HWW RESEARCH AND HASS/HALT TESTING
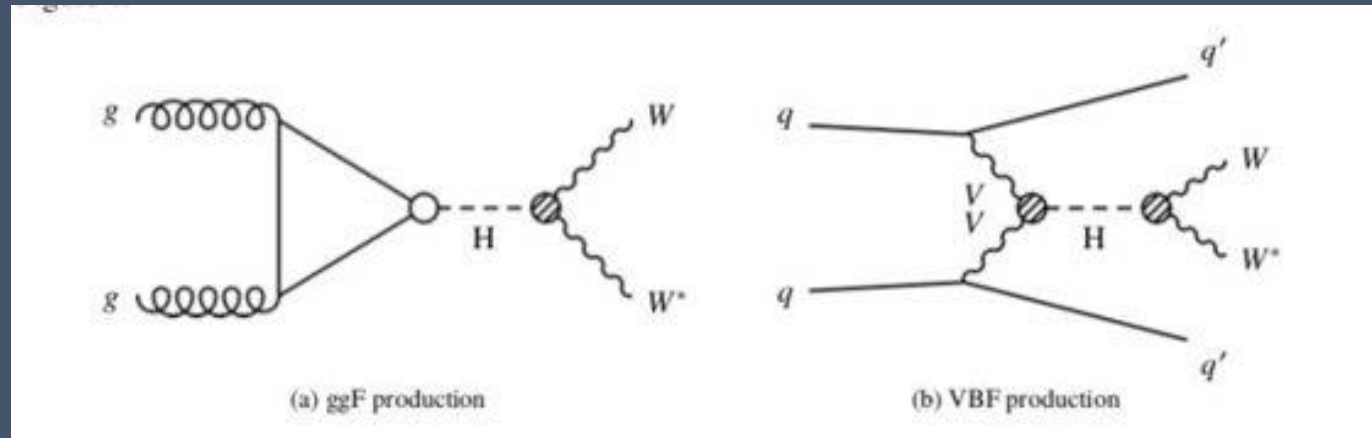
Noah Reidy

Summer 2019 OU REU
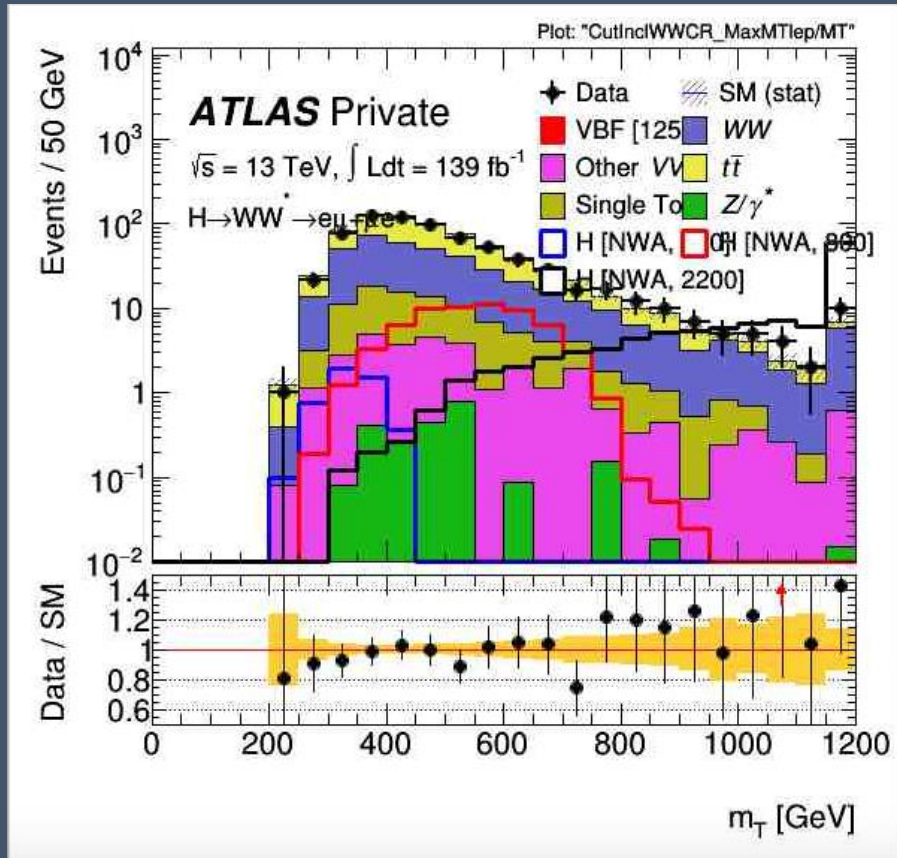
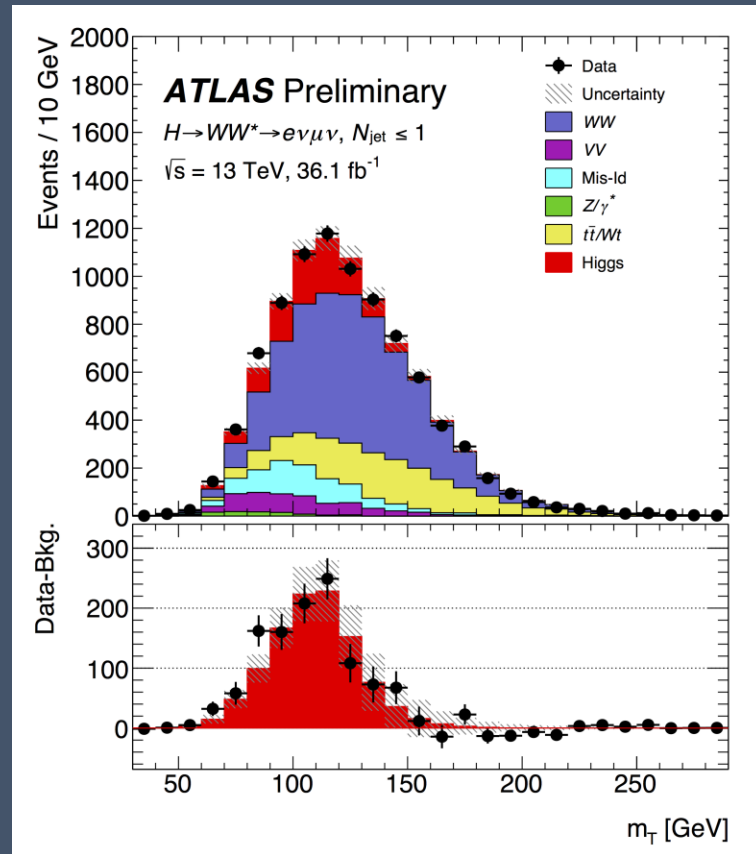HWW Advisor: Strauss; Hardware Advisor: Abbott

HWW RESEARCH

- Higgs decay channel to two W bosons

- This decay channel is the second most likely to occur

- We search for the Higgs in the ggF and VBF production processes (gluon-gluon fusion and vector boson fusion)

(a) ggF production   (b) VBF production
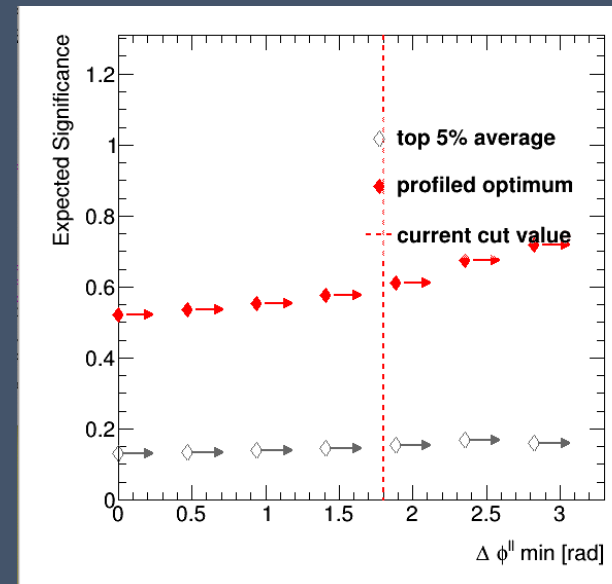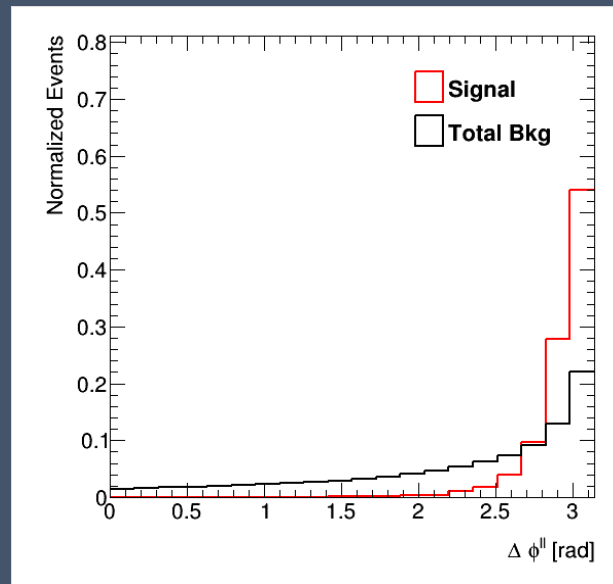
HISTOGRAM EXAMPLES

Higgs found in WW channel

CUT OPTIMIZATION

- Learning how to use the Common Analysis Framework (CAF)
- Optimizing cuts for the HWW decay channel using Gridscanner program

CUT OPTIMIZATION CONT.

- Moving on to optimizing cuts on different regions

- Two methods:
  - VBF as signal and ggF as background
  - VBF and ggF as signal with the whole background

HASS/HALT TESTING

- Hass- Highly Accelerated Stress Screen

- Halt- Highly Accelerated Life Test

- Temperature range from -50 C to 50 C

- Stress testing by continuous hitting with pistons

- Testing for the integrity of pixel detectors

MY TASK

- Soldered a board together

- Will start working on automating graph production

- Real time graph display