

# Some Title Involving $ZH \rightarrow llb\bar{b}$

A DISSERTATION PRESENTED  
BY  
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TO  
THE DEPARTMENT OF PHYSICS

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS  
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### ABSTRACT

The Higgs looks more Standard Model by the day. The bulk of this thesis is vomiting up what amount to book reports of the main analysis documents, a technical paper, and a R1 quality theory steak haché.

For a “unique intellectual contribution,” I made three different BDT’s and went shake and bake to what I’m sure will be a set of inconclusive results of dubious actual scientific value.

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THIS IS THE DEDICATION.

# Acknowledgments

THIS THESIS WOULD NOT HAVE BEEN POSSIBLE without large amounts of espresso.

# 0

## Introduction

The working plan of the thesis is this:

- Front matter: Introduction, Theory (EWSB), LHC, ATLAS
- Analysis: Physics objects (leptons, jets, tags), Data/MC, event selection, systematics, final likelihood fit
- Back matter: Chapter on possible extensions (preliminary results from studies, talks, notes folded in)

*If it's stupid but it works, it isn't stupid.*

Conventional Wisdom

1

Theory

MUCH HAS BEEN SAID about the so-called Standard Model of particle physics



*Noli turbare circulos meos*

Archimedes

# 2

## The Large Hadron Collider and the ATLAS Detector

Look at<sup>5, 1</sup>

THE CERN ACCELERATOR COMPLEX AND ITS EXPERIMENTS stand as a testament to human inge-

nuity and

*If it's stupid but it works, it isn't stupid.*

Conventional Wisdom

# 3

## Event Reconstruction and Selection

ATL-COM-PHYS-2016-1724 section 3

Your main reference for objects will be ATL-COM-PHYS-2016-1674.pdf

MUCH HAS BEEN SAID about the so-called Standard Model of particle physics

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Conventional Wisdom

# 4

## Characterization of Signal and Background Processes

ATL-COM-PHYS-2016-1724 section 4

Main reference: ATL-COM-PHYS-2016-1747.pdf<sup>7</sup>

MUCH HAS BEEN SAID about the so-called Standard Model of particle physics

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# 5

## Experimental Systematic Uncertainties

ATL-COM-PHYS-2016-1724 section 6 points to 1674 (section 11)

MUCH HAS BEEN SAID about the so-called Standard Model of particle physics

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Conventional Wisdom

# 6

## Multivariate Analysis

ATL-COM-PHYS-2016-1724 section 5

## 6.1 INPUT VARIABLE SETS

## 6.2 SETUP AND TRAINING

## 6.3 BDT TRANSFORMATION

MUCH HAS BEEN SAID about the so-called Standard Model of particle physics



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Conventional Wisdom

# 7

## Experimental Systematic Uncertainties

<sup>6</sup> ATL-COM-PHYS-2016-1724 section 7

MUCH HAS BEEN SAID about the so-called Standard Model of particle physics

# 8

## Conclusion

Well, we sort of found something, but nothing new. We're all fucked, eh?



## Telescoping Jets

Some teljet<sup>2</sup>

B

## Micromegas Trigger Misalignment

Regurgitate<sup>3</sup> and also mention<sup>4</sup>

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