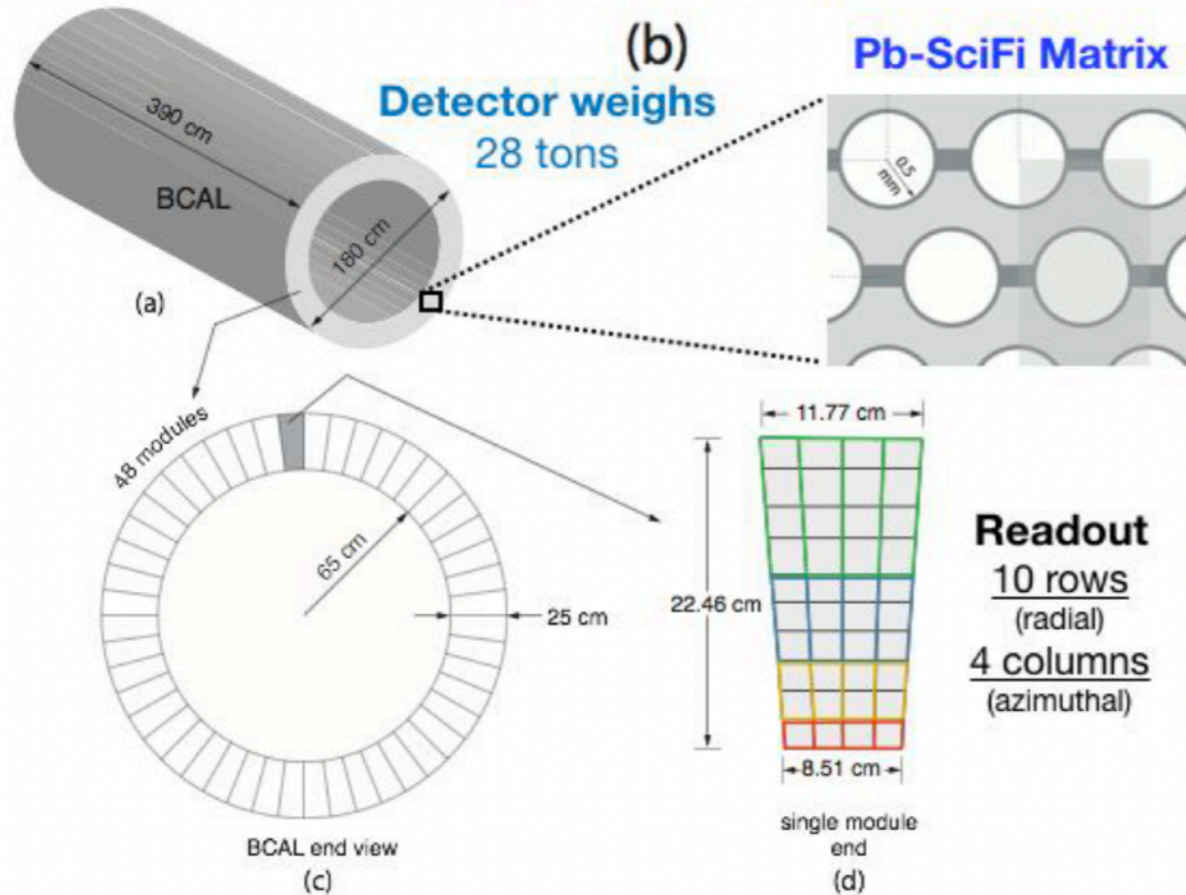
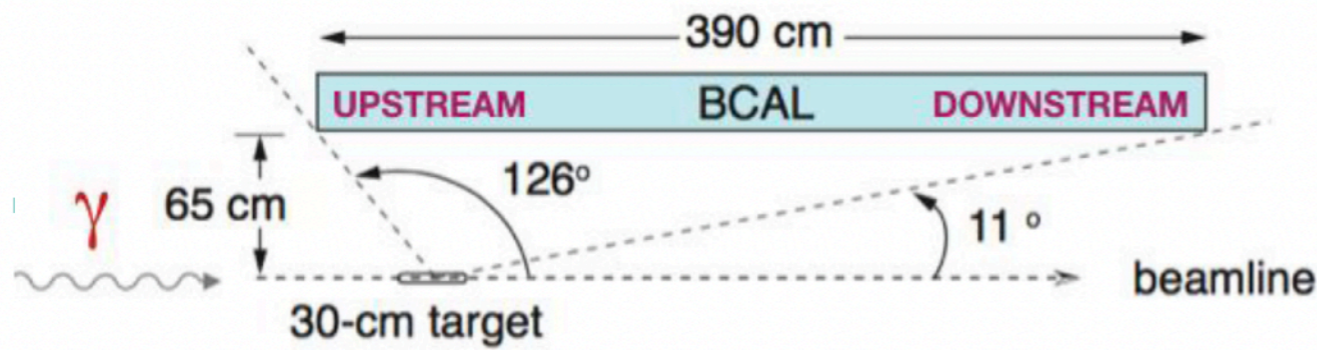


Barrel Calorimeter

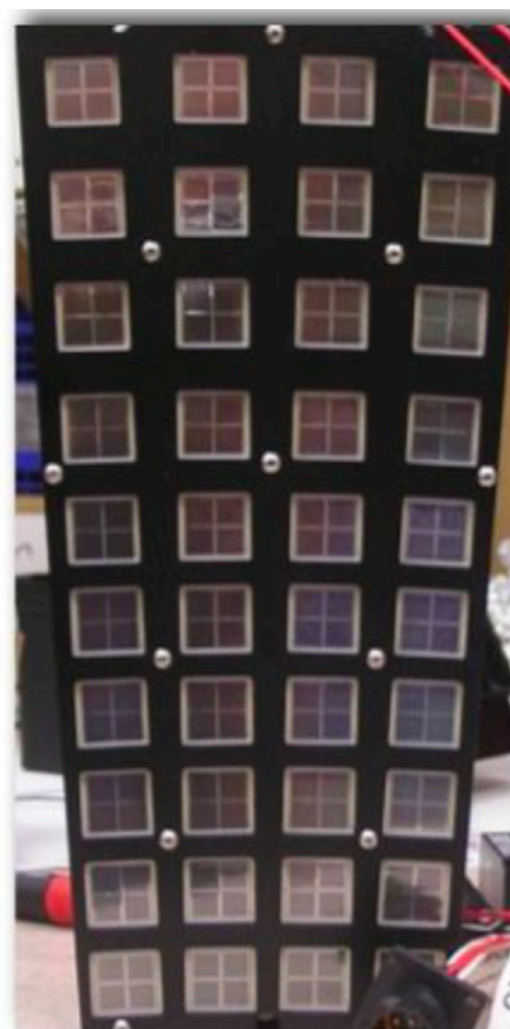
Nov 01/2021



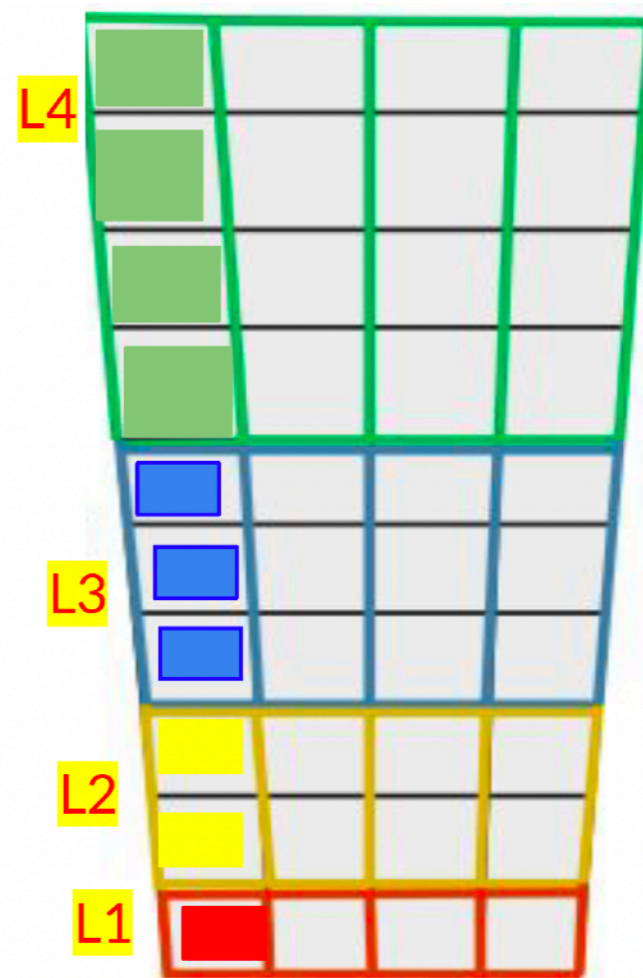
- ❑ 4 m long detector with $r_{<} = 65 \text{ cm}$ and $r_{>} = 90 \text{ cm}$
- ❑ Polar acceptance $12^\circ < \theta < 126^\circ$
- ❑ Segmented into 48 azimuthal modules with each module containing 40 SiPMs. Provides almost 2π coverage
- ❑ 1 module has 185 layers of Pb sheet with 184 layers of double clad scintillating fibres.
- ❑ Total 685000 fibres connected to 3840 SiPMs (Resistant up to 2T) with 1536 readouts



BCAL before inserting into the bore magnet



SiPM attached readout module



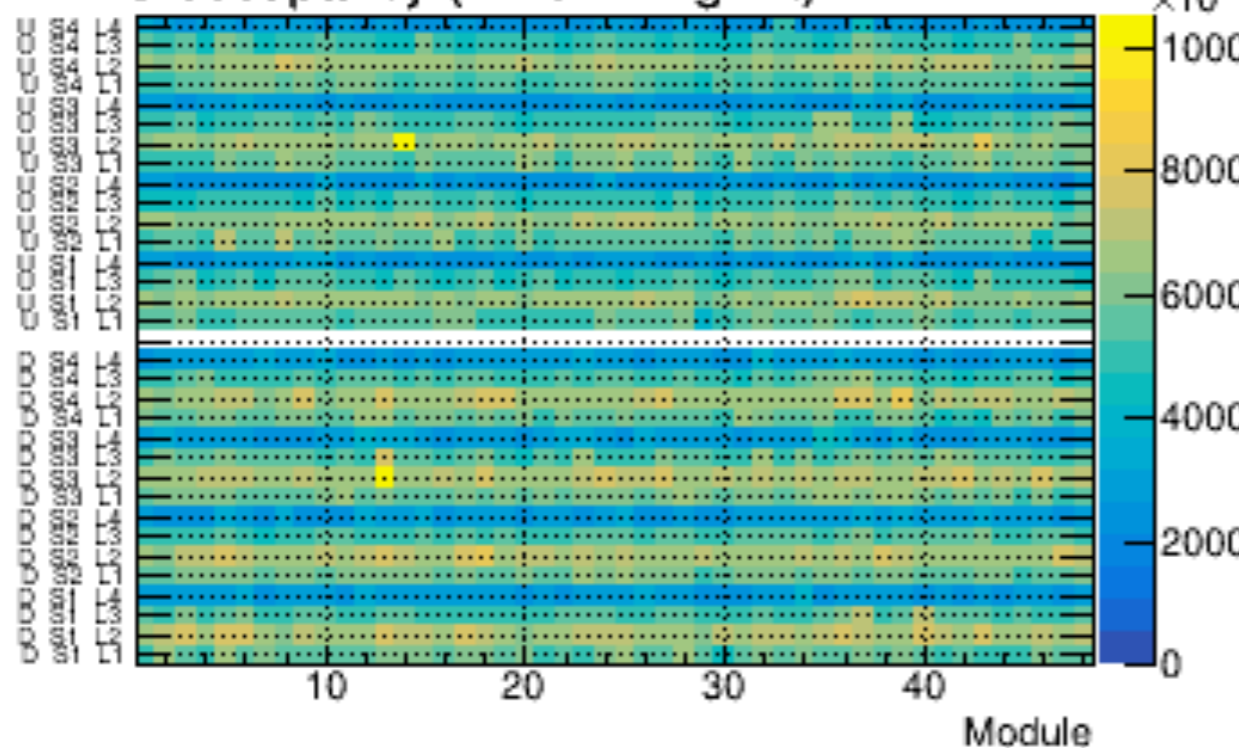
Summing scheme

$$\frac{\sigma(\mathbf{E})}{\sqrt{\mathbf{E}}} = \frac{5.2\%}{\sqrt{\mathbf{E}}} \oplus 3.6\%$$

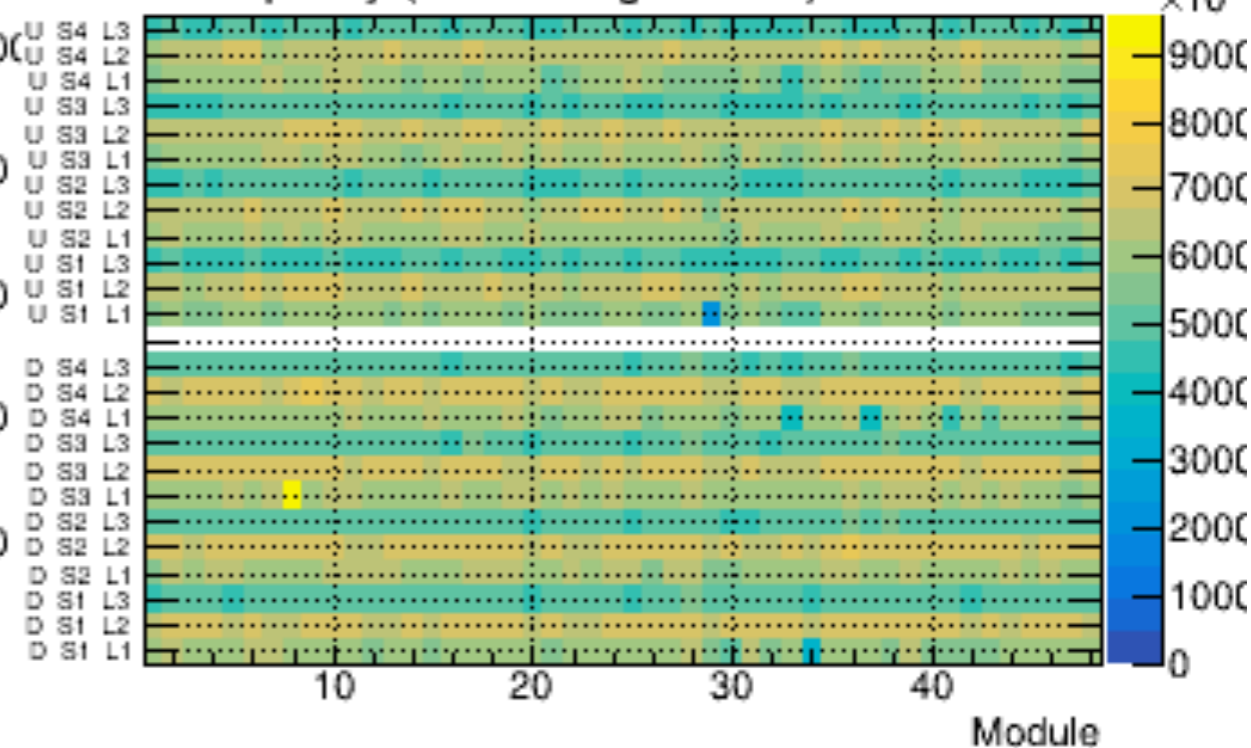
$$\sigma(\mathbf{z}) = 3\text{cm}$$

$$\sigma(t) \approx 200\text{ps @1 GeV}$$

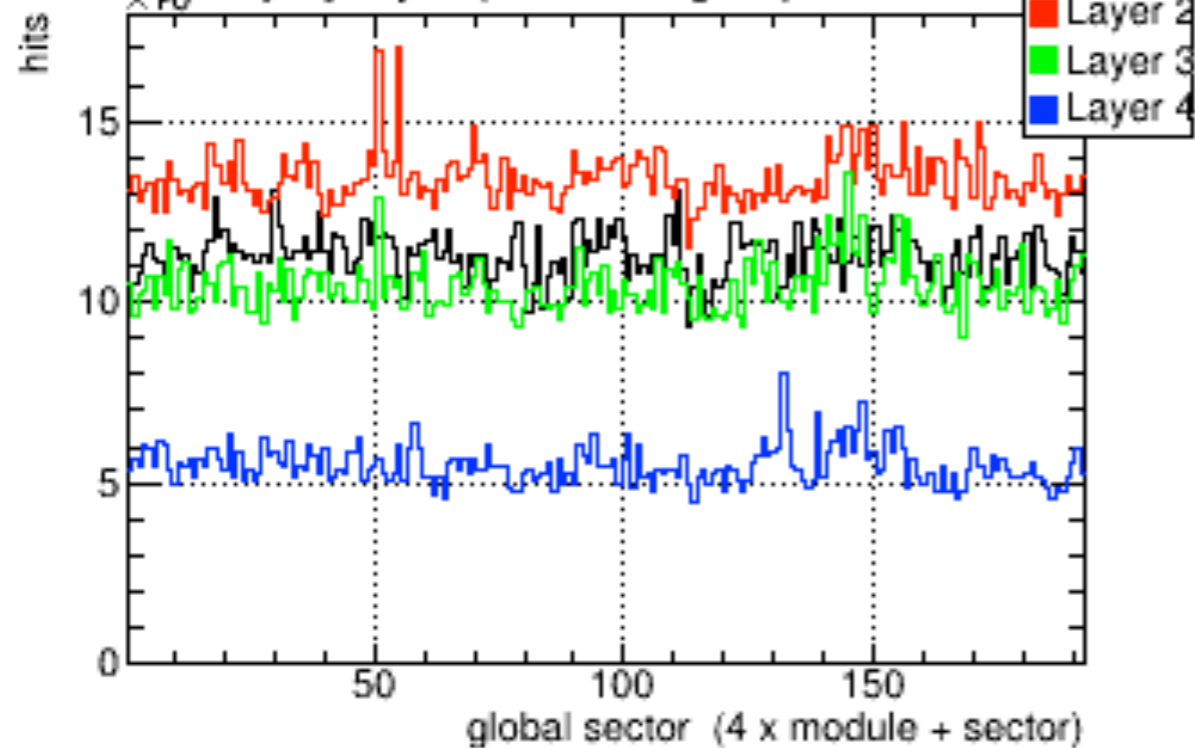
ADC occupancy (DBCALDigiHit)



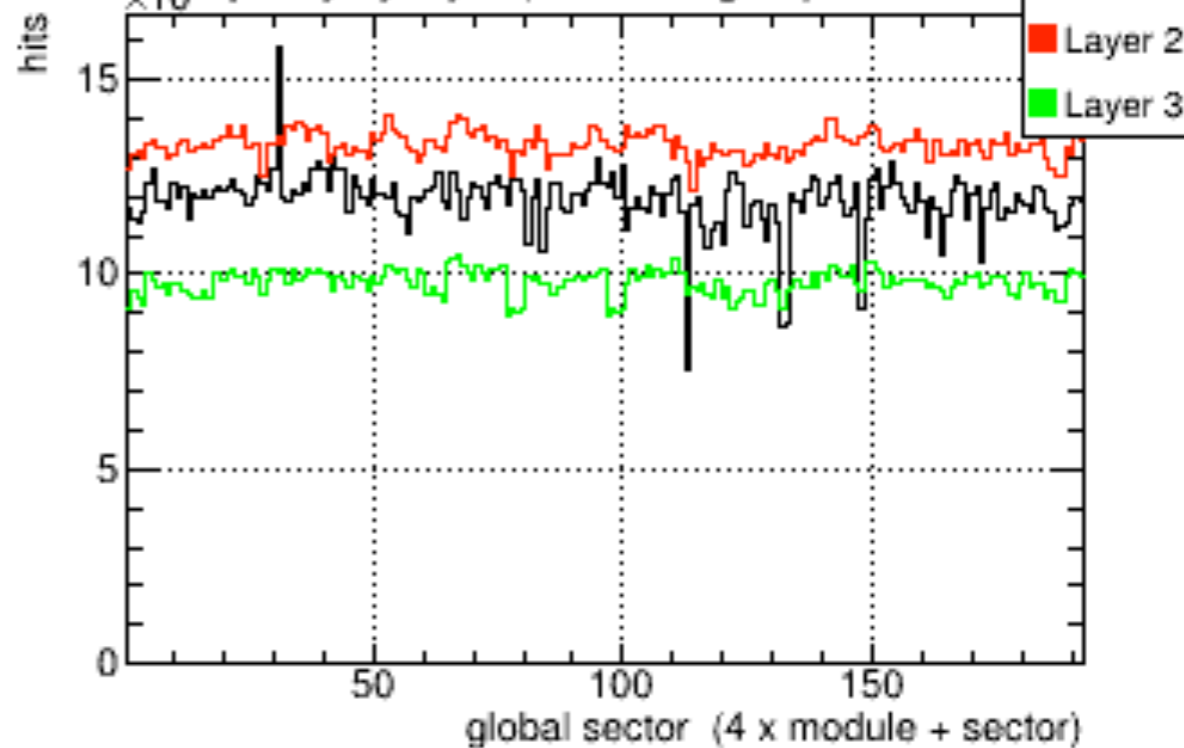
TDC occupancy (DBCALDigiTDCHit)



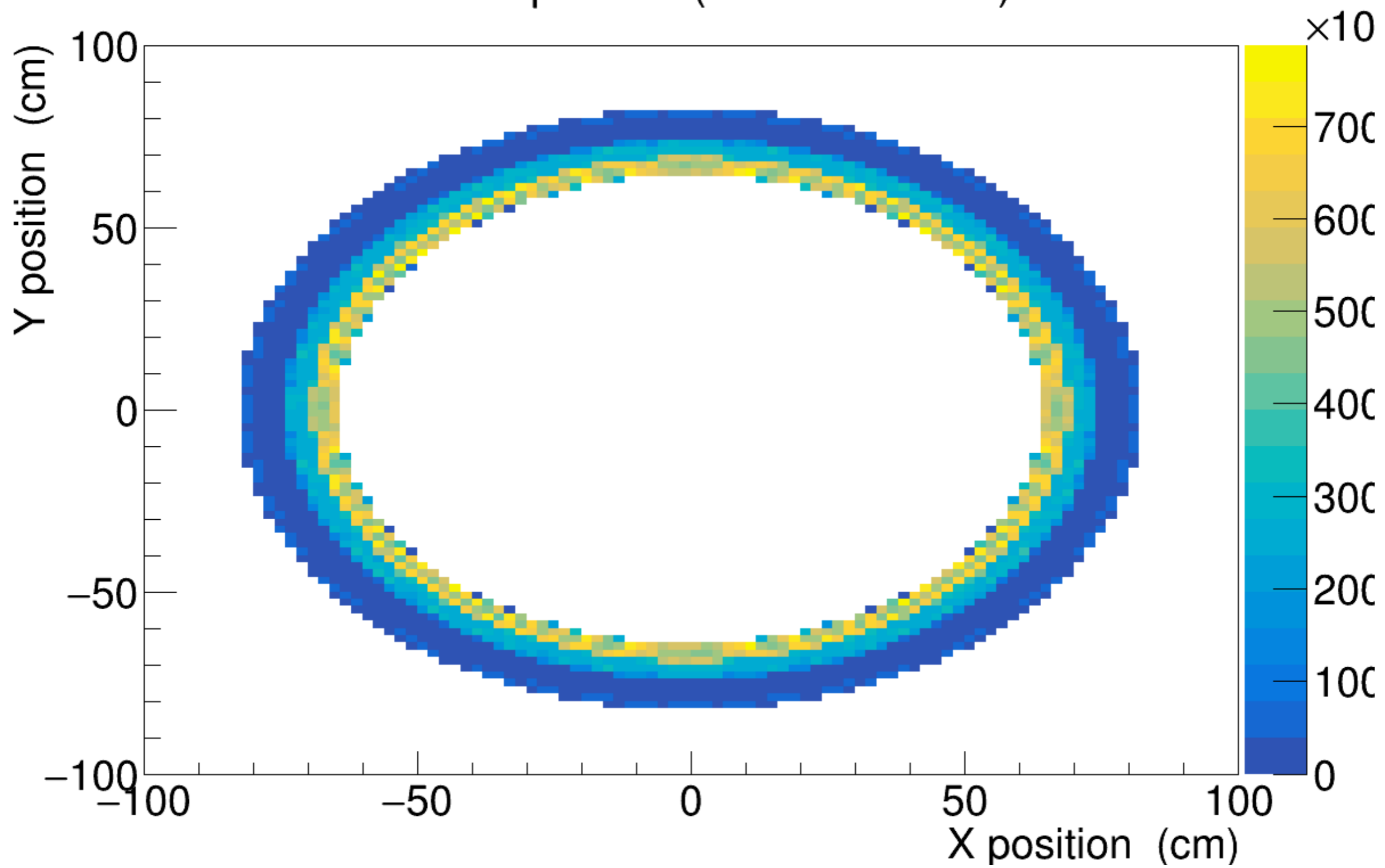
Occupancy by layer (DBCALDigiHit)

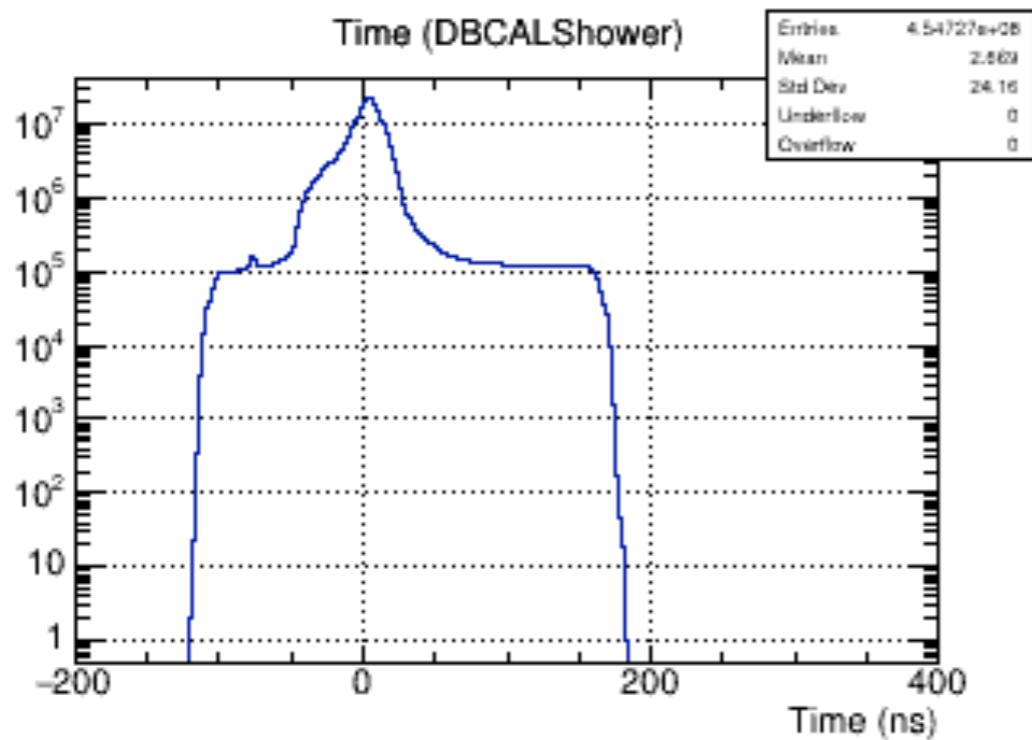
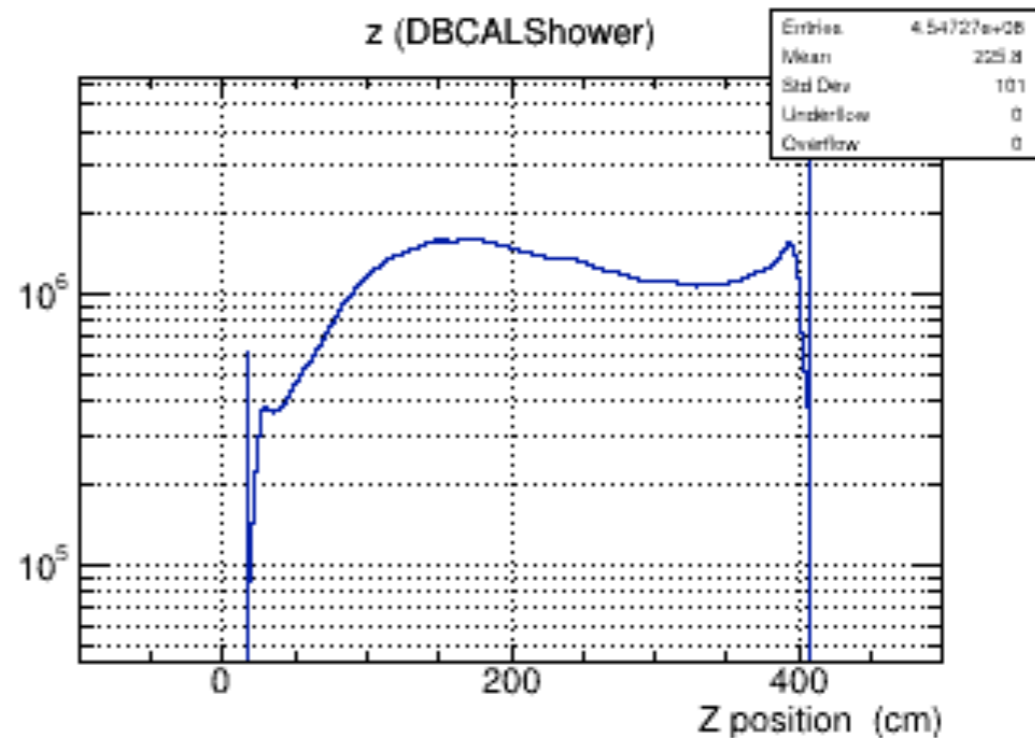
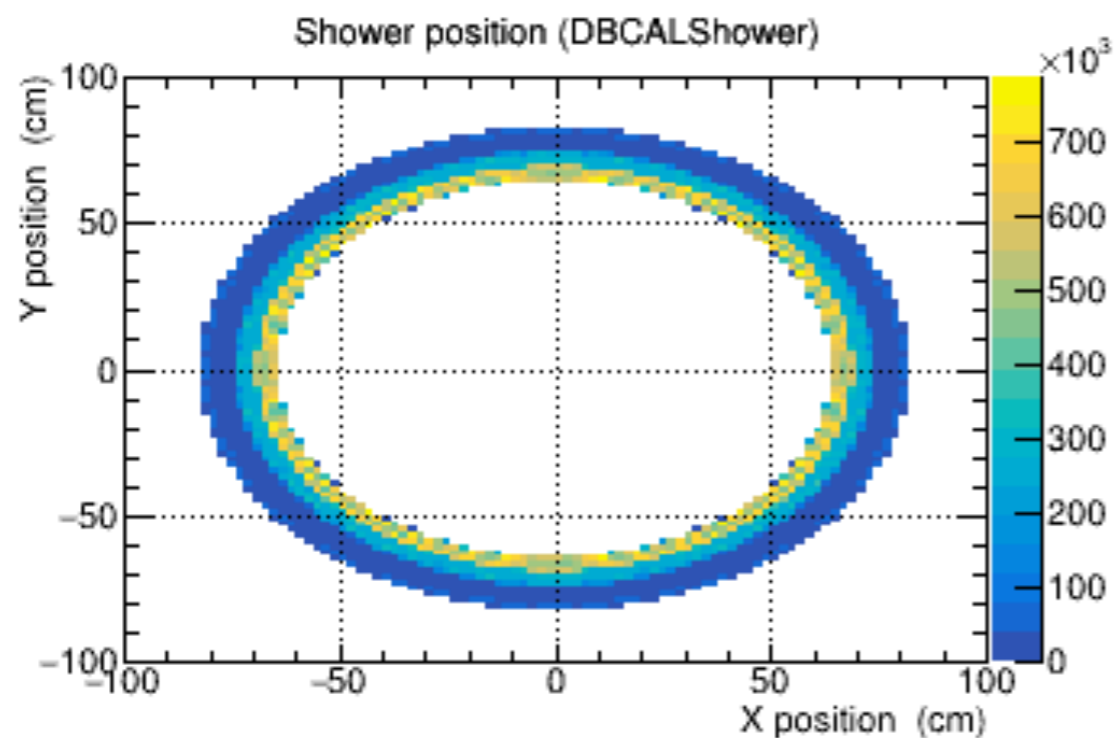


TDC Occupancy by layer (DBCALDigiHit)

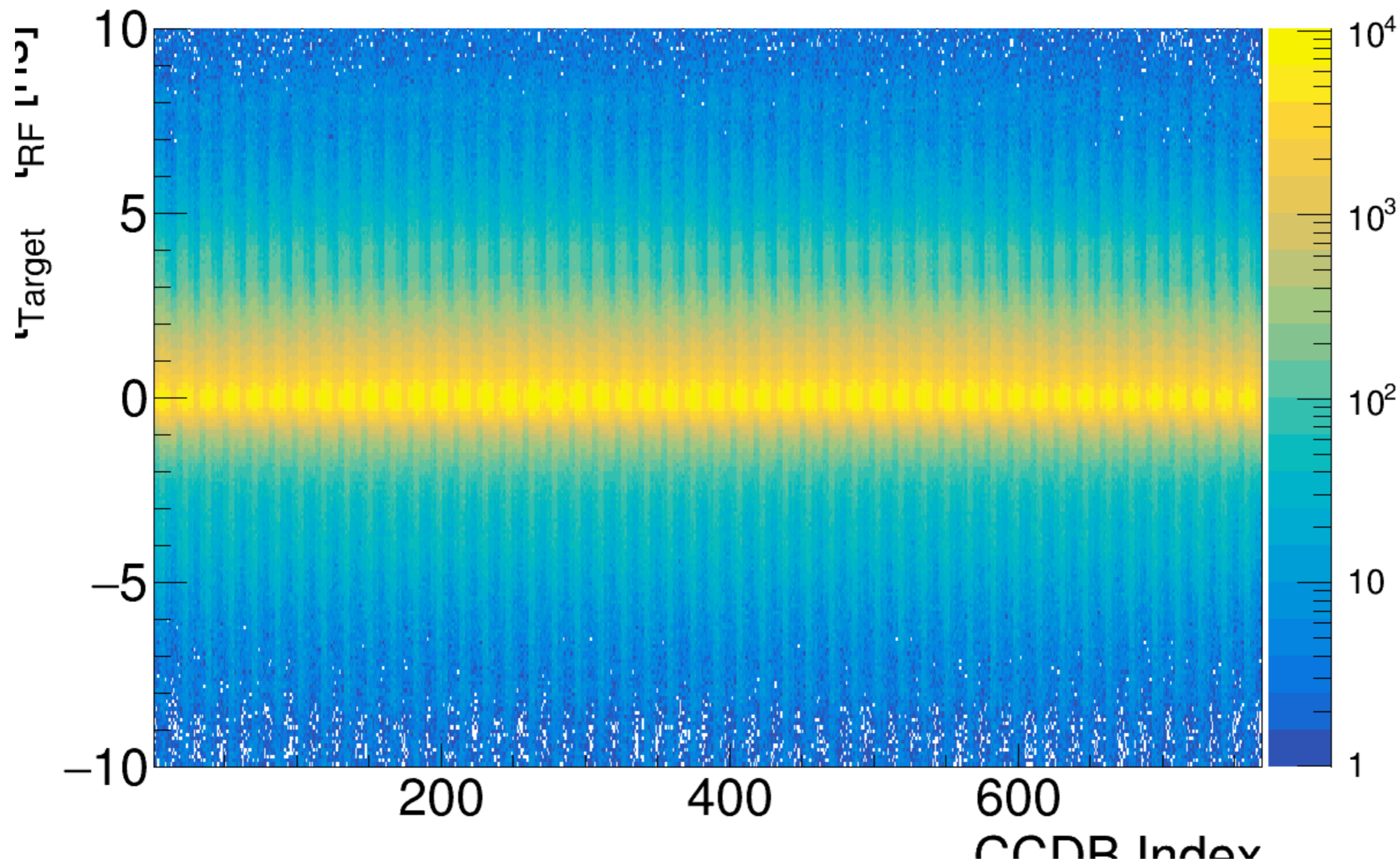


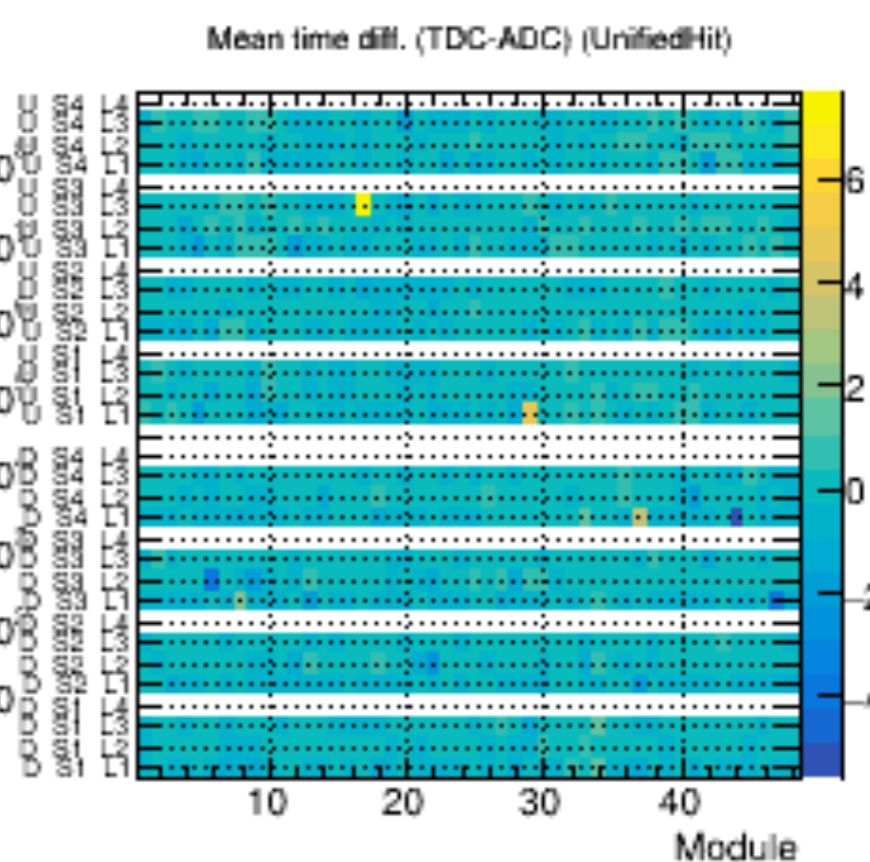
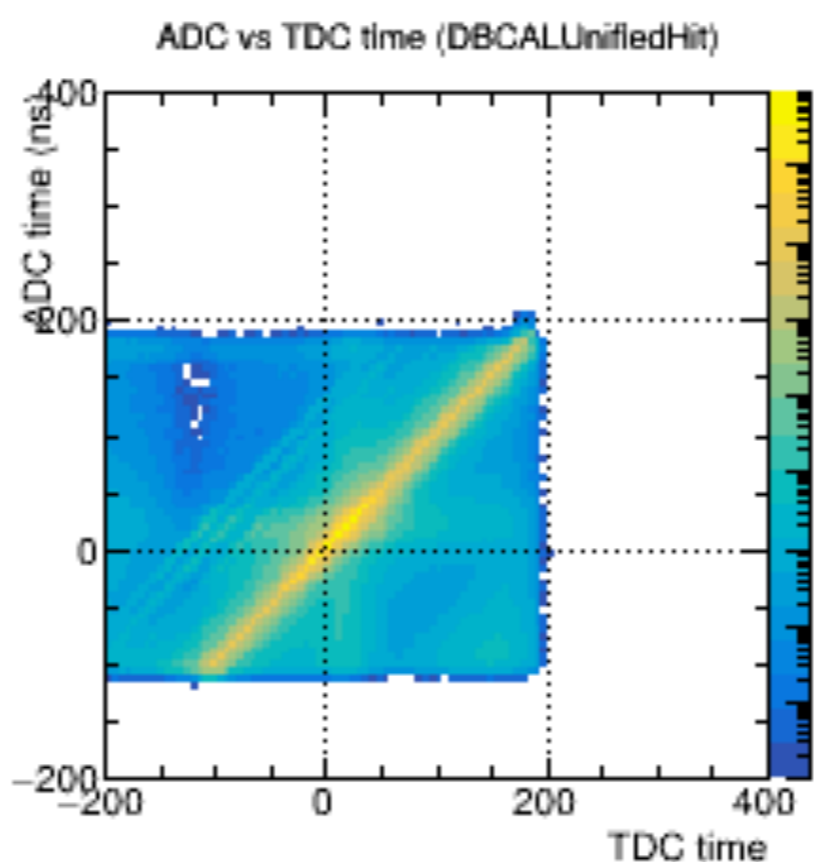
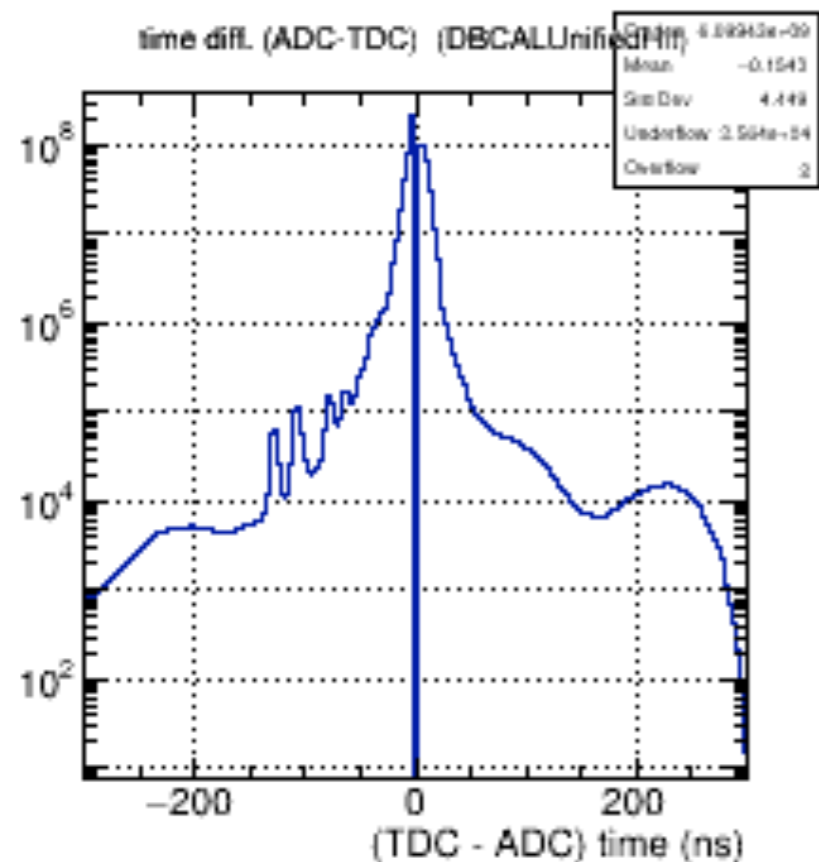
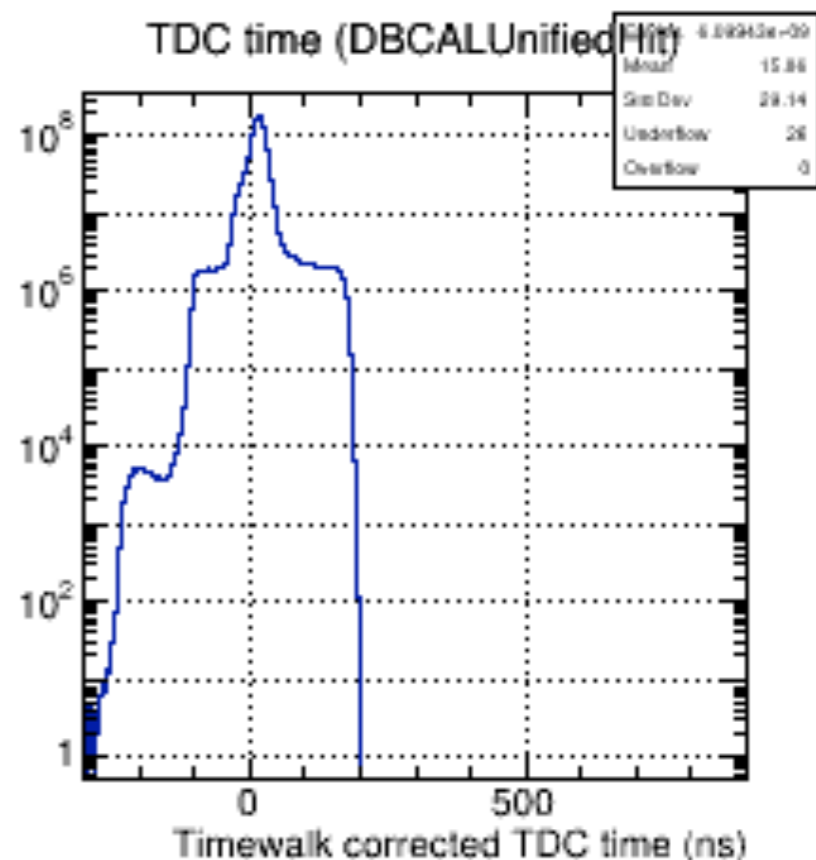
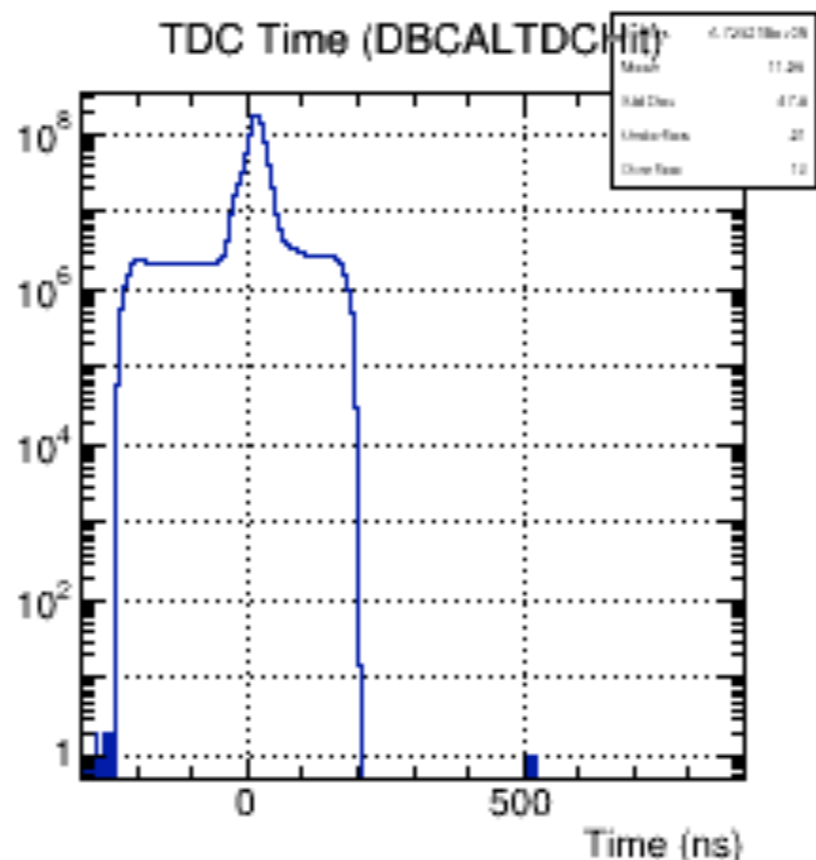
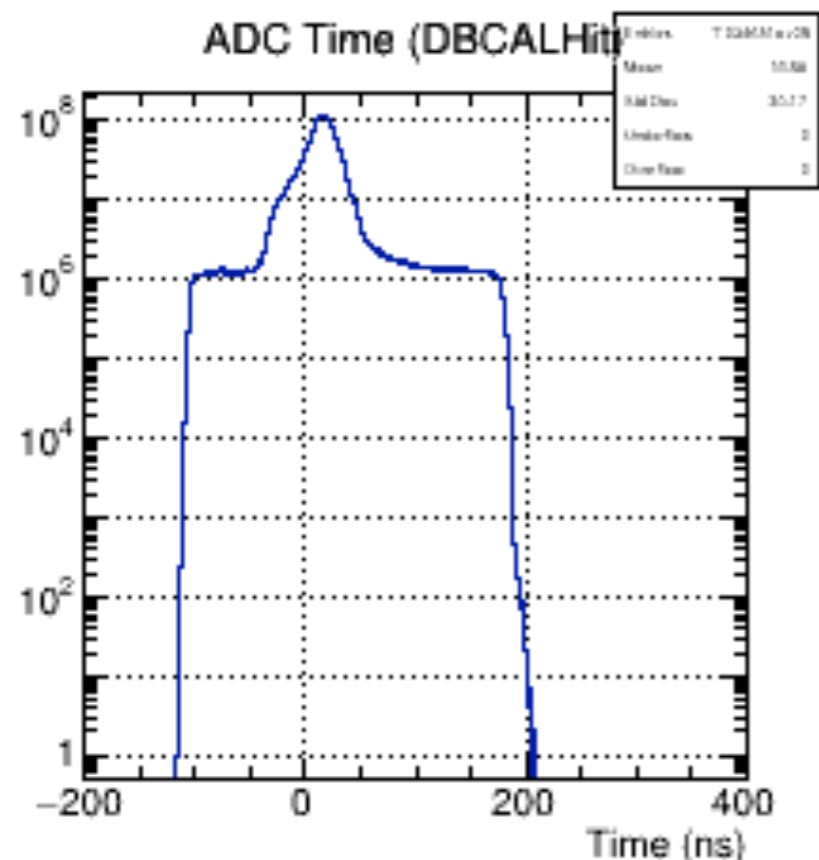
Shower position (DBCALShower)

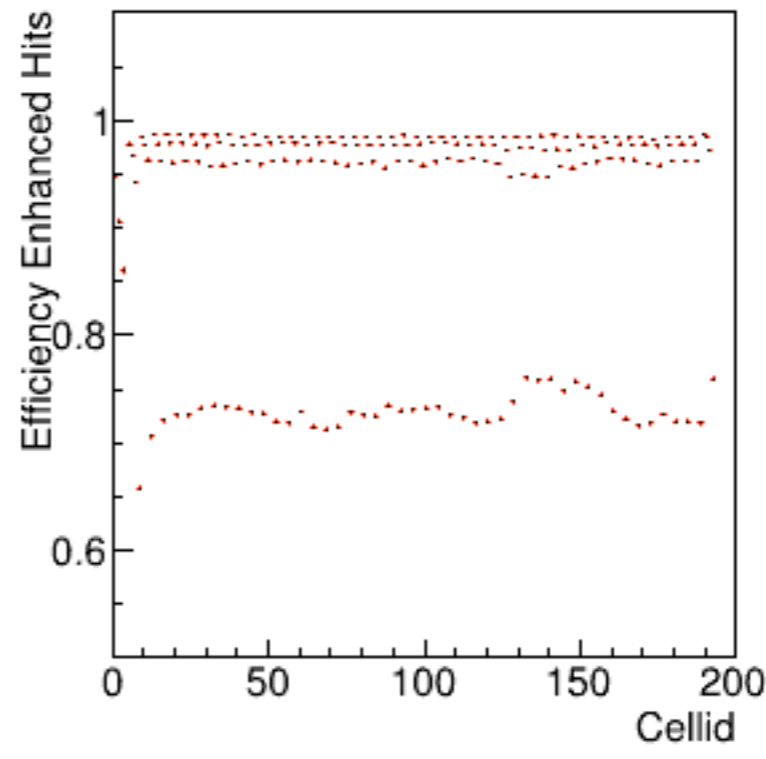
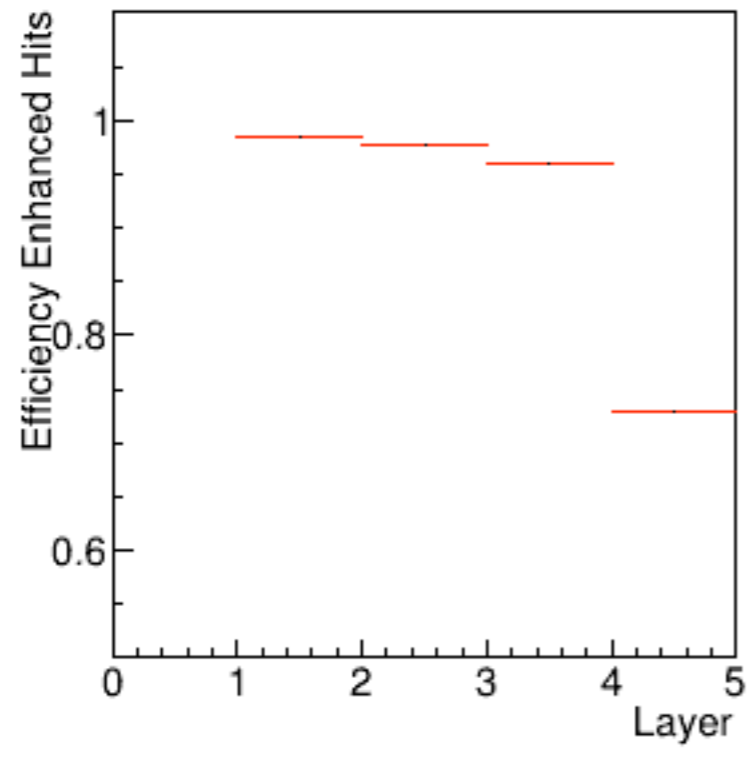
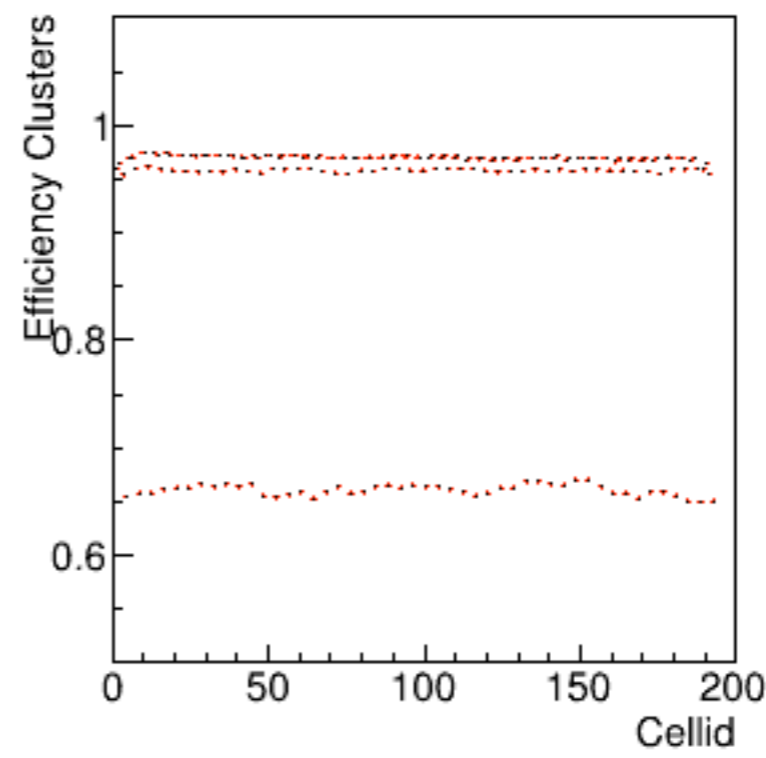
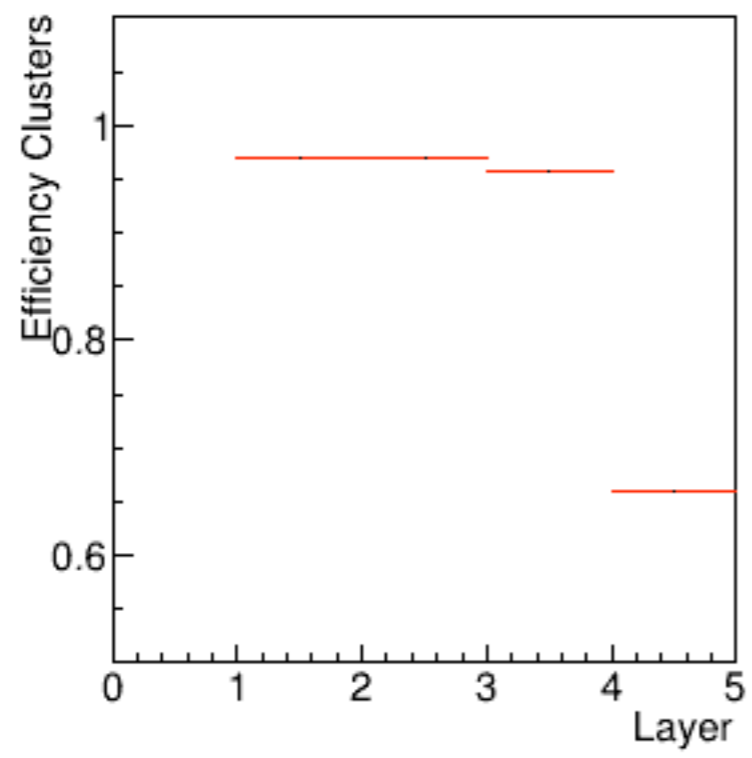


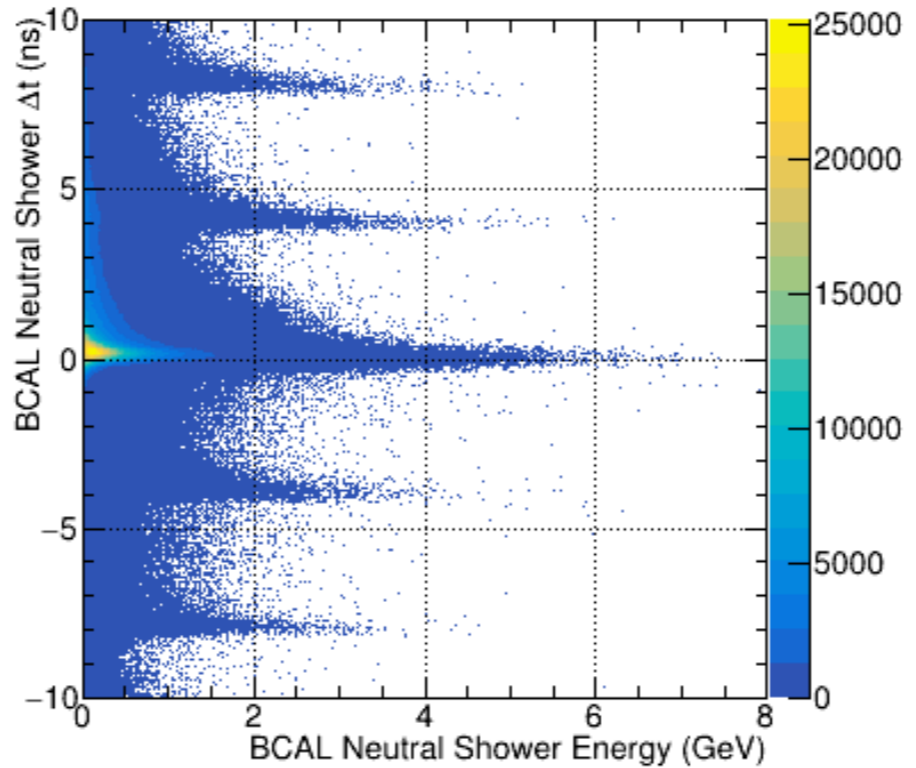
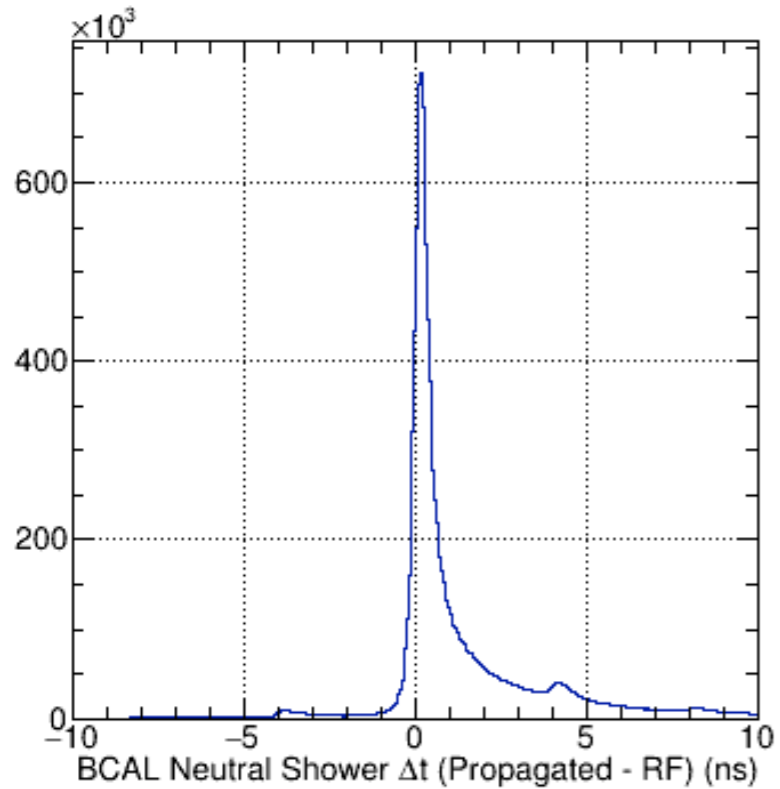
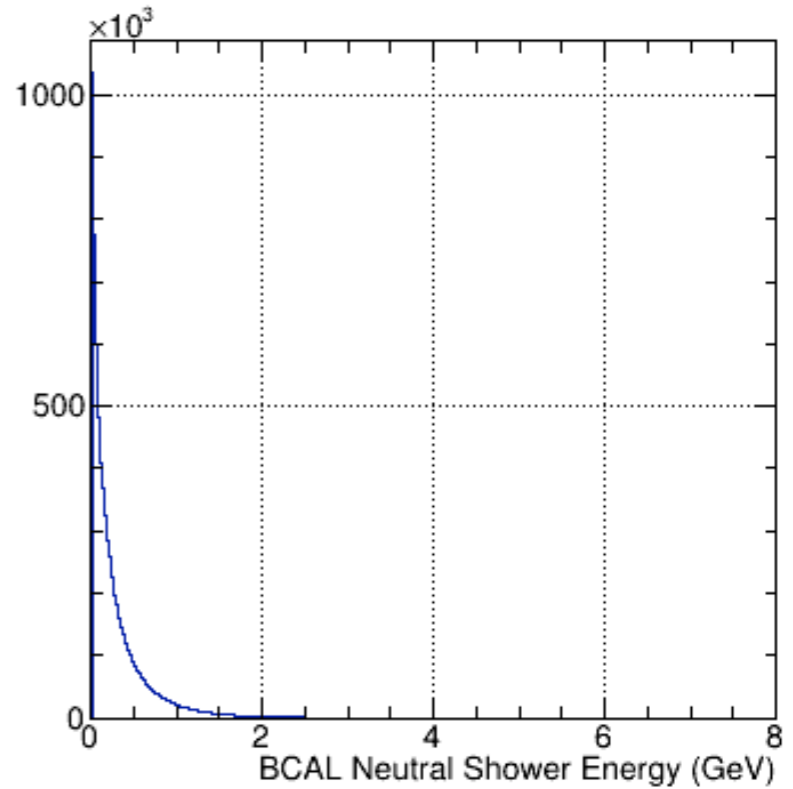
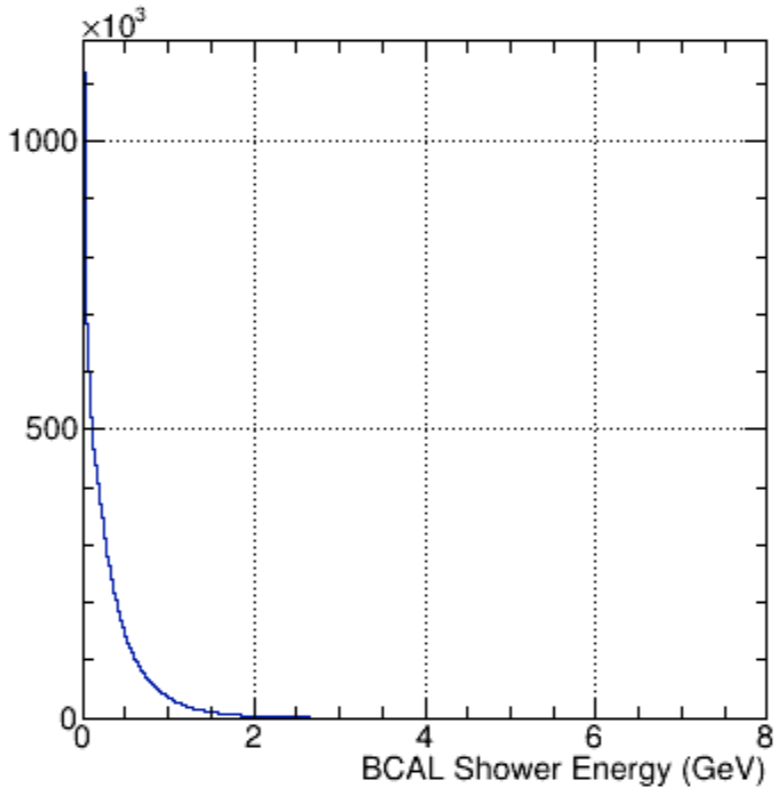
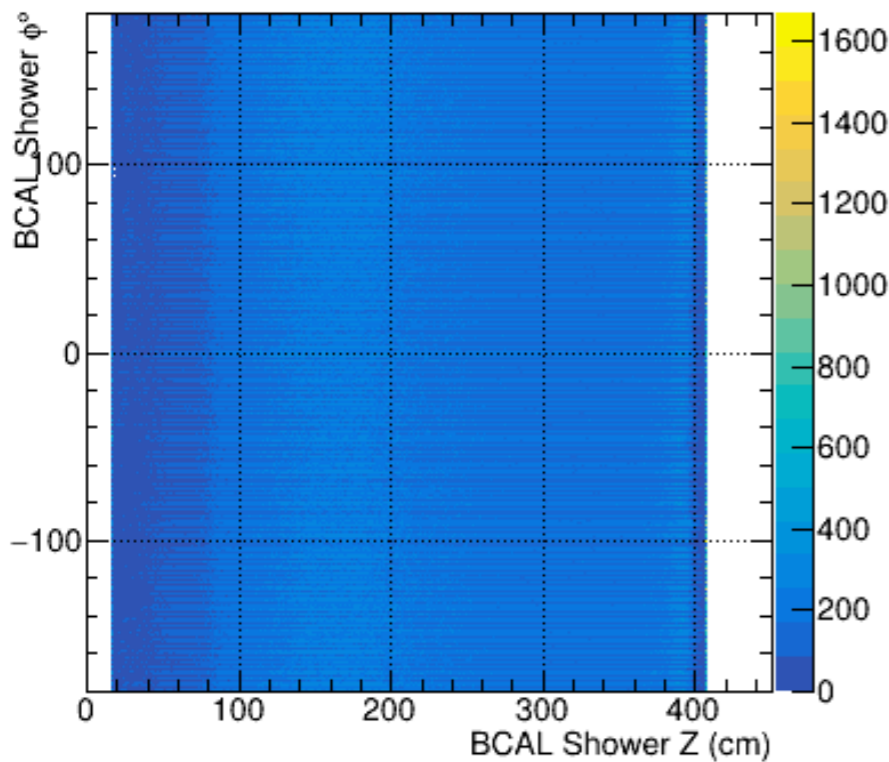


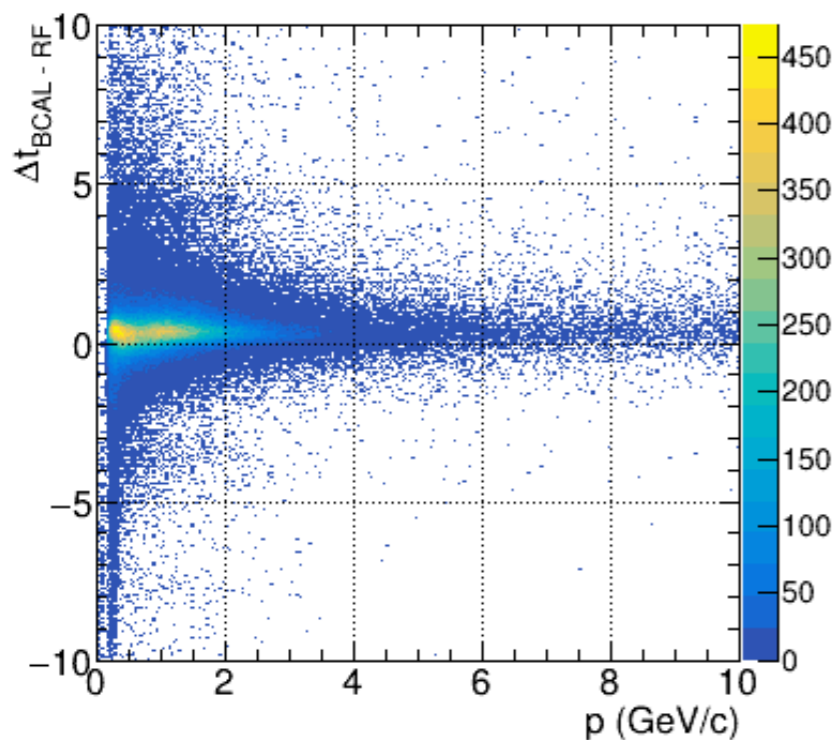
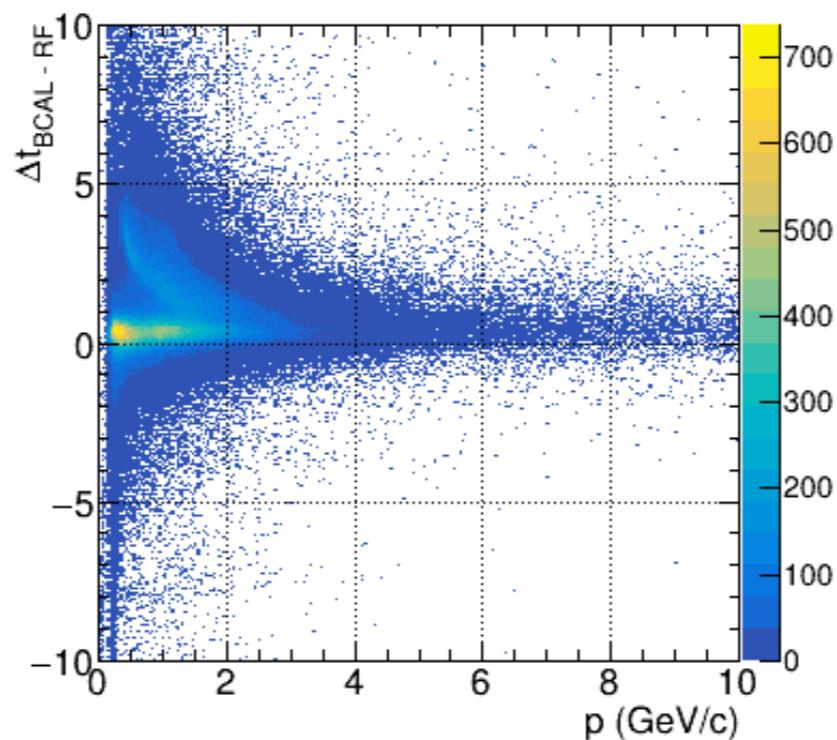
Charged shower points



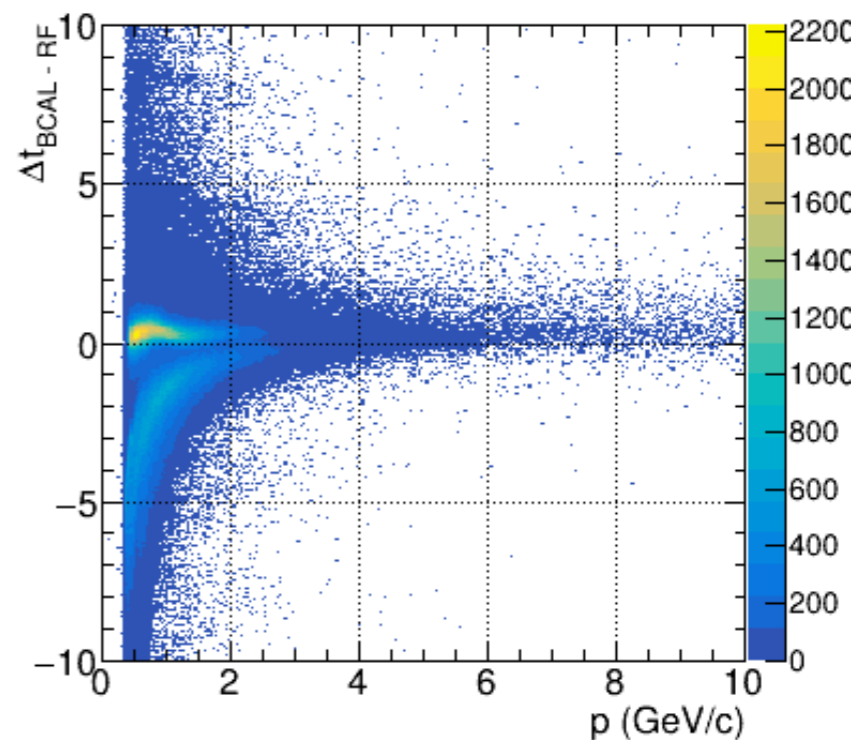
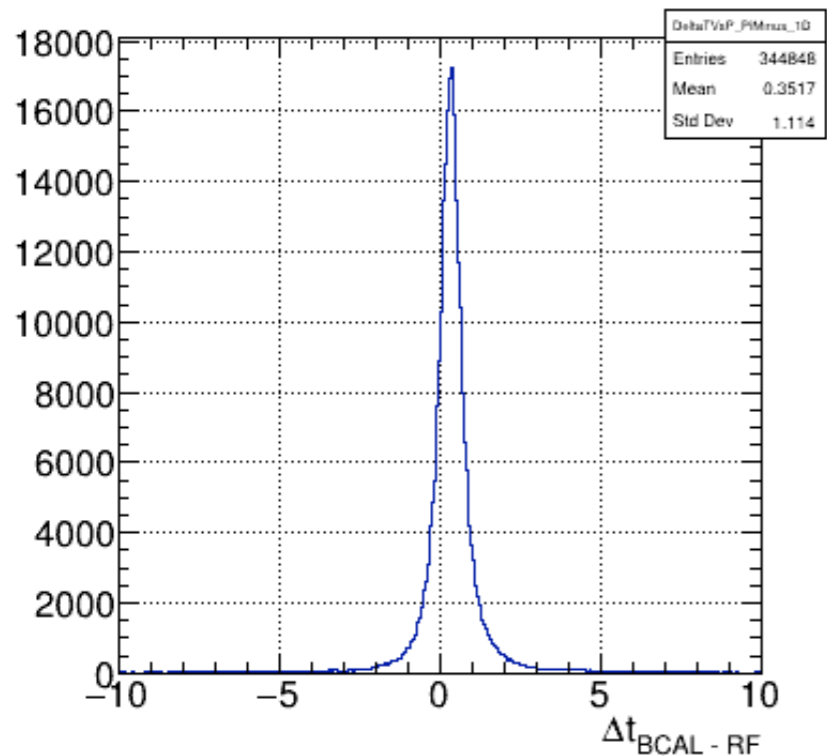
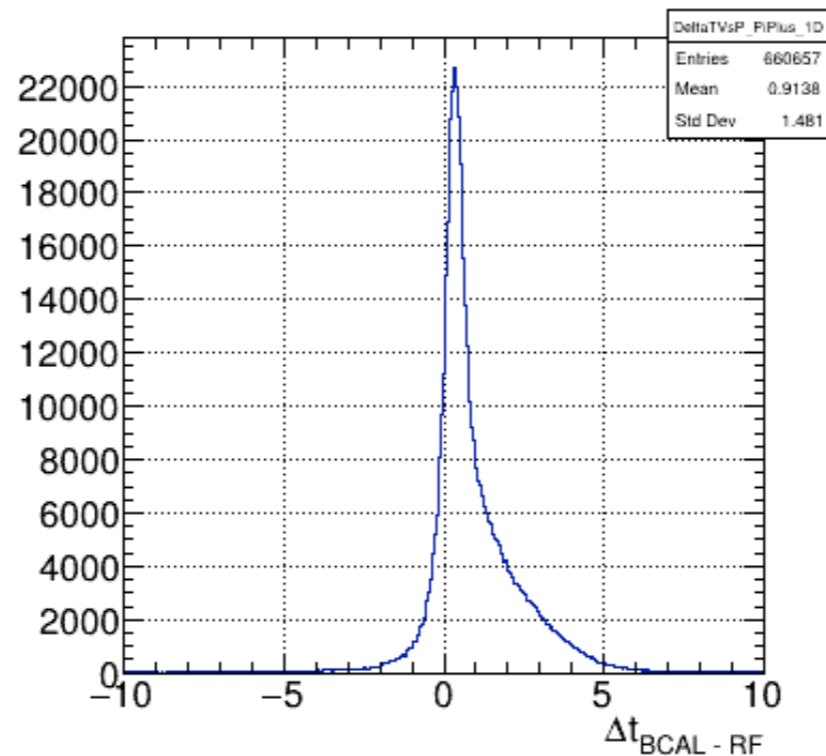




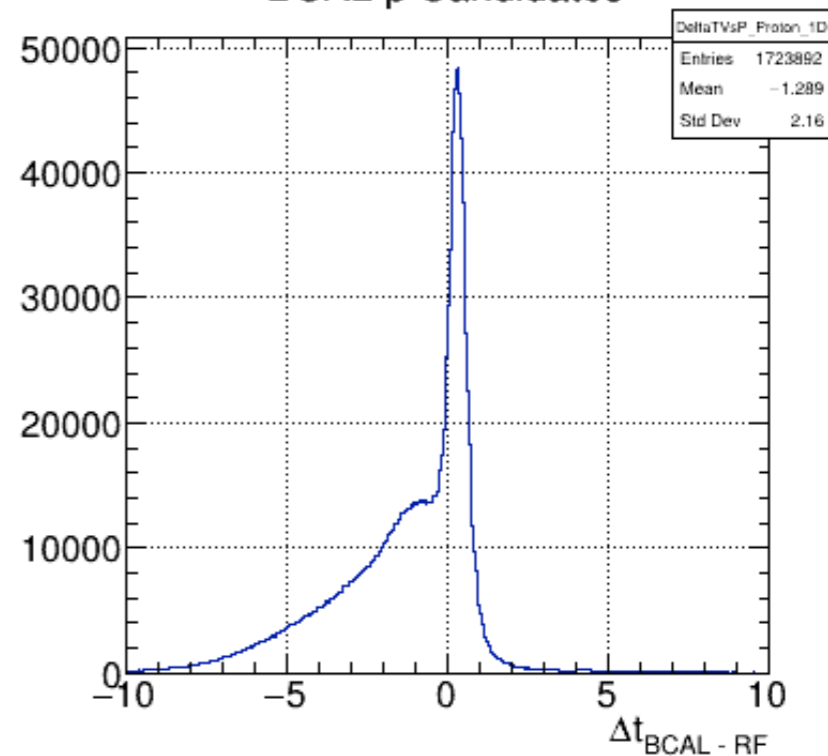


BCAL π^- CandidatesBCAL π^+ Candidates

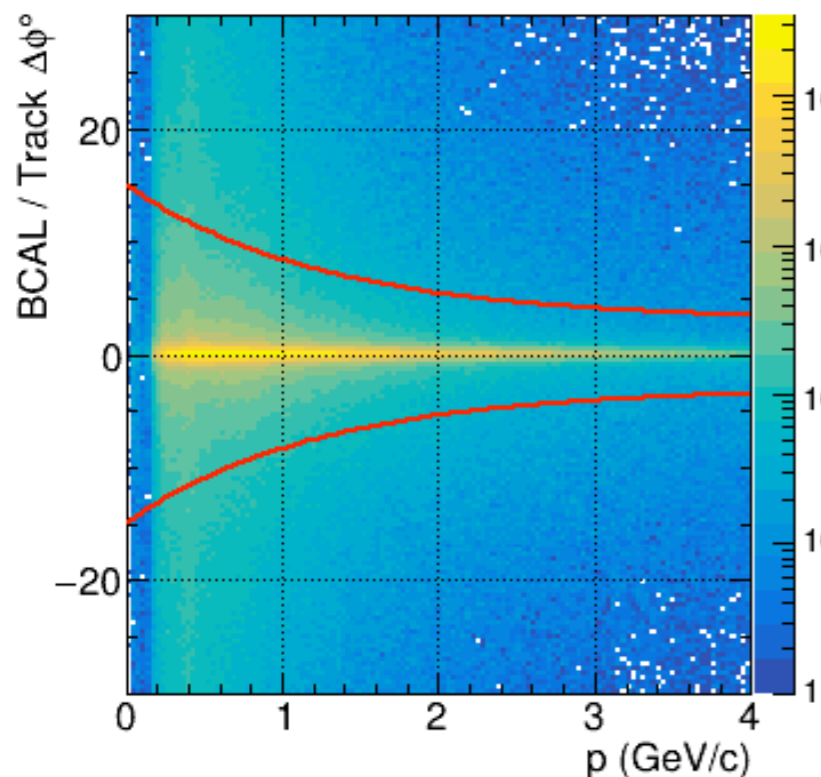
BCAL p Candidates

BCAL π^- CandidatesBCAL π^+ Candidates

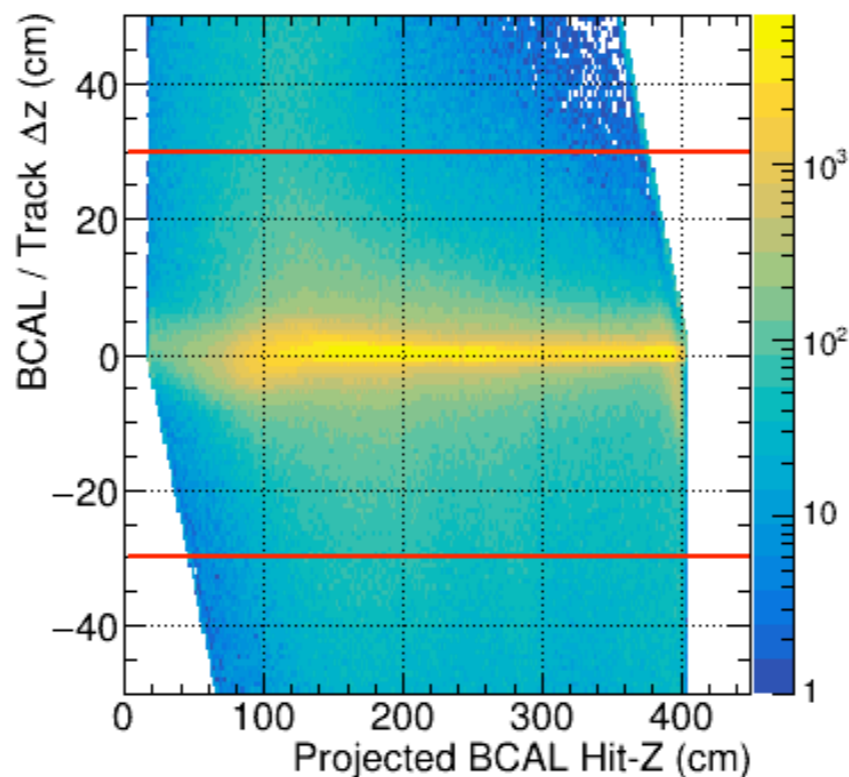
BCAL p Candidates



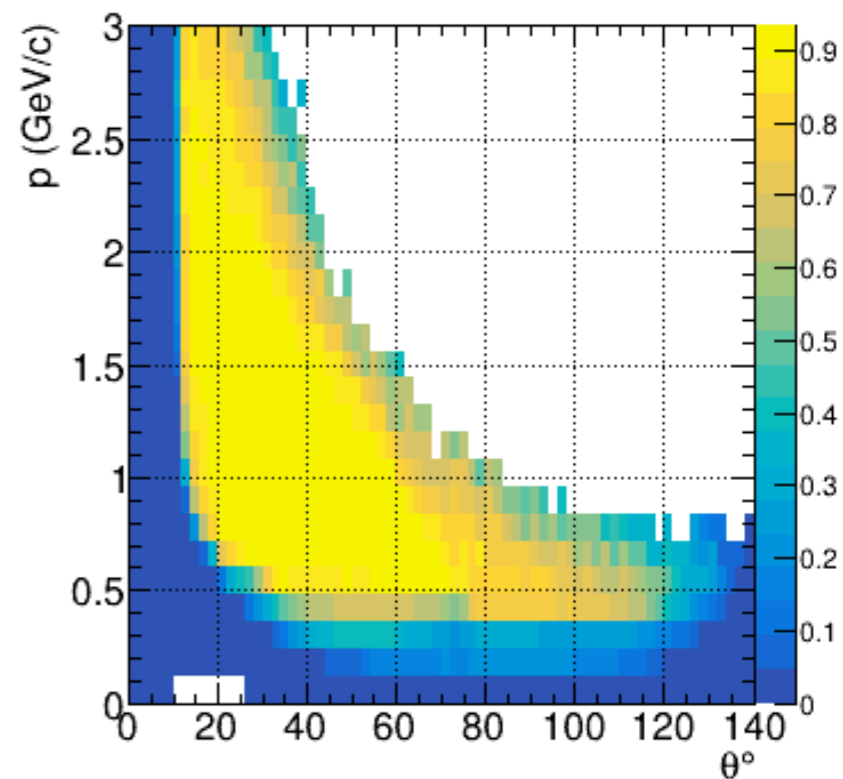
Time-Based Tracks



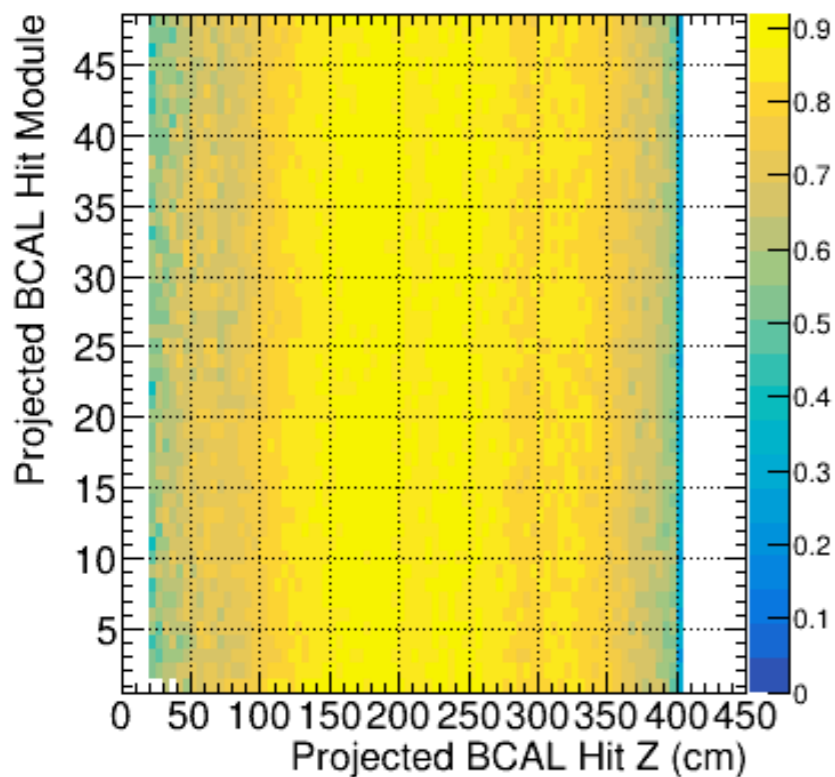
Time-Based Tracks



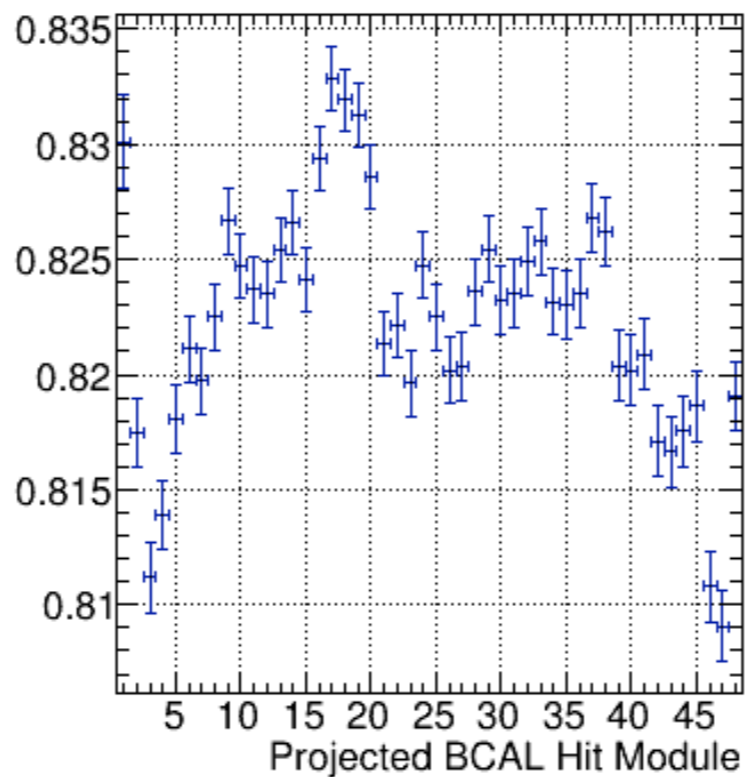
Track / BCAL Match Rate



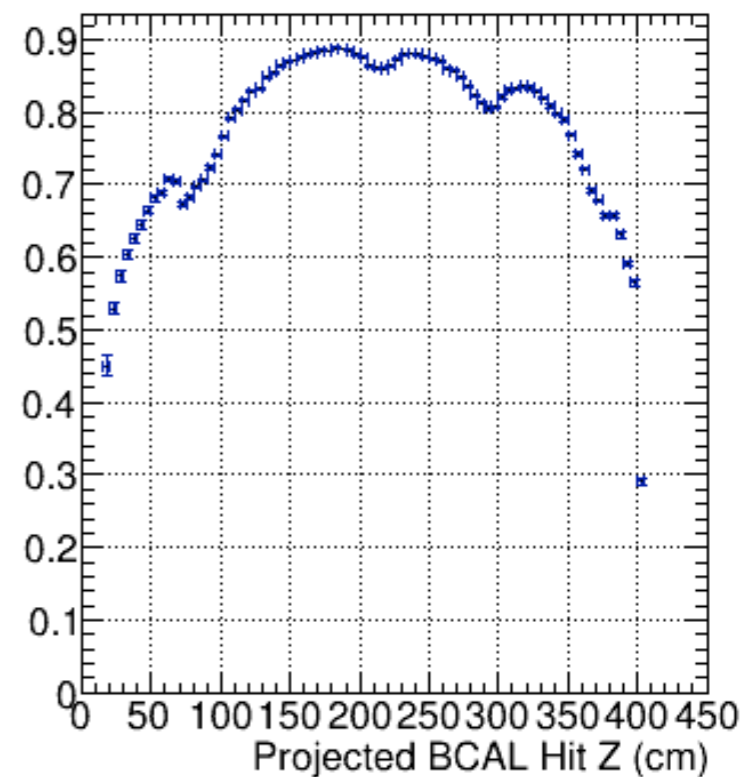
Track / BCAL Match Rate



Track / BCAL Match Rate




Track / BCAL Match Rate



Experts

Name	Extension
On call	757-354-9399
Elton Smith	269-7625
Mark Dalton	269-6931

Calibration

BCAL	Timing/z-position/gain ratios	Mark Dalton
BCAL	gains/non-linearities	Regina group 

- The calibration is done after the CDC calibration is finalized.
- The detector has been stable over the previous data runs and the calibration is not expected to change.
- Current calibration in the data base should be good enough for monitoring.