



# Updates from PMD Offline Week : 15-19 Nov'10

Overview  
Bugs and Software Update  
Simulation  
Detector Performance  
Summary

PMD-Offline

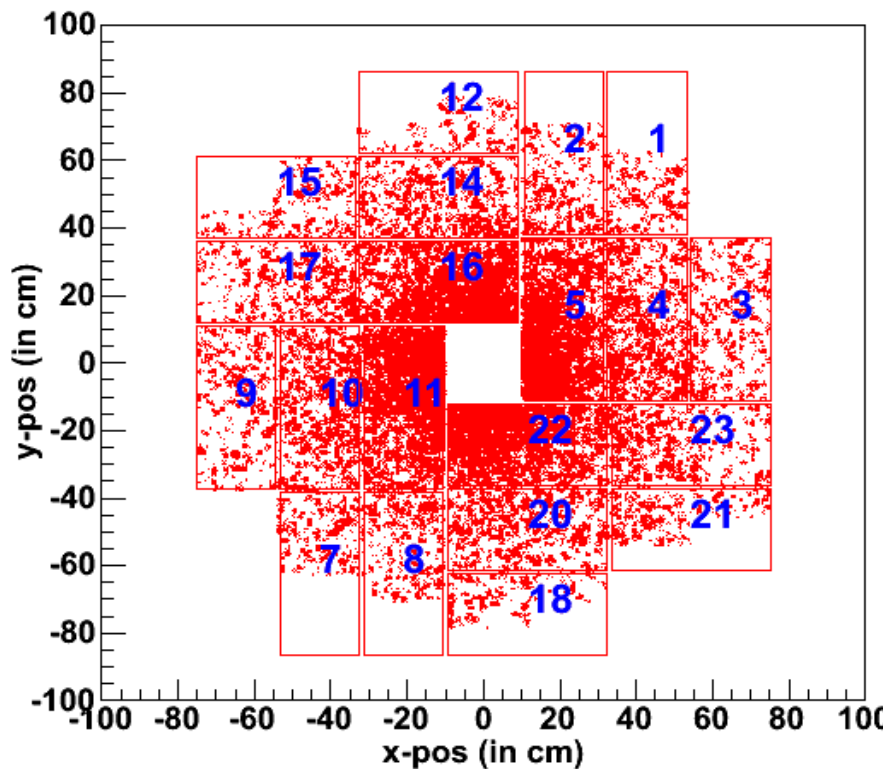
*Satyajit For PMD Collaboration*

PMD-Offline

*Satyajit For PMD Collaboration*

# Overview....

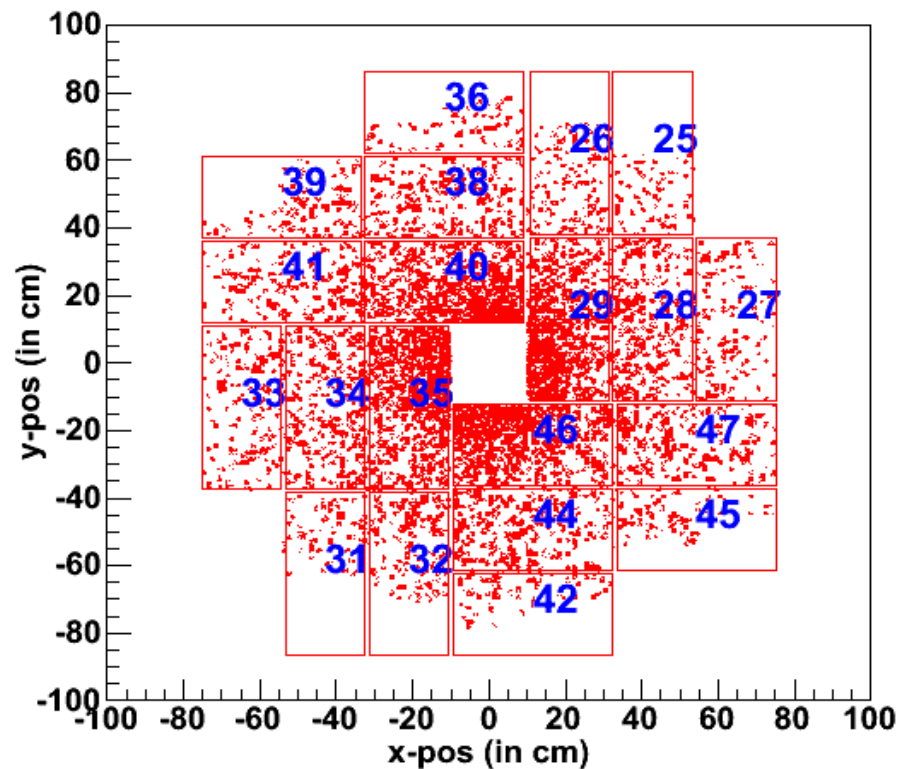
2



**No. of DDLs : 2**

DDL # **2304** for module #  
**1, 2, 3, 4, 5, 18, 20, 21, 22, 23**

DDL # **2305** for module #  
**7, 8, 9, 10, 11, 12, 14, 15, 16, 17**



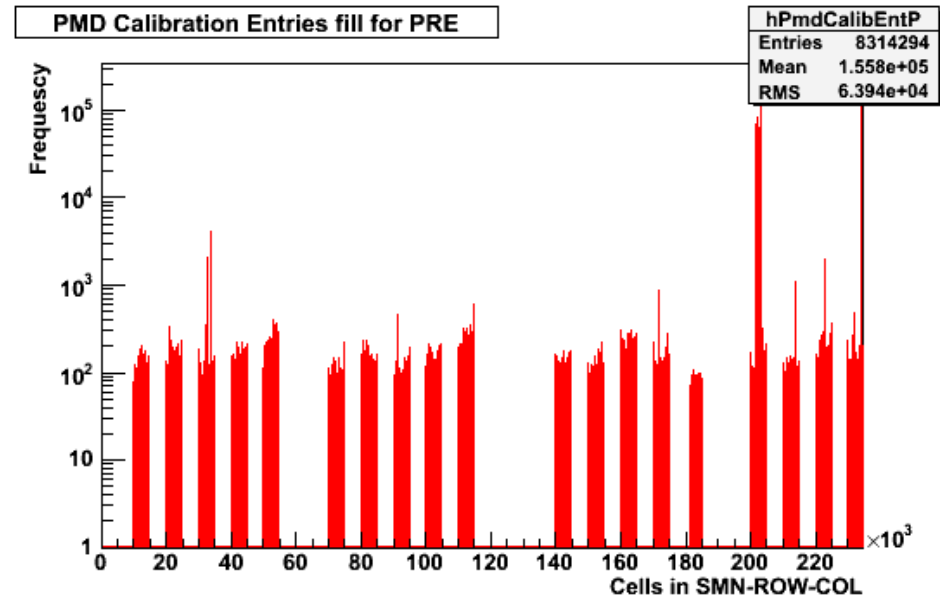
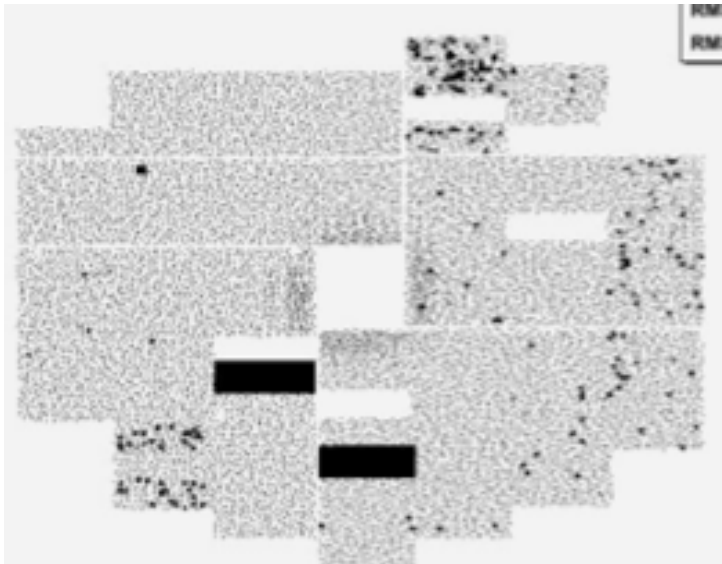
**No. of DDLs : 2**

DDL # **2308** for module #  
**25, 26, 27, 28, 29, 42, 44, 45, 46, 47**

DDL # **2309** for module #  
**31, 32, 33, 34, 35, 36, 38, 39, 40, 41**

# Status At P@2

3



92% of PMD Coverage is Working for PRE-Shower

Where as ~60% Coverage is in CPV

Repair of chains and module in winter shutdown

# Bug reports and Fixes

4

- #74633 Creation of simulated raw data crashes in PMD
- #74116 Request to Update Pmd CDB to Release
- #74022 Update PMD mapping CDB object AliRoot sjena
- #73999 No valid CDB object found: PMD/Calib/Ddlnfo
- #72757 Request to port PMD code to v4-19-Release
- #72670 Request to port PMD code to v4-19-Release
- #72560 PMD code crashes CAF reco
- #72505 Porting of updated services

2: Porting Request

3: CDB Update

3: Bugs

All are addressed and Closed:

# New Modules

5

- Coverity
  - Free from All Coverity Defects
  - Test ok now
- Analysis Module
  - 6 Classes to be Committed
  - A Document is ready (commit !!!)
- AliPMDddlinfoData
  - New Module to handle ddl-data into a CDB object
  - No ascii data input... ☺

# Simulation and Reconstruction

6

- Simulation:
  - We introduce a new parameter for conversion factor is called readout resolution
  - Discussed in slide#12
- Reconstruction:
  - Wrong approach was made to call CDBs by AliPMDUtility.. And later it is reported as bug
  - Corrected
  - Crashing for PbPb: ( fetching wrongly CDB object ): now solved...

# DQM:Calibration:Filtering Hot-Noisy Cells

7

- DQM:
  - Reduced Histograms number to 6.
- Calibration
  - No update
- Hot-Noisy Cells Removal
  - Hit frequency in eta bin over  $\rightarrow$  estimating threshold value for hot/noisy cells
  - Filtering of hot cells by this threshold and the Feeding back for reconstruction by Hot cell CDB object
  - To be ported SVN.

# Efficiency-Purity-Material Study

8

$$N_{\gamma like} = N_{\gamma}^{det} + N_{\gamma}^{split} + N_{\gamma like}^{others}$$

$$\epsilon = \frac{N_{\gamma}^{det}}{N_{\gamma}^{inc}} \quad p = \frac{N_{\gamma}^{det}}{N_{\gamma like}}$$

$$N_{\gamma}^{inc} = \frac{p}{\epsilon} * N_{\gamma like}$$

$N_{\gamma}^{inc}$

Number of Incident Gamma ( primary )

$N_{\gamma}^{det}$

Gamma Counted in ESD By PID

$N_{\gamma like}$

Cluster after photon  
hadrons discrimination



# Cont...

9

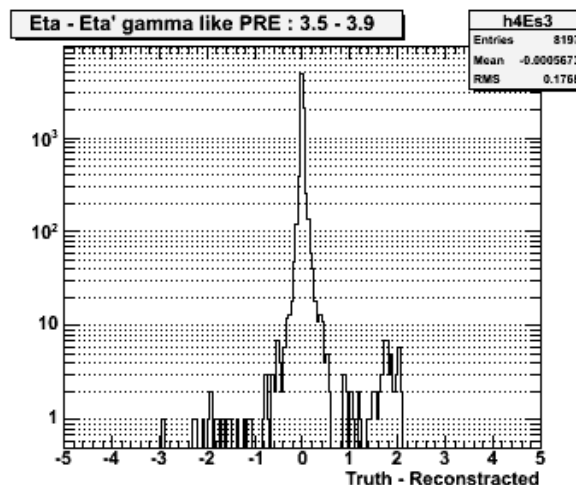
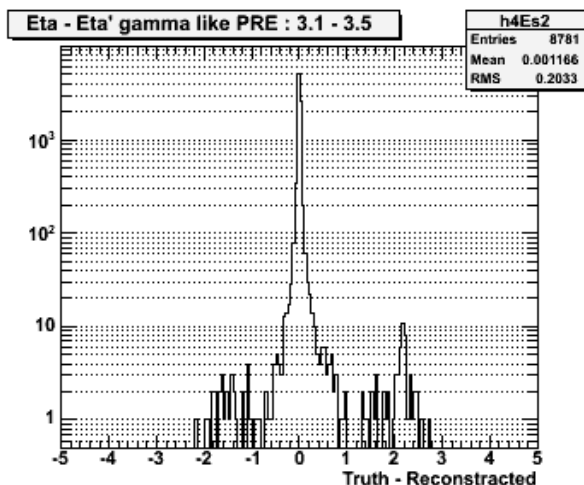
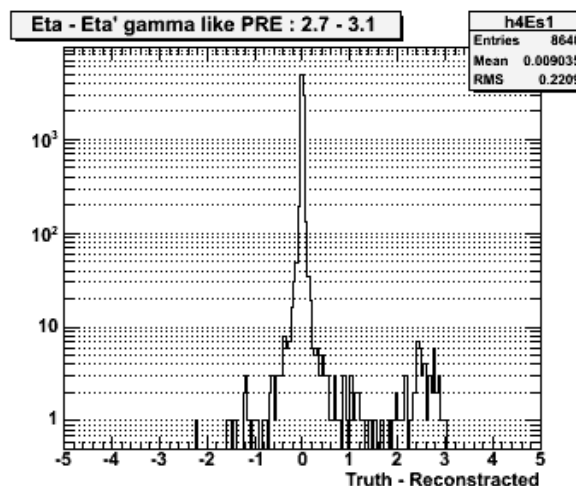
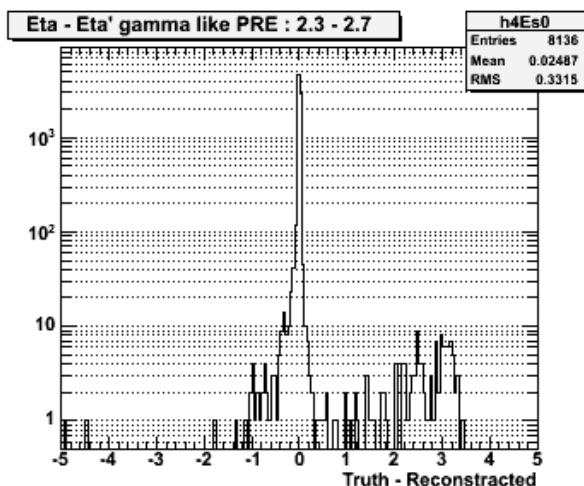
## Efficiency and Purity

-> Material Study ( upstream conversion)

-> **Splitting** of Clustering has to be estimated correctly

-> **Association** is applied.

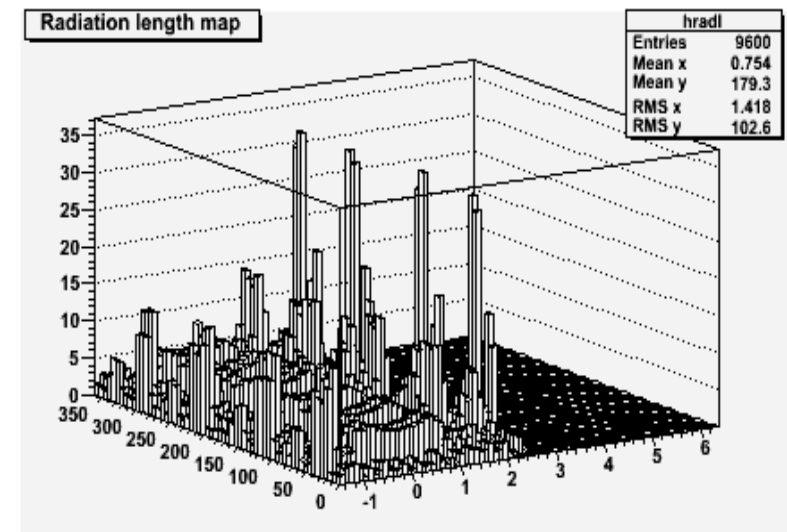
-> This needs to Have a separate track number assignment to unfold from splitting



# Requested Simulation:

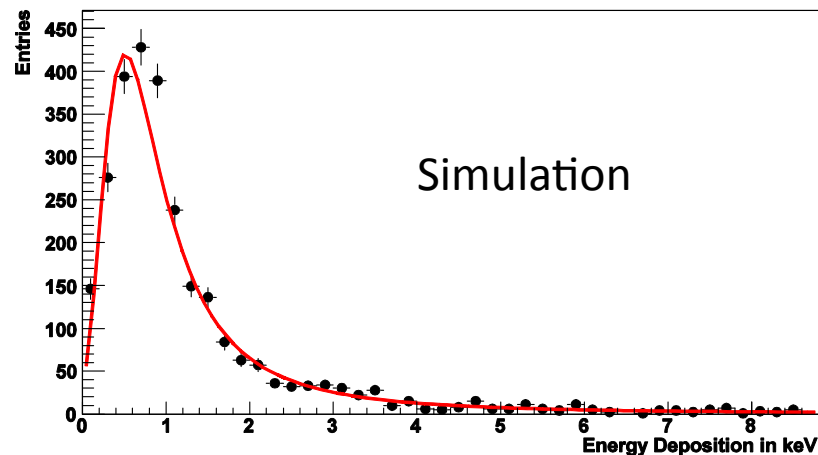
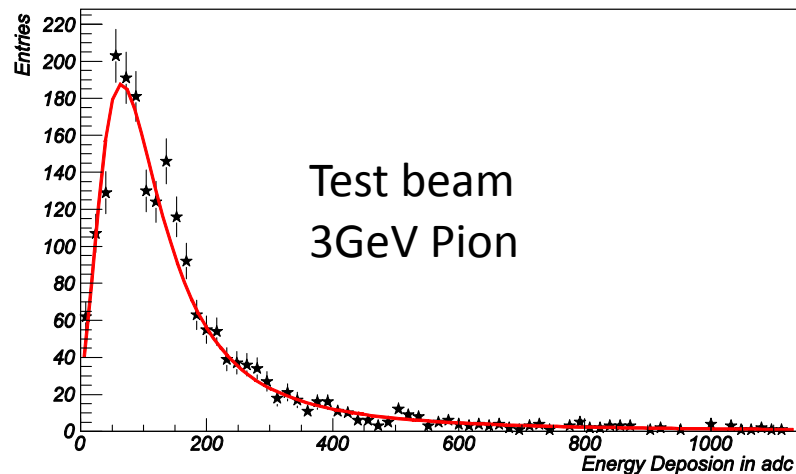
10

- **ITS Code is updated recently since v19-Rev-13**
- And we have one PP-7TeV Production
- The requested production must have **All Resonance->Decay ON** and would be needed for efficiency purity calculations
- Requested:(25/10/2010)
- 2 conditions
  - (all detectors / PMD only) x
  - 2 energies (900, 7000 GeV) x
  - 2 generators (PYTHIA, Phojet)
  - One Million of Events for each Case.
- PWG2 Task id **#229** and **#230**
- We need similar production for Heavy Ion



# Detector Performances...

11

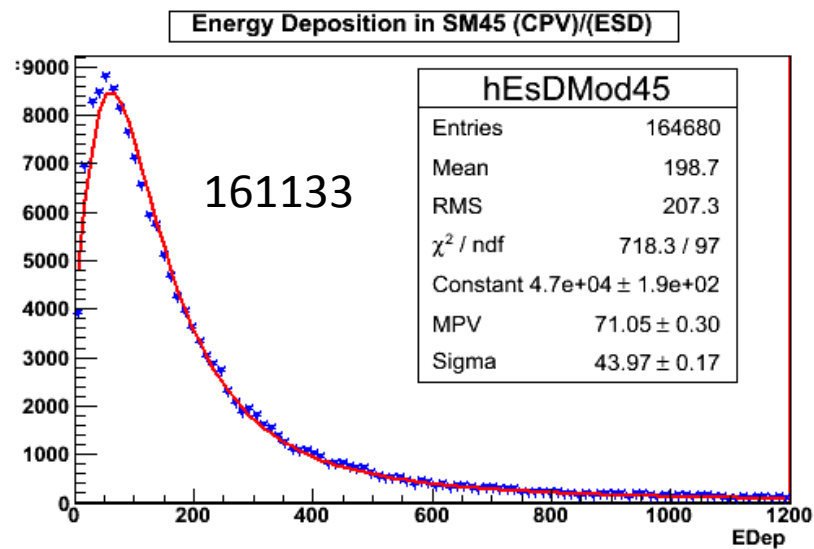


## MPV

Simulation : 0.56KeV

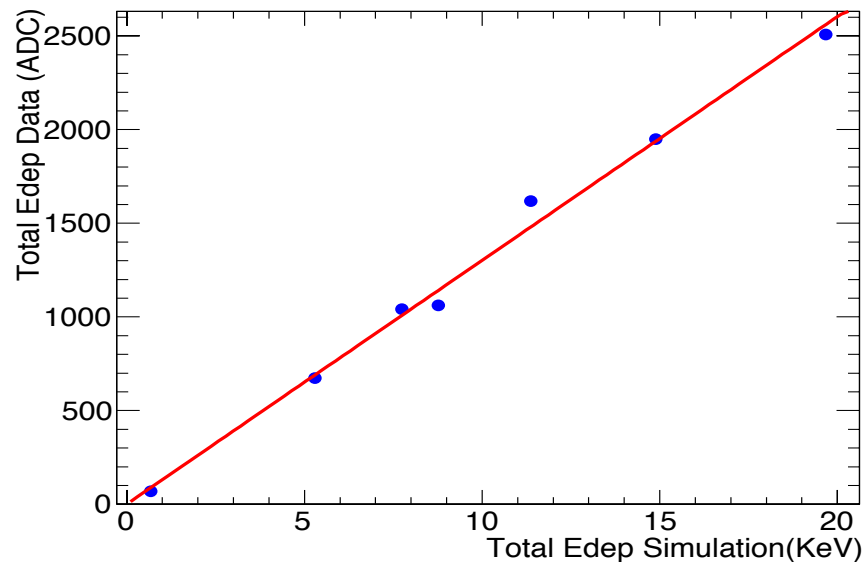
Test beam : 72 ADC

HI First Data: 71 ADC



# Test beam...

12



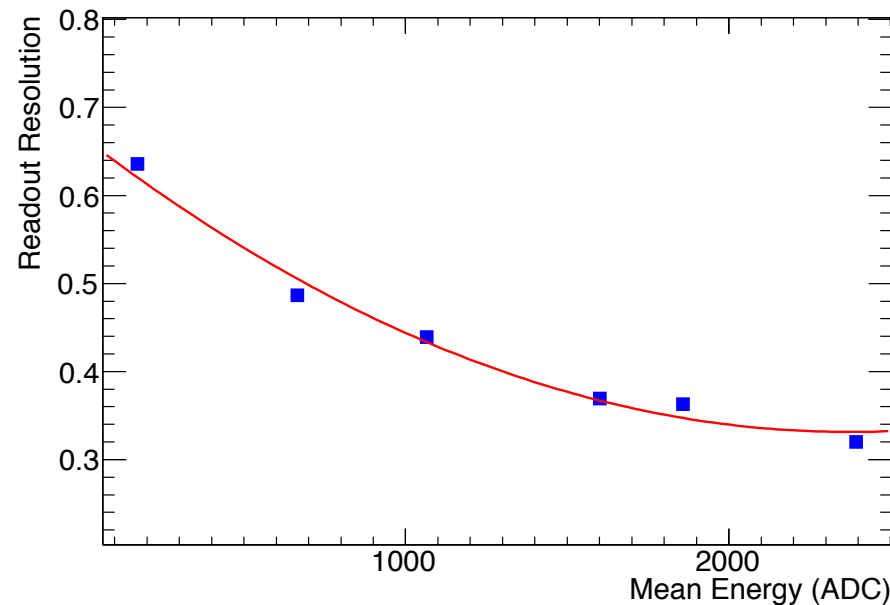
Simulation Output : KeV

Data : ADC

KeV to ADC conversion is called conversion factor

To remove fuzzy-ness due to fluctuations added and the added resolution is called readout resolution

$$= \sqrt{\left(\frac{Mean_{data}}{\Delta E_{data}}\right)^2 - \left(\frac{Mean_{sim}}{\Delta E_{sim}}\right)^2}$$



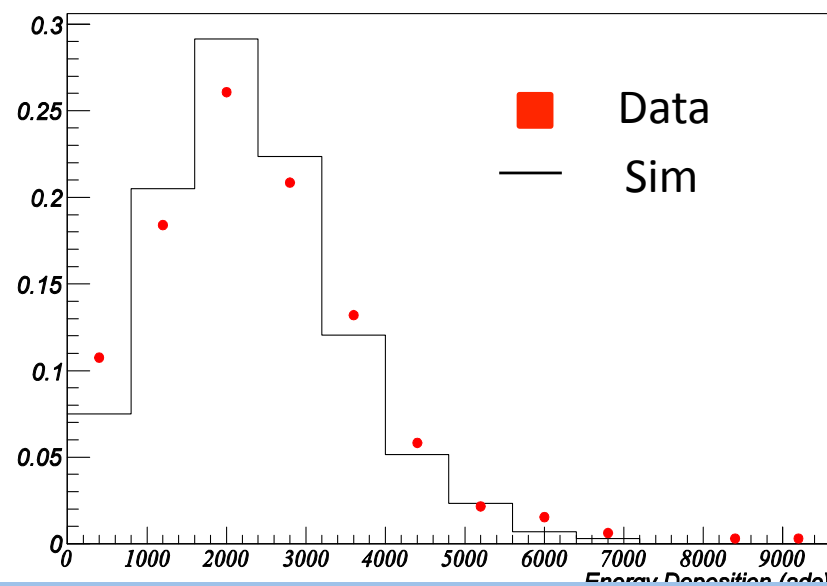
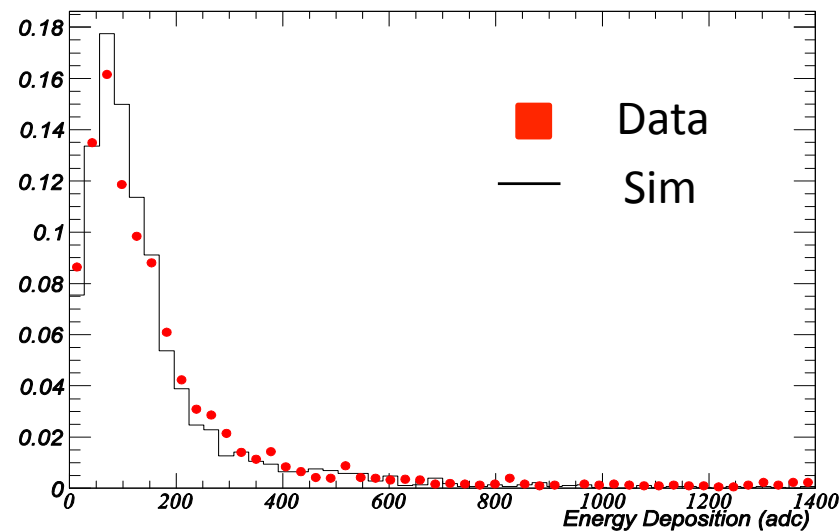
# Validity of Conversion Parameter

13

Conversion factors is applied first then followed by readout resolution

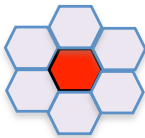
Pion: 3GeV  
MPV Ratio = 1.0097

Electron: (total adc, 3GeV)  
Mean Ratio = 0.9697



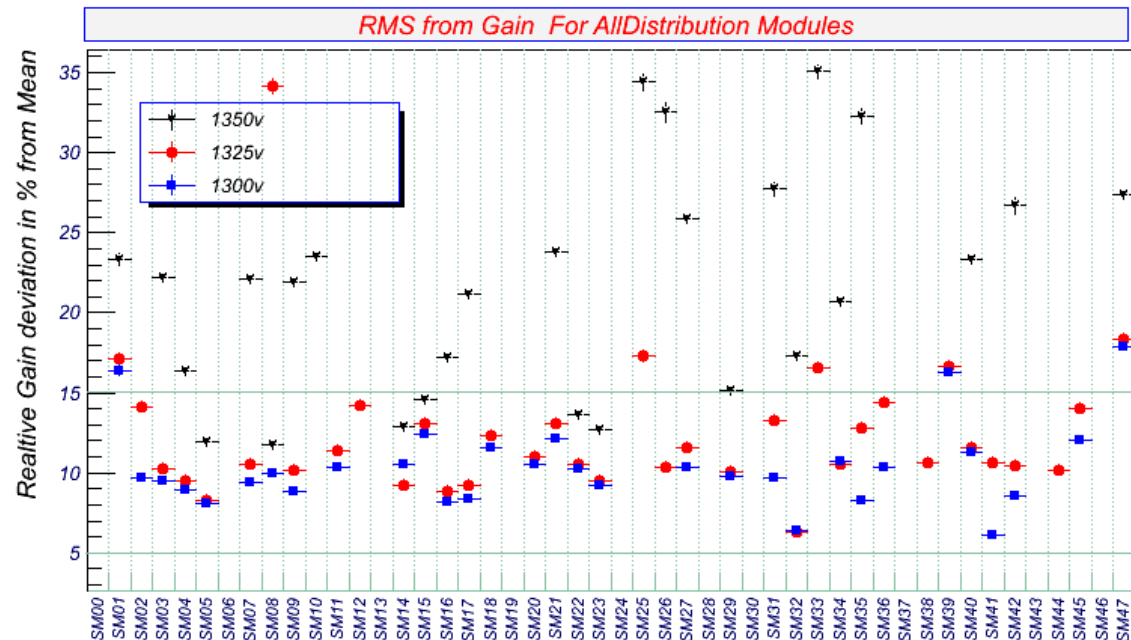
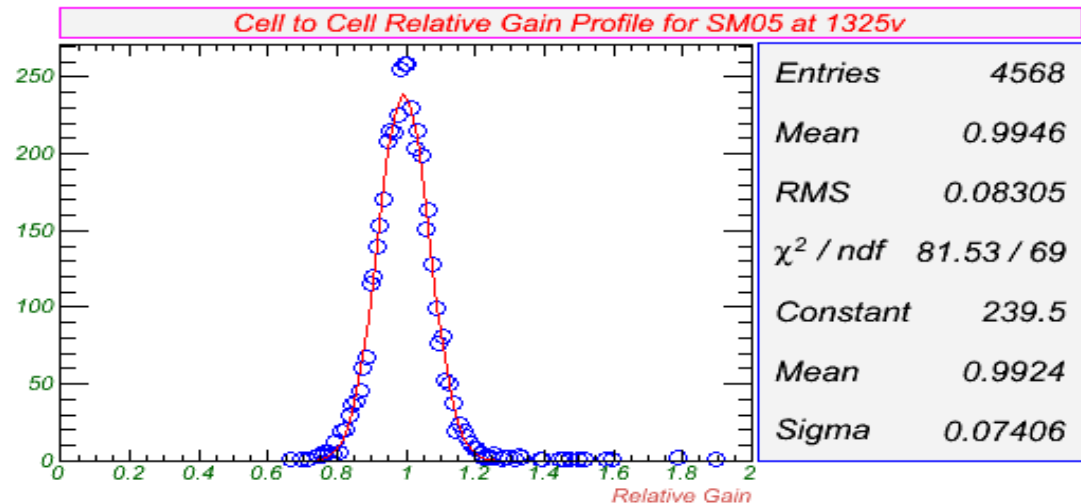
# Cell-to-cell Gain..

14



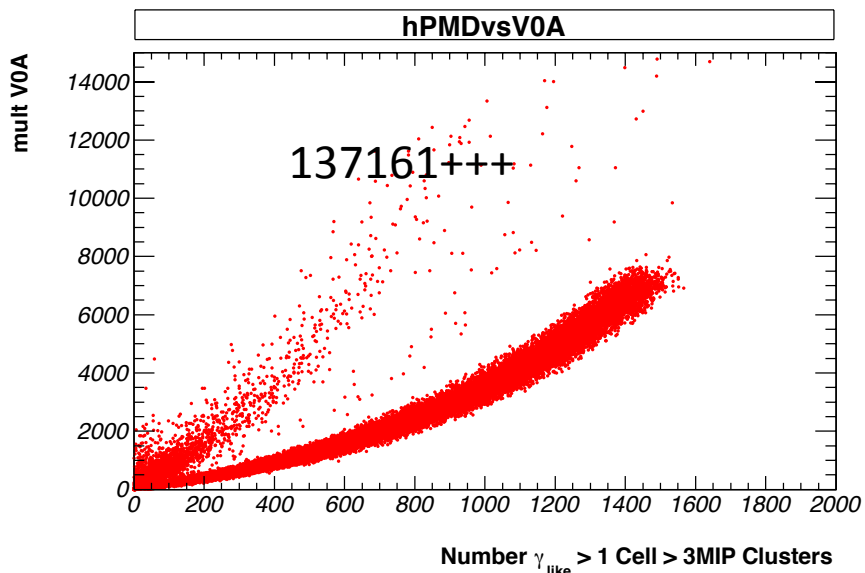
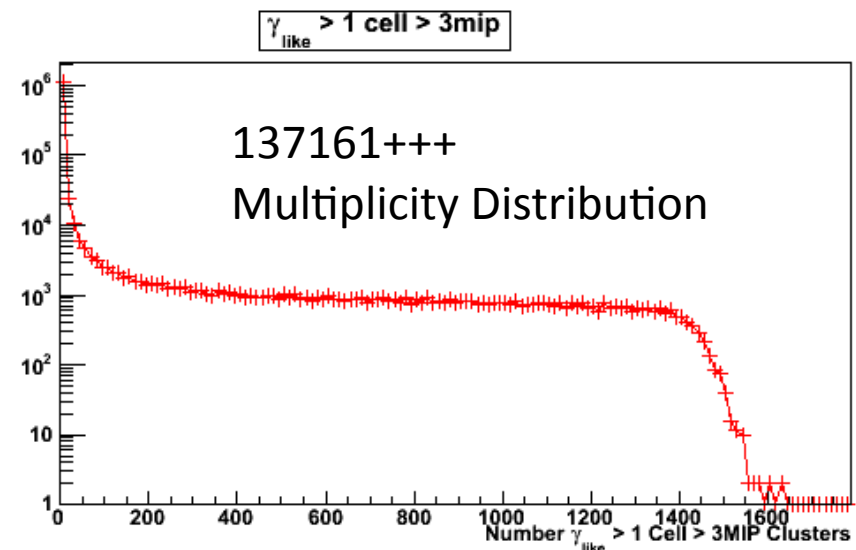
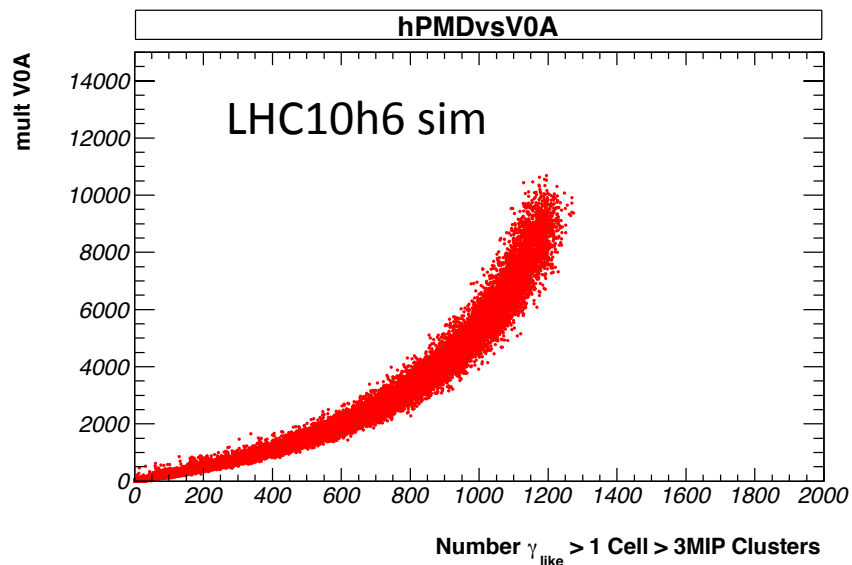
A special runs of about ~50 Millions of Events was taken in pp@7TeV

Cell-to-cell gain variation is < 10% within each module



# Detector Performance

15



Very Nice Distribution of PMD clusters ->  
Can be used for **Centrality Estimation**

To understand behaviors of  
this kind of Correlation

## *Summary..*

16

- PMD Software is free from coverity defect
- Bugs are reported
- Waiting for Simulation to complete for Publication in pp 0.9 TeV and 7 TeV very soon
- Heavy Ion Analysis is in progress

Thank you