

A search for sparticles in zero lepton final states

Russell W. Smith

Submitted in partial fulfillment of the  
requirements for the degree of  
Doctor of Philosophy  
in the Graduate School of Arts and Sciences

COLUMBIA UNIVERSITY

2016

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## ABSTRACT

A search for sparticles in zero lepton final states

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TODO : Here's where your abstract will eventually go. The above text is all in the center, but the abstract itself should be written as a regular paragraph on the page, and it should not have indentation. Just replace this text.



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## *Acknowledgements*





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*Dedication*



# Chapter 1

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## *Introduction*

Particle physics has been a remarkably successful field of scientific inquiry. The ability to precisely predict the properties of a exceedingly wide range of physical phenomenom, from the cosmic microwave background (cite planck) to the anomalous magnetic moment of the muon (cite paper on this) is truly amazing.

The theory that has allowed this range of predictions has been the Standard Model of particle physics (SM) as developed by Gell-Mann, guy and guy. This quantum field theory (QFT) contains a tiny number of particles, whose interactions describe phenomenom up to at least the TeVscale. These particles are manifestations of the fields of the Standard Model, after application of the Higgs Mechanism. This leads

Despite its impressive range of described phenomenom, the Standard Model has some theoretical and experimental deficiencies. The SM contains 26 free parameters.

<sup>1</sup>

This is a unique time in the history of particle physics. After decades of waiting, the Large Hadron Collider began collisions in 2010, with all the accompanying fanfare and excitement. The earliest searches failed to discover any new physical phenomenom; in 2011 and 2012, there was still no evidence of new physics, although statistical fluctuations continued to entice the community at

Only a few short years ago, when the Large Hadron Collider was turned on for the first time, there was considerable excitement about the potential to observe new phys-

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<sup>1</sup>This is the Standard Model corrected for neutrino masses. These parameters are the fermion masses (6 leptons, 6 quarks), CKM and PMNS mixing angles (8 angles, 2 CP-violating phases), W/Z/Higgs masses (3) , the Higgs field expectation value, and the couplings of the strong, weak, and electromagnetic forces (3  $\alpha_{force}$  ) .

ical phenomenom. After  $20 \text{ fb}^{-1}$  collected at  $\sqrt{s} = 8 \text{ TeV}$ , there were some tantalizing hints, yet there was no smoking guns available.

This thesis documents one of the many searches performed at 13 TeV by the ATLAS experiment. In particular, this is a search for decays t

Particle physics

Talk about SM in a paragraph

Talk about SUSY in a paragraph

Talk about RJR reconstruction in a paragraph

## Chapter 2

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### *The Standard Model*

Here you can write some introductory remarks about your chapter. I like to give each sentence its own line.

When you need a new paragraph, just skip an extra line.

### **Overview**

By using the asterisk to start a new section, I keep the section from appearing in the table of contents. If you want your sections to be numbered and to appear in the table of contents, remove the asterisk.

### **Fermions**

By using the asterisk to start a new section, I keep the section from appearing in the table of contents. If you want your sections to be numbered and to appear in the table of contents, remove the asterisk.

### **Bosons**

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## Symmetry breaking

By using the asterisk to start a new section, I keep the section from appearing in the table of contents. If you want your sections to be numbered and to appear in the table of contents, remove the asterisk.

## Chapter 3

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### *Supersymmetry*

Here you can write some introductory remarks about your chapter. I like to give each sentence its own line.

When you need a new paragraph, just skip an extra line.

### **Motivation**

Only Additional allowed Lorentz invariant symmetry Dark Matter

### **Phenomenology**

R parity Consequences for sq/gl decays





## Chapter 4

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### *The Large Hadron Collider*

Here you can write some introductory remarks about your chapter. I like to give each sentence its own line.

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### **Magnets**

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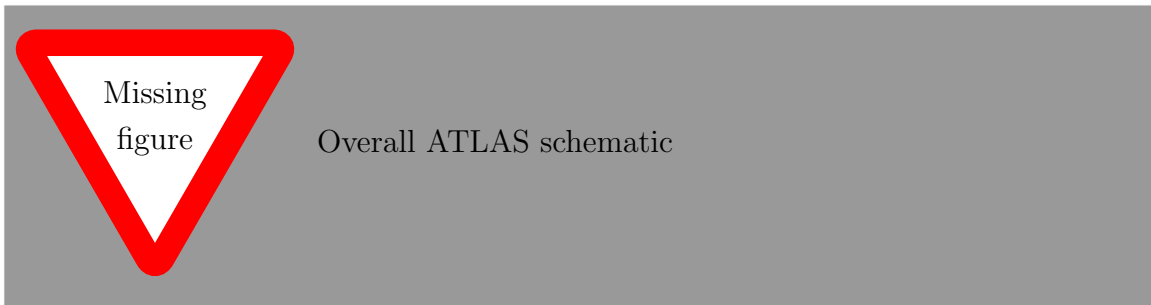
## Chapter 5

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### *The ATLAS detector*

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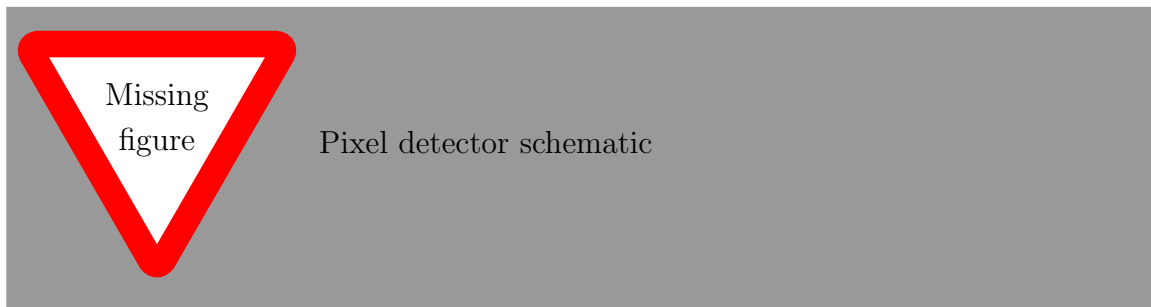
When you need a new paragraph, just skip an extra line.



## Inner Detector

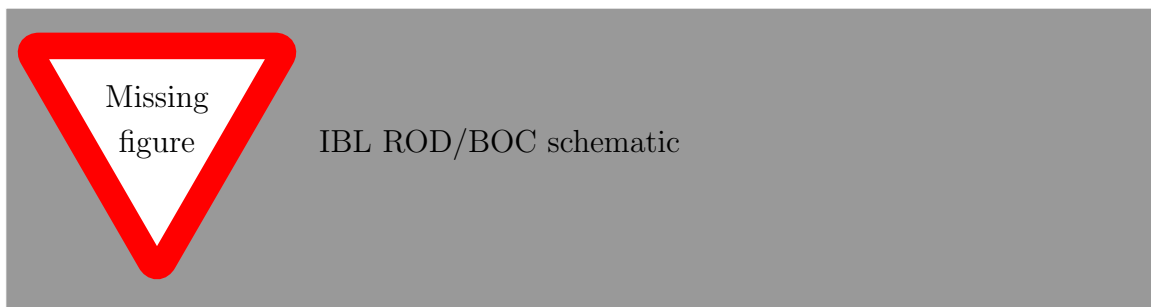
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## Pixel Detector

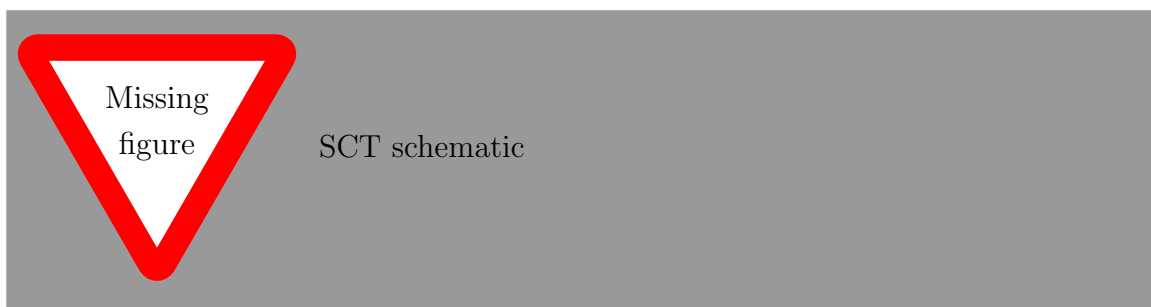


## Insertable B-Layer

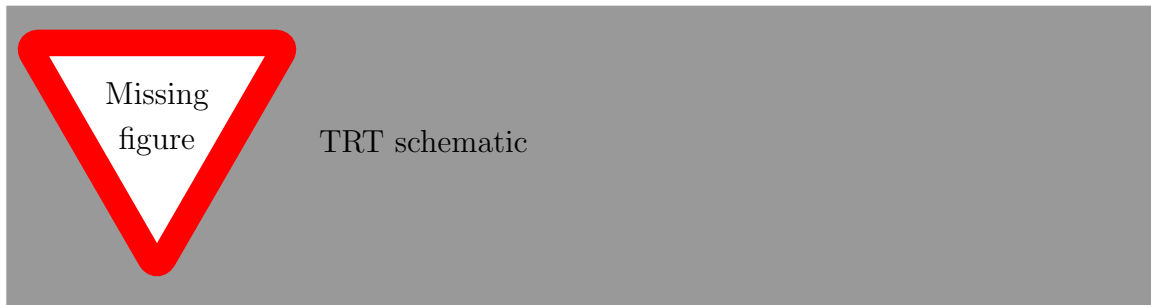
Qualification task, so add a bit more.



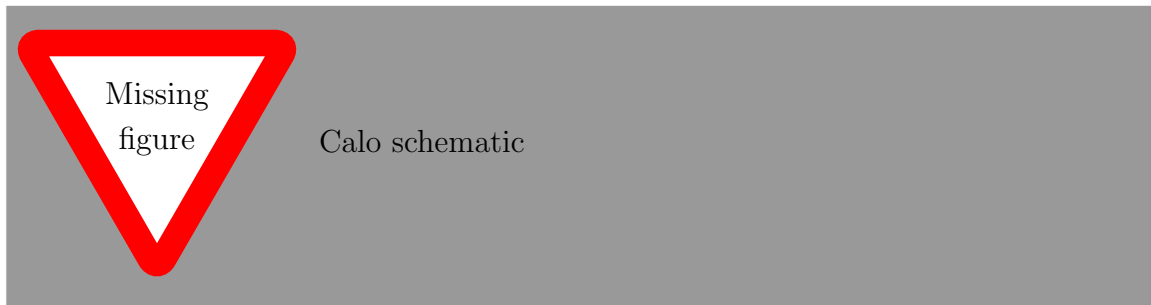
## Semiconductor Tracker



## Transition Radiation Tracker



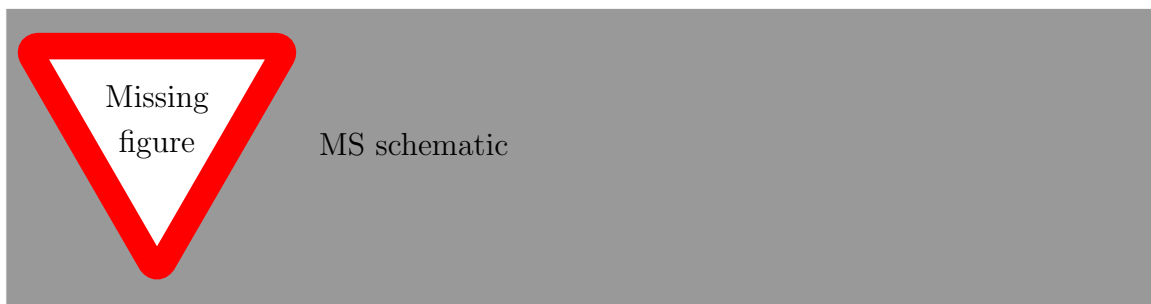
## Calorimeter



## Electromagnetic Calorimeter

## Hadronic Calorimeter

## Muon Spectrometer





## Chapter 6

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### *Title of Chapter 1*

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## Chapter 7

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### *Title of Chapter 1*

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## Chapter 8

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### *Title of Chapter 1*

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## *Conclusion*

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