36^{th} Eigenvector

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

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

$$\begin{aligned}
E_{36} &= \frac{1}{3}\left(-J + 2U + 7W - 2\cos(\theta_1)\sqrt{A_2}\right) \\
\\
|\Psi_{36}\rangle &= |3, \frac{1}{2}, \frac{1}{2}, \Gamma_{3,1}\rangle \\
&= C_{36,1}\left(|02u\rangle - |0u2\rangle\right) \\
&+ C_{36,2}\left(|20u\rangle - |2u0\rangle\right) \\
&+ C_{36,3}\left(|duu\rangle\right) \\
&+ C_{36,4}\left(|u02\rangle - |u20\rangle\right) \\
&+ C_{36,5}\left(|udu\rangle + |uud\rangle\right) \\
\\
C_{36-1} &= -\frac{1}{6}t\left(-2J + 9t - 2U + 2W + 2\cos(\theta_1)\sqrt{A_2}\right) \\
C_{36-2} &= \frac{1}{12}\left(18t^2 + 2Ut - 29Wt - 18UW + J(11t + 6(U + 2W))\right) \\
&\quad + \left(\frac{1}{36}\left(-2A_6^2 + (6J - 9t - 6U - 30W)A_6 - 54W(U + 2W) - 6t\cos(\theta_1)\sqrt{A_2}\right)\right) \\
C_{36-3} &= -\frac{1}{3}t\left(J + 9t + U - W + 2\cos(\theta_1)\sqrt{A_2}\right) \\
C_{36-4} &= \frac{1}{12}\left(36t^2 - 2Ut - 25Wt - 18UW + J(7t + 6(U + 2W))\right) \\
&\quad + \left(\frac{1}{36}\left(-2A_6^2 + (6J - 9t - 6U - 30W)A_6 - 54W(U + 2W) + 6t\cos(\theta_1)\sqrt{A_2}\right)\right) \\
C_{36-5} &= \frac{1}{6}t\left(J + 9t + U - W + 2\cos(\theta_1)\sqrt{A_2}\right) \\
N_{36} &= \sqrt{2C_{36,1}^2 + 2C_{36,2}^2 + C_{36,3}^2 + 2C_{36,4}^2 + 2C_{36,5}^2}
\end{aligned}$$