Standard Model is best model (working title)

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ABSTRACT

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J. Kroll

This is the abstract text.

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Preface

This is the preface. It's optional, but it's nice to give some context for the reader and stuff.

Will K. DiClemente
Philadelphia, February 2019

Chapter 1

Introduction

The Standard Model (SM)[1] has been remarkably successful...

[1] Here's a footnote.

Chapter 2

Theoretical Framework

(Some example introductory text for this chapter)...

2.1 Introduction to the Standard Model

Modern particle physics is generally interpreted in terms of the Standard Model (SM). This is a quantum field theory which encapsulates our understanding of the electromagnetic, weak, and strong interactions...

2.2 Electroweak Mixing and the Higgs Field

When the theory of the electroweak interaction was first developed [1, 2], the W and Z bosons were predicted to be massless (a typical mass term in the Lagrangian would violate the SU(2) symmetry). However, these were experimentally observed to have masses...

Chapter 3

LHC and the ATLAS Detector

3.1 The Large Hadron Collider

The Large Hadron Collider (LHC) [3] is...

3.2 The ATLAS Detector

ATLAS is a general-purpose particle detector...

3.2.1 The Inner Detector

The Inner Detector serves the primary purpose of measuring the trajectories of charged particles...

3.2.1.1 Pixel Detector

The Pixel detector consists of four cylindrical barrel layers and three disk-shaped endcap layers...

3.2.1.2 Semiconductor Tracker

The Semiconductor Tracker uses the same basic technology as the Pixels, but the fundamental unit of silicon is a larger “strip”...

3.2.1.3 Transition Radiation Tracker

The Transition Radiation Tracker is the outermost component of the ID...

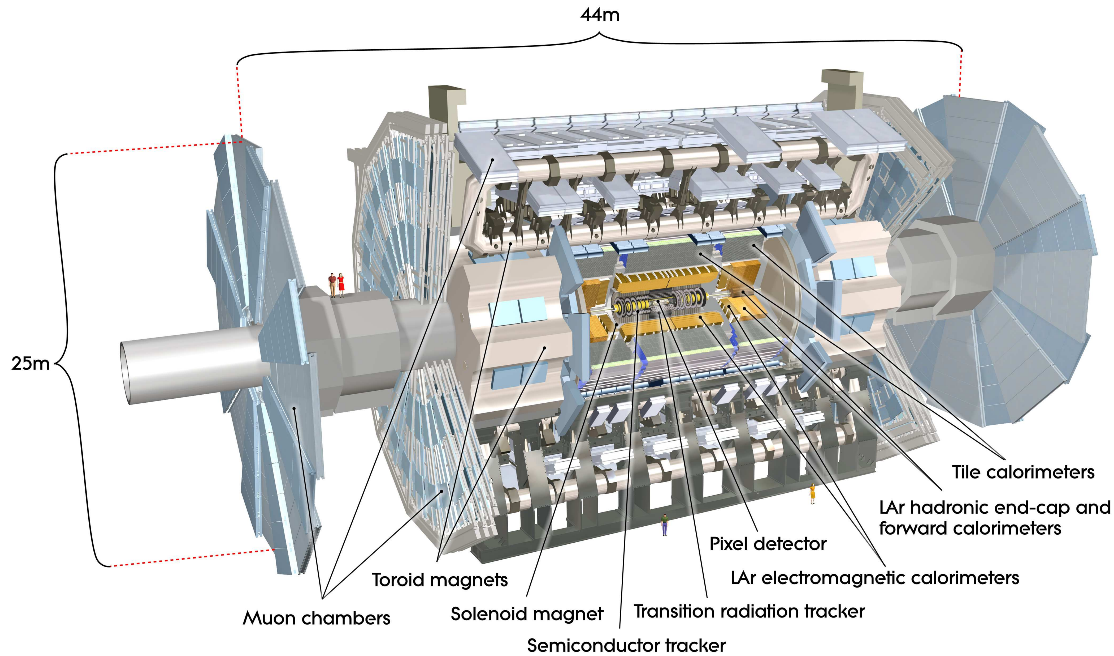

Figure 3.1: General cut-away view of the ATLAS detector [4].

3.2.2 The Calorimeters

ATLAS includes two types of calorimeter system for measuring electromagnetic and hadronic showers. These are the Liquid Argon (LAr) calorimeters and the Tile calorimeters. Together, these cover the region with $|\eta| < 4.9$...

3.2.2.1 Liquid Argon Calorimeters

The Liquid Argon system consists of...

3.2.2.2 Tile Calorimeters

The Tile calorimeter provides coverage for hadronic showers...

Chapter 4

Alignment of the ATLAS Inner Detector

In order for the subdetectors of the ID to operate at their designed precisions, it is essential that the locations of the sensors be known as precisely as possible. Differences between the expected and actual positions of a sensor can result in displaced particle hits and degrade track reconstruction quality. These misalignments can occur for any number of reasons, including but not limited to elemnts shifting during maintenance periods or cycles in ATLAS's magnetic field, or simply small movements during normal detector operations. Since it is not practical to physically realign hundreds of thousands of detector elements to μm precision by hand, an iterative track-based alignment algorithm is used to determine the physical positions and orientations of these elements [5]. The effects of misalignments and the steps taken to correct and monitor them are detailed in this chapter.

4.1 Effects of Misalignment

Hello world!

4.2 The Alignment Method

Hello world!

4.3 Momentum Bias Corrections

Hello world!

4.4 Alignment of the IBL

Hello world!

4.5 Alignment Monitoring

Hello world!

Chapter 5

WZ production @ $\sqrt{s} = 13$ TeV

Chapter 6

Same-sign WW @ $\sqrt{s} = 13$ TeV

Chapter 7

Prospects for same-sign WW at the HLLHC

CHAPTER 8

Conclusion

Here's where you wrap it up.

Looking Ahead

Here's an example of how to have an “informal subsection”.

Bibliography

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