

**Table 1:** Pressure broadening of Rb D<sub>1</sub> lines by <sup>3</sup>He, <sup>4</sup>He and N<sub>2</sub>. The broadening and shifting density coefficients are listed. The 4th and 6th columns are the temperature dependence for He and N<sub>2</sub>, respectively. All coefficients are given for 353 K, values for different temperatures can be calculated with the temperature dependence.

	<sup>4</sup> He	<sup>3</sup> He	Temp. depen.	N <sub>2</sub>	Temp. depen.
D <sub>1</sub> full width (GHz/amg)	18.0±0.2	18.7±0.3	T <sup>0.05±0.05</sup>	17.8±0.3	T <sup>0.3</sup>
D <sub>1</sub> line shift (GHz/amg)	4.3±0.1	5.64±0.15	T <sup>1.1±0.1</sup>	-8.25±0.15	T <sup>0.3</sup>

$$\frac{\partial M_x(t)}{\partial t} = \gamma (\mathbf{M}(t) \times \mathbf{B}(t))_x - \frac{M_x(t)}{T_2^*} \quad (1a)$$

$$\frac{\partial M_y(t)}{\partial t} = \gamma (\mathbf{M}(t) \times \mathbf{B}(t))_y - \frac{M_y(t)}{T_2^*} \quad (1b)$$

$$\frac{\partial M_z(t)}{\partial t} = \gamma (\mathbf{M}(t) \times \mathbf{B}(t))_z - \frac{M_z(t)}{T_1} \quad (1c)$$

$$S = A\omega \sin \alpha(t) = A\omega \frac{B_1}{\sqrt{B_1^2 + (B(t) - \omega/\gamma)^2}} \quad (2)$$

Thus for a single chamber cell,

$$\frac{1}{\gamma_{se}} \approx 15.9hrs \quad (3)$$

The coefficients of pressure broadening for <sup>3</sup>He, <sup>4</sup>He and N<sub>2</sub> are listed in Table 1.

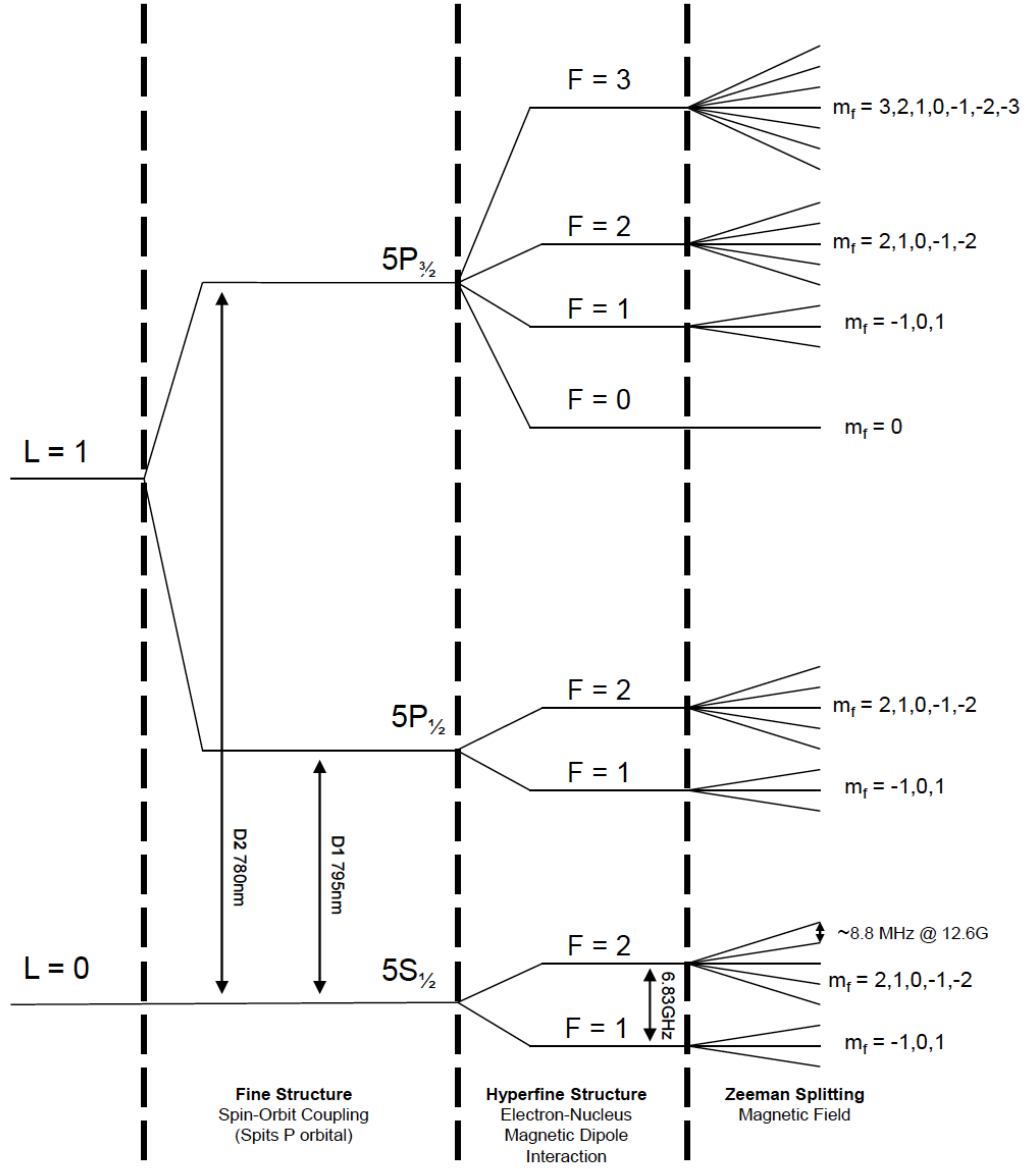


Figure 1: Level Diagram of  $^{87}\text{Rb}$ . The splittings are not to scale. Adapted from Dolph's PhD thesis.

The energy levels of  $^{87}\text{Rb}$  are shown in Fig. 1. where  $\Gamma_A$  is the pressure dependent FWHM,  $\Gamma_A \approx 0.04nm/amg \cdot [^3He]$ .

# Bibliography