Understanding Cosmics

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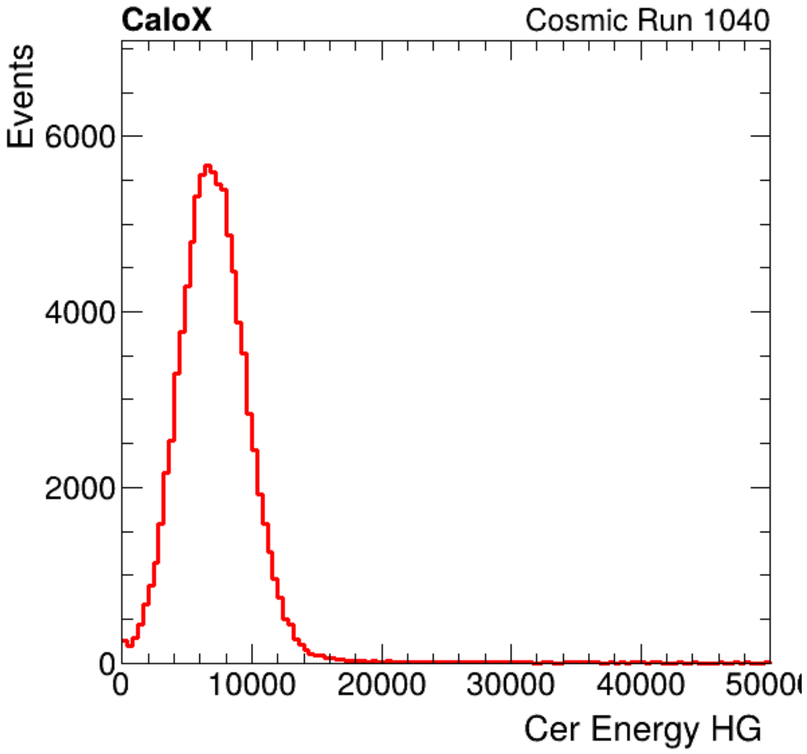
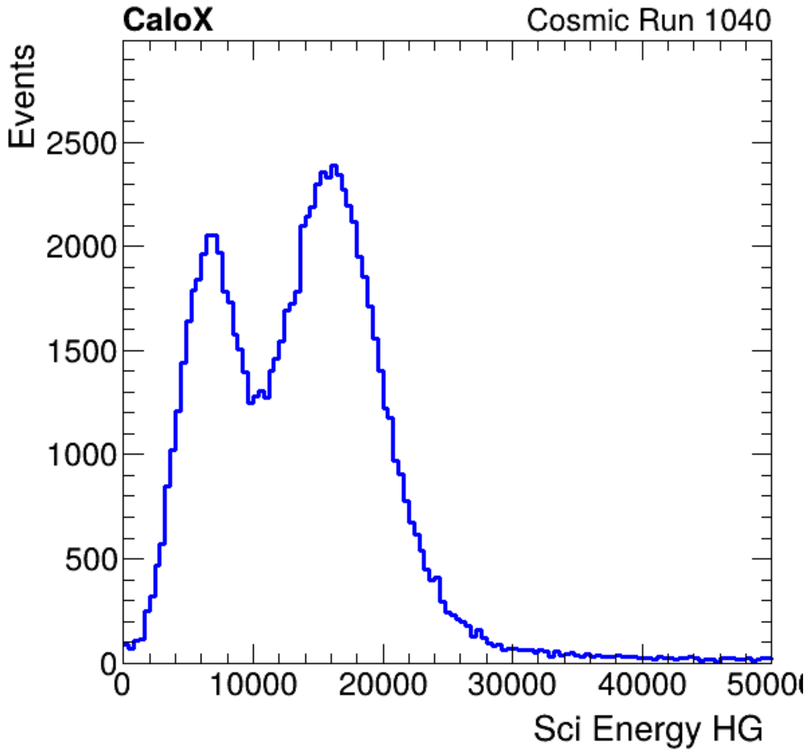
Cosmic Data

- Performed lots of cosmic runs (160GB, ~500K events).
  - 448 Sci channels + 448 Cer channels
  - Plus 192 DRS channels to read timing information (1024 time slice per channel per event)
  - ~200K floats per event
- **Working on understanding the cosmic data:**
  - SiPM gain, stability, and energy calibration
  - Timing performance, stability, and resolution
- Testing the workflow to do (semi)online analyses

- Today in this talk just focus briefly on the energy studies; **more results on timing performance and simulations in the next meeting(s)**

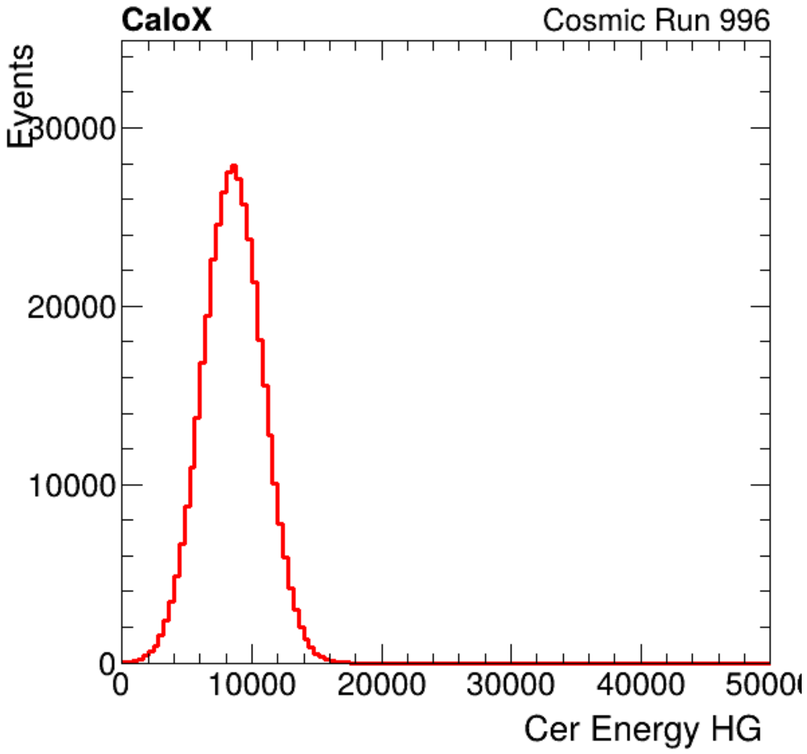
Energy Sum

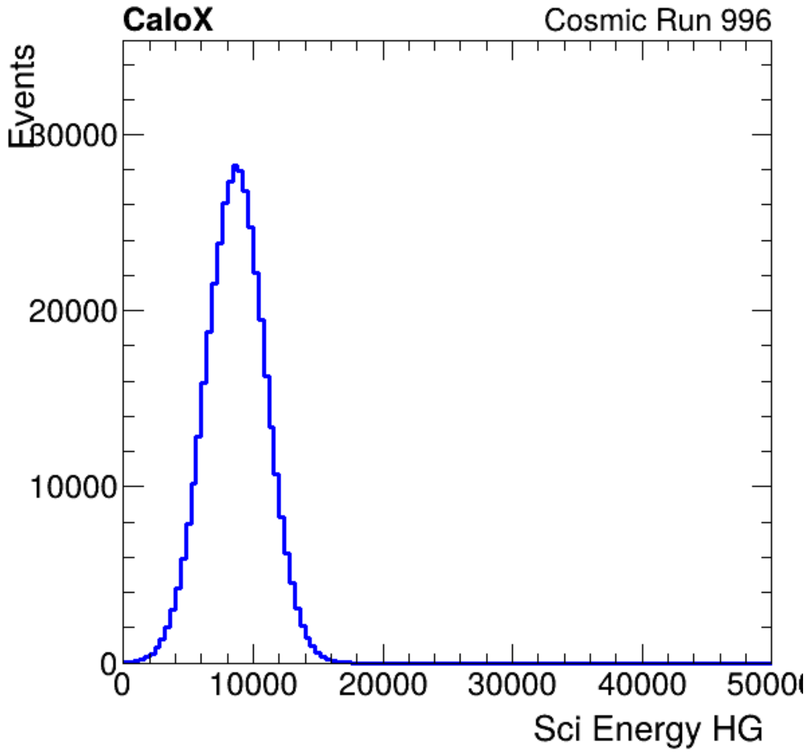




- Sum of all the energy deposits over all channels, after subtracting pedestals per channel
  - No gain calibration yet
  - Left is Cer, right is Sci
- Seems to be some detector noise (+ shower tail) in Cer, and detector noise + MIP peak (+ shower tail) in Sci
- More plots here

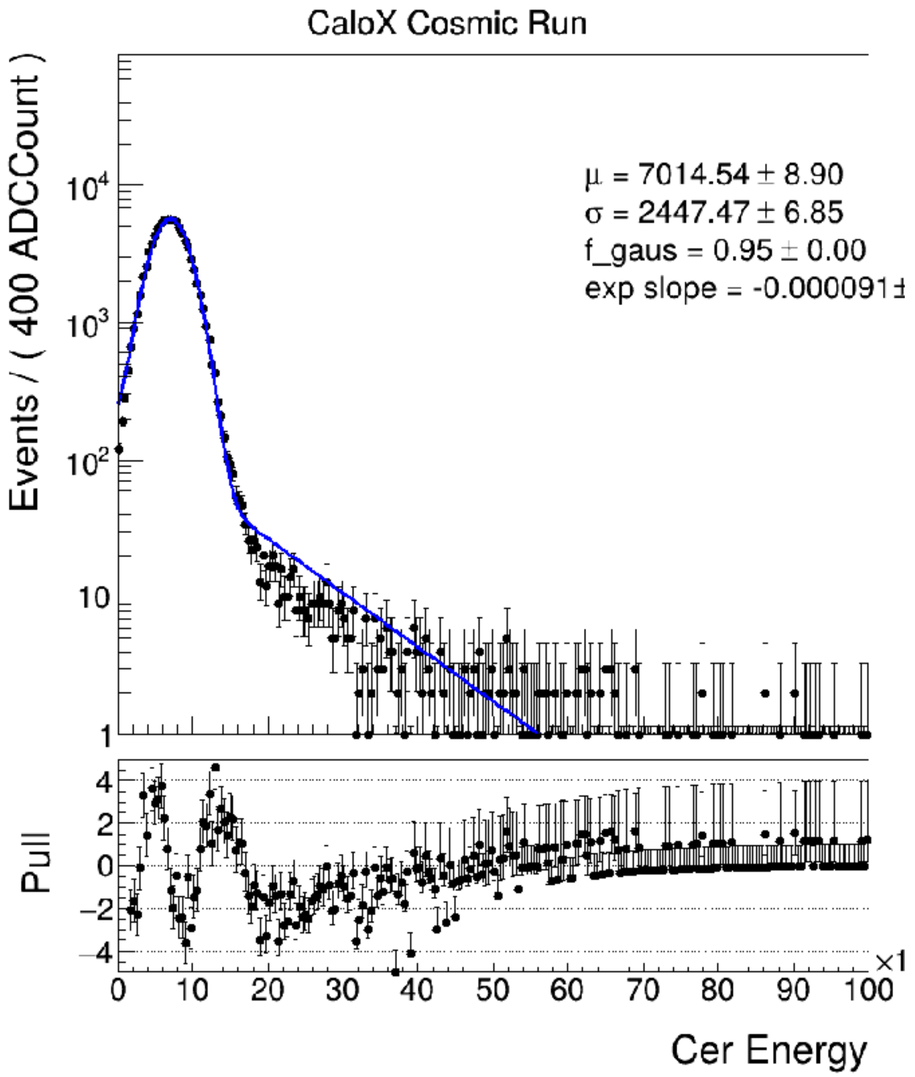
Randomly Trigger Events

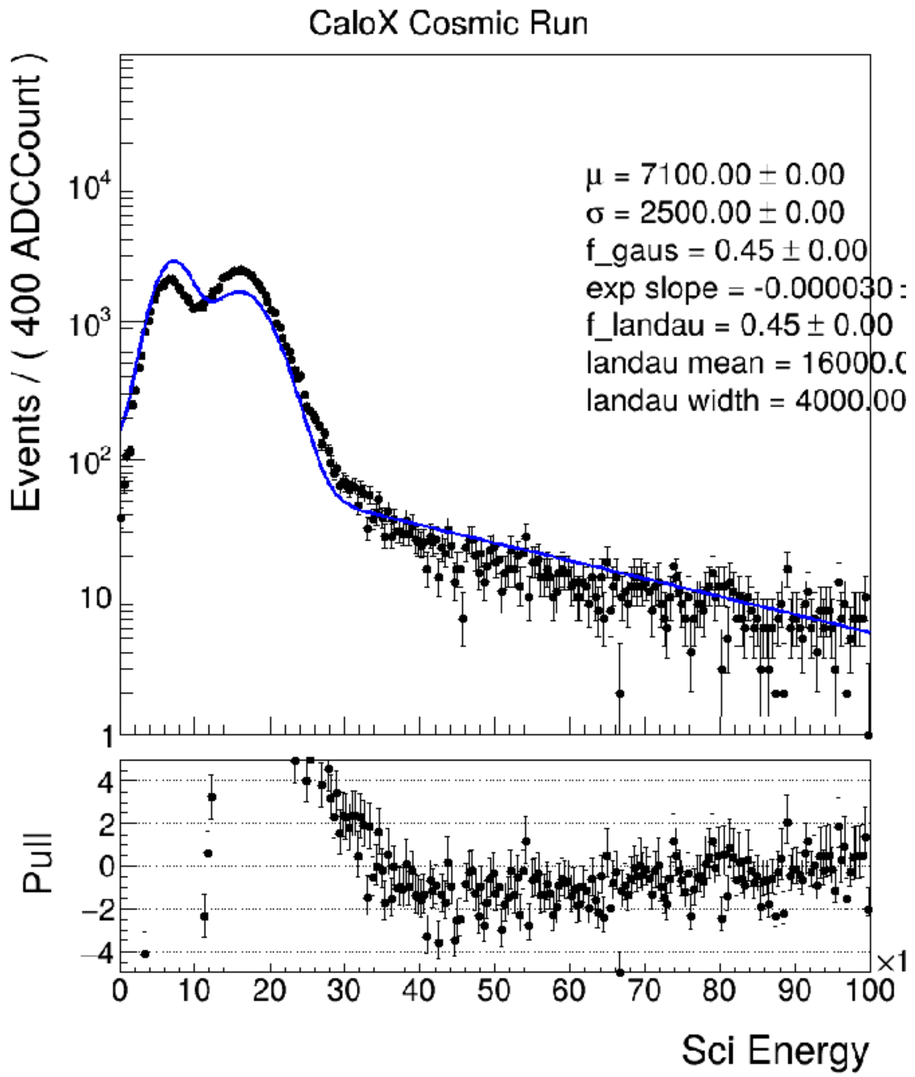




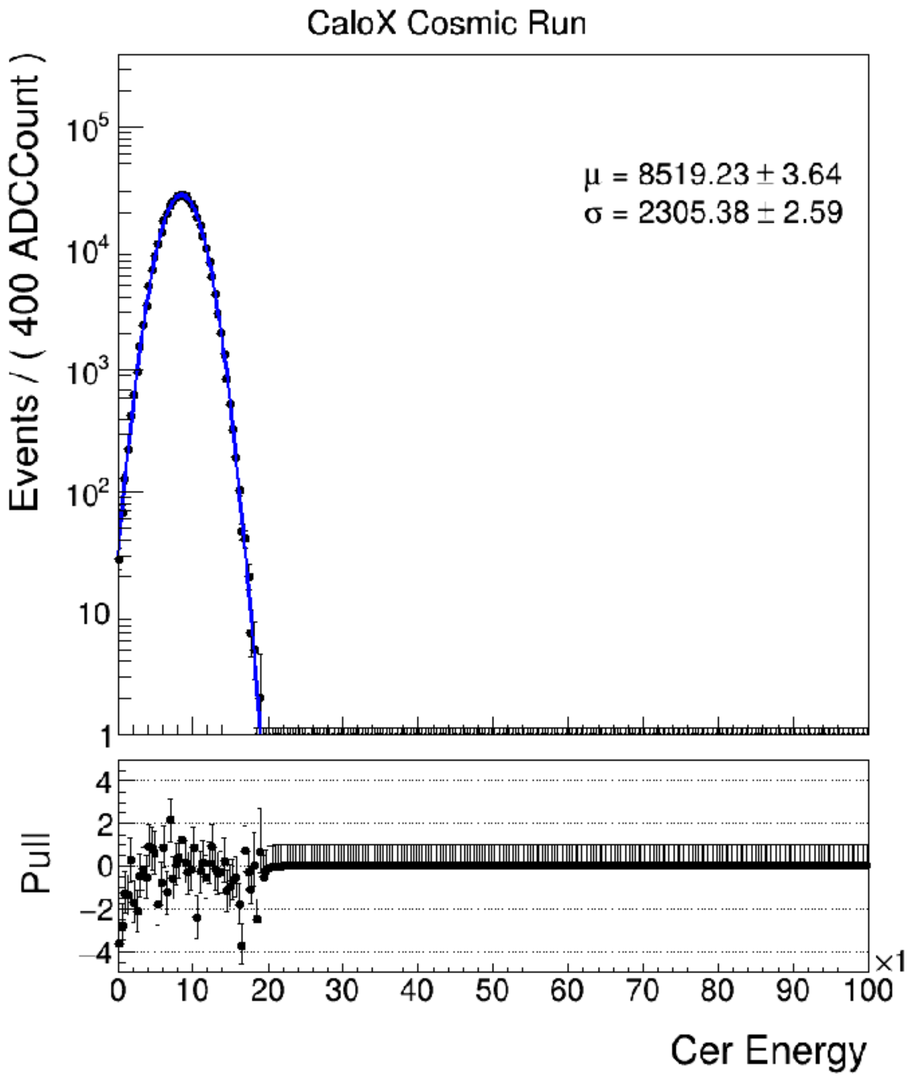
- Compare with randomly trigger events
  - Only showing “noise”

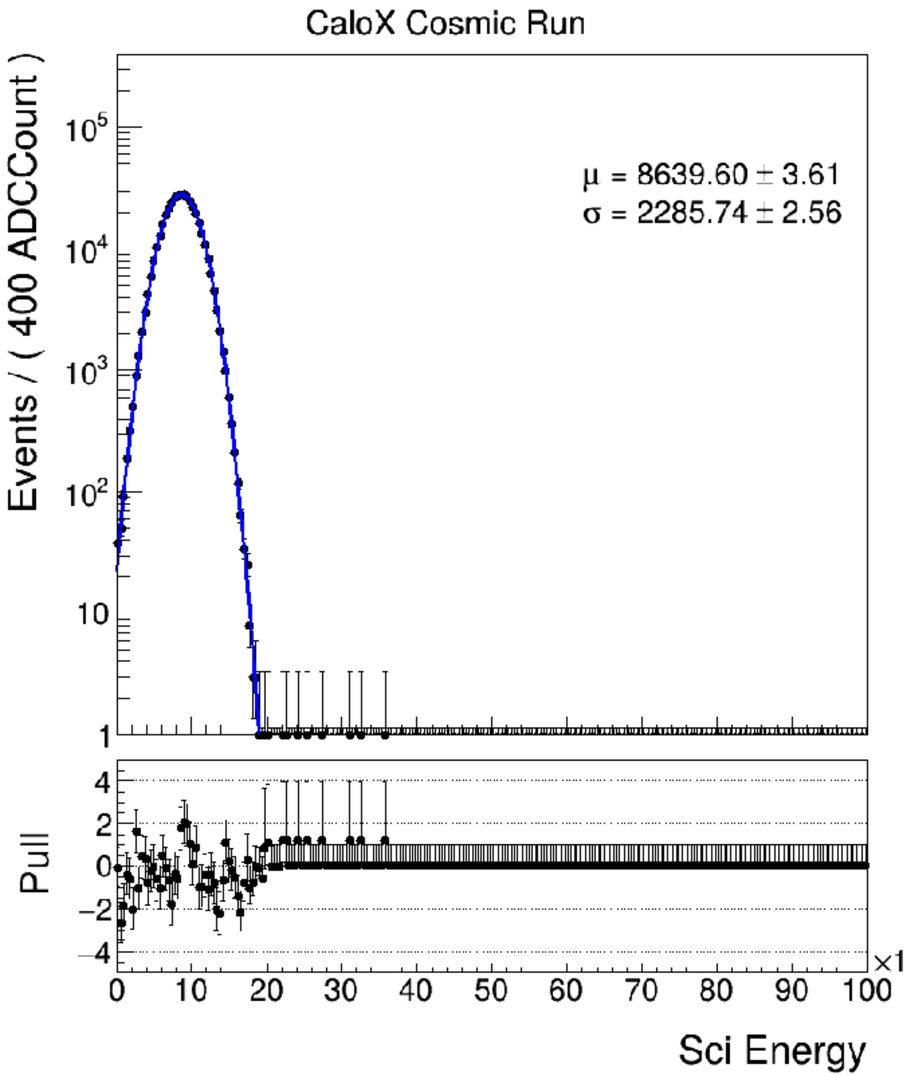
For Fun (Very Preliminary)





Randomly Trigger Events



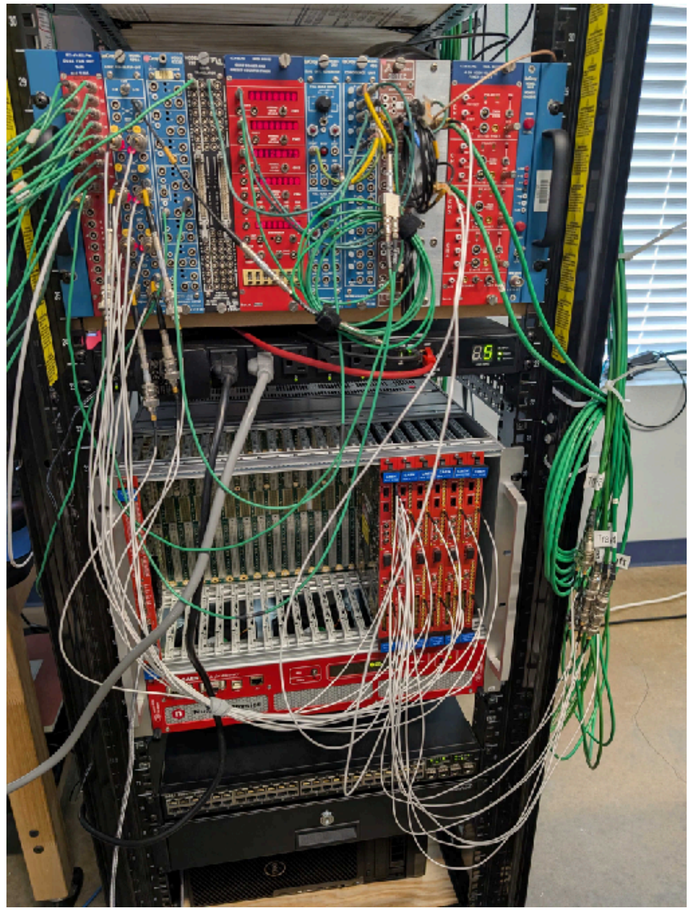


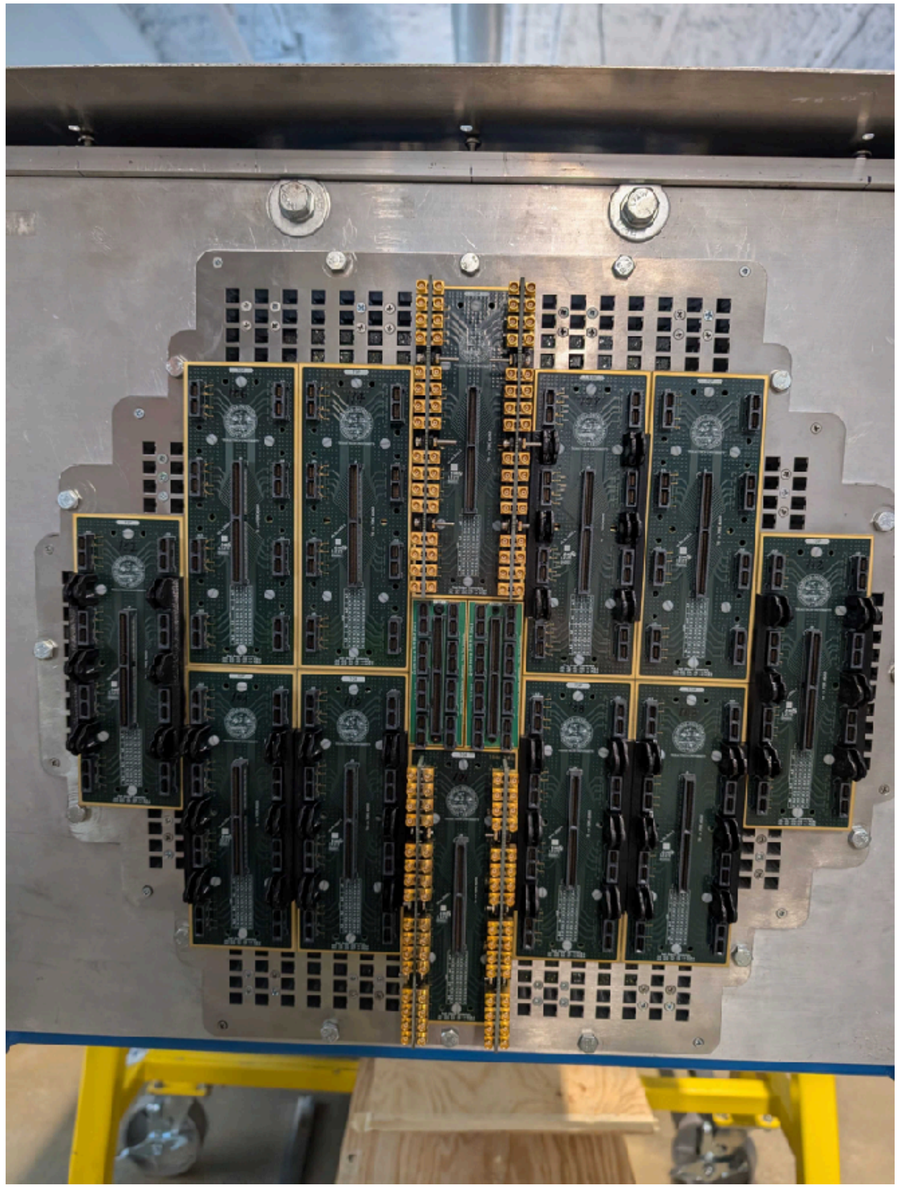
- Fit very well with Gaussian distributions

Back Up

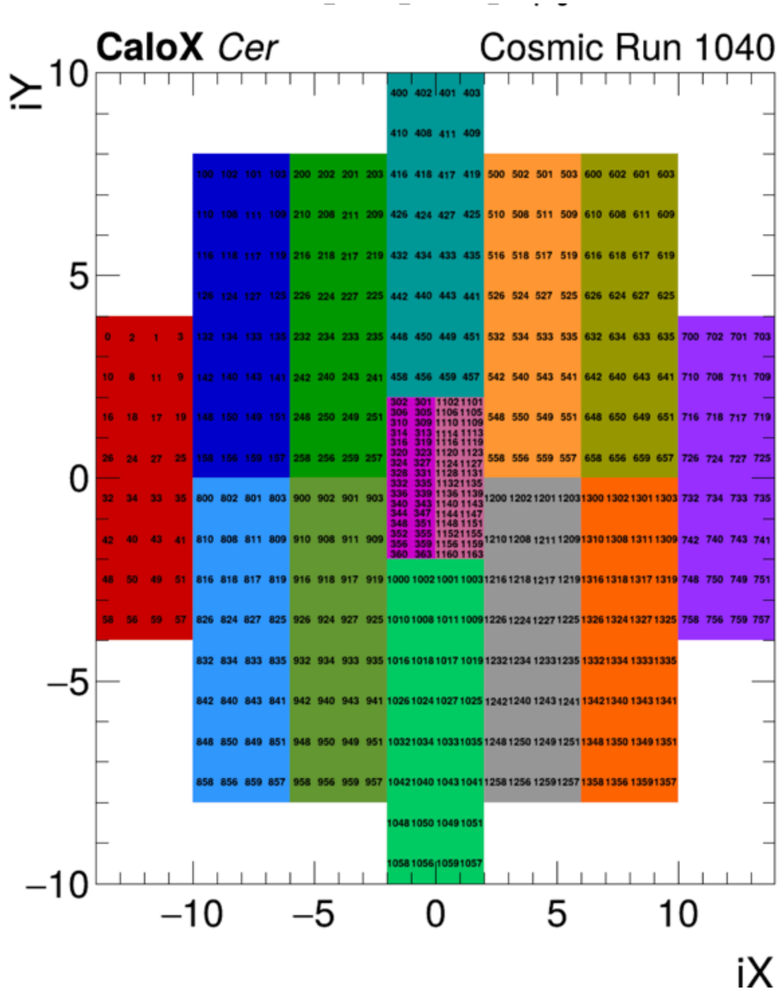
Detector & Cosmic Runs

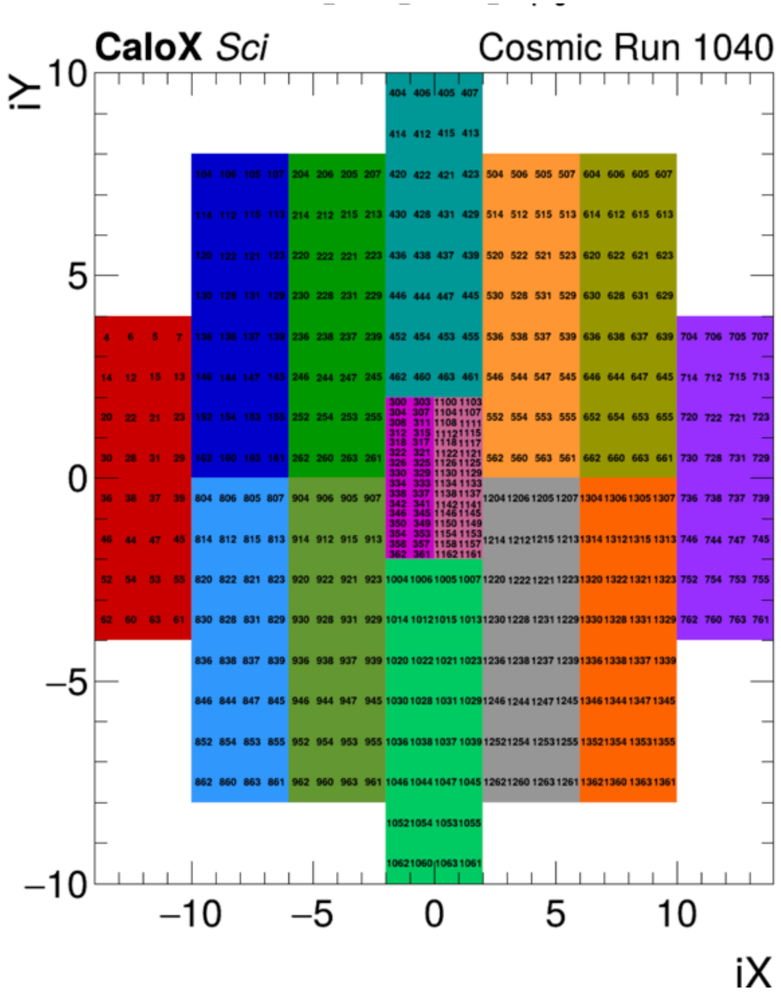
- Performed lots of cosmic runs (160GB, ~500K events).
- Working on understanding the data: energy deposit & calibration, pulses, timing resolution, etc
- Testing the workflow to do (semi)online analyses



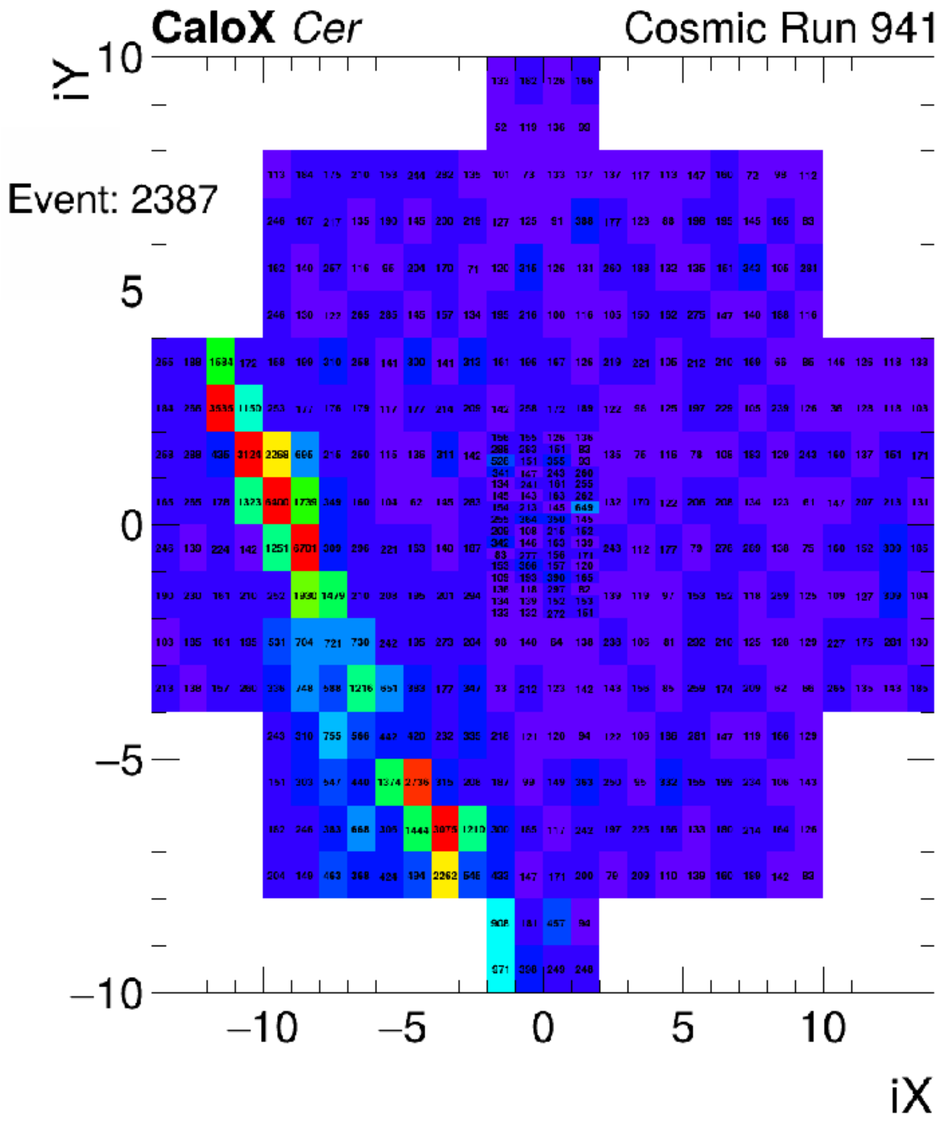


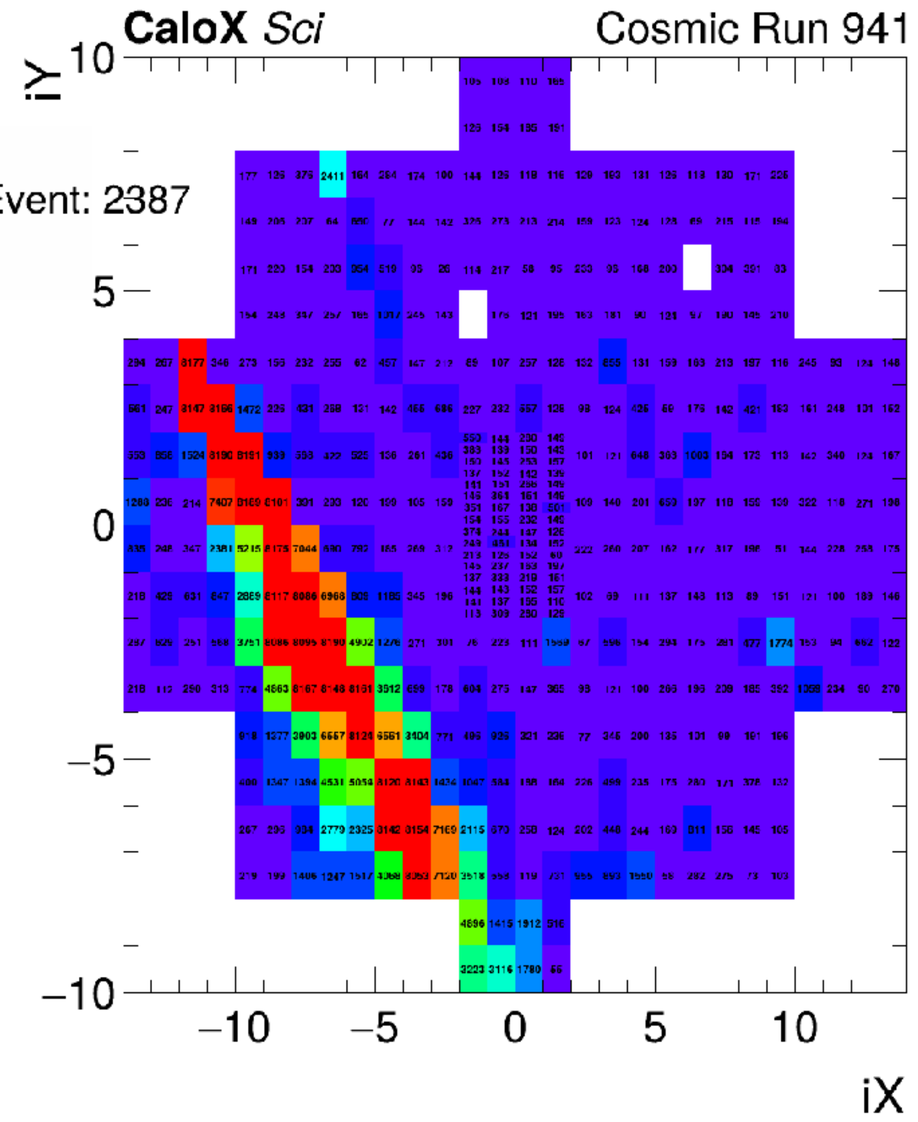
Channel Maps





Cosmic Events





Cosmic Events