Title of the experiment

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Abstract

In this experiment we studied a very important physical effect by measuring the dependence of a quantity V of the quantity X for two different sample temperatures. Our experimental measurements confirmed the quadratic dependence $V = kX^2$ predicted by Someone's first law. The value of the mystery parameter $k = 15.4 \pm 0.5$ s was extracted from the fit. We found that this value is 20% below theoretically predicted $k_{theory} = 17.34$ s. We attribute this discrepancy to low efficiency of our V-detector.

1 Theory overview

Here give a brief summary of the physical effect of interest and provide necessary equations. Here is how you insert an equation 1:

$$u(\lambda, T) = \frac{8\pi hc\lambda^{-5}}{e^{hc/\lambda kT} - 1}, \tag{1}$$

where T is temperature in Kelvin, c is the speed of light, etc. Don't forget to explain what each variable in the equation mean, when you introduce it for the first time!

1.1 Error analysis

Note: this section can be integrated with the previous one as long as you address the issue. Here explain how you determine uncertainties for different measured values. Suppose that in the experiment you make a series of measurements of a resistance of the wire R for different applied voltages V, then you calculate the temperature from the resistance using a known equation and make a plot temperature vs. voltage squared. Again suppose that this dependence is expected to be linear, and the proportionality coefficient is extracted from the graph. Then what you need to explain is that for the resistance and the voltage the uncertainties are instrumental (since each measurements in done only once), and they are .... Then give an equation for calculating the uncertainty of the temperature from the resistance uncertainty. Finally explain how the uncertainty of the slop of the graph was found (computer fitting, graphical method, *etc.*)

If in the process of data analysis you found any noticeable systematic error(s), you have to explain them in this section of the report.

2 Experimental setup and procedures

Give a schematic of the experimental setup(s) used in the experiment. Here I need to include a figure 2: Don't forget to list all important steps in your experimental procedure!

3 Experimental data and the data analysis

In this section you will need to show your experimental results. Use tables and graphs when it is possible. Table 1 is an example.

It is also recommended to plot the data graphically to efficiently illustrate any points of discussion. For example, it is easy to conclude that the experiment and theory match each other rather will if you look at Fig. 3

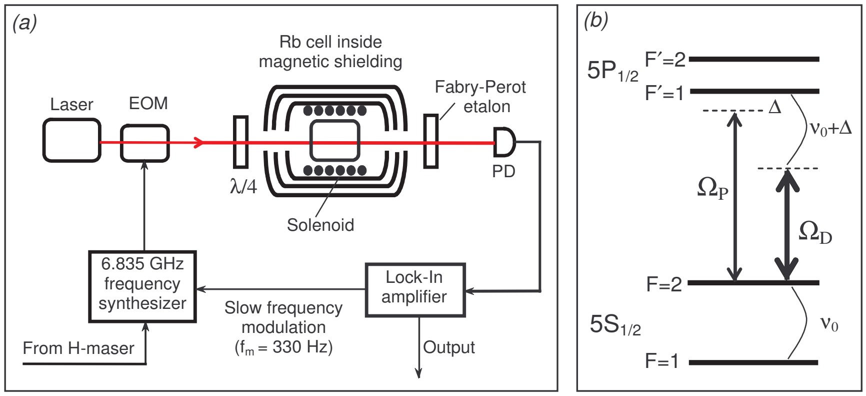

Figure 1: Every figure MUST have a caption. *Original captions for this figure*: (a) Experimental apparatus. (b) Energy levels and applied fields (Ω_P, Ω_D) for N-resonances on the D_1 line of ^{87}Rb. ν_0 is the ground electronic state hyperfine splitting and Δ is the detuning of the probe field from the $F = 2 \rightarrow F' = 1, 2$ resonance.

4 Conclusions

Here your briefly summarize your findings.

5 References

This section is necessary only if you used any external literature, such as books [1], journal publications [2] or web sites [3]. Then you have to include these references with your report.

References

[1] A. C. Melissinos and J. Napolitano, *Experiments in Modern Physics*, (Academic Press, New York, 2003).

[2] N. Cyr, M. Têtu, and M. Breton, IEEE Trans. Instrum. Meas. **42**, 640 (1993).

[3] *Expected value*, available at `http://en.wikipedia.org/wiki/Expected_value`.

Table 1: Every table needs a caption

Polarization	Target	Bin	$<x>$	$<Q^2>$	$A_\perp^{meas}$	$\Delta A_\perp$
$-$	LiD	1	0.0233323	0.8429978	0.0044151	0.0030871
		2	0.0638046	1.5017358	0.0021633	0.0021343
		3	0.1892825	3.1877837	0.0006640	0.0022467
		4	0.4766562	7.1827556	-0.0197585	0.0085528
	NH_3	1	0.0232572	0.8454089	0.0003600	0.0018642
		2	0.0633156	1.4870013	0.0023831	0.0013287
		3	0.1923955	3.1753302	-0.0024246	0.0013771
		4	0.4830315	7.3245904	-0.0284834	0.0047061
$+$	LiD	1	0.0233503	0.8340932	-0.0086018	0.0031121
		2	0.0638688	1.4785886	-0.0018465	0.0021452
		3	0.1892192	3.1277721	-0.0017860	0.0022525
		4	0.4778486	7.0313856	-0.0041773	0.0084659
	NH_3	1	0.0232964	0.8439092	-0.0022961	0.0018851
		2	0.0633764	1.4814540	0.0021355	0.0013354
		3	0.1924094	3.1580557	-0.0065302	0.0013775
		4	0.4825868	7.3191291	-0.0290878	0.0047329

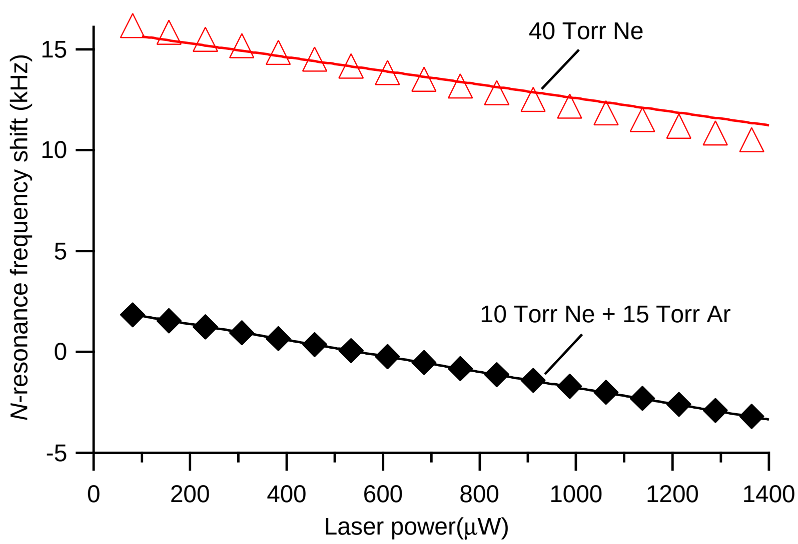

Figure 2: Every figure MUST have a caption. *Original captions for this figure*: The dependence of the N-resonance frequency on the total laser power in the cells with the 25 Torr Ne-Ar mixture (diamonds) and with 40 Torr of Ne (triangles). Theoretically calculated curves are shown as solid lines. The probe field is tuned to the $F = 2 \rightarrow F' = 1$ transition of ^{87}Rb.