Compressed SUSY searches with Monojet events at CMS

Robyn Elizabeth Lucas
Imperial College London

A dissertation submitted to Imperial College London
for the degree of Doctor of Philosophy

Abstract

This is the abstract, find me in frontmatter.tex

Declaration

This dissertation is the result of my own work, except where explicit reference is made to the work of others, and has not been submitted for another qualification to this or any other university. This dissertation does not exceed the word limit for the respective Degree Committee.

Robyn Lucas

Acknowledgements

Mr Darcy and Mr Merlin deserve particular thanks.

Preface

This thesis describes my research on various aspects of the CMS particle physics program, centred around the CMS detector and LHC accelerator at CERN in Geneva.

For this example, I'll just mention Chapter **??** and Chapter **??**.

Contents

1. Theory 2

2. The LHC and CMS experiment 3

2.1. The LHC . . . 3

2.2. The Compact Muon Solenoid Detector . . . 3

3. Jet Algorithms for the L1 Trigger Upgrade 4

4. Searching for Compressed SUSY with monojet events 6

4.1. Analysis . . . 6

A. Pointless extras 7

A.1. Like, duh . . . 7

A.2. $y = \alpha x^2$ . . . 7

Bibliography 10

List of Figures 11

List of Tables 12

"Writing in English is the most ingenious torture ever devised for sins committed in previous lives."

— James Joyce

Chapter 1.

Theory

"Laws were made to be broken."
— Christopher North, 1785–1854

Here is some theory about some stuff.

Chapter 2.

The LHC and CMS experiment

"There, sir! that is the perfection of vessels!"
— Jules Verne, 1828–1905

2.1. The LHC

Is very wonderful. And cold.

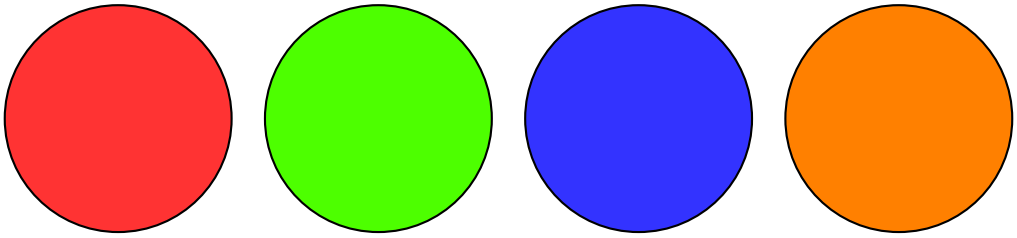
2.2. The Compact Muon Solenoid Detector

Is very heavy.

Chapter 3.

Jet Algorithms for the L1 Trigger Upgrade

Here are some funky floats using "continued captions", i.e. for a semantically collected group of float contents which are too numerous to fit into a single float, such as the pretty circles in the following figure:

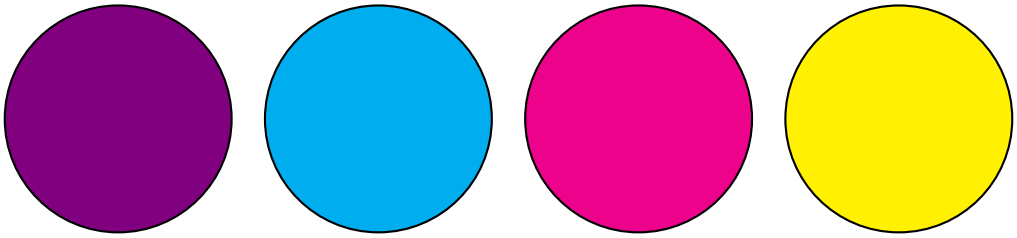


(a) Example 1a **(b)** Example 1b **(c)** Example 1c **(d)** Example 1d

Figure 3.1.: Demonstration of `subfig` continued captions.

This mechanism means that the same float label is used for both pages of floats. Note that we can refer to Figure 3.1 in general, or to Figure 3.1g on page 5 in particular!

Just for the hell of it, let's also refer to Section **??**.



(e) Example 1e **(f)** Example 1f **(g)** Example 1g **(h)** Example 1h

Figure 3.1.: Demonstration of `subfig` continued captions (continued).

Chapter 4.

Searching for Compressed SUSY with monojet events

"There, sir! that is the perfection of vessels!"
— Jules Verne, 1828–1905

4.1. Analysis

cp PAS.tex .

Appendix A.

Pointless extras

« Le savant n'étudie pas la nature parce que cela est utile;
il l'étudie parce qu'il y prend plaisir,
et il y prend plaisir parce qu'elle est belle. »
— Henri Poincaré, 1854–1912

Appendixes (or should that be "appendices"?) make you look really clever, 'cos it's like you had more clever stuff to say than could be fitted into the main bit of your thesis. Yeah. So everyone should have at least three of them...

A.1. Like, duh

Padding? What do you mean?

A.2. $y = \alpha x^2$

See, maths in titles automatically goes bold where it should (and check the table of contents: it *isn't* bold there!) Check the source: nothing needs to be specified to make this work. Thanks to Donald Arsenau for the teeny hack that makes this work.

Colophon

This thesis was made in LaTeX 2_ε using the "hepthesis" class [1].

Bibliography

[1] A. Buckley, The hepthesis LaTeX class.

List of Figures

3.1. Demonstration of `subfig` continued captions. 4

List of Tables