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Instructions for Authors Using LaTeX and the Springer Macro Package CLMono01 or CLMult01

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With a Reference Card

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Please address all questions regarding typography, sample pages, illustrations etc. to the *production editor* who is in charge of your project.

You can request a copy of this macro package on 3,5″ DOS diskettes together with a booklet containing the documentation but the files are also available via Internet. To obtain a copy via e-mail, send a message to `svserv@vax.ntp.springer.de` containing the line
`send   /tex/latex/clmomu01.zip`
or use anonymous `ftp` to `trick.ntp.springer.de`. Username is `ftp` or `anonymous`. Enter your e-mail address at the password prompt. The package resides in the directory `/pub/tex/latex/clmomu01`.

This machine is also a gopher server.

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The Goal

You would like to see your book published quickly and at an acceptable price. By using your computer and a laser printer, you can reduce the typesetting costs that make up a substantial part of the total production costs, and thus help make a reasonable retail price possible. The manuscript you submit will be reproduced directly from your hard copy and printed by the offset process. Thus you yourself determine the typography and the formal quality of your book. This booklet plus our LaTeX macro packages are designed to help you produce an optimal manuscript.

To enable you to format your manuscript with as little effort as possible, we have developed two macro packages which cover all important layout elements, such as size of type area, appearance of headings, styling of index, etc. Using our macros, you can prepare a manuscript for camera-ready reproduction that meets all the specifications of our publishing house.

Many careful and repeated checks are necessary before the final printout is made. Authors whose native language is not English should always have their English manuscripts checked by a colleague who is a native speaker of English. It is generally also advisable for a colleague with a linguistic background and/or a copy editor at Springer-Verlag to check the text before final printing. You are responsible for carrying out any corrections to the text that are necessary.

Please make your final printout on a printer with a resolution of at least 300 dpi. A resolution of 600 dpi would be preferable.

Moreover, please send to the production department which is in charge of your project as early as possible representative sample pages, including illustrations, tables, footnotes, references, appendix, index etc. (if these appear), so that we can examine the formal and technical quality of the laser printout.

In order to spare yourself and us extra work, please read the advice in this booklet carefully before you begin to input your text.

If you do not find a special macro in the packages for a specific text structure you may, of course, write one yourself.

1. Introduction

1.1 Book and Printout Format

The standard book format that Springer-Verlag uses for camera-ready publications is called "Grosshandbuch":

- *Trimmed format:* 15.5 cm × 23.5 cm
  Page margin widths: inside 1.9 cm, top 2.1 cm, outside 1.9 cm,
  bottom 2.5 cm.
- *Type area:* 11.7 cm × 18.9 cm, with a distance of 8 mm between the upper edge of the running head and the upper edge of the first line of text.

1.2 Typeface and Size

Using LaTeX and this macro package, your text is typeset automatically in Computer Modern Roman (CM) fonts and in the type area mentioned above. The main text is set in 10 points and small print in 9 points.

1.3 Parts of the Book

A book consists of front matter, the main text, and any references and indexes and/or appendices that may be included. The front matter is described in Chap. 4, the main text in Chap. 5, references in Chap. 7, and the index in Chap. 8.

Of course, if you are writing a chapter in a multi-author book or proceedings volume, you need only be concerned with instructions that apply to individual chapters.

2. Technical Instructions

2.1 Background Information

2.1.1 Why Format Files?

As our package requires a lot of fonts in addition to those preloaded by LaTeX, it will normally not work if used via the \documentstyle statement. It is therefore necessary to create a new so-called format file with our package. This is done by submitting a set of macro definitions to a program called initex. This program processes the definitions, the font specifications, and the original LaTeX macros and stores all of them in "compiled" form in a format file. This process does not produce any output like an ordinary run of TeX, but speeds things up for all subsequent runs you make using LaTeX in combination with our macros and font selection.

For technical details, please see Sect. 2.2.

2.1.2 Hardware and Software Requirements

As we are striving to meet all of the needs of authors producing a typescript in our format, the style file has developed into a product that requires a certain amount of disk storage capacity and memory space. In some installations of TeX you may have to increase the amount of memory that is allocated.[1]

Please refer to the documentation of your TeX installation for details.

2.1.3 TeX and LaTeX Version

We have developed this style file with emTeX3.0 [3a], LaTeX 2.09 and the New Font Selection Scheme (NFSS) vers. 1. We have tested it with PCTeX on TeX version 3.0 through 3.14; using it with other versions or implementations may cause difficulties. If you run into problems, please contact us and we will try to help.

---

[1] For PCTeX this is done by invoking TeX with the parameters /f and /m tex &<formatname> <filename> /f=40000 /m=65000. If you use cross referencing a lot, you may run out of pool space. With emTeX e.g. you can increase the pool size with the /mp=65500 option directly after the tex command.

Warning: PCTEX 2.9 contains a bug that will cause failure of the initex run!

2.1.4 Files

The following files have to be present on your system, as they will be read in when the format file is created:

- `latex.tex` as of March 25, 1992 or later
- `lplain.tex`
- `art10.sty`
- `article.sty`
- `hyphen.tex` or another hyphenation file
- the NFSS1. In addition to the files already present in the package you need the file `lfonts.new` to set up the NFSS1 correctly.

If you don't have this set of files, you can get it from any TEX file server or from Springer-Verlag NTP department on request. For those with access to anonymous FTP: The files reside in the directory `pub/tex/latex/nfss1` on the host `trick.ntp.springer.de`
All other files come with the macro package *CLMoMu01*.

2.1.5 Fonts

We have included access to the AMS[2] symbol fonts and the AMS Euler fonts in our macro package. These fonts contain many symbols used by mathematicians and are now available on a public domain basis, provided the publication where they are used mentions their use. You can order them from Springer-Verlag on DOS diskettes if necessary, but they are also available on all major TEX servers.

The tfm and pixel files of the fonts used by the style files must be present on your installation. For your convenience we have listed below the fonts used by this package.

If you don't have all the fonts mentioned in the list below, you have two possibilities:

- If you do not plan to use macros that need these fonts (e.g. Gothic (Fraktur) symbols) you can simply ignore the error messages issued by LATEX and proceed as usual.
- Otherwise, you must store the necessary font files to your disk before implementing our macros.

[2] American Mathematical Society.

Fontlist

CM fonts	5pt	6pt	7pt	8pt	9pt	10pt	11pt
cmr	×	×	×	×	×	×	10/10.95pt*
cmb	10/5pt**	10/6pt	10/7pt	10/8pt	—	×	—
cmbx	×	× 5/1200***	× 5/1440	× 7/1200	×	× 7/1440	10/1200
cmmi	×	×	×	×	×	×	—
cmsy	×	× (5/1200)	× (5/1440)	× (7/1200)	×	× (7/1440)	10/1200
cmmib	10/500	10/600	10/700	10/833	10/900	×	10/1200
cmti	—	—	—	×	×	×	—
cmtt	—	—	—	×	×	×	—
cmex	—	—	10/7pt	10/8pt	10/9pt	×	10/1200
msam	×	×	×	×	×	×	10/1200
msbm	×	×	×	×	×	×	10/1200
eufm	×	×	×	×	×	×	10/1200
cmss	10/5pt	10/6pt	10/7pt	10/8pt	10/9pt	×	—

* This means cmr10 scaled 1095 is necessary.
** This means cmb10 at 5pt is necessary.
*** This means cmbx5 scaled 1200 is also necessary.
× This means font is needed.
— This means font is not needed.

(For more fonts see next page.)

Fontlist (continued)

CM fonts	14.4pt	17pt	20pt	25pt
cmr	42/14.4pt	×	17/20.736pt	17/24.8832pt
cmb	—	—	—	
cmbx	10/1440	10/1728	—	12/2074
cmmi	—	—	—	—
cmsy	10/1440	10/1728	—	—
cmmib	10/1440	10/1728	—	—
cmti	—	—	—	—
cmtt	—	—	—	—
cmex	10/1440	10/1728	—	—
msam	10/1440	—	—	—
msbm	10/1440	—	—	—
eufm	10/1440	—	—	—
cmss	—	—	—	—

2.2 Creating Format Files

The package comes with the following files

`read.me`	General information on the package
`clmono01.ini`	`initex` file of the macro package *CLMono01* for monographs
`clmult01.ini`	`initex` file of the macro package *CLMult01* for multiauthor books
`flplain.tex`	Macro file
`clmono01.mac`	Macro file
`clmult01.mac`	Macro file
`fontdef.tex`	Font definitions (NFSS)

`preload.tex`	Copy of `preload.min` (NFSS)
`xxxlfont.sty`	Copy of `oldlfont.sty` (NFSS)
`amsfont.sty`	Macro file defining AMS fonts
`amssymb.sty`	Style option defining AMS symbols
`cropmark.sty`	Style option for cropmarks
`clmomu01.doc`	LaTeX source of the user's guide
`clm1-doc.dvi`	DVI file of this user's guide
`clmono01.ref`	"Reference card" listing all commands available for `CLMono01`
`clmult01.ref`	"Reference card" listing all commands available for `CLMult01`
`clmomu01.ind`	Example index file for `clmomu01.doc`
`sprmindx.sty`	Supplementary file for *MakeIndex*

For reasons that are explained in Sect. 2.1.1 our macros must be used as a format file and not merely via a `\documentstyle` statement.

Creating a format file is done using the program `initex`:

1. Create a directory called `clmomu01` and copy all files from the package except the style options into this directory. The style option files have to be transferred into a directory that TeX searches for input files.
2. Decide which format file you want to create. For monographs use `clmono01.ini`, for multi-author books (proceedings) use `clmult01.ini`.
3. Decide for which language you want to create a format file and, for a language other than English, edit the file `clmono01.ini` or `clmult01.ini` so that it includes the correct hyphenation patterns. Ask your TeXpert for the correct file name or consult the documentation of your TeX implementation. English hyphenation patterns are the default setting.
4. Make sure that all fonts required are on your hard disk. If necessary, install the NFSS and any fonts that are missing.
5. Run `initex` with the file `clmono01.ini` or `clmult01.ini`. The exact syntax of this command depends on the implementation. If necessary increase the amount of font and/or main memory allocated by TeX.
   After `initex` has successfully completed its task, you will have a format file called `clmono01.fmt` or `clmult01.fmt`.
6. After you have completed both format files you can remove the following files from your hard disk:

   `clmono01.ini`, `clmult01.ini`, `clmono01.mac`, `clmult01.mac`, `flplain.tex`
   `fontdef.tex`, `preload.tex`, `xxxlfont.sty`, `amsfont.sty`.

2.3 Installing the Fonts

For DOS installations you can have the program `finstall` (to be found on the AMS fonts diskettes only, not in the macro package itself) install the AMS fonts for you. In all other cases you must copy the files from diskettes into the appropriate directories yourself.

The AMS font data can also be retrieved through anonymous ftp from the directory `pub/tex/fonts` on the host `trick.ntp.springer.de` (IP#: 192.129.24.12)

Do not forget that, in general, the printer or screen driver must be instructed how to find the additional pixel files. Most of the drivers have a configuration file that contains the names of the fonts available to the printer. The names of these fonts have to be added to this file. Please refer to your driver manual. The names normally given to the pixel files by the installation program are

`\pctex\pixel\pk`*nnn*`\<fontname>.pk`

where *nnn* is a three-digit number indicating the size of the font.

3. Using the Style File

The *CLMono01* and *CLMult01* styles are adaptations of the LaTeX *article* style. Therefore you may use all *article* style commands to prepare your manuscript. These styles create a number of macros and redefines others. This may sometimes involve a change in syntax.

Although all style specifications are already incorporated in the format file, the `\documentstyle` command has to be entered as usual. This is done to prevent mismatching format file and style specifications.

The top of your file must thus contain the lines

`\documentstyle{clmono01}` or `\documentstyle{clmult01}`
`<any macro definitions you wish to make>`
`\begin{document}`

To create the DVI file you must then use a command similar to

`tex &clmono01 <filename>`

or

`tex &clmult01 <filename>`

Unix installations: The & character has a special meaning for the Unix shell, so you have to quote or to escape it in your command line.
Try `tex '&clmono01' <filename>` or `tex \&clmult01 <filename>`

Make sure that format file name and specified document style are the same!

3.1 Style Options

As style options can substantially change the layout of a document, we suggest that you use them with caution. The style options treated below, however, are suitable for our macro package. If you need other style options, you must include them on the diskette when you finally submit your file.

3.1.1 Standard LaTeX Options

The following standard options may be used with our formats:

```
array
draft
fleqn
leqno
makeidx
twoside
```

If your very special additional style option does really work in conjunction with the package you can stop it complaining by introducing a line `\@optiondef{<your option>}` in the `.ini` file just before the `\makeatother` line and rebuilding the format.

3.1.2 Style Options `referee` and `footinfo`

These two options are helpful when working on your text:
`referee` will produce double-spaced output for proofreading.
`footinfo` will generate footlines such as the one shown below to help distinguishing different versions of your document.

`Page: 11    job:clmomu01    macro: clmono01    date/time: 2-Mar-1993/12:41`

If you want to use both options, you must type `referee` before `footinfo`.

3.1.3 Style Options `deutsch`, `german` and `francais`

Some of our macros insert fixed phrases, such as *Theorem* or *Lemma*, into your text. In the default setting, these words are in English. If you publish a text in French or German, you can translate these words into the respective languages by including the option `deutsch` or `francais` respectively at the top of the file. Usually you will then also include an option like `german` to ease input of accented letters etc.

3.1.4 Style Option `numart`

Normally figures, tables, and equations are numbered with
`<chapter number>.<no>`
respectively. If you use the style option `numart`, these elements are numbered consecutively through the whole document (monograph or contribution).

3.1.5 Style Option `bibay`

Use this option if you want to reference by author's name and year of publication (see also Chap. 7).

3.1.6 Style Option `fleqn`

Please use this option for all books except for mathematics.

3.1.7 Style Option `vecphys`

By default vectors are typeset as bold upright letters. In physical science literature however by convention bold italic letters are used. This can be activated by using the style option `vecphys`.

3.1.8 Style Option `amssymb`

This option allows you to use the large number of special AMS symbols. Note, however, that this may cause your TeX to run out of pool, i.e. the capacity for characters in names of control sequences.

4. Front Matter

Roman numbers are used to number the pages in the front matter: p. I = half-title page, p. II = verso (even-numbered, hence on the left) of half-title page, p. III = title page, p. IV = verso of title page (copyright page). Pages I–IV will be typeset by Springer-Verlag, but please prepare a manuscript version of the title page and include it with your printout. With *CLMono01* this can be done by using the macros

```
\author{<name(s) of author(s)>}
\title{<title>}
\subtitle{<optional subtitle>}
\maketitle
```

The preface begins on page V (odd-numbered, hence on the right, or recto). A dedication and/or a foreword may precede the preface, in each case also starting on a new recto (right) page. The preface is followed by the table of contents, also starting on a new recto page.

A list of contributors (see Sect. 4.2) and/or a list of abbreviations and/or symbols may follow the table of contents, if necessary; each of them also starts on a new recto page.

The front matter is numbered with capital roman page numbers. This is done by inserting the command `\pagenumbering{Roman}` before the table of contents.

You thus have the structure

```
\pagenumbering{Roman}
\setcounter{page}{5}
\chapter*{Preface}
\addcontentsline{toc}{chapter}{Preface}
...
\tableofcontents
\listoffigures
\listoftables
\listofcontributors
\newpage
\pagenumbering{arabic}
```

4.1 Table of Contents

To typeset the table of contents, insert the command `\tableofcontents`. This command has been customized to meet Springer layout specifications, therefore it will only print entries up to the `subsection` level.

The table of contents of this document is an example for the layout used in monographs.

The body of the table of contents for a multi-author book has the following structure: For each contribution there is an entry consisting of one or more lines stating the title, then, in a new line, the name(s) of the author(s). The space between the last author's name and the page number is filled with a dotted line. The entries for the individual contributions are separated by blank lines.

Please note that if a chapter or section heading contains linebreaks (\\) these commands will also affect the line breaks of the entry in the tables of contents. To avoid this, you have to specify the entry for the toc in the `[]` argument of `\title`, `\chapter` and `\section`. This must also be done if the linebreaks inserted by TeX are not satisfactory. Linebreaks in the `[]` argument have to be `\protect`ed.

Remember that you have to run the unchanged file of your document twice to get a correct table of contents.

4.2 List of Contributors

The list of contributors always starts on a new recto (=right hand) page. Its pages are numbered with roman numerals and contain in alphabetical order the names and adresses of all authors contributing to the book. This list is set in double column format.

Here is how it is done: Enter the command

```
\begin{contributorlist}
⋮
\end{contributorlist}
```

This generates a heading "List of Contributors" and switches to double column layout and the `obeylines` environment that preserves the line structure of the input.

The addresses are then given in the form

```
{\bf <author name>}
<address>
\and
```

If you find that TeX generates a bad column break, putting an author's name at the bottom of a column and his address at the top of the following one, you can force a better column break by entering `\newpage` instead of `\and`.

The command `\end{contributorlist}` switches back to single column format.

Sample Input (with fictitious names)

```
\begin{contributorlist}
{\bf C.\,Brown}
California Institute of Technology
Pasadena
CA 91125, USA
\and
{\bf R.\,Carell}
Sterrewacht Leiden
P.O. Box 9513
NL-2300 RA Leiden
The Netherlands
\and
...
\end{contributorlist}
```

Sample Output: (next page)

List of Contributors

C. Brown
California Institute of Technology
Pasadena
CA 91125, USA

R. Carell
Sterrewacht Leiden
P.O. Box 9513
NL-2300 RA Leiden
The Netherlands

E. Douglas
Sterrewacht Leiden
P.O. Box 9513
NL-2300 RA Leiden
The Netherlands

R. Güsten
Max-Planck-Institut
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Auf dem Hügel 69
W-53121 Bonn
Germany

F. Lee
Sterrewacht Leiden
P.O. Box 9513
NL-2300 RA Leiden
The Netherlands

I. Ludwig
Sterrewacht Leiden
P.O. Box 9513
NL-2300 RA Leiden
The Netherlands

A. Schulz
Max-Planck-Institut
für Radioastronomie
Auf dem Hügel 69
W-53121 Bonn
Germany

D. Smith
Sterrewacht Leiden
P.O. Box 9513
NL-2300 RA Leiden
The Netherlands

G. Snyder
Sterrewacht Leiden
P.O. Box 9513
NL-2300 RA Leiden
The Netherlands

H. Wells
Sterrewacht Leiden
P.O. Box 9513
NL-2300 RA Leiden
The Netherlands

5. The Main Text

The main text of the book, which should usually begin with an introduction, is paginated with arabic numbers. The main text starts on page 1, a recto page. In multiauthor works, the first contribution starts on page 1, unless preceded by a part heading. Please begin each new chapter in a single-author work (or a work by a group of authors) on a new recto page, and each contribution in a multiauthor (edited) work on a new (even *or* odd) page.

To reset to arabic numbering at the end of the front matter, use the command `\pagenumbering{arabic}`.

5.1 Headings in Monographs

The chapter title, subtitle, and all subsequent headings should be typed in lowercase with initial capitals on all words except conjunctions, articles and prepositions with four letters or less. Letters and symbols that appear in equations should be typeset as in the text. Displayed headings have no end punctuation, but run-in headings do. Headings are typeset with the macros

```
\chapter{<text>}
\section{<text>}
\subsection{<text>}
\subsubsection{<text>}
\paragraph{<text>}
```

If no numbering is desired, e.g., for the foreword, use the "starred" version of the respective command (e.g. `\chapter*`).

Please remember that "starred" sectioning commands do not create an entry in the table of contents. This has to be done manually with the command `\addcontentsline`. Please refer to the LaTeX documentation for further details.

If a long displayed heading or chapter title is going to run over onto a second line, please use the command `\\` to split it at a convenient place. Please avoid using footnotes in headings.

Sample Input

```
\chapter{Introduction}
\section{General Rules}
\subsection{Experimental Findings}
\subsubsection{Hund Rule} Text follows directly
\paragraph{Theory} Text follows directly
```

Sample Output

1. Introduction

1.1 General Rules

1.1.1 Experimental Findings

1.1.1.1 Hund Rule Text follows directly.
Theory. Text follows directly.

5.2 Titles and Headings in Multi-Author Books

Titles of contributions are normally not numbered. They are set in the same size as chapter headings in monographs.

5.2.1 The Title

For the title and subtitle of your contribution are the following two commands:

```
\title{<your title>}
\subtitle{<your subtitle>}
```

Use `\\` to split a long `\title` or `\subtitle`.

5.2.2 Name(s) of the Author(s)

Use the command \author{<author's name>}. The names must be separated by the command `\and`.

If the authors have different affiliations, each name has to be followed by

```
\inst{<number>}
```

Numbers referring to different addresses should be attached to each author. If there is more than one `\inst` to an author, please separate them by `\fnmsep`.

If there are three or more authors, the running title should be changed as described in Sect. 5.3.

5.2.3 Affiliations

Addresses are set with the command `\institute`. 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.

```
\institute{<name of the first institute>
\and <name of the second institute> ...}
```

(Unlike usual LaTeX, in our style the `\and` command is also used within the `\institute` command.)

5.2.4 Typesetting the Title Block

After having entered the commands described so far in this section, please enter the command

```
\maketitle
```

This command will format the complete title of your article. If you leave it out, no title will be printed.

Sample Input

```
\title{Time-Dependent Transitions}
\author{Max Napf\inst{1} \and Hans M\"uller\inst{2}}
\institute{Institut f\"ur Festk\"orperforschung J\"ulich,
D-52428 J\"ulich, Germany
\and
Institut f\"ur Theoretische Physik, Universit\"at des
Saarlandes, D-66123 Saarbr\"ucken, Germany}
\maketitle
```

Sample Output

Time-Dependent Transitions

Max Napf[1] and Hans Müller[2]

[1] Institut für Festkörperforschung Jülich, D-52428 Jülich, Germany
[2] Institut für Theoretische Physik, Universität des Saarlandes, D-66123 Saarbrücken, Germany

5.2.5 Headings

To typeset headings use the macros

```
\section{<text>}
\subsection{<text>}
\subsubsection{<text>}
\paragraph{<text>}
```

If no numbering is desired, use the "starred" versions of the sectioning commands. If a long displayed heading is going to run over onto a second line, please use the command `\\` to split it at a convenient place.

5.3 Running Heads

Running heads at the tops of the pages are essential for readers to orientate themselves in the book and are generated automatically in small print (9 points) by our heading macros.

5.3.1 Single-Author Books

In single-author works the chapter numbers and chapter titles stand on verso (left-hand, even-numbered) pages and the 2nd-level headings on recto (right-hand, odd-numbered) pages.

If these headings do not fit into the space allocated for them, a shorter version has to be specified with the commands `\chaptermark` and `\sectionmark`. This is also the case if explicite line breaks have been inserted into the chapter- or section-heading or the version used for the table of contents (specified in the `[]` argument).

5.3.2 Multi-Author Books

In multi-author works the authors' name(s) stand(s) on the verso (left) pages and the contribution titles on recto (right) pages. If, however, there are three or more authors, please alter the running head to print just the first author's name and "et al."

If the running head is too long for the page header, our macros will produce an error message and you will be asked to supply a shorter version.

Changing the running head is done using the commands

```
\authorrunning{<name of first author> et al.}
\titlerunning{<short version of title>}
```

These two commands must appear before the command `\maketitle`.

5.4 Paragraphs

The first line of a paragraph should always be indented. No indent is used after a heading, since here it is clear that a new paragraph starts. These specifications are enforced by our package.

5.5 Footnotes

The superscript numerals used to refer to a footnote appear in the text either directly following a word to be discussed or – in relation to a phrase or a sentence – following the punctuation sign (comma, semicolon, or period). Footnotes themselves should have end punctuation. They should be coded at the relevant place in the text as follows: `\footnote{<text>}` (*no* blank before `\footnote`).

5.6 Lists

The preferred method to treat lists is to have each item of the list as a paragraph with all lines indented by the usual begin-of-paragraph indent. In the first line of each item, a marker (e.g., en-dash, number, lower case letter, or filled dots) is printed into the indentation. All this is of course done with the standard LaTeX environments *enumerate*, *itemize* and *description* which have been adapted to this layout. They also insert half a baselineskip before and after the lists.

Sample Input

```
There exists a subsequence (still denoted $h$) converging
to 0 and there exists $u$, such that
\begin{itemize}
\item the variable $y_h \to u$ in $L^\infty ({\cal R}_+; H)$
weak-star
\item the variable $z_h \to 0$ in $L^2 (0, T; H)$ strongly
\end{itemize} with very few exceptions.
```

Sample Output

There exists a subsequence (still denoted h) converging to 0 and there exists u, such that

– the variable $y_h \to u$ in $L^\infty(\mathcal{R}_+; H)$ weak-star
– the variable $z_h \to 0$ in $L^2(0, T; H)$ strongly

with very few exceptions.

We have enhanced the *description* environment (see LaTeX book p. 26 f.) by an optional parameter, which lets you specify the largest item label to appear within the list. If you code

```
\begin{description}[<largelabel>]
\item[<label1>] <text1>
\item[<label2>] <text2>
\end{description}
```

the texts of all items are indented by the width of `<largelabel>` and the item labels are typeset flush left within this space. Note: The optional parameter will work only two levels deep.

Sample Input

```
\begin{description}[IV]
\item[I]
A non-t.t. $U$-rank 1 type which is isolated among
non-algebraics has infinite multiplicity.
\item[II]
Let $A \subseteq B$, $S(A)\not\in p \subseteq q \in S(B)$.
Suppose $p$ and $q$ are non-t.t. and $U$-rank 1.
\item[III]
Let $p \in S(A)$ be an isolated and non-t.t. $U$-rank 1 type.
If $\models p$, then $p$ has infinitely many solated and
non-algebraic extensions over $Aa$.
\item[IV]
Let every $b \in \bar b$ have $U$-rank 1 and suppose the
minimal type $t(a/\bar b)$ which ${\rm dnf} /\emptyset$
is not isolated (and thus of finite multiplicity).
\end{description}
```

Sample Output

I A non-t.t. U-rank 1 type which is isolated among non-algebraics has infinite multiplicity.
II Let $A \subseteq B$, $S(A) \not\in p \subseteq q \in S(B)$. Suppose p and q are non-t.t. and U-rank 1. Further, let mult $(q) = \infty$.
III Let $p \in S(A)$ be an isolated and non-t.t. U-rank 1 type. If $\models p$, then p has infinitely many solated and non-algebraic extensions over Aa.
IV Let every $b \in \bar{b}$ have U-rank 1 and suppose the minimal type $t(a/\bar{b})$ which dnf$/\emptyset$ is not isolated (and thus of finite multiplicity).

5.7 Small Print

Small print (9 points) is used to set off a piece of text from the normal text. The text in small print should be treated and written like normal text. If long quotations are set in small print, however, each line should be indented by 3 mm, and quotation marks at the beginning and end omitted. Small print is also used for references (see Chap. 7), and the index (see Chap. 8), tables, figure captions, running heads and footnotes.

To typeset paragraphs in small print, use the syntax

```
\begin{petit} <text> \end{petit}
```

5.8 Emphasizing Text

Please use the `\em`-command to emphasize words[1] in running text. In certain (rare) cases bold type may also be used, but please avoid this as far as possible, since it reduces readability. Never emphasize words by using capitals, since they also reduce readability and are often used to indicate acronyms.

5.9 Fine Tuning of the Text

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

- `\,` a thin space, e.g. in numbers with more than 5 digits; a line division will not be made following this space.
- `-` hyphen; one stroke, *no* space at either end.
- `--` en-dash; two strokes, *no* space at either end. Please note: in LaTeX, `---` gives an em-dash "—"; Springer does not use this, but rather the shorter en-dash *with* spaces, i.e.
- `␣--␣` space, two strokes, for an en-dash, space → "Springer em-dash".
- `$-$` minus, in the text *only*.
- `~` tilde between parts of names or between numbers and units, producing a hard space.

Their use is best explained in the following example.

Sample Input

```
20\,000~km, 1\,000\,000~s, NGC 468\,324
1950--1985, pp.~11--21
this -- written on a computer -- is now printed
signal-to-noise ratio, early-type, metal-poor
non-relativistic
$-30$~K, $-5^{\circ}$C
Dr.~h.c.~Rockefeller-Smith and Prof.~Dr.~Mallory
```

[1] Italic in roman text and roman in italic text.

Sample Output

20 000 km, 1 000 000 s, NGC 468 324
1950–1985, pp. 11–21
this – written on a computer – is now printed
signal-to-noise ratio, early-type, metal-poor
non-relativistic
-30 K, -5°C
Dr. h.c. Rockefeller-Smith and Prof. Dr. Mallory

5.10 Typesetting Mathematics

In LaTeX by default displayed formulas are centered. For mathematics books this is also Springer style, but in all other fields equations should be flush left. Therefore the option `fleqn` has to be used.

Equations done with the equation environment are numbered automatically. Please punctuate a displayed equation in the same way as any other written statement. Note, however, that any punctuation should be within or immediately after the displayed equation, never after the equation number. Please insert `\;` before the punctuation sign to supply a little extra space.

In math mode LaTeX treats all letters as though they were mathematical or physical variables; hence they are typeset in italics. However, for certain components of equations this would be incorrect and therefore coding in roman is required. The following elements of an equation should be set in roman by using the command `{\rm ...}`:

a) Text. Since LaTeX ignores interword spaces in math mode, use the sequence `\mbox{\rm <text>}` to typeset more than one word.
b) Subscripts and superscripts where these are merely labels and not in themselves variables, e.g. $T_{\rm eff}$ not T_{eff}, $T_{\rm K}$ not T_K (K = Kelvin), $m_{\rm e}$ not m_e (e = electron). However, do not use roman if the sub-/superscripts represent variables, e.g. $\sum_{i=1}^n a_i$.
c) Please ensure that *abbreviations* such as Ord, Var, GL, SL, Hom, Aut, Ker, sgn, const. etc. and *physical units* (e.g. pc, erg, $\rm s^{-1}$, K, W, $\rm m^{-2}$, $\rm Hz^{-1}$) in math mode are always set in roman type. On p. 171 of the LaTeX manual and further pages referenced there, you will find common math functions to be used in math mode such as `\sin`, `\cos`, `\exp`, `\log`.
d) “d” used as “differential sign”, “e” used as “exponential function”, and “i” used as “imaginary unit”. Here we provide for use in physics texts the macros `\D` `\E` and `\I`. For example, `$\D z/\D x = \E^x+\I x$` yields ${\rm d}z/{\rm d}x = {\rm e}^x + {\rm i}x$. In mathematical texts these symbols usually appear in italics.
e) Chemical symbols and formulas should be set in roman, e.g. Fe not Fe, $\rm H_2O$ not H_2O, Hα not $H\alpha$.

5.11 Special Fonts and Symbols

Use the following commands to switch to other typefaces.

Vectors	Vectors are typed using the command \vec{<symbol>}. Example: $\vec{A}\times\vec{B}\times\vec{\Omega}$ yields $\mathbf{A}\times\mathbf{B}\times\boldsymbol{\Omega}$ or $\vec{A}^T \otimes\vec{\hat D}$ yields $\mathbf{A}^T\otimes\hat{\mathbf{D}}$ With the style option vecphys you would get $\boldsymbol{A}^T\times\boldsymbol{B}\times\boldsymbol{\Omega}$.
Tensors	Ordinary second-order tensors (without indices) are typed with the command \tens{<symbol>}. Example: $\tens{A}$ yields A
Gothic	The command \frak{<symbol>} requests $\mathfrak{fraktur}$ or $\mathfrak{gothic}$ letters.
Script	Use the command {\cal <symbol>} to type script symbols $\mathcal{ABC}$.
Sans serif	If no tensors are needed, use the command {\sf <symbol>} to get sans serif letters. Note the different syntax. Example: {\sf A} yields A.
Special roman	Use the command {\Bbb <symbol>} to get special roman (i.e. blackboard bold) letters from the AMS font. Example: {$\Bbb R$} yields $\mathbb{R}$.
AMS symbols	Further symbols from the AMS *msam* and *msbm* fonts may be accessed via the usual commands as listed in the AMS-TEX guide.[2]

Please note that \frak, \tens, \vec, \Bbb and \cal may only be used in math mode.

5.12 Mini-Environments Such as Lemmas and Theorems

To typeset environments such as theorems, definitions, examples, and a number of predefined environments are available:

claim, *conjecture*, *corollary*, *definition*, *example*, *exercise*, *lemma*, *note*, *problem*, *property*, *proposition*, *question*, *solution*, *theorem*, *proof* and *remark*.

The words "**Theorem**", "**Lemma**", "**Corollary**", "**Definition**", "**Proposition**" etc. are printed in **boldface**, followed by the formulation in *italics*. The words "*Proof*", "*Remark*", "*Example*" etc. are printed in *italics* with the formulation in ordinary (roman) typeface.

[2] Note that you then have to use the style option amssymb or define the necessary commands in the preamble.

These environments have the following syntax:

```
\begin{<name of environment>}[<optional material>]
<text for that environment>
\end{<name of environment>}
```

Note that the labeling as well as the counting is done by LaTeX. The optional material typed in angular brackets is appended to the label directly after the numbering. In this case no colon is set after the number, but after the optional material. Please refer also to the LaTeX book p. 58 f.

Sample input

```
\begin{conjecture}[L. Breiman] There is no such thing
as a free lunch. \end{conjecture}
```

Sample output

Conjecture 5.12.1 (L. Breiman). There is no such thing as a free lunch.

When using the style options deutsch or francais the captions for these predefined environments are translated into the respective language.

Please refer to appendix A.2 if you wish to define new environments or change existing ones.

5.13 Computer Programs

If you wish to include program listings or mention program commands in the text, these are normally set in typewriter font. We have four different commands for this purpose. Printing a short command string of just a few words inside a paragraph is done with the command \verb|<text>|. Everything between the modulus signs |...| is printed in typewriter font. If the text itself contains the sign |, any other sign that is not part of the text may be used as delimiter instead. Thus \verb|$a+b$| produces $a+b$ and \verb@$|a+b|$@ produces $|a+b|$.

The command \verb* basically works the same way, except that it marks blanks by the sign ␣, which is sometimes desirable. \verb*|tex myartic| gives tex␣myartic.

For small portions of a program where the line breaks should be preserved, please use the verbatim and verbatim* environments.

Example of a Computer Program

```
program Inflation (Output)
  {Assuming annual inflation rates of 7%, 8%, and 10%,...
   years};
   const
     MaxYears = 10;
```

```
    var
      Year: 0..MaxYears;
      Factor1, Factor2, Factor3: Real;
    begin
      Year := 0;
      Factor1 := 1.0; Factor2 := 1.0; Factor3 := 1.0;
      WriteLn('Year  7% 8% 10%'); WriteLn;
      repeat
        Year := Year + 1;
        Factor1 := Factor1 * 1.07;
        Factor2 := Factor2 * 1.08;
        Factor3 := Factor3 * 1.10;
        WriteLn(Year:5,Factor1:7:3,Factor2:7:3,Factor3:7:3)
      until Year = MaxYears
 end.
```

(Example from Jensen K., Wirth N. (1991) Pascal user manual and report. Springer, New York).

In all cases please note that TEX commands contained in the arguments of the verbatim commands will not be executed but printed as they appear in the input.

5.14 Abbreviations

Some standard abbreviations are used in Springer-Verlag publications for certain commonly-used terms. For example, "Chap. 1" indicates the first chapter, "Sect. 1.1" the first section of the first chapter, and "Fig. 1.1" the first figure in the first chapter. Page 10 is referred to as "p. 10" and pages 10–12 as "pp. 10–12". Please do not begin a sentence with an abbreviated word. In German, the word " Tabelle" should never be abbreviated. All other abbreviations and acronyms should normally be defined on first use.

6. Figures and Tables

We have adapted a number of macros that create an entity consisting either of a certain amount of blank space, in which a figure or externally produced table can be placed, or a table made with LaTeX, together with the formatted table caption or figure legend. The macros also place these “floating objects” at the correct position in your text. These codes should be inserted between two paragraphs at or slightly before the place you would prefer the material to appear.

With TeX, the position of insertions such as tables or figures is calculated by the program. If there is not enough space left on a page, the insertion is put on a stack and inserted on the next possible page. There are also other occasions when this will happen, but we will not describe them in detail here (for further information please read Chap. 3.5 of the LaTeX book).

Also, if your text contains a lot of insertions, this may lead to a breakdown of the page-making process. In this case you should try to improve the appearance of the pages by shifting the positions of the insertions in the input.

6.1 Figures

6.1.1 General Remarks

If you have access to suitable software, you can design your figures directly on a computer, but creation by other means is of course also possible. In any case the originals should be pasted into the camera-ready copy at the appropriate places and with the correct orientation. If necessary, the figures may be drawn overscale, but in this case suitably reduced copies should be pasted into the script.

For black-and-white halftone figures (photographs), please forward either slides or high-contrast glossy prints. Sufficient space should be left in the manuscript for the figures to be reproduced at the desired size. Halftone figures are reproduced independently of the text and therefore must be handled separately by the publishers and the printers.

If color illustrations are absolutely necessary, please forward these as slides or high-contrast glossy prints, and leave suitable space for them in the text as for black-and-white halftones.

If a figure is reproduced from another publication, you must obtain permission to reproduce from the copyright holder which is usually the publisher of the other book. The source must be given as a reference citation in parentheses at the end of the legend (e.g., from the example here, "... editors. From (Binding and Matthies 1993)" or "... editors. From [23]") and the full reference included in the reference list.

6.1.2 Lettering on Figures

Lettering on figures should be checked together with the text, in order to ensure a consistent use of terminology in text and figures. Please write the first word of each label in a figure with an initial capital. Check that the lettering in the figures is easily readable, i.e., that the capital letters are at least 2 mm tall and that the lines in the drawing are not less than 0.25 mm thick, but please do not use larger lettering than necessary. We recommend a CM-font, Times or a sans serif typeface such as Helvetica. Symbols and formulae letters should be identical with those used in the text.

6.1.3 Legends

Figure legends are created with the command `\figure` (see below). Figures are numbered chapterwise using arabic numerals. The number of the figure ends with a full stop but figure legends should not. In multi-author books, numbering of figures starts with the number 1 in each contribution.

6.1.4 Positioning of Figures and Captions

Figures and captions will always be positioned flush left, aligning with the left margin of the text.

To leave the desired amount of space for the height of each figure, please use the coding given below. To generate the necessary amount of white space for the figure, you can choose between the commands `\vspace <height>` and `\picplace{<height>}`, the latter drawing a frame of the height you specified. The necessary additional empty space above (at least 1 cm) and below (at least 0.5 cm) the figure will be inserted automatically.

See also Sect. 3.5.1 on p.59 in the LaTeX manual.

Important: The figure, including the legend, must not exceed 18.9 cm (pageheight).

We have added two macros for the figure environment called `\sidecaption` and `\mpicplace`. Using these macros will print the caption to the right of the figure if there is enough space for it and otherwise place it underneath the figure.

Syntax

```
\begin{figure}
\sidecaption
\mpicplace{<width> cm}{<height> cm}
\caption{<text of caption>}
\end{figure}
```

Sample Input

```
\begin{figure}
\sidecaption
\mpicplace{8 cm}{5 cm}
\caption{Example of a figure with the legend
printed at the right hand side}
\end{figure}
\begin{figure}
\sidecaption
\mpicplace{10 cm} {3 cm}
\caption{In this case the space beside the figure
was too narrow; thus the caption is
printed underneath the figure}
\end{figure}
```

Sample Output

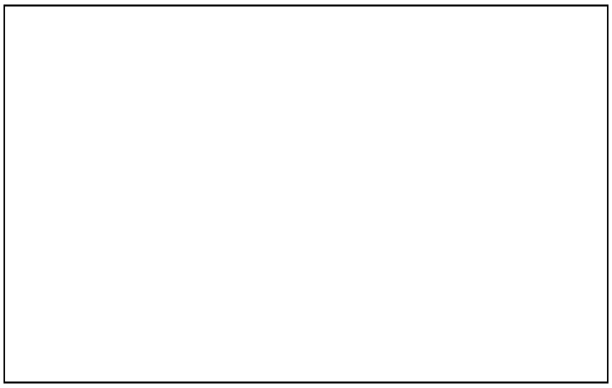

Fig. 6.1. Example of a figure with the legend printed at the right hand side

Fig. 6.2. In this case the space beside the figure was too narrow; thus the caption is printed underneath the figure

6.2 Tables

6.2.1 General Remarks

Tables may either be set in LaTeX, thus forming part of the LaTeX input of your book, or generated separately and pasted in. In either case, please stick to the following guidelines.

Each table should have a head rule, a rule between the column headings and the entries, and a foot rule. Further horizontal lines and also vertical lines may be introduced if they are necessary to make a table easier to understand. Like figures, tables are aligned with the left margin of the text. Within a table, the entries should be set with an initial capital and flush left in columns under their column headings. If footnotes are used, they should be indicated using superscript lowercase letters. Footnotes always begin with an initial capital letter and end with a period.

6.2.2 Table Captions

Table captions should be treated in the same way as figure legends, except that the table captions appear *above* the tables. By default the tables are numbered chapterwise (using arabic numerals). The number of the table should end with a full stop. In multi-author books, the numbering starts with 1 at the beginning of each new contribution.

6.2.3 Positioning of Tables

Tables and captions will always be positioned flush left, aligning with the left margin of the text.

Tables, including captions, must not exceed 18.9 cm (pageheight).

6.2.4 Tables Coded with LaTeX

Use the following standard syntax:

Sample Input

```
\begin{table}
\caption{This is the heading of the table}
\halign{\strut #\hfill\quad & #\hfill\quad & #\hfill\quad &
#\hfill\cr
\noalign{\hrule\smallskip}
Nominal dimension & Angle & Tolerance & Evaluation factor \cr
[mm] & & [$\mu$m] & \cr
\noalign{\smallskip\hrule\smallskip}
$10^1$ & $1^\circ$ & Untoleranced & $c_1 = 0$ \cr
& & dimension \cr
$10^{-1}$ & $1^{\prime\, {\rm a}}$ & 101--200 & $c_1 = 1$ \cr
$10^{-2}$ & $1^{\prime\prime\, {\rm b}}$ & 40--100 & $c_1 = 2$ \cr
$10^{-3}$ & & $< 50 $ & $c_1 = 3$ \cr
\noalign{\smallskip\hrule}\cr}
\noindent
$^{\rm a}$ One minute of arc. \\
$^{\rm b}$ One second of arc.
One second of arc. One second of arc.
One second of arc. One second of arc.
One second of arc. One second of arc.
\end{table}
```

Sample Output

Table 6.1. This is the heading of the table

Nominal dimension [mm]	Angle	Tolerance [μm]	Evaluation factor
10^1	1°	Untoleranced dimension	$c_1 = 0$
10^{-1}	$1^{\prime\, \rm a}$	101–200	$c_1 = 1$
10^{-2}	$1^{\prime\prime\, \rm b}$	40–100	$c_1 = 2$
10^{-3}		< 50	$c_1 = 3$

[a] One minute of arc.
[b] One second of arc. One second of arc. One second of arc. One second of arc. One second of arc. One second of arc. One second of arc.

6.2.5 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:

```
\begin{table}
\caption[]{<text of caption>}
\picplace{<height> cm}
\end{table}
```

Sample Input

```
\begin{table}
\caption[]{Example of a table not coded with \LaTeX}
\picplace{1 cm}
\end{table}
```

Table 6.2. Example of a table not coded with LaTeX

7. References

7.1 Citation in the Text

Three alternative forms of text citation are possible:

- the name(s) of the author(s) and year of publication (name/date system)
- the numerical system (numbers inside square brackets)
- letter or letter-number system (author's initials or these combined with numbers in square brackets).

One system only should be used consistently throughout the book.

In the name/date system, semicolons are used to separate references from different authors and commas to separate those from the same author. The letters a, b, c, etc., are used to distinguish between references that would otherwise be cited identically in the text.

In the numerical system and letter or letter-number system the references within one set of brackets are cited in numerical and alphabetical order, respectively. If several references that follow each other in the list are cited, use an en-dash to indicate this (e.g., [2, 3, 8–12, 16], [BH, HM, B1, G20]).

7.2 Reference List

All publications cited in the text must be included in the reference list. The spelling of authors' names and and dates in the text and reference list must correspond exactly. Personal communications and unpublished work should only be cited in the text, giving the originators' surnames and initials and the year.

The list of references, whether to a contribution or to a whole book, is headed "References" (styled like a `\chapter` heading in monographs and `\section` heading in a contribution) and is not assigned a number in the decimal system of headings. The list is set in small print and should be placed at the end of the contribution or the book.

Alphabetization. If the numerical system is being used, the list may be either in alphabetical order or, alternatively, in the order in which the references are cited in the text. If the name/date system is being used, the list of references should be in alphabetical order. If several works by the same first author are to be cited, please order the references as follows:

- Author: chronologically
- Author and single coauthor: alphabetically according to coauthor, then chronologically
- Author et al. (more than one coauthor): chronologically

Example:

Hutchinson A.D. (1971a) ...
Hutchinson A.D. (1971b) ...
Hutchinson A.D. (1973) ...
Hutchinson A.D., Hamilton B. (1969) ...
Hutchinson A.D, Smith J. (1968) ...
Hutchinson A.D., Smith J., Hamilton B. (1953a) ...
Hutchinson A.D., Hamilton B., Smith J. (1953b) ...
Hutchinson A.D., Jones S.L.P., Smith J., Hamilton B. (1975) ...

Please refer to p. 72 ff. and p. 187 ff. of the LaTeX manual for overall information on the reference environment. We have added a new mandatory argument to the bibliography environment, namely the title of the reference section.

Begin your bibliography with the command

```
\begin{thebibliography}[<label>]{<title>}
```

where `<title>` is something like `References` and `<label>` is the widest label (number or letter combination) to be used in the reference list. This argument is necessary to adjust the amount of indentation for wide labels. In the default setting the standard indentation for paragraphs is used.

7.3 References by Number or by Letter and Number

Using standard LaTeX syntax, references are cited in the text either by numbers or by the authors' initials plus a sequence number where necessary. This number or letter/number combination is enclosed in square brackets, e.g. [1], [2], [BG], [GP 1]. See p. 72 ff. of the LaTeX manual for details.

The reference list is then either organized alphabetically or sorted according to the sequence of the citation in the text (the latter applies to citation by number only).

7.4 Name/Date System

If you want to reference by author's name and year of publication, you have to use the style option `bibay`. This changes the syntax of the command `\bibitem`.

Your bibliography entries must have the following structure:

```
\bibitem{}{<key>}{<citation>} <bibliographic entry>,
```

where `<key>` is the key used when citing in the text with `\cite`. The argument of the third pair of braces, `<citation>`, is the text that is to be printed in the text, when a publication is cited. The braces around the citation text are printed automatically. Please note that LaTeX will not break a line inside the citation string and that the first pair of braces is obligatory.

Sample Input (Text Citation)

```
This is implicit in the recent work of \cite{ar} and the results
are also discussed in \cite{le}. Consider as an example the
theorem stated in \cite{dir}. We refer now to the hypothesis
given in \cite{rh}. Extensions of the theorems are also
interesting (Arnold 1968).
```

Sample Input (Reference List)

```
\begin{thebibliography}{References}{}
\bibitem{}{ar}{Arnold (1968)} Arnold V.I. (1968): Singularities
of smooth mappings. Usp. Mat. Nauk {\bf 23}, 3--44 (Russian).
[English transl.: Russ. Math. Surv. {\bf 23} (1968) 1--43]
\bibitem{}{dir}{Lerch et al. (1983)} Dirac, P.A.M. (1950): On
generalized Hamiltonian dynamics. Can. J. Math {\bf 2}(2),
129--148
\bibitem{}{gro}{Gr\"otschel et al. (1988)} Gr\"otschel, M.,
Lov\'asz, L., Schrijver, A. (1988): Geometric algorithms and
combinatorial optimization. (Algorithms and Combinatorics,
vol.\, 2) Springer, Berlin Heidelberg New York
\bibitem{}{le}{Lerche, Klosko et al. (1983)}Lerch, F.J., Klosko,
S.M., Patel, G.B. (1983): A refined gravity model from LAGEOS
(GEM-L2). NASA, Tech. Memo TM 84986
\bibitem{}{rh}{Rham (1931)}Rham G. de (1931): Sur l'analysis
situs de vari\'et\'es \'a $n$ dimensions. J. Math. Pure Appl.
{\bf 10}, 115--200
\end{thebibliography}
```

Sample Output (Text Citation)

This is implicit in the recent work of Arnold (1968) and the results are also discussed in Lerche, Klosko et al. (1983). Consider as an example the theorem stated in Lerch et al. (1983). We refer now to the hypothesis given in Rham (1931). Extensions of the theorems are also interesting (Arnold 1968).

Sample Output (Reference List) see next[1] page.

[1] In a monograph the reference list would start on a new righthand page.

References

Arnold V.I. (1968): Singularities of smooth mappings. Usp. Mat. Nauk **23**, 3–44 (Russian). [English transl.: Russ. Math. Surv. **23** (1968) 1–43]

Dirac, P.A.M. (1950): On generalized Hamiltonian dynamics. Can. J. Math **2**(2), 129–148

Grötschel, M., Lovász, L., Schrijver, A. (1988): Geometric algorithms and combinatorial optimization. (Algorithms and Combinatorics, vol. 2) Springer, Berlin Heidelberg New York

Lerch, F.J., Klosko, S.M., Patel, G.B. (1983): A refined gravity model from LAGEOS (GEM-L2). NASA, Tech. Memo TM 84986

Rham G. de (1931): Sur l'analysis situs de variétés á n dimensions. J. Math. Pure Appl. **10**, 115–200

8. Index

8.1 General Remarks

The index is one of the most important parts of a book as it gives the reader fast and easy access to the major topics covered in the book. As a rule the author or, for multi-author books, the editor has to select the keywords for the index.

Care should be taken that only words are included that are of help when searching for a certain subject. Words from headings are unneccessary in the index, as these are easily found through the table of contents. All words, i.e., main entries as well as subentries, are listed in the basic form, e.g., nouns in the singular, verbs in the infinitive. First-level entries are capitalized.

The following sections describe how the index may be prepared (almost) automatically. This procedure is only applicable for monographs. For multi-author books, where the authors have not marked all their index entries as described in the next section, collecting the keywords has to be done manually. Sorting and formatting can then be done with *MakeIndex* and our macros, see Sect. 7.3 for details. Section 7.4 explains the macros for typesetting an index that has been compiled manually.

8.2 Creating an Index with MakeIndex

LaTeX offers the automatic generation of an index to your text. For this purpose the commands `\makeindex` and `\index` are supplied. Sorting the index etc. is done by the program *MakeIndex* which was originally designed for LaTeX. Exhaustive information on MakeIndex is provided in its documentation. German users may also refer to: *LaTeX – Erweiterungsmöglichkeiten* by Helmut Kopka, Addison-Wesley 1990. We give here a summary of the features we feel are most important.

Use `\index{<text>}` to generate an entry to the index. To produce a subentry, the argument of the `\index` command should contain both the main entry and the subentry, separated by a `!` character. You can also make subsubentries by using the following construction:

```
\index{<mainentry>!<subentry>!<subsubentry>}
```

Only three levels of indexing are supported; subsubsubentries are thus not possible. This technique assumes use of the MakeIndex program, see 8.2.2 below.

8.2.1 The Argument to `\index`

Avoid putting a blank between the index command and the word this entry refers to, as otherwise there may be cases when the page break occurs right between these two items, thus resulting in a wrong page number in the index. Duplicate entries of a word on a page do not matter as MakeIndex will clear such superfluous entries. Note also that the sorting algorithm does not skip blanks. Thus `\index{a space}` and `\index{a  space}` will produce two separate entries.

Do no indexing in headings.

The signs `!`, `@`, and `|` are active characters inside the argument of `\index`. If you want to have these printed in your index, please precede them by a double quote `"`. Macros inside index entries are not expanded when the index file is being built, thus resulting in incorrect sorting of entries containing TEX commands. Section 8.2.3 tells you how to circumvent this.

8.2.2 Sorting and Printing the Index

Placing the command `\makeindex` in the preamble of your LATEX input makes the command `\index` write index entries to a file called `<filename>.idx`, where `<filename>` is the name of your root file. Commenting out this command suppresses generation of this file, which saves some time in the TEX run and may thus be useful when your text is still in raw form.

In the `<filename>.idx` file the entries are in the order in which they appear in the text. The program MakeIndex can then be used to merge multiple entries and sort everything alphabetically. After TEXing your document, start the program MakeIndex by typing `MAKEINDX -S SPRMINDX.STY <filename>` into the DOS command line. `SPRMINDX.STY` is a file that contains commands modifying the output of MakeIndex.

Please remember to specify the documentstyle option `[makeidx]` to enable printing of the index, otherwise the command `\printindex` is an "unknown command".

MakeIndex in turn generates a file called `<filename>.ind` containing the input for the index. This input is inserted into your text by placing the command

```
\printindex
```

at the end of your text.

Updating your text usually makes it necessary to go through a complete circle of TEXing, using MakeIndex and TEXing again to get the correct index printed.

8.2.3 Special Features

MakeIndex offers great flexibility in the generation of the index entries.

If an entry should be sorted at an exceptional place, you specify it in the form \index{<text1>@<text2>} which generates an entry <text2> sorted like <text1>. Use this feature to sort Greek letters and words containing accented letters correctly or to include entries that you want to type in a different font. For instance use the input

```
\index{major entry@{\it major entry}}
```

to set the text *major entry* in italics.

Sometimes entries of the form "function 7–9" is desired. To specify such a page range, put an \index{<entry>|(} at the beginning of the range and an \index{<entry>|)} command at the end of the range. Entries with the same text specified inside this range will be ignored, but entries outside this range will be listed separately.

8.2.4 Manipulation of the Page Number

In some indexes, certain page numbers are specially formatted – for example, an italic page number may indicate reference to a figure or an n after a page number may denote reference to a footnote. There are also instances, where the page number should be replaced by the phrase *see* ... In all these cases the construction

```
\index{<entry>|<macrocall without \>
<arguments of the above call where applicable>}
```

is used. The macro (now correctly preceeded by a backslash) is then attached to the page number.

These macros can also be combined with the page range mechanism.

To replace the page number by the phrase *see...* a macro

\see{<second entry>} is provided.

8.2.5 Example of Index Entries and Their Output

```
Page: 1 \index{Equations}
Page: 1 \index{Population!growth}
Page: 2 \index{Phi@$\phi$}
Page: 2 \index{Time}
Page: 2 \index{Function|(}
Page: 3 \index{Population!size of}
Page: 4 \index{Size}
Page: 4 \index{Function!birth!definition of}
Page: 4 \index{Solution}
Page: 5 \index{Function}
Page: 6 \index{Solving of mystery|see{solution}}
Page: 6 \index{Equilibrium@{\it Equilibrium}}
Page: 7 \index{Requirement}
Page: 7 \index{Size}
Page: 7 \index{Function|)}
Page: 7 \index{Data}
Page: 8 \index{Population}
Page: 8 \index{Size}
Page: 9 \index{Function}
Page: 9 \index{Size}
Page: 9 \index{Kohler syndrom@K\"ohler syndrom}
Page: 9 \index{Function}
```

Data 7

Equations 1
Equilibrum 6

Function 2–7, 9
– birth
– – definition of 4

Köhler syndrom 9

ϕ 2
Population 8
– size of 3
– growth 1

Requirement 7

Size 4, 7–9
Solution 4
Solving of mystery *see* solution

Time 2

8.3 Semimanual Creation of an Index

If the keywords have not been marked in the text using `\index`, you can type the file **<filename>.idx** containing the keywords in the form

```
\indexentry{<keyword>}{<pageno>}.
```

An individual entry is needed for every page on which the keyword appears. All special formatting and sorting requests (see Sect. 8.2.3) are specified just as with the `\index` command.

Example: If for automatic keyword extraction you had the following commands in your text file,

```
\index{Function}
\index{Equation|ii}
\index{Equation|nn}
\index{Function|(ii}
\index{Function|)
\index{A@b}
\index{Equilibrium@{\it Equilibrium}}
```

for semimanual index creation you would type

```
\indexentry{Function}{2}
\indexentry{Equation|ii}{3}
\indexentry{Equation|nn}{4}
\indexentry{Function|(ii}{7}
\indexentry{Function|)}{10}
\indexentry{A@b}{12}
\indexentry{Equilibrium@{\it Equilibrium}}{30}
```

After the file <filename>.idx is complete (be sure to update it if corrections you make to the text change the page breaks) you can proceed as described in Sect. 8.2.2.

8.4 Manual Creation of an Index

If you prefer to compile the index yourself or do not have the program MakeIndex available, you can code as follows:

\input{<filename.ind>} or \printindex

The input for the items of the subject index must be stored in a separate dataset called <filename>.ind. This file has the following structure:

- It starts with \begin{theindex} and ends with \end{theindex}.
- First level entries are coded as
  \item <entry>\idxquad <pagenumber(s)>
- If there is more than one page number, separate them by ,\,
- A range of page numbers is entered in the form
  <firstpage>--<last page>
- If reference to another entry instead of a page number is required, then type {\it see} <second entry>
- Second and third-level entries have the forms
  \subitem <entry>\idxquad <pagenumber(s)> and
  \subsubitem <entry>\idxquad <pagenumber(s)> respectively.
- Separate blocks of entries with different initial letters using the command \indexspace, which adds a little vertical space.

Sample Input

Dataset `clmomu01.doc`

```
\printindex
```

Dataset `clmomu01.ind`

```
\begin{theindex}
\item Absorption\idxquad 327
\item Absorption of radiation \idxquad 289--292,\, 299,\,300
\item Actinides \idxquad 244
\item Aharonov-Bohm effect\idxquad 142--146
\item Angular momentum\idxquad 101--112
\subitem algebraic treatment\idxquad 391--396
\item Angular momentum addition\idxquad 185--193
\item Angular momentum commutation relations\idxquad 101
\item Angular momentum quantization\idxquad 9--10,\,104--106
\item Angular momentum states\idxquad 107,\,321,\,391--396
\item Antiquark\idxquad 83
\item $\alpha$-rays\idxquad 101--103
\item Atomic theory\idxquad 8--10,\,219--249,\,327
\item Average value\\  ({\it see also\/} Expectation value)
15--16,\,25,\,34,\,37,\,357
\indexspace
\item Baker-Hausdorff formula\idxquad 23
\item Balmer formula\idxquad 8
\item Balmer series\idxquad 125
\item Baryon\idxquad 220,\,224
\item Basis\idxquad 98
\item Basis system\idxquad 164,\,376
\item Bell inequality\idxquad 379--381,\,382
\item Bessel functions\idxquad 201,\,313,\,337
\subitem spherical\idxquad 304--306,\, 309,\, 313--314,\,322
\item Bound state\idxquad 73--74,\,78--79,\,116--118,\,202,\, 267,\,
273,\,306,\,348,\,351
\item Boundary conditions\idxquad 59,\, 70
\item Bra\idxquad 159
\item Breit-Wigner formula\idxquad 80,\,84,\,332
\item Brillouin-Wigner perturbation theory\idxquad 203
\indexspace
...
\end{theindex}
```

Index

Appendices

A.1 Appendix

If you enter the command `\appendix`, the following sections will be numbered with capital letters.

A.2 Acknowledgements

The syntax for acknowledgements is

```
\begin{acknowledgement}
<text>
\end{acknowledgement}
```

A.3 Defining your Own Lemma-like Environments

We have changed the syntax of the commands `\newtheorem` and `\newtheorem*` used to define additional environments.

`\newtheorem` can be used in two ways.

A.3.1 Method 1

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

This defines a new environment <env_nam> which prints 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 section unless you specify something else with the optional parameter <within>.

Example

```
\newtheorem{joke}{Joke}[subsection]{\bf}{\rm}
```

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.

A.3.2 Method 2

Sometimes you will want to create an environment that shares its counter with another environment, say *main theorem* to be numbered like a *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}{\bf}{\it}
\begin{theorem} The early bird gets the worm. \end{theorem}
\begin{mainth} The early worm gets eaten. \end{mainth}
```

Sample Output

Theorem A.3.3. *The early bird gets the worm.*

Main Theorem A.3.4. The early worm gets eaten.

A.4 Unnumbered Environments

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

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

Articles in a Language Other Than English. Please note that unlike the headings of the predefined environments those of your newly defined environments will not be automatically translated when you switch to another language using the document style options `deutsch` or `francais`. You will have to define new environments with translated captions or change the English captions with:

```
\renewcommand{<env_nam>name}{<translated caption>}
```

Example: `\renewcommand{counterexamplename}{Gegenbeispiel}`