

Hamiltonian:

$$\begin{bmatrix} 6.0B_{20} + 12.0B_{40} & 0 & 1.0\sqrt{6}B_{22} + 3.0\sqrt{6}B_{42} & 0 & 12.0B_{44} \\ 0 & -3.0B_{20} - 48.0B_{40} & 0 & 3.0B_{22} - 12.0B_{42} & 0 \\ 1.0\sqrt{6}B_{22} + 3.0\sqrt{6}B_{42} & 0 & -6.0B_{20} + 72.0B_{40} & 0 & 1.0\sqrt{6}B_{22} + 3.0\sqrt{6}B_{42} \\ 0 & 3.0B_{22} - 12.0B_{42} & 0 & -3.0B_{20} - 48.0B_{40} & 0 \\ 12.0B_{44} & 0 & 1.0\sqrt{6}B_{22} + 3.0\sqrt{6}B_{42} & 0 & 6.0B_{20} + 12.0B_{40} \end{bmatrix}$$

Eigenvalue and eigenvector 1:

$$6.0B_{20} + 12.0B_{40} - 12.0B_{44}$$

$$\begin{bmatrix} -1.0 \\ 0 \\ 0 \\ 0 \\ 1.0 \end{bmatrix}$$

Eigenvalue and eigenvector 2:

$$42.0B_{40} + 6.0B_{44} - 30.0 \left(0.04B_{20}^2 - 0.4B_{20}B_{40} + 0.08B_{20}B_{44} + 0.0133333333333333B_{22}^2 + 0.08B_{22}B_{42} + B_{40}^2 - 0.4B_{40}B_{44} + 0.12B_{42}^2 + 0.04B_{44}^2 \right)^{0.5}$$

$$\begin{bmatrix} 1.0 \\ 0 \\ \frac{-2.44948974278318B_{20}B_{22} - 7.34846922834953B_{20}B_{42} + 12.2474487139159B_{22}B_{40} + 7.34846922834953B_{22}B_{44} - 12.2474487139159B_{22} \left(0.04B_{20}^2 - 0.4B_{20}B_{40} + 0.08B_{20}B_{44} + 0.0133333333333333B_{22}^2 + 0.08B_{22}B_{42} + B_{40}^2 - 0.4B_{40}B_{44} + 0.12B_{42}^2 + 0.04B_{44}^2 \right)^{0.5}}{12.0B_{20}B_{44} + B_{22}^2 + 6.0B_{22}B_{42} - 60.0B_{40}B_{44} + 9.0B_{42}^2 + 12.0B_{44}^2 - 60.0B_{44} \left(0.04B_{20}^2 - 0.4B_{20}B_{40} + 0.08B_{20}B_{44} \right)^{0.5}} \\ 0 \\ 1.0 \end{bmatrix}$$

Eigenvalue and eigenvector 3:

$$42.0B_{40} + 6.0B_{44} + 30.0 \left(0.04B_{20}^2 - 0.4B_{20}B_{40} + 0.08B_{20}B_{44} + 0.0133333333333333B_{22}^2 + 0.08B_{22}B_{42} + B_{40}^2 - 0.4B_{40}B_{44} + 0.12B_{42}^2 + 0.04B_{44}^2 \right)^{0.5}$$

$$\begin{bmatrix} 1.0 \\ 0 \\ \frac{-2.44948974278318B_{20}B_{22} - 7.34846922834953B_{20}B_{42} + 12.2474487139159B_{22}B_{40} + 7.34846922834953B_{22}B_{44} + 12.2474487139159B_{22} \left(0.04B_{20}^2 - 0.4B_{20}B_{40} + 0.08B_{20}B_{44} + 0.0133333333333333B_{22}^2 + 0.08B_{22}B_{42} + B_{40}^2 - 0.4B_{40}B_{44} + 0.12B_{42}^2 + 0.04B_{44}^2 \right)^{0.5}}{12.0B_{20}B_{44} + B_{22}^2 + 6.0B_{22}B_{42} - 60.0B_{40}B_{44} + 9.0B_{42}^2 + 12.0B_{44}^2 + 60.0B_{44} \left(0.04B_{20}^2 - 0.4B_{20}B_{40} + 0.08B_{20}B_{44} \right)^{0.5}} \\ 0 \\ 1.0 \end{bmatrix}$$

Eigenvalue and eigenvector 4:

$$-3.0B_{20} - 3.0B_{22} - 48.0B_{40} + 12.0B_{42}$$

$$\begin{bmatrix} 0 \\ -1.0 \\ 0 \\ 1.0 \\ 0 \end{bmatrix}$$

Eigenvalue and eigenvector 5:

$$-3.0B_{20} + 3.0B_{22} - 48.0B_{40} - 12.0B_{42}$$

$$\begin{bmatrix} 0 \\ 1.0 \\ 0 \\ 1.0 \\ 0 \end{bmatrix}$$