



PMD Status

Offline week, March 15-19, 2010

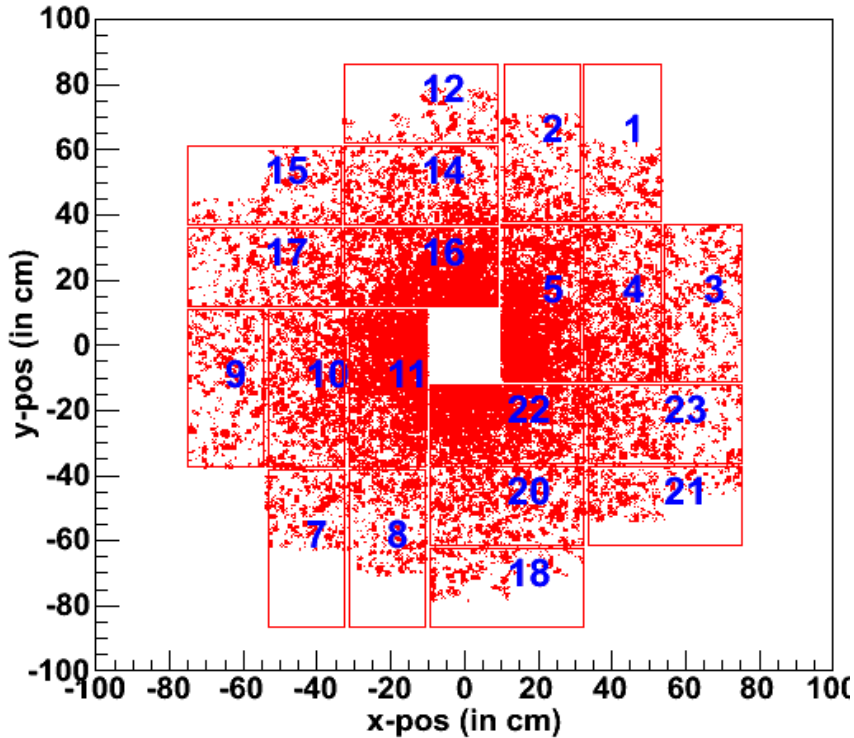
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VECC, Kolkata
for PMD

Outline :

1. Present status
2. Software update
3. Tasks to be completed
4. Data Analysis for pp collisions in 2009
Analysis in progress, preliminary results

PMD Configuration

PRE Shower Plane

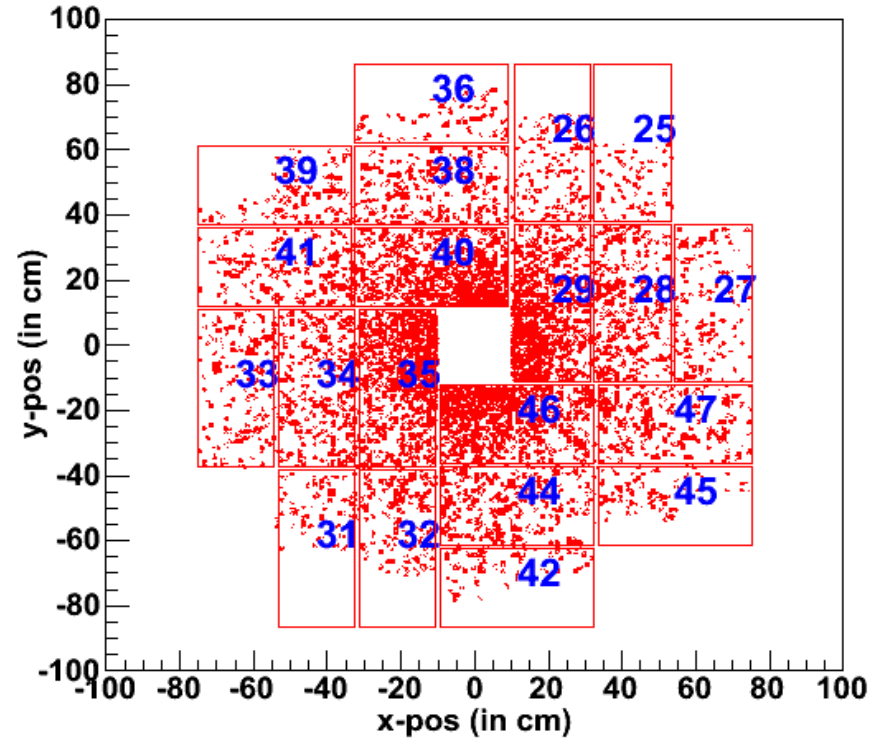


No. of DDLs : 2

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

CPV Plane



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

No. of chains : 100 + 100 = 200

Present Status of PMD Hardware

Since January 2010:

- PMD is moved to parking position for maintenance
- All electronics chains and modules are debugged
- One module is replaced in the pre-shower plane
- PMD moved to final position after all repairing work
- Survey of PMD completed
- **19/20** modules in PRE and **17/20** modules in CPV planes are at working voltage. Rest are being conditioned

13 0.25	12 1325.00		02 01 00			24 0.75	25 1324.50	26 1325.00	36 1324.50	37 0.50				
15 1325.00	14 1325.25		1326.00	1325.75	1.00				38 1317.00	39 1318.00				
17 1325.75	16 1325.50								40 1324.25	41 1324.75				
09 1325.50	10 1325.25	11 1000.25	PRE	05 1325.75	04 1324.75	03 1325.00	27 1322.25	28 1000.00	29 1324.50	CPV	35 1324.75	34 1323.75	33 997.25	
		22 1325.50		23 1324.75					47 1324.75		46 1000.00			
06 0.00	07 1324.75	08 1327.50		20 1325.75		21 1325.50					45 1325.00	44 1324.75		32 1325.00
		18 1325.50		19 0.00					43 0.00	42 1321.75				

Software update

- Pileup
- Reconstruction
- Calibration
- Quality Assurance

Pileup

- Handling of the time information from hits during digitization
- Peaking time of MANAS chip is 1.2 micro second.
- Time integration for PMD is done up to 1.2 micro second.
- In simulation, signals coming within 1.2 micro second are digitized rest are ignored.
- Hardware study for pile-up is on the way

Reconstruction:

- AliPMDClusterFinder class has been modified
- Noise cut has been implemented in the above class
- Corresponding Database object has been put in the OCDB

Detector Algorithm (DA)

PMD uses two DA codes for PMD: PEDESTAL & GAIN

- No change in the DA codes

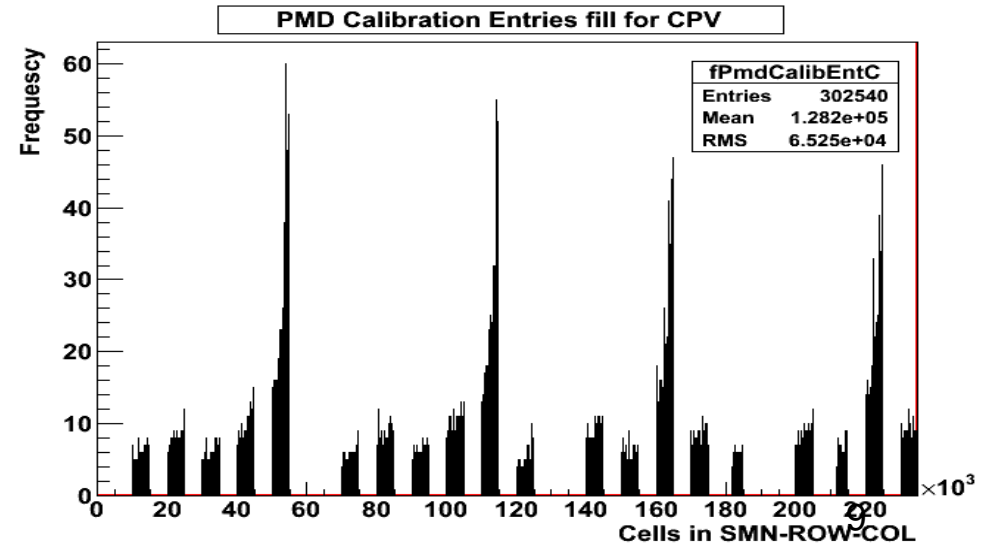
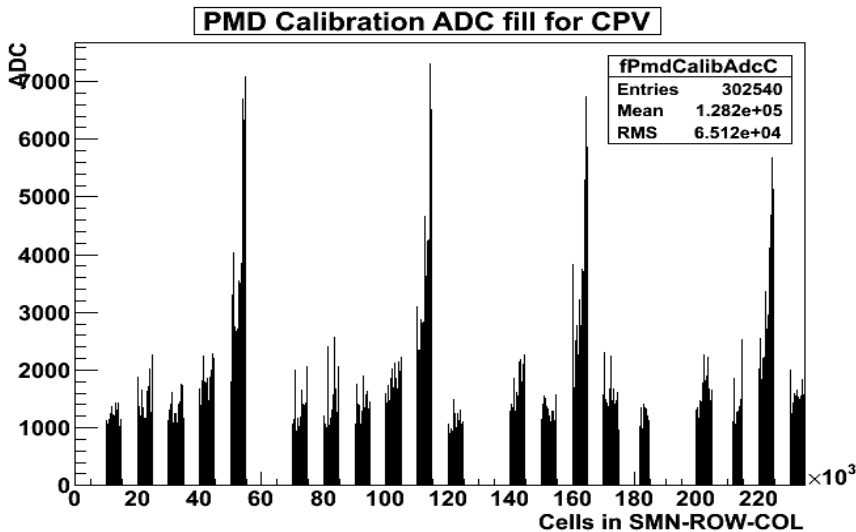
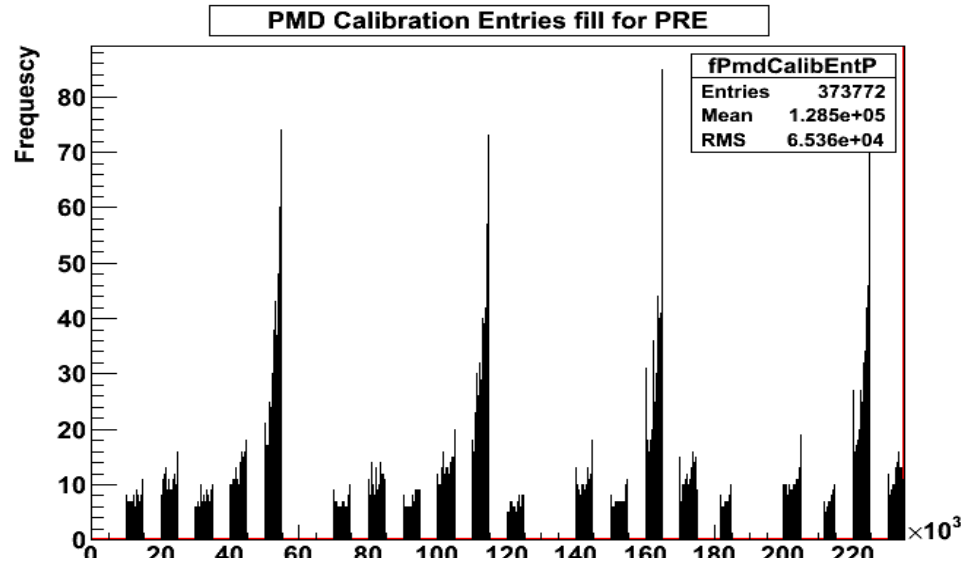
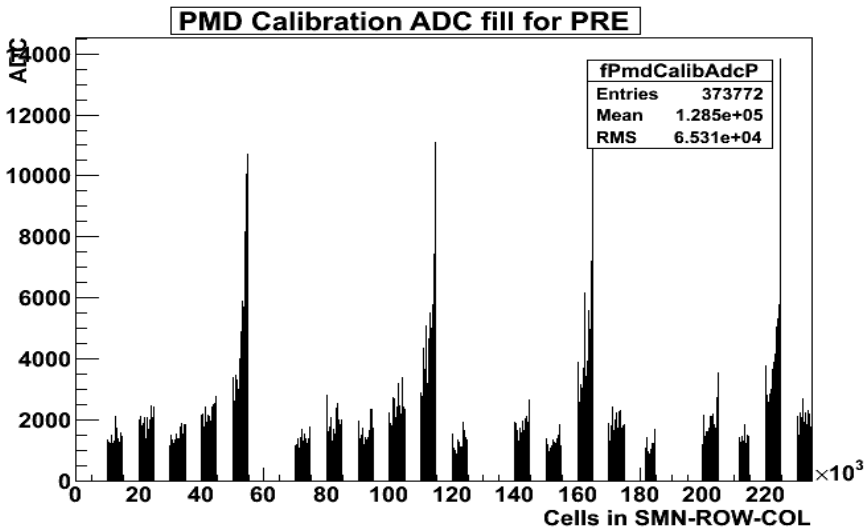
Status of Offline Calibration

A new class has been written for Offline Calibration train.

- Isolated cells are identified while searching for super-clusters (connected cells) during the reconstruction. Their tags are stored in the ESD file.
- The isolated cell information is stored in 2 histograms per plane:
 - Total ADC of the cell for large number of events
 - Total entries for the cell
- From these histograms we get mean ADC for each isolated cell which is used for gain calibration

Output Histograms:

fPmdCalibAdcP, fPmdCalibAdcC, fPmdCalibEntP, fPmdCalibEntC



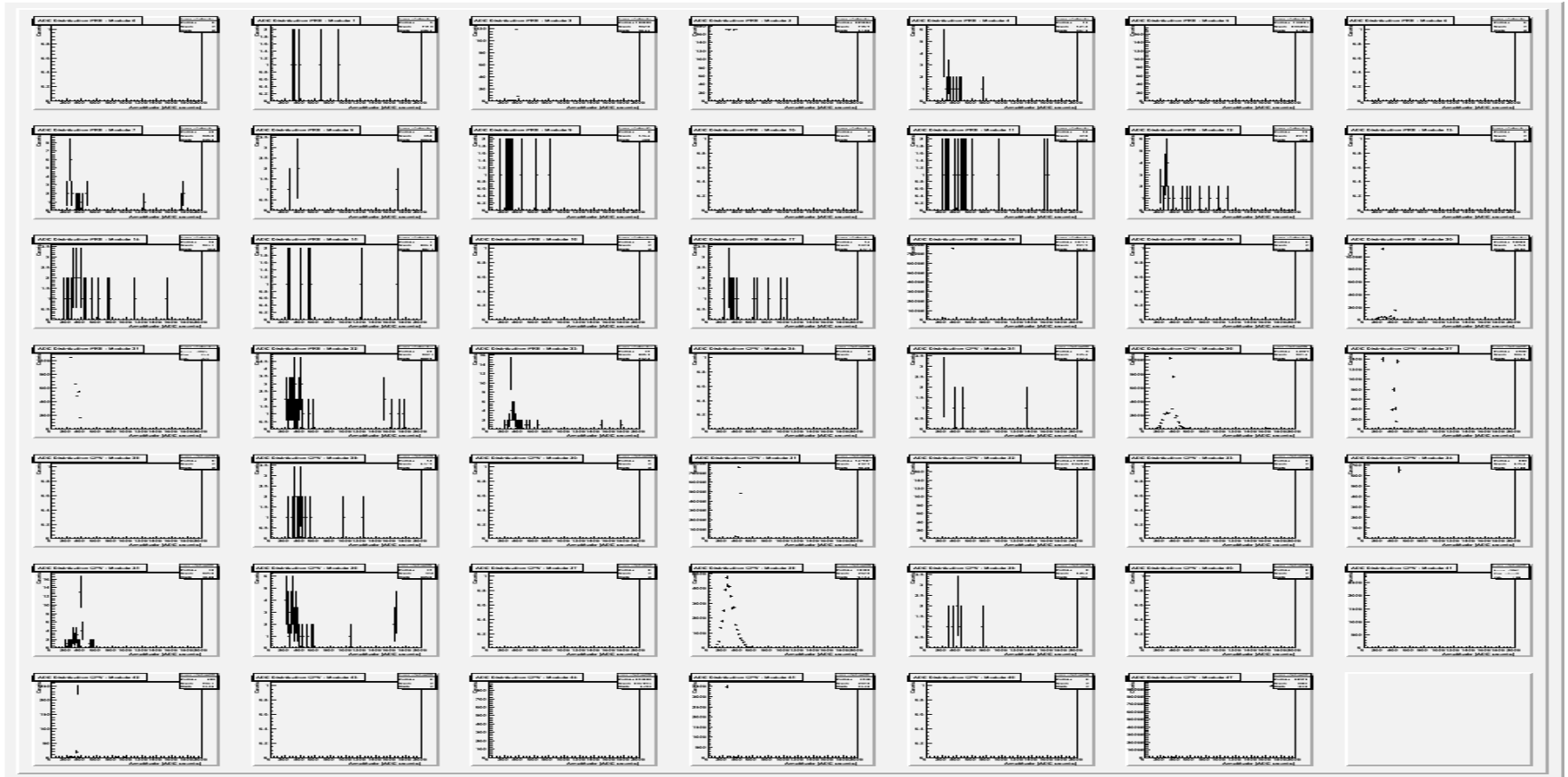
Status of Online Calibration

There were Bugs in PMD Pre-processor
- DCS Aliases corrected

Code has been modified, will be committed within a week.

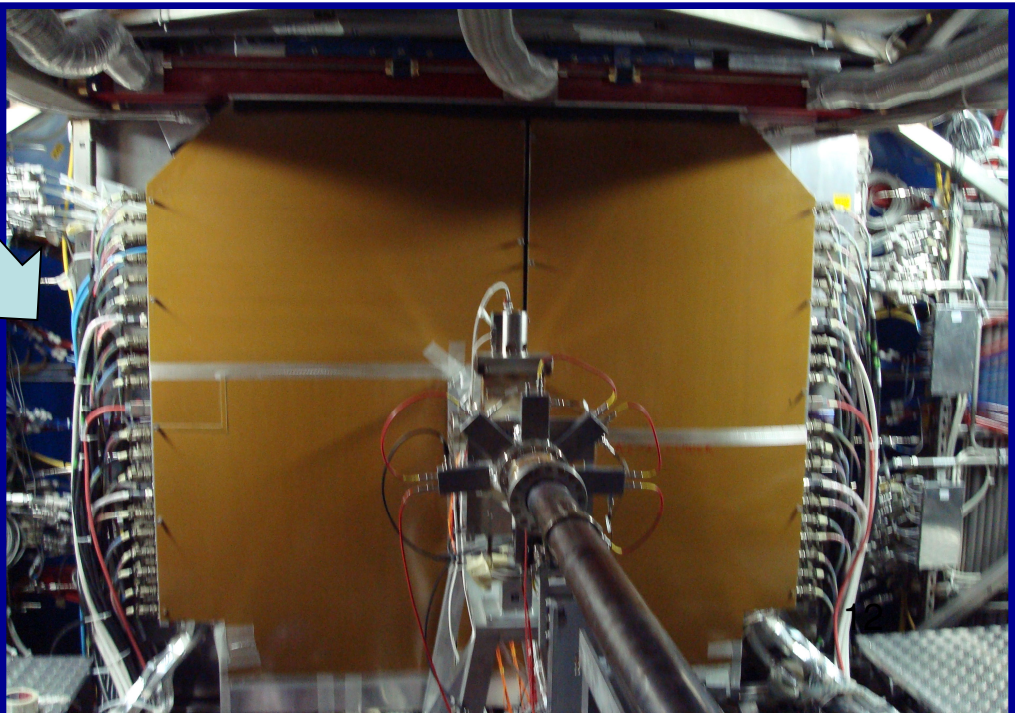
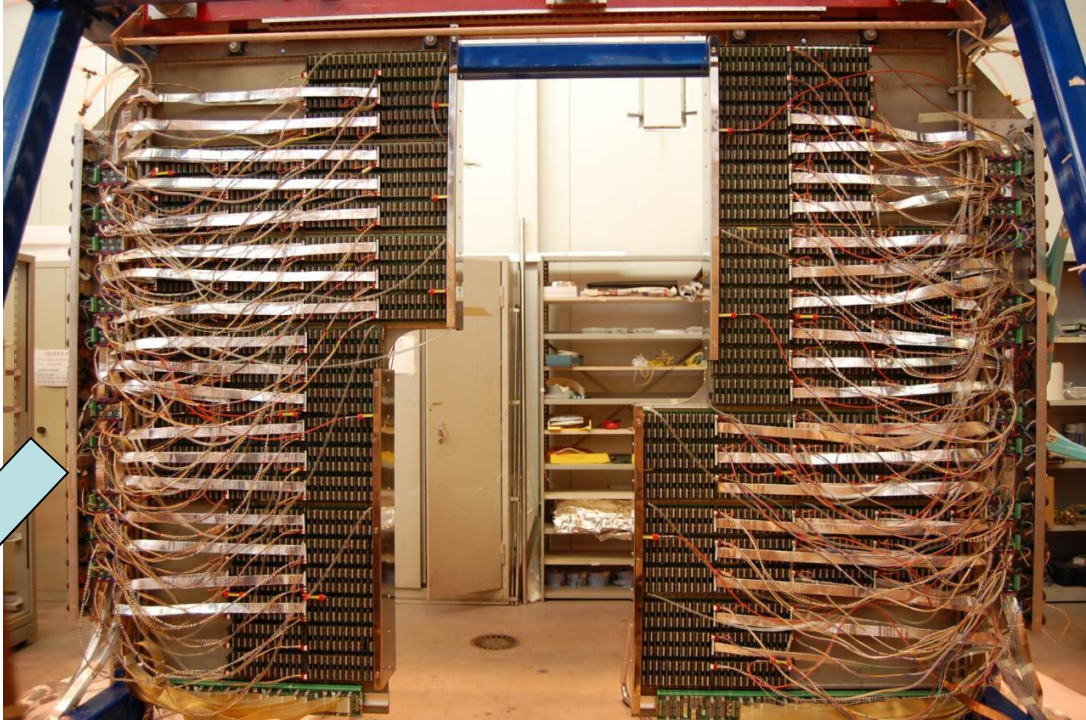
Status of QA using AMORE

- At present, AMORE uses the offline QA methods

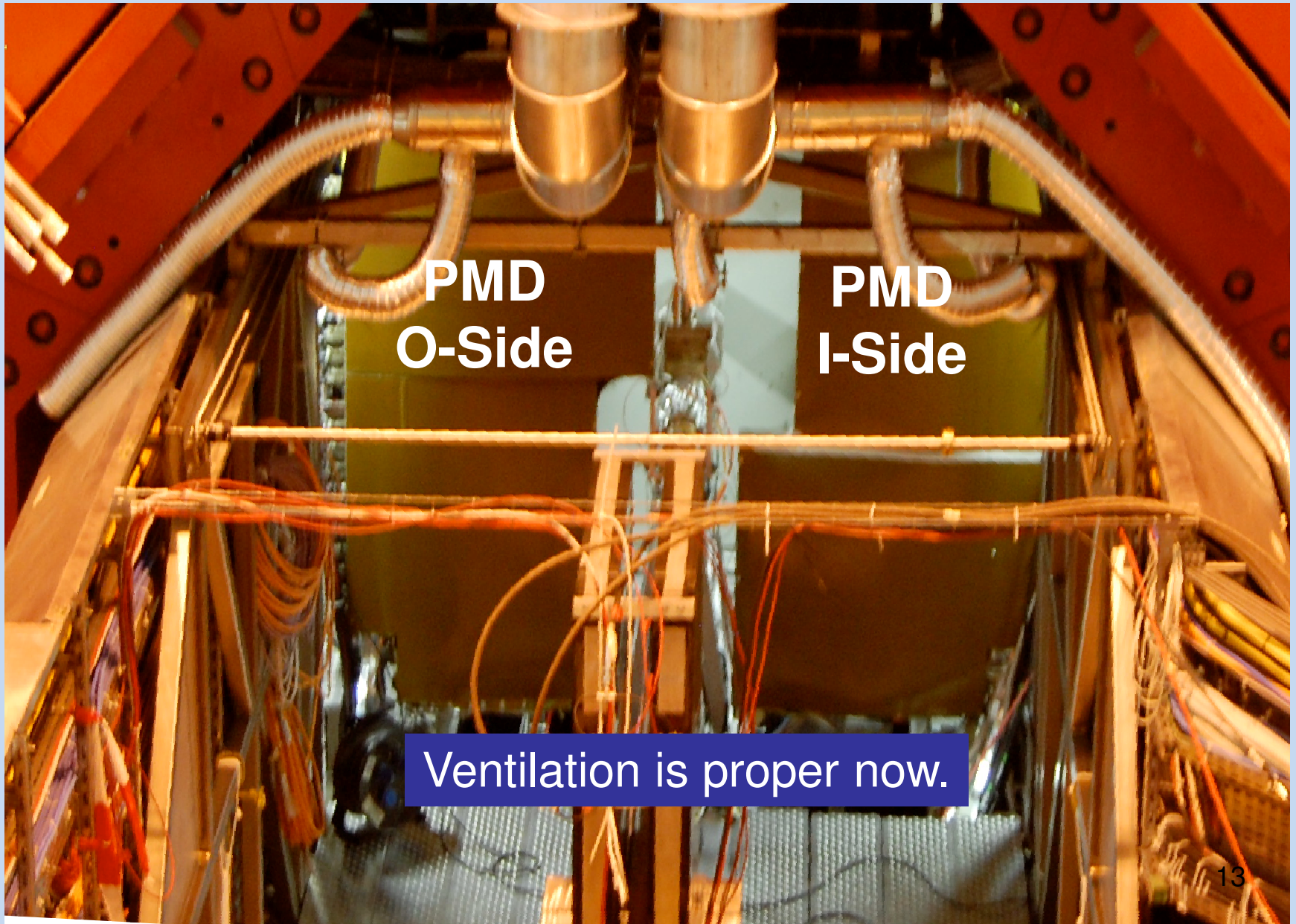


- Proposal is to write an independent AMORE module for online monitoring

PMD Installation



PMD in parking position



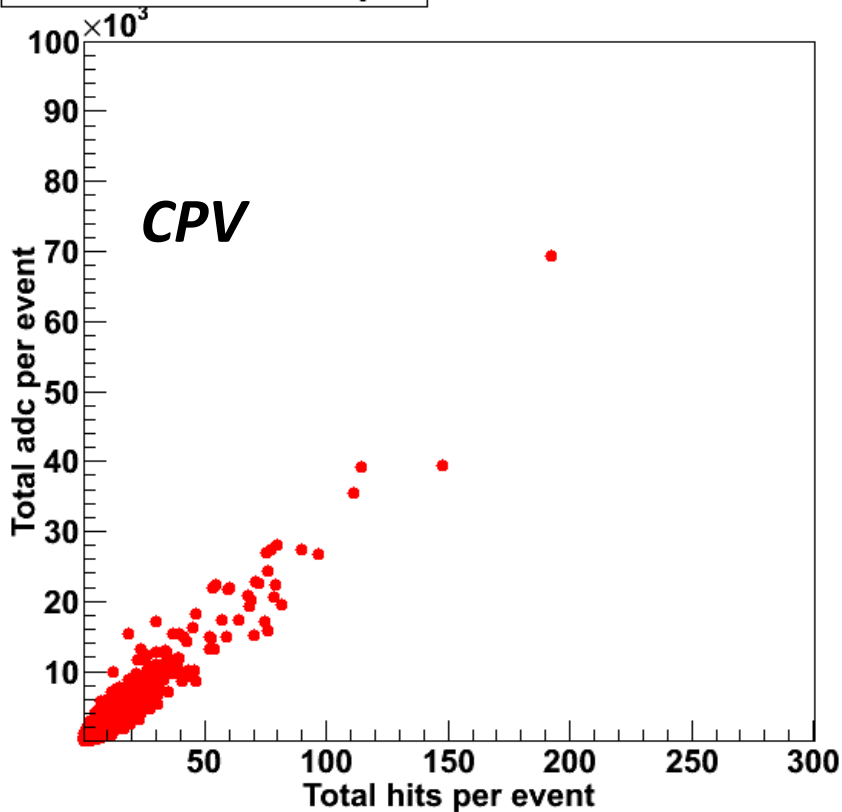
pp collisions at 900 GeV in 2009

Correlation between total hits vs. total ADC

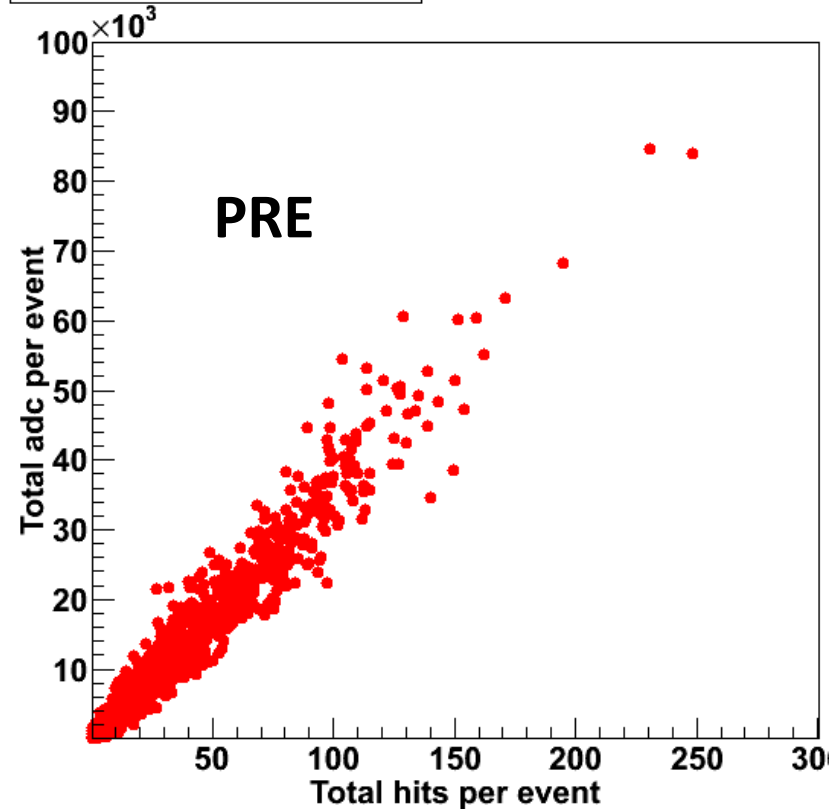
Run#104160

Trigger Type : CINT1B-ABCE-NOPF-ALL

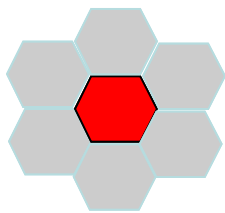
TotHitsVsTotAdcCpv



TotHitsVsTotAdcPre



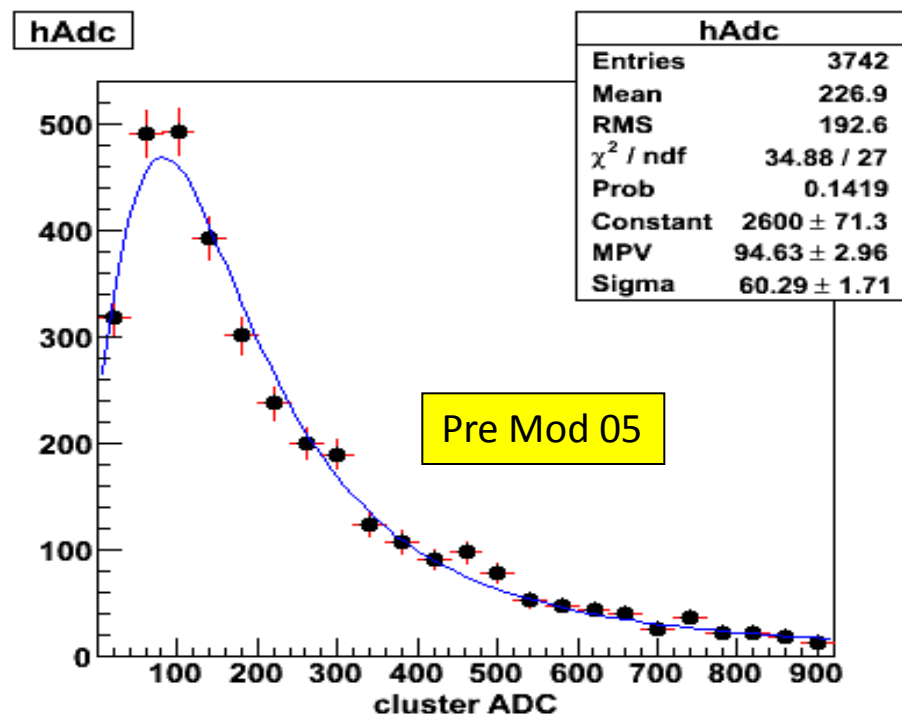
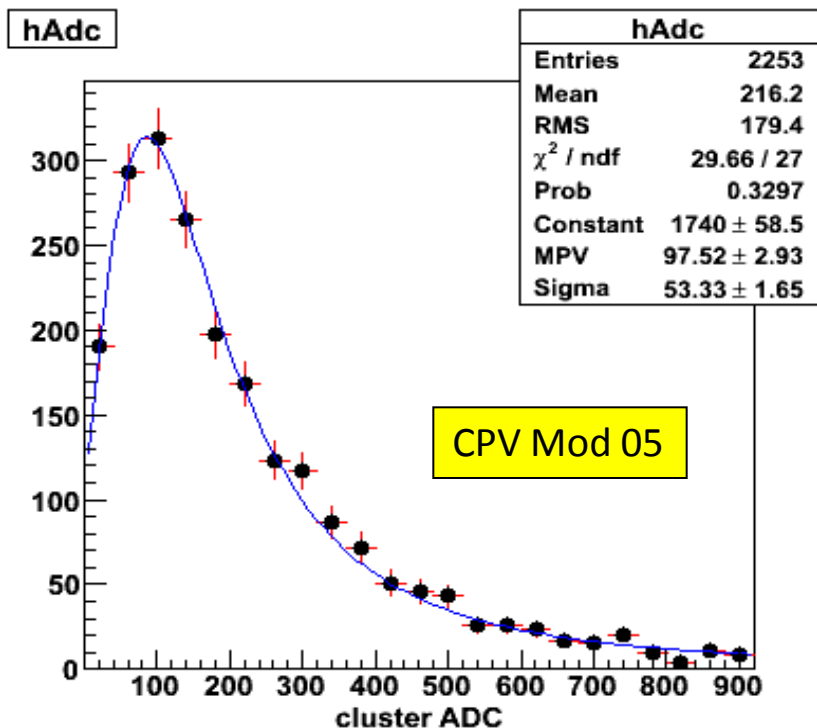
After correction of hot channels



Isolated cell ADC study

Run#104160

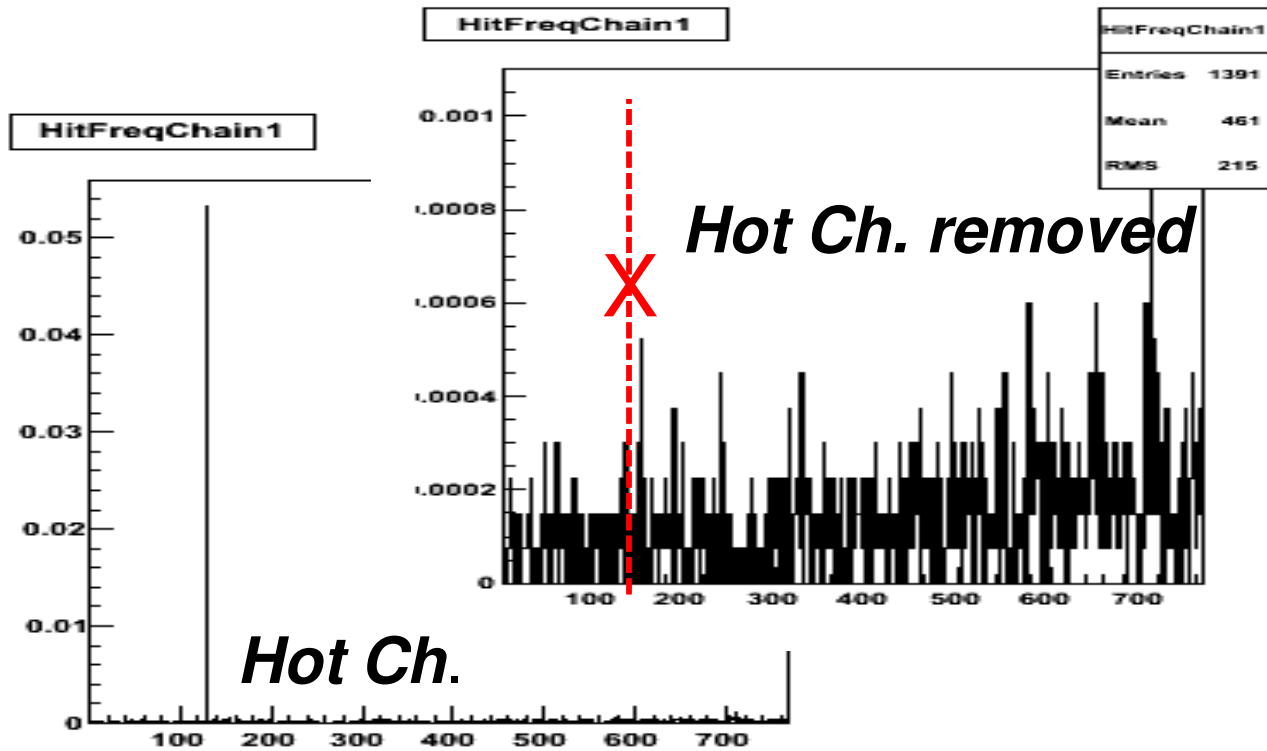
Trigger Type : CINT1B-ABCE-NOPF-ALL



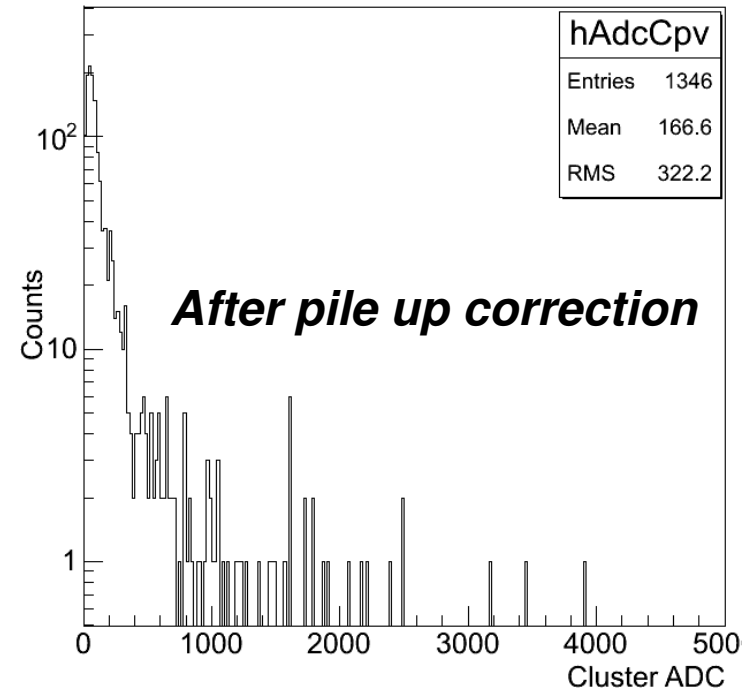
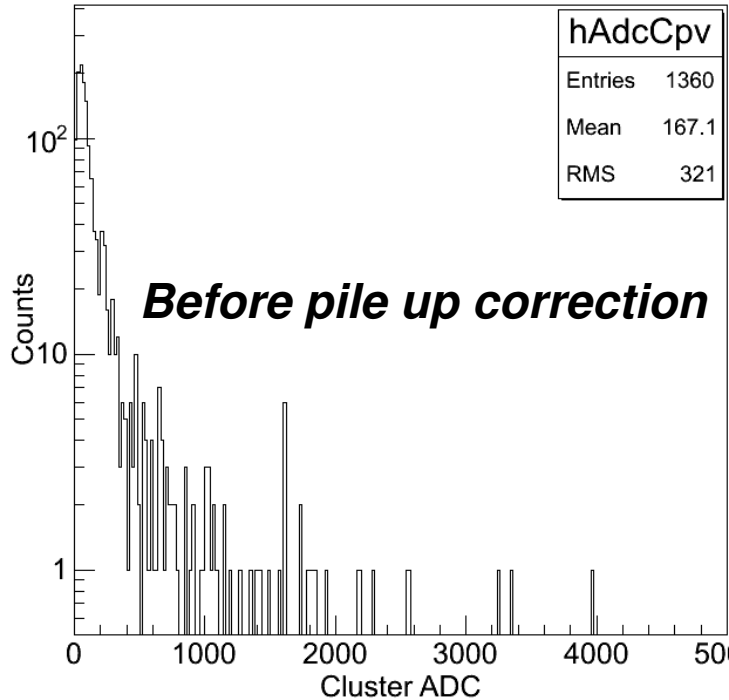
Isolated cell spectra is studied for all the modules to get the MIP adc distribution which will be used for relative gain calibration and photon-hadron discrimination.

Analysis in progress for pp@900 GeV – results will be available in a short time.

Back up slides



CPV Cluster ADC distribution :



- No change in the ADC spectrum – before and after the pileup correction for normal events.
- 14 tracks rejected in 100 events

Back up slides

Peaking time of MANAS = 1.2 micro sec => 833×10^3 Hz

Number of pp interactions,

$$\lambda = \sigma_{pp} \times L$$

$$L = \lambda / \sigma_{pp}$$

$$= 833 \times 10^3 / 80 \text{ mb}$$

$$= 833 \times 10^3 / 80 \times 10^{-3} \times 10^{-24}$$

$$= 10.41 \times 10^{30} \cong 10^{31} \text{ cm}^{-2} \text{ s}^{-1}$$