

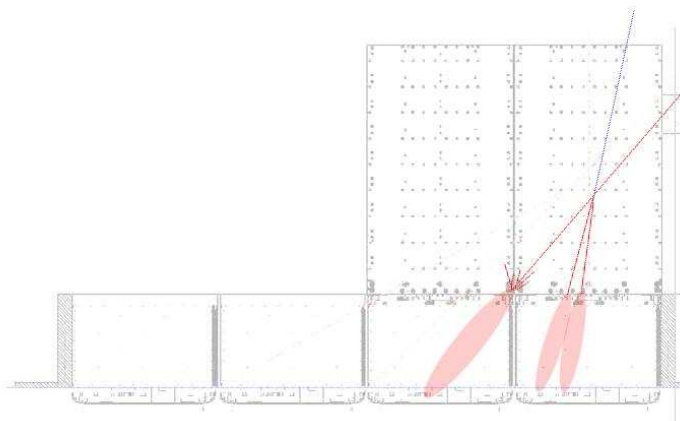
GLAST CERN 2006 Beamtest



Few funny things on Tkr hits and Cal Energy

Johan Bregeon (INFN-Pisa)

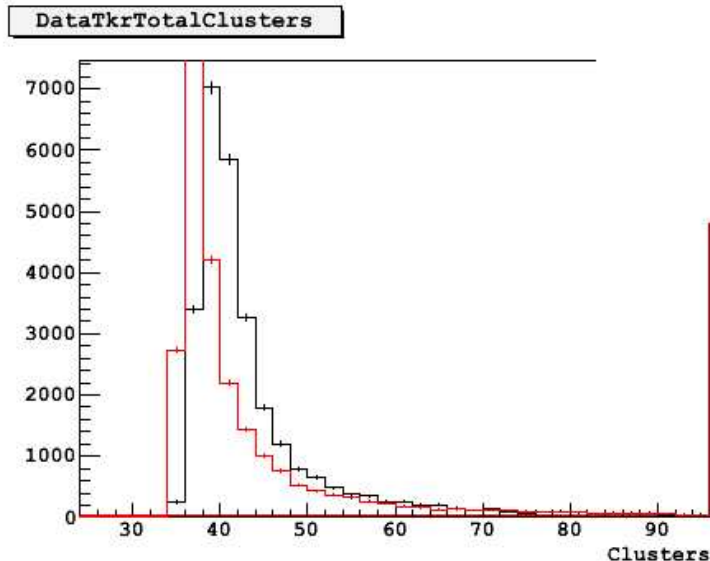
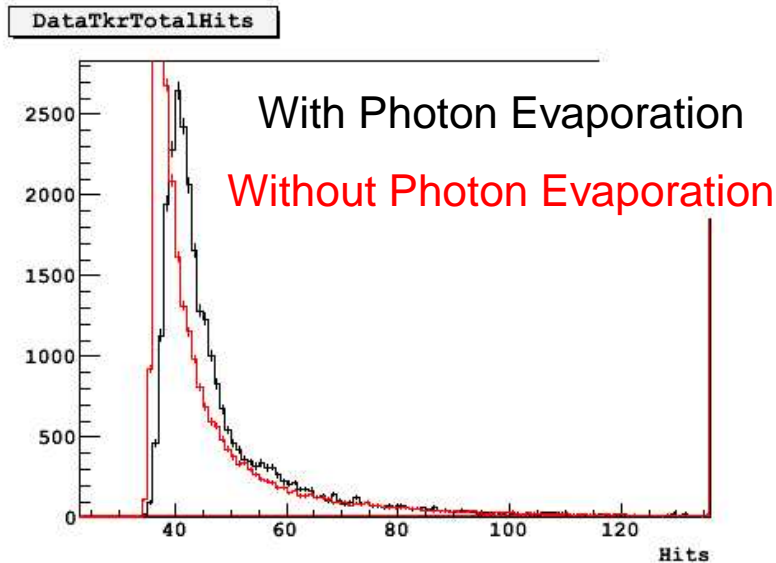
Beamtest Analysis - June 4th, 2007



Summary

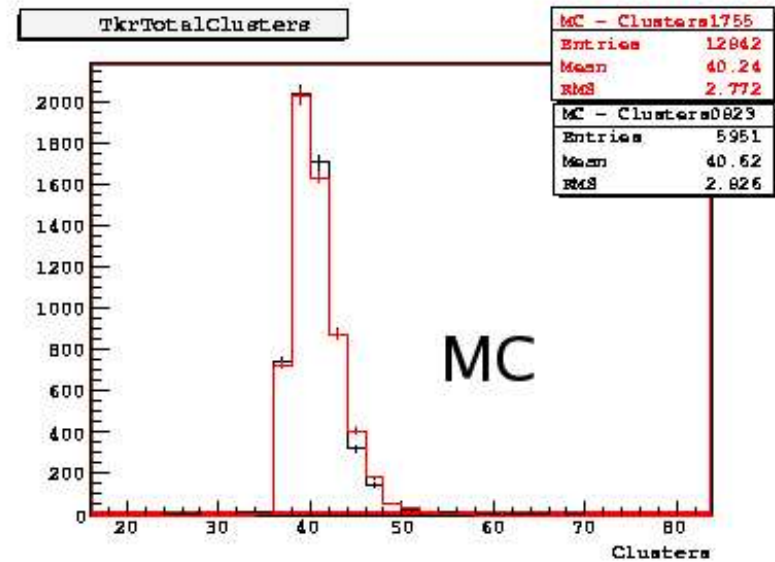
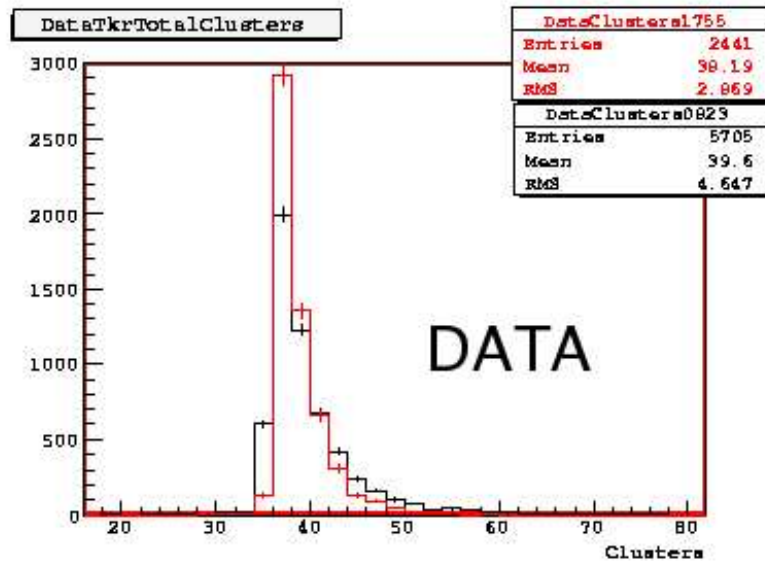
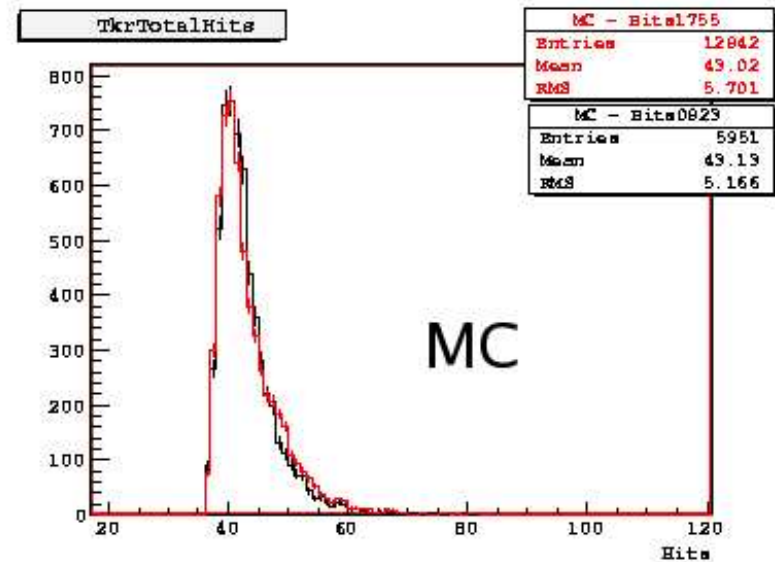
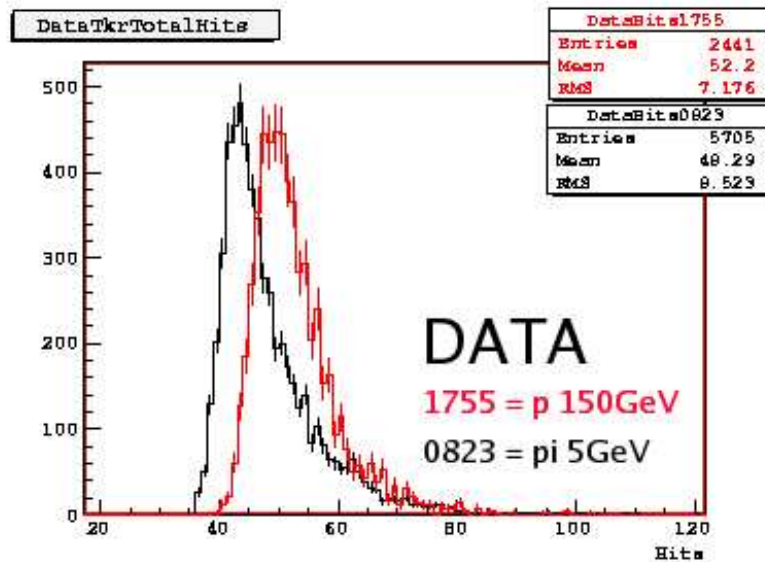
- G4 Photon Evaporation process in BTR v6r0925p2
- TkrTotalHits for low and high energy hadrons
- EM Shower profile for G4StdAlone, BT-Data and BT-MC
- 150GeV protons : 1755-Data/LHEP/QGSP_BERT

G4 Photon Evaporation process

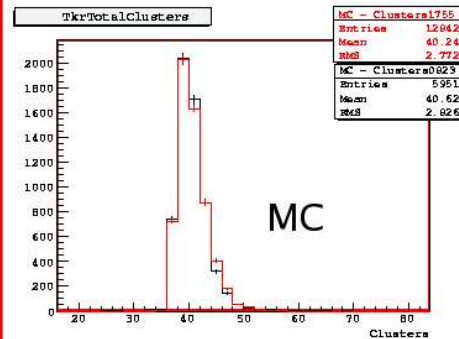
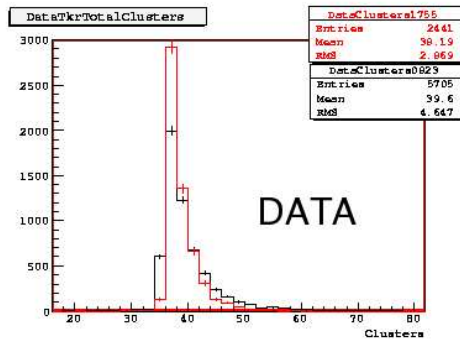
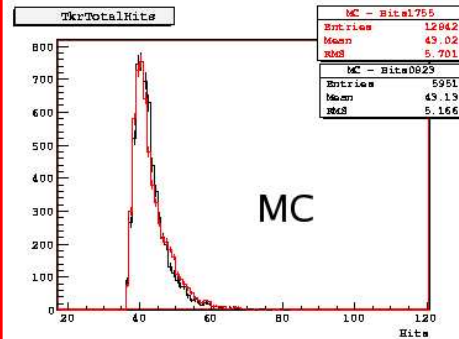
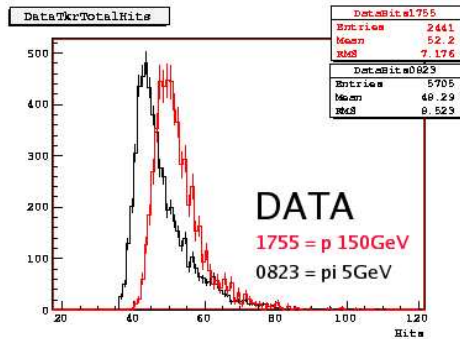


- When I ran BTR v6r0925p2 in the pipeline, the `G4LEVELGAMMADATA` environment variable is not set properly, so the Photon Evaporation was OFF
- ← Black with Photon Evaporation, Red no Photon Evaporation
- CAL distributions are identical but the number of hits in the tracker is lower !
- This bug highlights another kind of process responsible for hits in the tracker due to hadronic interactions.
- This will be fixed for the next BTR...

Pions : 5GeV 0823 vs 150GeV 1755



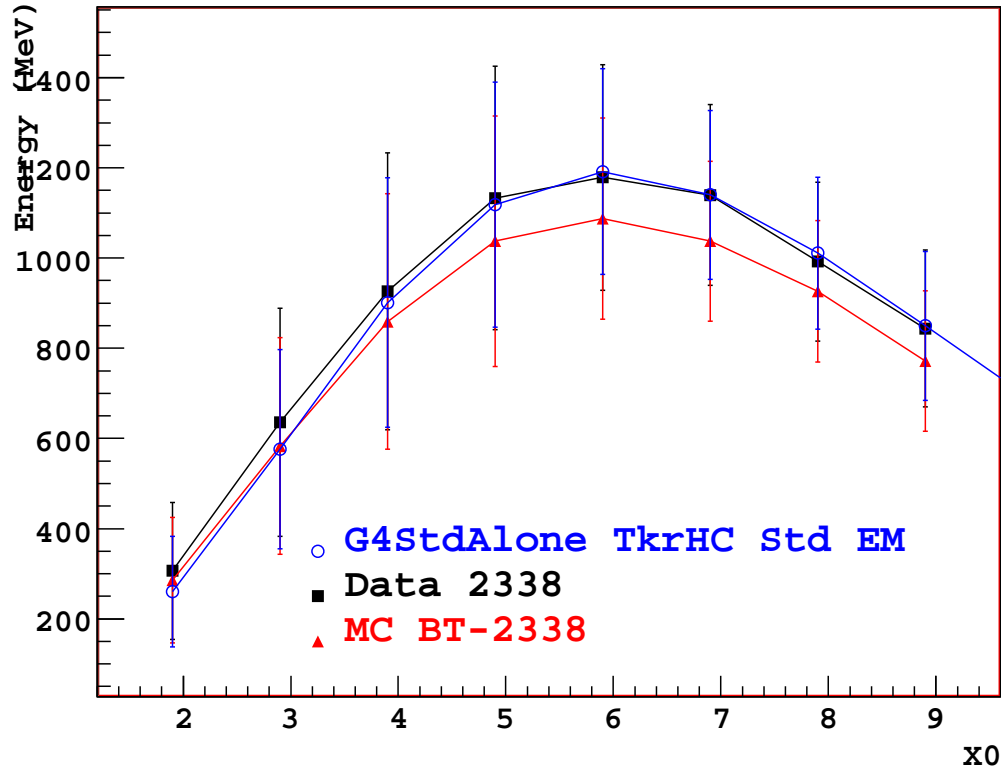
Pions : 5GeV 0823 vs 150GeV 1755



- Data : 150GeV protons produce more hits than 6GeV protons
- MC : 150GeV protons look the same as 5GeV pions
- Delta-ray production process in the MC ?
- Other processes ?

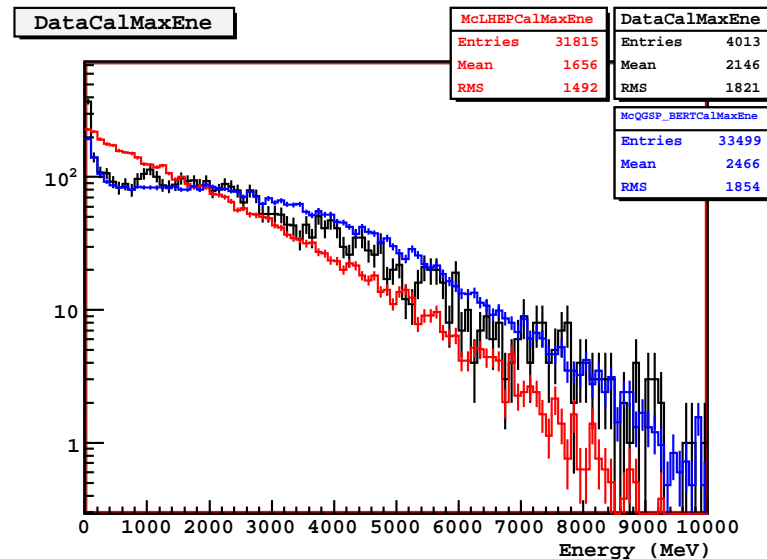
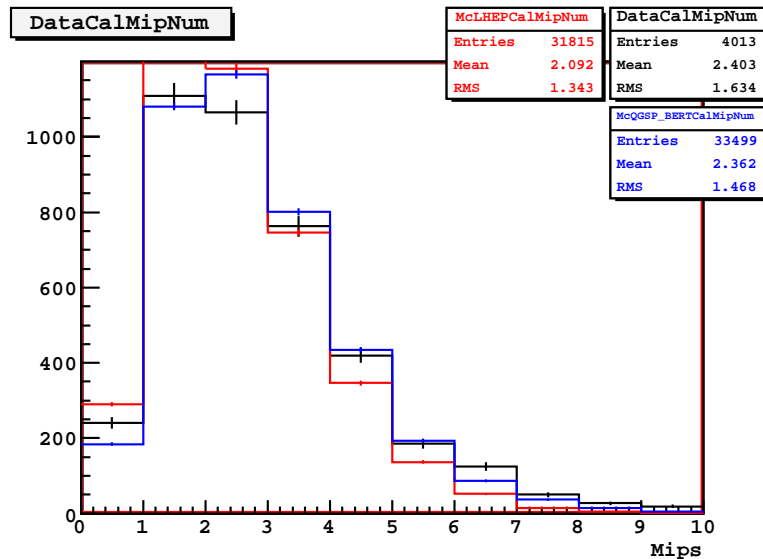
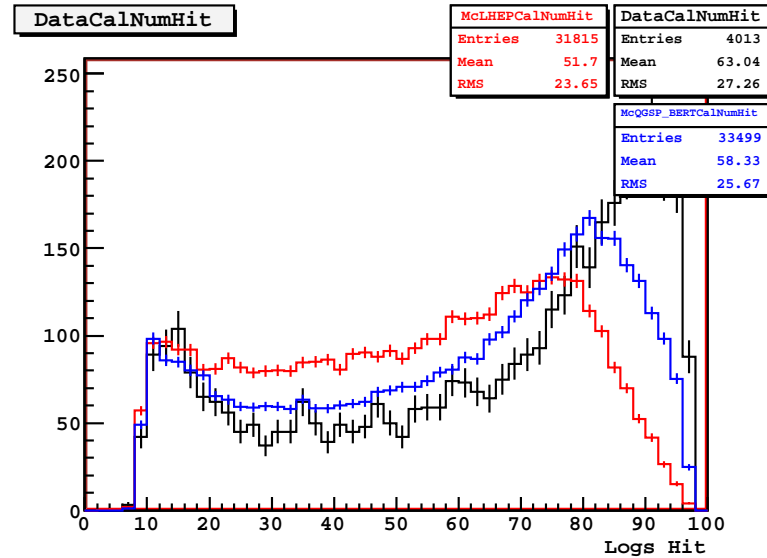
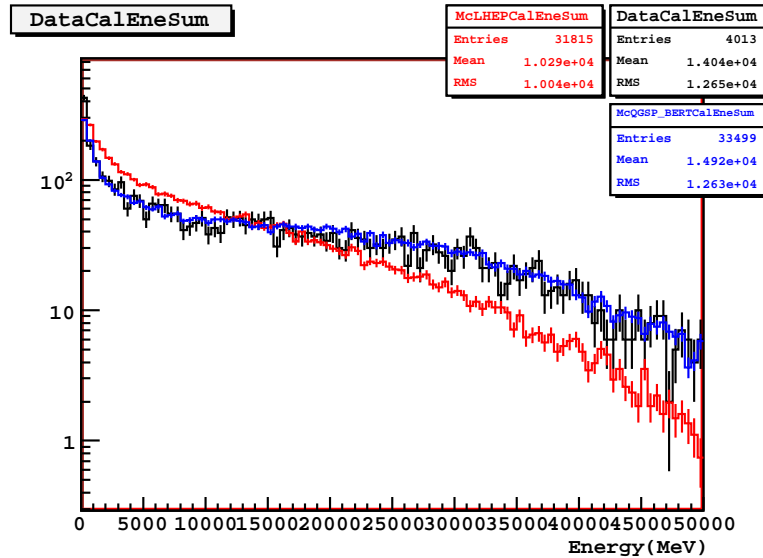
e10GeV Longitudinal profiles

e10GeV Profiles Mean and RMS

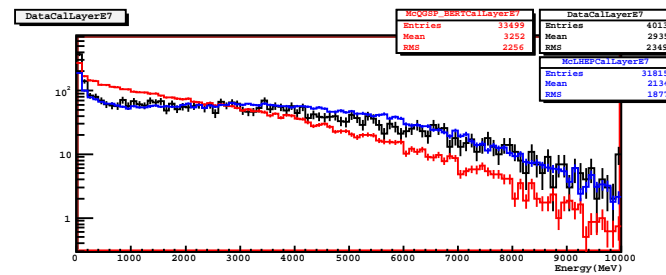
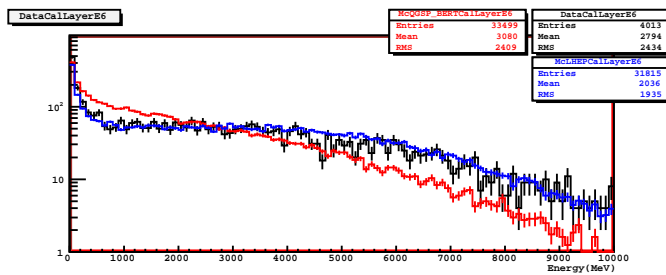
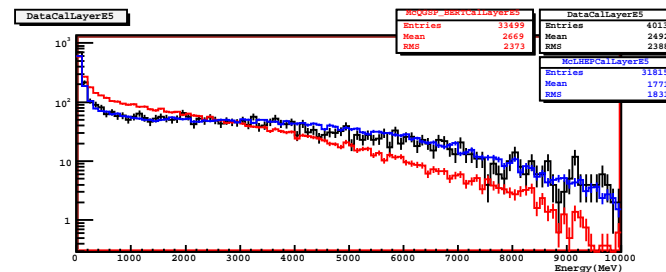
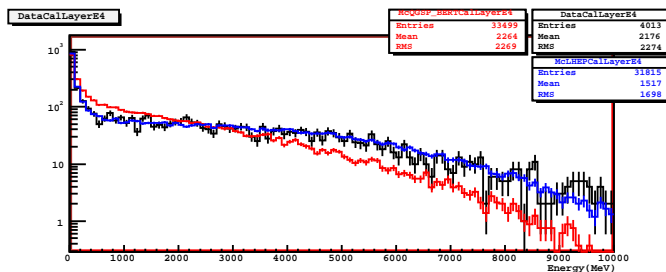
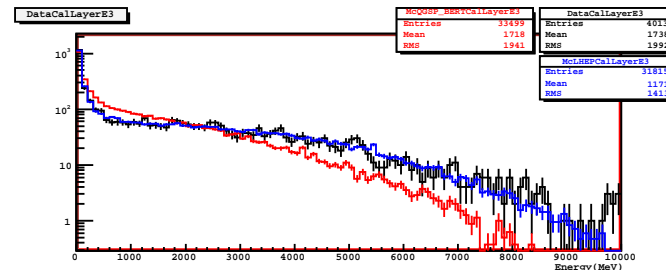
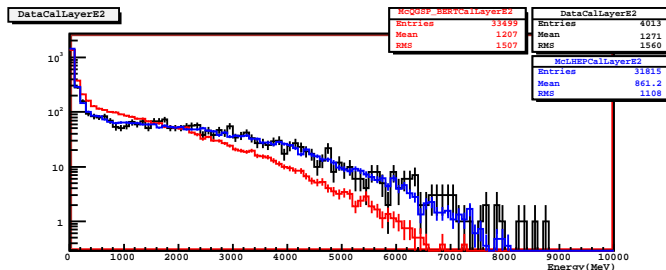
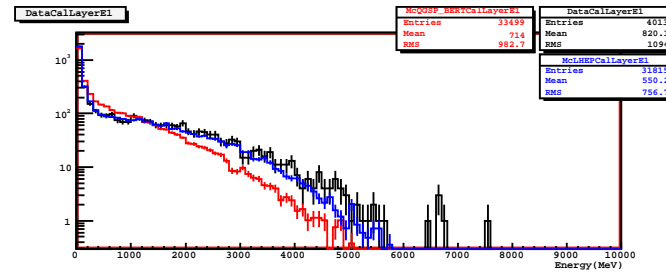
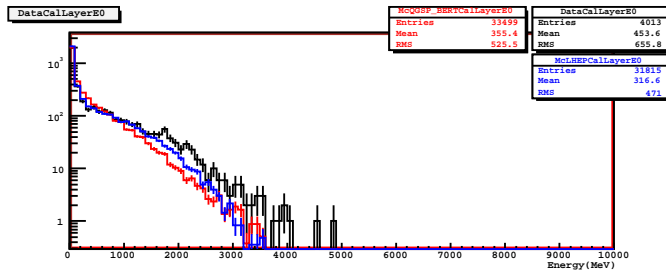


- G4StdAlone CAL is perfect (no gaps)
- Data : Cut on mips (also applied on BT-MC)
- BT-MC is definitely lower (in particular Emax)
- Is that just due to leakage ?

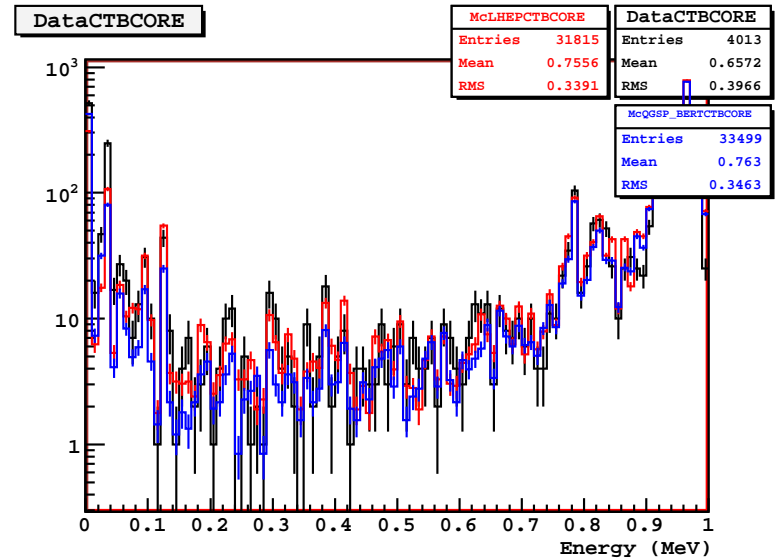
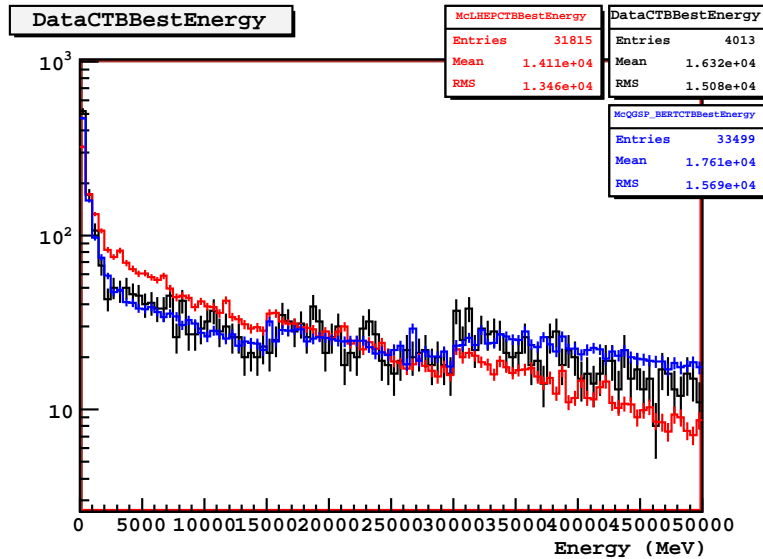
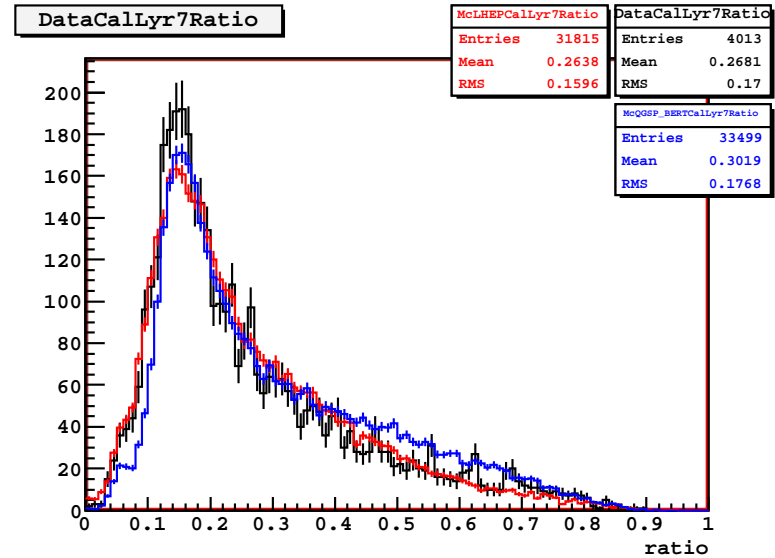
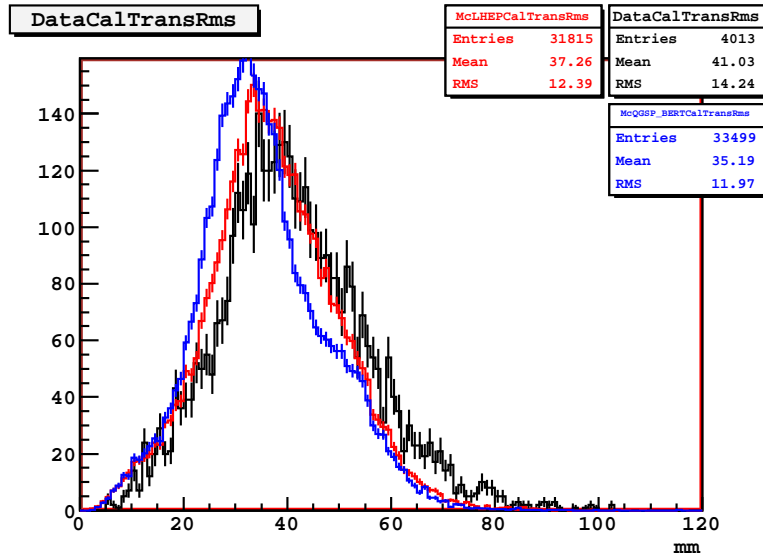
p 150GeV: 1755/LHEP/QGSP_BERT



p 150GeV: 1755/LHEP/QGSP_BERT



p 150GeV: 1755/LHEP/QGSP_BERT



thoughts...

- Is it reasonable that for our MC, a 150GeV proton produces as many hits as a 5GeV pion ?
- Which processes shall we check ? and how to do that ?
- Do we have an agreement *by chance* both for hadronic interactions and G4 standalone EM profile ?
- It may be useful to try to develop a more accurate geometry of the CAL in G4StandAlone code :
Beamtest06->Improved-G4StdAlone->Compare with Data
- *A dumb one* : are we sure about CAL geometry in MC ?
(Csl log dimensions)

ps : by the way, nobody could tell me what the unit of Tkr1Rms is !?