FUSION

European Master of Science
in Nuclear Fusion and Engineering Physics

Template for a Master Thesis to Obtain the Title Master of FUSION-EP with a very long thesis title indeed

Master Thesis
presented by

Stella Tokaya

Thesis Promoter
Prof. First Promoter
Universiteit Gent

Thesis Supervisor
S. Visor

June 26th, 2018

UNIVERSITEIT GENT

Universität Stuttgart

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Abstract

This template contains both instructions for the structure of your thesis and examples of LaTeX usage.

In this *one-page* abstract, describe what you have done, why you did it, and what the result was. Many readers of your thesis will read the title and the abstract to decide whether it is worth their time to read any further, so take great care in writing a compelling text. Furthermore, you will be graded on the quality of your abstract. Use the whole page.

Contents

Chapter 1

Introduction

These pages give guidance for the layout of the master thesis in the Erasmus mundus program. A basic knowledge of LaTeX is assumed. A good introduction can be found at

`http://www.ctan.org/get/info/lshort/english/lshort.pdf`

The template consists of the LaTeX input files for the text, the style file erasmus.sty, and the graphics for the title page. This is version 10 of the template. It supercedes all earlier versions.

Chapter 2

Figures

Figures should be included in eps (encapsulated postscript) format. All labels should be easily readable. Lines and symbols should not be distinguished by colour alone. Titles on top of the figures are not needed, all explanations should be indicated in the captions.

2.1 Example of a good figure with one flaw

As an example you find a reasonable representation in Fig. 2.1.

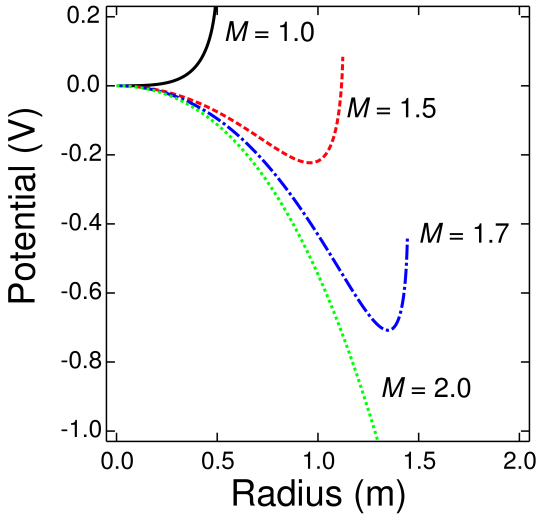

FIGURE 2.1: Calculated potential for different values of the Mach number M. This is an example of a nice figure, where the labels are large enough and the lines differ not only by colour. However, bright green and bright yellow are invisible on white.

2.2 Example of a bad figure

Not quite as nice is the representation in Fig. 2.2.

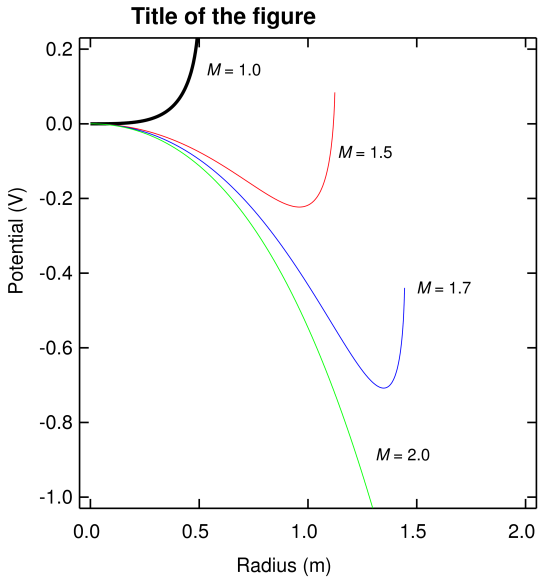

FIGURE 2.2: **Bad figure:** Here the labels are too small, the lines differ only by colour which is a problem for black-and-white copies. Furthermore the lines are too thin and a title is used.

Chapter 3

Tables

3.1 A nice table

You can find a nice table under Tab. 3.1.

Plasma	Fusion	Discharge	Interstellar	Ionosphere
temperature (eV)	1×10^{4}	1	0,1	0,1
density (m^{-3})	1×10^{20}	1×10^{16}	1×10^{7}	1×10^{12}
λ_D (m)	7×10^{-5}	7×10^{-5}	1	2×10^{-3}
N_D	2×10^{8}	2×10^{4}	2×10^{7}	5×10^{4}
ω_p (Hz)	6×10^{11}	6×10^{9}	2×10^{5}	6×10^{7}

TABLE 3.1: Values for characteristic plasma parameters for different discharges.

3.2 A not so nice table

Tab. 3.2 is not as nice because the column and row headings are not easily distinguishable from the data cells.

Plasma	Fusion	Discharge	Interstellar	Ionosphere
temperature (eV)	1×10^{4}	1	0,1	0,1
density (m^{-3})	1×10^{20}	1×10^{16}	1×10^{7}	1×10^{12}
λ_D (m)	7×10^{-5}	7×10^{-5}	1	2×10^{-3}
N_D	2×10^{8}	2×10^{4}	2×10^{7}	5×10^{4}
ω_p (Hz)	6×10^{11}	6×10^{9}	2×10^{5}	6×10^{7}

TABLE 3.2: **Bad table:** Values for characteristic plasma parameters for different discharges.

Chapter 4

Mathematics and Units

4.1 Mathematic formulas

For the syntax for writing mathematic formulas please consult a manual as you find e.g. on `http://www.ctan.org/get/info/lshort/english/lshort.pdf`. Some simple examples are given below.

Fractions as in Eq. 4.1 are written as

```
\begin{equation}
  a = \frac{b}{c}
  \label{eq:1}
\end{equation}
```

which will look like

$$a = \frac{b}{c} \tag{4.1}$$

For sin, cos, exp, ln one has to use a backslash in the equations to avoid the letters being typeset as individual mathematical symbols s, i, and n:

```
\begin{equation}
  a = \sin b \exp c +\ln d
  \label{eq:eq:2}
\end{equation}
```

produces

$$a = \sin b \exp c + \ln d \tag{4.2}$$

Inside the text, fractions should *not* be written as $\frac{a^2}{b}$ but rather as a^2/b.

4.2 Units

Units are written in the normal text font and seperated from the number by a "little" space (`\,`):

- Plasma density $n_e = 10^{19}\,\mathrm{m}^{-3}$ (`$n_{e} = 10^{19}$\,m$^{-3}$`)
- Electron temperature $T_e = 10\,\mathrm{eV}$ (`$T_{e} = 10$\,eV`)
- Magnetic field strength $B = 3\,\mathrm{T}$ (`$B = 3$\,T`)

4.3 Units inside equations

In displayed equations, units should be in normal fonts, too:

$$\omega_c = \frac{qB}{m} = 2.45\,\mathrm{GHz} \tag{4.3}$$

Chapter 5

How to Cite References

References are best stored in a database as BibTEX. Then you call them in the text as Ref. [1]. The entry for this reference looks like this

```
@article{One2007,
   author =  {A. One and B. Two and C. Three},
   title =   {An example},
   journal = {Plasma Phys. Contr. Fusion},
   volume =  40,
   number =  1,
   pages =   7,
   year =    2007,
}
```

and it is cited as `Ref.~\cite{One2007}`. If you want to quote multiple references as e.g. in Refs. [1, 2], then put them into the same brackets.

If you copy a figure or quote some other data, you also have to put a reference to it. Or you write "for a review see Ref. [3] or the textbook of Chandrasekhar [4]."

Bibliography

[1] A. One, B. Two, and C. Three, Plasma Phys. Contr. Fusion **40**, 7 (2007).

[2] C. S. A. Four, B. Five *et al.*, *Proc. of the* 25^{th} *Europ. Conf. on Controlled Fusion and Plasma Physics, Praha* (IAEA, Vienna, 1998), p. 749.

[3] A. A. Galeev and R. Z. Sagdeev, in *Neoclassical theory of diffusion* (Wiley, New York, 1976), Vol. 6, p. 311.

[4] S. Chandrasekhar, *Hydrodynamic and Hydromagnetic Stability* (Oxford University Press, London, England, 1961).

Acknowledgements

Here I would like to thank those who have helped.

. . .

Declaration in lieu of oath

Herewith I declare in lieu of oath that I have prepared this thesis exclusively with the help of my scientific teachers and the means quoted by them.

City, the

Stella Tokaya

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