

#### Gamma-ray Large Area Space Telescope



# 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 XO

## 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 XO, but P(E>=20 GeV) = 0
- 3. One scaling factor and  $P(\theta)$ 
  - 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  $P(E,\theta)$

## Scenario 1

beamtest meeting

Scaling factor = 0.93P = 2.07 bars Chi2 ~ 135

(data-MC)/MC as function of layer



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# Scenario 4 (in blue)

10GeV 10deg

0.05

Scaling factor = 0.93 Chi2 ~ 52

(data-MC)/MC as function of layer





















2.08

---- 2.07

## Scenario 4

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



# Scenario 3 (in red)

Scaling factor = 0.93Chi2 ~ 79

scenario 2 : Chi2 ~ 120

(data-MC)/MC as function of layer







2.58

2.58

2.58

2.81

1.73

2.62









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1.41

# 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

10GeV 20deg

10GeV 30deg

10GeV 10deg

10GeV 0deg

0.06 áo.osĘ 8 0.04 0.02 0.02 -0.02 -0.04 -0.04 -0.04 ans 1.00 -0.06 -0.05 -0.08 -0.08 1.00 1.00 1.00 -0.08 Scaling factor = 0.9220GeV 0deg 20GeV 10deg 20GeV 20deg 20GeV 30deg P = 1 bara.06 0.06 20.06 0.06 Chi2 ~ 205 ana ana ana ana 1.00 -0.02 -0.04 -0.04 -0.04 -0.05 -0.05 ---- 1.00 ····- 1.00 ···· 1.00 (data-MC)/MC as 50GeV 0deg 50GeV 10deg 50GeV 20deg 50GeV 30deg 0.08 0.08 0.06 0.05 0.05 10.06 0.04 function of layer -0.02 -0.04 -0.04 .0.04 .0.04 ···· -0.06 -0.06 1.00 -0.08 بسبيت أستاده ستستبقيه \_\_\_\_\_\_ 100GeV 0deg 100GeV 10deg 100GeV 20deg 100GeV 30deg UNI(0.08 0.02 0.02 -0.02 -0.02 -0.04 -0.04 -0.04 -0.06 -0.06 -0.05 -0.06 1.00 1.00 -0.08 -0.08 ياسب إستياسي المعالية المعالمة المعالمة المعالية المعالية المعالية المعالية المعالية المعالية المعالية المعالية .as<u>6.j....j....j....j....</u> 

# 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...