

## IN-CLASS WORK: LATEX & XFIG

The following steps walk you through **Latex**, which provides THE tool for writing scientific papers, especially when formulae and equations are involved. I will walk you through steps 1.-3. (For some of you this might be a reminder from junior lab.)

### 1. Sample File(s)

Copy

```
~kvollmay/share.dir/paper.dir/template_phys338.tex
```

```
~kvollmay/share.dir/paper.dir/samplefig1.eps
```

```
~kvollmay/share.dir/paper.dir/samplefig2.eps
```

into your working directory. Have a *quick* look at `template_phys338.tex`.

### 2. Compile, Look at Paper, Print Paper

The `template_phys338.tex` contains the “commands” and they need to be converted to something you can look at. Type (on the command line):

```
pdflatex template_phys338.tex
```

You can look at your paper with

```
atril template_phys338.pdf
```

Or any other pdf-viewer would work.

### 3. Title and Sections

Copy `template_phys338.tex` to a tex-file (with a different name) which you will use to write your paper. In this file change the title (search for `\title`). Use `pdflatex` and `atril` to look at the resulting document. Next change the sections (`\section`) and make more than one section by using the command multiple times.

### 4. Formulae

Next look at the equations Eq.(1) and Eq.(2). Try modifying these equations to the equations for the model of your project. Check the resulting pdf-file. See below where you can get more information.

### 5. References

Type in next at the end of the tex-file the references of your bibliography. Each reference starts with `\bibitem{}` where `{}` corresponds to the label for each reference.

### 6. (optional) Comment for advanced LaTeX:

There exists a more advanced bibliography-tool, “BibTeX”, which automatically lists your references at the end of your paper in the order of occurrence in the main text of your paper. Furthermore the Bibliography is automatically in the right format (e.g. journal volume in boldface). And last but not least, WebofScience has “RefWorks” which allows you to get the bibtex-text for a specific paper. (To use this click on the box to the left of the desired reference(s) and then change on the top “Save to EndNote online” in the drop down menu to “Save to Other File Formats” then choose for the Content “Author, Title, Source” and for the File Format choose “BibTeX”. When you click on “Send”, the bibtex commands are most likely saved in a file in your `~/Downloads/.`)

In case you would like to use BibTeX, copy

```
~kvollmay/share.dir/papers.dir/template_bibincl.tex
```

and also

```
~kvollmay/share.dir/papers.dir/template_bibincl.bib
```

In the header of `template_bibincl.tex` you find a quick description for how to use BibTeX and in the header of `template_bibincl.bib` is a description for how to use WebofScience to save you the typing and search for the complete information about a paper.

**Info:** For more information about latex please note on our webpage the links in the section "Guidelines For Main Project." Also please feel free to just ask me any time.

## 7. Xfig Intro

I will guide you through the following main commands of `xfig`, which is drawing tool:

- To get started: Type on the command line: `xfig &`  
This will open a new window.
- drawing tools: background grid, circle, line, text, picture, grouping, scaling, copying, editing.
- To save an `xfig` session use `File` → `SaveAs` and give your `xfig`-file a name ending with `.fig`. You can get back to this session any time on the command line with `xfig filename.fig &` or within `xfig` with `File` → `Open`.
- To make an `eps`-file out of your figure use `File` → `Export`, make sure to choose "EPS (Encapsulated Postscript)" and choose the same filename but with the ending `.eps`. This `eps`-file can then be included in your latex file for the paper. (Later into the course I will also show you a variation of latex, latex beamer, which we will use to make talk-slides. You will be able to use the same `eps`-files for the paper and for the talk and therefore your work on the `eps`-files for your paper will be very handy for your talk preparation.)

## 8. (optional) Comment for Advanced `xfig` Users:

In case you would like to use latex commands within `xfig` use the following steps: First copy

```
~kvollmay/share.dir/papers.dir/xfig2eps
```

and

```
~kvollmay/share.dir/papers.dir/xfig2pdf
```

then make both executable (these are perl-scripts)

```
chmod u+x xfig2*. These xfig2* files will be needed for step (3) below.
```

Instead of `xfig` use instead

```
(1) xfig -specialtext -latexfonts -startlatexFont default
```

```
(2) first save then export to "Combined PS/LaTeX (both parts)."
```

This creates two files: `filename.pstex` and `filename.pstex.t`. To then make an `eps`-file (which you can include in your paper) (3a) `xfig2eps filename`

or to make a `pdf`-file use

```
(3b)xfig2pdf filename
```

## 9. Figure(s) for Model Section

Work on the figure(s) which you will use for the model section and/or background section of your first paper.