LATEX2e SVProc Document Class Version 1.x Reference Guide for Proceedings

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1 Introduction

This reference guide gives a detailed description of the LaTeX 2_ε SVProc document class Version 1.x and its special features designed to facilitate the preparation of scientific books for Springer. It always comes as part of the SVProc tool package and should not be used on its own.

The components of the SVProc tool package are:

- The Springer Nature LaTeX class `SVProc.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 LaTeX 2_ε, BibTeX and MakeIndex—as is applicable—and and produce your own example output 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 Nature's layout specifications; use these pages as checklists before you submit your manuscript data.

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

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

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

- the *Editor Instructions* for compiling multiple contributions to a mutual book.

The documentation in the Springer Nature SVProc tool package is not intended to be a general introduction to LaTeX 2_ε 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].

SVProc was derived from the LaTeX 2_ε article document class. Should you encounter any problems or bugs in the SVProc document class please contact

`texhelp@springer.com`.

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

- multiple Springer Nature 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 Nature 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 SVProc Class Features – Contribution-wise

2.1 Initializing the SVProc Class

To use the document class, enter

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

at the beginning of your input.

2.2 SVProc Class Options

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

Page Style

default	twoside, single-spaced output, contributions starting always on a recto page
norunningheads	suppresses any headers and footers

Body Font Size

default	10 pt
11pt, 12pt	are ignored

Language for Fixed LaTeX Texts

In the SVPROC 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 Nature style requirements.

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

Equations Style

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

Numbering and Layout of Headings

default	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.

Numbering and Counting of Built-in Theorem-Like Environments

default	each built-in theorem-like environment gets its own counter without any chapter or section prefix and is reset for each unnumbered contribution.

envcountsect	each built-in environment gets its own counter and is numbered *sectionwise*
envcountsame	all built-in environments follow a *single counter* without any chapter or section prefix, and are counted consecutively throughout the book

N.B.1 When the option *envcountsame* is combined with the options *envcountresetchap* or *envcountresetsect* all predefined Springer Nature 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 Nature 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. 2.6.

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

References

default	the list of references is set as an unnumbered section at the end of your contribution, 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.
oribibl	use the Springer Nature class option *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 Nature requirements. (Please check usage of this option with your editor.)

2.3   Required and Recommended Packages

SVProc 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. If not installed on your system, the source of all standard LaTeX tools and packages is the *Comprehensive TeX Archive Network* (CTAN) at [4–6].

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

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 TeX 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 (preferrably `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 SVProc Commands and Environments in Text Mode

Use the command

`\title{}`

to typeset the (unnumbered) heading of your contribution. (There is no counterpart to generate a numbered heading).

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). If there is more than one author, the names should be separated by `\and`.

The author names will appear beneath the contribution's title.

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[`⟨*affiliation details separated by commas*⟩`\email`⟨*email address*⟩`]`

when the authors' names and affiliations shall appear at the bottom of the contribution's first page.

Please list multiple authors and/or affiliations by using the command `\and`, cf. the example below:

```
\institute{Princeton University, Princeton NJ 08544, USA,
\email{I.Ekeland@princeton.edu},
WWW home page: http://users/~iekeland/web/welcome.html
\and
Universit\'{e} de Paris-Sud,
Laboratoire d'Analyse Num\'{e}rique, B\^{a}timent 425,
F-91405 Orsay Cedex, France}
```

Use the command

> `\maketitle`

to compile the header of your contribution.

Use the command

> `\keywords{`⟨*keyword list*⟩`}`

within and as last element of the abstract environment to specify your keywords.

2.5 SVProc Commands in Math Mode

Use the new or enhanced symbol commands provided by the SVPROC 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 SVPROC 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 SVPROC 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 SVProc 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   SVProc Theorem-Like Environments

For individual text structures such as theorems, definitions, and examples, the SVProc 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.

Use the new symbol command

```
\qed
```

to produce an empty square at the end of your 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 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.

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`