

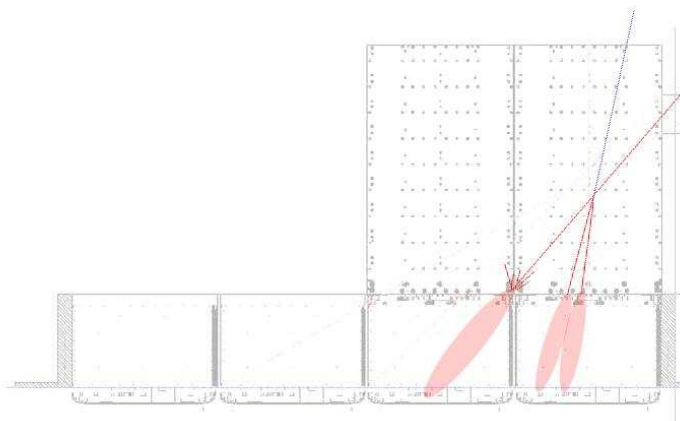
GLAST CERN 2006 Beamtest



Hadronic Cascades for protons at PS

Johan Bregeon (INFN-Pisa)

October 12th, 2006



Which events ?

Runs

- 6GeV protons : data run 700001423 with MC run 156
LHEP, 181 Bertini
- 10GeV protons : data Run 700001419 with MC run 155
LHEP
- Center of Tower 3 : [561, 13, 0] at 0 degree

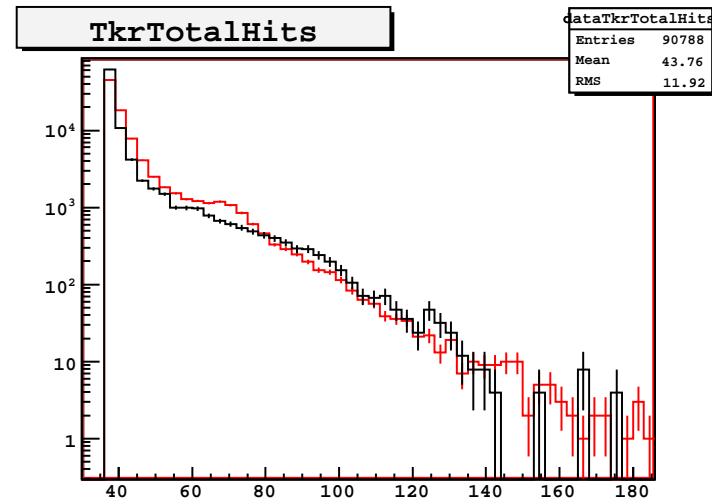
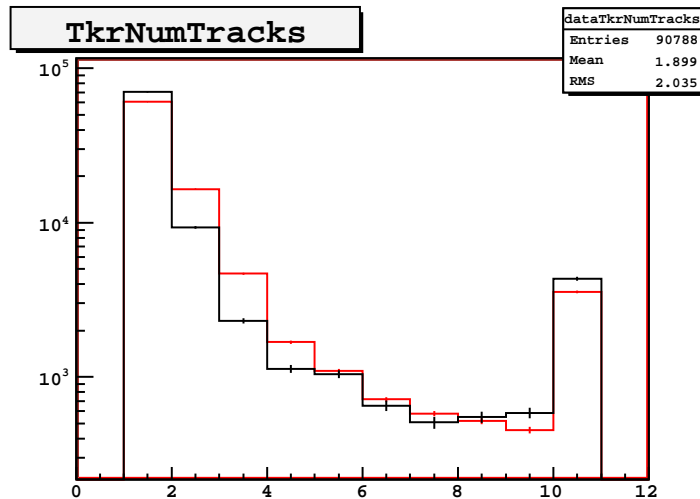
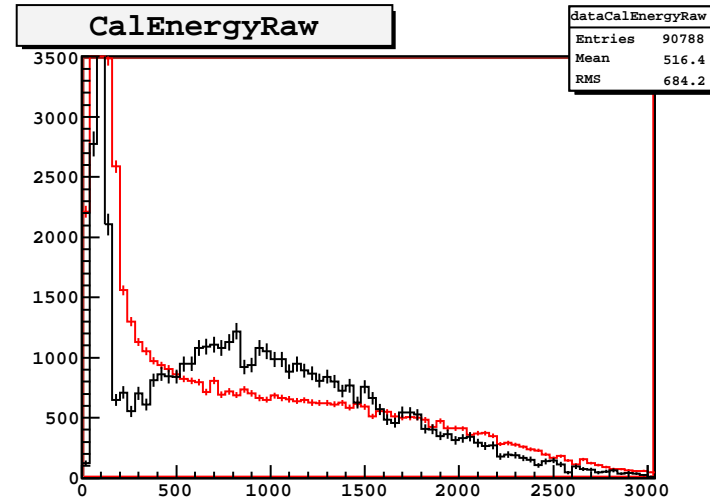
All Particles

- $TkrTotalHits \geq 36$: avoid gaps
- $CalEnergyRaw > 10MeV$: avoid gaps
- proton beam should be quite clean...
- CAL pedestal drift does not seem to be a big deal at first order.

Data-1423 vs 156-LHEP (1)

6GeV protons : **Data** and MC-LHEP

- + Missing some events for low CalEnergyRaw
- + Shift of TkrTotalHits
- + More Tracks observed

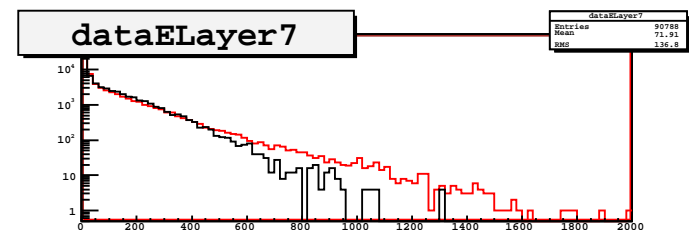
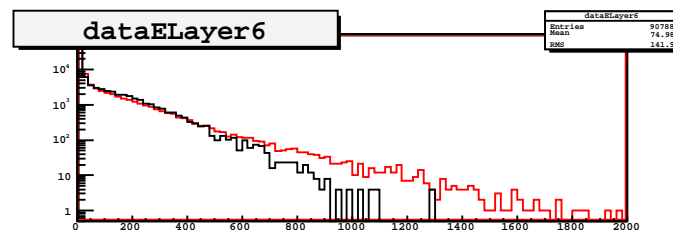
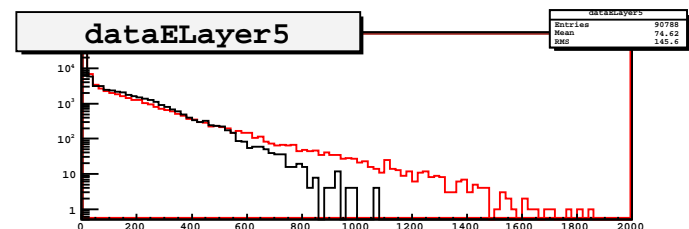
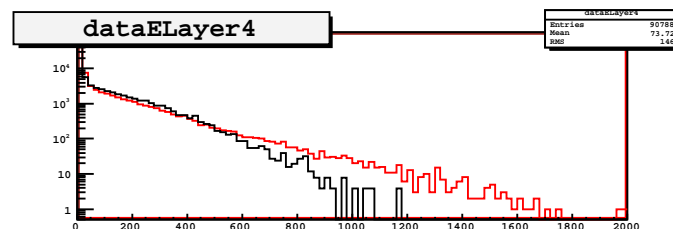
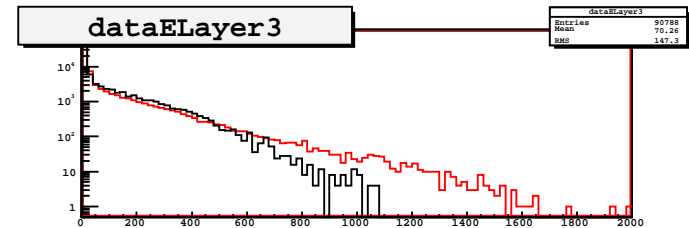
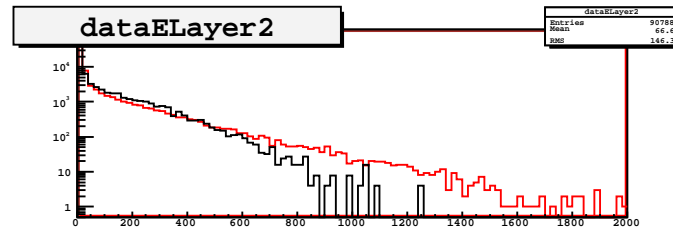
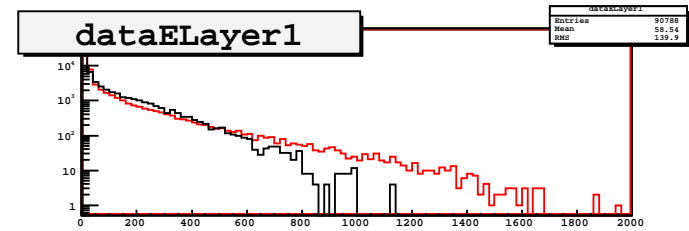
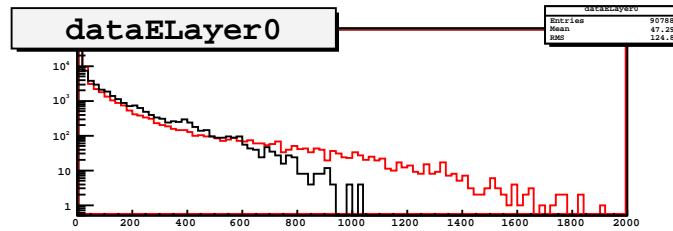


Data-1423 vs 156-LHEP (2)

LHEP model : 6GeV

● More Energy in
Data

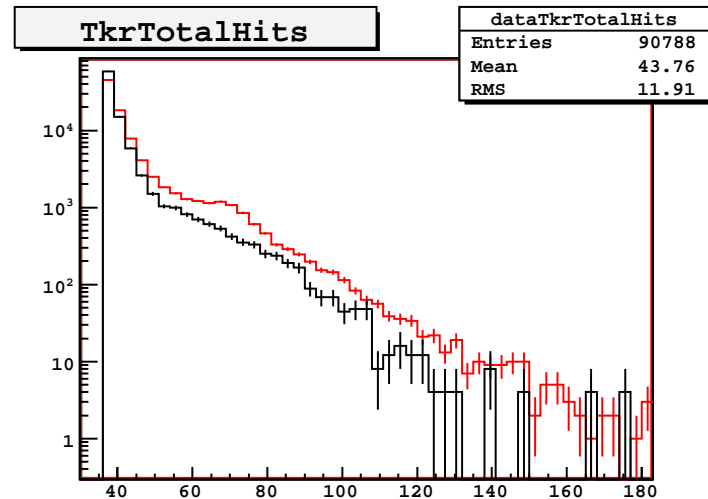
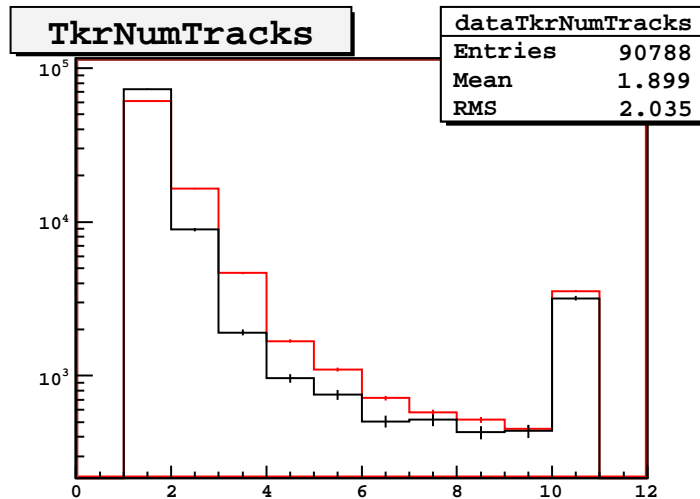
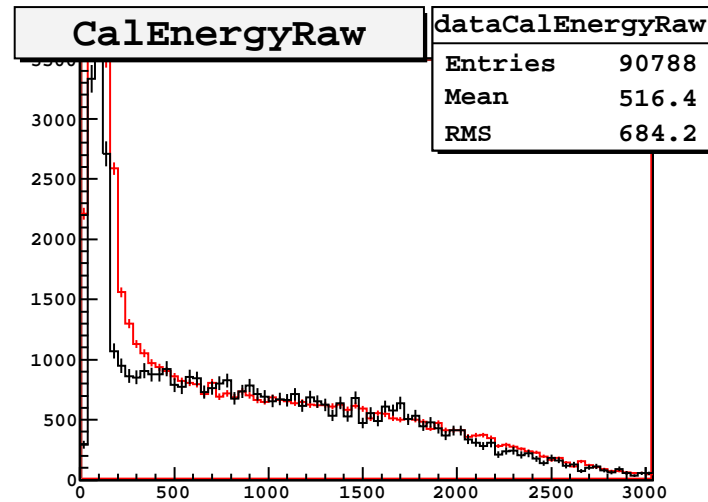
⇒ not bad though
for biggest part
of the stat.



Data-1423 vs 181-BERT (1)

6GeV protons : **Data** and MC-Bertini

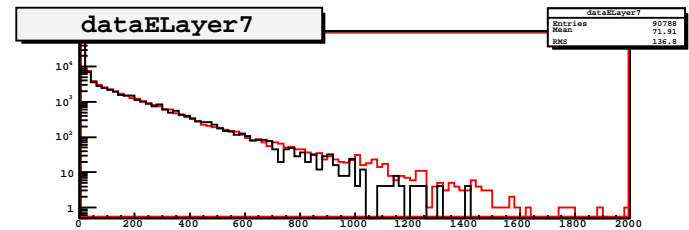
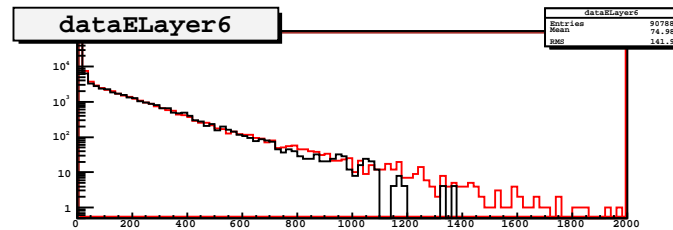
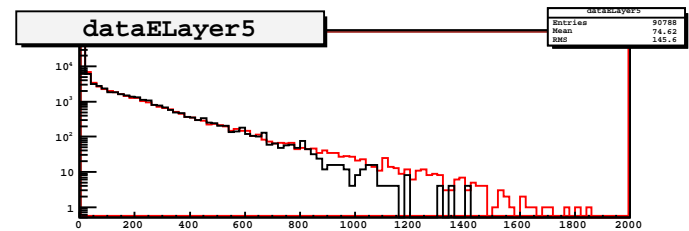
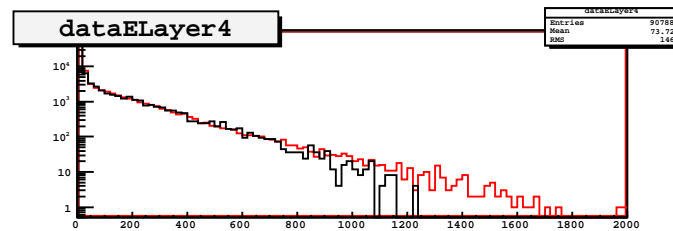
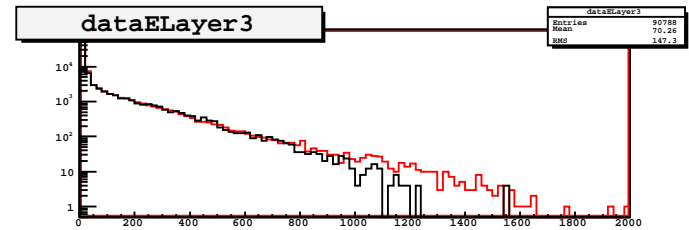
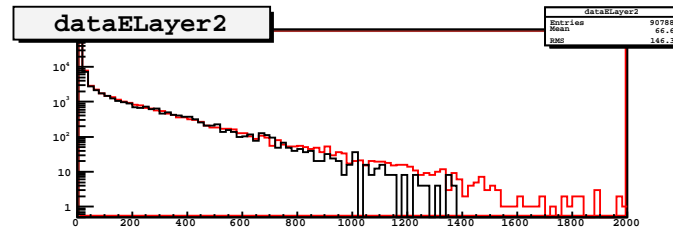
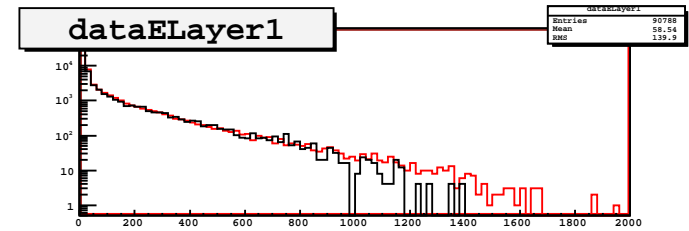
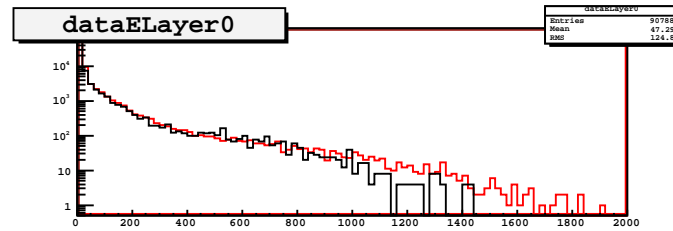
- + Good Agreement on Energy
- + More Tracks in Data
- + Hit distribution seems better too



Data-1423 vs 181-BERT (2)

Bertini model : 6GeV

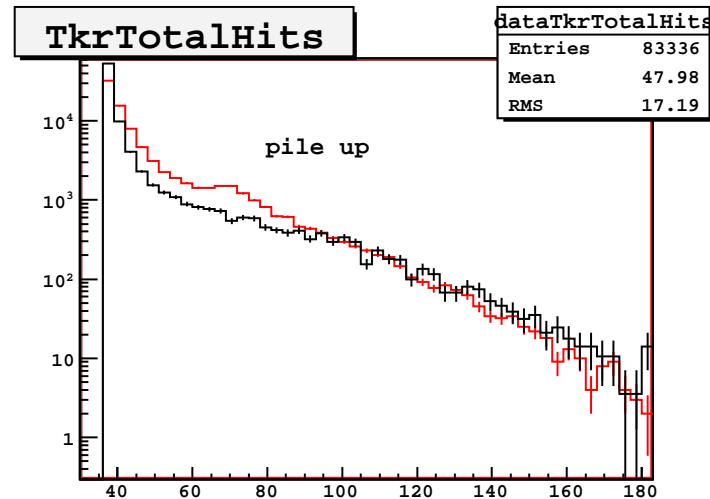
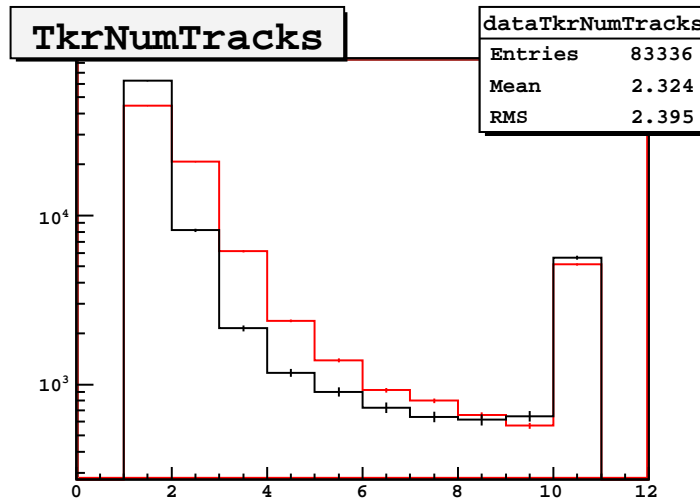
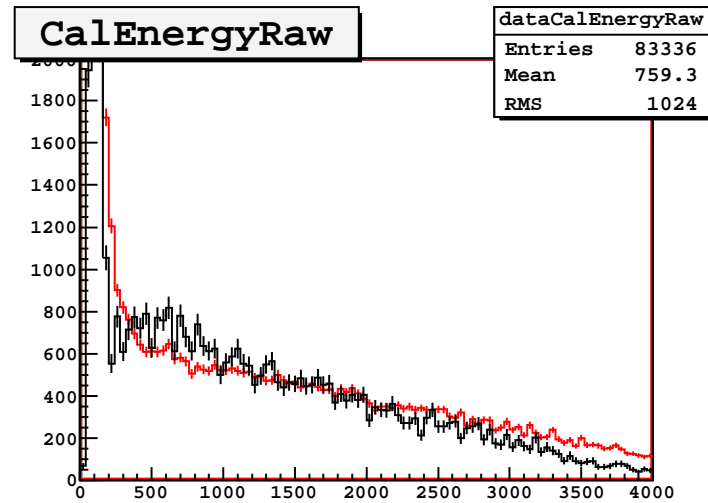
● more events
with high Elayer
⇒ very good
agreement



Data-1419 vs 155-LHEP (1)

10GeV protons : **Data** and MC-LHEP

- + Quite good agreement for Energy deposit
- + Still a shift on Track dist.
- + and more Hits in data

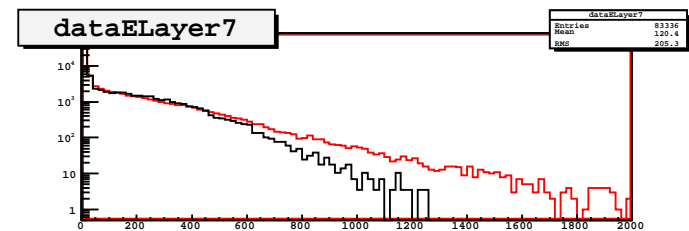
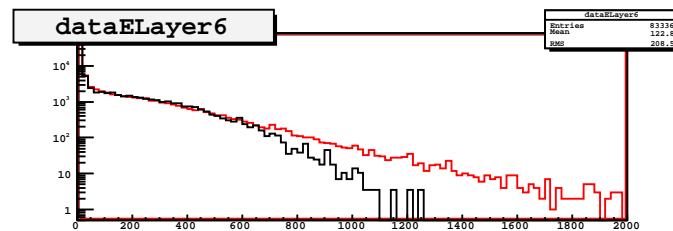
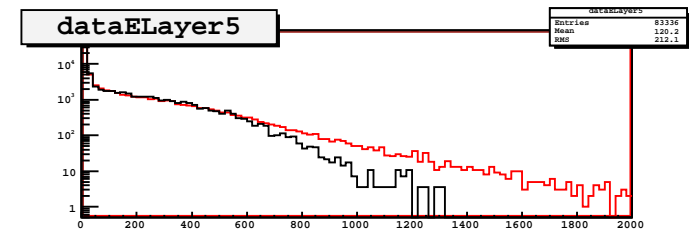
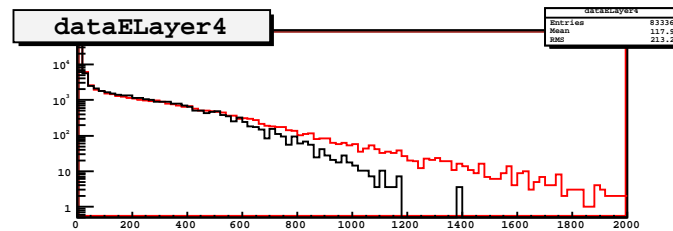
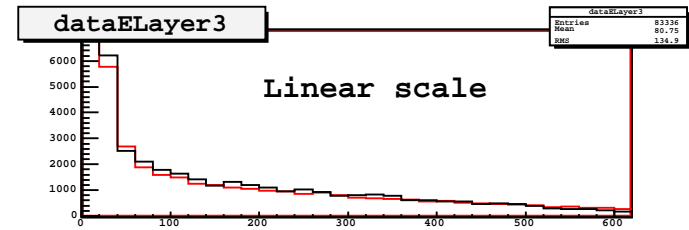
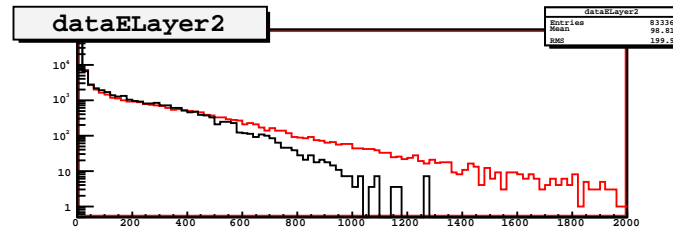
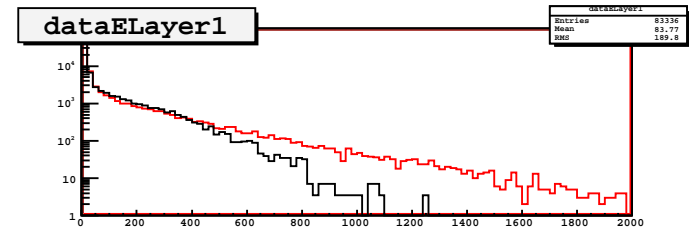
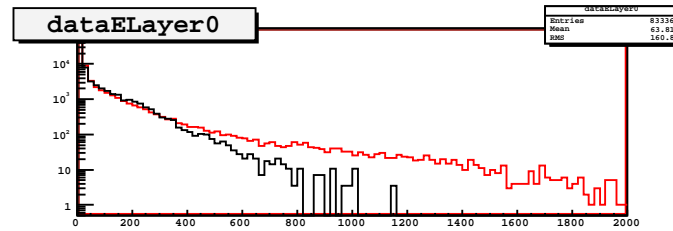


Data-1419 vs 155-LHEP (2)

LHEP model : 10GeV

● More Energy in
Data

⇒ not bad though
for biggest part
of the stat.



Conclusions

- Bertini model performs well at 6GeV, can it be extended up to 10GeV ?
- What about other models ? Binary Cascade for instance...
- Deeper analysis to be performed checking more CAL variables, but we may want to *fix* the MC for EM showers first.
- The tracker may be a nice tool to look into hadronic cascades, but again we may want first to understand discrepancies between data and MC for ionizing particles and EM showers.
- we also have runs at different angles.