Getting Started with LaTeX

And why I don't use Word anymore

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What is LaTeX?

A bit of Background

- Widely regarded as the standard typesetting method for academic journals
  - Far easier to present data, equations
  - Much easier to cite references (i.e. automatic footnotes, hyperlinking etc.)
  - Separates content from the formatting of documents
- Far more control over many aspects of the document
  - Backend rather than frontend (e.g. Word)
  - Images won't disappear when moved slightly
    - Everything is where you tell it to be

- Files can be as big as needed, don't need to worry about a 30+ page Word doc crashing
- Multi-file documents are very easy to achieve, no post-processing
- It looks pretty

Something to keep in mind throughout this presentation: *every single slide is done in LaTeX*

What can I do?

In short: anything you can do with Word + much much more!!

Images

Diagrams from scratch:

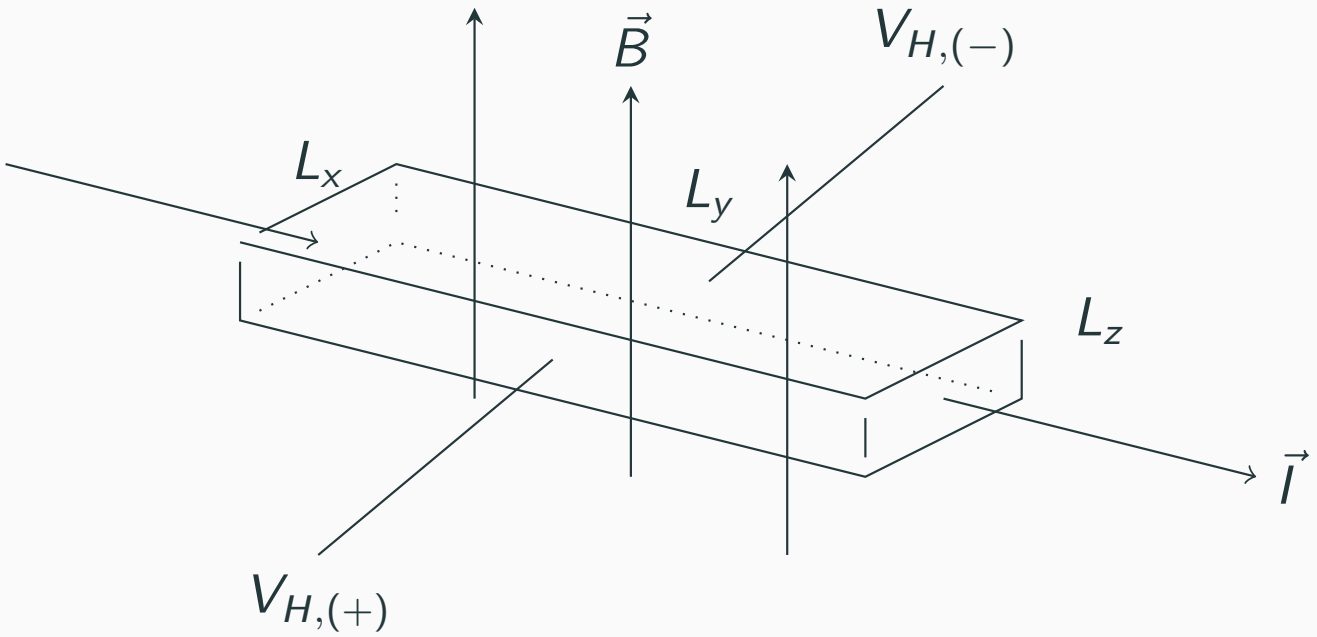


Figure 1: Semiconductor sample in B field

GIFS:

Maths

- Inline:
  It is known that $y = x^2 + 2x + 4$ is a parabola.
- Block:
  Here is a Fourier transform:

$$\mathcal{F}(\omega) = \int_{-\infty}^{\infty} f(t) e^{i\omega t} \mathrm{d}t$$

- Numbered:

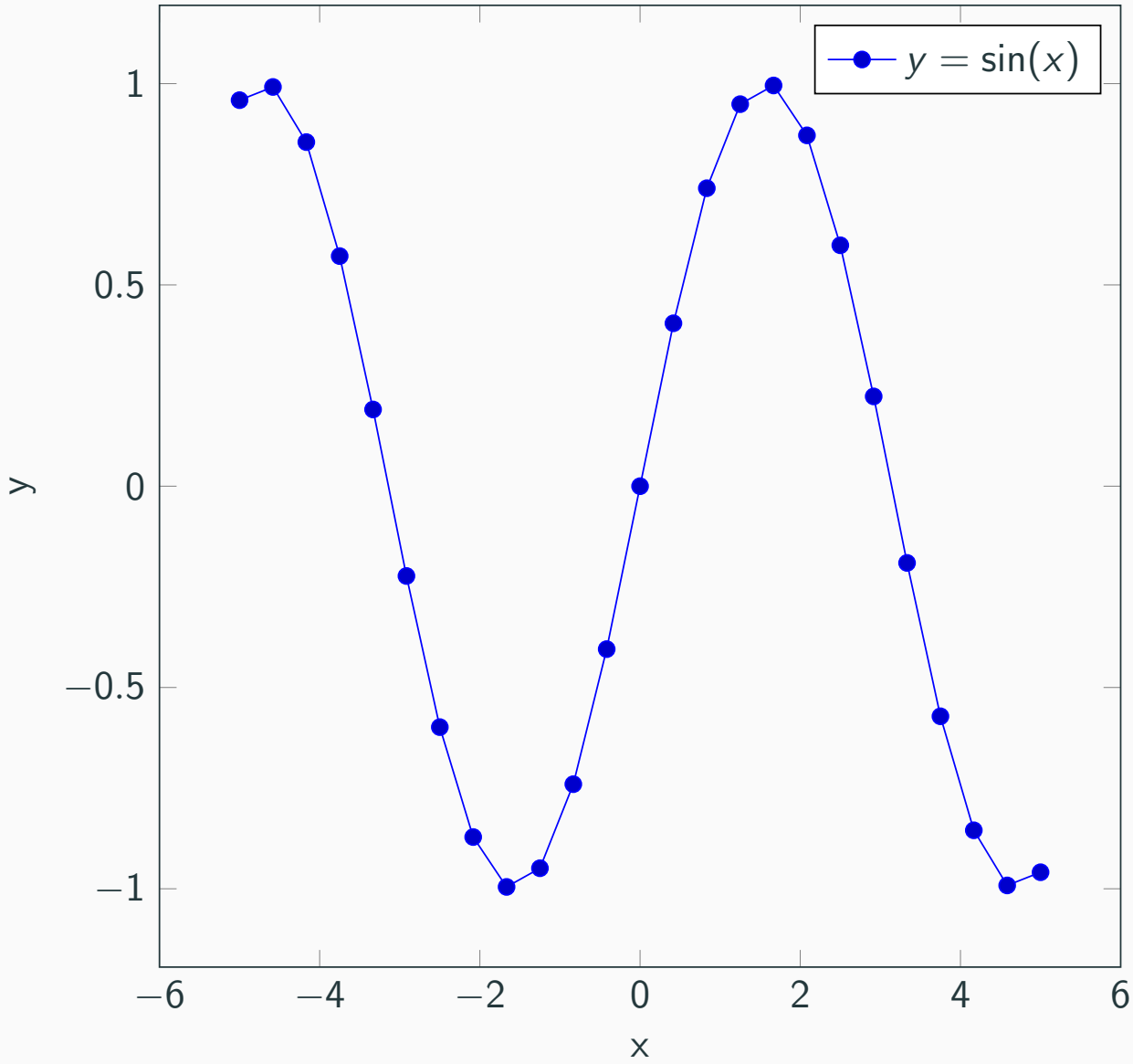
$$|+_x\rangle = \frac{1}{\sqrt{2}} |+\rangle + \frac{1}{\sqrt{2}} |-\rangle \tag{1a}$$

$$|-_x\rangle = -\frac{1}{\sqrt{2}} |+\rangle + \frac{1}{\sqrt{2}} |-\rangle \tag{1b}$$

$$|\langle +|+_x\rangle|^2 = 0.5 \tag{1c}$$

Plots

Using gnuplot:



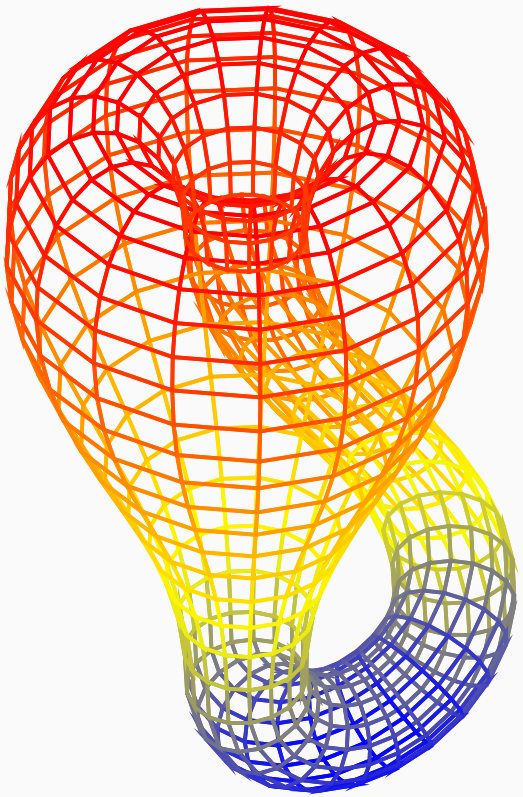


Figure 2: A Klein Bottle plotted via pgfplots/gnuplot

MATLAB Plots:

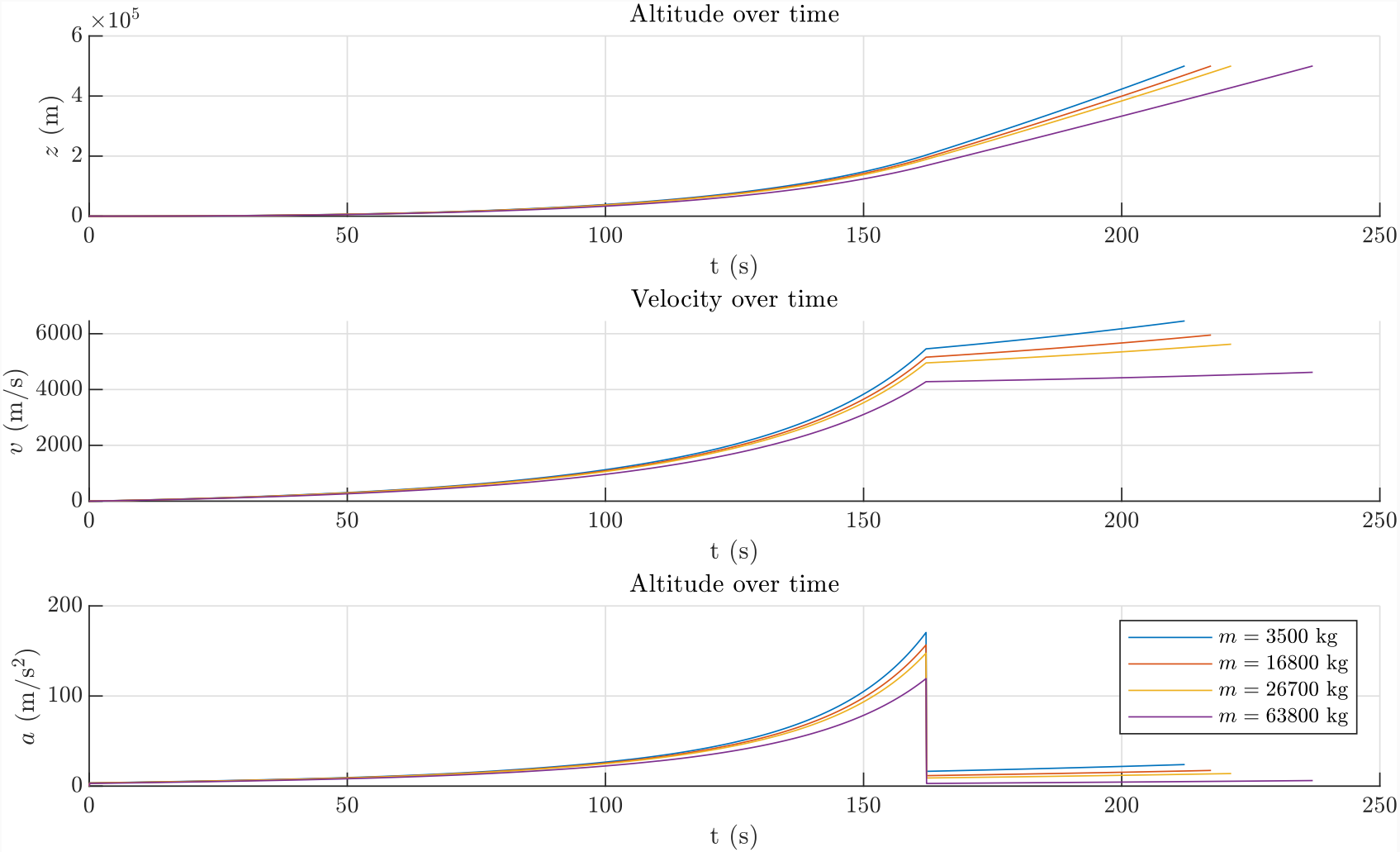


Figure 3: Simulated Falcon Heavy motion

Other Cool Stuff

I'm interested! How do I start learning?

Programs/Compilers

MikTex Standalone LaTeXcompiler and editor. Good for local installations on Windows.

- Very easy to use
- Good package support from CTAN (Comprehensive TeX Archive Network)
- Not the prettiest
- THE WHITE - IT BURNS

Overleaf Web based, cloud storage. The Google Docs of LaTeX.

- Very easy to use
- GitHub integration
- Free Pro+ account by registering as a USYD student/staff member
- Multiple author editing
- Some packages might not be recognisable

We'll be using Overleaf

`overleaf.com`

Other Programs To Consider