Clase 4

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February 20, 2024

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$$|m_1 m_2\rangle = \sum_{j=|j_1-j_2|}^{j_1+j_2} \sum_{m=j} |jm\rangle \langle jm|m_1 m_2\rangle$$

$$|jm\rangle = \sum_{m_1=-\frac{1}{2}}^{\frac{1}{2}} \sum_{m_2=-\frac{1}{2}}^{\frac{1}{2}} |m_1 m_2\rangle \langle m_1 m_2|jm\rangle$$

Tenemos que $\langle jm|m_1 m_2\rangle \neq 0$ sii $m = m_1 + m_2$ y $\langle jm|m_1 m_2\rangle$ si $m \neq m_1 + m_2$

$$|jm\rangle = \{|00\rangle, |11\rangle, |10\rangle, |1\ -1\rangle\}$$

$$|m_1 m_2\rangle = \left\{ \left|\frac{1}{2}\frac{1}{2}\right\rangle, \left|\frac{1}{2}\ -\frac{1}{2}\right\rangle, \left|-\frac{1}{2}\frac{1}{2}\right\rangle, \left|-\frac{1}{2}\ -\frac{1}{2}\right\rangle \right\}$$

$$\left\langle 11 \left| \frac{1}{2}\frac{1}{2} \right\rangle \neq 0 \qquad \langle 11|\times\times\rangle = 0$$

$$\left\langle 1\ -1 \left| -\frac{1}{2}\ -\frac{1}{2} \right\rangle \neq 0 \qquad \langle 1\ -1|\times\times\rangle = 0$$

Entonces

$$|jm\rangle = \{|00\rangle, |10\rangle\} \qquad |m_1 m_2\rangle = \left\{ \left|\frac{1}{2}\ -\frac{1}{2}\right\rangle, \left|-\frac{1}{2}\frac{1}{2}\right\rangle \right\}$$

$$\begin{bmatrix} |00\rangle \\ |10\rangle \end{bmatrix} = \begin{bmatrix} ? & ? \\ ? & ? \end{bmatrix} \begin{bmatrix} \left|\frac{1}{2}\ -\frac{1}{2}\right\rangle \\ \left|-\frac{1}{2}\ \frac{1}{2}\right\rangle \end{bmatrix}$$

$$\text{Unitario 2x2 real } \rightarrow \begin{bmatrix} \cos\alpha & -\sin\alpha \\ \sin\alpha & \cos\alpha \end{bmatrix} \quad \alpha = \frac{\pi}{4}$$

$$|00\rangle = \frac{1}{\sqrt{2}} \left(\left|\frac{1}{2}\ -\frac{1}{2}\right\rangle - \left|-\frac{1}{2}\ \frac{1}{2}\right\rangle \right)$$

$$|10\rangle = \frac{1}{\sqrt{2}} \left(\left|\frac{1}{2}\ -\frac{1}{2}\right\rangle + \left|-\frac{1}{2}\ \frac{1}{2}\right\rangle \right)$$