

30th Eigenvector

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

Irred. Representation : $\Gamma_{3,2}$

$$E_{30} = \frac{1}{3} \left(-J + 2U + 7W - 2 \cos(\theta_1) \sqrt{A_2} \right)$$

$$\begin{aligned} |\Psi_{30}\rangle &= \left| 3, \frac{1}{2}, -\frac{1}{2}, \Gamma_{3,2} \right\rangle \\ &= C_{30,1} (|02d\rangle + |0d2\rangle) \\ &+ C_{30,2} (|20d\rangle + |2d0\rangle) \\ &+ C_{30,3} (|d02\rangle + |d20\rangle) \\ &+ C_{30,4} (|ddu\rangle - |dud\rangle) \end{aligned}$$

$$C_{30-1} = -\frac{1}{6}t \left(-2J + 9t - 2U + 2W + 2 \cos(\theta_1) \sqrt{A_2} \right)$$

$$\begin{aligned} C_{30-2} &= \frac{1}{6} \left(J^2 - 4tJ - 6WJ + 9t^2 + 2U^2 - 4tU + 4tW \right) \\ &+ \left(\frac{1}{18} \left(-A_6^2 + 3W(4t + 8U + 17W) + 6(J + 2t - U - 5W) \cos(\theta_1) \sqrt{A_2} \right) \right) \end{aligned}$$

$$\begin{aligned} C_{30-3} &= \frac{1}{6} \left(-J^2 + 2(t + 3W)J - 2 \left(U^2 + t(W - U) \right) \right) \\ &+ \left(\frac{1}{18} \left(A_6^2 - 3W(2t + 8U + 17W) - 6(J + t - U - 5W) \cos(\theta_1) \sqrt{A_2} \right) \right) \end{aligned}$$

$$C_{30-4} = -\frac{1}{2}t \left(-J + 3t - U + W - 2 \cos(\theta_1) \sqrt{A_2} \right)$$

$$N_{30} = \sqrt{2} \sqrt{C_{30,1}^2 + C_{30,2}^2 + C_{30,3}^2 + C_{30,4}^2}$$