Instructions for use of the document class `elsart`

Simon Pepping

Elsevier, P.O. Box 103, 1000 AC Amsterdam, Netherlands

Abstract

This article discusses several features of preparing articles with the `elsart` document style, using Harvard style bibliographic references.

Key words: `elsart`, document class, instructions for use
PACS: 01.30.−y

1 Introduction

This article discusses how to prepare articles with the `elsart` document class. For more general information about LaTeX, see the LaTeX manual written by Lamport (1986).

Elsevier has prepared the following LaTeX support files for authors:

- The document class `elsart.cls`, which provides a preprint layout.
- The document classes `elsart1p.cls`, `elsart3p.cls`, `elsart5p.cls`, which each provide a layout in one of Elsevier's standard journal styles, called 1+, 3+ and 5+.
- The instructions for use of `elsart`, `instructions-harv` for use with a Harvard-style bibliography, and `instructions-num` for use with a numbered style bibliography.
- Template files for a quick start of your LaTeX article with `elsart`, `template-harv.tex` for use with a Harvard-style bibliography, and `template-num.tex` for use with a numbered style bibliography.

Email address: `s.pepping@elsevier.com` (Simon Pepping).
URL: `authors.elsevier.com/locate/latex` (Simon Pepping).

- Styles for BibTeX, `elsart-harv.bst` for a Harvard-style bibliography, and `elsart-num.bst` for a numbered style bibliography.

The files are freely available from Elsevier's Author Gateway http://authors.elsevier.com/locate/latex.

On Elsevier's Author Gateway you will also find support files for CRC journal articles. Support for monographs or contributed book chapters may be obtained via the publisher of the book.

Elsevier's LaTeX support files can also be obtained from one of the servers of the Comprehensive TeX Archive Network (CTAN) in the directory /tex-archive/macros/latex/contrib/supported/elsevier. CTAN is a mirrored network of FTP servers, with the following web front ends: www.tex.ac.uk, www.dante.de/software/ctan (in German) and www.ctan.org. The network is widely mirrored, see http://www.tug.org/tex-archive/CTAN.sites. It holds up-to-date copies of all the public-domain versions of TeX, LaTeX, Metafont and ancillary programs.

Note that CTAN is not related to Elsevier, and that Elsevier's author support cannot accept complaints or answer questions about the availability of any CTAN server.

The non-Elsevier macro packages recommended later in this document and many other useful macro packages can also be obtained from CTAN.

In the following sections we show how you may use the `elsart` document class.

2 Options

The `elsart` document class enables the following options:

doublespacing, reviewcopy This is a single option with two names to obtain double line spacing, as is sometimes required for copies submitted for review.

seceqn, secthm The option `seceqn` numbers the equation environments per section. The option `secthm` does the same for the `thm` environment. In elsart all predefined theorem environments except Algorithm, Note, Summary and Case use the same counter as the `thm` environment.

draft, final As in many other document classes, these are options to produce draft and final layout. In the draft layout you will see warnings for overfull boxes. You also need draft layout to test your formulas on a narrower display width, see option `narrowdisplay`.

narrowdisplay Many Elsevier journals print their text in two columns. Because the preprint layout uses a larger line width than such columns, the formulas are too wide for the line width in print. In draft mode (see the `draft` option) you can use the `narrowdisplay` option to force a narrower width for displayed formulas. The width is roughly equal to the column width of the printed journals, compensated for the larger font size of the preprint layout. The `narrowdisplay` option is ineffective with packages which redefine the equation environments, such as `amsmath`.

The `narrowdisplay` option is especially useful for journals for which the articles are printed from the author's LaTeX file. This is the case for a number of mathematics journals. When you break your formulas such that they fit in the narrow column width, the typesetter will be able to retain most of your breaks. Article for other journals are printed after transformation to an XML file. For such journals the formula layout in the LaTeX file is always lost in the transformation.

The narrow display width is obtained by giving the formulas a larger indent. Too wide formulas in the one-line display environments `equation` and `displaymath` will show an overfull rule:

$$\sum_{i=0}^{\infty} A^n \int \mathrm{d}x\, \frac{F_n(x)}{A_n + B_n} = B^n C^n \int \mathrm{d}x \int \mathrm{d}y\, \frac{G_n(x,y)}{\mathcal{A}_n x + \mathcal{B}_n y}. \quad (1)$$

This is not the case for the multiline display environment `eqnarray`. But in both cases too wide formulas will extend into the right margin, giving you visual feedback:

$$\begin{aligned} \sum_{i=0}^{\infty} A^n \int \mathrm{d}x\, \frac{F_n(x)}{A_n + B_n} &= B^n C^n \int \mathrm{d}x \int \mathrm{d}y\, \frac{G_n(x,y)}{\mathcal{A}_n x + \mathcal{B}_n y}, \\ \sum_{i=0}^{\infty} A^n \int \mathrm{d}x\, \frac{F_n(x)}{A_n + B_n} &= B^n C^n \int \mathrm{d}x \int \mathrm{d}y\, \frac{G_n(x,y)}{\mathcal{A}_n x + \mathcal{B}_n y} \end{aligned} \quad (2)$$

When you switch off draft mode, the formulas will have their normal indentation, and too wide formulas will no longer be signalled.

3 Print layout

Elsevier also makes available a few document classes that roughly reproduce the layout of the printed journals. The majority of Elsevier journals use one of a small set of standard layouts. We have document classes for three of those layouts:

elsart1p text width 32 picas (134 mm), text height 47 lines, one column.

elsart3p text width 39 picas (164 mm), text height 51 lines, one or two columns.
elsart5p text width 43.5 picas (183 mm), text height 57 lines, two columns.

These classes can be used in the same way as elsart. If you prepared an article for elsart, you can run it with one of these print layout classes without changes to the markup. In fact, they use elsart and you must have elsart on your system as well.

Note that the layout is only roughly the same as that of the printed journal. One major source of differences is the font. The printer uses a different font with different character widths, which will cause deviations in layout. There are various other sources of small differences. You cannot use the layout of one of these classes to make claims on the final layout of your article.

4 Frontmatter

The `elsart` document class has a separate `frontmatter` environment for the title, authors, addresses, abstract and keywords.

- `\title`: As in standard LaTeX, e.g. `\title{Model}`.
- `\author`: Different from standard LaTeX, the `\author` command contains only one author and no address. Multiple authors go into multiple `\author` commands, separated from each other by commas. The address goes into a separate `\address` command. Example: `\author{D.E. Knuth}`.
- `\address`: Here goes the address, e.g. `\address{CERN, Geneva}`.
- `\thanks` and `\thanksref`: These provide footnotes to the title, authors and addresses. The `\thanksref` command takes a label: `\thanksref{label}` to relate it to the `\thanks` command with the same label: `\thanks[label]`. There can be several references to a single `\thanks` command. Example:
  `\title{Model\thanksref{titlefn}}` and
  `\thanks[titlefn]{Supported by grants.}`
- `\corauth` and `\corauthref`: These provide footnotes to mark the corresponding author and the correspondence address. They are used in the same manner as `\thanks` and `\thanksref`. Example:
  `\author{A. Name\corauthref{cor}}` and
  `\corauth[cor]{Corresponding author. Address: ... .}`
- `\ead`: This command should be used for the email address or the URL of the author. It refers to the 'current author', i.e., the author last mentioned before the command. When it holds a URL, this should be indicated by setting the optional argument to 'url'. Example: `\ead{s.pepping@elsevier.com}`, `\ead[url]{authors.elsevier.com/locate/latex}`.

It is not necessary to give a `\maketitle` command. The title, authors and addresses are printed as soon as TEX sees them.

The authors and addresses can be combined in one of two ways:

- The simplest way lists the authors of one address or one group of addresses, followed by the address or addresses, and so on for all addresses or groups of addresses.
- The other way first lists all authors, and then all addresses. The authors and addresses are related to each other by labels: `\author[label1]{Name1}` corresponds to `\address[label1]{Address1}`. Example:
  ```
  \author[South]{T.R. Marsh},
  \author[Oxford]{S.R. Duck}
  \address[South]{University of Southampton, UK}
  \address[Oxford]{University of Oxford, UK}
  ```

See the extensive examples in figs. 1, 2, 3, 4.

If you put the frontmatter in an included file, that file should contain the whole frontmatter, including its `begin` and `end` commands. Otherwise, the labels of the frontmatter will remain undefined.

5 Abstract

The abstract should be self-contained. Therefore, do not refer to the list of references. Instead, quote the reference in full, as follows: Wettig & Brown (1996, NewA, 1, 17).

6 Keywords

In electronic publications a proper classification is more important than ever. Elsevier's physics journals use several keyword schemes:

Keywords: Uncontrolled keywords.
PACS: The PACS scheme, developed and maintained by the AIP, covers the whole field of Physics. See http://www.aip.org/pacs/pacs.html or http://www.elsevier.com/locate/pacs.
MSC: The MSC scheme, developed and maintained by the AMS, covers the whole field of Mathematics. See http://www.ams.org/msc or http://www.elsevier.com/locate/msc.

Keywords are entered below the abstract in the following way:

Fig. 1. Article opening with explicit links (input)

```
\documentclass{elsart}
\usepackage{graphicx,natbib,amssymb}
\journal{New Astronomy}
\begin{document}
\begin{frontmatter}

\title{Stroboscopic Doppler tomography of FO Aqr}
\author[South]{T.R. Marsh\corauthref{cor}},
\corauth[cor]{Corresponding author.}
\ead{trm@astro.soton.ac.uk}

\author[Oxford]{S.R. Duck\thanksref{now}}
\thanks[now]{Present address: Systems Engineering and Assessment Ltd.,
Beckington Castle, PO Box 800, Bath BA3 6TB, UK.}
\ead{srd@sea.co.uk}

\address[South]{University of Southampton, Department of Physics,
Highfield, Southampton SO17 1BJ, UK}
\address[Oxford]{University of Oxford, Department of Physics, Nuclear
Physics Laboratory, Keble Road, Oxford, OX1 3RH, UK}

\begin{abstract}
FO Aqr is a close binary star in
which a magnetic white dwarf accretes from a cool companion. Light
curves and spectra show variations on the orbital frequency, the
white dwarf's spin frequency and combinations of the two.
\end{abstract}
\begin{keyword}
Accretion, accretion disks \sep Line: profiles \sep
Binaries: close \sep Novae, cataclysmic variables
\PACS 97.10.Gz \sep 97.30.Qt \sep 97.80.Gm
\end{keyword}
\end{frontmatter}

\section{Introduction}
FO Aqr is a member of the DQ~Her class of stars which
are close binary stars in which a magnetic white dwarf accretes from
a late-type main-sequence secondary star. These stars have most
recently been reviewed by \citet{Patterson94}.
```

Fig. 2. Article opening with explicit links (output)

Stroboscopic Doppler tomography of FO Aqr

T.R. Marsh[a,*], S.R. Duck[b,1]

[a] *University of Southampton, Department of Physics, Highfield, Southampton SO17 1BJ, UK*
[b] *University of Oxford, Department of Physics, Nuclear Physics Laboratory, Keble Road, Oxford, OX1 3RH, UK*

Abstract

FO Aqr is a close binary star in which a magnetic white dwarf accretes from a cool companion. Light curves and spectra show variations on the orbital frequency, the white dwarf's spin frequency and combinations of the two.

Key words: Accretion, accretion disks, Line: profiles, Binaries: close, Novae, cataclysmic variables
PACS: 97.10.Gz, 97.30.Qt, 97.80.Gm

Introduction

FO Aqr is a member of the DQ Her class of stars which are close binary stars in which a magnetic white dwarf accretes from a late-type main-sequence secondary star. These stars have most recently been reviewed by Patterson (1994).

* Corresponding author.
[1] Present address: Systems Engineering and Assessment Ltd., Beckington Castle, PO Box 800, Bath BA3 6TB, UK.
Email addresses: trm@astro.soton.ac.uk (T.R. Marsh), srd@sea.co.uk (S.R. Duck).

Preprint submitted to New Astronomy *21 August 1997*

Fig. 3. Article opening with implicit links (input)

```
\documentclass{elsart}

\begin{document}
\begin{frontmatter}
\title{Integrability in
       random matrix models\thanksref{talk}}
\thanks[talk]{Expanded version of a talk
  presented at the Singapore Meeting on
  Particle Physics (Singapore, August 1990).}

\author{L. Alvarez-Gaum\'{e}\corauthref{cor}}
\address{Theory Division, CERN,
  CH-1211 Geneva 23, Switzerland}
\corauth[cor]{Corresponding author.}
\ead{lag@cern.ch}

\author{C. Gomez\corauthref{cor}\thanksref{SNSF}}
\address{D\'{e}partment de Physique Th\'{e}orique,
  Universit\'{e} de Gen\`{e}ve,
  CH-1211 Geneva 4, Switzerland}
\ead{cg@ug.ch}

\author{J. Lacki}
\address{School of Natural Sciences,
  Institute for Advanced Study,
  Princeton, NJ 08540, USA}
\ead[url]{www.ias.edu/~jl}
\thanks[SNSF]{Supported by the
  Swiss National Science Foundation}

\begin{abstract}
We prove the equivalence between the recent matrix
model formulation of 2D gravity and lattice
integrable models.  For even potentials this
system is the Volterra hierarchy.
\end{abstract}
\end{frontmatter}

\section{Introduction}
Some aspects of the recently discovered
non-perturbative solutions to non-critical strings
\cite{Patterson94} can be better understood and
clarified directly in terms of the integrability
properties of the random matrix model.
...
```

Fig. 4. Article opening with implicit links (output)

Integrability in random matrix models⋆

L. Alvarez-Gaumé*

Theory Division, CERN, CH-1211 Geneva 23, Switzerland

C. Gomez*,[1]

Départment de Physique Théorique, Université de Genève, CH-1211 Geneva 4, Switzerland

J. Lacki

School of Natural Sciences, Institute for Advanced Study, Princeton, NJ 08540, USA

Abstract

We prove the equivalence between the recent matrix model formulation of 2D gravity and lattice integrable models. For even potentials this system is the Volterra hierarchy.

1. Introduction

Some aspects of the recently discovered non-perturbative solutions to non-critical strings (Patterson, 1994) can be better understood and clarified directly in terms of the integrability properties of the random matrix model.
...

⋆ Expanded version of a talk presented at the Singapore Meeting on Particle Physics (Singapore, August 1990).

* Corresponding author.
Email adresses: lag@cern.ch (L. Alvarez-Gaumé), cg@ug.ch (C. Gomez).
URL: www.ias.edu/~jl (J. Lacki).

[1] Supported by the Swiss National Science Foundation

```
\begin{keyword}
Keyword \sep Keyword
\PACS PACS code \sep PACS code
\MSC MSC code \sep MSC code
\end{keyword}
```

7 Cross-references

In electronic publications articles may be internally hyperlinked. Hyperlinks are generated from proper cross-references in the article.

For example, the words Fig. 1 will never be more than simple text, whereas the proper cross-reference `\ref{mapfigure}` may be turned into a hyperlink to the figure itself.

In the same way, the words Governato et al. (1997) will fail to turn into a hyperlink; the proper cross-reference is `\citet{Gea97}`.

Cross-referencing is possible in LaTeX for sections, subsections, formulae, figures, tables, and literature references.

8 PostScript figures

LaTeX and PostScript have had a long and successful relationship. There are three packages for including PostScript figures:

- `graphics`. This simple package provides the command `\includegraphics*[<llx,lly>][<urx,ury>]{file}`. The `*` is optional; it enables the PostScript feature of clipping. In its simplest form, `\includegraphics{file}`, it includes the figure in the PostScript file `file` without resizing.
- `graphicx`. This package provides the command `\includegraphics*[key--value list]{file}`. The `*` is optional; it enables the PostScript feature of clipping. Often used keys are:
  - `scale=.40` to scale the size of the figure with 40%,
  - `width=25pc`, `height=15pc` to set the width or height of the figure,
  - `angle=90` to rotate the figure over 90°.
- `epsfig`. This package is really the `graphicx` package, but it allows one to include PostScript figures using the familiar commands from the earlier packages `epsfig` and `psfig`.

```
\begin{figure}
\begin{center}
\includegraphics*[width=5cm]{name.eps}
\end{center}
\caption{An example of a figure.}
\label{fig:exmp}
\end{figure}
```

Fig. 5. An example of a figure.

For detailed information, see the documentation of the `graphics` packages, in particular the file `grfguide.tex`.

9 Mathematical symbols

Many physics authors require more mathematical symbols than the few that are provided in standard LaTeX. A useful package for additional symbols is the `amssymb` package, developed by the American Mathematical Society. This package includes such oft used symbols as `\lesssim` for $\lesssim$, `\gtrsim` for $\gtrsim$ or `\hbar` for $\hbar$. Note that your TeX system should have the `msam` and `msbm` fonts installed. If you need only a few symbols, such as `\Box` for $\Box$, you might try the package `latexsym`.

In the `elsart` document class vectors are preferably coded as `\vec{a}` instead of `\bf{a}` or `\pol{a}`.

10 Line numbering

Reviewing an electronic version of an article has many advantages. However, reviewers have a harder task indicating remarks and desired changes to the article. Their task is made easier if the lines of the article are numbered. LaTeX's `lineno` package performs this task. It is compatible with `elsart`.

11 The Bibliography

In LaTeX literature references are listed in the `thebibliography` environment. Each reference is a `\bibitem`; each `\bibitem` is identified by a label, by which it can be cited in the text: `\bibitem[Elson et al.(1996)]{ESG96}` is cited as `\citet{ESG96}`. In connection with cross-referencing and possible future

hyperlinking it is not a good idea to collect more that one literature item in one `\bibitem`.

The so-called Harvard or author-year style of referencing is enabled by the LaTeX package `natbib`. With this package the literature can be cited as follows:

- Parenthetical: `\citep{WB96}` produces (Wettig & Brown, 1996).
- Textual: `\citet{ESG96}` produces Elson et al. (1996).
- An affix and part of a reference: `\citep[e.g.][Ch. 2]{Gea97}` produces (e.g. Governato et al., 1997, Ch. 2).

12 Template article

There is a template article `templat-harv.tex`, which you can use as a skeleton for your own article. It is available from Elsevier's Author Gateway, `http://authors.elsevier.com/locate/latex`.

References

Leslie Lamport: LaTeX, *A document preparation system*, 2nd edition, Addison-Wesley (Reading, Massachusetts, 1994).

Wettig, T., & Brown, G.E., The evolution of relativistic binary pulsars, 1996, NewA, 1, 17-34.

Elson, R.A.W., Santiago, B.X., & Gilmore, G.F., Halo stars, starbursts, and distant globular clusters: A survey of unresolved objects in the Hubble Deep Field, 1996, NewA, 1, 1-16.

Governato, F., Moore, B., Cen, R., Stadel, J., Lake, G., & Quinn, T., The Local Group as a test of cosmological models, 1997, NewA 2, 91-106.