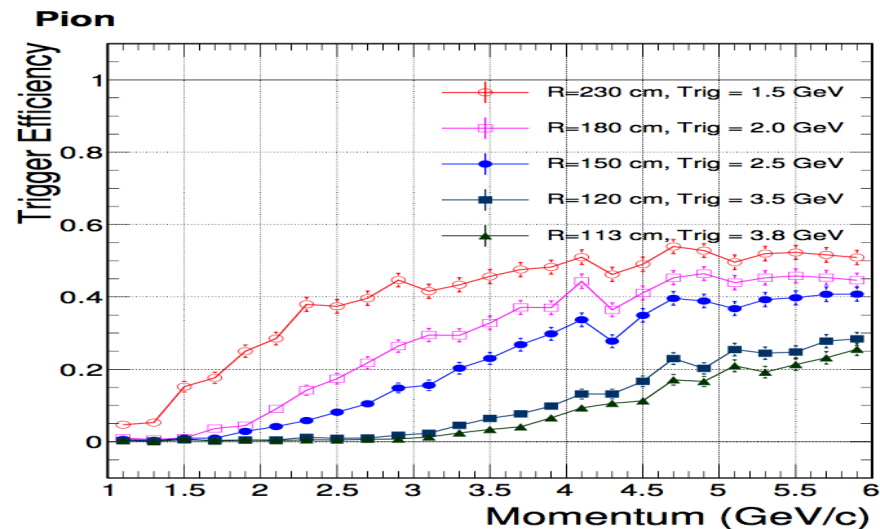
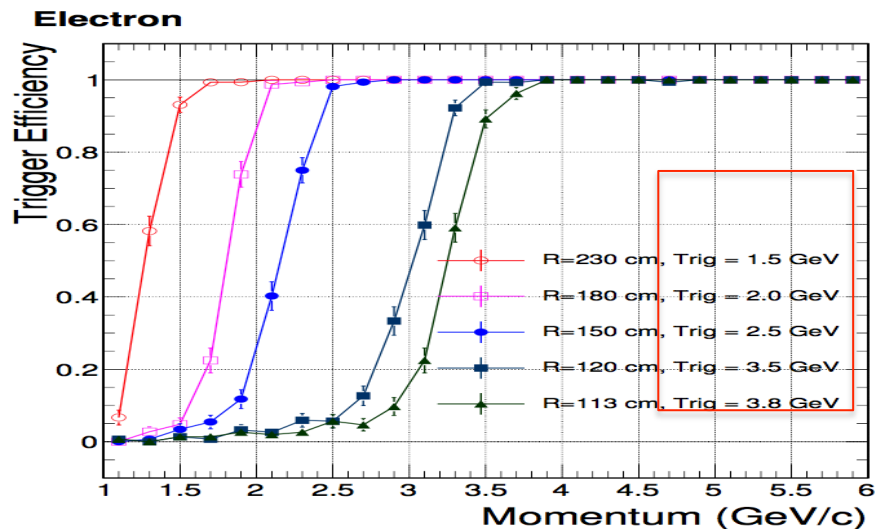


ECAL Trigger Response Updates

- PVDIS ECAL trigger response comparison: preCDR results, Rakitha's Remoll simulation, and GEMC simulation results.
- Backgrounds:
 - ┌ Merge individual background file (Geant EM, HalID
└ π^- , π^0 , and π^+)
 - ┌ Beam on target file (GEANT--EM+Hadrons).

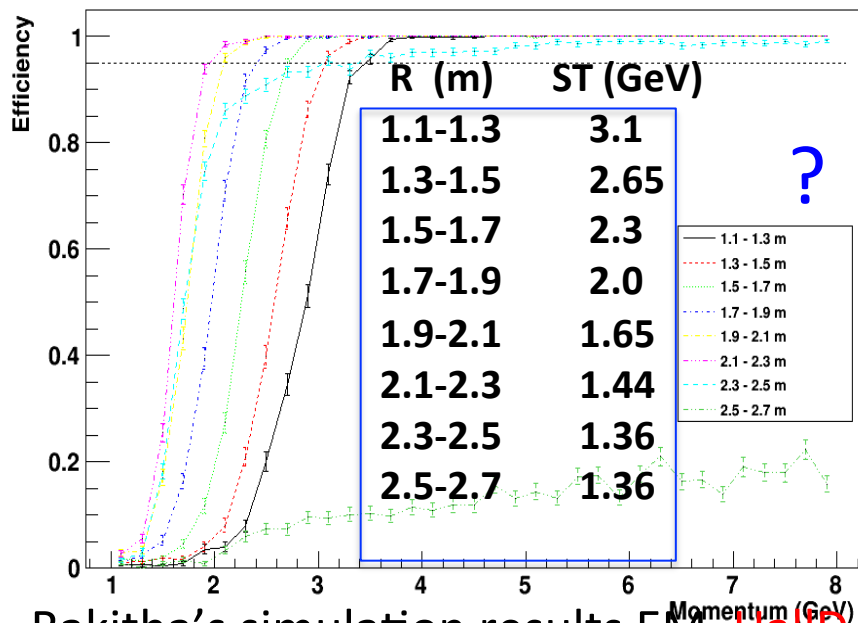
10/5/2017

ECAL Trigger Response Curves for PVDIS configuration

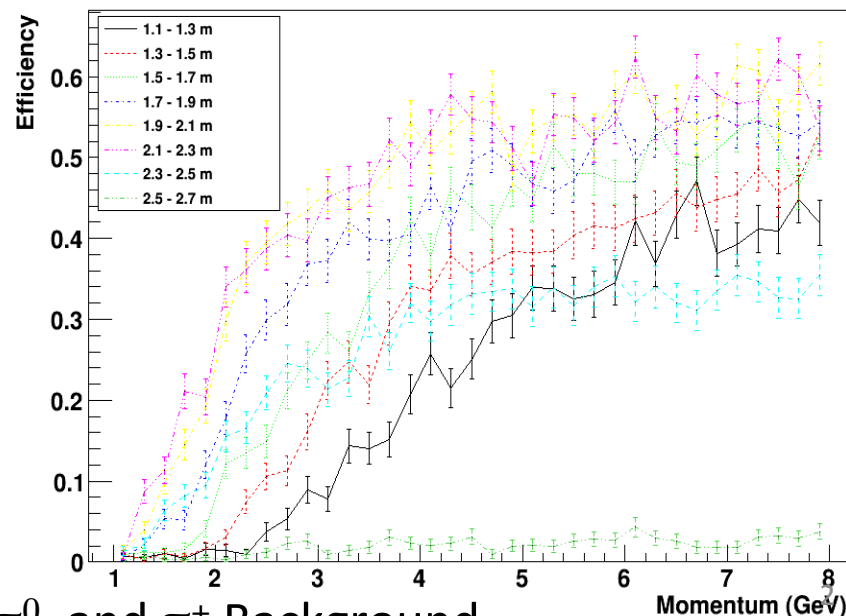


EM, **Wiser** π^- , π^0 , π^+ Background
 (b) Lower-radiation azimuthal region

Electron Efficiency



Pion Efficiency



Rakitha's simulation results EM, **HalfD** π^- , π^0 , and π^+ Background

Merge Backgrounds

Merged events are uniformly separated in time according to the background rates

- Vertex rate: π^+ (28.5 GHz), π^0 (27.3 GHz), and π^- (28.5 GHz)
- EC flux hit rate: EM (346.0GHz) ? Rakitha's method
($P_z > 0$)

- Vertex rate: π^+ (28.8 GHz), π^0 (27.5 GHz), and π^- (28.8 GHz)
- Vertex rate: EM (1.63×10^4 GHz) Ye's comparison method
($P_z > 0$)

rate = event number x $[50e^{-6}/1.6e^{-19}/(\text{total event number})]$ Hz

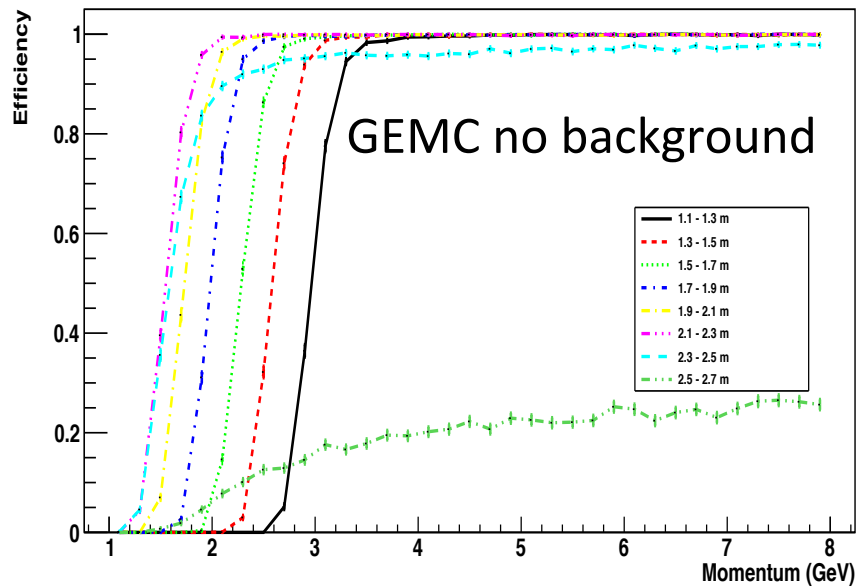
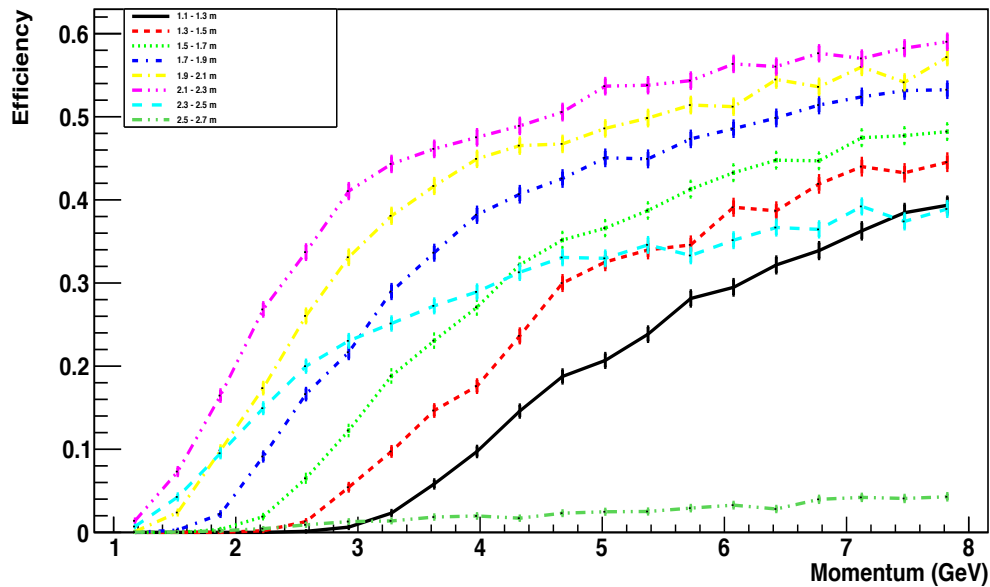
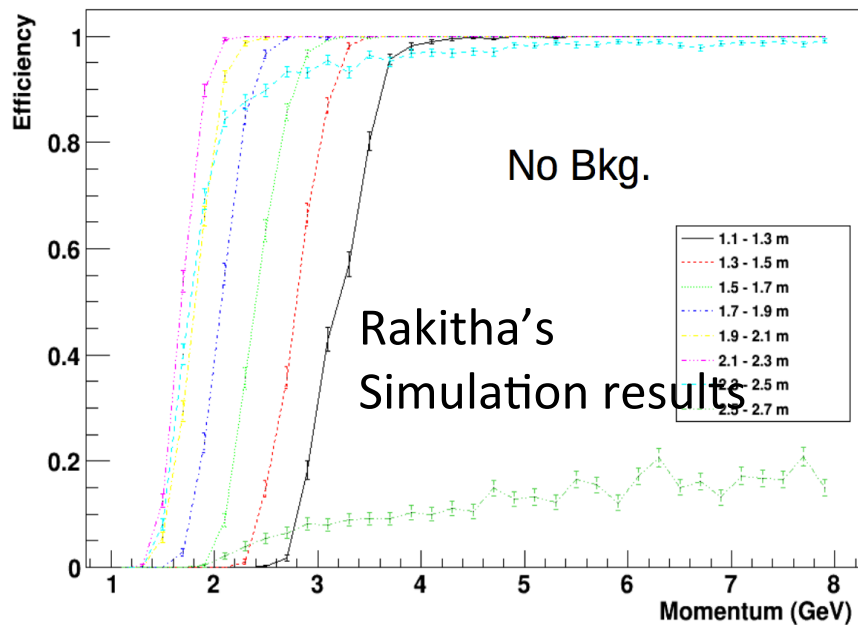
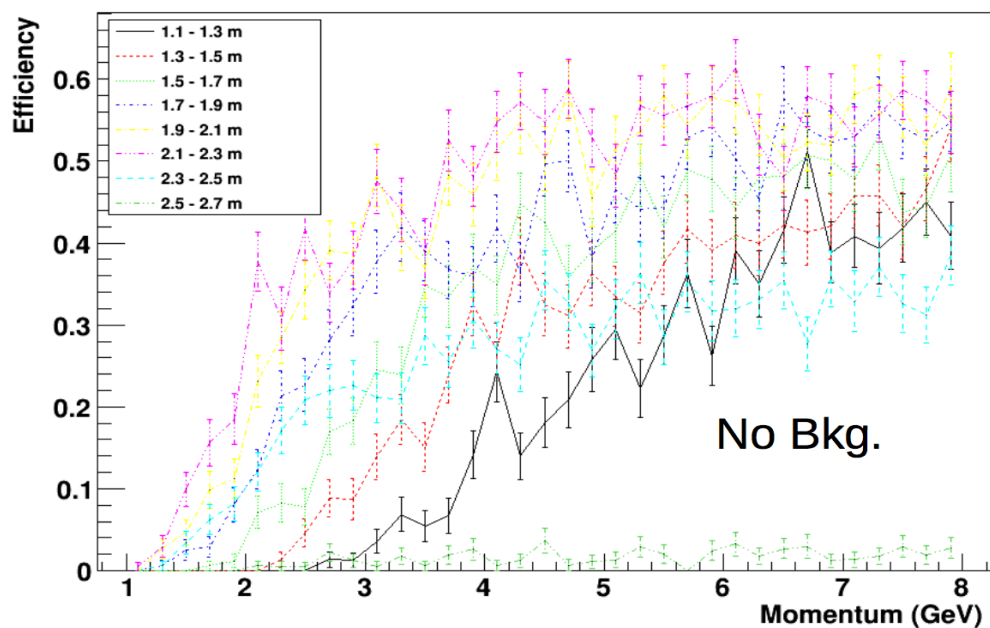
Beam on Target File for PVDIS

- 11 GeV e^- hit on deuterium target
- Geant4 physics: hadron, EM, and optical physics process.
- Mark event time window information (30 ns window) based on the Rates:

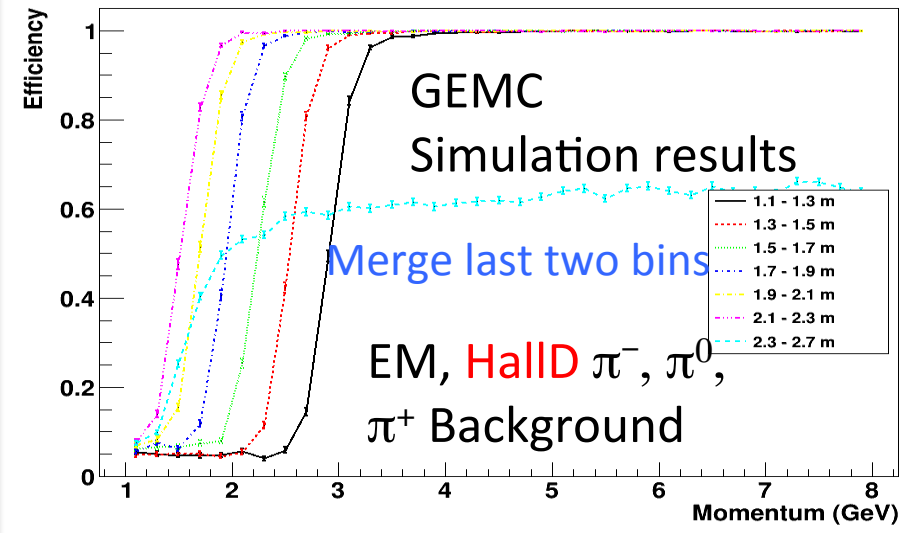
Vertex Rate = (factor* event number_{vertex}) Hz = 1.629×10^4 GHz
488700 events per window, and total time windows: 106

Event weight factor = $(50e^{-6}/1.6e^{-19}/\underline{1e9})$ Hz

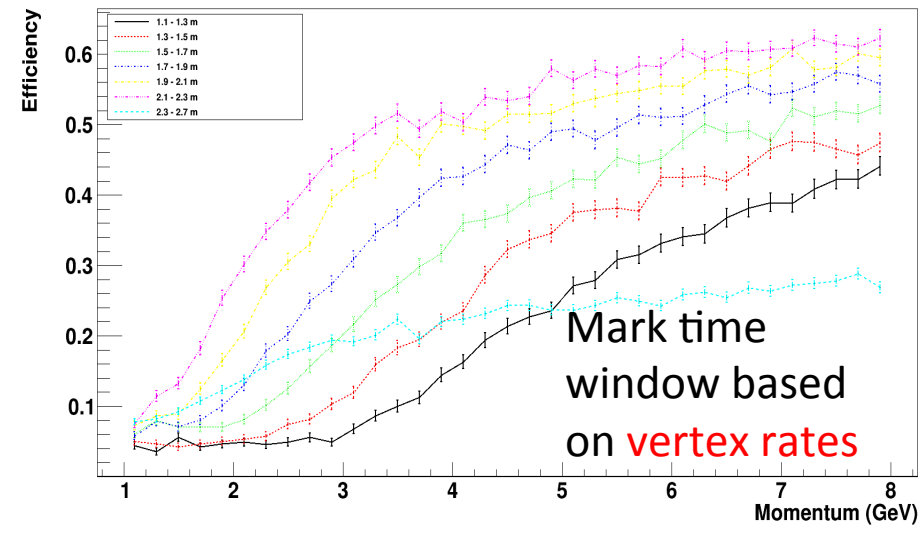
Generate 1 billion bkg events

Electron Efficiency**Pion Efficiency****Electron Efficiency****Pion Efficiency**

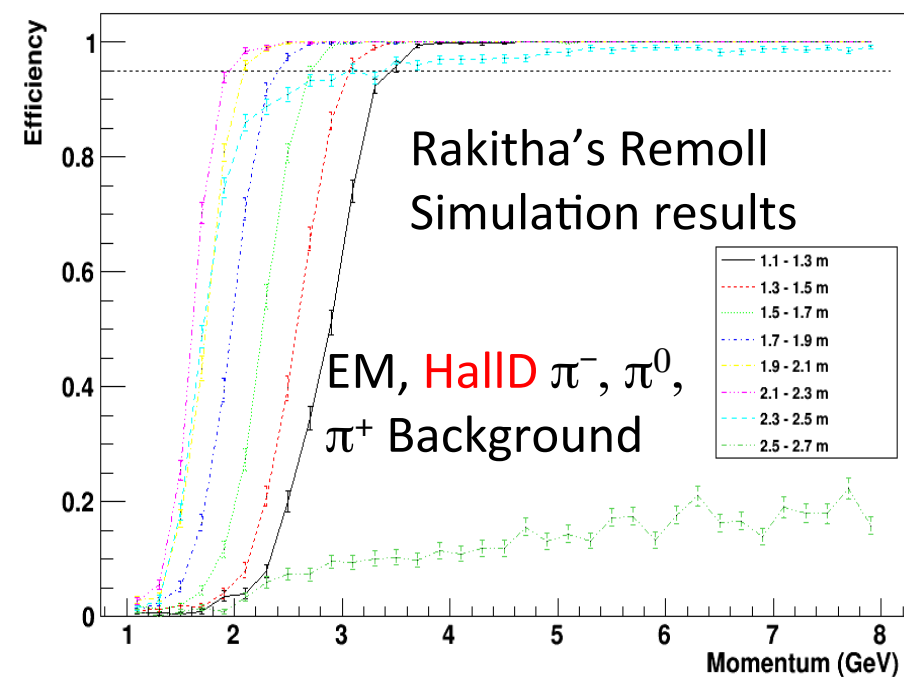
Electron Efficiency



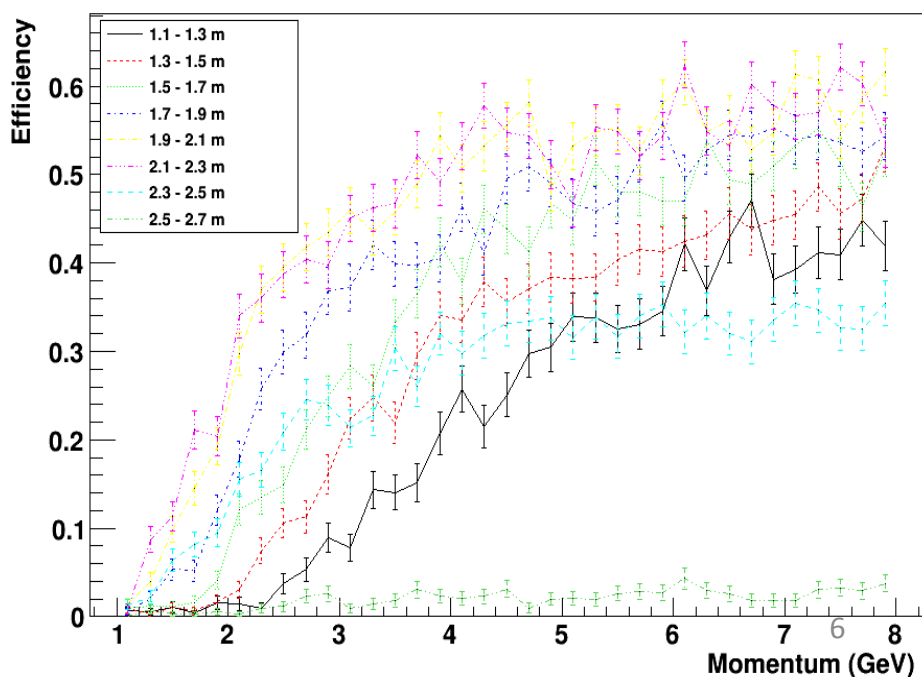
Pion Efficiency



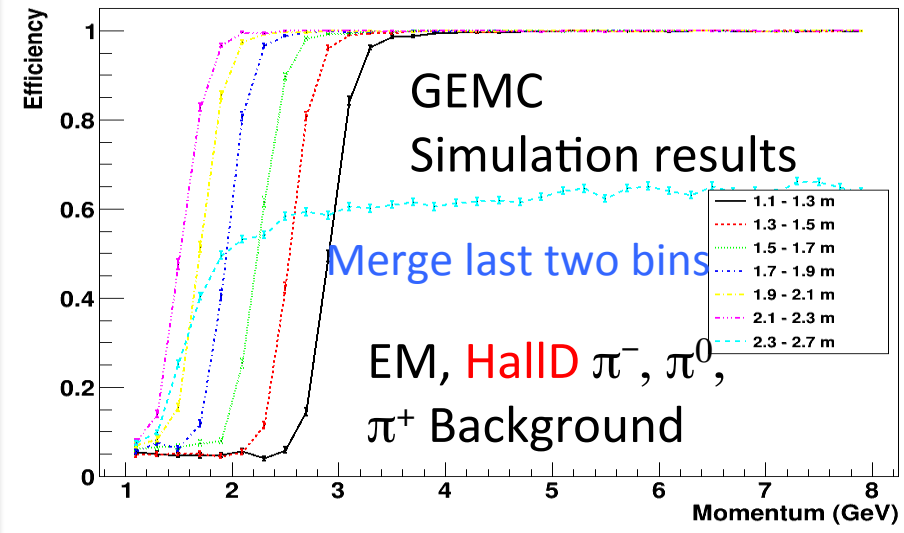
Electron Efficiency



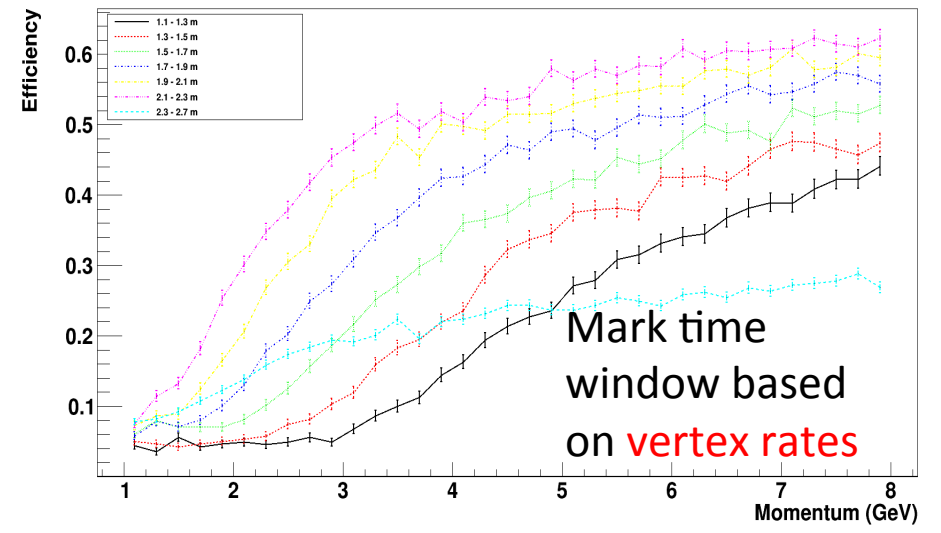
Pion Efficiency



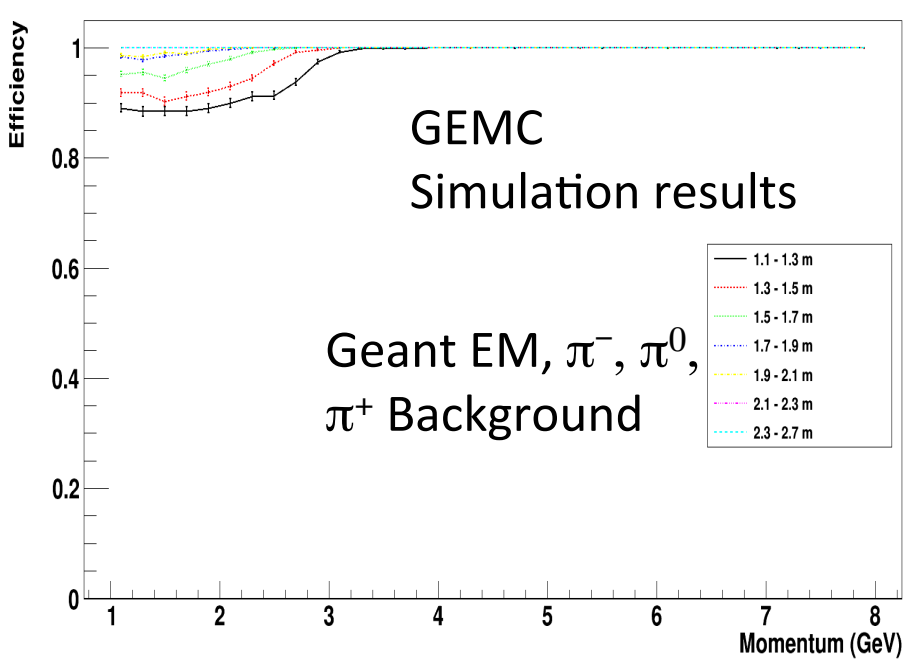
Electron Efficiency



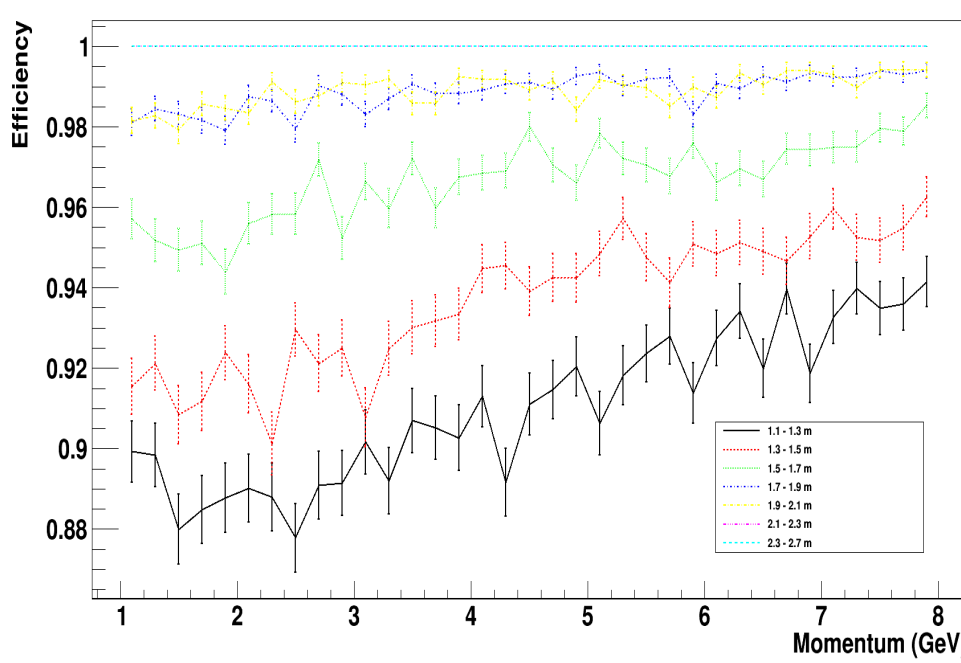
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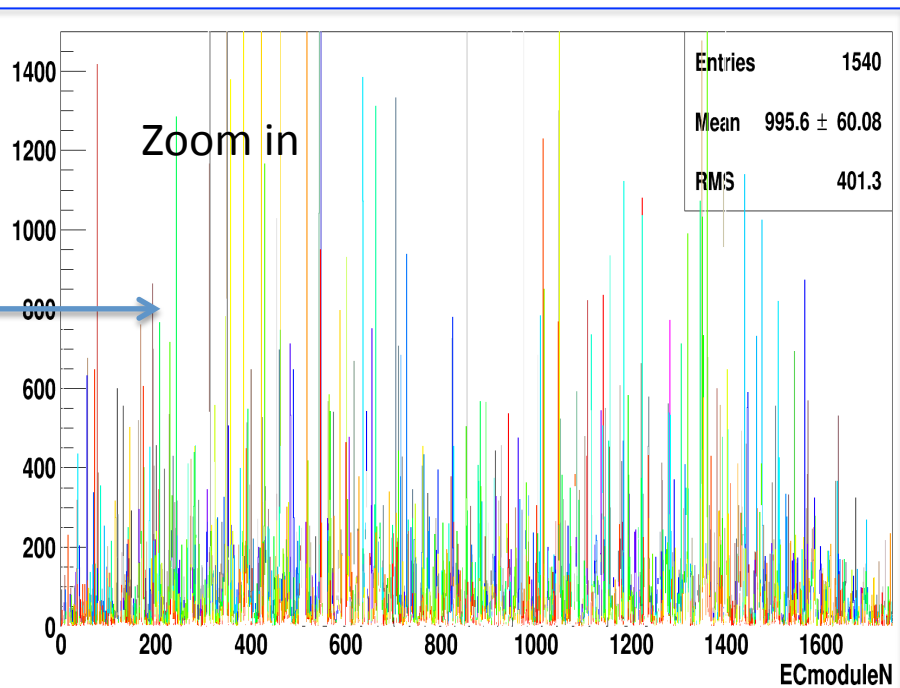
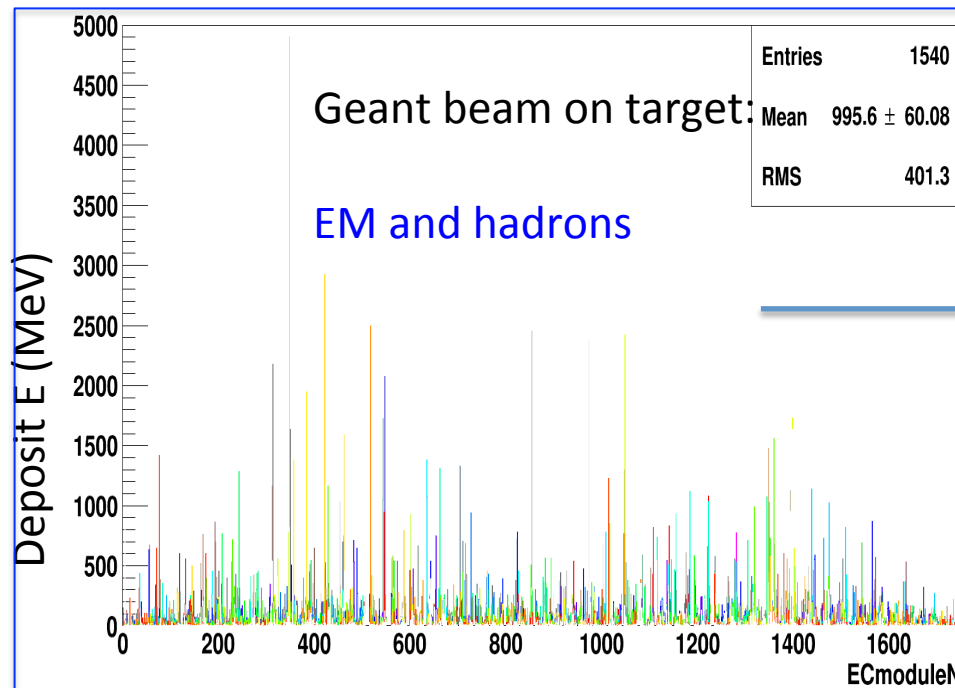
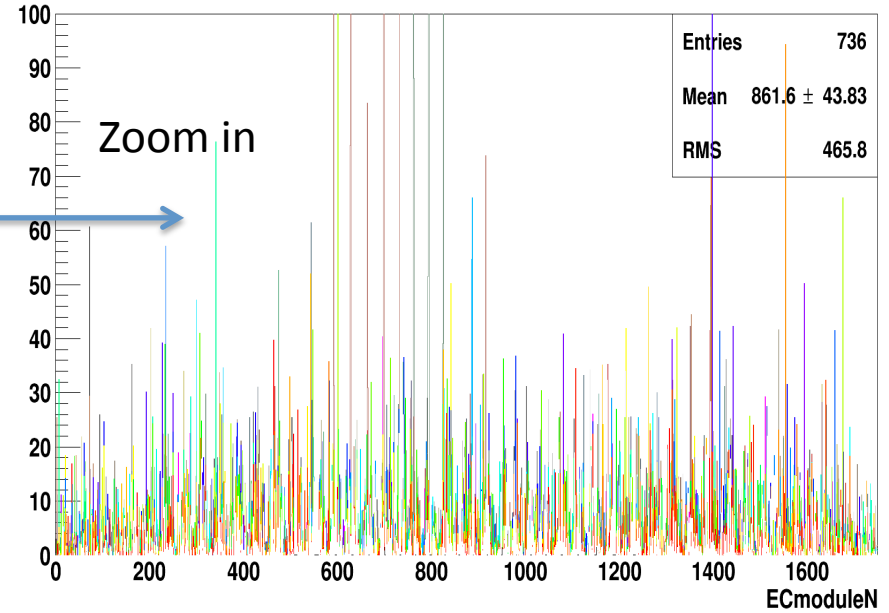
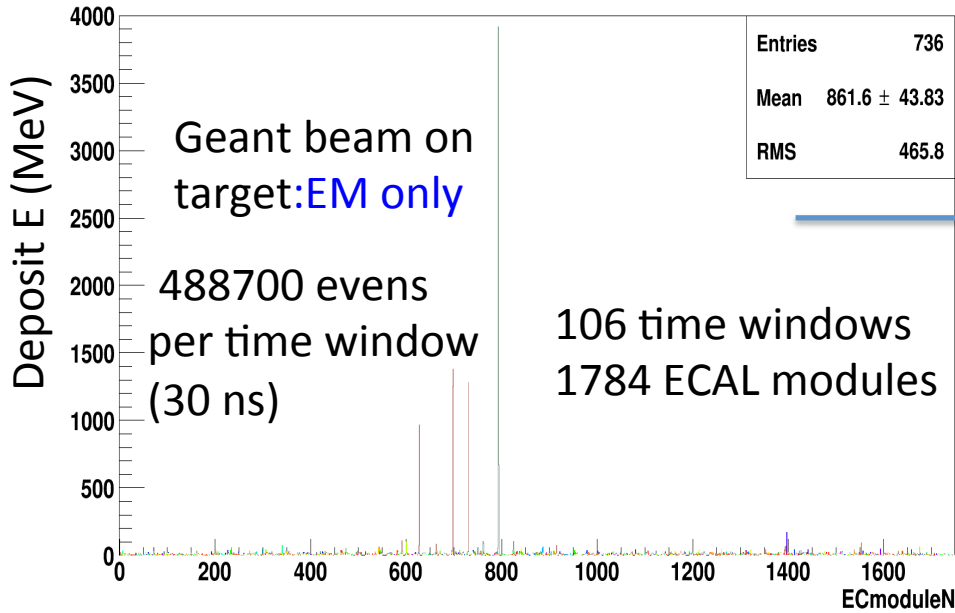
Electron Efficiency



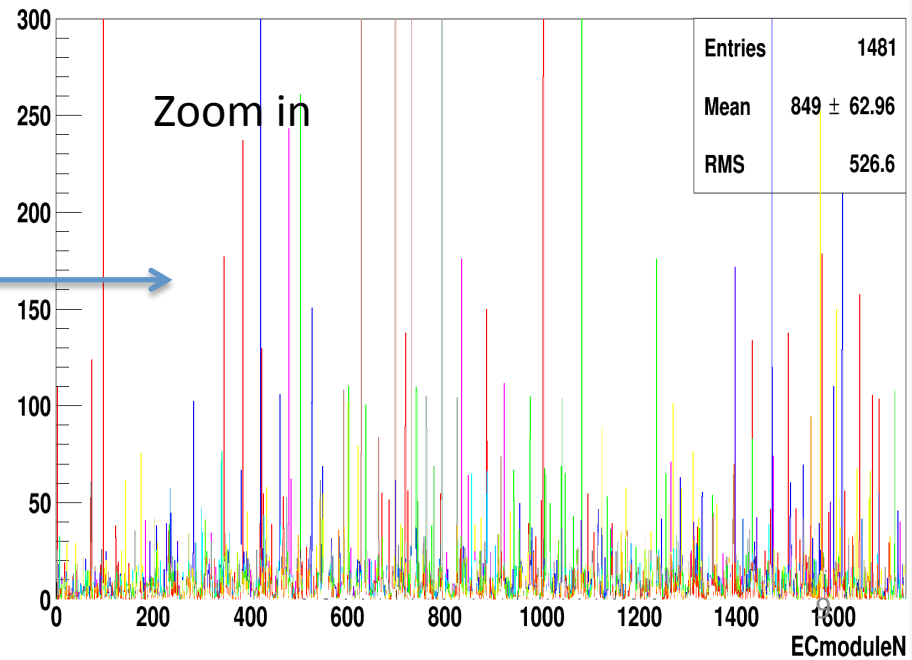
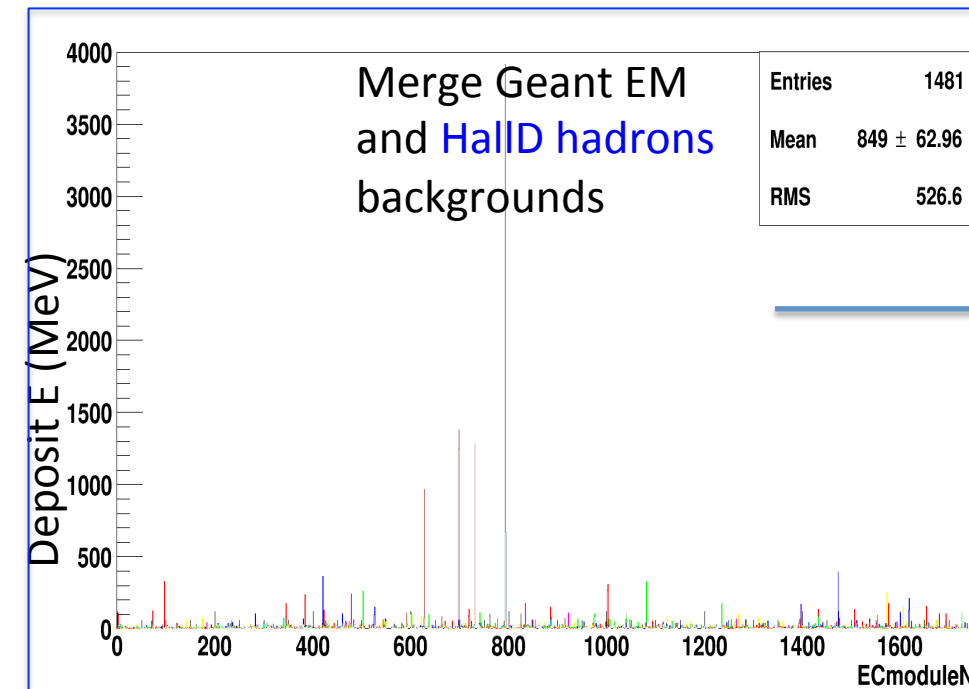
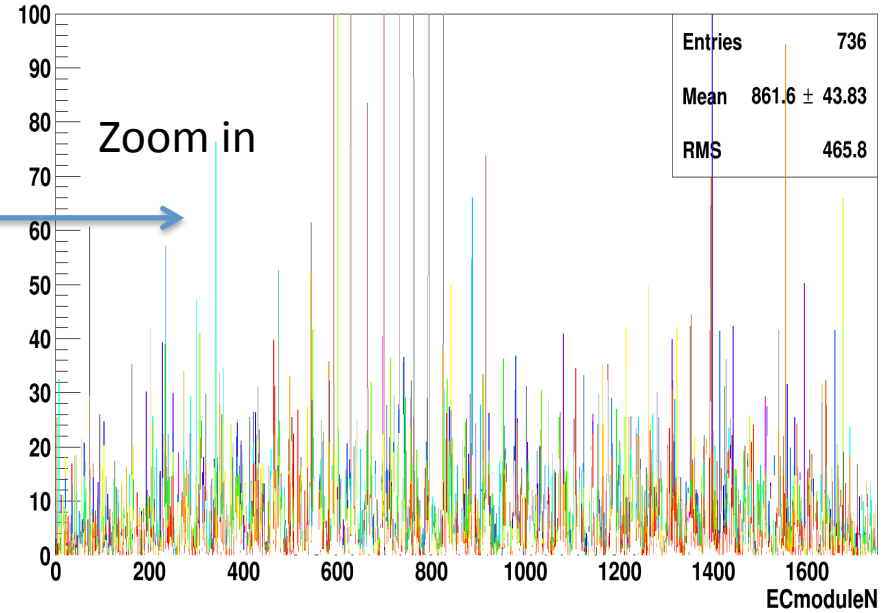
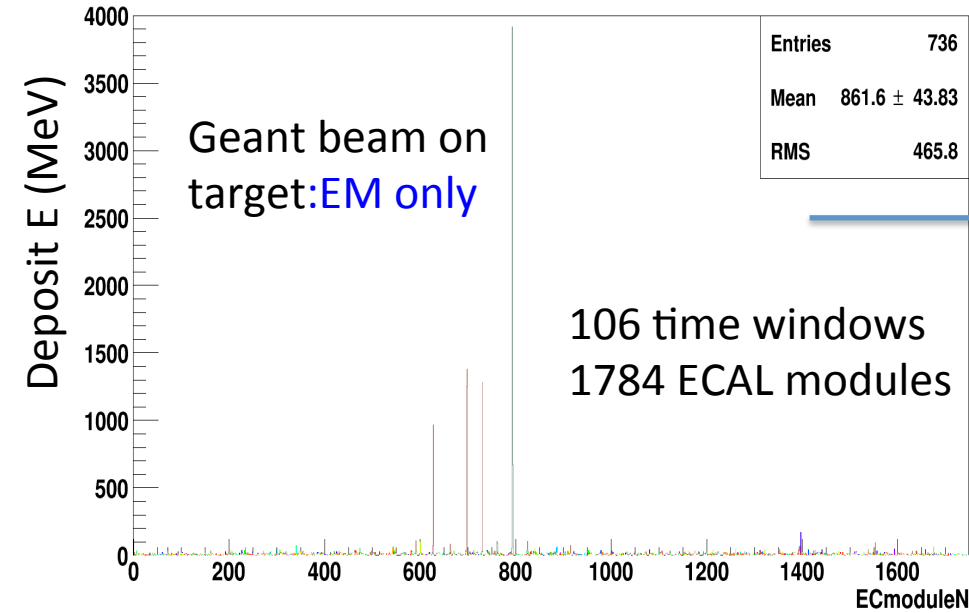
Pion Efficiency



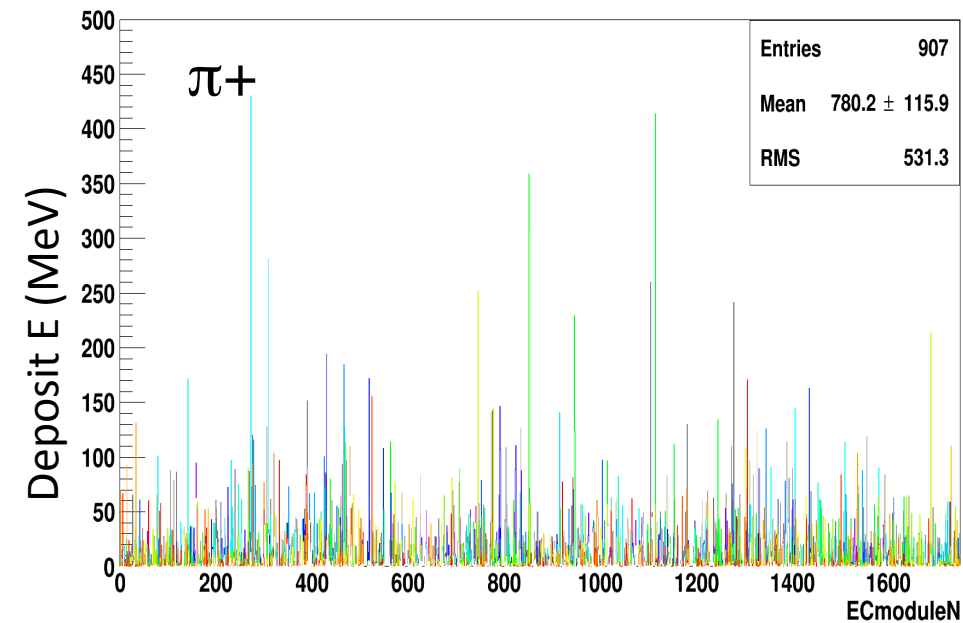
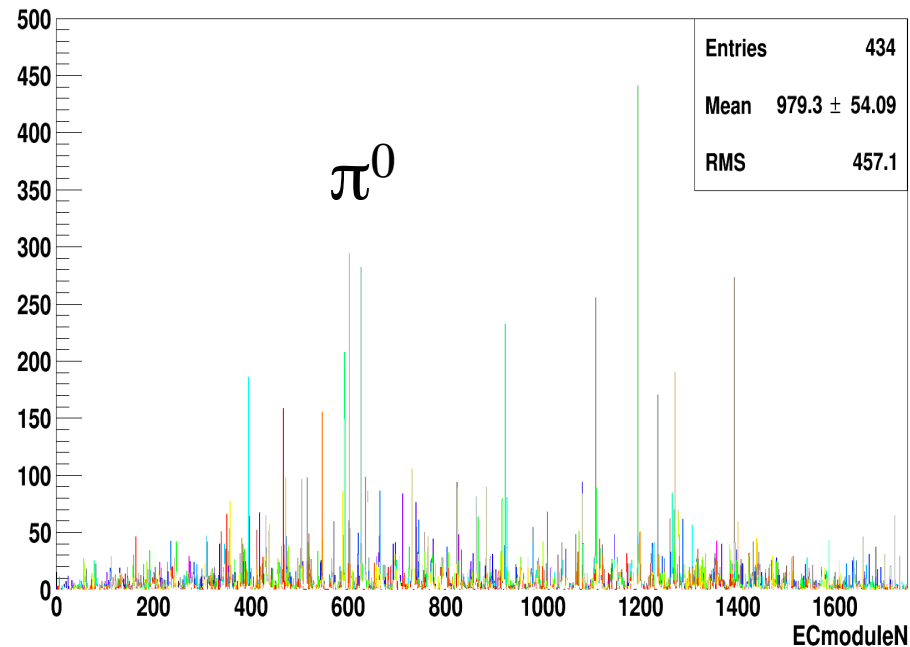
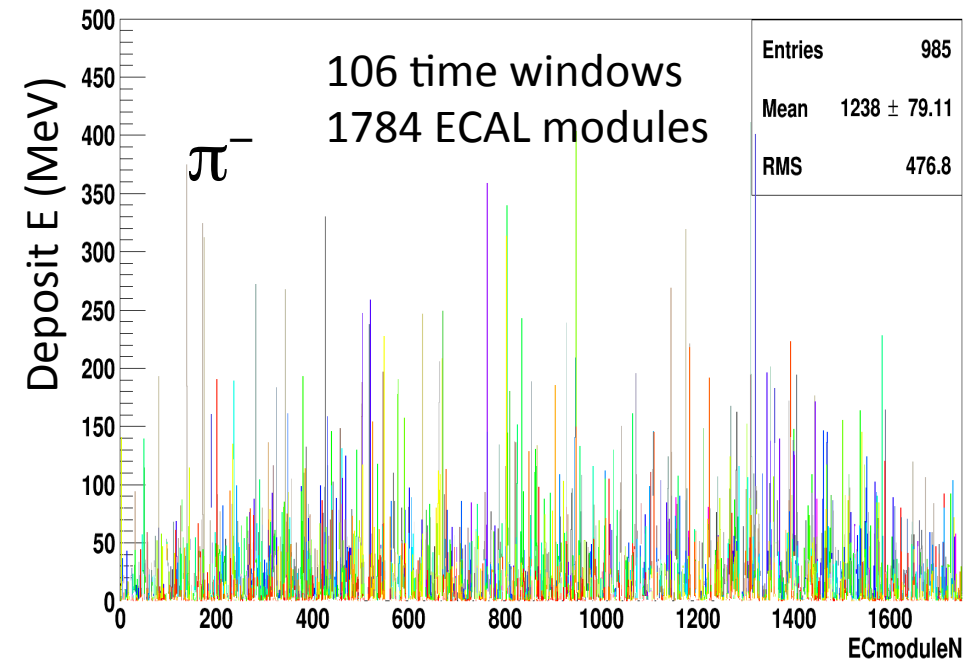
GEMC Backgrounds



GEMC Backgrounds



GEMC hadron Backgrounds (HallD)



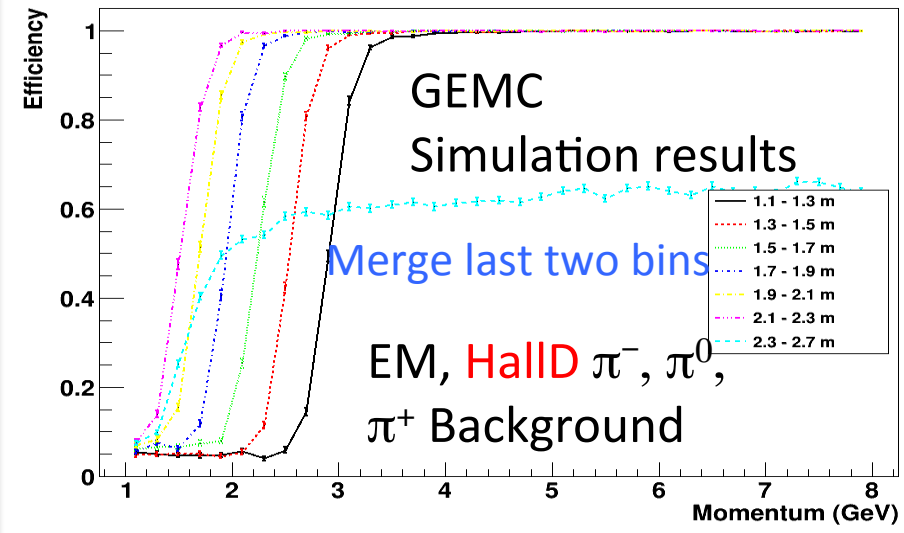
Summary

- Without background, the trigger response curves from Rakitha's Remoll simulation and that from GEMC simulation are consistent.
- The background contribution from beam on Target file (Geant4 simulation) is much larger than merging individual background file method (EM and HalD hadrons), which needs further study to pin down the difference.

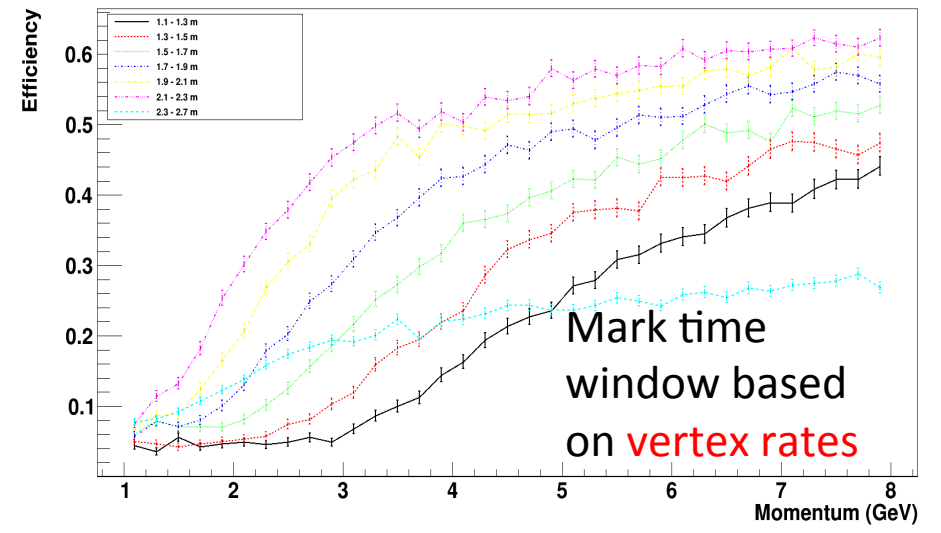
Any comments and suggestions ?

Back up

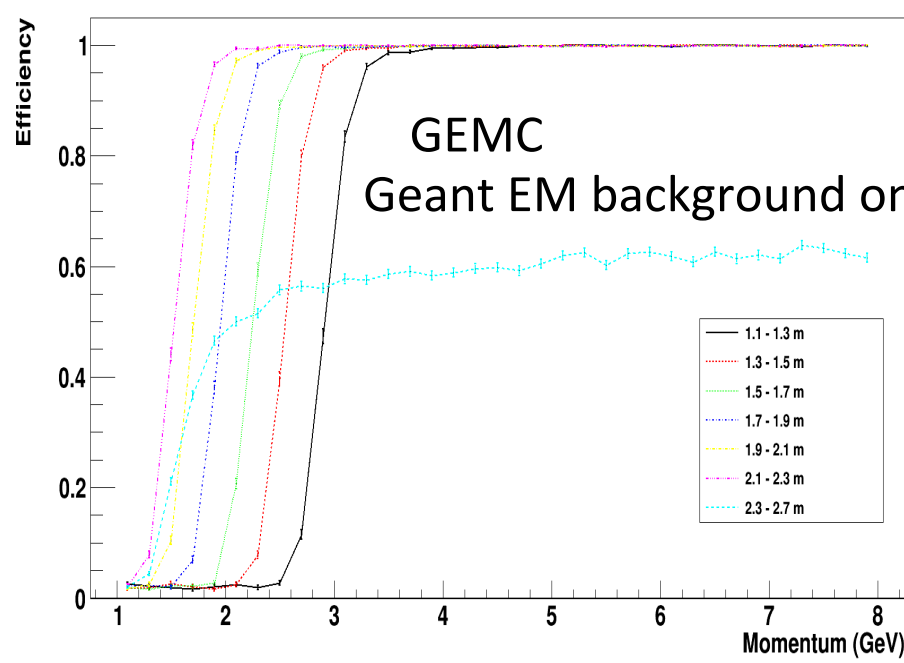
Electron Efficiency



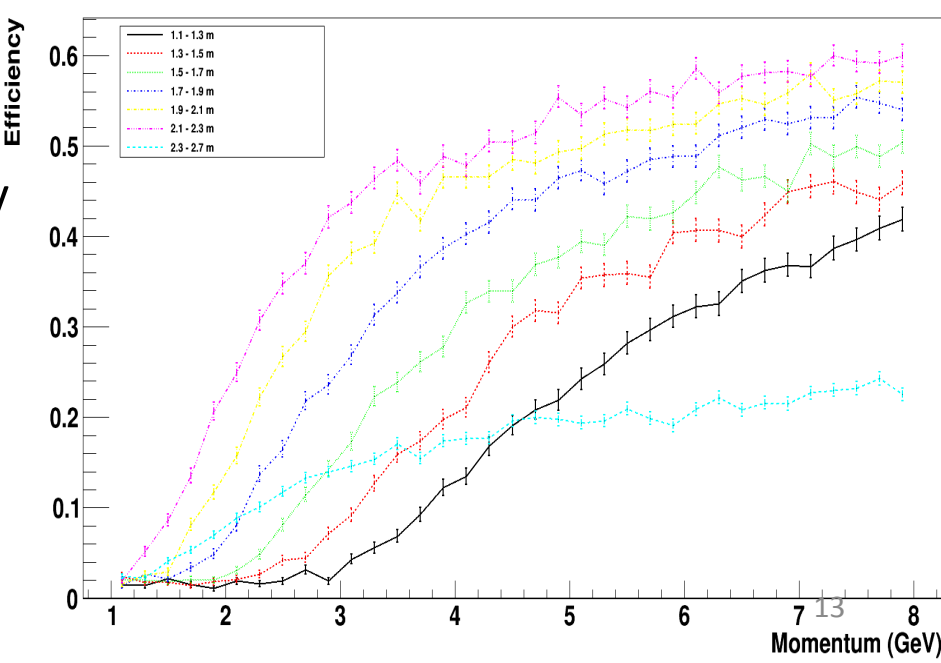
Pion Efficiency



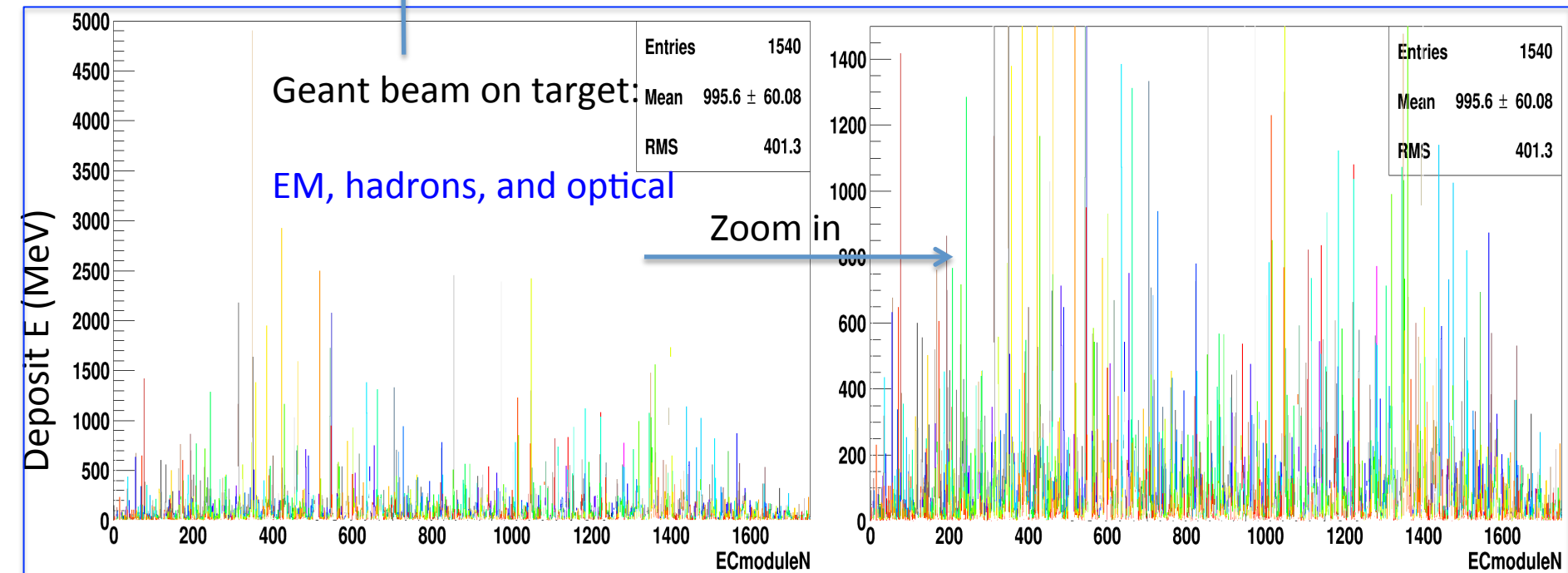
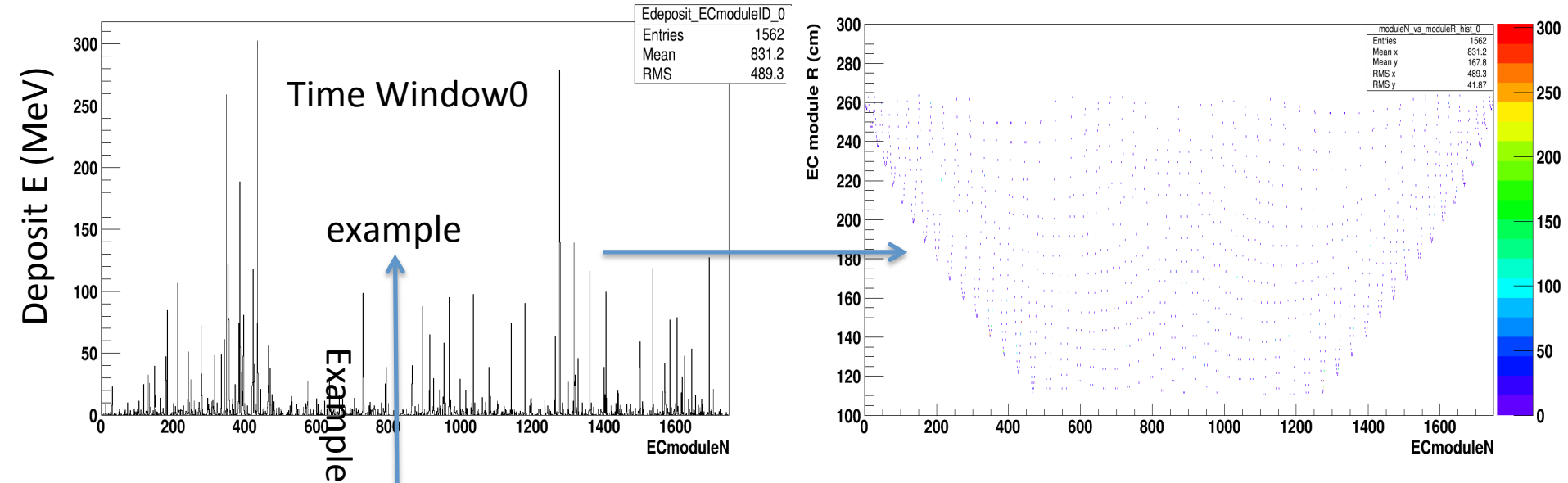
Electron Efficiency



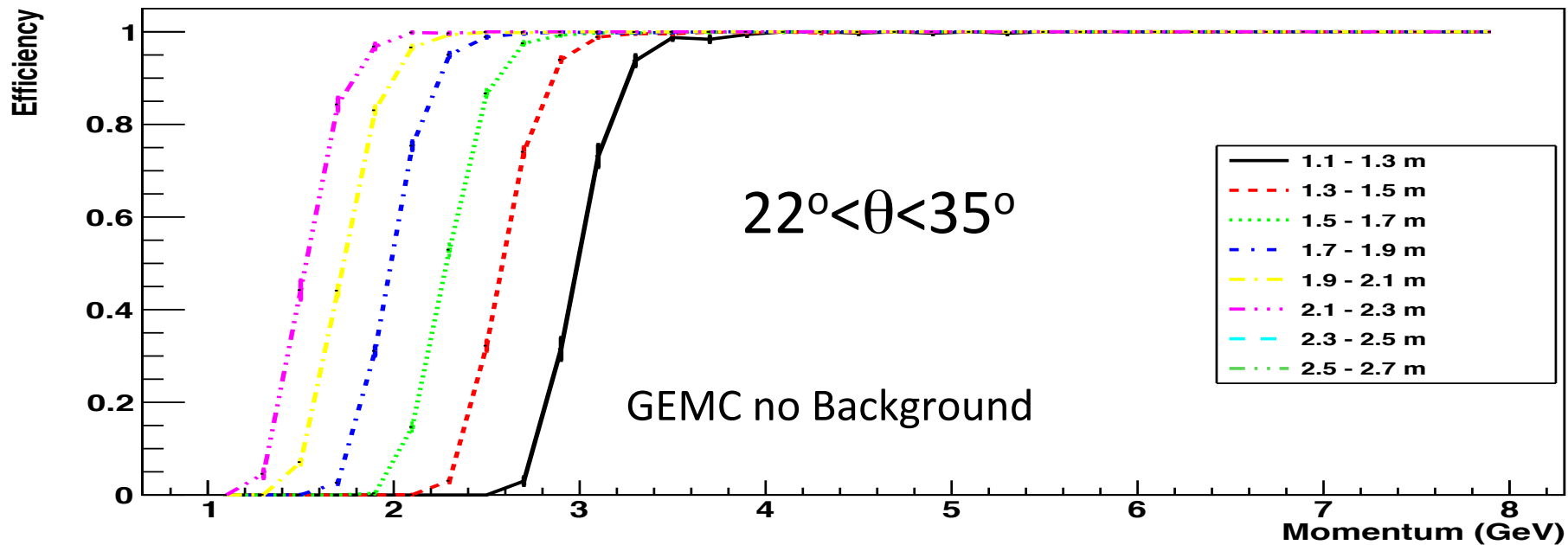
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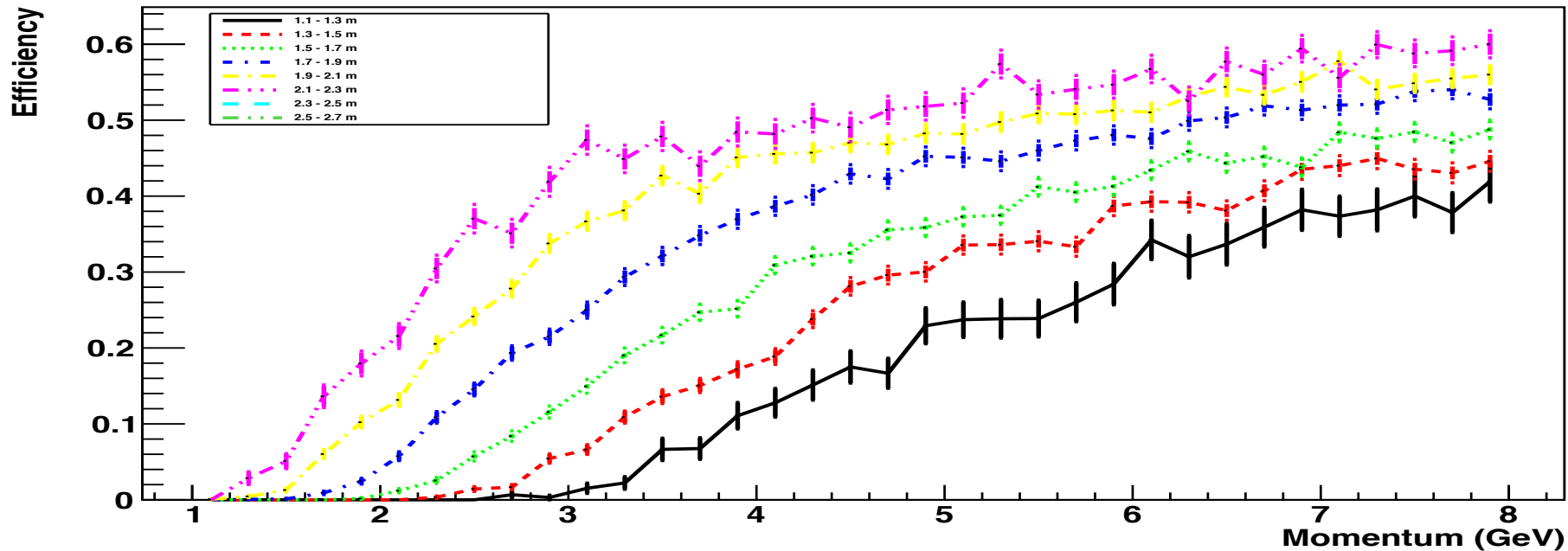
GEMC Backgrounds



Electron Efficiency



Pion Efficiency



6p1 Cluster Deposit Threshold Energy

