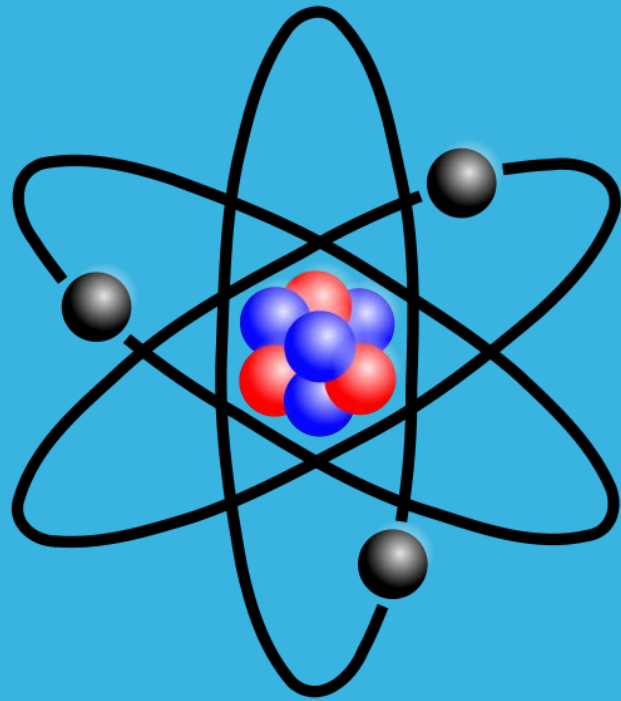


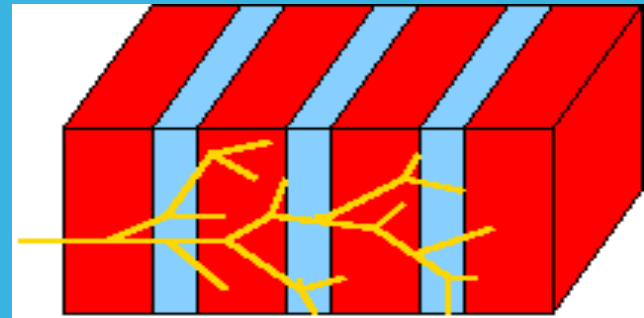
SARAH MARIE BRUNO
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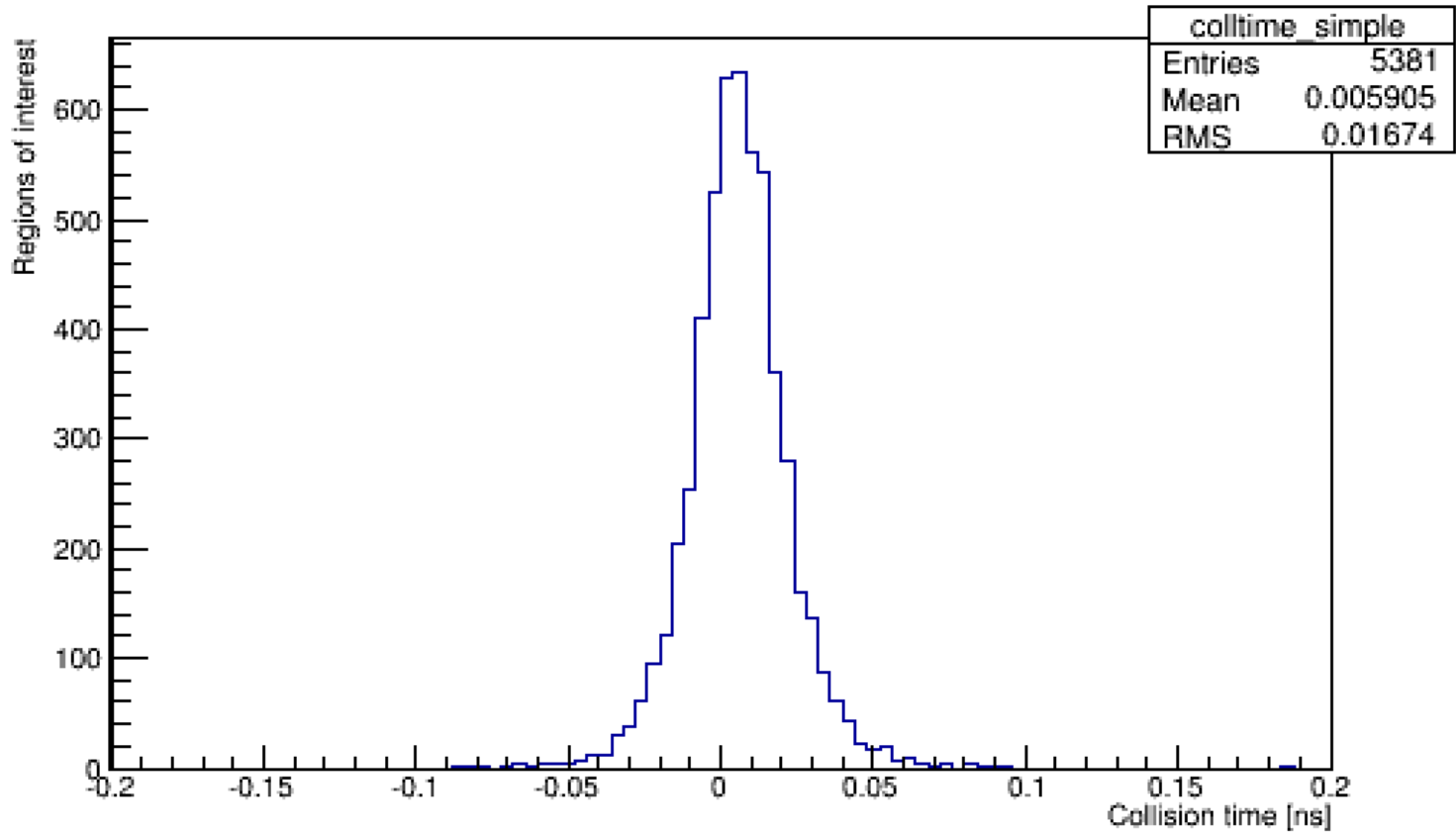
RESEARCH PROJECT: HGCAL TIMING

Caltech CMS Group

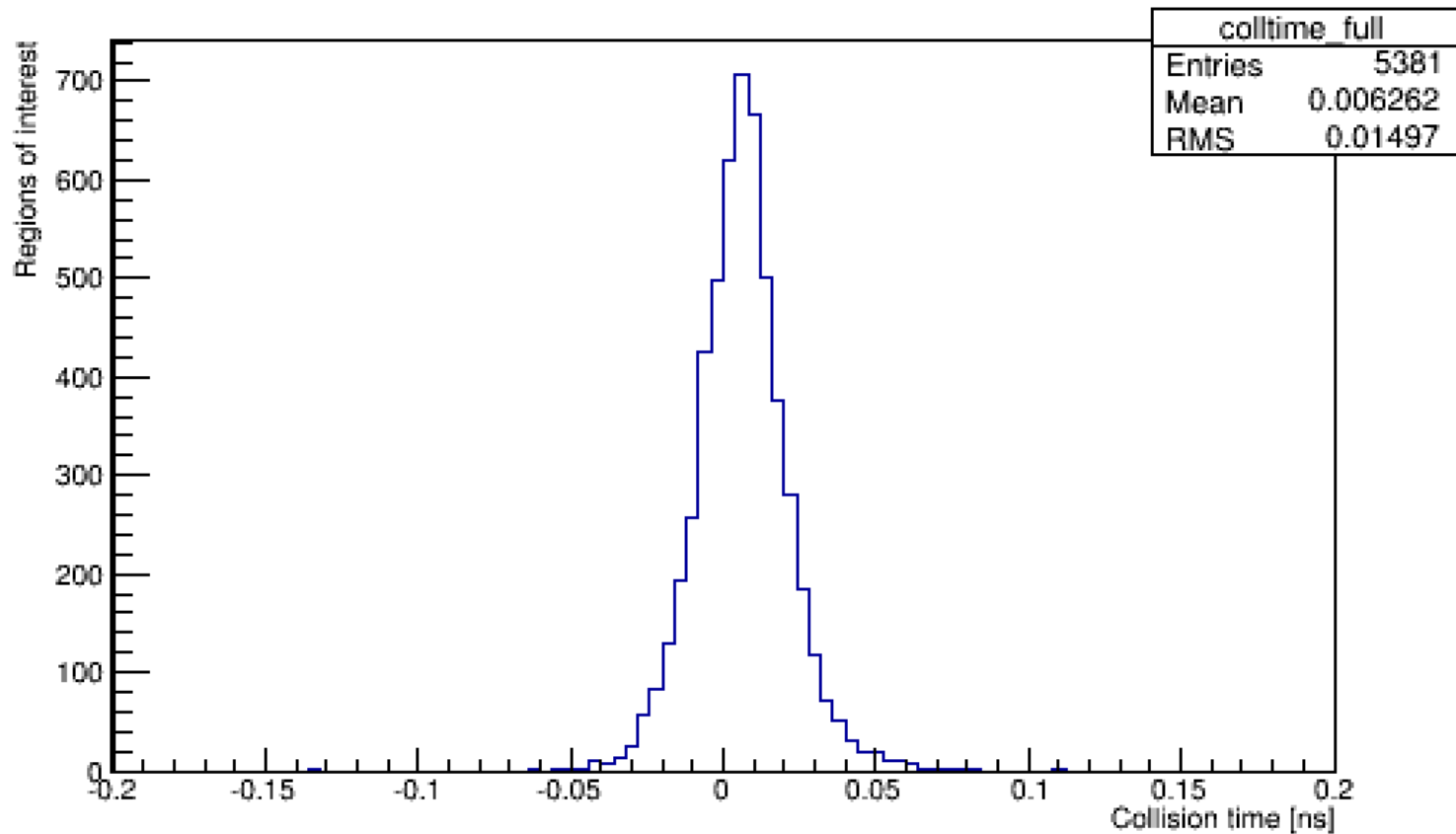
- Overview
 - Precision timing of photons from Higgs decays
 - Simulations using ROOT, Python, and GEANT
- Goals
 - Determine vertices of reconstructed Higgs
 - Account for noise from Pile-Up
 - Develop a method to weight hits to maximize precision and accuracy of event detection
 - Determine energy resolution for photons



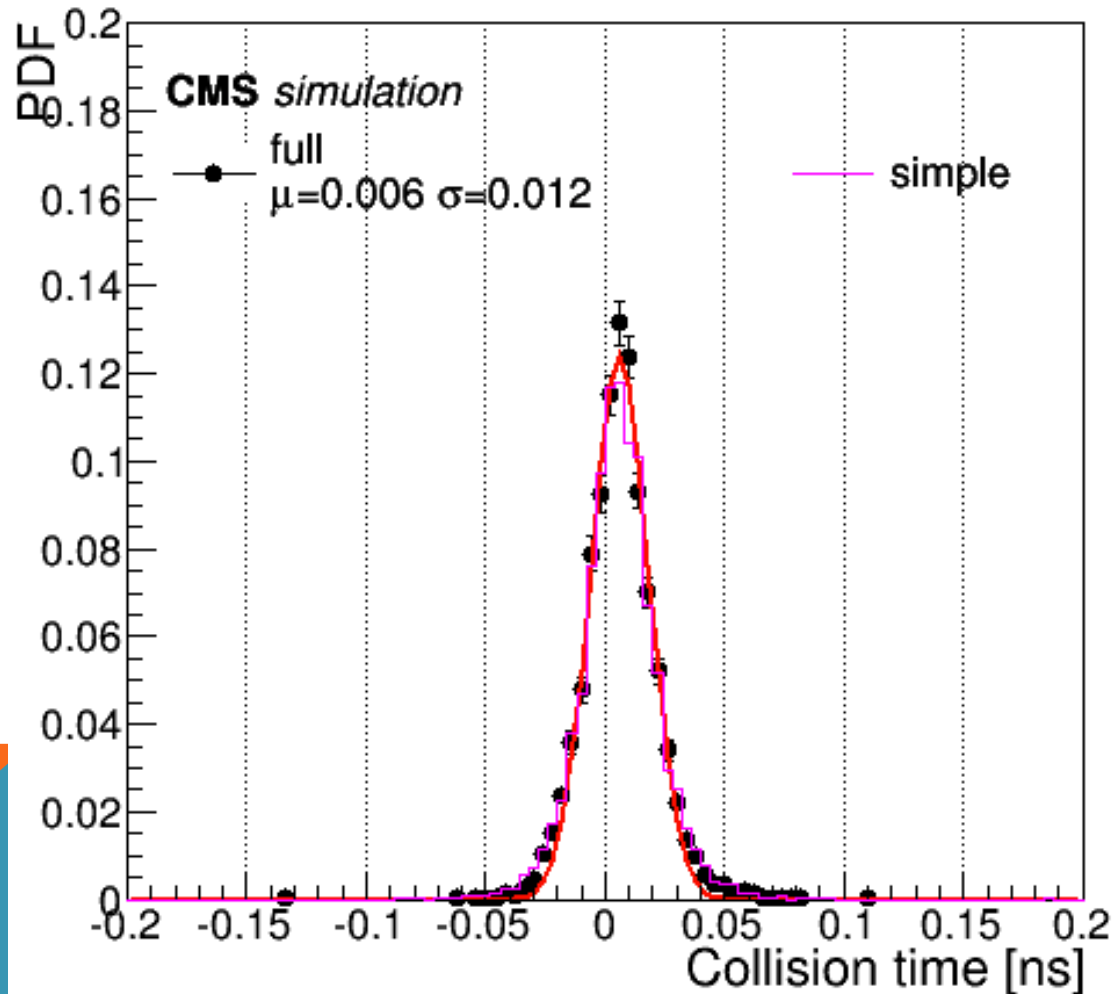
RECONSTRUCTED COLLISION TIME



RECONSTRUCTED COLLISION TIME



RECONSTRUCTED COLLISION TIME



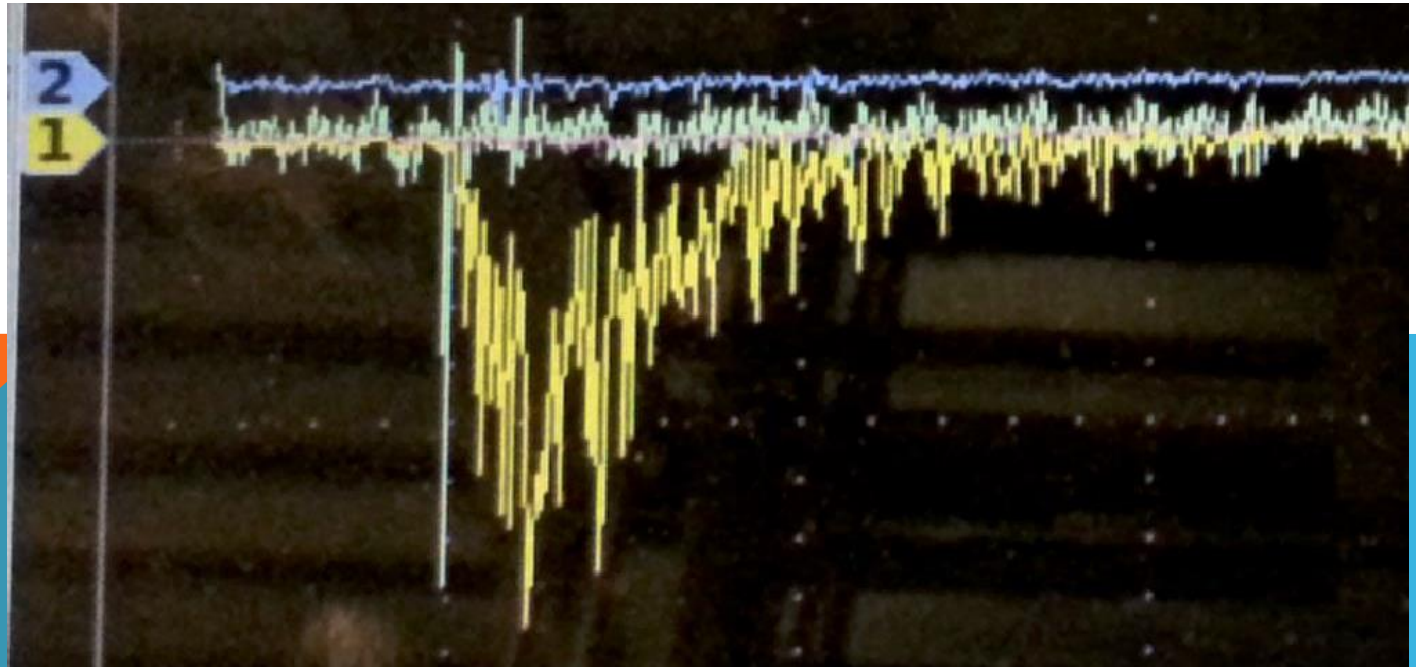
TEST BEAM

- Testing Shashlik detector
- Electron beam
- Set-up yesterday




TEST BEAM

- First snapshot (3am this morning)
- Detected muon signal
- Shashlik – yellow
- MCP - green



PROJECTED TIMELINE

- **By mid-July**
 - Be able to remove noise from pile-up
 - Be able to identify vertices of reconstructed objects
 - Develop an algorithm or improve the current algorithm for clustering to enable improved event detection and energy resolution for photons
 - **Final four weeks**
 - Determine the time of arrival of photons
 - Work with another summer student on applying the results to jet timing
- 

OUTSIDE OF CERN



FROM THE JURA



THANK YOU!

