

Table 1: Pressure broadening of Rb D₁ lines by ³He, ⁴He and N₂. The broadening and shifting density coefficients are listed. The 4th and 6th columns are the temperature dependence for He and N₂, respectively. All coefficients are given for 353 K, values for different temperatures can be calculated with the temperature dependence.

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

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

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

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

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

$$\mathcal{L}^N = \mathcal{N}\Gamma_s P_{He}^2 k_{se}^K = (7.46 \pm 0.62) \times 10^{-20} \text{ cm}^3/\text{s}$$

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

The coefficients of pressure broadening for ³He, ⁴He and N₂ are listed in Table 1.

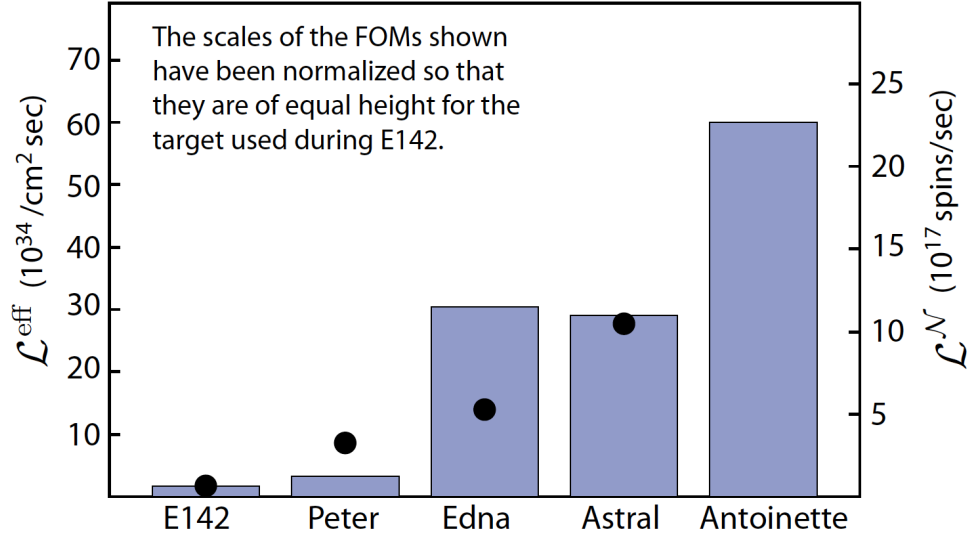


Figure 1: Shown are two figures of merit (FOM) for targets built for the indicated experiments. The circles (left axis) indicate the number of spins being polarized per second weighted by the square of polarization. The bars (right axis) represent the luminosity weighted by the square of polarization. While the first FOM is an indication of the potential of the polarization technique, the second FOM indicates performance achieved during an experiment. The actual cells used to formulate the FOMs are not necessarily the same.

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

Bibliography