12^{nd} Eigenvector

$\boldsymbol{N_e = 2 \qquad s = 0 \qquad m_s = 0}$

Irred. Representation : $\boldsymbol{\Gamma_1}$

$$E_{12} = \frac{1}{2}\left(-J + 2t + U + W + \sqrt{A_5}\right)$$

$$\begin{aligned} |\Psi_{12}\rangle &= |2,0,0,\Gamma_1\rangle \\ &= C_{12,1}\left(|002\rangle + |020\rangle + |200\rangle\right) \\ &+ C_{12,2}\left(|0du\rangle - |0ud\rangle + |d0u\rangle + |du0\rangle - |u0d\rangle - |ud0\rangle\right) \end{aligned}$$

$$\begin{aligned} C_{12-1} &= 2\sqrt{\frac{2}{3}}t \\ C_{12-2} &= \frac{J - 2t + U - W - \sqrt{A_5}}{2\sqrt{6}} \\ N_{12} &= \sqrt{3C_{12,1}^2 + 6C_{12,2}^2} \end{aligned}$$