

For spin  $\frac{5}{2}$  system:

$$J_x = \begin{pmatrix} 0 & \frac{\sqrt{5}}{2} & 0 & 0 & 0 & 0 \\ \frac{\sqrt{5}}{2} & 0 & \sqrt{2} & 0 & 0 & 0 \\ 0 & \sqrt{2} & 0 & \frac{3}{2} & 0 & 0 \\ 0 & 0 & \frac{3}{2} & 0 & \sqrt{2} & 0 \\ 0 & 0 & 0 & \sqrt{2} & 0 & \frac{\sqrt{5}}{2} \\ 0 & 0 & 0 & 0 & \frac{\sqrt{5}}{2} & 0 \end{pmatrix} \quad (1)$$

$$J_y = \begin{pmatrix} 0 & -\frac{\sqrt{5}}{2}i & 0 & 0 & 0 & 0 \\ \frac{\sqrt{5}}{2}i & 0 & -\sqrt{2}i & 0 & 0 & 0 \\ 0 & \sqrt{2}i & 0 & -\frac{3}{2}i & 0 & 0 \\ 0 & 0 & \frac{3}{2}i & 0 & -\sqrt{2}i & 0 \\ 0 & 0 & 0 & \sqrt{2}i & 0 & -\frac{\sqrt{5}}{2}i \\ 0 & 0 & 0 & 0 & \frac{\sqrt{5}}{2}i & 0 \end{pmatrix} \quad (2)$$

$$J_z = \begin{pmatrix} \frac{5}{2} & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{3}{2} & 0 & 0 & 0 & 0 \\ 0 & 0 & \frac{1}{2} & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{1}{2} & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{3}{2} & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{5}{2} \end{pmatrix} \quad (3)$$