PMD Data Taking in pp-ref and PbPb in Run-II (Nov-Dec)

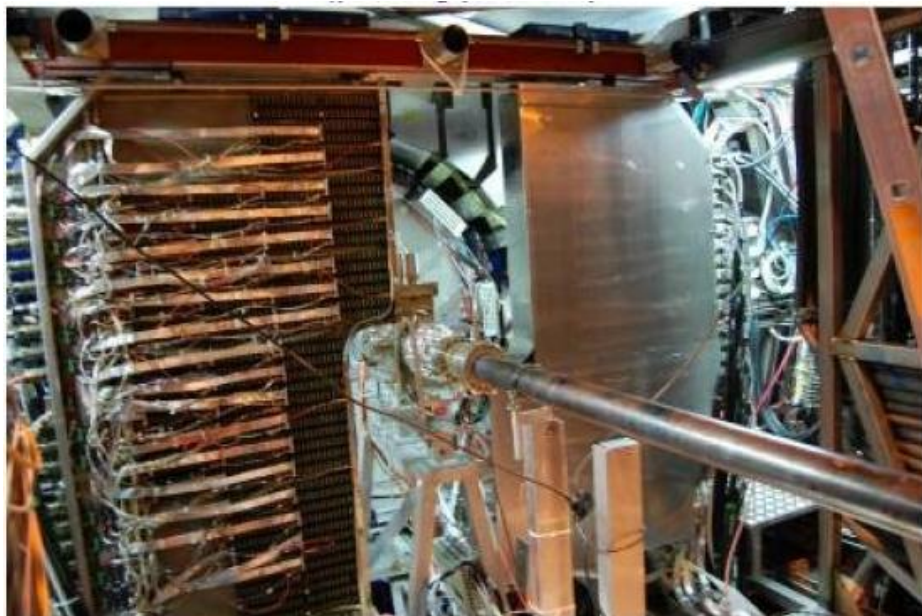**Sanjib Muhuri (VECC)**

and

**Ramanarayana Singaraju (VECC)**
Sidharth Kumar Prasad (BI)

ALICE-PMD at parking position. Finally two halves close around the beam-pipe to make compact plane.

Technology	Extended cathode honeycomb
Number of planes	veto+preshower
Distance from vertex	361.5 cm
η-coverage	2.3–3.5
Active area	2 m^2
Cell cross-section	0.22 cm^2
Cell depth (gas depth)	5 mm
No. of readout channels	182,000
No. of supermodules per plane	4
No. of unit modules in a SM	6
No. of cells in a UM	4608
No. of HV channels	48
Thickness of Pb-converter	1.5 cm
Thickness of SS support plate	0.5 cm
Total weight	1200 kg

HADRON   PHOTON

VETO DETECTOR

CONVERTER SUPPORT

LEAD CONVERTER

PRESHOWER DETECTOR
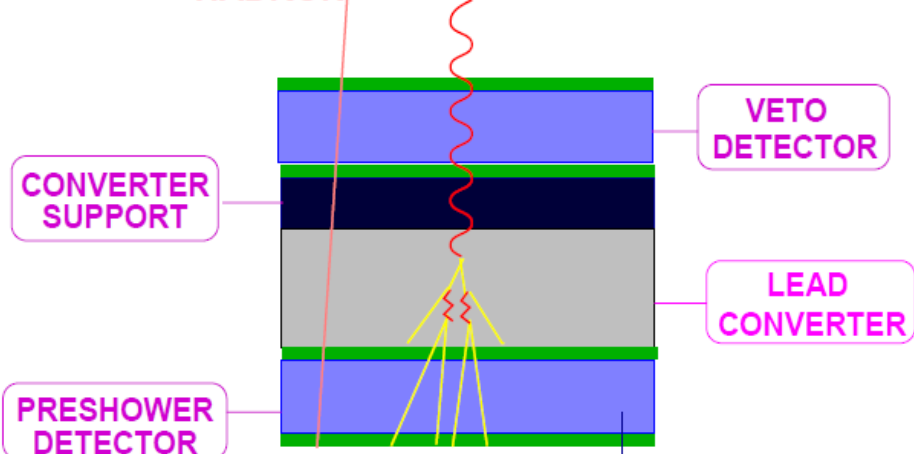
**Observable to be measured:
Photons:
Multiplicity and Transverse energy**

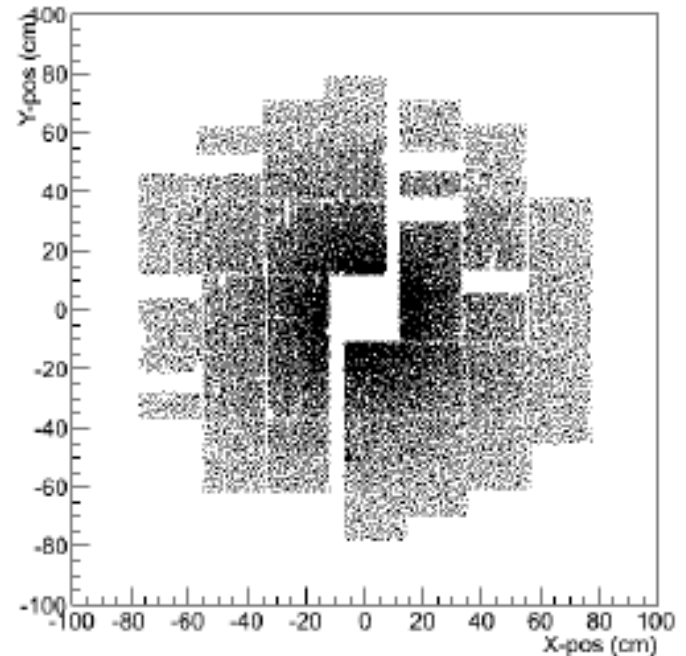**Experience from previous Data Runs**

2.76 "TeV"

Ideal "PMD"

Acceptance of PMD
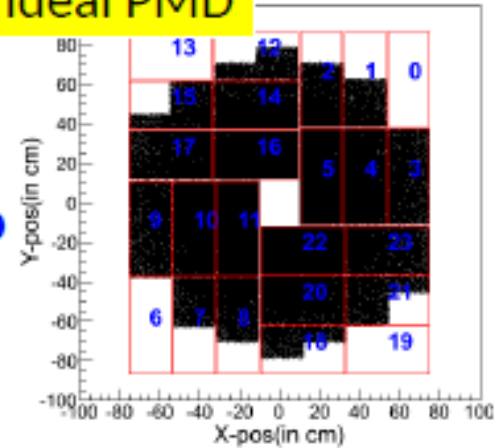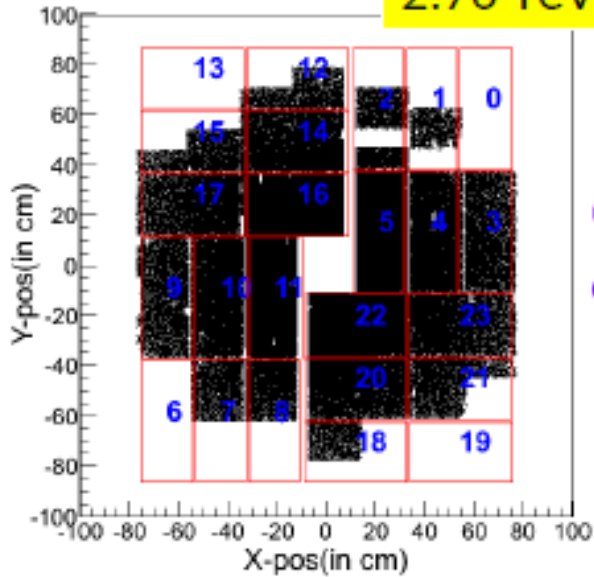
Coverage similar to earlier data taking

13 "TeV"

7 "TeV"
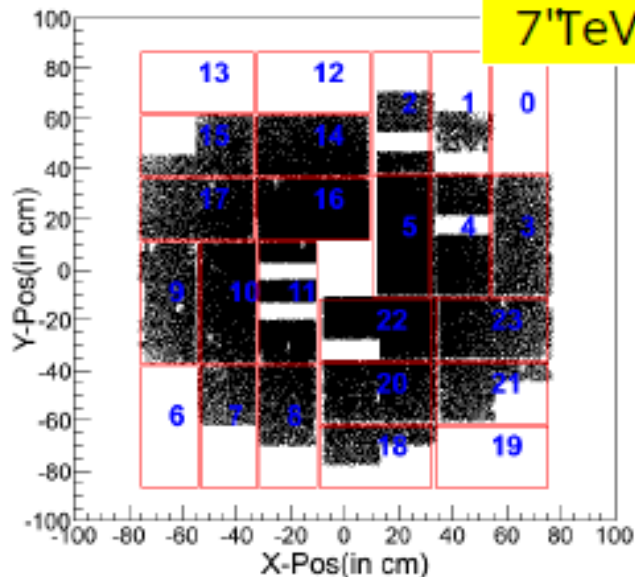
Proton-Proton @ 13 TeV

Vtx-Z distribution for selected events
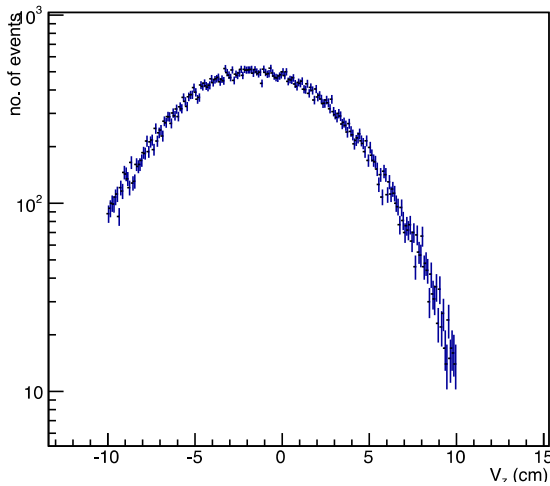
Isolated cell ADC in Mod-17 (CPV) fitted with landau

I_SMN_17	
Entries	60402
Mean	184.1
RMS	250.8
χ^2 / ndf	118.8 / 21
Constant	1888 ± 12.7
MPV	61.1 ± 0.4
Sigma	32.47 ± 0.21

pp@13 TeV Det-CPV, SMN-17
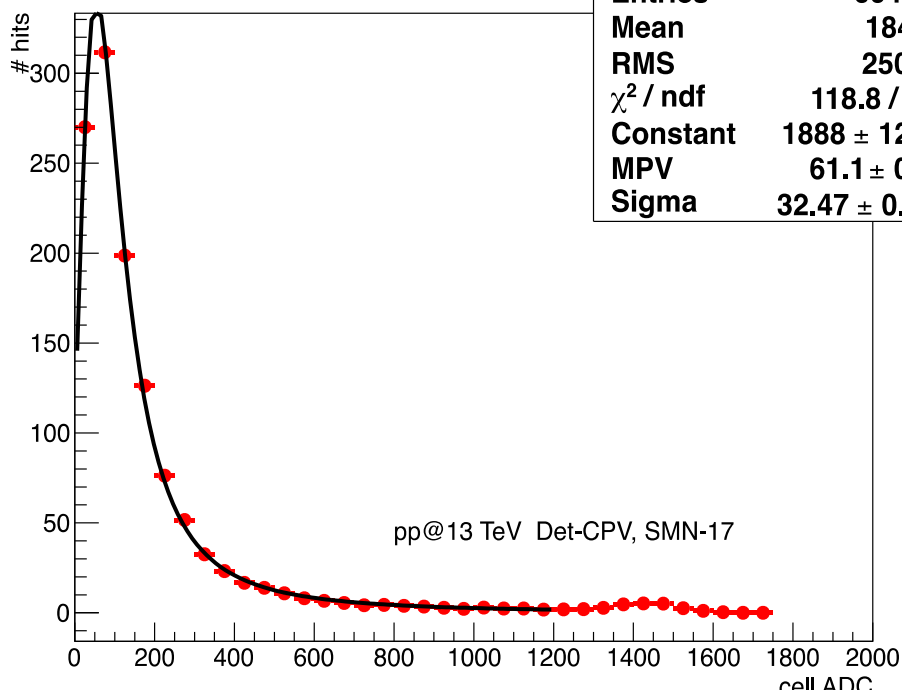
Phi distribution of photon like clusters

pp @ 13 TeV

$2.3 < \eta^{\gamma\text{-like}} < 3.9$

ADC>300 && Ncell>2

ADC>450 && Ncell>2

ϕ (rad)

$1/N_{evt}\ dN/d\phi\ (rad^{-1})$
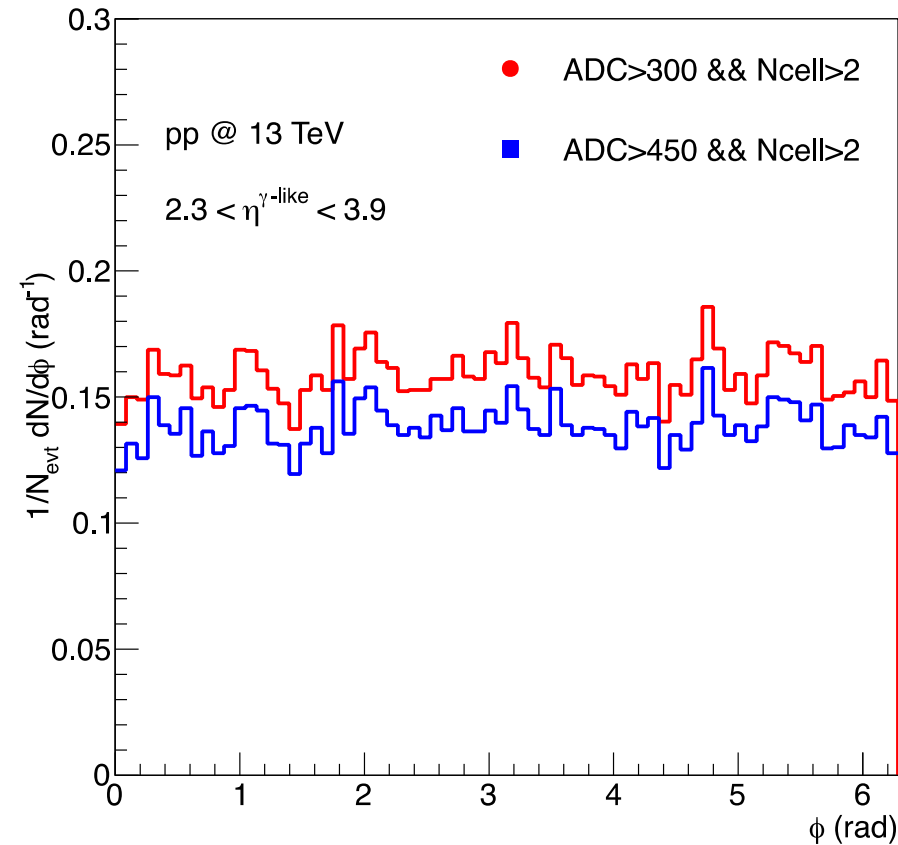
PMD data taking with pp-ref at 5.02TeV

//========================= //pp-ref run at 5.02TeV// =========================//
:====//

Beam	Date	Run#	period	# of Evnts	Av Evnt Size	Duration	Remarks
pp(5.02TeV)	19/11/2015	244340	LHC15n	3,217,645	7.0	58Min	Runs looks good
pp(5.02TeV)	19/11/2015	244343	LHC15n	3,280,680	7.0	1h	Runs looks good
pp(5.02TeV)	19/11/2015	244351	LHC15n	15,159,399	7.0	4h38Min	Runs looks good
pp(5.02TeV)	19/11/2015	244355	LHC15n	2,903,748	7.0	57Min	Runs looks good
pp(5.02TeV)	20/11/2015	244377	LHC15n	8,001,429	7.7	2h26Min	Runs looks good
pp(5.02TeV)	20/11/2015	244411	LHC15n	0,863,318	7.1	0h18Min	Runs looks good
pp(5.02TeV)	20/11/2015	244416	LHC15n	2,913,026	7.2	1h00Min	Runs looks good
pp(5.02TeV)	20/11/2015	244418	LHC15n	0,826,124	7.2	0h17Min	Runs looks good
pp(5.02TeV)	20/11/2015	244421	LHC15n	1,107,146	6.8	0h21Min	Runs looks good
pp(5.02TeV)	20/11/2015	244453	LHC15n	2,153,911	6.2	0h45Min	Runs looks good
pp(5.02TeV)	20/11/2015	244454	LHC15n	1,107,1½o	X.X	0h01Min	No Data
pp(5.02TeV)	20/11/2015	244456	LHC15n	3,946,54	6.6	1h14Min	Runs looks good
pp(5.02TeV)	21/11/2015	244480	LHC15n	8,18,507	6.3	2h53Min	Runs looks good
pp(5.02TeV)	21/11/2015	244481	LHC15n	1,917,317	6.3	0h36Min	Runs looks good
pp(5.02TeV)	21/11/2015	244482	LHC15n	8,087,405	6.3	2h36Min	Runs looks good
pp(5.02TeV)	21/11/2015	244483	LHC15n	1,296,379	6.3	0h26Min	Runs looks good
pp(5.02TeV)	21/11/2015	244485	LHC15n	12,478,921	6.3	3h54Min	Runs looks good
pp(5.02TeV)	21/11/2015	244617	LHC15n	0,528,007	6.5	0h14Min	Runs looks good
pp(5.02TeV)	23/11/2015	244618	LHC15n	0,168,525	6.5	0h05Min	Runs looks good
pp(5.02TeV)	23/11/2015	244619	LHC15n	0,367,733	6.6	1h10Min	Runs looks good
pp(5.02TeV)	23/11/2015	244621	LHC15n	0,083,621	6.9	0h02Min	Runs looks good
pp(5.02TeV)	23/11/2015	244624	LHC15n	0,240,865	6.9	0h04Min	Runs looks good
pp(5.02TeV)	23/11/2015	244625	LHC15n	XXXXXXXXXXX.X		0h01Min	Runs looks good
pp(5.02TeV)	23/11/2015	244626	LHC15n	6,780,445	9.2	2h10Min	Runs looks good
pp(5.02TeV)	23/11/2015	244627	LHC15n	2,315,951	10.0	0h48Min	Runs looks good
pp(5.02TeV)	23/11/2015	244628	LHC15n	1,107,146	6.8	0h51Min	Runs looks good

~90M data collected By PMD

PMD data taking with PbPb at 5.02TeV

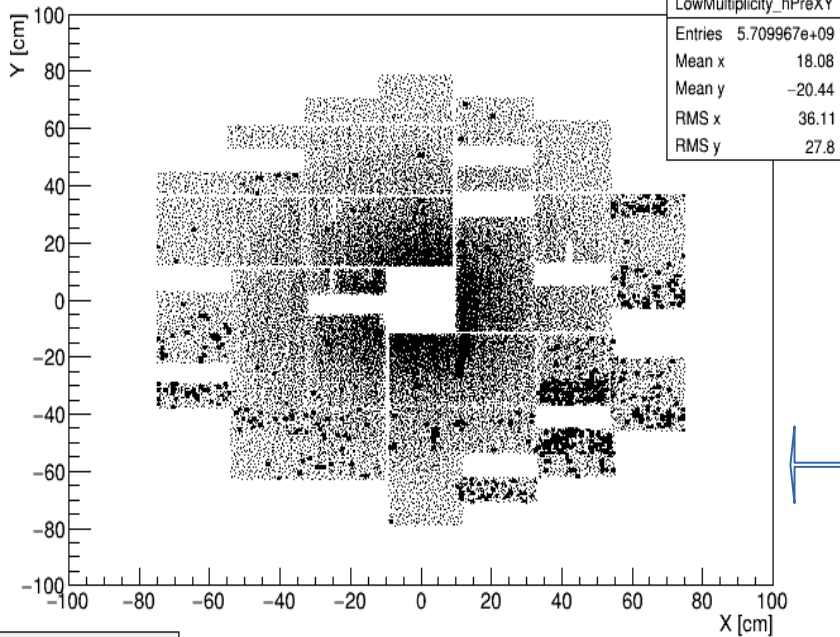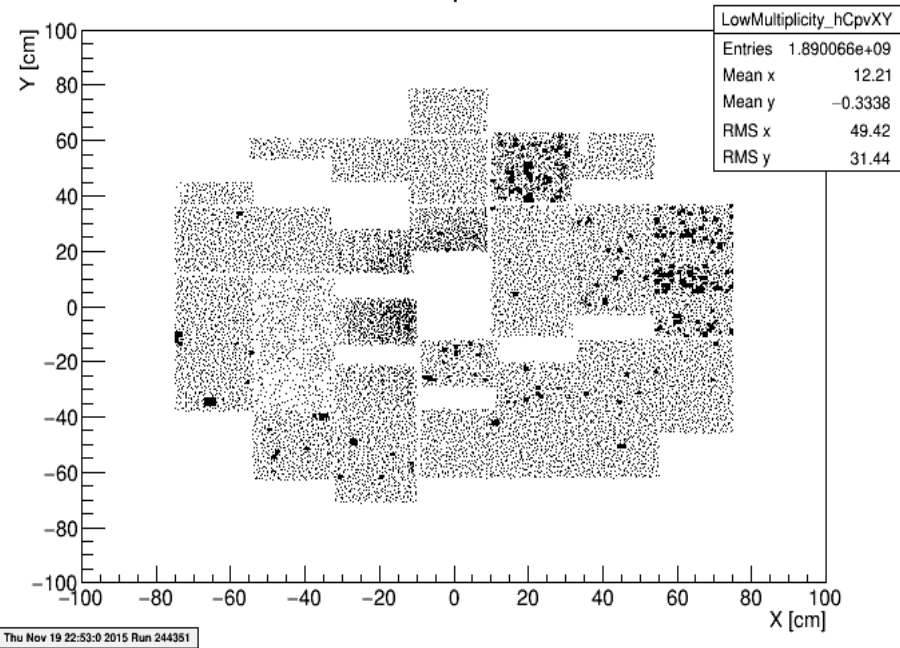| Beam	Date	Run#	period	# of Evnts	Av Evnt Size	Duration	Remarks
PbPb(5.02TeV)	25/11/2015	244914	LHC15o			0.6Min	
PbPb(5.02TeV)	25/11/2015	244916	LHC15o			0.2Min	
PbPb(5.02TeV)	25/11/2015	243917	LHC15o	0,038,041	13.1	6.0Min	Runs looks good
PbPb(5.02TeV)	25/11/2015	243918	LHC15o	0,577,633	13.0	2h01Min	Runs looks good
PbPb(5.02TeV)	26/11/2015	243975	LHC15o	0,292,957	12.4	14.0Min	Runs looks good
PbPb(5.02TeV)	26/11/2015	243980	LHC15o	1,139,758	8.7	27.0Min	Runs looks good
PbPb(5.02TeV)	26/11/2015	243982	LHC15o	1,198,677	12.6	44.0Min	Runs looks good
PbPb(5.02TeV)	26/11/2015	243983	LHC15o	0,462,138	12.6	18.0Min	Runs looks good
PbPb(5.02TeV)	26/11/2015	245061	LHC15o	0,139,816	24.7	09.0Min	Runs looks good
(There is some issue with Module-2, chain-5: Getting more hits)							
PbPb(5.02TeV)	26/11/2015	245065	LHC15o	1,303,355	25.2	1h31Min	Runs looks good
(There is some issue with Module-2, chain-5: Getting more hits)							
PbPb(5.02TeV)	26/11/2015	245066	LHC15o	0,312,337	25.5	26.0Min	Runs looks good
(There is some issue with Module-2, chain-5: Getting more hits)							
PbPb(5.02TeV)	26/11/2015	245068	LHC15o	0,163,181	25.7	13.0Min	Runs looks good
(There is some issue with Module-2, chain-5: Getting more hits)							
PbPb(5.02TeV)	26/11/2015	245143	LHC15o	0,008,525	22.8	>1Min	XXXXXXXXX
PbPb(5.02TeV)	26/11/2015	245144	LHC15o	0,060,472	22.3	2.29.Min	XXXXXXXXX
PbPb(5.02TeV)	26/11/2015	245145	LHC15o	1,556,460	22.8	1h9Min	Runs looks good
(There is some issue with Module-2, chain-5: Getting more hits)							
PbPb(5.02TeV)	26/11/2015	245146	LHC15o	1,949,793	23.2	1h36Min	Runs looks good
(There is some issue with Module-2, chain-5: Getting more hits)							
PbPb(5.02TeV)	26/11/2015	245149	LHC15o	0,236,019	22.4	0h27Min	Runs looks good
(There is some issue with Module-2, chain-5: Getting more hits)							
PbPb(5.02TeV)	26/11/2015	245151	LHC15o	0,343,613	25.7	0h13Min	Runs looks good
(There is some issue with Module-2, chain-5: Getting more hits)							
PbPb(5.02TeV)	26/11/2015	245152	LHC15o	0,483,915	26.0	0h16Min	Runs looks good
(There is some issue with Module-2, chain-5: Getting more hits)							
PbPb(5.02TeV)	27/11/2015	245231	LHC15o	0,561,808	22.0	0h31Min	Runs looks good
(There is some issue with Module-2, chain-5: Getting more hits)							
PbPb(5.02TeV)	27/11/2015	245232	LHC15o	1,006,505	22.9	0h46Min	Runs looks good
(There is some issue with Module-2, chain-5: Getting more hits)							

~60M data collected By PMD

**PMD in pp-ref runs in 2015 Nov-Dec
At 5.02TeV**

**PMD-CPV acceptance for
Pp-ref at 5.02TeV**

CPV plane

LowMultiplicity_hCpvXY	
Entries	1.890066e+09
Mean x	12.21
Mean y	−0.3338
RMS x	49.42
RMS y	31.44

Thu Nov 19 22:53:0 2015 Run 244351

PRE plane

LowMultiplicity_hPreXY	
Entries	5.709967e+09
Mean x	18.08
Mean y	−20.44
RMS x	36.11
RMS y	27.8

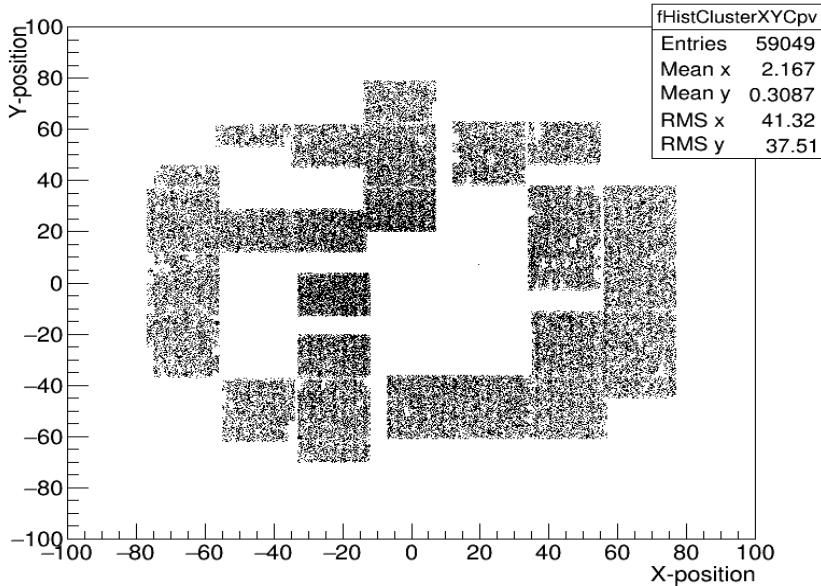Thu Nov 19 22:53:0 2015 Run 244351

**PMD-PRE acceptance for
pp-ref at 5.02TeV**

Acceptance remain unchanged compare to last 13 TeV pp run
(At the end of run few 4 chains had to be removed)
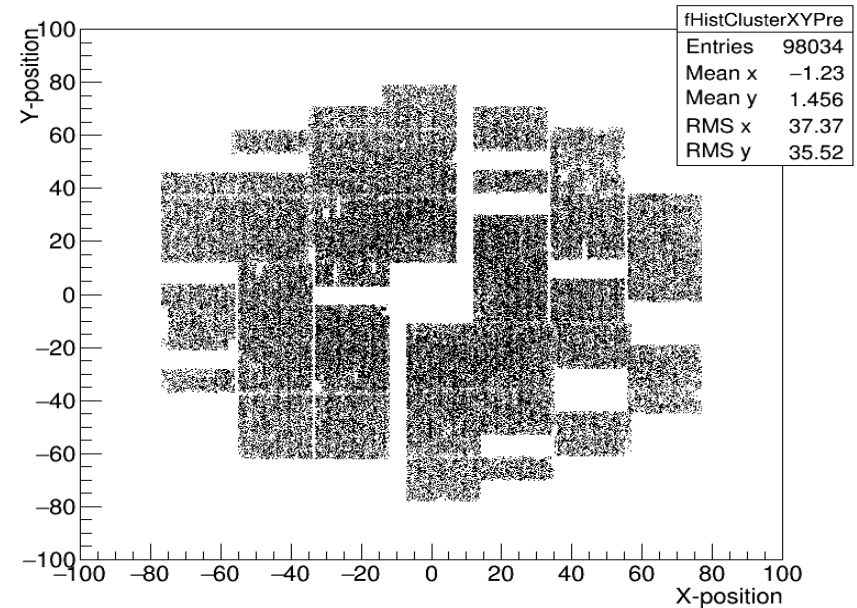
PMD in PbPb runs in 2015 Nov-Dec At 5.02TeV

ClusterX-Y Plot for CPV module

fHistClusterXYCpv	
Entries	59049
Mean x	2.167
Mean y	0.3087
RMS x	41.32
RMS y	37.51

PMD-CPV acceptance for PbPb-ref at 5.02TeV

ClusterX-Y Plot for PRE module

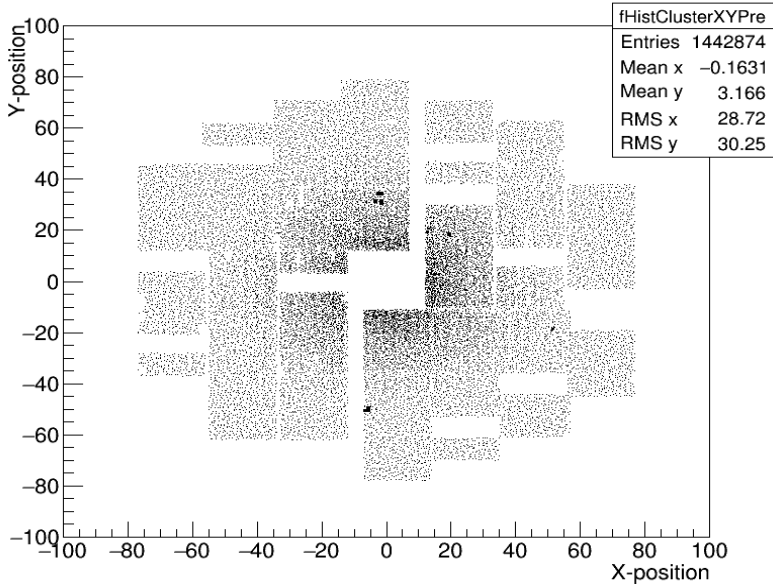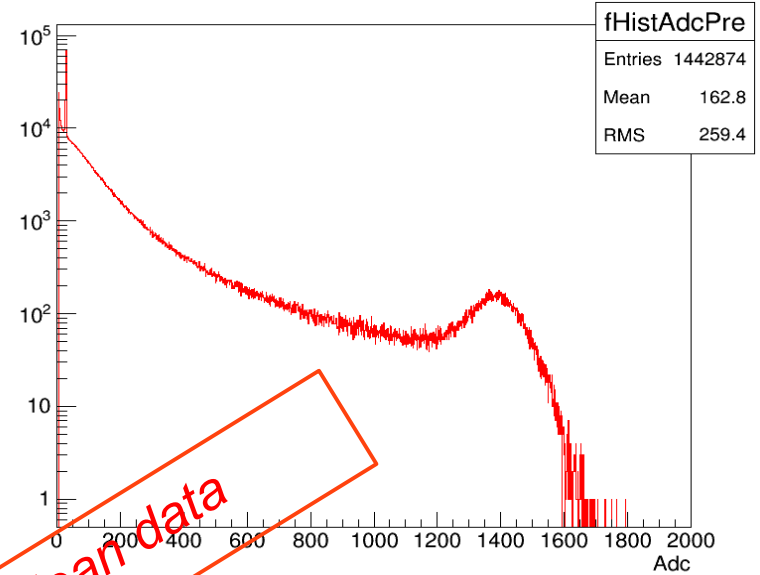| fHistClusterXYPre	
Entries	98034
Mean x	−1.23
Mean y	1.456
RMS x	37.37
RMS y	35.52

PMD-PRE acceptance for Pb-Pb at 5.02TeV

Acceptance remain unchanged compare to last 13 TeV pp run
(At the end of run few 4 chains had to be removed)
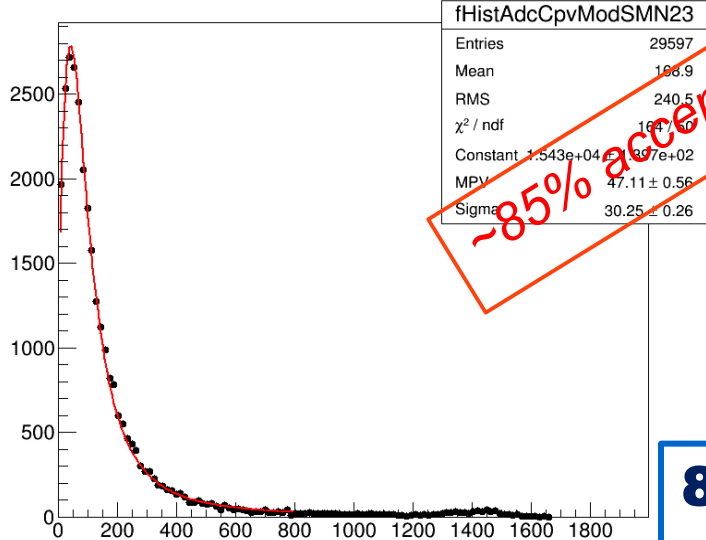
LHC Run-II: pp-ref @ 5.02 TeV

ClusterX-Y Plot for PRE module

fHistClusterXYPre	
Entries	1442874
Mean x	−0.1631
Mean y	3.166
RMS x	28.72
RMS y	30.25

ADC Distribution for PRE module

fHistAdcPre	
Entries	1442874
Mean	162.8
RMS	259.4

Adc CPV | SM 23

fHistAdcCpvModSMN23	
Entries	29597
Mean	168.9
RMS	240.5
χ² / ndf	164.7 / 60
Constant	1.543e+04 ± 1.897e+02
MPV	47.11 ± 0.56
Sigma	30.25 ± 0.26

Eta

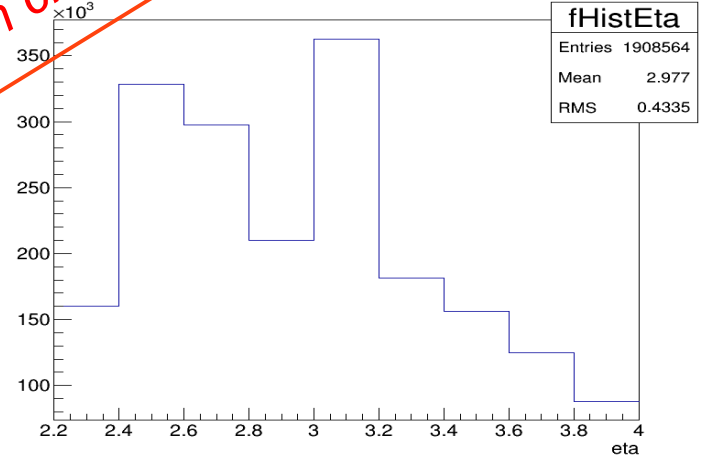| fHistEta	
Entries	1908564
Mean	2.977
RMS	0.4335

~85% acceptance with clean data
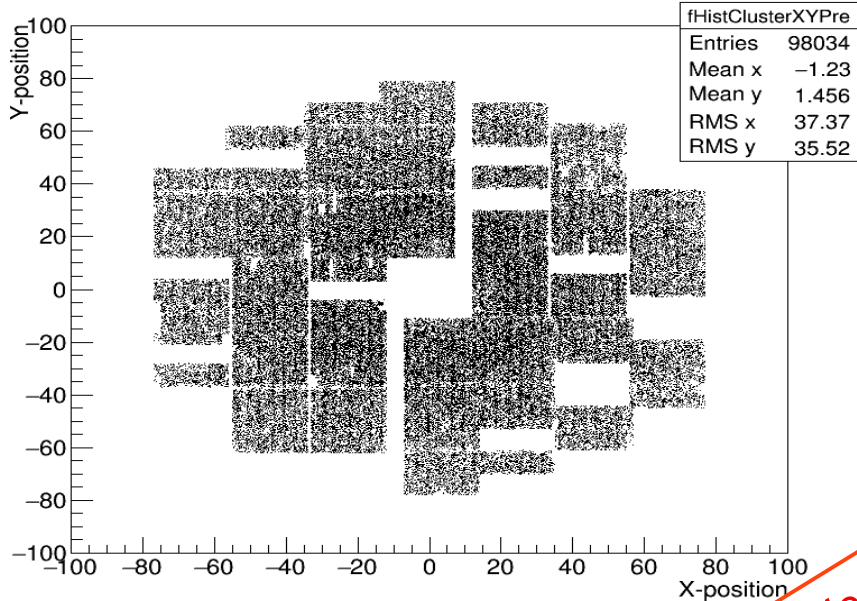
89.9M data has been recorded by PMD

LHC Run-II: Pb-Pb @ 5.02 TeV

ClusterX-Y Plot for PRE module

fHistClusterXYPre	
Entries	98034
Mean x	−1.23
Mean y	1.456
RMS x	37.37
RMS y	35.52

ADC Distribution for PRE module

fHistAdcPre	
Entries	98034
Mean	252.7
RMS	338.4

Adc CPV | SM 23

fHistAdcCpvModSMN23	
Entries	4919
Mean	190.8
RMS	164.9
χ² / ndf	64.35 / 50
Constant	2336 ± 54.1
MPV	52.22 ± 1.37
Sigma	32.7 ± 0.7

~85% acceptance with clean data

Eta

fHistEta	
Entries	143774
Mean	2.786
RMS	0.3715
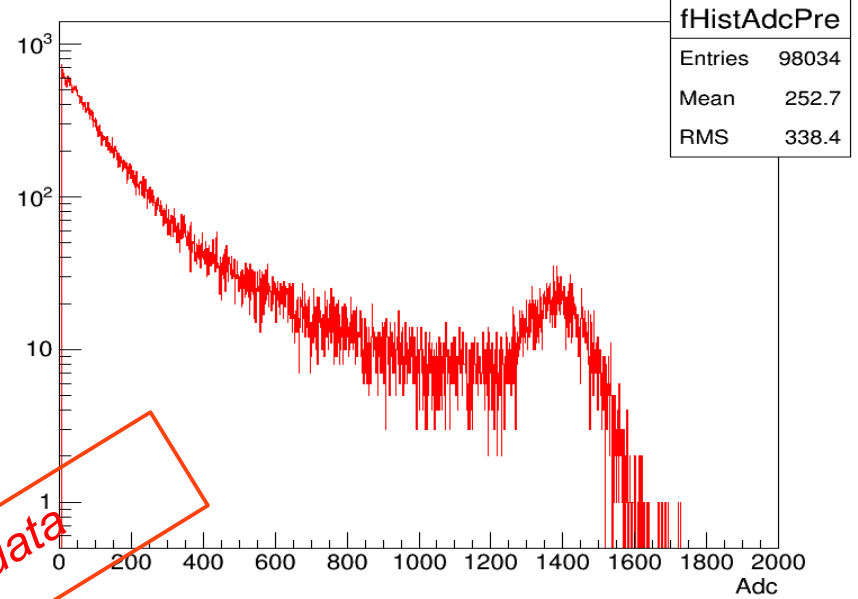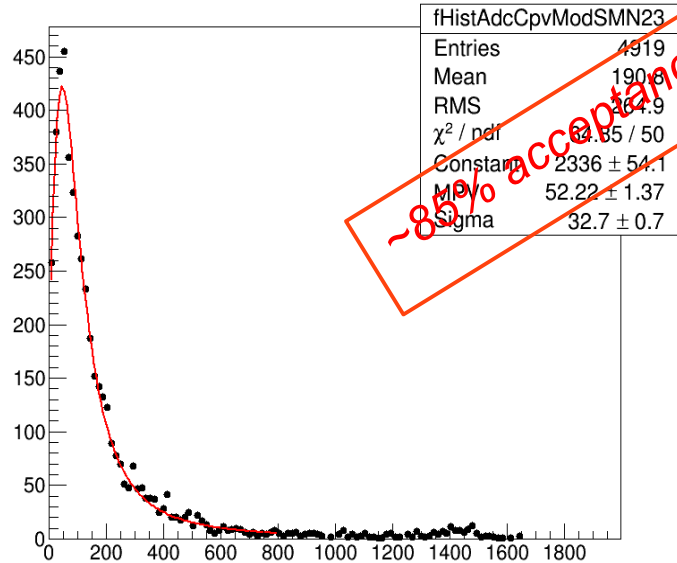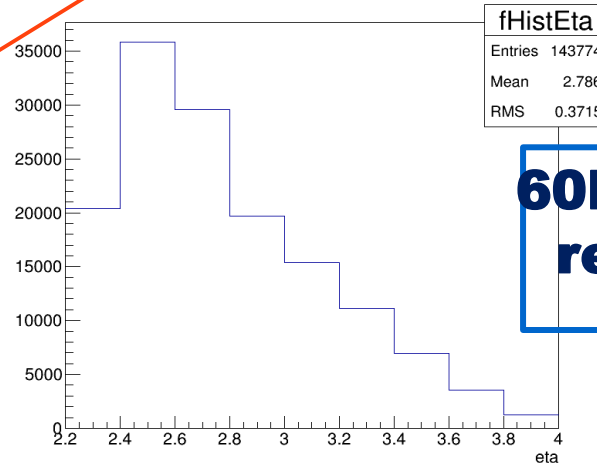
60M data Has been recorded by PMD

In the latter part of the data taking two more chains removed Which decrease the acceptance a little

Concluding ....

- ❑ *A good amount of data has been collected both for pp-ref and PbPb.*

- ❑ *Pass-1 reconstruction assures good quality of the data.*

- ❑ *Need calibration urgently for further processing of data.*

**PMD data Taking for this Year 2016 !!
Need to be discussed in senior discussion**