

L^AT_EX 2_ε SVMONO Document Class Version 5.x
Reference Guide
for
Monographs

© 2007, Springer
All rights reserved.

October 17, 2007

Contents

1	Introduction	2
2	SVMono Class Features	3
2.1	Initializing the SVMONO Class	3
2.2	SVMONO Class Options	3
2.3	Required and Recommended Packages	7
2.4	SVMONO Commands and Environments in Text Mode	9
2.5	SVMONO Commands in Math Mode	11
2.6	SVMONO Theorem-Like Environments	12
2.7	SVMONO Commands for the Figure and Table Environments	14
2.8	SVMONO Environments for Exercises, Problems and Solutions	16
2.9	SVMONO Commands for Styling References	16
2.10	SVMONO Commands for Styling the Index	17
2.11	SVMONO Commands for Styling the Table of Contents	17
	References	18

1 Introduction

This reference guide gives a detailed description of the $\text{\LaTeX} 2_{\epsilon}$ SVMONO document class Version 5.x and its special features designed to facilitate the preparation of scientific books for Springer. It always comes as part of the SVMONO tool package and should not be used on its own.

The components of the SVMONO tool package are:

- The *Springer* \LaTeX class `SVMono.cls`, MakeIndex styles `svind.ist`, `svindd.ist`, BibTeX styles `spmpsci.bst`, `spphys.bst`, `spbasic.bst` as well as the *templates* with preset class options, packages and coding examples;

Tip: Copy all these files to your working directory, run $\text{\LaTeX} 2_{\epsilon}$, BibTeX and MakeIndex—as is applicable—and 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.

Tip: Follow these instructions to set up your files, to type in your text and to obtain a consistent formal style in accordance with Springer’s layout specifications; use these pages as checklists before you submit your manuscript data.

- The *Reference Guide* describing SVMONO features with regards to their functionality.

Tip: Use it as a reference if you need to alter or enhance the default settings of the SVMONO document class and/or the templates.

The documentation in the Springer SVMONO tool package is not intended to be a general introduction to $\text{\LaTeX} 2_{\epsilon}$ or \TeX . For this we refer you to [1–3].

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 [4–6].

SVMONO was derived from the $\text{\LaTeX} 2_{\epsilon}$ `book.cls` and `article.cls`. Should you encounter any problems or bugs in the SVMONO document class please contact

`texhelp@springer.de`.

The main differences from the standard document classes `article.cls` and `book.cls` 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 $\LaTeX 2_{\epsilon}$ 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 SVMono Class Features

2.1 Initializing the SVMono Class

To use the document class, enter

```
\documentclass [options] {svmono}
```

at the beginning of your input.

2.2 SVMono Class Options

Choose from the following list of SVMONO class options if you need to alter the default layout settings of the Springer SVMONO document class. Please note that the optional features should only be chosen if instructed so by the editor of your book.

Page Style

<i>default</i>	twoside, single-spaced output, contributions starting always on a recto page
<i>referee</i>	produces double-spaced output for proofreading
<i>footinfo</i>	generates a footline with name, date, ... at the bottom of each page
<i>norunningheads</i>	suppresses any headers and footers

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

Body Font Size

<i>default</i>	10 pt
<i>11pt, 12pt</i>	are ignored

Language for Fixed L^AT_EX Texts

In the SVMONO class we have changed a few standard L^AT_EX 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.

<i>default</i>	English
<i>deutsch</i>	translates fixed L ^A T _E X texts into their German equivalent
<i>francais</i>	same as above for French

Text Style

<i>default</i>	plain text
<i>graybox</i>	automatically activates the packages <code>color</code> and <code>framed</code> and places a box with 15 percent gray shade in the background of the text when you use the SVMONO environment <code>\begin{svgraybox}... \end{svgraybox}</code> , see Sects. 2.3, 2.4.

Equations Style

<i>default</i>	centered layout, vectors boldface (<i>math style</i>)
<i>vecphys</i>	produces boldface italic vectors (<i>physics style</i>) when <code>\vec</code> -command is used
<i>vecarrow</i>	depicts vectors with an arrow above when <code>\vec</code> -command is used

Numbering and Layout of Headings

<i>default</i>	all section headings down to subsubsection level are numbered, second and subsequent lines in a multiline numbered heading are indented; Paragraph and Subparagraph headings are displayed but not numbered; figures, tables and equations are numbered chapterwise, individual theorem-like environments are counted consecutively throughout the book.
<i>nosecnum</i>	suppresses any section numbering; figures, tables and equations are counted chapterwise displaying the chapter counter, if applicable.
<i>nochapnum</i>	suppresses the chapter numbering only, subsequent section headings as well as figures, tables and equations are numbered chapterwise but without chapter counter.
<i>nonum</i>	suppresses any numbering of any headings; tables, figures, equations are counted consecutively throughout the book.
<code>\chapter*</code>	must not be used since all subsequent numbering will go bananas...

Warning !

Numbering of Figures, Tables and Equations

<i>default</i>	chapter-wise numbering
<i>numart</i>	numbers figures, tables, equations consecutively (not chapterwise) throughout the whole text, as in the standard article document class

Numbering and Counting of Built-in Theorem-Like Environments

<i>default</i>	each built-in theorem-like environment gets its own counter without any chapter or section prefix and is counted consecutively throughout the book
<i>envcountchap</i>	Each built-in environment gets its own counter and is numbered <i>chapterwise</i> . <i>To be selected as default setting for a book with numbered chapters.</i>
<i>envcountsect</i>	each built-in environment gets its own counter and is numbered <i>sectionwise</i>
<i>envcountsame</i>	all built-in environments follow a <i>single counter</i> without any chapter or section prefix, and are counted consecutively throughout the book

<i>envcountresetchap</i>	each built-in environment gets its own counter without any chapter or section prefix but with the counter <i>reset for each chapter</i>
<i>envcountresetsect</i>	each built-in environment gets its own counter without any chapter or section prefix but with the counter <i>reset for each section</i>

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.

N.B.4 Be careful not to use layout options that contradict the parameter of the selected environment option and vice versa.

Warning !

Use the Springer class option

<i>nospthms</i>	<i>only</i> if you want to suppress all Springer theorem-like environments and use the theorem environments of original L ^A T _E X package or other theorem packages instead. (Please check this with your editor.)
-----------------	--

References

<i>default</i>	the list of references is set as an unnumbered chapter starting on a new recto page, with automatically correct running heads and an entry in the table of contents. The list itself is set in small print and numbered with ordinal numbers.
<i>sectrefs</i>	sets the reference list as an unnumbered section, e.g. at the end of a chapter
<i>natbib</i>	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 <i>Comprehensive T_EX Archive Network</i> (CTAN...tex-archive/macros/latex/contrib/supported/natbib/), see [4–6])

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 L^AT_EX 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 and Recommended Packages

SVMONO document class has been tested with a number of Standard L^AT_EX tools. Below we list and comment on a selection of recommended packages for preparing fully formatted book manuscripts for Springer Verlag. If not installed on your system, the source of all standard L^AT_EX tools and packages is the *Comprehensive T_EX Archive Network* (CTAN) at [4–6].

Font Selection

default Times font family as default text body font together with Helvetica as sans serif and Courier as typewriter font.

`mathptmx.sty` defines Times Roman as default text font, and provides maths support using glyphs from the Symbol, Chancery and Computer Modern fonts together with letters, etc., from Times Roman.

`helvet.sty` defines Helvetica as sans serif font.

`courier.sty` defines Helvetica as typewriter font.

If the packages 'mathptmx.sty, helvet.sty, courier.sty' are not already installed with your L^AT_EX they can be found at `../tex-archive/fonts/psfonts/psnfss-source/` at the *Comprehensive T_EX Archive Network*(CTAN), see [4–6].

If Times Roman is not available on your system you may revert to CM fonts. However, the SVMONO layout requires font sizes which are not part of the default set of the computer modern fonts.

`type1cm.sty` The `type1cm` package enhances this default by enabling scalable versions of the (Type 1) CM fonts. If not already installed with your L^AT_EX it can be found at `../tex-archive/macros/latex/contrib/type1cm/` at the *Comprehensive T_EX Archive Network*(CTAN), see [4–6].

Body Text

When you select the SVMONO class option `[graybox]` the packages `framed` and `color` are required, see Sect. 2.2.

`framed.sty` makes it possible that framed or shaded regions can break across pages.

`color.sty` is part of the `graphics` bundle and makes it possible to select the color and define the percentage for the background of the box.

Equations

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 T_EX Archive Network*(CTAN), see [4–6].

`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.

Footnotes

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

Figures

`graphicx.sty` tool for including graphics files (preferably `eps` files)

References

default Reference lists are numbered with the references being cited in the text by their reference number

`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

`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
`svindd.ist` for German 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 SVMono Commands and Environments in Text Mode

Use the environment syntax

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

to typeset a dedication or quotation at the very beginning of the in preferred Springer layout.

Use the new commands

```
\foreword  
\preface
```

to typeset a *Foreword* or *Preface* with automatically generated runnings heads.

Use the new commands

```
\extrachap{<heading>}  
\Extrachap{<heading>}
```

to typeset—in the front or back matter of the book—an extra unnumbered chapter with your preferred heading and automatically generated runnings heads.

`\Extrachap` furthermore generates an automated TOC entry.

Use the new command

```
\partbacktext{<text>}
```

to typeset a text on the back side of a part title page.

Use the new command

```
\chapsubtitle[<subtitle>]
```

to typeset a possible subtitle to your chapter title. Beware that this subtitle is not tranferred automatically to the table of contents.

The command must be placed *before* the `\chapter` command.

Alternatively use the `\chapter`-command to typeset your subtitle together with the chapter title and separate the two titles by a period or an en-dash .

Alternative !

The command must be placed *before* the `\chapter` command.

Use the new command

`\chapauthor[(name)]`

to typeset the author name(s) beneath your chapter title. Beware that the author name(s) are not transferred automatically to the table of contents.

The command must be placed *before* the `\chapter` command.

Alternatively, if the book has rather the character of a contributed volume as opposed to a monograph you may want to use the SVMONO package with features that better suit the specific requirements.

Alternative !

Use the new commands

`\chaptermark{}`
`\sectionmark{}`

to alter the text of the running heads.

Use the new command

`\motto{(text)}`

to include *special text*, e.g. mottos, slogans, between the chapter heading and the actual content of the chapter in the preferred Springer layout.

The argument `{(text)}` contains the text of your inclusion. It may not contain any empty lines. To introduce vertical spaces use `\\[height]`.

If needed, the you may indicate an alternative widths in the optional argument.

N.B. The command must be placed *before* the relevant `heading`-command.

Use the new commands

`\abstract{(text)}`
`\abstract*{(text)}`

to typeset an abstract at the beginning of a chapter.

The text of `\abstract*` will not be depicted in the printed version of the book, but will be used for compiling `html` abstracts for the online publication of the individual chapters www.SpringerLink.com.

Please do not use the standard L^AT_EX environment `\begin{abstract}... \end{abstract}` – it will be ignored when used with the SVMONO document class!

Warning !!!

Use the new commands

`\runinhead[(title)]`
`\subruninhead[(title)]`

when you want to use unnumbered run-in headings to structure your text.

Use the new environment command

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

to typeset complete paragraphs within a box showing a 15 percent gray shade.

N.B. Make sure to select the SVMONO class option [graybox] in order to have all the required style packages available, see Sects. 2.2, 2.3.

Warning !

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 two levels 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.

Use the commands

```
\setitemindent{<largelabel>}  
\setitemitemindent{<largelabel>}
```

if you need to customize the indentation of your “itemized” or “enumerated” environments.

2.5 SVMono Commands in Math Mode

Use the new or enhanced symbol commands provided by the SVMONO 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 SVMONO 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 SVMONO document class and are taken from the T_EX 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 SVMONO 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`.

If you need to define further commands use the syntax below as an example:

```
\newcommand{\ualpha}{\allmodesymb{\greekSYM}{a}}
```

2.6 SVMono Theorem-Like Environments

For individual text structures such as theorems, definitions, and examples, the SVMONO document class provides a number of *pre-defined* 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.

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.

Example

```
\begin{proof}  
\smartqed  
Text  
\qed  
\end{proof}
```

Furthermore 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 Springer mechanism

```
\spnewtheorem*{<env name>}{<caption>}{<cap font>}{<body font>}
```

to define an *unnumbered* environment such as the pre-defined unnumbered environments *claim* and *proof*.

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.

2.7 SVMono Commands for the Figure and Table Environments

Use the new declaration

```
\sidecaption[<pos>]
```

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

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

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

N.B.2 This declaration works only if the figure width is less than 7.8 cm. The caption text will be set raggedright if the width of the caption is less than 3.4 cm.

Use the new declaration

`\samenum`

within the figure and table environment – directly after the `\begin{environment}` 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 alphabetically within a single figure-environment.

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

Use the new command

```
\svhline
```

for setting in tables the horizontal line that separates the table header from the table content.

2.8 SVMono Environments for Exercises, Problems and Solutions

Use the environment command

```
\begin{prob}  
\label{<problem:key>}  
<problem text>  
\end{prob}
```

to typeset and number each problem individually.

To facilitate the correct numbering of the solutions we have also defined a *solution environment*, which takes the problem's key, i.e. *<problem:key>* (see above) as argument.

Use the environment syntax

```
\begin{sol}{<problem:key>}  
<solution text>  
\end{sol}
```

to get the correct (i.e. problem =) solution number automatically.

2.9 SVMono Commands for Styling References

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.

2.10 SVMono Commands for Styling the Index

The Springer declaration

```
\threecolindex
```

sets the next index following the `\threecolindex` declaration 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.

2.11 SVMono Commands for Styling the 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:

<code>\tocchpnum</code>	for the	chapter number
<code>\tocsecnum</code>		section number
<code>\tocsubsecnum</code>		subsection number
<code>\tocsubsubsecnum</code>		subsubsection
<code>\tocparanum</code>		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
```

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>