

129th Eigenvector

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

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

$$E_{129} = \frac{A_{13}}{3}$$

$$\begin{aligned} |\Psi_{129}\rangle &= |4, 0, 0, \Gamma_{4,2}\rangle \\ &= C_{129,1} (|0220\rangle - |2002\rangle) \\ &+ C_{129,2} (|02du\rangle - |02ud\rangle + |0d2u\rangle - |0u2d\rangle - |20du\rangle + |20ud\rangle - |2d0u\rangle + |2u0d\rangle \\ &\quad - |d0u2\rangle + |d2u0\rangle - |du02\rangle + |du20\rangle + |u0d2\rangle - |u2d0\rangle + |ud02\rangle - |ud20\rangle) \\ &+ C_{129,3} (|0du2\rangle - |0ud2\rangle + |2du0\rangle - |2ud0\rangle - |d02u\rangle - |d20u\rangle + |u02d\rangle + |u20d\rangle) \end{aligned}$$

$$\begin{aligned} C_{129-1} &= -\frac{J^2 - 2(U + 10W)J - 8t^2 + U^2}{\sqrt{2}} \\ &+ \left(\frac{(30W - A_{13})(6(J - U - 5W) + A_{13})}{9\sqrt{2}} \right) \end{aligned}$$

$$\begin{aligned} C_{129-2} &= \frac{t(J + U)}{3\sqrt{2}} \\ &+ \left(\frac{t \left(U - 2W + (\cos(\theta_2) - \sqrt{3}\sin(\theta_2))\sqrt{A_2} \right)}{3\sqrt{2}} \right) \end{aligned}$$

$$\begin{aligned} C_{129-3} &= -2\sqrt{2}t^2 \\ N_{129} &= \sqrt{2C_{129,1}^2 + 16C_{129,2}^2 + 8C_{129,3}^2} \end{aligned}$$