Response Tensors up to 4th rank in C_2

— polar tensors —

$$C^{(0,Q)} = \begin{pmatrix} C^{(0,Q)} \end{pmatrix}$$

$$C^{(0,Q)} = Q_0$$

$$C^{(1,Q)} = \begin{pmatrix} 0 & C_y^{(1,Q)} & 0 \end{pmatrix}$$

$$C_y^{(1,Q)} = Q_y$$

$$S^{(2,Q)} = \begin{pmatrix} S_{xx}^{(2,Q)} & 0 & S_{xz}^{(2,Q)} \\ 0 & S_{yy}^{(2,Q)} & 0 \\ S_{xz}^{(2,Q)} & 0 & S_{zz}^{(2,Q)} \end{pmatrix}$$

$$S_{xx}^{(2,Q)} = Q_0 - Q_u + Q_v$$
$$S_{xz}^{(2,Q)} = Q_{zx}$$
$$S_{yy}^{(2,Q)} = Q_0 - Q_u - Q_v$$
$$S_{zz}^{(2,Q)} = Q_0 + 2Q_u$$

$$A^{(2,Q)} = \begin{pmatrix} 0 & 0 & A_{xz}^{(2,Q)} \\ 0 & 0 & 0 \\ -A_{xz}^{(2,Q)} & 0 & 0 \end{pmatrix}$$

$$A_{xz}^{(2,Q)} = -G_y$$

$$S^{(3,Q)} = \begin{pmatrix} 0 & S_{1y}^{(3,Q)} & 0 \\ 0 & S_{2y}^{(3,Q)} & 0 \\ 0 & S_{3y}^{(3,Q)} & 0 \\ S_{4x}^{(3,Q)} & 0 & S_{4z}^{(3,Q)} \\ 0 & S_{5y}^{(3,Q)} & 0 \\ S_{6x}^{(3,Q)} & 0 & S_{6z}^{(3,Q)} \end{pmatrix}$$

$$S_{1y}^{(3,Q)} = 2G_{zx}[1] + Q_y[2] - Q_y^{\alpha} - Q_y^{\beta}$$
$$S_{2y}^{(3,Q)} = 2Q_y[1] + Q_y[2] + 2Q_y^{\alpha}$$
$$S_{3y}^{(3,Q)} = -2G_{zx}[1] + Q_y[2] - Q_y^{\alpha} + Q_y^{\beta}$$
$$S_{4x}^{(3,Q)} = -3G_u[1] - G_v[1] + Q_{xyz}$$
$$S_{4z}^{(3,Q)} = G_{zx}[1] + Q_y[1] - Q_y^{\alpha} + Q_y^{\beta}$$
$$S_{5y}^{(3,Q)} = 3G_u[1] - G_v[1] + Q_{xyz}$$
$$S_{6x}^{(3,Q)} = -G_{zx}[1] + Q_y[1] - Q_y^{\alpha} - Q_y^{\beta}$$
$$S_{6z}^{(3,Q)} = 2G_v[1] + Q_{xyz}$$

$$A^{(3,Q)} = \begin{pmatrix} A_{4x}^{(3,Q)} & 0 & A_{4z}^{(3,Q)} \\ 0 & A_{5y}^{(3,Q)} & 0 \\ A_{6x}^{(3,Q)} & 0 & A_{6z}^{(3,Q)} \end{pmatrix}$$

$$\begin{aligned}
A_{4x}^{(3,Q)} &= G_0 - G_u[2] + G_v[2] \\
A_{4z}^{(3,Q)} &= G_{zx}[2] - Q_y[3] \\
A_{5y}^{(3,Q)} &= G_0 - G_u[2] - G_v[2] \\
A_{6x}^{(3,Q)} &= G_{zx}[2] + Q_y[3] \\
A_{6z}^{(3,Q)} &= G_0 + 2G_u[2]
\end{aligned}$$

$$S^{(4,Q)} = \begin{pmatrix} S_{11}^{(4,Q)} & S_{12}^{(4,Q)} & S_{13}^{(4,Q)} & 0 & S_{15}^{(4,Q)} & 0 \\ S_{12}^{(4,Q)} & S_{22}^{(4,Q)} & S_{23}^{(4,Q)} & 0 & S_{25}^{(4,Q)} & 0 \\ S_{13}^{(4,Q)} & S_{23}^{(4,Q)} & S_{33}^{(4,Q)} & 0 & S_{35}^{(4,Q)} & 0 \\ 0 & 0 & 0 & S_{44}^{(4,Q)} & 0 & S_{46}^{(4,Q)} \\ S_{15}^{(4,Q)} & S_{25}^{(4,Q)} & S_{35}^{(4,Q)} & 0 & S_{55}^{(4,Q)} & 0 \\ 0 & 0 & 0 & S_{46}^{(4,Q)} & 0 & S_{66}^{(4,Q)} \end{pmatrix}$$

$$\begin{aligned}
S_{11}^{(4,Q)} &= Q_0[1] + 2Q_0[2] - Q_{4u} + Q_{4v} + 2Q_4 - 2Q_u[1] - 4Q_u[2] + 2Q_v[1] + 4Q_v[2] \\
S_{12}^{(4,Q)} &= Q_0[1] + 2Q_{4u} - Q_4 - 2Q_u[1] \\
S_{13}^{(4,Q)} &= Q_0[1] - Q_{4u} - Q_{4v} - Q_4 + Q_u[1] + Q_v[1] \\
S_{15}^{(4,Q)} &= -Q_{4y}^{\alpha} - Q_{4y}^{\beta} + Q_{zx}[1] + 2Q_{zx}[2] \\
S_{22}^{(4,Q)} &= Q_0[1] + 2Q_0[2] - Q_{4u} - Q_{4v} + 2Q_4 - 2Q_u[1] - 4Q_u[2] - 2Q_v[1] - 4Q_v[2] \\
S_{23}^{(4,Q)} &= Q_0[1] - Q_{4u} + Q_{4v} - Q_4 + Q_u[1] - Q_v[1] \\
S_{25}^{(4,Q)} &= 2Q_{4y}^{\beta} + Q_{zx}[1] \\
S_{33}^{(4,Q)} &= Q_0[1] + 2Q_0[2] + 2Q_{4u} + 2Q_4 + 4Q_u[1] + 8Q_u[2] \\
S_{35}^{(4,Q)} &= Q_{4y}^{\alpha} - Q_{4y}^{\beta} + Q_{zx}[1] + 2Q_{zx}[2] \\
S_{44}^{(4,Q)} &= Q_0[2] - Q_{4u} + Q_{4v} - Q_4 + Q_u[2] - Q_v[2] \\
S_{46}^{(4,Q)} &= 2Q_{4y}^{\beta} + Q_{zx}[2] \\
S_{55}^{(4,Q)} &= Q_0[2] - Q_{4u} - Q_{4v} - Q_4 + Q_u[2] + Q_v[2] \\
S_{66}^{(4,Q)} &= Q_0[2] + 2Q_{4u} - Q_4 - 2Q_u[2]
\end{aligned}$$

$$\bar{S}^{(4,Q)} = \begin{pmatrix} 0 & \bar{S}_{12}^{(4,Q)} & \bar{S}_{13}^{(4,Q)} & 0 & \bar{S}_{15}^{(4,Q)} & 0 \\ -\bar{S}_{12}^{(4,Q)} & 0 & \bar{S}_{23}^{(4,Q)} & 0 & \bar{S}_{25}^{(4,Q)} & 0 \\ -\bar{S}_{13}^{(4,Q)} & -\bar{S}_{23}^{(4,Q)} & 0 & 0 & \bar{S}_{35}^{(4,Q)} & 0 \\ 0 & 0 & 0 & 0 & 0 & \bar{S}_{46}^{(4,Q)} \\ -\bar{S}_{15}^{(4,Q)} & -\bar{S}_{25}^{(4,Q)} & -\bar{S}_{35}^{(4,Q)} & 0 & 0 & 0 \\ 0 & 0 & 0 & -\bar{S}_{46}^{(4,Q)} & 0 & 0 \end{pmatrix}$$

$$\bar{S}_{12}^{(4,Q)} = 4G_{xyz}[1] - 2Q_v[3]$$
$$\bar{S}_{13}^{(4,Q)} = -4G_{xyz}[1] + 3Q_u[3] - Q_v[3]$$
$$\bar{S}_{15}^{(4,Q)} = -2G_y[1] + 2G_y^{\alpha}[1] + 2G_y^{\beta}[1] + Q_{zx}[3]$$
$$\bar{S}_{23}^{(4,Q)} = 4G_{xyz}[1] + 3Q_u[3] + Q_v[3]$$
$$\bar{S}_{25}^{(4,Q)} = -4G_y^{\beta}[1] + Q_{zx}[3]$$
$$\bar{S}_{35}^{(4,Q)} = 2G_y[1] - 2G_y^{\alpha}[1] + 2G_y^{\beta}[1] + Q_{zx}[3]$$
$$\bar{S}_{46}^{(4,Q)} = G_y[1] + 4G_y^{\alpha}[1]$$

$$A^{(4,Q)} = \begin{pmatrix} A_{xx}^{(4,Q)} & 0 & A_{xz}^{(4,Q)} \\ 0 & A_{yy}^{(4,Q)} & 0 \\ A_{xz}^{(4,Q)} & 0 & A_{zz}^{(4,Q)} \end{pmatrix}$$

$$A_{xx}^{(4,Q)} = Q_0[3] - 2Q_u[6] + 2Q_v[6]$$
$$A_{xz}^{(4,Q)} = 2Q_{zx}[6]$$
$$A_{yy}^{(4,Q)} = Q_0[3] - 2Q_u[6] - 2Q_v[6]$$
$$A_{zz}^{(4,Q)} = Q_0[3] + 4Q_u[6]$$

$$\bar{A}^{(4,Q)} = \begin{pmatrix} 0 & 0 & \bar{A}_{xz}^{(4,Q)} \\ 0 & 0 & 0 \\ -\bar{A}_{xz}^{(4,Q)} & 0 & 0 \end{pmatrix}$$

$$\bar{A}_{xz}^{(4,Q)} = -G_y[6]$$

$$M^{(4,Q)} = \begin{pmatrix} 0 & M_{1y}^{(4,Q)} & 0 \\ 0 & M_{2y}^{(4,Q)} & 0 \\ 0 & M_{3y}^{(4,Q)} & 0 \\ M_{4x}^{(4,Q)} & 0 & M_{4z}^{(4,Q)} \\ 0 & M_{5y}^{(4,Q)} & 0 \\ M_{6x}^{(4,Q)} & 0 & M_{6z}^{(4,Q)} \end{pmatrix}$$

$$M_{1y}^{(4,Q)} = G_y[3] - G_y^{\alpha}[2] - G_y^{\beta}[2] + 2Q_{zx}[4]$$
$$M_{2y}^{(4,Q)} = 2G_y[2] + G_y[3] + 2G_y^{\alpha}[2]$$
$$M_{3y}^{(4,Q)} = G_y[3] - G_y^{\alpha}[2] + G_y^{\beta}[2] - 2Q_{zx}[4]$$
$$M_{4x}^{(4,Q)} = G_{xyz}[2] - 3Q_u[4] - Q_v[4]$$
$$M_{4z}^{(4,Q)} = G_y[2] - G_y^{\alpha}[2] + G_y^{\beta}[2] + Q_{zx}[4]$$
$$M_{5y}^{(4,Q)} = G_{xyz}[2] + 3Q_u[4] - Q_v[4]$$
$$M_{6x}^{(4,Q)} = G_y[2] - G_y^{\alpha}[2] - G_y^{\beta}[2] - Q_{zx}[4]$$
$$M_{6z}^{(4,Q)} = G_{xyz}[2] + 2Q_v[4]$$

$$\bar{M}^{(4,Q)} = \begin{pmatrix} 0 & 0 & 0 & \bar{M}_{x4}^{(4,Q)} & 0 & \bar{M}_{x6}^{(4,Q)} \\ \bar{M}_{y1}^{(4,Q)} & \bar{M}_{y2}^{(4,Q)} & \bar{M}_{y3}^{(4,Q)} & 0 & \bar{M}_{y5}^{(4,Q)} & 0 \\ 0 & 0 & 0 & \bar{M}_{z4}^{(4,Q)} & 0 & \bar{M}_{z6}^{(4,Q)} \end{pmatrix}$$

$$\bar{M}_{x4}^{(4,Q)} = G_{xyz}[3] - 3Q_u[5] - Q_v[5]$$
$$\bar{M}_{x6}^{(4,Q)} = G_y[4] - G_y^{\alpha}[3] - G_y^{\beta}[3] - Q_{zx}[5]$$
$$\bar{M}_{y1}^{(4,Q)} = G_y[5] - G_y^{\alpha}[3] - G_y^{\beta}[3] + 2Q_{zx}[5]$$
$$\bar{M}_{y2}^{(4,Q)} = 2G_y[4] + G_y[5] + 2G_y^{\alpha}[3]$$
$$\bar{M}_{y3}^{(4,Q)} = G_y[5] - G_y^{\alpha}[3] + G_y^{\beta}[3] - 2Q_{zx}[5]$$
$$\bar{M}_{y5}^{(4,Q)} = G_{xyz}[3] + 3Q_u[5] - Q_v[5]$$
$$\bar{M}_{z4}^{(4,Q)} = G_y[4] - G_y^{\alpha}[3] + G_y^{\beta}[3] + Q_{zx}[5]$$
$$\bar{M}_{z6}^{(4,Q)} = G_{xyz}[3] + 2Q_v[5]$$

— axial tensors —

$$C^{(0,G)} = \begin{pmatrix} C^{(0,G)} \end{pmatrix}$$

$$C^{(0,G)} = G_0$$

$$C^{(1,G)} = \begin{pmatrix} 0 & C_y^{(1,G)} & 0 \end{pmatrix}$$

$$C_y^{(1,G)} = G_y$$

$$S^{(2,G)} = \begin{pmatrix} S_{xx}^{(2,G)} & 0 & S_{xz}^{(2,G)} \\ 0 & S_{yy}^{(2,G)} & 0 \\ S_{xz}^{(2,G)} & 0 & S_{zz}^{(2,G)} \end{pmatrix}$$

$$S_{xx}^{(2,G)} = G_0 - G_u + G_v$$
$$S_{xz}^{(2,G)} = G_{zx}$$
$$S_{yy}^{(2,G)} = G_0 - G_u - G_v$$
$$S_{zz}^{(2,G)} = G_0 + 2G_u$$

$$A^{(2,G)} = \begin{pmatrix} 0 & 0 & A_{xz}^{(2,G)} \\ 0 & 0 & 0 \\ -A_{xz}^{(2,G)} & 0 & 0 \end{pmatrix}$$

$$A_{xz}^{(2,G)} = -Q_y$$

$$S^{(3,G)} = \begin{pmatrix} 0 & S_{1y}^{(3,G)} & 0 \\ 0 & S_{2y}^{(3,G)} & 0 \\ 0 & S_{3y}^{(3,G)} & 0 \\ S_{4x}^{(3,G)} & 0 & S_{4z}^{(3,G)} \\ 0 & S_{5y}^{(3,G)} & 0 \\ S_{6x}^{(3,G)} & 0 & S_{6z}^{(3,G)} \end{pmatrix}$$

$$S_{1y}^{(3,G)} = G_y[2] - G_y^{\alpha} - G_y^{\beta} + 2Q_{zx}[1]$$
$$S_{2y}^{(3,G)} = 2G_y[1] + G_y[2] + 2G_y^{\alpha}$$
$$S_{3y}^{(3,G)} = G_y[2] - G_y^{\alpha} + G_y^{\beta} - 2Q_{zx}[1]$$
$$S_{4x}^{(3,G)} = G_{xyz} - 3Q_u[1] - Q_v[1]$$
$$S_{4z}^{(3,G)} = G_y[1] - G_y^{\alpha} + G_y^{\beta} + Q_{zx}[1]$$
$$S_{5y}^{(3,G)} = G_{xyz} + 3Q_u[1] - Q_v[1]$$
$$S_{6x}^{(3,G)} = G_y[1] - G_y^{\alpha} - G_y^{\beta} - Q_{zx}[1]$$
$$S_{6z}^{(3,G)} = G_{xyz} + 2Q_v[1]$$

$$A^{(3,G)} = \begin{pmatrix} A^{(3,G)}_{4x} & 0 & A^{(3,G)}_{4z} \\ 0 & A^{(3,G)}_{5y} & 0 \\ A^{(3,G)}_{6x} & 0 & A^{(3,G)}_{6z} \end{pmatrix}$$

$$\begin{aligned}
A^{(3,G)}_{4x} &= Q_0 - Q_u[2] + Q_v[2] \\
A^{(3,G)}_{4z} &= -G_y[3] + Q_{zx}[2] \\
A^{(3,G)}_{5y} &= Q_0 - Q_u[2] - Q_v[2] \\
A^{(3,G)}_{6x} &= G_y[3] + Q_{zx}[2] \\
A^{(3,G)}_{6z} &= Q_0 + 2Q_u[2]
\end{aligned}$$

$$S^{(4,G)} = \begin{pmatrix} S^{(4,G)}_{11} & S^{(4,G)}_{12} & S^{(4,G)}_{13} & 0 & S^{(4,G)}_{15} & 0 \\ S^{(4,G)}_{12} & S^{(4,G)}_{22} & S^{(4,G)}_{23} & 0 & S^{(4,G)}_{25} & 0 \\ S^{(4,G)}_{13} & S^{(4,G)}_{23} & S^{(4,G)}_{33} & 0 & S^{(4,G)}_{35} & 0 \\ 0 & 0 & 0 & S^{(4,G)}_{44} & 0 & S^{(4,G)}_{46} \\ S^{(4,G)}_{15} & S^{(4,G)}_{25} & S^{(4,G)}_{35} & 0 & S^{(4,G)}_{55} & 0 \\ 0 & 0 & 0 & S^{(4,G)}_{46} & 0 & S^{(4,G)}_{66} \end{pmatrix}$$

$$\begin{aligned}
S^{(4,G)}_{11} &= G_0[1] + 2G_0[2] - G_{4u} + G_{4v} + 2G_4 - 2G_u[1] - 4G_u[2] + 2G_v[1] + 4G_v[2] \\
S^{(4,G)}_{12} &= G_0[1] + 2G_{4u} - G_4 - 2G_u[1] \\
S^{(4,G)}_{13} &= G_0[1] - G_{4u} - G_{4v} - G_4 + G_u[1] + G_v[1] \\
S^{(4,G)}_{15} &= -G^{\alpha}_{4y} - G^{\beta}_{4y} + G_{zx}[1] + 2G_{zx}[2] \\
S^{(4,G)}_{22} &= G_0[1] + 2G_0[2] - G_{4u} - G_{4v} + 2G_4 - 2G_u[1] - 4G_u[2] - 2G_v[1] - 4G_v[2] \\
S^{(4,G)}_{23} &= G_0[1] - G_{4u} + G_{4v} - G_4 + G_u[1] - G_v[1] \\
S^{(4,G)}_{25} &= 2G^{\beta}_{4y} + G_{zx}[1] \\
S^{(4,G)}_{33} &= G_0[1] + 2G_0[2] + 2G_{4u} + 2G_4 + 4G_u[1] + 8G_u[2] \\
S^{(4,G)}_{35} &= G^{\alpha}_{4y} - G^{\beta}_{4y} + G_{zx}[1] + 2G_{zx}[2] \\
S^{(4,G)}_{44} &= G_0[2] - G_{4u} + G_{4v} - G_4 + G_u[2] - G_v[2] \\
S^{(4,G)}_{46} &= 2G^{\beta}_{4y} + G_{zx}[2] \\
S^{(4,G)}_{55} &= G_0[2] - G_{4u} - G_{4v} - G_4 + G_u[2] + G_v[2] \\
S^{(4,G)}_{66} &= G_0[2] + 2G_{4u} - G_4 - 2G_u[2]
\end{aligned}$$

$$\bar{S}^{(4,G)} = \begin{pmatrix} 0 & \bar{S}^{(4,G)}_{12} & \bar{S}^{(4,G)}_{13} & 0 & \bar{S}^{(4,G)}_{15} & 0 \\ -\bar{S}^{(4,G)}_{12} & 0 & \bar{S}^{(4,G)}_{23} & 0 & \bar{S}^{(4,G)}_{25} & 0 \\ -\bar{S}^{(4,G)}_{13} & -\bar{S}^{(4,G)}_{23} & 0 & 0 & \bar{S}^{(4,G)}_{35} & 0 \\ 0 & 0 & 0 & 0 & 0 & \bar{S}^{(4,G)}_{46} \\ -\bar{S}^{(4,G)}_{15} & -\bar{S}^{(4,G)}_{25} & -\bar{S}^{(4,G)}_{35} & 0 & 0 & 0 \\ 0 & 0 & 0 & -\bar{S}^{(4,G)}_{46} & 0 & 0 \end{pmatrix}$$

$$\bar{S}_{12}^{(4,G)} = -2G_v[3] + 4Q_{xyz}[1]$$
$$\bar{S}_{13}^{(4,G)} = 3G_u[3] - G_v[3] - 4Q_{xyz}[1]$$
$$\bar{S}_{15}^{(4,G)} = G_{zx}[3] - 2Q_y[1] + 2Q_y^{\alpha}[1] + 2Q_y^{\beta}[1]$$
$$\bar{S}_{23}^{(4,G)} = 3G_u[3] + G_v[3] + 4Q_{xyz}[1]$$
$$\bar{S}_{25}^{(4,G)} = G_{zx}[3] - 4Q_y^{\beta}[1]$$
$$\bar{S}_{35}^{(4,G)} = G_{zx}[3] + 2Q_y[1] - 2Q_y^{\alpha}[1] + 2Q_y^{\beta}[1]$$
$$\bar{S}_{46}^{(4,G)} = Q_y[1] + 4Q_y^{\alpha}[1]$$

$$A^{(4,G)} = \begin{pmatrix} A_{xx}^{(4,G)} & 0 & A_{xz}^{(4,G)} \\ 0 & A_{yy}^{(4,G)} & 0 \\ A_{xz}^{(4,G)} & 0 & A_{zz}^{(4,G)} \end{pmatrix}$$

$$A_{xx}^{(4,G)} = G_0[3] - 2G_u[6] + 2G_v[6]$$
$$A_{xz}^{(4,G)} = 2G_{zx}[6]$$
$$A_{yy}^{(4,G)} = G_0[3] - 2G_u[6] - 2G_v[6]$$
$$A_{zz}^{(4,G)} = G_0[3] + 4G_u[6]$$

$$\bar{A}^{(4,G)} = \begin{pmatrix} 0 & 0 & \bar{A}_{xz}^{(4,G)} \\ 0 & 0 & 0 \\ -\bar{A}_{xz}^{(4,G)} & 0 & 0 \end{pmatrix}$$

$$\bar{A}_{xz}^{(4,G)} = -Q_y[6]$$

$$M^{(4,G)} = \begin{pmatrix} 0 & M_{1y}^{(4,G)} & 0 \\ 0 & M_{2y}^{(4,G)} & 0 \\ 0 & M_{3y}^{(4,G)} & 0 \\ M_{4x}^{(4,G)} & 0 & M_{4z}^{(4,G)} \\ 0 & M_{5y}^{(4,G)} & 0 \\ M_{6x}^{(4,G)} & 0 & M_{6z}^{(4,G)} \end{pmatrix}$$

$$M_{1y}^{(4,G)} = 2G_{zx}[4] + Q_y[3] - Q_y^{\alpha}[2] - Q_y^{\beta}[2]$$
$$M_{2y}^{(4,G)} = 2Q_y[2] + Q_y[3] + 2Q_y^{\alpha}[2]$$
$$M_{3y}^{(4,G)} = -2G_{zx}[4] + Q_y[3] - Q_y^{\alpha}[2] + Q_y^{\beta}[2]$$
$$M_{4x}^{(4,G)} = -3G_u[4] - G_v[4] + Q_{xyz}[2]$$
$$M_{4z}^{(4,G)} = G_{zx}[4] + Q_y[2] - Q_y^{\alpha}[2] + Q_y^{\beta}[2]$$
$$M_{5y}^{(4,G)} = 3G_u[4] - G_v[4] + Q_{xyz}[2]$$
$$M_{6x}^{(4,G)} = -G_{zx}[4] + Q_y[2] - Q_y^{\alpha}[2] - Q_y^{\beta}[2]$$
$$M_{6z}^{(4,G)} = 2G_v[4] + Q_{xyz}[2]$$

$$\bar{M}^{(4,G)} = \begin{pmatrix} 0 & 0 & 0 & \bar{M}_{x4}^{(4,G)} & 0 & \bar{M}_{x6}^{(4,G)} \\ \bar{M}_{y1}^{(4,G)} & \bar{M}_{y2}^{(4,G)} & \bar{M}_{y3}^{(4,G)} & 0 & \bar{M}_{y5}^{(4,G)} & 0 \\ 0 & 0 & 0 & \bar{M}_{z4}^{(4,G)} & 0 & \bar{M}_{z6}^{(4,G)} \end{pmatrix}$$

$$\bar{M}_{x4}^{(4,G)} = -3G_u[5] - G_v[5] + Q_{xyz}[3]$$
$$\bar{M}_{x6}^{(4,G)} = -G_{zx}[5] + Q_y[4] - Q_y^{\alpha}[3] - Q_y^{\beta}[3]$$
$$\bar{M}_{y1}^{(4,G)} = 2G_{zx}[5] + Q_y[5] - Q_y^{\alpha}[3] - Q_y^{\beta}[3]$$
$$\bar{M}_{y2}^{(4,G)} = 2Q_y[4] + Q_y[5] + 2Q_y^{\alpha}[3]$$
$$\bar{M}_{y3}^{(4,G)} = -2G_{zx}[5] + Q_y[5] - Q_y^{\alpha}[3] + Q_y^{\beta}[3]$$
$$\bar{M}_{y5}^{(4,G)} = 3G_u[5] - G_v[5] + Q_{xyz}[3]$$
$$\bar{M}_{z4}^{(4,G)} = G_{zx}[5] + Q_y[4] - Q_y^{\alpha}[3] + Q_y^{\beta}[3]$$
$$\bar{M}_{z6}^{(4,G)} = 2G_v[5] + Q_{xyz}[3]$$