

ECAL Reconstruction /MC status

- Reconstruction
- MC
- MIP studies from January to August, KSC going on, ESTEC will be done also

S.Rosier Lees- Splinter meeting - 11 October KSC

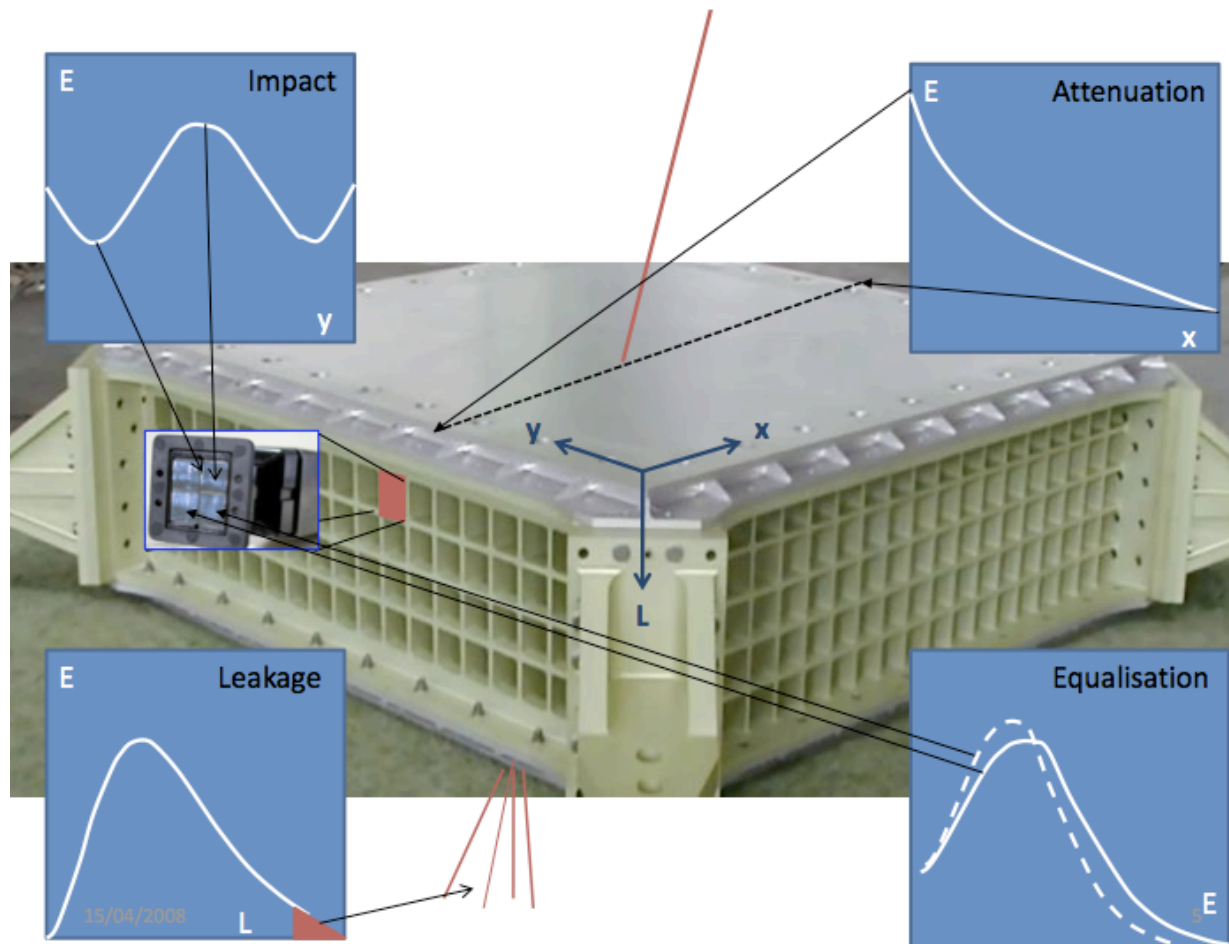
ECAL Reconstruction

From ADCs to MeVs

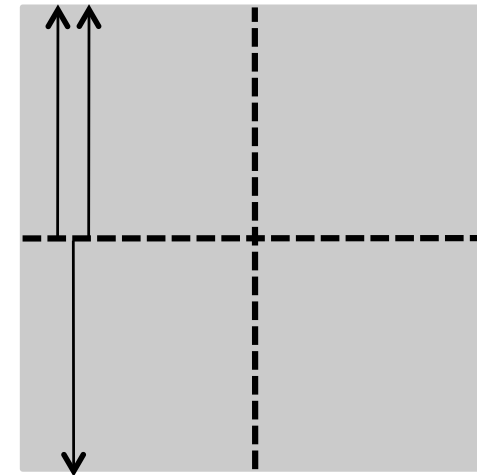
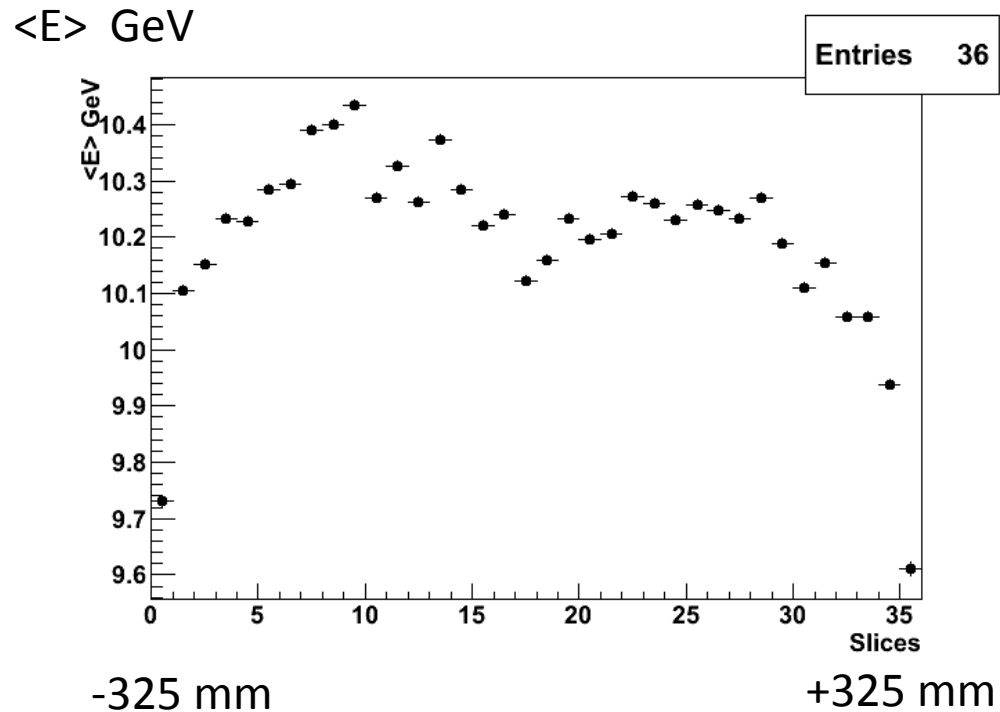
- Equalization factor
 - standard AMS EC – 2 others (PISA, LAPP)
comparison done, agreement within 2% (PISA, EC) by MI
- Gains (High gain/ Low gain)
 - standard AMS EC – 2 others (PISA(February), LAPP(Feb, Aug))
comparison within this week

Corrections (1)

Rear leakage, attenuation, impact position, done in Standard AMS EC, but also in the ECAL group with 2007 TB data



non uniformity correction (2) (CG-Test Beam 2007 data)



Scan along X @
10 GeV
30 GeV
150 GeV

300 MeV modulation along X : 3% ,

Correlation with layer depth measurements in PISA, to be checked (corrections going on)

ECAL Reconstruction (2)

From ADCs to MeVs

- Corrections
 - standard AMS EC – 1 other (from TB 2007)
comparison and implementaion within 1.5 month
- Calibration
 - Linearity, Energy resolution
within 2 months
- Cluster reconstruction
- Electromagnetic discriminant variables (e/p) rejection (cf testbeam analysis)

Monte Carlo

From ADCs to MeVs

- Geant3
 - Deep studies performed in Pisa (MI et al) comparing the longitudinal profile of the EM showers,
 - good agreement have been obtained after some modifications
 - MC data needed for the TB data taken in 2010
- Geant4
 - A standalone program has been developed at LAPP, for TB 2007 data/ MC comparisons. Need of further Xchecks (geometry)
- Systematics comparison between Data and MC, need to be done (3 months)

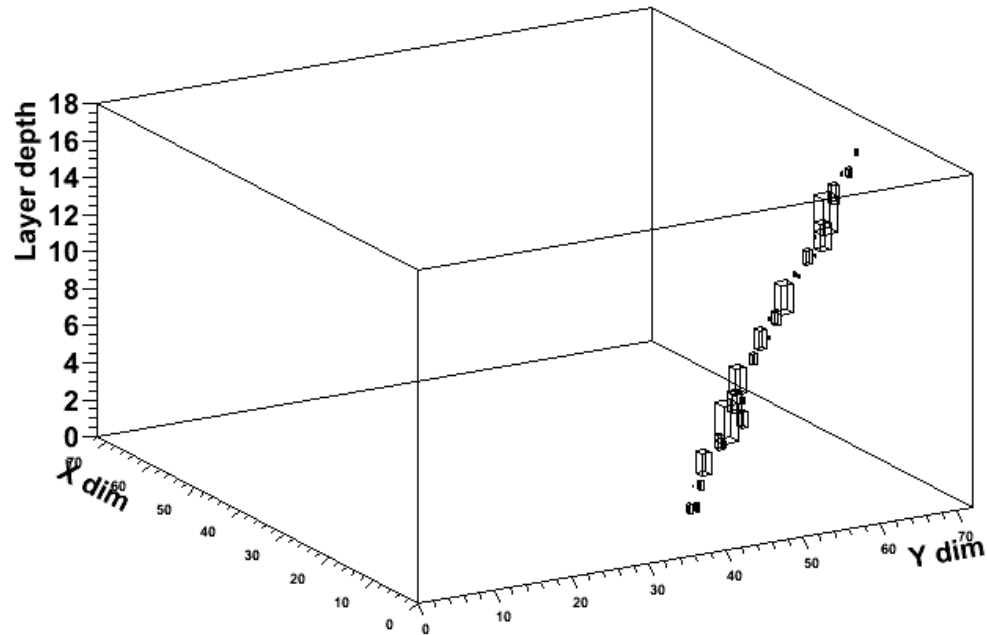
Cosmics data

Some MIP comparisons

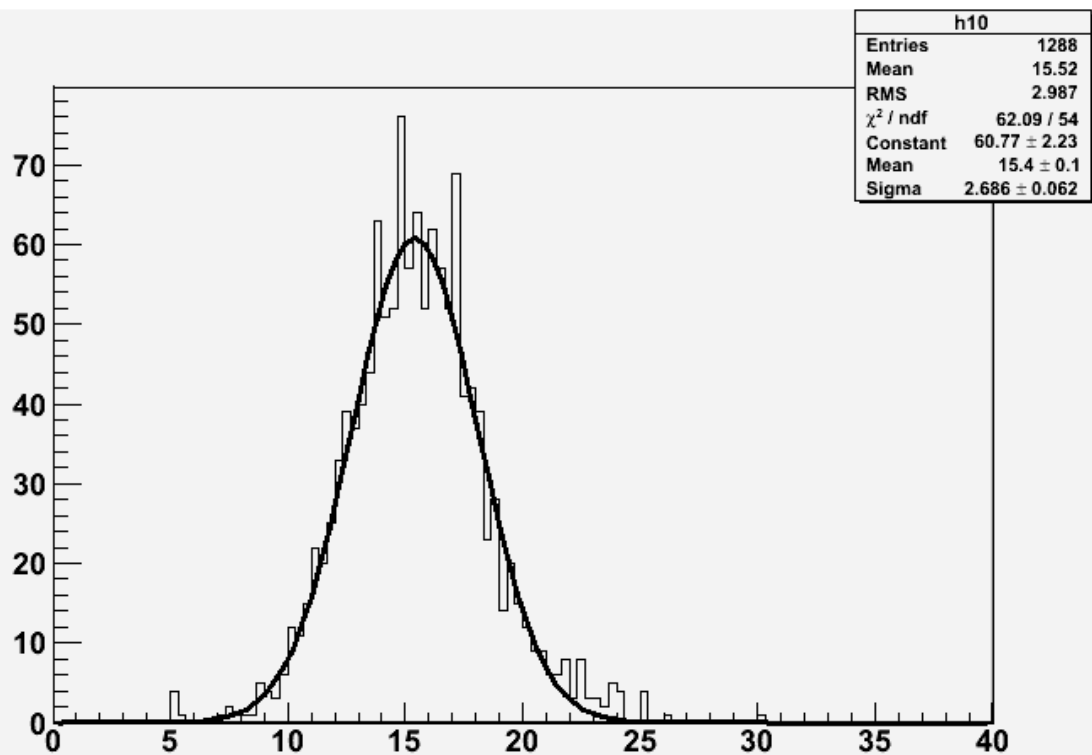
- MIP in January SuperConductiong magnet on, after HV settings and before Testbeam from In the clean room (LAPP)
- MIP in end of July in the Clean Room, permanent magnet, vertical position (LAPP)
- MIP during test beam in vertical position (no beam) (other track selection Pisa)
- Could we test equalization algorithm in space ?

MIP selection

Ecal High Gain (run:5 event:2000)



- On cosmic muons
- Track selection (2 different selection uts)
- Same Trigger configuration (TOF)



January (SC Magnet)

$\langle \text{MIP} \rangle = 15.4$

Spread 16-17 %

July (Permanet Magnet)

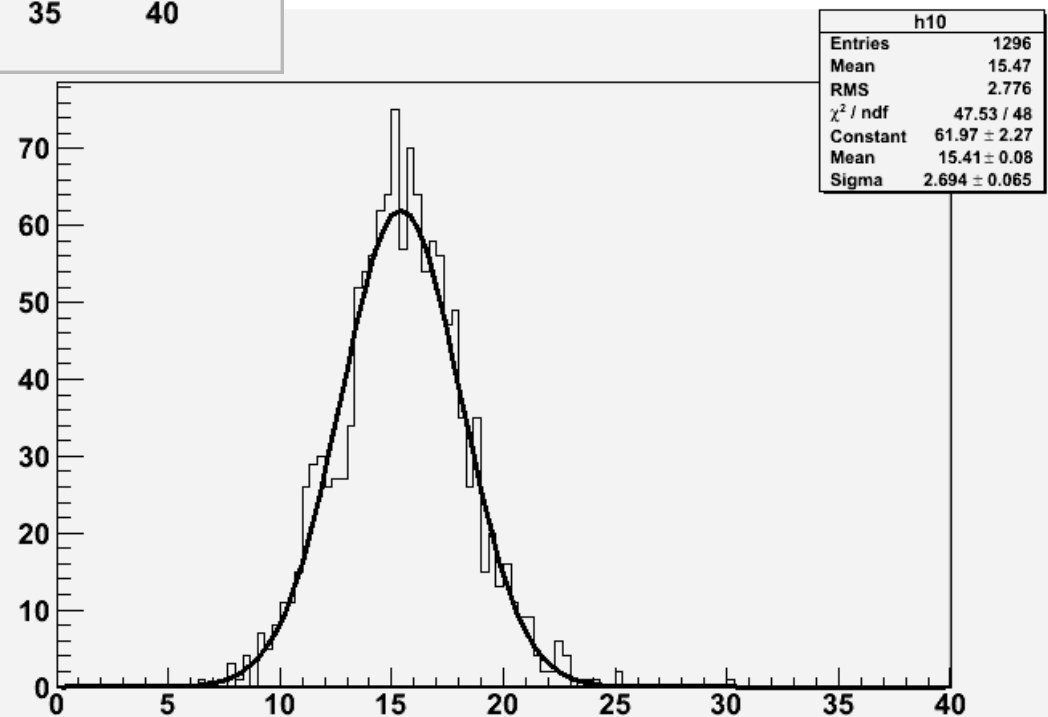
$\langle \text{MIP} \rangle = 15.4$

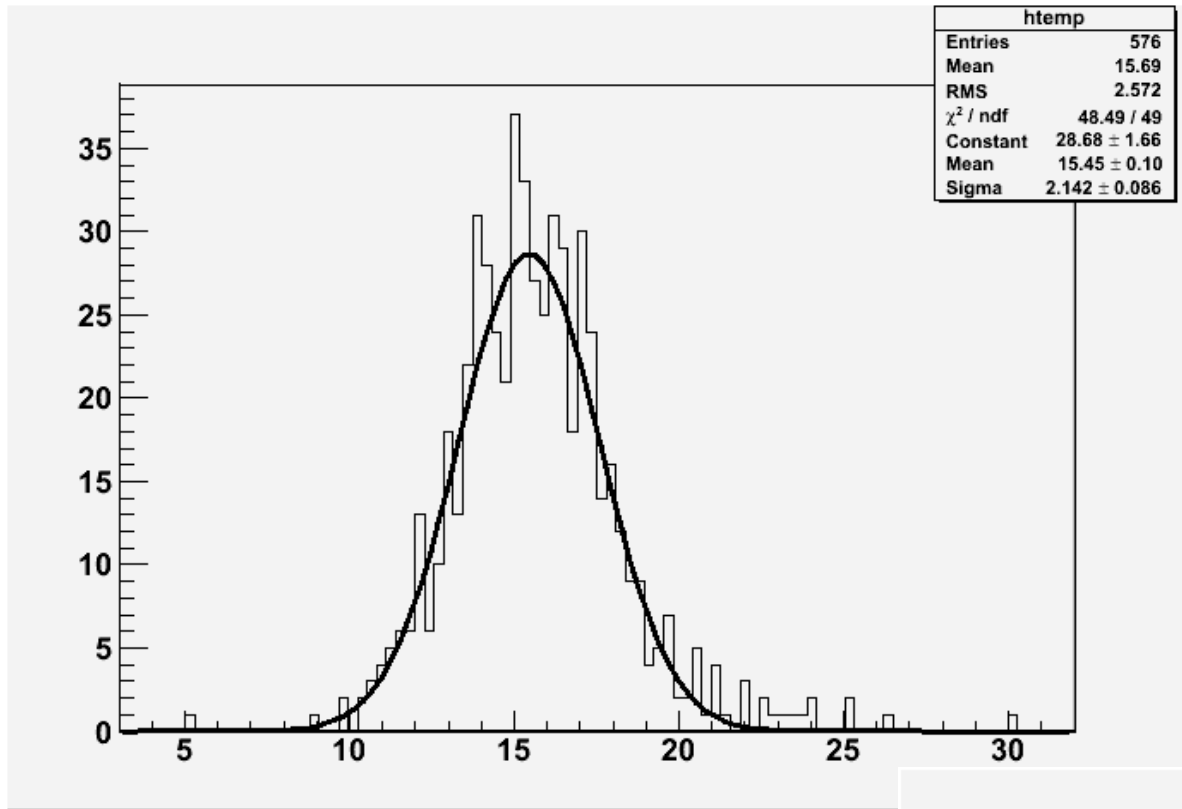
Spread 16-17 %

August (Permanet Magnet and vertical at testbeam)

$\langle \text{MIP} \rangle = 15.4$

Spread 16-17 %





January X view

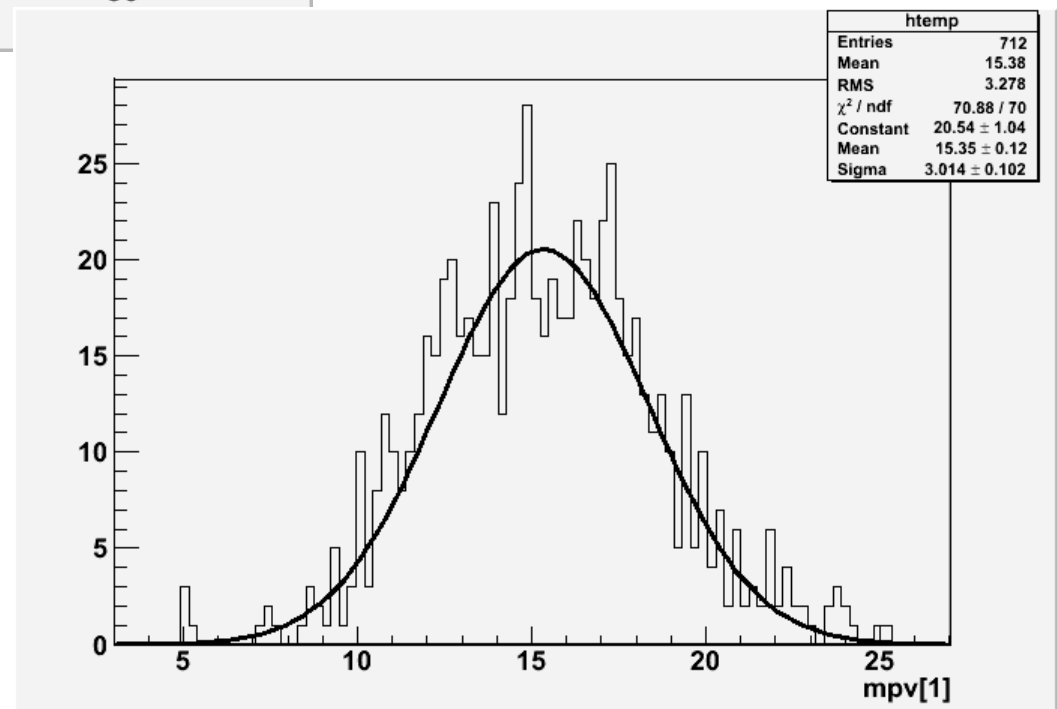
$\langle \text{MIP} \rangle = 15.45$

Spread 14-15 %

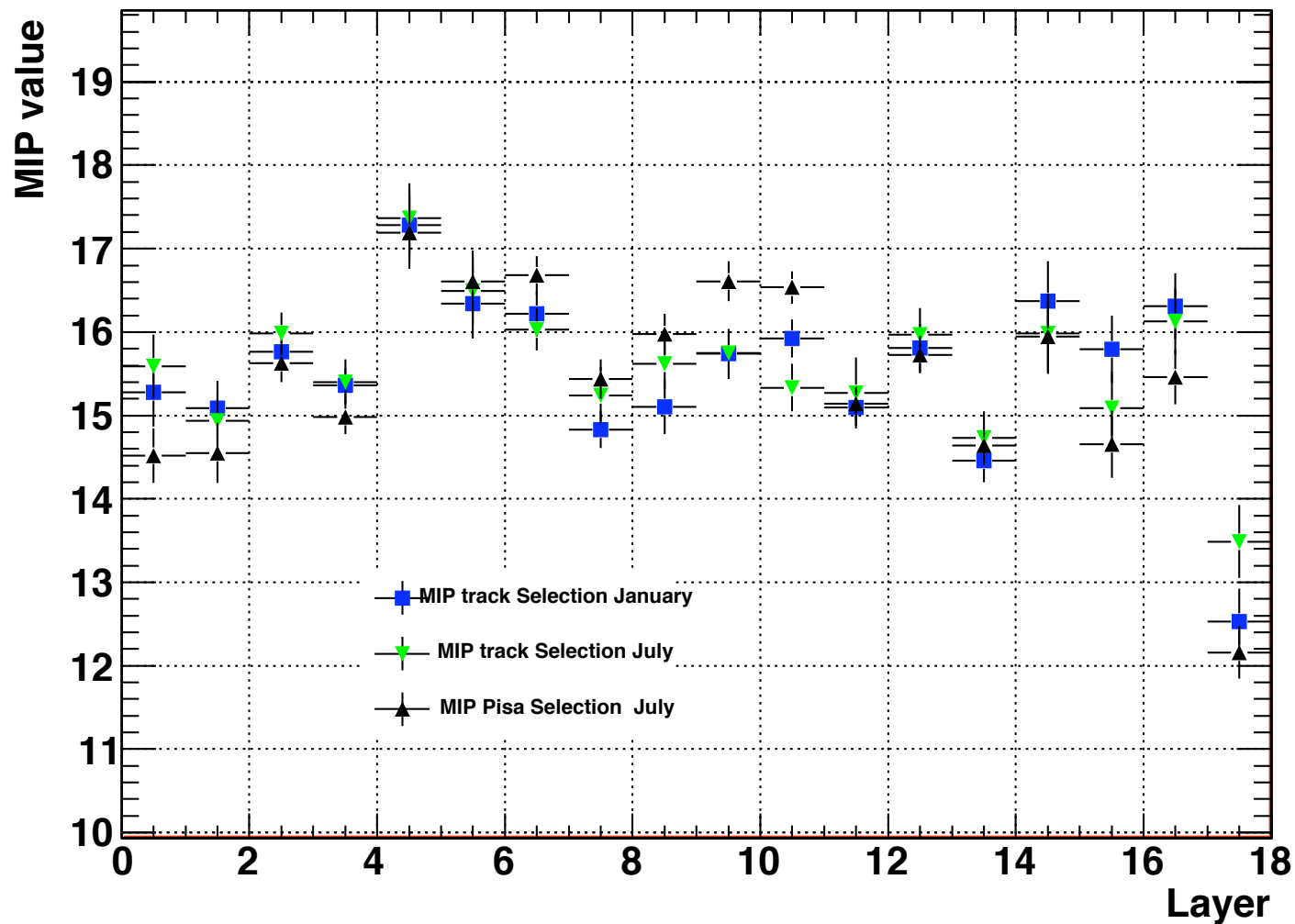
January Y view

$\langle \text{MIP} \rangle = 15.35$

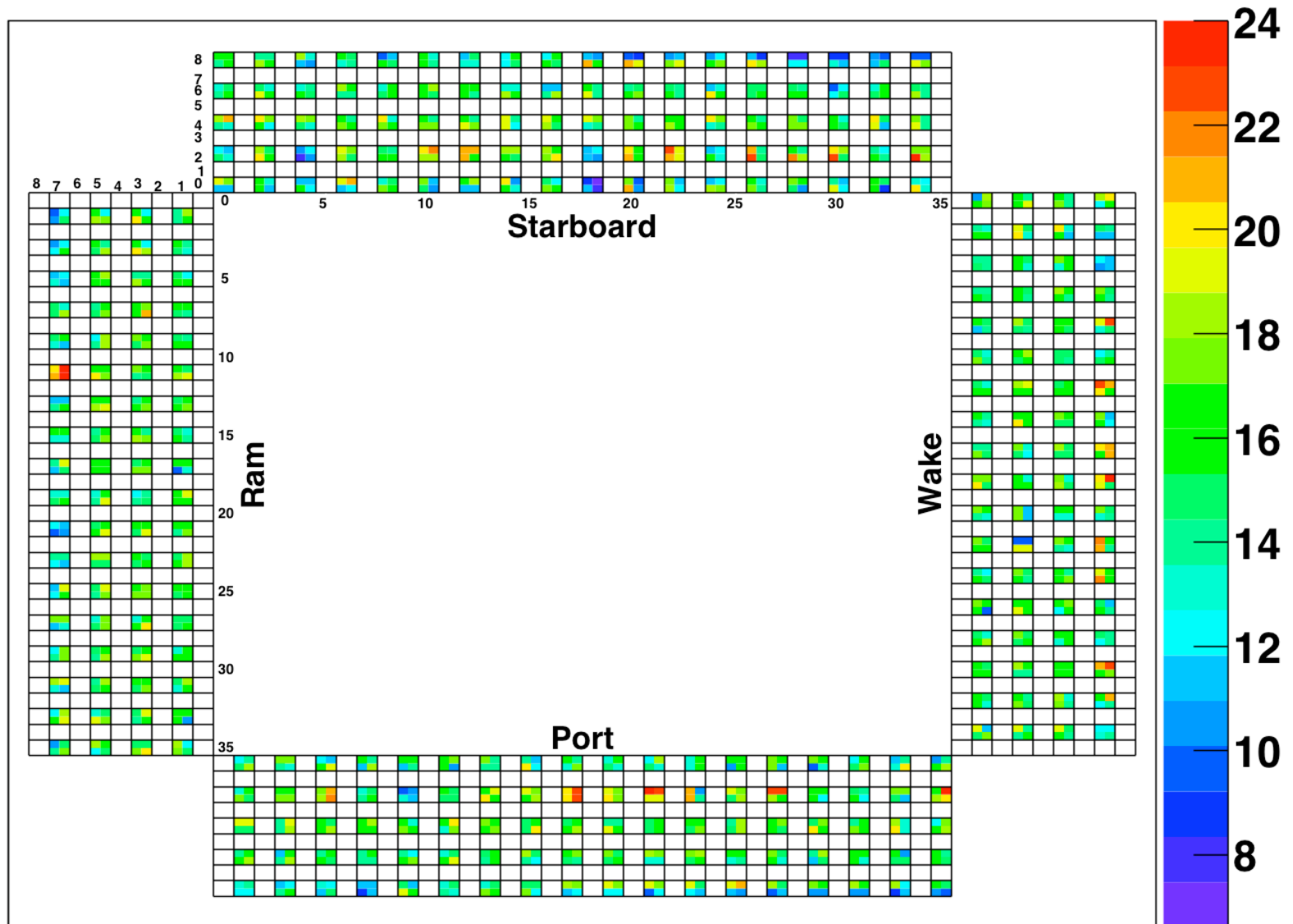
Spread 19-20 %



Comparison of the samples with respect to the layer



Same behaviour for the 3 samples,
Absolute value depends on the selection, statistics but relative correction ($mip / \langle mip \rangle$), all measurements agree within 2 %

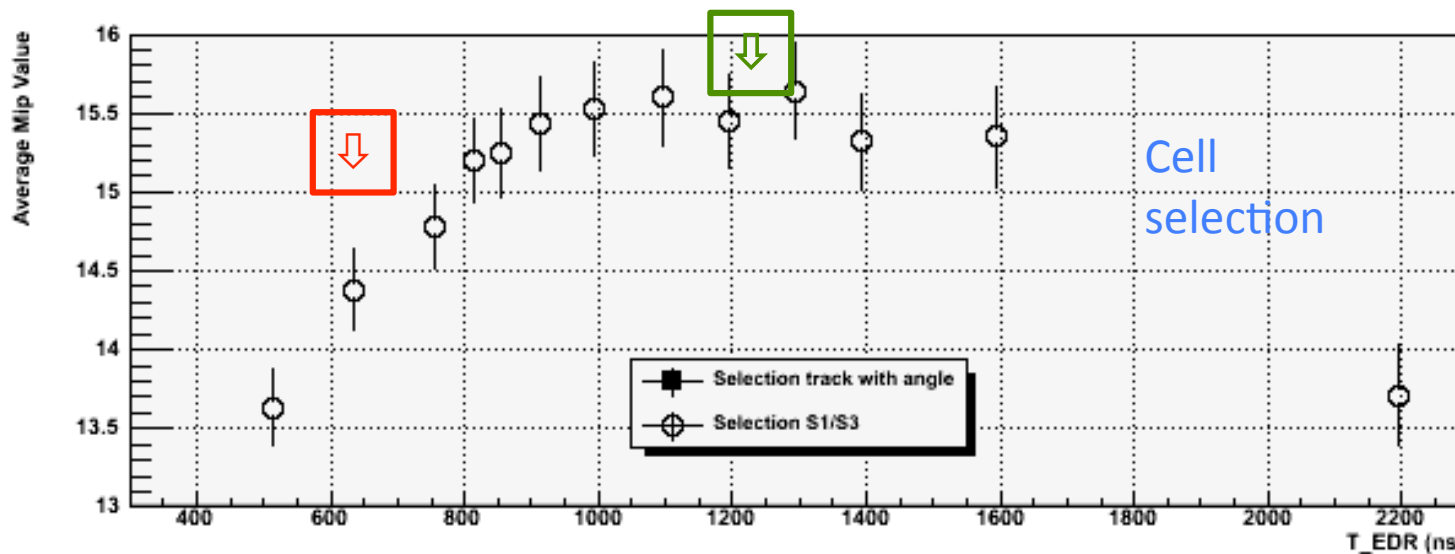
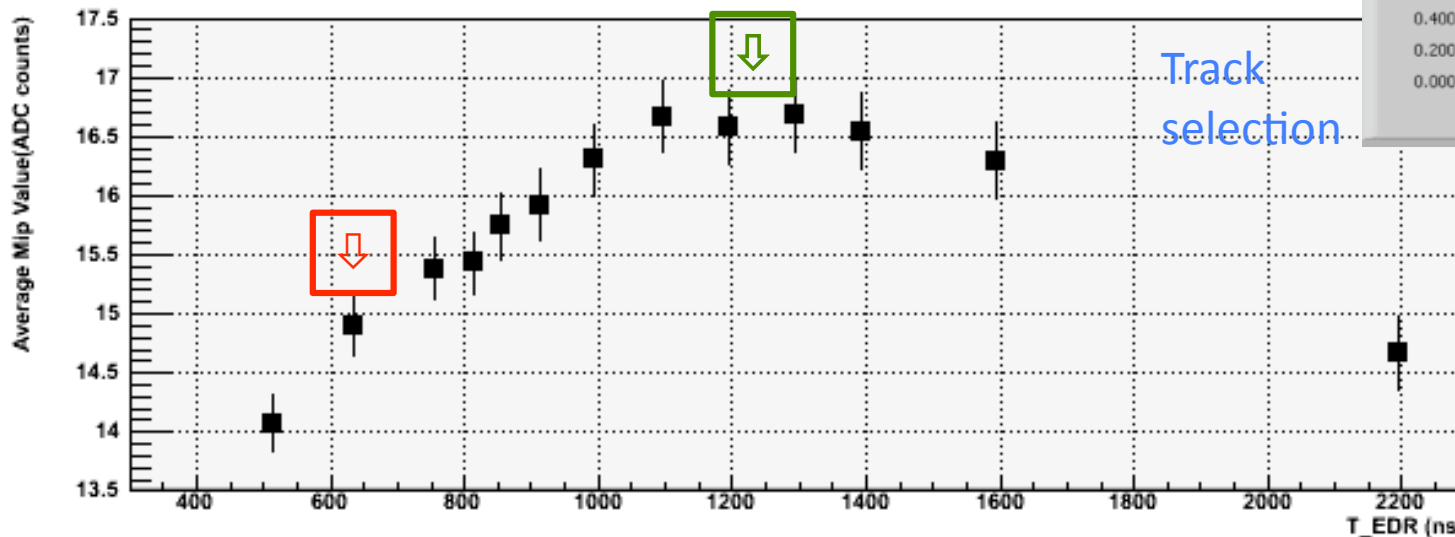
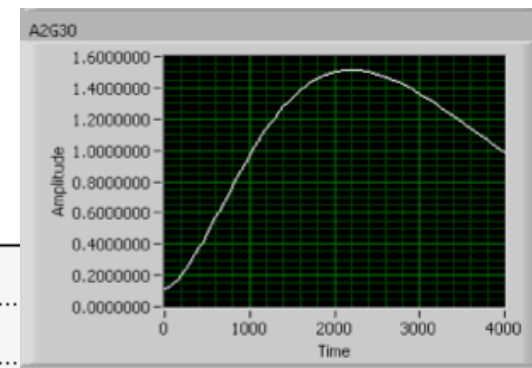


MIP August Testbeam, vertical position,
PISA Track selection

Algorithm for equalization in space

- Goal : optimize the selection and the statistics needs to reach an equalization with a precision at the level of few %.
- How to do this with KSC comics data ?
- External conditions are stable, unless we change some reading FE configurations

Hold delay tuning



Both methods reproduce the shaping curve !

Within the same Trigger configuration, could be sensitive to an overall relative variation of few %
With cone dedicated runtag



New reference $\tau_{EDR} = 1240$ ns



Old reference $\tau_{EDR} = 640$ ns