

# A Sample L<sup>A</sup>T<sub>E</sub>X document

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An article usually includes an abstract, a concise summary of the work covered at length in the main body of the article. It is used for secondary publications and for information retrieval purposes. Valid PACS numbers may be entered using the `\pacs{#1}` command.

## I. INTRODUCTION

Here is my introduction. In this section I explain the motivation for trying to find the relationship between “mechanical work” and “thermal energy,” that is, the relationship between  $W$  and  $Q$ .

TABLE I. Here is where I would put my caption.

Fuels	Energy Release (J/kg)	Converted Mass Fraction
<u>Chemical</u>		
LO/LH	$1.35 \times 10^7$	$1.25 \times 10^{-10}$
Atomic Hydrogen	$2.18 \times 10^8$	$2.40 \times 10^{-9}$
Metastable Helium	$4.77 \times 10^8$	$5.30 \times 10^{-9}$
<u>Nuclear Fission</u>		
$^{235}\text{U}$	$8.20 \times 10^{13}$	$9.10 \times 10^{-4}$
<u>Nuclear Fusion</u>		
DT (0.4/0.6)	$3.38 \times 10^{14}$	$3.75 \times 10^{-3}$
CAT-D T(1.0)	$3.45 \times 10^{14}$	$3.84 \times 10^{-3}$
D $^3\text{He}$ (0.4/0.6)	$3.52 \times 10^{14}$	$3.90 \times 10^{-3}$
p B <sup>11</sup> (0.1/0.9)	$7.32 \times 10^{13}$	$8.10 \times 10^{-4}$
<u>Matter-Antimatter</u>	$9 \times 10^{16}$	1.00

### A. Writing equations

When writing a physics paper, you will, of course, want to write some equations. Equations can be numbered or unnumbered. Let’s take a look at an unnumbered equation first.

$$v_{\text{wave}} = \sqrt{\frac{T}{\mu}}$$

Notice that the word “wave” is being written in the *math mode*. How can we correct that? Once it is corrected, we now have

$$v_{\text{wave}} = \sqrt{\frac{T}{\mu}}$$

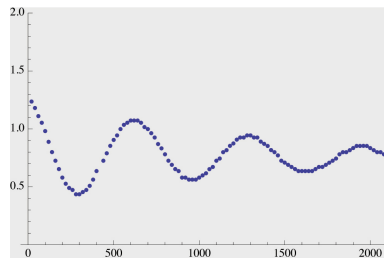


FIG. 1. Here is a picture of the damped harmonic oscillations measured from a Cavendish balance. The width of this picture is 2 inches. This is probably too small.

This looks better.

What about numbering equations? Noticed that the default is when I have a “double line break,” a new paragraph is generated.

$$v_{\text{wave}} = \sqrt{\frac{T}{\mu}} \quad (1)$$

How do I add text to the equation line? I didn’t really want to indent the above line when starting a new paragraph.

$$v_{\text{wave}} = \sqrt{\frac{T}{\mu}} \quad (\text{velocity of a traveling wave}) \quad (2)$$

We can also write an equation “in line” in the text. For example, the velocity of a traveling wave with a small amplitude is  $v = \sqrt{T/\mu}$ . You also write this as  $v = \sqrt{\frac{T}{\mu}}$ , but that gets a little harder to read.

### B. Inserting a picture

How do we go about introducing a picture? It’s possible to include pictures of different formats such as *tif*, *gif*, *jpg* and so on. For example, if you’re copying something from *Mathematica*, you will probably want to use the *.eps* format, *encapsulated postscript*. Here’s an example of a *Mathematica* figure. Let’s expand the picture so it’s easier to see.

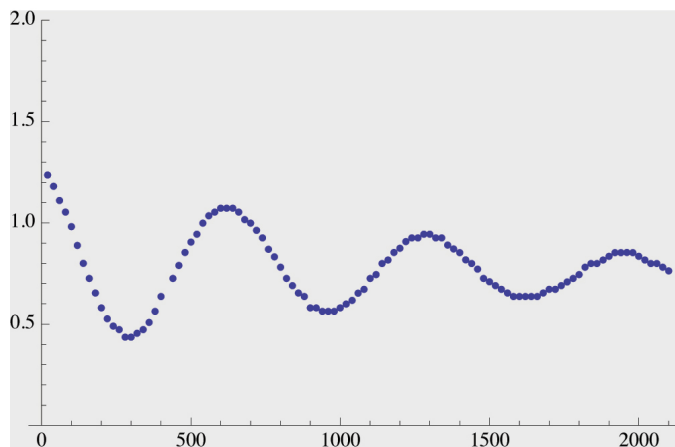


FIG. 2. Here is a picture of the damped harmonic oscillations measured from a Cavendish balance. The width of this picture is 3.5 inches. This is probably a little large.

How do you go about referring to these pictures? For example, the damped oscillating curve shown in Fig. 1 appears to be a good fit to the data.

## II. BIBLIOGRAPHY AND FOOTNOTES

In this section we will learn how to create a bibliography for our formal lab report.

First of all, I would like to reference the second figure in the previous section, that is, Fig. 2. Let's see how it is referred to in this section. I want to reference a paper by A. Einstein<sup>1</sup>. Next, I'm going to reference our classroom text book<sup>2</sup>. These references have nothing to do with the text in this `Sample1.txt`, but it shows you the variety of references you can make. Let's reference a URL on my `physicsx` website<sup>3</sup>. Let's also reference our PS315 textbook by A. Melissinos<sup>4</sup>. Let's reference the Nuclides and Isotopes manual from Lockheed Martin<sup>5</sup>.

So, that's an example of building your bibliography list.

## III. CONCLUSION

Okay. This is the final paragraph for this document. I hope found this document instructive as you prepare to write your formal lab reports.

<sup>1</sup>A. Einstein, Yu. Podolsky, and N. Rosen, *Phys. Rev.* **47**, 777 (1935).

<sup>2</sup>H. D. Young and R. A. Freedman, *University Physics*, 2<sup>nd</sup> Ed. (Pearson, 2016).

<sup>3</sup>D. Smith, (2015), <http://physicsx.pr.erau.edu/Courses/CoursesS2018/PS315/NuclearSpectroscopy/Radioactivity.pdf>.

<sup>4</sup>A. Melissinos and J. Napolitano, *Experiments in Modern Physics*, 2<sup>nd</sup> Ed. (Academic Press, 2003).

<sup>5</sup>E. Baum, H. Knox, and T. Miller, *Nuclides and Isotopes* (Lockheed Martin, 2002).