

Info:

- Computed up to N^4
- Max anticommutator value N^2

Term symbol:

- $^2\Sigma : S = 1/2, \Lambda = 0$

Basis states $|\Lambda, \Sigma, \Omega\rangle$:

- $|\pm 0, -1/2, -1/2\rangle$
- $|\pm 0, +1/2, +1/2\rangle$

Hamiltonian $H = H_r + H_{so} + H_{ss} + H_{sr} + H_{ld}$:

$$H_r = BN^2 - DN^4$$

$$H_{so} = 0$$

$$H_{ss} = 0$$

$$H_{sr} = \gamma N \cdot S + \frac{\gamma_D [N \cdot S, N^2]_+}{2}$$

$$H_{ld} = 0$$

Hamiltonian matrix:

$$\begin{bmatrix} 1.0Bx + 0.25B - 1.0Dx^2 - 1.5Dx - 0.3125D - 0.5\gamma - 1.0\gamma_Dx - 0.25\gamma_D & \sqrt{4x+1}(-0.5B + 0.25D(4x+1) + 0.25\gamma + \gamma_D(0.25x + 0.3125)) \\ \sqrt{4x+1}(-0.5B + 0.25D(4x+1) + 0.25\gamma + \gamma_D(0.25x + 0.3125)) & 1.0Bx + 0.25B - 1.0Dx^2 - 1.5Dx - 0.3125D - 0.5\gamma - 1.0\gamma_Dx - 0.25\gamma_D \end{bmatrix}$$

Eigenvalues:

$$F_1 = 1.0Bx + 0.25B - 1.0Dx^2 - 1.5Dx - 0.3125D - 0.5\gamma - 1.0\gamma_Dx - 0.25\gamma_D - \sqrt{16.0x + 4.0}(-0.25B + 0.5Dx + 0.125D + 0.125\gamma + 0.125\gamma_Dx + 0.15625\gamma_D)$$

$$F_2 = 1.0Bx + 0.25B - 1.0Dx^2 - 1.5Dx - 0.3125D - 0.5\gamma - 1.0\gamma_Dx - 0.25\gamma_D + \sqrt{16.0x + 4.0}(-0.25B + 0.5Dx + 0.125D + 0.125\gamma + 0.125\gamma_Dx + 0.15625\gamma_D)$$