COURSE 1

PREPARING A PAPER FOR "LES HOUCHES"

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Contents

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1 Introduction

This short note describes the `hch` LaTeX class for authors preparing a compuscript to be used in the book of "*L'École des Houches*". In itself it is an example of the use of the `hch` class. It is assumed that authors have some experience with LaTeX; if not, they are kindly referred to [2, 4, 7], and to [3, 6] for plain TeX. Apart from its few high-level structuring commands, standard LaTeX2$_\varepsilon$-commands will work normally (`\section{...}`, `\subsection{...}`, `\begin{...} ... \end{...}`, etc.).

2 About the "head" of your paper

Your paper contains essentially two parts: the *preamble*, where you put your personal macros, between the `\documentclass` and the `\begin{document}` commands, and its *body*, which is where you put its contents. The body is in turn made of two parts: the *top matter* and the *text*. The top matter is where you give the initial data of your paper (the date, your name, the abstract, etc..).

$$\begin{cases} \textit{Preamble} \\ \textit{Body} \begin{cases} \textit{Top matter} \\ \textit{Text} \end{cases} \end{cases}$$

Your paper should begin with its preamble:

```
\documentclass{hch}
⟨ your macros ⟩
```

Authors express their thanks here.

[1]Institute of Advanced Physics, New-York and Département de Physique, Université de Ludoc, France
[2]Darwin College, etc.

This is followed by its body:

```
\begin{document}
\title{your title}
\author{name of the first author}
\address{his/her address}
\maketitle
your text and your references
\section{···}
\section{···}
\Appendix
\section{···}
\begin{thebibliography}{···}
\end{thebibliography}
\end{document}
```

2.1 Your private macros (the preamble)

Your private definitions *must* be placed between the `\documentclass` and the `\begin{document}` commands (the *preamble*), and *at no other place*. The use of the commands

`\newcommand`, `\renewcommand`, `\newenvironment` `\renewenvironment`

must be the object of an extreme care.

Sensible, restricted usage of private definitions is thoroughly encouraged. Large macro packages should be avoided when they are not used but for very few macros that can be isolated. Pasting macros borrowed from everywhere without needing them must certainly be avoided. Do not change existing environments commands or any part of standard LaTeX. Never use macros that are mere abbreviations (v.g. `\bt` to replace `\begin{theorem}`) but use the facilities of your editor to minimize keystrokes. Intelligible comments of your macros are appreciated and may be useful.

2.2 The top matter

The *top matter* consists of the information obtained from the

`\title`, `\author`, `\address`, `\runningtitle`

commands. All these commands *must* come *before* the `\maketitle` command, which indicates the end of the top matter.

1. Title. The title of your paper is given with the `\title` command. The running head of odd pages is of the form

Author(s): Title

It often happens that this is too long, and for this reason, you may use the `\runningtitle` command, as in

```
\runningtitle{Dupond \etal:  Black holes \dots}
```

which will produce

Dupond *et al.*: Black holes ...

as the running head of odd pages.

Regarding running heads, the editor (1) may decide to redefine the (odd-page) running head, and (2) will set the even-page running head.

Remark: In addition to the latin abbreviation `\etal`, `hch` provides the following abbreviations: `\cf`, `\ie`, `\etc`, `\apriori`, `\afortiori`, `\loccit`, `\vg` the meanings of which should be evident.

2. Authors and addresses. In most cases, there is only one author to a contribution to *L'École des Houches*. However, occasionally there may be several authors. In this case, the author giving the course shall use

```
\author{  ···  }\address{  ···  }
```

and the authors shall use collectively

```
\authorsup{Author One\inst[his address]{1},
           Author Two\inst{1},
           Author Three\inst[his address]{2}, ...}
```

The addresses are an optional argument of `\inst`. Note that `\address` is used outside `\author`, while `\inst` is used inside `\authorsup`.

3. Table of contents, date, etc.. Do not use `\tableofcontents` as the `hch` class automatically generates a table of contents.

Do not use `\date` either, and as a rule, the top matter must contain only what is described in this note.

The `\thanks` command is optional; their uses are summarized by

```
\title{Measuring ...}\thanks{The P.T. Smith Laboratory}
```

4. Course, Seminar. The number of the Course will be set by the publisher. In case of your paper is a Seminar, just write in the preamble: `\Seminar{?}`.

3 About the body of your paper

Authors should write an abstract, using:

```
\begin{abstract}  ···  \end{abstract}
```

3.1 Available macros

Fixed mathematical "object", "operators", etc.. are usually typeset in roman (*v.g.* `\cos, \sup,` etc..). This should be the general rule, and the `hch` class provides macros in this spirit; for example `\xCzero` yields C^0. These macros are:

`\xCzero`	$\mapsto \mathrm{C}^0$	`\xCone`	$\mapsto \mathrm{C}^1$
`\xCtwo`	$\mapsto \mathrm{C}^2$	`\xCinfty`	$\mapsto \mathrm{C}^\infty$
`\xCn{p}`	$\mapsto \mathrm{C}^p$	`\xHzero`	$\mapsto \mathrm{H}^0$
`\xHone`	$\mapsto \mathrm{H}^1$	`\xHtwo`	$\mapsto \mathrm{H}^2$
`\xHinfty`	$\mapsto \mathrm{H}^\infty$	`\xHn{p}`	$\mapsto \mathrm{H}^p$
`\xLzero`	$\mapsto \mathrm{L}^0$	`\xLone`	$\mapsto \mathrm{L}^1$
`\xLtwo`	$\mapsto \mathrm{L}^2$	`\xLinfty`	$\mapsto \mathrm{L}^\infty$
`\xLn{p}`	$\mapsto \mathrm{L}^p$	`\xWzero`	$\mapsto \mathrm{W}^0$
`\xWone`	$\mapsto \mathrm{W}^1$	`\xWtwo`	$\mapsto \mathrm{W}^2$
`\xWinfty`	$\mapsto \mathrm{W}^\infty$	`\xWn{p}`	$\mapsto \mathrm{W}^p$
`\xGL`	$\mapsto \mathrm{GL}$	`\xSL`	$\mapsto \mathrm{SL}$
`\xPSL`	$\mapsto \mathrm{PSL}$	`\xSO`	$\mapsto \mathrm{SO}$
`\xSU`	$\mapsto \mathrm{SU}$	`\xDif u`	$\mapsto \mathrm{D}u$
`\xdif u`	$\mapsto \mathrm{d}u$	`\xdrv xt`	$\mapsto \frac{\mathrm{d}x}{\mathrm{d}t}$
`\xDrv Fx`	$\mapsto \frac{\mathrm{d}}{\mathrm{d}x}F$	`\xker u`	$\mapsto \ker u$
`\xcoker u`	$\mapsto \operatorname{coker} u$	`\xim u`	$\mapsto \operatorname{im} u$
`\xcoim u`	$\mapsto \operatorname{coim} u$	`\xtr A`	$\mapsto \operatorname{tr} A$
`\xdim V`	$\mapsto \dim V$	`\xcodim V`	$\mapsto \operatorname{codim} V$

`\xHom(X,Y)` $\mapsto \operatorname{Hom}(X,Y)$

`\xExt_{\Omega}(X,Y)` $\mapsto \operatorname{Ext}_\Omega(X,Y)$

`\xTor_{\varepsilon}^{\Lambda}(X,Y)` $\mapsto \operatorname{Tor}_\varepsilon^\Lambda(X,Y)$

Of course, they may be used in display style if necessary; for example, `\displaystyle{\xdrv{x_1}{t_1}}` $\mapsto \displaystyle\frac{\mathrm{d}x_1}{\mathrm{d}t_1}$. Recall that `\dim`, `\ker` are already defined in LaTeX, and may be used instead of `\xdim` and `\xker` (given here for uniformity). The macro `\xim` is for the image of a map, and LaTeX provides `\Re` and `\Im` for the real and the imaginary parts of a complex number; `$\Re z$` and `$\Im z$` yield $\Re z$ and $\Im z$ respectively.

The use of these macros is not mandatory, but it is recommended so as to give a greater uniformity to the book made out of your various contributions.

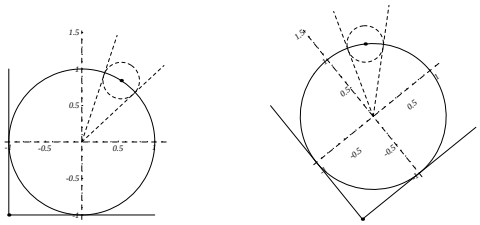

Fig. 1. To illustrate the use of the graphicx package

3.2 Cross references and bibliography

Authors should use the `\label`, `\ref`, `\cite`, ... commands and no "plain numbers". Every numbered part to which one wants to refer to should be labeled with a `\label{...}`.

There are two ways to produce literature references: either using the environment `\thebibliography` or using BibTeX (see [2, 4]); in all cases, your references must appear as numbers: (*v.g.*: use `\bibitem{abc}` and not `\bibitem[xyz]{abc}`, *i.e.* do not give the optional argument to `\bibitem`). Do not use a "hand-made" bibliography.

Appendix

A Including postscript files

There are several packages used to include postscript files. Authors are kindly asked to use the `graphicx` package by D.P. Carlisle and S.P.Q. Rahtz (it is most likely already in your TeX distribution). For a full documentation on this package, see [5], and more generally, for including postscript files, see [1].

First, your preamble must contain the line `\usepackage{graphicx}`. Let us suppose that you have an `eps` file called `circl.eps`; the lines below produce figure 1.

```
\begin{figure}
  \includegraphics[height=0.26\hsize]{circl.eps}
  \qquad
  \includegraphics[height=0.26\hsize,angle=39]{circl.eps}
  \caption{To illustrate the use of the graphicx package}
\end{figure}
```

B Appendices

Your contribution to *L'École des Houches* may contain one or more appendices. Appendices are treated as sections, and for sections to appear as appendices from a certain point onwards, just use the command `\Appendix`. For example, the TEX source of these lines contains the following:

```
\Appendix
\section{Including postscript files}
...
\section{Appendices}
...
```

References

[1] D.P. Carlisle, *Packages in the 'graphics' bundle*, available from CTAN as `grfguide.tex` and `grfguide.ps`.

[2] M. Goossens, Frank Mittelbach, and Alexander Samarin, *The LaTeX companion*, Addison-Wesley Co., Reading, MA, 1994.

[3] D. E. Knuth, *The TeXbook*, Addison-Wesley, Reading, MA, 1984.

[4] L. Lamport, *LaTeX: A document preparation system*, 2nd revised ed., Addison-Wesley, Reading, MA, 1994.

[5] K. Reckdahl, *Using EPS Graphics in LaTeX2ε Documents*, available as `epslatex.ps` from the `ftp://ftp.tex.ac.uk/tex-archive/info/` directory (or other CTAN sites).

[6] R. Séroul, *Le petit livre de TeX*, Masson, Paris, 1996.

[7] M. D. Spivak, *The joy of TeX*, 2nd revised ed., Amer. Math. Soc., Providence, RI, 1990.