EC performance

- PID performance

✓ Intrinsic e/π^- seperation: preshower and E/p cuts

PcDR (nobkg)
- 100:1 π^- rejection at 95% e efficiency for p>2GeV/C
- 50:1 π^- rejection at 90% e efficiency for 1<p<2 GeV/C (FAEC)

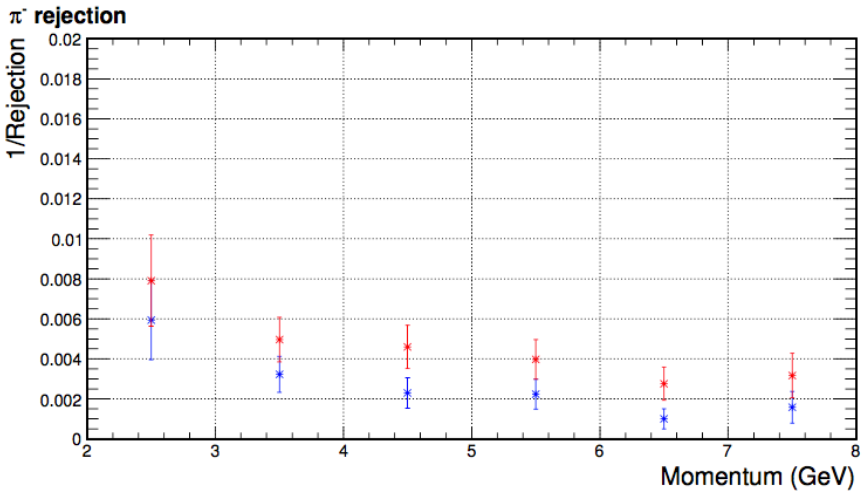
Now (no bkg)
- 100:1 π^- rejection at 98% e efficiency for p>2GeV/C
- 62:1 π^- rejection at 85% e efficiency for 1<p<2 GeV/C (FAEC)
- 50:1 π^- rejection at 95% e efficiency for p>2GeV/C (LAEC $\theta[17^o,22^o]$)

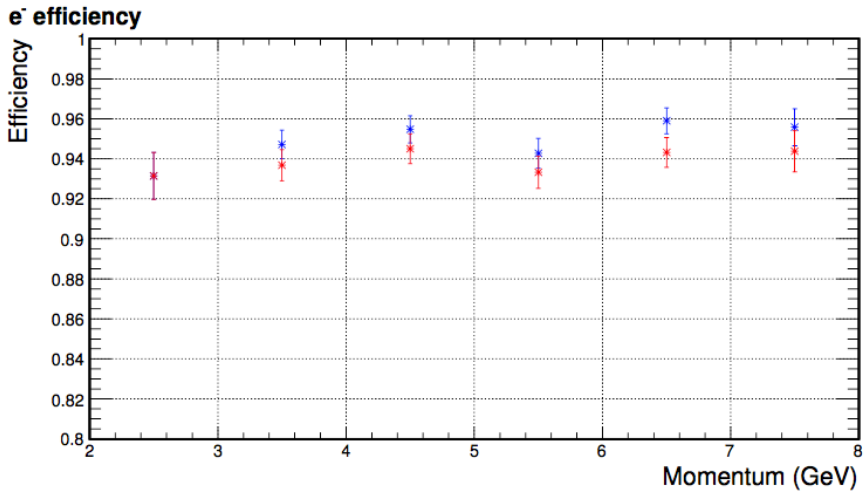
PcDR (bkg)
- EM (e^-, γ) GEANT4, DIS electrons (CTEQ6 PDF), and hadrons (pions and protons) Wiser Fit (10 kev<p<11 GeV)

Now (bkg)
- signal: evenly distributed e^-/π^- 1<P GeV/c, GEANT4
- bkg: EM (11GeV e^- beam on target) GEANT4, allnoeHallD hadrons, and allnoeHallD target windown/up

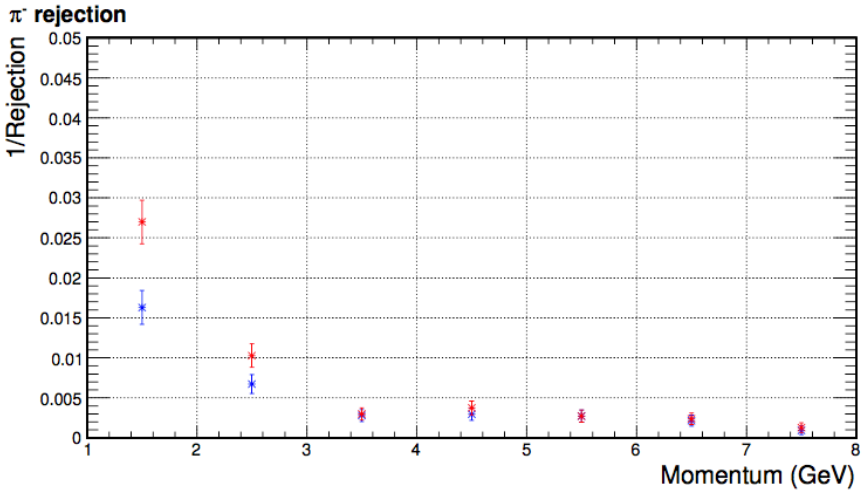
- Trigger capability: e^- E6p1threshold cut (μ-1.5σ), and the efficiency curves for both e^- and π^- are studied with the full background simulation.

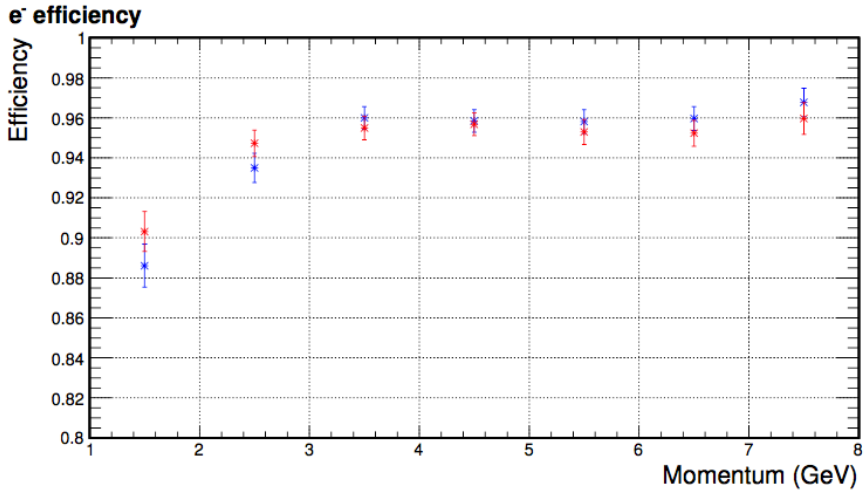
PcDR results





(a) SIDIS large-angle calorimeter

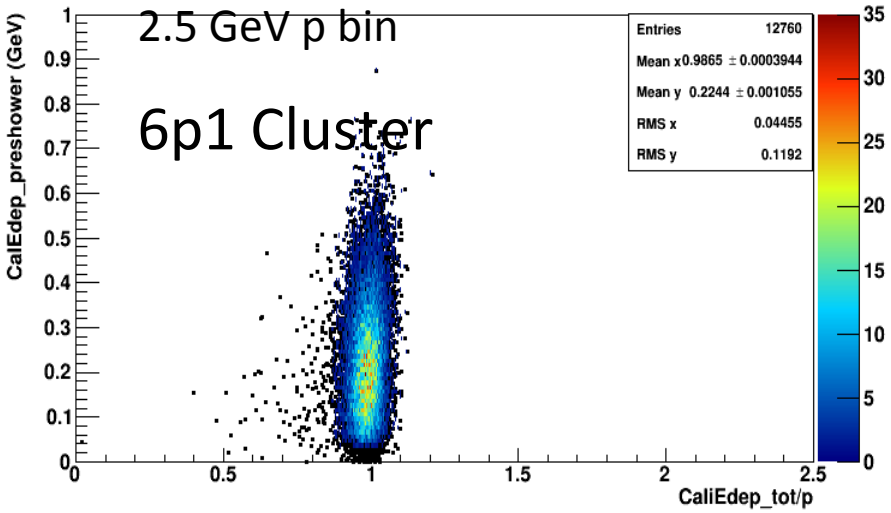


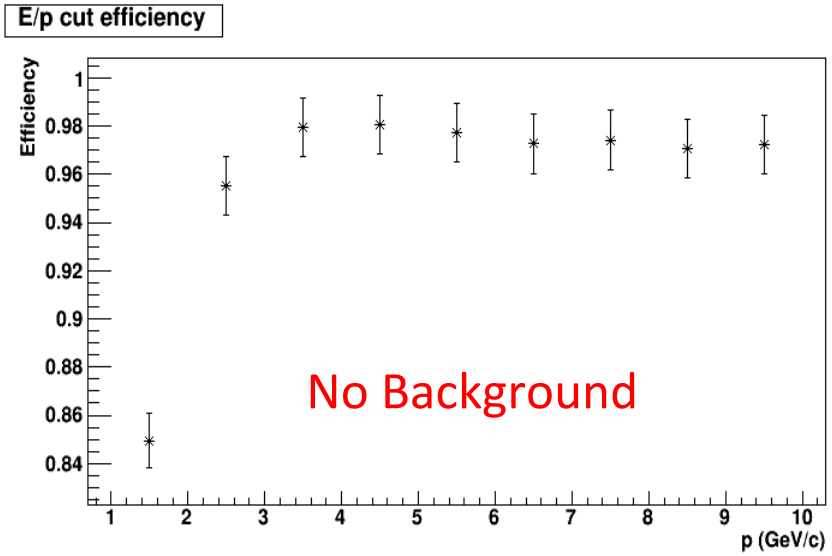


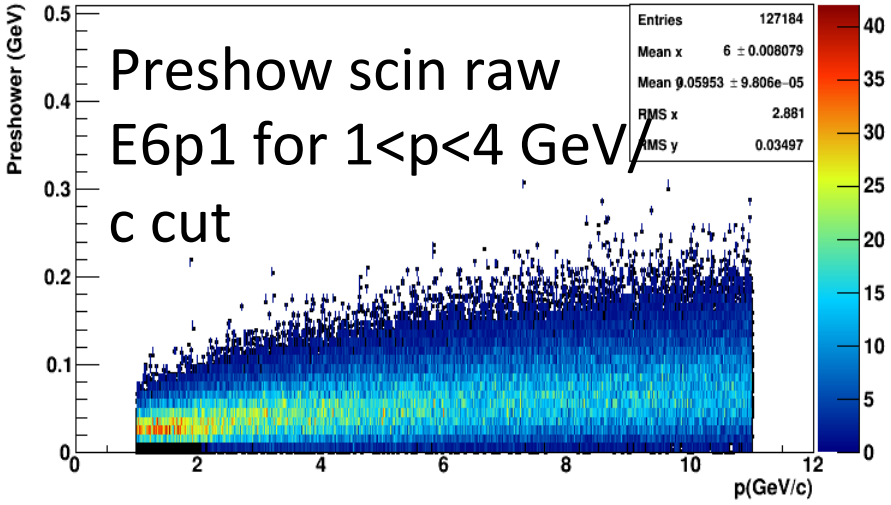
(b) SIDIS forward calorimeter

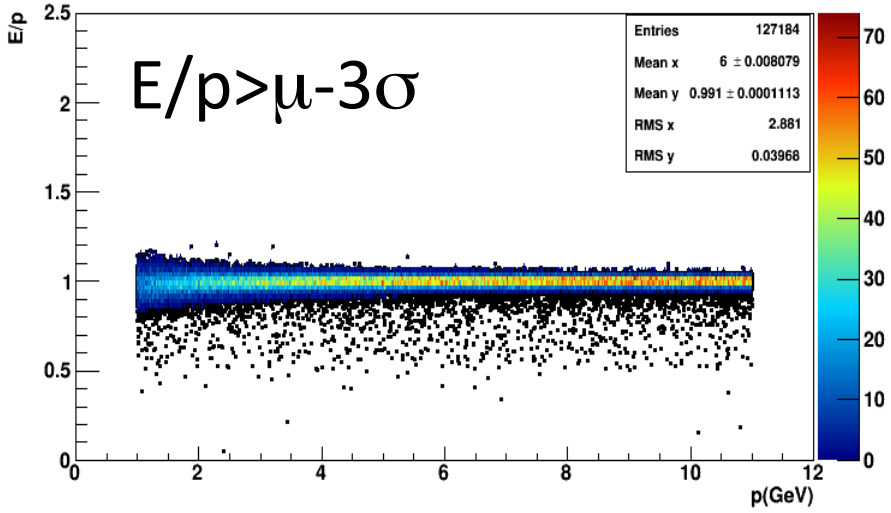
0-11 GeV e- beam, θe [7.5°,14.85°] Energy Calibration SIDIS FAEC Configuration

Prelead: 2.0X0



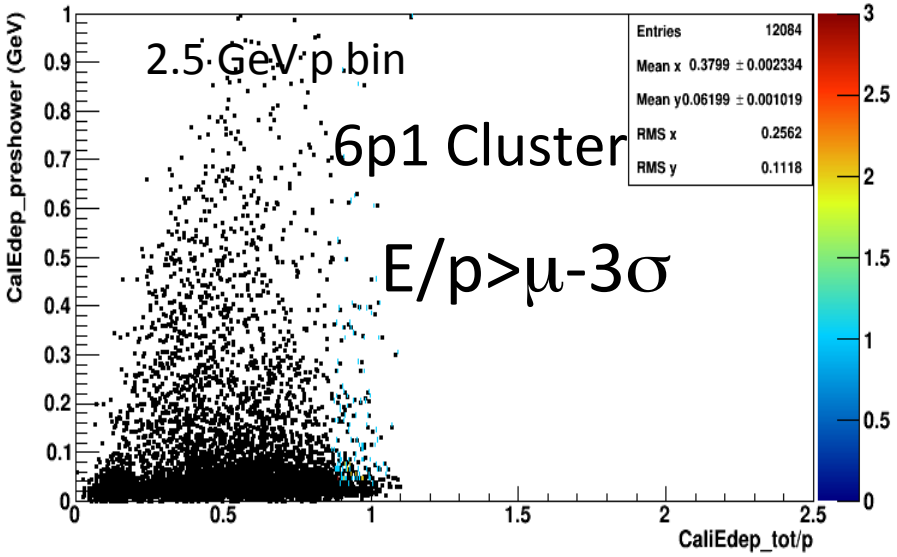


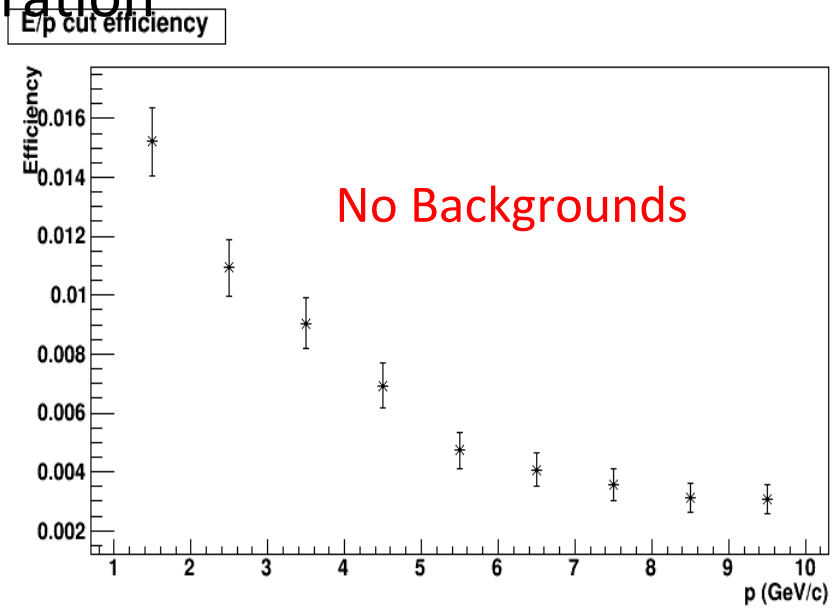


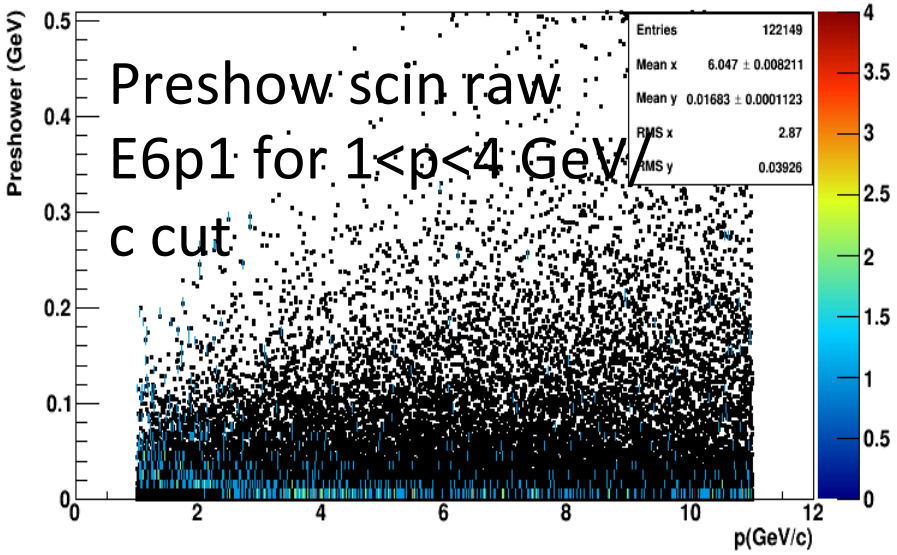


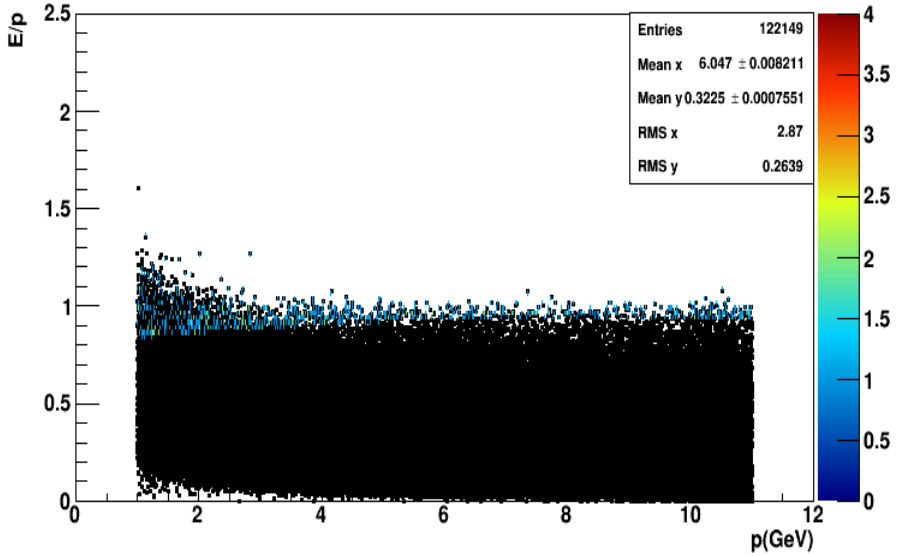
0-11 GeV π- beam, θe [7.5°,14.85°] Energy Calibration SIDIS FAEC configuration

Prelead: 2.0X0









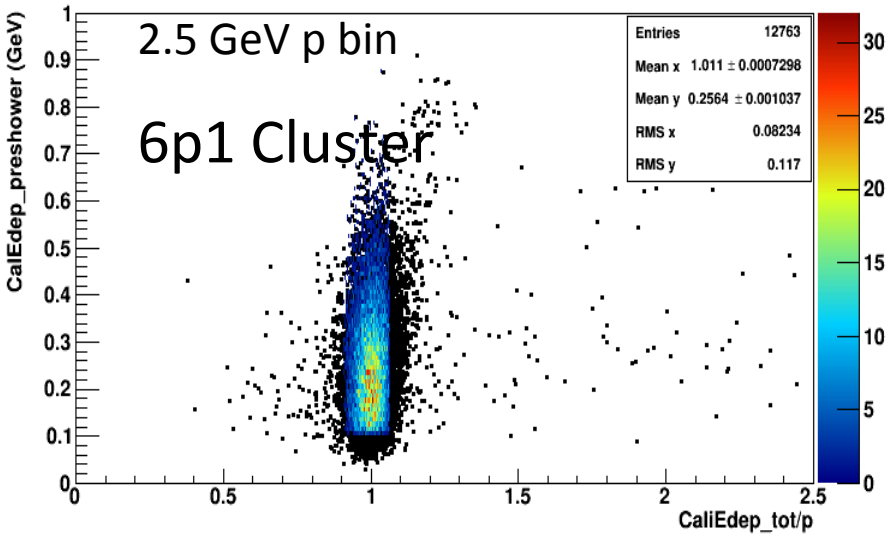
Merged backgrounds

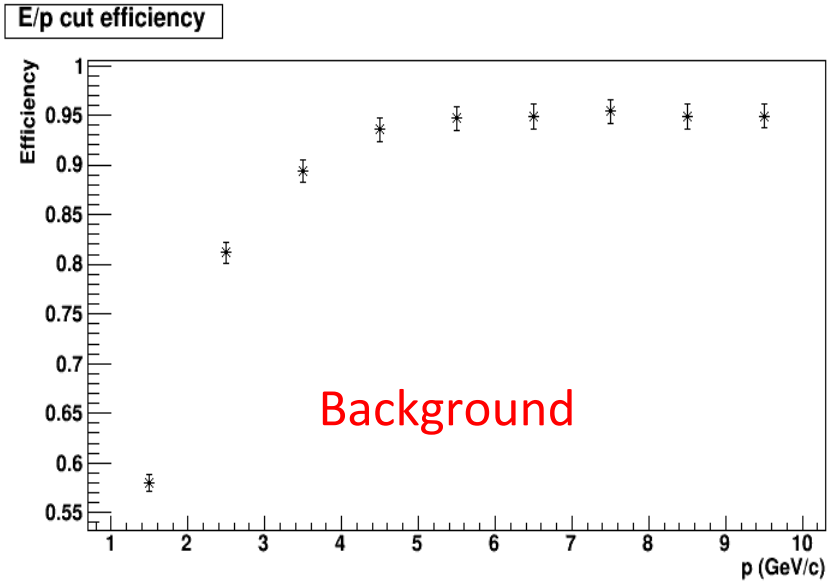
- Signal: 1-11 GeV evenly distributed e^- beam
- Backgrounds: EM, allnoeHallD hadrons, and allnoeHallD hadrons on target windows.

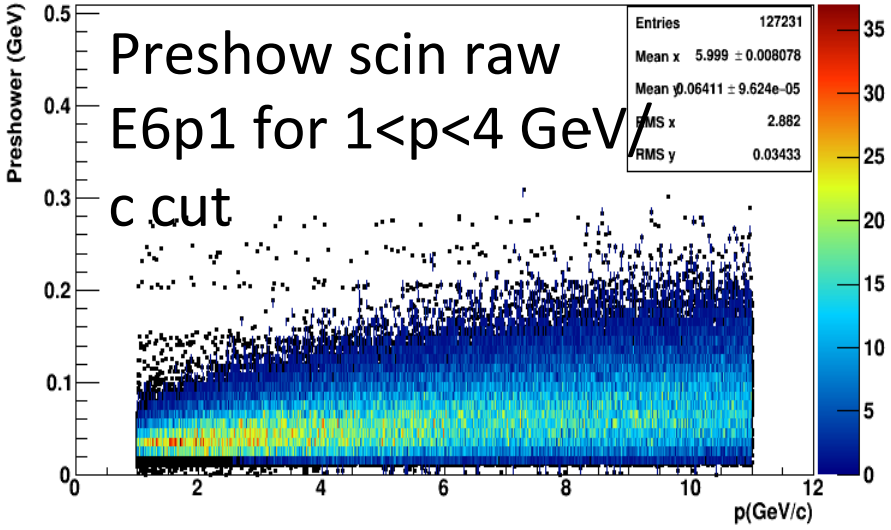
- Signal: 1-11GeV evenly distributed π^- beam
- Backgronds: EM, π^0, π^+, DIS e^-, and target windows (π^0, π^+, DIS electron)

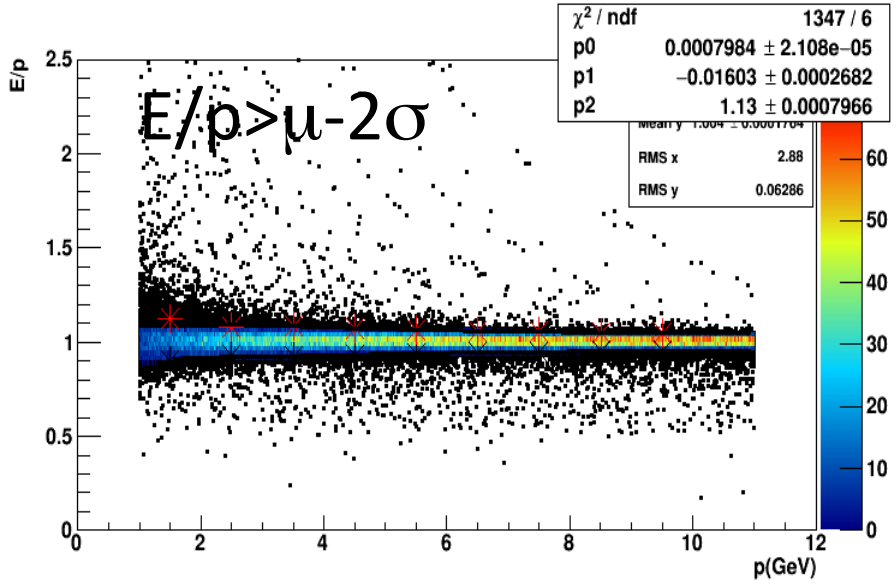
0-11 GeV e- beam, θe [7.5°,14.85°] Energy Calibration SIDIS FAEC Configuration

Prelead: 2.0X0



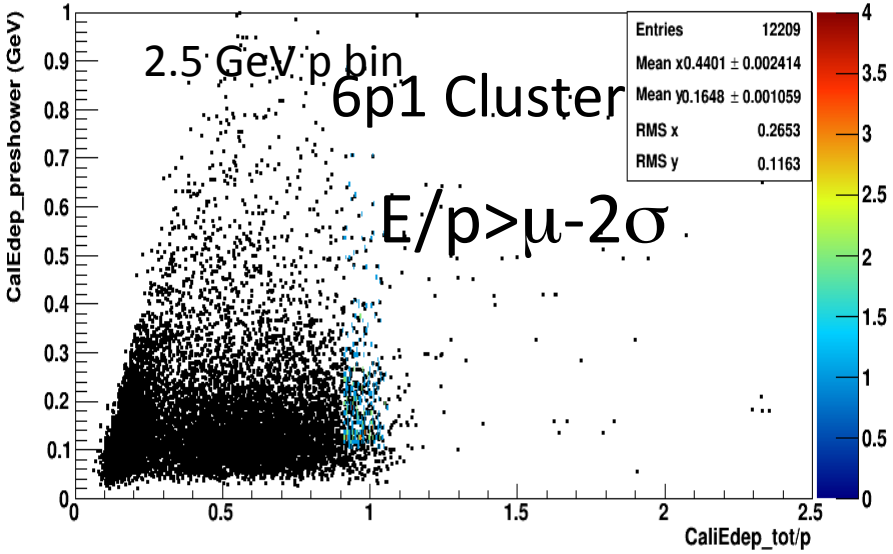


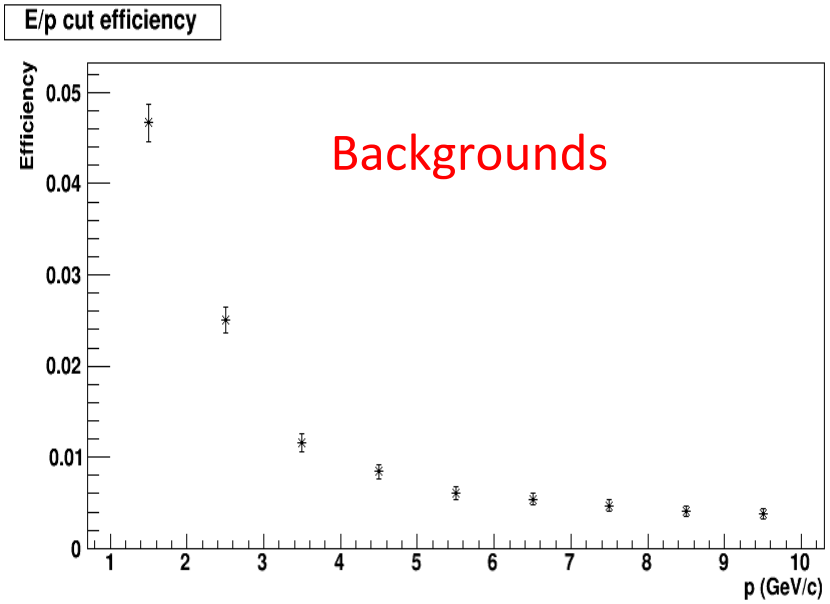


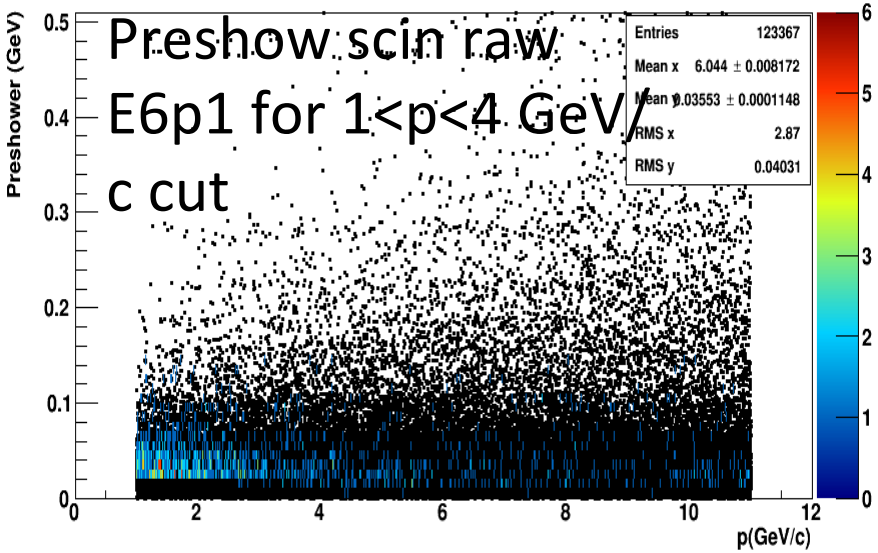


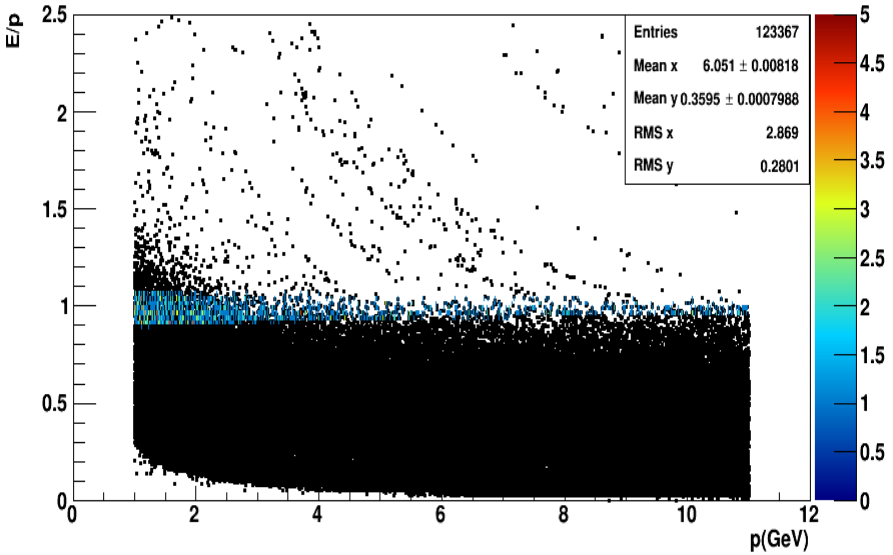
0-11 GeV π- beam, θe [7.5°,14.85°] Energy Calibration SIDIS FAEC configuration

Prelead: 2.0X0



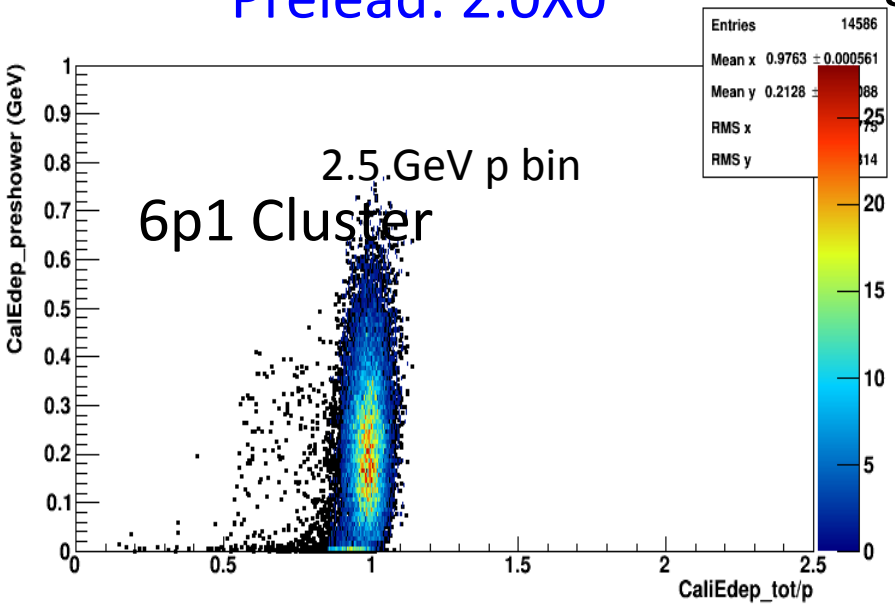


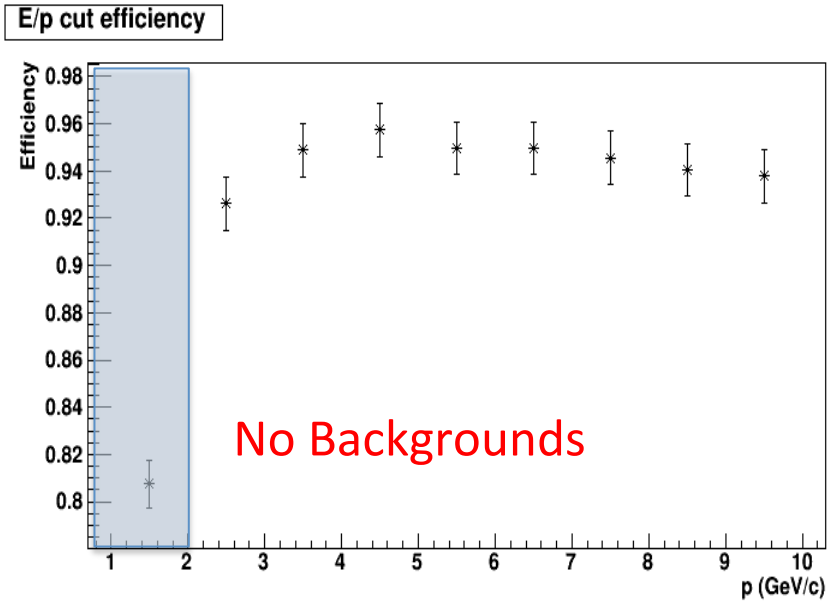




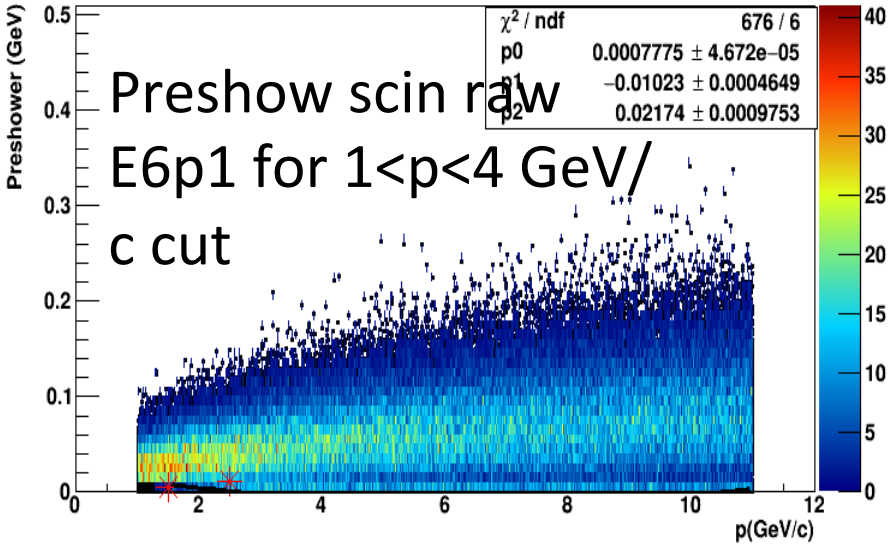
0-11 GeV e- beam, θe [17°, 22°] Energy Calibration SIDIS LAEC Configuration

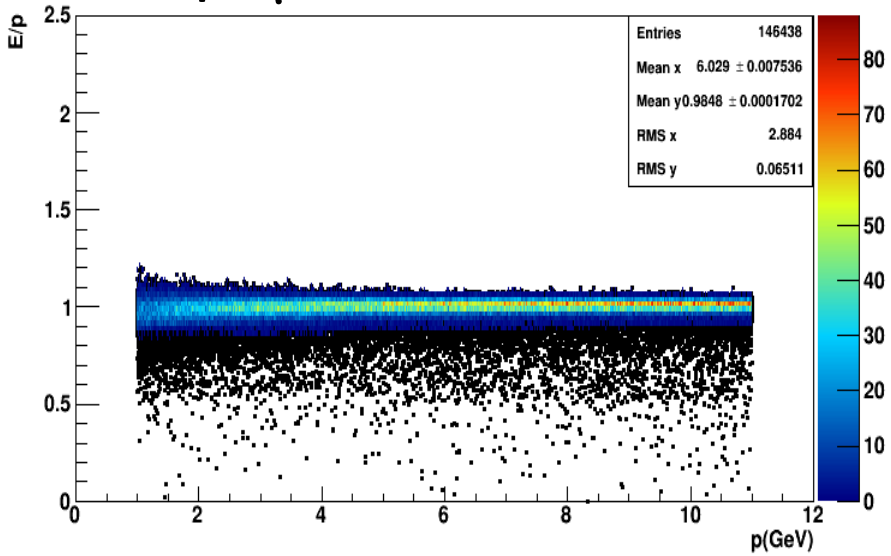
Prelead: 2.0X0





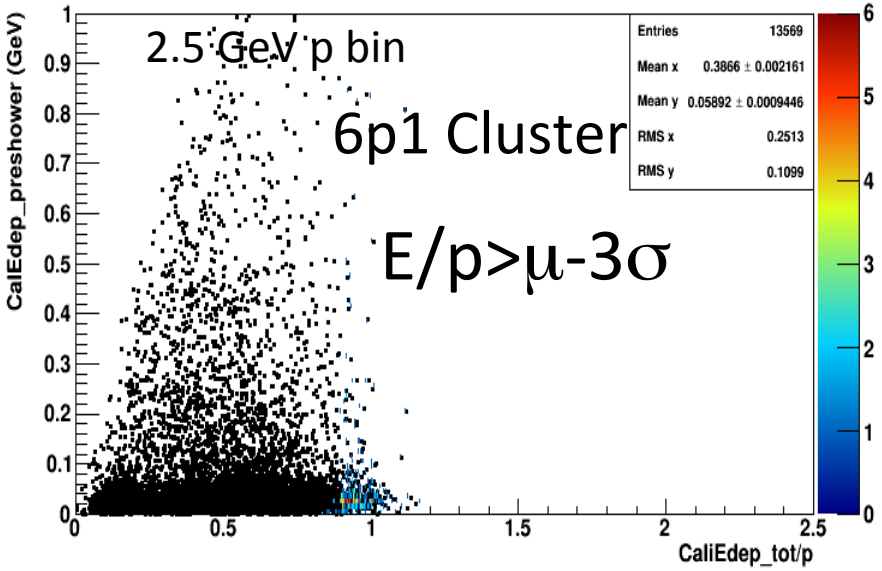
E/p>μ-3σ

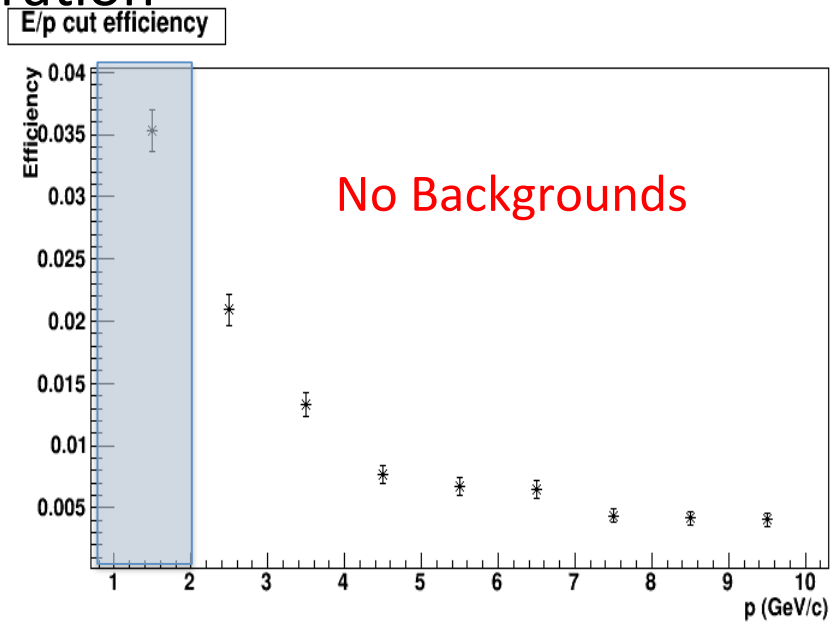


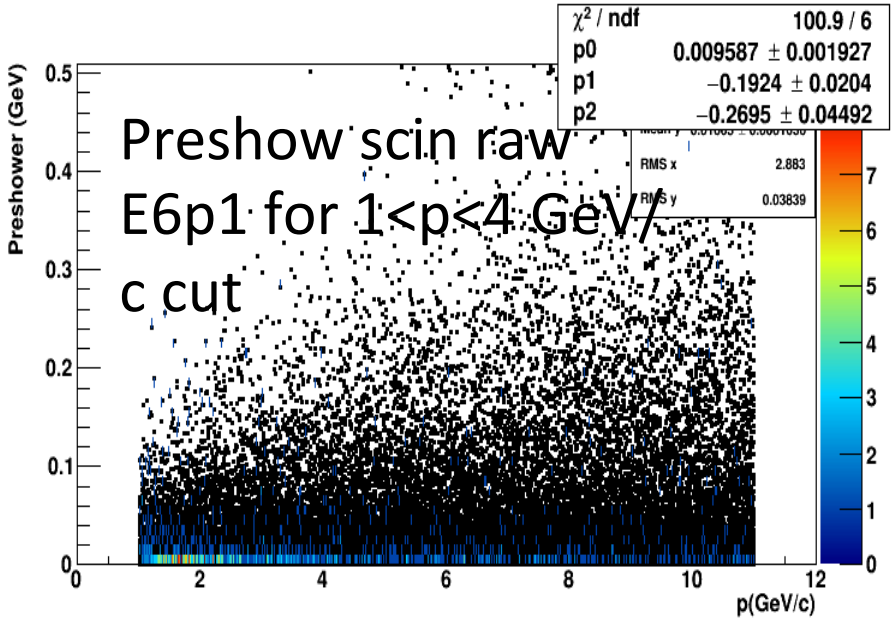


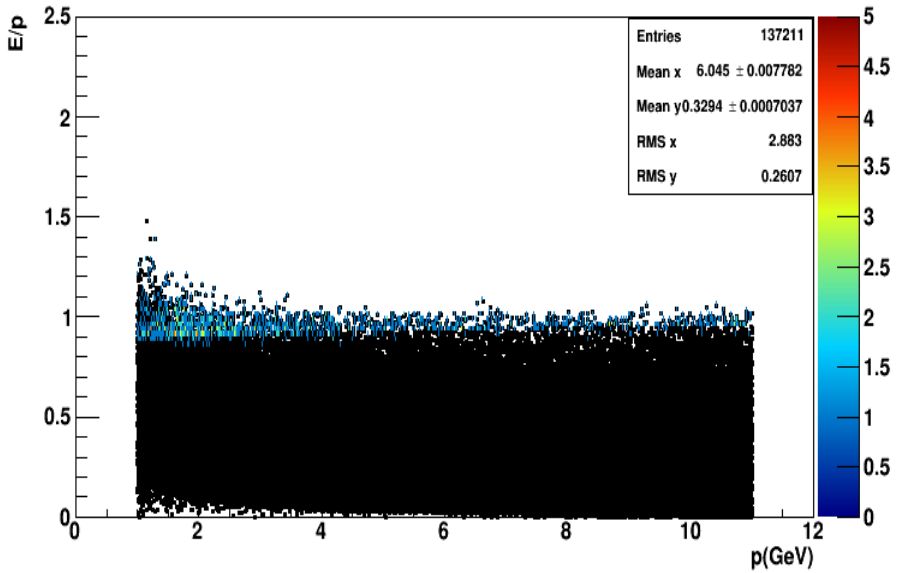
0-11 GeV π- beam, θe [17°,22°] Energy Calibration SIDIS LAEC configuration

Prelead: 2.0X0





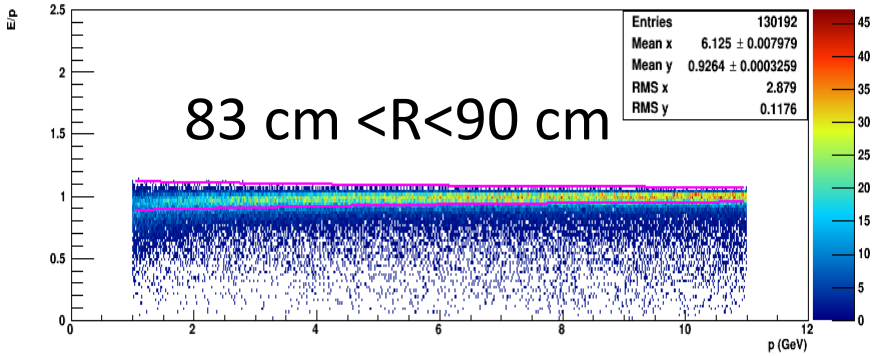


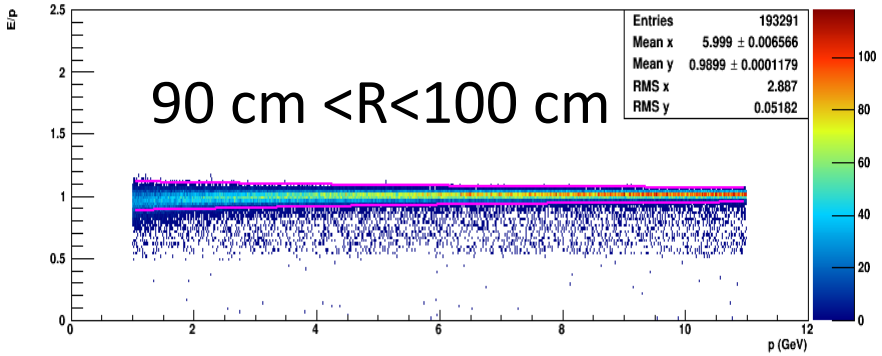


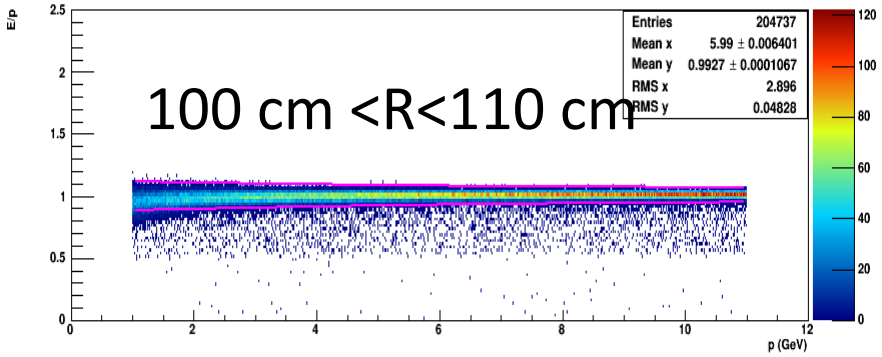
0-11 GeV e- beam, θe [16.3°, 24°] Energy Calibration SIDIS LAEC Configuration

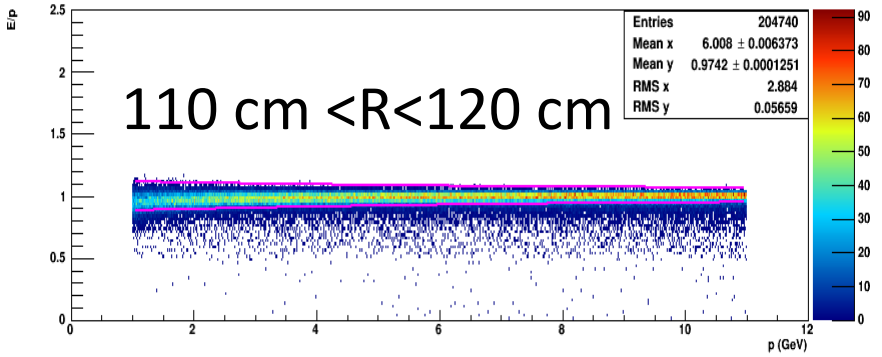
Prelead: 2.0X0

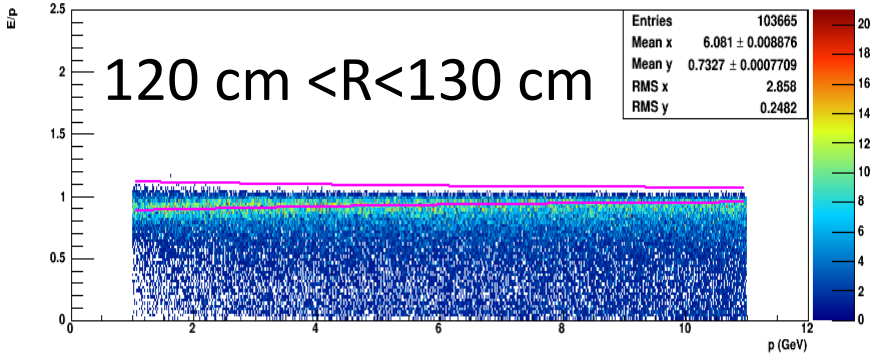
No Backgrounds

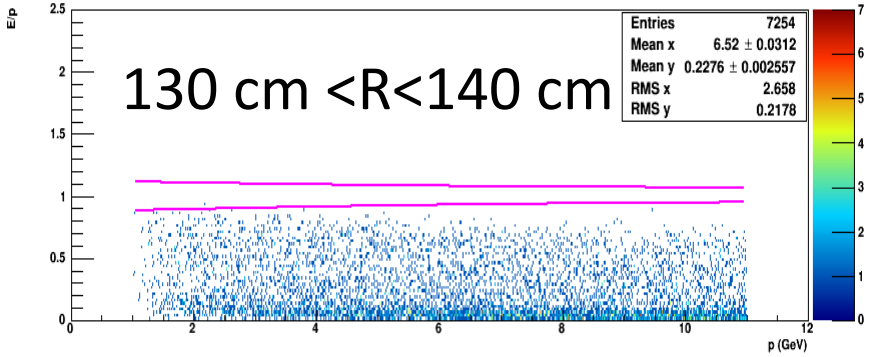








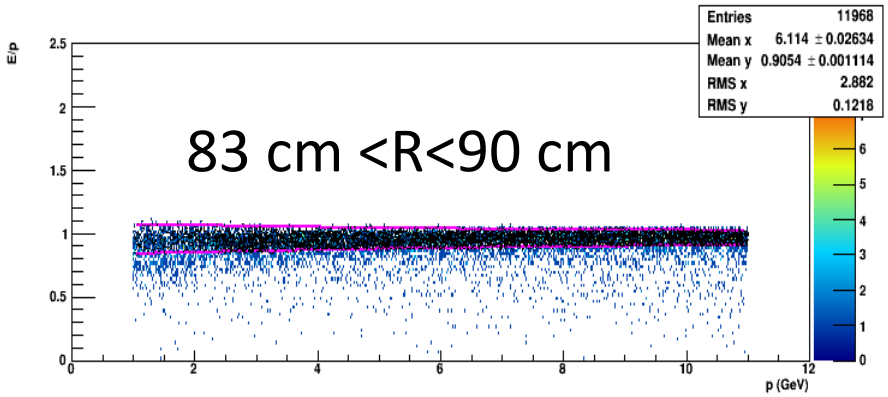


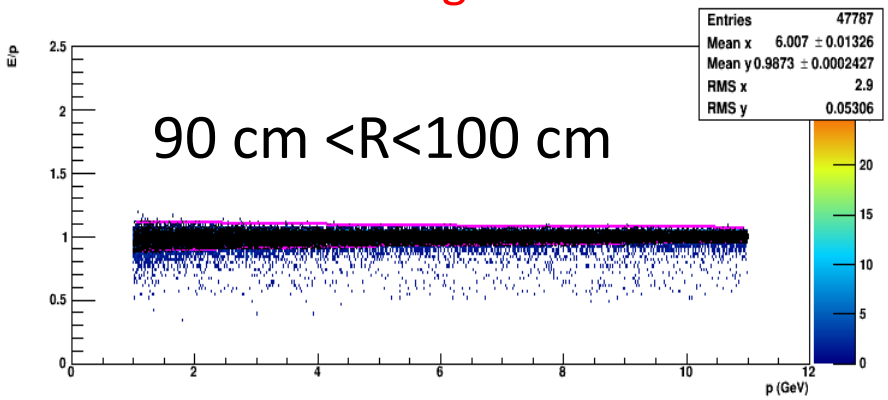


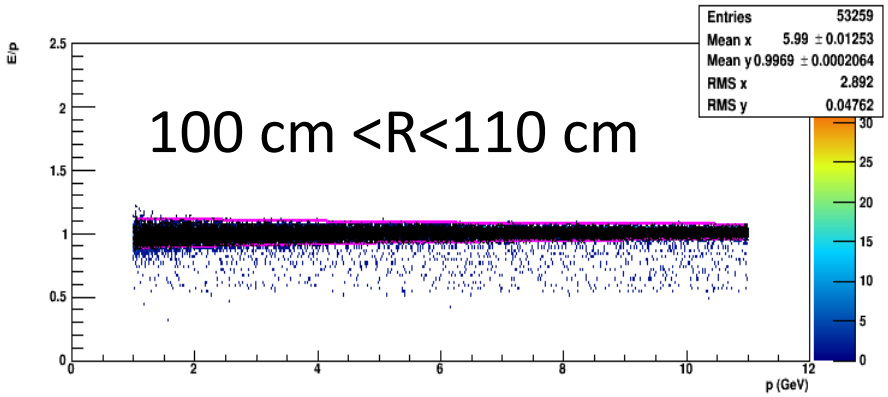
0-11 GeV e- beam, θe [17°, 22°] Energy Calibration SIDIS LAEC Configuration

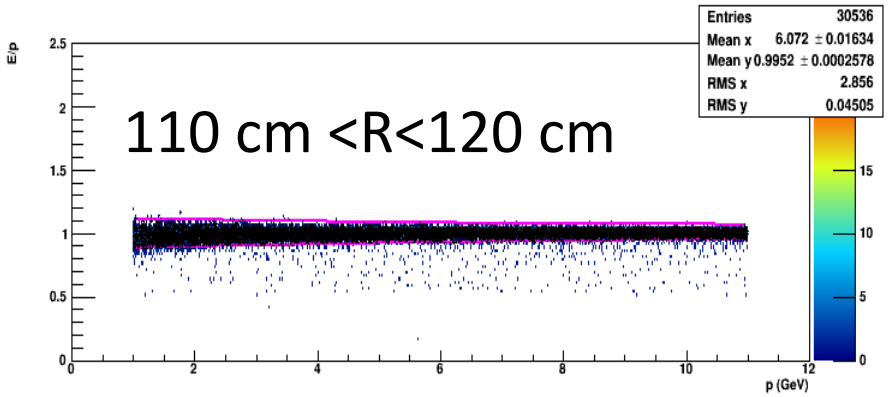
Prelead: 2.0X0

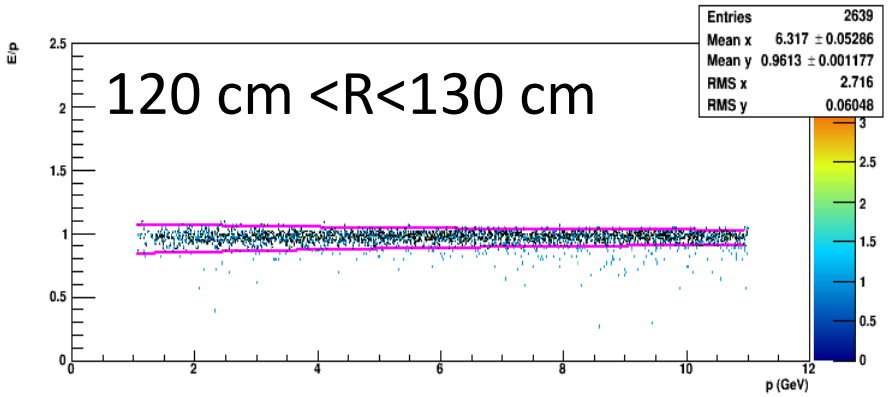
No Backgrounds

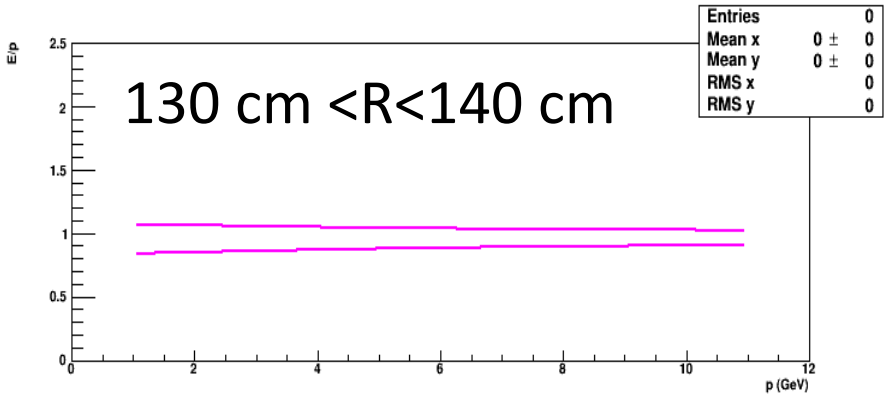






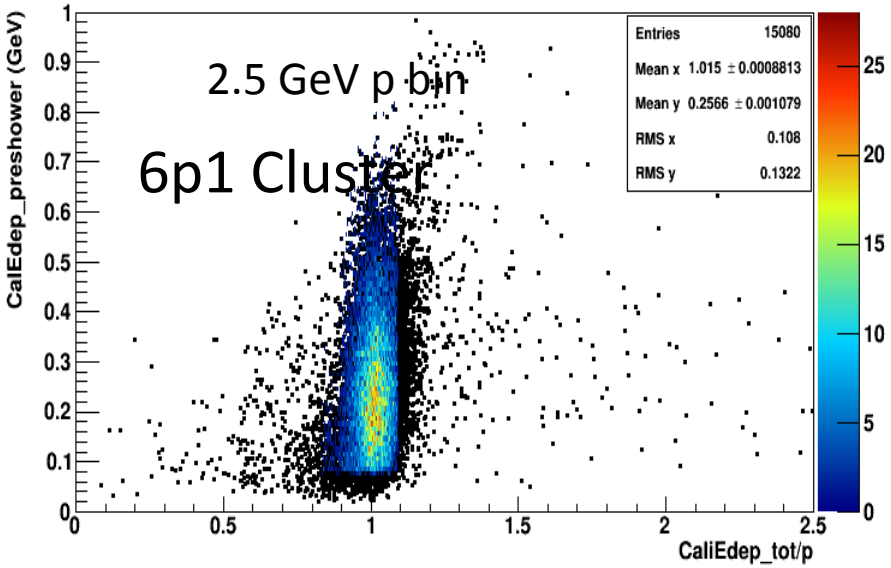


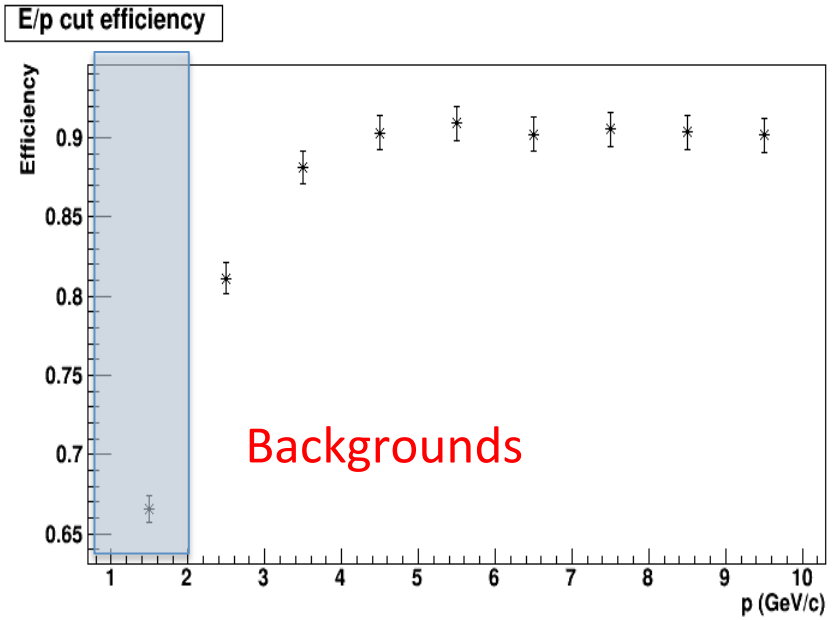




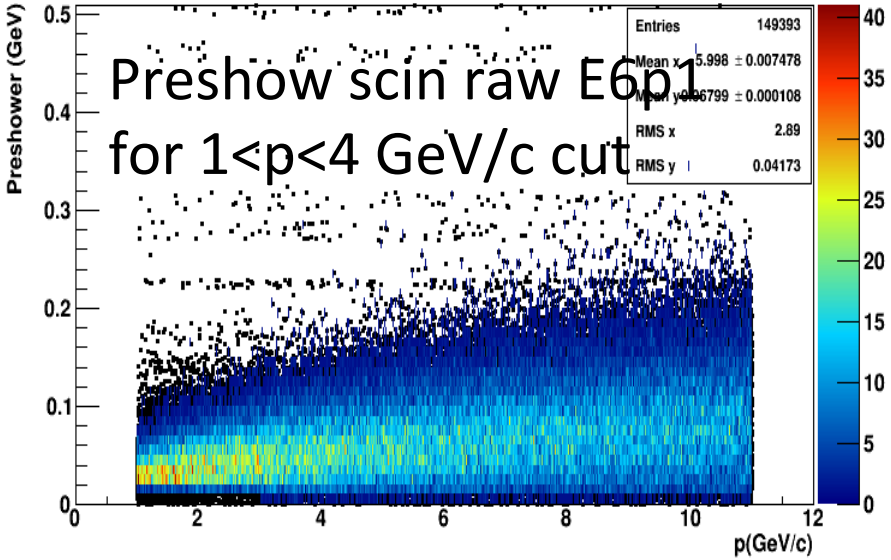
0-11 GeV e- beam, θe [17°, 22°] Energy Calibration SIDIS LAEC Configuration

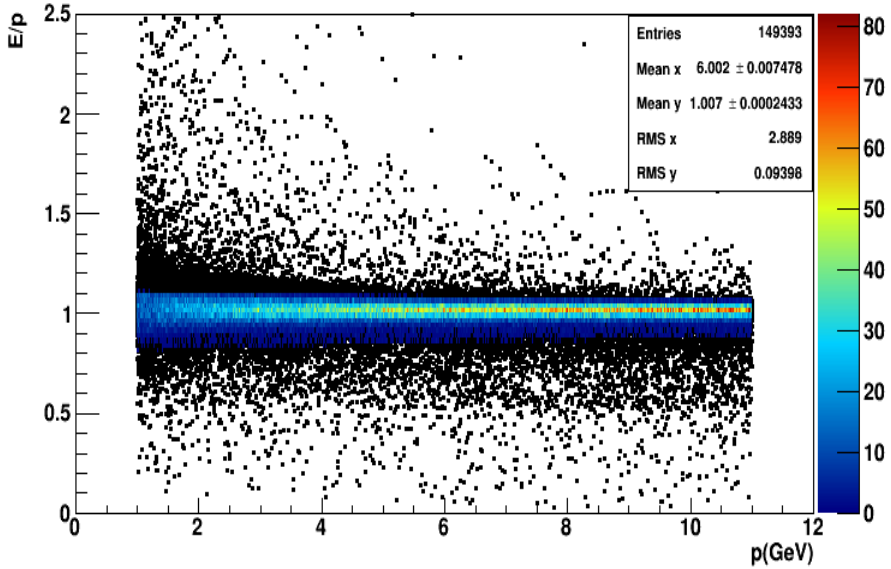
Prelead: 2.0X0





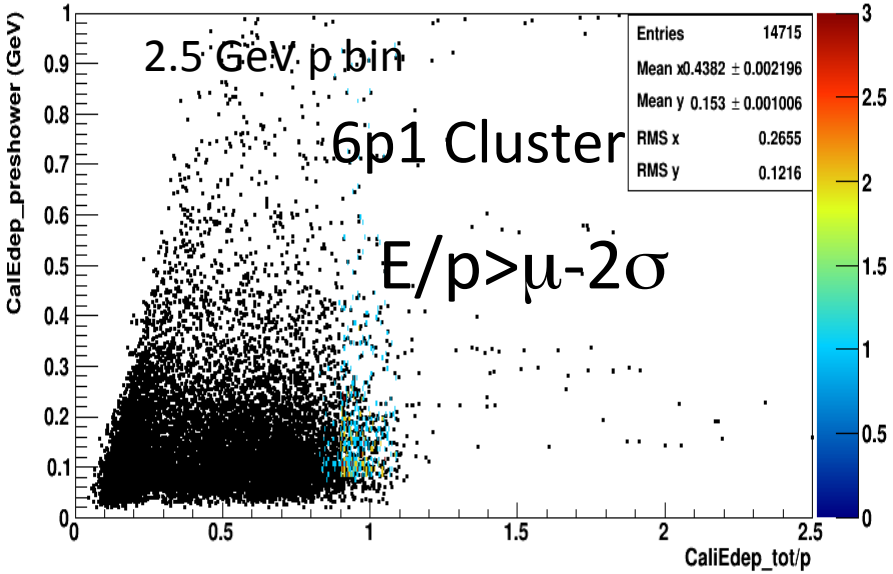
E/p>μ-2σ

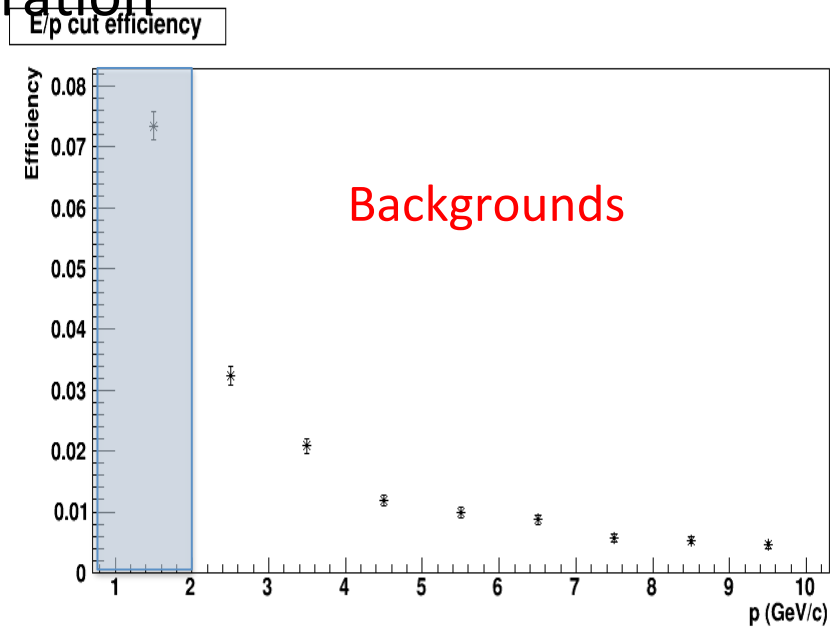


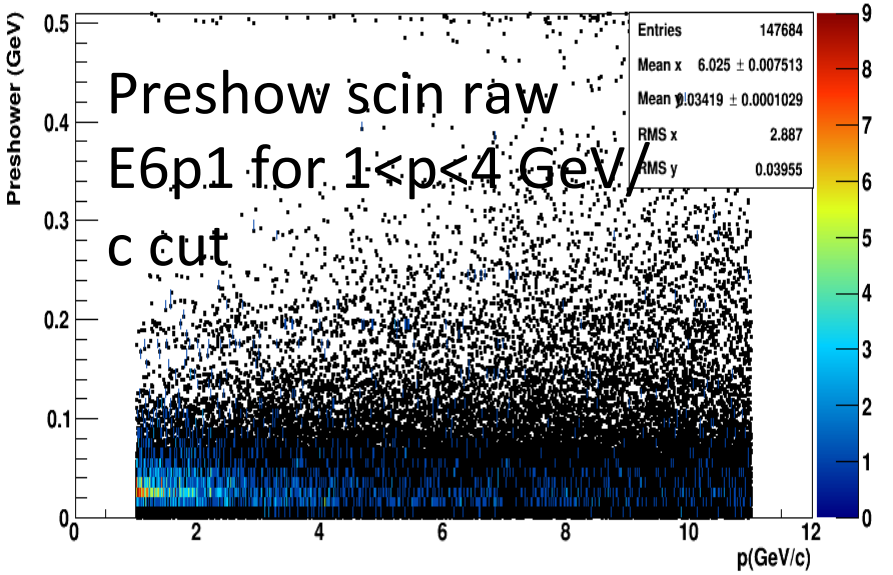


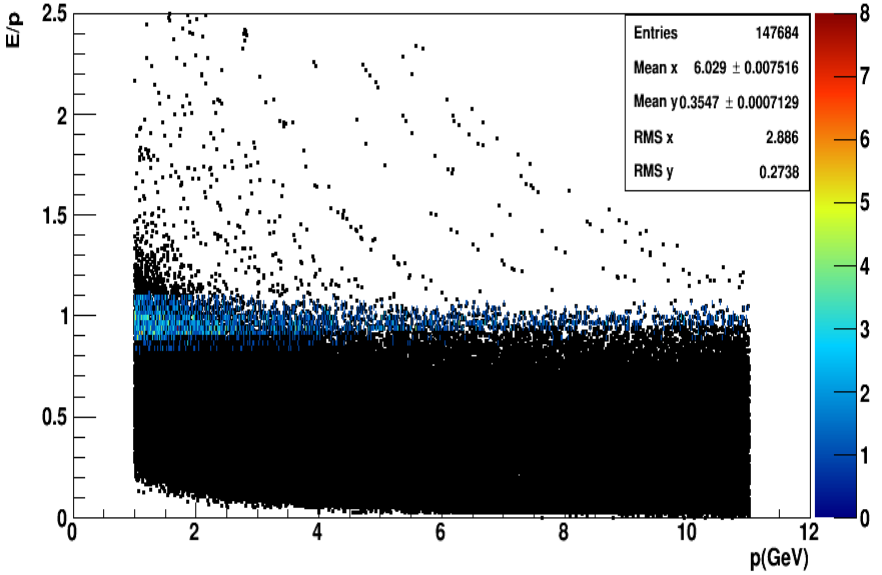
0-11 GeV π- beam, θe [17°,22°] Energy Calibration SIDIS LAEC configuration

Prelead: 2.0X0









Summary and Outlook

- The decreased e^- efficiency (no background) of LAEC configuration is due to the edge effect (6p1 cluster, angle effects, and …)

- The background merging procedure need to be improved, and Zhiwen might simulate full backgrounds in the near future.

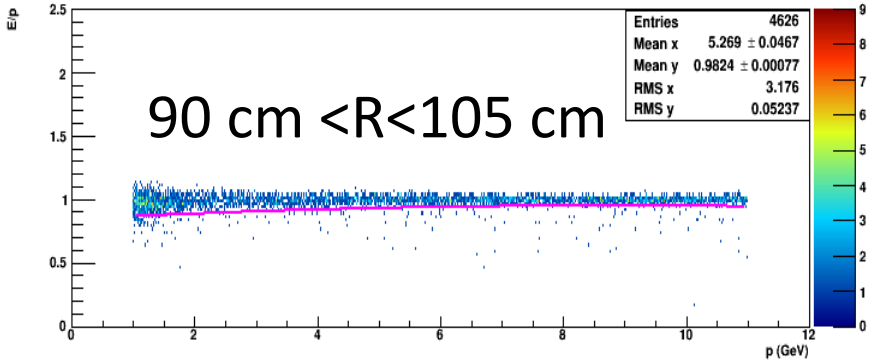
Any comments and suggestions ?

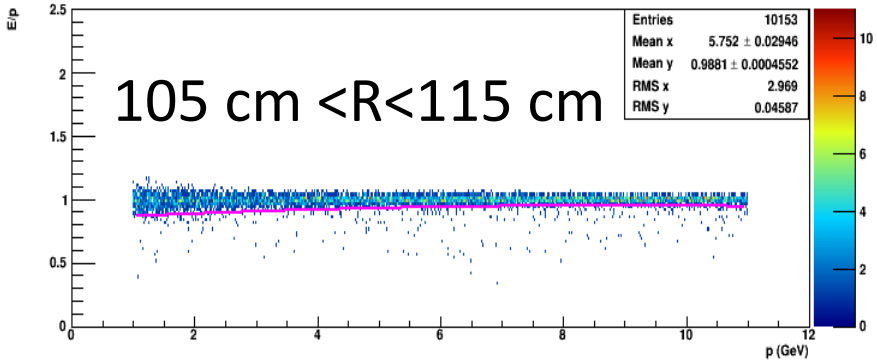
Back up

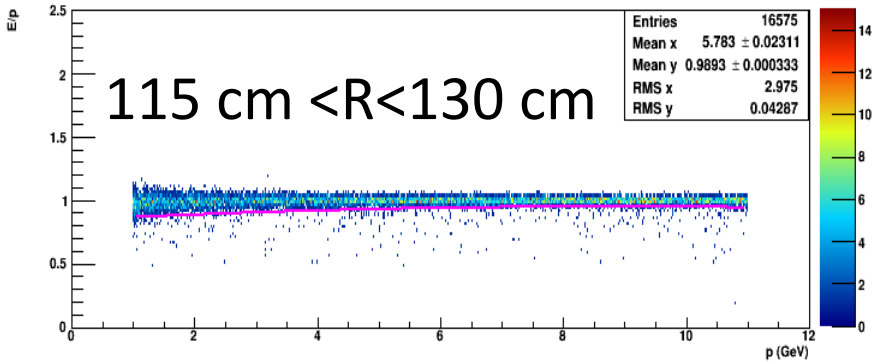
0-11 GeV e- beam, θe [7.5°, 14.85°] Energy Calibration SIDIS FAEC Configuration

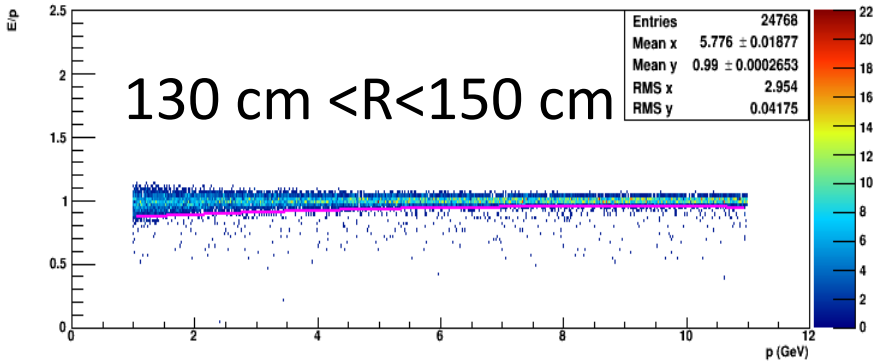
Prelead: 2.0X0

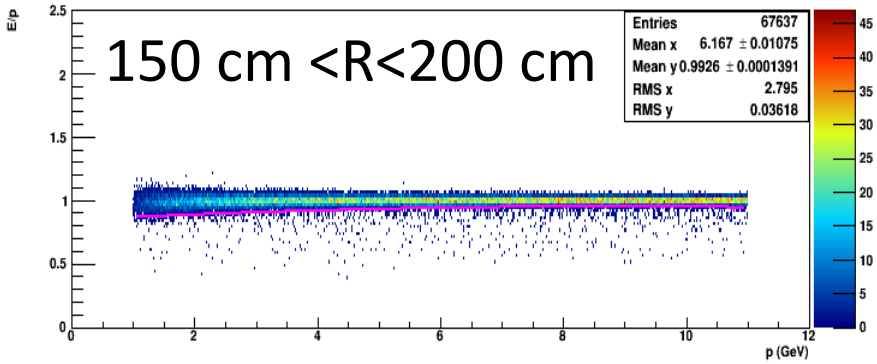
No Backgrounds

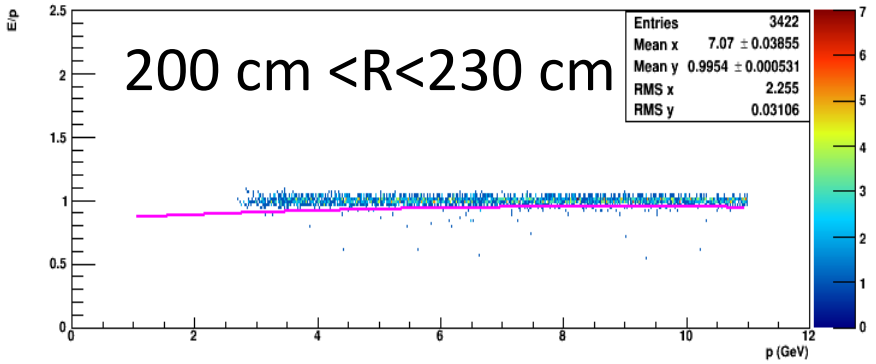






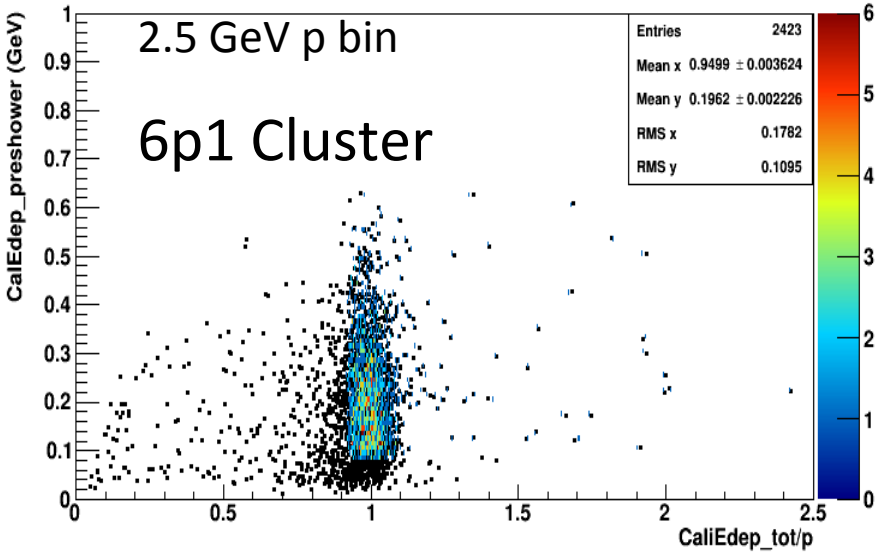


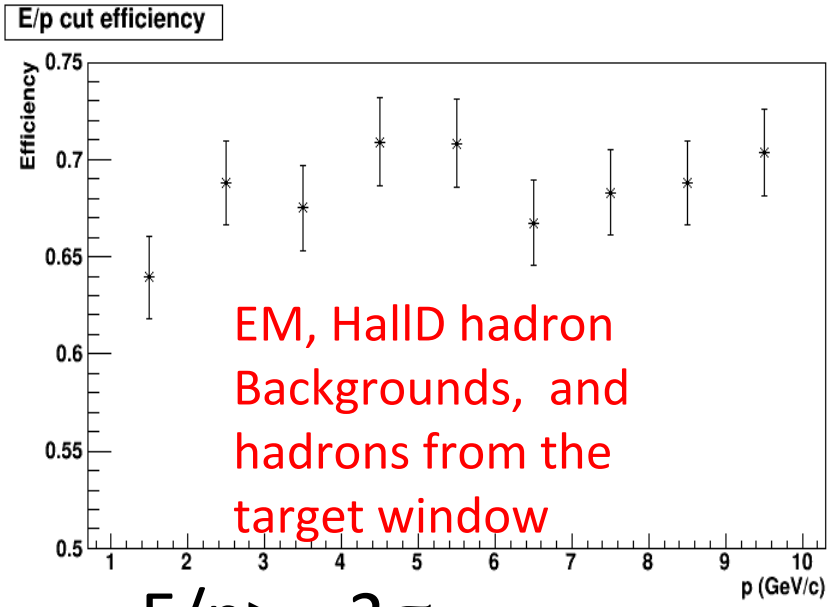




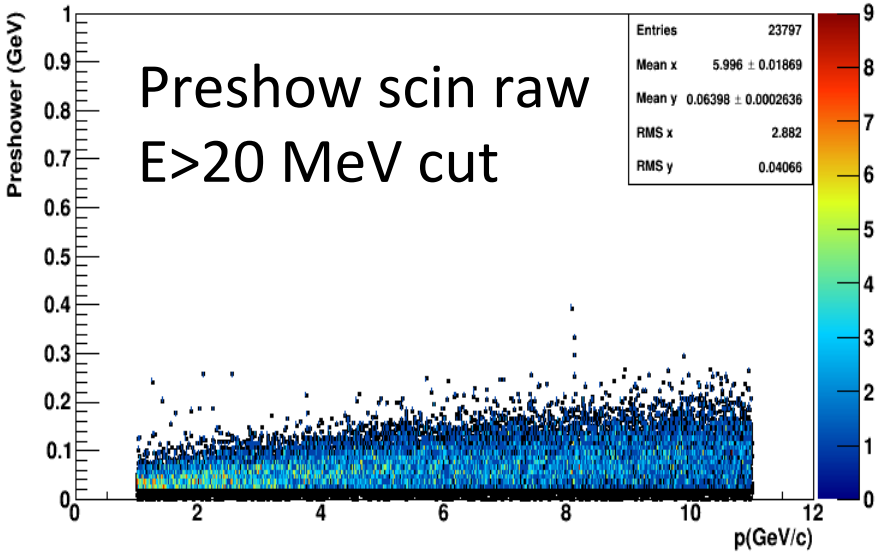
0-11 GeV e- beam, θe [16.3°,24°] Energy Calibration SIDIS LAEC Configuration

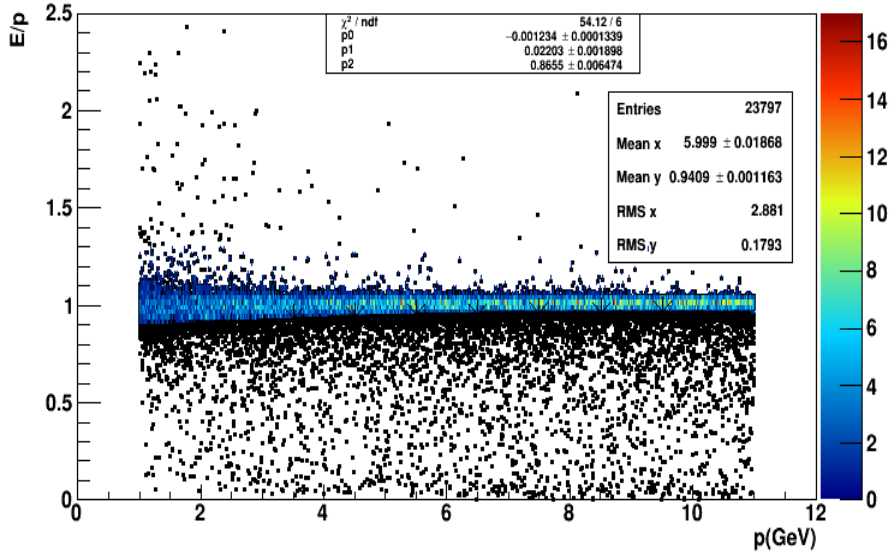
Prelead: 2.0X0





E/p>μ-2σ





0-11 GeV π- beam, θe [16.3°,24°] Energy Calibration SIDIS LAEC configuration

Prelead: 2.0X0