

Titel der Dissertation

Zur Erlangung des akademischen Grades eines

DOKTOR-INGENIEURS

von der Fakultät für
Elektrotechnik und Informationstechnik,
des Karlsruher Instituts für Technologie (KIT)

genehmigte

DISSERTATION

von

M.Sc. Vorname Nachname

geb. in Geburtsort

Tag der mündlichen Prüfung:

Hauptreferent:

Korreferent:

26.06.2019

Prof. Dr.-Ing. Hauptreferent

Prof. Dr.-Ing. Korreferent

Kurzfassung

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Abstract

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Preface

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Acronyms and symbols

Acronyms

IHE	Institute for High Frequency Technology and Electronics
KIT	Karlsruher Institute for Technology

Constants

π	Pi: 3,14159...
-------	----------------

Latin symbols and variables

B	Beamforming matrix
B	bandwidth
f	frequency
g	weighting factor

Greek symbols and variables

λ	wavelength
φ	phase shift

Operators and math symbols

a	complex size
\vec{a}	complex vector

General deep indexes

adapt	adaptive
incoh	incoherent

1 Notes for authors – necessary changes in L^AT_EX

1.1 Spacing for consecutive headlines

If two headlines are directly below each other, the author may have to manually adjust the vertical spacing between the headlines with the command “`\vspace`”. For the following sequence of headings, please refer to the vertical spacing as follows:

- No adjustment has to be made between “chapter” and “section”. (Target distance: 13 mm, measured from the baseline of the heading “chapter” to the H-line of the heading “section”)
- Between “section” and “subsection” please insert an additional vertical distance of 1.5 mm with the command “`\vspace`”.

```
\section{Headline level section} \vspace{1.5mm}  
\subsection{Headline level subsection}
```

(Target distance: 10 mm, measured from the baseline of the heading “section” to the H-line of the heading “subsection”)

- Between “subsection” and “subsubsection” please insert an additional vertical space of 3 mm with the command “`\vspace`”.

```
\subsection{Headline level subsection} \vspace{3mm}  
\subsubsection{Headline level subsubsection}
```

(Target distance: 10 mm, measured from the baseline of the heading “subsection” to the H-line of the heading “subsubsection”)

You can see the result with the corresponding vertical distances between the headlines in Chapter 5 (“Headline level 1 (chapter)”) on page 19 in this PDF file.

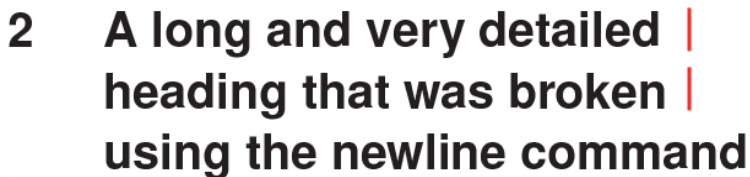
1.2 Breaks in headings

If long headings are to be shortened for the table of contents, the optional parameter of the respective command for headings offers the option of specifying a shorter heading. The following example shows the heading for the table of contents and the running title in square brackets. The heading stands for the running text in curly brackets.

```
\chapter[A short headline]{A long heading in the text over at least  
two lines}
```

If the heading is only enclosed in curly brackets with the command “\chapter{ }”, the heading in the text is identical to the heading in the table of contents and in the running title. A long heading can be broken manually in the text with the command “\newline”, as the following example shows.

```
\chpater[A short headline]{A long and very detailed \newline heading  
that was broken \newline using the newline command}
```



2 A long and very detailed heading that was broken using the newline command

Figure 1.1: Manually break headings in the text with the command “\newline”. The red lines in the example show the places where a manual line break was created.

Please make sure that the end of a chapter does not end with a figure or a table, as even manual adjustments to the distance to a subsequent heading are difficult to make.

1.3 Lists in an itemize or enumerate environment

Lists in an itemize or enumerate environment with less than three lines are left-justified. With the command “\raggedright” after the command “\item” this can be done, as the following example shows. You can see the result on page 6 in this PDF file.

```
\begin{itemize}  
\item[$\bullet$] \raggedright Text for lists with less than three lines  
are left-justified.  
\end{itemize}
```

Lists in an `itemize` or `enumerate` environment with three or more lines are justified. With the command “`\justifying`” after the command “`\item`” the paragraph can be formatted as a justification. In this way, the paragraph adapts optically to the body of the text and creates a coherent type area, as the following example shows. You can see the result on page 6 in this PDF file.

```
\begin{itemize}
\item[{$\bullet$}] \justifying Text for lists with three or more lines
are formatted as a justification.
\end{itemize}
```

Please note that even framed texts at the end of a chapter can falsify the distance to the following heading. In this case, it is best to add a paragraph to ensure the same spacing in front of headings (see target distance in chapter 1.1).

1.4 Bibliography, bibliography and citation style

Please note that the bibliography and citation style in this template are unlikely to meet the requirements of your institute. Due to the variety of different styles, this L^AT_EX template cannot provide a precisely defined bibliography and citation style for individual inquiries. Please use the L^AT_EX packages provided by your institute for the styles you are using and adapt the bibliography style “`\bibliographystyle{plainnat}`” in the file “Contents/Bibliography.tex” as well as the citation style “`\usepackage{natbib}`” in the file “KSP_Diss_17x24_EN.tex” according to your needs.

If you do not want to automatically output all titles from your file with the bibliographic information (e.g. “Bibliography/Literature.bib”) in the bibliography, please remove the commands “`\nocite{*}`” or “`\nocitejournal{*}`” and “`\nociteconference{*}`” from the file “Contents/Bibliography.tex”.

The counter for the titles in the bibliography (e.g. “Journal articles” or “Conference contributions”) is reset to “[1]” by default by the optional parameter “`resetlabels`” for the command “`\usepackage[resetlabels]{multibib}`” in the file “KSP_Diss_17x24_EN.tex”. If you want the titles for the bibliography to be numbered consecutively, please remove the optional parameter “`resetlabels`” in the above command.

2 Introduction and motivation (automatic indentation in the table of contents)

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2.1 Introduction

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2.2 Motivation

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- Lists with less than three lines are left-justified. With the command “raggedright” after the command “\item” this can be done.
- Lists with three or more lines are justified. With the command “\justifying” after the command “\item” the paragraph can be formatted as a justification. In this way, the paragraph adapts optically to the body of the text and creates a coherent type area.
- Bulletpoint 3
- Bulletpoint 4
- Bulletpoint 5

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3 State of the art (hyphenation in the table of contents is deactivated)

3.1 Literature and research

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3.1.1 Disciplinary development

3.1.1.1 Genesis of scientific concepts

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¹ First paragraph: This footnote has a one-digit footnote number with a fixed distance between the footnote number and the footnote text. This footnote spans two lines.

Second paragraph: The indentation depth of the second paragraph is identical to the indentation depth of the first paragraph.

¹³ This footnote has a two-digit footnote number with a fixed distance between the footnote number and the footnote text (about 2 mm). This footnote also spans two lines. Also in this footnote there would be no indentation of a second paragraph.

If you use three-digit footnotes, please adjust the LaTeX command under “Footnotes” in the “dokOptions_A5_EN.tex” file.

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Figure 3.1: Exterior view of the KIT library. Please always set images manually with the parameter [h]. At this point the image has been placed with the Figure parameter [h]. There is an empty line before and after the Figure environment.

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(a) Subfloat. Image No. 1. One-line captions are centered.



(b) Subfloat. Image No. 2.



(c) Subfloat. Image No. 3. Note: If there are only two lines, the caption will not be justified as ragged right when using a manual line break.



(d) Subfloat. Image No. 4.

Figure 3.2: Exterior view of the KIT library. Please always set images manually with the parameter [h]. This is where the picture has been placed with the Figure parameter [h].

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Figure 3.3: Scientist in his workplace. Please always set images manually with the parameter [h]. At this point the image has been placed with the Figure parameter [h]. There is an empty line before and after the figure environment.

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Table 4.1: Tables are also always inserted with the parameter [h]. There is an empty line before and after the table environment. Use the command “\newline” to insert manual line breaks if the spacing between words in a cell becomes too large.

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$$\operatorname{rot}(\vec{H}) = \frac{4 \cdot \pi}{c} \cdot \vec{j} \quad (4.1b)$$

$$\operatorname{rot}(\vec{E}) = -\frac{1}{c} \cdot \frac{\partial \vec{B}}{\partial t} \quad (4.1c)$$

$$\operatorname{div}(\vec{B}) = 0 \quad (4.1d)$$

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5 Headline level 1 (chapter)

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6 Summary

6.1 Summary

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A Appendix

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List of Publications

Journal articles

Joe Bloggs. Title of paper a. *International Journal*, 6(3–4):371–378, 1998. doi: 10.1017/S1754078714006221.

Joe Bloggs. Title of paper b. *International Journal*, 8(9–27):371–378, 1999. doi: 10.1017/S1754078714006221.

Conference contributions

Joe Bloggs. Title of paper c. In *IEEE International Conference*, pages 1–4, April 2015. doi: 10.1509.

Joe Bloggs. Title of paper d. In *IEEE International Conference*, pages 6–45, April 2016. doi: 10.1509.

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Conrad Book. *Title of Book*. Publisher, Address, 2nd edition, 2021.

Anna Journal. Title of article. *Name of Journal*, 6(3–4):371–378, 2000. doi: 10.1017/S1754078714006221.