

PHYS 510 Experiment

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January 30, 2003

Abstract

This document is an illustration of how to write up a small report, e.g. for PHYS 510 using L^AT_EX. It describes how to create the postscript `report.ps` and the PDF `report.pdf` files from the source file `report.tex`¹. By looking at the source file you can learn how to do the most common tasks such as setting up the document structure, writing equations, and including graphics, footnotes, and references.

1 Introduction

Once upon a time, every single student at the Physics Department was required to spend countless hours somewhere between the 2nd and the 5th floor of Clark Hall of Science....

The current experiment tries very hard to produce the ultimate result of such endeavors, a “Report Beam” [4] i.e. stationary stream of reports designed to satisfy the aesthetic eye of the physics faculty²!

2 Theoretical Background

Well, let’s leave it for the theorists [1, 2]. Actually it is useful to quote some important formulas:

$$S = \int_{t_1}^{t_2} \mathcal{L}(q, \dot{q}, t) dt \quad (1)$$

$$\delta S = 0 \quad (2)$$

$$\frac{d}{dt} \left(\frac{\partial \mathcal{L}}{\partial \dot{q}_i} \right) - \frac{\partial \mathcal{L}}{\partial q_i} = 0 \quad (3)$$

3 Experimental Setup

First you need the source file `report.tex` which can be downloaded from <http://computing.physics.cornell.edu>. Figure 1 shows the terminal window of a PECF machine, where all the action (1) takes place.

¹available at <http://computing.physics.cornell.edu/resources/report.tex>

²although L^AT_EX produces aesthetic documents, their content is entirely your responsibility



Figure 1: Command shell.

3.1 Initial compilation

Once we have the file `report.tex`, we can compile it on a shell prompt:

```
latex report.tex
```

3.2 Do it once again

Compile it once again to get the references right

```
latex report.tex,
```

and then view the DVI (device independent format) report:

```
xdvi report.dvi
```

3.3 Postscript time

After we like the DVI file we can create a postscript which is the language of every sensible printer:

```
dvips report.dvi -o report.ps,
```

and view the result with

```
gv report.ps
```

3.4 Some Like It PDF!

And pdf is not too hard either:

```
ps2pdf report.ps report.pdf
```

4 Results

L^AT_EX allows for extremely efficient minimization of the action (1) according to equation (2). All you need to do is specify the document structure and L^AT_EX takes care for the page layout, the proper numbering of the equations and references and even table of contents or lists of figures and tables are created by typing only a single word. After we have produced the postscript file as shown in section 3 we can print a copy by

```
lp report.ps
```

5 Summary and further directions

This document showed how to create a simple report using L^AT_EX. It contains the most common tasks such as setting the document structure, writing equations, including graphics, etc.. There is abundant L^AT_EX documentation in electronic ?? or hardcopy ?? format.

A Better pdf

In order to have nicer fonts in the PDF file, one must create the postscript using:

```
dvips -Ppdf report.dvi -o report.ps
```

B Tables

Tables are created like this:

Column 1	Column 2	Column 3	Column 4
π	3.1416	3.1416	3.14159265358979
e	2.7183	2.7183	2.71828182845905
$1/\alpha$	137	137	137

References

- [1] L.D. Landau and E.M. Lifshitz, *Mechanics*, 3rd ed., (Pergamon Press, New York, 1976).
- [2] P.A.M. Dirac, *The Principles of Quantum Mechanics*.
- [3] P. Hohenberg and W. Kohn, Phys Rev **136**, B864 (1964).
- [4] Dr. Evil.