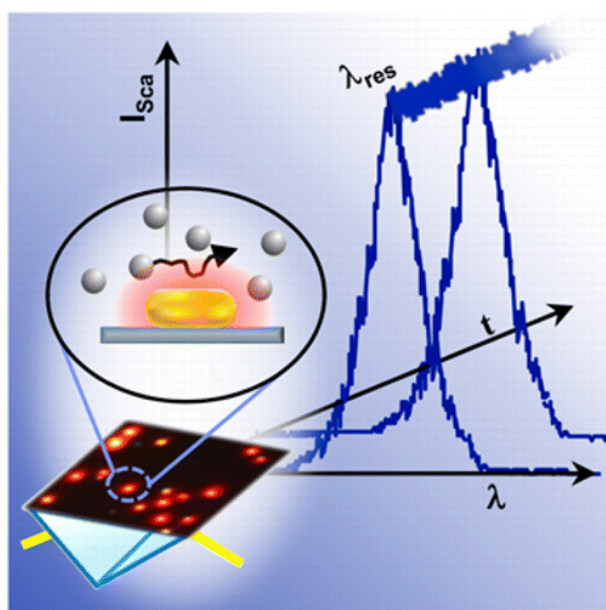




Summer Research Internship 2017



REPORT

submitted at the completion of

RESERACH INTERNSHIP

at

SINGLE-MOLECULE GROUP, LION

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Duration :	May-July 2017

Leiden, The Netherlands, July 11, 2017

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Acknowledgement

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Chapter 1

Introduction

In this Internship I used Fluroscene Spectrscopy to observe the Gold nanorods as they intract with their nearby particles like protein,silica etc.

1.1 Getting Started

Unzip the zip file into a directory and start with the file minimal.tex. On most systems this should compile if you have the 'lion-msc.cls' file and 'minimal.tex' in the same working directory. 'lion-msc' is based on the report class and any valid option for a report can be passed onto lion-msc. In addition, lion-msc uses several additional packages. Most modern L^AT_EX systems have features that allow you to automatically get missing files if your computer is connected to the internet.

A minimal L^AT_EX document that should compile with pdfL^AT_EX is the following (I called this file 'minimal.tex')

```
\documentclass[twoside,single]{lion-msc}
```

```
\title{Title}
```

```
\author{A. Uthor}
```

```
\begin{document}
```

```
\maketitle
```

```
\chapter{Chapter 1}
```

Here you type the text for the first chapter of

your thesis.

```
\end{document}
```

If problems arise at this point check if you compile \LaTeX directly to pdf. The older route that converts tex files to dvi files and then to postscript is not supported. It is very unlikely that this will be supported in the future.

If problems persist check if you have all necessary files in the right location, most notably 'lion-msc.cls' and 'logo-leidenuniv.pdf'. If you placed the files in some standard location for your tex installation make sure that your installation knows about these files. A quicker, more fail-safe way around this is to place these files in the same working directory as the \LaTeX file that you are trying to compile.

Once you have made these steps take a look at lion-msc.tex as it contains a more complete template that shows how to use the lion-msc documentclass.

1.1.1 Files in this package

The files included with this package are the following:

lion-msc.cls	documentclass file
logo-leidenuniv.pdf	PDF file with logo of Leiden University. This file is required by the document class
lion-msc.bst	bibliography style file that can be used with bibtex
lion-msc.layout	layout file used for integration with LyX environment
minimal.tex	Minimal \LaTeX file demonstrating the use of lion-msc.cls
AlexanderPRA.tex	\LaTeX file used as an example of a Master Thesis
lion-msc.tex	This file
lion-msc.pdf	PDF file of the compiled version of lion-msc.tex
thesisstyle.jpg	Image used for the cover
Fig1.png	Figure used in AlexanderPRA.tex
Fig2.png	Figure used in AlexanderPRA.tex
Fig3a.png	Figure used in AlexanderPRA.tex
Fig3b.png	Figure used in AlexanderPRA.tex
Fig4.png	Figure used in AlexanderPRA.tex
4photon.bib	BibTeX database file for AlexanderPRA.tex

1.2 List of available commands and options

This section gives an overview of special commands and options that are defined through this documentclass. You can use these to change the appearance of your thesis and to include all necessary information.

1.2.1 lion-msc options

Lion-msc inherits and passes its options to the report class. By default the class uses [a4paper, 12pt, fleqn]. If desired this can be passed on by including valid report class options to the options of lion-msc.

double	(default) double line spacing, useful for drafts
single	single line spacing. This looks better in the final version

1.2.2 Specific lion-msc commands

With the lion-msc documentclass most of the required information is entered in the preamble of the `LATEX`document (i.e. before `\begin{document}`). This information is made visible by using the `\maketitle` command. This should be the first command after `\begin{document}`.

Note that you have to fill out the required options. If you leave these empty, instructions will appear in red on the title page. Most of these commands are quite flexible. For instance you can insert newline characters (`\\`) in the affiliation command. This is practical if you do a project outside LION.

<code>\author</code>	(required) Defines the author
<code>\title</code>	(required) Defines the title of your thesis
<code>\abstract</code>	(required) Provide your abstract here, making sure that it fits on the page.
<code>\affiliation</code>	Sets the affiliation to something else than the default value.
<code>\address</code>	Use this to change the default address if needed.
<code>\studentid</code>	(required) enter your student ID (studentnummer)
<code>\supervisor</code>	(required) provide a valid supervisor. This should be a staff member of the Leiden Physics Department
<code>\corrector</code>	(required) provide the name of the 2 nd dsupervisor. This could be an external supervisor.
<code>\degree</code>	(optional) Default is "Bachelor of Science" Use this to change the default value.
<code>\major</code>	(optional) Default is "Physics" Use this to change the default value.
<code>\coverpicture</code>	(optional) Insert a cover picture on the first page Usage: <code>\coverpicture{\includegraphics[width=13cm]{picture.jpg}}</code>

Note that these commands are highly flexible and a bit a L^AT_EX knowledge will allow you to make all kinds of smart modifications. A common, and reasonable desire is to give credit to the PhD student or postdoc that guided you during the project. You can do this by trying the following code:

```
\supervisor{PhD student \ \hspace*{\fill}Supervisor}.
```

Note that you should always have a staff member from Leiden as your supervisor because this person is authorized to give you the final grade.

1.2.3 Packages and additional styling tips

This documentclass uses a number of standard packages, such as `amsmath`, `amssymb` for extra functions and symbols to display math and the `graphicx` package to display graphics in the document. It uses the `natbib` package to deal with references to automatically sort and compress multiple references. I do not recommend making changes to this in the document preamble. In particular the interplay between `natbib` and the `bibliography` style can give very unexpected results.

The default configuration also uses the `hyperref` package to create a pdf with hyperlinks. The links are hidden so that the text looks normal; try clicking one of the references or in the table of contents and you will see that you are automatically brought to the appropriate reference or section.

The use of packages inside the documentclass can cause an error when you try to use a package within your \LaTeX document. This typically happens when both the documentclass and your own \LaTeX document use some options. There is a `\PassOptionsToPackage` command that you can use before the `\documentclass` to try to pass the desired option to the package.

Headers with fancyhdr

The headers and footers on each page contain some useful info. This is done using the `fancyhdr` package. You can change the appearance of these by using the `\fancyhead` and `\fancyfoot` commands. See the `fancyhdr` documentation for details. You can also open `lion-msc.cls` in a text editor and look for these commands. You can place your own commands before the `\begin{document}` command in your \LaTeX file. The grey text at the bottom with date and time is there to help you and your supervisor to keep track of the version, so that we do not end up correcting an old version. It may look somewhat strange in the final version and can be removed by using

```
\fancyfoot[CE,CO]{}
```

Table of contents styling

Some people may want to get the original dots back into the table of contents. There is an old-fashioned way of doing this without extra packages. Insert the following in the document preamble. The separation of 4.5 is the default value and can be changed to tune the spacing between dots.

```
\makeatletter
\renewcommand\@dotsep{4.5}
\makeatother
```

An alternative is to use the `tocloft` package that offers additional styling options. Insert the following to use this package. (Suggestion by Casper Remeijer)

```
\usepackage{tocloft}
\renewcommand{\cftchapidotsep}{\cftdotsep}
```

Subfigures

It can be quite useful to have multiple figures next to each other. This can be done with the `subcaption` package. (Suggestion by Casper Remeijer)

```
\usepackage[labelformat=simple,justification=centering]{subcaption}
\renewcommand\thesubfigure{(\alph{subfigure})}
```

Typesetting of units

Some people rely on a package called 'siunitx' to deal with the correct typesetting of units in the SI system. The following commands could be added to the document preamble. (Suggestion by Casper Remeijer)

```
\usepackage{siunitx}
\sisetup{separate-uncertainty = true, multi-part-units = single, inter-unit-p
% use \pm symbol for uncertainty values, don't repeat the unit, unit mult
```

Indentation of paragraphs

Some people do not like the standard LaTeX indentation at the beginning of the paragraph. This can be changed using the parskip package

```
\usepackage{parskip}
```

1.3 Using LyX

Lyx is a powerfull visual editor that used LaTeX for typesetting. It exports .tex files that can be submitted to journals. Specifically the visual formula editor is very usefull. It also support track-changes, which is very usefull when collaborating. Some people do not like LyX.

1.3.1 Installation

In order to use the lion-msc style in LyX, the latex style should be installed systemwide. With miktex this is done automatically. Now identify the lion-msc.layout file. It might be located at "c:\program files\miktex\doc\lion-msc".

The next thing to do is to set the document class to a local layout and choose for the *lion-msc.layout* file:

Documents ▷ Settings ▷ Document Class ▷ Local-layout

Chapter 2

Mathematical model

Chapter 3

Results and Discussion