LaTeX2e SVMult Document Class Reference Guide for Contributed Books

June 9, 2004

Contents

1 Introduction

This reference guide gives a detailed description of the SVMult LaTeX 2$_\varepsilon$ document class and its special features designed to facilitate the preparation of scientific contributed books for Springer Verlag. It always comes as part of the SVMult tool package and should not be used on its own.

The components of the SVMult tool package are:

- the *Springer LaTeX class* `SVMult.cls` and - if applicable - further *Springer styles* as well as the *templates* with preset class options and packages as well as coding examples;

  Tip: Copy all of them to your working directory, run LaTeX 2$_\varepsilon$ and produce your own example *.dvi file; rename the template files as you see fit and use them for your own input.

- *Author Instructions* with style and coding instructions *specific* to the subject area or book series you are writing for;

  Follow these instructions to set up your files, to type in your text and to obtain a consistent formal style and use the pages as checklists before you submit your ready-to-print manuscript.

- the *Reference Guide* describing all possible SVMult features independent of any specific style requirements.

  Tip: Use it as a reference if you need to alter or enhance the default settings provided by the SVMult document class and the templates.

For *editors* only the SVMult tool package is enhanced by

- the *editor instructions* for compiling multiple contributions to a mutual book.

The documentation in the Springer SVMult tool package is not intended to be a general introduction to LaTeX 2$_\varepsilon$ or TeX. For this we refer you to [1, 2, 3].

Should we refer in this tool package to standard tools or packages that are not installed on your system, please consult the *Comprehensive TeX Archive Network* (CTAN) at [4, 5, 6].

SVMult was derived from the LaTeX 2$_\varepsilon$ article.cls. Should you encounter any problems or bugs in the SVMult document class please contact

`texhelp@springer.de`.

The main differences from the standard article class are the presence of

- multiple Springer class options,
- a number of newly built-in environments for individual text structures like theorems, exercises, lemmas, proofs, etc.,
- enhanced environments for the layout of figures and captions, and
- new declarations, commands and useful enhancements of standard environments to facilitate your math and text input and to ensure their output conforms with Springer layout standards.

Nevertheless, text, formulae, figures, and tables are typed using the standard LaTeX 2_ε commands. The standard sectioning commands are also used.

Always give a `\label` where possible and use `\ref` for cross-referencing. Such cross-references may then be converted to hyperlinks in any electronic version of your book.

The `\cite` and `\bibitem` mechanism for bibliographic references is also obligatory.

2 Basic SVMult Class Features

2.1 Initializing the Class

To use the document class, enter

```
\documentclass [⟨options⟩] {svmult}
```

at the beginning of your input.

2.2 New Class Options

Choose from the following list of class options if - in conjunction with the editor of your book - you decide to alter the default layout settings of the Springer SVMult document class.

Page Layout *Default*: horizontal line above first level heading, all headings are displayed except for subparagraph headings, first level items of a list start with a bullet.

multhd	removes horizontal line, allows inline headings on subsubsection and paragraph level, first level list items start with a hyphen
multphys	removes horizontal line, first level list items start with a hyphen
sechang	indents second and subsequent lines in a multiline heading

Page Style *Default*: twoside, single-spaced output, contributions starting always on a recto page

referee	produces double-spaced output for proofreading
footinfo	generates a footline with name, date, ... at the bottom of each page
norunningheads	suppresses any headers and footers

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

Font Size *Default*: 10 pt

11pt, 12pt	are ignored

Language for Fixed LaTeX Texts. In the SVMult class we have changed a few standard LaTeX texts (e.g. Figure to Fig. in figure captions) and assigned names to newly defined theorem-like environments so that they conform with Springer style requirements. The *default* language is English.

deutsch	translates fixed LaTeX texts into their German equivalent
francais	same as above for French

Equations Style *Default*: centered layout

fleqn	sets equations (and short figure and table captions) flushleft
vecphys	produces boldface italic vectors when `\vec`-command is used
vecarrow	depicts vectors with an arrow above when `\vec`-command is used

Numbering and Counting of Built-in Theorem-Like Environments

For a list of built-in theorem-like environments refer to Sect. 2.7.

default setting	each built-in theorem-like environment gets its own counter without any chapter or section prefix and is counted consecutively throughout the book
envcountsame	all built-in environments follow a *single counter* without any chapter or section prefix, and are counted consecutively throughout the book
envcountchap	each built-in environment gets its own counter and is numbered *chapterwise*
envcountsect	each built-in environment gets its own counter and is numbered *sectionwise*
envcountresetchap	each built-in environment gets its own counter without any chapter or section prefix but with the counter *reset for each chapter*

envcountresetsect	each built-in environment gets its own counter without any chapter or section prefix but with the counter *reset for each section*

N.B.1 When the option *envcountsame* is combined with the options *envcountresetchap* or *envcountresetsect* all predefined Springer environments get the same counter; but the counter is reset for each chapter or section.

N.B.2 When the option *envcountsame* is combined with the options *envcountchap* or *envcountsect* all predefined Springer environments get a common counter with a chapter or section prefix; but the counter is reset for each chapter or section.

N.B.3 We have designed a new easy-to-use mechanism to define your own environments, see Sect. 3.3.

Use the Springer class option

nospthms	*only* if you want to suppress all Springer theorem-like environments and use the theorem environments of original LaTeX package or other theorem packages instead. (Please check this with your editor.)

References By *default*, the list of references is set as an unnumbered section at the end of your contribution, the running head is set lower case, the list itself is set in small print and numbered with ordinal numbers.

chaprefs	sets the reference list as an unnumbered chapter e.g. at the end of the book
natbib	sorts reference entries in the author-year system (make sure that you have the natbib package by Patrick W. Daly installed. Otherwise it can be found at the *Comprehensive TeX Archive Network* (CTAN...tex-archive/macros/latex/contrib/supported/natbib/), see [4, 5, 6]

Use the Springer class option

oribibl	*only* if you want to set reference numbers in square brackets without automatic TOC entry etc., as is the case in the original LaTeX bibliography environment. But please note that most page layout features are nevertheless adjusted to Springer requirements. (Please check usage of this option with your editor.)

2.3 Required Packages

SVMult document class has been tested with a number of Standard LaTeX tools. Below we list and comment on a selection of recommended packages for preparing fully formatted book manuscripts for Springer Verlag. Refer to Sect. 3

for a list of other useful, but not essential, standard packages. If not installed on your system, the source of all standard LaTeX tools and packages is the *Comprehensive TeX Archive Network* (CTAN) at [4, 5, 6].

Book Layout

For some book series or subject areas Springer Verlag provides specific styles. Please check your *author instructions*, Sect. "Required Packages", for more details.

Footnotes

`footmisc.sty`	used with style option `[bottom]` places all footnotes at the bottom of the page

Figures

`graphics.sty` or `graphicx.sty`	powerful tool for including, rotating, scaling and sizing graphics files (preferrably `eps` files)

References

`cite.sty`	generates compressed, sorted lists of numerical citations: e.g. [8,11–16]; preferred style for books published in a print version only

Index

`makeidx.sty`	provides and interprets the command `\printindex` which "prints" the externally generated index file *.ind.
`multicol.sty`	balances out multiple columns on the last page of your subject index, glossary or the like

N.B. Use the *MakeIndex* program together with one of the Springer styles

`svind.ist`	for English texts

to generate a subject index automatically in accordance with Springer layout requirements. For a detailed documentation of the program and its usage we refer you to [1]

2.4 The Contribution's Header

Use the command

`\title*{}`

to typeset an unnumbered heading of your contribution.

`\title{}`

to typeset a numbered heading of your contribution.

Use the command

`\toctitle{}`

if you want to alter the line break of your heading for the table of content.

Use the command

`\titlerunning{}`

if you need to abbreviate your heading to fit into the running head.

Use the command

`\author{}`

for your name(s). Always give your first name in full. If there is more than one author, the names should be separated by `\and`.

Use the command

`\inst{`$\langle n \rangle$`}`

to assign your affiliation as specified in the `\institute` command (see below).

Use the command

`\tocauthor{}`

to change manually the list of authors to appear in the table of contents.

Use the command

`\authorrunning{}`

if there are more than two authors; abbreviate the list of authors to the main author's name and add "et al." for the running head.

Use the command

`\institute{}`

for your affiliation(s). Please be sure to include your e-mail address here.

If there is more than one affiliation, they should be separated by `\and`.

Use the command

```
\maketitle
```

to compile the header of your contribution.

To format an abstract enter

```
\begin{abstract}
⟨Text of Abstract⟩
\end{abstract}
```

Use the command

```
\keywords{⟨keyword list⟩}
```

within the abstract environment to specify your keywords and/or subject classification.

To create and format a short table of contents enter prior to the command `\dominitoc`, *see below*

```
\setcounter{minitocdepth}{⟨n⟩}
```

with n depicting the highest sectioning level of your short table of content (default is 0) and then enter

```
\dominitoc
```

To format the list of abbreviations and symbols

```
\begin{abbrsymblist}[⟨widest acronym or symbol⟩]
\item[⟨acronym or symbol⟩] ⟨full word or explanation⟩
\end{abbrsymblist}
```

2.5 New Commands in Text Mode

Use the new environment command

```
\begin{petit}
⟨text⟩
\end{petit}
```

to typeset complete paragraphs in small print.

Use the enhanced environment command

```
\begin{description}[⟨largelabel⟩]
\item[⟨label1⟩] ⟨text1⟩
\item[⟨label2⟩] ⟨text2⟩
\end{description}
```

for your individual itemized lists.

The new optional parameter `[⟨largelabel⟩]` lets you specify the largest item label to appear within the list. 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.

2.6 New Commands in Math Mode

Use the new or enhanced symbol commands provided by the SVMult document class:

`\D`	upright d for differential d
`\I`	upright i for imaginary unit
`\E`	upright e for exponential function
`\tens`	depicts tensors as sans serif upright
`\vec`	depicts vectors as boldface characters instead of the arrow accent

N.B. By default the SVMult document class depicts Greek letters as italics because they are mostly used to symbolize variables. However, when used as operators, abbreviations, physical units, etc. they should be set upright.

All *upright* upper-case Greek letters have been defined in the SVMult document class and are taken from the TEX alphabet.

Use the command prefix

```
\var...
```

with the upper-case name of the Greek letter to set it upright, e.g. `\varDelta`.

Many *upright* lower-case Greek letters have been defined in the SVMult document class and are taken from the PostScript Symbol font.

Use the command prefix

```
\u...
```

with the lower-case name of the Greek letter to set it upright, e.g. `\umu`.

2.7 New Built-in Theorem-Like Environments

For individual text structures such as theorems, definitions, and examples, the SVMult document class provides a number of predefined environments which conform with the specific Springer layout requirements.

Use the environment command

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

for the newly defined *environments*.

Unnumbered environments will be produced by

`claim` and `proof`.

Numbered environments will be produced by

`case`, `conjecture`, `corollary`, `definition`, `example`, `exercise`, `lemma`, `note`, `problem`, `property`, `proposition`, `question`, `remark`, `solution`, and `theorem`.

The optional argument `[`⟨*optional material*⟩`]` lets you specify additional text which will follow the environment caption and counter.

N.B. We have designed a new easy-to-use mechanism to define your own environments, refer to Sect. 3.3.

Use the new symbol command

```
\qed
```

to produce an empty square at the end of your proof.

In addition, use the new declaration

```
\smartqed
```

to move the position of the predefined qed symbol to be flush right (in text mode). If you want to use this feature throughout your book the declaration must be set in the preamble, otherwise it should be used individually in the relevant environment, i.e. proof.

2.8 New Commands for the Figure Environment

Use the new declaration

```
\sidecaption[⟨pos⟩]
```

to move the figure caption from beneath the figure (*default*) to the lower right-hand side of the figure.

The optional parameter `[t]` moves the figure caption to the upper right-hand side of the figure

N.B. (1) Make sure the declaration `\sidecaption` follows the `\begin{figure}` command, and (2) remember to use the standard `\caption{}` command for your caption text.

3 More Advanced Tips and Tricks

If the structuring and formatting of your manuscript needs more attention you may find some useful hints for this in the sections below.

Further to the packages listed in Sect.2.3, SVMult document class has been tested with the following style files.

3.1 Packages for Typesetting Mathematics

A useful package for subnumbering each line of an equation array can be found at ../tex-archive/macros/latex/contrib/supported/subeqnarray/ at the *Comprehensive TEX Archive Network*(CTAN), see [4, 5, 6].

`subeqnarray.sty` defines the `subeqnarray` and `subeqnarray*` environments, which behave like the equivalent `eqnarray` and `eqnarray*` environments, except that the individual lines are numbered as 1a, 1b, 1c, etc.

3.2 Enhanced Figure and Table Environment

Use the new declaration

`\samenumber`

within the figure environment – directly after the `\begin{figure}` command – to give the caption concerned the same counter as its predecessor (useful for long tables or figures spanning more than one page, see also the declaration `\subfigures` below.

To arrange multiple figures in a single environment use the newly defined commands

`\leftfigure[`⟨*pos*⟩`]` and `\rightfigure[`⟨*pos*⟩`]`

within a `{minipage}{\textwidth}` environment. To allow enough space between two horizontally arranged figures use `\hspace{\fill}` to separate the corresponding `\includegraphics{}` commands . The required space between vertically arranged figures can be controlled with `\\[12pt]`, for example.

The default position of the figures within their predefined space is flush left. The optional parameter `[c]` centers the figure, whereas `[r]` positions it flush right – use the optional parameter *only* if you need to specify a position other than flush left.

Use the newly defined commands

`\leftcaption{}` and `\rightcaption{}`

outside the `minipage` environment to put two figure captions next to each other.

Use the newly defined command

`\twocaptionwidth{`⟨*width*⟩`}{`⟨*width*⟩`}`

to overrule the default horizontal space of 5.4 cm provided for each of the above-described caption commands. The first argument corresponds to `\leftcaption` and the latter to `\rightcaption`.

Use the new declaration

`\subfigures`

within the figure environment – directly after the `\begin{figure}` command – to subnumber multiple captions within a single figure-environment alphabetically.

N.B.: When used in combination with `\samenumber` the main counter remains the same and the alphabetical subnumbering is continued. It works properly only when you stick to the sequence `\samenumber\subfigures`.

If you do not include your figures as electronic files use the newly defined command

`\mpicplace{`⟨*width*⟩`}{`⟨*height*⟩`}`

to leave the desired amount of space for each figure. This command draws a vertical line of the height you specified.

3.3 Enhanced Definitions for Theorem-Like Environments

In the SVMult document class the functions of the standard `\newtheorem` command have been enhanced to allow a more flexible font selection. All standard functions though remain intact (e.g. adding an optional argument specifying additional text after the environment counter).

Use the new Springer mechanism

`\spdefaulttheorem{`⟨*env name*⟩`}{`⟨*caption*⟩`}{`⟨*cap font*⟩`}{`⟨*body font*⟩`}`

to define an environment compliant with the selected class options (see Sect. 2.2) and designed as the predefined Springer theorem-like environments.

The argument `{`⟨*env name*⟩`}` specifies the environment name; `{`⟨*caption*⟩`}` specifies the environment's heading; `{`⟨*cap font*⟩`}` and `{`⟨*body font*⟩`}` specify the font shape of the caption and the text body.

N.B. If you want to use optional arguments in your definition of a new theorem-like environment as done in the standard `\newtheorem` command, see below.

Use the new Springer mechanism

`\spnewtheorem{`⟨*env name*⟩`}[`⟨*numbered like*⟩`]{`⟨*caption*⟩`}{`⟨*cap font*⟩`}{`⟨*body font*⟩`}`

to define an environment that shares its counter with another predefined environment `[`⟨*numbered like*⟩`]`.

The optional argument `[`⟨*numbered like*⟩`]` specifies the environment with which to share the counter.

N.B. If you select the class option "envcountsame" the only valid "numbered like" argument is `[theorem]`.

Use the newly defined Springer mechanism

`\spnewtheorem{`⟨*env name*⟩`}{`⟨*caption*⟩`}[`⟨⟨*within*⟩⟩`]{`⟨*cap font*⟩`}{`⟨*body font*⟩`}`

to define an environment whose counter is prefixed by either the chapter or section number (use `[chapter]` or `[section]` for `[`⟨*within*⟩`]`).

Use the newly defined declaration

`\nocaption`

in the argument `{`⟨*caption*⟩`}` if you want to skip the environment caption and use an environment counter only.

Use the newly defined environment

```
\begin{theopargself}
...
\end{theopargself}
```

as a wrapper to any theorem-like environment defined with the Springer mechanism. It suppresses the brackets of the optional argument specifying additional text after the environment counter.

3.4 References

The style

`natbib.sty`	sorts reference entries in the author–year system (among other features)

N.B. This style must be installed when the class option *natbib* is used, see Sect. 2.2.

The Springer command

`\biblstarthook{`⟨*text*⟩`}`

allows the inclusion of explanatory *text* between the bibliography heading and the actual list of references. The command must be placed before the `thebibliography` environment.

4 Editor's Section

Please refer to the *Editor Instructions* for details on how to compile all contributions into a single book. In addition to these instructions and the details described in the previous sections of this *reference guide* you find below a list of further Springer class options, declarations and commands which you may find especially useful for editing your *Contributed Book*.

4.1 Book Layout

Choose the Springer class option

openany	to allow contributions to start indifferently on both recto and verso pages

4.2 Preface and the Like

Use the Springer new command

`\preface[`⟨*althead*⟩`]`

to typeset the heading of your preface or any other unnumbered chapter (with automatically generated runnings heads, but without automatic TOC entry).

The default heading text is "Preface". If you choose a "language" class option, it will automatically be translated.

In the optional argument `[`⟨*althead*⟩`]`, alternative headings (e.g. Foreword) may be indicated.

4.3 Table of Contents

Use the command

`\setcounter{tocdepth}{number}`

to alter the numerical depth of your table of contents.

Use the macro

```
\calctocindent
```

to recalculate the horizontal spacing for large section numbers in the table of contents set with the following variables:

`\tocchpnum` for the	chapter number
`\tocsecnum`	section number
`\tocsubsecnum`	subsection number
`\tocsubsubsecnum`	subsubsection
`\tocparanum`	paragraph number

Set the sizes of the variables concerned at the maximum numbering appearing in the current document.

In the preamble set e.g:

```
\settowidth{\tocchpnum}{36.\enspace}
\settowidth{\tocsecnum}{36.10\enspace}
\settowidth{\tocsubsecnum}{99.88.77}
\calctocindent
```

4.4 List of Contributors

Use the new environment command

```
\begin{thecontriblist}
  ⟨Author 1 Information⟩
\and
  ⟨Author 2 Information⟩
\end{thecontriblist}
```

to create a list of contributors. Please note that this environment makes use of the "obeylines"-function, so ideally you follow the input example given below for your author information:

```
\textbf{Author Name}
University/Institute Name
Street No.
X - Place, Postal Code
\texttt{name@e-mail.*}
```

4.5 Appendix

Use the declaration

`\appendix`

after the `\backmatter` command to add an appendix at the end of the book. Use the `\chapter` command to typeset the heading.

4.6 Index(es)

The Springer declaration

`\threecolindex`

allows the next index following the `\threecolindex` declaration to be set in three columns.

The Springer declaration

`\indexstarthook{`⟨*text*⟩`}`

allows the inclusion of explanatory *text* between the index heading and the actual list of references. The command must be placed before the `theindex` environment.

References

[1] L. Lamport: *LaTeX: A Document Preparation System* 2nd ed. (Addison-Wesley, Reading, Ma 1994)

[2] M. Goossens, F. Mittelbach, A. Samarin: *The LaTeX Companion* (Addison-Wesley, Reading, Ma 1994)

[3] D. E. Knuth: *The TeXbook* (Addison-Wesley, Reading, Ma 1986) revised to cover TeX3 (1991)

[4] TeX Users Group (TUG), http://www.tug.org

[5] Deutschsprachige Anwendervereinigung TeX e.V. (DANTE), Heidelberg, Germany, http://www.dante.de

[6] UK TeX Users' Group (UK-TuG), http://uk.tug.org