

An Update on Shower Calibration, Scalers, and Beamline

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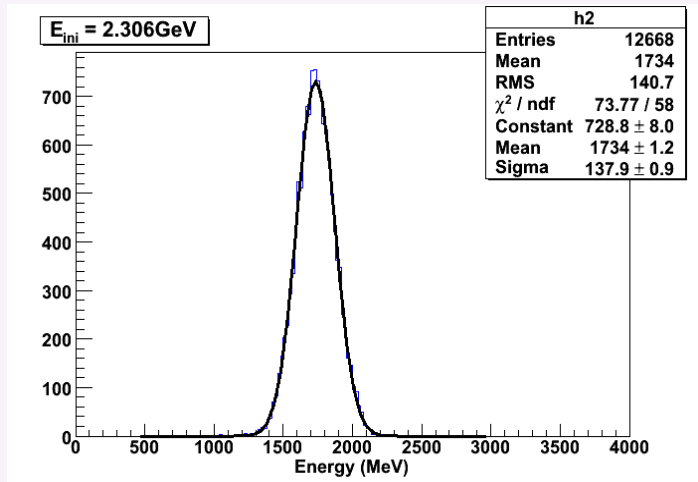
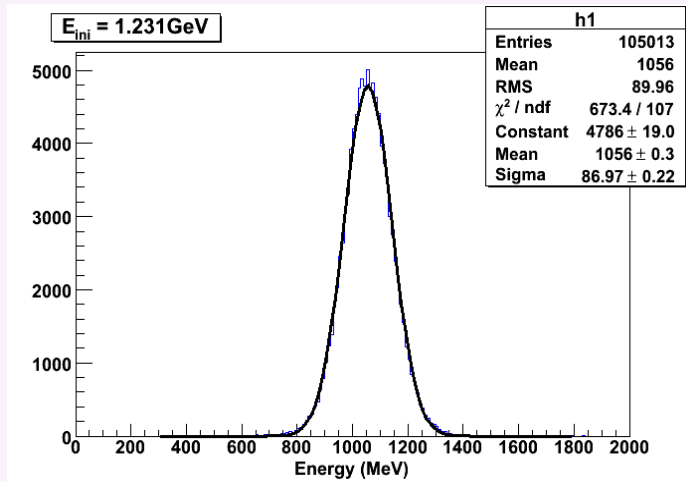
Hall-A Transversity Collaboration Meeting, May 22nd, 2009

Shower Calibration

- Shower calibration done using one-pass and two-pass H2 elastic runs.
- Combined both one and two-pass H2 elastic data.
- A single set of calibration constants for all the data set.
- PMT gain drop on the preshower has been corrected.
- New corrected variables for the energy added in the BigBite shower class.

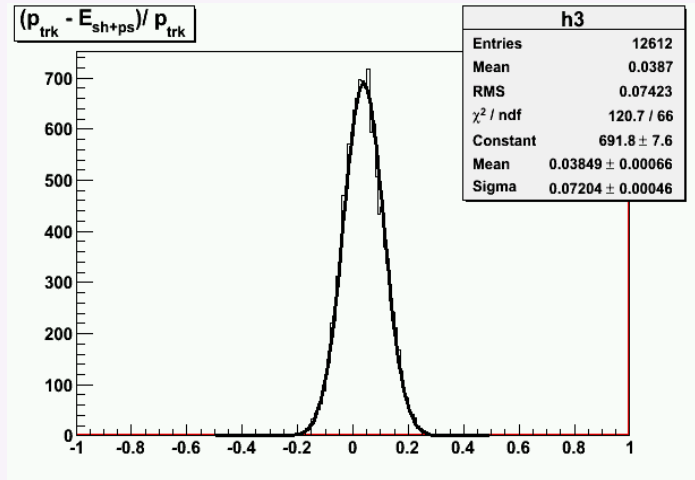
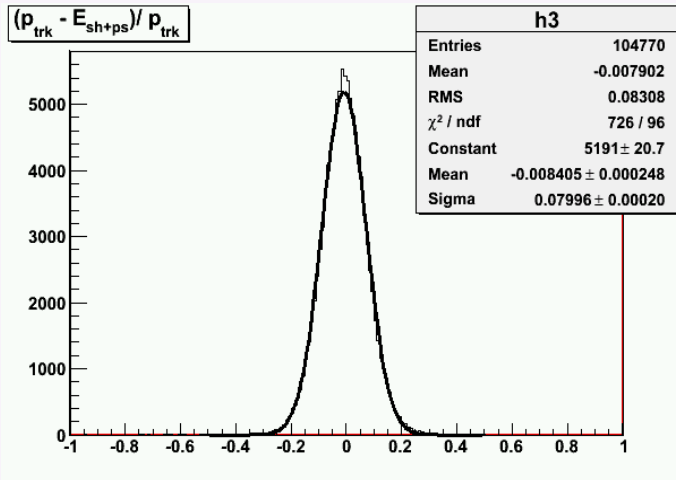
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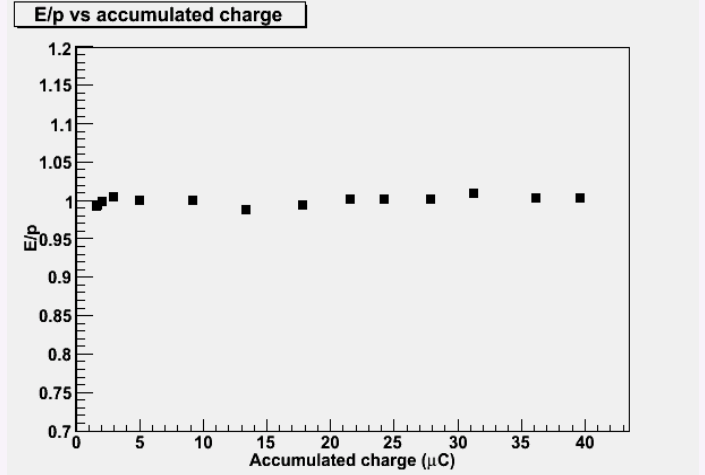
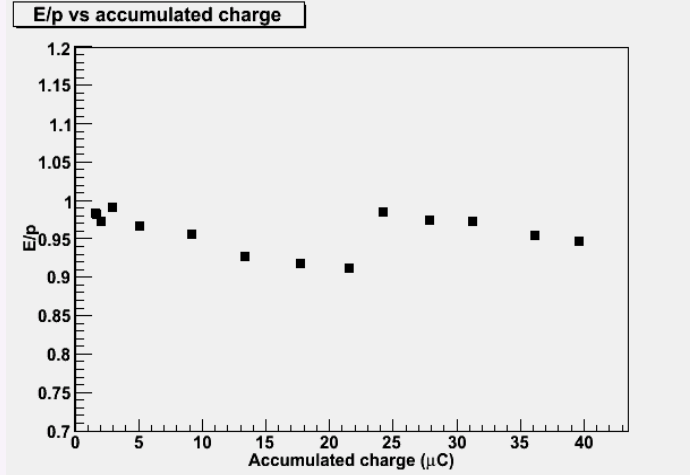
Shower Calibration

Shower resolution(very rough formula) : $\sigma_{dE/E} = 0.045018 + \frac{0.0358}{\sqrt{E(\text{GeV})}}$



Shower gain correction

- Drop in preshower PMT gain over time due to radiation.
- A correction factor is applied based on accumulated charge.
- E/p is roughly constant - a uniform cut over all the data.



BCM calibration

- Two BCM calibrations were performed - Oct 2008 and Feb. 2009
- Calibration constants were obtained by fitting OLO2 current with scaler value.
- BigBite scaler were used.
- Normalization class is updated with new BCM coeff. - charge information run-by-run basis.
- Deadtime for each trigger in all four targ-hel states (++, +- , -+ , -).

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- BPMs were calibrated during the experiment.(V.Sulkosky)
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Raster corrections

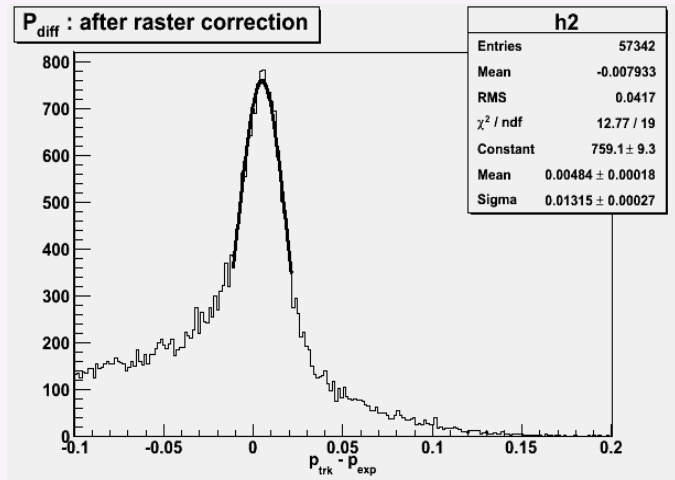
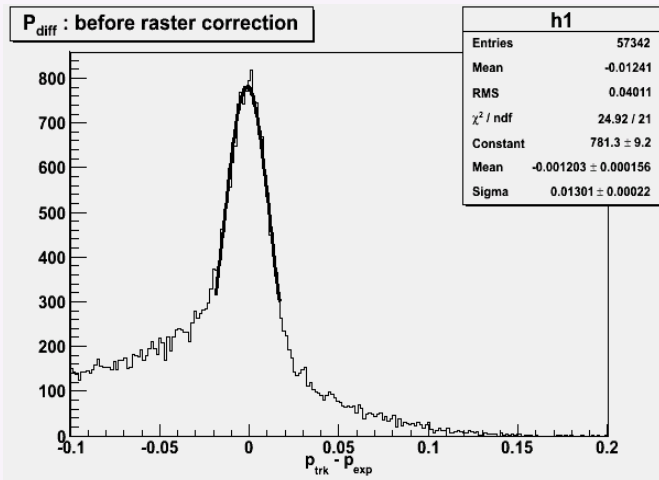
- Raster was not calibrated.(work in progress)
- Set of coefficients for the linear transformation from raster currents(ADC channel) to x/y position.

$$x = b1 + a11*raster_x + a12*raster_y$$

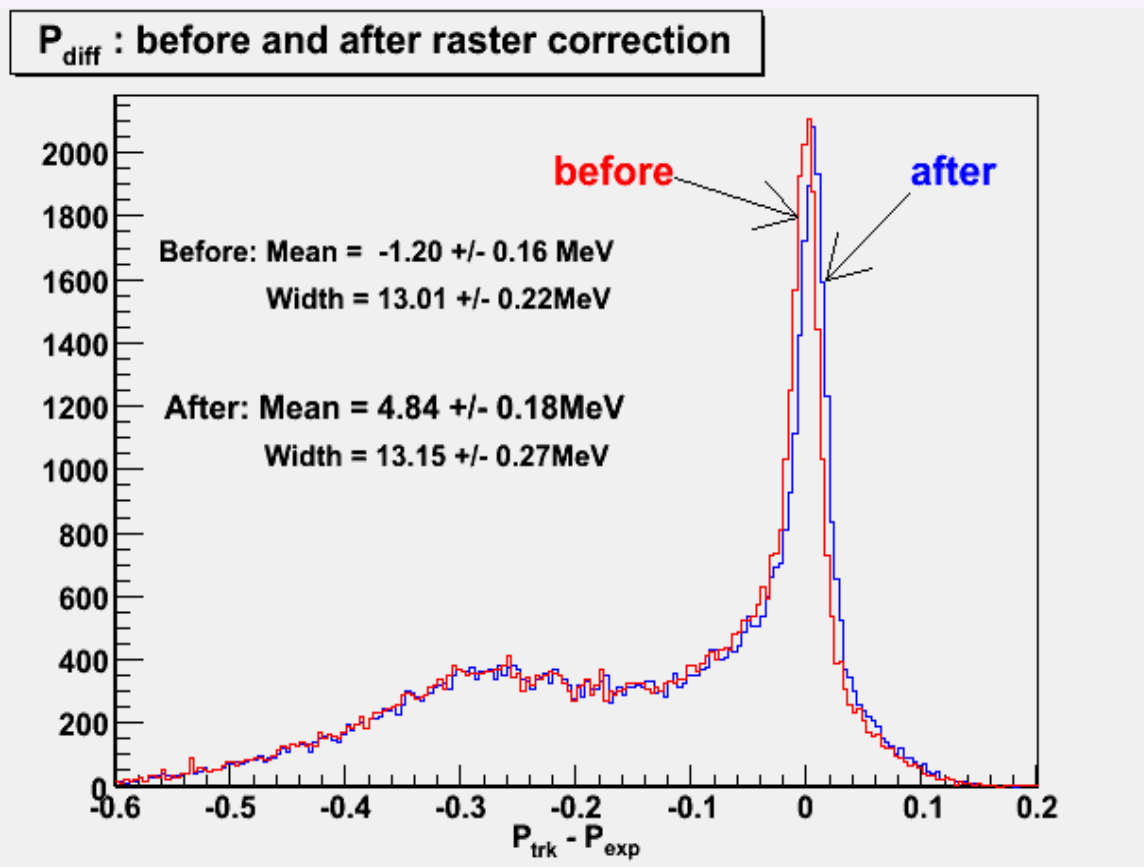
$$y = b2 + a21*raster_x + a22*raster_y$$

Raster Correction

- A set of transformation coefficients obtained for e-p elastic run.
- Momentum difference before and after raster correction.



- Almost no change in width but mean shifted by approx 6MeV



Summary/Roadmap

- **Pre-shower/shower**

- Shower calibration finished - need checks on farm production data.
- Finalize the PID/geometry cuts - to be included in 3rd farm production train(?)
- Pion contamination study using BigBite gas Cerenkov (Yi Zhang/J.Katich (??))

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- Do we need beam-trip cut for the asymmetry analysis?

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● BPM/Raster

- BPMs calibration was already done.
- BPMs are slow to give position information.
- Raster corrections - work in-progress.
- No easy way to get raster coeffs run-by-run basis at the moment.