

Chapter 1

Style and Formatting

Specifications for SPIE Press Single-author Books

1.1 Introduction

This document shows the required format and appearance of a manuscript prepared for SPIE Press books. Formatting guidelines must be followed since papers will not be typeset. Authors are advised to print this sample manuscript and use it as a reference while preparing their own paper, to ensure all guidelines are met.

1.2 Use of this document

This document is prepared using LaTeX2e with the class file `spiebook.cls`.^{1,2} The LaTeX source file used to create this document is `single-author.tex`, which contains important formatting information embedded in it. Authors may use it as template to create their own manuscript. While LaTeX properly handles most formatting issues, the author may occasionally need to intervene to obtain a satisfactorily formatted manuscript.

1.3 English

Authors are strongly encouraged to follow the principles of sound technical writing, as found in Refs. 3 and 4, for example. In addition, good English usage is essential. Authors whose native language is not English may wish to collaborate with a colleague whose English skills are more advanced. A spell checker can be helpful to discover misspelled words, but authors should also proofread their papers carefully prior to submission. Manuscripts that do not meet acceptable English standards or lack clarity may be rejected.

1.4 Page setup and fonts

All text and figures, including footnotes, must fit inside a text area 5 in. wide by 8 in. high (21.59 by 27.94 cm). Manuscripts must be formatted for US letter paper,

on which the margins should be 1.7 in. (4.32 cm) on the top, 1.3 in. (3.3 cm) on the bottom, and 1.75 in. (4.44 cm) on the left and right.

Use Times font in the body of the manuscript and in footers. Helvetica is used for all headers, including the chapter number and title, captions, running headers. If these fonts are not available, use a similar serif/sans serif fonts. Sizes and styles shown in Table 1.1. The manuscript should not contain headers or footers. Pages should not be numbered. The page numbers will be added by the publisher after acceptance.

Table 1.1 Fonts sizes and styles.

Document entity	Font	Brief description
Chapter number	Helvetica	20 pt., bold
Chapter title	Helvetica	24 pt., bold
Section heading	Helvetica	12 pt., bold
Subsection heading	Helvetica	11 pt., normal
Subsubsection heading	Helvetica	10 pt., bold
Paragraph heading	Helvetica	10 pt., italic
Normal text	Times	11 pt.,
Figure/table numbers	Helvetica	9 pt., bold
Figure/table captions	Helvetica	9 pt.
Footnote	Times	9 pt., hanging indent

1.5 Parts of a Manuscript

This section describes the normal structure of a manuscript and how each part should be handled. The appropriate vertical spacing between various parts of this document is achieved in LaTeX through the proper use of defined constructs, such as `\section{}`. A line break is created with `\\`.

1.5.1 Preface

The preface provides the reader with an understanding of the text including reasons for writing the book, methods of research, the intended audience, and the appropriate prior knowledge that should be possessed by the intended audience. The author's name and the date should appear flush left at the end of the preface.

1.5.2 Acknowledgments

Acknowledgments can be included in the preface or as a separate section at the end of the preface if they are longer than a paragraph.

1.5.3 Chapter and title

Chapters begin 1 in. (2.54 cm) below the top margin and are moved down with the use of hard returns (please see the example above). All chapters begin with

“Chapter x,” where “x” is the number of the chapter, followed by the title of the chapter on the next line. The chapter number is 20 pt Helvetica font, bold; the chapter title is 24 pt Helvetica, bold. Titles should be in headline case: capitalize the first element and subsequent elements unless they are articles, or prepositions. Do not begin titles with articles (e.g., a, an, the) or prepositions (e.g., on, by, etc.). Avoid the use of acronyms in the title, unless they are widely understood.

1.5.4 Body of paper

The body of the paper consists of numbered sections that present the main findings. These sections should be organized to best present the material. See Sec. 1.6 for formatting instructions.

1.5.5 Appendices

Auxiliary material that is best left out of the main body of the paper may be included in the appendices, for example, derivations of equations, proofs of theorems, and details of algorithms. Appendices follow the body and are enumerated with upper-case Latin letters in alphabetic order.

1.5.6 References

The References section lists books, articles, and reports that are cited in the paper. This section does not have a section number. The references are numbered in the order in which they are cited. Examples of the format to be followed are given at the end of this document.

The reference list at the end of this document is created using BibTeX, which looks through the file `report.bib` for the entries cited in the LaTeX source file. The format of the reference list is determined by the bibliography style file `spiebook.bst`, as specified in the `\bibliographystyle{spiebook}` command. Alternatively, the references may be directly formatted in the LaTeX source file.

For books the listing includes the list of authors (initials plus last name), book title (in italics), page or chapter numbers, publisher, city, and year of publication.¹⁻³ Journal-article references include the author list, title of the article (in quotes), journal name (in italics, properly abbreviated), volume number (in bold), inclusive page numbers or citation identifier, and year.^{5,6} A reference to a proceedings paper or a chapter in an edited book⁷ includes the author list, title of the article (in quotes), conference name (in italics), editors (if appropriate), volume title (in italics), volume number if applicable (in bold), inclusive page numbers, publisher, city, and year. References to an article in the SPIE Proceedings may include the conference name, as shown in Ref. 8.

The references are numbered in the order of their first citation. Citations to the references are using brackets around the numerals, as demonstrated in the preceding paragraph. One may also directly refer to a reference within the text, e.g., “as

shown in Ref. 5...” Two or more references should be separated by a comma with no space between them. Multiple sequential references should be displayed with a dash between the first and last numbers.¹⁻⁵

Footnotes may be used to provide auxiliary information that doesn't need to appear in the text, e.g., to explain measurement units. They should be used sparingly. To insert a footnote*, use the command `\footnote{Your footnote text goes here.}`.

1.5.7 Biographies

The author should provide a brief professional biography not to exceed 250 words along with a photograph. Biographies should be placed at the end of the manuscript. Personal information such as hobbies or birthplace/birthdate should not be included.

1.6 Section formatting

In LaTeX, a new section is created with the `\section{}` command, which automatically numbers the sections. Sections will be numbered sequentially, starting with the first section after the chapter title. (Note that numbering of section headings is not required, but the numbering must be consistent if used.) All section headings should be left justified.

Main section headings are in Helvetica 11 pt., bold font letters, and headline case. The heading starts with the section number without a period.

Paragraphs that immediately follow a section heading are leading paragraphs and should not be indented, according to standard publishing style. The same goes for leading paragraphs of subsections and sub-subsections. Subsequent paragraphs are standard paragraphs, with 0.225-in indentation. There is no additional space between paragraphs. In LaTeX, paragraphs are separated by blank lines in the source file. Indentation of the first line of a paragraph may be avoided by starting it with `\noindent`.

1.6.1 Subsection headings

Only the first word of a subsection heading is capitalized. The rest of the text is not capitalized, except for proper names and acronyms (the latter should only be used if well known). Subsection numbers consist of the section number, followed by a period, and the subsection number within that section, without a period at the end. The heading is left justified and its font is Helvetica 11 pt., bold.

1.6.1.1 Sub-subsection headings

The first word of a sub-subsection is capitalized. The rest of the text is not capitalized, except for proper names and acronyms (the latter should only be used if well

*Your footnote text goes here.

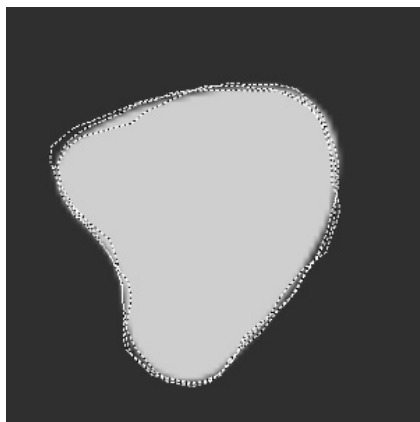


Figure 1.1 Example of a figure caption.

known). The heading is left justified and its font is Helvetica 10 pt., bold.

Paragraph headings Fourth level heading is left justified and its font is Helvetica 10 pt., italic.

1.7 Figures and Tables

1.7.1 Figures

Figures are numbered in the order in which they are called out in the text (and are named by chapter number and sequence). They should appear in the document in numerical order and as close as possible to their first reference in the text (which should be “Fig. x.x” or “Figure x.x” if beginning a sentence). It may be necessary to move figures or tables around to enhance readability. LaTeX will attempt to place figures at the top or bottom of a page.

Figures, along with their captions, should be separated from the main text by 0.25 in. and centered. Figure captions are centered below the figure or graph. Figure captions start with the word “Figure” in front of the chapter number, followed by a period, and figure number without a period and the text in Helvetica 9-pt. font. See Fig. 1.1 for an example.

Authors may wish to create figures consisting of two or more images, in which case, they should be neatly arranged in a rectangular array. Figure 1.2 shows two side-by-side images. Another option would be to create two side-by-side figures, each with its own figure number and caption, by placing them inside a `tabular` environment. In no case, should the chapter’s text be wrapped around a figure.

1.7.2 Tables

Tables are numbered in the order in which they referred to. They should appear in the document in numerical order and as close as possible to their first reference

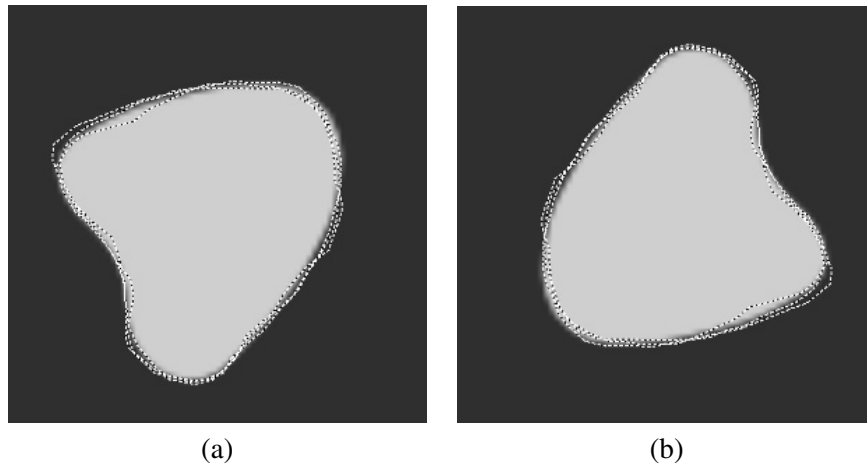


Figure 1.2 Example of a figure containing two side-by-side images. The letters (a) and (b) have been added to provide a means of referring to each image. Alternatively, the author may wish to simply refer to the left or the right image.

in the text. It is preferable to have tables appear at the top or bottom of the page, if possible. Table captions are handled identically to those for figures, except that they appear above the table and when called out in the text, the word “Table” is always spelled out. See Table 1.1 for an example.

1.8 Miscellaneous Formatting Details

It is often important to refer back (or forward) to specific sections. Such references are made by indicating the section number, for example, “In Sec. 2 we showed” or “Section 2.1 contained a description.” When the section reference starts a sentence, “Section” is spelled out; otherwise use its abbreviation, “Sec.” References to figures, tables, theorems, etc. are handled in the same way.

At the first occurrence of an acronym, spell it out (unless it is widely known such as CCD, LED, UV), followed by the acronym in parentheses, e.g., noise power spectrum (NPS).

At times it may be desired, for formatting reasons, to break a line without starting a new paragraph. In a LaTeX source file, a linebreak is created with `\`.

1.8.1 Formatting equations

Equations may appear inline with the text, if they are simple, short, and not of major importance; e.g., $\beta = b/r$. Important equations appear on their own line. Such equations are centered. For example, “The expression for the field of view is

$$2a = \frac{(b+1)}{3c}, \quad (1.1)$$

where a is the ...” Principal equations are numbered, with the equation number placed within parentheses and right justified.

Equations are considered to be part of a sentence and should be punctuated accordingly. In the above example, a comma appears after the equation because the next line is a subordinate clause. If the equation ends the sentence, a period should follow the equation. The line following an equation should not be indented unless it is meant to start a new paragraph. Indentation after an equation is avoided in LaTeX by not leaving a blank line between the equation and the subsequent text.

References to equations include the equation number in parentheses, for example, “Equation (1.1) shows ...” or “Combining Eqs. (1.2) and (1.3), we obtain ...” Note that the word “Equation” is spelled out if it begins a sentence, but is abbreviated as “Eq.” otherwise. Using a tilde in the LaTeX source file between two characters avoids unwanted line breaks, for example between “Eq.” and the following equation number.

1.8.2 Formatting theorems

To include theorems in a formal way, the theorem identification should appear in a 11-point, left justified, and followed by a period. The text of the theorem continues on the same line in normal, 11-pt font. For example,

Theorem 1. For any unbiased estimator ...

1.9 Some \LaTeX Guidance

To work properly, the LaTeX style file `spiebook.cls` used to create this document requires following LaTeX packages: `times.sty`, `float.sty`, `ifthen.sty`, `cite.sty` (version 4.01 or later), and If you do not have them in your LaTeX environment, see your system manager, or download them from <http://www.ctan.org>.

The author is required to make sure his or her manuscript is properly formatted. LaTeX sometimes needs some help to avoid making gross formatting blunders. The source file for this document provides examples of how to cope with LaTeX’s shortcomings.

1.9.1 Margins and PostScript fonts

Manuscripts submitted for SPIE books as Portable Document Format (PDF) files must be formatted for US-letter-size paper and have the correct margins. The output of the LaTeX utility is a file with the extension DVI (for Device Independent), which encodes the formatted document.

One may directly create a PDF file from the DVI file with the LaTeX utility `dvipdfm`, for example. No options are necessary. Appealing aspects of this utility are that Acrobat Distiller is not needed, and Type 1 PostScript fonts are automatically included in the resulting PDF file. Furthermore, `dvipdfm` allows one

to directly incorporate images in JPEG, PNG, and PDF formats, and not just EPS, which is normally used with LaTeX.

Alternatively, with an application such as Adobe Acrobat, PDF files can be created from PostScript (PS) files, which can be produced by DVIPS. In most cases, the following DVIPS options should be invoked.

An important DVIPS option specifies the incorporation of (scalable) PostScript Type 1 fonts in its output PS file. This feature is important for obtaining a subsequent PDF file that will be clearly displayed on a computer monitor by Adobe Acrobat Reader. The option “-P pdf” makes DVIPS include these fonts in its output PS file.

LaTeX margins are related to the document’s paper size. The paper size is set at two separate places in the process of creating a PS file. The first place is in `latex`. The second place is in the application DVIPS. DVIPS has its own default paper size, which can be overridden with the option “-t letter” or “-t a4”. If the foregoing steps do not produce the correct top margin, you can move the text lower on the page (by 9 mm) with the command `\addtolength{\voffset}{9mm}`, placed right after the `\documentclass` command.

The `times.sty` package produces a bug in the handling of certain combinations of letters; for example, ‘fi’ is interpreted as a British pound symbol. Use the option “-G0” (capital G and zero) to avoid this problem.

To summarize, the following DVIPS options are recommended when making the PS file: “-t letter -P pdf -G0”.

1.9.2 Bold math symbols

The `math` package from the American Mathematical Society allows one to easily produce bold math symbols, well beyond what is available in LaTeX. It also provides many useful capabilities for creating elaborate mathematical expressions. You need to load the AMS math package near the top of the LaTeX source file, right after the `\documentclass` command:

```
\usepackage[] {amsmath}
```

Then for bold math symbols, use `\boldsymbol`; for example,

`$$\boldsymbol{\pi}$$` yields a bold pi. You can make it easier to use by defining a shorthand command:

```
\newcommand{\bm}[1]{\boldsymbol{#1}}
```

and then using it like so `$$\bm{\pi}$$`.

Not all math symbols are available in bold. In a pinch, you can use `\pmb` (“poor man’s bold”), which is defined in `amsmath`. This command approximates a bold character with a superposition of several, slightly displaced unbold characters.

If you want a Greek symbol in the article title, it should be both larger and bold. The easiest thing is to load the AMS math package as described above. Then, in

the title, use something like:

```
\chapter{Estimation of  $\alpha$  by a  
Monte Carlo technique}
```

Note that the command to create the alpha character is enclosed within braces to form a self-contained environment.

1.9.3 Uppercase letters and special symbols in BibTeX and LaTeX

BibTeX tries to enforce standard publishing rules regarding article titles and authors' names; it sometimes changes uppercase letters to lower case. LaTeX does the same thing for the article title. BibTeX also has trouble with umlauts, generally created in LaTeX with `\"{}o`, because it is looking for the `"` to end the input line.

The general rule for overriding LaTeX's and BibTeX's reinterpretation of your input text is to put the items you wish to be unchanged within braces `{}`. Thus, to obtain an umlaut in an author's name or in an article title, or to force an uppercase letter, do something like the following:

```
@article{Kaczmarz37,  
  author = "S. Kaczmarz",  
  title = "Angen\{a}hrte {A}ufl\{o}sung von  
{S}ystemen linearer {G}leichungen",  
  journal= "Bull. Acad. Polon. Sci. Lett.",  
  volume = "A35",  
  pages = "355-357",  
  year = "1937" }
```

This example shows the treatment for both umlauts and uppercase letters.

References

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