Experiment X

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Abstract

In order to investigate Y about physical system Z, we carried out experiment X. A T apparatus was used to carry out the experiments. We measured some parameter to be 6 ± 5 J (J is units – always remember units!).

1 Introduction

Describe the phenomenon being measured and any historical info. This should not contain much information about what you did in the experiment– just roundly what you aim to do. The intro is mainly useful background.

In order to make another paragraph, leave a space between this and the previous paragraph. If you refer to a previous work on the subject, you'll want to cite it like this [1]. Note the citation goes inside the sentence. See the end of the documentary for the bibliography specification along with the tag "Erdos01".

Another good use of the introduction is to introduce essential equations when going through the background science. Here is an important equation.

$$E = h\nu = E_{kin} + W_0 \tag{1}$$

We use the "label" command so that we can latter use the "ref" command to reference this equation.

2 Experiment

In this section we describe the experiment setup and procedure, including apparatus etc.

The apparatus is was incredibly complicated and impossible to describe in just words. See Figure 1. See the label mark-up in the apparatus figure specification. ALWAYS use the ref/label pairs instead of putting in an absolute reference like "Figure 1". This way if you move figures, then the numbering through out the text automatically adjusts. You should mark up your figure with text to describe the subsystems of the apparatus. Then you should use those same words (or letters that may be symbols in equations from the intro) to describe how the apparatus works here.

We came up with a particularly clever way to carry out the experiment. First, we did A because of B. Then in order to C, we had to do D. In the end, for each setting of E we obtained five data points. We took the measurement at E to be the average of these five data and the error to be their scatter. The data is given in Table 1. The errors are the size they are likely because ...

You can also intertwine the description of the apparatus with the procedure instead of having them in separate paragraphs as used here.

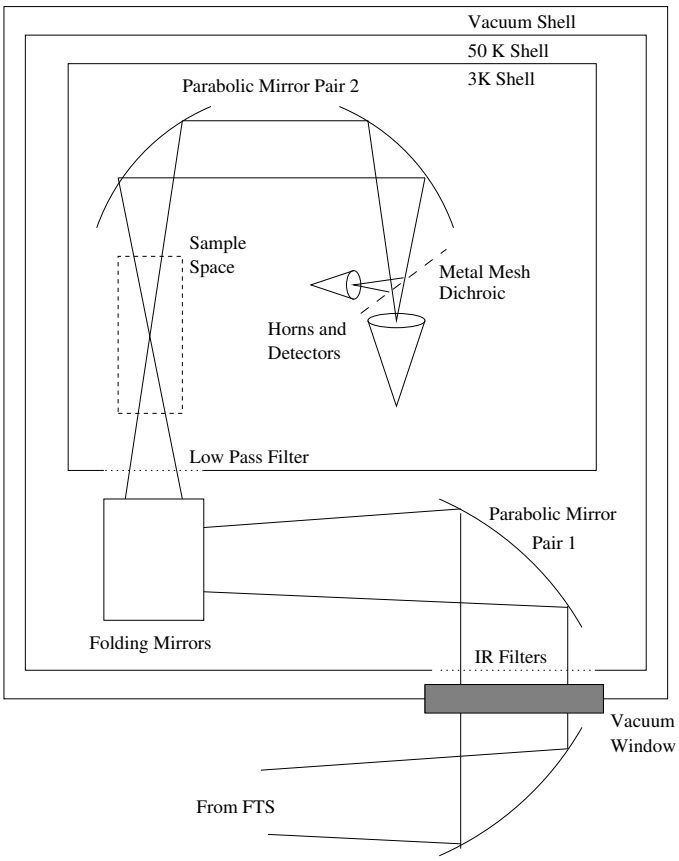

Figure 1: Apparatus. Include some valuable information here in the caption. Make sure all critical components are clearly labeled.

3 Analysis

Describe the model that you used to fit the data. Discuss the goodness of the fit and, if the fit was good, the derived model parameters and errors. Here is the model for this experiment

$$m(x; a, b, c) = ax^2 + bx + c \tag{2}$$

This is obviously a simple model with parameters a, b and c. The model equation is linear in the parameters, so I choose to fit this with a simple linear least squares approach. The model is plotted with the deta in Figure 2. The fit has a chi-sq of 8.97 for six degrees of freedom and a corresponding probability to exceed (PTE) of 0.18. The best fit parameters are $a = X.XX \pm 0.YY$, etc.

If you refer to a particular analysis technique that you don't describe fully, then it's important

E (Unit for E)	Measured Value (Unit)
5.	$1.32 \pm .24$
...	...

Table 1: Measurements of XYZ. Average measured values and errors are based on five data points obtained as described in Section 2.

to give a reference [2].

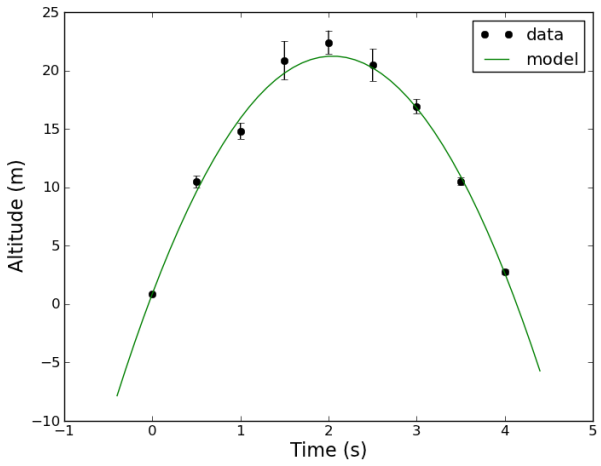

Figure 2: Data with Model. Use the caption to say something interesting.

4 Discussion

Interpret your results and discuss what may have gone wrong if, e.g., the fit in the Data Analysis section was not good.

5 Conclusion

A short section where you summarize the paper.

References

[1] P. Erdős, *A selection of problems and results in combinatorics*, Recent trends in combinatorics (Matrahaza, 1995), Cambridge Univ. Press, Cambridge, 2001, pp. 1–6.

[2] R.L. Graham, D.E. Knuth, and O. Patashnik, *Concrete mathematics*, Addison-Wesley, Reading, MA, 1989.