Updates: Daniel Jeans, 9 Feb 2009

2007 SiW data

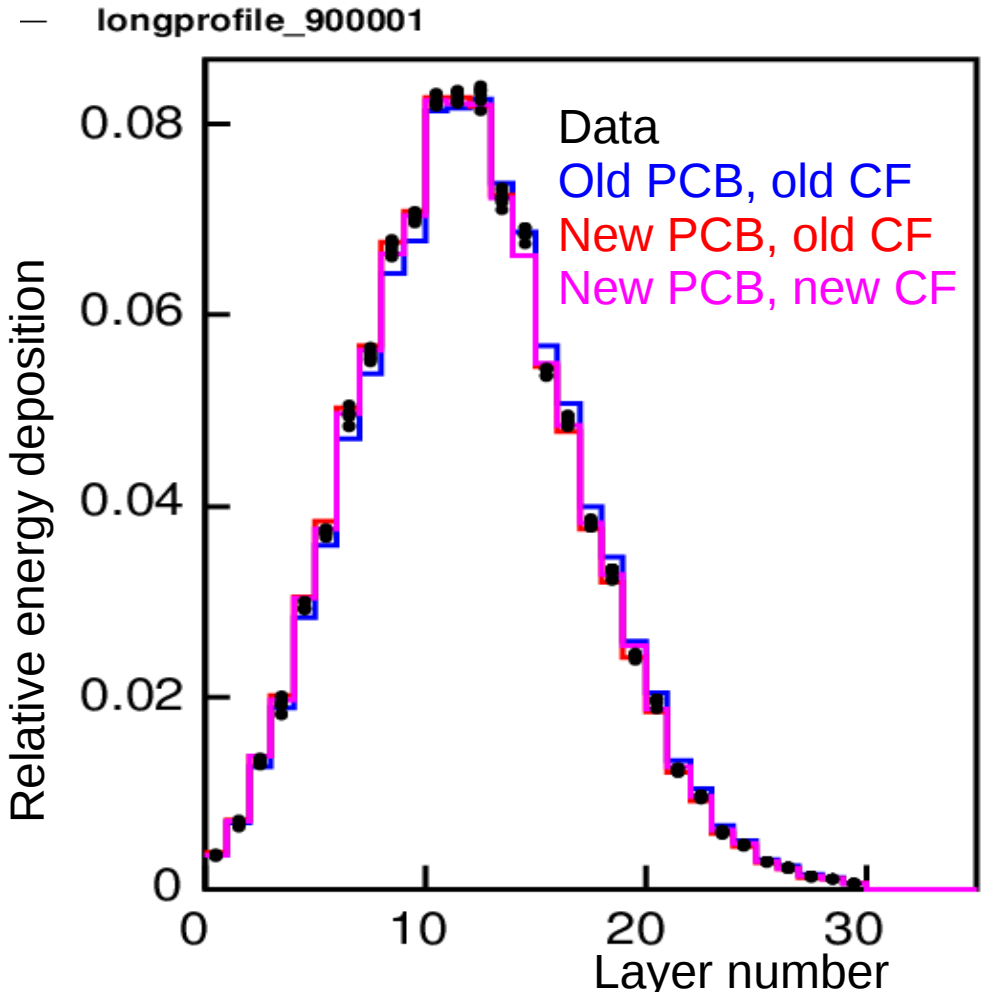
2008 tracking

Last time, showed that more accurate description of PCB helps longitudinal profile

While looking at the Mokka materials, noticed that the carbon fibre support structure has slightly non-realistic ratios of graphite and epoxy.

The new CF definition has X0 and lambda changed by <1% w.r.t. previous definition.

Gabriel simulated a few events with the new definition.



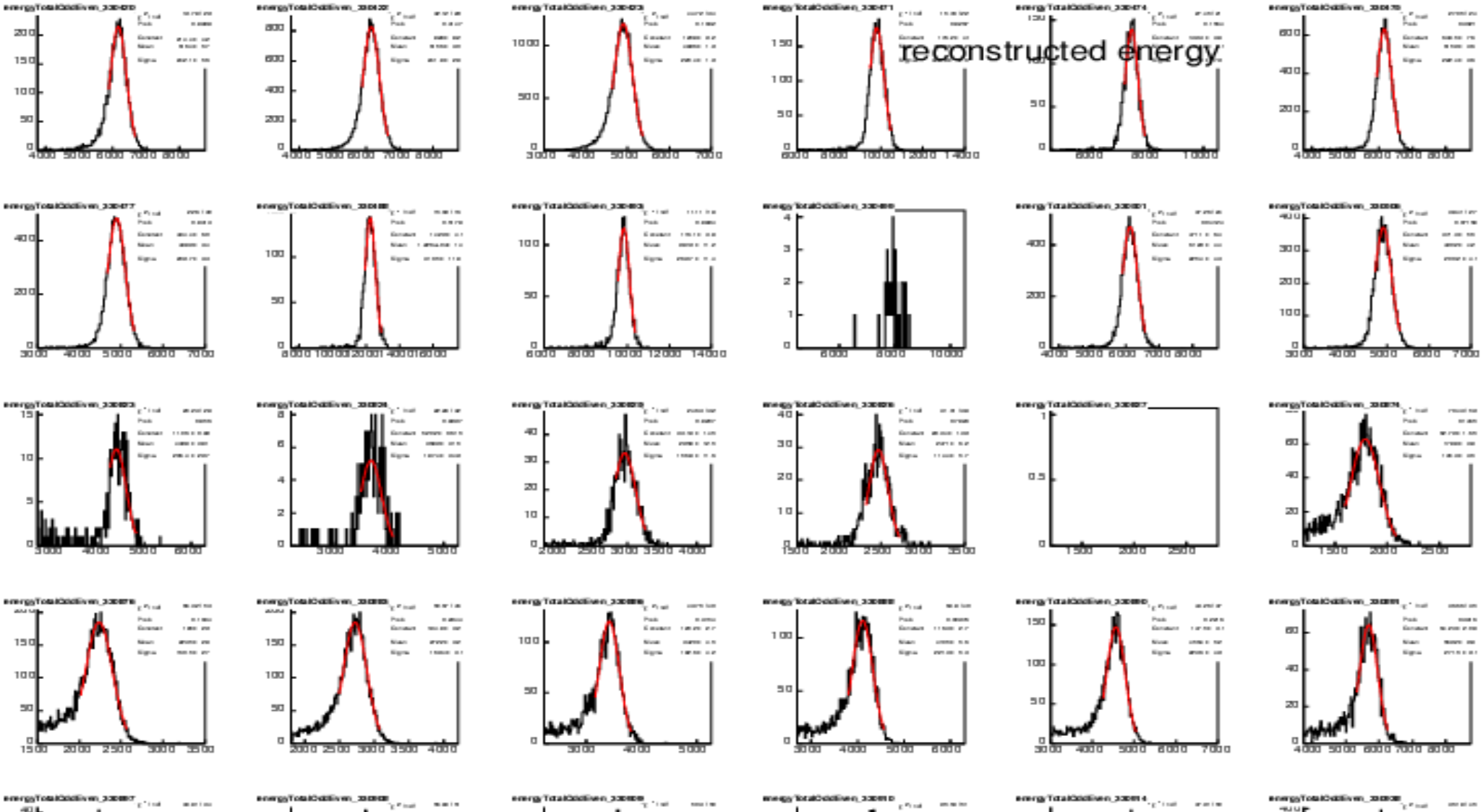
New CF definition has very little effect

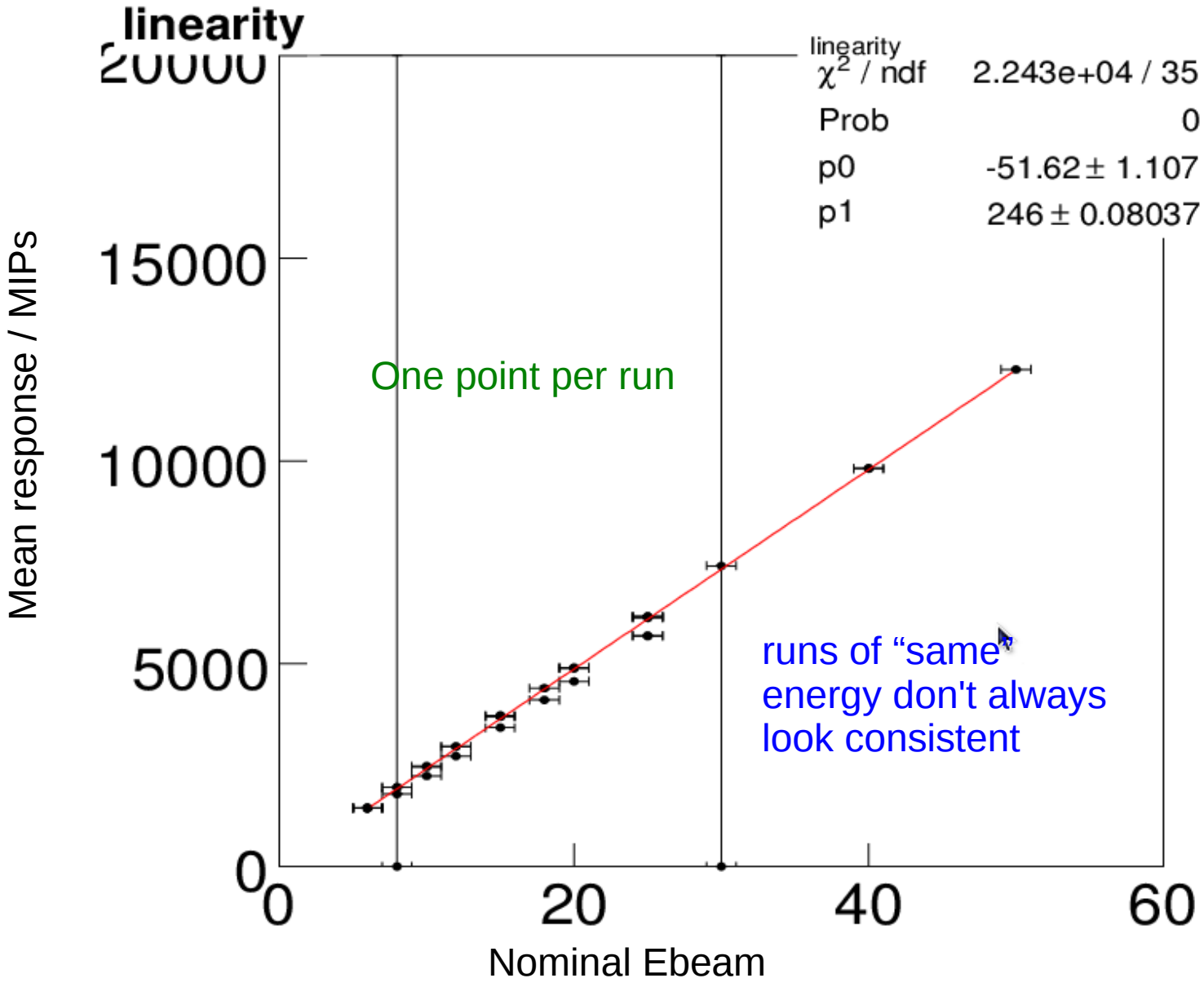
Probably it will go into the next Mokka tag

Looking at 2007 CERN data - reconstructed by Marcel

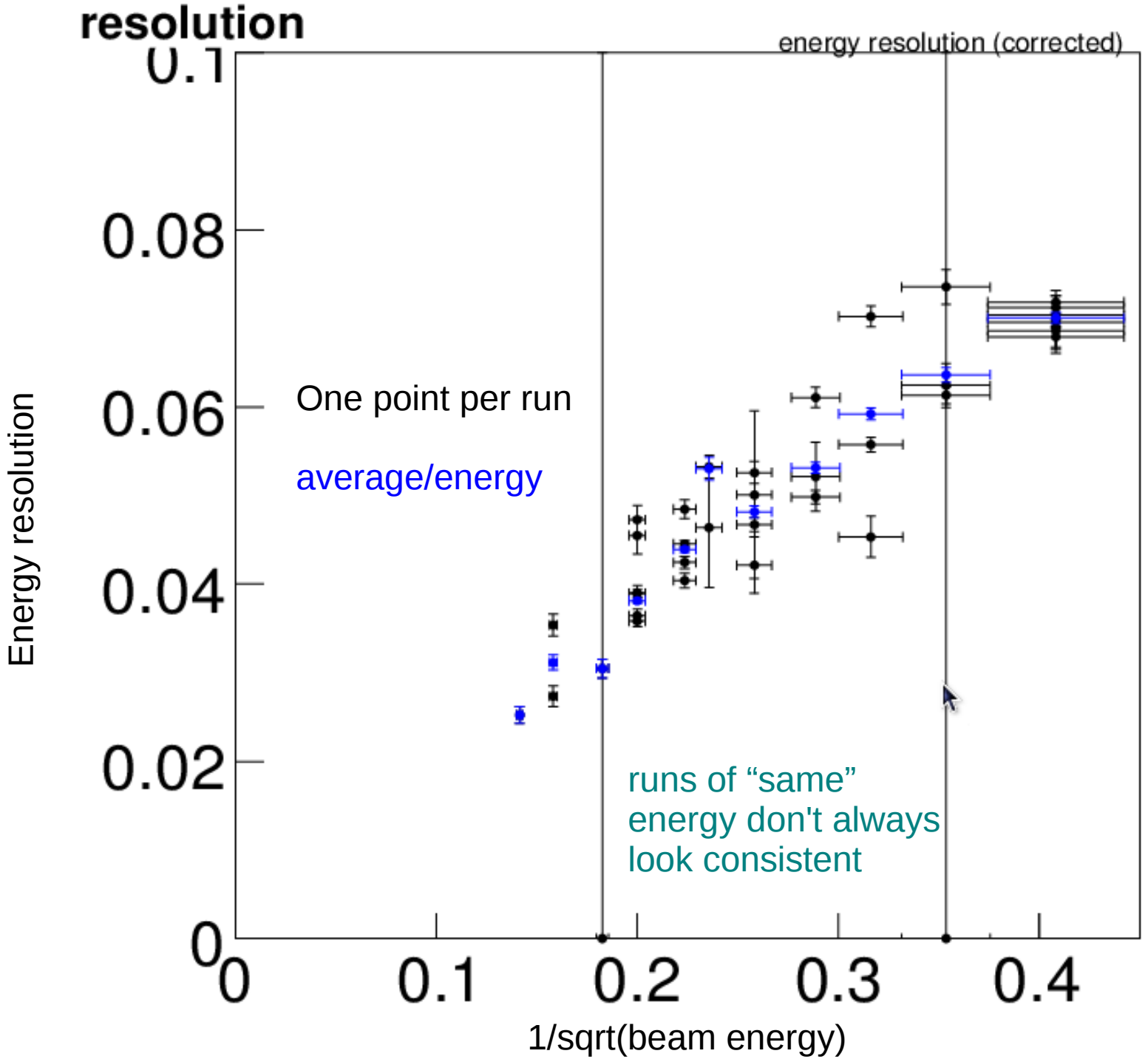
Similar procedure as for 2006: shower centre-of-gravity far from gaps, detector edge
“blindly” apply standard electron selection
Cerenkov not used

Total reconstructed energy for some runs: some rather “dirty” beams seen
Need to improve pion rejection....





I'm using completely arbitrary uncertainty on the beam energy:
how to estimate beam momentum spread, energy uncertainty?


resolution
energy resolution (corrected)
0.1
0.08
0.06
0.04
0.02
0
Energy resolution
One point per run
average/energy
runs of “same”
energy don't always
look consistent
0
0.1
0.2
0.3
0.4
1/sqrt(beam energy)

Tracking (with Paul Dauncey):

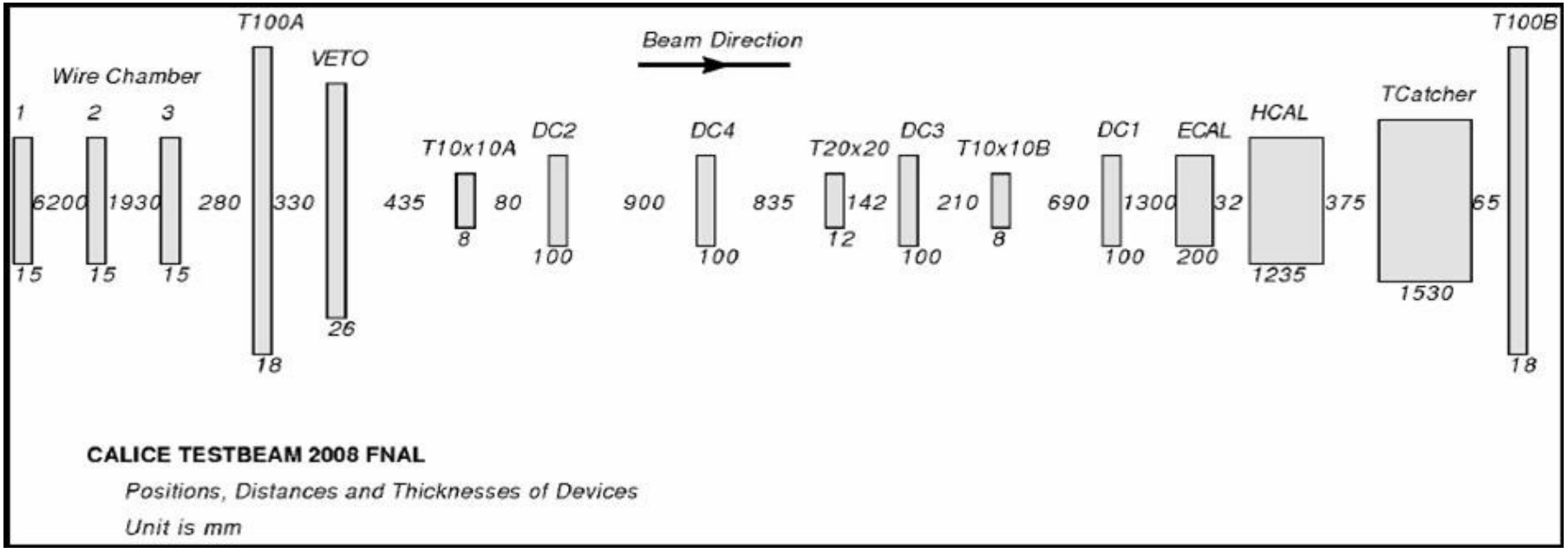
Now have simulated samples of 2008 data (thanks Shaojun)
- Pions, Electrons @ 20 GeV
- Electrons @ 1 GeV

First task: estimate the scattering in the beamline.

Monochromatic, perfectly parallel beam.

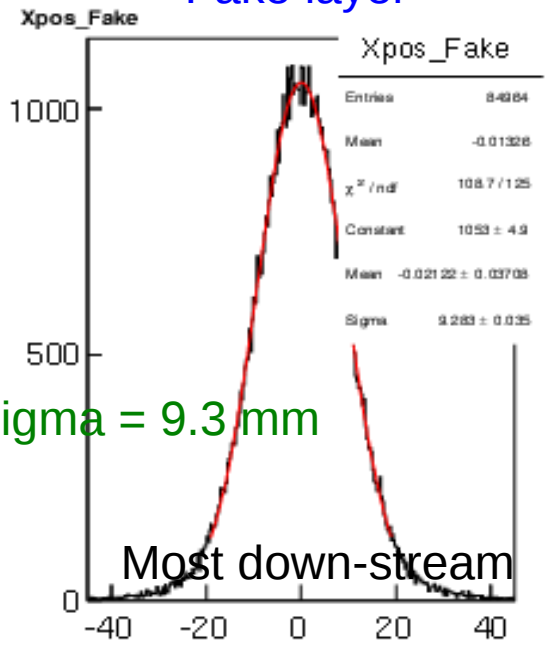
Look at hit positions in the 4 drift chambers, and in the “fake layer” (just before ECAL)
- Separately in x, y directions

Select only tracks with X&Y hits in all 4 drift chamber layers, and fake layer hit.



20GeV pions

"Fake layer"

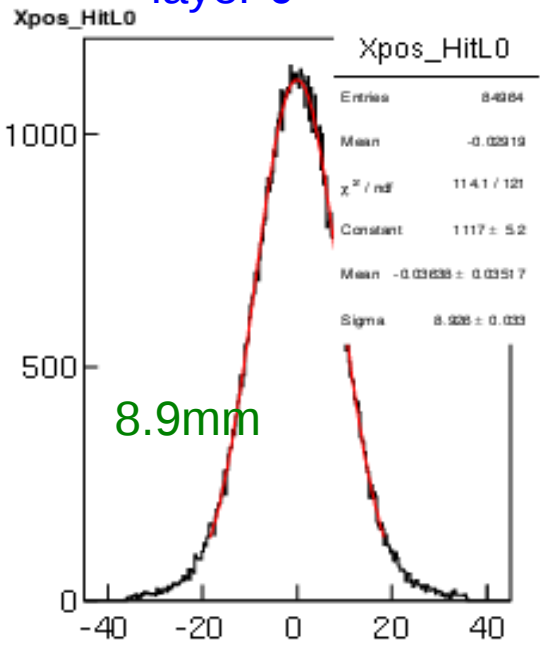


Sigma = 9.3 mm

Most down-stream

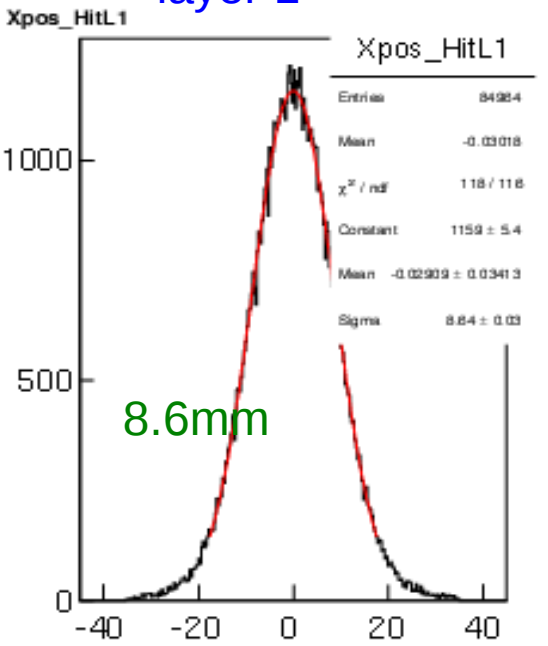
Hit position X [mm]

layer 0



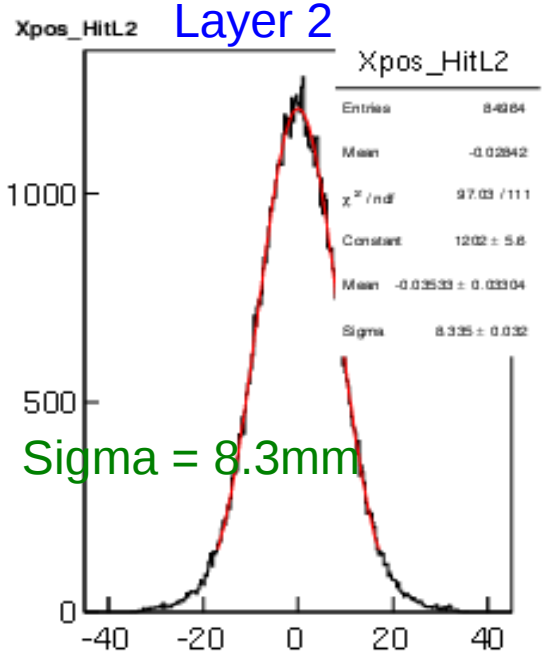
8.9mm

layer 1



8.6mm

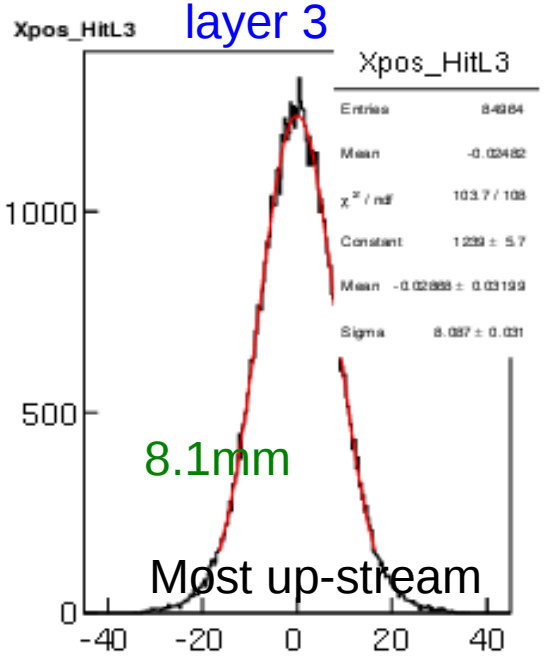
Layer 2



Sigma = 8.3mm

Hit position X [mm]

layer 3



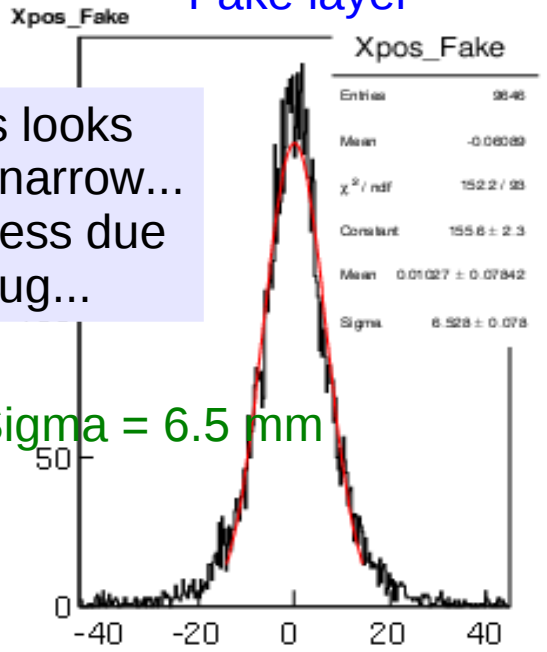
8.1mm

Most up-stream

Typical widths ~8-9mm

20GeV electrons

"Fake layer"

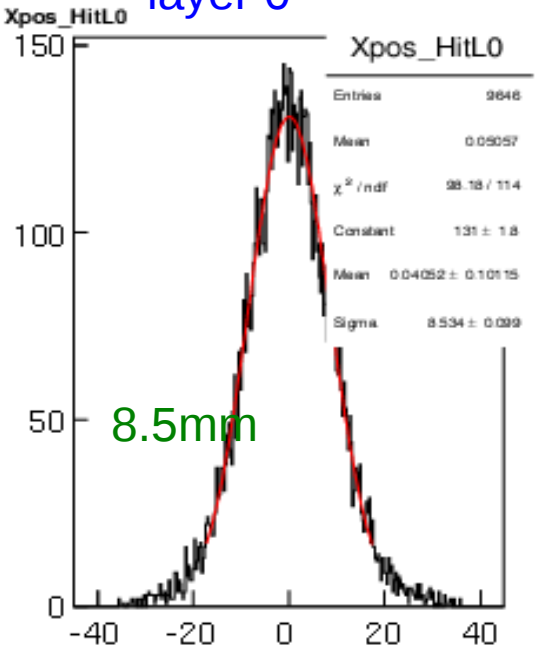


This looks too narrow... I guess due to bug...

Sigma = 6.5 mm

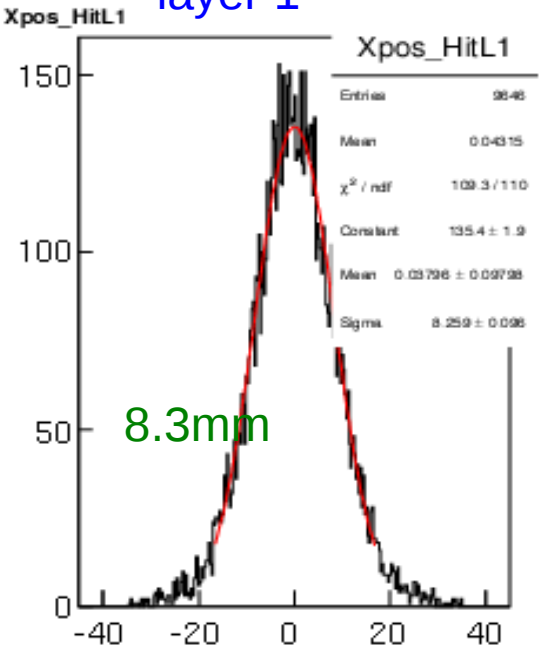
Hit position X [mm]

layer 0



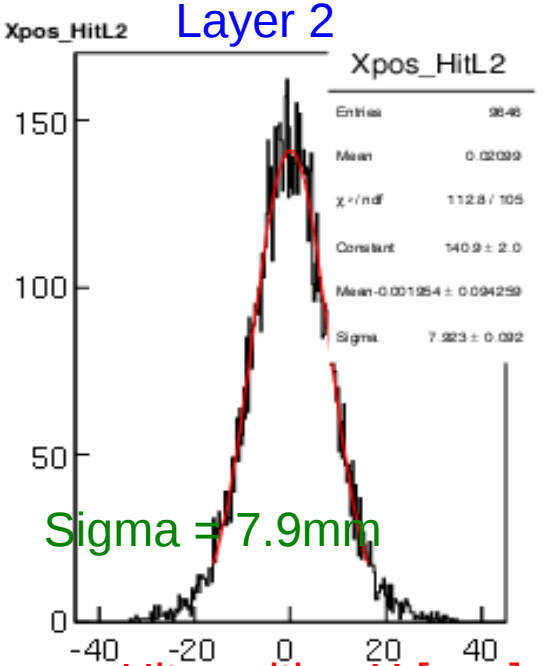
8.5mm

layer 1



8.3mm

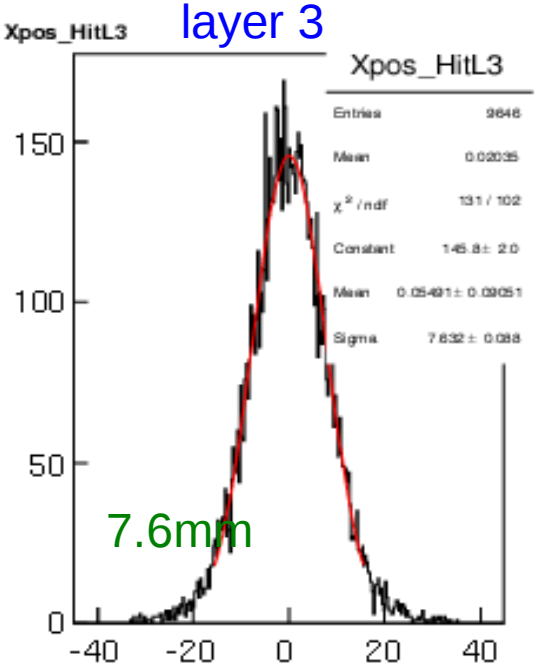
Layer 2



Sigma = 7.9mm

Hit position X [mm]

layer 3

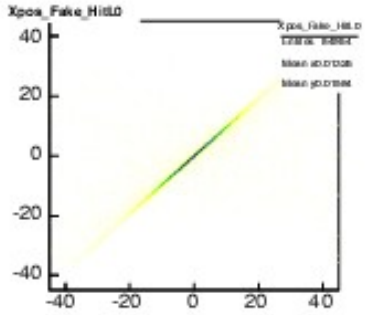


7.6mm

Typical widths ~8mm

Looks slightly larger for 20GeV pions compared to 20GeV electrons...?

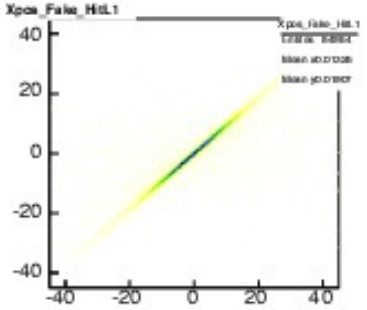
Naively expect the opposite...

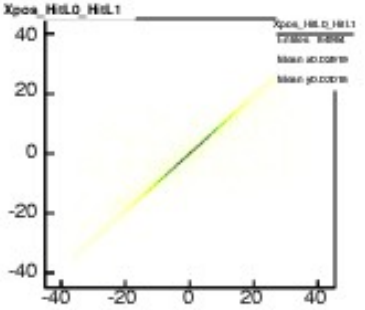


layer 0

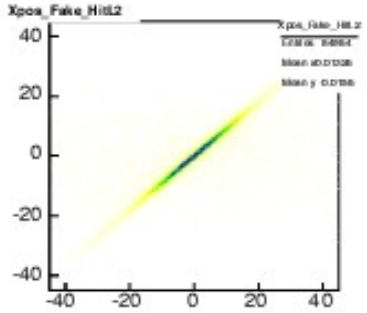
Correlation between X position measurements in different layers

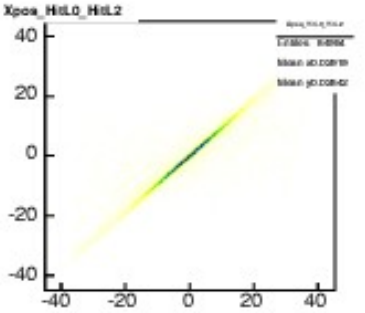
Checking that ~ correct correlation coefficients are calculated from these distributions

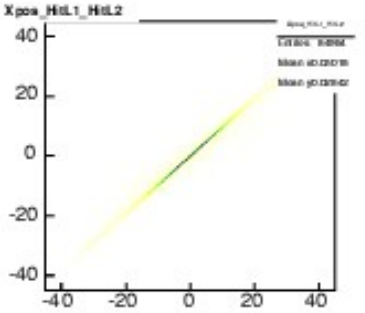




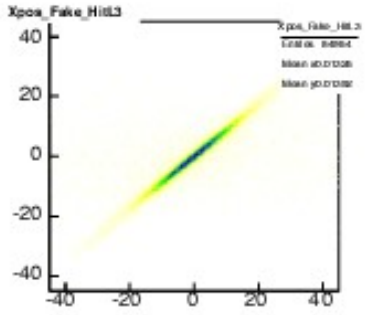
layer 1

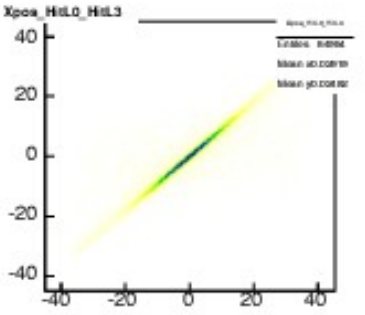


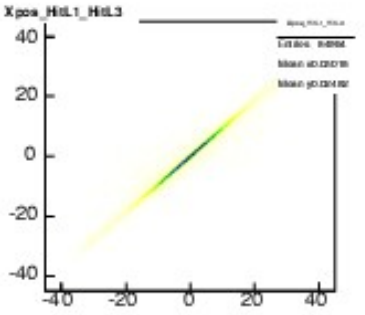


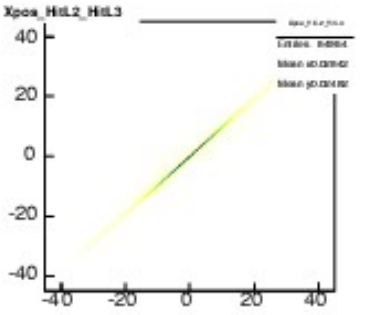


layer 2









Layer 3

Fake layer | layer 0 | layer 1 | layer 2

To do (tracking):

Check that simulation is OK (to first order it is, I think)

Make more samples at different energies
    Look at energy dependence of scattering

Write scattering matrices into database

Look at misalignments, drift velocities in the data.