

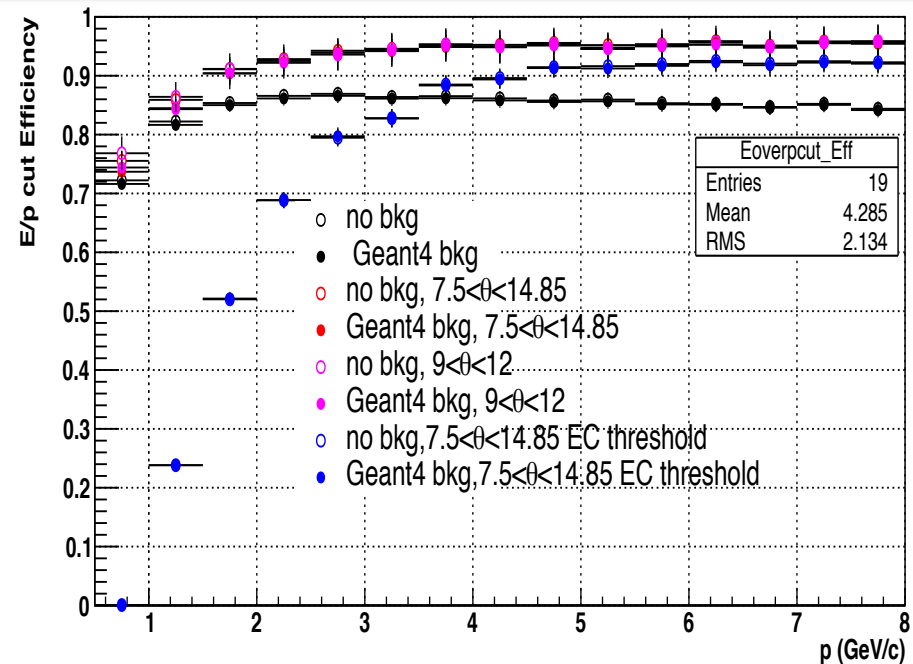
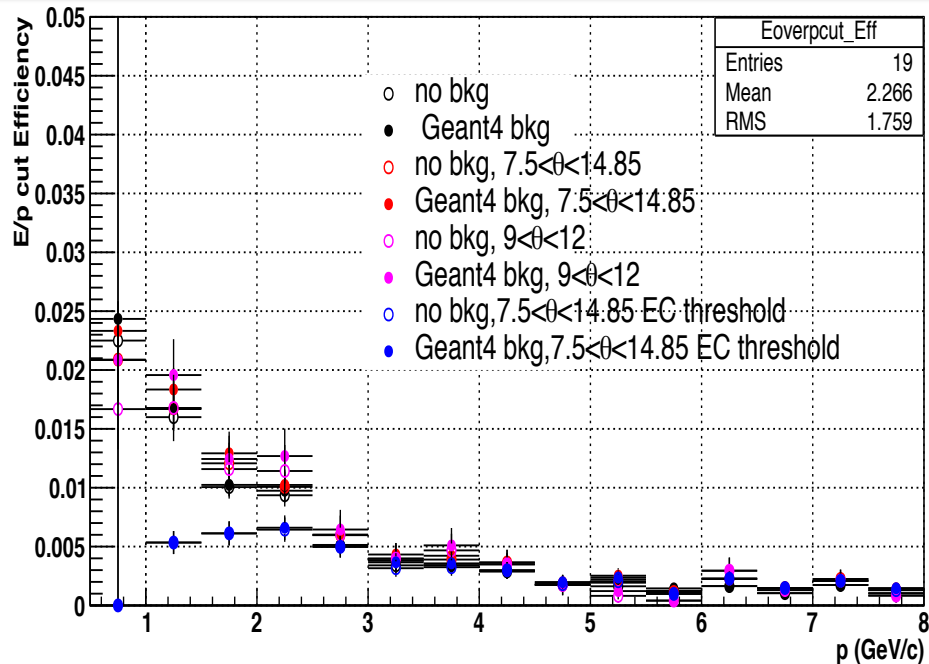
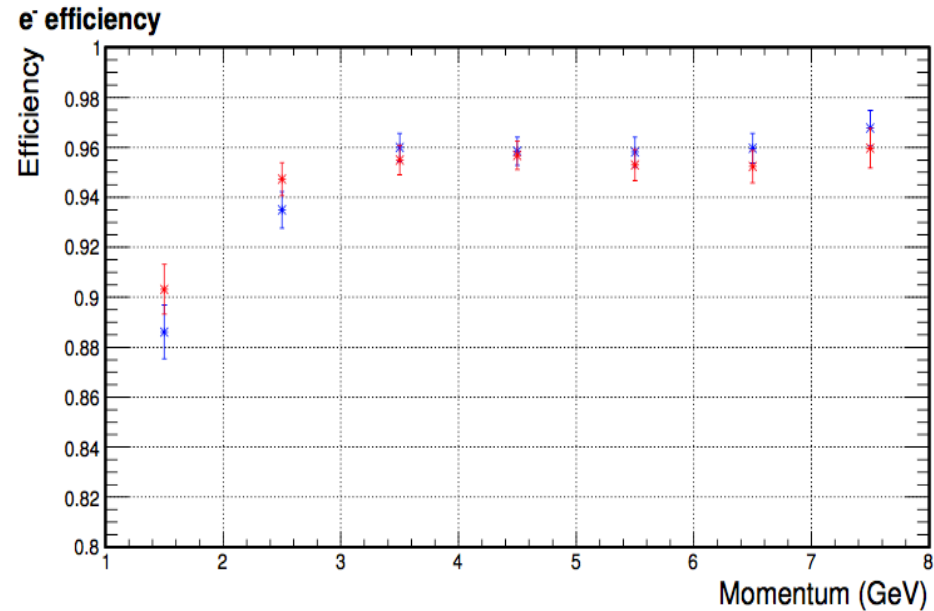
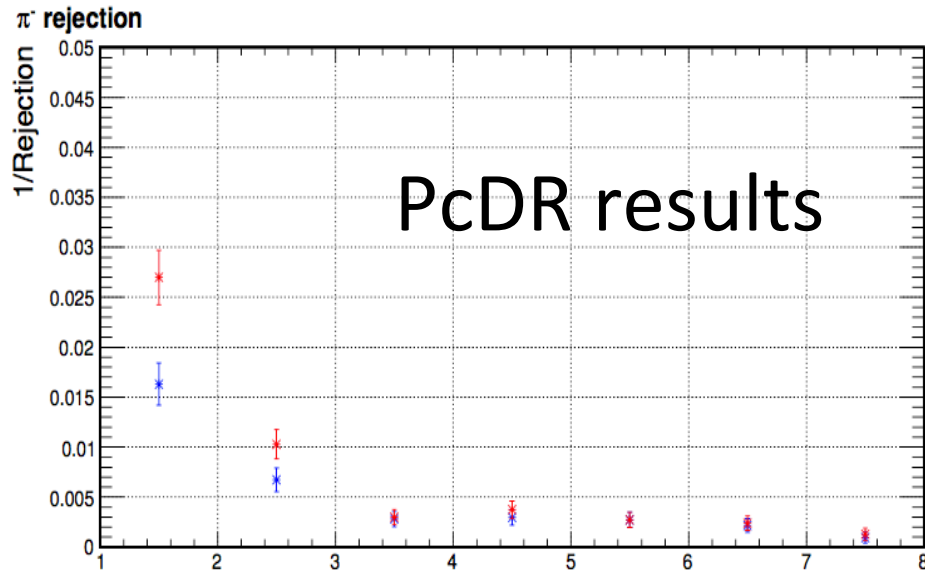
# SIDIS PID Performance Updates

11/30/2017

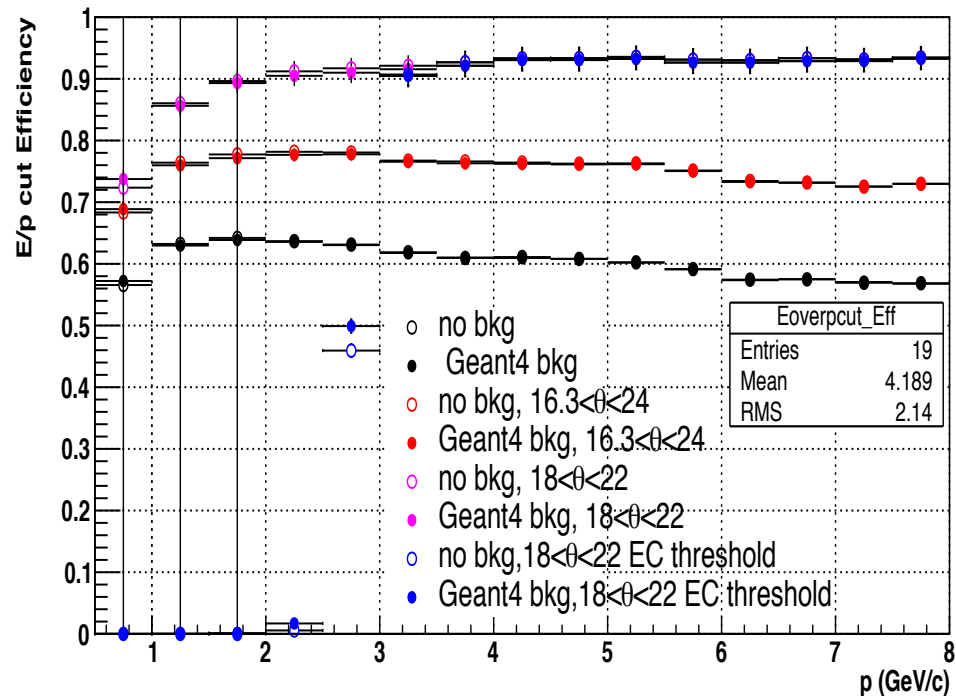
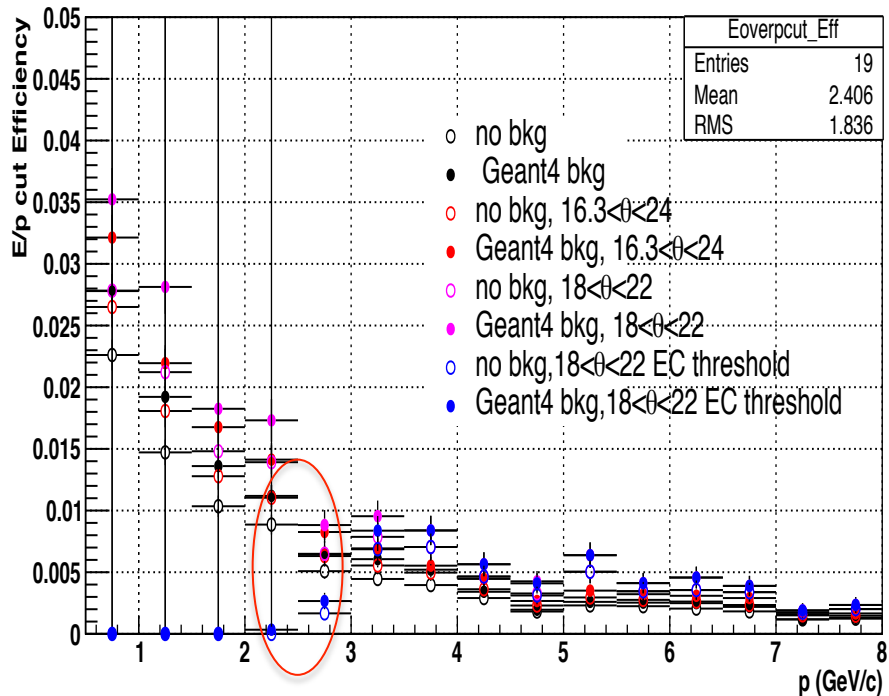
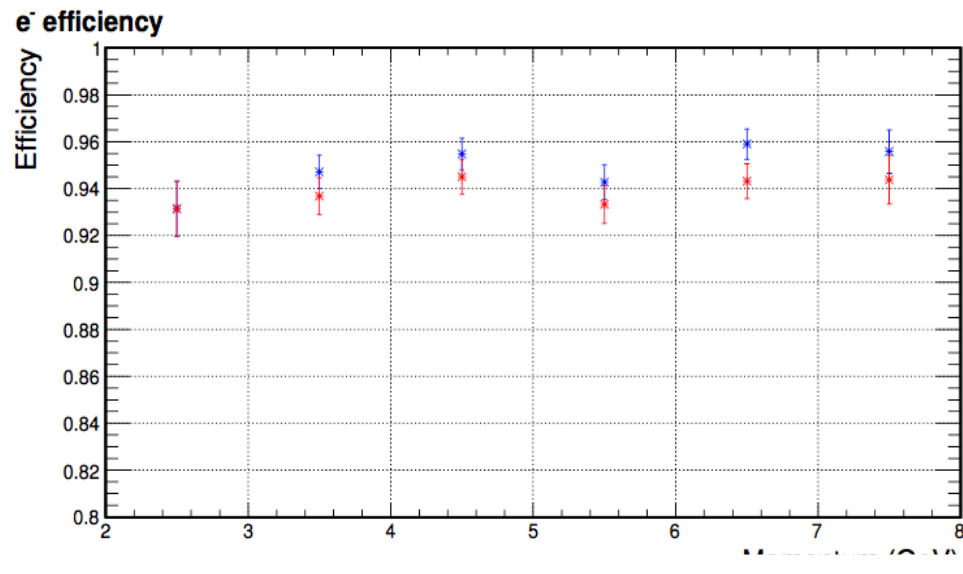
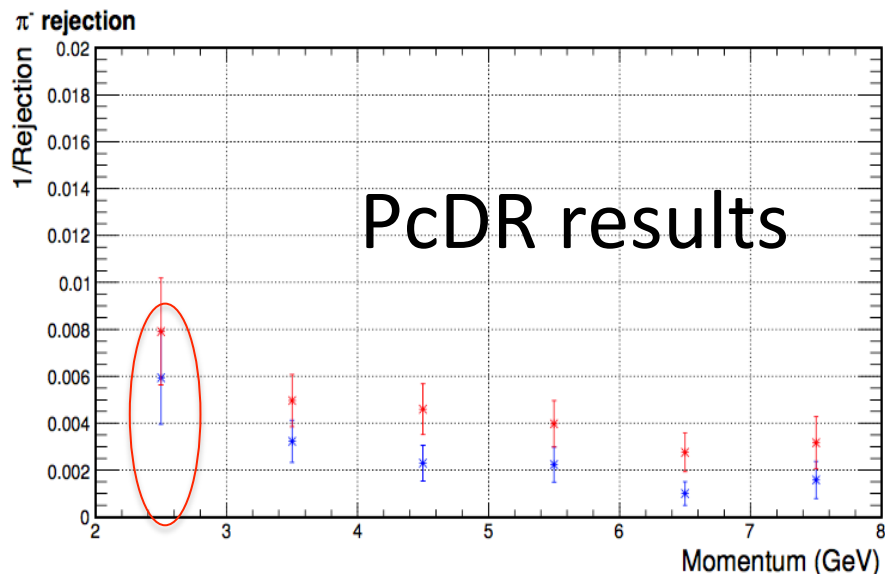
## Previous Issues

- With current simulated backgrounds, PID performance from both FAEC and LAEC are worse than PcDR results.

# FAEC PID Cuts Efficiency



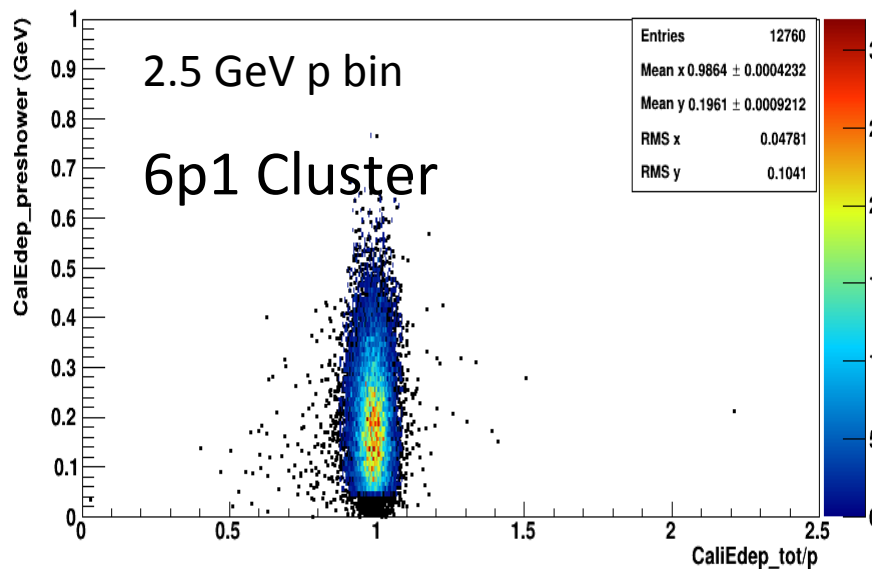
# LAEC PID Cuts Efficiency



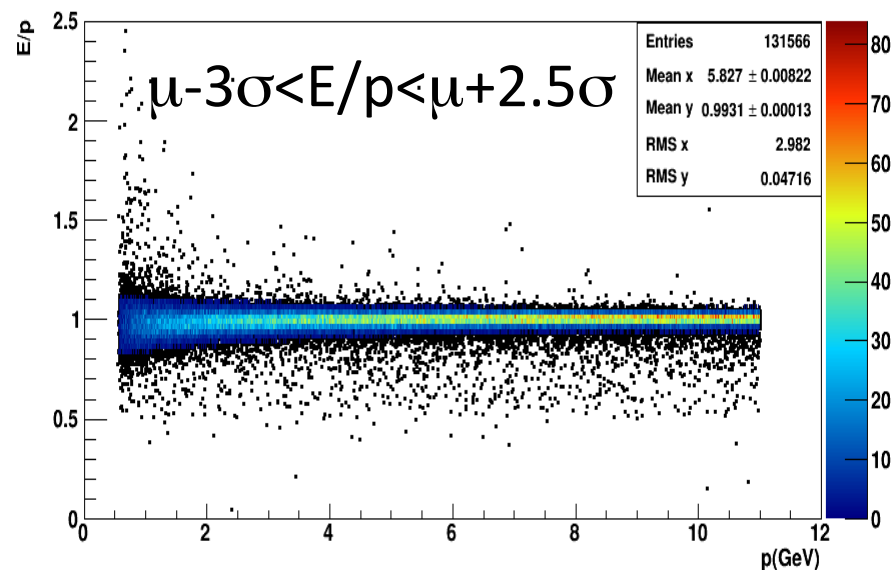
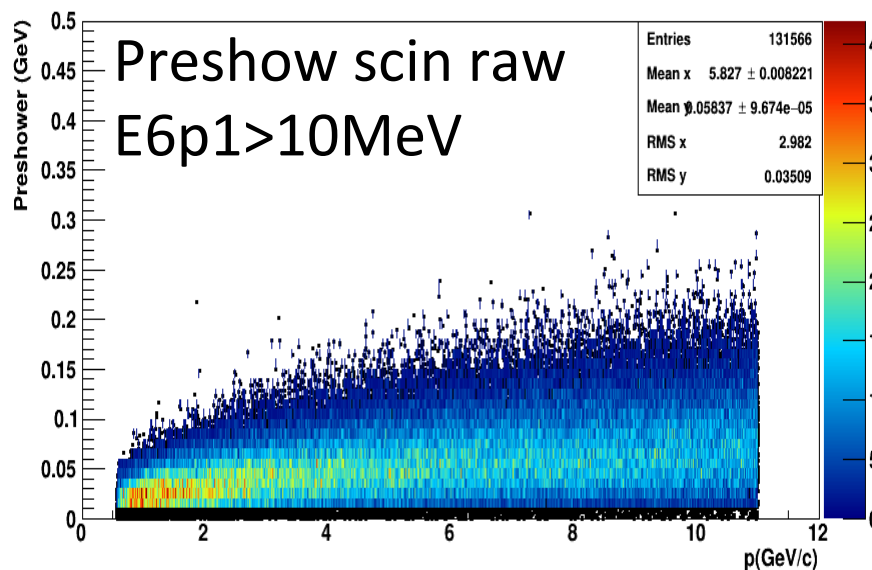
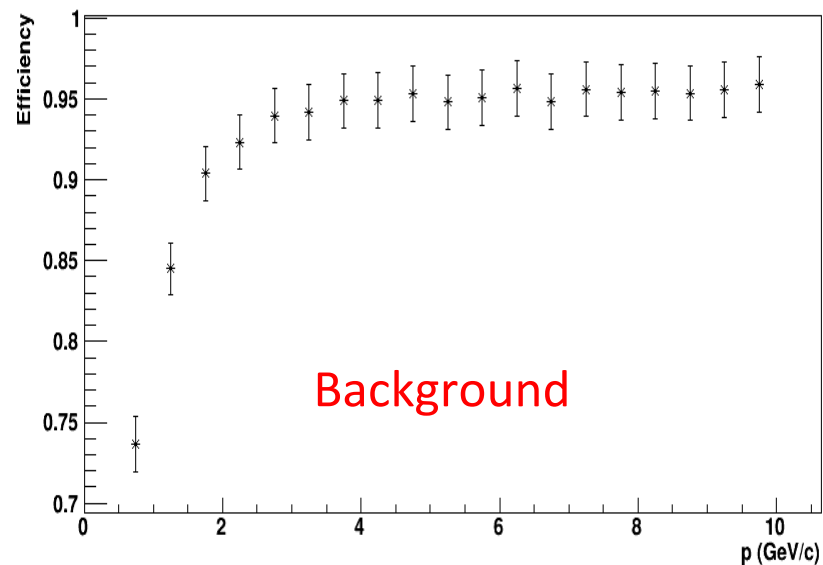
# 0-11 GeV $e^-$ beam, $\theta_e [7.5^\circ, 14.85^\circ]$ Energy Calibration SIDIS FAEC

Prelead: 2.0X0

## Configuration



E/p cut efficiency

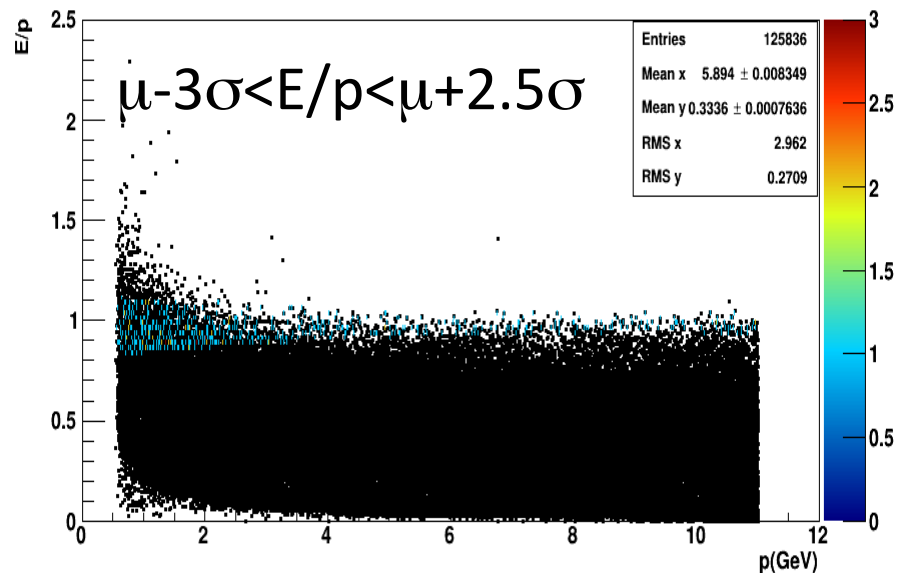
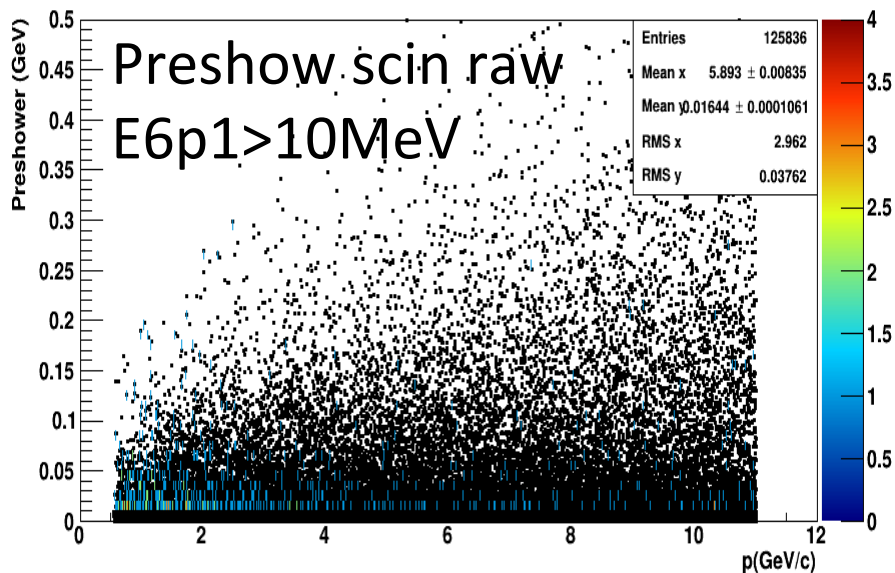
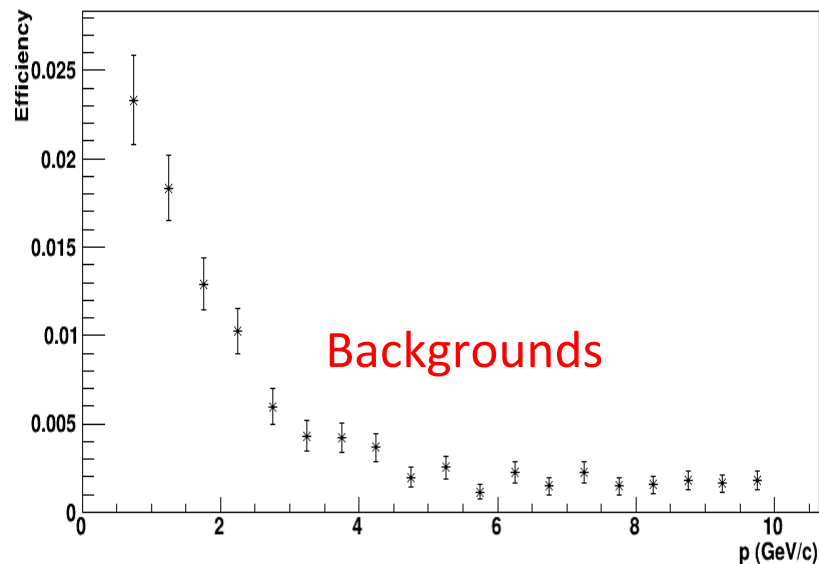
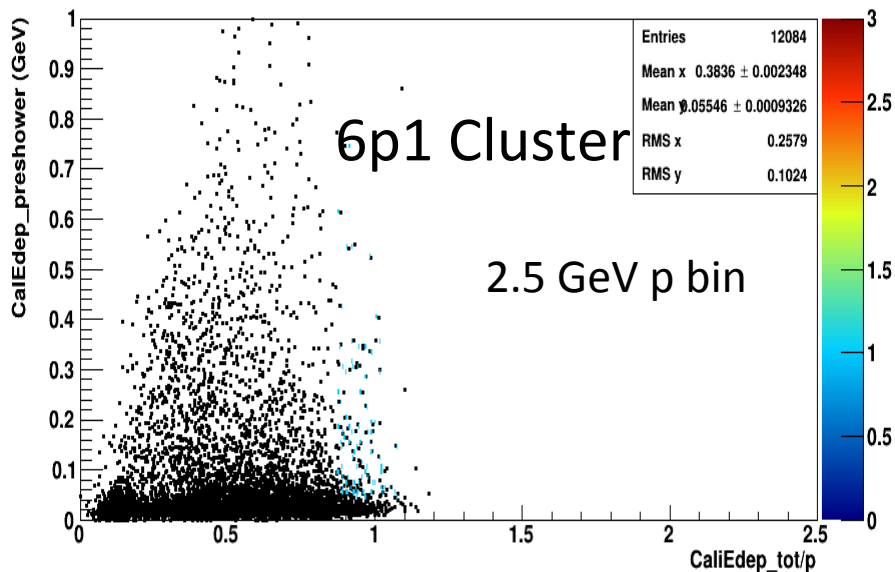


# 0-11 GeV $\pi^-$ beam, $\theta_e$ [7.5°,14.85°] Energy Calibration SIDIS FAEC

Prelead: 2.0X0

configuration

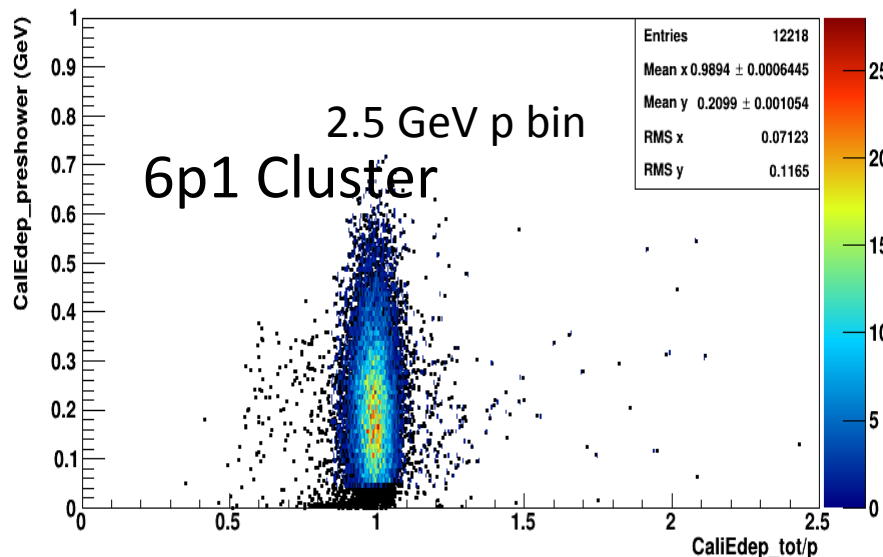
E/p cut efficiency



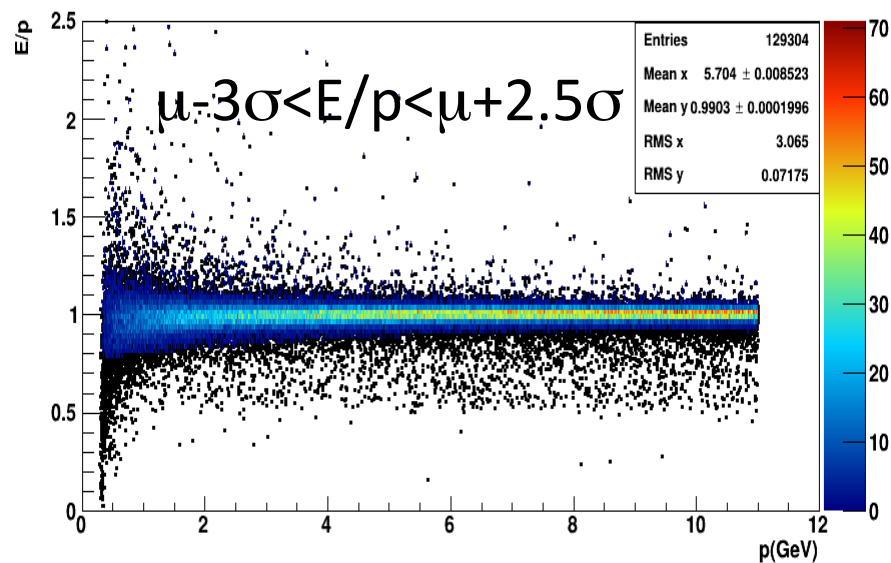
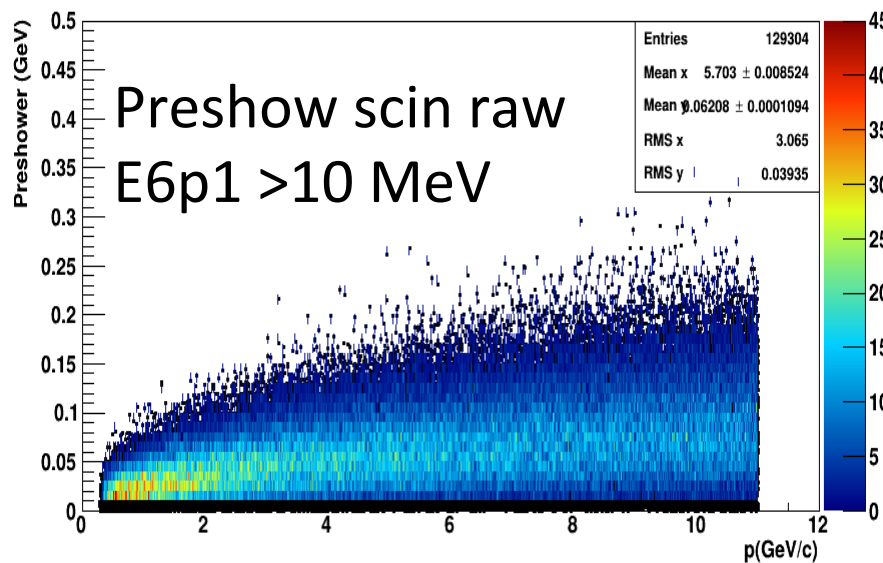
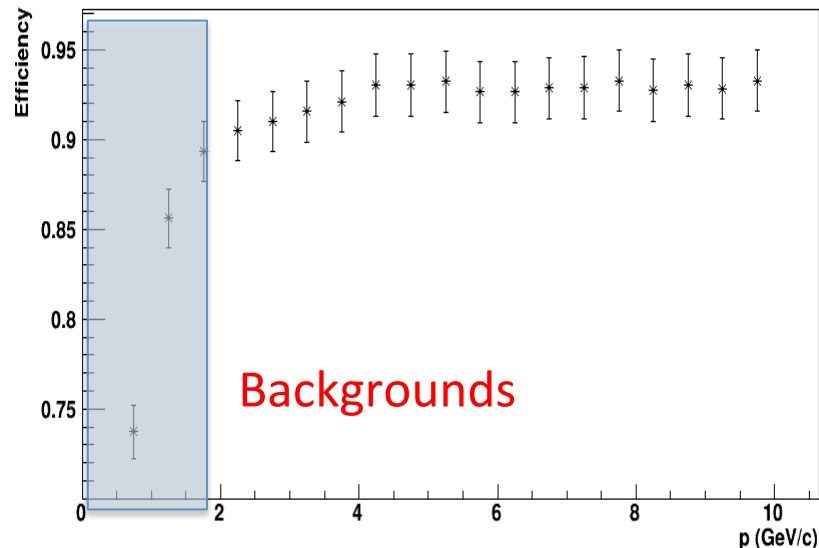
# 0-11 GeV e- beam, $\theta_e [18^\circ, 22^\circ]$ Energy Calibration SIDIS LAEC

Prelead: 2.0X0

## Configuration



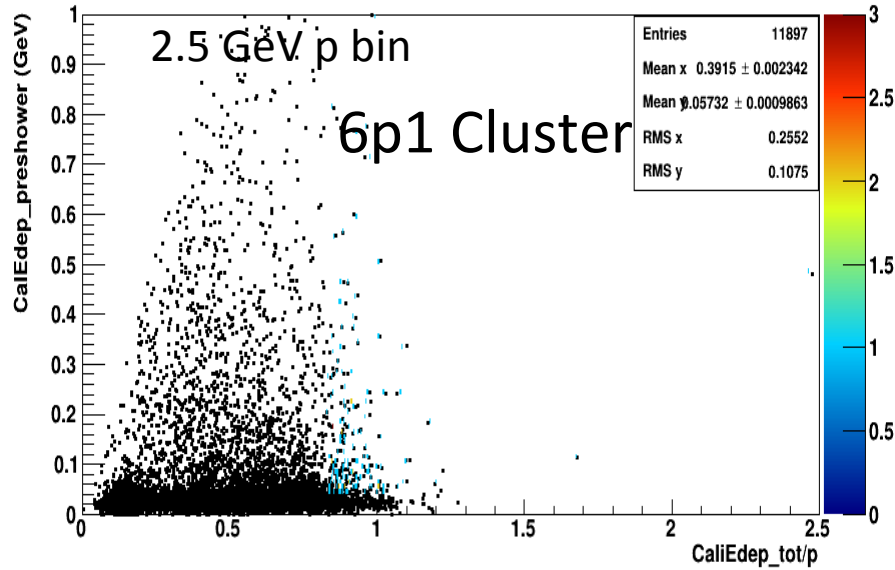
E/p cut efficiency



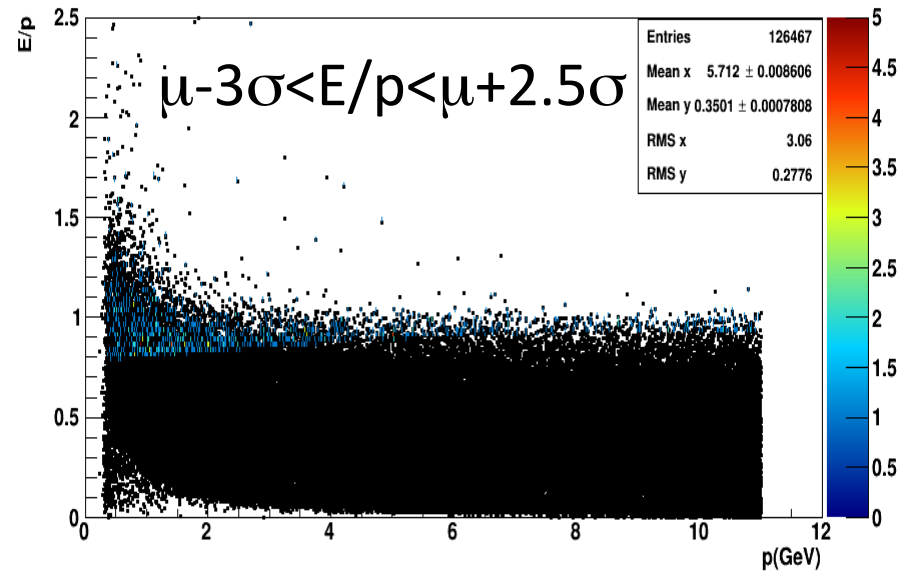
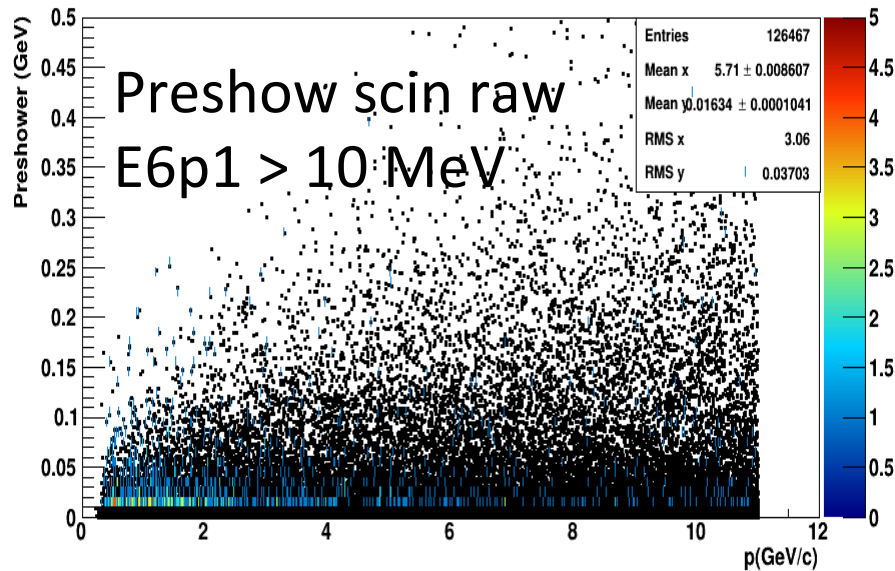
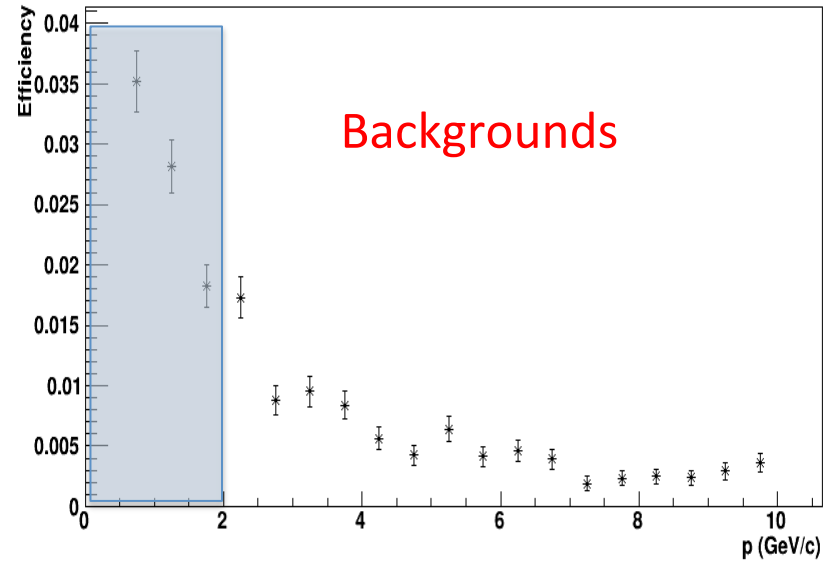
# 0-11 GeV $\pi^-$ beam, $\theta_e$ [18°,22°] Energy Calibration SIDIS LAEC

Prelead: 2.0X0

configuration



E/p cut efficiency





# Summary and Outlook

- Including the current SIDIS simulated backgrounds, PID performance ( $e/\pi^-$  separation) from both FAEC and LAEC are consistent with PcDR results (Jing's results) (by ignoring the edge effect)
- For low momentum ( $p < 1\text{GeV}/c$ ) events, electron efficiency is about 70-80%, and pion rejection is worse, which need further study.

Any comments and suggestions ?

Back up

# SIDIS electron trigger

## FAEC electron trigger

Radius(cm)	E Threshold (GeV)	Jin's cut (GeV)
90 - 105	5.0	shE-preshE>4.4
105 - 115	4.0	shE-preshE>3.5
115 - 130	3.0	shE-preshE>2.6
130 - 150	2.0	shE-preshE>1.6
150 - 200	1.0	shE>0.9

Radius(cm)	6+1 Cluster Threshold (MeV)
90 - 105	990.09
105 - 115	762.60
115 - 130	557.97
130 - 150	355.25
150 - 200	170.87

6p1 E<sub>dep</sub> in ECAL

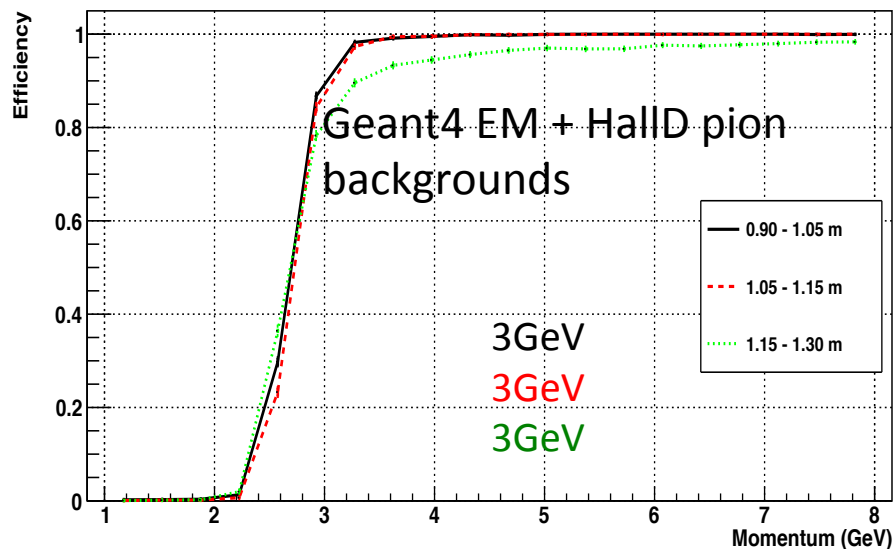
## LAEC electron trigger

Radius(cm)	P Threshold (GeV)
90 - 105	3.0
105 - 115	3.0
115 - 130	3.0

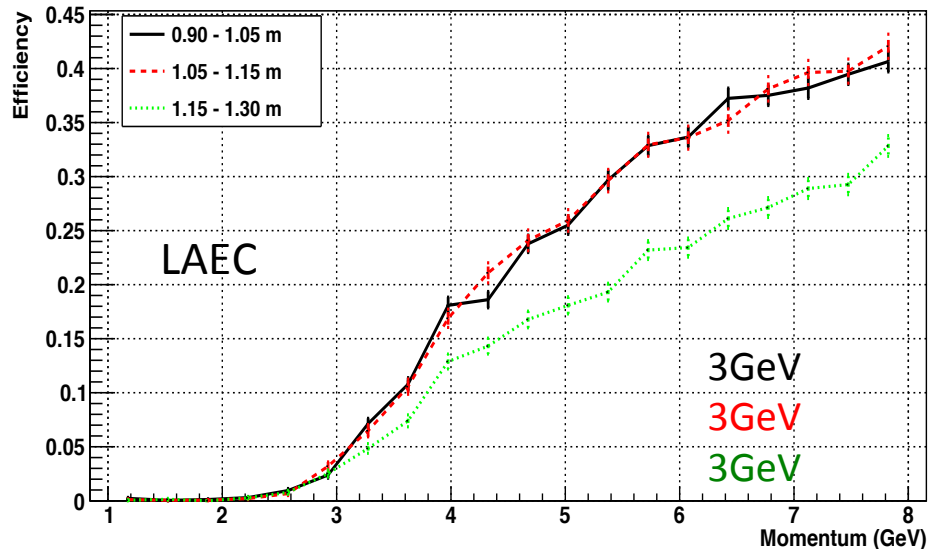
Radius(cm)	6+1 Cluster Threshold (MeV)
90 - 105	571.50
105 - 115	571.90
115 - 130	531.60

# SIDIS Electron and Pion Efficiency Curves

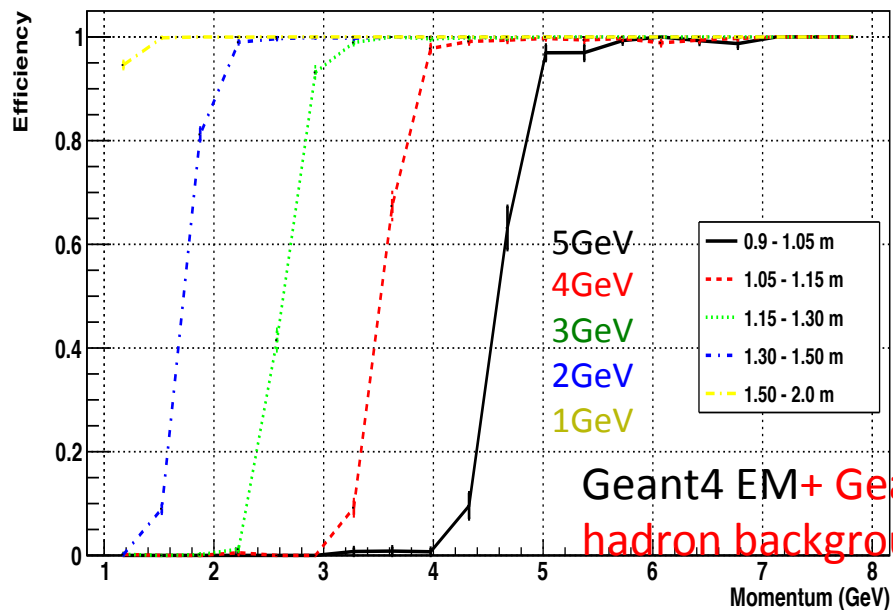
### Electron Efficiency



### Pion Efficiency



### Electron Efficiency



### Pion Efficiency

