Idealizing the Higgs Boson Control Regions

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Introduction

- The Standard Model unifies 3 of the elementary forces and classifies elementary particles

- Higgs boson-the last Standard Model particle to be discovered

- Decay channels

- Higgs->WW->$e\upsilon\mu\upsilon$

- SM predicts how often different decays happen
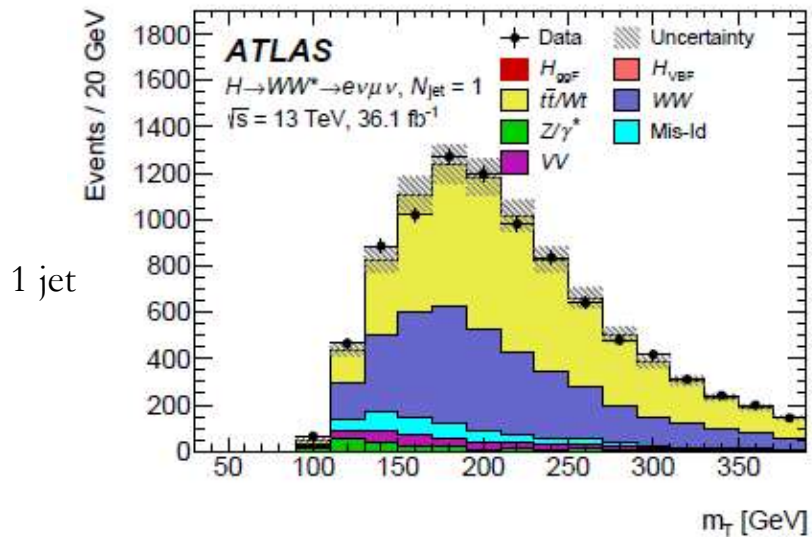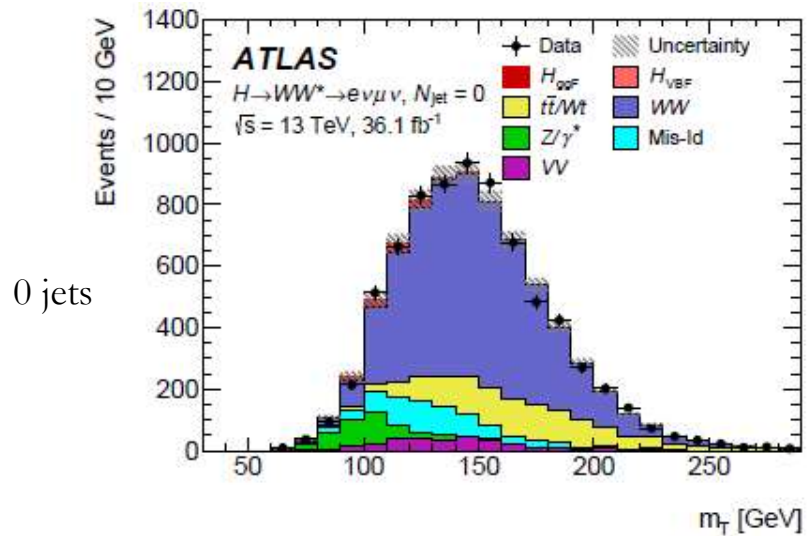 - We want to confirm/find deviations from SM

Data Analysis Techniques

◦ Monte Carlos

◦ Orthogonal cut to data

◦ Signal vs control regions

◦ Control regions are dominated by a single particle

ttbar control region, 0 jets (left) and 1 jet (right)
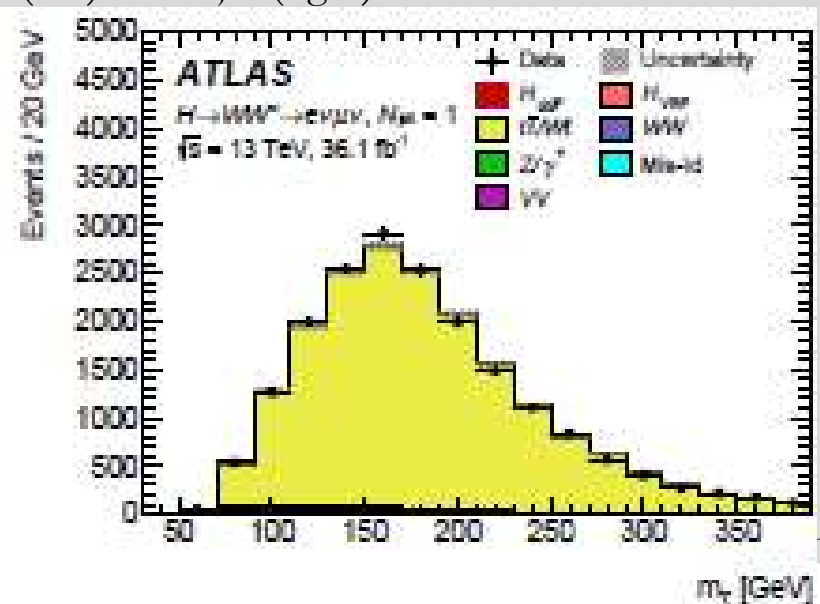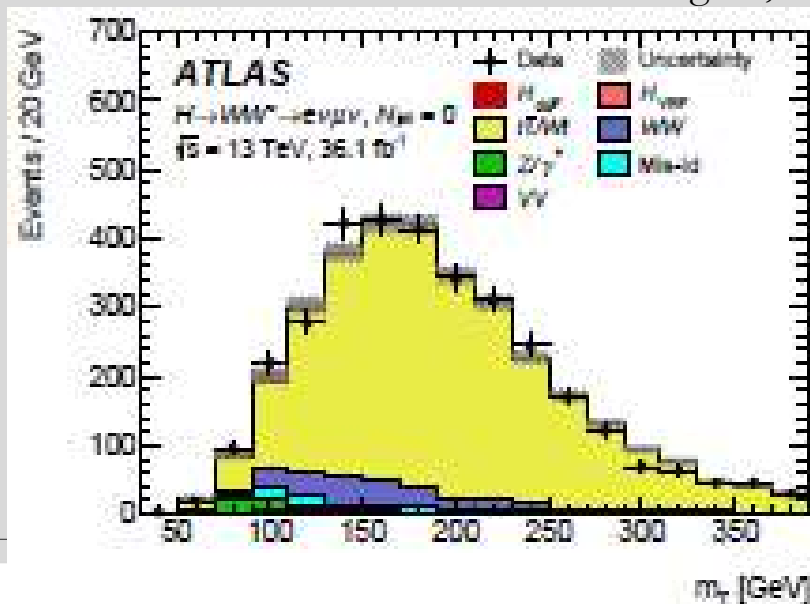
WW Control Regions

0 jets

1 jet

The Problem

○ These are both graphs both depict the WW (purple) control region

○ The bottom graph has more yellow than purple

Analysis Programming

- ROOT Program
  - Based on C++
- ROOT tuples and trees

This Summer I Will…

◦Analyze Monte Carlo and data files

  ◦Write programs to do this

◦Look at each of the variables with cuts already made

◦Explore better ways to define WW control region with less top particles

◦Recreate the graphs shown in this presentation

QUESTIONS