

ECAL analysis update

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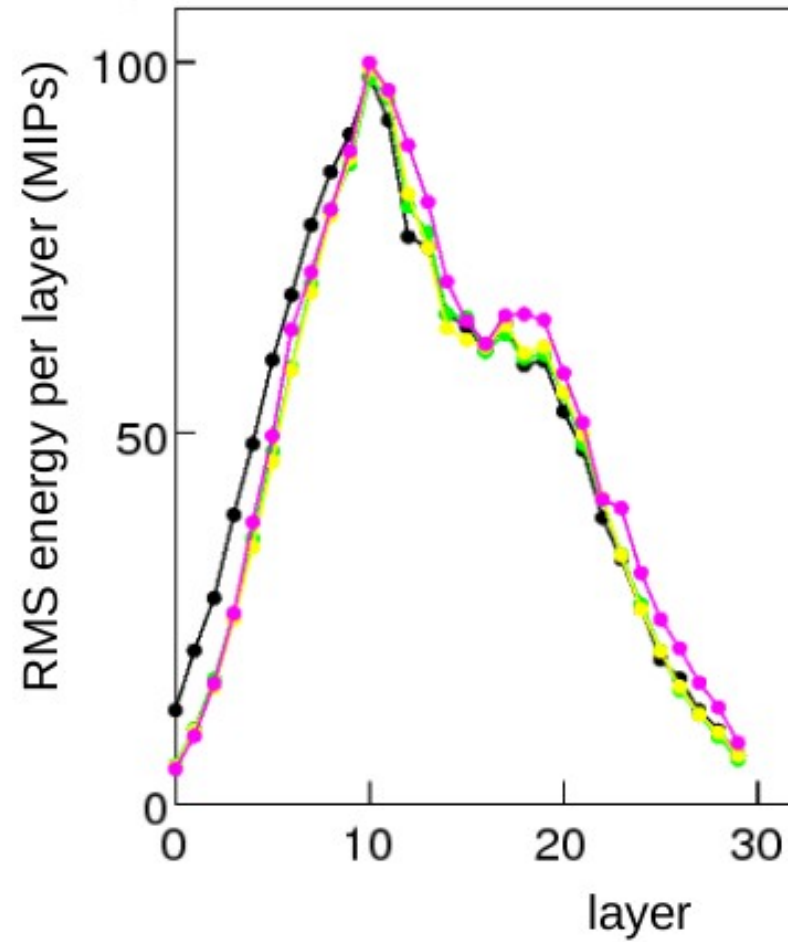
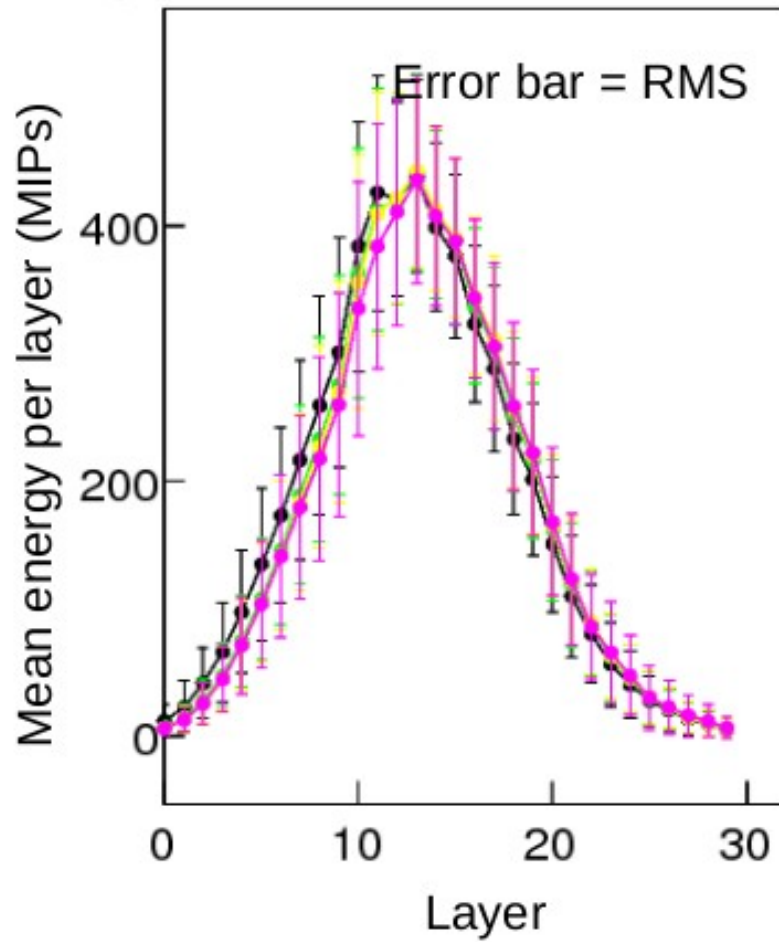
CALICE analysis meeting 29 June 2009

- 2007 data
- standard electron selection

- a few new plots

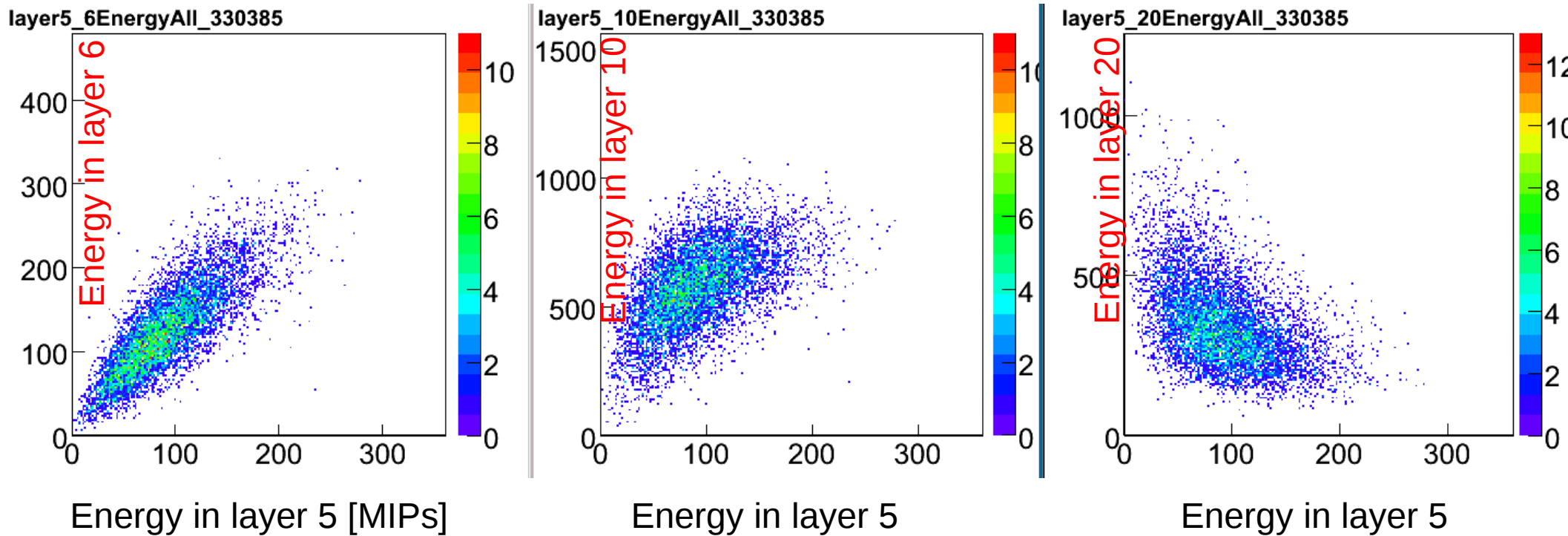
Reminder from last time:
looking at energy fluctuations per layer in electron showers:

A few 40 GeV electron runs from 2007 (one colour per run)



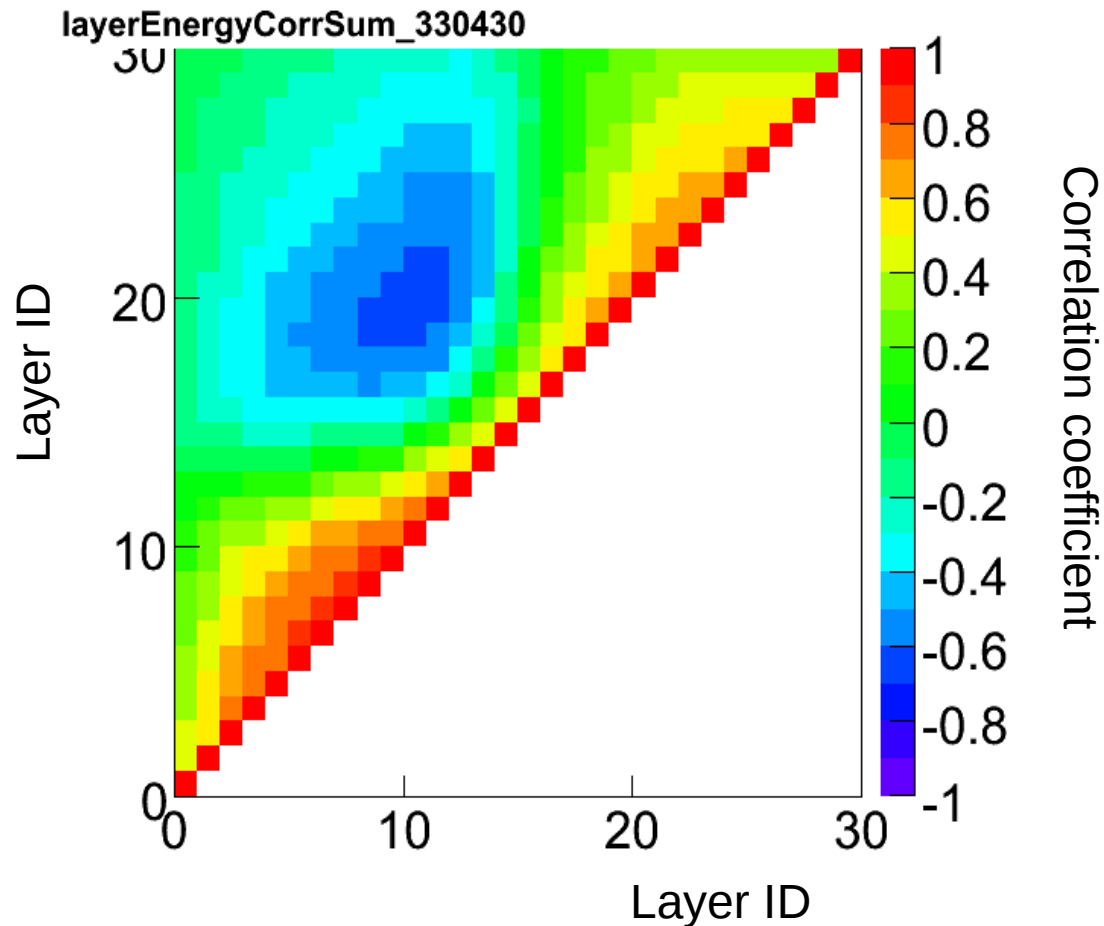
layer-to-layer fluctuations/correlations (a 30 GeV electron run)

Energy deposit per layer



Correlation between energy deposit in different layers

(n.b. Distributions not always Gaussian)

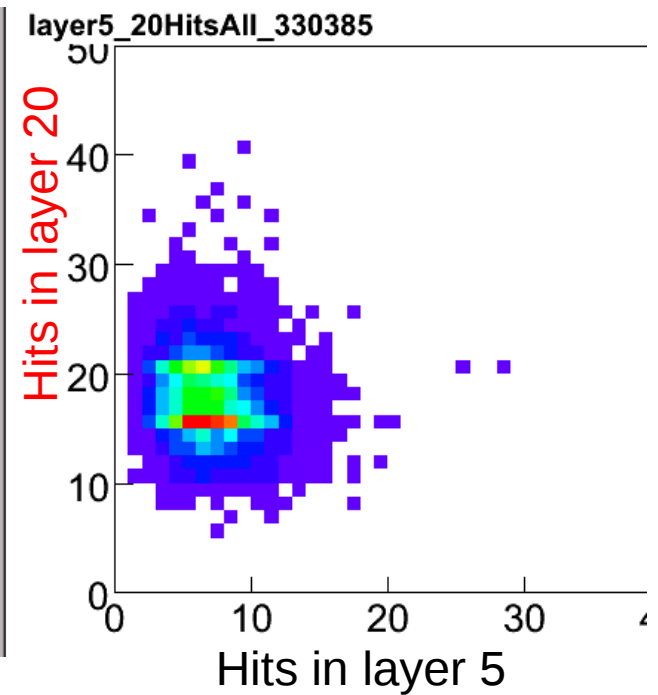
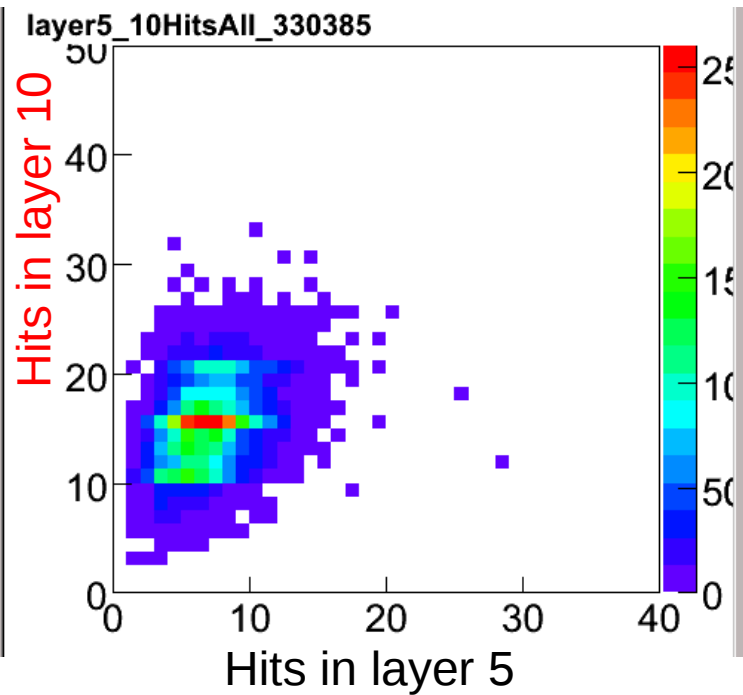
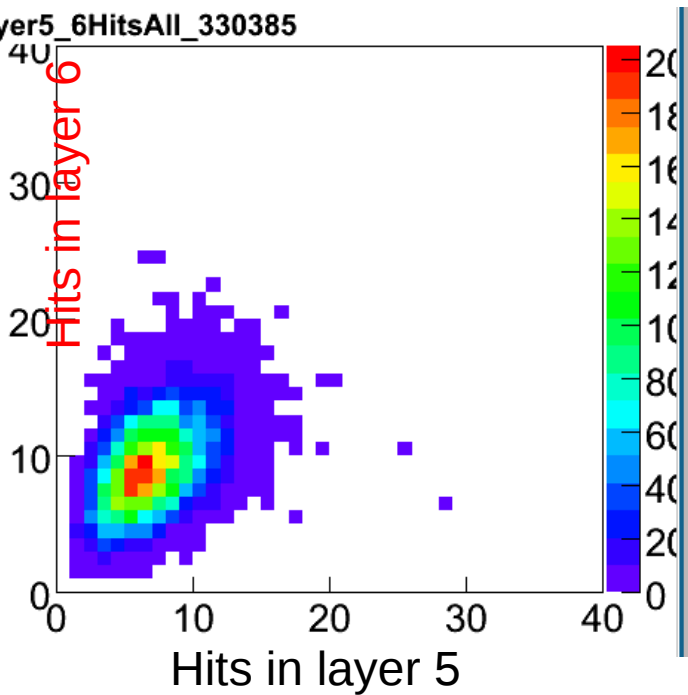


Some interesting structure!

Relatively large positive correlations in range 2-> 5 layers

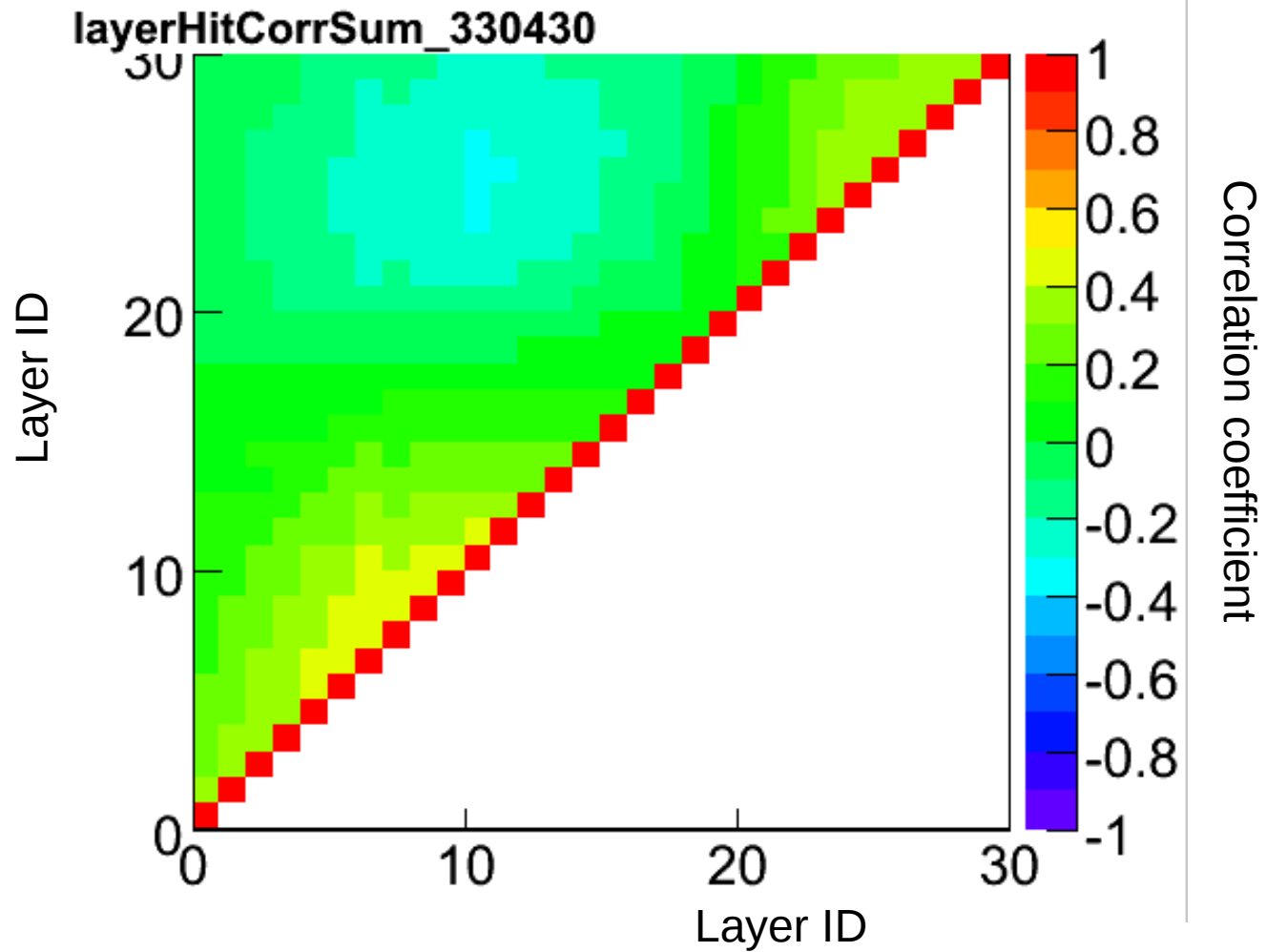
Some negative correlations in range of ~10 layers

Same plots for number of hits per layer



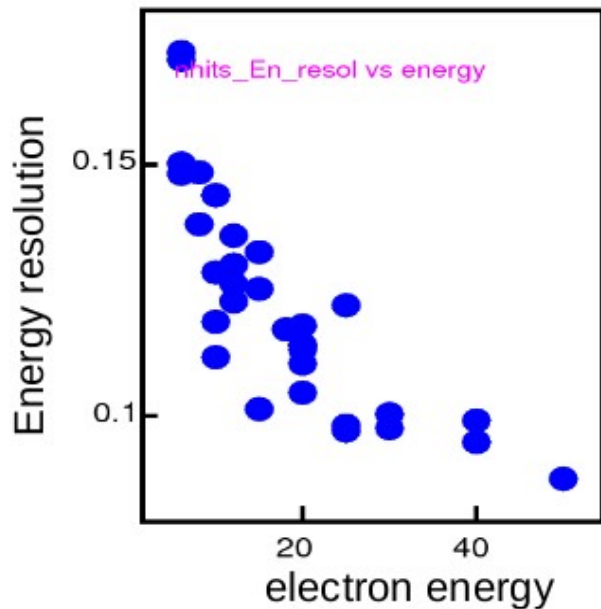
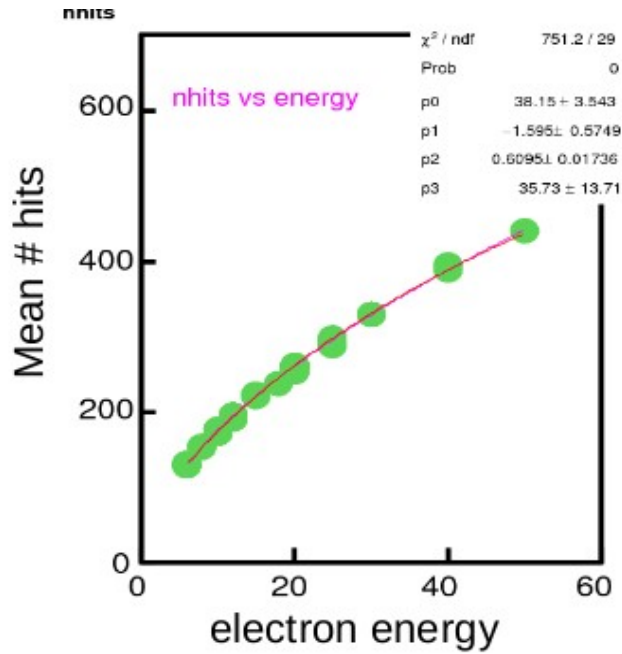
Correlation between # hits in different layers

(n.b. Distributions not always Gaussian)



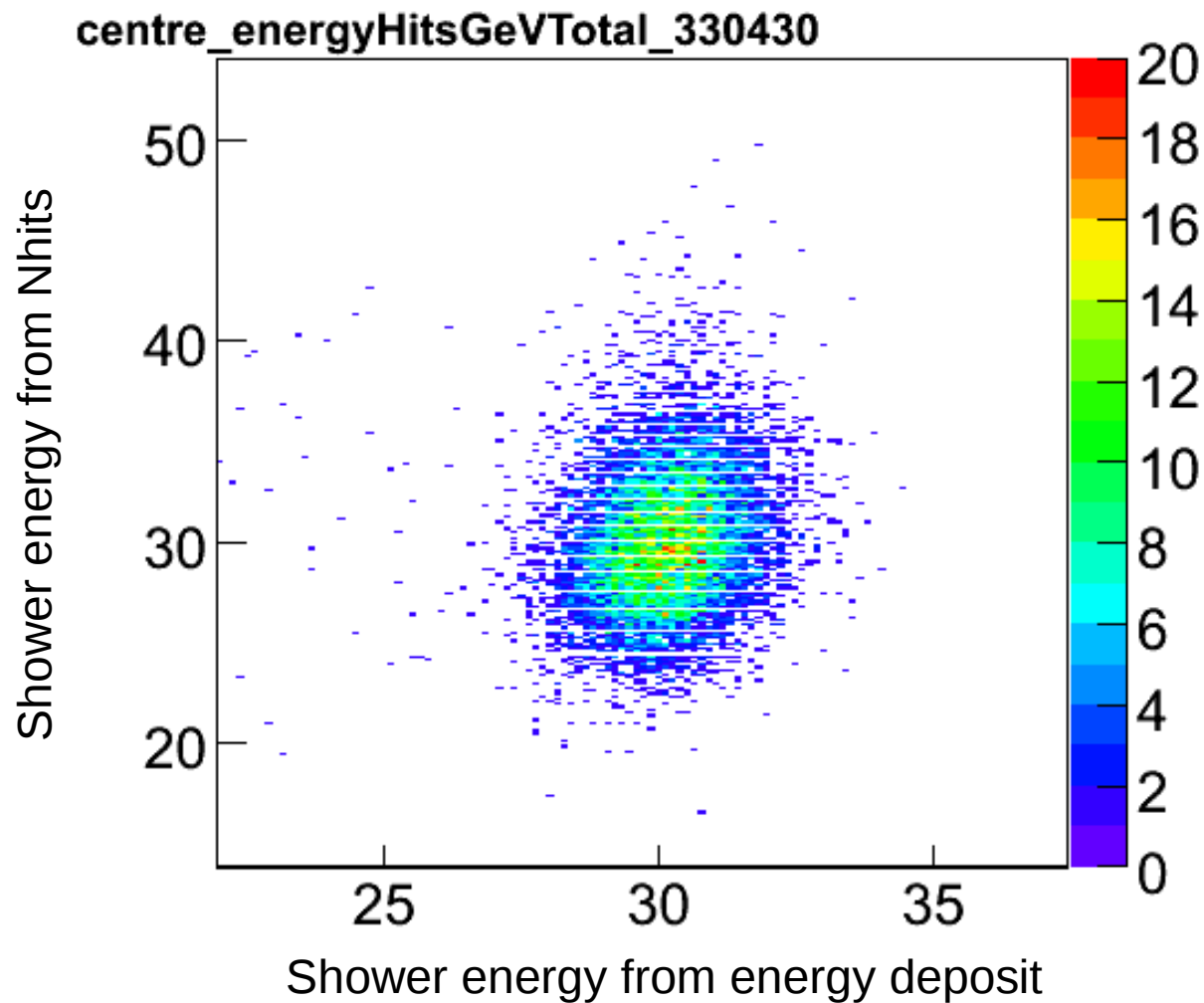
Significantly weaker correlations than for deposited energy

Reminder from last time:
using ECAL as digital calorimeter



Now try to combine
deposited energy and
number of hits:

Significant improvement
to total energy
resolution?



Sigma (energy) ~ 0.97 GeV
Sigma (nhits) ~ 3.0 GeV
Small correlation factor ~ 0.2

If we try to combine measurements, nhits get weight of $\sim 4\%$ (for 30 GeV electrons)
-> rather limited improvement in resolution (should be more useful @ low energy)

In progress, plans:

- comparison with simulation
- correlations in transverse direction
- event-by-event fitting of shower shape