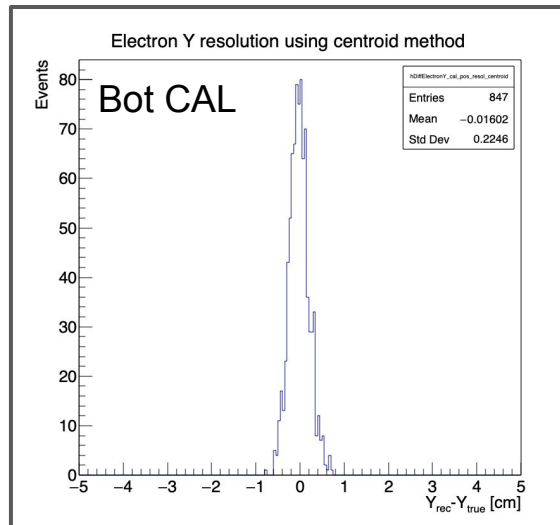
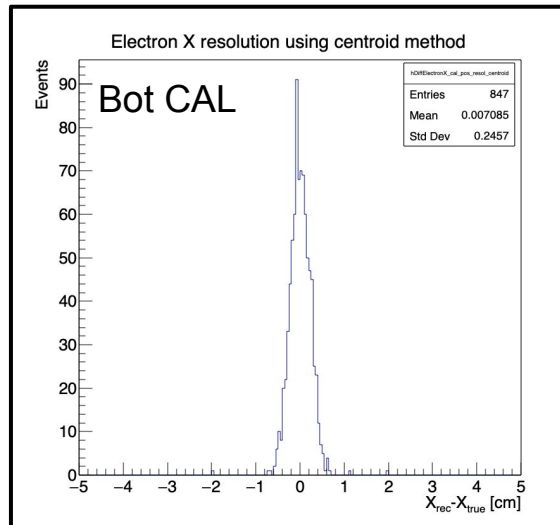
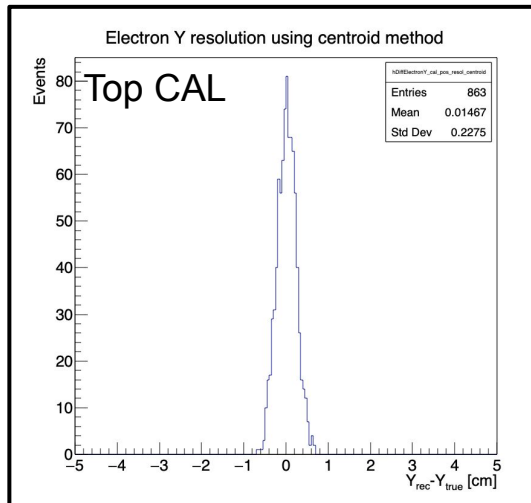
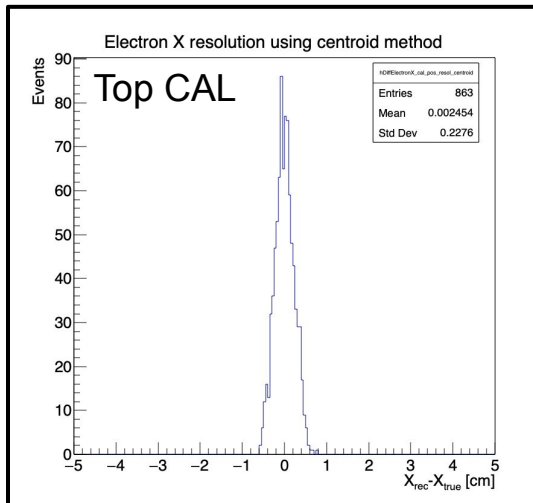


07-23-26 Update

- a. Previously, study of acceptance with Pair Spectrometer
- b. Focus on Photon Position Resolution with Pair Spectrometer
 - i. These two contributed significantly in ZEUS systematics.
 - ii. The x-y photon resolution differ significantly - why ?

Standalone PSCAL Position Resolution

- Electron gun positioned in front of CAL, randomly in x-y plane.
- CASE 1 : ($\theta = \text{rnd}$ and $\varphi = \text{rnd}$) i.e, **gun at random in xyz solid angle**

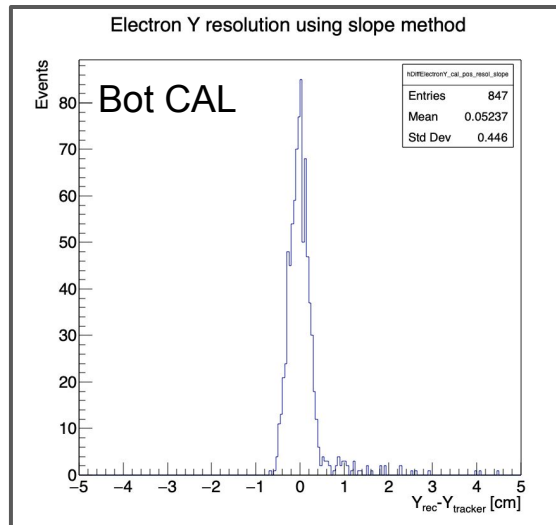
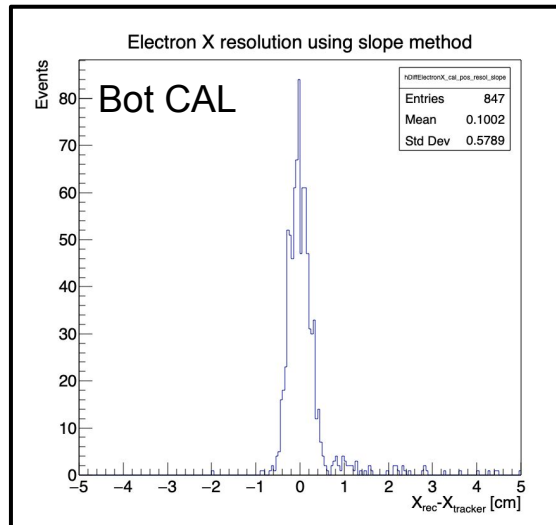
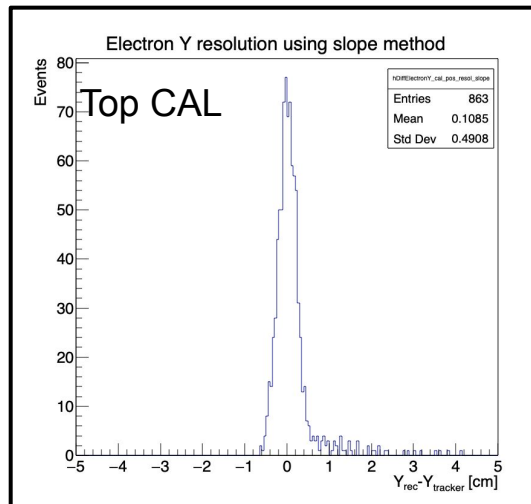
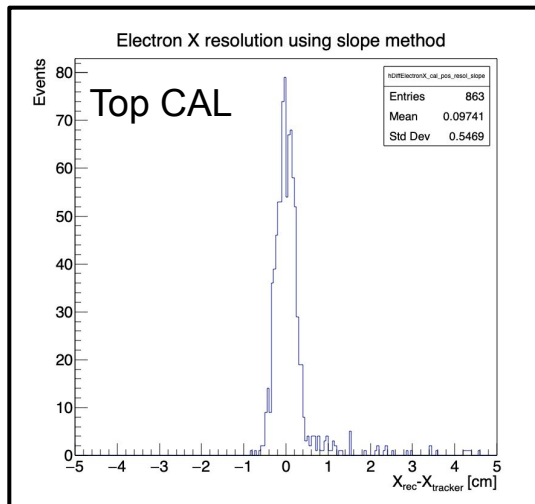


- The tracker in front of the CAL was used as a proxy for the true CAL hit location.
- The difference between this position and the CAL centroid is plotted.
- The centroid was calculated using a logarithmic weighting method.
- The x- and y-centroid position resolutions are the same for the top and bottom CALs.

* θ Uniform[180 - 2.5, 180 + 2.5] , φ Uniform [-180 , 180]

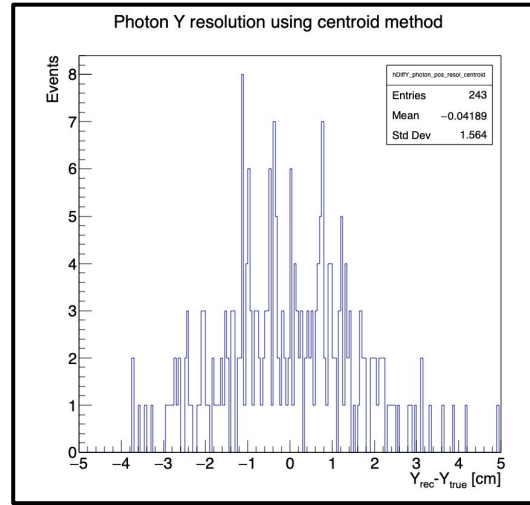
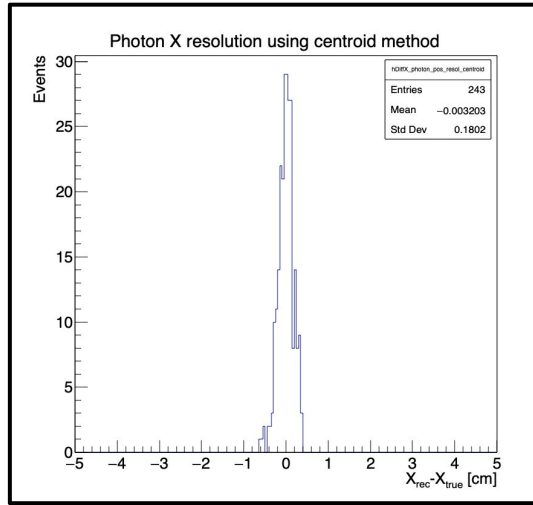
Standalone PSCAL Position Resolution

- Electron gun positioned in front of CAL, randomly in x-y plane.
- CASE 1 : ($\theta = \text{rnd}$ and $\varphi = \text{rnd}$) i.e, **gun at random in xyz solid angle**

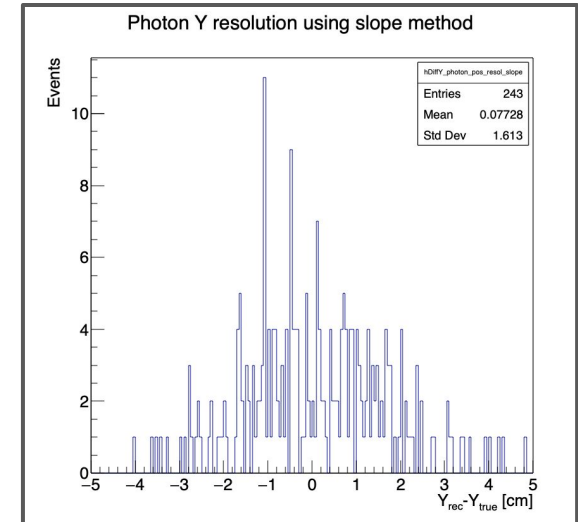
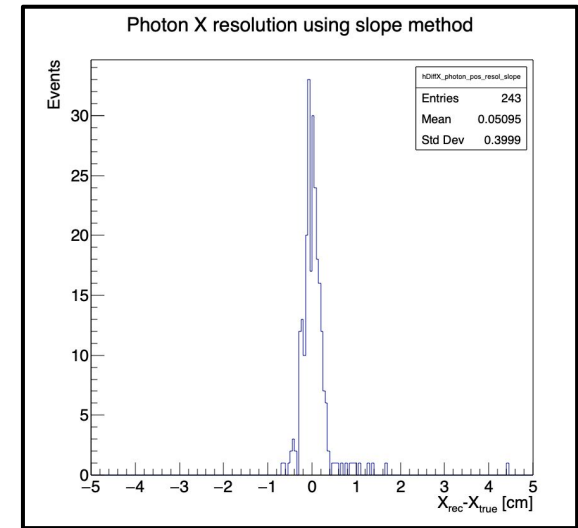


- The tracker in front of the CAL was used as a proxy for the true CAL hit location.
- The difference between this position and the position projected from the shower slope is plotted.
- The shower slope was calculated using a linear least-squares fit to the energy-weighted mean position in each layer.
- The x- and y-position resolutions at the tracker are the same for the top and bottom CALs.

Photon Position Resolution at Thin Film



- The y-position was reconstructed using an energy-weighted mean to account for magnetic-field deflection.
- The x-position was reconstructed using a simple average.
- X and y resolution not the same !!!



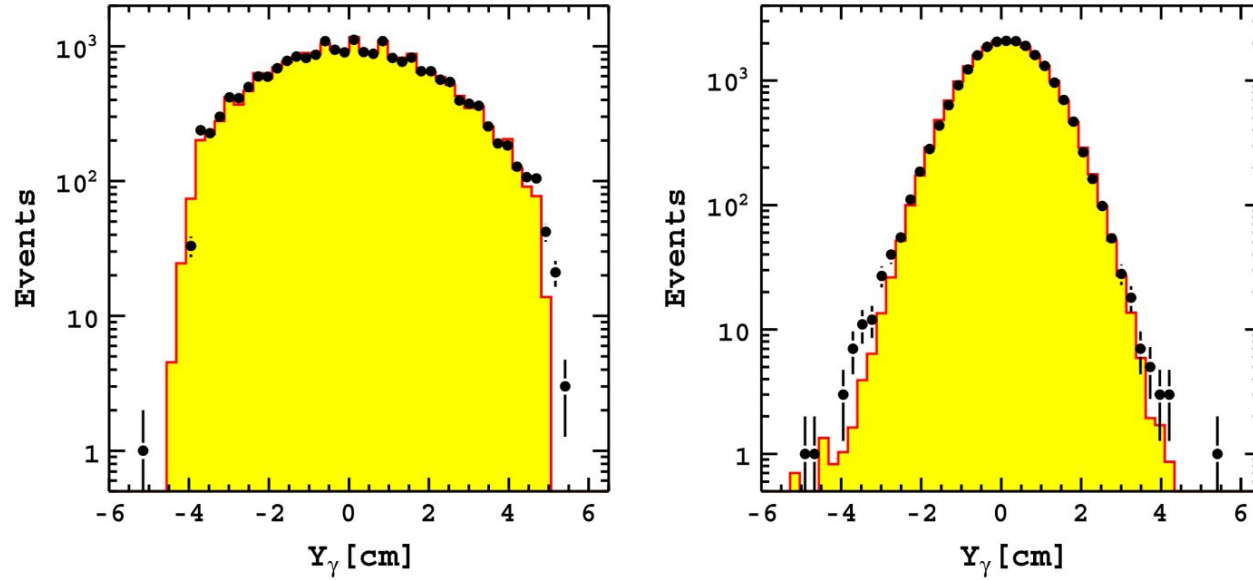


Fig. 7. The reconstructed x (left) and y -positions (right) of accepted photons in the spectrometer collected in one environmental record. Dots with error bars are data and the histogram is the Monte Carlo prediction. The structure in the center of the x distribution is due to the scintillator strips and the simple center of gravity algorithm applied to the shower position reconstruction.