

Homework 11 (10 points)

1. Obtain the explicit form of the generators of rotation in spin half space. Obtain also the eigenstates and eigenvalues of S^2 and S_z operators.

2. Show that L and S will not commute with $L \cdot S$ term, while $J = L + S$ will commute.

3. Express χ_{j,m_j} through ψ_{l,m_l,s,m_s} for $l = 0$ and spin = $1/2$ case.

4. Express χ_{j,m_j} through ψ_{l,m_l,s,m_s} for a system consisting of two composite particles with $s = 1/2$.

5. Express χ_{j,m_j} through ψ_{l,m_l,s,m_s} for a system consisting of $s = 1/2$ and $l = 1$.