LaTeX instructions and commands

9th January 2024

CHAPTER 1

Including graphics

Images must be exported/saved as PDF files. Please use vector graphics whenever possible. Please select a maximum width of 16.9 cm and a maximum height of 23.6 cm in the programs you use for this purpose. Use non-serif font type, font size 10 and a minimum line size of 1 pt. Never use the "scale" command.
Please save your PDF image files in the subfolder "Figures", which is located in your local project folder. Thus, LaTeX can integrate your images into the LaTeX document. For embedding please enter in your tex-file (e.g. C4.tex) in the "\includegraphics" command the file name of your image without the extension ".pdf":

\includegraphics{\ThisPath Figures/<Filename of your image>}

You can label the graphic with the

\caption{}

command. For a later reference of your graphic in the text with

\ref{fig:<yourlabel>},

give the graphic an internal key (label) with the

\label{}

command. This label is not visible in the final document. Important: Please note the naming conventions for labels (see example). Labels for images always start with "fig:", tables with "tab:" and equations with "eq:". To avoid conflicts with same labeling in other projects use the following structure and reclace only the <individual label> part:

\label{fig:\Project <individual label>}

CHAPTER 2

Literature

Literature references will be generated automatically from the Oxyflame Citavi database.

Literature originating from the CRC/TRR 129
This literature should already been included. If you recognice, something is missing, use the normal way to upload the PDF via Sciebo: Oxyflame Inbox → Literature
Other literature
Upload all literature references not from Oxyflame with a PDF in the following Sciebo folder: Oxyflame Inbox → Final report → Literature → Folder of your project.
It will be added by us to the Citavi database and can then be cited. Only the cited publications will appear in the literature list.

Citations can be made with

\cite{bibkey}.

The bibkey can be seen in the Citavi database and is unique. Typically its style is AuthorYear. If this combination appears more than one times a letter (b,c,...) is added. The keys are not only valid for your project but for the entire document.

CHAPTER 3

Format instructions

In the following sections, some formatting hints are presented so that the formatting of the document is done uniformly and correctly from the beginning.

3.1 Spaces and strokes

A few basic rules should be followed: Abbreviations are separated with a small space "\," indicating that they belong together and that they are not separated by a line break. Protected spaces are achieved with the command "~". If a hyphen appears in a word, LaTeX will only separate it at the same hyphen. Therefore, it should be set with ""=" instead. A protected hyphen is done with ""~". Dashes "–" can be set with "--" and surrounding spaces. If a dash equals "to", then a dash is set without spaces (The latter is only allowed between numbers, not between words. For ranges of numbers use the "\SIrange" command.)
If the words are wrongly seperated by LaTeX you can use "\-" to help and mark (possible) separation points. The word will then only be separated at the marked positions.
If somewhere (usually in larger formulas that are supposed to fit on one line) **less** space between two characters is desired, you can insert a negative space with "\!". Example: Nu or Nu. In the second case (with a negative space) it is clearly the Nußelt-Number and not a product of N and u.

3.2 Quotation marks

For quotation marks please use the command

\enquote{<your text in quotation marks>}.

This ensures that the quotation marks are consistent throughout the document.

3.3 Units and Numbers

Units are best set with the *siunitx* package. On the one hand, you can set numbers using the command "\num{*number*}". This does not have much effect, except that it allows you to manipulate the formatting of the numbers (i.e., of all the numbers that are set) via an option when the package is loaded. Numbers with units are set with

\SI{*number*}{*units*}.

For example, type

\SI{10}{\kilogram \per \second \per \square \meter } to get $10\,\mathrm{kg\,s^{-1}\,m^{-2}}$.

For a range of units use the following:

\SIrange{*number from*}{*number to*}{*units*}

3.4 Highlighted text

If you want to distinguish something from the rest of the text, e. g. because it is a proper name or a newly introduced term, you can do this with

\emph{*highlighted text*}.

This results in *italic* font by default. For example, if you want to replace the name of a computer program (e.g. MATLAB or LABVIEW), you can use CHAPTERS, which you can get with

\textsc{TEXT IN CHAPTERS}.

If you need more highlighting, you can write **bold** with

\textbf{**bold text**},

but this is usually not needed. Sometimes also `program code` or similar is necessary; you can get something like this with

\texttt{`Typewriter"=Text`}.

3.5 Math-mode

Variables are set *italic* (except dimensionless numbers such as Reynolds number Re), which LaTeX also does by default when you use math mode, which is started and ended with "$".

$ \dot{V} = u \cdot A $ results in $\dot{m} = \rho \cdot u \cdot A$.

Carefully with indexes. Sometimes they should be in italic, sometimes they should not. It depends on whether they stand for a variable (e. g. heat capacity at constant pressure c_p) or not (e. g. H_u). You can get upright letters in math mode with the command

\mathrm{}.

For (non-italic) indexes the short-command

\ix{}

is defined at the beginning.
A detailed LaTeX symbol documentation is available online: `http://de.wikipedia.org/wiki/Hilfe:TeX`

3.5.1 Chemical formulas

For chemical formulas the *mhchem* package is suitable. With this package (almost) everything can be solved with the

\ce{}

command.

\ce{H2O} gives H_2O

and

\ce{NO_ x} gives NO_x.

This package can be used in (almost) any environment. In headlines it sometimes produces warnings, but these are harmless.

3.5.2 Equation-arrays

Equations that should be aligned to each other are best set with *align*

3.5.3 Example

As examples for formulas in latex, the Archimedes number (equation 3.1), the Fourier partial sum (equation 3.2) and the dimensionless transformed Robin boundary condition (equation 3.3) are shown here. Equation 3.4 shows the use of "\align" and the suppression of line numbers. The examples are set in the "equation" environment, which is especially useful for longer and numbered equations.

$$\mathrm{Ar} = \frac{d_\mathrm{P}^3 g \left(\rho_\mathrm{P} - \rho_\mathrm{G}\right)}{\nu^2 \cdot \rho_\mathrm{G}} \tag{3.1}$$

$$S_N(x) = \sum_{n=0}^{N} \left(a_n \sin(nx) + b_n \cos(nx) \right) \tag{3.2}$$

$$-\lambda Z_0 \frac{\partial \hat{T}}{\partial x} = \alpha(\xi)\, \hat{T} \tag{3.3}$$

$$\begin{aligned} x &= ai + b \\ \bar{x} &= ai - b \end{aligned} \tag{3.4}$$

3.6 Special commands for this book/proposal

The DFG uses the wording "project" for the German "Teilprojekt". So please don't use anything like sub-project or SP.

Please use the following commands within your proposal, whenever you want to do the following:

- refering to the collabrative research center: \CRC resulting in " CRC/TRR 129 "
- refering to your own or another project: \linkproject{<Project ID>}. This will automatically add bold font and a link to the other project.

CHAPTER 4

Problem Contact

Whenever you have problems with LaTeX, GIT or Citavi, you can contact Stefan Pielsticker

- Stefan Pielsticker (pielsticker@wsa.rwth-aachen.de, 0241 80 94796)