

## 131<sup>st</sup> Eigenvector

$$N_e = 4 \quad s = 0 \quad m_s = 0$$

Irred. Representation :  $\Gamma_{4,3}$

$$E_{131} = -\frac{2A_{10}}{3}$$

$$\begin{aligned} |\Psi_{131}\rangle &= |4, 0, 0, \Gamma_{4,3}\rangle \\ &= C_{131,1} (|0202\rangle - |2020\rangle) \\ &+ C_{131,2} (|02du\rangle - |02ud\rangle + |0du2\rangle - |0ud2\rangle - |20du\rangle + |20ud\rangle - |2du0\rangle + |2ud0\rangle \\ &\quad - |d02u\rangle + |d20u\rangle + |du02\rangle - |du20\rangle + |u02d\rangle - |u20d\rangle - |ud02\rangle + |ud20\rangle) \\ &+ C_{131,3} (|0d2u\rangle - |0u2d\rangle + |2d0u\rangle - |2u0d\rangle - |d0u2\rangle - |d2u0\rangle + |u0d2\rangle + |u2d0\rangle) \end{aligned}$$

$$\begin{aligned} C_{131-1} &= -\frac{J^2 - 2(U + 10W)J - 8t^2 + U^2}{\sqrt{2}} \\ &+ \left( \frac{2}{9}\sqrt{2} (3(J - U - 5W) - A_{10}) (15W + A_{10}) \right) \end{aligned}$$

$$C_{131-2} = \frac{t (J + U - 2W - 2 \cos(\theta_2) \sqrt{A_2})}{3\sqrt{2}}$$

$$C_{131-3} = -2\sqrt{2}t^2$$

$$N_{131} = \sqrt{2C_{131,1}^2 + 16C_{131,2}^2 + 8C_{131,3}^2}$$