

28th Eigenvector

$$N_e = 3 \quad s = \frac{1}{2} \quad m_s = -\frac{1}{2}$$

Irred. Representation : $\Gamma_{3,1}$

$$E_{28} = \frac{A_8}{3}$$

$$\begin{aligned} |\Psi_{28}\rangle &= |3, \frac{1}{2}, -\frac{1}{2}, \Gamma_{3,1}\rangle \\ &= C_{28,1} (|02d\rangle - |0d2\rangle) \\ &+ C_{28,2} (|20d\rangle - |2d0\rangle) \\ &+ C_{28,3} (|d02\rangle - |d20\rangle) \\ &+ C_{28,4} (|ddu\rangle + |dud\rangle) \\ &+ C_{28,5} (|udd\rangle) \end{aligned}$$

$$\begin{aligned} C_{28-1} &= \frac{t(-J + 3t - U)}{\sqrt{6}} \\ &+ \left(\frac{t \left(\sqrt{3}(W - U) + \left(\sqrt{3} \cos(\theta_1) + 3 \sin(\theta_1) \right) \sqrt{A_2} \right)}{3\sqrt{2}} \right) \end{aligned}$$

$$\begin{aligned} C_{28-2} &= -\frac{t(J + 3t + U)}{\sqrt{6}} \\ &+ \left(\frac{t \left(\sqrt{3}(W - U) + \left(\sqrt{3} \cos(\theta_1) + 3 \sin(\theta_1) \right) \sqrt{A_2} \right)}{3\sqrt{2}} \right) \end{aligned}$$

$$C_{28-3} = -\sqrt{6}t^2$$

$$C_{28-4} = -\frac{-3t^2 + (U + 2W)^2 + \frac{A_8^2}{9} - \frac{2}{3}(U + 2W)A_8}{\sqrt{6}}$$

$$C_{28-5} = \sqrt{\frac{2}{3}} \left(-3t^2 + (U + 2W)^2 + \frac{A_8^2}{9} - \frac{2}{3}(U + 2W)A_8 \right)$$

$$N_{28} = \sqrt{2C_{28,1}^2 + 2C_{28,2}^2 + 2C_{28,3}^2 + 2C_{28,4}^2 + C_{28,5}^2}$$