We are organising an informal **workshop** on the **intermediate and advanced topics** in LaTeX. Although there are various LaTeXtutorials and templates floating around, but they often omit some tools and packages that are useful in meteorology and geophysics. The workshop is primary focused on PhD students who are starting to write their thesis, but it is open to other LaTeXusers as well.

1. Monday 19. June — from 12:45 in CIP room
2. Wednesday 21. June — from 15:00 in CIP room

You can work from CIP workstation or bring your own device.

target audience:	people with previous experience with LaTeX
aims:	discuss LaTeX topics practise skills
duration:	one and half hour from start time or until you start getting tired
topics:	see following sections **??** and **??**
registration:	comment in this Slack thread

Chapter 1

Monday

1.0.1 Combining Document from Pieces

Combining documents from multiple files speeds up the editing process, makes collaboration easier, and also lowers the risk of accidentally rewriting something. You can see an example how most of the header of this document is in a separate file. To try this, write some dummy text in a separate file and insert is here using the `input` command:

The `input` statement can also work on multiple levels

1. Make a copy of `style1headerfooter.tex` and modify it.
2. Open `in1header.tex` and replace `style1headerfooter.tex` with the name of your new file.
3. Recompile the main document.

1.0.2 Automatically Generated Lists

There is an easy way how to create list of figures, tables, as well as index of phrases.

Advanced LaTeX Workshop

Your Name Here

19 June 2023

Contents

List of Tables

List of Figures

List of Symbols

notation	unit	meaning
$\sim$	·	similar - assignment of probability distribution
$\propto$	·	proportional equivalent to; i.e. equivalent up to a constant
$\overline{(\,\cdot\,)}$	·	horizontal averaging
$\overline{\varphi}$	·	mean value of a quantity φ

List of Abbreviations

notation	meaning
AWS	automatic weather station
ABL	atmospheric boundary layer
CAO	cold–air outbreak
CBL	convective boundary layer
SBL	stable boundary layer
Sc	stratocumulus
SH	sensible heat
TKE	turbulent kinetic energy

1.0.3 Modifying Plots and Schematics

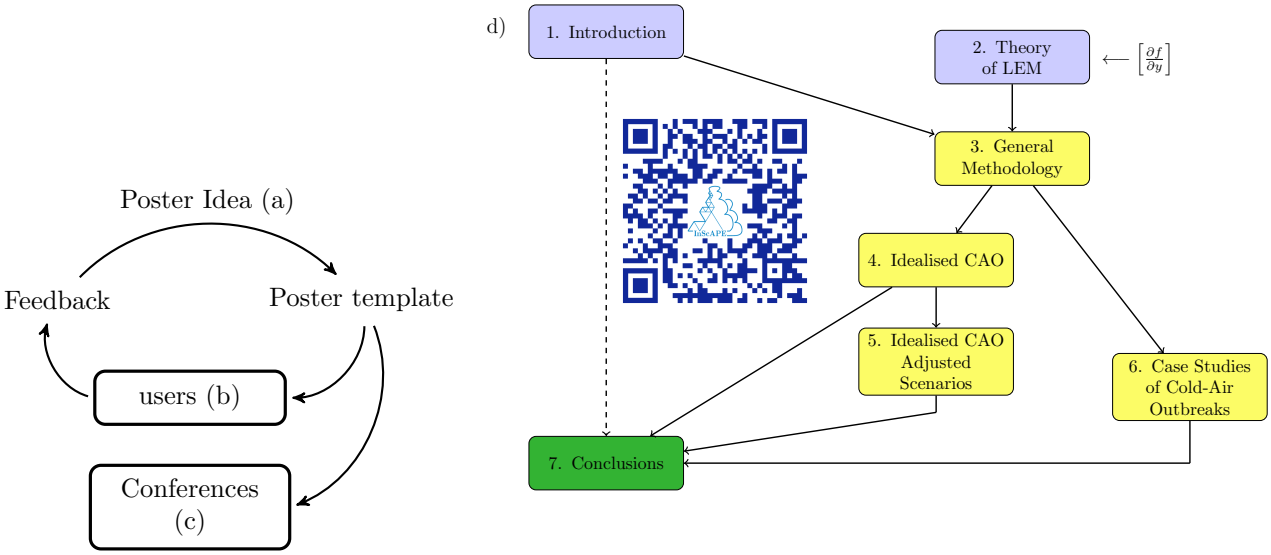

Figure 1.1: Here we combine a **Tikz** diagrams and images. We can also compile the figure as separate **standalone** pdf and then include it as a graphical element.

1.0.4 Counters

How did we suddenly jump from section **??** to **??** ?

1.0.5 Customizing Links, References, and Citations

Such as modifying the style of links to other parts of the same document (**??**) and links to external websites.

1.0.6 Version Control and Comparison

We also look at the external tools such as `latexdiff` that compares two LaTeXfiles, and `pdfdiff` that compares ... you know what.

Chapter 2

Wednesday

We will start with: ~~This very short silly text that serves just as an example for the first task~~If you see this text in black, it means that the difference between files is not highlighted.

2.1 Guidelines

To speed up today the progress of the workshop today, the new commands are not only listed in the text but also included as comments. To make the commands actives, just remove or add comment signs.

2.2 External tools

First we will have a quick look at the *latexdiff* tool from the last time. But this time, we will show its shortomings. First, look at the beginning of today chapter and swap which lines are commented between `sillytext1.txt` and `sillytext2.txt`
Secondly, open your shell, change to the folder with this file and type:

```
~~latexdiff day2latex.tex day2latex_v2.tex > different.tex~~
latexdiff day2latex.tex day2latex_v2.tex > daydifferent.tex
```

and then compile the output file. Does it highlight any differences?
~~Fortunatelly there is a way to show the differences in the included files. Use the option `--flatten`~~

```
~~latexdiff --flatten day2latex.tex day2latex_v2.tex > differentshow.tex~~
latexdiff --flatten day2latex.tex day2latex_v2.tex > comdaydifferent.tex
```

However, we can refine the comparison document by options such as:

- UNDERLINE — the added text is not only blue, but also underlined
- PDFCOMMENT — changes marked as pdf comments

There are a couple of other tools that can speed up your work with latex. Unfortunately they are not installed here. But you can try them later:

- *pdfgrep* — similar to grep, searches inside a PDF document that was already compiled.
- *pdftk* — tool for splitting, combing and mixing pdf documents

2.3 Fillers

2.3.1 Filler text

Sometimes we need to test whether the structure of the document and the formatting works. Instead of spending time copying and pasting random stuff, we use the *Lore Ipsum* generator. In the header we already inserted `lipsum` package, and here we insert the following command:

```
\lipsum[0-2]      %generates dummy text
```

2.4 Code Listing with Highligths

Such as showing a lines from external script or showing the code of this page.

```
93 \lstinputlisting[ language={[latex]tex},                    % tex syntax, latex option
94   firstline=93, firstnumber=93, lastline=99, numbers=left,
95   breaklines=true, basicstyle=\scriptsize, frame=single,
96   keywordstyle=\color{magenta}, commentstyle=\color{gray}  % comments are gray colour
97 ]{./latex_adv.tex}
98
99 \subsection{Tables} \label{sec:tables}
```

2.4.1 Tables

Instead of copy & paste values into tables, we just read them from an external csv file and format them.

z [m]	$\bar{u}$ [m s^{-1}]	$\bar{\theta}$ [K]
180	17.0	313.0
140	16.0	312.0
100	15.0	311.0
80	14.0	294.0
60	13.0	287.0
50	12.0	285.0
40	13.0	284.5
30	12.0	284.0
20	11.0	283.5
10	7.0	283.0
5	2.0	282.0
	...	

And the we will further style-up the table.

2.5 Formatting

2.5.1 Dashes

Dash is not the same thing as minus.

2.5.2 More on Macros

We can define shortcuts for symbols such as $\theta^{(\mathrm{ML})}$, but we can even write conditional statements.

2.5.3 Posters and Slideshows

If you have been struggling with Powerpoint, there is a way out ...