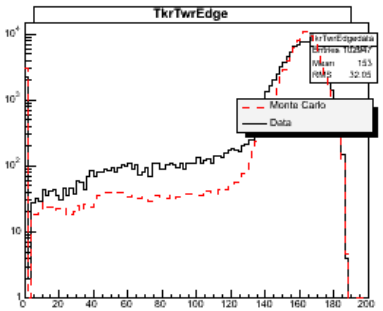
A first look at the proton data

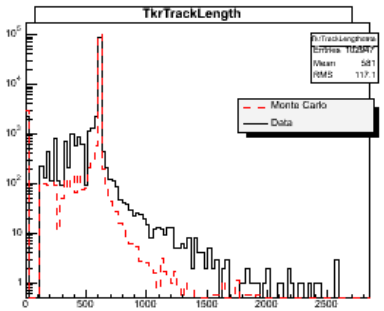
Comparison Data - MC

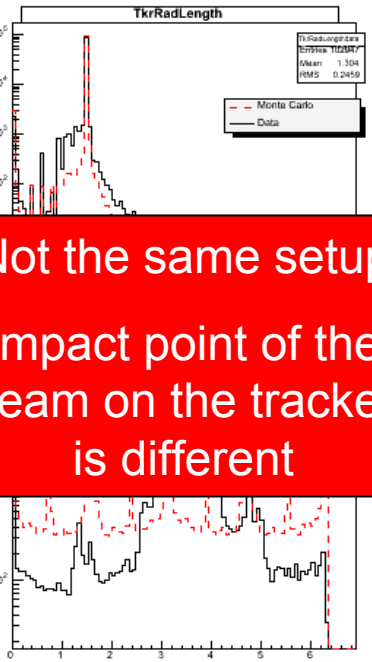
- Real data:
  - Energies: 6 GeV and 10 GeV
  - Angles: 0°, 30°, 60°, 90°; into the center of Twr3
- Monte Carlo data:
  - Energies: 10 GeV
  - Angles: 0°, 60°, 120°

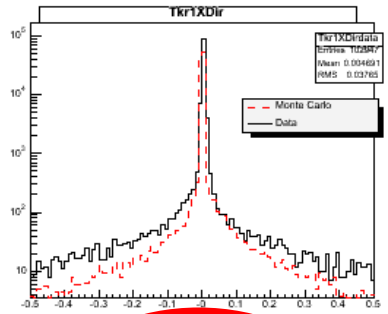
→ picked 10 GeV, 0° for comparison

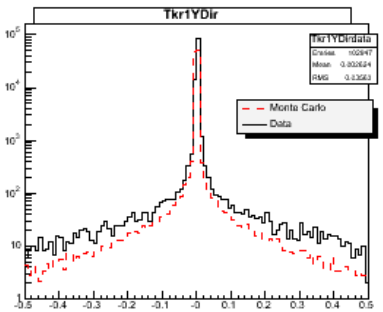
Tracker Direction Variables

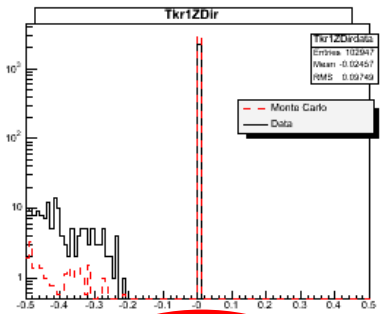






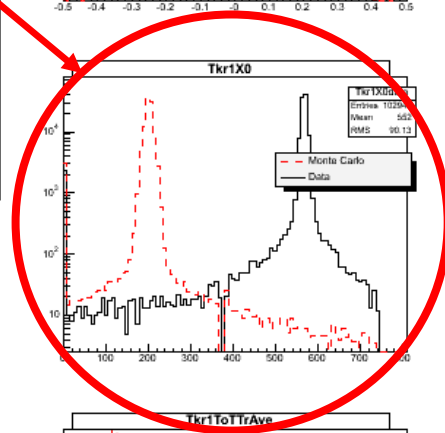


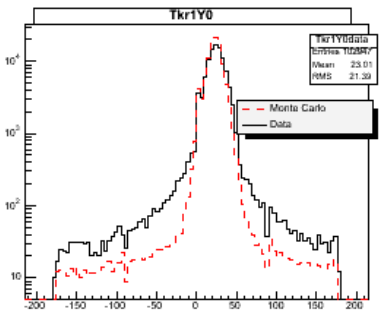


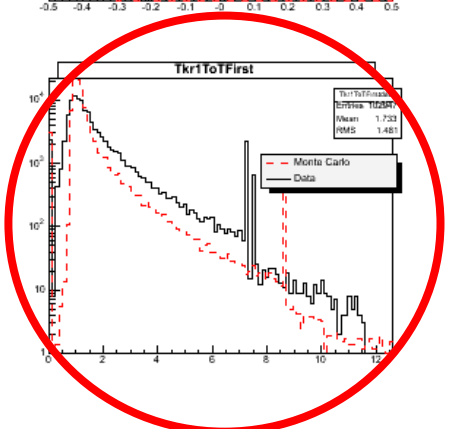


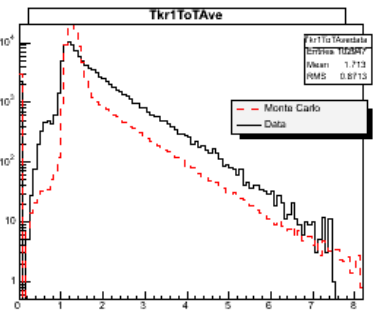
Not the same setup

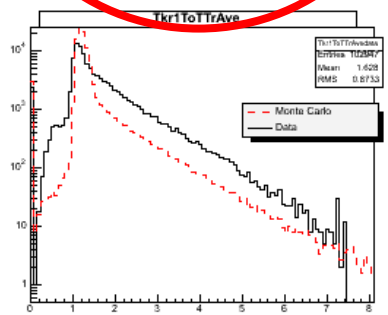
Impact point of the beam on the tracker is different



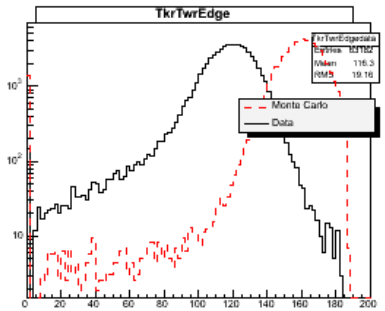


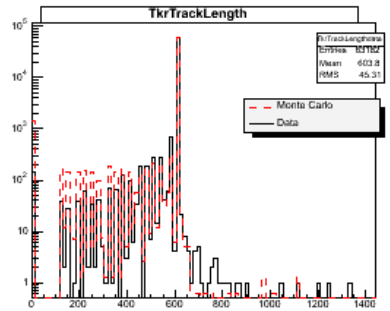


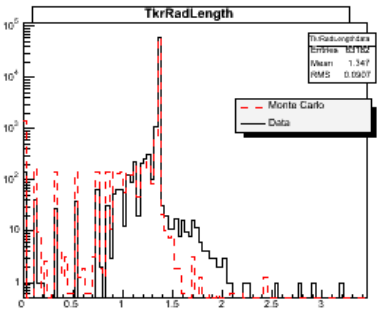


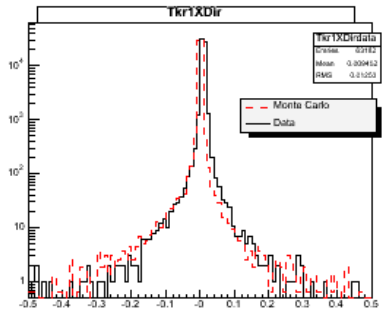


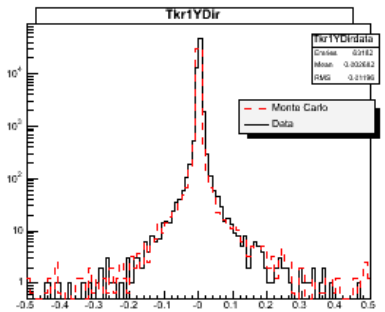
Same problem for Electron runs

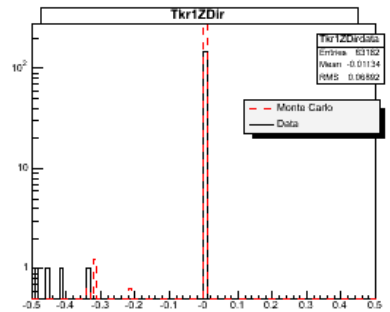


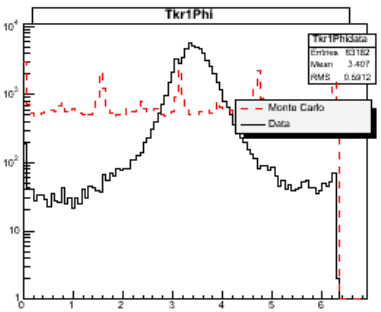


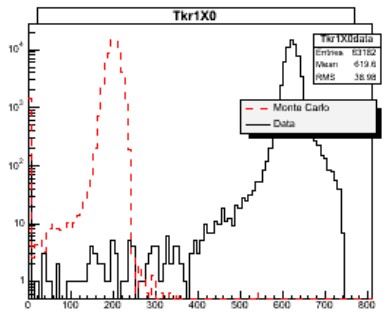


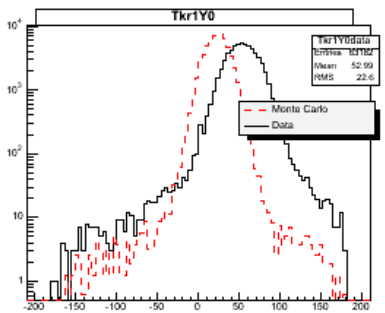


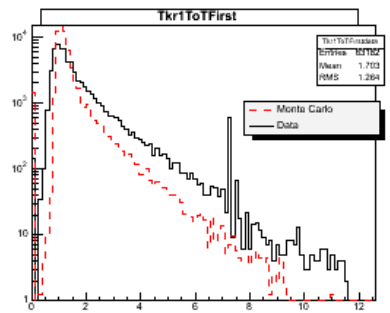


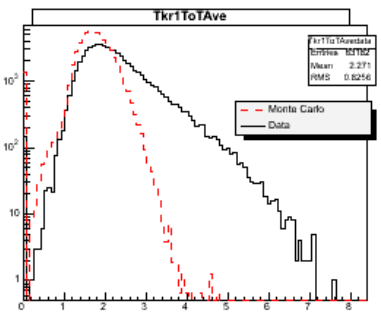


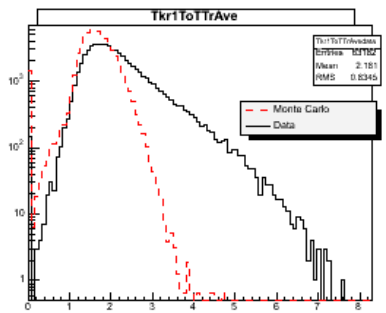






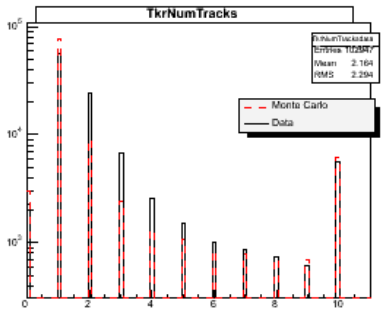


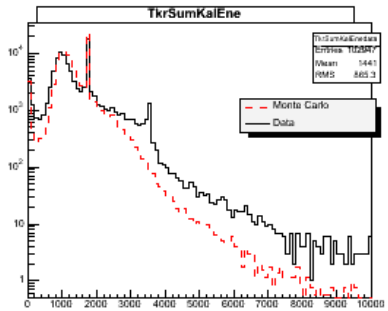


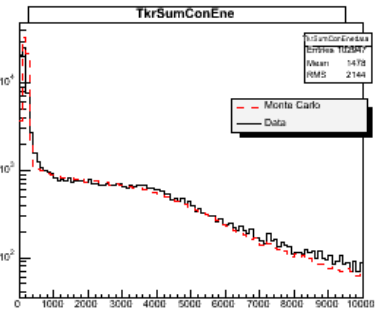


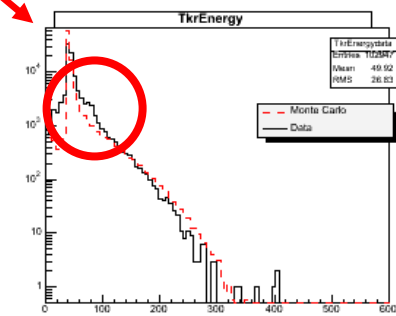
Tracker Energy Variables

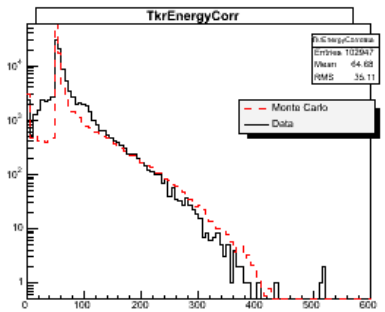
Pile Up

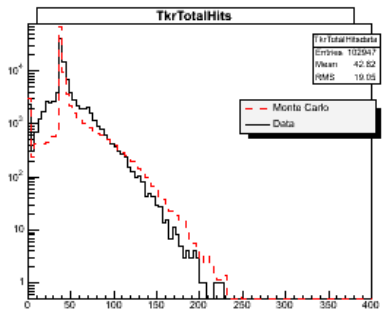


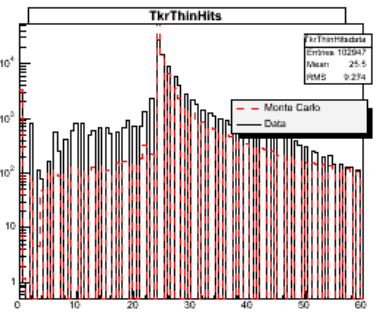


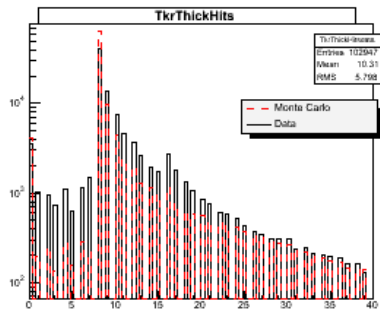


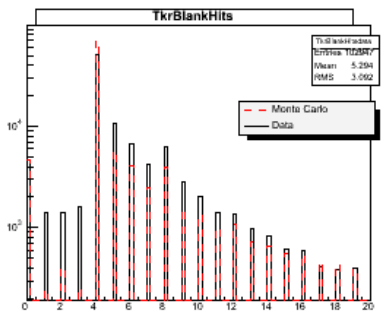


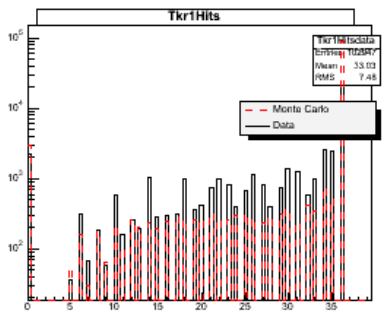


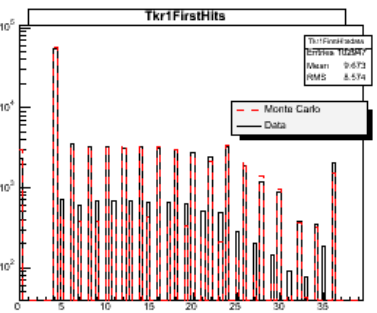


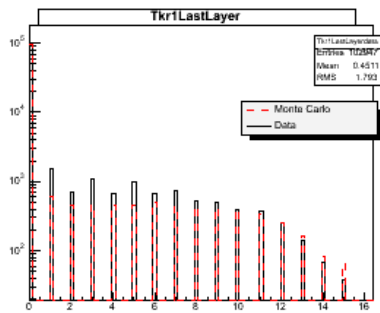








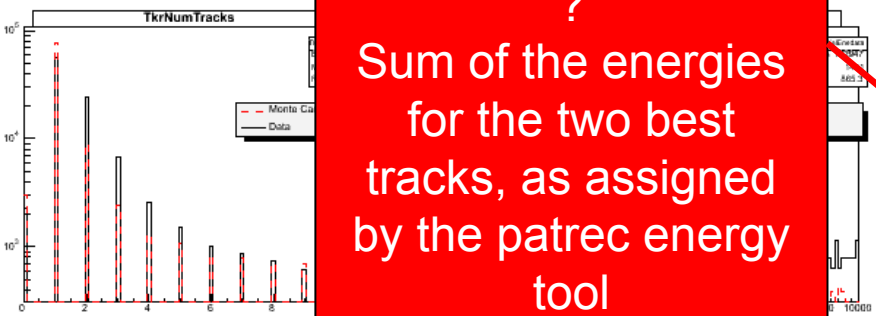


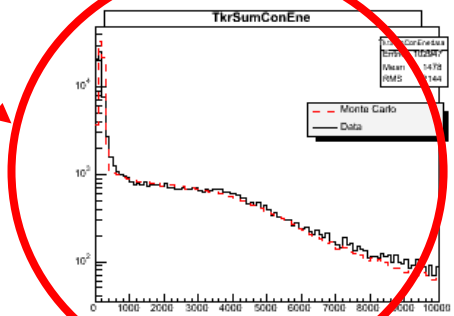


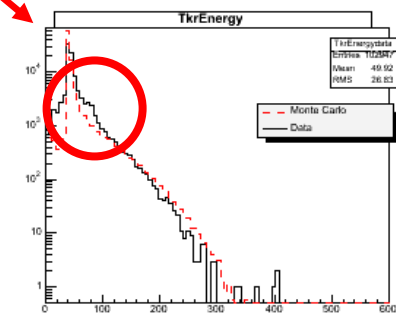
Tracker Energy Variables

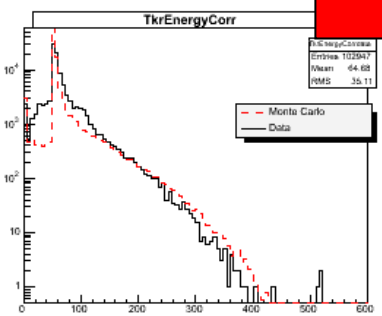
Pile Up

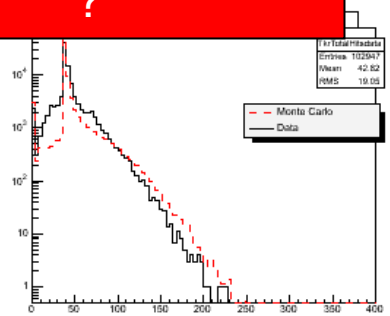
?
Sum of the energies for the two best tracks, as assigned by the patrec energy tool
?

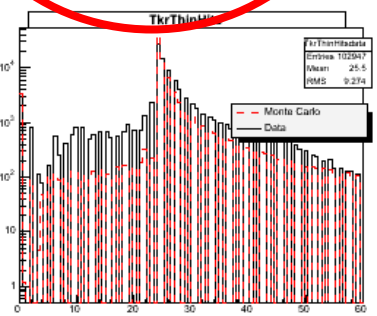


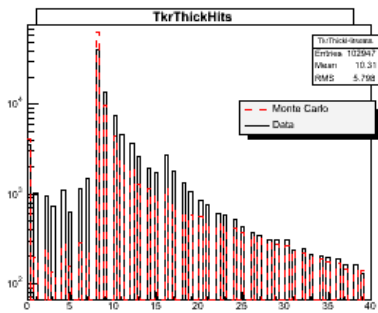


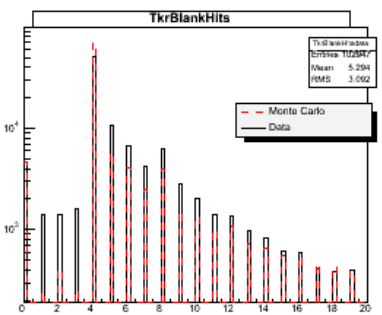


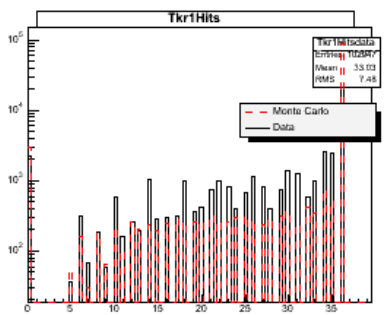


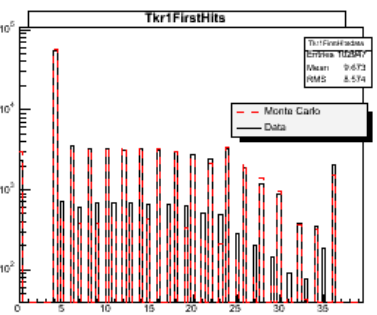


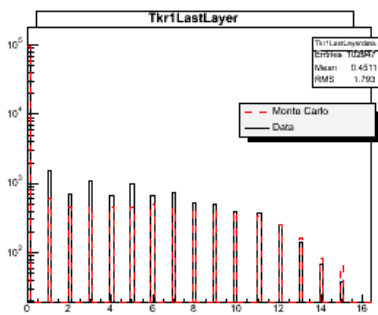






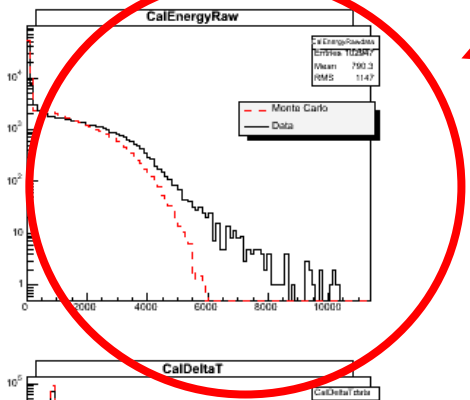


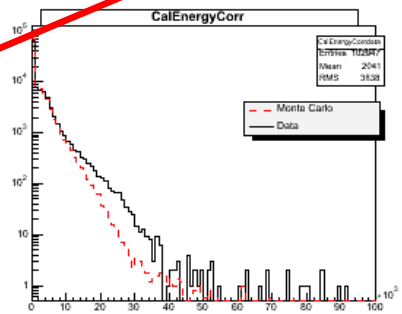


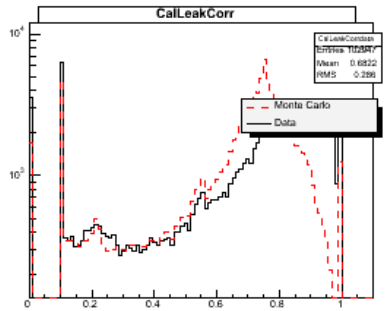


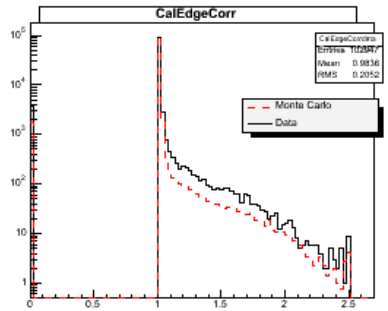
Cal Ene… …bles:

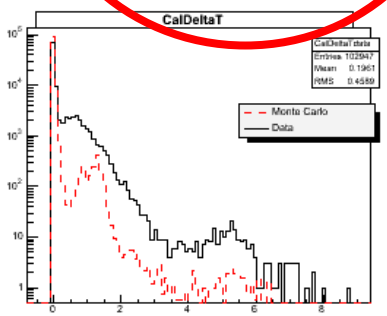
The high energy end does not match very well (pileup?)

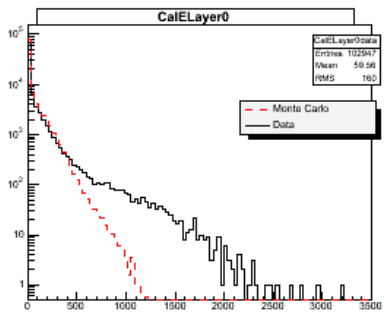


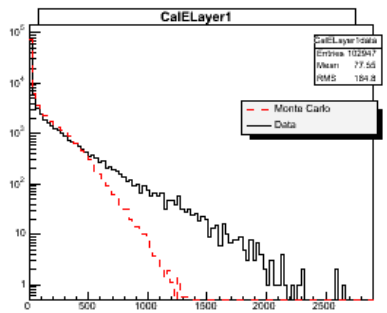


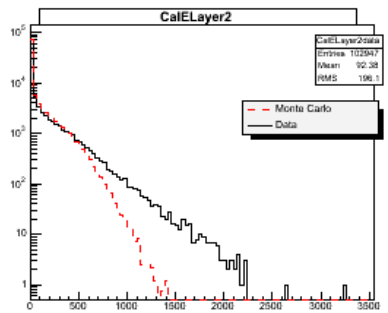


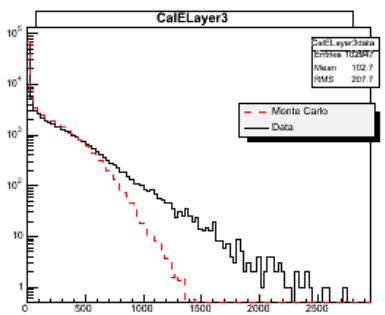


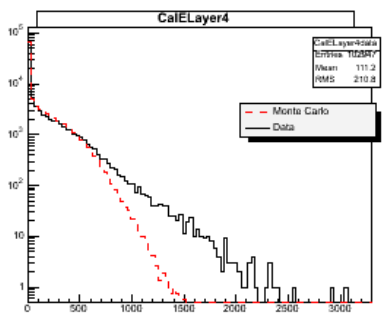


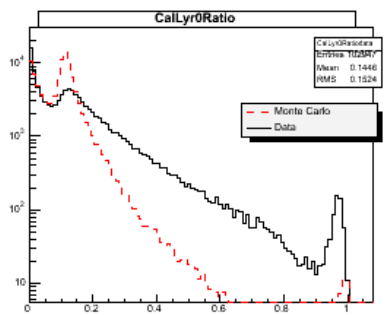


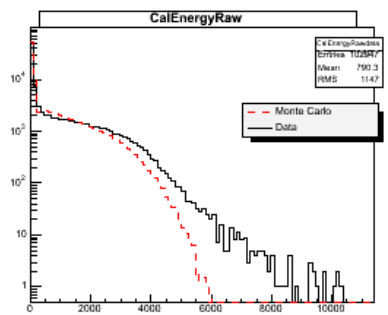












Summary

- Agreement not perfect but not too bad
- We need to run matching MCs now to be able to properly compare
- Same holds for the electrons
- Pile up problem (put it in the MC?)

What do they mean?

Variable	Description
TkrTwrEdge	The average distance of the best track from the "edge" of each tray, weighted by radiation lengths traversed. (The edge is a plane halfway between the towers.
TkrTrackLength	Distance between the start of the best track and the grid, along the track axis.
TkrRadLength	Radiation lengths traversed by the best track. This is from half-way thru the initial converter to the lowest bi-plane in the tracker, whether or not the track actually gets to the end.
Tkr[1/2][X/Y/Z]Dir	Track [x/y/z] direction cosine
Tkr[1/2]Phi	Track phi, radians (direction from which particle comes, not particle direction!) range: (0, 2pi)
Tkr[1/2][X/Y/Z]0	Track [x/y/z] position at first hit
Tkr1ToTFirst	ToT of first hit on best track (All ToT's are adjusted for pathlength in the measuring and non-measuring directions in the strip, and for the strip width.)
Tkr1ToTAve	Average ToT for the hits on the best track

What do they mean?

Variable	Description
TkrNumTracks	Number of tracks found
TkrSumConEne	Sum of the energies for the two best tracks, as assigned by the patrec energy tool
TkrEnergy	Energy in tracker, as determined from linear regression analysis of number of clusters
TkrEnergyCorr	TkrEnergy corrected by TkrEdgeCorr
TkrTotalHits	Deprecated. Use TkrSurplusHCInside instead
TkrThinHits	Number of clusters in the above cone in the thin-converter layers
TkrThickHits	Number of clusters in the above cone in the thick-converter layers
TkrBlankHits	Number of clusters in the above cone in the no-converter layers