.5\sqrt{5}} & 0.05\sqrt{5}+0.25 \end{pmatrix}$
Gu	$\begin{pmatrix} 0 & \sqrt{0.1\sqrt{5}+0.5} & 0.25-0.25\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} \\ 0 & 0.5-0.1\sqrt{5} & 0.5\sqrt{0.5\sqrt{5}+2.5} & 0.25-0.05\sqrt{5} \\ 0.25+0.25\sqrt{5} & 0.5\sqrt{0.5-0.1\sqrt{5}} & 0 & -\sqrt{0.5-0.1\sqrt{5}} \\ 0.5\sqrt{2.5-0.5\sqrt{5}} & -0.25-0.05\sqrt{5} & 0 & 0.1\sqrt{5}+0.5 \end{pmatrix}$
Hu	$\begin{pmatrix} 0.2 & 0.4\sqrt{3} & 0 & -0.4\sqrt{3} & 0 \\ -0.04\sqrt{5}\left(\sqrt{5}+5\right) & 0.15+0.15\sqrt{5} & -0.5\sqrt{0.5-0.1\sqrt{5}} & 0.1+0.1\sqrt{5} & \sqrt{0.5-0.1\sqrt{5}} \\ -0.2\sqrt{7.5-1.5\sqrt{5}} & 0.3\sqrt{2.5-0.5\sqrt{5}} & 0.05\sqrt{5}+0.25 & \sqrt{0.1-0.02\sqrt{5}} & -0.5-0.1\sqrt{5} \\ 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & 0.1-0.1\sqrt{5} & -\sqrt{0.1\sqrt{5}+0.5} & 0.15-0.15\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} \\ -0.2\sqrt{1.5\sqrt{5}+7.5} & -0.2\sqrt{0.5\sqrt{5}+2.5} & 0.5-0.1\sqrt{5} & -0.3\sqrt{0.5\sqrt{5}+2.5} & 0.25-0.05\sqrt{5} \end{pmatrix}$

Ih	$\hat{S}_6(7)$
Ag	1

$T1g$

$$\begin{pmatrix} 0.25 - 0.25\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} & -\sqrt{0.1\sqrt{5}+0.5} \\ -0.5\sqrt{0.5\sqrt{5}+2.5} & -0.25+0.05\sqrt{5} & 0.5-0.1\sqrt{5} \\ 0 & \frac{2\sqrt{5}}{5} & \frac{\sqrt{5}}{5} \end{pmatrix}$$

$T2g$

$$\begin{pmatrix} -\frac{\sqrt{5}}{5} & 0 & -\frac{2\sqrt{5}}{5} \\ -\sqrt{0.5-0.1\sqrt{5}} & 0.25+0.25\sqrt{5} & 0.5\sqrt{0.5-0.1\sqrt{5}} \\ 0.1\sqrt{5}+0.5 & 0.5\sqrt{2.5-0.5\sqrt{5}} & -0.25-0.05\sqrt{5} \end{pmatrix}$$

Gg

$$\begin{pmatrix} 0 & \sqrt{0.1\sqrt{5}+0.5} & -0.25+0.25\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} \\ 0 & -0.5+0.1\sqrt{5} & 0.5\sqrt{0.5\sqrt{5}+2.5} & -0.25+0.05\sqrt{5} \\ -0.25\sqrt{5}-0.25 & 0.5\sqrt{0.5-0.1\sqrt{5}} & 0 & -\sqrt{0.5-0.1\sqrt{5}} \\ 0.5\sqrt{2.5-0.5\sqrt{5}} & 0.05\sqrt{5}+0.25 & 0 & -0.5-0.1\sqrt{5} \end{pmatrix}$$

Hg

$$\begin{pmatrix} -0.2 & -0.4\sqrt{3} & 0 & 0.4\sqrt{3} & 0 \\ 0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.15\sqrt{5}-0.15 & -0.5\sqrt{0.5-0.1\sqrt{5}} & -0.1\sqrt{5}-0.1 & \sqrt{0.5-0.1\sqrt{5}} \\ -0.2\sqrt{7.5-1.5\sqrt{5}} & 0.3\sqrt{2.5-0.5\sqrt{5}} & -0.25-0.05\sqrt{5} & \sqrt{0.1-0.02\sqrt{5}} & 0.1\sqrt{5}+0.5 \\ -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.1+0.1\sqrt{5} & -\sqrt{0.1\sqrt{5}+0.5} & -0.15+0.15\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} \\ -0.2\sqrt{1.5\sqrt{5}+7.5} & -0.2\sqrt{0.5\sqrt{5}+2.5} & -0.5+0.1\sqrt{5} & -0.3\sqrt{0.5\sqrt{5}+2.5} & -0.25+0.05\sqrt{5} \end{pmatrix}$$

Au	-1

$T1u$

$$\begin{pmatrix} -0.25+0.25\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} & \sqrt{0.1\sqrt{5}+0.5} \\ 0.5\sqrt{0.5\sqrt{5}+2.5} & 0.25-0.05\sqrt{5} & -0.5+0.1\sqrt{5} \\ 0 & -\frac{2\sqrt{5}}{5} & -\frac{\sqrt{5}}{5} \end{pmatrix}$$

$T2u$

$$\begin{pmatrix} \frac{\sqrt{5}}{5} & 0 & \frac{2\sqrt{5}}{5} \\ \sqrt{0.5-0.1\sqrt{5}} & -0.25\sqrt{5}-0.25 & -0.5\sqrt{0.5-0.1\sqrt{5}} \\ -0.5-0.1\sqrt{5} & -0.5\sqrt{2.5-0.5\sqrt{5}} & 0.05\sqrt{5}+0.25 \end{pmatrix}$$

Gu

$$\begin{pmatrix} 0 & -\sqrt{0.1\sqrt{5}+0.5} & 0.25-0.25\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} \\ 0 & 0.5-0.1\sqrt{5} & -0.5\sqrt{0.5\sqrt{5}+2.5} & 0.25-0.05\sqrt{5} \\ 0.25+0.25\sqrt{5} & -0.5\sqrt{0.5-0.1\sqrt{5}} & 0 & \sqrt{0.5-0.1\sqrt{5}} \\ -0.5\sqrt{2.5-0.5\sqrt{5}} & -0.25-0.05\sqrt{5} & 0 & 0.1\sqrt{5}+0.5 \end{pmatrix}$$

Hu

$$\begin{pmatrix} 0.2 & 0.4\sqrt{3} & 0 & -0.4\sqrt{3} & 0 \\ -0.04\sqrt{5}\left(\sqrt{5}+5\right) & 0.15+0.15\sqrt{5} & 0.5\sqrt{0.5-0.1\sqrt{5}} & 0.1+0.1\sqrt{5} & -\sqrt{0.5-0.1\sqrt{5}} \\ \sqrt{0.3-0.06\sqrt{5}} & -0.3\sqrt{2.5-0.5\sqrt{5}} & 0.05\sqrt{5}+0.25 & -0.2\sqrt{2.5-0.5\sqrt{5}} & -0.5-0.1\sqrt{5} \\ 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & 0.1-0.1\sqrt{5} & \sqrt{0.1\sqrt{5}+0.5} & 0.15-0.15\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} \\ \sqrt{0.06\sqrt{5}+0.3} & \sqrt{0.02\sqrt{5}+0.1} & 0.5-0.1\sqrt{5} & 0.3\sqrt{0.5\sqrt{5}+2.5} & 0.25-0.05\sqrt{5} \end{pmatrix}$$

Ih	$\hat{S}_6^5(7)$
Ag	1

$T1g$

$$\begin{pmatrix} 0.25 - 0.25\sqrt{5} & -0.5\sqrt{0.5\sqrt{5}+2.5} & 0 \\ 0.5\sqrt{0.1\sqrt{5}+0.5} & -0.25+0.05\sqrt{5} & \frac{2\sqrt{5}}{5} \\ -\sqrt{0.1\sqrt{5}+0.5} & 0.5-0.1\sqrt{5} & \frac{\sqrt{5}}{5} \end{pmatrix}$$

$T2g$

$$\begin{pmatrix} -\frac{\sqrt{5}}{5} & -\sqrt{0.5-0.1\sqrt{5}} & 0.1\sqrt{5}+0.5 \\ 0 & 0.25+0.25\sqrt{5} & 0.5\sqrt{2.5-0.5\sqrt{5}} \\ -\frac{2\sqrt{5}}{5} & 0.5\sqrt{0.5-0.1\sqrt{5}} & -0.25-0.05\sqrt{5} \end{pmatrix}$$

Gg

$$\begin{pmatrix} 0 & 0 & -0.25\sqrt{5}-0.25 & 0.5\sqrt{2.5-0.5\sqrt{5}} \\ \sqrt{0.1\sqrt{5}+0.5} & -0.5+0.1\sqrt{5} & 0.5\sqrt{0.5-0.1\sqrt{5}} & 0.05\sqrt{5}+0.25 \\ -0.25+0.25\sqrt{5} & 0.5\sqrt{0.5\sqrt{5}+2.5} & 0 & 0 \\ 0.5\sqrt{0.1\sqrt{5}+0.5} & -0.25+0.05\sqrt{5} & -\sqrt{0.5-0.1\sqrt{5}} & -0.5-0.1\sqrt{5} \end{pmatrix}$$

Hg

$$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.2\sqrt{7.5-1.5\sqrt{5}} & -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.2\sqrt{1.5\sqrt{5}+7.5} \\ -0.4\sqrt{3} & -0.15\sqrt{5}-0.15 & 0.3\sqrt{2.5-0.5\sqrt{5}} & -0.1+0.1\sqrt{5} & -0.2\sqrt{0.5\sqrt{5}+2.5} \\ 0 & -0.5\sqrt{0.5-0.1\sqrt{5}} & -0.25-0.05\sqrt{5} & -\sqrt{0.1\sqrt{5}+0.5} & -0.5+0.1\sqrt{5} \\ 0.4\sqrt{3} & -0.1\sqrt{5}-0.1 & \sqrt{0.1-0.02\sqrt{5}} & -0.15+0.15\sqrt{5} & -0.3\sqrt{0.5\sqrt{5}+2.5} \\ 0 & \sqrt{0.5-0.1\sqrt{5}} & 0.1\sqrt{5}+0.5 & -0.5\sqrt{0.1\sqrt{5}+0.5} & -0.25+0.05\sqrt{5} \end{pmatrix}$$

| Au | -1 |

$T1u$

$$\begin{pmatrix} -0.25+0.25\sqrt{5} & 0.5\sqrt{0.5\sqrt{5}+2.5} & 0 \\ -0.5\sqrt{0.1\sqrt{5}+0.5} & 0.25-0.05\sqrt{5} & -\frac{2\sqrt{5}}{5} \\ \sqrt{0.1\sqrt{5}+0.5} & -0.5+0.1\sqrt{5} & -\frac{\sqrt{5}}{5} \end{pmatrix}$$

$T2u$

$$\begin{pmatrix} \frac{\sqrt{5}}{5} & \sqrt{0.5-0.1\sqrt{5}} & -0.5-0.1\sqrt{5} \\ 0 & -0.25\sqrt{5}-0.25 & -0.5\sqrt{2.5-0.5\sqrt{5}} \\ \frac{2\sqrt{5}}{5} & -0.5\sqrt{0.5-0.1\sqrt{5}} & 0.05\sqrt{5}+0.25 \end{pmatrix}$$

Gu

$$\begin{pmatrix} 0 & 0 & 0.25+0.25\sqrt{5} & -0.5\sqrt{2.5-0.5\sqrt{5}} \\ -\sqrt{0.1\sqrt{5}+0.5} & 0.5-0.1\sqrt{5} & -0.5\sqrt{0.5-0.1\sqrt{5}} & -0.25-0.05\sqrt{5} \\ 0.25-0.25\sqrt{5} & -0.5\sqrt{0.5\sqrt{5}+2.5} & 0 & 0 \\ -0.5\sqrt{0.1\sqrt{5}+0.5} & 0.25-0.05\sqrt{5} & \sqrt{0.5-0.1\sqrt{5}} & 0.1\sqrt{5}+0.5 \end{pmatrix}$$

Hu

$$\begin{pmatrix} 0.2 & -0.04\sqrt{5}\left(\sqrt{5}+5\right) & \sqrt{0.3-0.06\sqrt{5}} & 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & \sqrt{0.06\sqrt{5}+0.3} \\ 0.4\sqrt{3} & 0.15+0.15\sqrt{5} & -0.3\sqrt{2.5-0.5\sqrt{5}} & 0.1-0.1\sqrt{5} & \sqrt{0.02\sqrt{5}+0.1} \\ 0 & 0.5\sqrt{0.5-0.1\sqrt{5}} & 0.05\sqrt{5}+0.25 & \sqrt{0.1\sqrt{5}+0.5} & 0.5-0.1\sqrt{5} \\ -0.4\sqrt{3} & 0.1+0.1\sqrt{5} & -0.2\sqrt{2.5-0.5\sqrt{5}} & 0.15-0.15\sqrt{5} & 0.3\sqrt{0.5\sqrt{5}+2.5} \\ 0 & -\sqrt{0.5-0.1\sqrt{5}} & -0.5-0.1\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} & 0.25-0.05\sqrt{5} \end{pmatrix}$$

Ag	1
$T1g$	$\begin{pmatrix} 0.25+0.25\sqrt{5} & 0.5\sqrt{0.5-0.1\sqrt{5}} & -\sqrt{0.5-0.1\sqrt{5}} \\ 0.5\sqrt{2.5-0.5\sqrt{5}} & -0.25-0.05\sqrt{5} & 0.1\sqrt{5}+0.5 \\ 0 & -\frac{2\sqrt{5}}{5} & -\frac{\sqrt{5}}{5} \end{pmatrix}$
$T2g$	$\begin{pmatrix} \frac{\sqrt{5}}{5} & 0 & \frac{2\sqrt{5}}{5} \\ \sqrt{0.1\sqrt{5}+0.5} & 0.25-0.25\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} \\ 0.5-0.1\sqrt{5} & 0.5\sqrt{0.5\sqrt{5}+2.5} & -0.25+0.05\sqrt{5} \end{pmatrix}$
Gg	$\begin{pmatrix} 0 & \sqrt{0.5-0.1\sqrt{5}} & -0.25\sqrt{5}-0.25 & 0.5\sqrt{0.5-0.1\sqrt{5}} \\ 0 & -0.5-0.1\sqrt{5} & -0.5\sqrt{2.5-0.5\sqrt{5}} & -0.25-0.05\sqrt{5} \\ -0.25+0.25\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} & 0 & \sqrt{0.1\sqrt{5}+0.5} \\ 0.5\sqrt{0.5\sqrt{5}+2.5} & 0.25-0.05\sqrt{5} & 0 & -0.5+0.1\sqrt{5} \end{pmatrix}$
Hg	$\begin{pmatrix} -0.2 & -0.4\sqrt{3} & 0 & 0.4\sqrt{3} & 0 \\ 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.15+0.15\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} & -0.1+0.1\sqrt{5} & -\sqrt{0.1\sqrt{5}+0.5} \\ -0.2\sqrt{1.5\sqrt{5}+7.5} & 0.3\sqrt{0.5\sqrt{5}+2.5} & -0.25+0.05\sqrt{5} & \sqrt{0.02\sqrt{5}+0.1} & 0.5-0.1\sqrt{5} \\ -0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.1\sqrt{5}-0.1 & -\sqrt{0.5-0.1\sqrt{5}} & -0.15\sqrt{5}-0.15 & -0.5\sqrt{0.5-0.1\sqrt{5}} \\ \sqrt{0.3-0.06\sqrt{5}} & \sqrt{0.1-0.02\sqrt{5}} & -0.5-0.1\sqrt{5} & 0.3\sqrt{2.5-0.5\sqrt{5}} & -0.25-0.05\sqrt{5} \end{pmatrix}$
Au	-1
$T1u$	$\begin{pmatrix} -0.25\sqrt{5}-0.25 & -0.5\sqrt{0.5-0.1\sqrt{5}} & \sqrt{0.5-0.1\sqrt{5}} \\ -0.5\sqrt{2.5-0.5\sqrt{5}} & 0.05\sqrt{5}+0.25 & -0.5-0.1\sqrt{5} \\ 0 & \frac{2\sqrt{5}}{5} & \frac{\sqrt{5}}{5} \end{pmatrix}$
$T2u$	$\begin{pmatrix} -\frac{\sqrt{5}}{5} & 0 & -\frac{2\sqrt{5}}{5} \\ -\sqrt{0.1\sqrt{5}+0.5} & -0.25+0.25\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} \\ -0.5+0.1\sqrt{5} & -0.5\sqrt{0.5\sqrt{5}+2.5} & 0.25-0.05\sqrt{5} \end{pmatrix}$
Gu	$\begin{pmatrix} 0 & -\sqrt{0.5-0.1\sqrt{5}} & 0.25+0.25\sqrt{5} & -0.5\sqrt{0.5-0.1\sqrt{5}} \\ 0 & 0.1\sqrt{5}+0.5 & 0.5\sqrt{2.5-0.5\sqrt{5}} & 0.05\sqrt{5}+0.25 \\ 0.25-0.25\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} & 0 & -\sqrt{0.1\sqrt{5}+0.5} \\ -0.5\sqrt{0.5\sqrt{5}+2.5} & -0.25+0.05\sqrt{5} & 0 & 0.5-0.1\sqrt{5} \end{pmatrix}$
Hu	$\begin{pmatrix} 0.2 & 0.4\sqrt{3} & 0 & -0.4\sqrt{3} & 0 \\ -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & 0.15-0.15\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} & 0.1-0.1\sqrt{5} & \sqrt{0.1\sqrt{5}+0.5} \\ \sqrt{0.06\sqrt{5}+0.3} & -0.3\sqrt{0.5\sqrt{5}+2.5} & 0.25-0.05\sqrt{5} & -0.2\sqrt{0.5\sqrt{5}+2.5} & -0.5+0.1\sqrt{5} \\ 0.04\sqrt{5}\left(\sqrt{5}+5\right) & 0.1+0.1\sqrt{5} & \sqrt{0.5-0.1\sqrt{5}} & 0.15+0.15\sqrt{5} & 0.5\sqrt{0.5-0.1\sqrt{5}} \\ -0.2\sqrt{7.5-1.5\sqrt{5}} & -0.2\sqrt{2.5-0.5\sqrt{5}} & 0.1\sqrt{5}+0.5 & -0.3\sqrt{2.5-0.5\sqrt{5}} & 0.05\sqrt{5}+0.25 \end{pmatrix}$

Ih	$\hat{S}_6^5(8)$
Ag	1

$T1g$

$$\begin{pmatrix} 0.25 + 0.25\sqrt{5} & 0.5\sqrt{2.5 - 0.5\sqrt{5}} & 0 \\ 0.5\sqrt{0.5 - 0.1\sqrt{5}} & -0.25 - 0.05\sqrt{5} & -\frac{2\sqrt{5}}{5} \\ -\sqrt{0.5 - 0.1\sqrt{5}} & 0.1\sqrt{5} + 0.5 & -\frac{\sqrt{5}}{5} \end{pmatrix}$$

$T2g$

$$\begin{pmatrix} \frac{\sqrt{5}}{5} & \sqrt{0.1\sqrt{5} + 0.5} & 0.5 - 0.1\sqrt{5} \\ 0 & 0.25 - 0.25\sqrt{5} & 0.5\sqrt{0.5\sqrt{5} + 2.5} \\ \frac{2\sqrt{5}}{5} & -0.5\sqrt{0.1\sqrt{5} + 0.5} & -0.25 + 0.05\sqrt{5} \end{pmatrix}$$

Gg

$$\begin{pmatrix} 0 & 0 & -0.25 + 0.25\sqrt{5} & 0.5\sqrt{0.5\sqrt{5} + 2.5} \\ \sqrt{0.5 - 0.1\sqrt{5}} & -0.5 - 0.1\sqrt{5} & -0.5\sqrt{0.1\sqrt{5} + 0.5} & 0.25 - 0.05\sqrt{5} \\ -0.25\sqrt{5} - 0.25 & -0.5\sqrt{2.5 - 0.5\sqrt{5}} & 0 & 0 \\ 0.5\sqrt{0.5 - 0.1\sqrt{5}} & -0.25 - 0.05\sqrt{5} & \sqrt{0.1\sqrt{5} + 0.5} & -0.5 + 0.1\sqrt{5} \end{pmatrix}$$

Hg

$$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(-5 + \sqrt{5}\right) & -0.2\sqrt{1.5\sqrt{5} + 7.5} & -0.04\sqrt{5}\left(\sqrt{5} + 5\right) & \sqrt{0.3 - 0.06\sqrt{5}} \\ -0.4\sqrt{3} & -0.15 + 0.15\sqrt{5} & 0.3\sqrt{0.5\sqrt{5} + 2.5} & -0.1\sqrt{5} - 0.1 & \sqrt{0.1 - 0.02\sqrt{5}} \\ 0 & 0.5\sqrt{0.1\sqrt{5} + 0.5} & -0.25 + 0.05\sqrt{5} & -\sqrt{0.5 - 0.1\sqrt{5}} & -0.5 - 0.1\sqrt{5} \\ 0.4\sqrt{3} & -0.1 + 0.1\sqrt{5} & \sqrt{0.02\sqrt{5} + 0.1} & -0.15\sqrt{5} - 0.15 & 0.3\sqrt{2.5 - 0.5\sqrt{5}} \\ 0 & -\sqrt{0.1\sqrt{5} + 0.5} & 0.5 - 0.1\sqrt{5} & -0.5\sqrt{0.5 - 0.1\sqrt{5}} & -0.25 - 0.05\sqrt{5} \end{pmatrix}$$

Au	-1

$T1u$

$$\begin{pmatrix} -0.25\sqrt{5} - 0.25 & -0.5\sqrt{2.5 - 0.5\sqrt{5}} & 0 \\ -0.5\sqrt{0.5 - 0.1\sqrt{5}} & 0.05\sqrt{5} + 0.25 & \frac{2\sqrt{5}}{5} \\ \sqrt{0.5 - 0.1\sqrt{5}} & -0.5 - 0.1\sqrt{5} & \frac{\sqrt{5}}{5} \end{pmatrix}$$

$T2u$

$$\begin{pmatrix} -\frac{\sqrt{5}}{5} & -\sqrt{0.1\sqrt{5} + 0.5} & -0.5 + 0.1\sqrt{5} \\ 0 & -0.25 + 0.25\sqrt{5} & -0.5\sqrt{0.5\sqrt{5} + 2.5} \\ -\frac{2\sqrt{5}}{5} & 0.5\sqrt{0.1\sqrt{5} + 0.5} & 0.25 - 0.05\sqrt{5} \end{pmatrix}$$

Gu

$$\begin{pmatrix} 0 & 0 & 0.25 - 0.25\sqrt{5} & -0.5\sqrt{0.5\sqrt{5} + 2.5} \\ -\sqrt{0.5 - 0.1\sqrt{5}} & 0.1\sqrt{5} + 0.5 & 0.5\sqrt{0.1\sqrt{5} + 0.5} & -0.25 + 0.05\sqrt{5} \\ 0.25 + 0.25\sqrt{5} & 0.5\sqrt{2.5 - 0.5\sqrt{5}} & 0 & 0 \\ -0.5\sqrt{0.5 - 0.1\sqrt{5}} & 0.05\sqrt{5} + 0.25 & -\sqrt{0.1\sqrt{5} + 0.5} & 0.5 - 0.1\sqrt{5} \end{pmatrix}$$

Hu

$$\begin{pmatrix} 0.2 & -0.04\sqrt{5}\left(-5 + \sqrt{5}\right) & \sqrt{0.06\sqrt{5} + 0.3} & 0.04\sqrt{5}\left(\sqrt{5} + 5\right) & -0.2\sqrt{7.5 - 1.5\sqrt{5}} \\ 0.4\sqrt{3} & 0.15 - 0.15\sqrt{5} & -0.3\sqrt{0.5\sqrt{5} + 2.5} & 0.1 + 0.1\sqrt{5} & -0.2\sqrt{2.5 - 0.5\sqrt{5}} \\ 0 & -0.5\sqrt{0.1\sqrt{5} + 0.5} & 0.25 - 0.05\sqrt{5} & \sqrt{0.5 - 0.1\sqrt{5}} & 0.1\sqrt{5} + 0.5 \\ -0.4\sqrt{3} & 0.1 - 0.1\sqrt{5} & -0.2\sqrt{0.5\sqrt{5} + 2.5} & 0.15 + 0.15\sqrt{5} & -0.3\sqrt{2.5 - 0.5\sqrt{5}} \\ 0 & \sqrt{0.1\sqrt{5} + 0.5} & -0.5 + 0.1\sqrt{5} & 0.5\sqrt{0.5 - 0.1\sqrt{5}} & 0.05\sqrt{5} + 0.25 \end{pmatrix}$$

Ih	$\hat{S}_6(9)$
Ag	1

$T1g$

$$\begin{pmatrix} 0.25+0.25\sqrt{5} & -0.5\sqrt{0.5-0.1\sqrt{5}} & \sqrt{0.5-0.1\sqrt{5}} \\ -0.5\sqrt{2.5-0.5\sqrt{5}} & -0.25-0.05\sqrt{5} & 0.1\sqrt{5}+0.5 \\ 0 & -\frac{2\sqrt{5}}{5} & -\frac{\sqrt{5}}{5} \end{pmatrix}$$

$T2g$

$$\begin{pmatrix} \frac{\sqrt{5}}{5} & 0 & \frac{2\sqrt{5}}{5} \\ -\sqrt{0.1\sqrt{5}+0.5} & 0.25-0.25\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} \\ 0.5-0.1\sqrt{5} & -0.5\sqrt{0.5\sqrt{5}+2.5} & -0.25+0.05\sqrt{5} \end{pmatrix}$$

Gg

$$\begin{pmatrix} 0 & -\sqrt{0.5-0.1\sqrt{5}} & -0.25\sqrt{5}-0.25 & -0.5\sqrt{0.5-0.1\sqrt{5}} \\ 0 & -0.5-0.1\sqrt{5} & 0.5\sqrt{2.5-0.5\sqrt{5}} & -0.25-0.05\sqrt{5} \\ -0.25+0.25\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} & 0 & -\sqrt{0.1\sqrt{5}+0.5} \\ -0.5\sqrt{0.5\sqrt{5}+2.5} & 0.25-0.05\sqrt{5} & 0 & -0.5+0.1\sqrt{5} \end{pmatrix}$$

Hg

$$\begin{pmatrix} -0.2 & -0.4\sqrt{3} & 0 & 0.4\sqrt{3} & 0 \\ 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.15+0.15\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} & -0.1+0.1\sqrt{5} & \sqrt{0.1\sqrt{5}+0.5} \\ \sqrt{0.06\sqrt{5}+0.3} & -0.3\sqrt{0.5\sqrt{5}+2.5} & -0.25+0.05\sqrt{5} & -0.2\sqrt{0.5\sqrt{5}+2.5} & 0.5-0.1\sqrt{5} \\ -0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.1\sqrt{5}-0.1 & \sqrt{0.5-0.1\sqrt{5}} & -0.15\sqrt{5}-0.15 & 0.5\sqrt{0.5-0.1\sqrt{5}} \\ -0.2\sqrt{7.5-1.5\sqrt{5}} & -0.2\sqrt{2.5-0.5\sqrt{5}} & -0.5-0.1\sqrt{5} & -0.3\sqrt{2.5-0.5\sqrt{5}} & -0.25-0.05\sqrt{5} \end{pmatrix}$$

Au	-1

$T1u$

$$\begin{pmatrix} -0.25\sqrt{5}-0.25 & 0.5\sqrt{0.5-0.1\sqrt{5}} & -\sqrt{0.5-0.1\sqrt{5}} \\ 0.5\sqrt{2.5-0.5\sqrt{5}} & 0.05\sqrt{5}+0.25 & -0.5-0.1\sqrt{5} \\ 0 & \frac{2\sqrt{5}}{5} & \frac{\sqrt{5}}{5} \end{pmatrix}$$

$T2u$

$$\begin{pmatrix} -\frac{\sqrt{5}}{5} & 0 & -\frac{2\sqrt{5}}{5} \\ \sqrt{0.1\sqrt{5}+0.5} & -0.25+0.25\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} \\ -0.5+0.1\sqrt{5} & 0.5\sqrt{0.5\sqrt{5}+2.5} & 0.25-0.05\sqrt{5} \end{pmatrix}$$

Gu

$$\begin{pmatrix} 0 & \sqrt{0.5-0.1\sqrt{5}} & 0.25+0.25\sqrt{5} & 0.5\sqrt{0.5-0.1\sqrt{5}} \\ 0 & 0.1\sqrt{5}+0.5 & -0.5\sqrt{2.5-0.5\sqrt{5}} & 0.05\sqrt{5}+0.25 \\ 0.25-0.25\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} & 0 & \sqrt{0.1\sqrt{5}+0.5} \\ 0.5\sqrt{0.5\sqrt{5}+2.5} & -0.25+0.05\sqrt{5} & 0 & 0.5-0.1\sqrt{5} \end{pmatrix}$$

Hu

$$\begin{pmatrix} 0.2 & 0.4\sqrt{3} & 0 & -0.4\sqrt{3} & 0 \\ -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & 0.15-0.15\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} & 0.1-0.1\sqrt{5} & -\sqrt{0.1\sqrt{5}+0.5} \\ -0.2\sqrt{1.5\sqrt{5}+7.5} & 0.3\sqrt{0.5\sqrt{5}+2.5} & 0.25-0.05\sqrt{5} & \sqrt{0.02\sqrt{5}+0.1} & -0.5+0.1\sqrt{5} \\ 0.04\sqrt{5}\left(\sqrt{5}+5\right) & 0.1+0.1\sqrt{5} & -\sqrt{0.5-0.1\sqrt{5}} & 0.15+0.15\sqrt{5} & -0.5\sqrt{0.5-0.1\sqrt{5}} \\ \sqrt{0.3-0.06\sqrt{5}} & \sqrt{0.1-0.02\sqrt{5}} & 0.1\sqrt{5}+0.5 & 0.3\sqrt{2.5-0.5\sqrt{5}} & 0.05\sqrt{5}+0.25 \end{pmatrix}$$

Ih	$\hat{S}_6^5(9)$
Ag	1
$T1g$	$\begin{pmatrix} 0.25+0.25\sqrt{5} & -0.5\sqrt{2.5-0.5\sqrt{5}} & 0 \\ -0.5\sqrt{0.5-0.1\sqrt{5}} & -0.25-0.05\sqrt{5} & -\frac{2\sqrt{5}}{5} \\ \sqrt{0.5-0.1\sqrt{5}} & 0.1\sqrt{5}+0.5 & -\frac{\sqrt{5}}{5} \end{pmatrix}$
$T2g$	$\begin{pmatrix} \frac{\sqrt{5}}{5} & -\sqrt{0.1\sqrt{5}+0.5} & 0.5-0.1\sqrt{5} \\ 0 & 0.25-0.25\sqrt{5} & -0.5\sqrt{0.5\sqrt{5}+2.5} \\ \frac{2\sqrt{5}}{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} & -0.25+0.05\sqrt{5} \end{pmatrix}$
Gg	$\begin{pmatrix} 0 & 0 & -0.25+0.25\sqrt{5} & -0.5\sqrt{0.5\sqrt{5}+2.5} \\ -\sqrt{0.5-0.1\sqrt{5}} & -0.5-0.1\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} & 0.25-0.05\sqrt{5} \\ -0.25\sqrt{5}-0.25 & 0.5\sqrt{2.5-0.5\sqrt{5}} & 0 & 0 \\ -0.5\sqrt{0.5-0.1\sqrt{5}} & -0.25-0.05\sqrt{5} & -\sqrt{0.1\sqrt{5}+0.5} & -0.5+0.1\sqrt{5} \end{pmatrix}$
Hg	$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & \sqrt{0.06\sqrt{5}+0.3} & -0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.2\sqrt{7.5-1.5\sqrt{5}} \\ -0.4\sqrt{3} & -0.15+0.15\sqrt{5} & -0.3\sqrt{0.5\sqrt{5}+2.5} & -0.1\sqrt{5}-0.1 & -0.2\sqrt{2.5-0.5\sqrt{5}} \\ 0 & -0.5\sqrt{0.1\sqrt{5}+0.5} & -0.25+0.05\sqrt{5} & \sqrt{0.5-0.1\sqrt{5}} & -0.5-0.1\sqrt{5} \\ 0.4\sqrt{3} & -0.1+0.1\sqrt{5} & -0.2\sqrt{0.5\sqrt{5}+2.5} & -0.15\sqrt{5}-0.15 & -0.3\sqrt{2.5-0.5\sqrt{5}} \\ 0 & \sqrt{0.1\sqrt{5}+0.5} & 0.5-0.1\sqrt{5} & 0.5\sqrt{0.5-0.1\sqrt{5}} & -0.25-0.05\sqrt{5} \end{pmatrix}$
Au	-1
$T1u$	$\begin{pmatrix} -0.25\sqrt{5}-0.25 & 0.5\sqrt{2.5-0.5\sqrt{5}} & 0 \\ 0.5\sqrt{0.5-0.1\sqrt{5}} & 0.05\sqrt{5}+0.25 & \frac{2\sqrt{5}}{5} \\ -\sqrt{0.5-0.1\sqrt{5}} & -0.5-0.1\sqrt{5} & \frac{\sqrt{5}}{5} \end{pmatrix}$
$T2u$	$\begin{pmatrix} -\frac{\sqrt{5}}{5} & \sqrt{0.1\sqrt{5}+0.5} & -0.5+0.1\sqrt{5} \\ 0 & -0.25+0.25\sqrt{5} & 0.5\sqrt{0.5\sqrt{5}+2.5} \\ -\frac{2\sqrt{5}}{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} & 0.25-0.05\sqrt{5} \end{pmatrix}$
Gu	$\begin{pmatrix} 0 & 0 & 0.25-0.25\sqrt{5} & 0.5\sqrt{0.5\sqrt{5}+2.5} \\ \sqrt{0.5-0.1\sqrt{5}} & 0.1\sqrt{5}+0.5 & -0.5\sqrt{0.1\sqrt{5}+0.5} & -0.25+0.05\sqrt{5} \\ 0.25+0.25\sqrt{5} & -0.5\sqrt{2.5-0.5\sqrt{5}} & 0 & 0 \\ 0.5\sqrt{0.5-0.1\sqrt{5}} & 0.05\sqrt{5}+0.25 & \sqrt{0.1\sqrt{5}+0.5} & 0.5-0.1\sqrt{5} \end{pmatrix}$
Hu	$\begin{pmatrix} 0.2 & -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.2\sqrt{1.5\sqrt{5}+7.5} & 0.04\sqrt{5}\left(\sqrt{5}+5\right) & \sqrt{0.3-0.06\sqrt{5}} \\ 0.4\sqrt{3} & 0.15-0.15\sqrt{5} & 0.3\sqrt{0.5\sqrt{5}+2.5} & 0.1+0.1\sqrt{5} & \sqrt{0.1-0.02\sqrt{5}} \\ 0 & 0.5\sqrt{0.1\sqrt{5}+0.5} & 0.25-0.05\sqrt{5} & -\sqrt{0.5-0.1\sqrt{5}} & 0.1\sqrt{5}+0.5 \\ -0.4\sqrt{3} & 0.1-0.1\sqrt{5} & \sqrt{0.02\sqrt{5}+0.1} & 0.15+0.15\sqrt{5} & 0.3\sqrt{2.5-0.5\sqrt{5}} \\ 0 & -\sqrt{0.1\sqrt{5}+0.5} & -0.5+0.1\sqrt{5} & -0.5\sqrt{0.5-0.1\sqrt{5}} & 0.05\sqrt{5}+0.25 \end{pmatrix}$

Ih	$\hat{\sigma}(0)$
Ag	1

$T1g$
$$\begin{pmatrix} -0.25\sqrt{5}-0.25 & 0.5\sqrt{2.5-0.5\sqrt{5}} & 0 \\ 0.5\sqrt{2.5-0.5\sqrt{5}} & 0.25+0.25\sqrt{5} & 0 \\ 0 & 0 & -1 \end{pmatrix}$$

$T2g$
$$\begin{pmatrix} -1 & 0 & 0 \\ 0 & -0.25+0.25\sqrt{5} & 0.5\sqrt{0.5\sqrt{5}+2.5} \\ 0 & 0.5\sqrt{0.5\sqrt{5}+2.5} & 0.25-0.25\sqrt{5} \end{pmatrix}$$

Gg
$$\begin{pmatrix} 0.25+0.25\sqrt{5} & -0.5\sqrt{2.5-0.5\sqrt{5}} & 0 & 0 \\ -0.5\sqrt{2.5-0.5\sqrt{5}} & -0.25\sqrt{5}-0.25 & 0 & 0 \\ 0 & 0 & 0.25-0.25\sqrt{5} & 0.5\sqrt{0.5\sqrt{5}+2.5} \\ 0 & 0 & 0.5\sqrt{0.5\sqrt{5}+2.5} & -0.25+0.25\sqrt{5} \end{pmatrix}$$

Hg
$$\begin{pmatrix} 1 & 0 & 0 & 0 & 0 \\ 0 & -0.25+0.25\sqrt{5} & -0.5\sqrt{0.5\sqrt{5}+2.5} & 0 & 0 \\ 0 & -0.5\sqrt{0.5\sqrt{5}+2.5} & 0.25-0.25\sqrt{5} & 0 & 0 \\ 0 & 0 & 0 & -0.25\sqrt{5}-0.25 & -0.5\sqrt{2.5-0.5\sqrt{5}} \\ 0 & 0 & 0 & -0.5\sqrt{2.5-0.5\sqrt{5}} & 0.25+0.25\sqrt{5} \end{pmatrix}$$

Au	-1

$T1u$
$$\begin{pmatrix} 0.25+0.25\sqrt{5} & -0.5\sqrt{2.5-0.5\sqrt{5}} & 0 \\ -0.5\sqrt{2.5-0.5\sqrt{5}} & -0.25\sqrt{5}-0.25 & 0 \\ 0 & 0 & 1 \end{pmatrix}$$

$T2u$
$$\begin{pmatrix} 1 & 0 & 0 \\ 0 & 0.25-0.25\sqrt{5} & -0.5\sqrt{0.5\sqrt{5}+2.5} \\ 0 & -0.5\sqrt{0.5\sqrt{5}+2.5} & -0.25+0.25\sqrt{5} \end{pmatrix}$$

Gu
$$\begin{pmatrix} -0.25\sqrt{5}-0.25 & 0.5\sqrt{2.5-0.5\sqrt{5}} & 0 & 0 \\ 0.5\sqrt{2.5-0.5\sqrt{5}} & 0.25+0.25\sqrt{5} & 0 & 0 \\ 0 & 0 & -0.25+0.25\sqrt{5} & -0.5\sqrt{0.5\sqrt{5}+2.5} \\ 0 & 0 & -0.5\sqrt{0.5\sqrt{5}+2.5} & 0.25-0.25\sqrt{5} \end{pmatrix}$$

Hu
$$\begin{pmatrix} -1 & 0 & 0 & 0 & 0 \\ 0 & 0.25-0.25\sqrt{5} & 0.5\sqrt{0.5\sqrt{5}+2.5} & 0 & 0 \\ 0 & 0.5\sqrt{0.5\sqrt{5}+2.5} & -0.25+0.25\sqrt{5} & 0 & 0 \\ 0 & 0 & 0 & 0.25+0.25\sqrt{5} & 0.5\sqrt{2.5-0.5\sqrt{5}} \\ 0 & 0 & 0 & 0.5\sqrt{2.5-0.5\sqrt{5}} & -0.25\sqrt{5}-0.25 \end{pmatrix}$$

Ih	$\hat{\sigma}(1)$
Ag	1
$T1g$	$\begin{pmatrix} -0.5 & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & \sqrt{0.5-0.1\sqrt{5}} \\ 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.5+\frac{\sqrt{5}}{5} & 0.1\sqrt{5}+0.5 \\ \sqrt{0.5-0.1\sqrt{5}} & 0.1\sqrt{5}+0.5 & -\frac{\sqrt{5}}{5} \end{pmatrix}$
$T2g$	$\begin{pmatrix} \frac{\sqrt{5}}{5} & -\sqrt{0.1\sqrt{5}+0.5} & 0.5-0.1\sqrt{5} \\ -\sqrt{0.1\sqrt{5}+0.5} & -0.5 & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} \\ 0.5-0.1\sqrt{5} & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -0.5-\frac{\sqrt{5}}{5} \end{pmatrix}$
Gg	$\begin{pmatrix} -0.25+0.25\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} & -0.5 & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} \\ 0.5\sqrt{0.1\sqrt{5}+0.5} & 0.25+0.15\sqrt{5} & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -0.3\sqrt{5} \\ -0.5 & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -0.25\sqrt{5}-0.25 & -0.5\sqrt{0.5-0.1\sqrt{5}} \\ 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.3\sqrt{5} & -0.5\sqrt{0.5-0.1\sqrt{5}} & 0.25-0.15\sqrt{5} \end{pmatrix}$
Hg	$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & \sqrt{0.06\sqrt{5}+0.3} & -0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.2\sqrt{7.5-1.5\sqrt{5}} \\ 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & 0.1-\frac{\sqrt{5}}{5} & -0.1\sqrt{2\sqrt{5}+5} & 0.4 & -0.2\sqrt{2\sqrt{5}+10} \\ \sqrt{0.06\sqrt{5}+0.3} & -0.1\sqrt{2\sqrt{5}+5} & 0.5 & \sqrt{0.4-0.08\sqrt{5}} & 0 \\ -0.04\sqrt{5}\left(\sqrt{5}+5\right) & 0.4 & \sqrt{0.4-0.08\sqrt{5}} & 0.1+\frac{\sqrt{5}}{5} & 0.1\sqrt{5-2\sqrt{5}} \\ -0.2\sqrt{7.5-1.5\sqrt{5}} & -0.2\sqrt{2\sqrt{5}+10} & 0 & 0.1\sqrt{5-2\sqrt{5}} & 0.5 \end{pmatrix}$
Au	-1
$T1u$	$\begin{pmatrix} 0.5 & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -\sqrt{0.5-0.1\sqrt{5}} \\ -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & 0.5-\frac{\sqrt{5}}{5} & -0.5-0.1\sqrt{5} \\ -\sqrt{0.5-0.1\sqrt{5}} & -0.5-0.1\sqrt{5} & \frac{\sqrt{5}}{5} \end{pmatrix}$
$T2u$	$\begin{pmatrix} -\frac{\sqrt{5}}{5} & \sqrt{0.1\sqrt{5}+0.5} & -0.5+0.1\sqrt{5} \\ \sqrt{0.1\sqrt{5}+0.5} & 0.5 & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} \\ -0.5+0.1\sqrt{5} & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & \frac{\sqrt{5}}{5}+0.5 \end{pmatrix}$
Gu	$\begin{pmatrix} 0.25-0.25\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} & 0.5 & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} \\ -0.5\sqrt{0.1\sqrt{5}+0.5} & -0.15\sqrt{5}-0.25 & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & 0.3\sqrt{5} \\ 0.5 & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & 0.25+0.25\sqrt{5} & 0.5\sqrt{0.5-0.1\sqrt{5}} \\ -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & 0.3\sqrt{5} & 0.5\sqrt{0.5-0.1\sqrt{5}} & -0.25+0.15\sqrt{5} \end{pmatrix}$
Hu	$\begin{pmatrix} 0.2 & -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.2\sqrt{1.5\sqrt{5}+7.5} & 0.04\sqrt{5}\left(\sqrt{5}+5\right) & \sqrt{0.3-0.06\sqrt{5}} \\ -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.1+\frac{\sqrt{5}}{5} & 0.1\sqrt{2\sqrt{5}+5} & -0.4 & \sqrt{0.08\sqrt{5}+0.4} \\ -0.2\sqrt{1.5\sqrt{5}+7.5} & 0.1\sqrt{2\sqrt{5}+5} & -0.5 & -0.2\sqrt{10-2\sqrt{5}} & 0 \\ 0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.4 & -0.2\sqrt{10-2\sqrt{5}} & -\frac{\sqrt{5}}{5}-0.1 & -0.1\sqrt{5-2\sqrt{5}} \\ \sqrt{0.3-0.06\sqrt{5}} & \sqrt{0.08\sqrt{5}+0.4} & 0 & -0.1\sqrt{5-2\sqrt{5}} & -0.5 \end{pmatrix}$

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Ih	$\hat{\sigma}(2)$
Ag	1

$T1g$

$$\begin{pmatrix} -0.25 + 0.25\sqrt{5} & 0.5\sqrt{0.5\sqrt{5}+2.5} & 0 \\ 0.5\sqrt{0.5\sqrt{5}+2.5} & 0.25 - 0.25\sqrt{5} & 0 \\ 0 & 0 & -1 \end{pmatrix}$$

$T2g$

$$\begin{pmatrix} -1 & 0 & 0 \\ 0 & -0.25\sqrt{5}-0.25 & -0.5\sqrt{2.5-0.5\sqrt{5}} \\ 0 & -0.5\sqrt{2.5-0.5\sqrt{5}} & 0.25 + 0.25\sqrt{5} \end{pmatrix}$$

Gg

$$\begin{pmatrix} 0.25 - 0.25\sqrt{5} & -0.5\sqrt{0.5\sqrt{5}+2.5} & 0 & 0 \\ -0.5\sqrt{0.5\sqrt{5}+2.5} & -0.25 + 0.25\sqrt{5} & 0 & 0 \\ 0 & 0 & 0.25 + 0.25\sqrt{5} & -0.5\sqrt{2.5-0.5\sqrt{5}} \\ 0 & 0 & -0.5\sqrt{2.5-0.5\sqrt{5}} & -0.25\sqrt{5}-0.25 \end{pmatrix}$$

Hg

$$\begin{pmatrix} 1 & 0 & 0 & 0 & 0 \\ 0 & -0.25\sqrt{5}-0.25 & 0.5\sqrt{2.5-0.5\sqrt{5}} & 0 & 0 \\ 0 & 0.5\sqrt{2.5-0.5\sqrt{5}} & 0.25 + 0.25\sqrt{5} & 0 & 0 \\ 0 & 0 & 0 & -0.25 + 0.25\sqrt{5} & -0.5\sqrt{0.5\sqrt{5}+2.5} \\ 0 & 0 & 0 & -0.5\sqrt{0.5\sqrt{5}+2.5} & 0.25 - 0.25\sqrt{5} \end{pmatrix}$$

Au	-1

$T1u$

$$\begin{pmatrix} 0.25 - 0.25\sqrt{5} & -0.5\sqrt{0.5\sqrt{5}+2.5} & 0 \\ -0.5\sqrt{0.5\sqrt{5}+2.5} & -0.25 + 0.25\sqrt{5} & 0 \\ 0 & 0 & 1 \end{pmatrix}$$

$T2u$

$$\begin{pmatrix} 1 & 0 & 0 \\ 0 & 0.25 + 0.25\sqrt{5} & 0.5\sqrt{2.5-0.5\sqrt{5}} \\ 0 & 0.5\sqrt{2.5-0.5\sqrt{5}} & -0.25\sqrt{5}-0.25 \end{pmatrix}$$

Gu

$$\begin{pmatrix} -0.25 + 0.25\sqrt{5} & 0.5\sqrt{0.5\sqrt{5}+2.5} & 0 & 0 \\ 0.5\sqrt{0.5\sqrt{5}+2.5} & 0.25 - 0.25\sqrt{5} & 0 & 0 \\ 0 & 0 & -0.25\sqrt{5}-0.25 & 0.5\sqrt{2.5-0.5\sqrt{5}} \\ 0 & 0 & 0.5\sqrt{2.5-0.5\sqrt{5}} & 0.25 + 0.25\sqrt{5} \end{pmatrix}$$

Hu

$$\begin{pmatrix} -1 & 0 & 0 & 0 & 0 \\ 0 & 0.25 + 0.25\sqrt{5} & -0.5\sqrt{2.5-0.5\sqrt{5}} & 0 & 0 \\ 0 & -0.5\sqrt{2.5-0.5\sqrt{5}} & -0.25\sqrt{5}-0.25 & 0 & 0 \\ 0 & 0 & 0 & 0.25 - 0.25\sqrt{5} & 0.5\sqrt{0.5\sqrt{5}+2.5} \\ 0 & 0 & 0 & 0.5\sqrt{0.5\sqrt{5}+2.5} & -0.25 + 0.25\sqrt{5} \end{pmatrix}$$

Ih	$\hat{\sigma}(3)$
Ag	1
$T1g$	$\begin{pmatrix} -0.25\sqrt{5}-0.25 & 0.5\sqrt{0.5-0.1\sqrt{5}} & -\sqrt{0.5-0.1\sqrt{5}} \\ 0.5\sqrt{0.5-0.1\sqrt{5}} & -0.75+0.05\sqrt{5} & -0.5-0.1\sqrt{5} \\ -\sqrt{0.5-0.1\sqrt{5}} & -0.5-0.1\sqrt{5} & \frac{\sqrt{5}}{5} \end{pmatrix}$
$T2g$	$\begin{pmatrix} -\frac{\sqrt{5}}{5} & \sqrt{0.1\sqrt{5}+0.5} & -0.5+0.1\sqrt{5} \\ \sqrt{0.1\sqrt{5}+0.5} & -0.25+0.25\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} \\ -0.5+0.1\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} & -0.75-0.05\sqrt{5} \end{pmatrix}$
Gg	$\begin{pmatrix} 0.25-0.25\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} & 0 & \sqrt{0.1\sqrt{5}+0.5} \\ -0.5\sqrt{0.1\sqrt{5}+0.5} & -0.15\sqrt{5}-0.25 & \sqrt{0.5-0.1\sqrt{5}} & -\frac{\sqrt{5}}{5} \\ 0 & \sqrt{0.5-0.1\sqrt{5}} & 0.25+0.25\sqrt{5} & 0.5\sqrt{0.5-0.1\sqrt{5}} \\ \sqrt{0.1\sqrt{5}+0.5} & -\frac{\sqrt{5}}{5} & 0.5\sqrt{0.5-0.1\sqrt{5}} & -0.25+0.15\sqrt{5} \end{pmatrix}$
Hg	$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & \sqrt{0.06\sqrt{5}+0.3} & -0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.2\sqrt{7.5-1.5\sqrt{5}} \\ 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & 0.05\sqrt{5}+0.35 & -0.1\sqrt{12.5-5.5\sqrt{5}} & -\frac{4}{5} & 0.2\sqrt{2\sqrt{5}+5} \\ \sqrt{0.06\sqrt{5}+0.3} & -0.1\sqrt{12.5-5.5\sqrt{5}} & 0.25+0.15\sqrt{5} & 0.2\sqrt{5-2\sqrt{5}} & \frac{\sqrt{5}}{5} \\ -0.04\sqrt{5}\left(\sqrt{5}+5\right) & -\frac{4}{5} & 0.2\sqrt{5-2\sqrt{5}} & 0.35-0.05\sqrt{5} & 0.1\sqrt{5.5\sqrt{5}+12.5} \\ -0.2\sqrt{7.5-1.5\sqrt{5}} & 0.2\sqrt{2\sqrt{5}+5} & \frac{\sqrt{5}}{5} & 0.1\sqrt{5.5\sqrt{5}+12.5} & 0.25-0.15\sqrt{5} \end{pmatrix}$
Au	-1
$T1u$	$\begin{pmatrix} 0.25+0.25\sqrt{5} & -0.5\sqrt{0.5-0.1\sqrt{5}} & \sqrt{0.5-0.1\sqrt{5}} \\ -0.5\sqrt{0.5-0.1\sqrt{5}} & 0.75-0.05\sqrt{5} & 0.1\sqrt{5}+0.5 \\ \sqrt{0.5-0.1\sqrt{5}} & 0.1\sqrt{5}+0.5 & -\frac{\sqrt{5}}{5} \end{pmatrix}$
$T2u$	$\begin{pmatrix} \frac{\sqrt{5}}{5} & -\sqrt{0.1\sqrt{5}+0.5} & 0.5-0.1\sqrt{5} \\ -\sqrt{0.1\sqrt{5}+0.5} & 0.25-0.25\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} \\ 0.5-0.1\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} & 0.05\sqrt{5}+0.75 \end{pmatrix}$
Gu	$\begin{pmatrix} -0.25+0.25\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} & 0 & -\sqrt{0.1\sqrt{5}+0.5} \\ 0.5\sqrt{0.1\sqrt{5}+0.5} & 0.25+0.15\sqrt{5} & -\sqrt{0.5-0.1\sqrt{5}} & \frac{\sqrt{5}}{5} \\ 0 & -\sqrt{0.5-0.1\sqrt{5}} & -0.25\sqrt{5}-0.25 & -0.5\sqrt{0.5-0.1\sqrt{5}} \\ -\sqrt{0.1\sqrt{5}+0.5} & \frac{\sqrt{5}}{5} & -0.5\sqrt{0.5-0.1\sqrt{5}} & 0.25-0.15\sqrt{5} \end{pmatrix}$
Hu	$\begin{pmatrix} 0.2 & -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.2\sqrt{1.5\sqrt{5}+7.5} & 0.04\sqrt{5}\left(\sqrt{5}+5\right) & \sqrt{0.3-0.06\sqrt{5}} \\ -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.35-0.05\sqrt{5} & 0.1\sqrt{12.5-5.5\sqrt{5}} & \frac{4}{5} & -0.2\sqrt{2\sqrt{5}+5} \\ -0.2\sqrt{1.5\sqrt{5}+7.5} & 0.1\sqrt{12.5-5.5\sqrt{5}} & -0.15\sqrt{5}-0.25 & -0.2\sqrt{5-2\sqrt{5}} & -\frac{\sqrt{5}}{5} \\ 0.04\sqrt{5}\left(\sqrt{5}+5\right) & \frac{4}{5} & -0.2\sqrt{5-2\sqrt{5}} & -0.35+0.05\sqrt{5} & -0.1\sqrt{5.5\sqrt{5}+12.5} \\ \sqrt{0.3-0.06\sqrt{5}} & -0.2\sqrt{2\sqrt{5}+5} & -\frac{\sqrt{5}}{5} & -0.1\sqrt{5.5\sqrt{5}+12.5} & -0.25+0.15\sqrt{5} \end{pmatrix}$

Ih	$\hat{\sigma}(4)$
Ag	1

$T1g$
$$\begin{pmatrix} -0.5 & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -\sqrt{0.1\sqrt{5}+0.5} \\ -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -0.5-\frac{\sqrt{5}}{5} & 0.5-0.1\sqrt{5} \\ -\sqrt{0.1\sqrt{5}+0.5} & 0.5-0.1\sqrt{5} & \frac{\sqrt{5}}{5} \end{pmatrix}$$

$T2g$
$$\begin{pmatrix} -\frac{\sqrt{5}}{5} & -\sqrt{0.5-0.1\sqrt{5}} & 0.1\sqrt{5}+0.5 \\ -\sqrt{0.5-0.1\sqrt{5}} & -0.5 & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} \\ 0.1\sqrt{5}+0.5 & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.5+\frac{\sqrt{5}}{5} \end{pmatrix}$$

Gg
$$\begin{pmatrix} -0.25\sqrt{5}-0.25 & 0.5\sqrt{0.5-0.1\sqrt{5}} & -0.5 & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} \\ 0.5\sqrt{0.5-0.1\sqrt{5}} & 0.25-0.15\sqrt{5} & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & 0.3\sqrt{5} \\ -0.5 & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.25+0.25\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} \\ -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & 0.3\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} & 0.25+0.15\sqrt{5} \end{pmatrix}$$

Hg
$$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.2\sqrt{7.5-1.5\sqrt{5}} & -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.2\sqrt{1.5\sqrt{5}+7.5} \\ 0.04\sqrt{5}\left(\sqrt{5}+5\right) & 0.1+\frac{\sqrt{5}}{5} & -0.1\sqrt{5-2\sqrt{5}} & 0.4 & \sqrt{0.4-0.08\sqrt{5}} \\ -0.2\sqrt{7.5-1.5\sqrt{5}} & -0.1\sqrt{5-2\sqrt{5}} & 0.5 & \sqrt{0.08\sqrt{5}+0.4} & 0 \\ -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & 0.4 & \sqrt{0.08\sqrt{5}+0.4} & 0.1-\frac{\sqrt{5}}{5} & -0.1\sqrt{2\sqrt{5}+5} \\ -0.2\sqrt{1.5\sqrt{5}+7.5} & \sqrt{0.4-0.08\sqrt{5}} & 0 & -0.1\sqrt{2\sqrt{5}+5} & 0.5 \end{pmatrix}$$

Au	-1

$T1u$
$$\begin{pmatrix} 0.5 & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & \sqrt{0.1\sqrt{5}+0.5} \\ 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & \frac{\sqrt{5}}{5}+0.5 & -0.5+0.1\sqrt{5} \\ \sqrt{0.1\sqrt{5}+0.5} & -0.5+0.1\sqrt{5} & -\frac{\sqrt{5}}{5} \end{pmatrix}$$

$T2u$
$$\begin{pmatrix} \frac{\sqrt{5}}{5} & \sqrt{0.5-0.1\sqrt{5}} & -0.5-0.1\sqrt{5} \\ \sqrt{0.5-0.1\sqrt{5}} & 0.5 & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} \\ -0.5-0.1\sqrt{5} & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & 0.5-\frac{\sqrt{5}}{5} \end{pmatrix}$$

Gu
$$\begin{pmatrix} 0.25+0.25\sqrt{5} & -0.5\sqrt{0.5-0.1\sqrt{5}} & 0.5 & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} \\ -0.5\sqrt{0.5-0.1\sqrt{5}} & -0.25+0.15\sqrt{5} & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.3\sqrt{5} \\ 0.5 & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & 0.25-0.25\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} \\ 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -0.3\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} & -0.15\sqrt{5}-0.25 \end{pmatrix}$$

Hu
$$\begin{pmatrix} 0.2 & -0.04\sqrt{5}\left(\sqrt{5}+5\right) & \sqrt{0.3-0.06\sqrt{5}} & 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & \sqrt{0.06\sqrt{5}+0.3} \\ -0.04\sqrt{5}\left(\sqrt{5}+5\right) & -\frac{\sqrt{5}}{5}-0.1 & 0.1\sqrt{5-2\sqrt{5}} & -0.4 & -0.2\sqrt{10-2\sqrt{5}} \\ \sqrt{0.3-0.06\sqrt{5}} & 0.1\sqrt{5-2\sqrt{5}} & -0.5 & -0.2\sqrt{2\sqrt{5}+10} & 0 \\ 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.4 & -0.2\sqrt{2\sqrt{5}+10} & -0.1+\frac{\sqrt{5}}{5} & 0.1\sqrt{2\sqrt{5}+5} \\ \sqrt{0.06\sqrt{5}+0.3} & -0.2\sqrt{10-2\sqrt{5}} & 0 & 0.1\sqrt{2\sqrt{5}+5} & -0.5 \end{pmatrix}$$

Ih	$\hat{\sigma}(5)$
Ag	1
$T1g$	$\begin{pmatrix} -0.25 + 0.25\sqrt{5} & 0.5\sqrt{0.1\sqrt{5} + 0.5} & -\sqrt{0.1\sqrt{5} + 0.5} \\ 0.5\sqrt{0.1\sqrt{5} + 0.5} & -0.75 - 0.05\sqrt{5} & -0.5 + 0.1\sqrt{5} \\ -\sqrt{0.1\sqrt{5} + 0.5} & -0.5 + 0.1\sqrt{5} & -\frac{\sqrt{5}}{5} \end{pmatrix}$
$T2g$	$\begin{pmatrix} \frac{\sqrt{5}}{5} & -\sqrt{0.5 - 0.1\sqrt{5}} & -0.5 - 0.1\sqrt{5} \\ -\sqrt{0.5 - 0.1\sqrt{5}} & -0.25\sqrt{5} - 0.25 & 0.5\sqrt{0.5 - 0.1\sqrt{5}} \\ -0.5 - 0.1\sqrt{5} & 0.5\sqrt{0.5 - 0.1\sqrt{5}} & -0.75 + 0.05\sqrt{5} \end{pmatrix}$
Gg	$\begin{pmatrix} 0.25 + 0.25\sqrt{5} & 0.5\sqrt{0.5 - 0.1\sqrt{5}} & 0 & -\sqrt{0.5 - 0.1\sqrt{5}} \\ 0.5\sqrt{0.5 - 0.1\sqrt{5}} & -0.25 + 0.15\sqrt{5} & \sqrt{0.1\sqrt{5} + 0.5} & \frac{\sqrt{5}}{5} \\ 0 & \sqrt{0.1\sqrt{5} + 0.5} & 0.25 - 0.25\sqrt{5} & 0.5\sqrt{0.1\sqrt{5} + 0.5} \\ -\sqrt{0.5 - 0.1\sqrt{5}} & \frac{\sqrt{5}}{5} & 0.5\sqrt{0.1\sqrt{5} + 0.5} & -0.15\sqrt{5} - 0.25 \end{pmatrix}$
Hg	$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(\sqrt{5} + 5\right) & \sqrt{0.3 - 0.06\sqrt{5}} & -0.04\sqrt{5}\left(-5 + \sqrt{5}\right) & \sqrt{0.06\sqrt{5} + 0.3} \\ 0.04\sqrt{5}\left(\sqrt{5} + 5\right) & 0.35 - 0.05\sqrt{5} & 0.1\sqrt{5.5\sqrt{5} + 12.5} & -\frac{4}{5} & -0.2\sqrt{5 - 2\sqrt{5}} \\ \sqrt{0.3 - 0.06\sqrt{5}} & 0.1\sqrt{5.5\sqrt{5} + 12.5} & 0.25 - 0.15\sqrt{5} & 0.2\sqrt{2\sqrt{5} + 5} & -\frac{\sqrt{5}}{5} \\ -0.04\sqrt{5}\left(-5 + \sqrt{5}\right) & -\frac{4}{5} & 0.2\sqrt{2\sqrt{5} + 5} & 0.05\sqrt{5} + 0.35 & 0.1\sqrt{12.5 - 5.5\sqrt{5}} \\ \sqrt{0.06\sqrt{5} + 0.3} & -0.2\sqrt{5 - 2\sqrt{5}} & -\frac{\sqrt{5}}{5} & 0.1\sqrt{12.5 - 5.5\sqrt{5}} & 0.25 + 0.15\sqrt{5} \end{pmatrix}$
Au	-1
$T1u$	$\begin{pmatrix} 0.25 - 0.25\sqrt{5} & -0.5\sqrt{0.1\sqrt{5} + 0.5} & \sqrt{0.1\sqrt{5} + 0.5} \\ -0.5\sqrt{0.1\sqrt{5} + 0.5} & 0.05\sqrt{5} + 0.75 & 0.5 - 0.1\sqrt{5} \\ \sqrt{0.1\sqrt{5} + 0.5} & 0.5 - 0.1\sqrt{5} & \frac{\sqrt{5}}{5} \end{pmatrix}$
$T2u$	$\begin{pmatrix} -\frac{\sqrt{5}}{5} & \sqrt{0.5 - 0.1\sqrt{5}} & 0.1\sqrt{5} + 0.5 \\ \sqrt{0.5 - 0.1\sqrt{5}} & 0.25 + 0.25\sqrt{5} & -0.5\sqrt{0.5 - 0.1\sqrt{5}} \\ 0.1\sqrt{5} + 0.5 & -0.5\sqrt{0.5 - 0.1\sqrt{5}} & 0.75 - 0.05\sqrt{5} \end{pmatrix}$
Gu	$\begin{pmatrix} -0.25\sqrt{5} - 0.25 & -0.5\sqrt{0.5 - 0.1\sqrt{5}} & 0 & \sqrt{0.5 - 0.1\sqrt{5}} \\ -0.5\sqrt{0.5 - 0.1\sqrt{5}} & 0.25 - 0.15\sqrt{5} & -\sqrt{0.1\sqrt{5} + 0.5} & -\frac{\sqrt{5}}{5} \\ 0 & -\sqrt{0.1\sqrt{5} + 0.5} & -0.25 + 0.25\sqrt{5} & -0.5\sqrt{0.1\sqrt{5} + 0.5} \\ \sqrt{0.5 - 0.1\sqrt{5}} & -\frac{\sqrt{5}}{5} & -0.5\sqrt{0.1\sqrt{5} + 0.5} & 0.25 + 0.15\sqrt{5} \end{pmatrix}$
Hu	$\begin{pmatrix} 0.2 & -0.04\sqrt{5}\left(\sqrt{5} + 5\right) & -0.2\sqrt{7.5 - 1.5\sqrt{5}} & 0.04\sqrt{5}\left(-5 + \sqrt{5}\right) & -0.2\sqrt{1.5\sqrt{5} + 7.5} \\ -0.04\sqrt{5}\left(\sqrt{5} + 5\right) & -0.35 + 0.05\sqrt{5} & -0.1\sqrt{5.5\sqrt{5} + 12.5} & \frac{4}{5} & 0.2\sqrt{5 - 2\sqrt{5}} \\ -0.2\sqrt{7.5 - 1.5\sqrt{5}} & -0.1\sqrt{5.5\sqrt{5} + 12.5} & -0.25 + 0.15\sqrt{5} & -0.2\sqrt{2\sqrt{5} + 5} & \frac{\sqrt{5}}{5} \\ 0.04\sqrt{5}\left(-5 + \sqrt{5}\right) & \frac{4}{5} & -0.2\sqrt{2\sqrt{5} + 5} & -0.35 - 0.05\sqrt{5} & -0.1\sqrt{12.5 - 5.5\sqrt{5}} \\ -0.2\sqrt{1.5\sqrt{5} + 7.5} & 0.2\sqrt{5 - 2\sqrt{5}} & \frac{\sqrt{5}}{5} & -0.1\sqrt{12.5 - 5.5\sqrt{5}} & -0.15\sqrt{5} - 0.25 \end{pmatrix}$

Ih	$\hat{\sigma}(6)$
Ag	1
$T1g$	$\begin{pmatrix} -0.25\sqrt{5}-0.25 & -0.5\sqrt{0.5-0.1\sqrt{5}} & \sqrt{0.5-0.1\sqrt{5}} \\ -0.5\sqrt{0.5-0.1\sqrt{5}} & -0.75+0.05\sqrt{5} & -0.5-0.1\sqrt{5} \\ \sqrt{0.5-0.1\sqrt{5}} & -0.5-0.1\sqrt{5} & \frac{\sqrt{5}}{5} \end{pmatrix}$
$T2g$	$\begin{pmatrix} -\frac{\sqrt{5}}{5} & -\sqrt{0.1\sqrt{5}+0.5} & -0.5+0.1\sqrt{5} \\ -\sqrt{0.1\sqrt{5}+0.5} & -0.25+0.25\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} \\ -0.5+0.1\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} & -0.75-0.05\sqrt{5} \end{pmatrix}$
Gg	$\begin{pmatrix} 0.25-0.25\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} & 0 & -\sqrt{0.1\sqrt{5}+0.5} \\ 0.5\sqrt{0.1\sqrt{5}+0.5} & -0.15\sqrt{5}-0.25 & -\sqrt{0.5-0.1\sqrt{5}} & -\frac{\sqrt{5}}{5} \\ 0 & -\sqrt{0.5-0.1\sqrt{5}} & 0.25+0.25\sqrt{5} & -0.5\sqrt{0.5-0.1\sqrt{5}} \\ -\sqrt{0.1\sqrt{5}+0.5} & -\frac{\sqrt{5}}{5} & -0.5\sqrt{0.5-0.1\sqrt{5}} & -0.25+0.15\sqrt{5} \end{pmatrix}$
Hg	$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.2\sqrt{1.5\sqrt{5}+7.5} & -0.04\sqrt{5}\left(\sqrt{5}+5\right) & \sqrt{0.3-0.06\sqrt{5}} \\ 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & 0.05\sqrt{5}+0.35 & 0.1\sqrt{12.5-5.5\sqrt{5}} & -\frac{4}{5} & -0.2\sqrt{2\sqrt{5}+5} \\ -0.2\sqrt{1.5\sqrt{5}+7.5} & 0.1\sqrt{12.5-5.5\sqrt{5}} & 0.25+0.15\sqrt{5} & -0.2\sqrt{5-2\sqrt{5}} & \frac{\sqrt{5}}{5} \\ -0.04\sqrt{5}\left(\sqrt{5}+5\right) & -\frac{4}{5} & -0.2\sqrt{5-2\sqrt{5}} & 0.35-0.05\sqrt{5} & -0.1\sqrt{5.5\sqrt{5}+12.5} \\ \sqrt{0.3-0.06\sqrt{5}} & -0.2\sqrt{2\sqrt{5}+5} & \frac{\sqrt{5}}{5} & -0.1\sqrt{5.5\sqrt{5}+12.5} & 0.25-0.15\sqrt{5} \end{pmatrix}$
Au	-1
$T1u$	$\begin{pmatrix} 0.25+0.25\sqrt{5} & 0.5\sqrt{0.5-0.1\sqrt{5}} & -\sqrt{0.5-0.1\sqrt{5}} \\ 0.5\sqrt{0.5-0.1\sqrt{5}} & 0.75-0.05\sqrt{5} & 0.1\sqrt{5}+0.5 \\ -\sqrt{0.5-0.1\sqrt{5}} & 0.1\sqrt{5}+0.5 & -\frac{\sqrt{5}}{5} \end{pmatrix}$
$T2u$	$\begin{pmatrix} \frac{\sqrt{5}}{5} & \sqrt{0.1\sqrt{5}+0.5} & 0.5-0.1\sqrt{5} \\ \sqrt{0.1\sqrt{5}+0.5} & 0.25-0.25\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} \\ 0.5-0.1\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} & 0.05\sqrt{5}+0.75 \end{pmatrix}$
Gu	$\begin{pmatrix} -0.25+0.25\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} & 0 & \sqrt{0.1\sqrt{5}+0.5} \\ -0.5\sqrt{0.1\sqrt{5}+0.5} & 0.25+0.15\sqrt{5} & \sqrt{0.5-0.1\sqrt{5}} & \frac{\sqrt{5}}{5} \\ 0 & \sqrt{0.5-0.1\sqrt{5}} & -0.25\sqrt{5}-0.25 & 0.5\sqrt{0.5-0.1\sqrt{5}} \\ \sqrt{0.1\sqrt{5}+0.5} & \frac{\sqrt{5}}{5} & 0.5\sqrt{0.5-0.1\sqrt{5}} & 0.25-0.15\sqrt{5} \end{pmatrix}$
Hu	$\begin{pmatrix} 0.2 & -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & \sqrt{0.06\sqrt{5}+0.3} & 0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.2\sqrt{7.5-1.5\sqrt{5}} \\ -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.35-0.05\sqrt{5} & -0.1\sqrt{12.5-5.5\sqrt{5}} & \frac{4}{5} & 0.2\sqrt{2\sqrt{5}+5} \\ \sqrt{0.06\sqrt{5}+0.3} & -0.1\sqrt{12.5-5.5\sqrt{5}} & -0.15\sqrt{5}-0.25 & 0.2\sqrt{5-2\sqrt{5}} & -\frac{\sqrt{5}}{5} \\ 0.04\sqrt{5}\left(\sqrt{5}+5\right) & \frac{4}{5} & 0.2\sqrt{5-2\sqrt{5}} & -0.35+0.05\sqrt{5} & 0.1\sqrt{5.5\sqrt{5}+12.5} \\ -0.2\sqrt{7.5-1.5\sqrt{5}} & 0.2\sqrt{2\sqrt{5}+5} & -\frac{\sqrt{5}}{5} & 0.1\sqrt{5.5\sqrt{5}+12.5} & -0.25+0.15\sqrt{5} \end{pmatrix}$

Ih	$\hat{\sigma}(7)$
Ag	1

$T1g$

$$\begin{pmatrix} -0.5 & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & \sqrt{0.1\sqrt{5}+0.5} \\ 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -0.5-\frac{\sqrt{5}}{5} & 0.5-0.1\sqrt{5} \\ \sqrt{0.1\sqrt{5}+0.5} & 0.5-0.1\sqrt{5} & \frac{\sqrt{5}}{5} \end{pmatrix}$$

$T2g$

$$\begin{pmatrix} -\frac{\sqrt{5}}{5} & \sqrt{0.5-0.1\sqrt{5}} & 0.1\sqrt{5}+0.5 \\ \sqrt{0.5-0.1\sqrt{5}} & -0.5 & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} \\ 0.1\sqrt{5}+0.5 & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.5+\frac{\sqrt{5}}{5} \end{pmatrix}$$

Gg

$$\begin{pmatrix} -0.25\sqrt{5}-0.25 & -0.5\sqrt{0.5-0.1\sqrt{5}} & -0.5 & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} \\ -0.5\sqrt{0.5-0.1\sqrt{5}} & 0.25-0.15\sqrt{5} & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & 0.3\sqrt{5} \\ -0.5 & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.25+0.25\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} \\ 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & 0.3\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} & 0.25+0.15\sqrt{5} \end{pmatrix}$$

Hg

$$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(\sqrt{5}+5\right) & \sqrt{0.3-0.06\sqrt{5}} & -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & \sqrt{0.06\sqrt{5}+0.3} \\ 0.04\sqrt{5}\left(\sqrt{5}+5\right) & 0.1+\frac{\sqrt{5}}{5} & 0.1\sqrt{5-2\sqrt{5}} & 0.4 & -0.2\sqrt{10-2\sqrt{5}} \\ \sqrt{0.3-0.06\sqrt{5}} & 0.1\sqrt{5-2\sqrt{5}} & 0.5 & -0.2\sqrt{2\sqrt{5}+10} & 0 \\ -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & 0.4 & -0.2\sqrt{2\sqrt{5}+10} & 0.1-\frac{\sqrt{5}}{5} & 0.1\sqrt{2\sqrt{5}+5} \\ \sqrt{0.06\sqrt{5}+0.3} & -0.2\sqrt{10-2\sqrt{5}} & 0 & 0.1\sqrt{2\sqrt{5}+5} & 0.5 \end{pmatrix}$$

Au	-1

$T1u$

$$\begin{pmatrix} 0.5 & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -\sqrt{0.1\sqrt{5}+0.5} \\ -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & \frac{\sqrt{5}}{5}+0.5 & -0.5+0.1\sqrt{5} \\ -\sqrt{0.1\sqrt{5}+0.5} & -0.5+0.1\sqrt{5} & -\frac{\sqrt{5}}{5} \end{pmatrix}$$

$T2u$

$$\begin{pmatrix} \frac{\sqrt{5}}{5} & -\sqrt{0.5-0.1\sqrt{5}} & -0.5-0.1\sqrt{5} \\ -\sqrt{0.5-0.1\sqrt{5}} & 0.5 & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} \\ -0.5-0.1\sqrt{5} & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & 0.5-\frac{\sqrt{5}}{5} \end{pmatrix}$$

Gu

$$\begin{pmatrix} 0.25+0.25\sqrt{5} & 0.5\sqrt{0.5-0.1\sqrt{5}} & 0.5 & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} \\ 0.5\sqrt{0.5-0.1\sqrt{5}} & -0.25+0.15\sqrt{5} & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.3\sqrt{5} \\ 0.5 & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & 0.25-0.25\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} \\ -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -0.3\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} & -0.15\sqrt{5}-0.25 \end{pmatrix}$$

Hu

$$\begin{pmatrix} 0.2 & -0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.2\sqrt{7.5-1.5\sqrt{5}} & 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.2\sqrt{1.5\sqrt{5}+7.5} \\ -0.04\sqrt{5}\left(\sqrt{5}+5\right) & -\frac{\sqrt{5}}{5}-0.1 & -0.1\sqrt{5-2\sqrt{5}} & -0.4 & \sqrt{0.4-0.08\sqrt{5}} \\ -0.2\sqrt{7.5-1.5\sqrt{5}} & -0.1\sqrt{5-2\sqrt{5}} & -0.5 & \sqrt{0.08\sqrt{5}+0.4} & 0 \\ 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.4 & \sqrt{0.08\sqrt{5}+0.4} & -0.1+\frac{\sqrt{5}}{5} & -0.1\sqrt{2\sqrt{5}+5} \\ -0.2\sqrt{1.5\sqrt{5}+7.5} & \sqrt{0.4-0.08\sqrt{5}} & 0 & -0.1\sqrt{2\sqrt{5}+5} & -0.5 \end{pmatrix}$$

Ih	$\hat{\sigma}(8)$
Ag	1
$T1g$	$\begin{pmatrix} -0.25+0.25\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} & \sqrt{0.1\sqrt{5}+0.5} \\ -0.5\sqrt{0.1\sqrt{5}+0.5} & -0.75-0.05\sqrt{5} & -0.5+0.1\sqrt{5} \\ \sqrt{0.1\sqrt{5}+0.5} & -0.5+0.1\sqrt{5} & -\frac{\sqrt{5}}{5} \end{pmatrix}$
$T2g$	$\begin{pmatrix} \frac{\sqrt{5}}{5} & \sqrt{0.5-0.1\sqrt{5}} & -0.5-0.1\sqrt{5} \\ \sqrt{0.5-0.1\sqrt{5}} & -0.25\sqrt{5}-0.25 & -0.5\sqrt{0.5-0.1\sqrt{5}} \\ -0.5-0.1\sqrt{5} & -0.5\sqrt{0.5-0.1\sqrt{5}} & -0.75+0.05\sqrt{5} \end{pmatrix}$
Gg	$\begin{pmatrix} 0.25+0.25\sqrt{5} & -0.5\sqrt{0.5-0.1\sqrt{5}} & 0 & \sqrt{0.5-0.1\sqrt{5}} \\ -0.5\sqrt{0.5-0.1\sqrt{5}} & -0.25+0.15\sqrt{5} & -\sqrt{0.1\sqrt{5}+0.5} & \frac{\sqrt{5}}{5} \\ 0 & -\sqrt{0.1\sqrt{5}+0.5} & 0.25-0.25\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} \\ \sqrt{0.5-0.1\sqrt{5}} & \frac{\sqrt{5}}{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} & -0.15\sqrt{5}-0.25 \end{pmatrix}$
Hg	$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.2\sqrt{7.5-1.5\sqrt{5}} & -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.2\sqrt{1.5\sqrt{5}+7.5} \\ 0.04\sqrt{5}\left(\sqrt{5}+5\right) & 0.35-0.05\sqrt{5} & -0.1\sqrt{5.5\sqrt{5}+12.5} & -\frac{4}{5} & 0.2\sqrt{5-2\sqrt{5}} \\ -0.2\sqrt{7.5-1.5\sqrt{5}} & -0.1\sqrt{5.5\sqrt{5}+12.5} & 0.25-0.15\sqrt{5} & -0.2\sqrt{2\sqrt{5}+5} & -\frac{\sqrt{5}}{5} \\ -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -\frac{4}{5} & -0.2\sqrt{2\sqrt{5}+5} & 0.05\sqrt{5}+0.35 & -0.1\sqrt{12.5-5.5\sqrt{5}} \\ -0.2\sqrt{1.5\sqrt{5}+7.5} & 0.2\sqrt{5-2\sqrt{5}} & -\frac{\sqrt{5}}{5} & -0.1\sqrt{12.5-5.5\sqrt{5}} & 0.25+0.15\sqrt{5} \end{pmatrix}$
Au	-1
$T1u$	$\begin{pmatrix} 0.25-0.25\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} & -\sqrt{0.1\sqrt{5}+0.5} \\ 0.5\sqrt{0.1\sqrt{5}+0.5} & 0.05\sqrt{5}+0.75 & 0.5-0.1\sqrt{5} \\ -\sqrt{0.1\sqrt{5}+0.5} & 0.5-0.1\sqrt{5} & \frac{\sqrt{5}}{5} \end{pmatrix}$
$T2u$	$\begin{pmatrix} -\frac{\sqrt{5}}{5} & -\sqrt{0.5-0.1\sqrt{5}} & 0.1\sqrt{5}+0.5 \\ -\sqrt{0.5-0.1\sqrt{5}} & 0.25+0.25\sqrt{5} & 0.5\sqrt{0.5-0.1\sqrt{5}} \\ 0.1\sqrt{5}+0.5 & 0.5\sqrt{0.5-0.1\sqrt{5}} & 0.75-0.05\sqrt{5} \end{pmatrix}$
Gu	$\begin{pmatrix} -0.25\sqrt{5}-0.25 & 0.5\sqrt{0.5-0.1\sqrt{5}} & 0 & -\sqrt{0.5-0.1\sqrt{5}} \\ 0.5\sqrt{0.5-0.1\sqrt{5}} & 0.25-0.15\sqrt{5} & \sqrt{0.1\sqrt{5}+0.5} & -\frac{\sqrt{5}}{5} \\ 0 & \sqrt{0.1\sqrt{5}+0.5} & -0.25+0.25\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} \\ -\sqrt{0.5-0.1\sqrt{5}} & -\frac{\sqrt{5}}{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} & 0.25+0.15\sqrt{5} \end{pmatrix}$
Hu	$\begin{pmatrix} 0.2 & -0.04\sqrt{5}\left(\sqrt{5}+5\right) & \sqrt{0.3-0.06\sqrt{5}} & 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & \sqrt{0.06\sqrt{5}+0.3} \\ -0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.35+0.05\sqrt{5} & 0.1\sqrt{5.5\sqrt{5}+12.5} & \frac{4}{5} & -0.2\sqrt{5-2\sqrt{5}} \\ \sqrt{0.3-0.06\sqrt{5}} & 0.1\sqrt{5.5\sqrt{5}+12.5} & -0.25+0.15\sqrt{5} & 0.2\sqrt{2\sqrt{5}+5} & \frac{\sqrt{5}}{5} \\ 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & \frac{4}{5} & 0.2\sqrt{2\sqrt{5}+5} & -0.35-0.05\sqrt{5} & 0.1\sqrt{12.5-5.5\sqrt{5}} \\ \sqrt{0.06\sqrt{5}+0.3} & -0.2\sqrt{5-2\sqrt{5}} & \frac{\sqrt{5}}{5} & 0.1\sqrt{12.5-5.5\sqrt{5}} & -0.15\sqrt{5}-0.25 \end{pmatrix}$

Ih	$\hat{\sigma}(9)$
Ag	1

$T1g$

$$\begin{pmatrix} -0.25\sqrt{5}-0.25 & -0.5\sqrt{2.5-0.5\sqrt{5}} & 0 \\ -0.5\sqrt{2.5-0.5\sqrt{5}} & 0.25+0.25\sqrt{5} & 0 \\ 0 & 0 & -1 \end{pmatrix}$$

$T2g$

$$\begin{pmatrix} -1 & 0 & 0 \\ 0 & -0.25+0.25\sqrt{5} & -0.5\sqrt{0.5\sqrt{5}+2.5} \\ 0 & -0.5\sqrt{0.5\sqrt{5}+2.5} & 0.25-0.25\sqrt{5} \end{pmatrix}$$

Gg

$$\begin{pmatrix} 0.25+0.25\sqrt{5} & 0.5\sqrt{2.5-0.5\sqrt{5}} & 0 & 0 \\ 0.5\sqrt{2.5-0.5\sqrt{5}} & -0.25\sqrt{5}-0.25 & 0 & 0 \\ 0 & 0 & 0.25-0.25\sqrt{5} & -0.5\sqrt{0.5\sqrt{5}+2.5} \\ 0 & 0 & -0.5\sqrt{0.5\sqrt{5}+2.5} & -0.25+0.25\sqrt{5} \end{pmatrix}$$

Hg

$$\begin{pmatrix} 1 & 0 & 0 & 0 & 0 \\ 0 & -0.25+0.25\sqrt{5} & 0.5\sqrt{0.5\sqrt{5}+2.5} & 0 & 0 \\ 0 & 0.5\sqrt{0.5\sqrt{5}+2.5} & 0.25-0.25\sqrt{5} & 0 & 0 \\ 0 & 0 & 0 & -0.25\sqrt{5}-0.25 & 0.5\sqrt{2.5-0.5\sqrt{5}} \\ 0 & 0 & 0 & 0.5\sqrt{2.5-0.5\sqrt{5}} & 0.25+0.25\sqrt{5} \end{pmatrix}$$

Au	-1

$T1u$

$$\begin{pmatrix} 0.25+0.25\sqrt{5} & 0.5\sqrt{2.5-0.5\sqrt{5}} & 0 \\ 0.5\sqrt{2.5-0.5\sqrt{5}} & -0.25\sqrt{5}-0.25 & 0 \\ 0 & 0 & 1 \end{pmatrix}$$

$T2u$

$$\begin{pmatrix} 1 & 0 & 0 \\ 0 & 0.25-0.25\sqrt{5} & 0.5\sqrt{0.5\sqrt{5}+2.5} \\ 0 & 0.5\sqrt{0.5\sqrt{5}+2.5} & -0.25+0.25\sqrt{5} \end{pmatrix}$$

Gu

$$\begin{pmatrix} -0.25\sqrt{5}-0.25 & -0.5\sqrt{2.5-0.5\sqrt{5}} & 0 & 0 \\ -0.5\sqrt{2.5-0.5\sqrt{5}} & 0.25+0.25\sqrt{5} & 0 & 0 \\ 0 & 0 & -0.25+0.25\sqrt{5} & 0.5\sqrt{0.5\sqrt{5}+2.5} \\ 0 & 0 & 0.5\sqrt{0.5\sqrt{5}+2.5} & 0.25-0.25\sqrt{5} \end{pmatrix}$$

Hu

$$\begin{pmatrix} -1 & 0 & 0 & 0 & 0 \\ 0 & 0.25-0.25\sqrt{5} & -0.5\sqrt{0.5\sqrt{5}+2.5} & 0 & 0 \\ 0 & -0.5\sqrt{0.5\sqrt{5}+2.5} & -0.25+0.25\sqrt{5} & 0 & 0 \\ 0 & 0 & 0 & 0.25+0.25\sqrt{5} & -0.5\sqrt{2.5-0.5\sqrt{5}} \\ 0 & 0 & 0 & -0.5\sqrt{2.5-0.5\sqrt{5}} & -0.25\sqrt{5}-0.25 \end{pmatrix}$$

Ih	$\hat{\sigma}(10)$
Ag	1
$T1g$	$\begin{pmatrix} -0.5 & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -\sqrt{0.5-0.1\sqrt{5}} \\ -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.5+\frac{\sqrt{5}}{5} & 0.1\sqrt{5}+0.5 \\ -\sqrt{0.5-0.1\sqrt{5}} & 0.1\sqrt{5}+0.5 & -\frac{\sqrt{5}}{5} \end{pmatrix}$
$T2g$	$\begin{pmatrix} \frac{\sqrt{5}}{5} & \sqrt{0.1\sqrt{5}+0.5} & 0.5-0.1\sqrt{5} \\ \sqrt{0.1\sqrt{5}+0.5} & -0.5 & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} \\ 0.5-0.1\sqrt{5} & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -0.5-\frac{\sqrt{5}}{5} \end{pmatrix}$
Gg	$\begin{pmatrix} -0.25+0.25\sqrt{5} & -0.5\sqrt{0.1\sqrt{5}+0.5} & -0.5 & -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} \\ -0.5\sqrt{0.1\sqrt{5}+0.5} & 0.25+0.15\sqrt{5} & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -0.3\sqrt{5} \\ -0.5 & 0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & -0.25\sqrt{5}-0.25 & 0.5\sqrt{0.5-0.1\sqrt{5}} \\ -0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & -0.3\sqrt{5} & 0.5\sqrt{0.5-0.1\sqrt{5}} & 0.25-0.15\sqrt{5} \end{pmatrix}$
Hg	$\begin{pmatrix} -0.2 & 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.2\sqrt{1.5\sqrt{5}+7.5} & -0.04\sqrt{5}\left(\sqrt{5}+5\right) & \sqrt{0.3-0.06\sqrt{5}} \\ 0.04\sqrt{5}\left(-5+\sqrt{5}\right) & 0.1-\frac{\sqrt{5}}{5} & 0.1\sqrt{2\sqrt{5}+5} & 0.4 & \sqrt{0.08\sqrt{5}+0.4} \\ -0.2\sqrt{1.5\sqrt{5}+7.5} & 0.1\sqrt{2\sqrt{5}+5} & 0.5 & -0.2\sqrt{10-2\sqrt{5}} & 0 \\ -0.04\sqrt{5}\left(\sqrt{5}+5\right) & 0.4 & -0.2\sqrt{10-2\sqrt{5}} & 0.1+\frac{\sqrt{5}}{5} & -0.1\sqrt{5-2\sqrt{5}} \\ \sqrt{0.3-0.06\sqrt{5}} & \sqrt{0.08\sqrt{5}+0.4} & 0 & -0.1\sqrt{5-2\sqrt{5}} & 0.5 \end{pmatrix}$
Au	-1
$T1u$	$\begin{pmatrix} 0.5 & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & \sqrt{0.5-0.1\sqrt{5}} \\ 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & 0.5-\frac{\sqrt{5}}{5} & -0.5-0.1\sqrt{5} \\ \sqrt{0.5-0.1\sqrt{5}} & -0.5-0.1\sqrt{5} & \frac{\sqrt{5}}{5} \end{pmatrix}$
$T2u$	$\begin{pmatrix} -\frac{\sqrt{5}}{5} & -\sqrt{0.1\sqrt{5}+0.5} & -0.5+0.1\sqrt{5} \\ -\sqrt{0.1\sqrt{5}+0.5} & 0.5 & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} \\ -0.5+0.1\sqrt{5} & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & \frac{\sqrt{5}}{5}+0.5 \end{pmatrix}$
Gu	$\begin{pmatrix} 0.25-0.25\sqrt{5} & 0.5\sqrt{0.1\sqrt{5}+0.5} & 0.5 & 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} \\ 0.5\sqrt{0.1\sqrt{5}+0.5} & -0.15\sqrt{5}-0.25 & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & 0.3\sqrt{5} \\ 0.5 & -0.5\sqrt{1-\frac{2\sqrt{5}}{5}} & 0.25+0.25\sqrt{5} & -0.5\sqrt{0.5-0.1\sqrt{5}} \\ 0.5\sqrt{\frac{2\sqrt{5}}{5}+1} & 0.3\sqrt{5} & -0.5\sqrt{0.5-0.1\sqrt{5}} & -0.25+0.15\sqrt{5} \end{pmatrix}$
Hu	$\begin{pmatrix} 0.2 & -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & \sqrt{0.06\sqrt{5}+0.3} & 0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.2\sqrt{7.5-1.5\sqrt{5}} \\ -0.04\sqrt{5}\left(-5+\sqrt{5}\right) & -0.1+\frac{\sqrt{5}}{5} & -0.1\sqrt{2\sqrt{5}+5} & -0.4 & -0.2\sqrt{2\sqrt{5}+10} \\ \sqrt{0.06\sqrt{5}+0.3} & -0.1\sqrt{2\sqrt{5}+5} & -0.5 & \sqrt{0.4-0.08\sqrt{5}} & 0 \\ 0.04\sqrt{5}\left(\sqrt{5}+5\right) & -0.4 & \sqrt{0.4-0.08\sqrt{5}} & -\frac{\sqrt{5}}{5}-0.1 & 0.1\sqrt{5-2\sqrt{5}} \\ -0.2\sqrt{7.5-1.5\sqrt{5}} & -0.2\sqrt{2\sqrt{5}+10} & 0 & 0.1\sqrt{5-2\sqrt{5}} & -0.5 \end{pmatrix}$

Ih	$\hat{\sigma}(11)$
Ag	1

$T1g$

$$\begin{pmatrix} -0.25+0.25\sqrt{5} & -0.5\sqrt{0.5\sqrt{5}+2.5} & 0 \\ -0.5\sqrt{0.5\sqrt{5}+2.5} & 0.25-0.25\sqrt{5} & 0 \\ 0 & 0 & -1 \end{pmatrix}$$

$T2g$

$$\begin{pmatrix} -1 & 0 & 0 \\ 0 & -0.25\sqrt{5}-0.25 & 0.5\sqrt{2.5-0.5\sqrt{5}} \\ 0 & 0.5\sqrt{2.5-0.5\sqrt{5}} & 0.25+0.25\sqrt{5} \end{pmatrix}$$

Gg

$$\begin{pmatrix} 0.25-0.25\sqrt{5} & 0.5\sqrt{0.5\sqrt{5}+2.5} & 0 & 0 \\ 0.5\sqrt{0.5\sqrt{5}+2.5} & -0.25+0.25\sqrt{5} & 0 & 0 \\ 0 & 0 & 0.25+0.25\sqrt{5} & 0.5\sqrt{2.5-0.5\sqrt{5}} \\ 0 & 0 & 0.5\sqrt{2.5-0.5\sqrt{5}} & -0.25\sqrt{5}-0.25 \end{pmatrix}$$

Hg

$$\begin{pmatrix} 1 & 0 & 0 & 0 & 0 \\ 0 & -0.25\sqrt{5}-0.25 & -0.5\sqrt{2.5-0.5\sqrt{5}} & 0 & 0 \\ 0 & -0.5\sqrt{2.5-0.5\sqrt{5}} & 0.25+0.25\sqrt{5} & 0 & 0 \\ 0 & 0 & 0 & -0.25+0.25\sqrt{5} & 0.5\sqrt{0.5\sqrt{5}+2.5} \\ 0 & 0 & 0 & 0.5\sqrt{0.5\sqrt{5}+2.5} & 0.25-0.25\sqrt{5} \end{pmatrix}$$

| Au | -1 |

$T1u$

$$\begin{pmatrix} 0.25-0.25\sqrt{5} & 0.5\sqrt{0.5\sqrt{5}+2.5} & 0 \\ 0.5\sqrt{0.5\sqrt{5}+2.5} & -0.25+0.25\sqrt{5} & 0 \\ 0 & 0 & 1 \end{pmatrix}$$

$T2u$

$$\begin{pmatrix} 1 & 0 & 0 \\ 0 & 0.25+0.25\sqrt{5} & -0.5\sqrt{2.5-0.5\sqrt{5}} \\ 0 & -0.5\sqrt{2.5-0.5\sqrt{5}} & -0.25\sqrt{5}-0.25 \end{pmatrix}$$

Gu

$$\begin{pmatrix} -0.25+0.25\sqrt{5} & -0.5\sqrt{0.5\sqrt{5}+2.5} & 0 & 0 \\ -0.5\sqrt{0.5\sqrt{5}+2.5} & 0.25-0.25\sqrt{5} & 0 & 0 \\ 0 & 0 & -0.25\sqrt{5}-0.25 & -0.5\sqrt{2.5-0.5\sqrt{5}} \\ 0 & 0 & -0.5\sqrt{2.5-0.5\sqrt{5}} & 0.25+0.25\sqrt{5} \end{pmatrix}$$

Hu

$$\begin{pmatrix} -1 & 0 & 0 & 0 & 0 \\ 0 & 0.25+0.25\sqrt{5} & 0.5\sqrt{2.5-0.5\sqrt{5}} & 0 & 0 \\ 0 & 0.5\sqrt{2.5-0.5\sqrt{5}} & -0.25\sqrt{5}-0.25 & 0 & 0 \\ 0 & 0 & 0 & 0.25-0.25\sqrt{5} & -0.5\sqrt{0.5\sqrt{5}+2.5} \\ 0 & 0 & 0 & -0.5\sqrt{0.5\sqrt{5}+2.5} & -0.25+0.25\sqrt{5} \end{pmatrix}$$

Ih	$\hat{\sigma}(12)$
Ag	1
$T1g$	$\begin{pmatrix} -1 & 0 & 0 \\ 0 & \frac{\sqrt{5}}{5} & -\frac{2\sqrt{5}}{5} \\ 0 & -\frac{2\sqrt{5}}{5} & -\frac{\sqrt{5}}{5} \end{pmatrix}$
$T2g$	$\begin{pmatrix} \frac{\sqrt{5}}{5} & 0 & \frac{2\sqrt{5}}{5} \\ 0 & -1 & 0 \\ \frac{2\sqrt{5}}{5} & 0 & -\frac{\sqrt{5}}{5} \end{pmatrix}$
Gg	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 0 & \frac{2\sqrt{5}}{5} & 0 & \frac{\sqrt{5}}{5} \\ 1 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{5}}{5} & 0 & -\frac{2\sqrt{5}}{5} \end{pmatrix}$
Hg	$\begin{pmatrix} -0.2 & -0.4\sqrt{3} & 0 & 0.4\sqrt{3} & 0 \\ -0.4\sqrt{3} & \frac{4}{5} & 0 & 0.4 & 0 \\ 0 & 0 & -\frac{\sqrt{5}}{5} & 0 & \frac{2\sqrt{5}}{5} \\ 0.4\sqrt{3} & 0.4 & 0 & \frac{4}{5} & 0 \\ 0 & 0 & \frac{2\sqrt{5}}{5} & 0 & \frac{\sqrt{5}}{5} \end{pmatrix}$
Au	-1
$T1u$	$\begin{pmatrix} 1 & 0 & 0 \\ 0 & -\frac{\sqrt{5}}{5} & \frac{2\sqrt{5}}{5} \\ 0 & \frac{2\sqrt{5}}{5} & \frac{\sqrt{5}}{5} \end{pmatrix}$
$T2u$	$\begin{pmatrix} -\frac{\sqrt{5}}{5} & 0 & -\frac{2\sqrt{5}}{5} \\ 0 & 1 & 0 \\ -\frac{2\sqrt{5}}{5} & 0 & \frac{\sqrt{5}}{5} \end{pmatrix}$
Gu	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 0 & -\frac{2\sqrt{5}}{5} & 0 & -\frac{\sqrt{5}}{5} \\ -1 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{5}}{5} & 0 & \frac{2\sqrt{5}}{5} \end{pmatrix}$
Hu	$\begin{pmatrix} 0.2 & 0.4\sqrt{3} & 0 & -0.4\sqrt{3} & 0 \\ 0.4\sqrt{3} & -\frac{4}{5} & 0 & -0.4 & 0 \\ 0 & 0 & \frac{\sqrt{5}}{5} & 0 & -\frac{2\sqrt{5}}{5} \\ -0.4\sqrt{3} & -0.4 & 0 & -\frac{4}{5} & 0 \\ 0 & 0 & -\frac{2\sqrt{5}}{5} & 0 & -\frac{\sqrt{5}}{5} \end{pmatrix}$

Ih	$\hat{\sigma}(13)$
Ag	1
$T1g$	$\begin{pmatrix} -1 & 0 & 0 \\ 0 & -\frac{\sqrt{5}}{5} & \frac{2\sqrt{5}}{5} \\ 0 & \frac{2\sqrt{5}}{5} & \frac{\sqrt{5}}{5} \end{pmatrix}$
$T2g$	$\begin{pmatrix} -\frac{\sqrt{5}}{5} & 0 & -\frac{2\sqrt{5}}{5} \\ 0 & -1 & 0 \\ -\frac{2\sqrt{5}}{5} & 0 & \frac{\sqrt{5}}{5} \end{pmatrix}$
Gg	$\begin{pmatrix} 0 & 0 & 1 & 0 \\ 0 & -\frac{2\sqrt{5}}{5} & 0 & -\frac{\sqrt{5}}{5} \\ 1 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{5}}{5} & 0 & \frac{2\sqrt{5}}{5} \end{pmatrix}$
Hg	$\begin{pmatrix} -0.2 & -0.4\sqrt{3} & 0 & 0.4\sqrt{3} & 0 \\ -0.4\sqrt{3} & \frac{4}{5} & 0 & 0.4 & 0 \\ 0 & 0 & \frac{\sqrt{5}}{5} & 0 & -\frac{2\sqrt{5}}{5} \\ 0.4\sqrt{3} & 0.4 & 0 & \frac{4}{5} & 0 \\ 0 & 0 & -\frac{2\sqrt{5}}{5} & 0 & -\frac{\sqrt{5}}{5} \end{pmatrix}$
Au	-1
$T1u$	$\begin{pmatrix} 1 & 0 & 0 \\ 0 & \frac{\sqrt{5}}{5} & -\frac{2\sqrt{5}}{5} \\ 0 & -\frac{2\sqrt{5}}{5} & -\frac{\sqrt{5}}{5} \end{pmatrix}$
$T2u$	$\begin{pmatrix} \frac{\sqrt{5}}{5} & 0 & \frac{2\sqrt{5}}{5} \\ 0 & 1 & 0 \\ \frac{2\sqrt{5}}{5} & 0 & -\frac{\sqrt{5}}{5} \end{pmatrix}$
Gu	$\begin{pmatrix} 0 & 0 & -1 & 0 \\ 0 & \frac{2\sqrt{5}}{5} & 0 & \frac{\sqrt{5}}{5} \\ -1 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{5}}{5} & 0 & -\frac{2\sqrt{5}}{5} \end{pmatrix}$
Hu	$\begin{pmatrix} 0.2 & 0.4\sqrt{3} & 0 & -0.4\sqrt{3} & 0 \\ 0.4\sqrt{3} & -\frac{4}{5} & 0 & -0.4 & 0 \\ 0 & 0 & -\frac{\sqrt{5}}{5} & 0 & \frac{2\sqrt{5}}{5} \\ -0.4\sqrt{3} & -0.4 & 0 & -\frac{4}{5} & 0 \\ 0 & 0 & \frac{2\sqrt{5}}{5} & 0 & \frac{\sqrt{5}}{5} \end{pmatrix}$

Ih	$\hat{\sigma}(14)$
Ag	1
$T1g$	$\begin{pmatrix} 1 & 0 & 0 \\ 0 & -1 & 0 \\ 0 & 0 & -1 \end{pmatrix}$
$T2g$	$\begin{pmatrix} -1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & -1 \end{pmatrix}$
Gg	$\begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 0 & 0 & 0 & 1 \end{pmatrix}$
Hg	$\begin{pmatrix} 1 & 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & 0 & 0 \\ 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & -1 \end{pmatrix}$
Au	-1
$T1u$	$\begin{pmatrix} -1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{pmatrix}$
$T2u$	$\begin{pmatrix} 1 & 0 & 0 \\ 0 & -1 & 0 \\ 0 & 0 & 1 \end{pmatrix}$
Gu	$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & -1 \end{pmatrix}$
Hu	$\begin{pmatrix} -1 & 0 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & -1 & 0 \\ 0 & 0 & 0 & 0 & 1 \end{pmatrix}$