Data/MC energy discrepancy and scaling factor and extra material (II)

- What's new from last presentation (24/10/2007) ?
  - We now have pressure scans for 16 configurations (10,20,50,100 GeV) x (0,10,20,30 deg) instead of 8 configurations two weeks ago
  - In the scan : 2x5m Cherenkov with CO2 : 1 bar corresponds to 0.05 X0
- Real situation at SPS
  - 1 bar at 10 GeV and 0 bar for E >= 20 GeV
  - but filled with He and not CO2, so it's negligible in X0

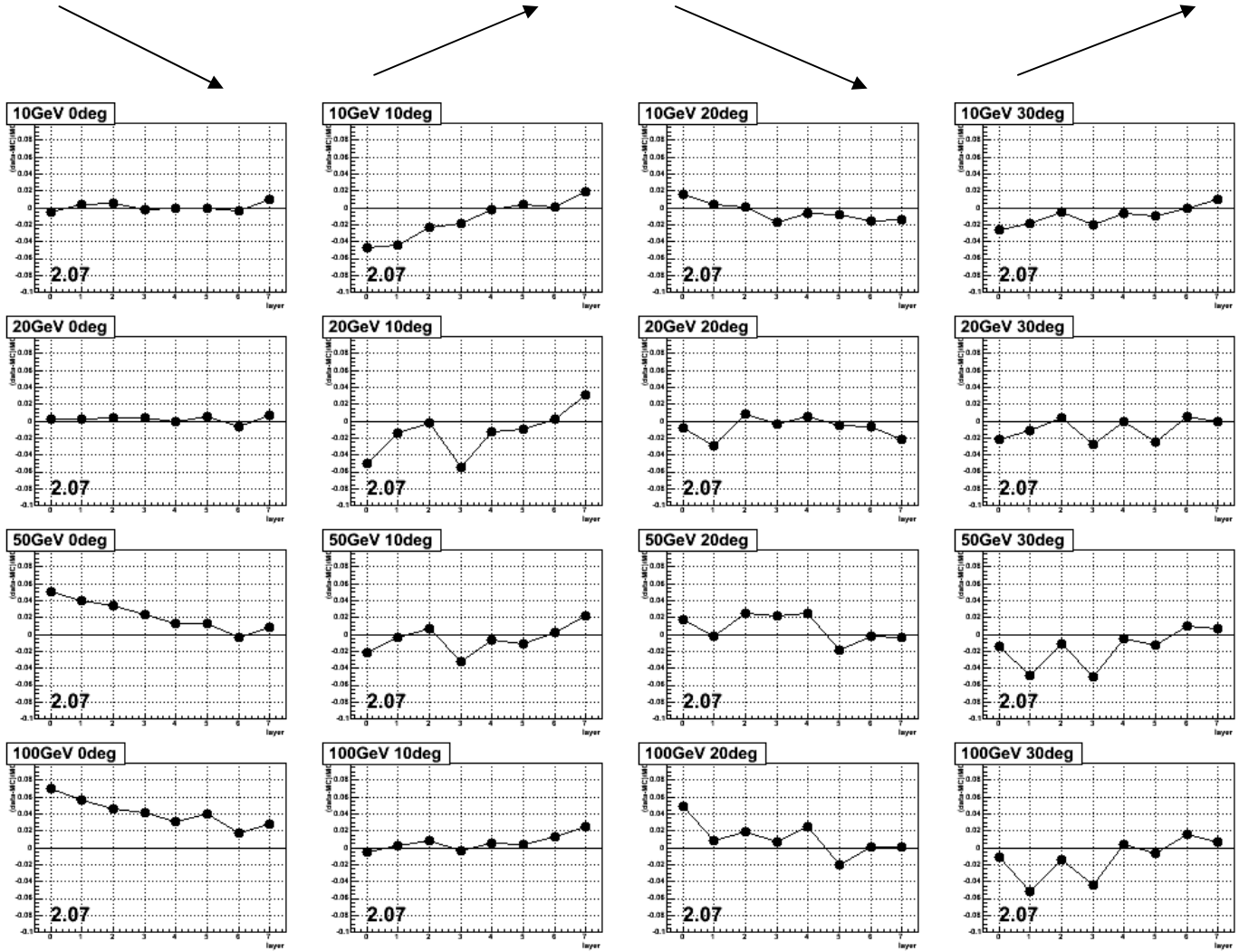
Various scenarios

1. One scaling factor and one pressure
   - Extra material upstream the CU and independent of the configurations
2. One scaling factor and P(E)
   - Would correspond to the real situation if CO2 instead of He : P(10 GeV) = 1 bar -> 0.05 X0, but P(E>=20 GeV) = 0
3. One scaling factor and P(θ)
   - Would correspond to the case in which the CU geometry is not well described in the MC and this can have different consequences depending on the trajectory of the electrons inside the CU
4. One scaling factor and P(E,θ)

Scenario 1

Scaling factor = 0.93
P = 2.07 bars
Chi2 ~ 135

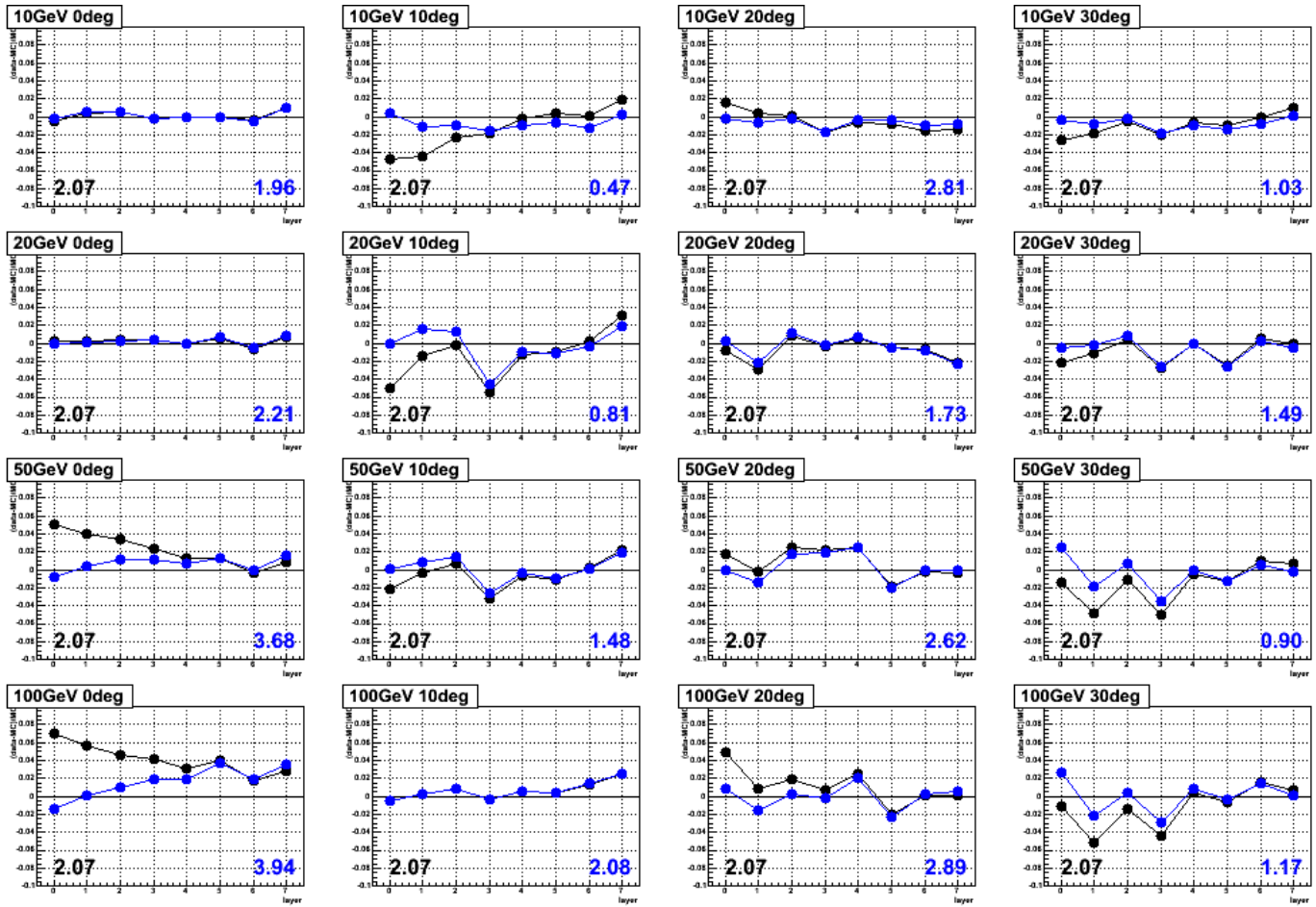
(data-MC)/MC as function of layer



Scenario 4 (in blue)

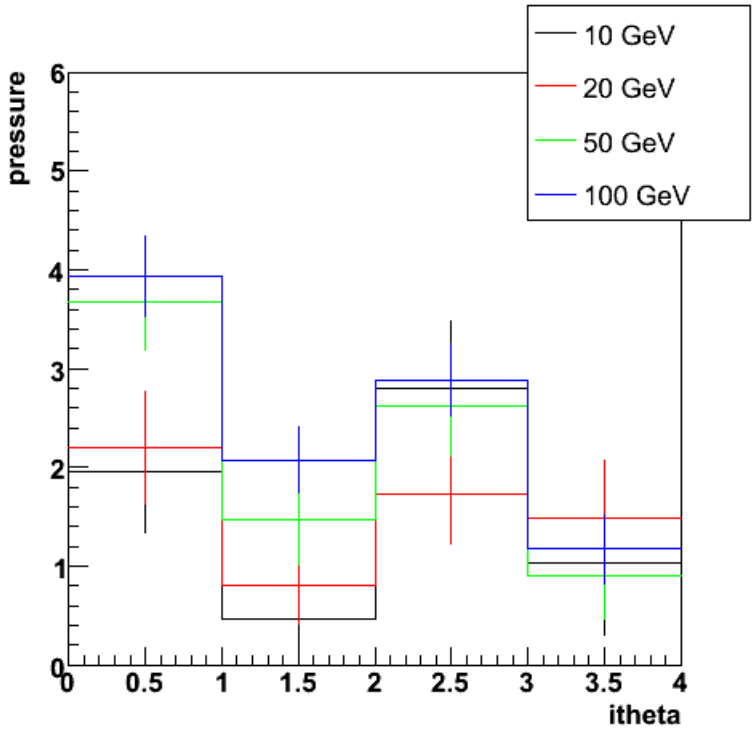
Scaling factor = 0.93
Chi2 ~ 52

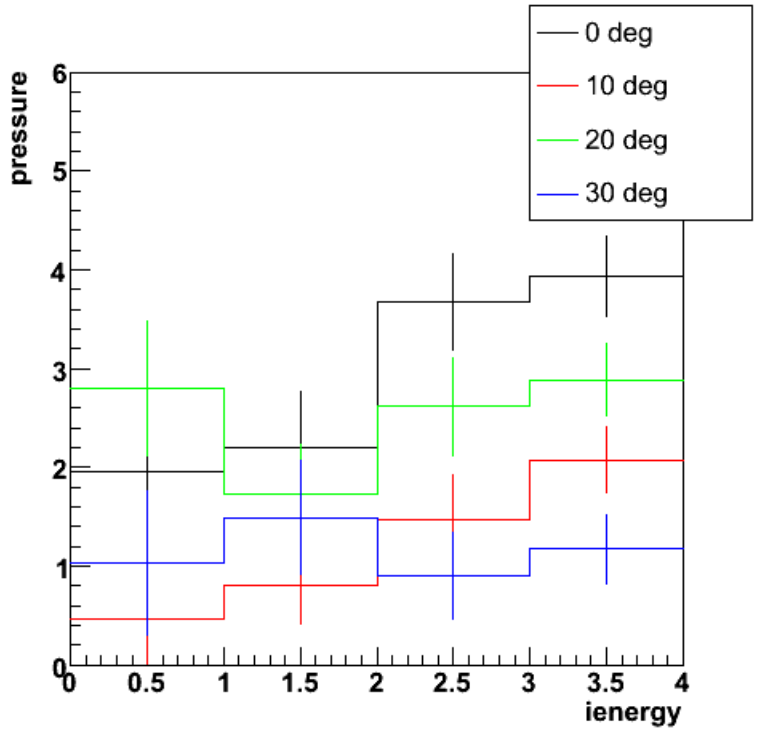
(data-MC)/MC as function of layer



Scenario 4

- P(E) (right plot) are ~ more constants than P(θ) (left plot)
- Would be more in favour of scenario 3 than 2



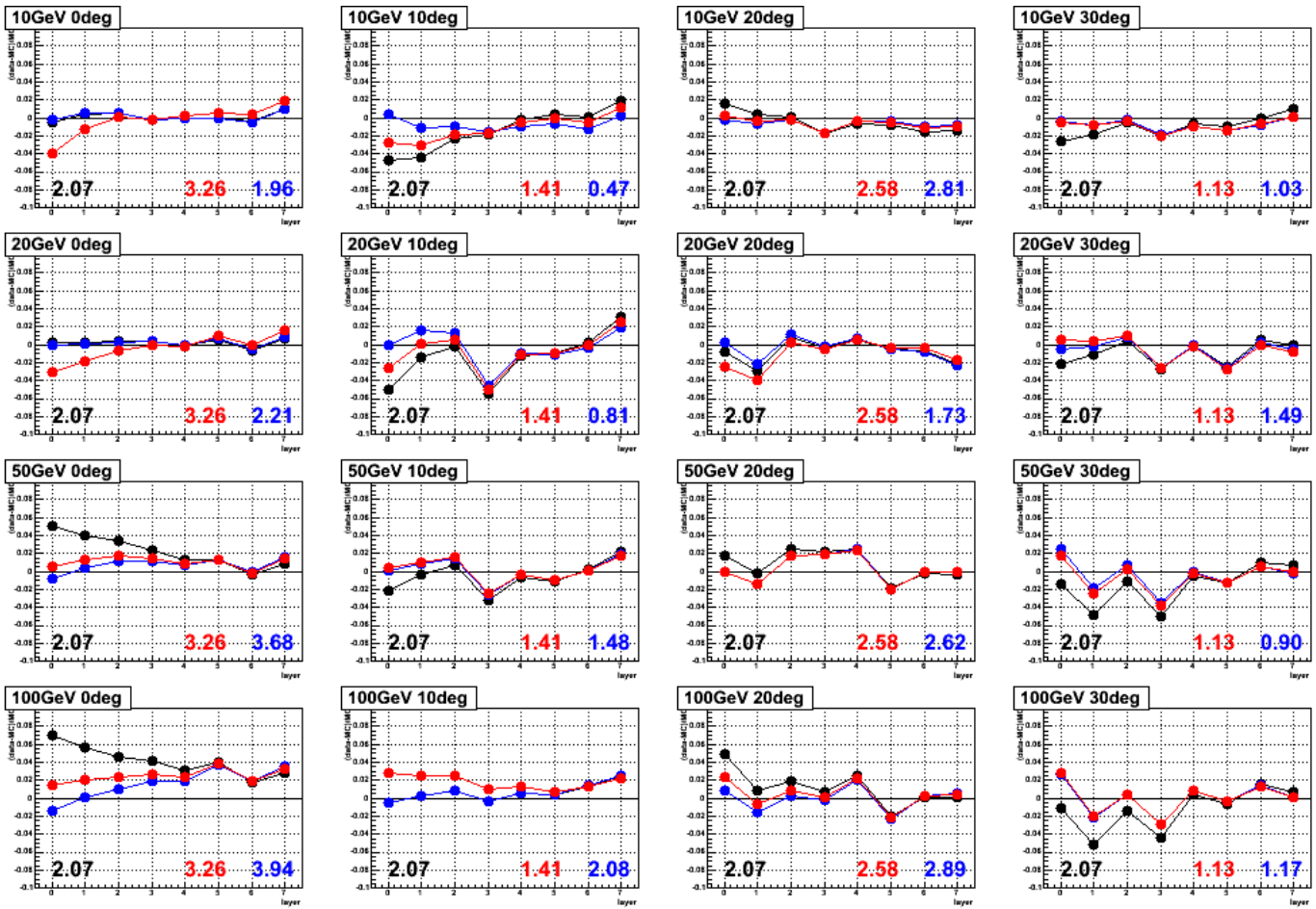


Scenario 3 (in red)

Scaling factor = 0.93
Chi2 ~ 79

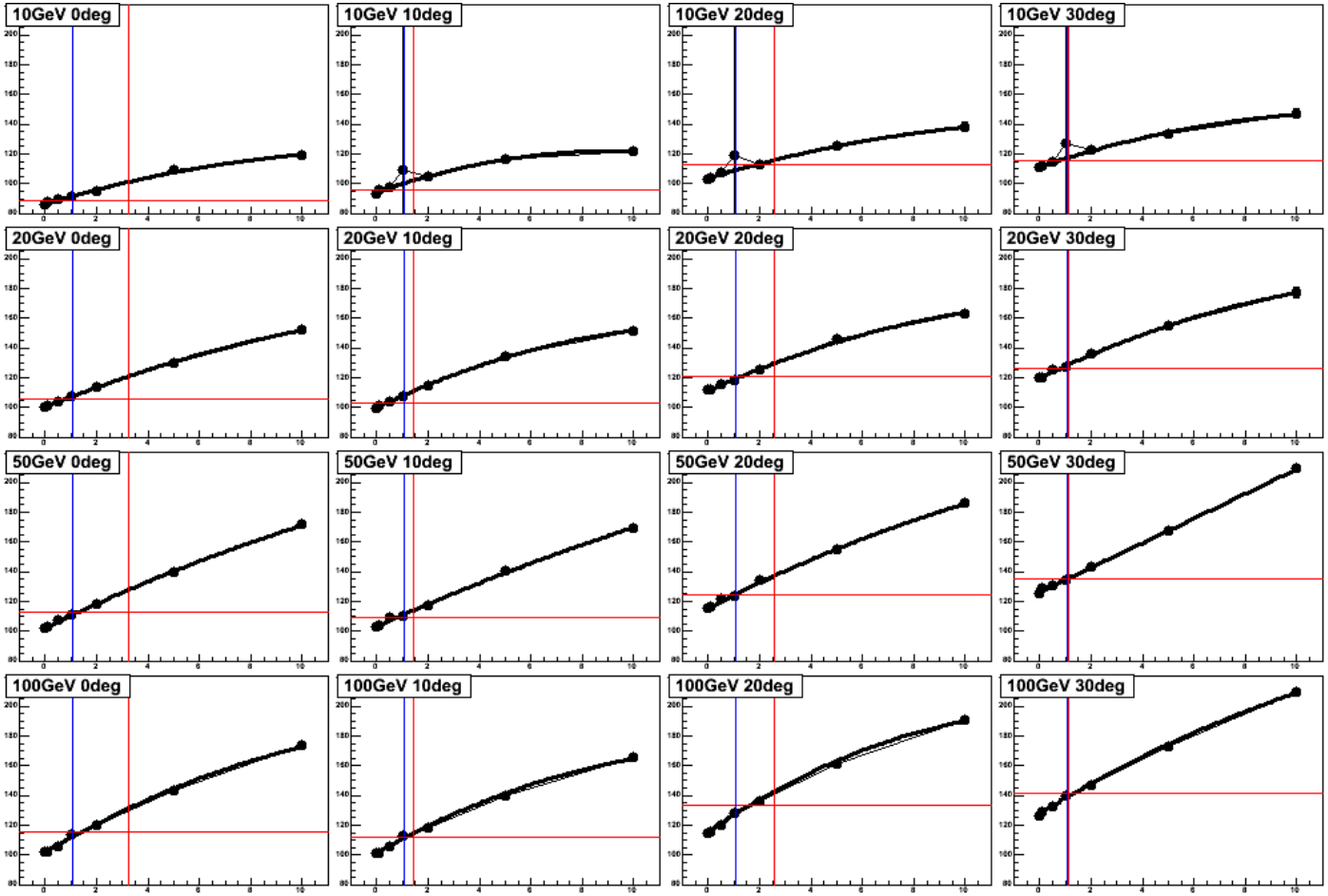
scenario 2 :
Chi2 ~ 120

(data-MC)/MC as function of layer



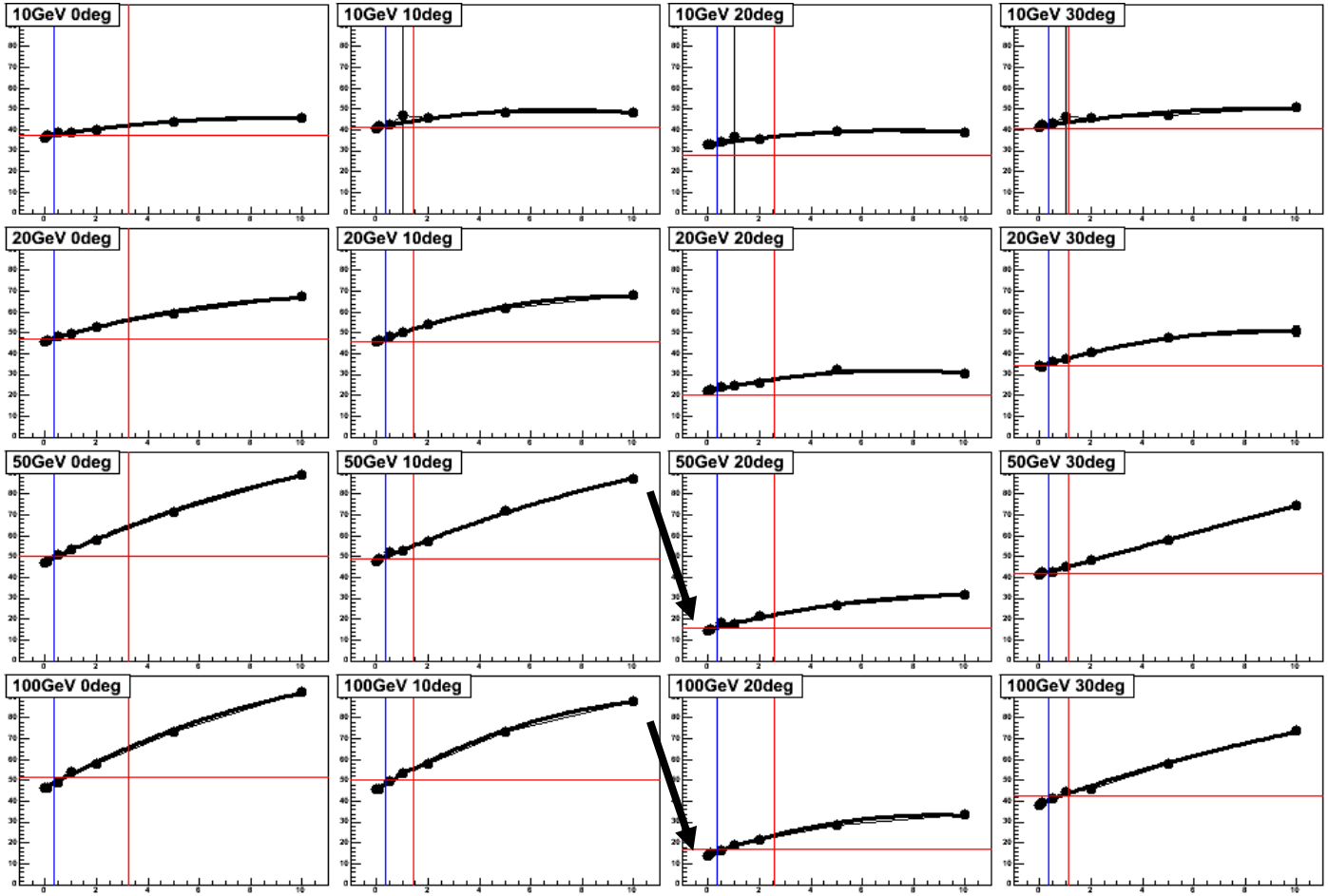
TkrTotalHits (merit)

- Fitting P using TkrTotalHits gives P = 1 +- 0.1 bar



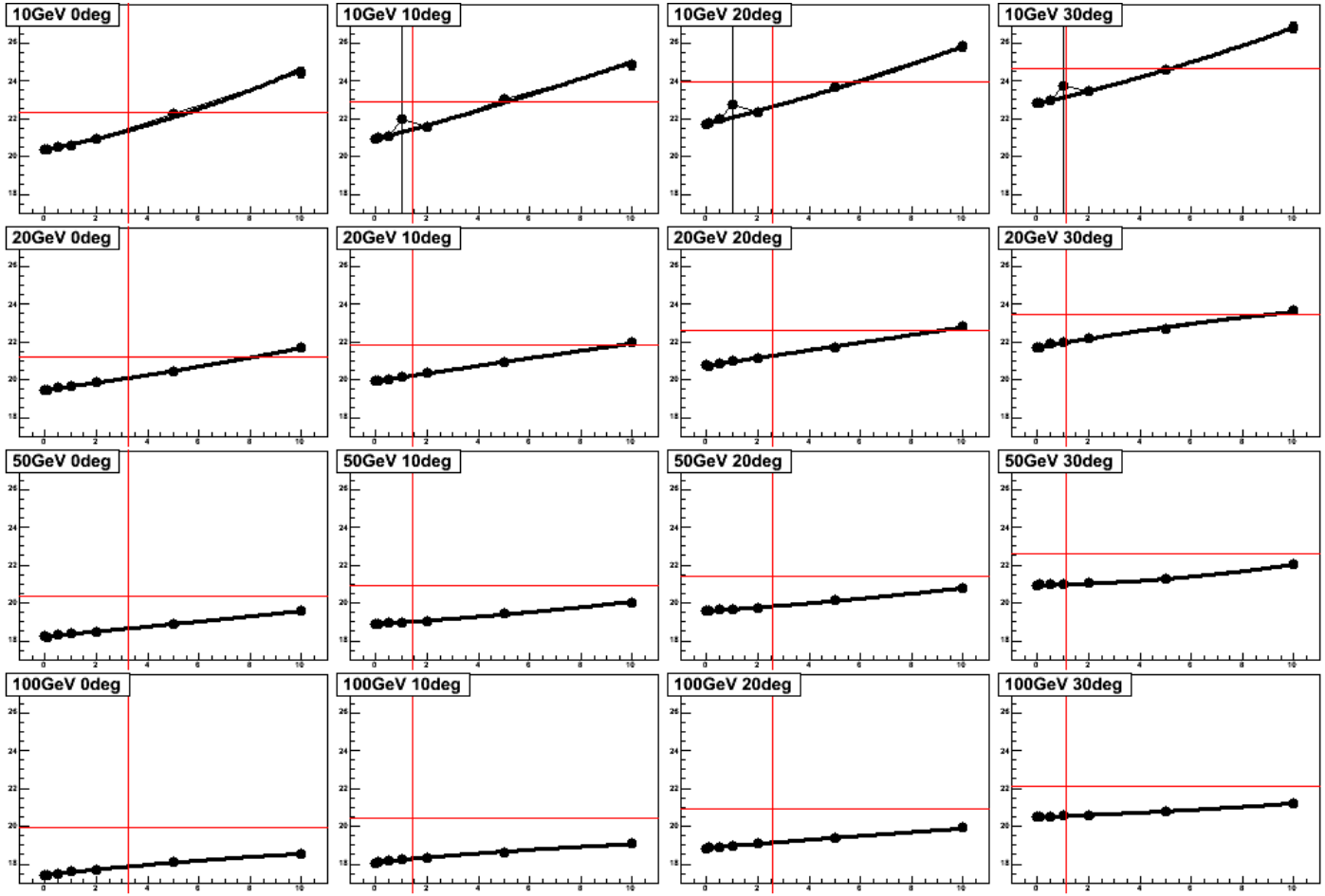
Tkr1CoreHC

- Fitting P using Tkr1CoreHC gives P = 0.3 +- 0.05 bar



CalTransRms

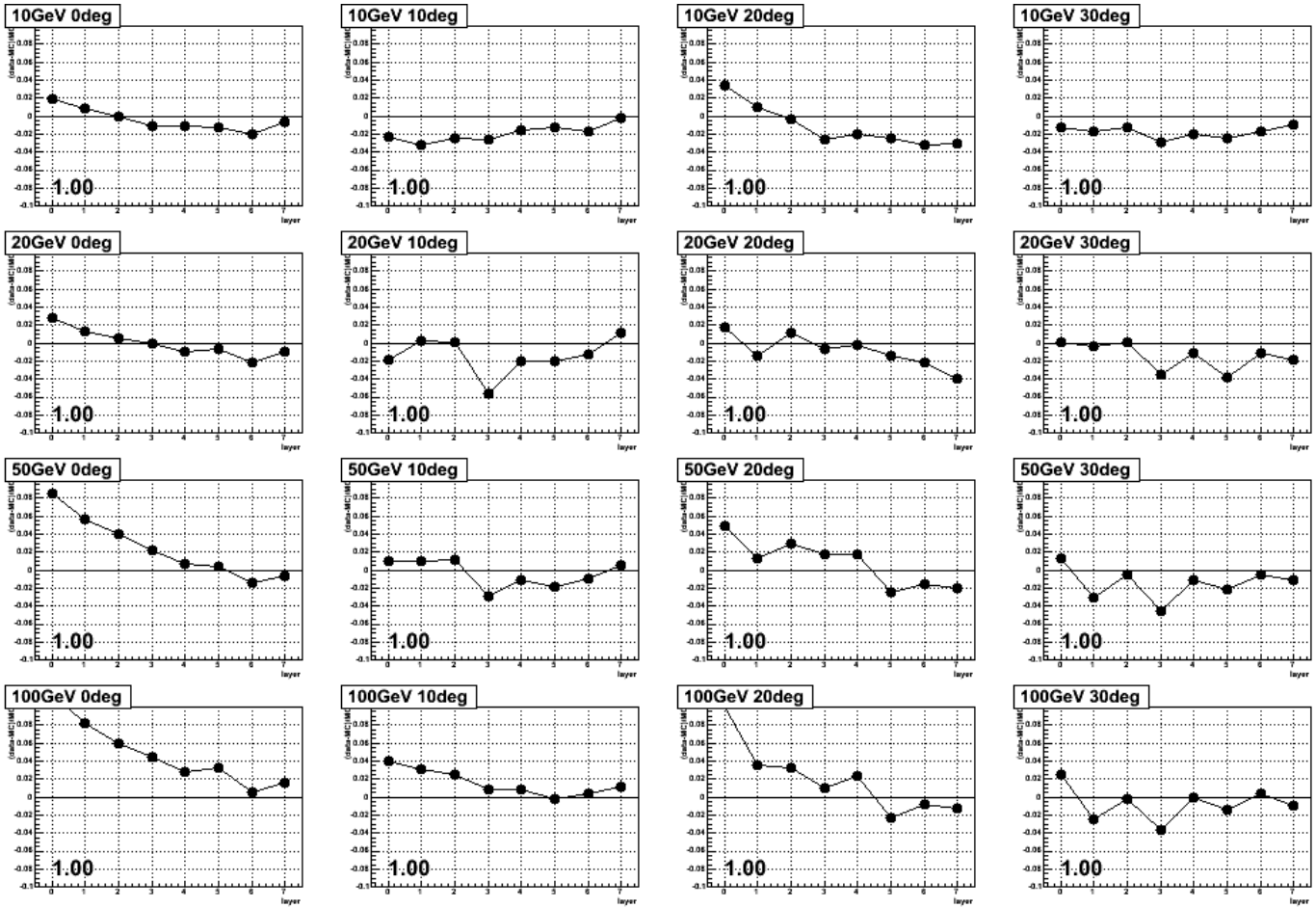
- Here we are in trouble…



Scenario 1 with P = 1 bar

Scaling factor = 0.92
P = 1 bar
Chi2 ~ 205

(data-MC)/MC as function of layer



Conclusions

- TkrTotalHits would require 1 bar = 0.05 X0 upstream the CU
- Layer Energies would require P(θ) (scenario 3)
- Btw, in scenario 3, all P(θ)>1 bar : at least compatible with TkrTotalHits requirement
- But it is hard to imagine how the amount of extra material between tracker and Cal could depend on the angle
- 200 and 280 GeV are still interesting
- All this would not solve the CalTransRms discrepancy…