Table 1: Pressure broadening of Rb D_1 lines by ^3He, ^4He and N_2. The broadening and shifting density coefficients are listed. The 4th and 6th columns are the temperature dependence for He and N_2, respectively. All coefficients are given for 353 K, values for different temperatures can be calculated with the temperature dependence.

	^4He	^3He	Temp. depen.	N_2	Temp. depen.
D_1 full width (GHz/amg)	18.0±0.2	18.7±0.3	$T^{0.05\pm0.05}$	17.8±0.3	$T^{0.3}$
D_1 line shift (GHz/amg)	4.3±0.1	5.64±0.15	$T^{1.1\pm0.1}$	-8.25±0.15	$T^{0.3}$

$$\frac{\partial M_x(t)}{\partial t} = \gamma\left(\boldsymbol{M(t)} \times \boldsymbol{B(t)}\right)_x - \frac{M_x(t)}{T_2^*} \tag{1a}$$

$$\frac{\partial M_y(t)}{\partial t} = \gamma\left(\boldsymbol{M(t)} \times \boldsymbol{B(t)}\right)_y - \frac{M_y(t)}{T_2^*} \tag{1b}$$

$$\frac{\partial M_z(t)}{\partial t} = \gamma\left(\boldsymbol{M(t)} \times \boldsymbol{B(t)}\right)_z - \frac{M_z(t)}{T_1} \tag{1c}$$

$$V_1(\vec{R}) = \gamma(R)\vec{N} \cdot \vec{S} + A(R)\vec{I_b} \cdot \vec{S} \tag{2}$$

Thus for a single chamber cell,

$$\frac{1}{\gamma_{se}} \approx 15.9hrs \tag{3}$$

The coefficients of pressure broadening for ^3He, ^4He and N_2 are listed in Table 1.

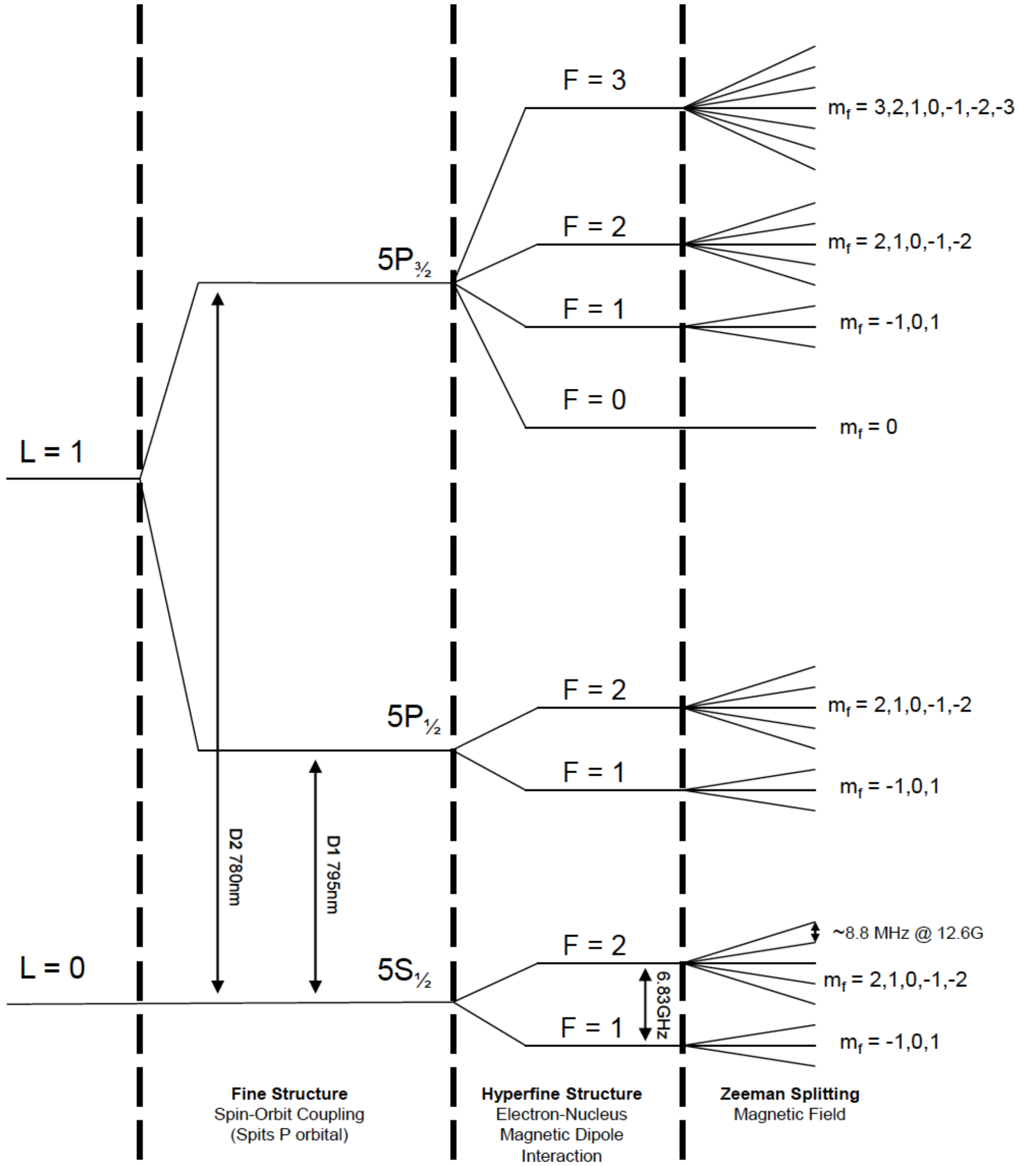

Figure 1: Level Diagram of ^{87}Rb. The splittings are not to scale. Adapted from Dolph's PhD thesis.

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

Bibliography