Addition of angular momentum

Review from 37-3 lecture

(*) Based on the previous calculations for each individual axis S_x, S_y, S_z [spin of every axis]

$$S_x = \frac{\hbar}{2}\begin{bmatrix} 0 & 1 \\ 1 & 0 \end{bmatrix} \quad S_y = \frac{\hbar}{2}\begin{bmatrix} 0 & -i \\ i & 0 \end{bmatrix} \quad S_z = \frac{\hbar}{2}\begin{bmatrix} 1 & 0 \\ 0 & -1 \end{bmatrix}$$

eigen function

Simply put

$\vec{S} = \frac{\hbar}{2}\vec{\sigma}$ → eigen function

eigen value

$\vec{S} = \frac{\hbar}{2}|\sigma_x\rangle$ → eigen function for spin value x axis

$\frac{\hbar}{2}|\sigma_y\rangle$

$\frac{\hbar}{2}\sigma_z$

Pauli spin metrices