

\* Rank 0 tensor.

$$[M]$$

$$M = M_s^{(1)}$$

\* Rank 1 tensor.

$$[0 \ 0 \ M_z]$$

$$M_z = M_{pz}^{(1)}$$

\* Rank 2 tensor (s).

$$\begin{bmatrix} M_{xx} & 0 & 0 \\ 0 & M_{xx} & 0 \\ 0 & 0 & M_{zz} \end{bmatrix}$$

$$M_{xx} = -M_{du}^{(1)} + M_s^{(1)}$$

$$M_{zz} = 2M_{du}^{(1)} + M_s^{(1)}$$

\* Rank 2 tensor (a).

$$\begin{bmatrix} 0 & M_{xy} & 0 \\ -M_{xy} & 0 & 0 \\ 0 & 0 & 0 \end{bmatrix}$$

$$M_{xy} = T_{pz}^{(1)}$$

\* Rank 3 tensor (s).

$$\begin{bmatrix} 0 & 0 & M_{xxz} \\ 0 & 0 & M_{xxz} \\ 0 & 0 & M_{zzz} \\ M_{yzz} & M_{yzy} & 0 \\ M_{yzy} & -M_{yzz} & 0 \\ 0 & 0 & 0 \end{bmatrix}$$

$$M_{xxz} = -M_{faz}^{(1)} + M_{pz}^{(1)}$$

$$M_{zzz} = 2M_{faz}^{(1)} + M_{pz}^{(1)} + 2M_{pz}^{(2)}$$

$$M_{yzz} = -3T_{du}^{(1)}$$

$$M_{yzy} = -M_{faz}^{(1)} + M_{pz}^{(2)}$$

\* Rank 3 tensor (a).

$$\begin{bmatrix} M_{yzz} & M_{yzy} & 0 \\ -M_{yzy} & M_{yzz} & 0 \\ 0 & 0 & M_{xyz} \end{bmatrix}$$

$$M_{yzz} = -T_{du}^{(2)} + T_s^{(1)}$$

$$M_{yzy} = M_{pz}^{(3)}$$

$$M_{xyz} = 2T_{du}^{(2)} + T_s^{(1)}$$

\* Rank 4 tensor (sss).

$$\begin{bmatrix} M_{xxxx} & M_{xxyy} & M_{xxzz} & 0 & 0 & 0 \\ M_{xxyy} & M_{xxxx} & M_{xxzz} & 0 & 0 & 0 \\ M_{xxzz} & M_{xxzz} & M_{zzzz} & 0 & 0 & 0 \\ 0 & 0 & 0 & M_{yzyz} & 0 & 0 \\ 0 & 0 & 0 & 0 & M_{yzyz} & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{M_{xxxx}}{2} - \frac{M_{xxyy}}{2} \end{bmatrix}$$

$$M_{xxxx} = -2M_{du}^{(1)} - 4M_{du}^{(2)} + 3M_{g0}^{(1)} + M_s^{(1)} + 2M_s^{(2)}$$

$$M_{xxyy} = -2M_{du}^{(1)} + M_{g0}^{(1)} + M_s^{(1)}$$

$$M_{xxzz} = M_{du}^{(1)} - 4M_{g0}^{(1)} + M_s^{(1)}$$

$$M_{zzzz} = 4M_{du}^{(1)} + 8M_{du}^{(2)} + 8M_{g0}^{(1)} + M_s^{(1)} + 2M_s^{(2)}$$

$$M_{yzyz} = M_{du}^{(2)} - 4M_{g0}^{(1)} + M_s^{(2)}$$

\* Rank 4 tensor (ssa).

$$\begin{bmatrix} 0 & 0 & M_{xxzz} & 0 & 0 & M_{xxyy} \\ 0 & 0 & M_{xxzz} & 0 & 0 & -M_{xxxz} \\ -M_{xxzz} & -M_{xxzz} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & M_{yzzx} & 0 \\ 0 & 0 & 0 & -M_{yzzx} & 0 & 0 \\ -M_{xxxz} & M_{xxxz} & 0 & 0 & 0 & 0 \end{bmatrix}$$

$$M_{xxzz} = 3M_{du}^{(3)}$$

$$M_{xxxz} = -2T_{faz}^{(1)} + 2T_{pz}^{(1)}$$

$$M_{yzzx} = -4T_{faz}^{(1)} - T_{pz}^{(1)}$$

\* Rank 4 tensor (aas).

$$\begin{bmatrix} M_{yzyz} & 0 & 0 \\ 0 & M_{yzyz} & 0 \\ 0 & 0 & M_{xyxy} \end{bmatrix}$$

$$M_{yzyz} = -2M_{du}^{(4)} + M_s^{(3)}$$

$$M_{xyxy} = 4M_{du}^{(4)} + M_s^{(3)}$$

\* Rank 4 tensor (aaa).

$$\begin{bmatrix} 0 & M_{yzzx} & 0 \\ -M_{yzzx} & 0 & 0 \\ 0 & 0 & 0 \end{bmatrix}$$

$$M_{yzzx} = -T_{pz}^{(2)}$$

\* Rank 4 tensor (sa).

$$\begin{bmatrix} 0 & 0 & M_{xxxz} \\ 0 & 0 & M_{xxxz} \\ 0 & 0 & M_{zzxy} \\ M_{yzyz} & M_{yzzx} & 0 \\ M_{yzzx} & -M_{yzyz} & 0 \\ 0 & 0 & 0 \end{bmatrix}$$

$$M_{xxxz} = -T_{faz}^{(2)} + T_{pz}^{(3)}$$

$$M_{zzxy} = 2T_{faz}^{(2)} + T_{pz}^{(3)} + 2T_{pz}^{(4)}$$

$$M_{yzyz} = -3M_{du}^{(5)}$$

$$M_{yzzx} = -T_{faz}^{(2)} + T_{pz}^{(4)}$$

\* Rank 4 tensor (as).

$$\begin{bmatrix} 0 & 0 & 0 & M_{yzyz} & M_{yzxx} & 0 \\ 0 & 0 & 0 & M_{yzxx} & -M_{yzyz} & 0 \\ M_{xyxx} & M_{xyxx} & M_{xyzz} & 0 & 0 & 0 \end{bmatrix}$$

$$M_{yzyz} = -3M_{du}^{(6)}$$

$$M_{yzxx} = -T_{faz}^{(3)} + T_{pz}^{(6)}$$

$$M_{xyxx} = -T_{faz}^{(3)} + T_{pz}^{(5)}$$

$$M_{xyzz} = 2T_{faz}^{(3)} + T_{pz}^{(5)} + 2T_{pz}^{(6)}$$

\* Rank 4 tensor (s).

$$\begin{bmatrix} M_{xxxx} & M_{xxyy} & M_{xxzz} & 0 & 0 & M_{xxxz} & 0 & 0 & M_{xxxy} \\ M_{xxyy} & M_{xxxx} & M_{xzzz} & 0 & 0 & -M_{xxyx} & 0 & 0 & -M_{xxxz} \\ M_{zzxx} & M_{zzxx} & M_{zzzz} & 0 & 0 & M_{zzxy} & 0 & 0 & -M_{zzxy} \\ 0 & 0 & 0 & M_{yzyz} & M_{yzxx} & 0 & M_{yzyz} & M_{yzxx} & 0 \\ 0 & 0 & 0 & -M_{yzxx} & M_{yzyz} & 0 & -M_{yzyz} & M_{yzxy} & 0 \\ -\frac{M_{xxxx}}{2} - \frac{M_{xxyy}}{2} & \frac{M_{xxyy}}{2} + \frac{M_{xxxy}}{2} & 0 & 0 & 0 & \frac{M_{xxxx}}{2} - \frac{M_{xxyy}}{2} & 0 & 0 & \frac{M_{xxxx}}{2} - \frac{M_{xxyy}}{2} \end{bmatrix}$$

$$M_{xxxx} = -2M_{du}^{(1)} - 4M_{du}^{(2)} + 3M_{g0}^{(1)} + M_s^{(1)} + 2M_s^{(2)}$$

$$M_{xxyy} = -2M_{du}^{(1)} + M_{g0}^{(1)} + M_s^{(1)}$$

$$M_{xxzz} = M_{du}^{(1)} + 3M_{du}^{(3)} - 4M_{g0}^{(1)} + M_s^{(1)}$$

$$M_{xxxz} = -2T_{faz}^{(1)} - T_{faz}^{(2)} + 2T_{pz}^{(1)} + T_{pz}^{(3)}$$

$$M_{xxxy} = -2T_{faz}^{(1)} + T_{faz}^{(2)} + 2T_{pz}^{(1)} - T_{pz}^{(3)}$$

$$M_{zzxx} = M_{du}^{(1)} - 3M_{du}^{(3)} - 4M_{g0}^{(1)} + M_s^{(1)}$$

$$M_{zzzz} = 4M_{du}^{(1)} + 8M_{du}^{(2)} + 8M_{g0}^{(1)} + M_s^{(1)} + 2M_s^{(2)}$$

$$M_{zzxy} = 2T_{faz}^{(2)} + T_{pz}^{(3)} + 2T_{pz}^{(4)}$$

$$M_{yzyz} = M_{du}^{(2)} - 3M_{du}^{(5)} - 4M_{g0}^{(1)} + M_s^{(2)}$$

$$M_{yzzx} = -4T_{faz}^{(1)} - T_{faz}^{(2)} - T_{pz}^{(1)} + T_{pz}^{(4)}$$

$$M_{yzyy} = M_{du}^{(2)} + 3M_{du}^{(5)} - 4M_{g0}^{(1)} + M_s^{(2)}$$

$$M_{yzxz} = -4T_{faz}^{(1)} + T_{faz}^{(2)} - T_{pz}^{(1)} - T_{pz}^{(4)}$$

\* Rank 4 tensor (a).

$$\begin{bmatrix} 0 & 0 & 0 & M_{yzyz} & M_{yzxx} & 0 & M_{yzyy} & M_{yzxz} & 0 \\ 0 & 0 & 0 & M_{yzxx} & -M_{yzyy} & 0 & M_{yzzz} & -M_{yzyz} & 0 \\ M_{xyxx} & M_{xyxx} & M_{xyzz} & 0 & 0 & M_{xyxy} & 0 & 0 & -M_{xyxy} \end{bmatrix}$$

$$M_{yzyz} = -2M_{du}^{(4)} - 3M_{du}^{(6)} + M_s^{(3)}$$

$$M_{yzxx} = -T_{faz}^{(3)} - T_{pz}^{(2)} + T_{pz}^{(6)}$$

$$M_{yzyy} = 2M_{du}^{(4)} - 3M_{du}^{(6)} - M_s^{(3)}$$

$$M_{yzxz} = -T_{faz}^{(3)} + T_{pz}^{(2)} + T_{pz}^{(6)}$$

$$M_{xyxx} = -T_{faz}^{(3)} + T_{pz}^{(5)}$$

$$M_{xyzz} = 2T_{faz}^{(3)} + T_{pz}^{(5)} + 2T_{pz}^{(6)}$$

$$M_{xyxy} = 4M_{du}^{(4)} + M_s^{(3)}$$

\* Rank 4 tensor (t).

$$\begin{bmatrix} M_{xxxx} & 0 & 0 \\ 0 & M_{xxxx} & 0 \\ 0 & 0 & M_{zzzz} \\ 0 & 0 & M_{yyzz} \\ M_{zzxx} & 0 & 0 \\ 0 & M_{xxyy} & 0 \\ 0 & M_{yzyz} & 0 \\ 0 & 0 & -\frac{M_{xxxx}}{2} + \frac{3M_{xxyy}}{2} + M_{yyzz} - M_{yzyz} + M_{zzxx} \\ \frac{M_{xxxx}}{2} - \frac{M_{xxyy}}{2} & 0 & 0 \\ 0 & 0 & 0 \end{bmatrix}$$

$$M_{xxxx} = -2M_{du}^{(1)} - 4M_{du}^{(2)} + 3M_{g0}^{(1)} + 3M_s^{(1)}$$

$$M_{zzzz} = 4M_{du}^{(1)} + 8M_{du}^{(2)} + 8M_{g0}^{(1)} + 3M_s^{(1)}$$

$$M_{yyzz} = M_{du}^{(1)} + 3M_{du}^{(3)} - 4M_{g0}^{(1)} + M_s^{(1)}$$

$$M_{zzxx} = M_{du}^{(1)} - 3M_{du}^{(3)} - 4M_{g0}^{(1)} + M_s^{(1)}$$

$$M_{xxyy} = -2M_{du}^{(1)} + M_{g0}^{(1)} + M_s^{(1)}$$

$$M_{yzyz} = M_{du}^{(2)} + 3M_{du}^{(5)} - 4M_{g0}^{(1)} + M_s^{(1)}$$