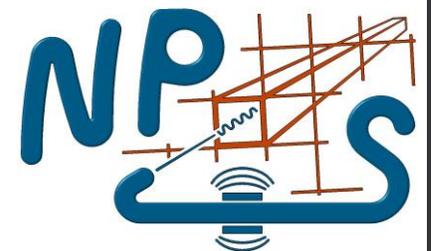


Electron PID

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Electron Identification

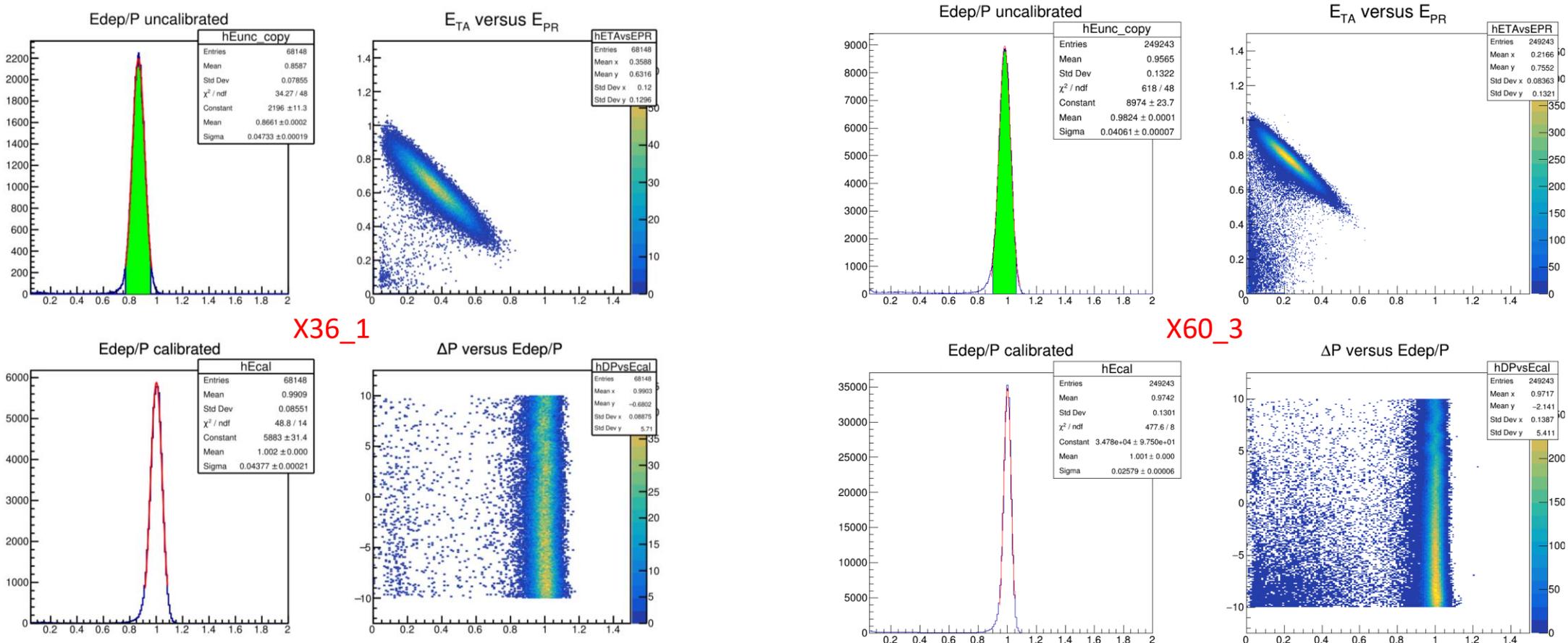
- Particle identification in the HMS is accomplished using the Cherenkov detector and calorimeter
- Both detectors need to be calibrated and their electron detection efficiencies studied
- The calorimeter PMT HVs were adjusted to have uniform signal amplitudes
- PMTs gain varies vertically from particles of higher momentum hitting the bottom of the calorimeter and vice versa
- Calibration is needed to correct for this variation in gains

Calorimeter Calibration Status

- Using the original timing windows and reference times set in September, I've ran the calibration scripts for just a few kinematics on LH2:
 - X36_1 ,
 - X60_1 , X60_2 , X60_3a , X60_3b
- Made bash script to run calibration for all kinematics on the farm. (need to make a runlist first)
- Need to verify from Avnish/Yaopeng which kinematics have had their timing windows and reference times check/changed.

Calorimeter Calibrations

- So far already looks pretty good. E/P around 1 for electrons
 - A run from May 12th for X36_1 had a shift in E/P. Need to check other kinematics from that time period
- The normalized shower vs preshower distribution shows the e vs π^0 distinction
- δ dependence shows electron energy deposited is uniform across vertical acceptance



Planned Work on PID

- Complete the Cherenkov calibrations.
- Set a cut on the Cherenkov NPE, then vary cuts on calorimeter E/P and calculate the calorimeter electron detection efficiency as a function of these cuts.
- In a similar manner, use cuts on the “preshower vs normalized energy deposited” in the calorimeter to calculate Cherenkov electron efficiency?
- Any other things to look at?