Simulation Updates on PVDIS EC

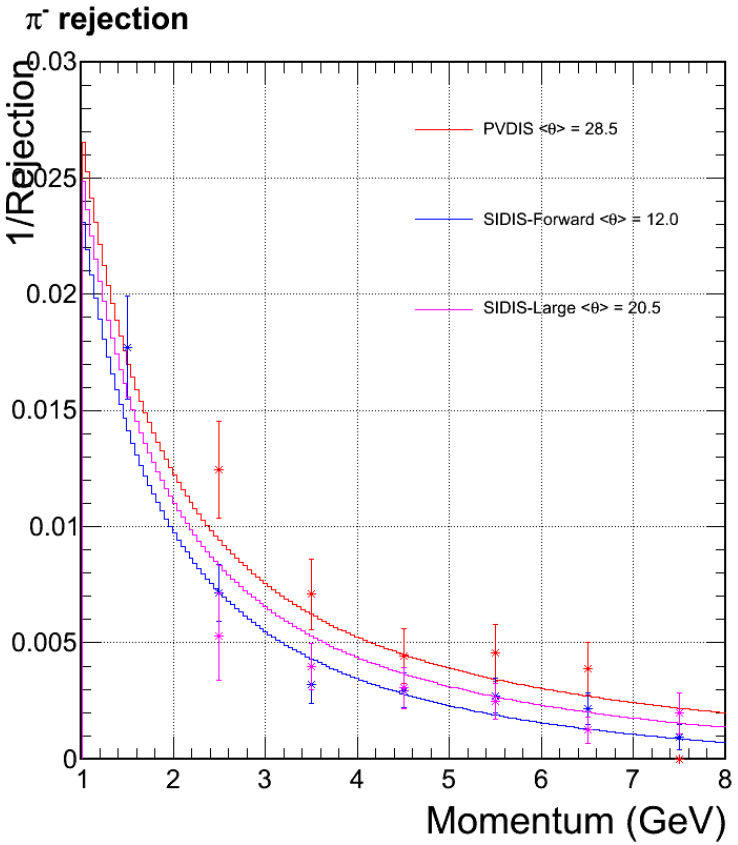
Jin Huang

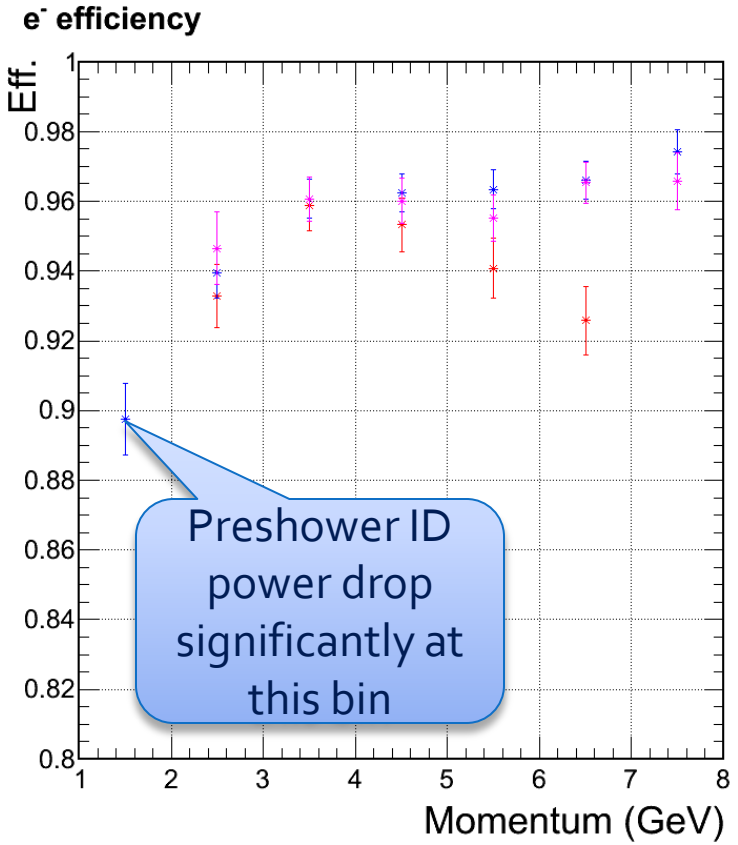
Los Alamos National Lab

Jefferson Lab

EC performance w/o background

- Cited from March collaboration Meeting





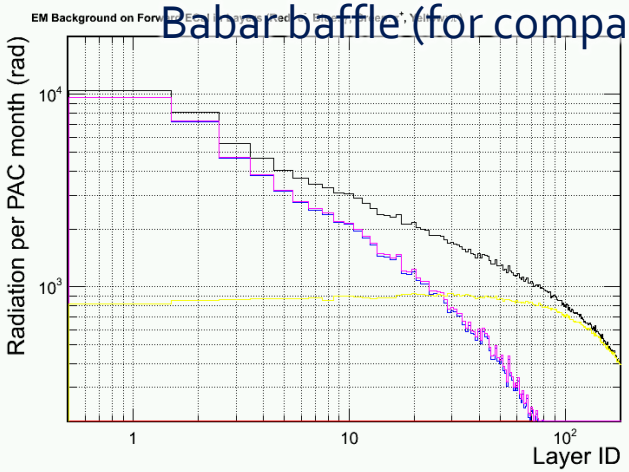
Second update of CLEO background

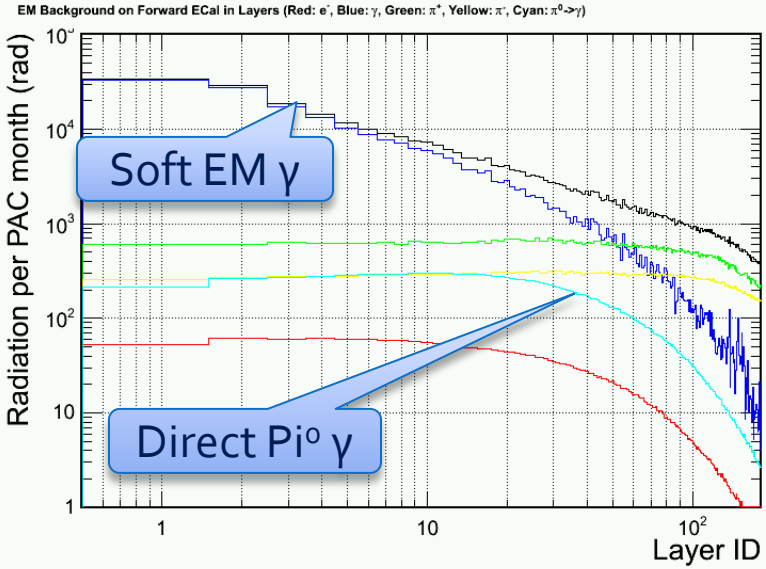
- Reported Apr 30 Calorimeter Meeting

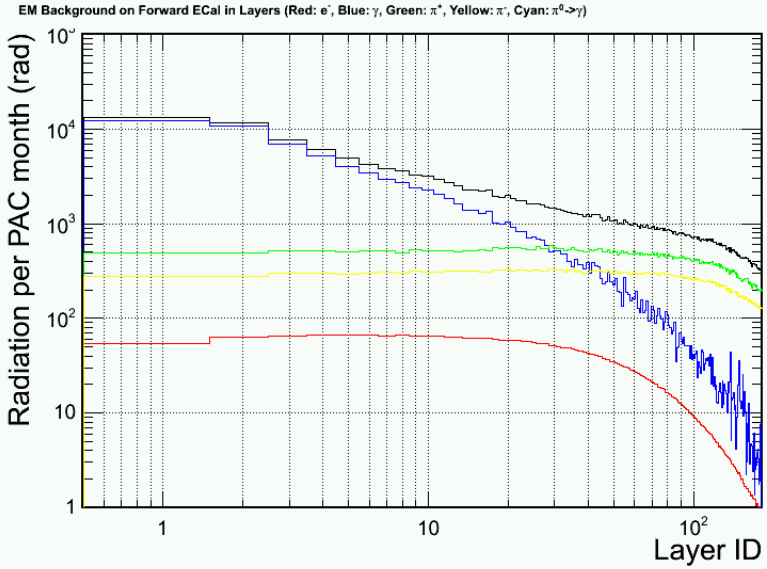
For each sector, background rate were calculated in high and low regions in phi

- Photon (EM) <- dominant!
- Photon (Pi^0)
- Electron
- Pion- Pion+

Babar baffle (for compare)





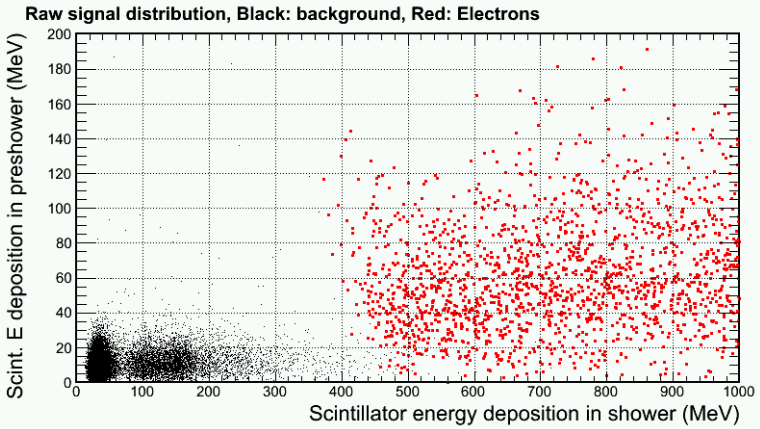


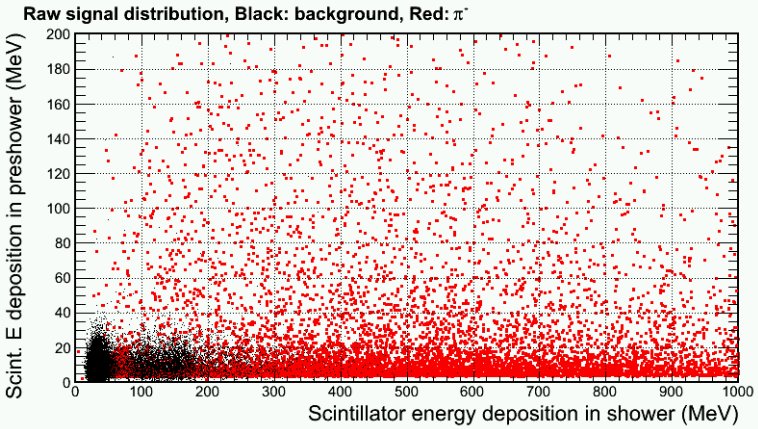
High radiation azimuthal region

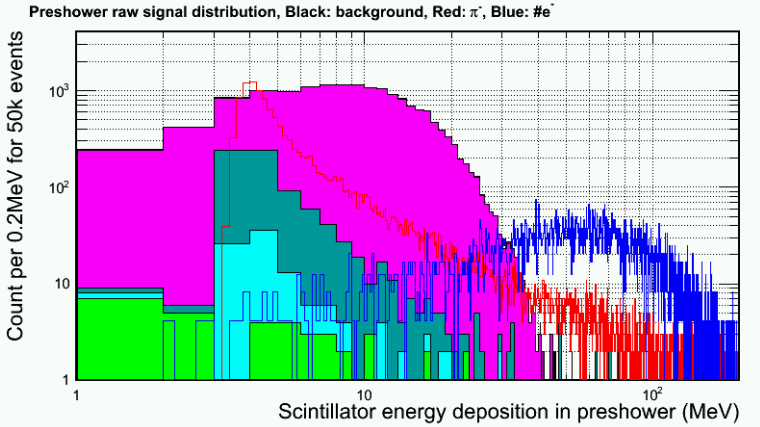
Low radiation azimuthal region

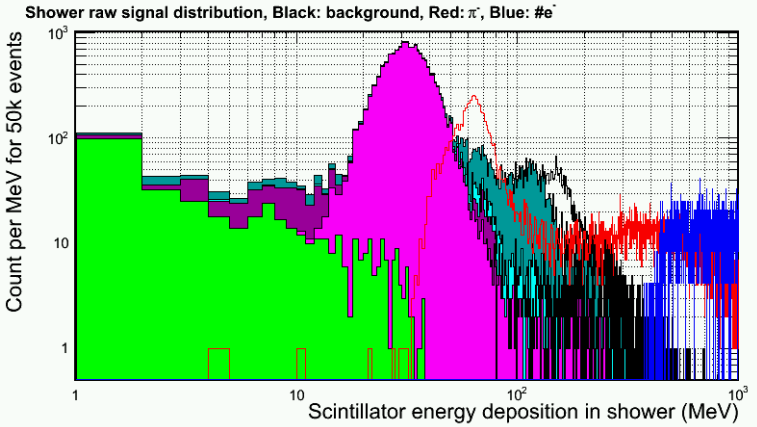
Background distribution

New: with photon and pi+, Mid R, High Rad phi slice





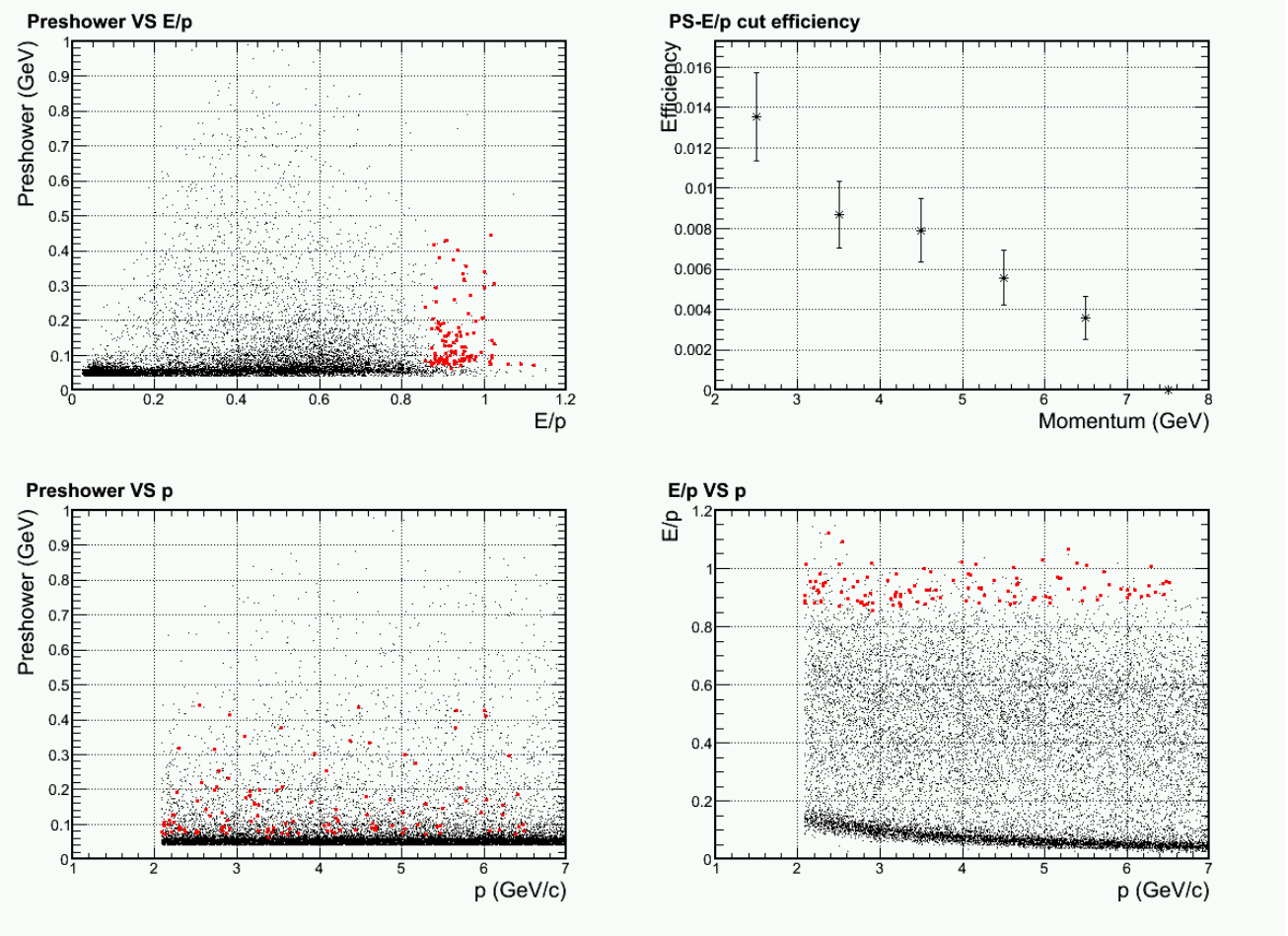




- Photon (7 GHz/6+1 Hex cluster!)
- Electron
- Pion- Pion+

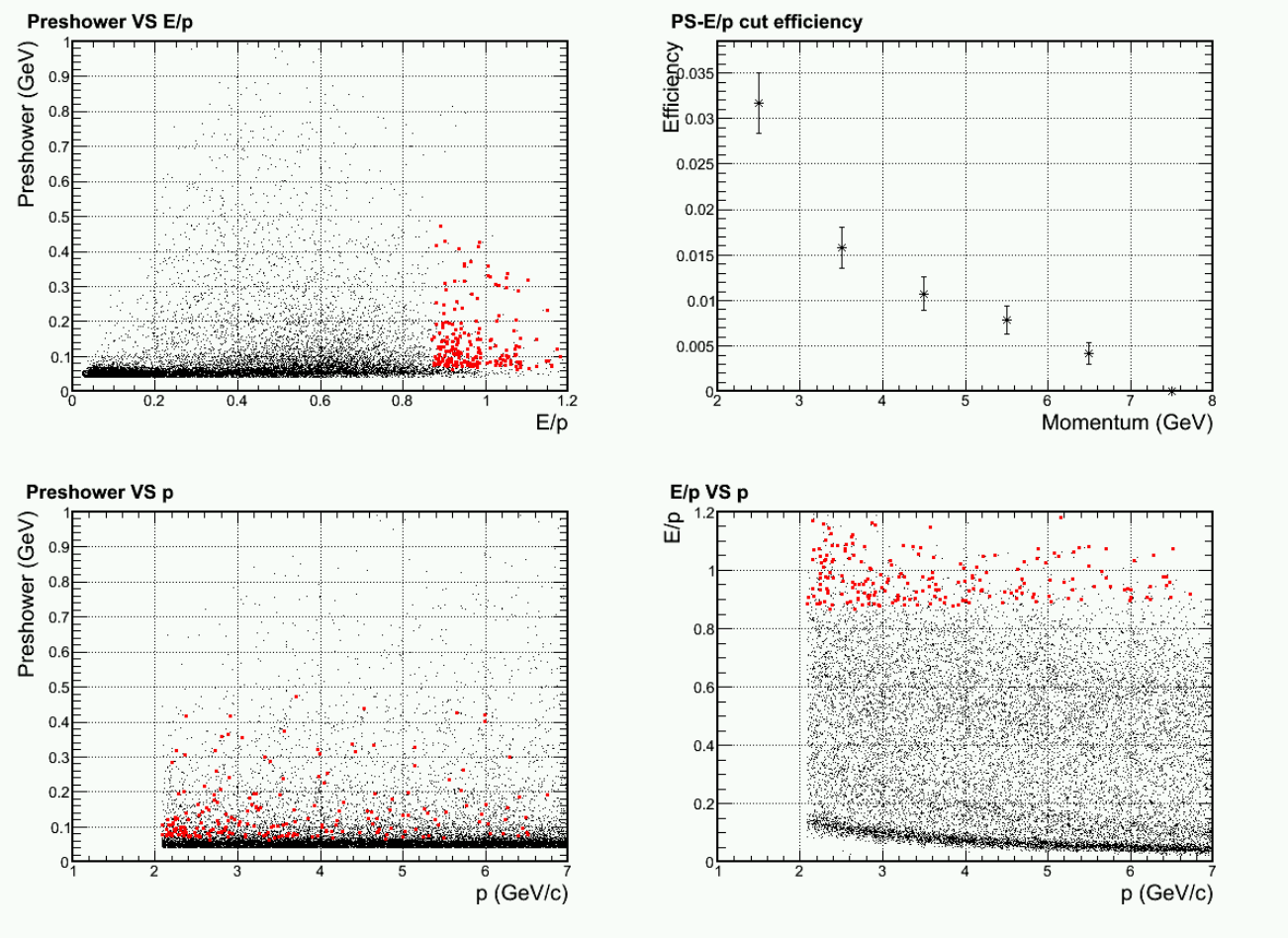
PID Performance (pion eff. w/ 94% elec. eff)

w/o photon and pi+, Mid R, High Rad phi slice

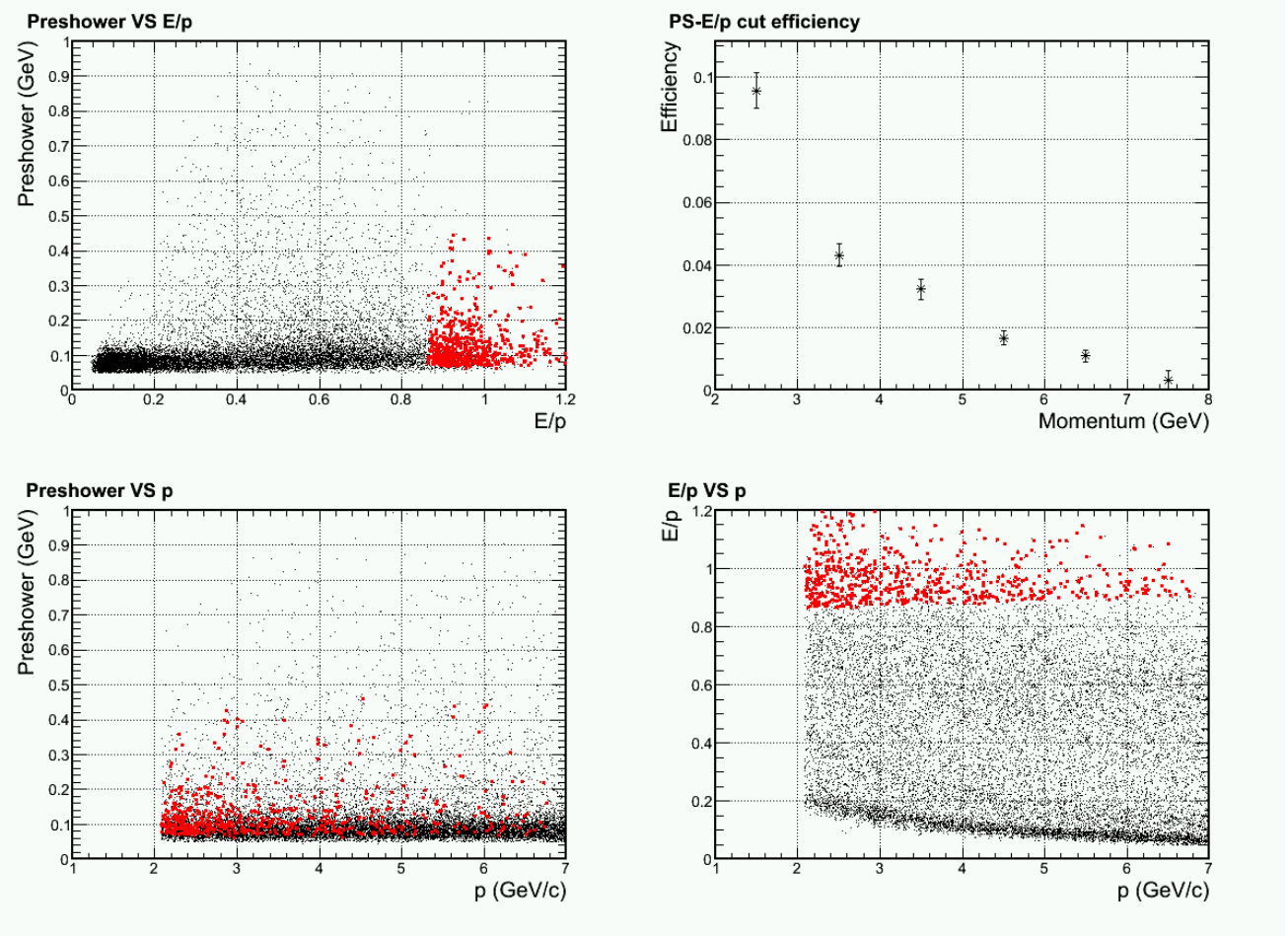


PID Performance (pion eff. w/ 94% elec. eff)

w/o photon, w/ pi+, Mid R, High Rad phi slice

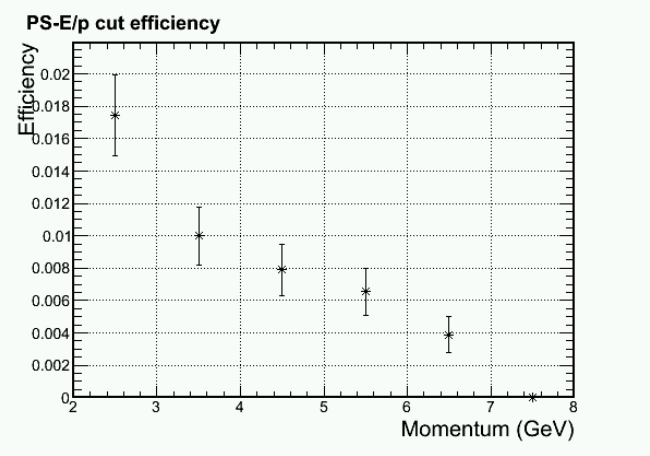


PID Performance (pion eff. w/ 94% elec. eff) w/ photon, w/ pi+, Mid R, High Rad phi slice

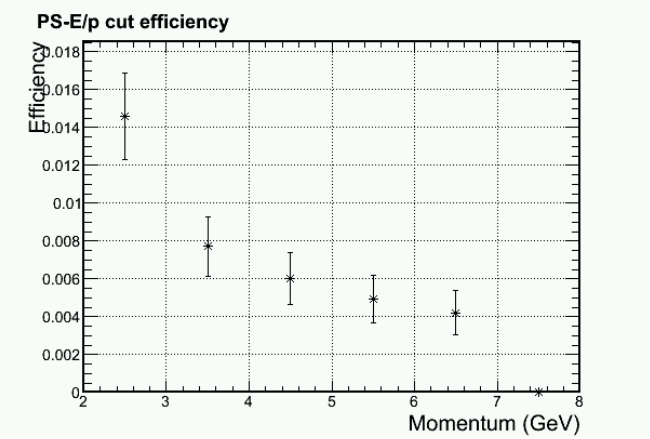


Look elsewhere, Outer/Inner R
PID Performance (pion eff. w/ 94% elec. eff)

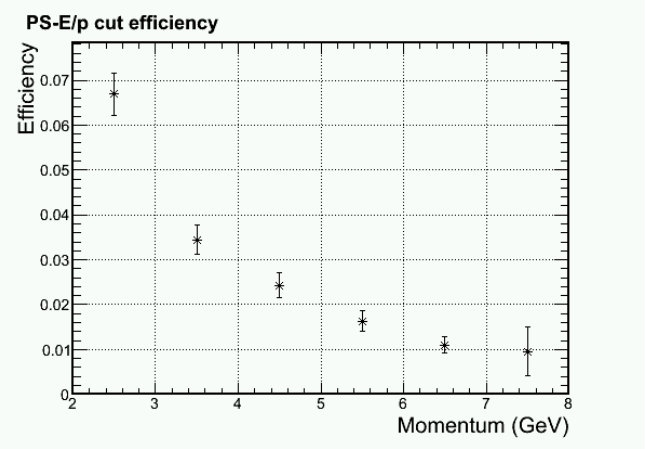
w/ photon, w/ pi+, Outer R, High Rad phi slice



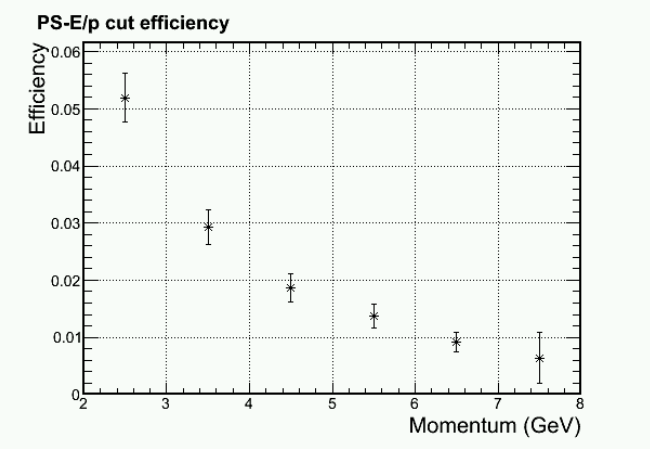
w/ photon, w/ pi+, Outer R, Low Rad phi slice



w/ o photon, w/ pi+, Inner R, High Rad phi slice



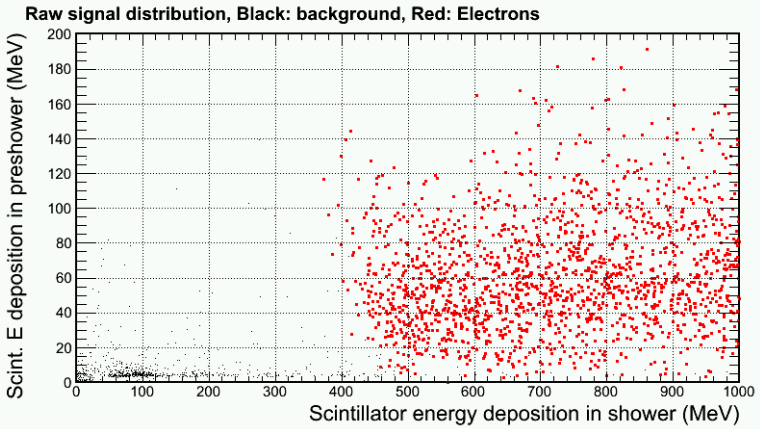
w/ o photon, w/ pi+, Inner R, Low Rad phi slice

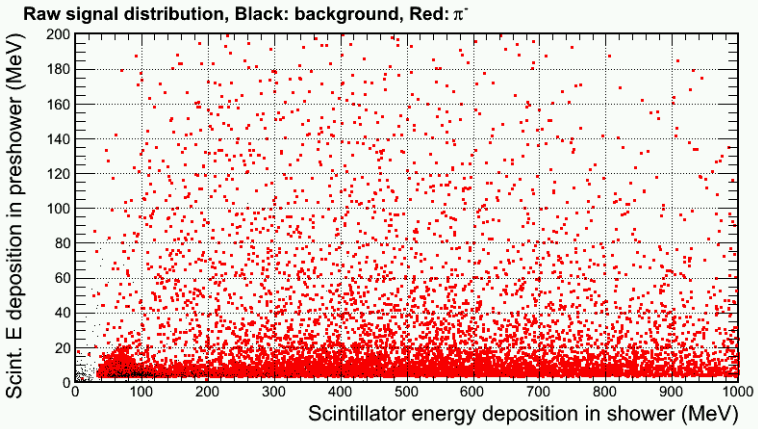


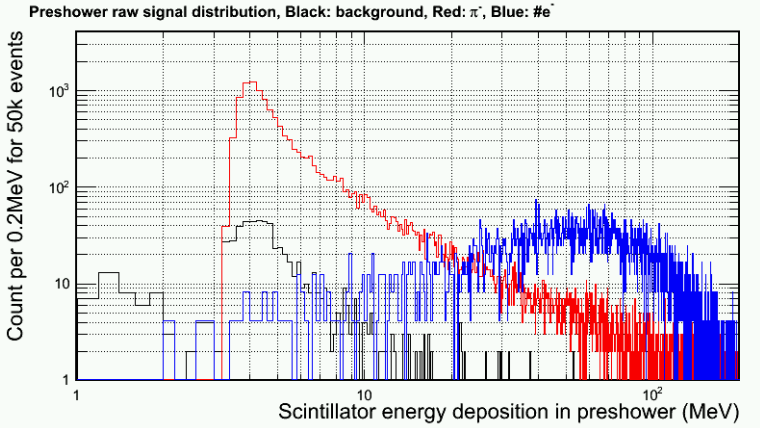
First update of CLEO background

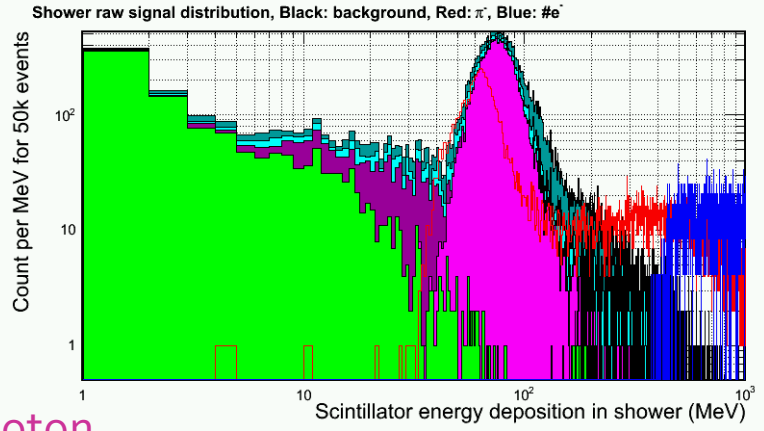
- Reported Apr 23 Calorimeter Meeting

Zhiwen Updated background contribution for all configurations. PVDIS shown here:



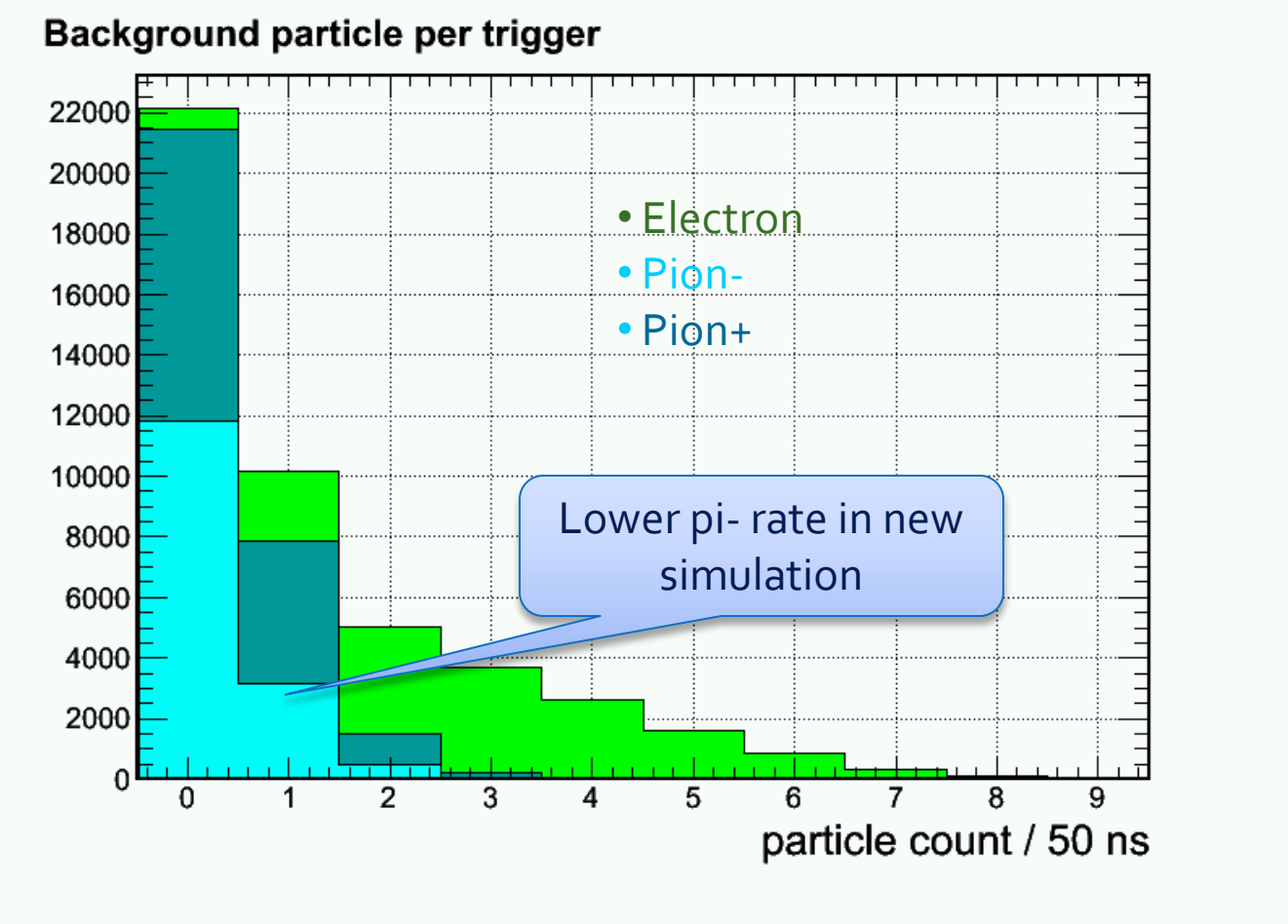




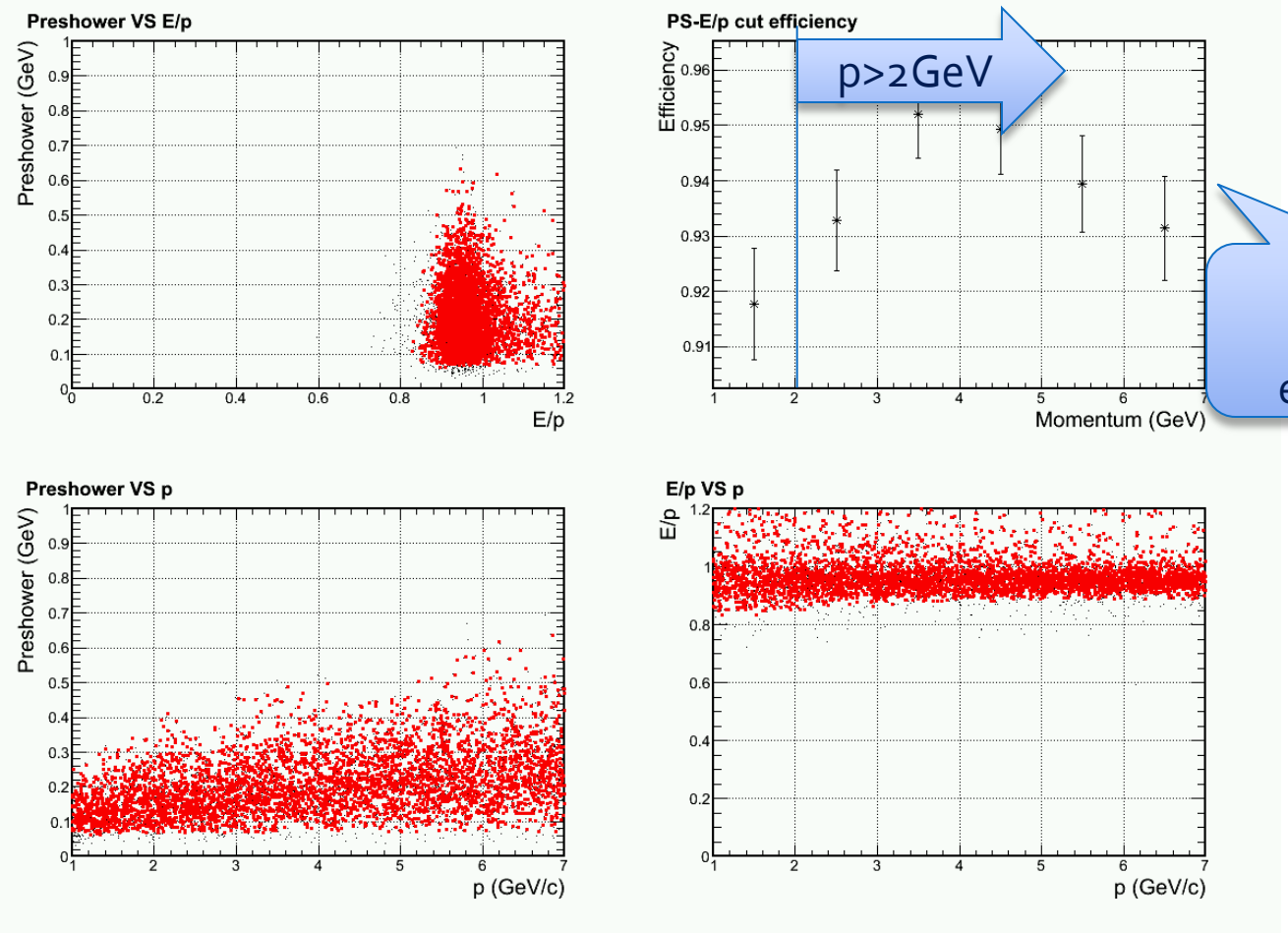


- Photon
- Electron
- Pion- Pion+

Updated: Per-event pion rate for 1+6 hexagon cluster at inner radius

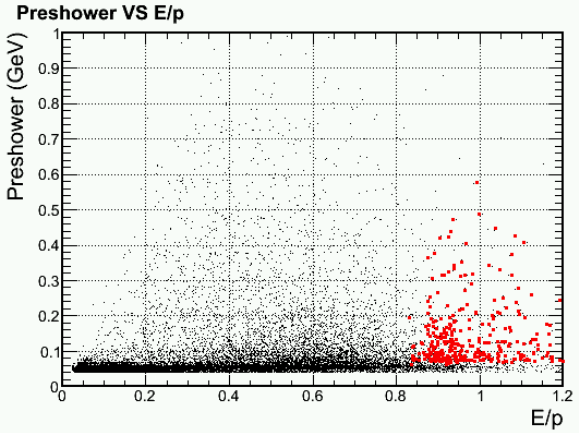


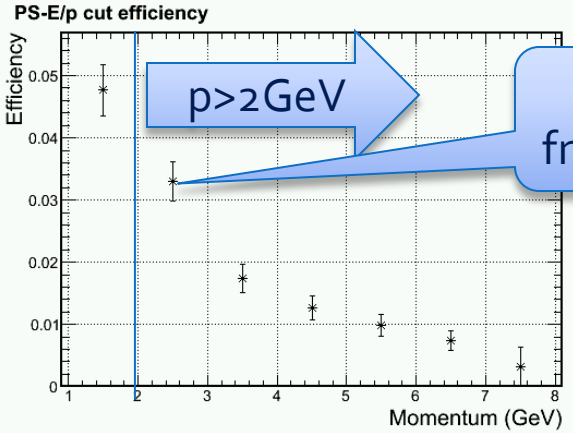
Updated: electron efficiency
Only electron and pi- background used

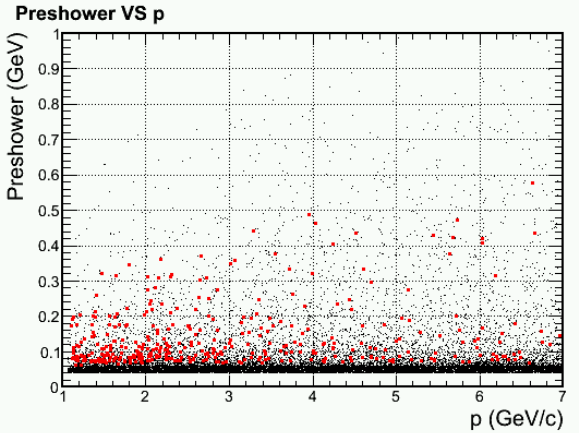


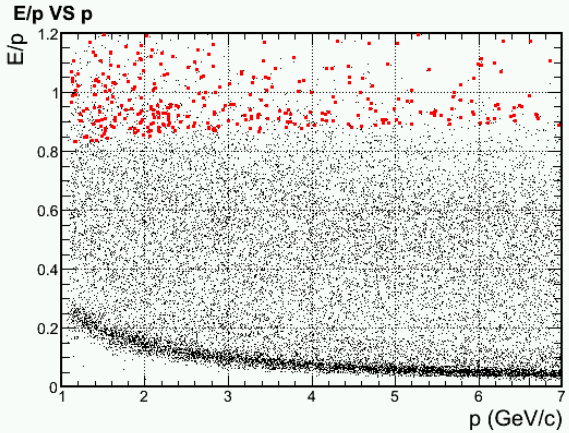
Not much change in electron eff.

Updated: pion rejection
Only electron and pi- background used



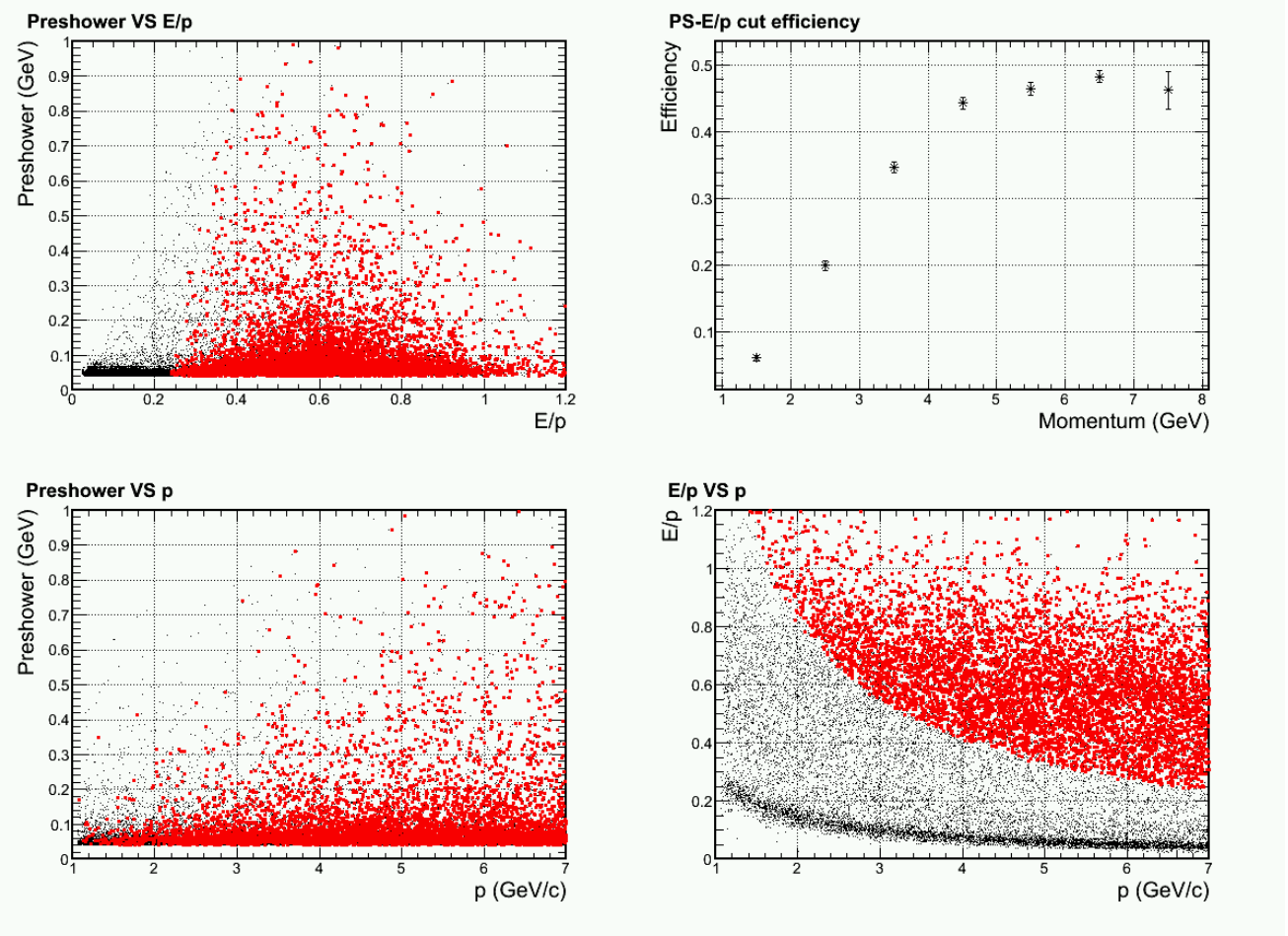






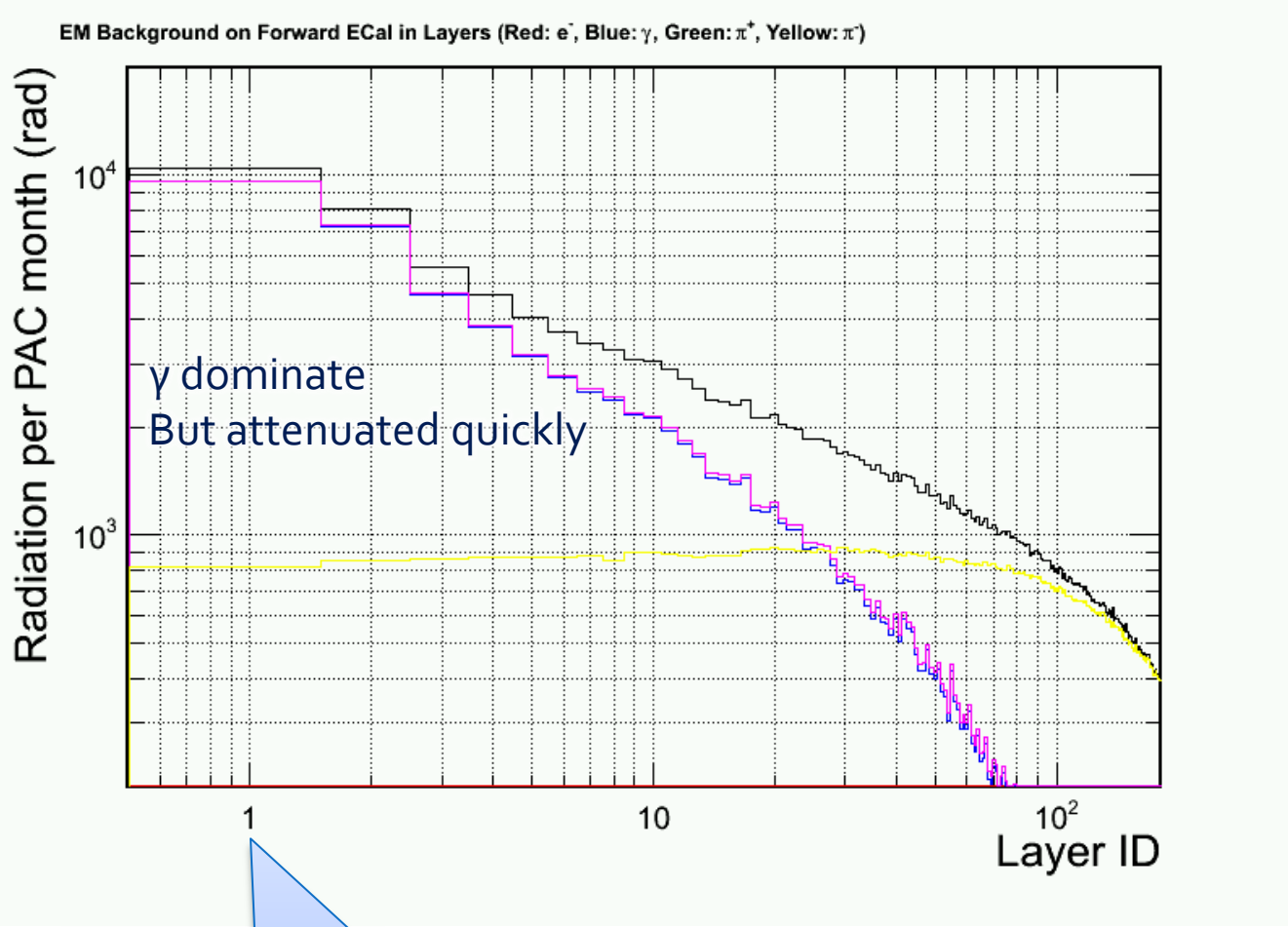
PVDIS trigger turn on curve

2GeV electron cut based on shower Hex1+6 cluster only



PVDIS – current baffle (with direct γ)

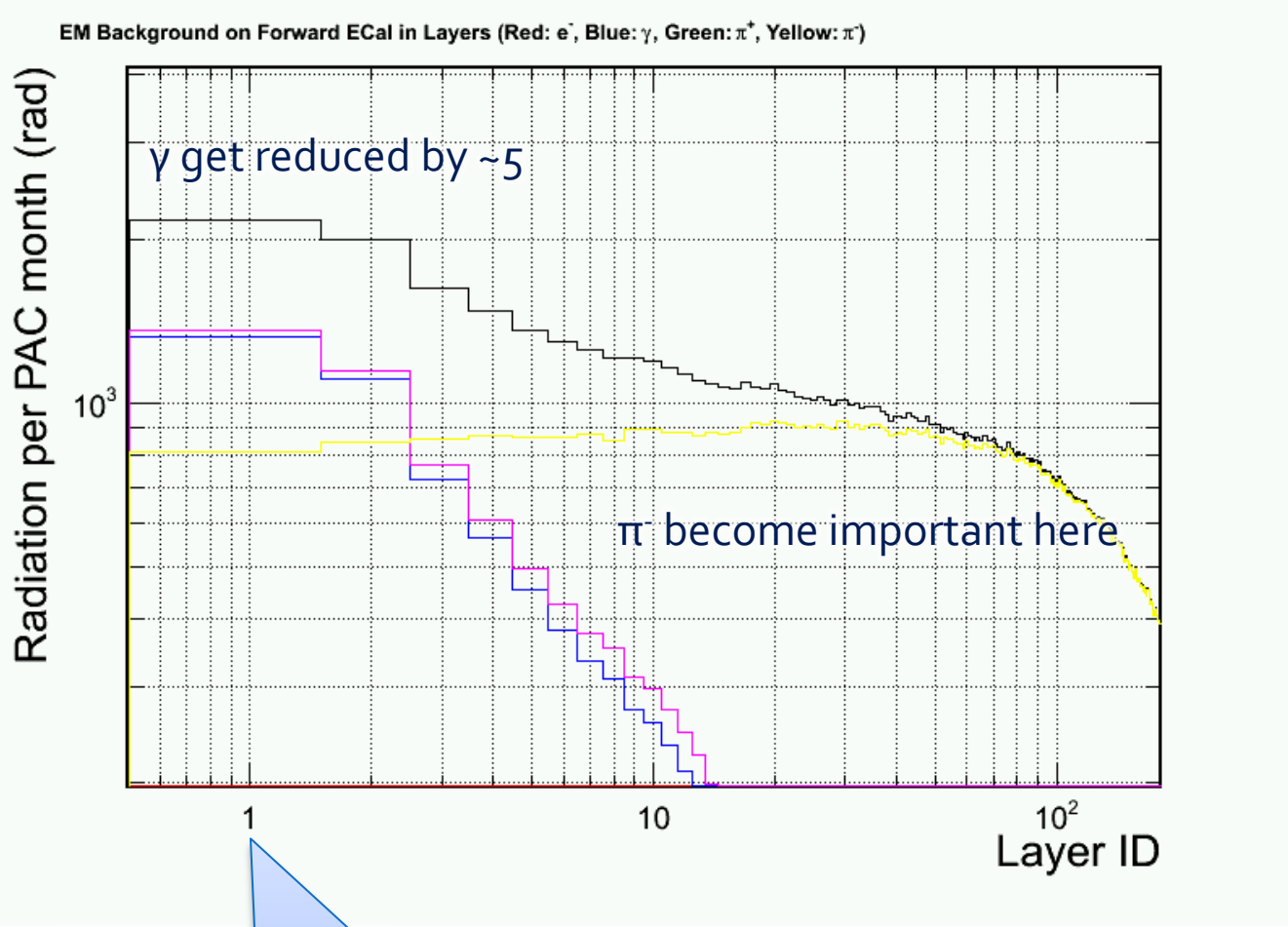
From Dec Collaboration Meeting



Layer #1 is 2cm preshower scint.

PVDIS – preview for a baffle w/o direct γ

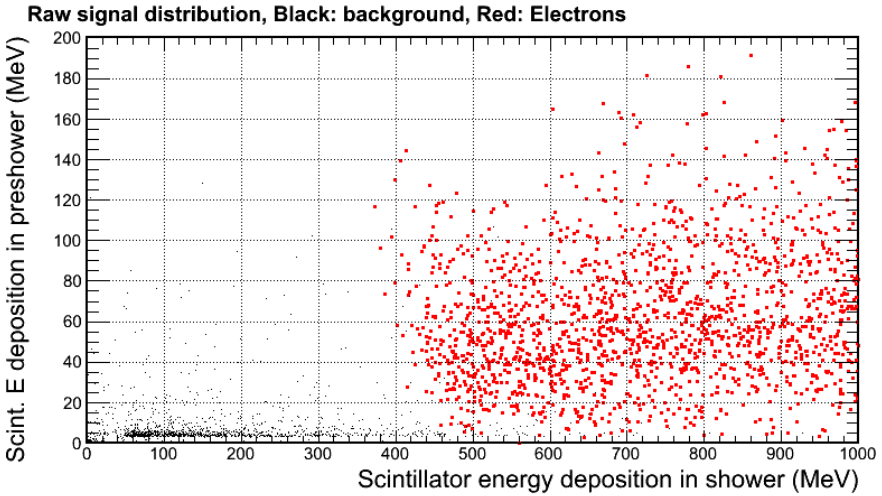
From Dec Collaboration Meeting

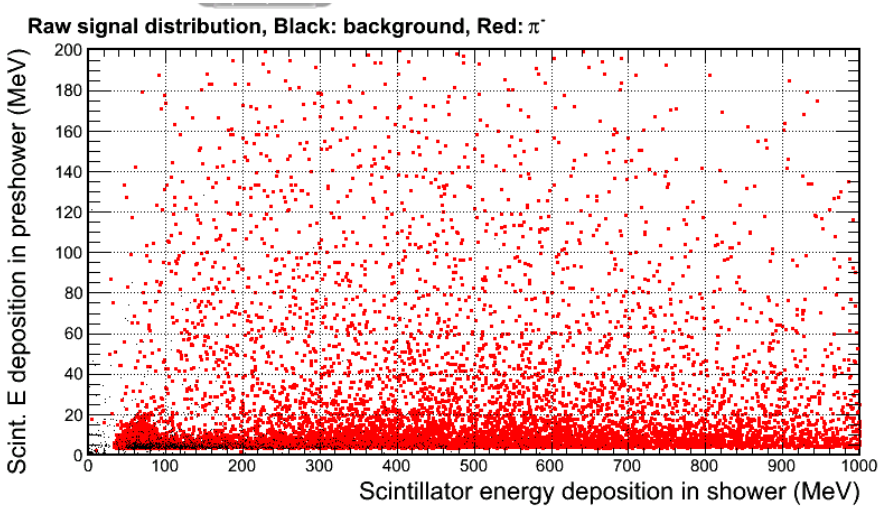


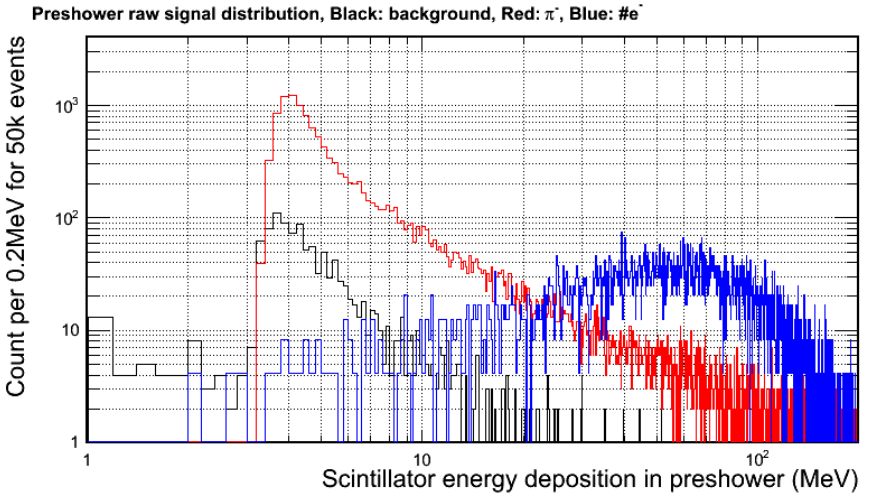
Layer #1 is 2cm preshower scint.

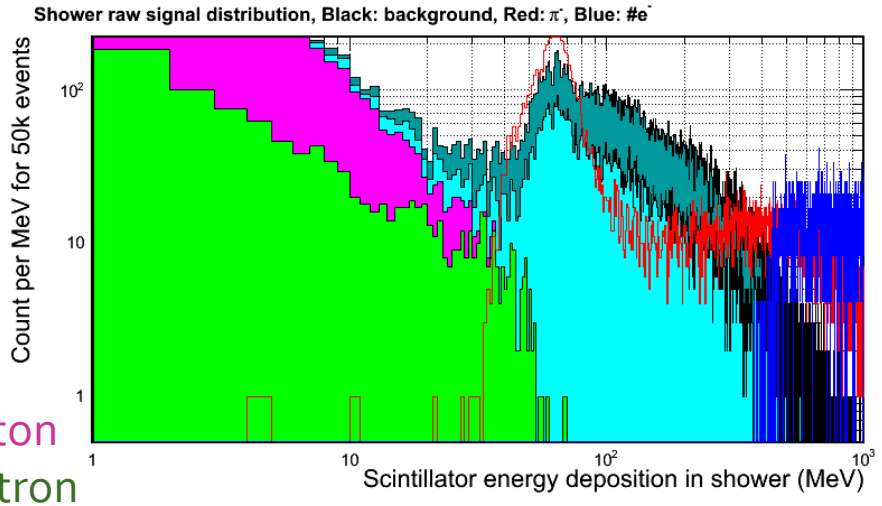
Last Version of Background Simulation (reported last week)

Why it is hard – lots of deep pions



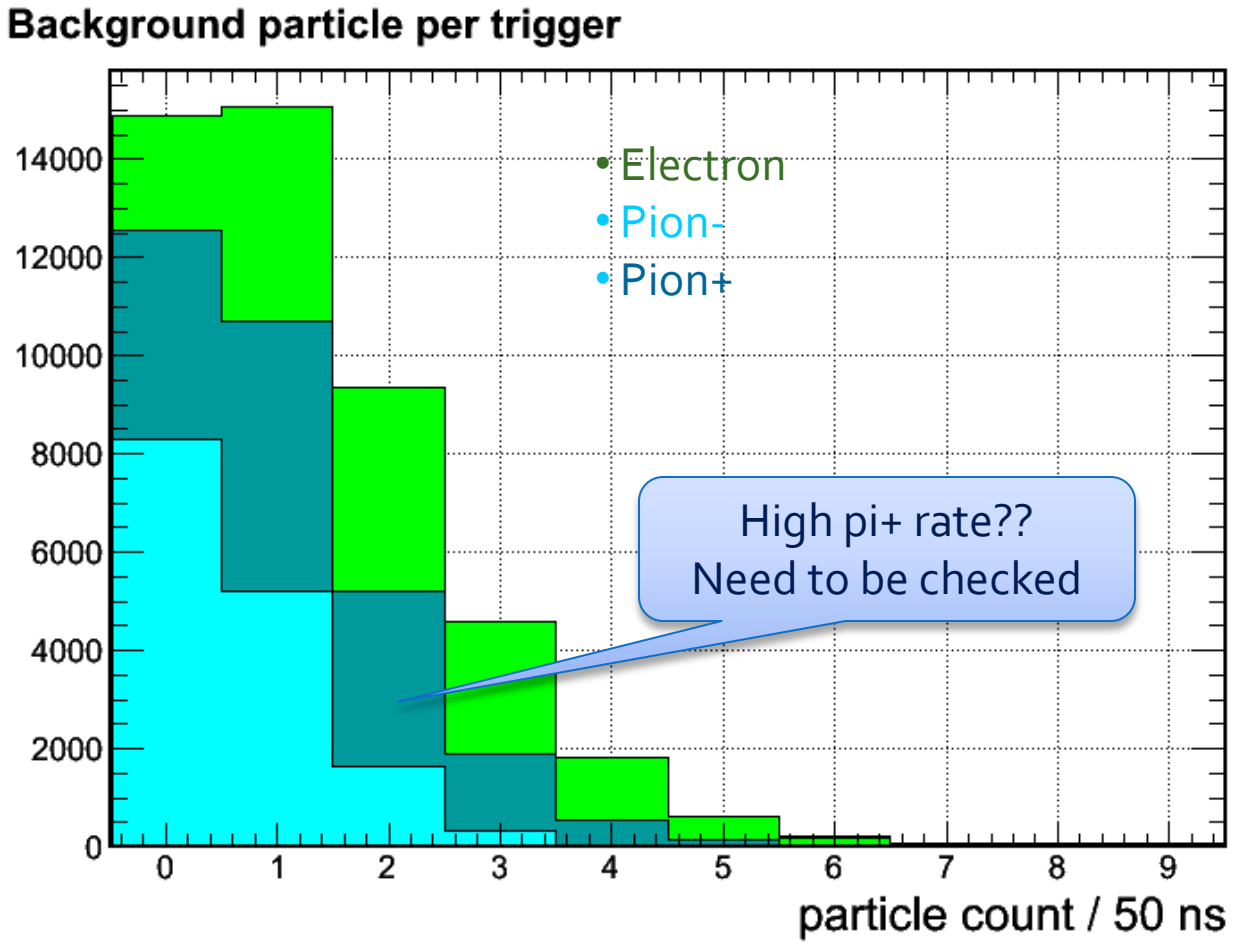




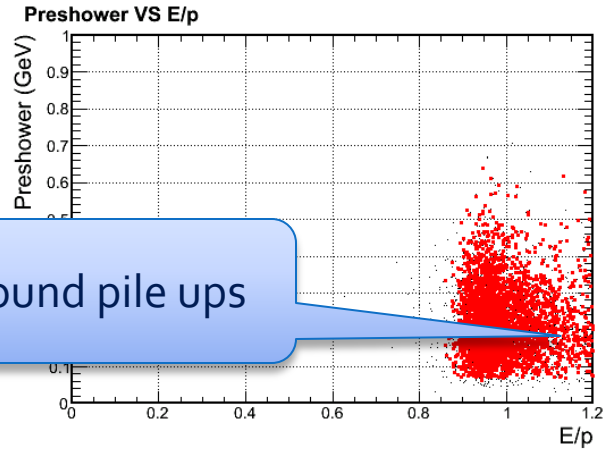


- Photon
- Electron
- Pion- Pion+

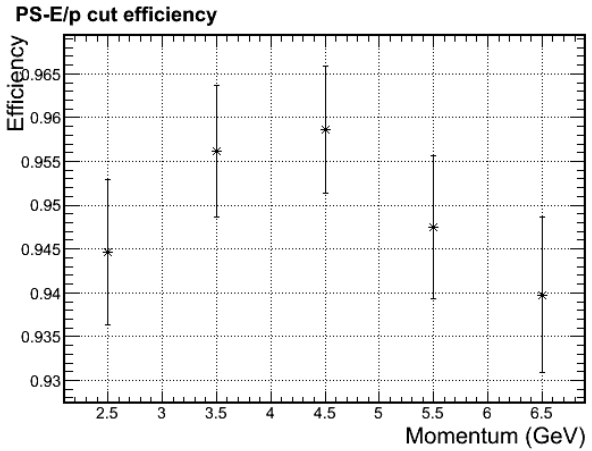
Per-event pion rate for 1+6 hexagon cluster at inner radius

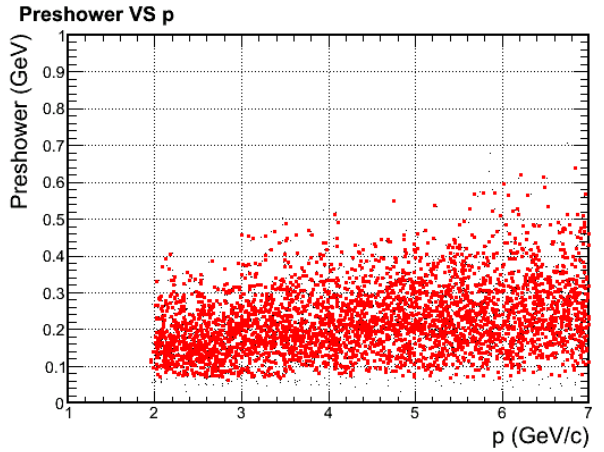


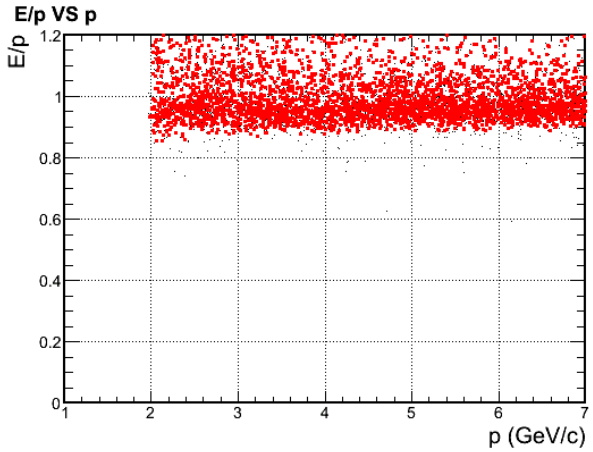
Electron efficiency w/ background at inner radius. Ignore gamma and pi+ bgd



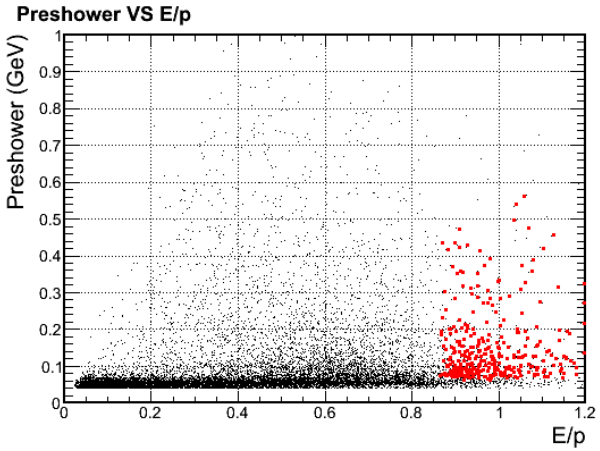
Background pile ups

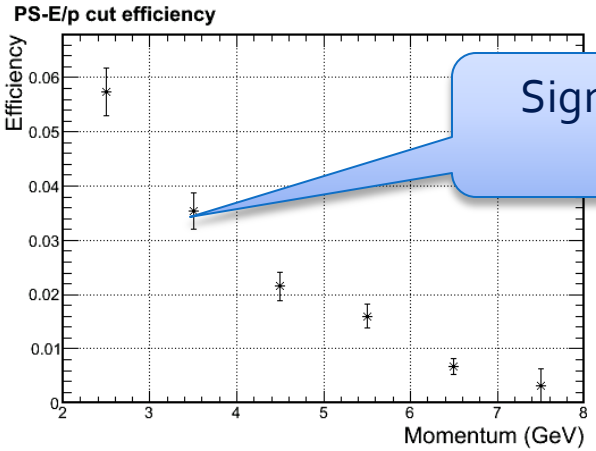




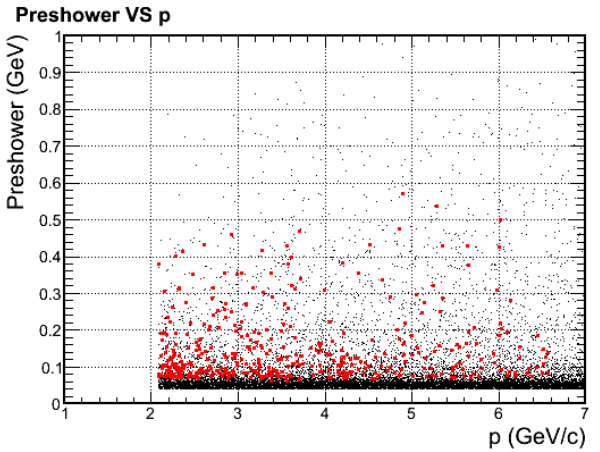


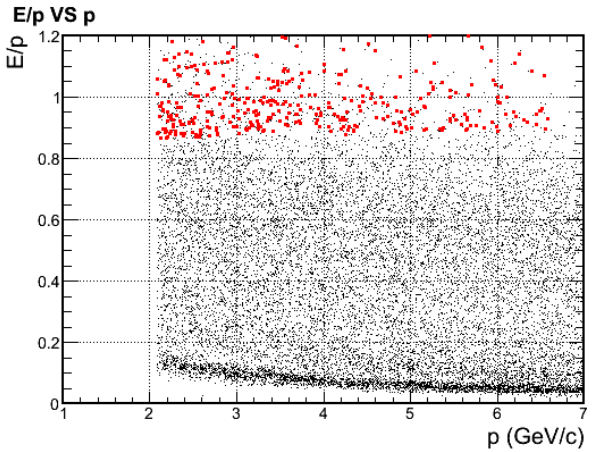
Pion efficiency w/ background at inner radius. Ignore gamma and pi+ bgd





Significant drop in rejection





What we can further try

- Position or kinematic dependent trigger threshold and cut threshold
- Use track multiplicity to assist calorimeter cuts