

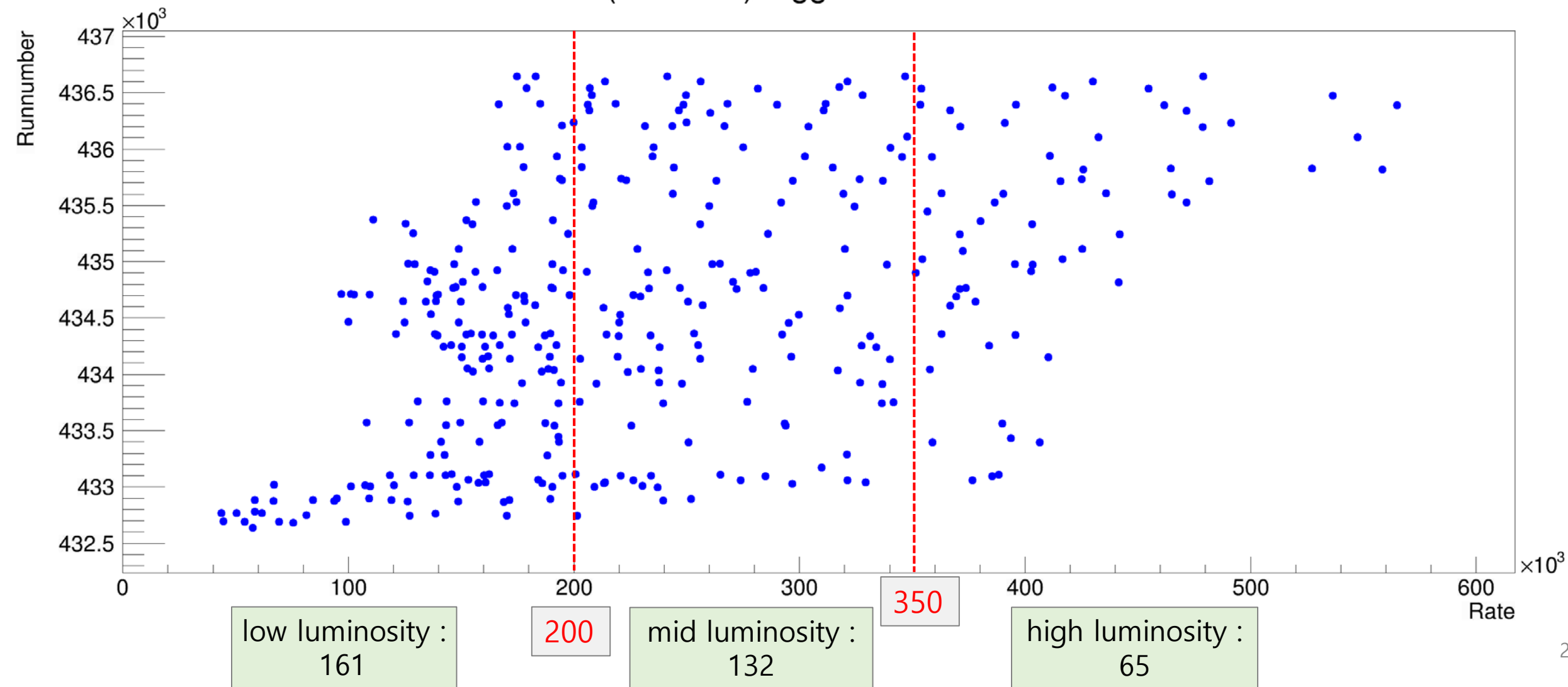
Charged pion analysis

π^\pm Production in transverse-single-spin asymmetries for midrapidity at pA collisions $\sqrt{s_{NN}} = 200$ GeV in Run15

Korea Univ.
Jaehee Yoo

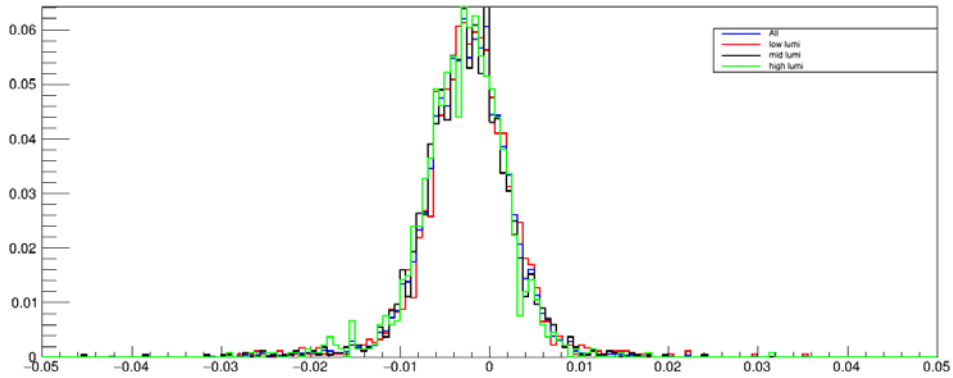
Luminosity

BBCLL1(>0 tubes) trigger rate vs. Runnumber

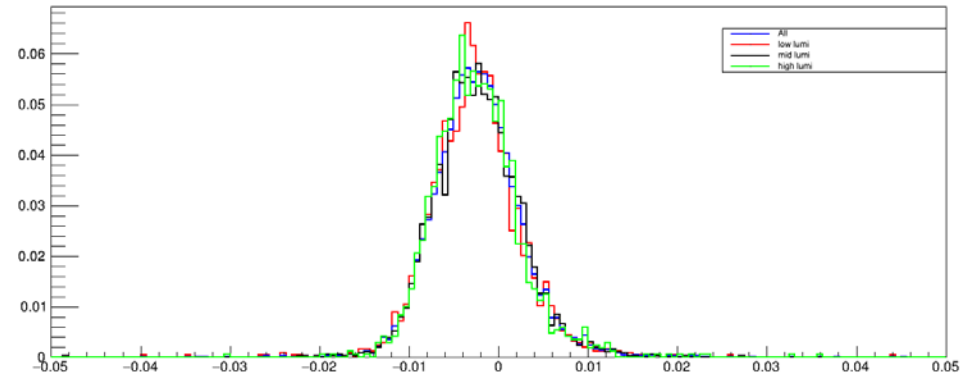


EMCdphi ($5 < p_T < 6$) (all, low, mid, high)

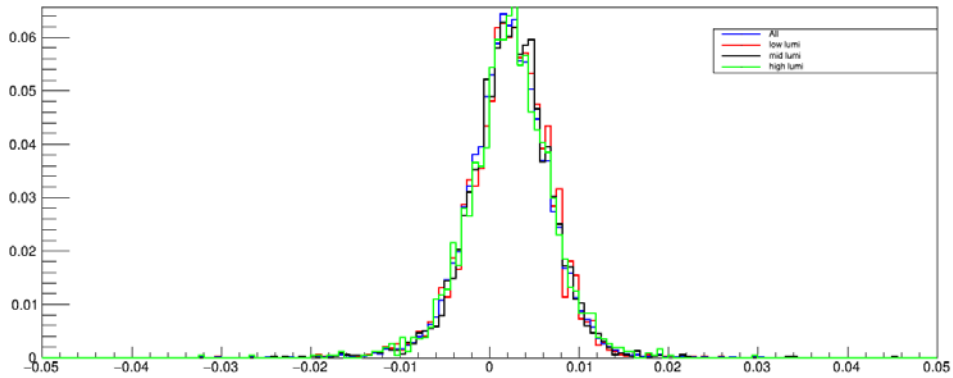
emcdphi_w_plus_5_6



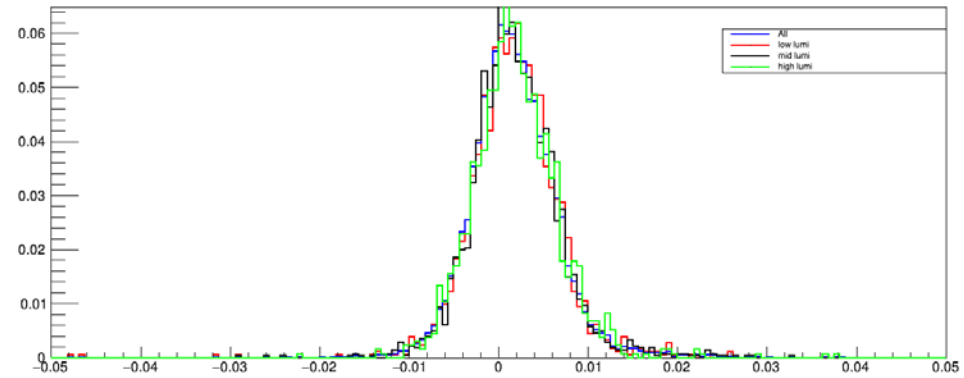
emcdphi_w_minus_5_6



emcdphi_e_plus_5_6



emcdphi_e_minus_5_6

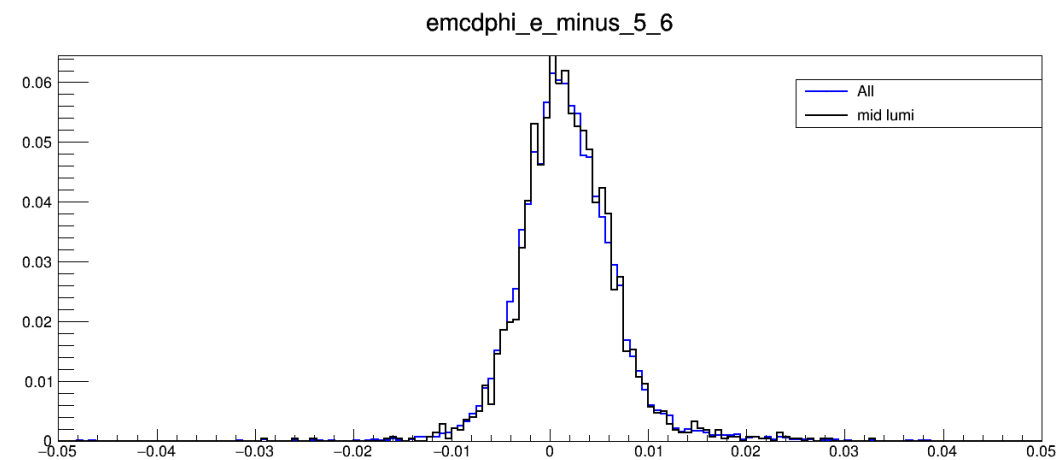
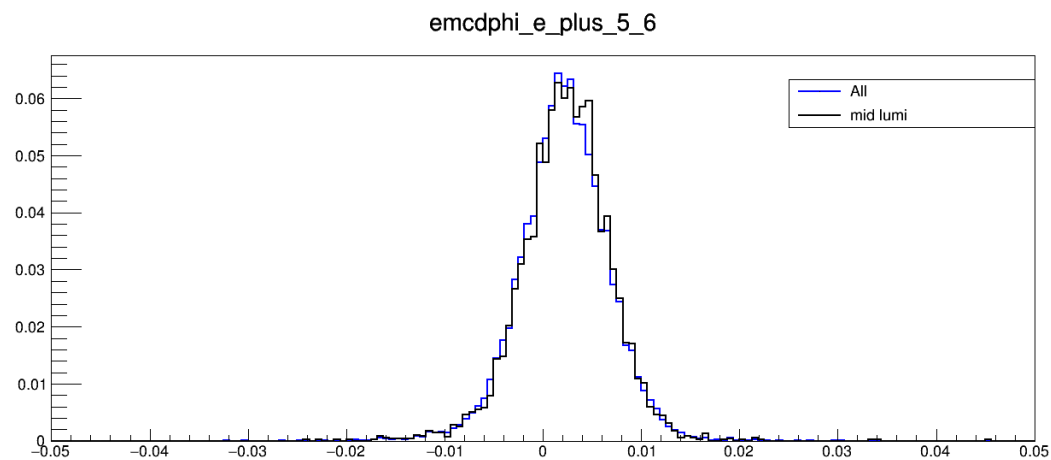
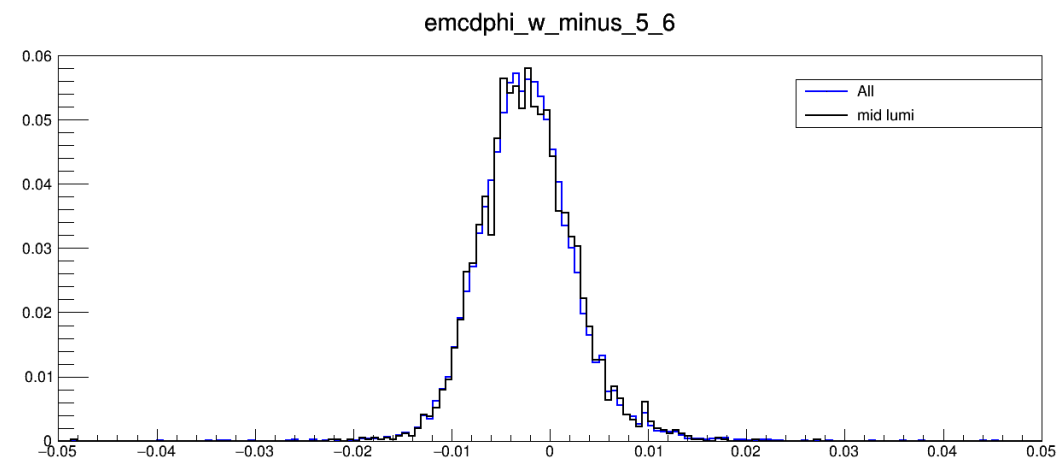
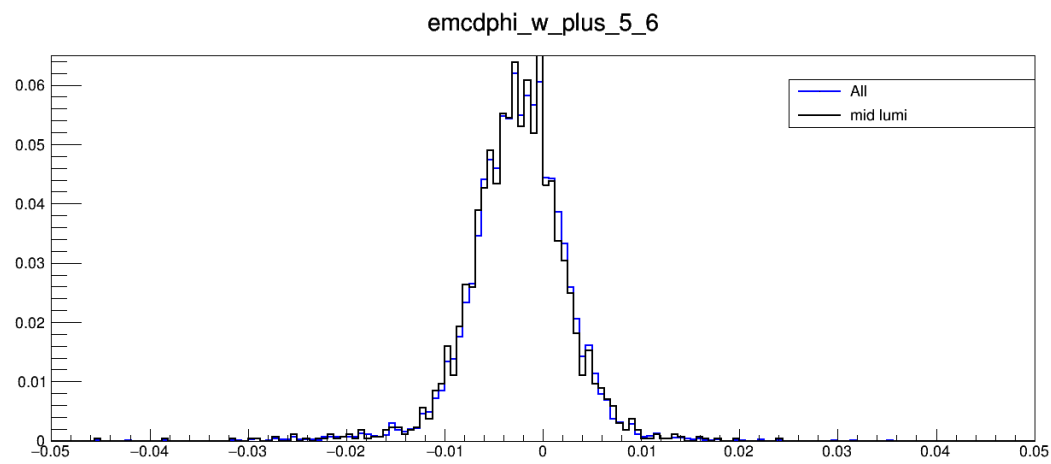


- normalized each histogram.

- ALL
- low luminosity
- mid luminosity
- high luminosity

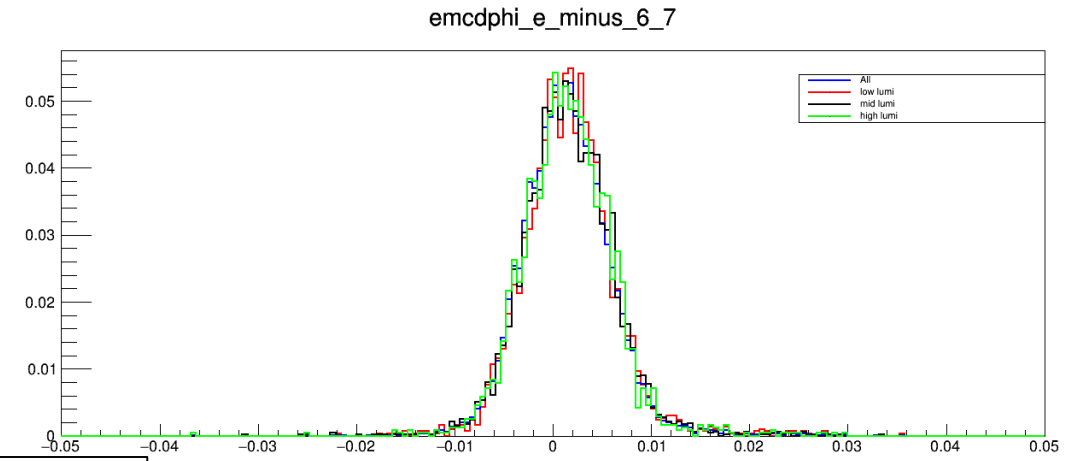
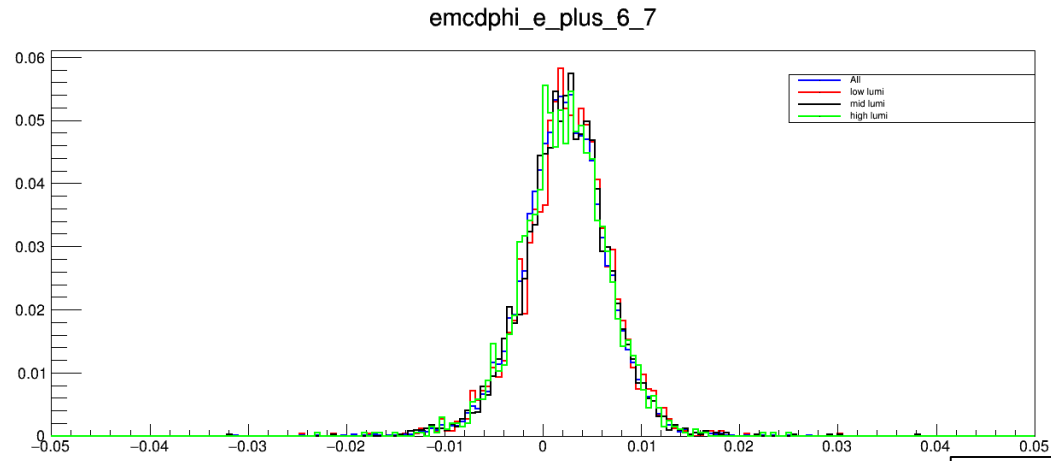
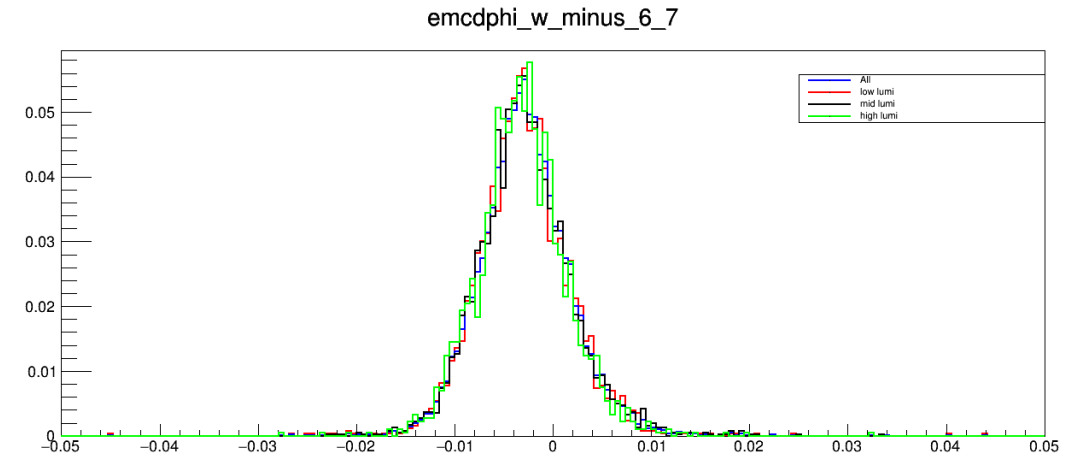
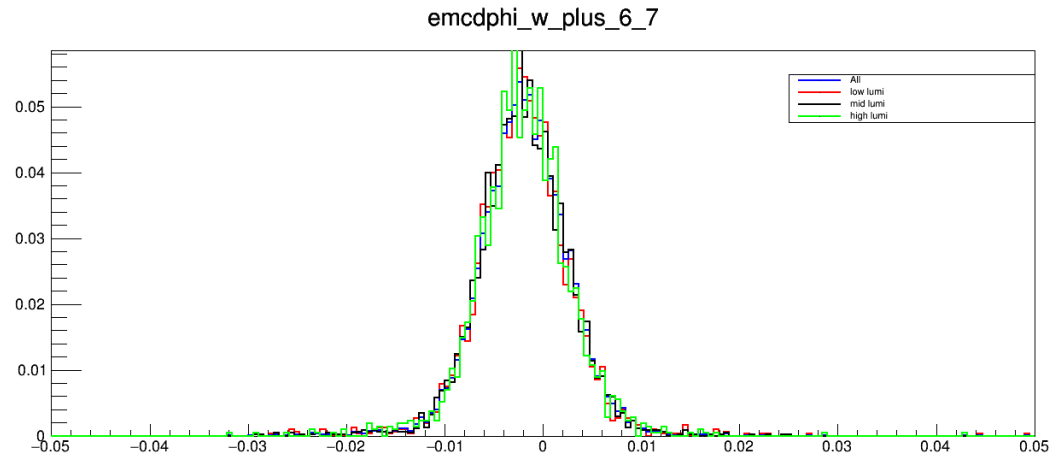
- Applied Cuts
 - I. $-2 < p_T < 25$ (GeV/c)
 - II. quality == 31 or 63
 - III. $n_1 > 0$
 - IV. $|BBCZ| < 30$ (cm)
 - V. $|DCZed| < 70$ (cm)
 - VI. Shower shape (prob) < 0.01
 - VII. $0.2 < emce/p < 0.7$
 - VIII. Warnmap Cut
 - IX. $pc3dphi > -1000$ && $pc3dz > -1000$
 - X. sect > -1000

EMCdphi ($5 < p_T < 6$) (mid)



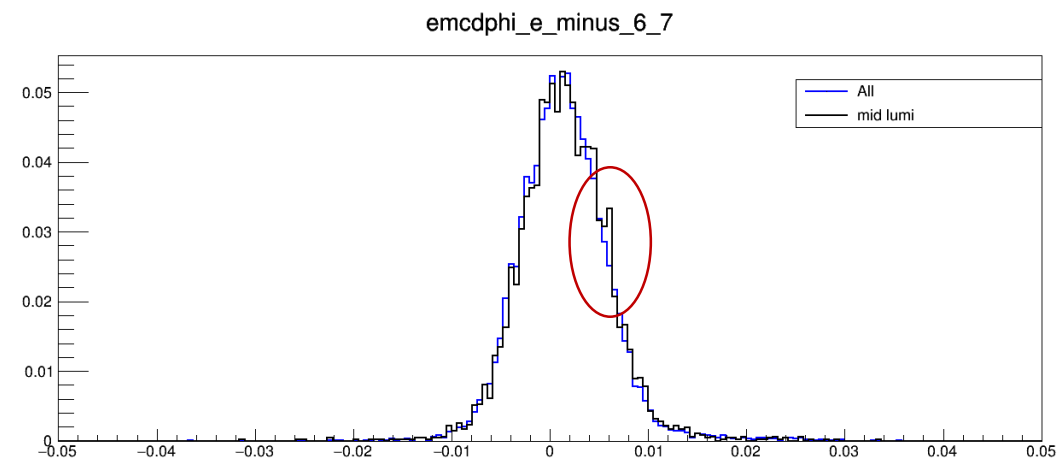
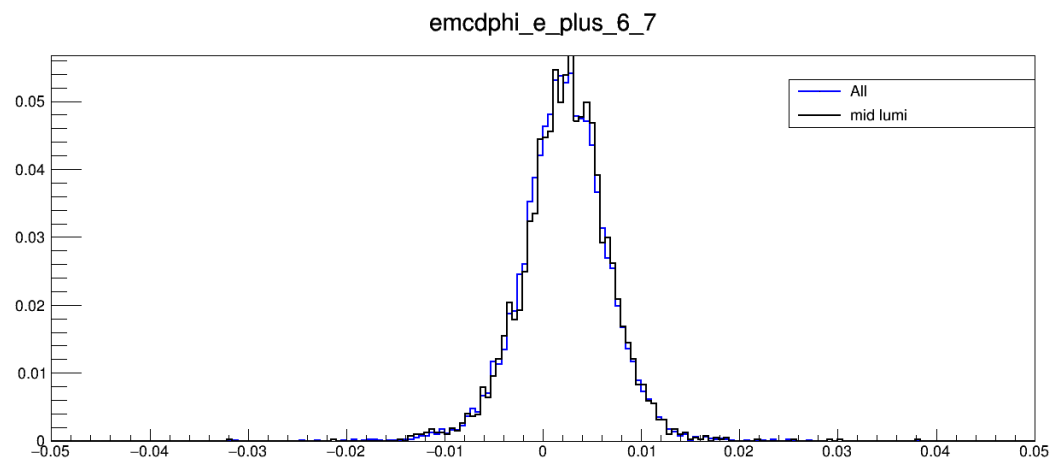
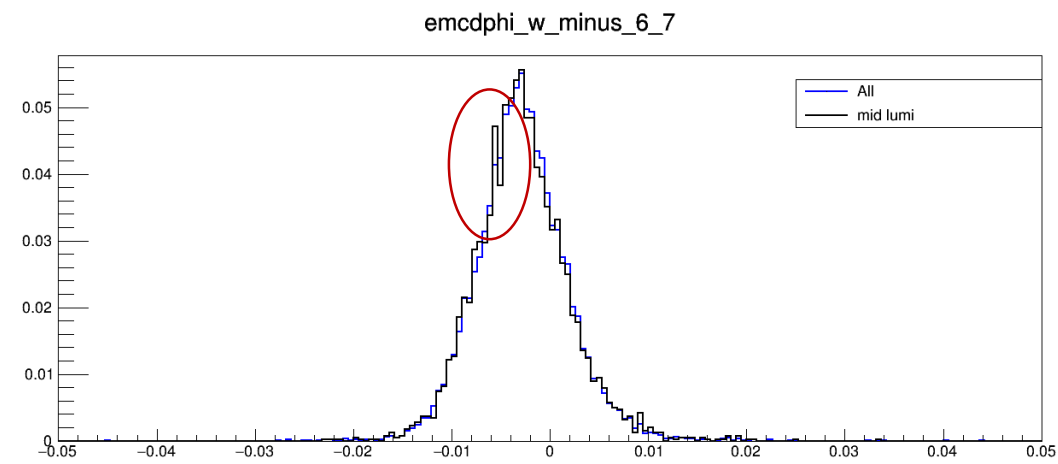
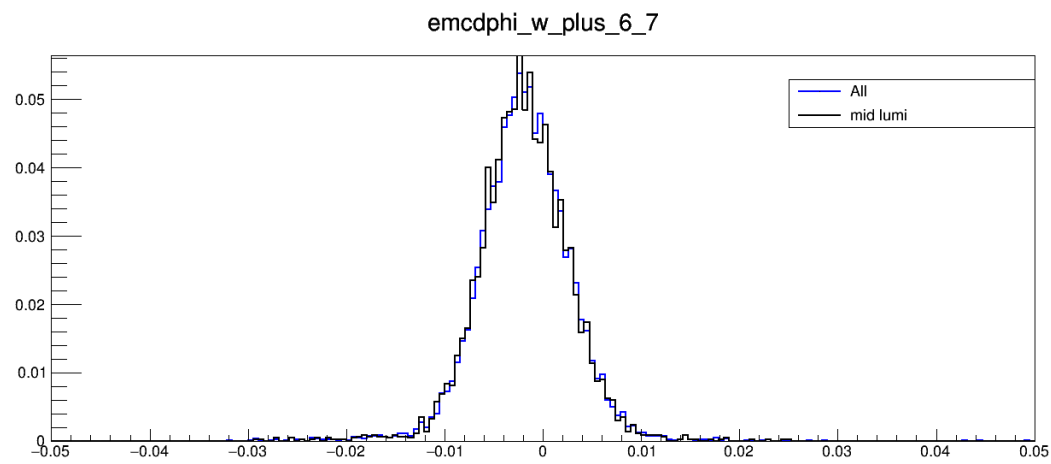
- ALL
- low luminosity
- mid luminosity
- high luminosity

EMCdphi ($6 < p_T < 7$) (all, low, mid, high)



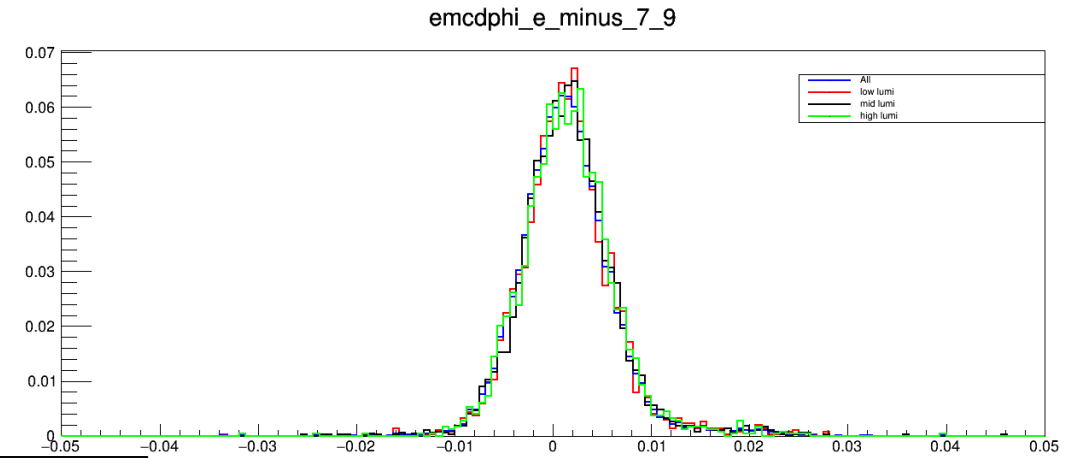
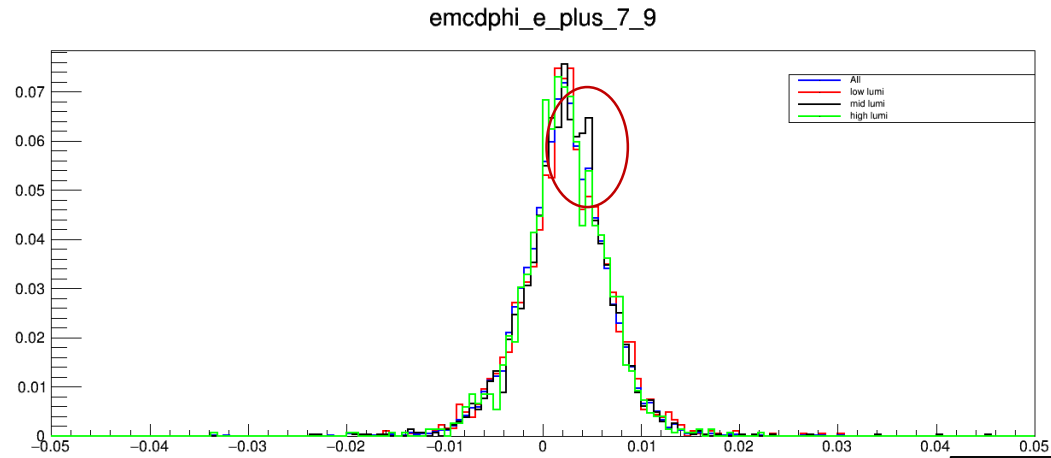
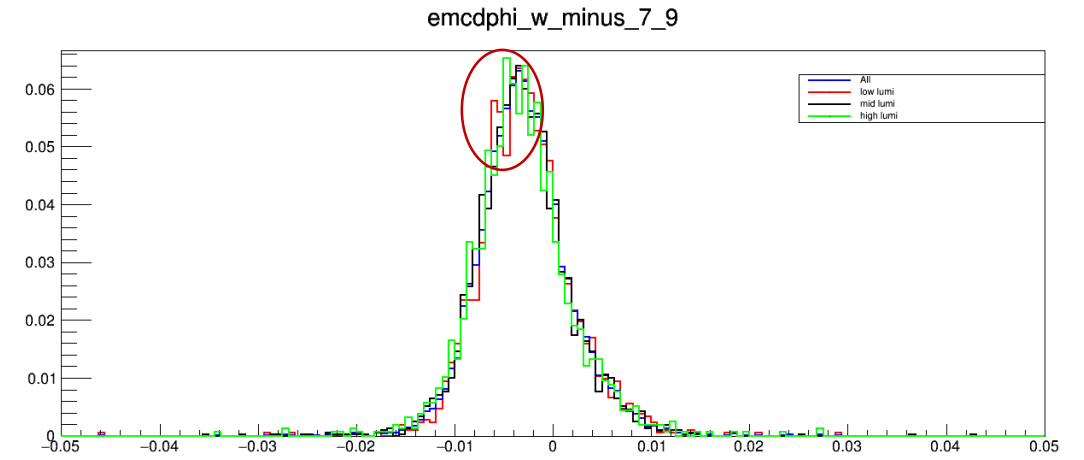
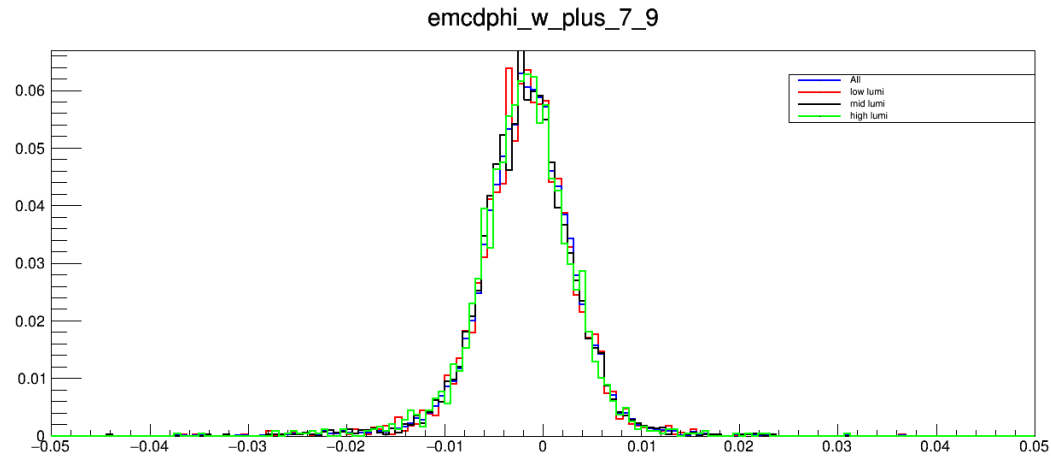
- ALL
- low luminosity
- mid luminosity
- high luminosity

EMCdphi ($6 < p_T < 7$) (mid)



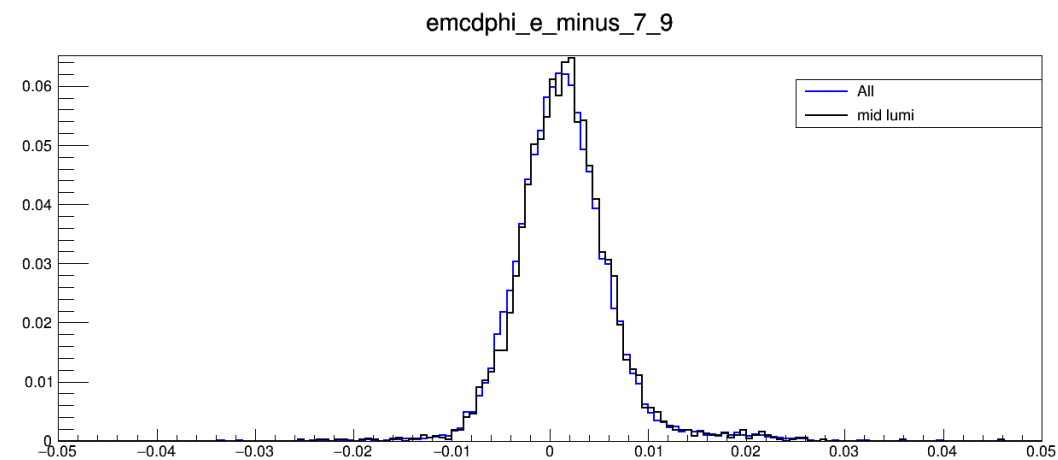
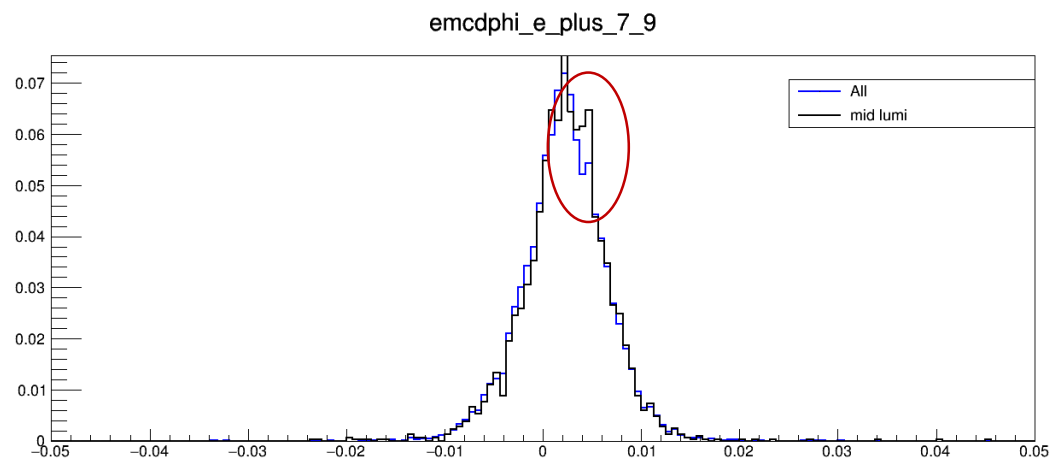
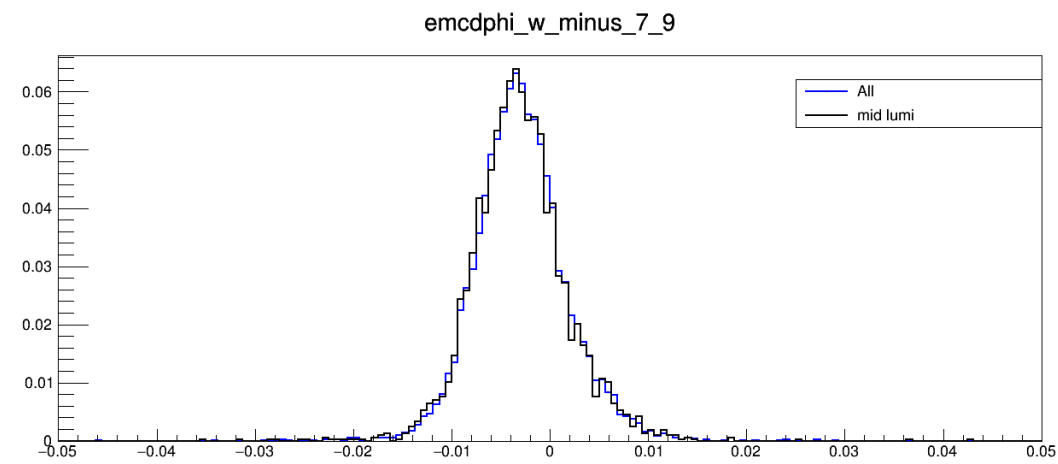
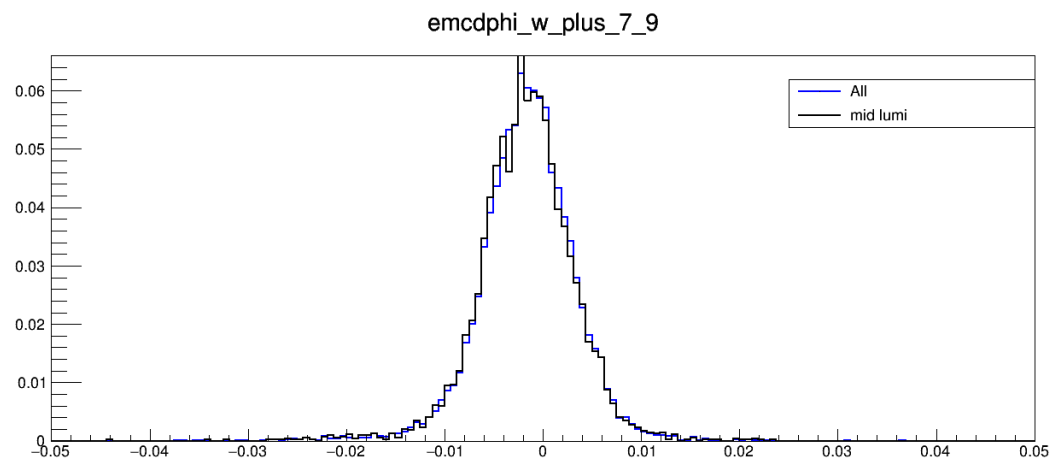
- ALL
- low luminosity
- mid luminosity
- high luminosity

EMC ϕ ($7 < p_T < 9$) (all, low, mid, high)



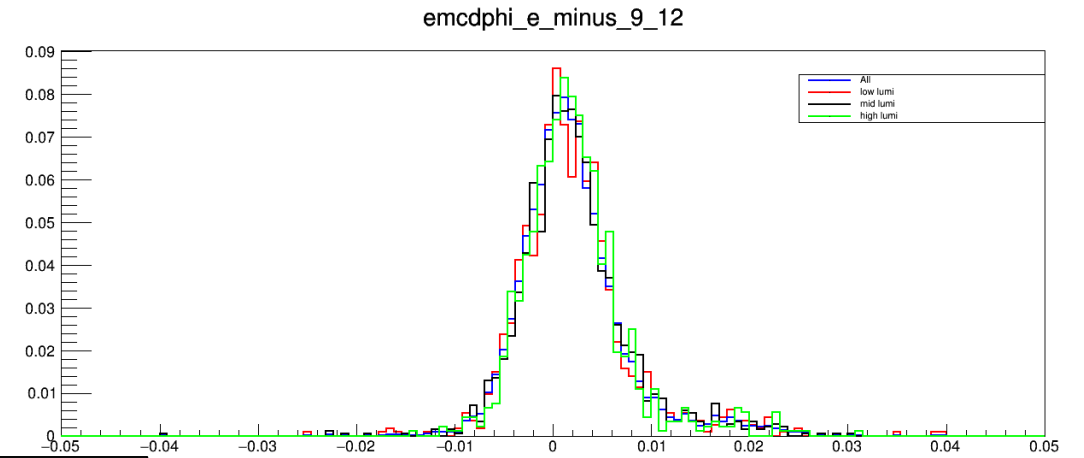
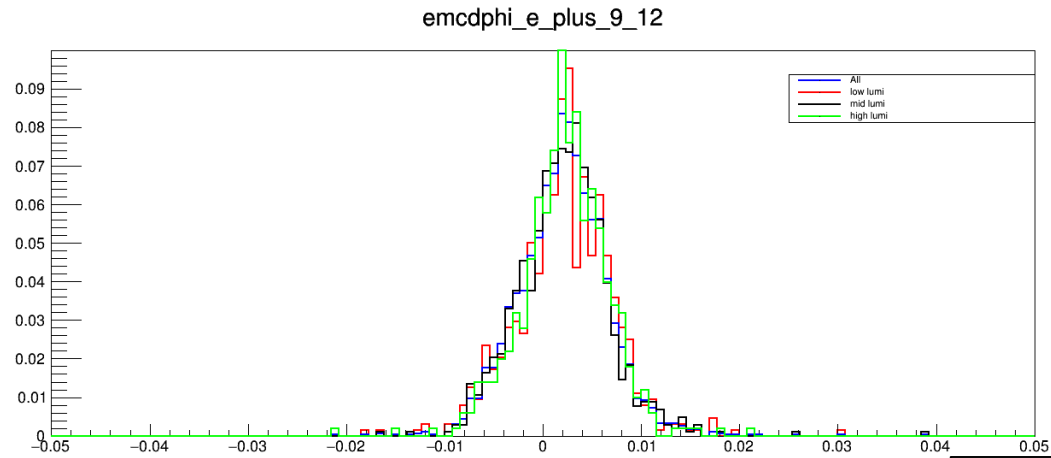
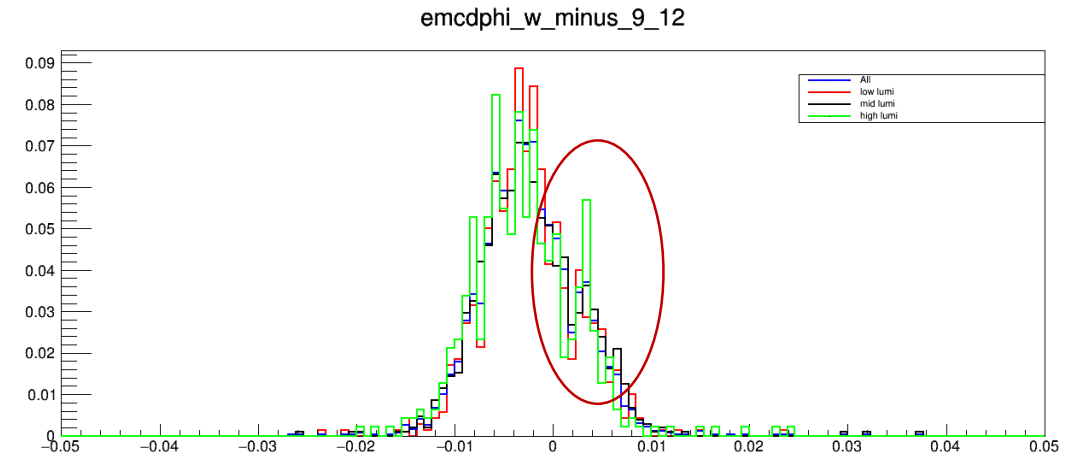
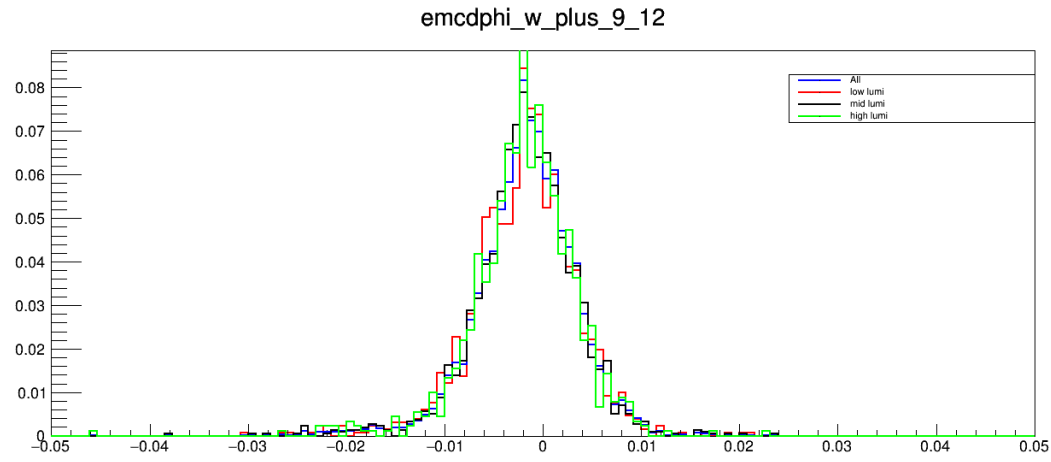
- ALL
- low luminosity
- mid luminosity
- high luminosity

EMCdphi ($7 < p_T < 9$) (mid)



- ALL
- low luminosity
- mid luminosity
- high luminosity

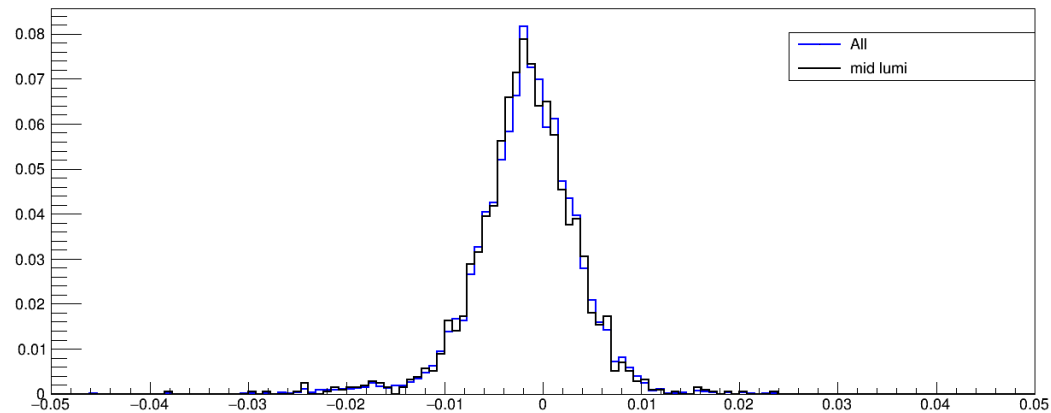
EMCdphi ($9 < p_T < 12$) (all, low, mid, high)



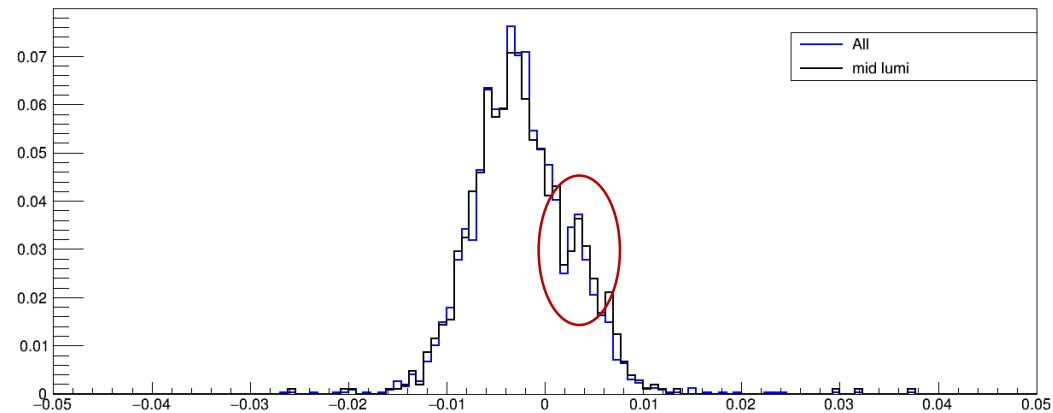
- ALL
- low luminosity
- mid luminosity
- high luminosity

EMCdphi ($9 < p_T < 12$) (mid)

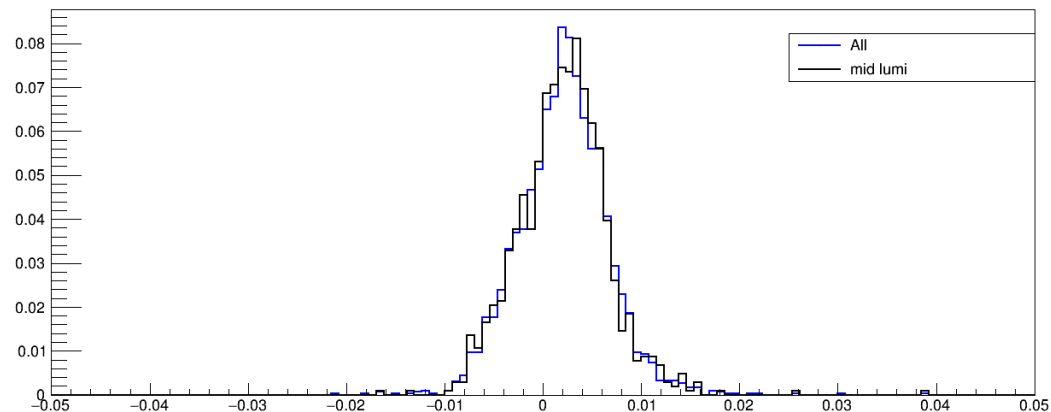
emcdphi_w_plus_9_12



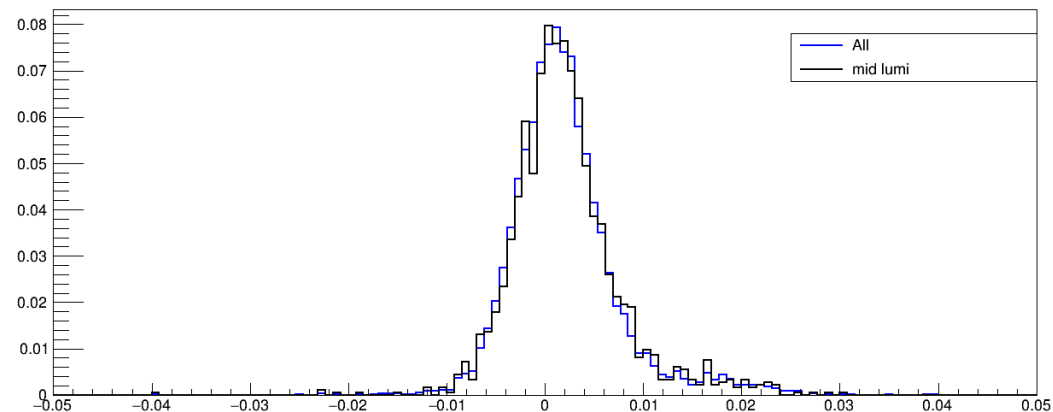
emcdphi_w_minus_9_12



emcdphi_e_plus_9_12



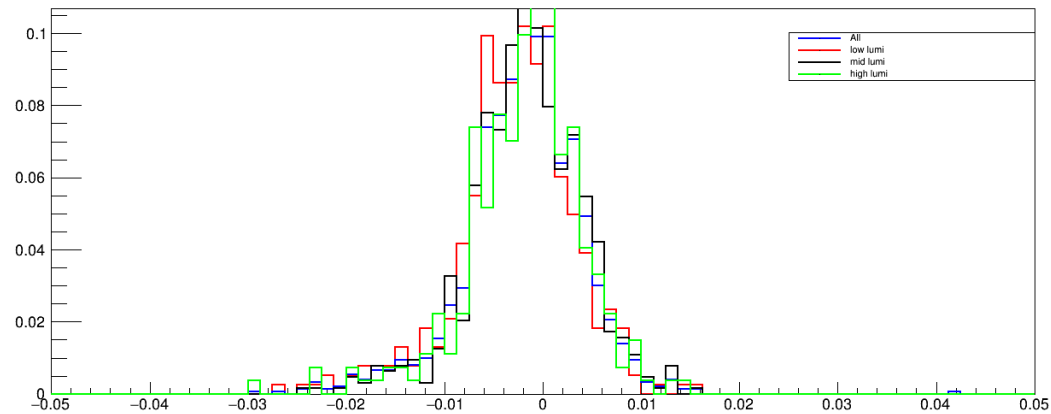
emcdphi_e_minus_9_12



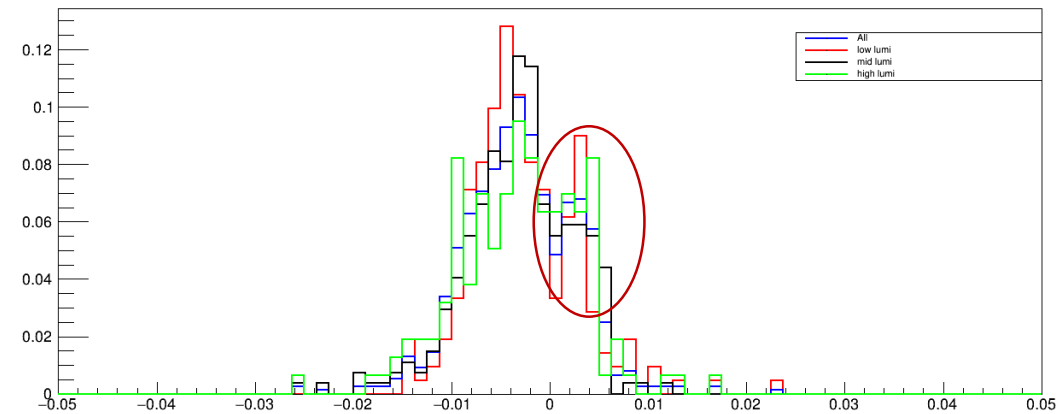
- ALL
- low luminosity
- mid luminosity
- high luminosity

EMCdphi ($12 < p_T < 16$) (all, low, mid, high)

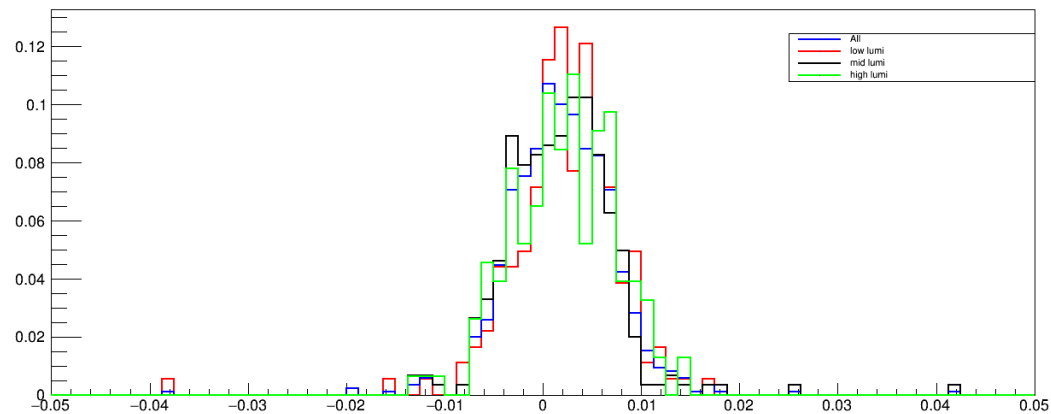
emcdphi_w_plus_12_16



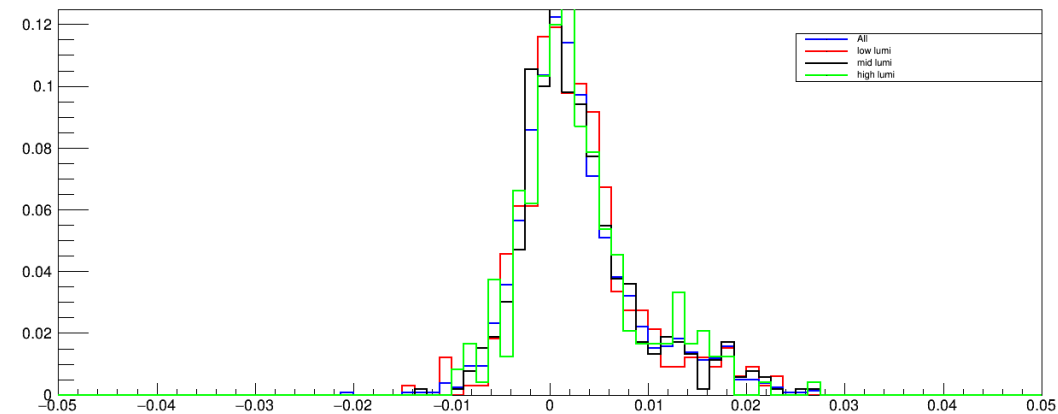
emcdphi_w_minus_12_16



emcdphi_e_plus_12_16



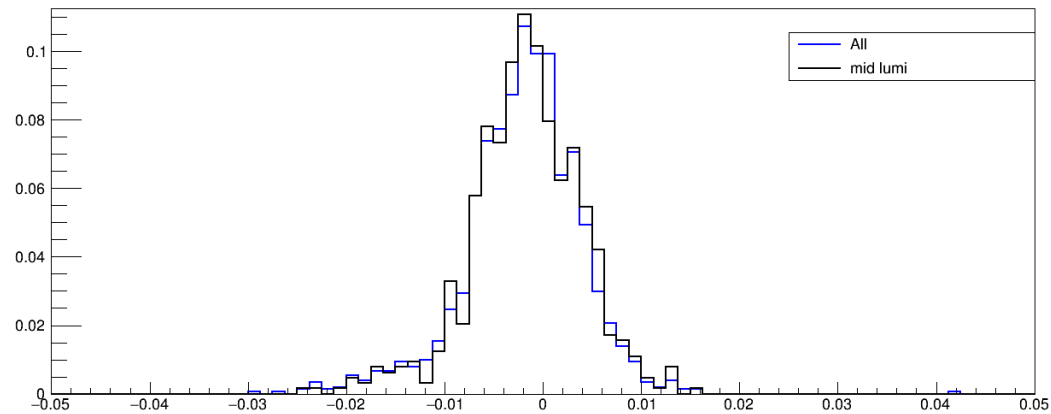
emcdphi_e_minus_12_16



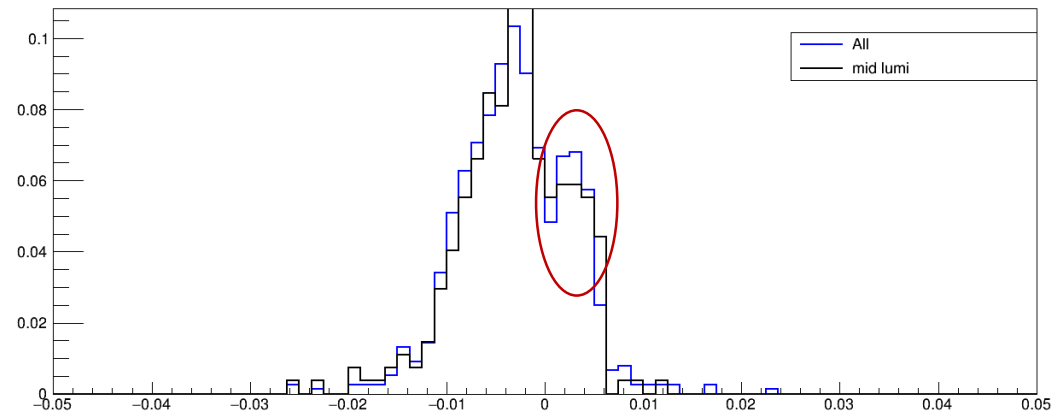
- ALL
- low luminosity
- mid luminosity
- high luminosity

EMCdphi ($12 < p_T < 16$) (mid)

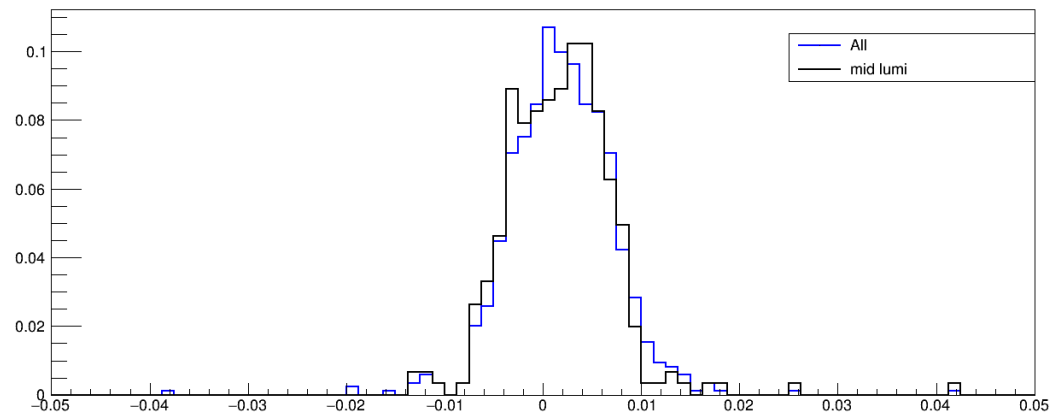
emcdphi_w_plus_12_16



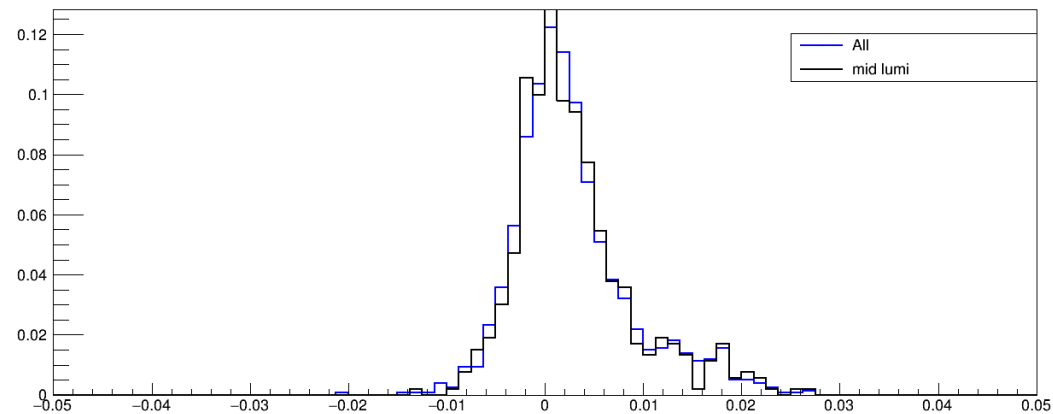
emcdphi_w_minus_12_16



emcdphi_e_plus_12_16

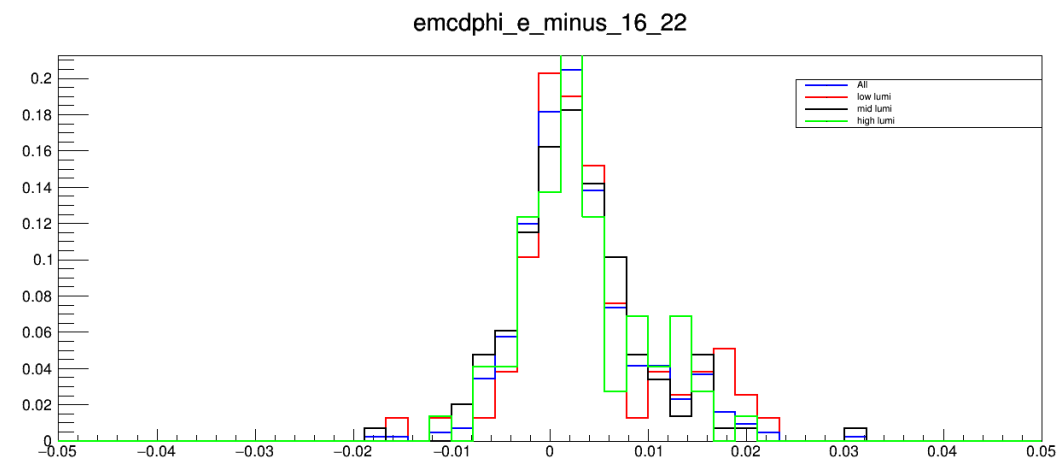
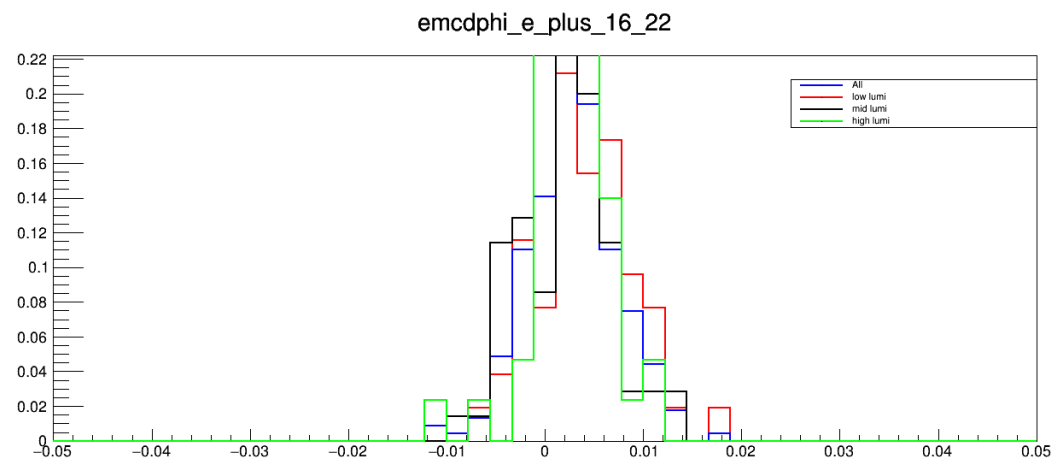
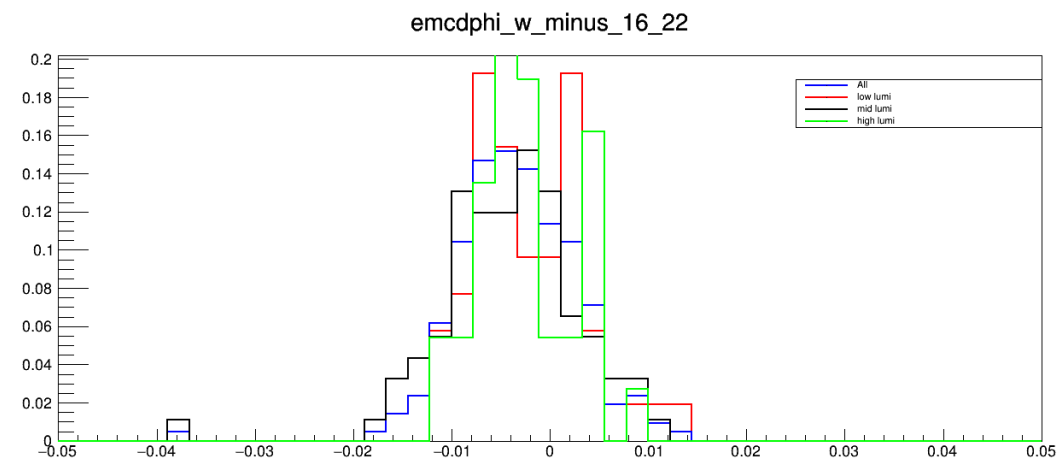
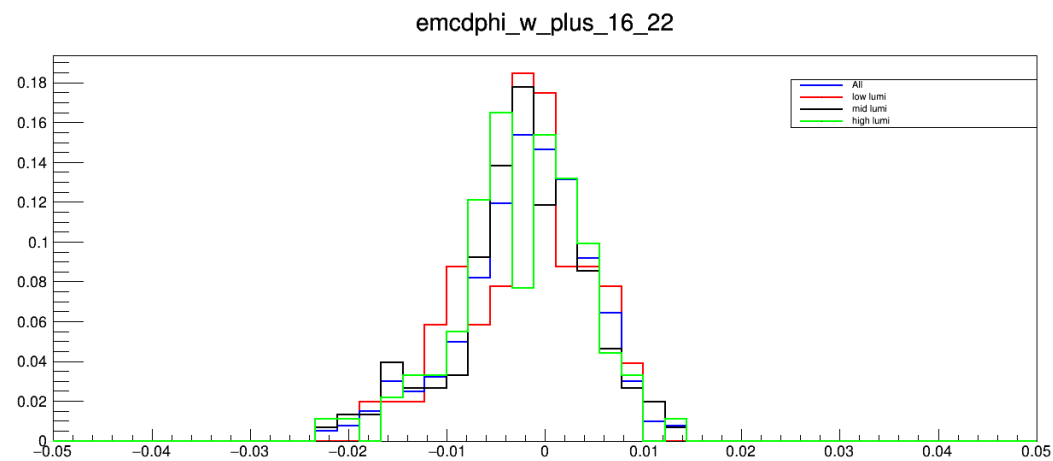


emcdphi_e_minus_12_16



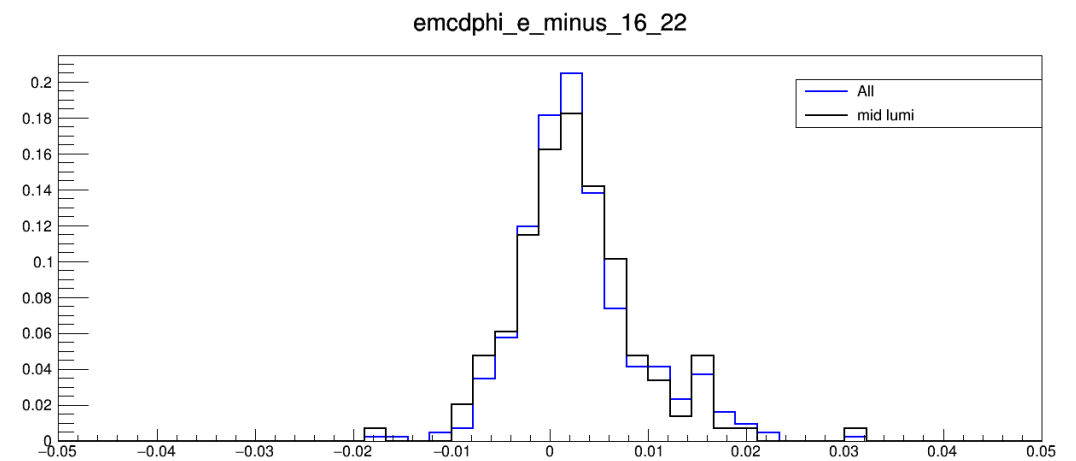
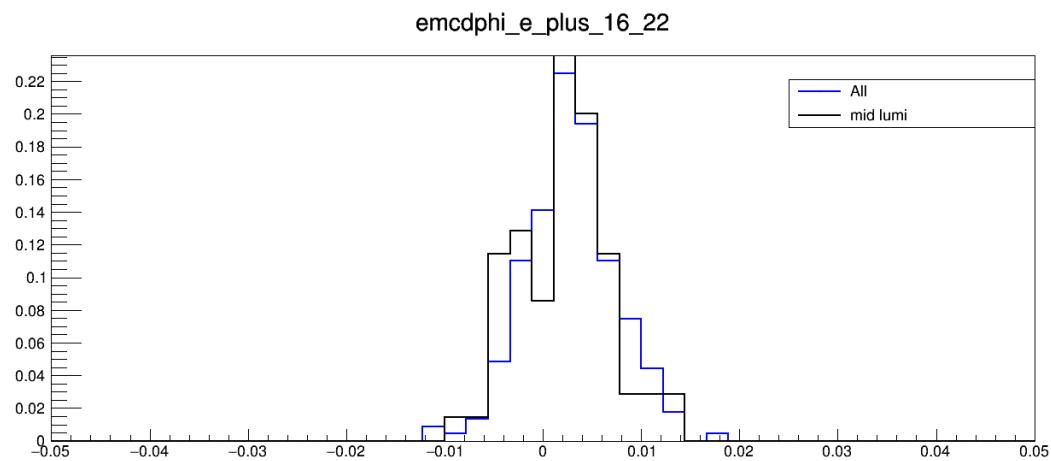
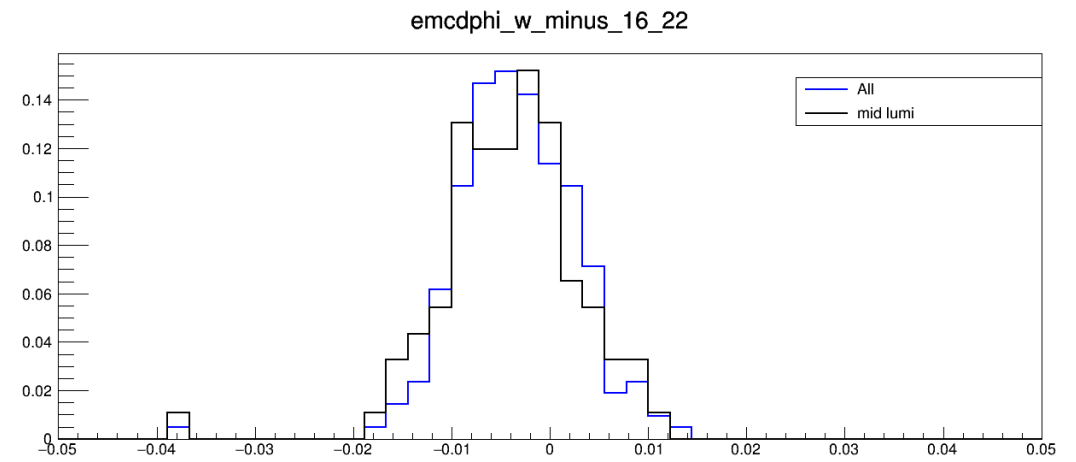
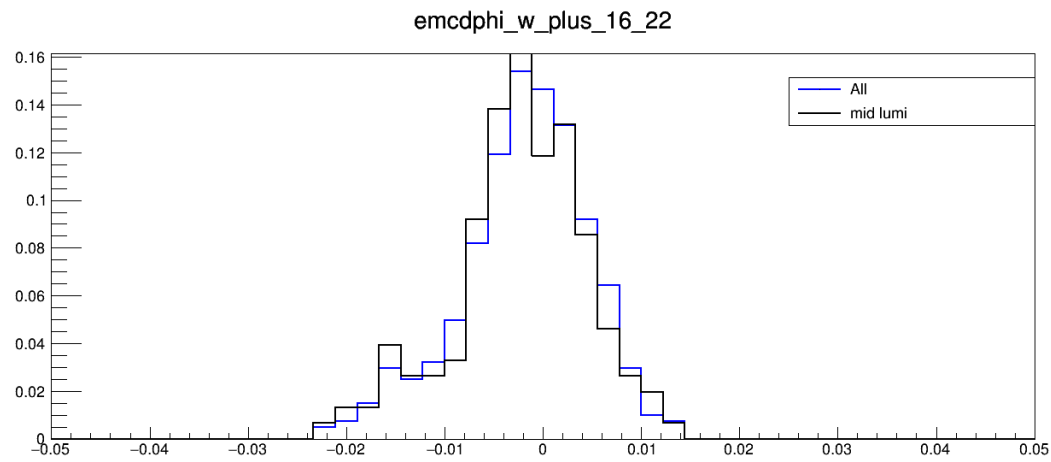
- ALL
- low luminosity
- mid luminosity
- high luminosity

EMCdphi ($16 < p_T < 22$) (all, low, mid, high)



- ALL
- low luminosity
- mid luminosity
- high luminosity

EMCdphi ($16 < p_T < 22$) (mid)



- ALL
- low luminosity
- mid luminosity
- high luminosity

result

- second peak doesn't disappear by luminosity cut.
- I have plan to do beam offset calibration.

Back up

Luminosity (low)

runnumber	Raw Trigger Rate
432640	57528.46
432684	75505.74
432691	98910.13
432692	69330.95
432693	53901.21
432694	44596.45
432746	170265.9
432747	127098.4
432748	81339.04
432762	138697.5
432766	61581.55
432767	50412.19
432768	43679.3
432780	58465.53
432866	168975.1
432872	148708.6
432873	126202.1
432874	93659.44
432875	66846.7
432883	171434
432884	119129.5
432885	84347.21
432886	58394.94
432895	189563.8
432898	109121.8
432900	94761.98
433001	190432.8
433003	147995.2
433004	109635.7
433005	101210.3
433014	120158.8
433015	107324.6
433020	67120.95
433032	186029
433036	157767.4

433044	160737.1
433063	184068.1
433065	153199.9
433102	194979.8
433103	160210.9
433104	143022.2
433105	136125.5
433106	128901.7
433107	118396.3
433114	162440.8
433116	145845.1
433278	188186.6
433284	142552.1
433285	136397.7
433400	193460.3
433401	158087
433402	141042.7
433446	193113.9
433547	191383.7
433548	166185.8
433549	143396.5
433568	187235.9
433570	167898
433571	149566.7
433572	126996.8
433573	108125.6
433744	193243.9
433745	173593.5
433746	167020.4
433759	159681.2
433760	143516.9
433761	130745.1
433921	177068.2
433928	194305
434024	185733.8

434027	155244.56
434040	191032.73
434050	188709.2
434051	162407.95
434052	152845.25
434139	171642.5
434140	159547.19
434152	150302.67
434157	189270.94
434160	161925.58
434243	184139.78
434244	160680.81
434245	150172.06
434246	142296.11
434259	192127.03
434260	167024.14
434261	145608.39
434344	186998.27
434345	164191.14
434347	139495.03
434354	172388.03
434355	159222.06
434356	152314.5
434357	138475
434358	121160.88
434363	189502.7
434364	154397.72
434461	178643.11
434462	148940.98
434463	124955.38
434467	100020.88
434533	171113.72
434534	136579.92
434591	170668.3
434615	182719.08

434644	149829.19
434645	134234.64
434648	178178.94
434649	138808.2
434650	124306.53
434693	177779.36
434698	139140.77
434705	198055.72
434706	174213.92
434707	102485.83
434708	139649.2
434710	109476.3
434711	101160.94
434712	96825.82
434762	190762.73
434765	146383.84
434773	190007.83
434774	159453.61
434775	147687.22
434823	150615.91
434824	135087.27
434912	156297.92
434913	138099.98
434924	195236.17
434925	166016.98
434926	136342.11
434977	190475.19
434978	146909.25
434979	129368.05
434984	126550.88
435114	172693.77
435115	148924.5
435247	197334.23
435254	128692.3
435335	155077.31

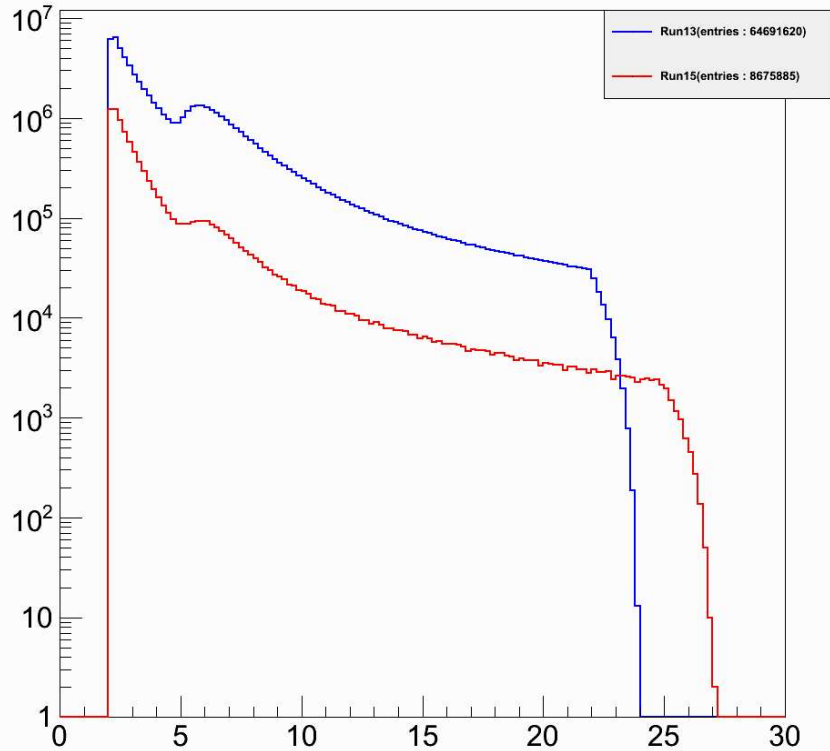
435337	125413.13
435370	190557.53
435371	152231.8
435372	110990.74
435495	170178.41
435529	174508.91
435530	156456.94
435606	173056.19
435725	194626.05
435737	193914.67
435841	177667.95
435935	192387.42
436019	176029.91
436020	170506.12
436210	194721.86
436236	199833.38
436396	166573.16
436403	185052.08
436541	178946.19
436646	182993.2
436647	174747.88

Analysis Plan

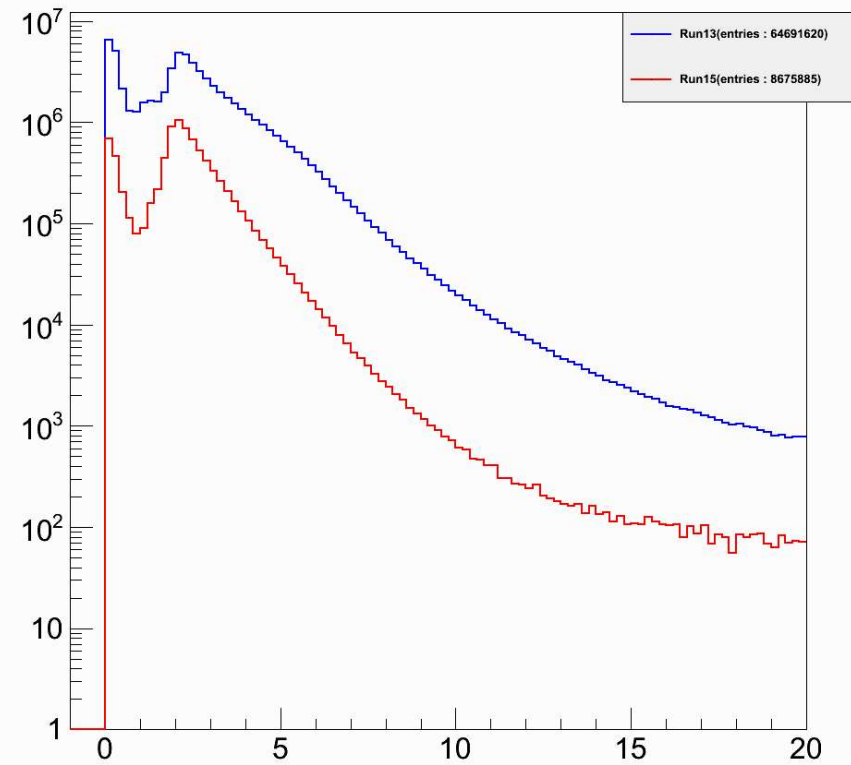
1. Run QA	Feb. March	2.28 (10days)	
2. calibration - EMCal gain matching (carried norbert) - PC calibration -	March	3.17 (20 days)	
3. Event selection - Convincing evidences of each cuts.	March Aprill May	3.17 ~ 5.18 (2 monthes)	3.17 ~ 10.31
4. Suvival rate true events Background rejection power	May June	5.19 ~ 6.22 (1 month)	11.01 ~ 12.01
4.1 trigger efficeincy calculation			11.01 ~ 11.30
4.2 Simulation and recon_eff			12.01 ~ 01.31
5. Luminosity study	June July	6.23 ~ 7.13 (3 weeks)	02.01 ~ 02.21
6. Cross section as function of pT compare with π^0	July August September	7.14 ~ 9.14 (2 monthes)	02.22 ~ 04.30
7. A_N spin anaysis +-	October November	9.18 ~ 11.16 (2 monthes)	05.01 ~ 06.30
8. Systematic error	December	11.17 ~ 12.14 (1 monthes)	07.01 ~ 07.31
9. Preliminary	End of year 2018	2 weeks	08.01

momentum && emce(deposit energy)

mom



emce

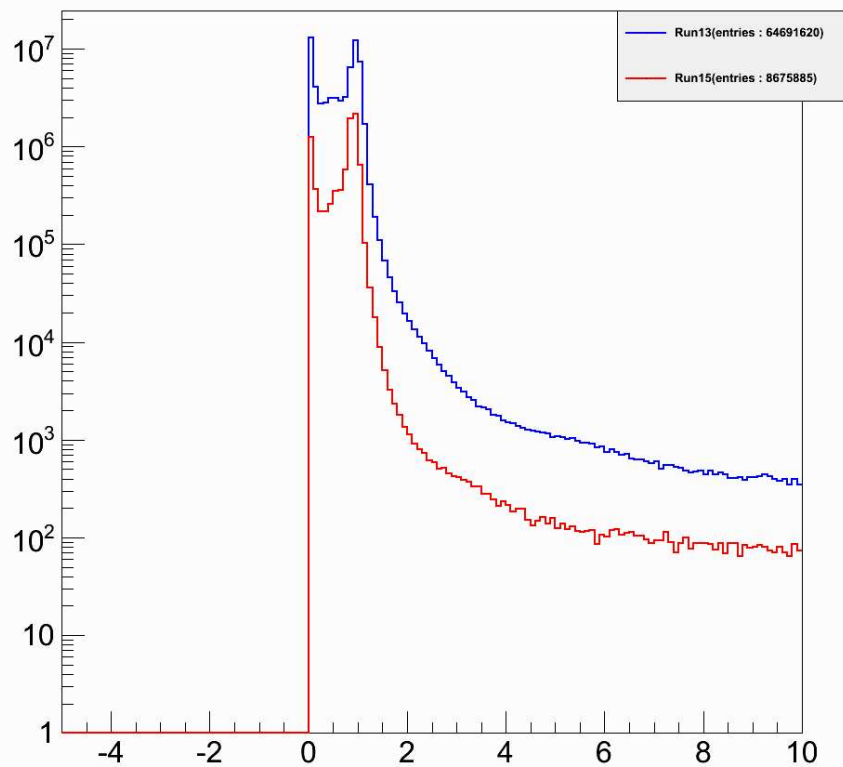


Applied cut :

- $n1 > 0$
- quality == 31 or 63
- $|BBCZ| < 30$ cm

$$\frac{emce}{p} < 0.9$$

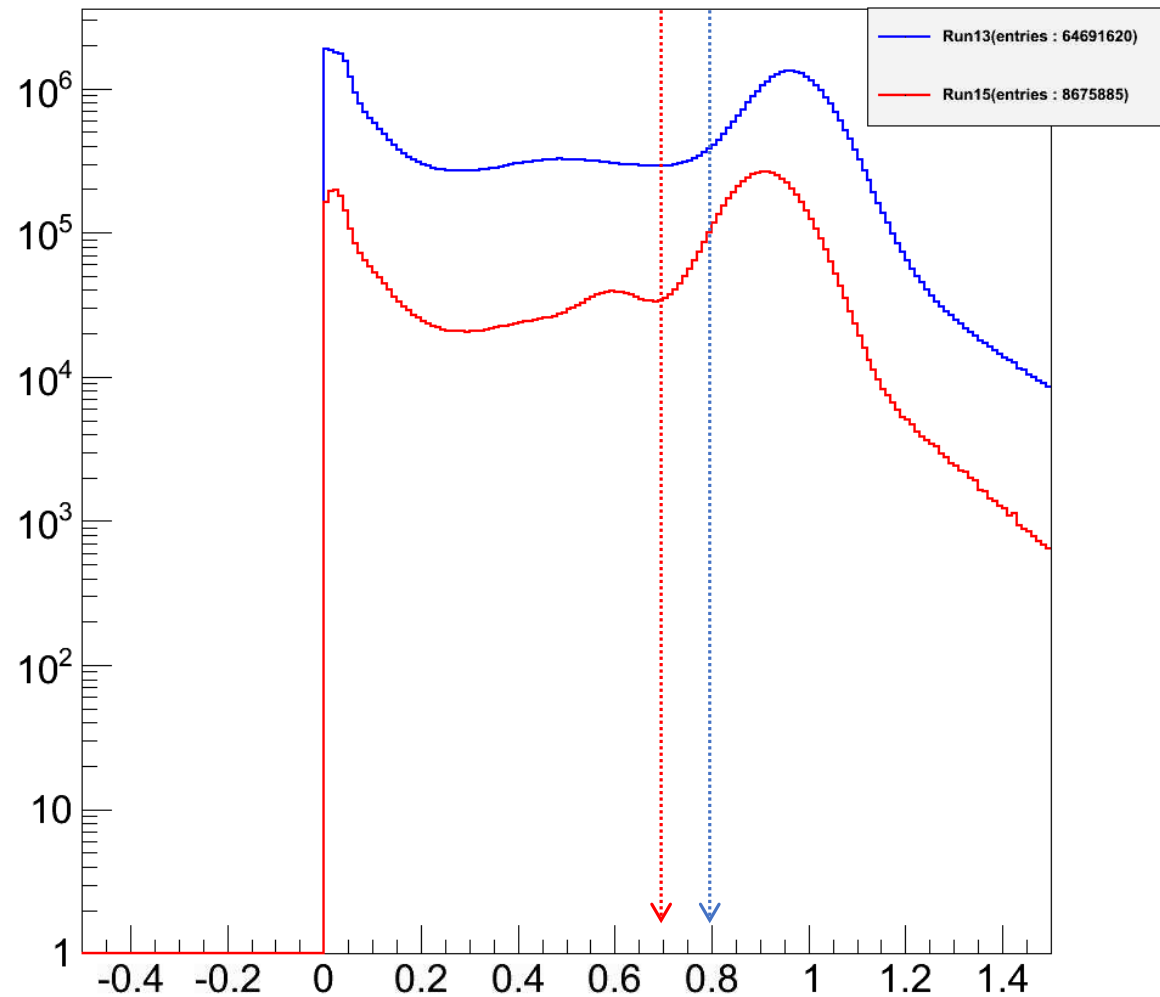
emce/mom



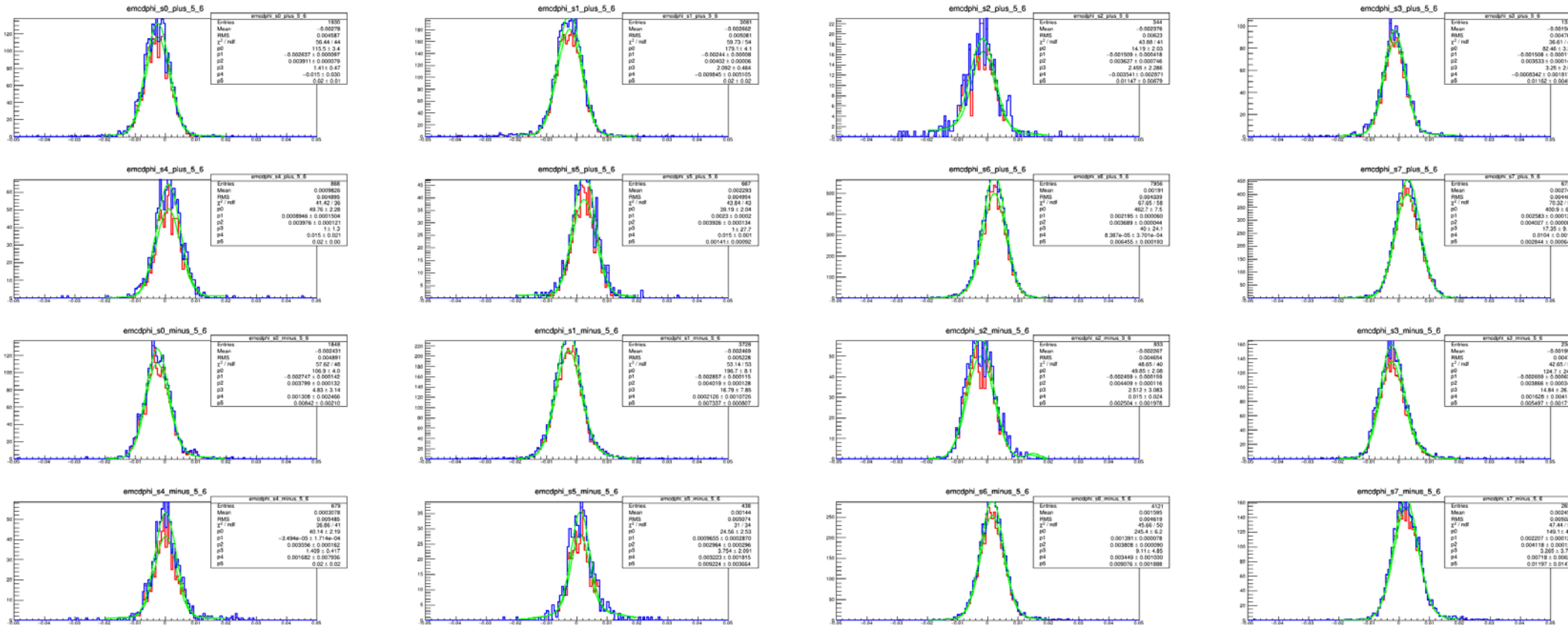
Applied cut :

- $n1 > 0$
- quality == 31 or 63
- $|BBCZ| < 30$ cm

emce/mom



Compare distribution ($e/p < 0.8$ vs $e/p < 0.7$)



histogram separation

- sector : 0~7
- charge : +, -

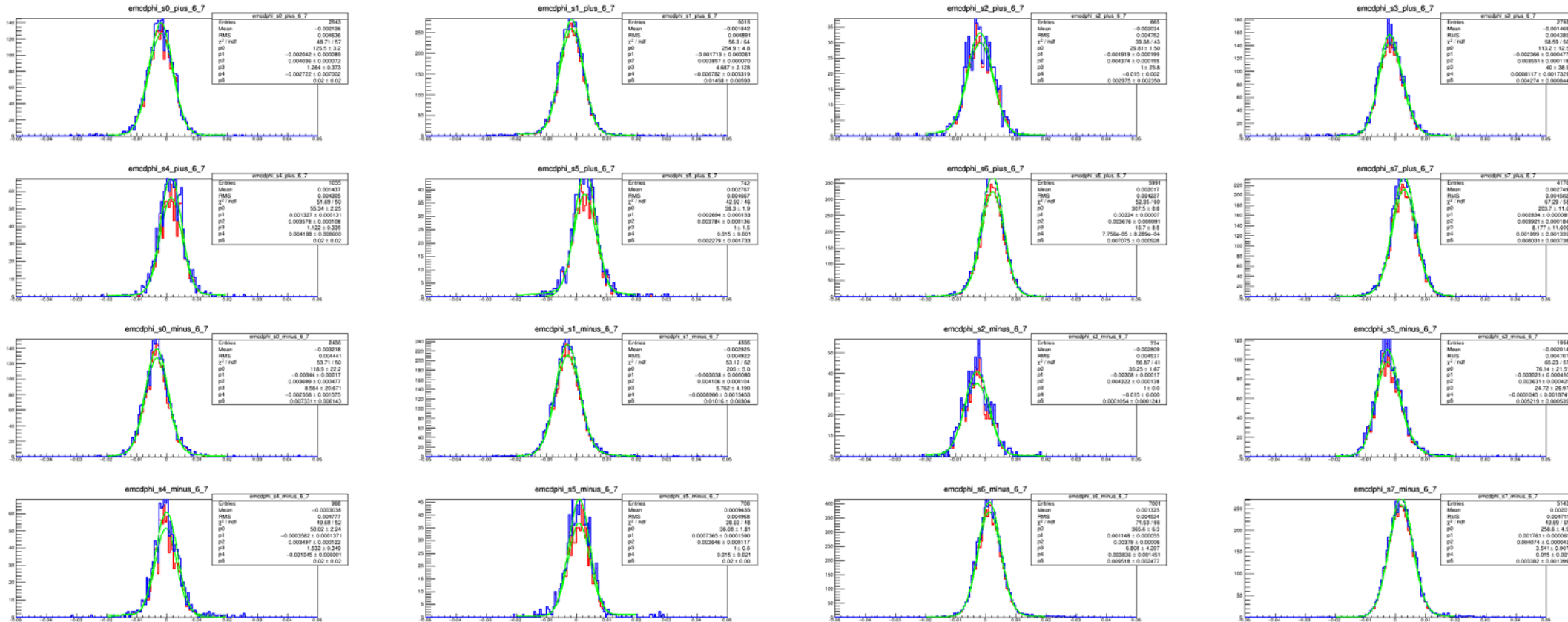
$8 \times 2 = 16$

$5 < p_T < 6$
(GeV)

- $0.2 < e/p < 0.8$
- $0.2 < e/p < 0.7$

- There is no noticeable change in shape of distribution.
- Those different is seems overall suppression.

Compare distribution ($e/p < 0.8$ vs $e/p < 0.7$)



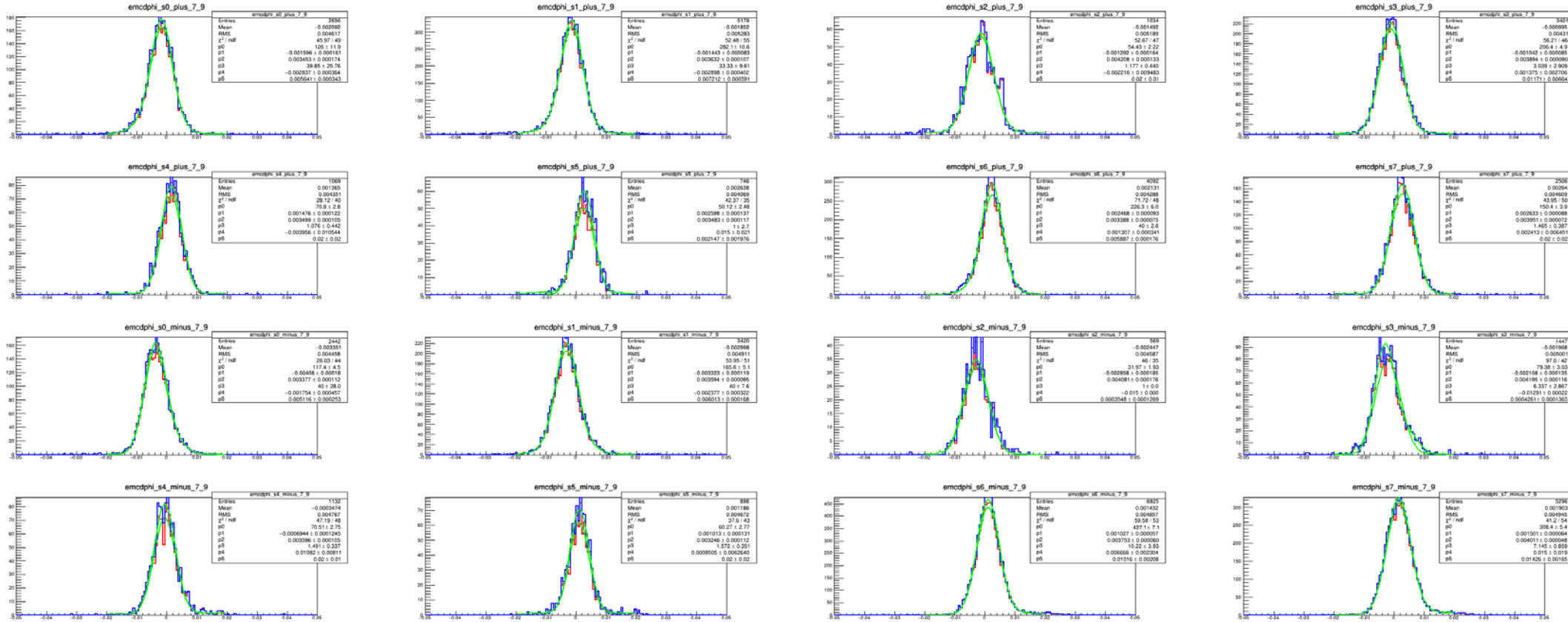
histogram separation
 - sector : 0~7
 - charge : +, -
 8 X 2 = 16

6 < pT < 7
 (GeV)

- 0.2 < e/p < 0.8
 - 0.2 < e/p < 0.7

- There is no noticeable change in shape of distribution.
 - Those different is seems overall suppression.

Compare distribution ($e/p < 0.8$ vs $e/p < 0.7$)



histogram separation

- sector : 0~7
- charge : +, -

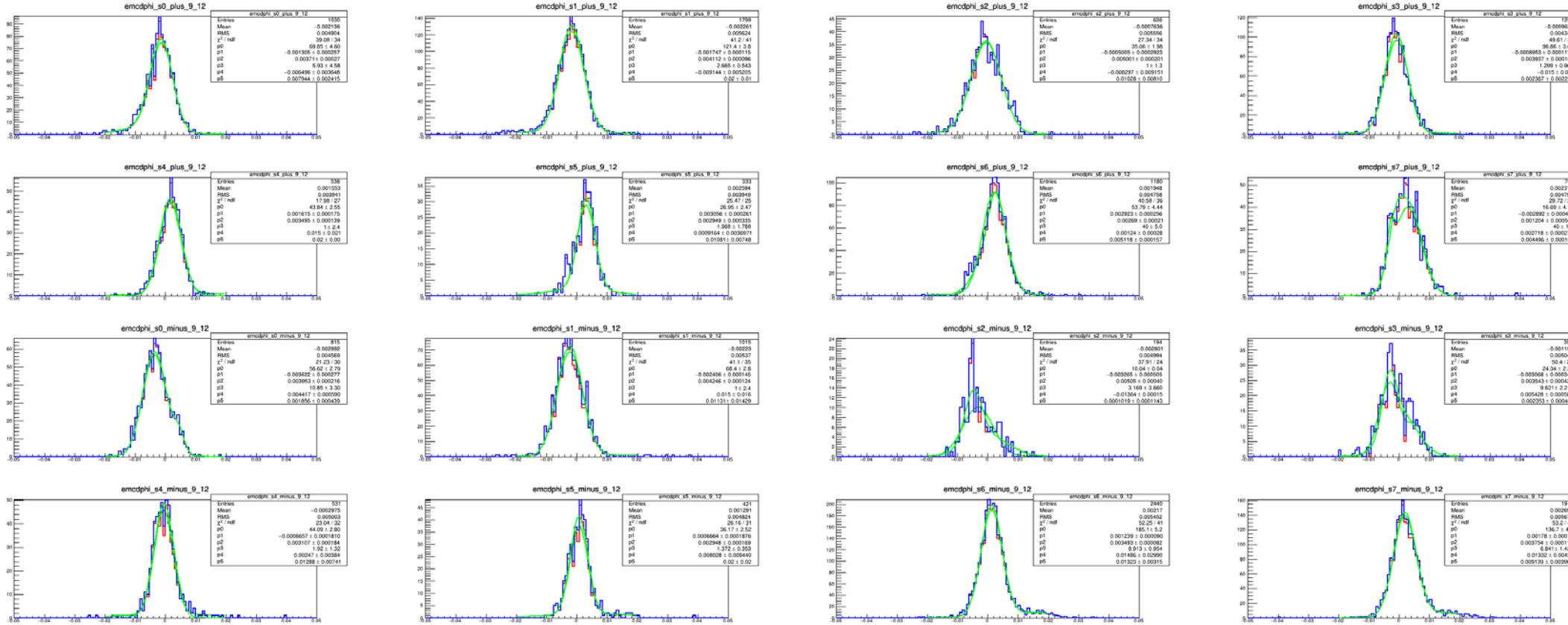
8 X 2 = 16

7 < pT < 9
(GeV)

- 0.2 < e/p < 0.8
- 0.2 < e/p < 0.7

- There is no noticeable change in shape of distribution.
- Those different is seems overall suppression.
- The larger PT range, the less suppression.

Compare distribution ($e/p < 0.8$ vs $e/p < 0.7$)



histogram separation

- sector : 0~7
- charge : +, -

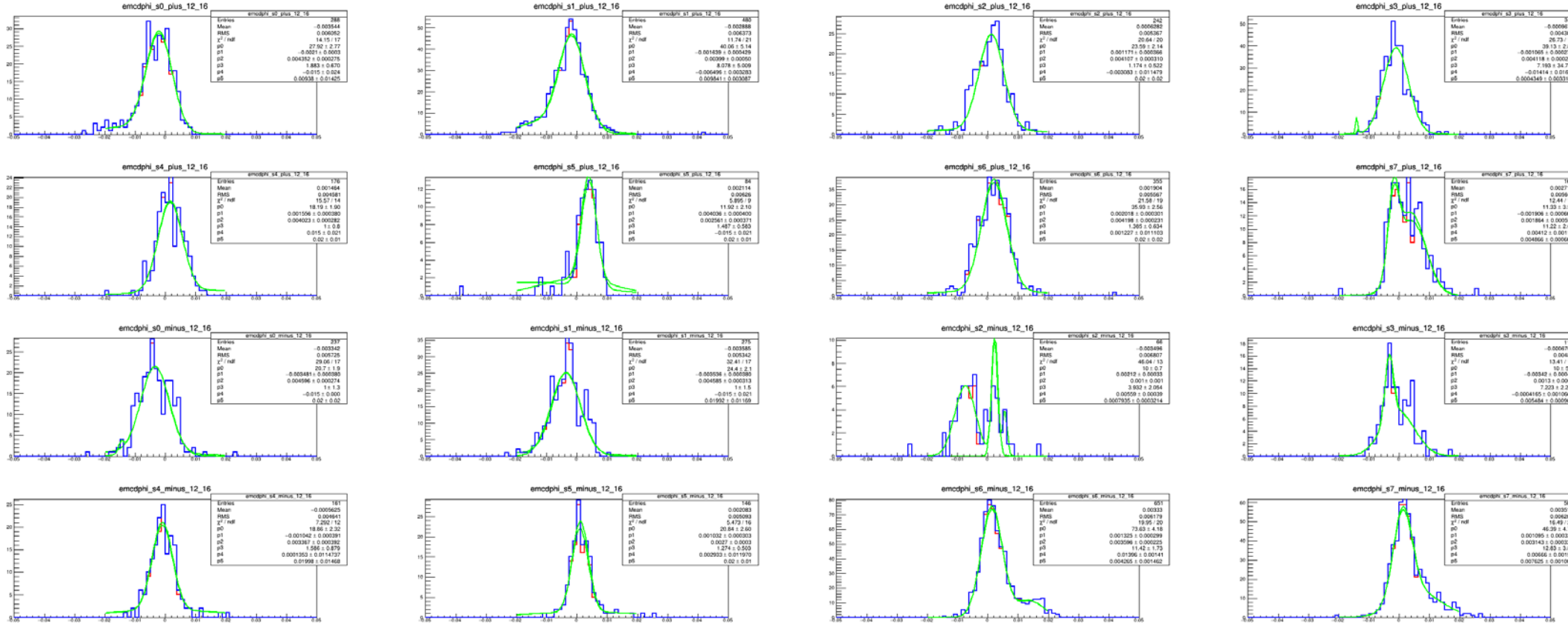
8 X 2 = 16

9 < pT < 12
(GeV)

- 0.2 < e/p < 0.8
- 0.2 < e/p < 0.7

- There is no noticeable change in shape of distribution.
- Those different is seems overall suppression.
- The larger PT range, the less suppression.

Compare distribution ($e/p < 0.8$ vs $e/p < 0.7$)



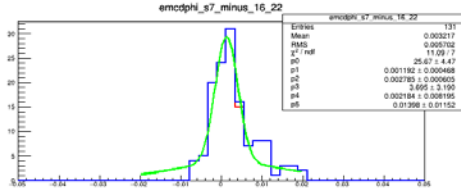
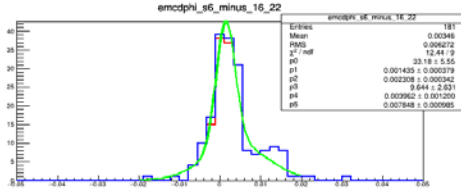
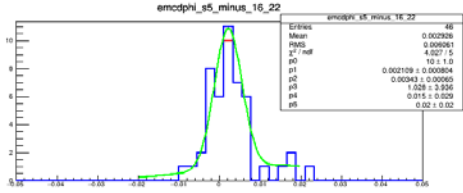
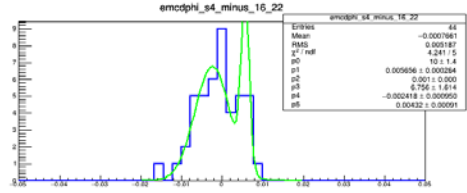
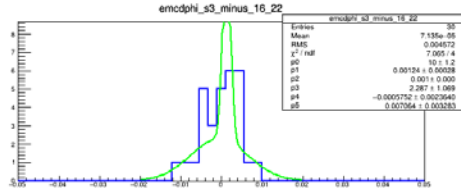
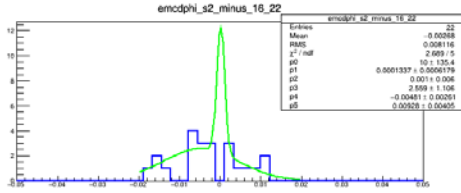
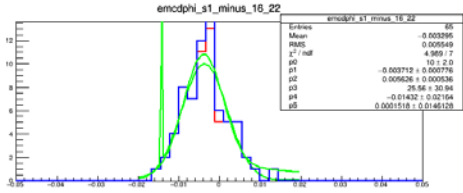
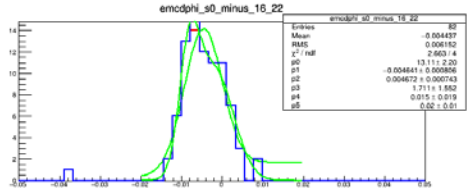
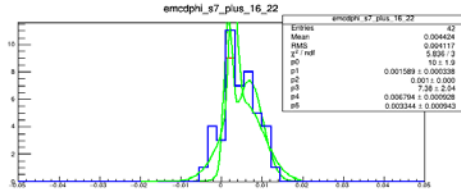
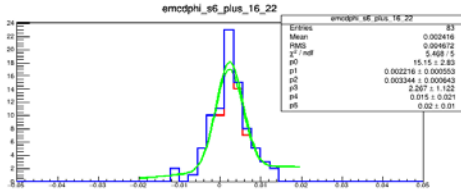
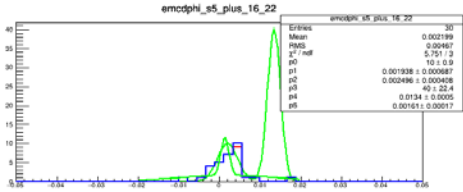
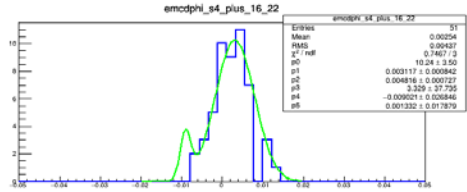
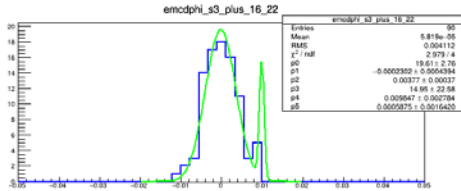
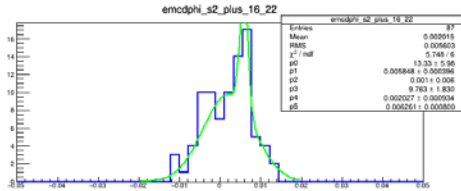
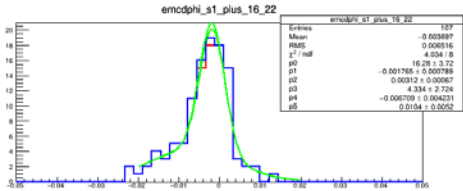
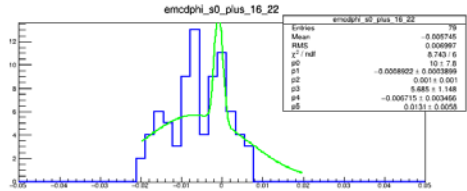
histogram separation
 - sector : 0~7
 - charge : +, -
 8 X 2 = 16

12 < pT < 16
 (GeV)

- 0.2 < e/p < 0.8
 - 0.2 < e/p < 0.7

- There is no noticeable change in shape of distribution.
 - Those different is seems overall suppression.
 - The larger PT range, the less suppression.

Compare distribution ($e/p < 0.8$ vs $e/p < 0.7$)



histogram separation
- sector : 0~7
- charge : +, -
8 X 2 = 16

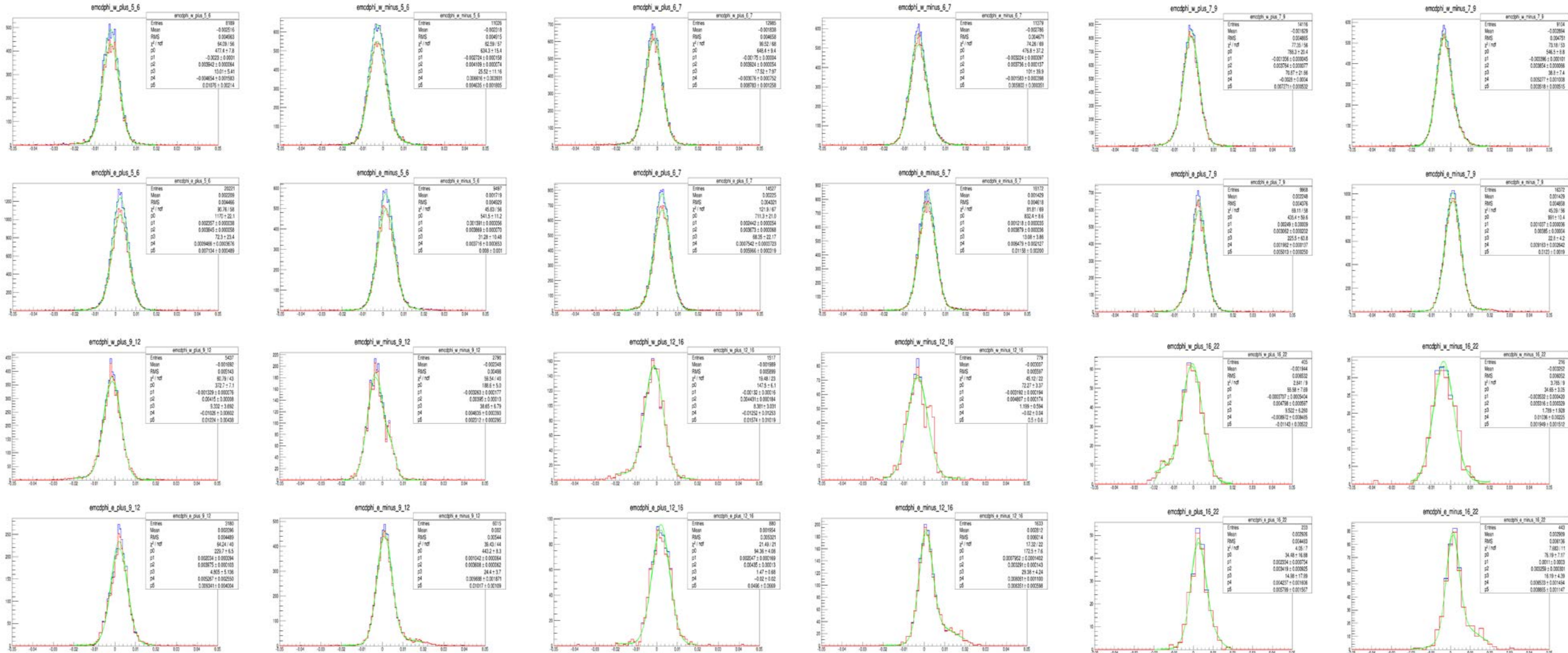
16 < pT < 22
(GeV)

- 0.2 < e/p < 0.8
- 0.2 < e/p < 0.7

- There is no noticeable change in shape of distribution.
- Those different is seems overall suppression.
- The larger PT range, the less suppression.

Compare distribution ($e/p < 0.8$ vs $e/p < 0.7$)

- emcdphi



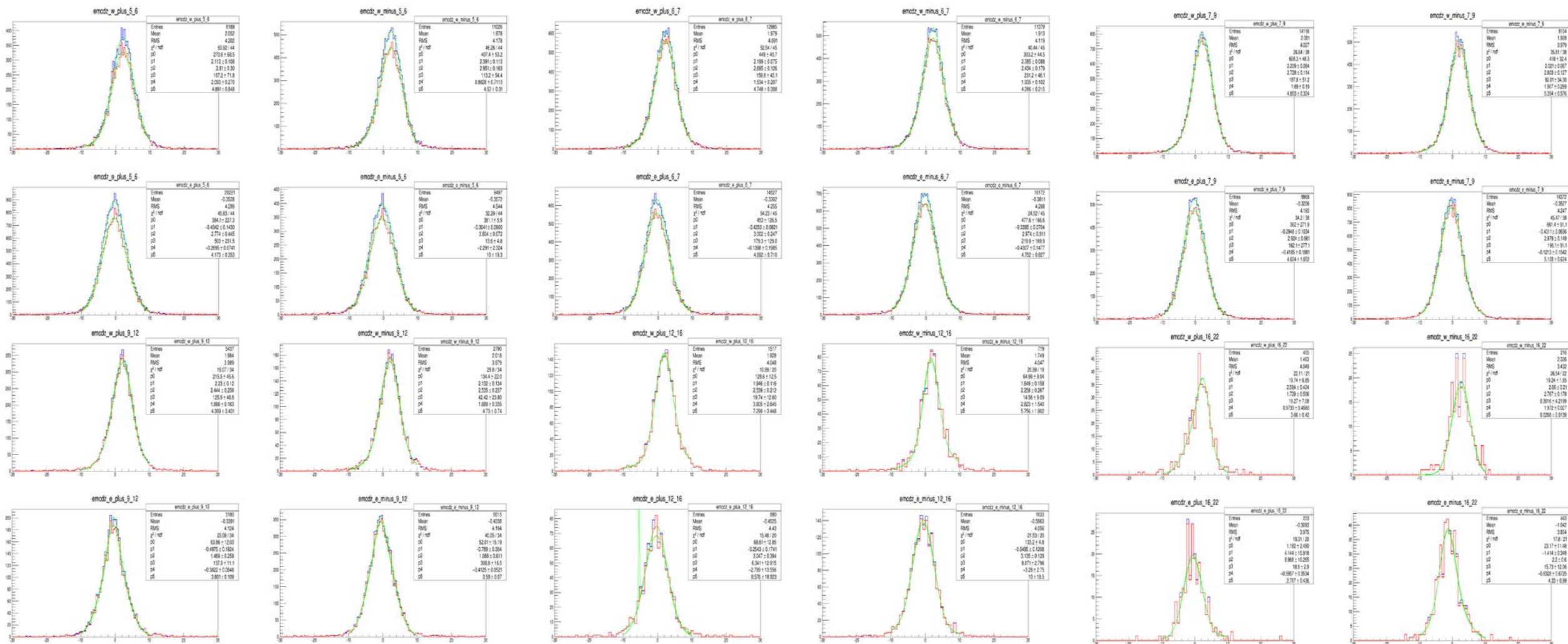
- $0.2 < e/p < 0.8$
- $0.2 < e/p < 0.7$

histogram separation

- arm : west, east $2 \times 2 = 4$
- charge : +, -

Compare distribution (e/p < 0.8 vs e/p < 0.7)

- emcdz

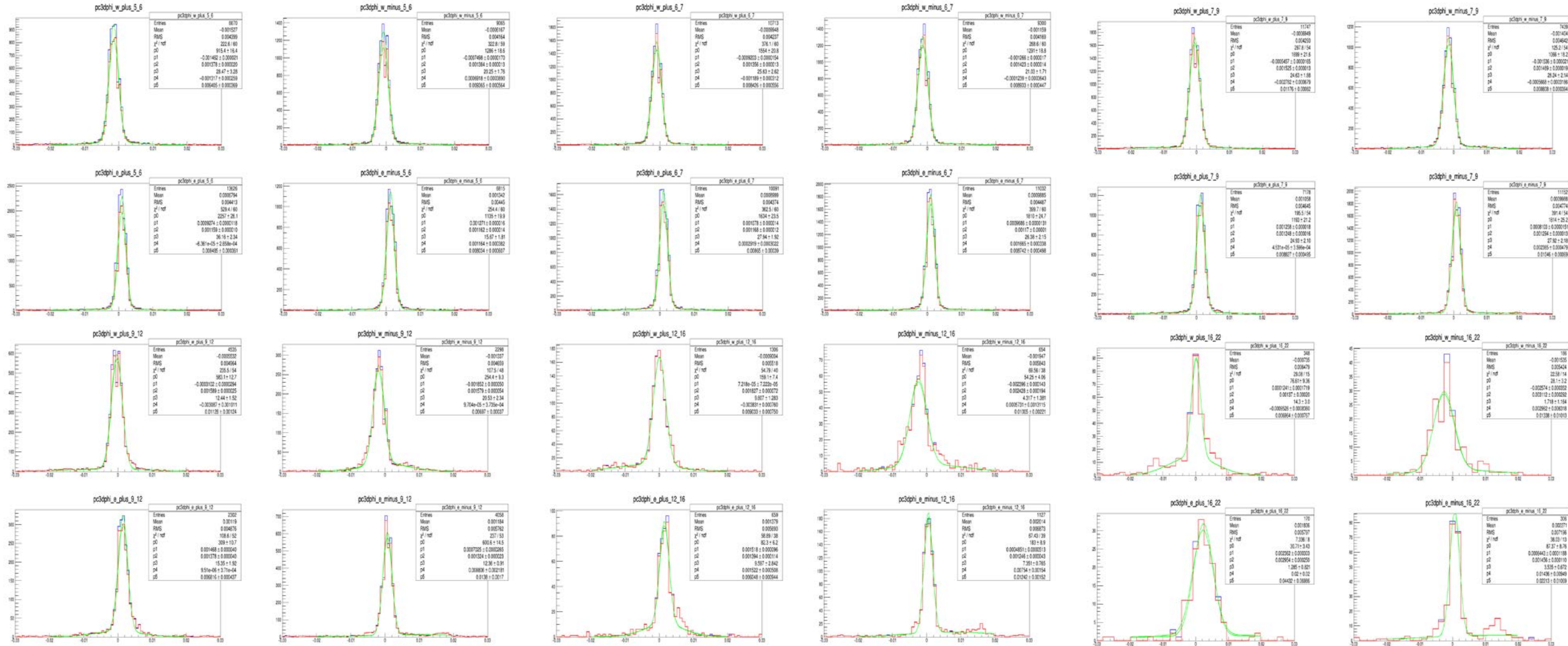


- 0.2 < e/p < 0.8
- 0.2 < e/p < 0.7

histogram separation
 - arm : west, east 2 X 2 = 4
 - charge : +, -

Compare distribution ($e/p < 0.8$ vs $e/p < 0.7$)

- pc3dphi



- $0.2 < e/p < 0.8$
- $0.2 < e/p < 0.7$

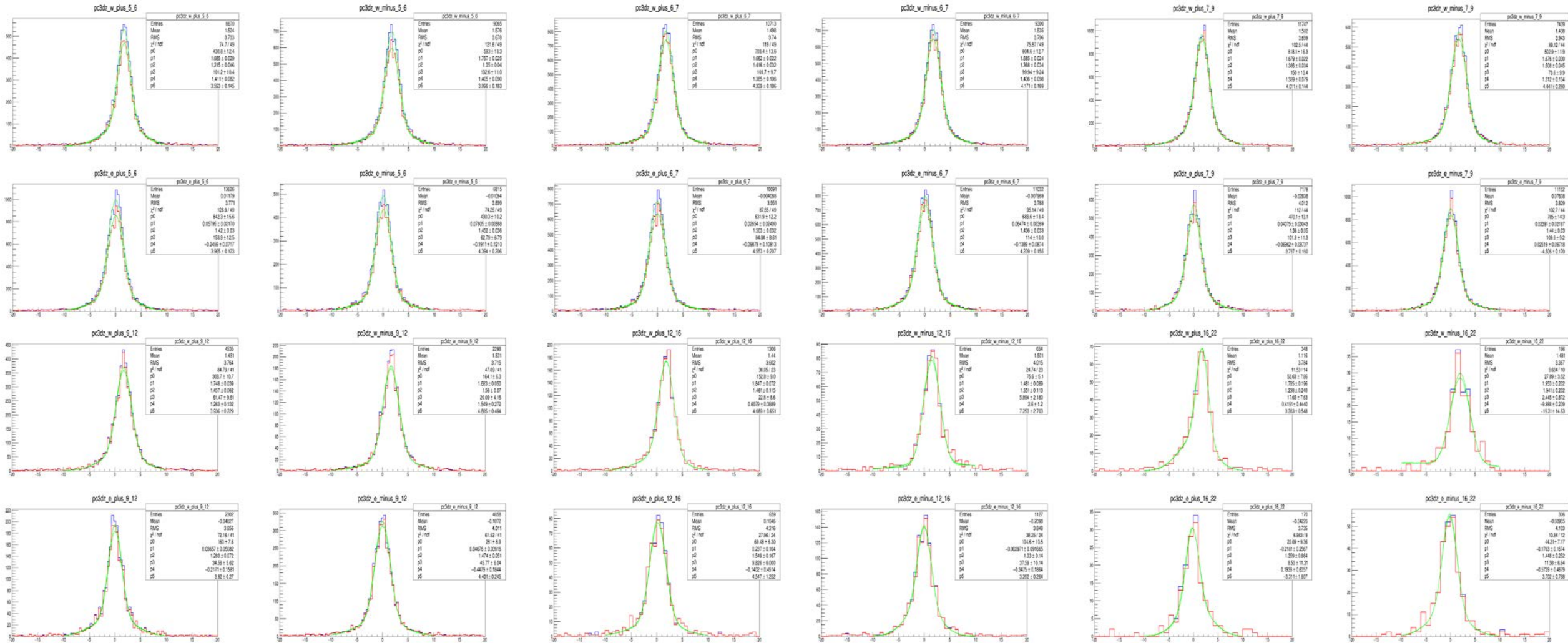
histogram separation

- arm : west, east
- charge : +, -

2 X 2 = 4

Compare distribution (e/p < 0.8 vs e/p < 0.7)

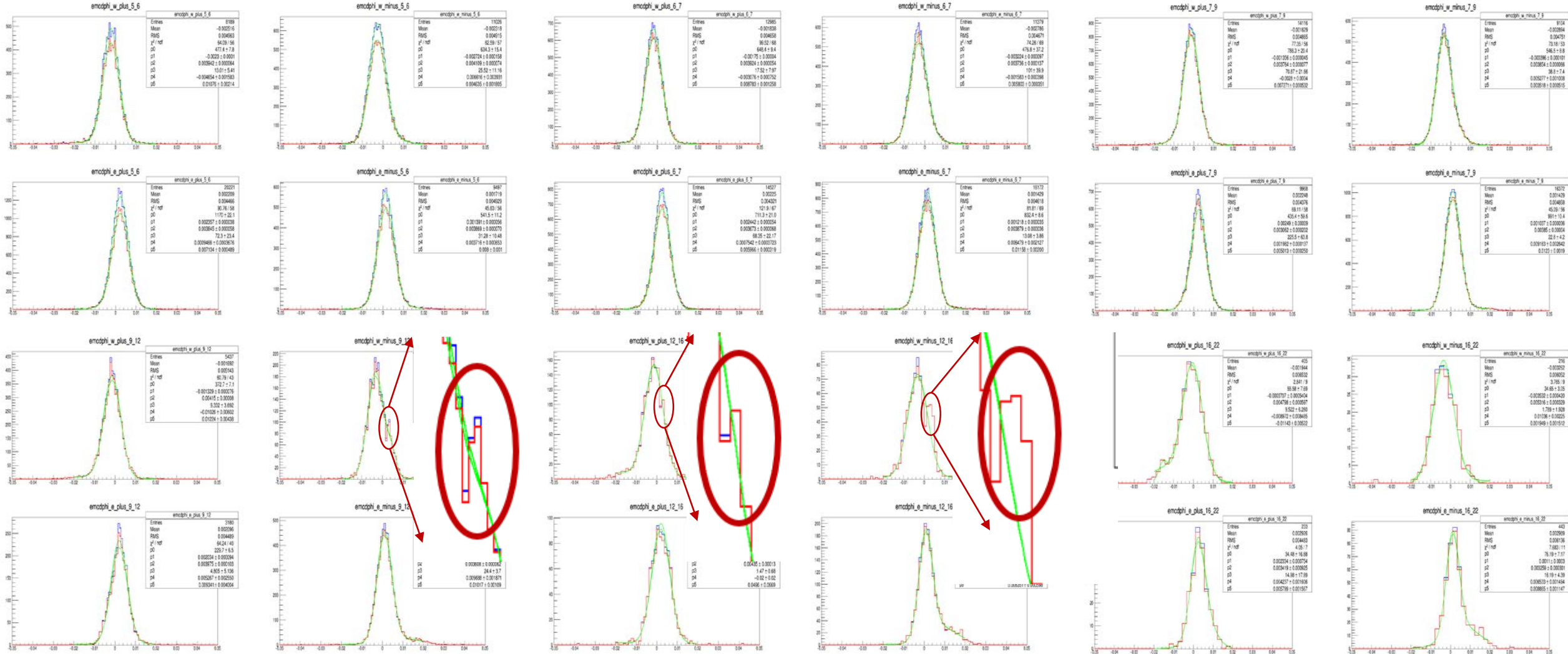
- pc3dz



- $0.2 < e/p < 0.8$
- $0.2 < e/p < 0.7$

histogram separation
 - arm : west, east 2 X 2 = 4
 - charge : +, -

Compare distribution ($e/p < 0.8$ vs $e/p < 0.7$) - emcdphi



- $0.2 < e/p < 0.8$
- $0.2 < e/p < 0.7$

histogram separation
- arm : west, east $2 \times 2 = 4$
- charge : +, -

- There is no noticeable change in shape of distribution.