

$I \rightarrow$ total angular momentum

c.f. \rightarrow coordinate frame

$M \rightarrow$ the projection of I onto I_z

$\alpha \rightarrow$ additional q.n. describing properties independent of orientation of the c.f.

$K' \rightarrow R(K)$

$$R_z(\chi) |\varphi\rangle_K = |\varphi\rangle_{K'}$$

$$\Rightarrow |\alpha I M'\rangle_{K'} = \sum_M |\alpha I M\rangle_K \langle I M | e^{-i\chi \cdot I} | I M'\rangle$$

$$\sum_M |\alpha I M\rangle_K \langle \alpha I I | = \underline{1}$$