44^{th} Eigenvector

$$\boldsymbol{N_e} \;=\; \mathbf{3} \qquad \boldsymbol{s} = \frac{\mathbf{1}}{\mathbf{2}} \qquad \boldsymbol{m_s} = -\frac{\mathbf{1}}{\mathbf{2}}$$

Irred. Representation : $\boldsymbol{\Gamma_{3,1}}$

$$E_{44} \;=\; \frac{1}{2}\left(-J - 2t + U + 10W - \sqrt{A_4}\right)$$

$$\begin{aligned}
|\Psi_{44}\rangle &= |3, \frac{1}{2}, -\frac{1}{2}, \Gamma_{3,1}\rangle \\
&= C_{44,1}\left(|002d\rangle + |00d2\rangle + |02d0\rangle + |0d20\rangle + |200d\rangle + |2d00\rangle + |d002\rangle + |d200\rangle\right) \\
&+ C_{44,2}\left(|020d\rangle + |0d02\rangle + |20d0\rangle + |d020\rangle\right) \\
&+ C_{44,3}\left(|0ddu\rangle - |0udd\rangle - |d0ud\rangle - |dd0u\rangle + |ddu0\rangle + |du0d\rangle + |u0dd\rangle - |udd0\rangle\right)
\end{aligned}$$

$$\begin{aligned}
C_{44-1} &= -\frac{t}{2\sqrt{2}} \\
C_{44-2} &= \frac{t}{\sqrt{2}} \\
C_{44-3} &= \frac{J - 2t + U - 2W + \sqrt{A_4}}{4\sqrt{2}} \\
N_{44} &= 2\sqrt{2C_{44,1}^2 + C_{44,2}^2 + 2C_{44,3}^2}
\end{aligned}$$