Response Tensors up to 4th rank in T

— polar tensors —

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

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

$$S^{(2,Q)} = \begin{pmatrix} S^{(2,Q)}_{xx} & 0 & 0 \\ 0 & S^{(2,Q)}_{xx} & 0 \\ 0 & 0 & S^{(2,Q)}_{xx} \end{pmatrix}$$

$$S^{(2,Q)}_{xx} = Q_0$$

$$S^{(3,Q)} = \begin{pmatrix} 0 & 0 & 0 \\ 0 & 0 & 0 \\ 0 & 0 & 0 \\ S^{(3,Q)}_{4x} & 0 & 0 \\ 0 & S^{(3,Q)}_{4x} & 0 \\ 0 & 0 & S^{(3,Q)}_{4x} \end{pmatrix}$$

$$S^{(3,Q)}_{4x} = Q_{xyz}$$

$$A^{(3,Q)} = \begin{pmatrix} A^{(3,Q)}_{4x} & 0 & 0 \\ 0 & A^{(3,Q)}_{4x} & 0 \\ 0 & 0 & A^{(3,Q)}_{4x} \end{pmatrix}$$

$$A^{(3,Q)}_{4x} = G_0$$

$$S^{(4,Q)} = \begin{pmatrix} S^{(4,Q)}_{11} & S^{(4,Q)}_{12} & S^{(4,Q)}_{12} & 0 & 0 & 0 \\ S^{(4,Q)}_{12} & S^{(4,Q)}_{11} & S^{(4,Q)}_{12} & 0 & 0 & 0 \\ S^{(4,Q)}_{12} & S^{(4,Q)}_{12} & S^{(4,Q)}_{11} & 0 & 0 & 0 \\ 0 & 0 & 0 & S^{(4,Q)}_{44} & 0 & 0 \\ 0 & 0 & 0 & 0 & S^{(4,Q)}_{44} & 0 \\ 0 & 0 & 0 & 0 & 0 & S^{(4,Q)}_{44} \end{pmatrix}$$

$$S^{(4,Q)}_{11} = Q_0[1] + 2Q_0[2] + 2Q_4$$
$$S^{(4,Q)}_{12} = Q_0[1] - Q_4$$
$$S^{(4,Q)}_{44} = Q_0[2] - Q_4$$

$$\bar{S}^{(4,Q)} = \begin{pmatrix} 0 & \bar{S}^{(4,Q)}_{12} & -\bar{S}^{(4,Q)}_{12} & 0 & 0 & 0 \\ -\bar{S}^{(4,Q)}_{12} & 0 & \bar{S}^{(4,Q)}_{12} & 0 & 0 & 0 \\ \bar{S}^{(4,Q)}_{12} & -\bar{S}^{(4,Q)}_{12} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 \end{pmatrix}$$

$$\bar{S}_{12}^{(4,Q)} = 4G_{xyz}[1]$$

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

$$A_{xx}^{(4,Q)} = Q_0[3]$$

$$M^{(4,Q)} = \begin{pmatrix} 0 & 0 & 0 \\ 0 & 0 & 0 \\ 0 & 0 & 0 \\ M_{4x}^{(4,Q)} & 0 & 0 \\ 0 & M_{4x}^{(4,Q)} & 0 \\ 0 & 0 & M_{4x}^{(4,Q)} \end{pmatrix}$$

$$M_{4x}^{(4,Q)} = G_{xyz}[2]$$

$$\bar{M}^{(4,Q)} = \begin{pmatrix} 0 & 0 & 0 & \bar{M}_{x4}^{(4,Q)} & 0 & 0 \\ 0 & 0 & 0 & 0 & \bar{M}_{x4}^{(4,Q)} & 0 \\ 0 & 0 & 0 & 0 & 0 & \bar{M}_{x4}^{(4,Q)} \end{pmatrix}$$

$$\bar{M}_{x4}^{(4,Q)} = G_{xyz}[3]$$

— axial tensors —

$$C^{(0,G)} = \left(C^{(0,G)}\right)$$

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

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

$$S_{xx}^{(2,G)} = G_0$$

$$S^{(3,G)} = \begin{pmatrix} 0 & 0 & 0 \\ 0 & 0 & 0 \\ 0 & 0 & 0 \\ S_{4x}^{(3,G)} & 0 & 0 \\ 0 & S_{4x}^{(3,G)} & 0 \\ 0 & 0 & S_{4x}^{(3,G)} \end{pmatrix}$$

$$S_{4x}^{(3,G)} = G_{xyz}$$

$$A^{(3,G)} = \begin{pmatrix} A_{4x}^{(3,G)} & 0 & 0 \\ 0 & A_{4x}^{(3,G)} & 0 \\ 0 & 0 & A_{4x}^{(3,G)} \end{pmatrix}$$

$$A_{4x}^{(3,G)} = Q_0$$

$$S^{(4,G)} = \begin{pmatrix} S_{11}^{(4,G)} & S_{12}^{(4,G)} & S_{12}^{(4,G)} & 0 & 0 & 0 \\ S_{12}^{(4,G)} & S_{11}^{(4,G)} & S_{12}^{(4,G)} & 0 & 0 & 0 \\ S_{12}^{(4,G)} & S_{12}^{(4,G)} & S_{11}^{(4,G)} & 0 & 0 & 0 \\ 0 & 0 & 0 & S_{44}^{(4,G)} & 0 & 0 \\ 0 & 0 & 0 & 0 & S_{44}^{(4,G)} & 0 \\ 0 & 0 & 0 & 0 & 0 & S_{44}^{(4,G)} \end{pmatrix}$$

$$S_{11}^{(4,G)} = G_0[1] + 2G_0[2] + 2G_4$$
$$S_{12}^{(4,G)} = G_0[1] - G_4$$
$$S_{44}^{(4,G)} = G_0[2] - G_4$$

$$\bar{S}^{(4,G)} = \begin{pmatrix} 0 & \bar{S}_{12}^{(4,G)} & -\bar{S}_{12}^{(4,G)} & 0 & 0 & 0 \\ -\bar{S}_{12}^{(4,G)} & 0 & \bar{S}_{12}^{(4,G)} & 0 & 0 & 0 \\ \bar{S}_{12}^{(4,G)} & -\bar{S}_{12}^{(4,G)} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 \end{pmatrix}$$

$$\bar{S}_{12}^{(4,G)} = 4Q_{xyz}[1]$$

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

$$A_{xx}^{(4,G)} = G_0[3]$$

$$M^{(4,G)} = \begin{pmatrix} 0 & 0 & 0 \\ 0 & 0 & 0 \\ 0 & 0 & 0 \\ M_{4x}^{(4,G)} & 0 & 0 \\ 0 & M_{4x}^{(4,G)} & 0 \\ 0 & 0 & M_{4x}^{(4,G)} \end{pmatrix}$$

$$M_{4x}^{(4,G)} = Q_{xyz}[2]$$

$$\bar{M}^{(4,G)} = \begin{pmatrix} 0 & 0 & 0 & \bar{M}_{x4}^{(4,G)} & 0 & 0 \\ 0 & 0 & 0 & 0 & \bar{M}_{x4}^{(4,G)} & 0 \\ 0 & 0 & 0 & 0 & 0 & \bar{M}_{x4}^{(4,G)} \end{pmatrix}$$

$$\bar{M}_{x4}^{(4,G)} = Q_{xyz}[3]$$