

¹ **I. PHOTON SCATTERING OFF NUCLEI**

² *a. September 12, 2019* When

3 II. FORMULAS AND CONSTANTS

(Wigner) 3- j symbol:
$$\begin{pmatrix} L & S & J \\ m_l & m_s & -m_j \end{pmatrix} = (-1)^{L-S+m_j} (2J+1)^{-\frac{1}{2}} (Lm_l \ Sm_s \mid LS \ Jm_j) \quad (1)$$

Matrix for single-axis rotation:
$$\begin{aligned} \mathcal{D}_{m',m}^{(j)}(0 \ \beta \ 0) &\equiv d_{m',m}^{(j)}(\beta) \\ &= \left[\frac{(j+m')!(j-m')!}{(j+m)!(j-m)!} \right]^{\frac{1}{2}} \\ &\quad \cdot \sum_{\sigma} \begin{pmatrix} j+m \\ j-m'-\sigma \end{pmatrix} \begin{pmatrix} j-m \\ \sigma \end{pmatrix} (-1)^{j-m'-\sigma} \\ &\quad \cdot \left(\cos \frac{\beta}{2} \right)^{2\sigma+m+m'} \left(\sin \frac{\beta}{2} \right)^{2j-2\sigma-m-m'} \end{aligned} \quad (2)$$