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INTERNAL NOTE

European XFEL LaTeX User Guide

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Contents

Abstract

This guide describes LaTeX document classes developed for Technical Reports, Technical Notes, and Internal Notes at European XFEL.

You can download this guide as a PDF from any of the following Alfresco sites:

- **Editing**
  https://docs.xfel.eu/share/page/site/editing/dashboard
- **Templates**
  https://docs.xfel.eu/share/page/site/templates/dashboard
- **XFEL Docs**
  https://docs.xfel.eu/share/page/site/xfeldocs/dashboard

Versions

This guide is updated periodically, based on enhancements to the LaTeX document classes. To request enhancements to the LaTeX document classes, contact the editor, Kurt Ament <kurt.ament@xfel.eu>.

Version 1.5.1

Release date: 23 January 2017

Improvement anc change:

- Added new address and logo to cover page background.

Version 1.5

Release date: 9 August 2013

Improvements and changes:

- Fixed the indentation of part entries in the table of contents (TOC).
- Added the package `csquotes` (used by `biblatex`) .
- Added the package `mnsymbol` for improved mathematical typography (especially plus and minus signs).
- Added `biblatex` loading to class files.
- Added `biblatex.cfg` with adaptions of the BibLaTeX numeric style file to match the “References” guidelines in the *European XFEL Style Guide*.
- Added Appendix B, “Bibliography by type”, for testing and reference purposes.
- Added the `sectionWithoutNumber` command.

Version 1.4.1

Release date: 17 July 2013

Improvements and changes:

- Improved the rendering of the title page to avoid dependency on the `adjustbox` package (not available on MiKTeX).
- Fixed the indentation of second-level ordered list items.

Version 1.4

Release date: 15 June 2013

Improvements and changes:

- Updated to Version 1.4 to get in sync with the ID of this document.
- Added the `shorttitle` command to enable users to shorten document titles in document footers.
- Added the `chapterWithoutNumber` command.
- Changed that math font to sans serif.
- Improved rendering of the title page to avoid dependency on the `adjustbox` package (not available on MiKTeX).
- Fixed indentation of second-level ordered list items.
- Added BibLaTeX support.
- Fixed small bugs.

Version 1.2

Release date: 15 January 2013

Improvements and changes:

- Improved the font setting for enumeration labels.
- Removed hyphenation in tables and section titles (by means of the `hyphenat` package).
- Removed the `nohyphens` and `nohyphenation` commands.
- Added the `fixltx2e` package.

Version 1.1

Release date: 1 November 2012

Improvements and changes:

- Added TOCs to the beginnings of chapters.
- Changed white space setting of list environments: (a) added a blank line between lists and preceeding text and (b) removed inter-item white space.
- Replaced icons for box environments.
- Renamed the `warningbox` environment to `cautionbox`.
- Removed the `tcolorbox` package from class files for compatibility with TEXLive 2009 (Debian/Squeeze and Ubuntu).
- Adjusted font sizes on the title page.
- Adjusted the dimensions of the orange box on the title page.
- Added section and chapter numbers in PDF bookmarks.
- Created PDF bookmarks on the first compilation.
- Used `cleverref` and `varioref` for cross-referencing.
- Included the bibliography in the TOC.
- Changed the font size from 8 to 7 pt .
- Changed `footersize` from `scriptsize` to `footnotesize`.
- Changed the style of enumeration.

Version 1.0

Release date: 31 July 2012

The launch version includes the `report` document class only, based on the Microsoft Word templates developed for Technical Reports, Technical Notes, and Internal Notes at European XFEL.

Part I

SETTING UP LaTeX

1 Introduction

This chapter describes TEX LATEX, and document classes:

1.1 TEX and LATEX

TEX is a typesetting program “intended for the creation of beautiful books—and especially for books that contain a lot of mathematics”, as creator Donald Knuth put it [8, page v]. Although TEX was developed in the late 1970s, it is still widely used and has a very lively developer community. Its paragraph and math typesetting algorithms are still considered state-of-the-art. The former, for instance, has been incorporated into Adobe InDesign.

TEX is also a complete programming language that can be rather difficult to master. Using TEX becomes much easier with LATEX, a document markup language and document preparation system for the TEX typesetting program.

1.2 Document classes

1.2.1 Default classes

LATEX provides different document classes for different types of publications.

The most commonly used classes are:

- **book**
  Books with front matter (title page, TOC, foreword, introduction), body (parts, chapters, sections), and back matter (appendices, bibliography, index)

- **report**
  Smaller books (title page, TOC, [parts,] chapters, and sections)

- **article**
  Articles in scientific journals or short reports (sections only; no title page, parts, or chapters)

- **letter**
  Written correspondence

- **slides**
  Screen-based presentations

1.2.2 Custom classes

The European XFEL LaTeX document classes are used to generate PDFs that match the look and feel of official book-length European XFEL publications (for example, technical design reports). The classes take care of the format automatically, allowing authors to focus on the content.

For the time being, only the `report` class is implemented in the European XFEL LaTeX document classes. Other document classes may be added in future versions.

To request enhancements to the LaTeX document classes, contact the editor, Kurt Ament <kurt.ament@xfel.eu>.

2 Installation

This chapter show you how to install a LaTeX distribution, a LaTeX editor, and the European XFEL LaTeX document classes.

2.1 Installing a LaTeX distribution

Before you can use the European XFEL LaTeX document classes, you need to have TeX and LaTeX installed on your system.

The European XFEL LaTeX document classes have been tested with the following LaTeX distributions:

- **MiKTeX 2.9**
  Available through DESY NetInstall for Windows.

- **TeX Live 2011**
  Availabe for Windows, Linux, and MacOS.

- **TeX Live 2009**
  For the time being, TeX Live 2009 can be used to support Debian/Squeeze and related Ubuntu versions. This may change with the release of Debian/Wheezy (in 2013).

To compile LaTeX documents, you have to use pdfLaTeX 1.40 or higher.

2.2 Installing a LaTeX editor

Although LaTeX can be used from the command line, there are many free LaTeX editors available as well.

The following LaTeX editors are recommended:

- **Eclipse with TeXlipse**
  http://www.eclipse.org
  http://texlipse.sourceforge.net
  Platform: Windows, MacOS, or Linux.
  Eclipse is a free multi-purpose development environment that comes with handy text comparison tools for easy change management. TeXlipse is a free plug-in for Eclipse that allows you to compile LaTeX documents within Eclipse.

- **TeXnicCenter**
  http://www.texniccenter.org
  Platform: Windows only. Available through DESY NetInstall.
  TeXnicCenter is a free feature-rich and easy-to-use integrated environment for creating LaTeX documents on the Windows platform.

- **TeXmaker**
  http://www.xm1math.net/texmaker/
  Platform: Windows, MacOS, or Linux.
  TeXmaker is a free multi-platform LaTeX development environment.

- **TeXShop**
  http://pages.uoregon.edu/koch/texshop/
  Platform: MacOS.
  TeXshop shop is a free LaTeX development environment for MacOS.

2.3 Installing the European XFEL class files

To make the European XFEL LaTeX document classes available on your system, install them in one of the following locations:

- **Project directory** (recommended)
  Use the files for one particular project only. For instructions, see Section 2.3.1, “Recommended: Installing to a project directory”.

- **Central directory**
  Share the files across different publication projects. For instructions, see Section 2.3.2, “Advanced: Installing to a central directory".

2.3.1 Recommended: Installing to a project directory

As a rule, it is recommended that you copy the files of the European XFEL LaTeX document classes into the directory of your publication project.

To install the European XFEL class files to your project directory, follow these steps:

1. Create or open the directory of your publication project.

2. Get the latest version of the European XFEL LaTeX document classes from one of the following Alfresco sites:

   - **Editing**
     https://docs.xfel.eu/share/page/site/editing/dashboard

   - **Templates**
     https://docs.xfel.eu/share/page/site/templates/dashboard

3. Unzip the file to your project directory.

2.3.2 Advanced: Installing to a central directory

If you work on multiple publication projects and want them to share the same installation of the European XFEL LaTeX document classes, you can install the classes to a central directory and then create subdirectories for each publication project.

To install European XFEL class files to a central directory, follow these steps:

1 Find the directory where TeX is located on your machine.

   At the command line, enter the following:

   ```
   kpsepath tex
   ```

   The result is a list of folder names.

2 In this list, locate the main directory of TeX, which ends with `-dist` (for the purposes of this procedure, `<texdirectory>`).

3 Move to the `<texdirectory>` directory by typing:

   ```
   cd <texdirectory>
   ```

4 Create a subfolder `xfel` in that directory by typing:

   ```
   mkdir xfel
   ```

5 Get the latest version of the European XFEL LaTeX document classes from one of the following Alfresco sites:

   - **Editing**
     https://docs.xfel.eu/share/page/site/editing/dashboard

   - **Templates**
     https://docs.xfel.eu/share/page/site/templates/dashboard

6 Unzip the file to your project directory.

7 Update the TEX system:

- **MiKTEX**
  Type the following:

  ```
  initexmf --update-fndb
  ```

  For MiKTEX 2.7 or later installed on Widows XP or later, you can use the GUI:

  a Click **Start** > **All Programs** > **MiKTEX** > **Settings**.

  b In the Settings menu, choose the first tab and click **Refresh FNDB**.

  MiKTEX will check the Program Files directory and update the list of the File Name DataBase.

  c When it is done, click **OK**.

- **TEX Live**
  Type the following:

  ```
  texhash
  ```

For more about installing class files into a central directory, see the following:

http://en.wikibooks.org/wiki/LaTeX/Packages/Installing_Extra_Packages

Part II

SETTING UP PROJECTS

3 Getting started

This chapter explains how to set up a subdirectory structure for your LaTeX project, create a simple document, and add parts, chapters, and sections to the document.

3.1 Creating a subdirectory structure

If you use multiple content les for your project (for instance, one le per chapter), it is recommended that you put one main le in your project directory and the other les in the subdirectory /content .

If you include images in your document, the European XFEL document classes will automatically look for them in the subdirectory /content/images .

- /content
  Content (*.tex) les that are included via the \include or \input command within the main le [1]

- /content/images
  Image (*.gif , *.jpg , *.pdf , *.png) les

[1] The \include command inserts a page break, but it comes with the handy \includeonly command for partial compiling of the main le.

3.2 Creating a document

Create a new document with the filename suffix .tex in your publication project directory (for instance, myreport.tex). For filenames, use lower-case letters, digits, hyphens (-), and underscores (_). Avoid blank spaces in filenames.

Make sure that the character encoding of this document is set to Unicode (either UTF-8 or UTF-16).

The simplest document comprises the following lines:

```
% Sets the class to format the document as a report.
\documentclass{xfel.eu-report}
% Sets the metadata used to typeset the title page.
\documentid{XFEL.EU IN-2012-003-01}
\documenttype{Internal Note}
\title{European XFEL \LaTeX\ User Guide}
\date{October 2012}
\author{D. Rathje and K. Ament}
\authoraffiliation{for European XFEL}
\begin{document}
% Add your document text here.
\end{document}
```

3.2.1 Setting the document class

To format your document as a European XFEL report, begin your .tex file with the following line:

```
\documentclass{xfel.eu-report}
```

3.2.2 Formatting the title page and footers

To structure the title page, type the following commands:

```
\documentid{XFEL.EU TR-2011-002}
\documenttype{Technical Design Report}
\title{X-Ray Optics and Beam Transport}
\date{April 2011}
\author{H. Sinn, J. Gaudin, L. Samoylova, A. Trapp, and G. Galasso}
\authoraffiliation{for X-Ray Optics and Beam Transport (WP73)
at European XFEL}
```

You must enter the following commands:

- \documentid{<documentid>}
  Number of the report.

- \documenttype{<documenttype>}
  Type of report.

- \title{<title>}
  Exact title of the report.

- \date{<date>}
  Month and year in which the report was published.

- \author{<author>}
  First initial and last name of the authors.

- \authoraffiliation{<authoraffiliation>}
  Work package group name and number.

3.2.3 Adding parts, chapters, and sections

To structure your document, you can add parts, chapters, appendices, sections, and subsections:

```
\chapter{Getting started}
This chapter explains how to set up a subdirectory structure for your \LaTeX\
project, create a simple document, and add parts, chapters, and sections to
the document.

\section{Creating a document}
Create a new document with the filename suffix {\tt .tex} in your publication
project directory (for instance, {\tt myreport.tex}).
```

To give your report a structure, use the following commands:

- \part{<title>}
  Optional. Creates a document part beginning with a capitalized Roman numeral.
  Example: “I Overview”

- \chapter{<title>}
  Mandatory. Creates a chapter beginning with a whole number.
  Example: “3 Getting started”

- \section{<title>}
  Optional. Creates a chapter section with a decimal number.
  Example: “4.2 Creating documents”

- \subsection{<title>}
  Optional. Creates a chapter subsection with a decimal number.
  Example: “4.2.3 Adding parts, chapters, and sections”

- \subsubsection{}
  Optional. Creates a chapter subsubsection with a decimal number.
  Example: “4.2.3.1 Adding parts”

Body text does not require any commands, just text. Use double line breaks to create paragraphs.

> Adding a single line break to the input file does not does not affect the text flow in the output file.

Input

```
Body text does not require any commands, just text.

To create a paragraph break in the output file,
add two line breaks to the input file.
```

Output

Body text does not require any commands, just text.

To create a paragraph break in the output file, add two line breaks to the input file.

4 Document components

This chapter explains how to use basic document components.

4.1 Bibliographies and citations

This section explains how to add a bibliography to your document and then cite bibliographical references in the text of that document.

4.1.1 Bibiographies

There are two methods for adding a bibliography at the end of your LaTeX document.

4.1.1.1 Method 1: thebibliography

The first method is to use thebibliography environment:

```
\begin{thebibliography}{99}
\bibitem{texbook} D. E. Knuth: \emph{The TEXbook},
Addison-Wesley, Reading, Massachusetts, second edition, 1984
\end{thebibliography}
```

This method is a convenient way to handle small bibliographies, although it comes with two drawbacks: (a) you have to manually format each bibliography item and (b) you have to reformat it when you are required to change the bibliography style. This method is good for short LaTeX documents.

4.1.1.2 Method 2: BibTeX

The second method is to use BibTeX. For the time being, there is no BibTeXsupport for the European XFEL LaTeX classes. If you are in need of such support, contact the editor, Kurt Ament <kurt.ament@xfel.eu>.

Table 4.1 shows the bibliography style defined in the European XFEL Style Guide [3, “References”, p. 51].

Table 4.1: European XFEL bibliography style [3, p. 51]

Guideline		Example
BOOK authors: title (publisher, city year)	[1]	N. Wiener: Extrapolation, Interpolation, and Smoothing of Stationary Time Series (MIT Press, Cambridge, Massachusetts 1949)
TECHNICAL REPORT authors: “title”, number (year)	[2]	G. Geloni, V. Kocharyan, E. Saldin: “Cascade self-seeding scheme with wake monochromator for narrow-bandwidth X-ray FELs”, DESY 10-080 (2010)
JOURNAL ARTICLE authors: “title”, journal, volume, pages (year)	[3]	M. Altarelli, R.P. Kurta, I.A. Vartanyants: “X-ray cross-correlation analysis and local symmetries of disordered systems: General theory”, Phys. Rev. B, 82, 104207 (2010)
PROCEEDINGS PAPER authors: “title”, conference, city (year)	[4]	E.L. Saldin, E.A. Schneidmiller, M.V. Yurkov: “Expected Properties of the Radiation from a Soft X-ray SASE FEL (SASE3) at the European XFEL”, Proc. FEL 2009, Liverpool (2009)
MANY AUTHORS author1, author2, author3 et al.: ... editor1, editor2, editor3 et al. (eds.): ...	[5]	M. Altarelli, R. Brinkmann, M. Chergui et al. (eds.): “Technical Design Report: The European X-Ray Free-Electron Laser”, DESY Report 2006-097 (2006)

4.1.2 Citations in text

You can site individual or multiple references in text.

4.1.2.1 Single citation

To cite a single references in text, use the \cite{} command.

Input

```
\cite{the-tex-book} or \cite[p. 82]{texbook}
```

Output

[8] or [8, p. 82]

4.1.2.2 Multiple citations

To cite multiple references in text, use the \cites{} command.

Input

```
\cites{the-tex-book}[p. 82]{xfel-tdr-2006}
```

Output

[8; 1, p. 82]

4.2 Cross-references

For cross-references, you can use the following commands, where <label> is a label de ned within the targetted object:

- \ref{<label>}
  Prints the number of the referenced object. You must explicitly type Chapter, Appendix, Section , Figure , or Table. To keep the object and number on the same line, type a tilde (for example, Chapter \ref{<label>} .

- \nameref{<label>}
  Prints the name of the referenced object (for example, “Cross-references”).

- \vref{<label>}
  Prints the type of the referenced object (Chapter, Appendix, Section , Figure , or Table) and its page number. For targets on adjacent pages, it uses “on the preceding page”, “on this page”, ”on the current page”, or “on the next page”.

4.2.1 Cross-referencing chapters and appendices

To cross-reference a chapter or appendix, use \ref{<label>} and \nameref{<label>} .

Input

```
For details, see Chapter~\ref{chap:document-components},
``\nameref{chap:document-components}''.
```

Output

For details, see Chapter 4, “Document components”.

4.2.2 Cross-referencing sections, figures, and tables

To cross-reference a section, figure, or table, use \vref{<label>} .

Input

```
For details, see \vref{tab:bibliographystyle}.
```

Output

For details, see Table 4.1 on page 25.

4.3 Equations

When adding equations, use the equation environment.

Input

```
\begin{equation}
E = mc^2
\label{eq:massenergyrelation}
\end{equation}
```

Output

$$E = mc^2 \tag{4.1}$$

4.4 Figures

Put the images for your document in the /content/images subfolder of your project folder. Use one of the following formats: PDF , EPS, GIF, JPG, or PNG.

> EPS les are automatically converted to PDF les. The rst time you build a le, this conversion could take some time.

To add a gure to your document, use the figure command, as follows:

```
\begin{figure}[h]
\includegraphics[width=\textwidth]{beamline-layout_rgb.pdf}
\caption{Layout of the photon beam systems at the European XFEL facility.}
\label{fig:beta-parameter}
\end{figure}
```

This command syntax produces the following gure and caption:

Figure 4.1: Layout of the photon beam systems at the European XFEL facility.

4.5 Lists

This section shows how to produce lists.

4.5.1 Itemized lists

To produce itemized lists, use the itemize environment.

Input

```
\begin{itemize}
   \item Item 1
   \item Item 2
\end{itemize}
```

Output

- Item 1
- Item 2

4.5.2 Ordered lists

To produce ordered lists, use the enumerate environment.

Input

```
\begin{enumerate}
   \item Item 1
   \item Item 2
\end{enumerate}
```

Output

1. Item 1
2. Item 2

4.5.3 Nested lists

You can nest lists (itemized and ordered) up to three levels.

Input

```
\begin{enumerate}
   \item  Item  1
   \begin{itemize}
      \item  Item  1.1
            \begin{itemize}
               \item  Item  1.1.1
            \end{itemize}
   \end{itemize}
   \item  Item  2
   \begin{enumerate}
      \item  Item  2.1
         \begin{enumerate}
            \item  Item  2.1.1
            \item  Item  2.1.2
         \end{enumerate}
   \end{itemize}
\end{enumerate}
```

Output

1 Item 1
- ì Item 1.1
  - – Item 1.1.1

2 Item 2
- a Item 2.1
  - i Item 2.1.1
  - ii Item 2.1.2

4.6 Footnotes and boxes

This section describes how to use footnotes and boxes.

4.6.1 Footnotes

To produce itemized lists, use the footnote environment.

Input

```
Lorem ipsum dolor sit amet, consectetuer adipiscing elit\footnote{Lorem ipsum
dolor sit amet, consectetuer adipiscing elit.}. Ut purus elit, vestibulumut,
placerat ac, adipiscing vitae, felis\footnote{Ut purus elit, vestibulumut,
placerat ac, adipiscing vitae, felis.}. Curabitur dictum gravida
mauris\footnote{Curabitur dictum gravida mauris.arcu libero,
nonummy eget, consectetuer id, vulputate a, magna.}.
Donec vehicula augue eu neque\footnote{Donec vehicula augue eu neque.}.
```

Output

Lorem ipsum dolor sit amet, consectetuer adipiscing elit[a]. Ut purus elit, vestibulumut, placerat ac, adipiscing vitae, felis[b]. Curabitur dictum gravida mauris[c]. Donec vehicula augue eu neque[d].

[a] Lorem ipsum dolor sit amet, consectetuer adipiscing elit.
[b] Ut purus elit, vestibulumut, placerat ac, adipiscing vitae, felis.
[c] Curabitur dictum gravida mauris.arcu libero, nonummy eget, consectetuer id, vulputate a, magna.
[d] Donec vehicula augue eu neque.

4.6.2 Tip boxes

For helpful but non-essential tips, use the tipbox environment, which includes the following icon: .

Input

```
\begin{tipbox}
Use a tip box for helpful but non-essential tips
(for example, on information how to create an em dash
in Microsoft Word)
\end{tipbox}
```

Output

Use a tip box for helpful but non-essential tips (for example, on information how to create an em dash in Microsoft Word)

4.6.3 Caution boxes

For cautions about actions that can have in negative consequences, use the cautionbox environment, which includes the following icon: .

Input

```
\begin{cautionbox}
Use a caution box for notes about actions
that can have in negative consequences.
\end{cautionbox}
```

Output

Use a caution box for notes about actions that can result in negative consequences.

4.6.4 Reference boxes

For cross-references to related topics in the current or another document, use the referencebox environment, which includes the following icon: .

Input

```
\begin{referencebox}
Use a reference box for cross-references
to related topics in the current or another document.
\end{referencebox}
```

Output

Use a reference box for cross-references to related topics in the current or another document.

4.6.5 Quotation boxes

For quotes form other sources, use the quotationbox environment, which includes the following icon: .

Input

```
\begin{quotationbox}
Use a quotation box for quotes from other sources.
\end{quotationbox}
```

Output

Use a quotation box for quotes from other sources.

4.7 Tables

This section shows examples of tables in the European XFEL LaTeX classes. When designing tables, avoid vertical lines and double lines. To separate sections of table, use different widths of lines: \toprule , \midrule , and \bottomrule .

4.7.1 De nition tables

To produce a table with terms in the left column and de nitions in the right column, use the table command with the following syntax:

```
\begin{table}[ht]
  \caption{This is the caption of the table. }
  \begin{tabularx}{\textwidth}{@{}>{\sf\bfseries}l>{\sf}X@{}}
    \toprule
    Force & Rate of change
    of the momentum of the body that would be induced by that
    vector quantity acting alone\\
    \midrule
    Moment of a force & With respect to an origin,
    the cross product of the position vector (with
    respect to the same origin) and the force\\
    \bottomrule
  \end{tabularx}
  \label{tab:table1}
\end{table}
```

This command syntax produces the following table:

Table 4.2: This is the caption of the table.

Force	Rate of change of the momentum of the body that would be induced by that vector quantity acting alone
Moment of a force	With respect to an origin, the cross product of the position vector (with respect to the same origin) and the force

4.7.2 Numerical tables

To produce a table with numbers that line up horizontally at the decimal point, use S for table cell alignment:

```
\begin{table}[ht]
\caption{Beam size (FWHM) at the different beamline components in the
\em intermediate focusing scheme after CRL-2}
      \label{beam_size_second_table}
      \footnotesize
      \begin{tabular}{p{3cm} S S S S S S}
      \toprule
        & & \bf{5 keV} & \bf{8 keV} & \bf{12 keV} & \bf{16 keV} & \bf{25 keV} \\
      \bf{Device} & \bf{Position [m]} & \bf{Size [\textmu m]} & \bf{Size [\textmu m]}
      & \bf{Size [\textmu m]} & \bf{Size [\textmu m]} & \bf{Size [\textmu m]} \\ \midrule
      Shutter-2 & 940 & 262 & 191 & 147 & 123 & 95  \\ \midrule
      Monochromator-2 & 948 & 156 & 113 & 87 & 73 & 57 \\ \midrule
      Split and delay line & 951.5 & 109 & 80 &  62 & 52 & 40 \\ \midrule
      Shutter-3 & 953.5 & 83 & 61 & 47 & 40 & 31 \\ \midrule
      Mirror & 955 & 63 & 47  & 37  & 31 & 24 \\ \midrule
      Sample position & 959.5 & 18 & 16 & 14 & 12 &  10 \\ \midrule
      Beam stop & 968 & 116 & 84 & 65 & 55 &  42 \\
      \bottomrule
      \end{tabular}
\end{table}
```

This command syntax produces the following table and caption:

Table 4.3: Beam size (FWHM) at the different beamline components in the intermediate focusing scheme after CRL-2

Device	Position [m]	5 keV Size [µm]	8 keV Size [µm]	12 keV Size [µm]	16 keV Size [µm]	25 keV Size [µm]
Shutter-2	940	262	191	147	123	95
Monochromator-2	948	156	113	87	73	57
Split and delay line	951.5	109	80	62	52	40
Shutter-3	953.5	83	61	47	40	31
Mirror	955	63	47	37	31	24
Sample position	959.5	18	16	14	12	10
Beam sto p	968	116	84	65	55	42

4.8 Weblinks

To create web links, use the href command.

Input

```
\href{http://www.xfel.eu}

\href{http://www.xfel.eu}{www.xfel.eu}
```

Output

http://www.xfel.eu
www.xfel.eu

5 BibLaTeX

The European XFEL LaTeX classes ship with support for the BibLaTeX package, which is based on BibTeX. For details about BibLaTeX, see the BibLaTeX documentation [9].

> To see the references cited in this guide listed by BibLaTeX type, go to Appendix B, "Bibliography by type".

5.1 BibLaTeX usage

To link your LaTeX-document to a .bib file, use the bibliography command.

```
\bibliography{<name of .bib file>}
```

To render the bibliography itself, use the printbibliography command.

```
\printbibliography[heading=bibnumbered]
```

> To generate a bibliography, run (a) LaTeX once, (b) BibTeX twice, and (c) LaTeX again.

5.2 Supported BibLaTeX types

The European XFEL LaTeX classes have been tested with these BibLaTeX types[1]:

- @article
  Article in a journal, magazine, newspaper, or other periodical that forms a self-contained unit with its own title.

- @book
  Single-volume book with one or more authors where the authors share credit for the work as a whole.

- @mvbook
  Multiple-volume book with one or more authors where the authors share credit for the work as a whole.

- @inbook
  Part of a book that forms a self-contained unit with its own title.

- @inproceedings
  Article in a conference proceeding.

- @online
  Online resource. This entry type is intended for online resources, such as websites.

- @report
  Technical report, research report, or white paper published by a university or some other institution. Use the type field to specify the type of report.

- @thesis
  Thesis written for an educational institution to satisfy the requirements for a degree.

Other bibliographical entry types may work as well. To add a bibliographical entry type, contact the editor, Kurt Ament <kurt.ament@xfel.eu>.

[1] The type descriptions are taken from the BibLaTeX manual.

5.2.1 @article

You can use the BibLaTeX type @article for an article in a journal, magazine, newspaper, or other periodical that forms a self-contained unit with its own title.

Field	Mandatory?	Description
author	Yes	Author(s) of the article
title	Yes	Title of the article
date | year month	Yes	Date of publication
journal | journaltitle	Yes	Title of the periodical
volume	No	Volume of the journal
issue	No	Issue of the journal
pages	No	One or more page numbers or page ranges
numpages	No	Number of pages
publisher	No	Publisher of the journal
doi	No	DOI of the article
url	No	URL of the article

BibTeX input

```
@article{PhysRevB.82.104207,
title = {X-ray cross-correlation analysis and local
symmetries of disordered systems: General theory},
author = {Altarelli, M. and Kurta, R. P. and Vartanyants, I. A.},
journaltitle = {Phys. Rev. B},
volume = {82},
issue = {10},
pages = {104207},
numpages = {13},
date = {2010-09},
doi = {10.1103/PhysRevB.82.104207},
url = {http://link.aps.org/doi/10.1103/PhysRevB.82.104207},
publisher = {American Physical Society}
}
```

Citation input

```
\cite{PhysRevB.82.104207}
```

Citation output

[2]

5.2.2 @book

You can use the BibLaTeX type @book for an single-volume book with one or more authors where the authors share credit for the work as a whole.

Field	Mandatory?	Description
author | editor	Yes	Author(s) or editors(s) of the book
title	Yes	Title of the book
date | year month	Yes	Year of publication
publisher	Yes	Name of the publisher
location	No	Location of the publisher
subtitle	No	Subtitle of the book
edition	No	Edition of the book
origdate	No	Publication date of the original edition if the work is a translation, a reprint, or something similar
doi	No	DOI of the book

BibTeX input

```
@book{the-tex-book,
   author = {Donald Knuth},
   title = {The \TeX book},
   date = {1984}
   publisher = {Addison-Wesley Longman, Amsterdam}
}
```

Citation input

```
\cite{the-tex-book}
```

Citation output

[8]

5.2.3 @mvbook

You can use the BibLaTeX type @mvbook for a multiple-volume book with one or more authors where the authors share credit for the work as a whole.

Field	Mandatory?	Description
author | editor	mandatory	Author(s) or editor(s) of the book
title	Yes	Title of the book
date | year month	Yes	Year of publication
publisher	Yes	Name of the publisher
subtitle	No	Subtitle of the book
edition	No	edition of the book
origdate	No	Dublication date of the original edition if the work is a translation, a reprint, or something similar
location	No	Location of the publisher
volumes	No	Number of volumes
doi	No	DOI of the book

BibTeX input

```
@mvbook{Weinberg,
   author = {Steven Weinberg},
   title = {The Quantum Theory of Fields},
   date = {2005},
   volumes = {3},
   publisher = {Cambridge University Press},
   location = {Cambridge}
}
@book{Weinberg1,
   title = {The Quantum Theory of Fields: Foundations},
   date = {2005},
   volume = {1},
   pagetotal = {609},
   crossref = {Weinberg},
}
```

Citation input

```
\cite{Weinberg} with part \cite{Weinberg1}
```

Citation output

[11] with part [12]

5.2.4 @inbook

You can use the BibLaTeX type @inbook for a part of a book that forms a self-contained unit with its own title.

Field	Mandatory?	Description
author	Yes	Author(s) of the book
title	Yes	Title of the book
date | year/month	Yes	Year of publication
booktitle	Yes	Title of the containing book
publisher	Yes	Name of the publisher
subtitle	No	Subtitle of the book
location	No	Location of the publisher
doi	No	DOI of the containing book

BibTeX input

```
@book{botan-hazleton-public-relations-theory,
   editor = {Botan, Carl H. and Hazleton, Vincent Jr},
   title = {Public Relations Theory},
   date = {1989},
   publisher = {Lawrence Erlbaum Associates},
   location = {Hillsdale et al.}
}
@inbook{botan-hazleton-public-relations-theory-introduction,
   author = {Botan, Carl H. and Hazleton, Vincent Jr},
   title = {The Role of Theory in Public Relations.},
   pages = {3--15},
   crossref = {botan-hazleton-public-relations-theory},
}
```

Citation input

```
\cite{botan-hazleton-public-relations-theory-introduction}
```

Citation output

[5]

5.2.5 @inproceedings

You can use the BibLaTeX type @inproceedings for an article in a conference proceeding.

Field	Mandatory?	Description
author	Yes	author(s) of the contribution
title	Yes	Title of the contribution
date | year month	Yes	Year of publication
booktitle	Yes	Title of the containing book
publisher	Yes	Name of the publisher
editor	No	Subtitle of the containing book
location	No	Location of the publisher
doi	No	DOI of the proceeding

BibTeX input

```
@inproceedings{proceedings-FEL2009-saldin-et-al,
   author = {E. L. Saldin and E. A. Schneidmiller and M. V. Yurkov},
   title = {Expected Properties of the Radiation from a Soft X-ray SASE FEL
   (SASE3) at the European XFEL},
   booktitle = {Proceedings FEL2009, Liverpool, UK},
   date = {2009}
}
```

Citation input

```
\cite{proceedings-FEL2009-saldin-et-al}
```

Citation output

[10]

5.2.6 @online

You can use the BibLaTeX type @online for an online resource. This entry type is intended for online resources, such as websites.

Note that all entry types support the url field. For example, when adding an article from an online journal, it may be preferable to use the @article type and its url field.

Field	Mandatory?	Description
author | editor	Yes	Author(s) or editor(s) of the resource
title	Yes	Title of the resource
url	Yes	URL of the resource
urldate	Yes	Date of the last check

BibTeX input

```
@online{xfel.eu,
   author = {European XFEL GmbH},
   title = {www.xfel.eu},
   url = {http://www.xfel.eu},
   urldate = {2013-04-25}
}
```

Citation input

```
\cite{xfel.eu}
```

Citation output

[7]

5.2.7 @report

You can use the BibLaTeX type @report for a technical report, research report, or white paper published by a university or some other institution.

Use the type field to specify the type of report. The sponsoring institution goes in the institution field.

Field	Mandatory?	Description
author	Yes	Author(s) of the report
title	Yes	Title of the report
date | year month	Yes	Date or year and month of the report
institution	Yes	Name of the sponsoring institution
type	Yes	Type of report (e.g. Technical Report)
number	Yes	Number of the report
doi	No	DOI of the report

BibTeX input

```
@report{european-xfel-style-guide-2011,
   author = {K. Ament and et al.},
   title = {European XFEL Style Guide},
   type = {Technical Report},
   institution = {European XFEL},
   number = {XFEL.EU IN-2011-001},
   date = {2011}
}
```

Citation input

```
\cite{european-xfel-style-guide-2011}
```

Citation output

[3]

5.2.8 @thesis

You can use the BibLaTeX type @thesis for a thesis written for an educational institution to satisfy the requirements for a degree. Use the type field to specify the type of thesis.

Field	Mandatory?	Description
author	Yes	Author(s) of the thesis
title	Yes	Title of the thesis
date | year month | year	Yes	Date or year of the thesis
institution	Yes	Name of the educational institution
type	Yes	Type of the thesis (e.g. bachelor thesis, master thesis, doctoral thesis, or Ph.D. thesis)
doi	No	DOI of the thesis

BibTeX input

```
@thesis{einsteins-doctoral-thesis,
   author = {Albert Einstein},
   title = {A New Determination of Molecular Dimensions},
   date = {1905},
   type = {Doctoral thesis},
   institution = {Zurich Polytechnic},
}
```

Citation input

```
\cite{einsteins-doctoral-thesis}
```

Citation output

[6]

6 Options

This chapter describes class options and optional environments.

6.1 Class options

The European XFEL LaTeX document classes come with options that can be set with the declaration of the class at the beginning of a document.

For this declaration, just put a comma-seperated list of options in square brackets between the documentclass command and the document class name:

```
\documentclass[<option1>, <option2>, <option3>]{xfel.eu-report}
```

You can use one of the following options:

- draftwatermark
  Print a watermark label “draft" on each page of the document.

- nosecnum
  Use unnumbered chapter and section labels.

- notableofcontents
  Hide the table of contents.

- notitlepage
  Hide the title page.

- twoside
  Alternate running footers.

6.2 Optional environments

The European XFEL LaTeX document classes come with additional supplementary enviroments that can be used to in uence the output.

A LaTeX environment is declared with the following syntax:

```
\begin{<environmentname>}
...
\end{<environmentname>}
```

Currently, we offer one such environment:

- fullwidth
  Expands the width of the live area from the text width to the page width (excluding the page border).

Part III

REFERENCES

A Bibliography

[1] M. Altarelli, R. Brinkmann, M. Chergui, et al. (eds.): “Technical Design Report: The European X-Ray Free-Electron Laser”, DESY Report 2006-097 (2006)

[2] M. Altarelli, R. P. Kurta, I. A. Vartanyants: “X-ray cross-correlation analysis and local symmetries of disordered systems: General theory”, Phys. Rev. B 82, 104207 (2010) doi:10.1103/PhysRevB.82.104207

[3] K. Ament, et al.: “European XFEL Style Guide”, XFEL.EU IN-2011-001 (2011)

[4] C. H. Botan, V. J. Hazleton (eds.): Public Relations Theory (Lawrence Erlbaum Associates, Hillsdale et al., 1st ed. 1989)

[5] C. H. Botan, V. J. Hazleton: “The Role of Theory in Public Relations.”, in: C. H. Botan, V. J. Hazleton (eds.): Public Relations Theory, 3–15 (Lawrence Erlbaum Associates, Hillsdale et al., 1st ed. 1989)

[6] A. Einstein: “A New Determination of Molecular Dimensions”, Doctoral thesis (Zurich Polytechnic 1905)

[7] European XFEL GmbH: www.xfel.eu, http://www.xfel.eu (visited on April 25, 2013)

[8] D. Knuth: The TEXbook (Addison-Wesley Longman, Amsterdam 1984)

[9] P. Lehman: The biblatex Package, Programmable Bibliographies and Citations (2013)

[10] E. L. Saldin, E. A. Schneidmiller, M. V. Yurkov: “Expected Properties of the Radiation from a Soft X-ray SASE FEL (SASE3) at the European XFEL”, Proc. FEL 2009, Liverpool (2009)

[11] S. Weinberg: The Quantum Theory of Fields, 3 vols. (Cambridge University Press, Cambridge 2005)

[12] S. Weinberg: The Quantum Theory of Fields, vol. 1: The Quantum Theory of Fields: Foundations, 3 vols. (Cambridge University Press, Cambridge 2005)

B Bibliography by type

This appendix lists the references in Appendix A, “Bibliography”, by BibLaTeX type.

For details about BibLaTeX types, see Section 5.2, “Supported BibLaTeX types”.

B.1 @article

[2] M. Altarelli, R. P. Kurta, I. A. Vartanyants: “X-ray cross-correlation analysis and local symmetries of disordered systems: General theory”, Phys. Rev. B 82, 104207 (2010) doi:10.1103/PhysRevB.82.104207

B.2 @book

[4] C. H. Botan, V. J. Hazleton (eds.): Public Relations Theory (Lawrence Erlbaum Associates, Hillsdale et al., 1st ed. 1989)

[8] D. Knuth: The TeXbook (Addison-Wesley Longman, Amsterdam 1984)

[12] S. Weinberg: The Quantum Theory of Fields, vol. 1: The Quantum Theory of Fields: Foundations, 3 vols. (Cambridge University Press, Cambridge 2005)

B.3 @mvbook

[11] S. Weinberg: The Quantum Theory of Fields, 3 vols. (Cambridge University Press, Cambridge 2005)

B.4 @inbook

[5] C. H. Botan, V. J. Hazleton: “The Role of Theory in Public Relations.”, in: C. H. Botan, V. J. Hazleton (eds.): Public Relations Theory, 3–15 (Lawrence Erlbaum Associates, Hillsdale et al., 1st ed. 1989)

B.5 @inproceedings

[10] E. L. Saldin, E. A. Schneidmiller, M. V. Yurkov: “Expected Properties of the Radiation from a Soft X-ray SASE FEL (SASE3) at the European XFEL”, Proc. FEL 2009, Liverpool (2009)

B.6 @online

[7] European XFEL GmbH: www.xfel.eu, http://www.xfel.eu (visited on April 25, 2013)

B.7 @report

[1] M. Altarelli, R. Brinkmann, M. Chergui, et al. (eds.): “Technical Design Report: The European X-Ray Free-Electron Laser”, DESY Report 2006-097 (2006)

[3] K. Ament, et al.: “European XFEL Style Guide”, XFEL.EU IN-2011-001 (2011)

B.8 @thesis

[6] A. Einstein: “A New Determination of Molecular Dimensions”, Doctoral thesis (Zurich Polytechnic 1905)

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