# This is a descriptive title

Your Name, Partner Name

*Physics Department, The College of Wooster, Wooster, Ohio 44691, USA*

Day Month Year

## Abstract

The abstract should state very concisely (usually in one paragraph) the scope and nature of the subject discussed, the basic method or approach, and a summary of the major results. It is more valuable for the reader to learn, for example, that "we calculated the speed of light to be $(2.97 \pm 0.03) \times 10^8$ m/s, which is within 0.67% of the accepted value" than to read that "the speed of light was measured". The abstract should stand alone without reference to the rest of the paper, since many people will read only your abstract and not the full paper.

## I. INTRODUCTION

The introduction should outline for the reader exactly what is to be discussed in the paper, the purpose of the work, and a brief history [1-2] of previous work relevant to the investigation [3]. Here the authors of an original research paper can describe what is new in their work and how it contributes to the field.

## II. THEORY

Experiments are designed and performed within a theoretical context. Describe this context here and summarize, motivate, or derive the relevant equations.

Equations should be treated like words in sentences. They should not stand outside sentences, but should be punctuated as words inside the sentences, even when they are indented and numbered. For example, if

$$ax^2 + bx + c = 0, \tag{1}$$

then

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}. \tag{2}$$

To preserve the tabs in these equation lines, copy, paste, and edit them to create other equations.

Use superscripts for exponents in scientific notation. Be sure to explain what each symbol means. Do not assume the reader knows what *F* or *i* means. When referring to variables in a sentence, they are traditionally italicized (as in the previous sentence).

## III. PROCEDURE

Briefly describe what you did in full sentences and complete paragraphs. Do not write this

section as a numbered list of steps, and do not imitate a lab manual! Typically use the past tense. Figures of the apparatus, including either schematics or digital photographs, are often valuable here, but all figures should be numbered, captioned, and references in the text. Serial numbers of each piece of equipment are not necessary, but you should identify the major equipment used. This is also the place to describe experimental difficulties and how (or whether!) they were overcome and any corrections or calibrations which were used.

## IV. RESULTS

Concisely summarize your results and discuss them. This section will probably include plots and tables to display your results. Plots and tables do not stand alone; each one must be discussed in the text. For example, soliton speeds decrease monotonically with angle, as in Fig. 1. Guide the reader through the important things to notice when looking at the figure.

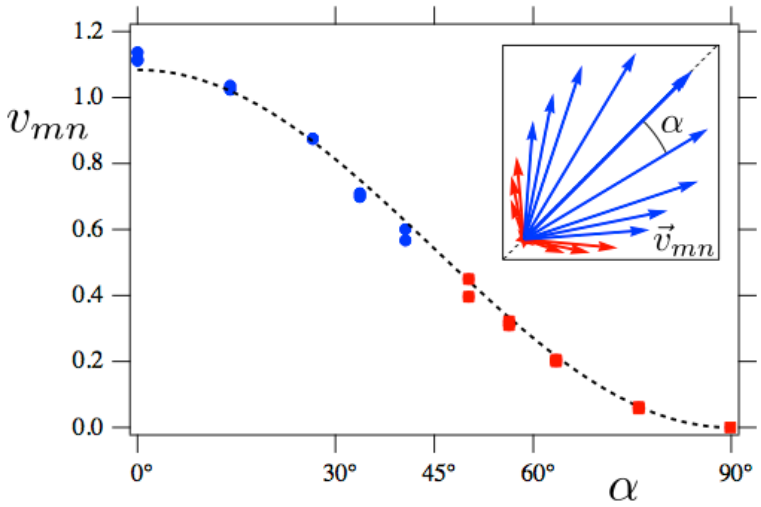


FIG. 1: Simulated soliton speeds as a function of angle. The dotted curve is a phenomenological fit. Inset depicts velocity vectors. Blue and red colors indicate positive and negative modes.

All graphs, figures and tables must be labeled and captioned. Graphs must be titled, tables should have headings, and both should be labeled with units. Graphs and figures should be large enough to be clear; include error bars in your graphs. Graphs and tables should be on the page they are first mentioned or on the next page, not appended to the end of the report. Verify that

your results (including slopes of graphs) have proper units, the appropriate number of significant figures, and uncertainty estimates. For example, "We estimate Planck's constant $h$ to be $(7.0 \pm 1.9) \times 10^{-34}\,\mathrm{J \cdot s}$, which is within one standard deviation of the accepted value". Typically, you will not include in your report all the raw data in your lab notebook.

## V. CONCLUSIONS

In some cases the purpose of the experiment is the measurement of specific quantities (for example, Millikan Electron Charge or The Speed of Light). Your result should be compared, whenever possible, with previously measured values, handbook or textbook values, or a theoretically calculated result. You should indicate the extent of agreement or disagreement and discuss any discrepancies.

In other experiments (for example, Franck-Hertz Energy Quantization) an important aspect of the investigation is to illustrate an effect or to distinguish between rival models or theories. Here is where you should draw conclusions based on your data. This may also involve a discussion of uncertainties. In some cases you may have to say that no conclusions can be drawn from your data. You might also suggest possible improvements in the experiment.

**Acknowledgments**

If you borrowed apparatus from another laboratory, obtained ideas in discussions with others, or had financial support for your experiment, you should acknowledge such assistance here.

[1] J. F. Lindner, A. R. Bulsara, Phys. Rev. E 74, 020105 (2006).

[2] J. F. Lindner, K. M. Patton, P. M. Odenthal, J. C. Gallagher, B. J. Breen, Phys. Rev. E 78, 066604 (2008).

[3] A. A. Fuki, Y. A. Kravtsov, O. N. Naida, *Geometrical Optics of Weakly Anisotropic Media* (CRC Press, 1998)