

## 178<sup>th</sup> Eigenvector

$$N_e = 5 \quad s = \frac{1}{2} \quad m_s = -\frac{1}{2}$$

Irred. Representation :  $\Gamma_{4,2}$

$$E_{178} = \frac{1}{3} \left( -J - 3t + 5U + 50W + \left( \cos(\theta_5) + \sqrt{3} \sin(\theta_5) \right) \sqrt{A_6} \right)$$

$$\begin{aligned} |\Psi_{178}\rangle &= \left| 5, \frac{1}{2}, -\frac{1}{2}, \Gamma_{4,2} \right\rangle \\ &= C_{178,1} (|022d\rangle - |20d2\rangle - |2d02\rangle + |d220\rangle) \\ &+ C_{178,2} (|02d2\rangle + |0d22\rangle - |202d\rangle - |220d\rangle + |22d0\rangle + |2d20\rangle - |d022\rangle - |d202\rangle) \\ &+ C_{178,3} (|2dud\rangle - |2udd\rangle + |d2du\rangle + |dd2u\rangle + |ddu2\rangle - |dud2\rangle - |u2dd\rangle - |ud2d\rangle) \end{aligned}$$

$$\begin{aligned} C_{178-1} &= \frac{1}{6} \left( J^2 + (t - 2(U + 18W))J + 27t^2 + 9U^2 - 11tU - 98tW + 164UW \right) \\ &+ \left( \frac{1}{18} \left( -A_{24}^2 + 12W(41U + 209W) - 3(J + 4t - 3U - 34W) \left( \cos(\theta_5) + \sqrt{3} \sin(\theta_5) \right) \sqrt{A_6} \right) \right) \end{aligned}$$

$$\begin{aligned} C_{178-2} &= \frac{1}{3} t (J + 6t + U) \\ &+ \left( \frac{1}{6} t \left( 2(U - 2W) + \left( \cos(\theta_5) + \sqrt{3} \sin(\theta_5) \right) \sqrt{A_6} \right) \right) \end{aligned}$$

$$\begin{aligned} C_{178-3} &= \frac{1}{6} t (-J + 12t - U) \\ &+ \left( \frac{1}{6} t \left( -U + 2W + \left( \cos(\theta_5) + \sqrt{3} \sin(\theta_5) \right) \sqrt{A_6} \right) \right) \end{aligned}$$

$$N_{178} = 2 \sqrt{C_{178,1}^2 + 2(C_{178,2}^2 + C_{178,3}^2)}$$