

48th Eigenvector

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

Irred. Representation : $\Gamma_{4,1}$

$$E_{48} = \frac{1}{3} \left(-J + 3t + 2U + 14W - 2 \cos(\theta_4) \sqrt{A_5} \right)$$

$$\begin{aligned} |\Psi_{48}\rangle &= \left| 3, \frac{1}{2}, -\frac{1}{2}, \Gamma_{4,1} \right\rangle \\ &= C_{48,1} (|002d\rangle + |00d2\rangle - |2d00\rangle - |d200\rangle) \\ &+ C_{48,2} (|020d\rangle + |02d0\rangle - |0d02\rangle - |0d20\rangle + |200d\rangle + |20d0\rangle - |d002\rangle - |d020\rangle) \\ &+ C_{48,3} (|0ddu\rangle - |0dud\rangle + |d0du\rangle - |d0ud\rangle - |du0d\rangle - |dud0\rangle + |ud0d\rangle + |udd0\rangle) \end{aligned}$$

$$C_{48-1} = -\frac{t(J + 12t + U - 2W + 2 \cos(\theta_4) \sqrt{A_5})}{3\sqrt{2}}$$

$$C_{48-2} = \frac{t(-J + 4t - U + 2W - 2 \cos(\theta_4) \sqrt{A_5})}{2\sqrt{2}}$$

$$C_{48-3} = \frac{-15t^2 - 5Ut - U^2 + J(t + 2U + 8W)}{6\sqrt{2}}$$

$$+ \left(\frac{A_{19}^2 + 6(4J - 13t - 10U - 32W)W + 6(t + 2U + 8W) \cos(\theta_4) \sqrt{A_5}}{18\sqrt{2}} \right)$$

$$N_{48} = 2\sqrt{C_{48,1}^2 + 2(C_{48,2}^2 + C_{48,3}^2)}$$