

Notes and Thoughts on Implementing Windowed-Multipole through Vector Fitting

Andrew Holcomb

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Contents

1	Introduction	2
2	Mathematical Equations	2
3	Figures and Images	3
3.1	Multiple Subfigures	3
4	Tables	4
5	Citations and References	4
6	Cross-References and Hyperlinks	4
7	Code and Listings	4
8	Conclusion	5

1 Introduction

This document demonstrates various LaTeX features including cross-references, hyperlinks, equations, figures, and citations. This is a sample introduction that references Section 2 and Figure 1.

You can create hyperlinks to external websites like [The LaTeX Project](#) or [Overleaf](#).

2 Mathematical Equations

Here are some examples of numbered equations that will be automatically numbered:

$$ax^2 + bx + c = 0 \tag{1}$$

The solutions to Equation (1) are given by the quadratic formula:

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} \tag{2}$$

You can also have multi-line equations:

$$f(x) = x^2 + 2x + 1 \tag{3}$$

$$= (x + 1)^2 \tag{4}$$

As shown in Equation (4), the expression can be factored.

For inline math, you can write $E = mc^2$ or $\int_{-\infty}^{\infty} e^{-x^2} dx = \sqrt{\pi}$.

3 Figures and Images

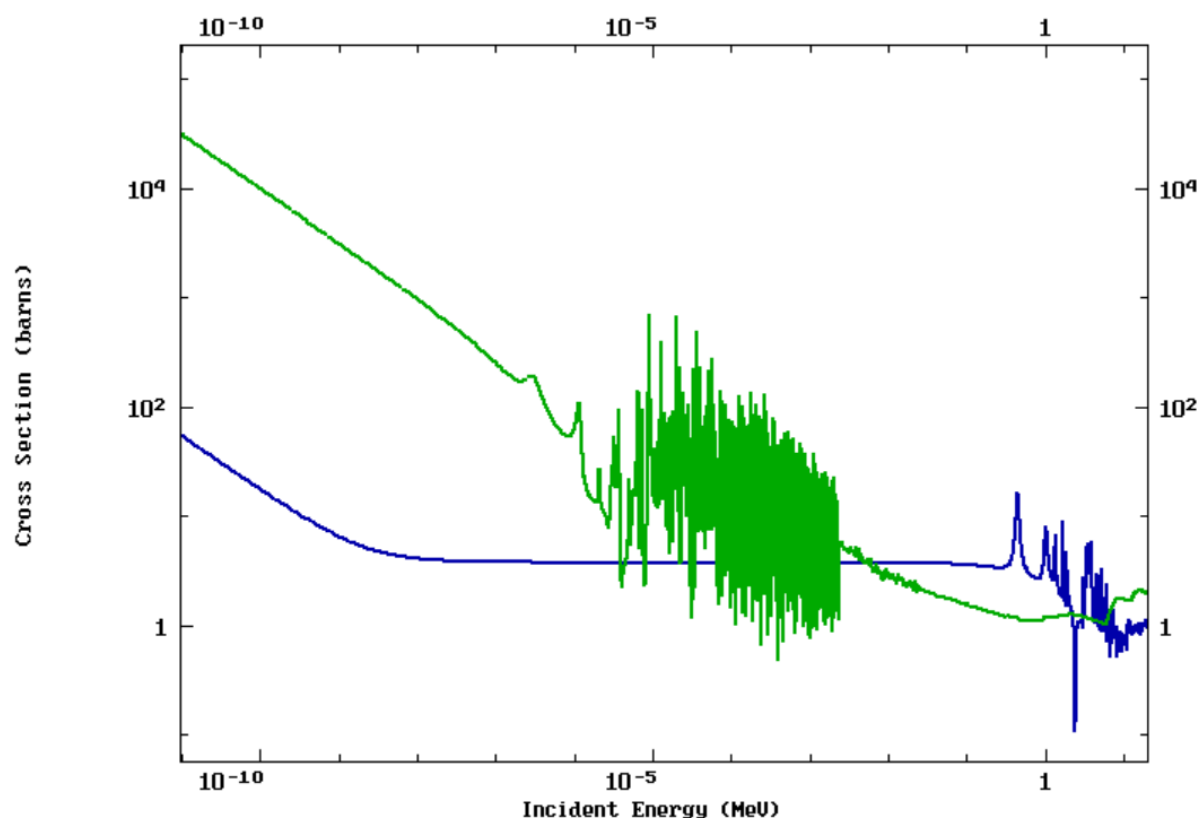


Figure 1: This is a sample figure demonstrating figure inclusion.

As you can see in Figure 1, figures are automatically numbered and can be cross-referenced throughout the document.

3.1 Multiple Subfigures

You can also create subfigures:

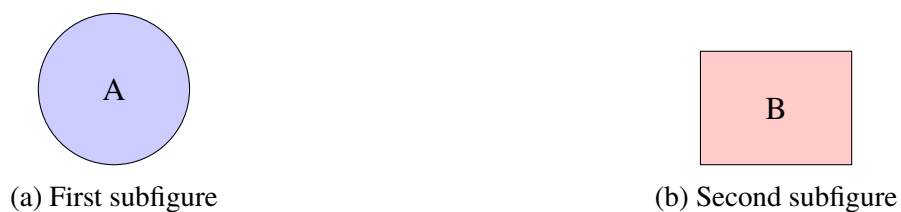


Figure 2: Example of subfigures with [a](#) showing a circle and [b](#) showing a rectangle.

4 Tables

Table 1: Sample data table

Parameter	Value	Unit
Temperature	25.4	°C
Pressure	101.3	kPa
Humidity	65	%

The data in Table 1 shows typical environmental conditions.

5 Citations and References

You can cite references using various styles. For example, you might reference a seminal paper (Einstein 1905) or discuss the work of Newton (1687).

Multiple citations can be grouped together (Einstein 1905; Newton 1687).

6 Cross-References and Hyperlinks

This document demonstrates several types of cross-references:

- Section references: Section 1, Section 2
- Equation references: Equation (1), Equation (2)
- Figure references: Figure 1, Figure 2
- Table references: Table 1

External links include:

- [CTAN - The Comprehensive TeX Archive Network](#)
- [TeX Stack Exchange](#)
- [Detexify - LaTeX symbol recognition](#)

7 Code and Listings

You can include code snippets:

Listing 1: Sample Python code

```
def hello_world():  
    print("Hello , World!")  
    return True  
  
if __name__ == "__main__":  
    hello_world()
```

8 Conclusion

This boilerplate document provides a solid foundation for academic and technical writing with LaTeX. It includes all the essential packages and examples for the features you requested.

References

- Einstein, Albert (1905). “Zur elektrodynamik bewegter körper.” In: *Annalen der physik* 17.10, pp. 891–921.
- Newton, Isaac (1687). *Philosophiæ naturalis principia mathematica*. Jussu Societatis Regiæ ac Typis Joseph Streater.