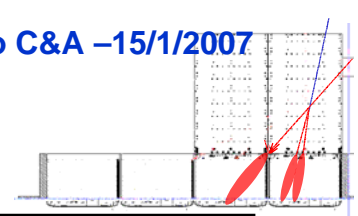


Beam Test analysis update

News from the Beam Test Team
C&A Meeting – 15 january 2006



GSI Test Program

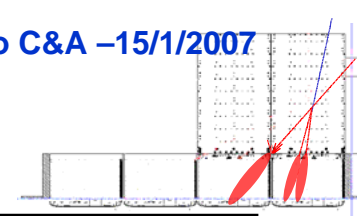


☐ News

- Next F2F meeting at SLAC on 9 february
- 4 contributions submitted to GLAST Symposium
 - General BT overview talk
 - CU response to background
 - CU performance
 - CU response to heavy ions
- Test report submitted to CERN on 16 december

☐ First round of mass simulation completed (Francesco, Johan, Luca B, Carnelo)

- Latest MC with
 - Correct W thickness
 - Air not vacuum inside CU
 - SPS beam line material reviewed (minor changes)
 - + geometry, physics list, particle cuts
- > 900 good runs
- > 300 different configurations (particle, energy, angle, impact point, geometry)
- 124 simulated (see table for detailes)
- Future round easy to run
 - Automatic script and JO generation in place
 - Special configurations to be handled by hand taken care

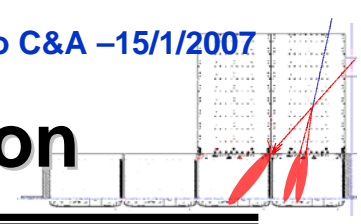


Mass simulated data

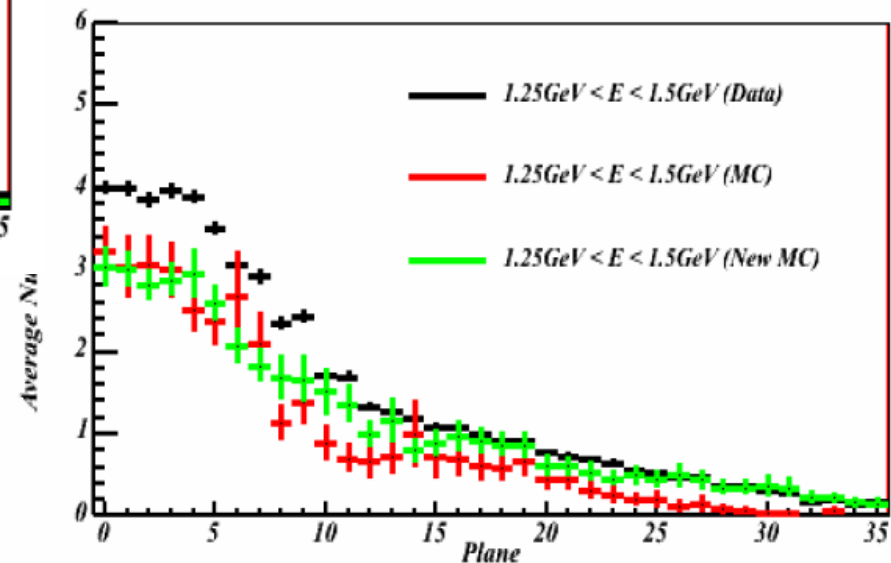
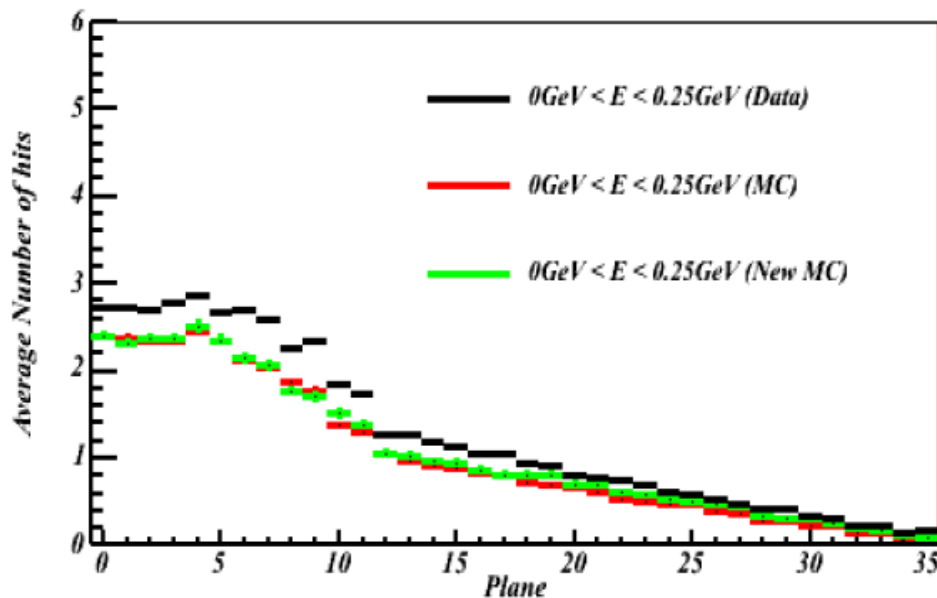
Site	Particle	Energy	Angle	Position/comments
PS	Full-brem	2.5	0,30,50,-215	Twr3 only
PS	Tagged g	0.5,1,1.5 ,2.5	0,10,20,30,50	Twr3 only
PS	e+, e-	1		e- for comparison, both setups
PS	e- scan	5		43 configurations
PS	p	6,10	0,30,60,90	Including runs through MMS
SPS	e-	10,20,50 ,100,200 ,280	10,20,30,45,60 degree	same position - twr2 can we give up 20 and 45 degrees?
SPS	p	20,100	0	



First look at MC massive production

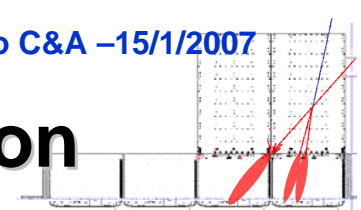


- ❑ Hit comparison for photon runs at PS (Monica B)
 - New (green) and old MC (red) do not differ so much
 - MC still fewer hits than data (black) on whole spectrum



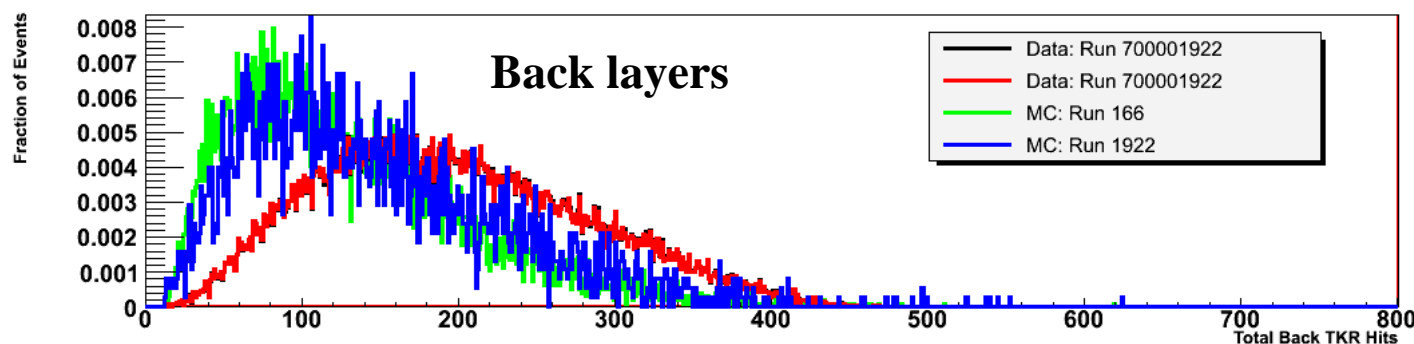
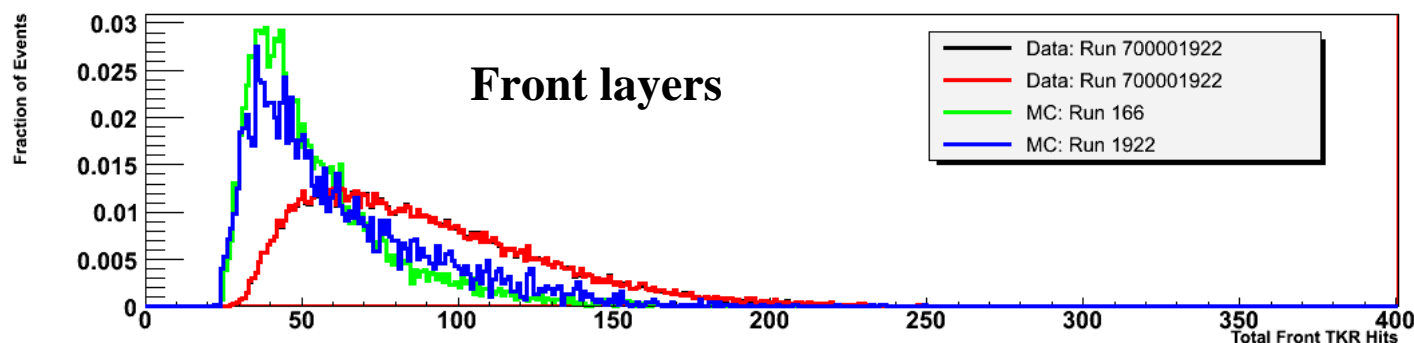


First look at MC massive production



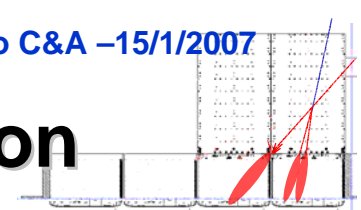
- ❑ Hit comparison for electrons at SPS (Nicola M, Claudia M)
 - New (blue) slightly better than old MC (green) with increasing energy
 - MC still fewer hits than

e 280 GeV

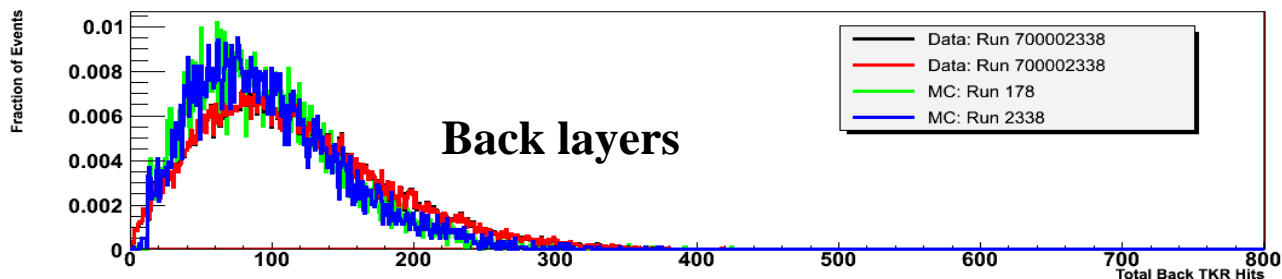
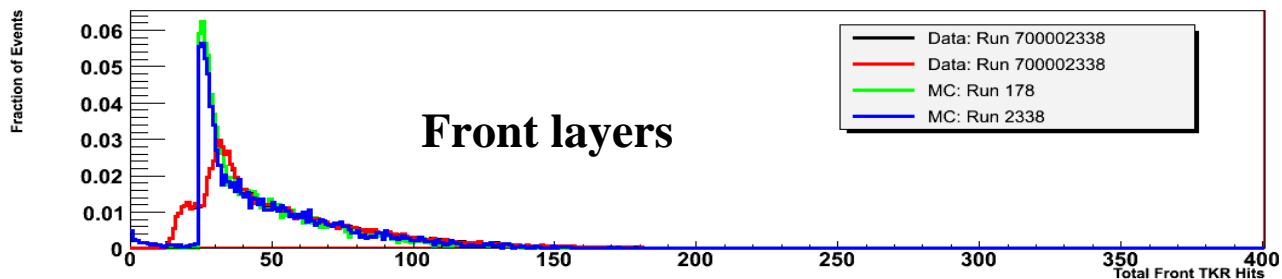




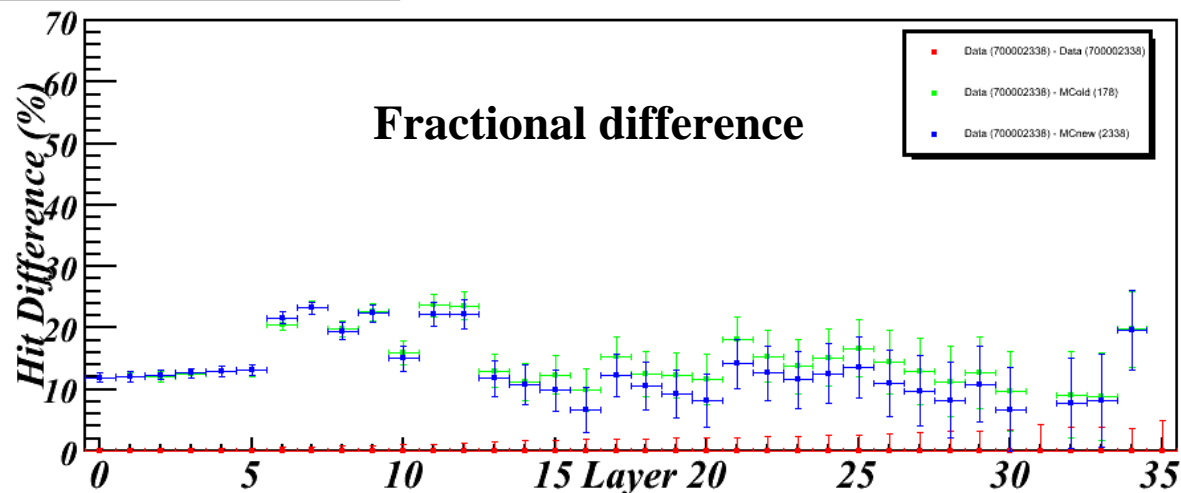
First look at MC massive production



e 10 GeV

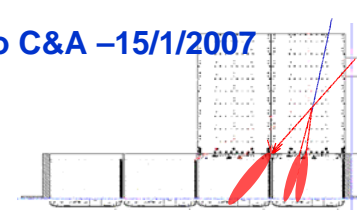


Electrons 10 GeV/c 0 deg -- TWR 2



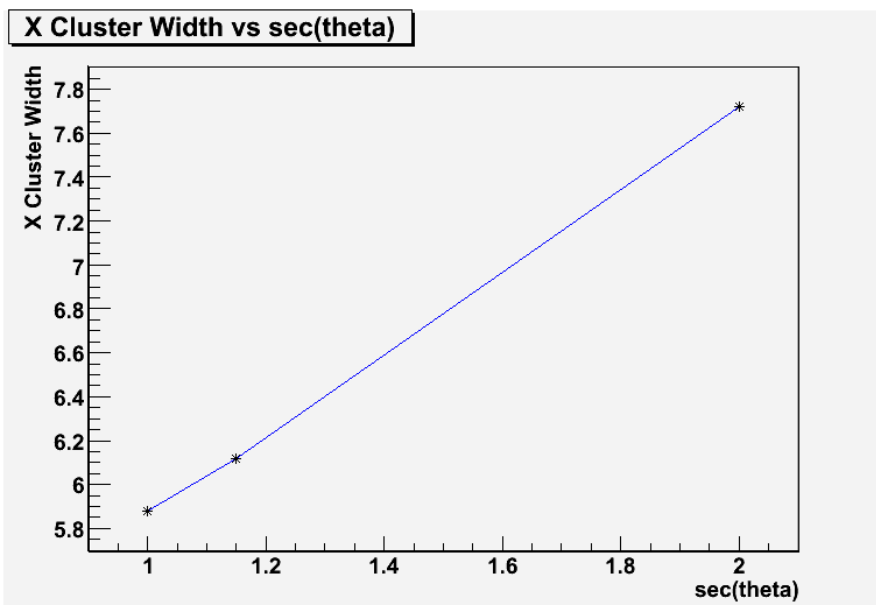


GSI Test Analysis

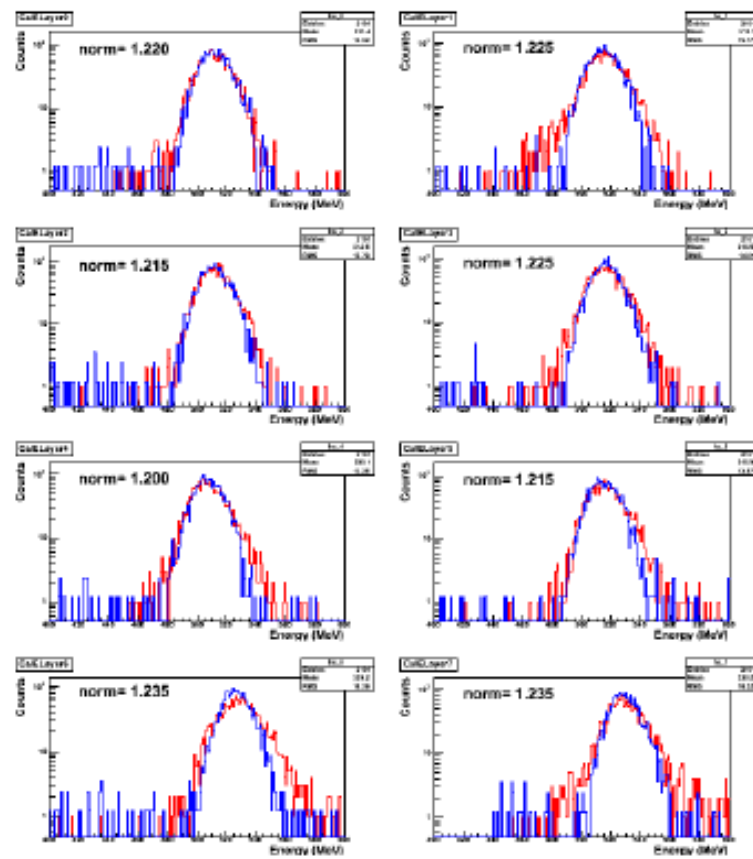


□ GSI results

- Large TKR clusters (x2 MC) with expected angle dependence (Leon, Bari)
- Same CAL quenching factors measured in 2003 (Thierry, Benoit)
- work on identifying secondary ions from Xe on target for TKR cluster, ACD calibration studies

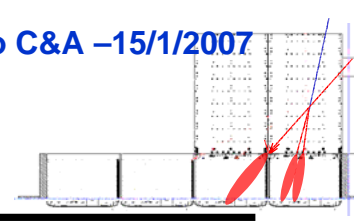


Run 2518 (~100 Hz)





Analysis status and prospects



❑ TKR: hit excess

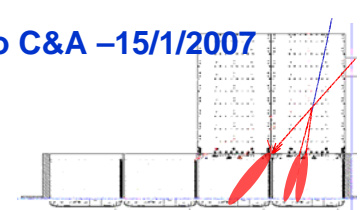
- No problems with very restrictive cuts on reconstructed clusters from I&T CR analysis
- Still there with bare hits also with new MC
- Need to work on digitization algorithm
 - Joint effort with new digi algorithm for heavy ions
- Tray standalone MC
 - verify effect of material distribution

❑ CAL: energy excess wrt MC

- MC has been investigated a lot
 - shower profile fitting
 - extra material along the beam line
 - Geant3 vs Geant4
 - physics list and parameters
 - Francesco is in touch with Geant4 experts of electromagnetic processes

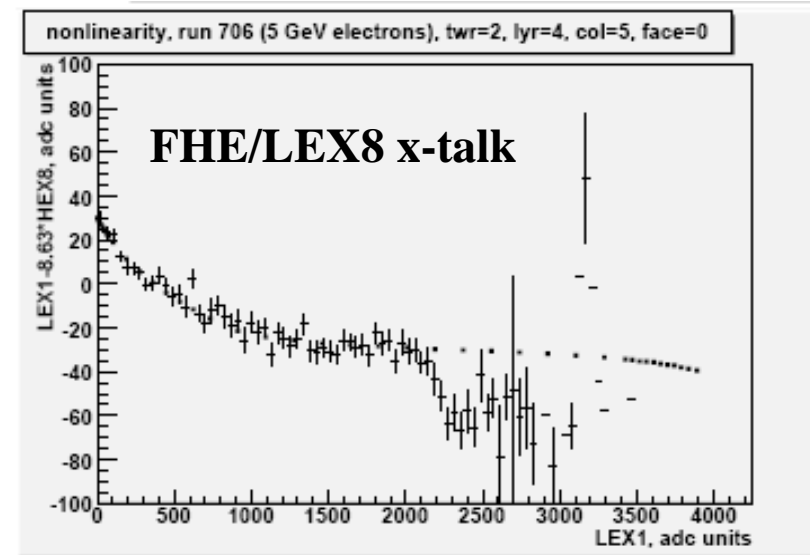


Analysis status and prospects



❑ CAL excess (cont'd)

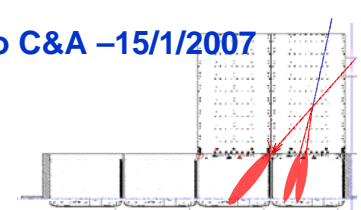
- it has become clear that we can NOT go forward without a stable and final calibration
- new source of cross-talk and non-linearity found by Sasha



- LEX1 nonlinearity on the axis of 5 GeV electron beam
 - Squares - charge injection measurement
 - Deviation at $lex1 > 2500$ due to FHE crosstalk in HEX8 (see previous slide)

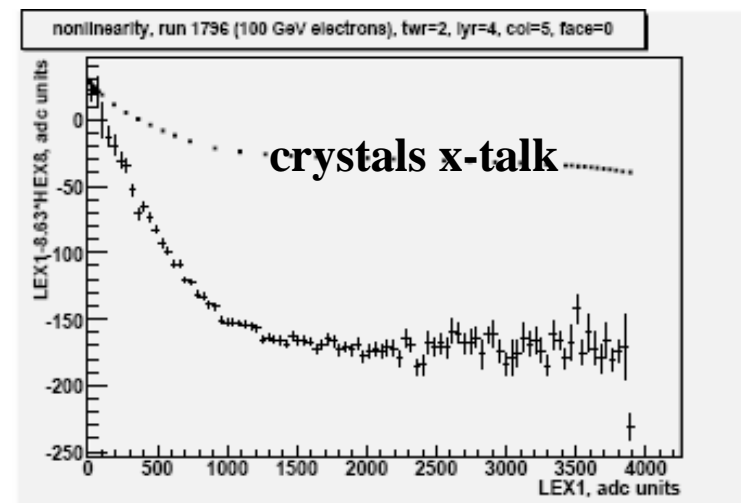


Analysis status and prospects



□ CAL excess (cont'd)

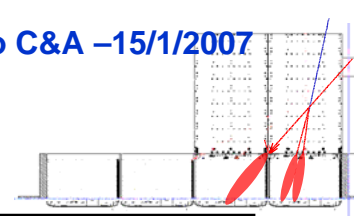
- Generate look-up-table for x-talk correction running special charge injection scans on the CU
- another non-linearity, which could account for the discrepancy we see, under investigation by Sasha (next beamtest VRVS meeting)



- When 100 GeV electron beam hits crystal 6 - nonlinearity curve for crystal 5 becomes very different from charge injection



Conclusions and prospects



☐ TKR

- Need to work on digitization algorithms

☐ CAL

- the beamtests have compelled us to understand better the electronics and the calibration of the calorimeter; but this work is not finished still and we need it to be fully completed in order to rely be able to go forward in the analysis of the beamtest data
- Beware that it has nothing to do with beam conditions and all this is valid for LAT calorimeters

☐ Next step will be moving to CU performance calculations