

ECAL Update

Energy Resolution : Shower

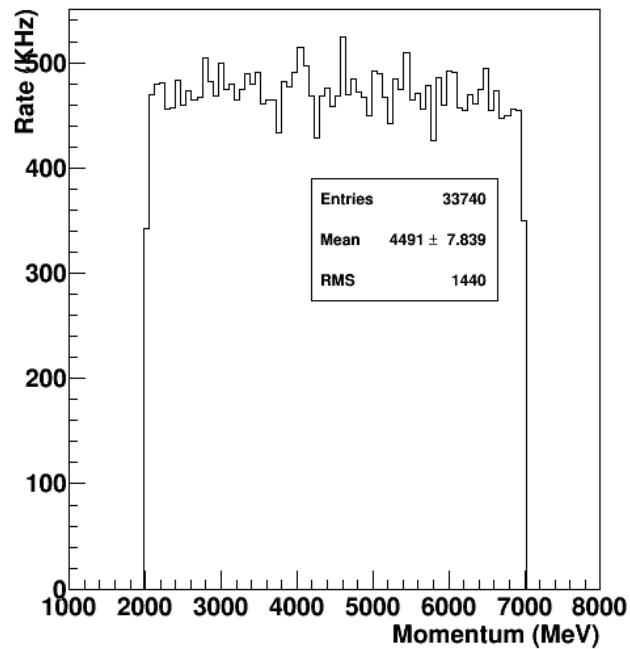
- Input flat distribution : electrons
- Use ecal cluster energy and input momentum to get
 - Energy Resolution

Steps to Obtain Energy Resolution

- Get Pre Shower (PS) and Shower Cluster (SC) energy deposit for each input event
 - For 6+1 and 2+1 clusters maximum edep cluster is selected for each event
- Get the RMS fluctuation of the E_{ecal}/P_f ratio

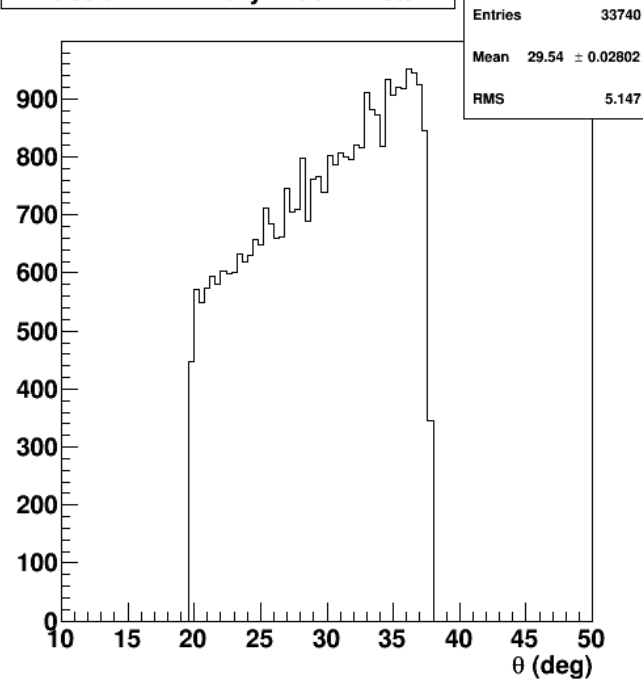
Input Flat Distribution at Last GEM

Last GEM Primary Track Momentum



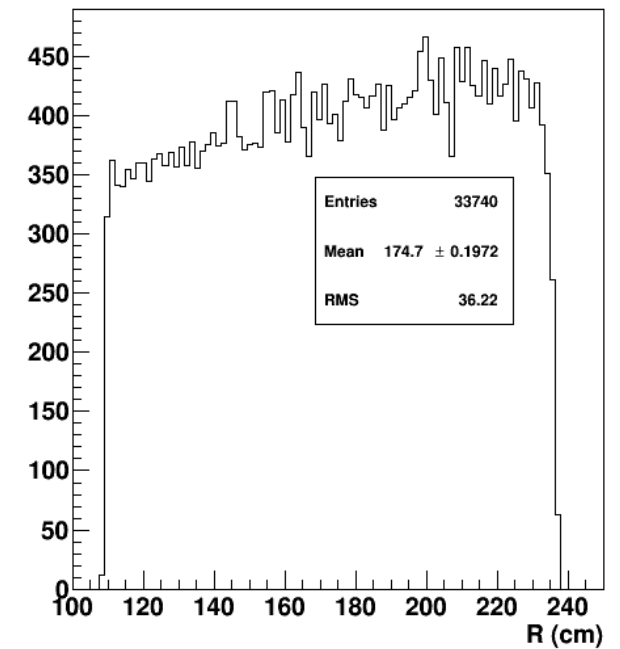
Input Momentum

Last GEM Primary Track Theta



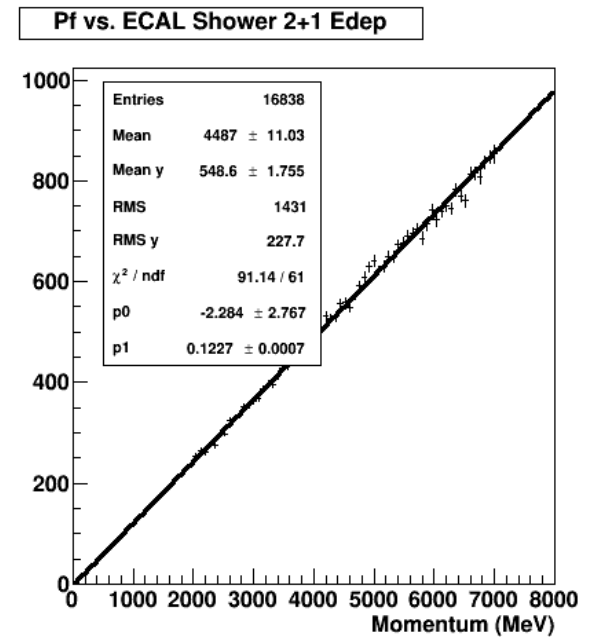
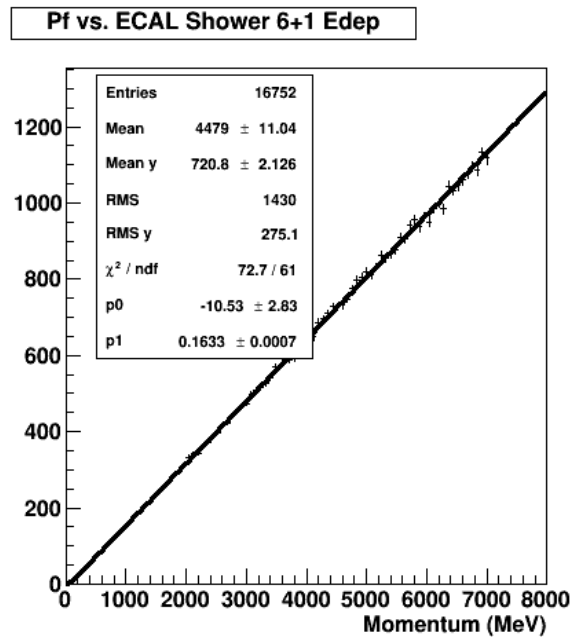
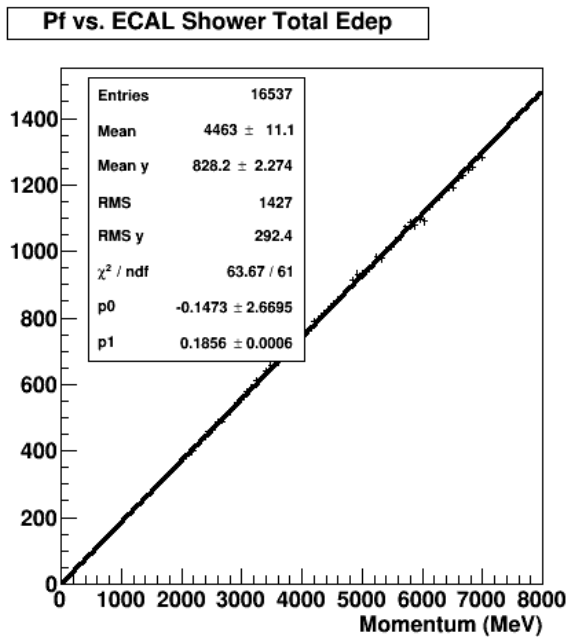
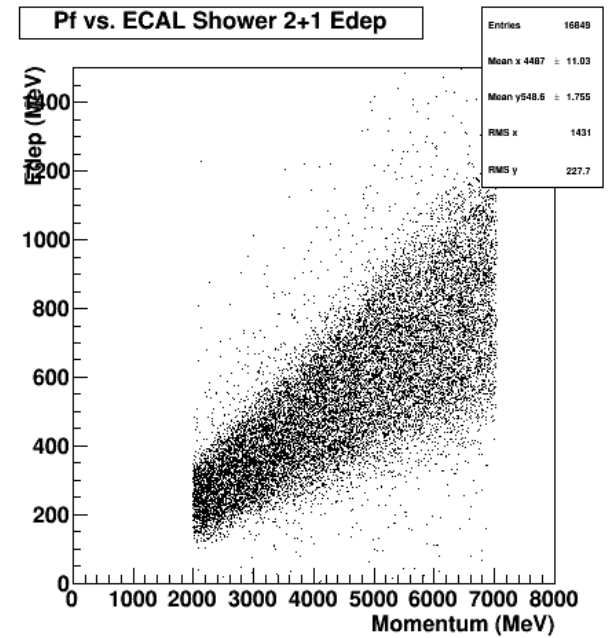
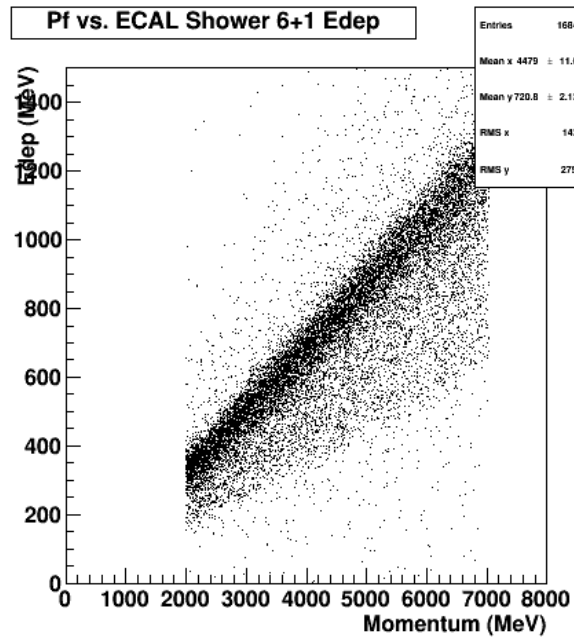
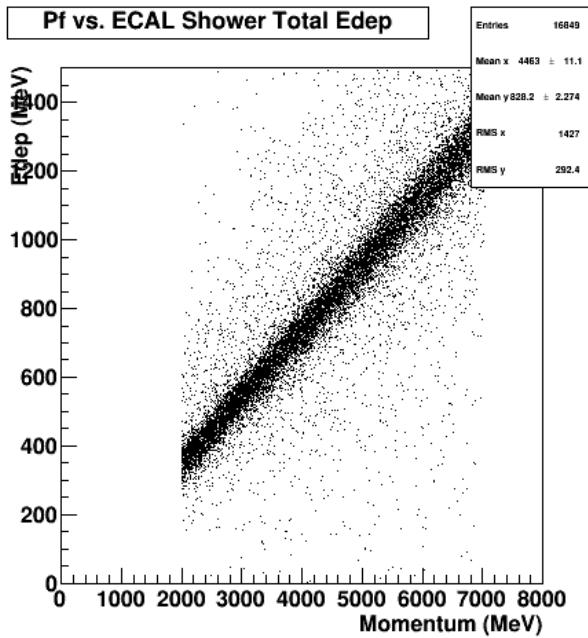
Input Angle

Last GEM Primary Track Hit Radius

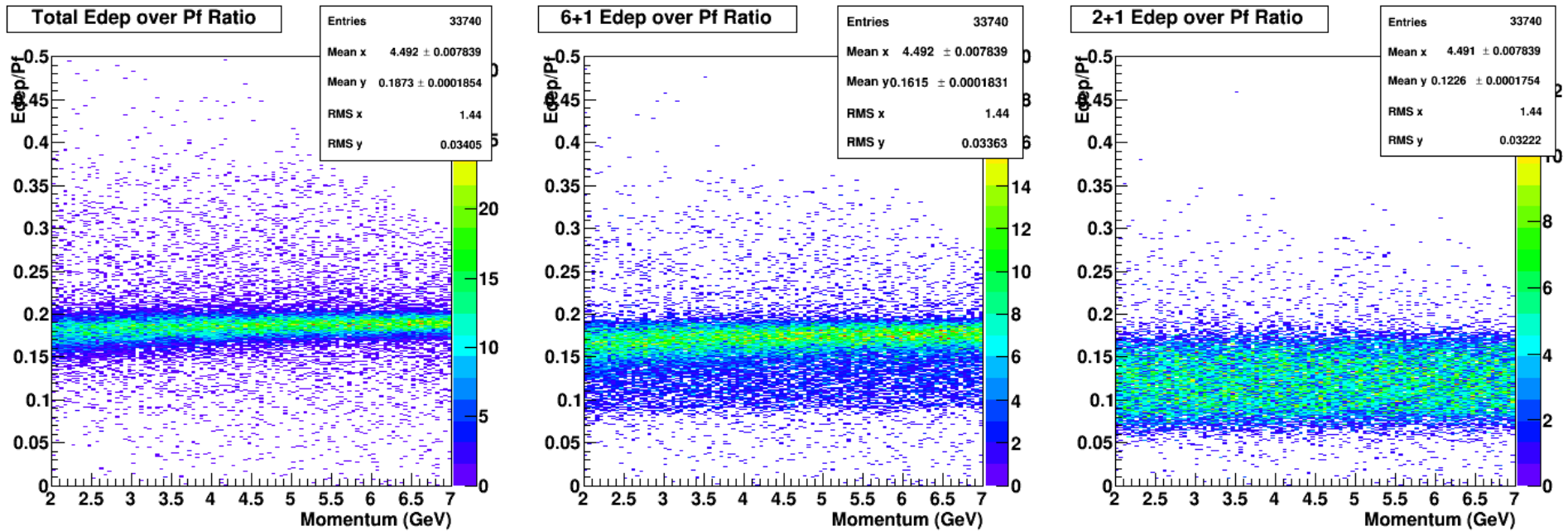


Input Radius

Edep in Shower Cluster

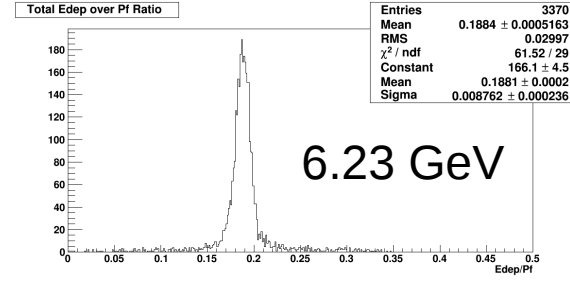
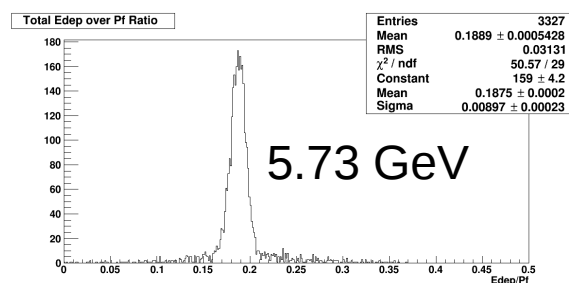
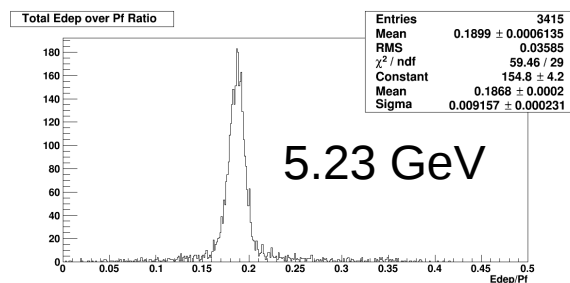
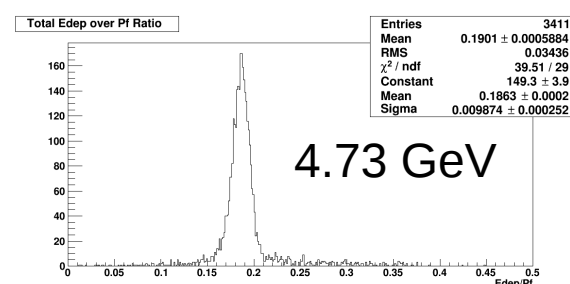
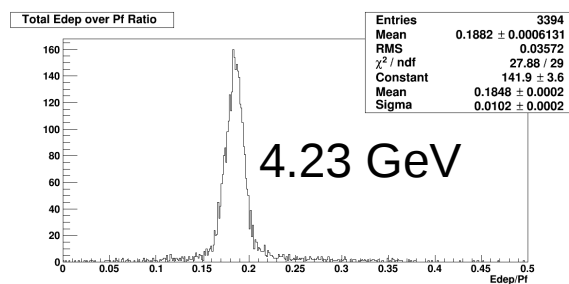
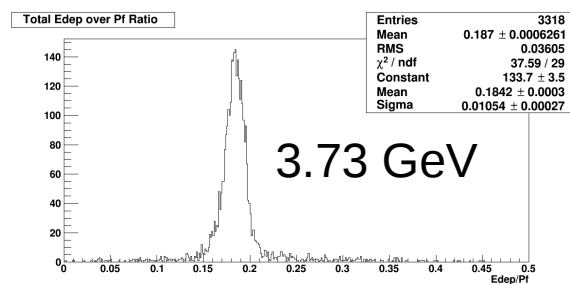
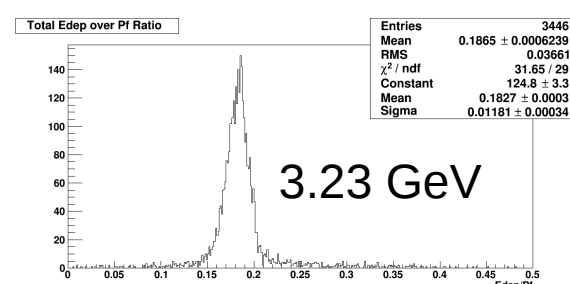
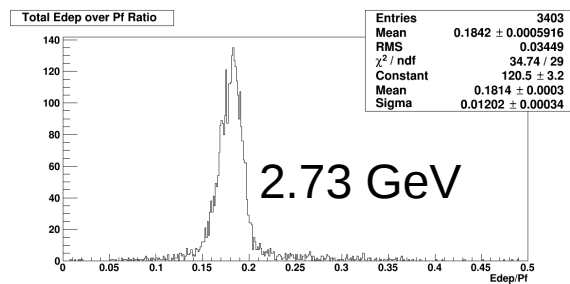
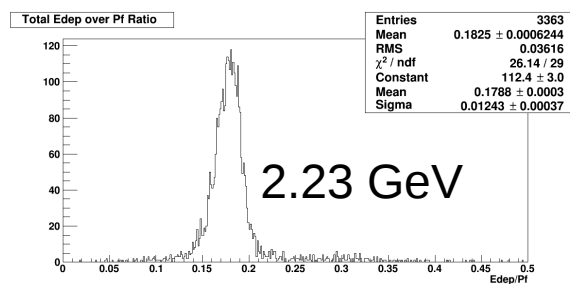


edep over P_f Ratio in Shower

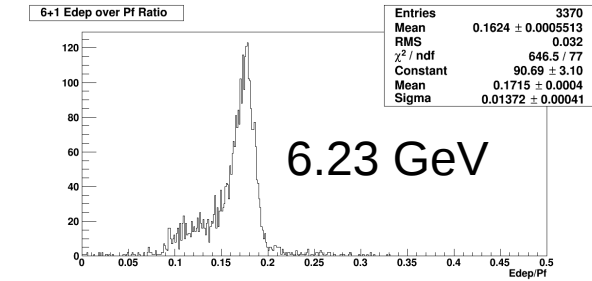
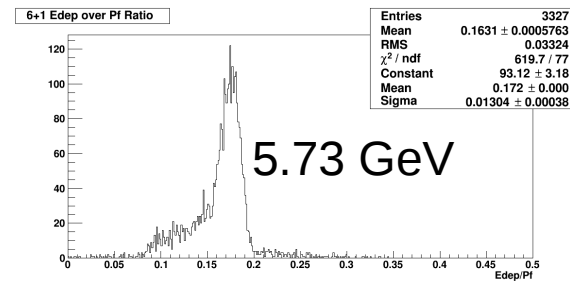
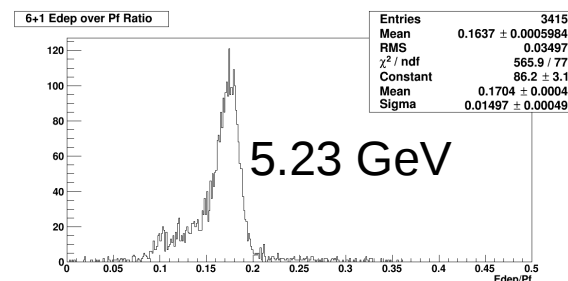
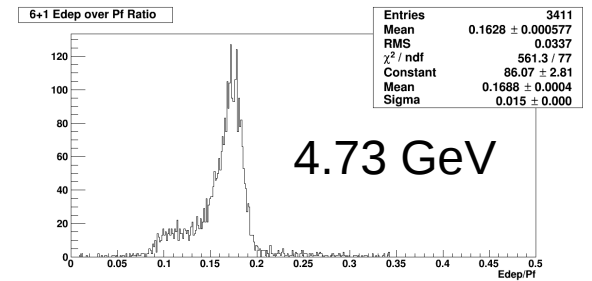
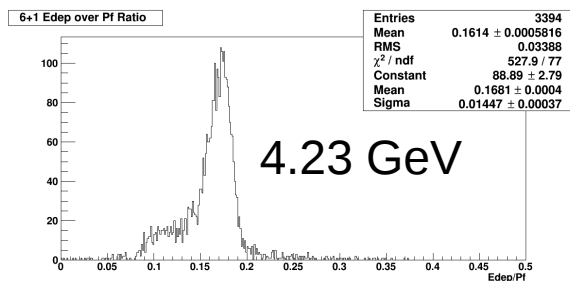
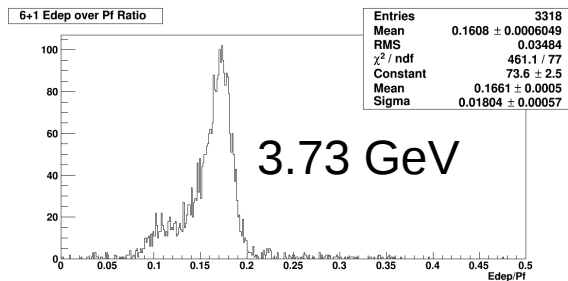
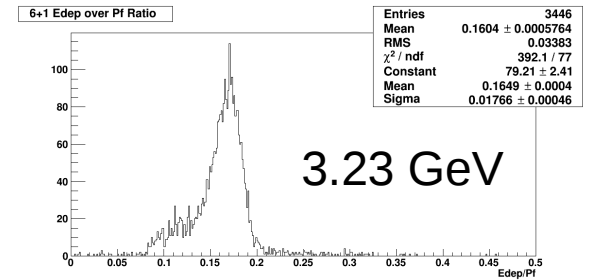
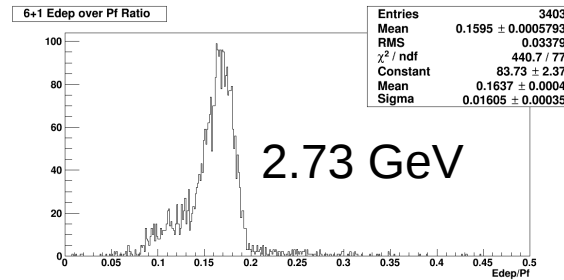
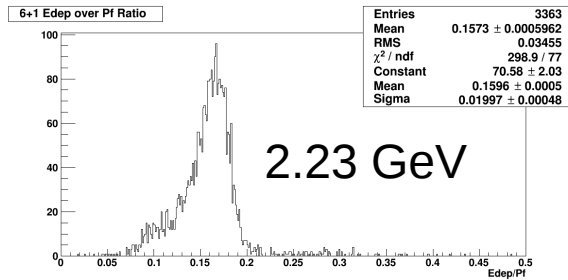


Momentum (edep) over P_f Ratio

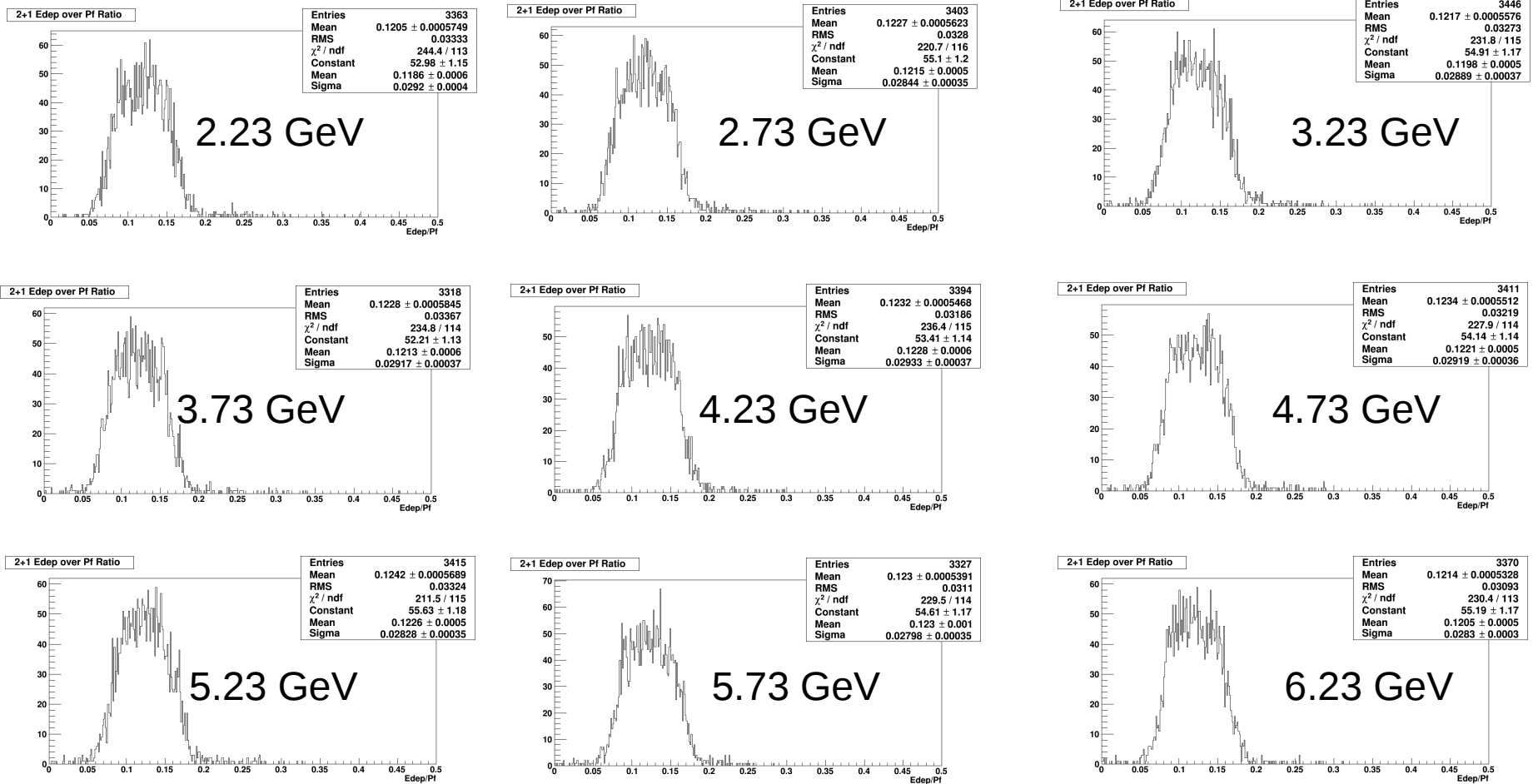
- Get the spread in edep over P_f ratio in incident energy bins
 - Energy resolution based on total energy deposit



Momentum (edep) over P_f Ratio : 6+1

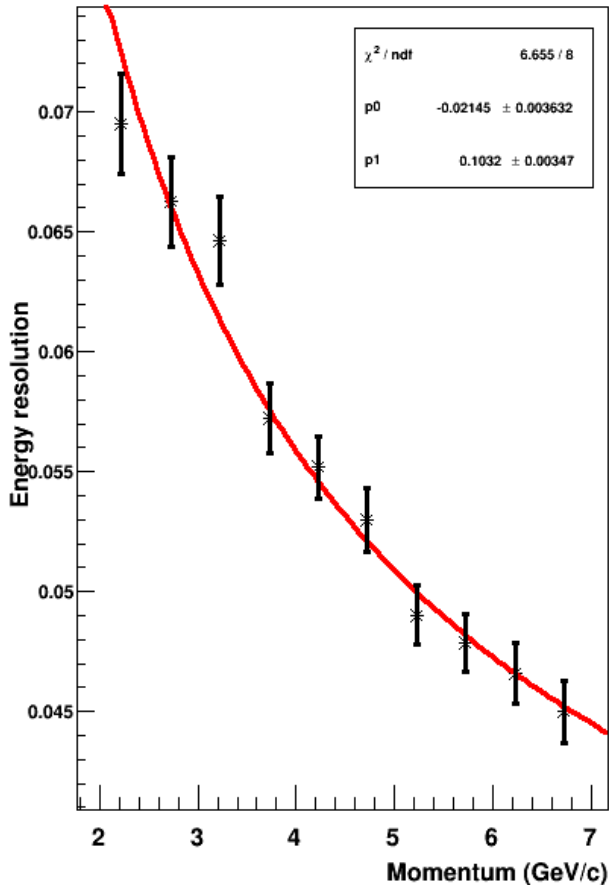


Momentum (edep) over Pf Ratio : 2+1

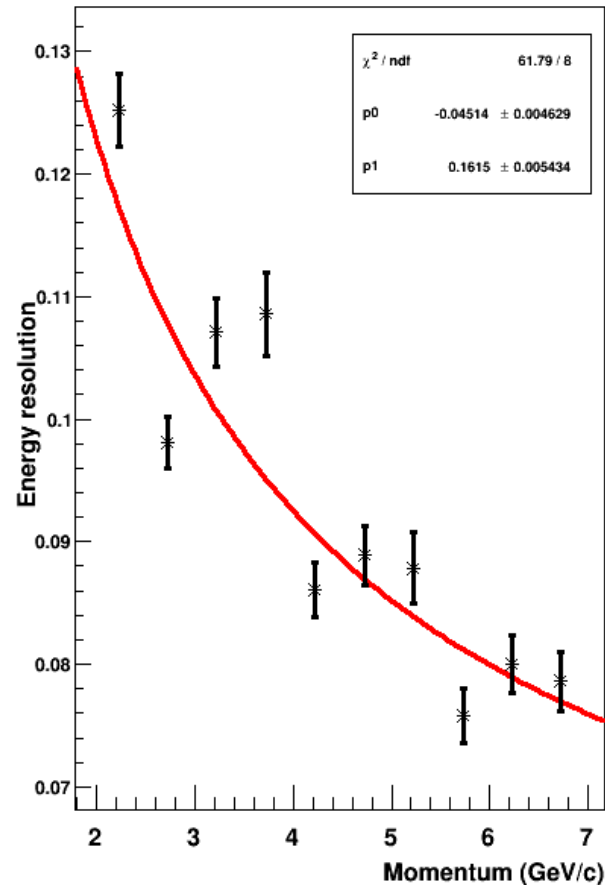


Shower Energy Resolution

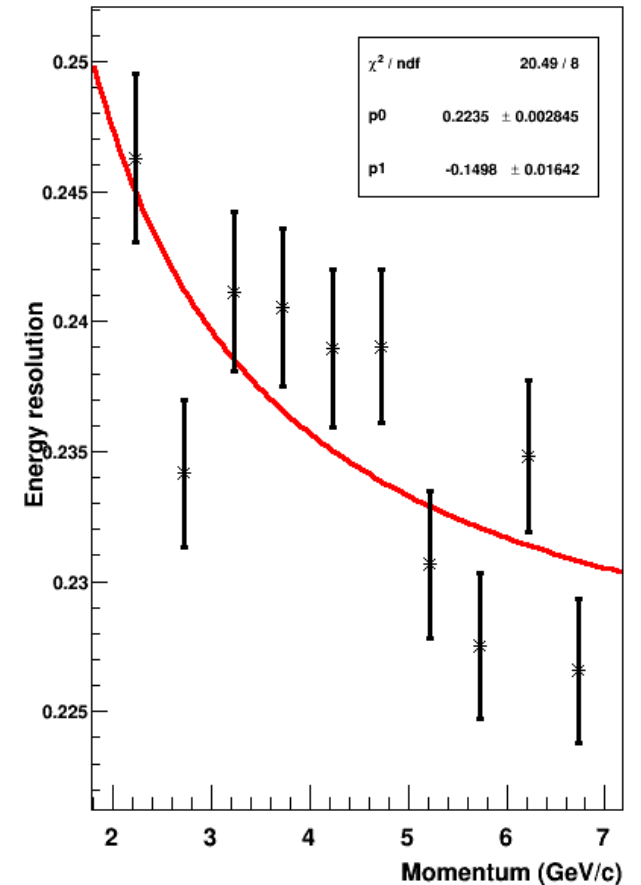
ECAL Shower Total Energy Resolution VS p



ECAL Shower 6+1 Energy Resolution VS p



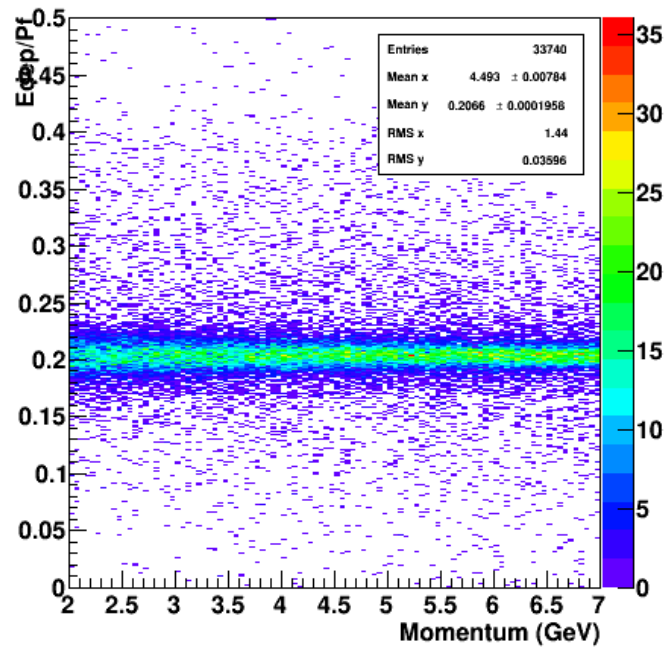
ECAL Shower 2+1 Energy Resolution VS p



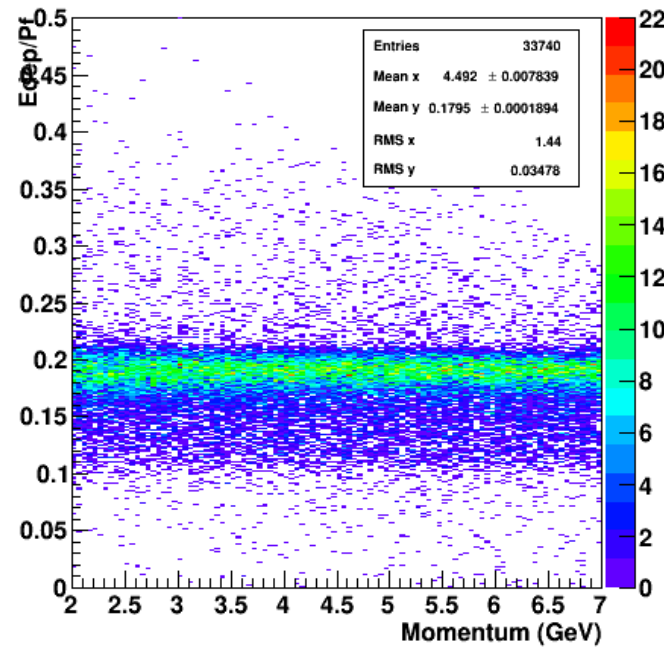
Based on total energy deposit in the Ecal

edep over P_f Ratio in PS+SH

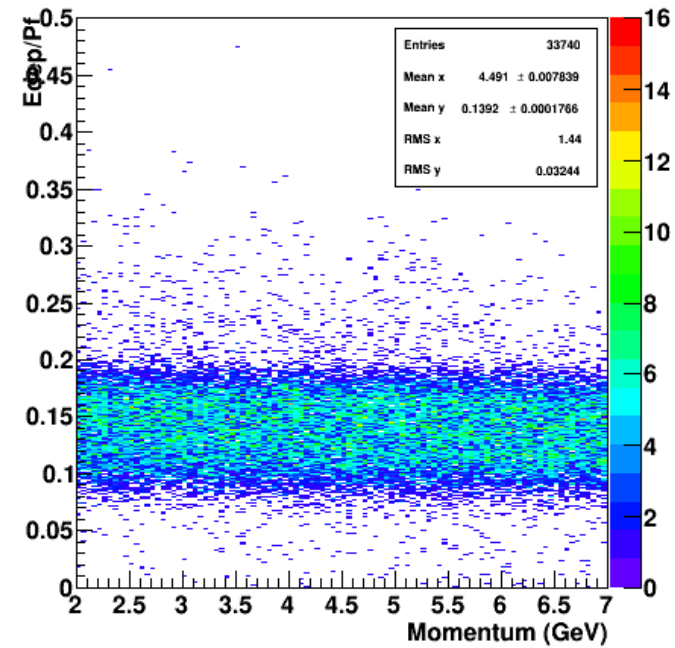
Total PS+Sh Edep over Pf Ratio



6+1 PS+Sh Edep over Pf Ratio

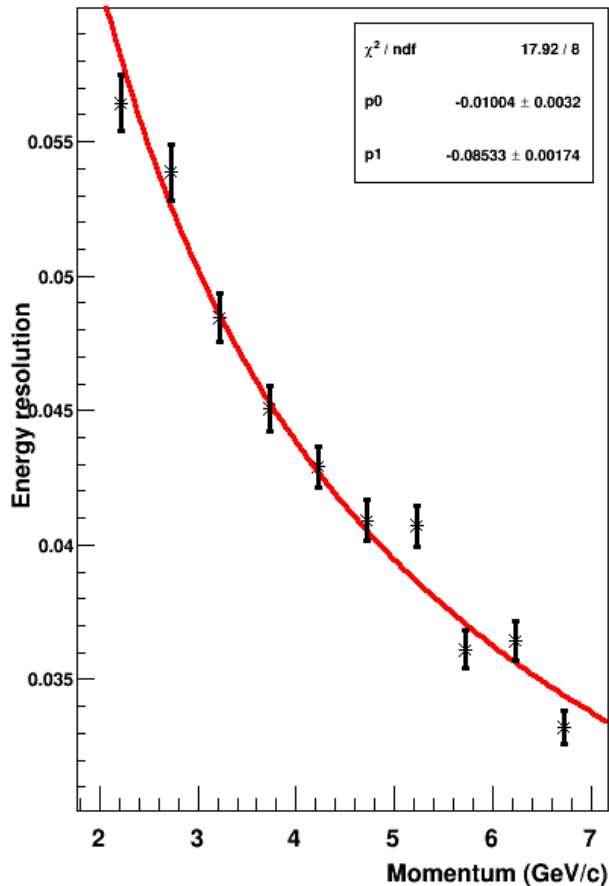


2+1 PS+Sh Edep over Pf Ratio

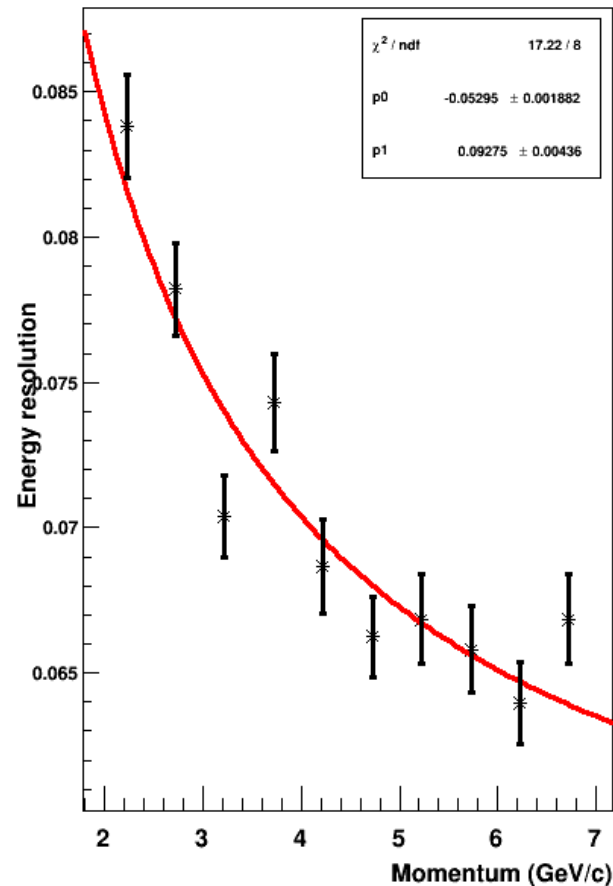


Pre Shower + Shower Energy Resolution

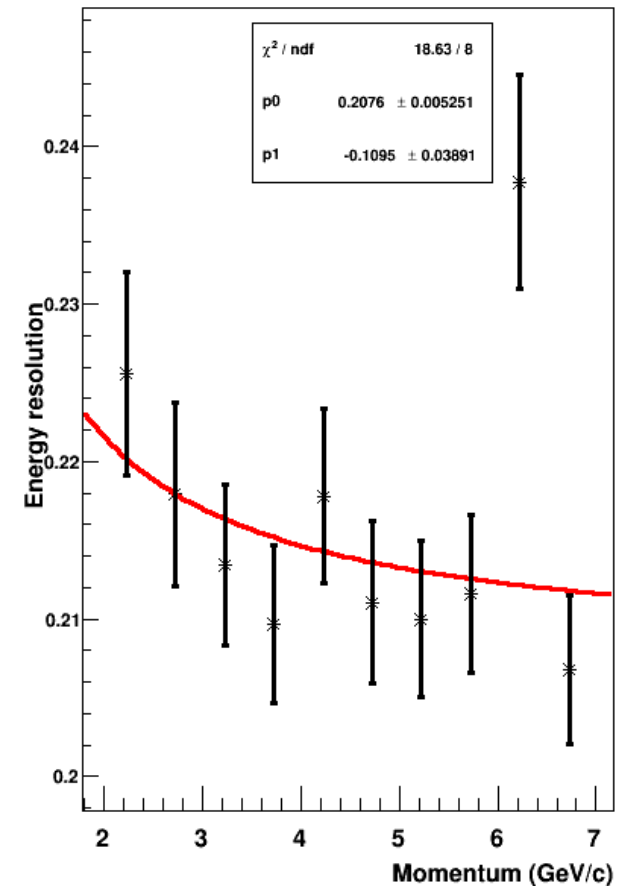
ECAL PS+Sh Total Energy Resolution VS p



ECALL PS+Sh 6+1 Energy Resolution VS p



ECALL PS+Sh 2+1 Energy Resolution VS p



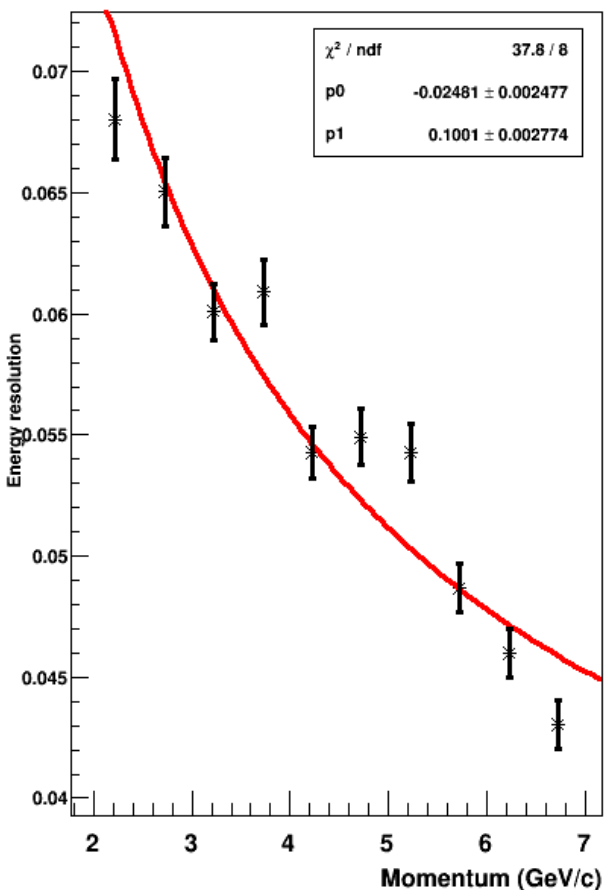
Using total energy
deposit in the
pre-shower and shower

Energy Resolution with Ion+Non-Ion Edep

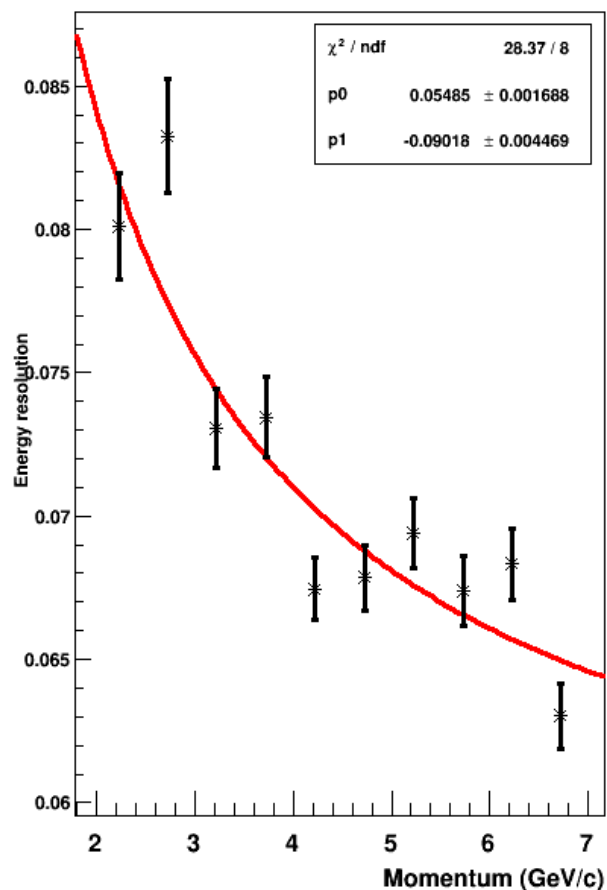
- The energy resolution is generated using ionization energy deposit in the scintillator material
- Next set of plots are generated using ionization + non-ionization energy deposit in the scintillator material

Shower Energy Resolution

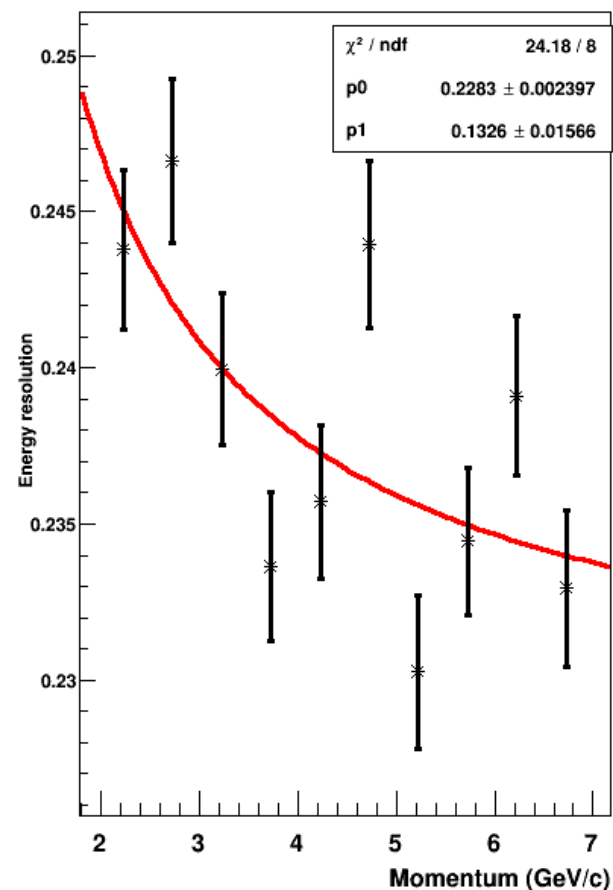
ECAL Shower Total Energy Resolution VS p



ECAL Shower 6+1 Energy Resolution VS p



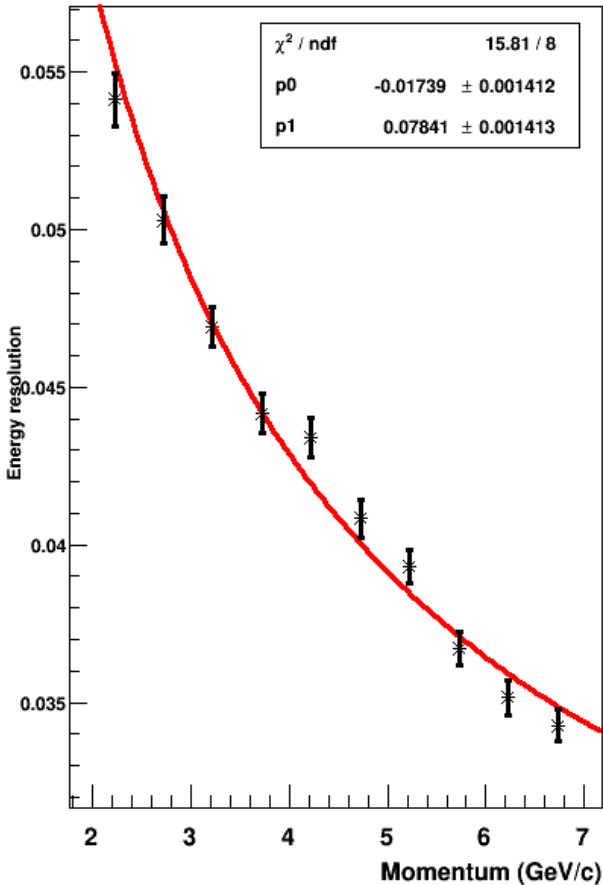
ECAL Shower 2+1 Energy Resolution VS p



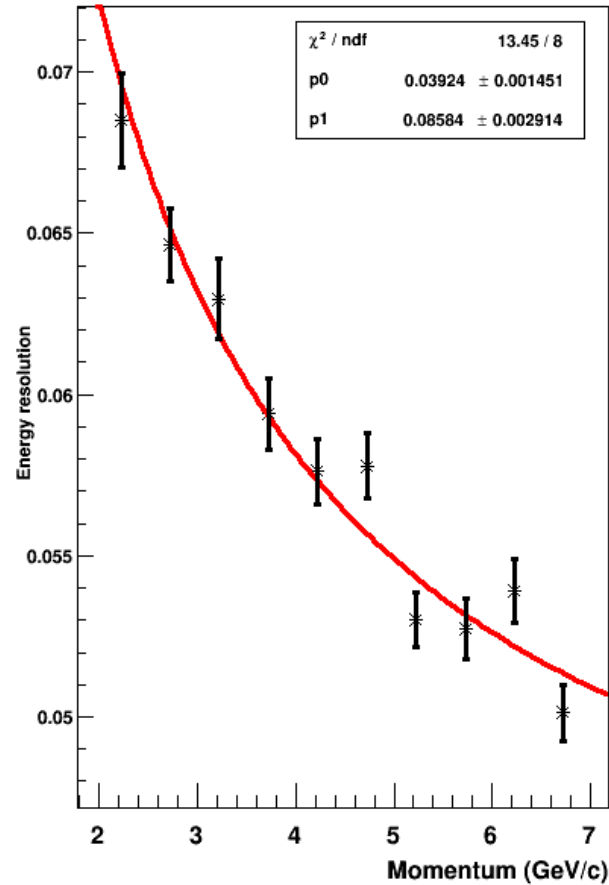
Using total energy
deposit in the shower

Pre Shower + Shower Energy Resolution

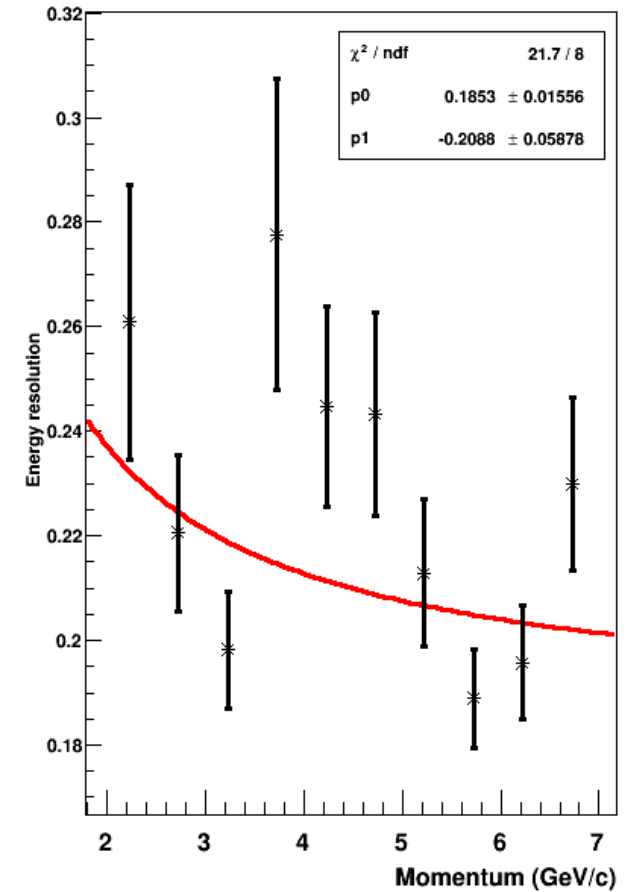
ECAL PS+Sh Total Energy Resolution VS p



ECALL PS+Sh 6+1 Energy Resolution VS p



ECALL PS+Sh 2+1 Energy Resolution VS p



Using total energy
deposit in the
pre-shower and shower

Jin's Energy Resolution (with No Phot. Elec.)

- Jin's estimation was based on ecal energy deposition
 - No Photo-Electron (PE) contributions

