PCB Irradiation Test - Next Analysis Steps

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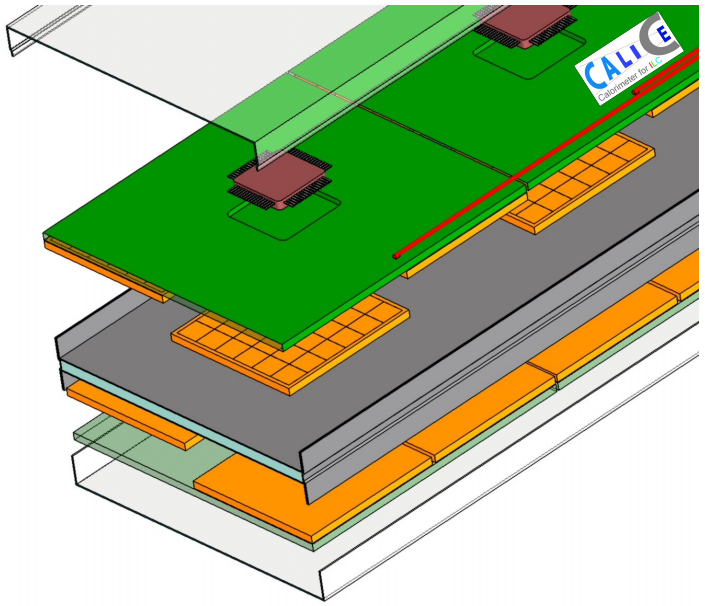
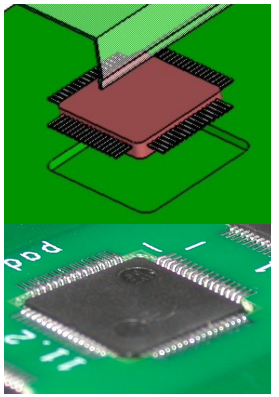
Calice Ecal Meeting
6/2/08

Introduction

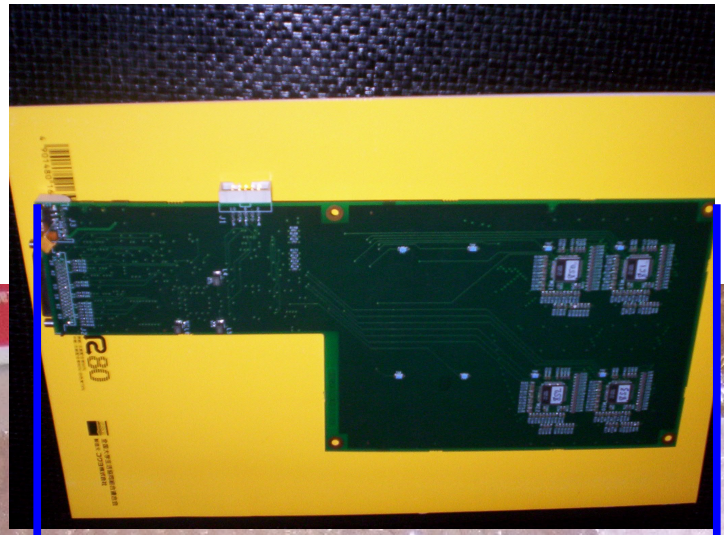
Calorimeter Electronics to be interleaved with layer structure





Do high energetic showers create signals directly in electronics ?
If yes, Rate of faked signals ?

Special PCB in Ecal Prototype during CERN 07 testbeam – Experimental Setup I



Test PCB
- equipped with
  PHY3 Chip Set

Prepared Slab
- W dummy
- capton and paper
  for electrical shielding

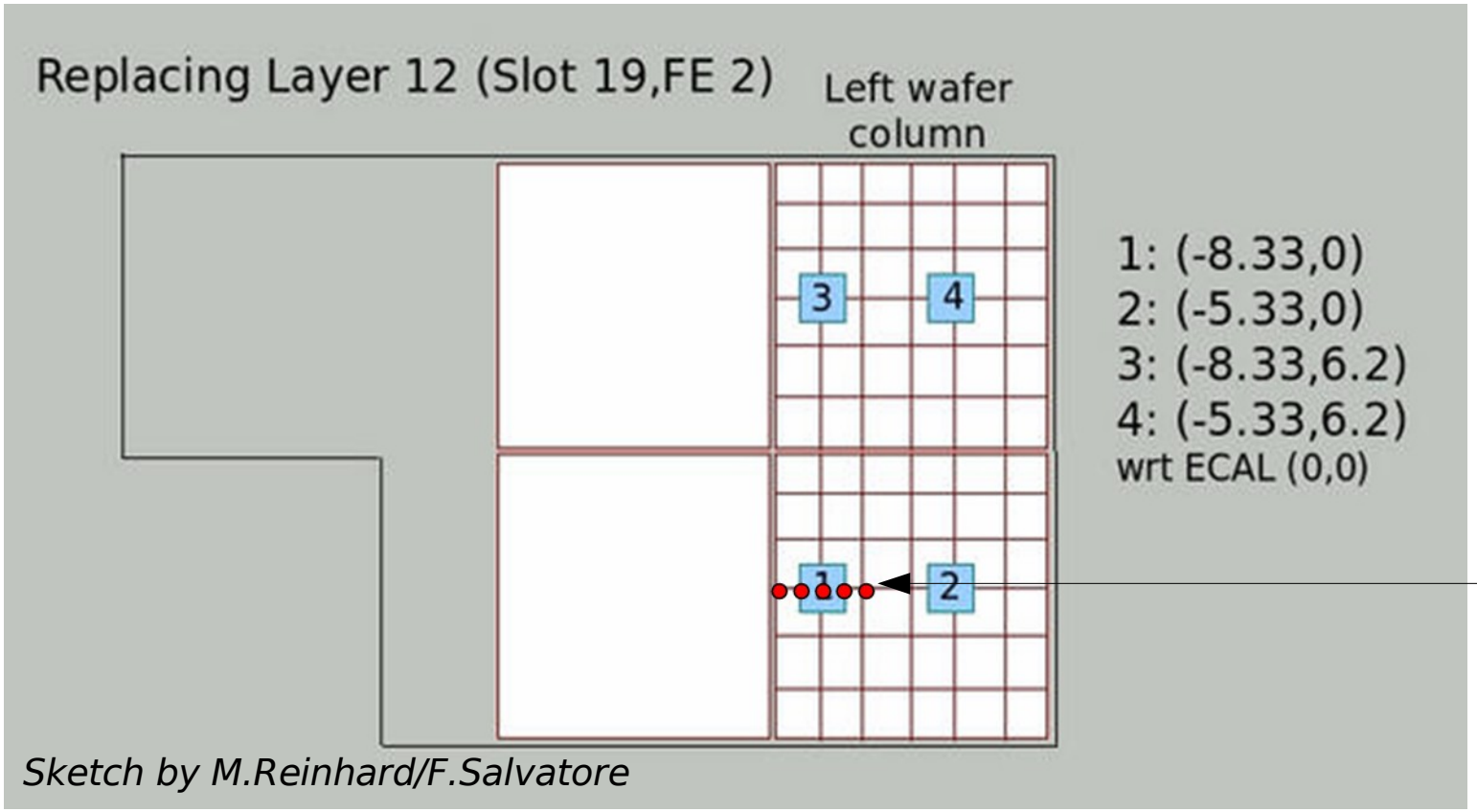
Usual Slab

Picture courtesy of B.Lutz

Special PCB in Ecal Prototype during CERN 07 testbeam – Experimental Setup II

- PCB positioned at place of layer 12 in Ecal ~ shower maximum
  x,y position identical to layer 2

- Schematic view of test PCB - 'Expect' signals from 72 pads, 4x18 = 2 Wafer

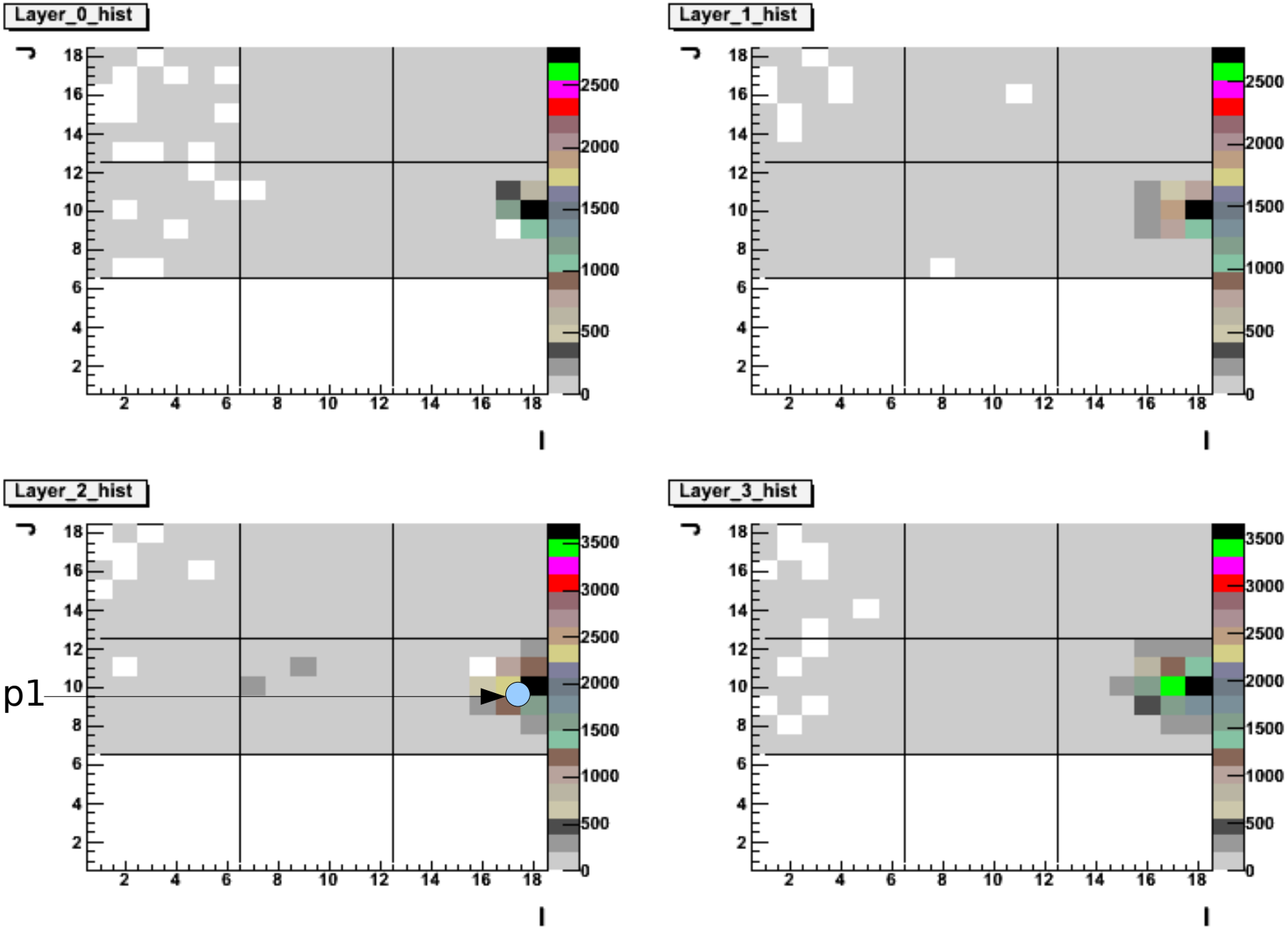


- 7 10^6 Triggers with 90 GeV Electrons (- 1 10^6 with 70 GeV Electrons)
  At least 250 K at each scanning point
  Runs 331462 – 331518
  Today: Analysis of 10k Events per analysed run

- Runs were subject to the same data processing chain as 'usual' runs

First Steps of Data Analysis – Rough Alignment Studies

Beam Impact at nominal center of Chip 1 (-8.33,0) cm

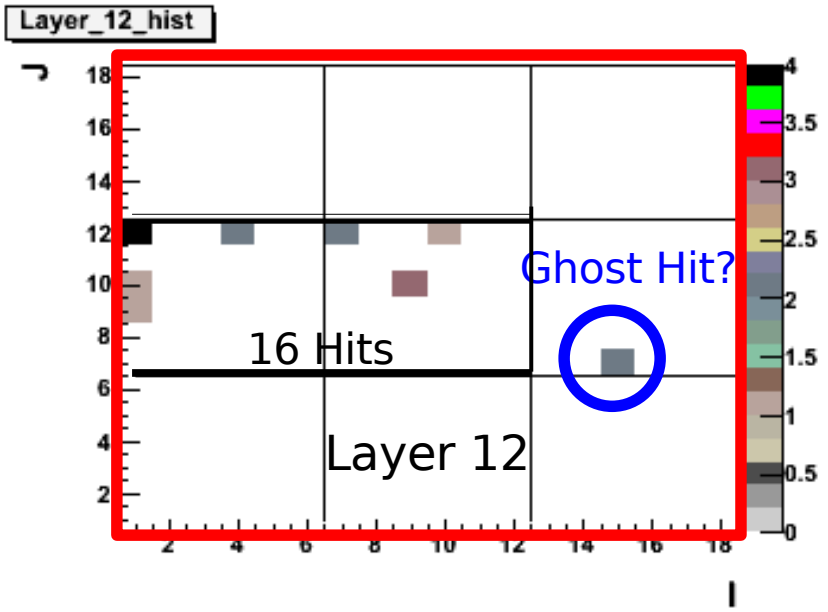


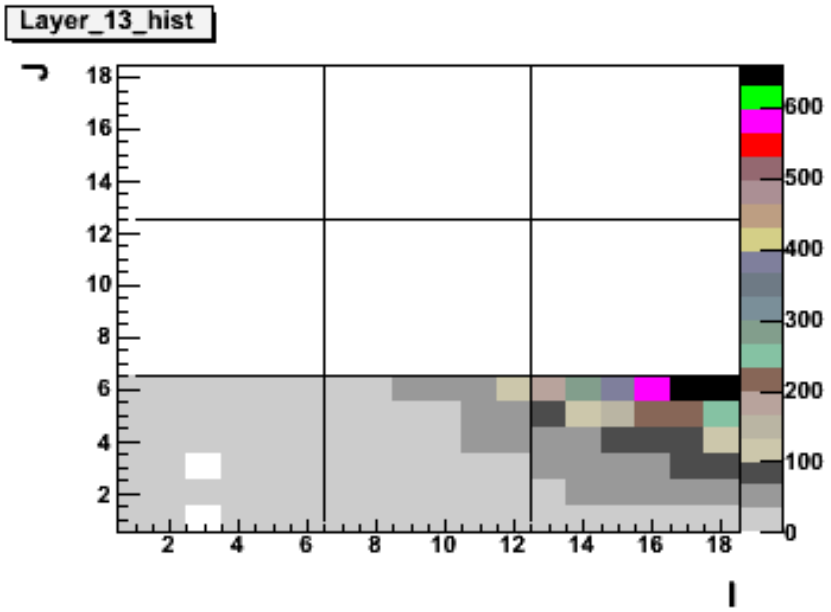
Projection of Center of Chip1 onto layer 2

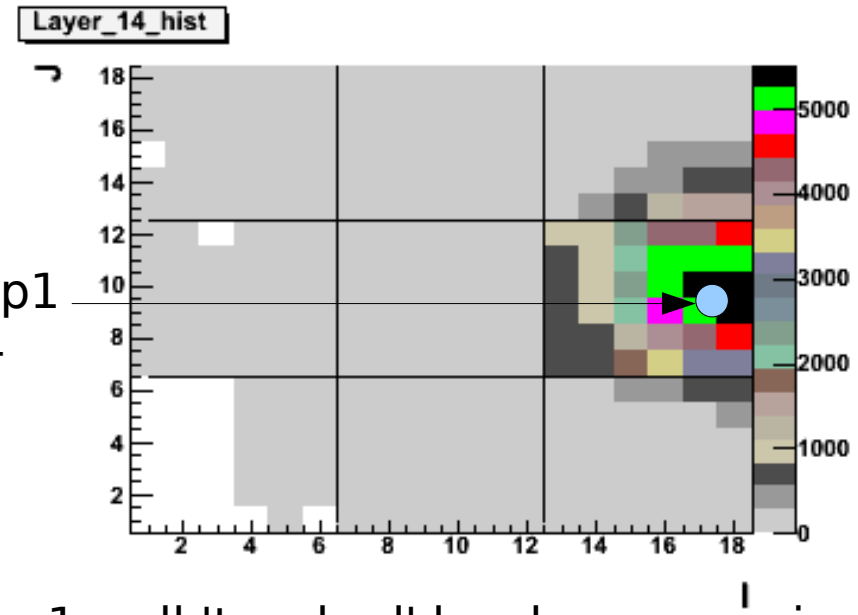
Looks like we've shot a bit too high and too close to the Ecal Border

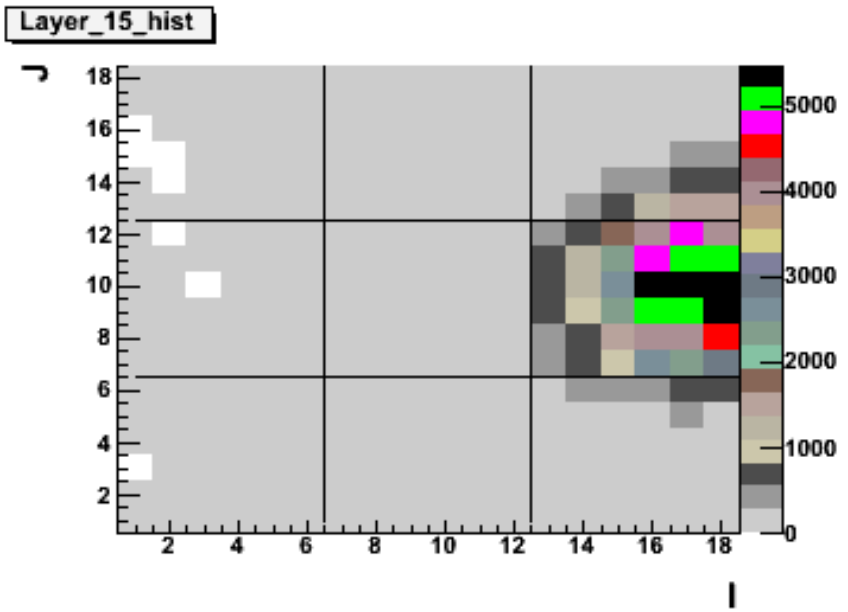
First Steps of Data Analysis – Rough Alignment Studies

70 GeV e- - Beam Impact at nominal center of Chip 1 (-8.33,0) cm





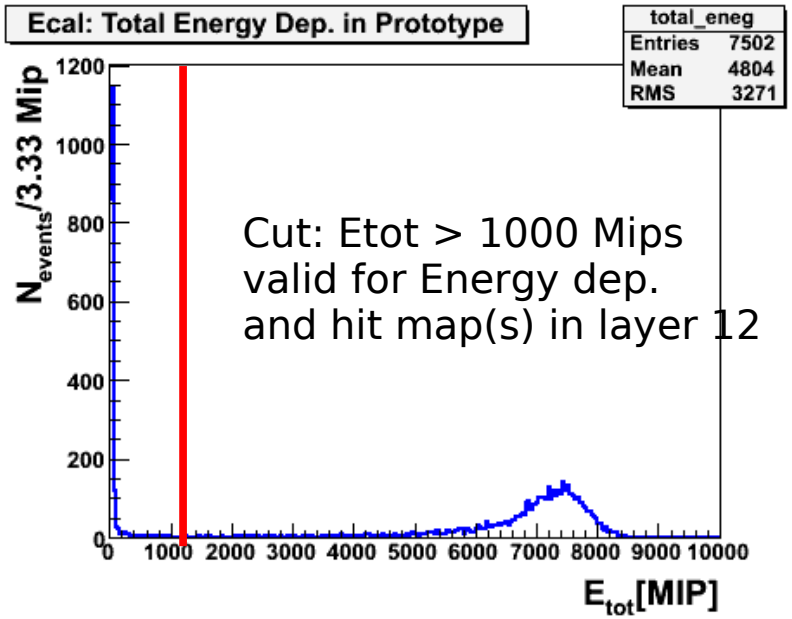




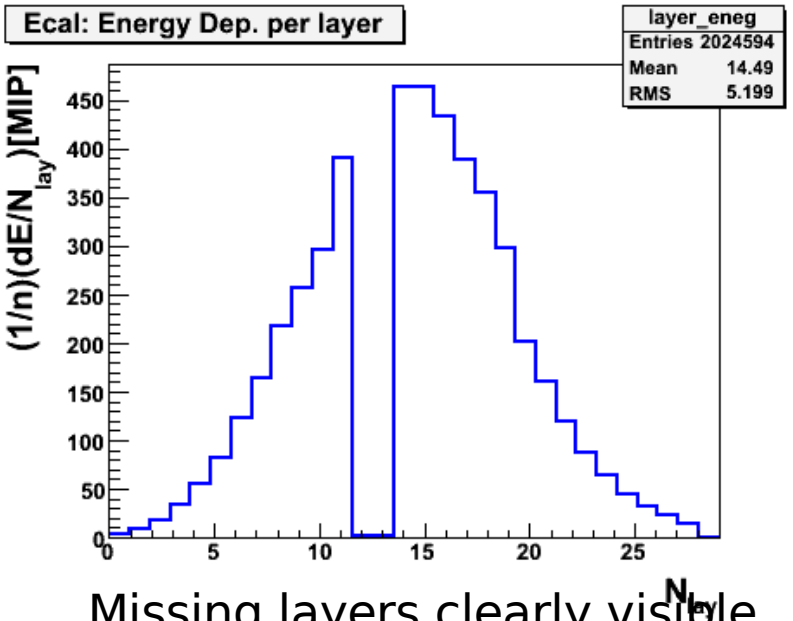
Projection of Center of Chip1 onto layer 14

- Chip 1 well 'touched' by shower maximum
- Small Activity in Layer 12

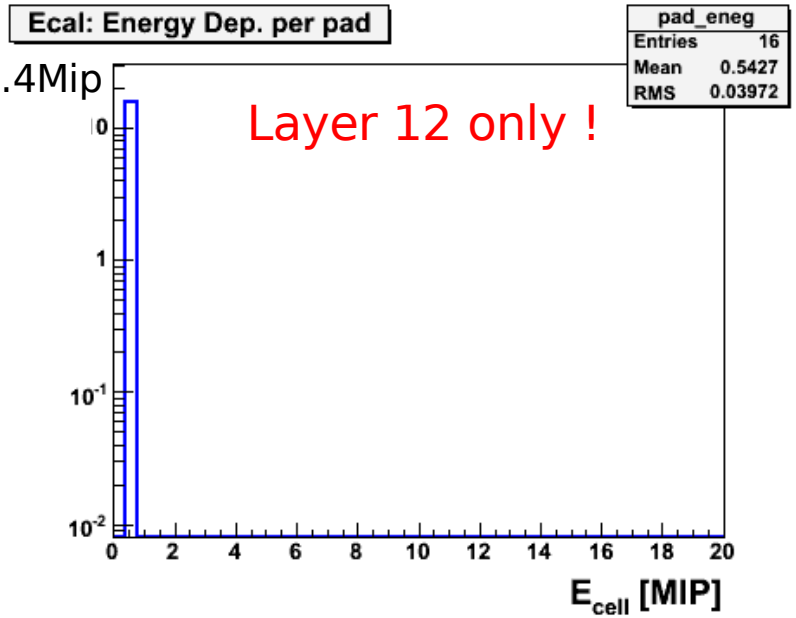
Basic Spectra



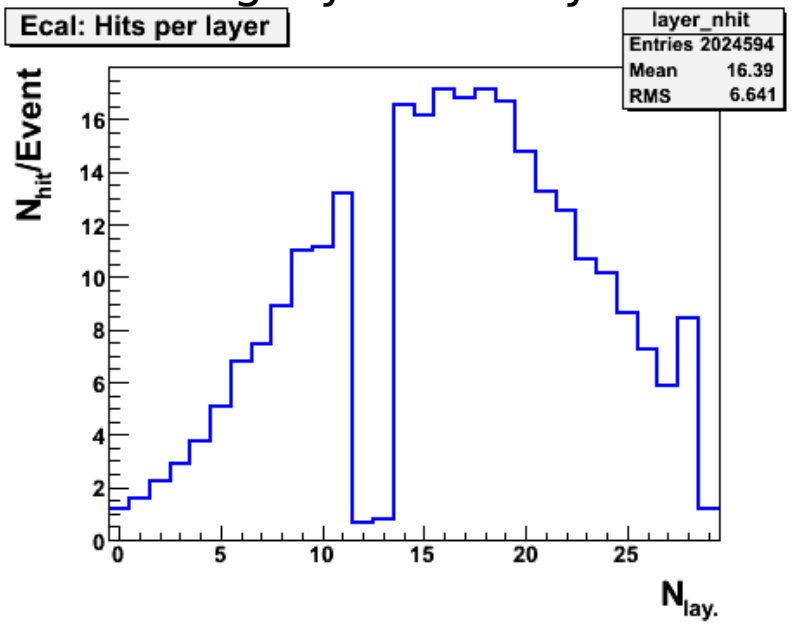
Cut: Etot > 1000 Mips
valid for Energy dep.
and hit map(s) in layer 12



Missing layers clearly visible



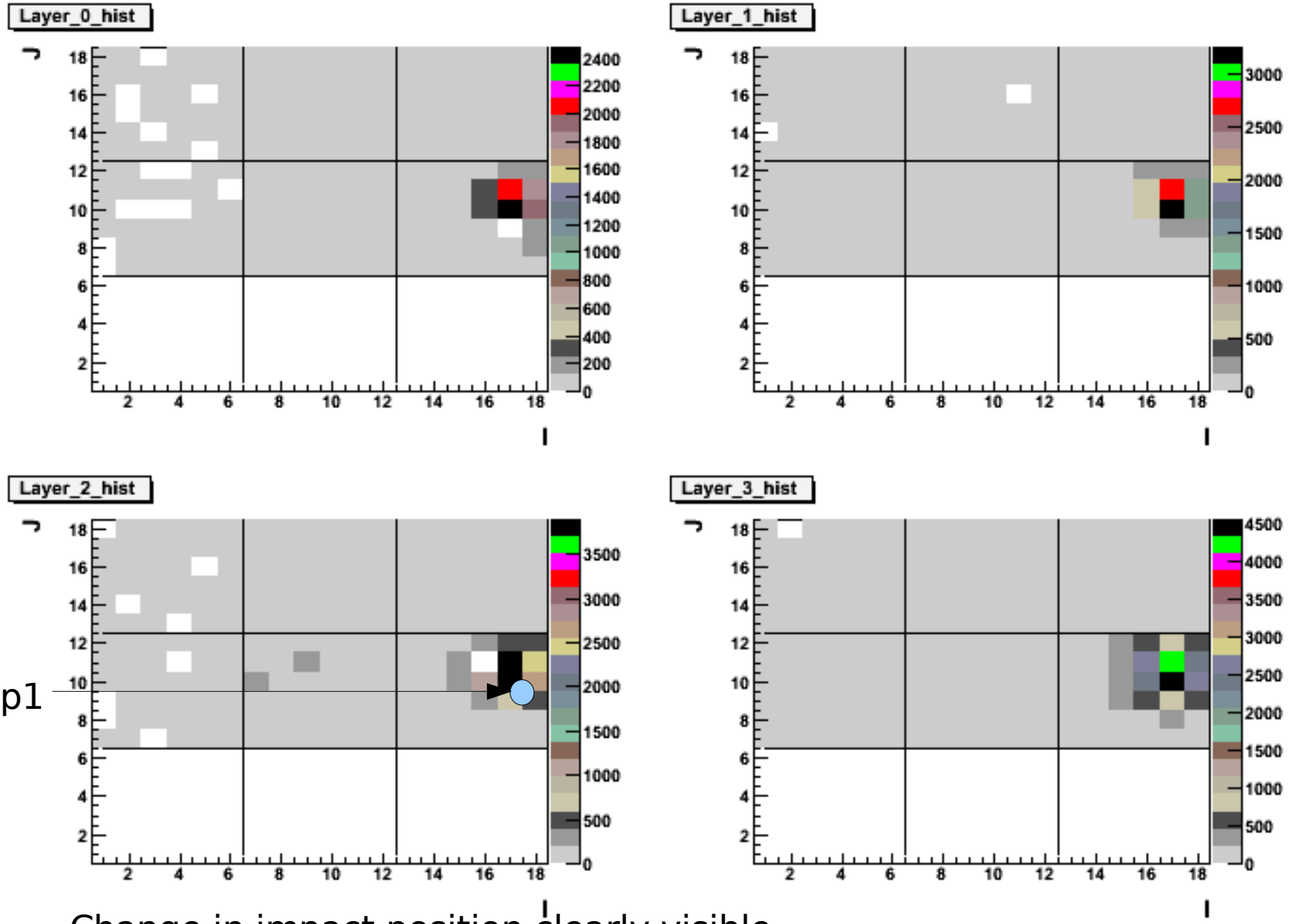
Layer 12 only !



No signal beyond 1 MIP!!!

First Steps of Data Analysis – Rough Alignment Studies

Moving towards Center of Ecal (-7.8,0) cm



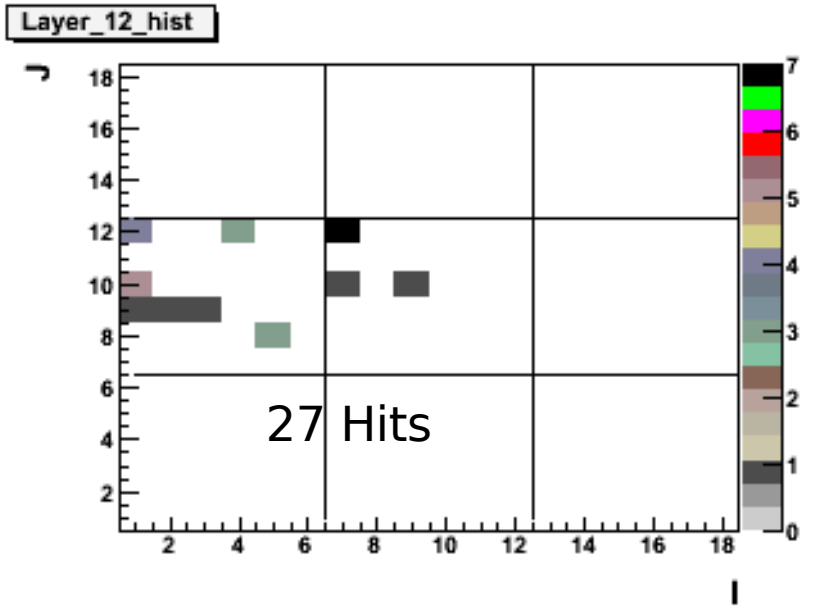
Projection of Center of Chip1 onto layer 2

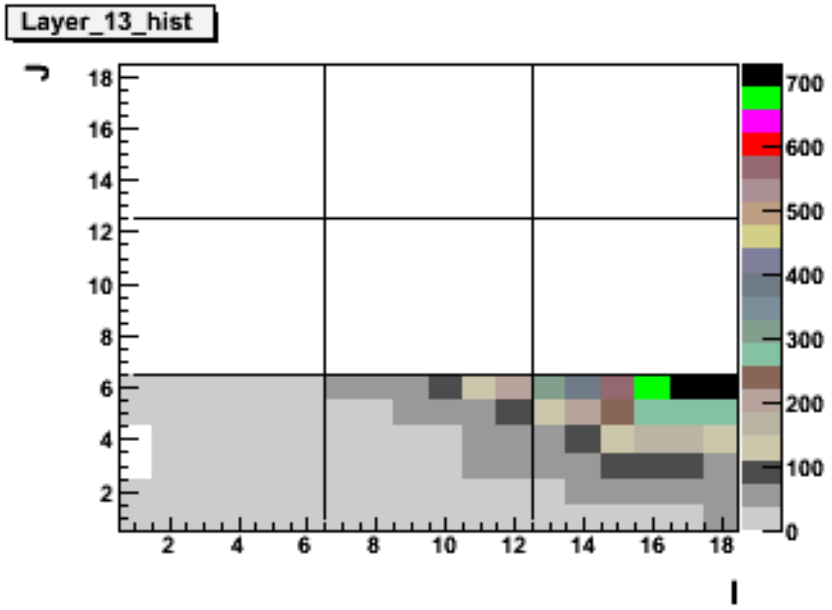
Change in impact position clearly visible

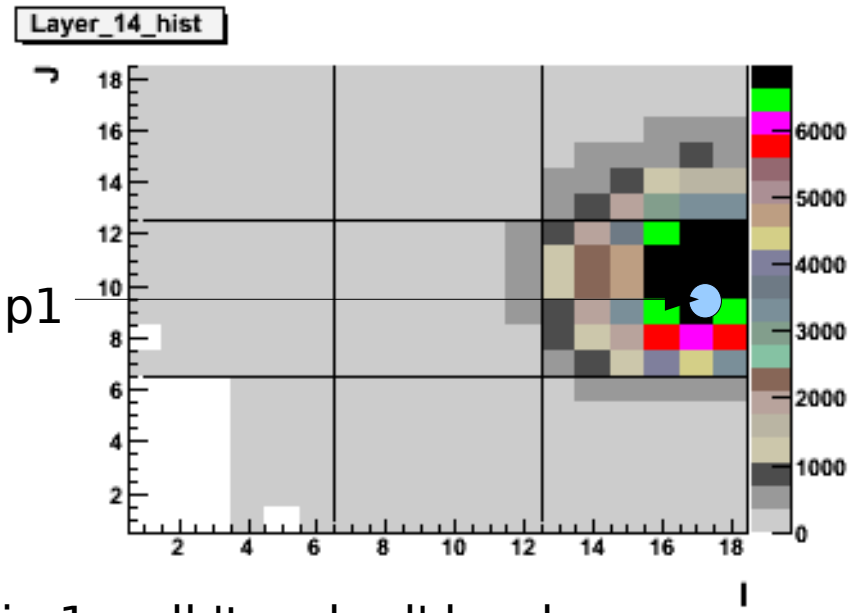
'Beam Spot too far left and too high ? - More detailed study needed !

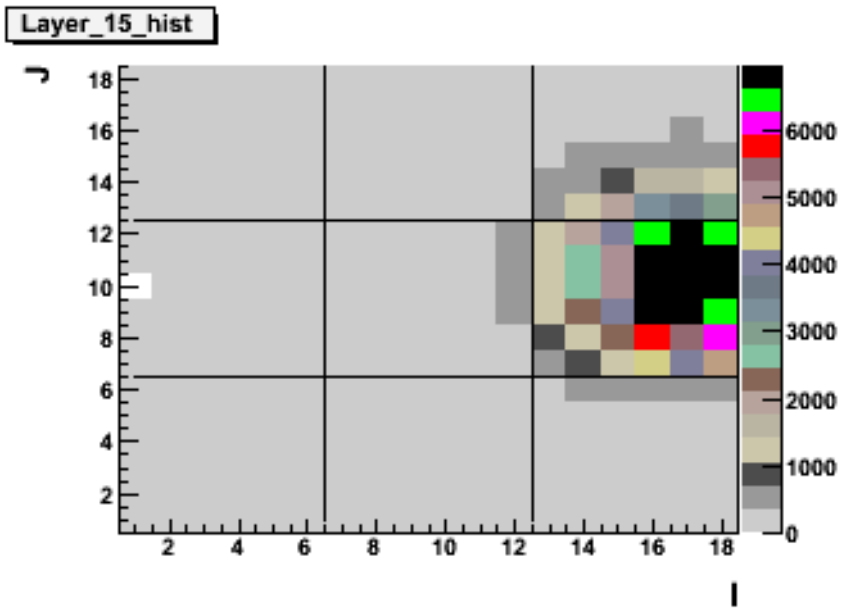
First Steps of Data Analysis – Rough Alignment Studies

90 GeV e- - Moving towards Center of Ecal (-7.8,0) cm





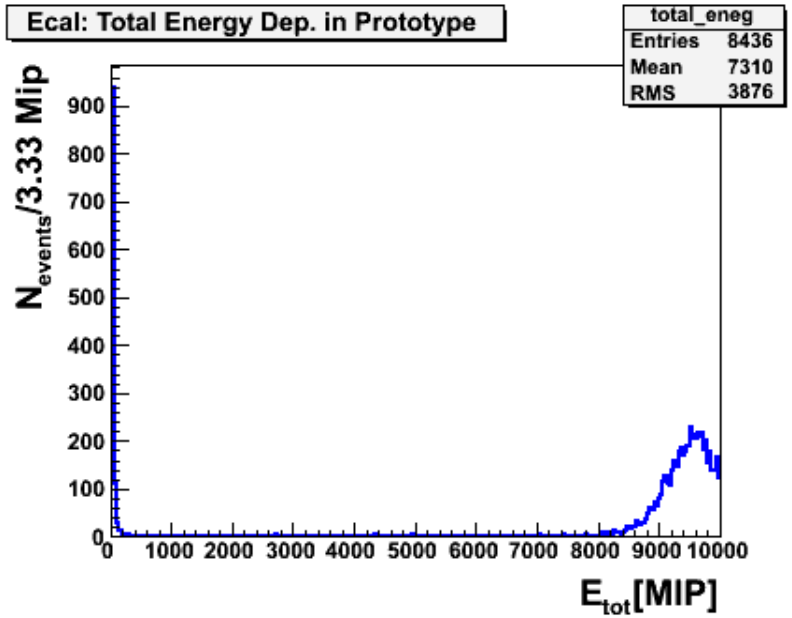


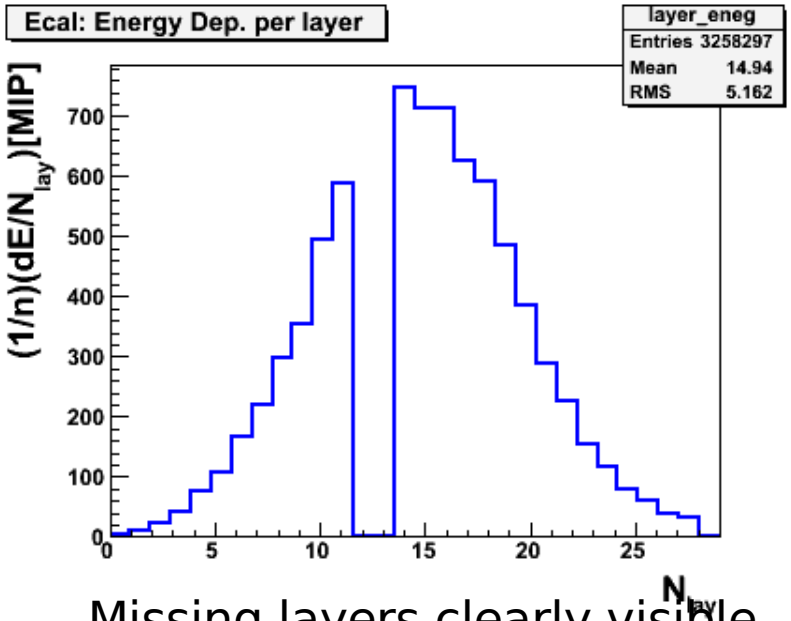


Projection of Center of Chip1 onto layer 2

- Chip 1 well 'touched' by shower core
- Small Activity in Layer 12 (bit larger than for 70 GeV and 'nominal' Center)

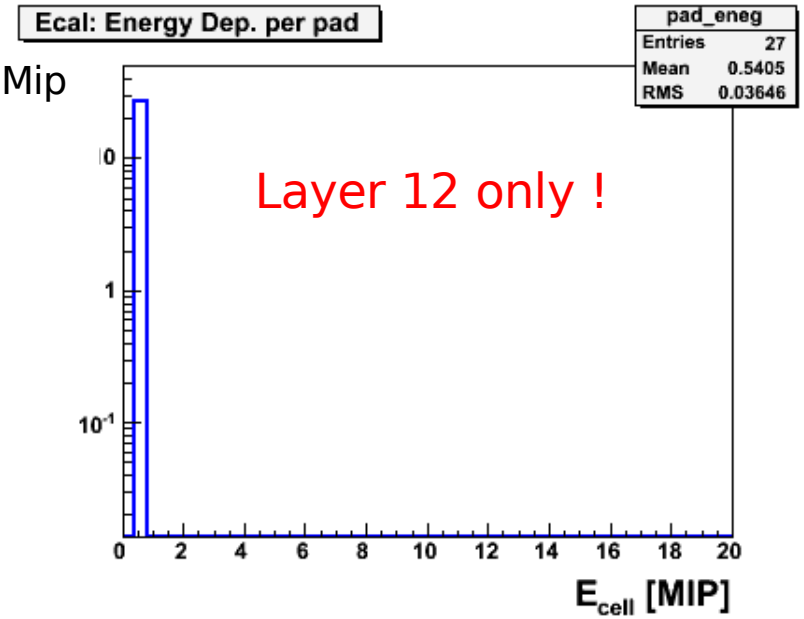
Basic Spectra

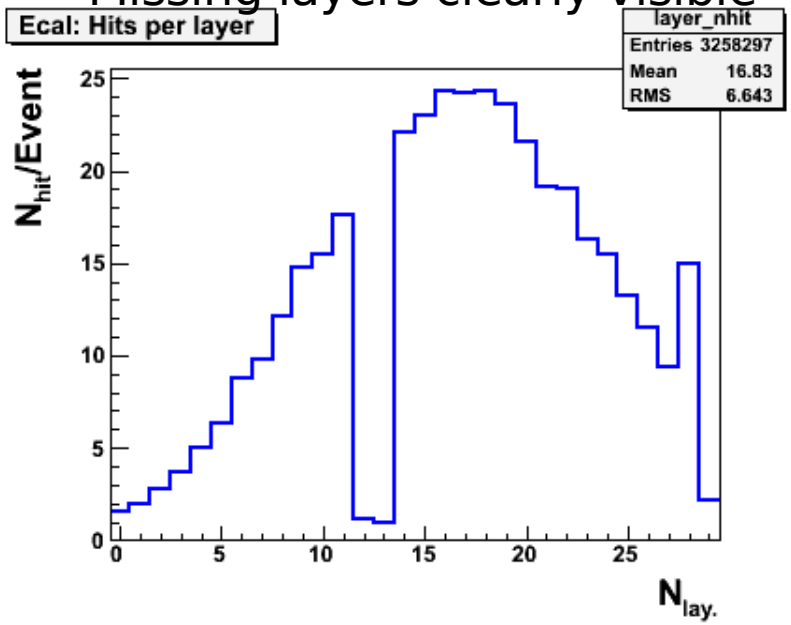




Missing layers clearly visible

Nhit/0.4Mip





No signal beyond 1 MIP!!!

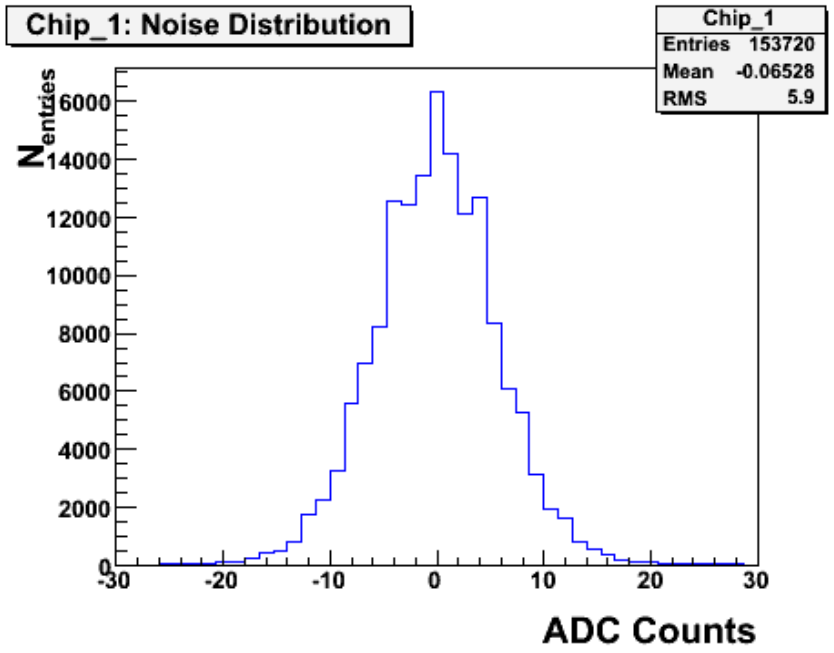
70 GeV -> 90 GeV Layer 12 outside of shower maximum

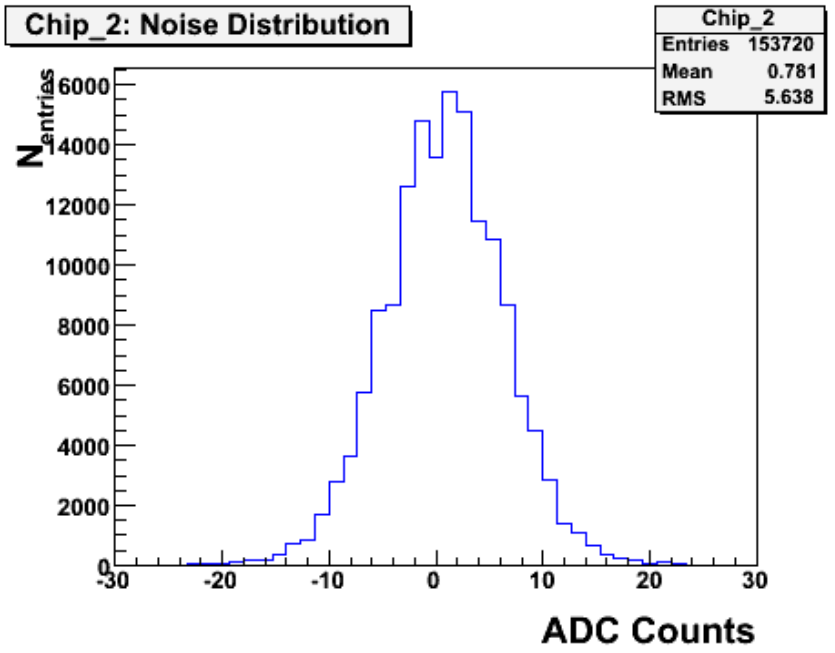
So far all runs have been reconstruction using usual reco software

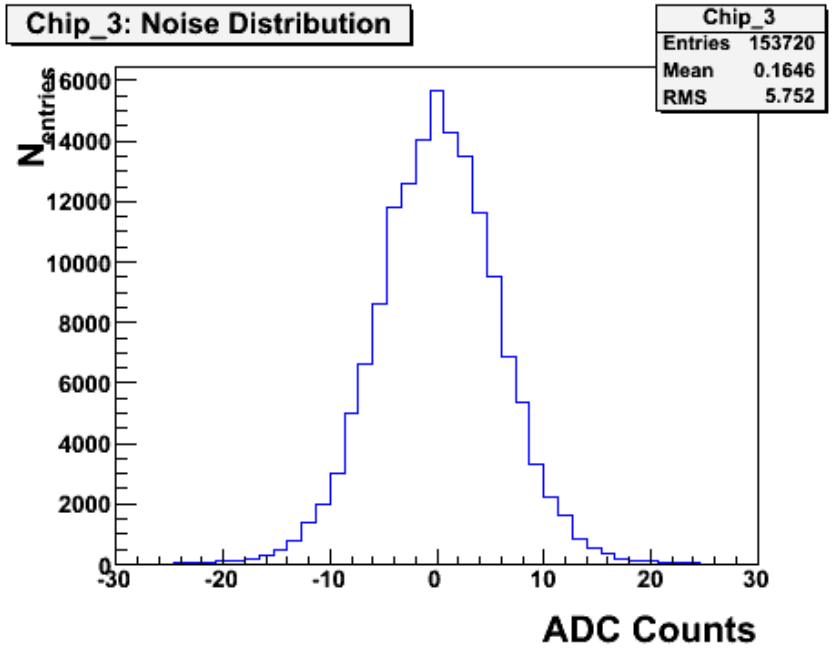
Now

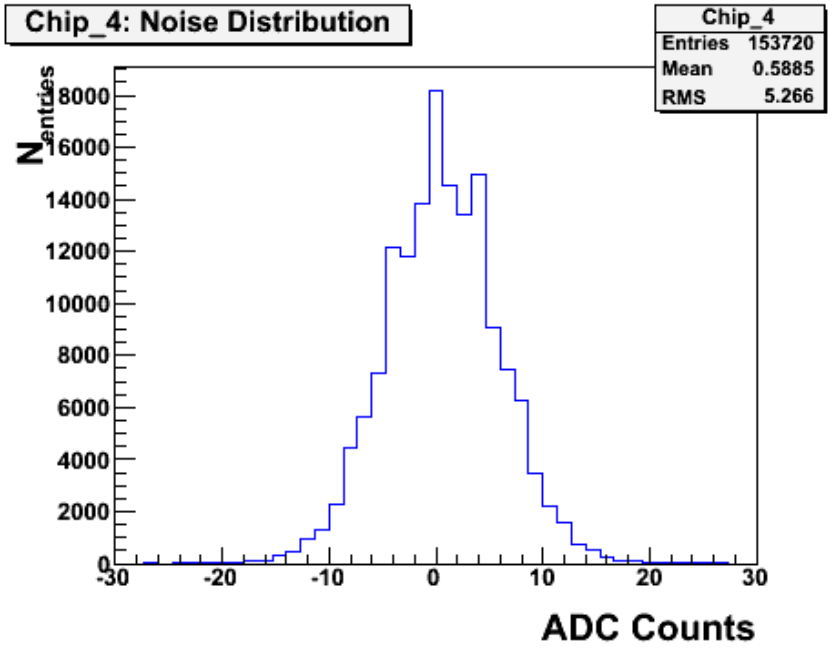
Discarding all (Offline) Pedestal Corrections

Typical Noise Distribution - “Signal Events” (Run331498 -6.3cm,6.2cm)

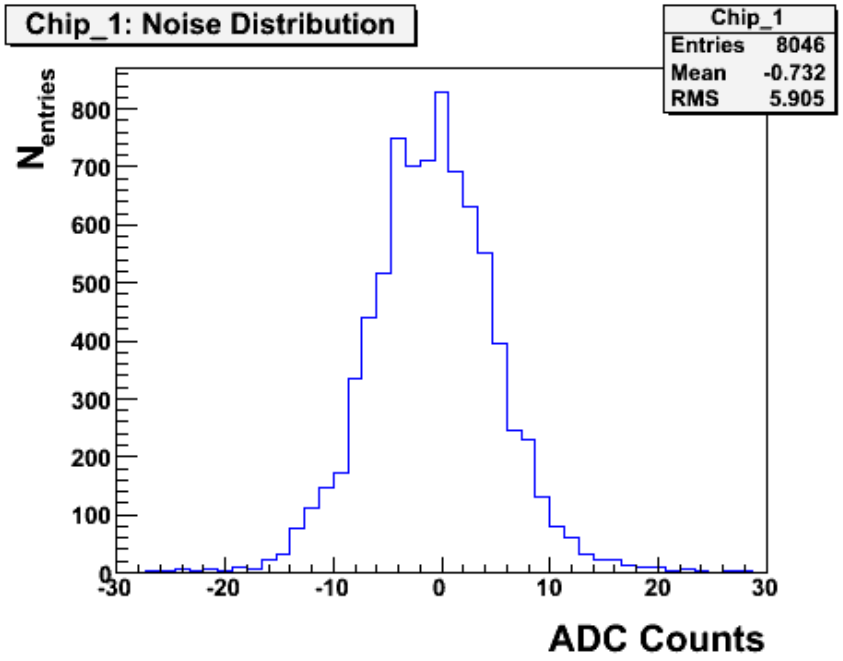


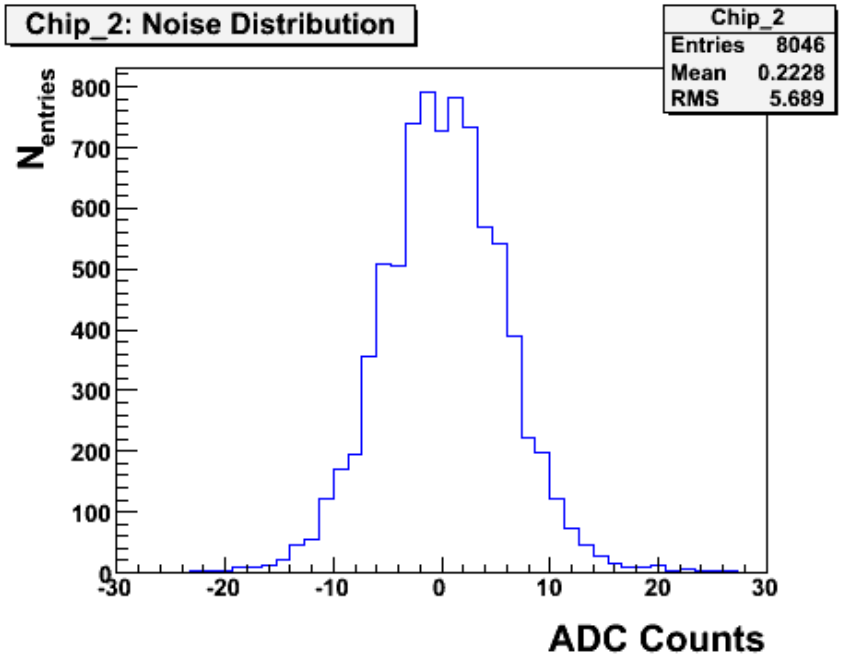


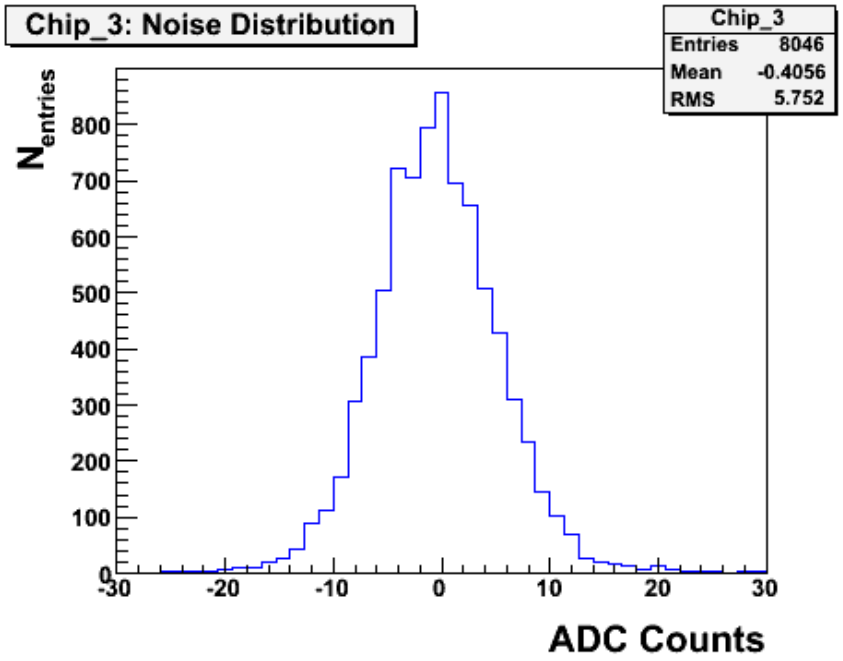


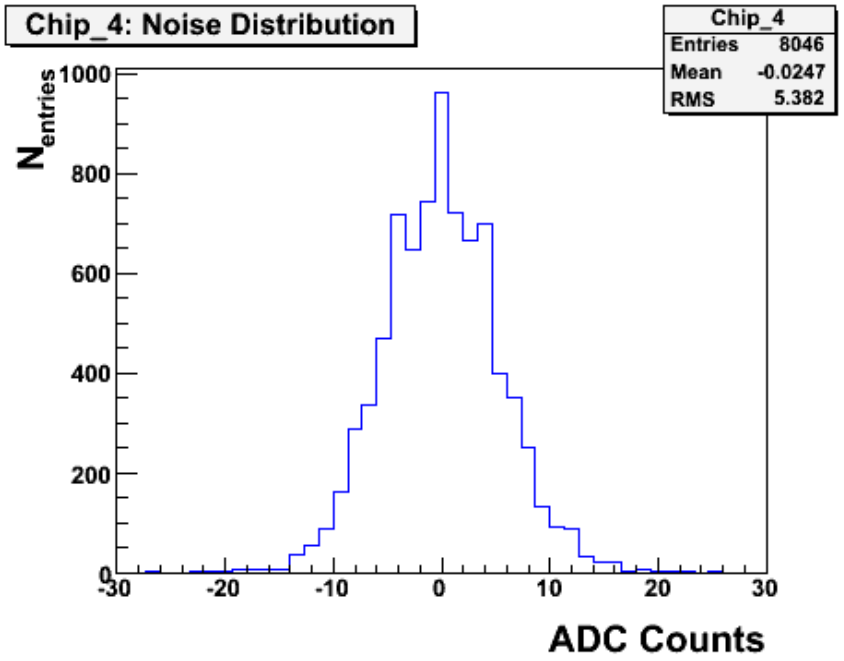


Typical Noise Distribution - “Pedestal” Events (Run331498 -6.3cm,6.2cm)

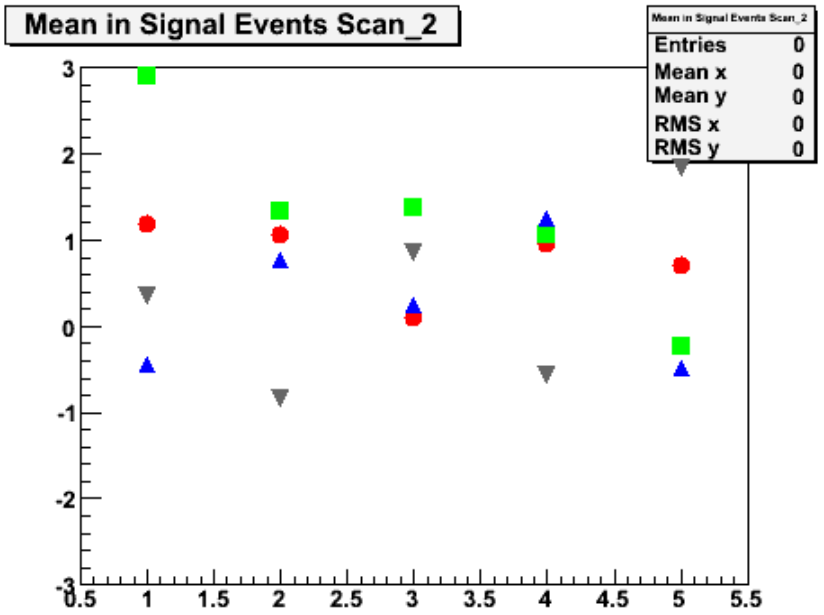


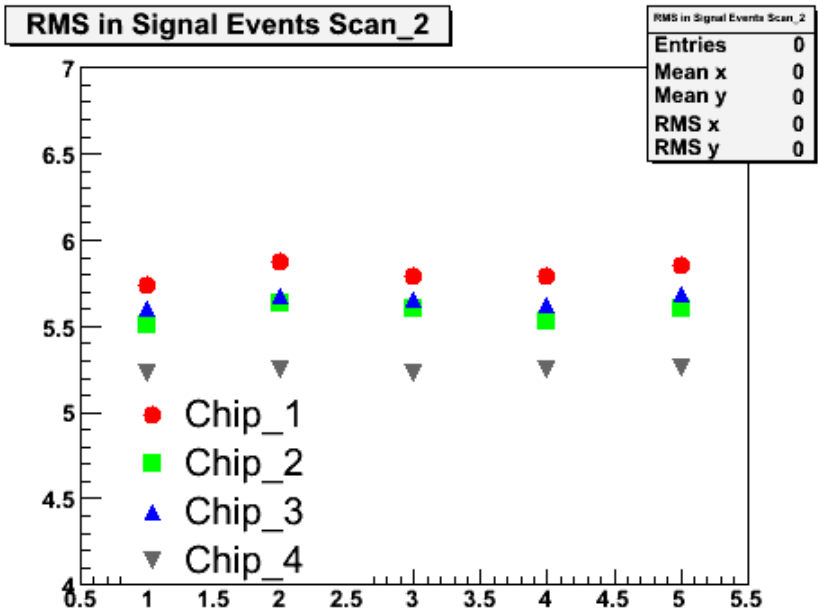


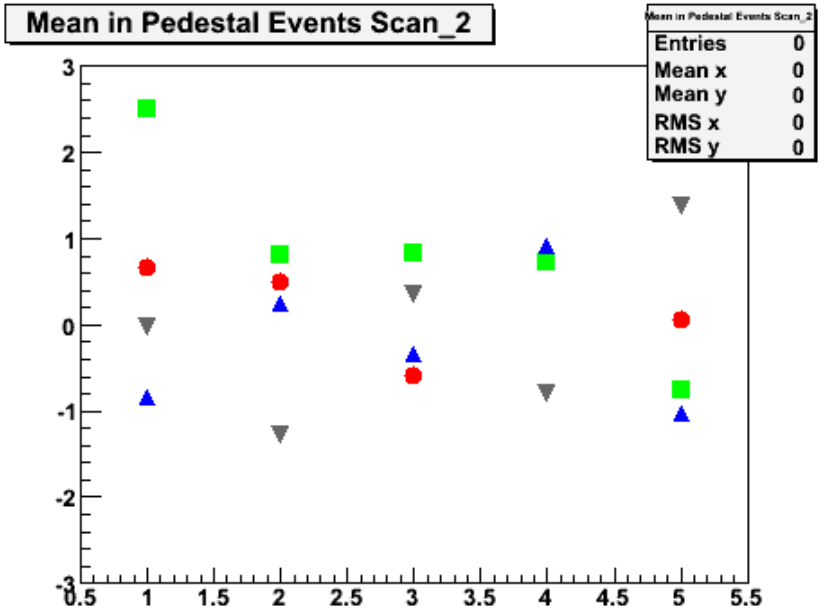


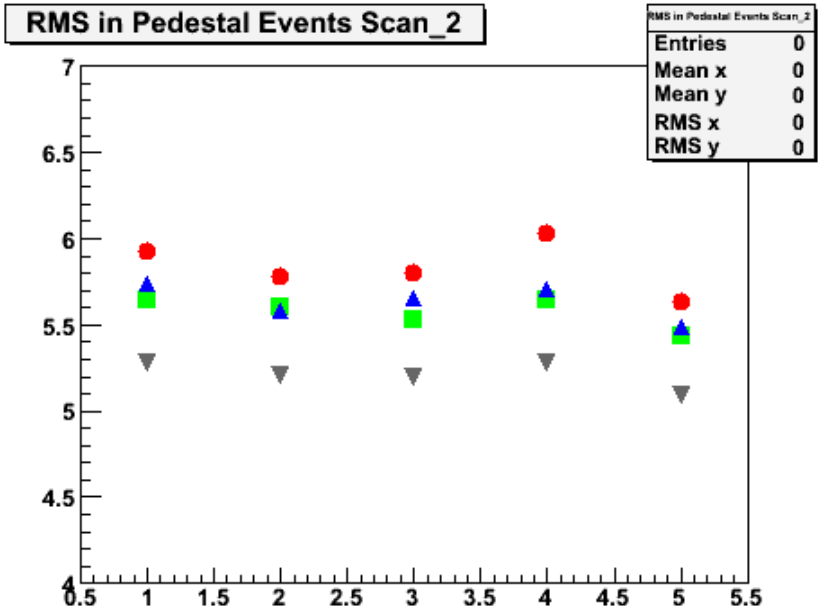


Scan over Chip 1

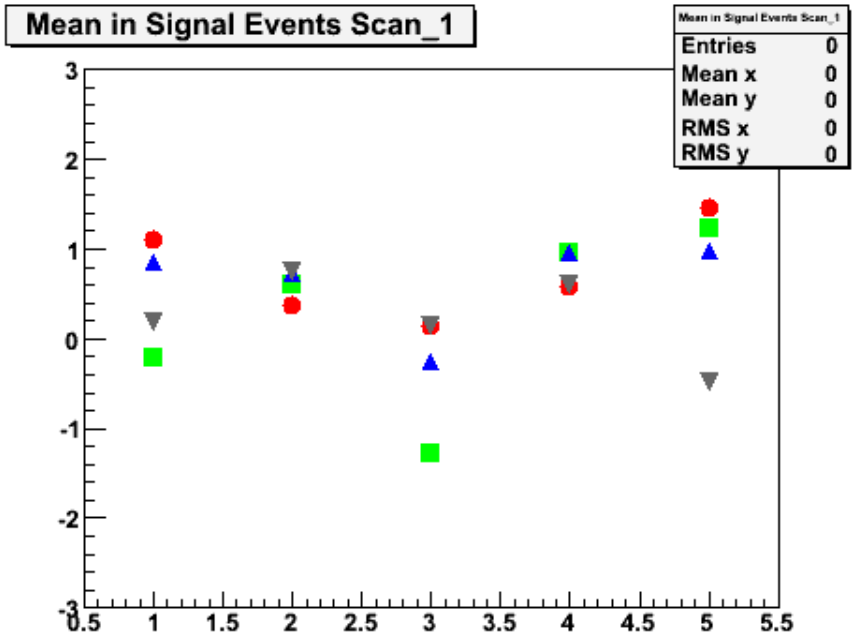


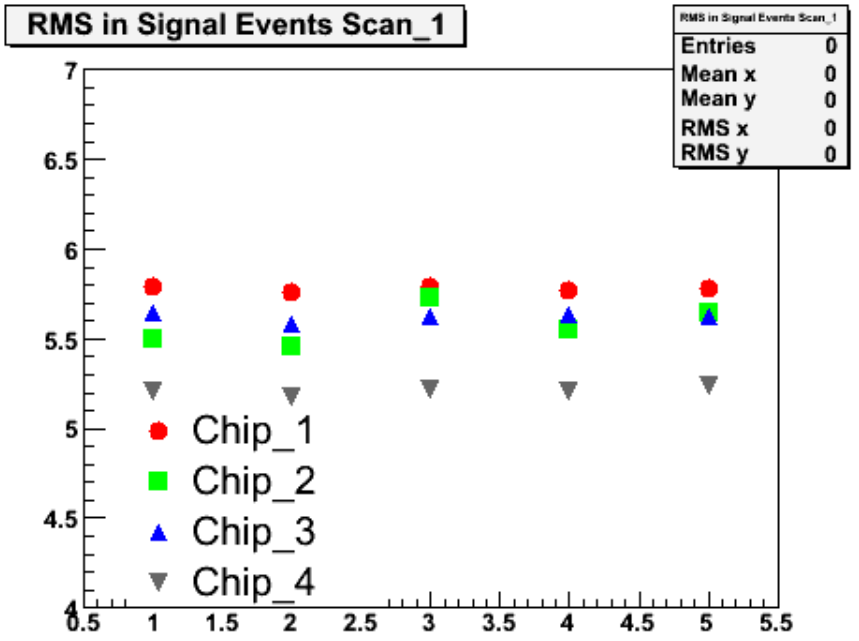


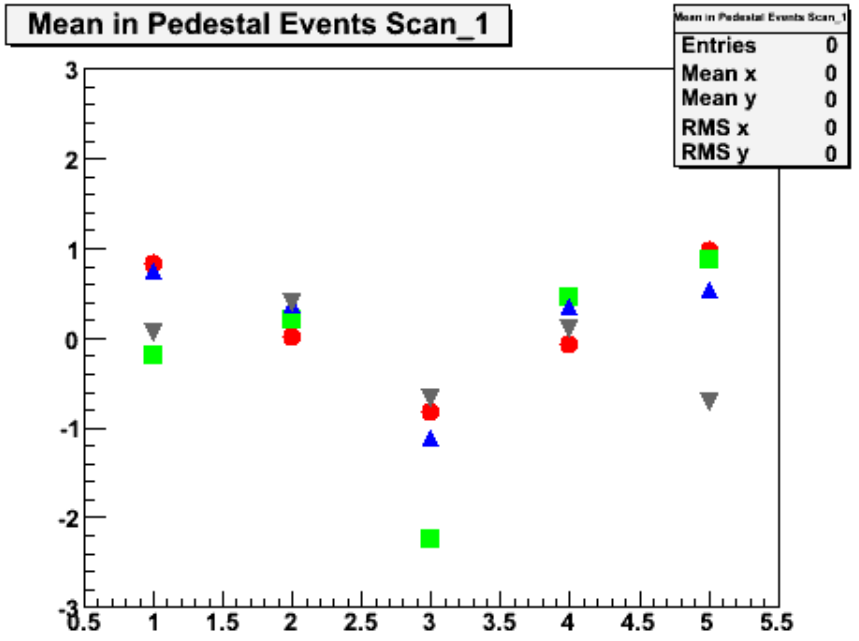


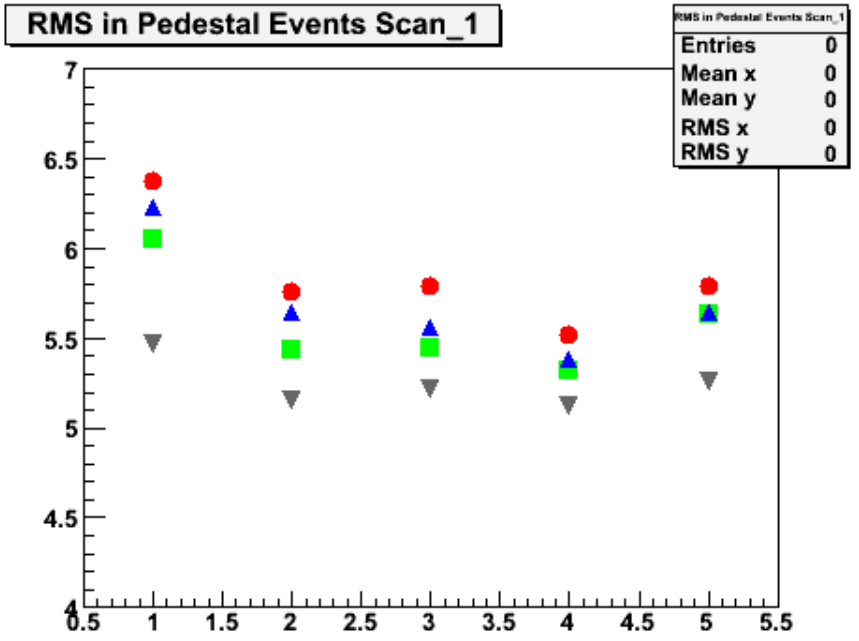


Scan over Chip 2

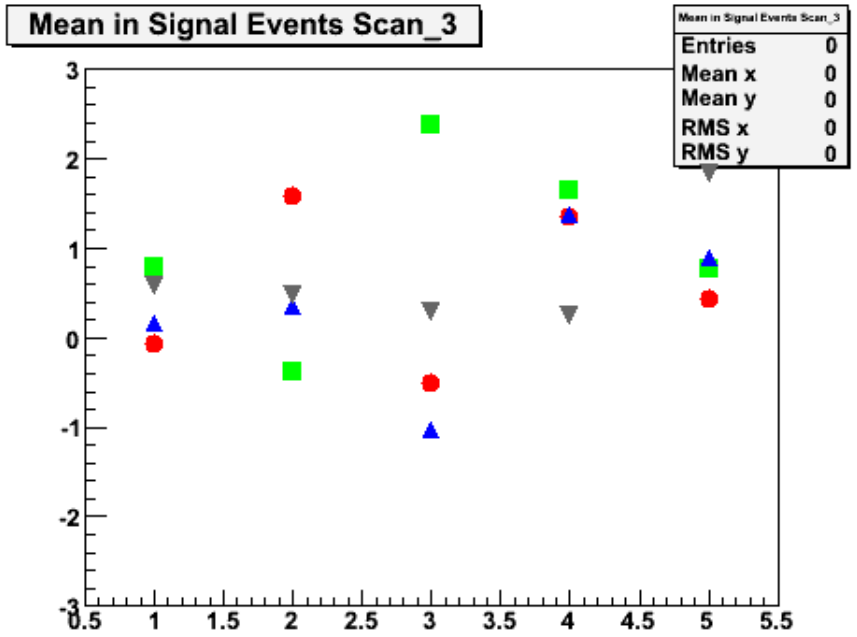


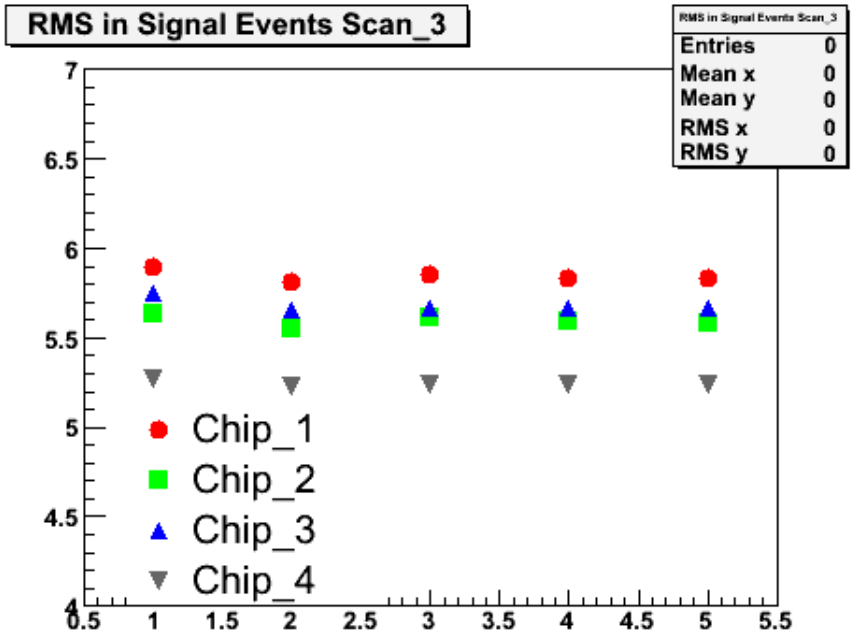


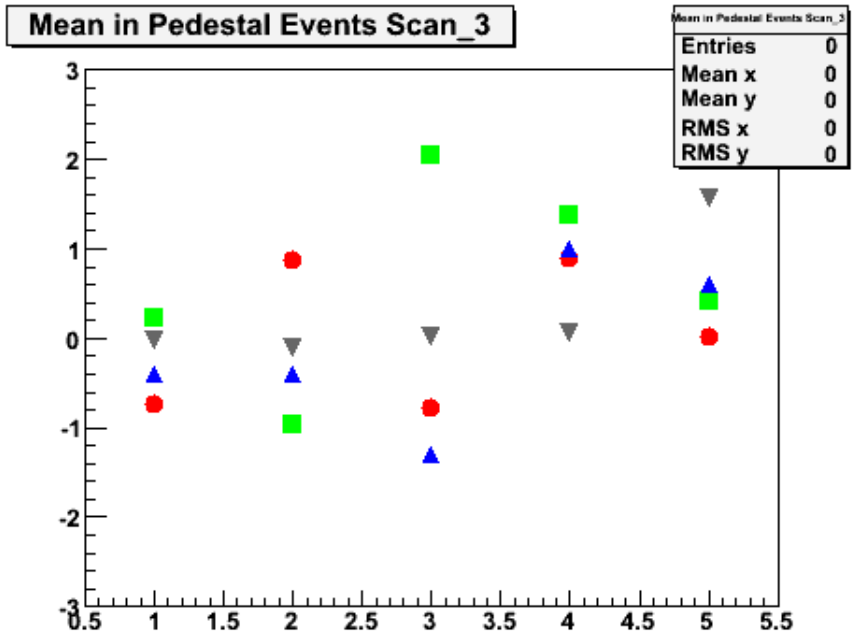


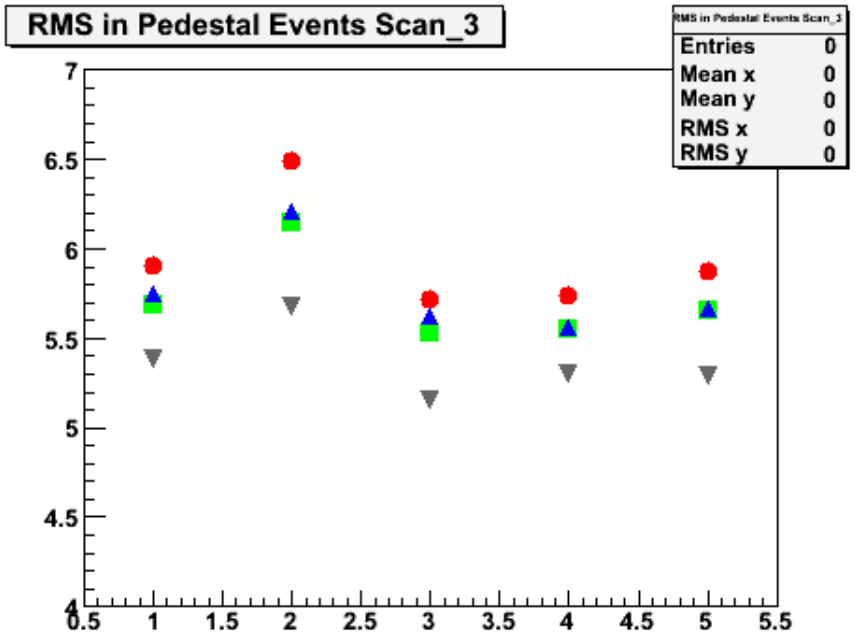


Scan over Chip 4









More slides and conclusions for next monday's analysis meeting ....