A Look the CT variables

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Introduction

- I have a very poor idea about CT and how it works
- I just started looking at the variable with two purposes:
  - Understand better the meaning of the quantities I'm looking at
  - Understand the reason of the differences in Data and MC
- My aim, with this presentation, is to collect ideas and suggestions on this activity

First Step: selecting the variables

From the slides at SLAC F2F meeting, 7 CT are showed for ‘Energy Analysis’
Selecting the first 4 variables for each CT I made a list of ‘interesting’ quantities
And the first problem arrived:

- Some variables are missing in our standard ntuple
- Some variables are not documented

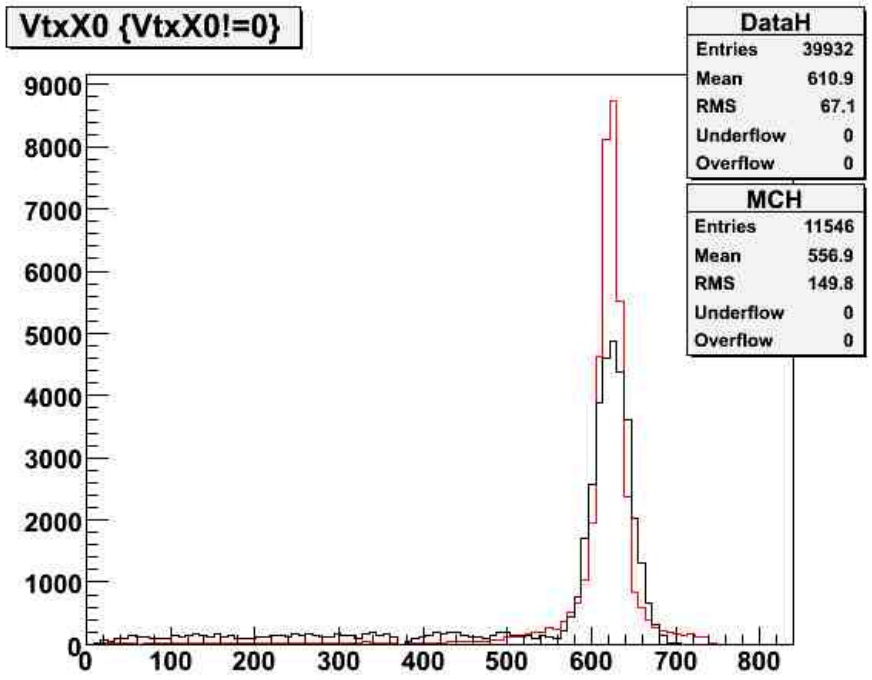
Some variables extracted from F2F CT slides ("Energy Analysis Logic")

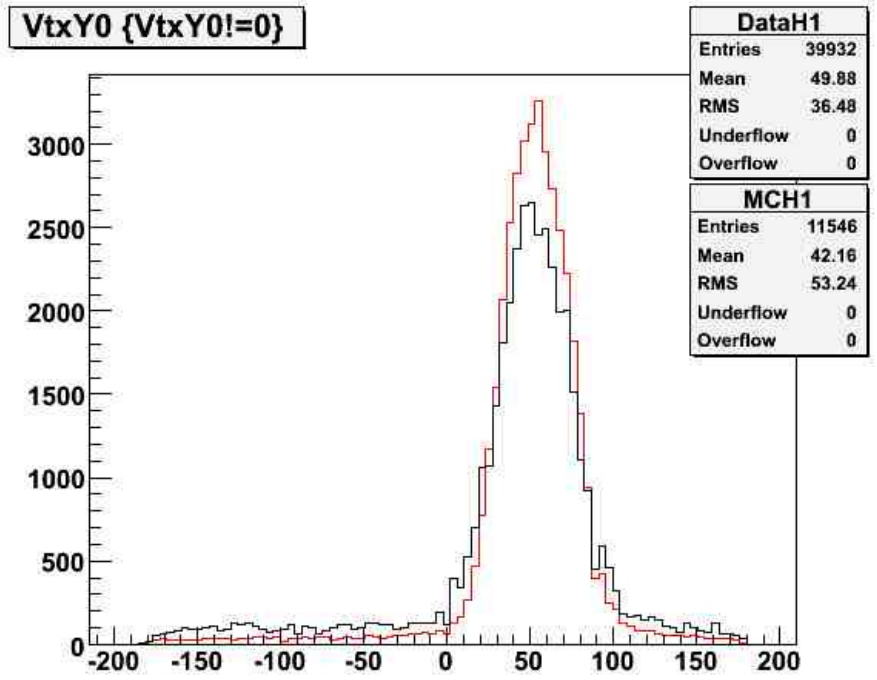
Variable	Type	Default value	Description
CalEdgeCorr	F	0	Effective layer-by-layer edge correction mainly due to the gaps between Cal modules; multiplicative
CfpRatio	X	X	NOT FOUND
CalTwrEdgeCntr	F	0	Distance of the energy centroid from the nearest tower boundary.
CalLkHdEneErr	X	0	NOT DOCUMENTED
LkHdRatio	X	X	NOT FOUND
CalTrackDoca	F	0 (?)	Distance between the projected vertex (or track if only one track) and the energy centroid, evaluated at the z of the centroid.
CalTotalCorr	F	0	Global total correction. Includes effect due to dead material; multiplicative
CalLeakCorr	F	0	Leakage correction: this is the contained fraction of the total energy after edge corrections.
CalTrackAngle	F	?	Angle between "gamma" direction in the tracker and direction of the CAL "track"
EvtLogEnergyRaw	X	X	NOT FOUND, maybe EvtLogEnergy
EvtLogEnergy	F	1	log10 of EvtEnergySumOpt, pegged between log10(20) and log10(50,000). Was EvtLogESum
CalCfpEffRLn	X	0	NOT DOCUMENTED
CalCfpChiSq	X	0	NOT DOCUMENTED
CalLATRLn	F	0	Total radiation lengths integrated along the event axis (including the tracker).
CalGapFraction	F	0	Approximate fraction of the shower volumn which falls in inter-tower gaps.

Than select a run

As reference run, I used a full-brem run at 0 deg on Twr 3: BT-1445
Fancesco Longo just provided a new run with ‘better’ beam spot.

Some differences between Data and MC are still there, need investigation…

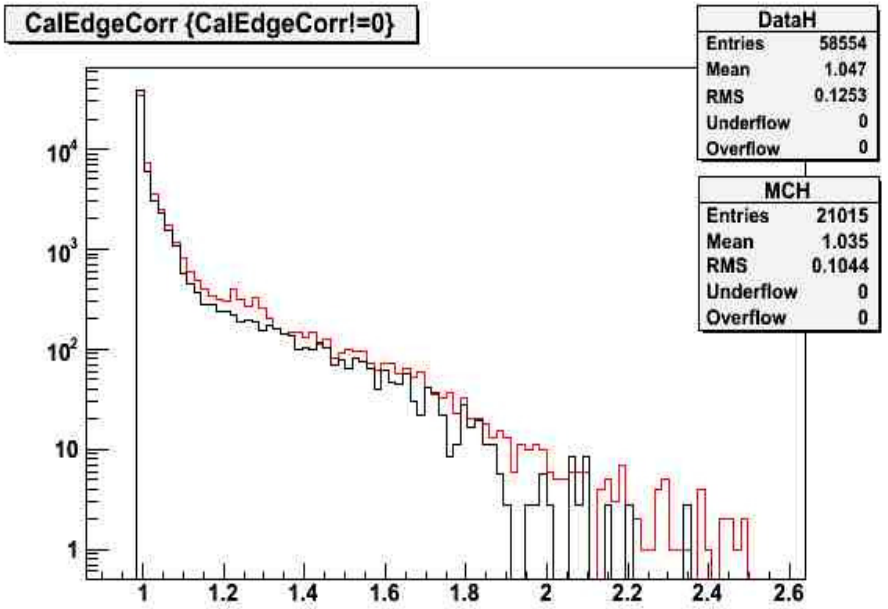


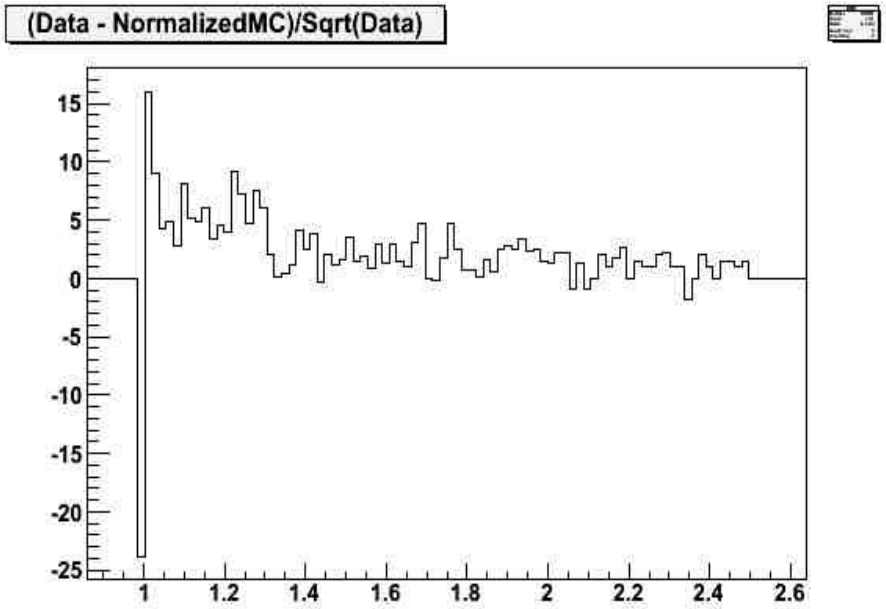


Finally let's look at the variables I

I put here some examples, I don't pretend to understand the differences, but to provide an hint for further discussions

The first quantity in my list: not too bad!
Can be improved after calorimeter energy discrepancy solved?

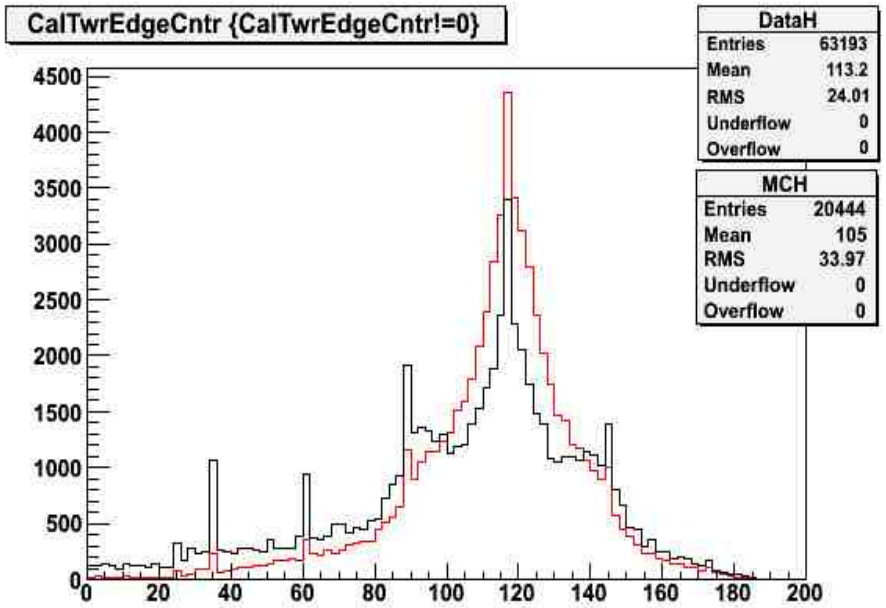


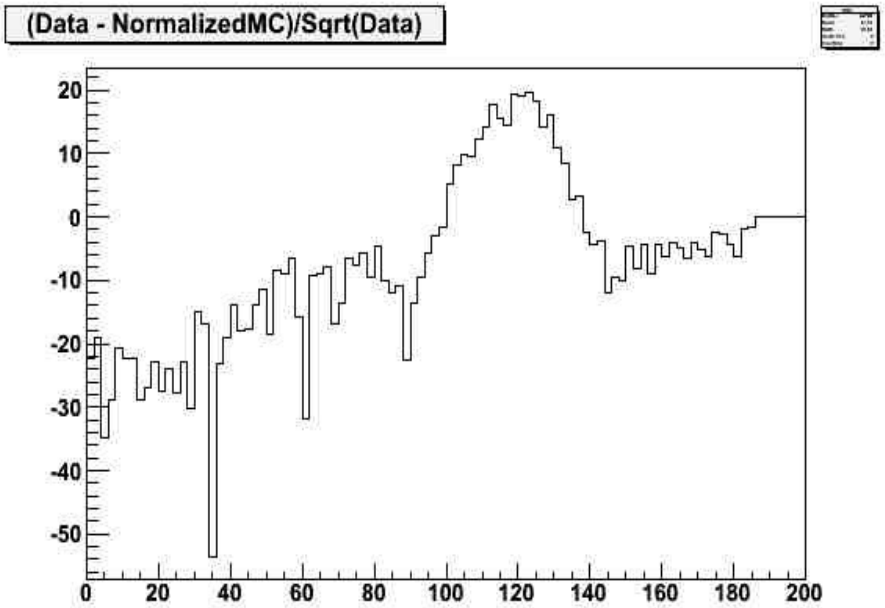


Finally let's look at the variables II

The second variable should to be related to the position of the energy centroid as reconstructed in the cal.

How can be improved?
- is related to cal energy issue?
- is related to beam spot?

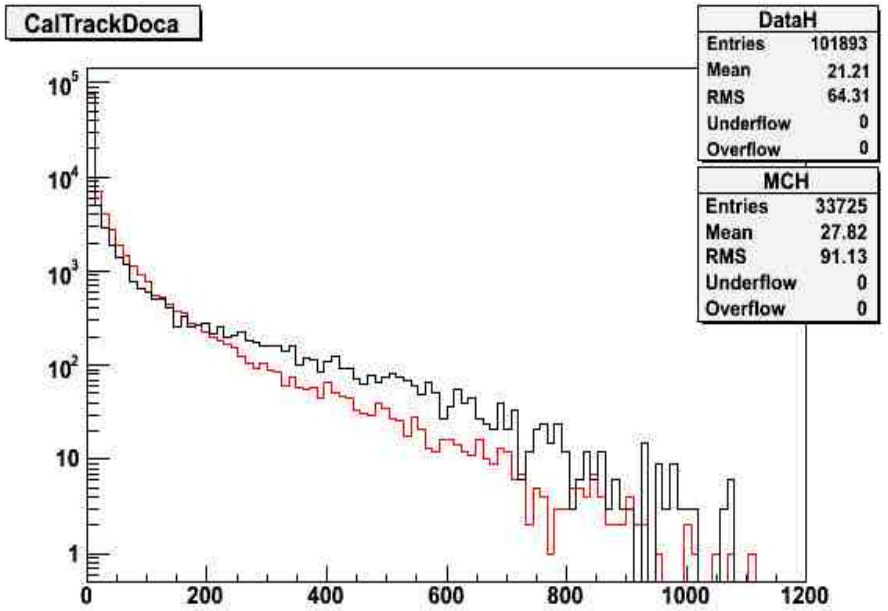


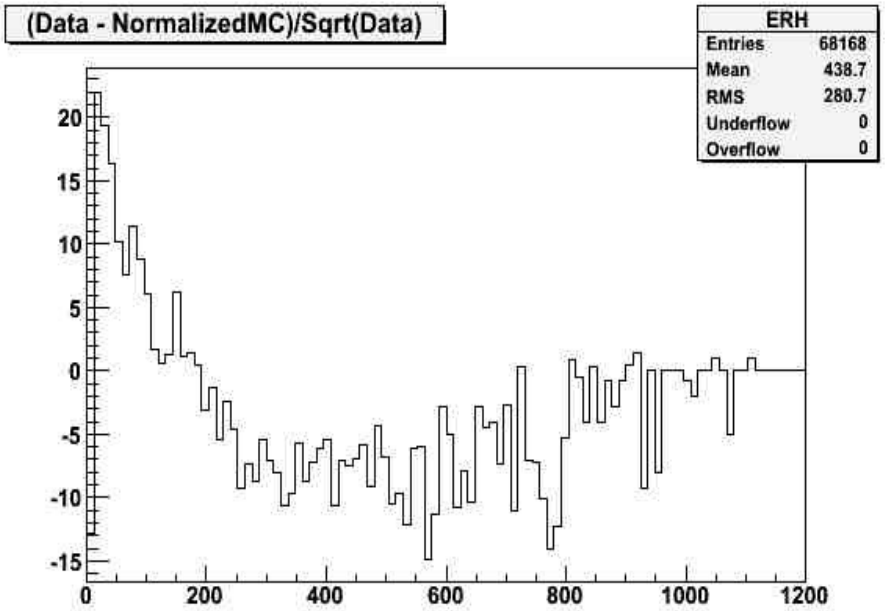


Finally let's look at the variables III

A further example: now also the tracker reconstruction is involved

How can be improved?





Conclusions

No conclusions: we just started…