Abstract

In this article, I attempt to show the 2003 IUCF summer students the power of computer typesetting. I try to distinguish typesetting from word processing. I ridicule those who use word processing for scientific documents. I make rude remarks; I insult their pets and relatives. I make sure that they will never use a regular word processor again. Bwaaah–hah hahhh!

1 Introduction

1.1 Why Do We Use \LaTeX? 

\LaTeX is a typesetter, not a word processor. Word processors are for girly-men. Typesetters are for physicists with pumpitude.

To make a new paragraph in \LaTeX, skip a line.

You have a choice of fonts in \LaTeX. You can print in italics, boldface, slanted, typewriter and sans-serif.

1.2 \LaTeX Does Math!

It sure does! You can put mathematics inside of paragraphs: \( c = \sqrt{a^2 + b^2} \), or you can display equations:

\[
\int_0^1 x^2 \, dx = \frac{1}{3} \quad \int \cos(x) \, dx = \sin(x)
\]
It will automatically number equations too.

\[-\frac{\hbar^2}{2M} \nabla^2 \Psi(R) + V(R) \Psi(R) = E \Psi(R)\]  \hspace{1cm} (1)

Of course, you will recognize Eq. 1 as the Schrödinger equation!

Next, we study the electromagnetic field–strength tensor:

\[F^{\alpha\beta} = \partial^\alpha A^\beta - \partial^\beta A^\alpha = \begin{pmatrix} 0 & -E_x & -E_y & -E_z \\ E_x & 0 & -B_z & B_y \\ E_y & B_z & 0 & -B_x \\ E_z & -B_y & B_x & 0 \end{pmatrix}\]  \hspace{1cm} (2)

Yes, \LaTeX\ can do \textit{lots} of equations!

\[W_{\mu\nu}(p, q) = \frac{1}{4M} \sum_\sigma \int \frac{d^4 \xi}{2\pi} e^{iq\cdot\xi} \langle p, \sigma | [J^m_\mu(\xi), J^m_\nu(0)] | p, \sigma \rangle\]

And here’s another one! I can’t help myself! I’m a wild, crazy, equation–writin’ fool! \textit{Bwaaahh-hahh hahh!}

\[\frac{dq_i(x, t)}{dt} = \frac{\alpha_s(t)}{2\pi} \int_x^1 \frac{dy}{y} \left[ P_{qq}(x/y)q_i(y, t) + P_{qG}(x/y)G(y, t) \right]\]

1.3 \LaTeX\ Does Tables!

<table>
<thead>
<tr>
<th>Country</th>
<th>Language</th>
<th>Currency</th>
<th>1 USD =</th>
</tr>
</thead>
<tbody>
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<tr>
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<td>31.82 CZK</td>
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<td>Burkina Faso</td>
<td>French</td>
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<td>752.8 XOF</td>
</tr>
</tbody>
</table>

1.4 \LaTeX\ Can Do Figures! But if You Spend Too Much Time on This, Andy Bacher Will Yell At Me!

The most awkward aspect of \LaTeX\ is the inclusion of figures in a document. It can be done, but it’s tricky and can consume enormous amounts of time that is better spent on the \textit{content} of your paper. I’ll discuss some simple ways to include pictures, but I advise you to do the simplest thing that works.
The first method is to just skip some space in the document and paste in the picture later on. And that is what I did in Fig. 1. When the original document was printed, there was nothing in this space. But now there is!

Of course, you’ve got to use the (literal) cut–and–paste method if your picture is not stored in electronic (i.e. PostScript) form.

If you do have an illustration in PostScript form, it’s not too difficult to print it with the document. An example is given in Fig. 2.

Both of these figures “floated” to the top of the current page.

So it is possible to put graphics into a \LaTeX document, but you may have to consult the local expert to be sure how it’s done!