

A SEARCH FOR LEPTON FLAVOR VIOLATING DECAYS OF THE HIGGS BOSON  
AND A MEASUREMENT OF W BOSON PRODUCTION USING THE CMS DETECTOR  
AT THE LHC

*by*

Aaron Levine

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Dissertation approved by the following members of the Final Oral Committee:

Sridhara Dasu · Professor of Physics

Wesley Smith · Professor of Physics

Other Member · Professor of Physics

Other Member · Professor of Physics

Other Member · Professor of Other Department



## **Abstract**

Abstract Goes Here

## Acknowledgements

This is where any acknowledgements would go.

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- 1.2 Motivations for Analyses: Explain why I studied what I did and why the results are useful

## Chapter 2

# Theory of the Standard Model of Particle Physics and Beyond

### 2.1 Standard Model

Elementary Particles

Elementary Forces

The Higgs Boson

### 2.2 The Standard Model at the LHC

Proton-Proton Collisions

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### 2.3 Beyond the Standard Model: Mention BSM theories that predict an LFV Higgs, mention why we know that there must be new physics beyond the Standard Model

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# Experimental Design: The Headings below are self explanatory

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# Event Simulation

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**Event Reconstruction:** Discuss how physics objects are reconstructed from detector deposits (or lack thereof)

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## Chapter 6

# Analysis Strategy (Summarize LFV, W+Jets ANs)

### 6.1 Background Estimation

**Monte Carlo Samples Used:** This section will simply list the Monte Carlo samples used, in contrast with the Monte Carlo Generation section which will list the different Monte Carlo generator techniques.

**QCD Estimation**

**Tau Embedding**

**Fake Rate Method**

### 6.2 Selection Optimization

**W+Jets**

**LFV Higgs**

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