138^{th} Eigenvector

$\boldsymbol{N_e = 4 \qquad s = 1 \qquad m_s = 0}$

Irred. Representation : $\boldsymbol{\Gamma_{5,1}}$

$$E_{138} = \frac{A_{15}}{3}$$

$$\begin{aligned}
|\Psi_{138}\rangle &= |4,1,0,\Gamma_{5,1}\rangle \\
&= C_{138,1}\left(|02du\rangle + |02ud\rangle + |0du2\rangle + |0ud2\rangle + |20du\rangle + |20ud\rangle + |2du0\rangle + |2ud0\rangle \right.\\
&\qquad \left. -|d02u\rangle - |d20u\rangle + |du02\rangle + |du20\rangle - |u02d\rangle - |u20d\rangle + |ud02\rangle + |ud20\rangle\right) \\
&+ C_{138,2}\left(|0d2u\rangle + |0u2d\rangle - |2d0u\rangle - |2u0d\rangle - |d0u2\rangle + |d2u0\rangle - |u0d2\rangle + |u2d0\rangle\right) \\
&+ C_{138,3}\left(|dudu\rangle - |udud\rangle\right)
\end{aligned}$$

$$\begin{aligned}
C_{138-1} &= -\frac{t(J+U)}{3\sqrt{2}} \\
&\quad + \left(-\frac{t\left(U - 2W + \left(\sqrt{3}\sin(\theta_3) - \cos(\theta_3)\right)\sqrt{A_2}\right)}{3\sqrt{2}}\right) \\
C_{138-2} &= -2\sqrt{2}t^2 \\
C_{138-3} &= -\frac{-8t^2 + (U+10W)^2 + \frac{A_{15}^2}{9} - \frac{2}{3}(U+10W)A_{15}}{\sqrt{2}} \\
N_{138} &= \sqrt{16C_{138,1}^2 + 8C_{138,2}^2 + 2C_{138,3}^2}
\end{aligned}$$