# Calo production update

Blair Seidlitz

Columbia University

Calo Calibrations Mtg: Nov. 6th, 2023

- I am requesting a new production, these are the changes that will be included in it.

- "repair" missing ieta=8 & 95 calibrations
  - Issue in EMCal calibration where calibration factors are accidentally set to zero
  - We want to calibrate from roughly calibrated towers so we need to repair these calibration so we get some calibrated data out.
- Added timing cuts (i.e. setting isBadTime status bit)
- Updating HCal waveform template to one derived with beam data (the previous was derived in test-beam data).
- Relaxing the isBadChi2 threshold to > 1e4 (it was 3e3)

- Need to do something for hot clusters (for expediency this could be left up to analyzer for the upcoming pass)
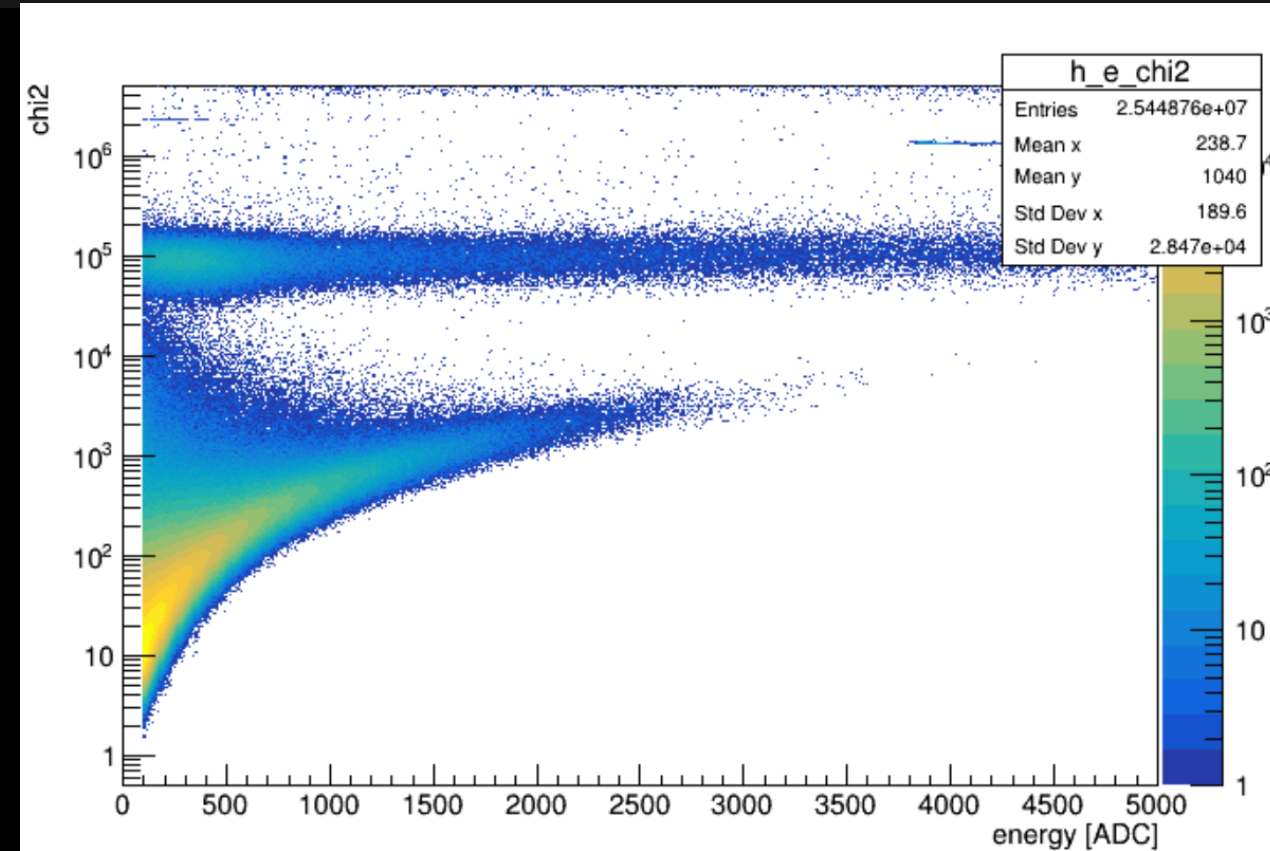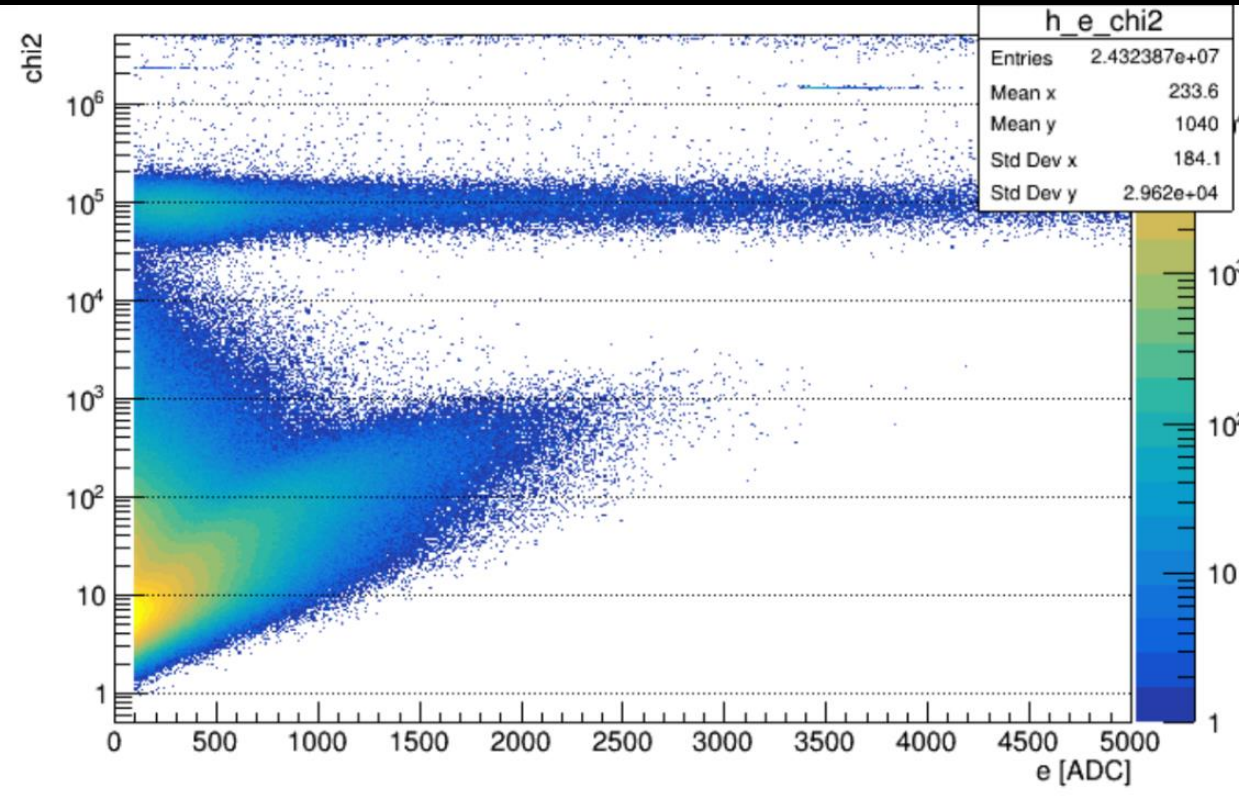
- ➢Left: Chi2 vs. ADC with new beam template.
- ➢Right: same distribution but with old test-beam template
- ➢Details for those not following closely
  - Chi2 is a least squares /ndf
  - Distribution at 1e6 are improperly configured towers with unphysical waveforms.

Timing cuts

- ➤ **Left mean time for hit (> 0.5 GeV)**
  - If ploted in 1D it looks like two gausians cetered around 0.8 and -0.2
  - There is effect of a rounding error when detector is timed in due to disagreement of FPGA time and GTM (experts can confirm)
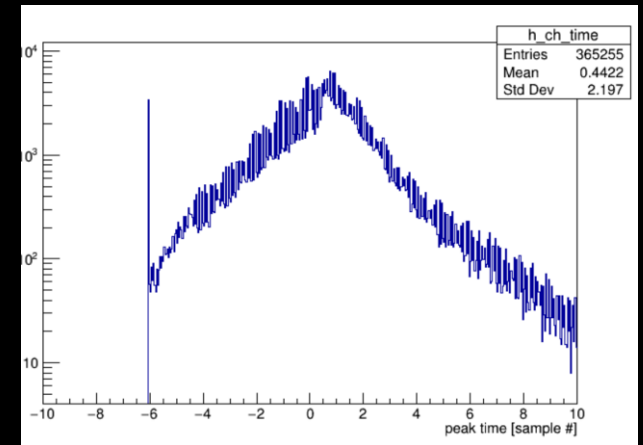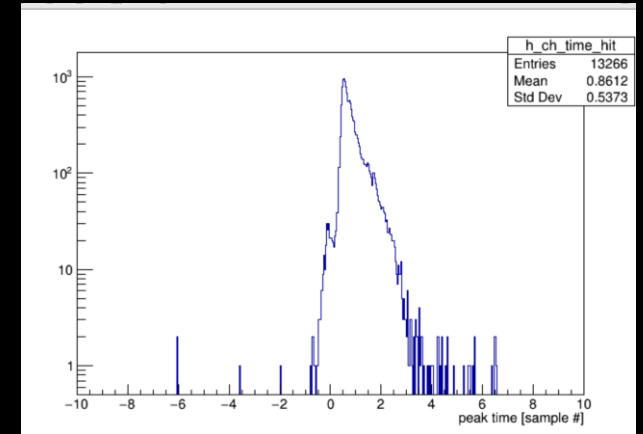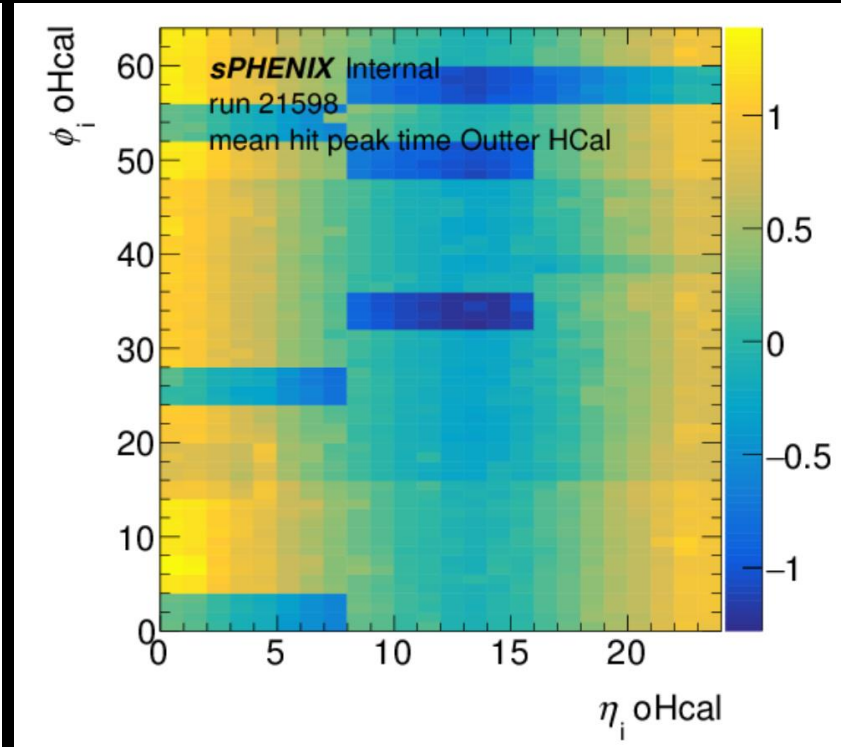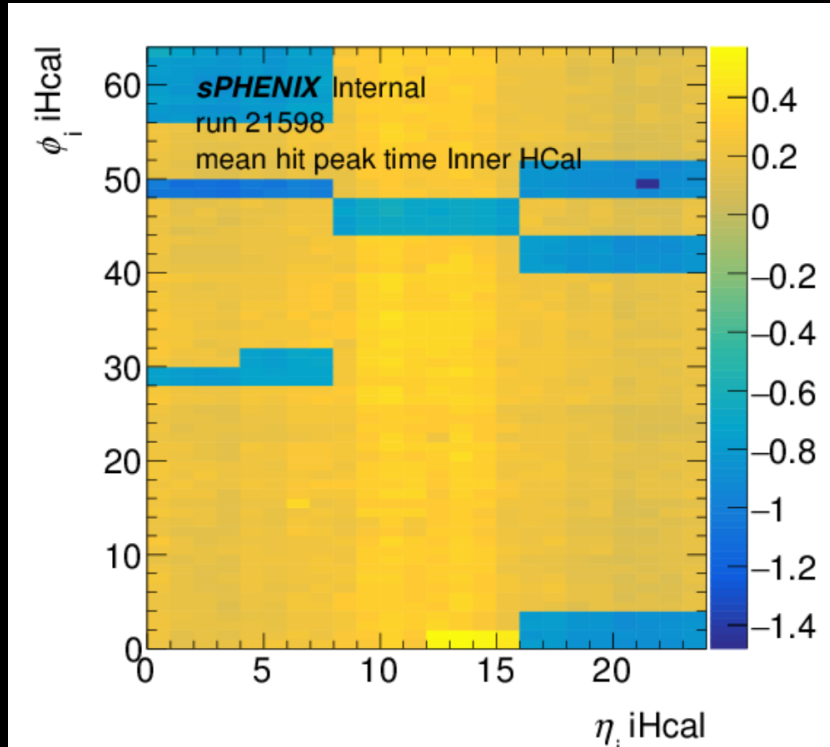- ➤ **Middle: single channel (ieta=20 iphi=62) timing distribution for hists**
- ➤ **Right: same channel for all events**
- ➤ **Need to look into default value (ie.e. what is returned when bin is empty)**
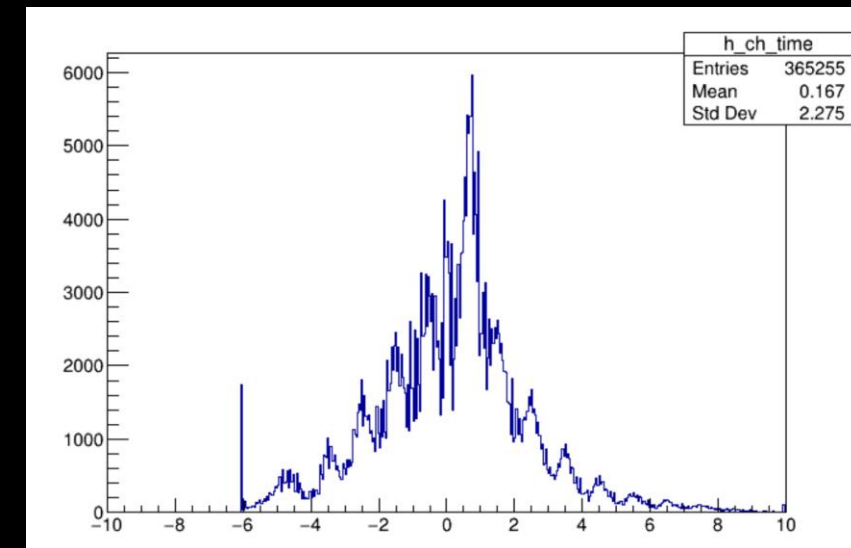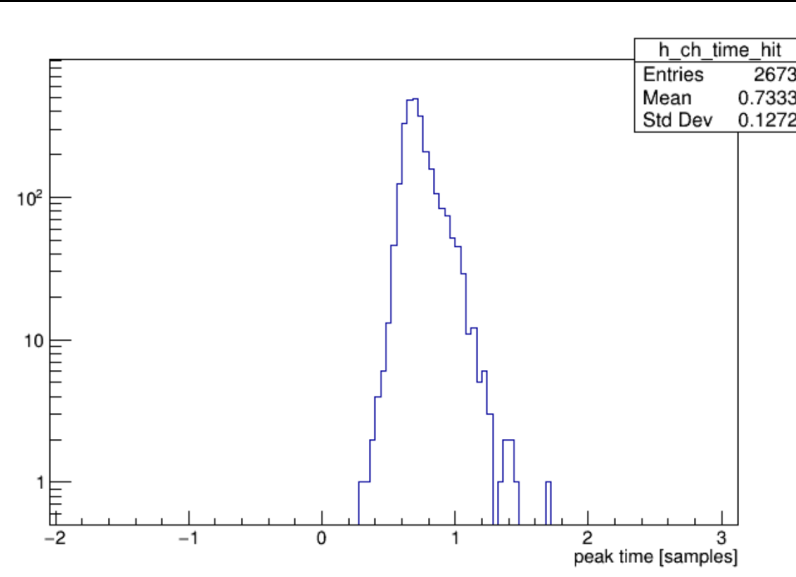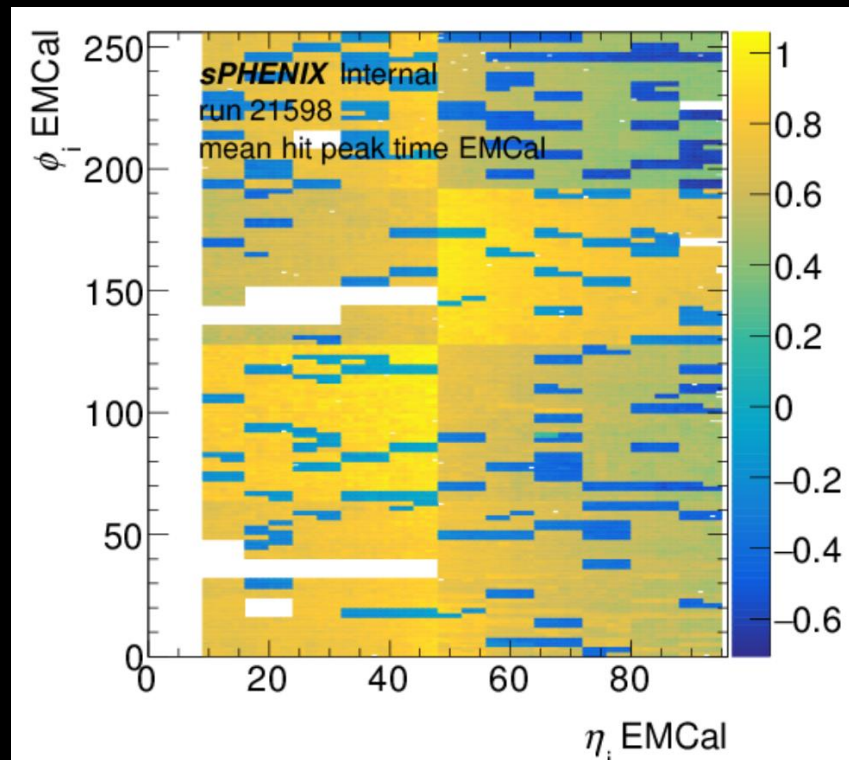
- ➢ **Outer Hcal has significant differences in signal cable length leading to peak time change as a function of eta – much smaller effect in iHCal and EMCal**
- ➢ **Right figures: single OHCal channel (ieta=20 iphi=62) timing distribution for hits (top, ADC > 200) and all events (bottom).**
  - Timing distribution for a single channel seems wider for ourter hcal

Thanks!