Simulation of Pedestals in the EM

Data analysis of muon files take at SLAC durring this fall:

- Configuration: Tkr+Cal trigger, vertical position
- digi and recon root files produced by Xin Chen:

slac.glast.u03/EM2003/rootFiles...em_v1r030302p5

Smearing of the muon signal is important:

- muon signal is better fitted by gaussian-convoluted landau

Bridge between pedestal and muon signal:

- non gaussian tail to the noise ?

Partial correlation between channels of a same diode (*EX1 –* EX8),
and in between diodes (HEX – LEX)

Simulation:

Today: - ALL pedestals means are equal to 100 FLE_DAC units.

not realistic: should have one per channel (ADC / FLE_DAC units ? Xml ?)

- no correlation between diodes.

Is it necessary to simulate this? Will this be a flight feature?

- complete correlation between channels of a same diode.

not realistic: implementing this requires bidimensional pedestal fits.

To simulate correctly the EM, it is necessary to modify the simulation: use different dynamic ranges for all channnels.

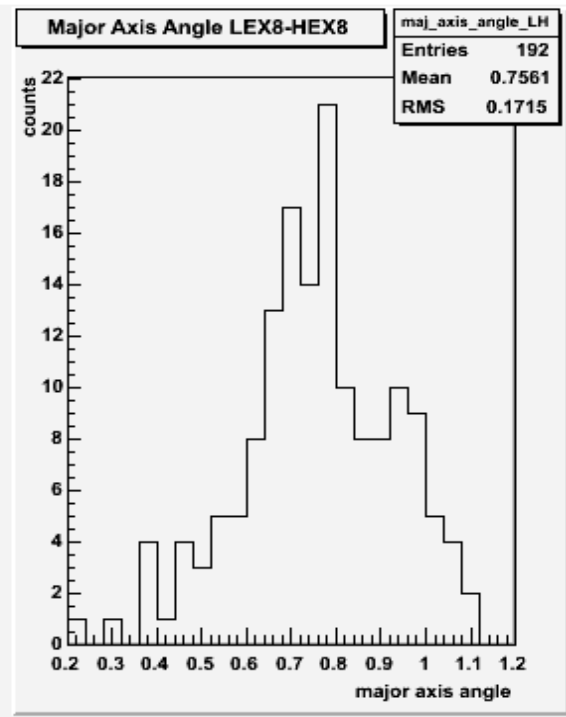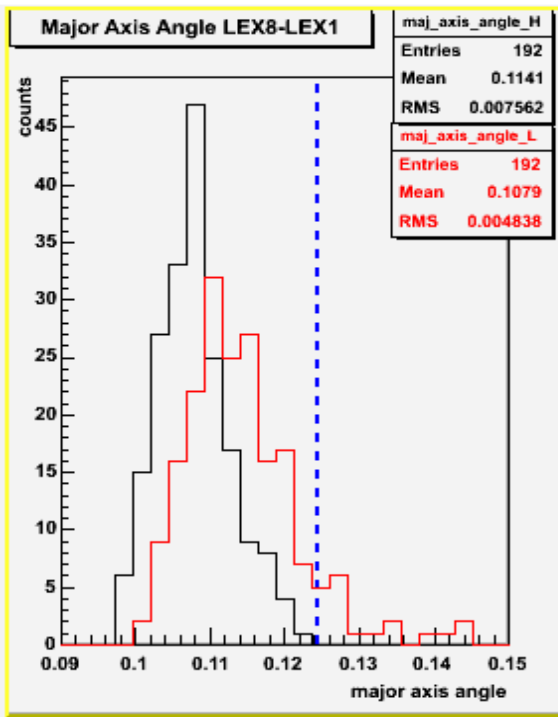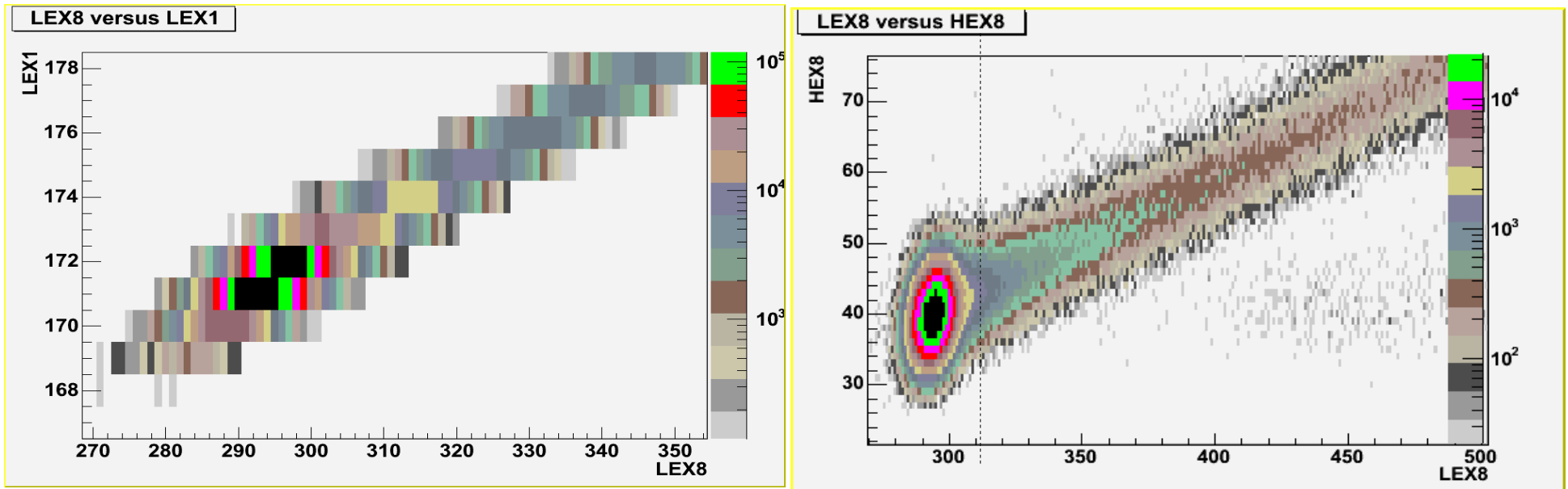The partial correlation of the pedestals will affect "best range" efficiency.

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Fitting the signal:
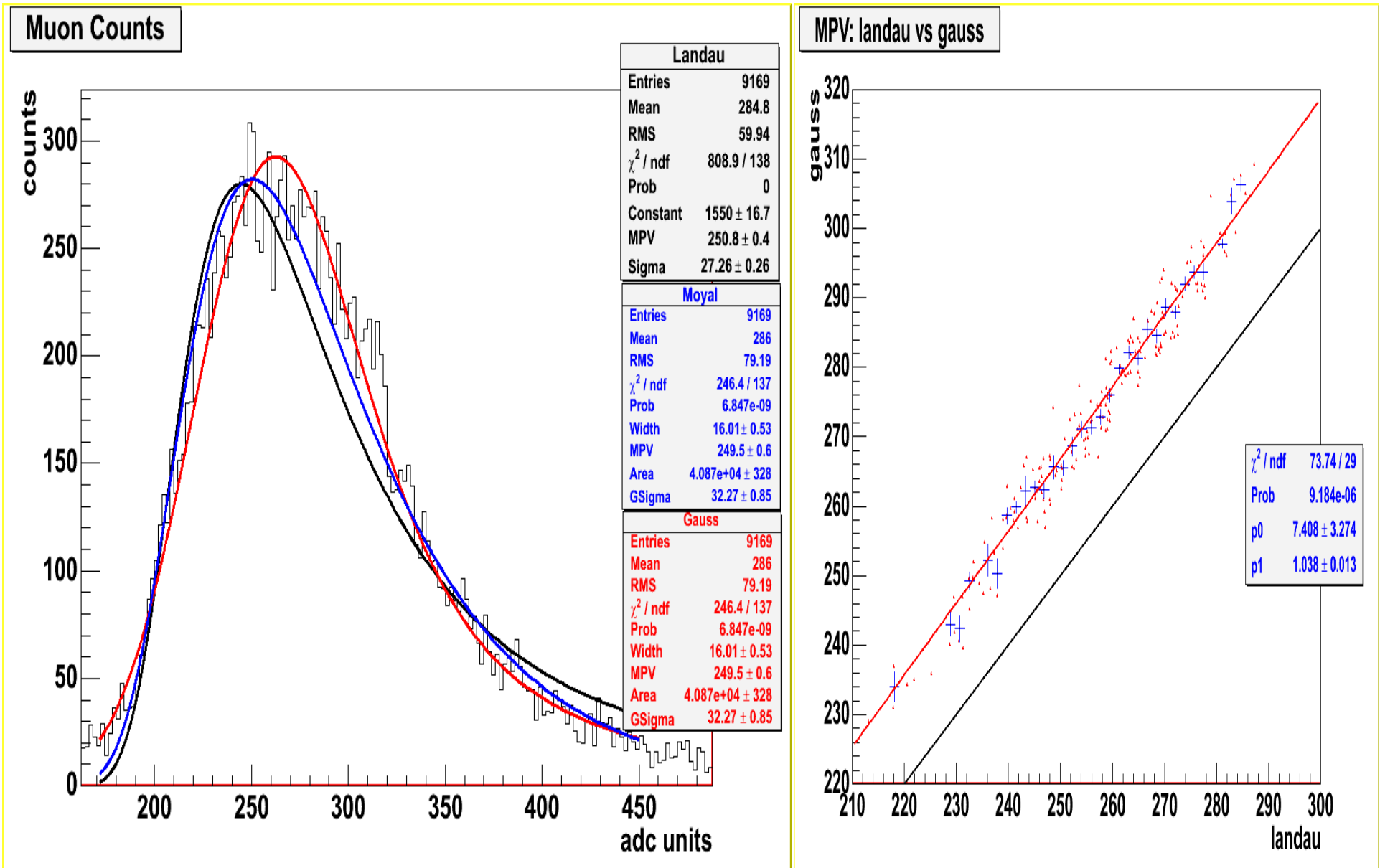
The signal is pedestal subtracted, attenuation and path corrected.

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Pedestal Correlation: visible on muon data.

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Top graphs: correlation between channels, axes are in units of adc.

Bottom graph is the result of fit by :
    exp(0.5* (X*X/g1 + Y*Y/g2))),

    X= x cos(angle) + y sin(angle)
    Y= -x sin(angle) + y cos(angle)
X= X` - Xmean., Y= Y` -Ymean

blue line expected value if the correlation was due to gain only.