Instructions for Authors
Coding with LaTeX

LaTeX 2_ε Class for Lecture Notes in Computational Science and Engineering

Version 1.0

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1 Introduction

Authors wishing to code their contribution with LaTeX, as well as those who have already coded with LaTeX, will be provided with a document class that will give the text the desired layout. Authors are requested to adhere strictly to these instructions; *the style file must not be changed.*

The text output area is automatically set within an area of 11.7 cm horizontally and 19 cm vertically.

If you are already familiar with LaTeX, then the LNCSE class should not give you any major difficulties. It will change the layout to the required LNCSE style (it will for instance define the layout of `\section`). We had to invent some extra commands, which are not provided by LaTeX (e.g. `\institute`, see also Sect. 5)

For the main body of the paper (the text) you should use the commands of the standard LaTeX "article" class. Even if you are familiar with those commands, we urge you to read this entire documentation thoroughly. It contains many suggestions on how to use our commands properly; thus your paper will be formatted exactly to LNCSE standard. For the input of the references at the end of your contribution, please follow our instructions given in Sect. 16 References.

The majority of these hints are not specific for LNCSE; they may improve your use of LaTeX in general. Furthermore, the documentation provides suggestions about the proper editing and use of the input files (capitalization, abbreviation etc.) (see Sect. 4: How to Edit Your Input File).

2 How to Proceed

The package consists of the following files:

`lncsedoc.tex`	general instructions (source of this document), `lncsedoc.tex` means *doc*umentation for *L*ecture *N*otes in *C*omputational *S*cience and *E*ngeneering
`lncsedoc.sty`	class option to help for the instructions
`sprdemo.tex`	an example showing how to code the text
`lncse.cls`	class file for LaTeX

and a few additional files that are either input by the documentation or the demo file.

2.1 How to Invoke the LNCSE Document Class

The LNCSE class is an extension of the standard LaTeX "article" document class. Therefore you may use all "article" commands for the body of your contribution to prepare your manuscript. LNCSE class is invoked by replacing "article" by "lncse" in the first line of your document:

```
\documentclass{lncse}
%
\begin{document}
  <Your contribution>
\end{document}
```

2.2 Contributions Already Coded with LaTeX without the LNCSE document class

If your file is already coded with LaTeX you can easily adapt it a posteriori to the LNCSE document class.

Please refrain from using any LaTeX or TeX commands that affect the layout or formatting of your document (i.e. commands like `\textheight`, `\vspace`, `\headsep` etc.). There may nevertheless be exceptional occasions on which to use some of them.

The LNCSE document class has been carefully designed to produce the right layout from your LaTeX input. If there is anything specific you would like to do and for which the style file does not provide a command, *please contact us*. Same holds for any error and bug you discover (there is however no reward for this – sorry).

3 General Rules for Coding Formulas

With mathematical formulas you may proceed as described in Sect. 3.3 of the *LaTeX User's Guide & Reference Manual* by Leslie Lamport (2nd ed. 1994), Addison-Wesley Publishing Company, Inc.

Equations are automatically numbered sequentially throughout your contribution using arabic numerals in parentheses on the right-hand side.

When you are working in math mode everything is typeset in italics. Sometimes you need to insert non-mathematical elements (e.g. words or phrases). Such insertions should be coded in roman (with `\mbox`) as illustrated in the following example:

Sample Input

```
\begin{equation}
  \left(\frac{a^{2} + b^{2}}{c^{3}} \right) = 1 \quad
  \mbox{ if } c\neq 0 \mbox{ and if } a,b,c\in \bbbr \enspace .
\end{equation}
```

Sample Output

$$\left(\frac{a^{2} + b^{2}}{c^{3}} \right) = 1 \quad \mbox{ if } c\neq 0 \mbox{ and if } a,b,c\in \mathbb{R} \enspace . \tag{1}$$

If you wish to start a new paragraph immediately after a displayed equation, insert a blank line so as to produce the required indentation. If there is no new paragraph either do not insert a blank line or code `\noindent` immediately before continuing the text.

Please punctuate a displayed equation in the same way as other ordinary text but with an `\enspace` before end punctuation.

Note that the sizes of the parentheses or other delimiter symbols used in equations should ideally match the height of the formulas being enclosed. This is automatically taken care of by the following LaTeX commands:

`\left(` or `\left[` and `\right)` or `\right]`.

3.1 Italic and Roman Type in Math Mode

a) In math mode LaTeX treats all letters as though they were mathematical or physical variables, hence they are typeset as characters of their own in italics. However, for certain components of formulas, like short texts, this would be incorrect and therefore coding in roman is required. Roman should also be used for subscripts and superscripts *in formulas* where these are merely labels and not in themselves variables, e.g. T_{eff} *not* T_{eff}, T_{K} *not* T_K (K = Kelvin), m_{e} *not* m_e (e = electron). However, do not code for roman if the sub/superscripts represent variables, e.g. $\sum_{i=1}^{n} a_i$.
b) Please ensure that *physical units* (e.g. pc, erg s^{-1} K, cm^{-3}, W m^{-2} Hz^{-1}, m kg s^{-2} A^{-2}) and *abbreviations* such as Ord, Var, GL, SL, sgn, const. are always set in roman type. To ensure this use the `\mathrm` command: `\mathrm{Hz}`. On p. 44 of the *LaTeX User's Guide & Reference Manual* by Leslie Lamport you will find the names of common mathematical functions, such as log, sin, exp, max and sup. These should be coded as `\log`, `\sin`, `\exp`, `\max`, `\sup` and will appear in roman automatically.
c) Chemical symbols and formulas should be coded for roman, e.g. Fe not Fe, $\mathrm{H_2O}$ not H_2O.
d) Familiar foreign words and phrases, e.g. et al., a priori, in situ, bremsstrahlung, eigenvalues should not be italicized.

4 How to Edit Your Input (Source) File

4.1 Headings

All words in headings should be capitalized except for conjunctions, prepositions (e.g. on, of, by, and, or, but, from, with, without, under) and definite and indefinite articles (the, a, an) unless they appear at the beginning. Formula letters must be typeset as in the text.

4.2 Capitalization and Non-capitalization

a) The following should always be capitalized:
   - Headings (see preceding Sect. 4.1)
   - Abbreviations and expressions in the text such as Fig(s)., Table(s), Sect(s)., Chap(s)., Theorem, Corollary, Definition etc. when used with numbers, e.g. Fig. 3, Table 1, Theorem 2.

   Please follow the special rules in Sect. 4.3 for referring to equations.
b) The following should *not* be capitalized:
   - The words figure(s), table(s), equation(s), theorem(s) in the text when used without an accompanying number.
   - Figure legends and table captions except for names and abbreviations.

4.3 Abbreviation of Words

a) The following *should* be abbreviated when they appear in running text *unless* they come at the beginning of a sentence: Chap., Sect., Fig.; e.g. The results are depicted in Fig. 5. Figure 9 reveals that ....
   Please note: Equations should usually be referred to solely by their number in parentheses: e.g. (14). However, when the reference comes at the beginning of a sentence, the unabbreviated word "Equation" should be used: e.g. Equation (14) is very important. However, (15) makes it clear that ....
b) If abbreviations of names or concepts are used throughout the text, they should be defined at first occurrence, e.g. Plurisubharmonic (PSH) Functions, Strong Optimization (SOPT) Problem.

5 How to Code the Beginning of Your Contribution

The title of a single contribution (it is mandatory) should be coded as follows:

```
\title{<Your contribution title>}
```

All words in titles should be capitalized except for conjunctions, prepositions (e.g. on, of, by, and, or, but, from, with, without, under) and definite and indefinite articles (the, a, an) unless they appear at the beginning. Formula letters must be typeset as in the text. Titles have no end punctuation.

If a long `\title` must be divided please use the code `\\` (for new line).

If you are to produce running heads for a specific volume the standard (of no such running heads) is overwritten with the `[runningheads]` option in the `\documentclass` line. For long titles that do not fit in the single line of the running head a warning is generated. You can specify an abbreviated title for the running head on odd pages with the command

```
\titlerunning{<Your abbreviated contribution title>}
```

There is also a possibility to change the text of the title that goes into the table of contents (that's for volume editors only – there is no table of contents for a single contribution). For this use the command

```
\toctitle{<Your changed title for the table of contents>}
```

An optional subtitle may follow then:

```
\subtitle{<subtitle of your contribution>}
```

Now the name(s) of the author(s) must be given:

```
\author{<author(s) name(s)>}
```

Numbers referring to different addresses or affiliations are to be attached to each author with the `\inst{<no>}` command. If there is more than one author, the order is up to you; the `\and` command provides for the separation.

If you have done this correctly, this entry now reads, for example:

```
\author{Ivar Ekeland\inst{1} \and Roger Temam\inst{2}}
```

The first name[1] is followed by the surname.

As for the title there exist two additional commands (again for volume editors only) for a different author list. One for the running head (on odd pages) – if there is any:

```
\authorrunning{<abbreviated author list>}
```

And one for the table of contents where the affiliation of each author is simply added in braces.

```
\tocauthor{<enhanced author list for the table of contents>}
```

Next the address(es) of institute(s), company etc. is (are) required. If there is more than one address, the entries are numbered automatically with `\and`, in the order in which you type them. Please make sure that the numbers match those placed next to to the authors' names to reflect the affiliation.

```
\institute{<name of an institute>
\and <name of the next institute>
\and <name of the next institute>}
```

If footnote like things are needed anywhere in the contribution heading please code (immediately after the word where the footnote indicator should be placed):

```
\thanks{<text>}
```

[1] Other initials are optional and may be inserted if this is the usual way of writing your name, e.g. Alfred J. Holmes, E. Henry Green.

`\thanks` may only appear in `\title`, `\author` and `\institute` to footnote anything. If there are two or more footnotes or affiliation marks to a specific item separate them with `\fnmsep` (i.e. *f*oot*n*ote *m*ark *sep*arator).

The command

```
\maketitle
```

then formats the complete heading of your article. If you leave it out the work done so far will produce *no* text.

Then the abstract should follow. Simply code

```
\begin{abstract}
<Text of the summary of your article>
\end{abstract}
```

or refer to the demonstration file `sprdemo.tex` for an example or to the *Sample Input* on p. 12.

Remark to Running Heads and the Table of Contents

If you are the author of a single contribution you normally have no running heads and no table of contents. Both are done only by the editor of the volume or at the printers.

6 Special Commands for the Volume Editor

The volume editor can produce a complete camera ready output including running heads, a table of contents, preliminary text (frontmatter), and index or glossary. For activating the running heads there is the class option `[runningheads]`.

The table of contents of the volume is printed wherever the command `\tableofcontents` is placed. A simple compilation of all contributions (fields `\title` and `\author`) is done. If you wish to change this automatically produced list use the commands

```
\titlerunning      \toctitle
\authorrunning     \tocauthor
```

to enhance the information in the specific contributions. See the demonstration file `sprdemo.tex` for examples.

An additional structure can be added to the table of contents with the `\addtocmark{<text>}` command. It has an optional numerical argument, a digit from 1 through 3. 3 (the default) makes an unnumbered chapter like entry in the table of contents. If you code `\addtocmark[2]{text}` the corresponding page number is listed also, `\addtocmark[1]{text}` even introduces a chapter number beyond it.

7 How to Code Your Text

The contribution title and all headings should be capitalized except for conjunctions, prepositions (e.g. on, of, by, and, or, but, from, with, without, under) and definite and indefinite articles (the, a, an) unless they appear at the beginning. Formula letters must be typeset as in the text.

Headings will be automatically numbered by the following codes.

Sample Input

```
\section{This is a First-Order Title}
\subsection{This is a Second-Order Title}
\subsubsection{This is a Third-Order Title.}
\paragraph{This is a Fourth-Order Title.}
```

`\section` and `\subsection` have no end punctuation.
`\subsubsection` and `\paragraph` need to be punctuated at the end.

In addition to the above-mentioned headings your text may be structured by subsections indicated by run-in headings (theorem-like environments). All the theorem-like environments are numbered automatically throughout the sections of your document. If your first call for such a theorem-like environment is `\begin{lemma}`, it will be numbered 1; if corollary follows, this will be numbered 2; if you then call lemma again, this will be numbered 3.

But in case you want to reset this counter to 1 in each section, please specify the documentclass option `envcountreset`:

```
\documentclass[envcountreset]{lncse}
```

Even a numbering on section level (including the section counter) is possible with the documentclass option `envcountsect`.

8 Predefined Theorem like Environments

The following variety of run-in headings are at your disposal:

a) **Bold** run-in headings with italicized text as built-in environments:

```
\begin{corollary} <text> \end{corollary}
\begin{lemma} <text> \end{lemma}
\begin{proposition} <text> \end{proposition}
\begin{theorem} <text> \end{theorem}
```

b) The following generally appears as *italic* run-in heading:

```
\begin{proof} <text>    \qed    \end{proof}
```

It is unnumbered and may contain an eye catching square (call for that with `\qed`) before the environment ends.

c) Further *italic* or **bold** run-in headings with roman environment body may also occur:

```
\begin{definition} <text> \end{definition}
\begin{example} <text> \end{example}
\begin{exercise} <text> \end{exercise}
\begin{note} <text> \end{note}
\begin{problem} <text> \end{problem}
\begin{question} <text> \end{question}
\begin{remark} <text> \end{remark}
\begin{solution} <text> \end{solution}
```

All these environments use and share by default one counter.

9 Defining your Own Theorem like Environments

We have changed the syntax of `\newtheorem` and `\newtheorem*` used to define additional environments. They now require two additional arguments namely the type style in which the keyword of the environment appears and second the style for the text of your new environment.

`\newtheorem` can be used in two ways.

9.1 Method 1 *(preferred)*

You may want to create an environment that shares its counter with another environment, say *main theorem* to be numbered like the predefined *theorem*. In this case, use the syntax

```
\newtheorem{<env_nam>}[<num_like>]{<caption>}
{<cap_font>}{<body_font>}
```

Here the environment with which the new environment should share its counter is specified with the optional argument `[<num_like>]`.

Sample Input

```
\newtheorem{mainth}[theorem]{Main Theorem}{\bfseries}{\itshape}
\begin{theorem} The early bird gets the worm. \end{theorem}
\begin{mainth} The early worm gets eaten. \end{mainth}
```

Sample Output

Theorem 3. *The early bird gets the worm.*

Main Theorem 4. The early worm gets eaten.

The sharing of the default counter (`[theorem]`) is desired. If you omit the optional second argument of `\newtheorem` a separate counter for your new environment is used throughout your document.

9.2 Method 2 *(assumes* `[envcountsect]` *documentstyle option)*

```
\newtheorem{<env_nam>}{<caption>}[<within>]
{<cap_font>}{<body_font>}
```

This defines a new environment <env_nam> which the caption <caption> in the font <cap_font> and the text itself in the font <body_font>. The environment is numbered beginning anew with every new sectioning element you specify with the optional parameter <within>.

Example

```
\newtheorem{joke}{Joke}[subsection]{\bfseries}{\rmfamily}
```

defines a new environment called `joke` which prints the caption **Joke** in boldface and the text in roman. The jokes are numbered starting from 1 at the beginning of every subsection with the number of the subsection preceding the number of the joke e.g. 7.2.1 for the first joke in subsection 7.2.

9.3 Unnumbered Environments

If you wish to have an unnumbered environment, please use the syntax

```
\newtheorem*{<env_nam>}{<caption>}{<cap_font>}{<body_font>}
```

Sample Input (of a simple contribution)

```
\title{Hamiltonian Mechanics}
\author{Ivar Ekeland\inst{1} \and Roger Temam\inst{2}}
\institute{Princeton University, Princeton NJ 08544, USA
\and
Universit\'{e} de Paris-Sud,
Laboratoire d'Analyse Num\'{e}rique, B\^{a}timent 425,\\
F-91405 Orsay Cedex, France}
\maketitle
%
\begin{abstract}
This paragraph shall summarize the contents of the paper
in short terms.
\end{abstract}
%
\section{Fixed-Period Problems: The Sublinear Case}
With this chapter, the preliminaries are over, and we begin the
search for periodic solutions \dots
%
\subsection{Autonomous Systems}
```

```
%
In this section we will consider the case when the Hamiltonian
$H(x)$ \dots
%
\subsubsection*{The General Case: Nontriviality.}
%
We assume that $H$ is
$\left(A_{\infty}, B_{\infty}\right)$-subqua\-dra\-tic
at infinity, for some constant \dots
%
\paragraph{Notes and Comments.}
The first results on subharmonics were \dots
%
\begin{proposition}
Assume $H'(0)=0$ and $ H(0)=0$. Set \dots
\end{proposition}
\begin{proof}[of proposition]
Condition (8) means that, for every $\delta'>\delta$, there is
some $\varepsilon>0$ such that \dots \qed
\end{proof}
%
\begin{example}[\rmfamily (External forcing)]
Consider the system \dots
\end{example}
\begin{corollary}
Assume $H$ is $C^{2}$ and
$\left(a_{\infty}, b_{\infty}\right)$-subquadratic
at infinity. Let \dots
\end{corollary}
\begin{lemma}
Assume that $H$ is $C^{2}$ on $\bbbr^{2n}\backslash \{0\}$
and that $H''(x)$ is \dots
\end{lemma}
\begin{theorem}[(Ghoussoub-Preiss)]
Let $X$ be a Banach Space and $\Phi:X\to\bbbr$ \dots
\end{theorem}
\begin{definition}
We shall say that a $C^{1}$ function $\Phi:X\to\bbbr$
satisfies \dots
\end{definition}
```

Sample Output (follows on the next page together with examples of the above run-in headings)

Hamiltonian Mechanics

Ivar Ekeland[1] and Roger Temam[2]

[1] Princeton University, Princeton NJ 08544, USA
[2] Université de Paris-Sud, Laboratoire d'Analyse Numérique, Bâtiment 425, F-91405 Orsay Cedex, France

Abstract. This paragraph shall summarize the contents of the paper in short terms.

1 Fixed-Period Problems: The Sublinear Case

With this chapter, the preliminaries are over, and we begin the search for periodic solutions ...

1.1 Autonomous Systems

In this section we will consider the case when the Hamiltonian $H(x)$ ...

The General Case: Nontriviality. We assume that H is (A_∞, B_∞)-subquadratic at infinity, for some constant ...

Notes and Comments. The first results on subharmonics were ...

Proposition 1. *Assume $H'(0) = 0$ and $H(0) = 0$. Set ...*

Proof (of proposition). Condition (8) means that, for every $\delta' > \delta$, there is some $\varepsilon > 0$ such that ... □

Example 2 (External forcing). Consider the system ...

Corollary 3. *Assume H is C^2 and (a_∞, b_∞)-subquadratic at infinity. Let ...*

Lemma 4. *Assume that H is C^2 on $\mathbb{R}^{2n}\backslash\{0\}$ and that $H''(x)$ is ...*

Theorem 5 (Ghoussoub-Preiss). *Let X be a Banach Space and $\Phi : X \to \mathbb{R}$ ...*

Definition 6. We shall say that a C^1 function $\Phi : X \to \mathbb{R}$ satisfies ...

10 Fine Tuning of the Text

The following should be used to improve the readability of the text:

`\,`	a thin space, e.g. between numbers or between units and numbers; a line division will not be made following this space
`--`	en dash; two strokes, without a space at either end
`␣--␣`	en dash; two strokes, with a space at either end
`-`	hyphen; one stroke, no space at either end
`$-$`	minus, in the text *only*

Input

```
21\,$^{\circ}$C etc.,
Dr h.\,c.\,Rockefellar-Smith \dots
20,000\,km and  Prof.\,Dr Mallory \dots
1950--1985 \dots
this -- written on a computer -- is now printed
$-30$\,K \dots
```

Output

21 °C etc., Dr h. c. Rockefellar-Smith . . .
20,000 km and Prof. Dr Mallory . . .
1950–1985 . . .
this – written on a computer – is now printed
-30 K . . .

11 Special Typefaces

Normal type (roman text) need not be coded. *Italic* (`{\em <text>}` better still `\emph{<text>}`) or, if necessary, **boldface** should be used for emphasis.

`{\itshape Text}`	*Italicized Text*
`{\em Text}`	*Emphasized Text – if you would like to emphasize* a definition *within an italicized text (e.g. of* a theorem) *you should code the expression to be emphasized by* `\em`.
`{\bfseries Text}`	**Important Text**
`\vec{Symbol}`	Vectors may only appear in math mode. The default LaTeX vector symbol has been adapted to LNCSE conventions. `$\vec{A \times B\cdot C}` yields $\boldsymbol{A \times B \cdot C}$ `$\vec{A}^{T} \otimes \vec{B} \otimes \vec{\hat{D}}$` yields $\boldsymbol{A}^T \otimes \boldsymbol{B} \otimes \hat{\boldsymbol{D}}$

12 Footnotes

Footnotes within the text should be coded:

```
\footnote{Text}
```

Sample Input

Text with a footnote`\footnote{The footnote is automatically numbered.}` and text continues ...

Sample Output

Text with a footnote[1] and text continues ...

13 Lists

Please code lists as described below:

Sample Input

```
\begin{enumerate}
  \item First item
  \item Second item
  \begin{enumerate}
    \item First nested item
    \item Second nested item
  \end{enumerate}
  \item Third item
\end{enumerate}
```

Sample Output

1. First item
2. Second item
   (a) First nested item
   (b) Second nested item
3. Third item

14 Figures

Figure environments should be inserted after (not in) the paragraph in which the figure is first mentioned. They will be numbered automatically.

Preferably the images should be enclosed as PostScript files – best as EPS data using the *graphics or graphicx* package of LaTeX.

If you cannot include them into your output this way and use other techniques for a separate production, the figures should be handled as follows:

– Line drawings should be pasted directly into the printout.

[1] The footnote is automatically numbered.

– Halftone figures and line drawings containing halftones or extremely weak lines should be sent separately because they will be reproduced in a different manner.

The lettering in the figures (line drawings and halftones) should have a size of at least 1.8 mm and not more than 2.5 mm for capital letters – even after a probably necessary reduction. Check that lines and other details are uniformly black and that the lettering on figures is clearly legible.

To leave the desired amount of space for the height of your figures, please use the coding described below. The surrounding space is provided by the figure environment, so that you should only leave the space equivalent to the size of the figure itself. Please note that "`x`" in the following coding stands for the actual height of the figure:

```
\begin{figure}
\vspace{x cm}
\caption[ ]{...text of caption...}
\end{figure}
```

Sample Input

```
\begin{figure}
\vspace{2cm}
\caption{This is the caption of the figure displaying a white
eagle and a white horse on a snow field}
\end{figure}
```

Sample Output

Fig. 1. This is the caption of the figure displaying a white eagle and a white horse on a snow field

If your contribution contains 4-colour-graphics, we would ask you to get in touch with us at the address given on page 2. We can then discuss a possible data transfer of the graphics as well as the integration of these in the text. Generally, we ask authors to try and combine all 4-colour-graphics in one table, so that the high costs caused by these can be kept within appropriate limits.

You will find an example for such a colour plate on the next page. For the input please refer to the source file of this document `lncsedoc.tex`.

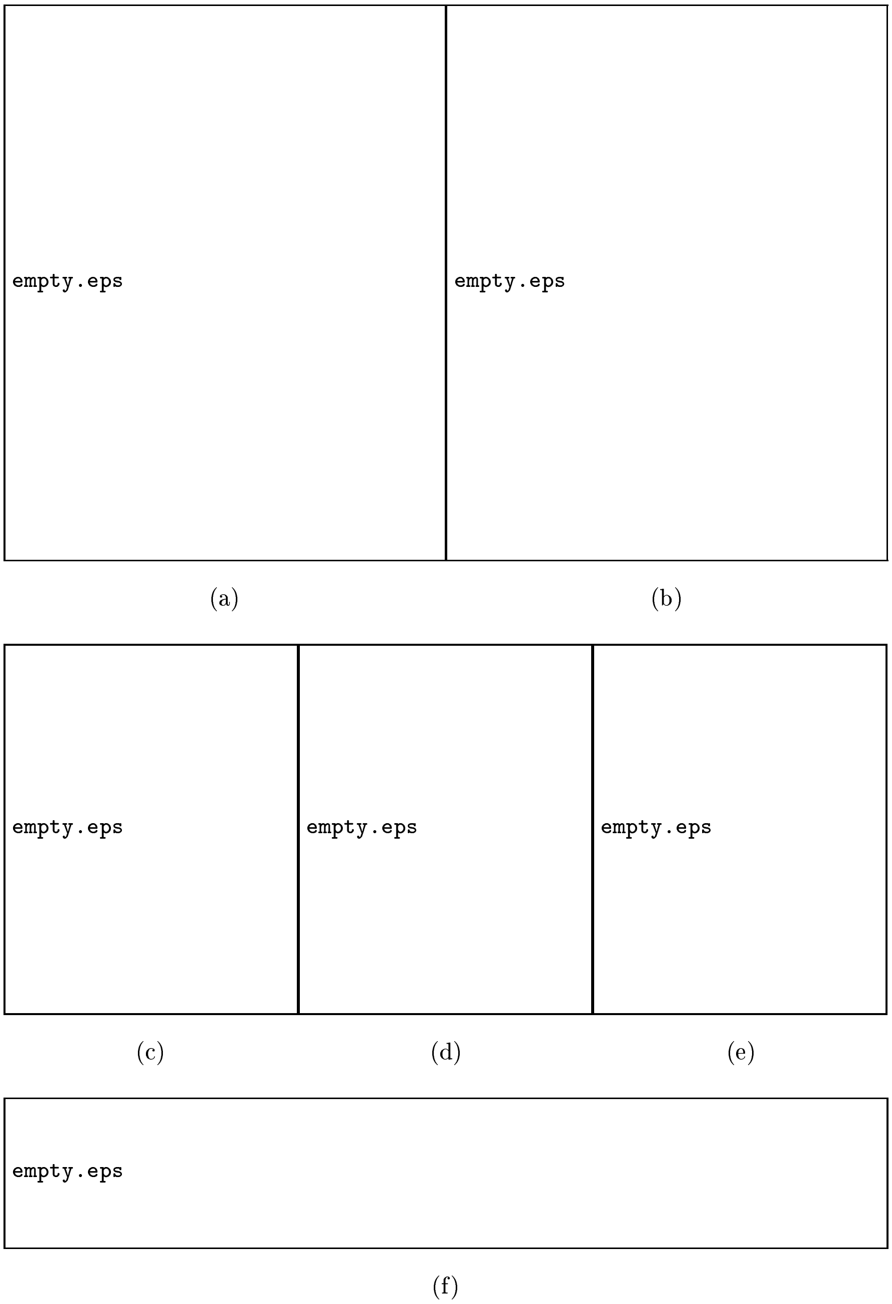

Fig. 2. An example of a color plate made up from six images. Scaling of the EPS data is done by the *graphicx* package of LaTeX.

15 Tables

Table captions should be treated in the same way as figure legends, except that the table captions appear *above* the tables. The tables will be numbered automatically.

15.1 Tables Coded with LaTeX

Please use the following coding:

Sample Input

```
\begin{table}
\caption{Critical $N$ values}
\begin{center}
\begin{tabular}{llllll}
\hline\noalign{\smallskip}
${\mathrm M}_\odot$ & $\beta_{0}$ & $T_{\mathrm c6}$ & $\gamma$
  & $N_{\mathrm{crit}}^{\mathrm L}$
  & $N_{\mathrm{crit}}^{\mathrm{Te}}$\\
\noalign{\smallskip}
\hline
\noalign{\smallskip}
 30 & 0.82 & 38.4 & 35.7 & 154 & 320 \\
 60 & 0.67 & 42.1 & 34.7 & 138 & 340 \\
120 & 0.52 & 45.1 & 34.0 & 124 & 370 \\
\hline
\end{tabular}
\end{center}
\end{table}
```

Sample Output

Table 1. Critical N values

${\mathrm M}_\odot$	β_{0}	$T_{\mathrm c6}$	γ	$N_{\mathrm{crit}}^{\mathrm L}$	$N_{\mathrm{crit}}^{\mathrm{Te}}$
30	0.82	38.4	35.7	154	320
60	0.67	42.1	34.7	138	340
120	0.52	45.1	34.0	124	370

Before continuing your text you need an empty line. ...

For further information you will find a complete description of the tabular environment on p. 62 ff. and p. 204 of the *LaTeX User's Guide & Reference Manual* by Leslie Lamport.

15.2 Tables Not Coded with LaTeX

If you do not wish to code your table using LaTeX but prefer to have it reproduced separately, proceed as for figures and use the following coding:

Sample Input

```
\begin{table}
\caption{text of your caption}
\vspace{x cm}     % the actual height needed for your table
\end{table}
```

15.3 Signs and Characters

Special Signs. You may need to use special signs. The available ones are listed in the *LaTeX User's Guide & Reference Manual* by Leslie Lamport, pp. 41 ff. We have created further symbols for math mode (enclosed in $):

`\grole`	yields	$\gtrless$	`\getsto`	yields	$\leftrightarrows$
`\lid`	yields	$\leqq$	`\gid`	yields	$\geqq$

Gothic (Fraktur). If gothic letters are *necessary*, please use those of the relevant $\mathcal{A}\mathcal{M}\mathcal{S}$-TeX alphabet which are available using the amstex package of the American Mathematical Society.

In LaTeX only the following gothic letters are available: `$\Re$` yields $\Re$ and `$\Im$` yields $\Im$. These should *not* be used when you need gothic letters for your contribution. Use $\mathcal{A}\mathcal{M}\mathcal{S}$-TeX gothic as explained above. For the real and the imaginary parts of a complex number within math mode you should use instead: `$\mathrm{Re}$` (which yields Re) or `$\mathrm{Im}$` (which yields Im).

Script. For script capitals use the coding

`$\mathcal{AB}$` which yields $\mathcal{AB}$

(see p. 42 of the LaTeX book).

Special Roman. If you need other symbols than those below, you could use the blackboard bold characters of $\mathcal{A}\mathcal{M}\mathcal{S}$-TeX, but there might arise capacity problems in loading additional $\mathcal{A}\mathcal{M}\mathcal{S}$-TeX fonts. Therefore we created the blackboard bold characters listed below.

\bbbc	(complex numbers)	: $\mathbb{C}$	\bbbf	(blackboard bold F)	: $\mathbb{F}$
\bbbh	(blackboard bold H)	: $\mathbb{H}$	\bbbk	(blackboard bold K)	: $\mathbb{K}$
\bbbm	(blackboard bold M)	: $\mathbb{M}$	\bbbn	(natural numbers N)	: $\mathbb{N}$
\bbbp	(blackboard bold P)	: $\mathbb{P}$	\bbbq	(rational numbers)	: $\mathbb{Q}$
\bbbr	(real numbers)	: $\mathbb{R}$	\bbbs	(blackboard bold S)	: $\mathbb{S}$
\bbbt	(blackboard bold T)	: $\mathbb{T}$	\bbbz	(whole numbers)	: $\mathbb{Z}$
\bbbone	(symbol one)	: $\mathbb{1}$			

$$\mathbb{C}^{\mathbb{C}^{\mathbb{C}}} \otimes \mathbb{F}_{\mathbb{F}_{\mathbb{F}}} \otimes \mathbb{H}_{\mathbb{H}_{\mathbb{H}}} \otimes \mathbb{K}_{\mathbb{K}_{\mathbb{K}}} \otimes \mathbb{M}^{\mathbb{M}^{\mathbb{M}}} \otimes \mathbb{N}_{\mathbb{N}_{\mathbb{N}}} \otimes \mathbb{P}^{\mathbb{P}^{\mathbb{P}}}$$
$$\otimes \mathbb{Q}_{\mathbb{Q}_{\mathbb{Q}}} \otimes \mathbb{R}^{\mathbb{R}^{\mathbb{R}}} \otimes \mathbb{S}^{\mathbb{S}_{\mathbb{S}}} \otimes \mathbb{T}^{\mathbb{T}^{\mathbb{T}}} \otimes \mathbb{Z} \otimes \mathbb{1}^{\mathbb{1}_{\mathbb{1}}}$$

16 References

There are three reference systems available; only one, of course, should be used for your contribution. With each system (by number only, by letter-number or by author-year) a reference list containing all citations in the text, should be included at the end of your contribution placing the LaTeX environment `thebibliography` there. For an overall information on that environment see the *LaTeX User's Guide & Reference Manual* by Leslie Lamport, p. 71. At the moment there is no special BibTeX style for LNCSE – sorry.

16.1 References by Letter-Number or by Number Only

References are cited in the text – using the `\cite` command of LaTeX – by number or by letter-number in square brackets, e.g. [1] or [E1, S2], [P1], according to your use of the `\bibitem` command in the `thebibliography` environment. The coding is as follows: if you choose your own label for the sources by giving an optional argument to the `\bibitem` command the citations in the text are marked with the label you supplied. Otherwise a simple numbering is done, which is preferred.

```
The results in this section are a refined version
of \cite{clar:eke}; the minimality result of Proposition~14
was the first of its kind.
```

The above input produces the citation: "... refined version of [CE1]; the minimality...". Then the `\bibitem` entry of the `thebibliography` environment should read:

```
\begin{thebibliography}{[MT1]}
.
.
\bibitem[CE1]{clar:eke}
Clarke, F., Ekeland, I.:
```

```
Nonlinear oscillations and boundary-value problems for
Hamiltonian systems.
Arch. Rat. Mech. Anal. {\bfseries 78} (1982) 315--333
.
.
\end{thebibliography}
```

The complete bibliography looks like this:

References

[CE1] Clarke, F., Ekeland, I.: Nonlinear oscillations and boundary-value problems for Hamiltonian systems. Arch. Rat. Mech. Anal. **78** (1982) 315–333

[CE2] Clarke, F., Ekeland, I.: Solutions périodiques, du période donnée, des équations hamiltoniennes. Note CRAS Paris **287** (1978) 1013–1015

[MT1] Michalek, R., Tarantello, G.: Subharmonic solutions with prescribed minimal period for nonautonomous Hamiltonian systems. J. Diff. Eq. **72** (1988) 28–55

[Ta1] Tarantello, G.: Subharmonic solutions for Hamiltonian systems via a $\mathbb{Z}_p$ pseudoindex theory. Annali di Matematica Pura (to appear)

[Ra1] Rabinowitz, P.: On subharmonic solutions of a Hamiltonian system. Comm. Pure Appl. Math. **33** (1980) 609–633

Number-Only System. For this preferred system do not use the optional argument in the `\bibitem` command: then, only numbers will appear for the citations in the text (enclosed in square brackets) as well as for the marks in your bibliography (here the number is only end-punctuated without square brackets).

Subsequent citation numbers in the text are collapsed to ranges. Non-numeric and undefined labels are handled correctly but no sorting is done.

E.g., `\cite{n1,n3,n2,n3,n4,n5,foo,n1,n2,n3,?,n4,n5}` – where nx is the key of the x^{th} `\bibitem` command in sequence, `foo` is the key of a `\bibitem` with an optional argument, and `?` is an undefined reference – gives 1,3,2-5,foo,1-3,?,4,5 as the citation reference.

```
\begin{thebibliography}{1}
\bibitem {clar:eke}
Clarke, F., Ekeland, I.:
Nonlinear oscillations and boundary-value problems for
Hamiltonian systems.
Arch. Rat. Mech. Anal. {\bfseries 78} (1982) 315--333
\end{thebibliography}
```

16.2 Author-Year System

References are cited in the text by name and year in parentheses and should look as follows: (Smith 1970, 1980), (Ekeland et al. 1985, Theorem 2), (Jones and Jaffe 1986; Farrow 1988, Chap. 2). If the name is part of the sentence only the year may appear in parentheses, e.g. Ekeland et al. (1985, Sect. 2.1) The reference list should contain all citations occurring in the text, ordered alphabetically by surname (with initials following). If there are several works by the same author(s) the references should be listed in the appropriate order indicated below:

a) One author: list works chronologically;
b) Author and same co-author(s): list works chronologically;
c) Author and different co-authors: list works alphabetically according to co-authors.

If there are several works by the same author(s) and in the same year, but which are cited separately, they should be distinguished by the use of "a", "b" etc., e.g. (Smith 1982a), (Ekeland et al. 1982b).

How to Code Author-Year System. If you want to use this system you have to specify the option `[citeauthoryear]` in the `documentclass`, like:

```
\documentclass[citeauthoryear]{lncse}
```

Write your citations in the text explicitly except for the year, leaving that up to LaTeX with the `\cite` command. Then give only the appropriate year as the optional argument (i.e. the label in square brackets) with the `\bibitem` command(s).

Sample Input

```
The results in this section are a refined version
of Clarke and Ekeland (\cite{clar:eke}); the minimality result
of Proposition~14 was the first of its kind.
```

The above input produces the citation: "... refined version of Clarke and Ekeland (1982); the minimality...". Then the `\bibitem` entry of `clar:eke` in the `thebibliography` environment should read:

```
\begin{thebibliography}{}  % (do not forget {})
.
.
\bibitem[1982]{clar:eke}
Clarke, F., Ekeland, I.:
Nonlinear oscillations and boundary-value problems for
Hamiltonian systems.
Arch. Rat. Mech. Anal. {\bfseries 78} (1982) 315--333
```

```
.
.
\end{thebibliography}
```

Sample Output

References

Clarke, F., Ekeland, I.: Nonlinear oscillations and boundary-value problems for Hamiltonian systems. Arch. Rat. Mech. Anal. **78** (1982) 315–333

17 Index Generation

For an overall reference on how to generate an index you may have a look into Sect. 4.5 of the *LaTeX User's Guide & Reference Manual* by Leslie Lamport. In the following you will find an example on how to make an authors index as well as a subject index at the end of the book (refer also to the demonstration file of the LNCSE package `sprdemo.tex`).

```
\addtocmark[2]{Author Index}
\markboth{Author Index}{Author Index}%
\renewcommand{\indexname}{Author Index}%
\threecolindex  % starts the next index in three column mode
\printindex
\clearpage
\addtocmark[2]{Subject Index}
\markboth{Subject Index}{Subject Index}
\renewcommand{\indexname}{Subject Index}
\makeatletter
\@input@{subjidx.ind}
\end{document}
```

The `\addtocmark` commands make an additional numbered TOC entry. Also `\markboth` is used to change the running title as the index file itself does neither produce an entry in the table of contents nor an updated running head. In addition the title of the index heading is changed to reflect both the author index and then the subject index.