

Charged pion analysis

warmmap for EMCal
Deadmap for DC, PC, RICH
Acc x Rec eff.
pp , pAl, pAu

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Jaehee Yoo

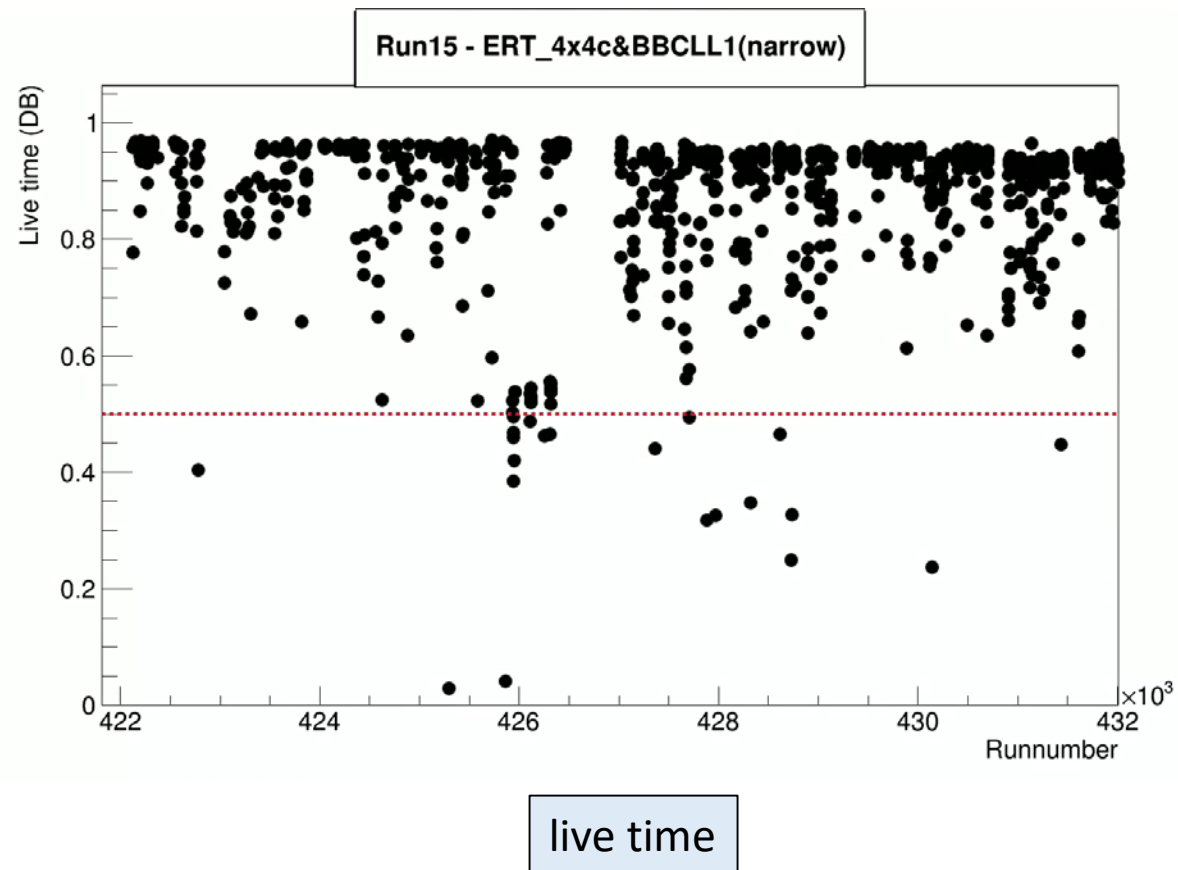
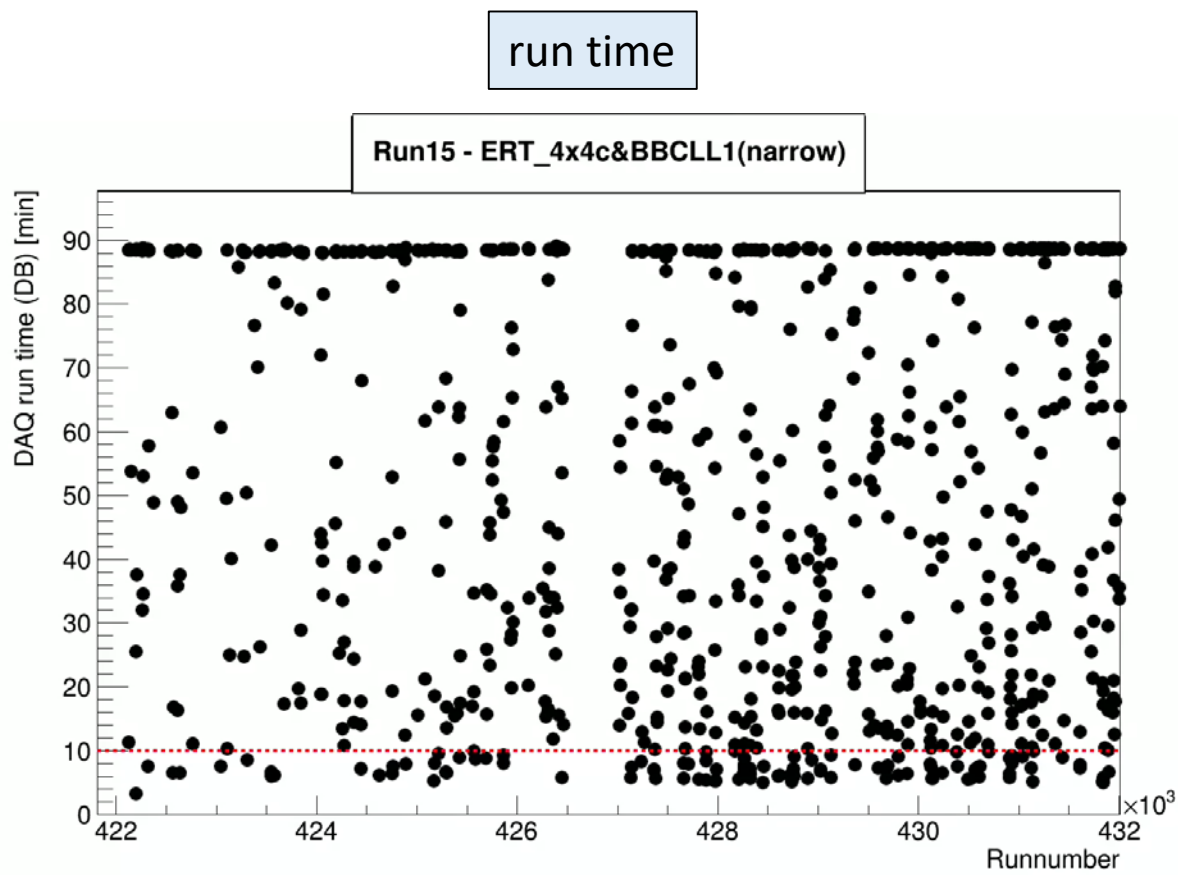
2020. 02. 20

RunQA from Database

Run15 pp, pAl, pAu dataset

Run QA at daq in Database (pp)

- Trigger
 - ERT_4x4c&BBCLL1(narrow)
- Cut
 - DAQ Run time > 10 min
 - DAQ live time > 0.5



Run QA at daq in Database (pp)

- **Good run**

- 168 runs are rejected from 844 runs by Run QA from DAQ.
- 676 runs are passed Run QA from DAQ in the DB.

422123	422124	422135	422141	422147	422148	422200	422201	422202	422203	422205	422255	422256	422260	422262	422263	422266	422267	422268	422269	422272	422273
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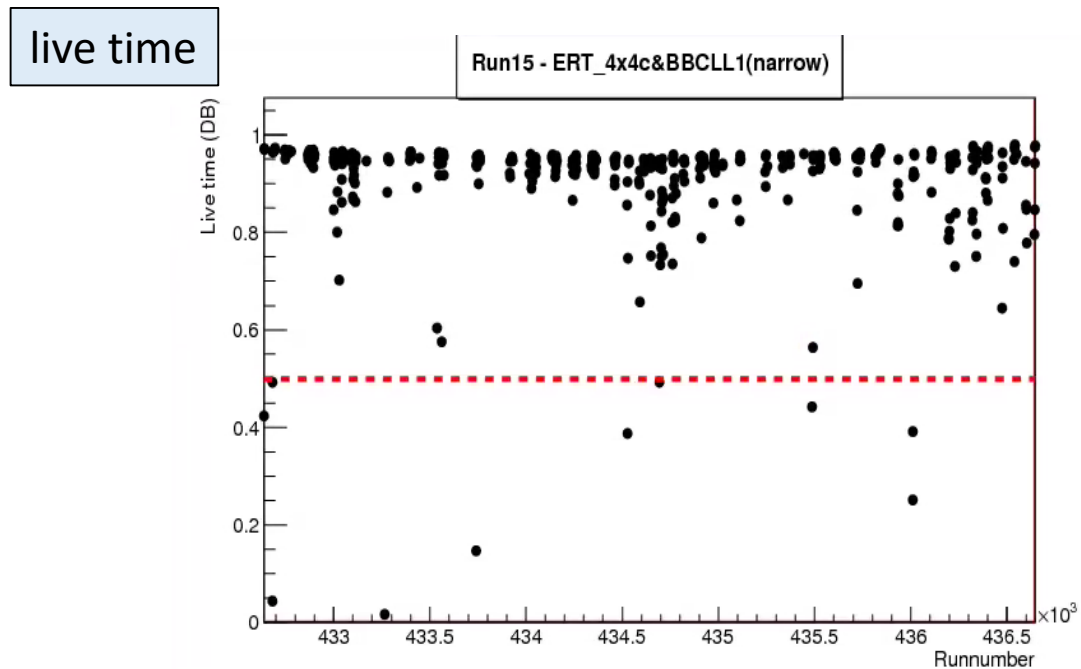
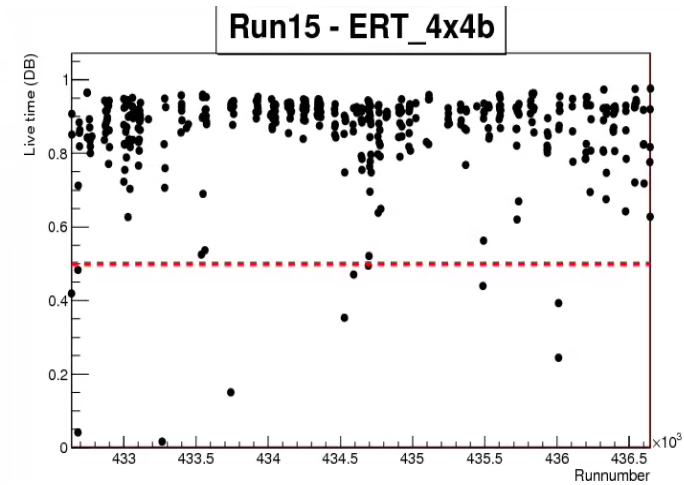
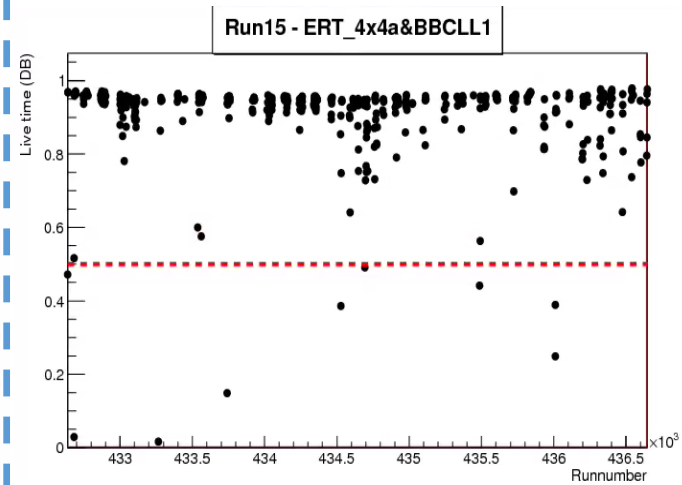
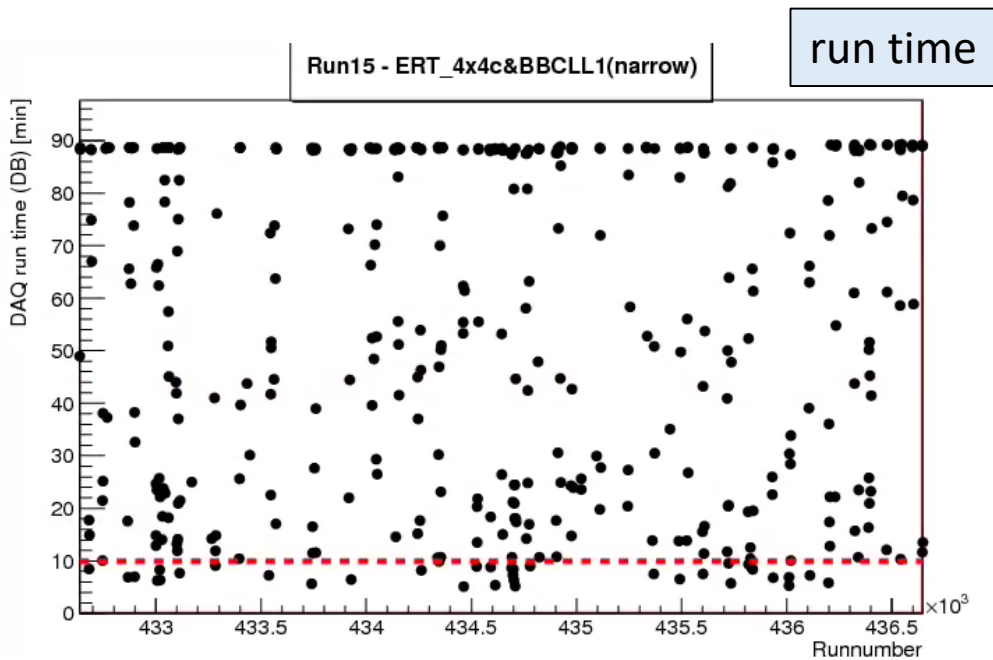
Runlist by ERT dataset (pAu)

- Datasets: Run15pAu200CAERTPro108
- 330 runs survive in Analysis Train by using ERT dataset.

432639	432640	432684	432691	432692	432693	432694	432745	432746	432747	432762
432766	432767	432768	432780	432866	432872	432873	432874	432875	432881	432883
432884	432885	432886	432894	432895	432898	432899	432999	433000	433001	433003
433004	433005	433007	433009	433014	433015	433017	433019	433020	433028	433030
433031	433032	433036	433042	433043	433044	433058	433059	433060	433061	433063
433065	433096	433097	433100	433101	433102	433103	433104	433105	433106	433107
433110	433111	433112	433113	433114	433116	433171	433283	433284	433285	433290
433396	433397	433538	433543	433546	433547	433548	433549	433562	433564	433567
433568	433570	433571	433572	433573	433741	433743	433744	433745	433746	433754
433756	433758	433759	433760	433761	433915	433917	433918	433921	433926	433927
433928	433929	433930	434017	434021	434024	434027	434028	434037	434040	434046
434048	434049	434050	434051	434052	434134	434137	434138	434139	434140	434152
434153	434154	434156	434157	434160	434241	434242	434243	434244	434245	434246
434256	434257	434258	434259	434260	434261	434262	434341	434343	434344	434345
434346	434347	434351	434352	434353	434354	434355	434356	434357	434358	434360
434362	434363	434364	434459	434460	434461	434462	434463	434464	434467	434526
434527	434528	434529	434533	434534	434587	434590	434591	434592	434612	434613
434614	434615	434644	434645	434646	434647	434648	434649	434650	434689	434690
434692	434693	434694	434697	434698	434700	434701	434703	434704	434705	434706
434707	434708	434709	434710	434711	434712	434759	434760	434761	434762	434765
434767	434768	434769	434773	434774	434775	434779	434816	434821	434823	434824
434903	434904	434905	434910	434911	434912	434913	434914	434923	434924	434925
434926	434974	434975	434976	434977	434978	434979	434980	434981	434984	435022
435023	435096	435111	435112	435113	435114	435115	435182	435184	435185	435186
435244	435245	435246	435247	435254	435331	435332	435335	435337	435361	435368
435370	435371	435372	435444	435487	435490	435492	435493	435494	435495	435525
435526	435527	435528	435529	435530	435600	435601	435602	435603	435604	435606
435608	435609	435716	435717	435719	435720	435721	435723	435724	435725	435731
435732	435735	435736	435737	435817	435818	435819	435826	435828	435832	435836
435841	435930	435931	435933	435934	435935	435936	435938	436013	436016	436017

Run QA at daq in Database (pAu)

- Trigger
 - ERTLL1_4x4a&BBCLL1
 - ERT_4x4b
 - ERT_4x4c&BBCLL1(narrow)
- Cut
 - DAQ Run time > 10 min
 - DAQ live time > 0.5



Run QA at daq in Database (pAu)

- **Good run**

- 37 runs are rejected from 330 runs by Run QA from DAQ.
- 293 runs are passed Run QA from DAQ in the DB.

432639	432640	432684	432691	432692	432693	432694	432745	432746	432747	432762
432766	432767	432768	432780	432866	432872	432873	432874	432875	432881	432883
432884	432885	432886	432894	432895	432898	432999	433000	433001	433003	433004
433005	433009	433014	433015	433020	433028	433031	433032	433036	433042	433043
433044	433058	433059	433060	433061	433063	433065	433096	433097	433100	433101
433102	433103	433104	433105	433106	433107	433110	433111	433112	433114	433116
433171	433284	433285	433290	433396	433397	433543	433546	433547	433548	433549
433562	433564	433568	433570	433571	433572	433573	433741	433743	433744	433745
433746	433754	433756	433758	433759	433760	433761	433915	433917	433918	433921
433926	433927	433928	433930	434017	434021	434024	434027	434028	434037	434040
434046	434048	434049	434050	434051	434052	434134	434137	434138	434139	434140
434152	434153	434154	434156	434157	434160	434241	434242	434243	434244	434245
434246	434256	434257	434258	434259	434260	434261	434341	434343	434344	434345
434347	434351	434352	434353	434354	434355	434356	434357	434358	434360	434362
434363	434364	434459	434460	434461	434462	434463	434467	434527	434529	434533
434534	434587	434590	434591	434612	434613	434615	434644	434645	434646	434647
434648	434649	434650	434689	434692	434693	434698	434701	434704	434705	434706
434707	434708	434710	434711	434712	434759	434760	434761	434762	434765	434767
434768	434769	434773	434774	434775	434816	434821	434823	434824	434903	434904
434905	434910	434911	434912	434913	434914	434923	434924	434925	434926	434974
434975	434976	434977	434978	434979	434980	434981	434984	435022	435023	435096
435111	435112	435113	435114	435115	435244	435245	435246	435247	435254	435331
435332	435335	435337	435361	435370	435371	435372	435444	435492	435493	435494
435495	435525	435526	435527	435528	435529	435530	435600	435602	435603	435604
435606	435608	435609	435716	435717	435719	435720	435721	435723	435725	435731
435732	435736	435737	435817	435819	435826	435828	435836	435841	435930	435931
435933	435934	435935	435938	436013	436016	436017				

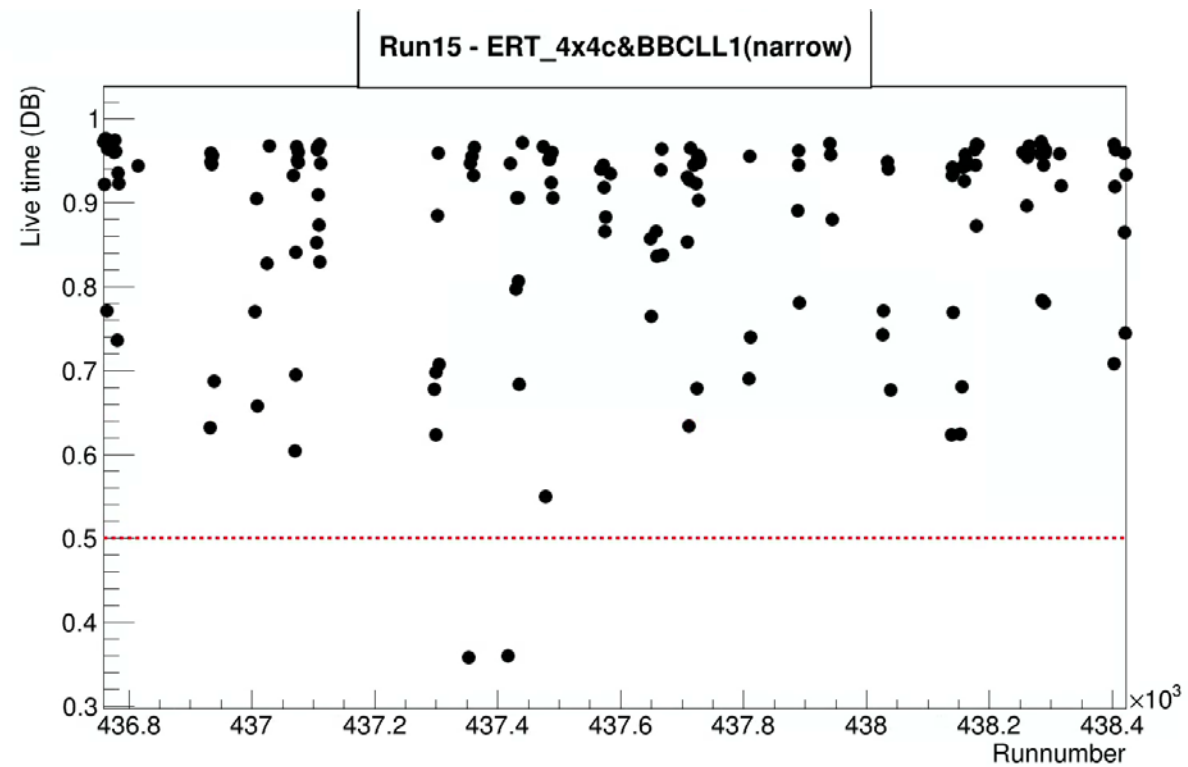
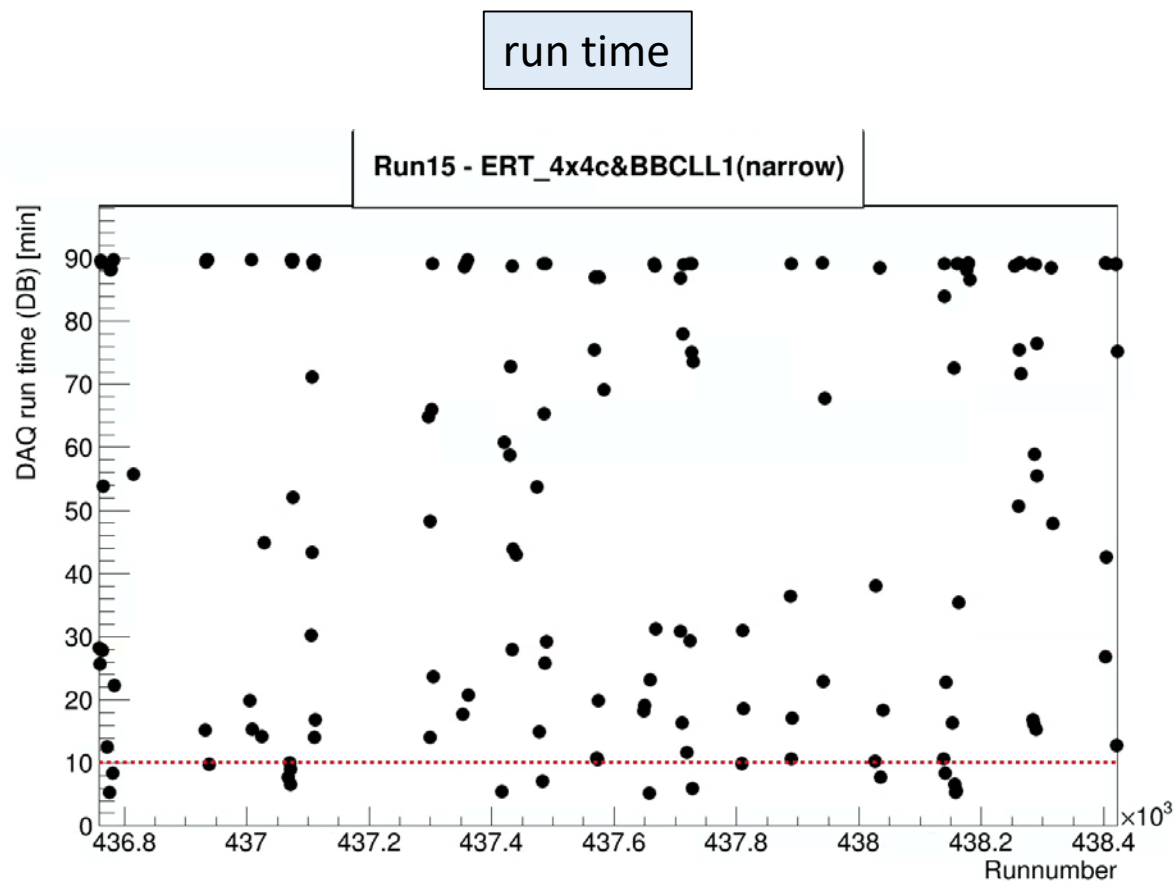
Runlist by ERT dataset (pAI)

- Datasets: Run15pAI200ERTPro104
- 138 runs survive in Analysis Train by using ERT dataset.

436763	436764	436765	436772	436776	436777	436778	436782	436933	436934
436935	436936	437008	437009	437025	437067	437070	437071	437072	437073
437074	437075	437106	437107	437109	437110	437111	437112	437297	437299
437300	437302	437303	437304	437353	437356	437358	437361	437362	437417
437421	437430	437431	437433	437434	437435	437440	437474	437478	437483
437484	437486	437487	437488	437568	437569	437572	437573	437574	437575
437583	437649	437650	437658	437659	437666	437667	437668	437708	437709
437711	437712	437713	437714	437719	437723	437724	437725	437726	437727
437728	437809	437810	437811	437888	437889	437890	437891	437940	437941
437944	438026	438028	438033	438034	438035	438138	438139	438140	438141
438142	438153	438155	438157	438158	438159	438160	438162	438163	438176
438177	438178	438179	438181	438254	438260	438261	438262	438263	438264
438283	438284	438286	438287	438288	438289	438290	438291	438314	438316
438402	438403	438404	438405	438419	438420	438421	438422		

Run QA at daq in Database (pAI)

- Trigger
 - ERT_4x4c&BBCLL1(narrow)
- Cut
 - DAQ Run time > 10 min
 - DAQ live time > 0.5



live time

Run QA at daq in Database (pAI)

- **Good run**

- 17 runs are rejected from 138 runs by Run QA from DAQ.
- 121 runs are passed Run QA from DAQ in the DB.

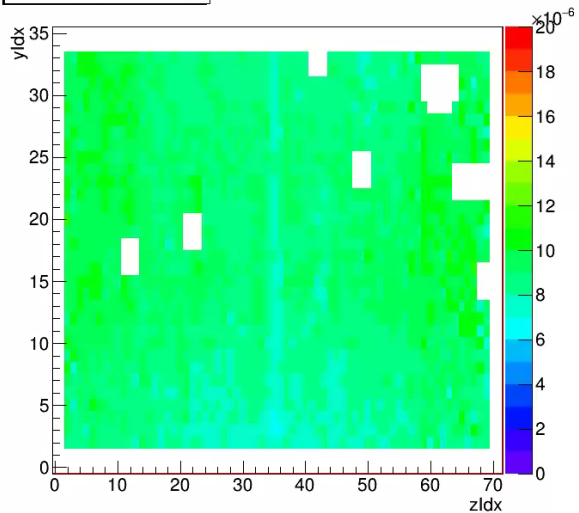
436763	436764	436765	436772	436777	436778	436782	436933	436934	436935
436936	437008	437009	437025	437070	437073	437074	437075	437106	437107
437109	437110	437111	437112	437297	437299	437300	437302	437303	437304
437356	437358	437361	437362	437421	437430	437431	437433	437434	437435
437440	437474	437478	437484	437486	437487	437488	437568	437569	437572
437573	437574	437575	437583	437649	437650	437659	437666	437667	437668
437708	437709	437711	437712	437713	437719	437723	437724	437725	437726
437727	437810	437811	437888	437889	437890	437891	437940	437941	437944
438026	438028	438034	438138	438139	438140	438142	438153	438155	438160
438162	438163	438176	438177	438178	438179	438181	438254	438260	438261
438262	438263	438264	438283	438284	438286	438287	438288	438289	438290
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438422									

Warnmap for EMCal

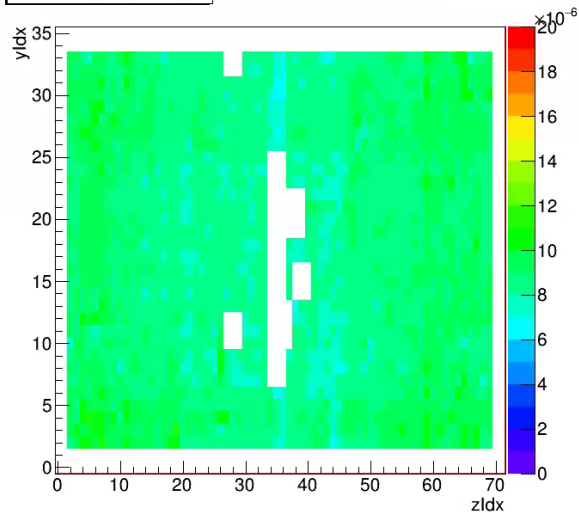
Run15 pp, pAl, pAu dataset

Warnmap for pp

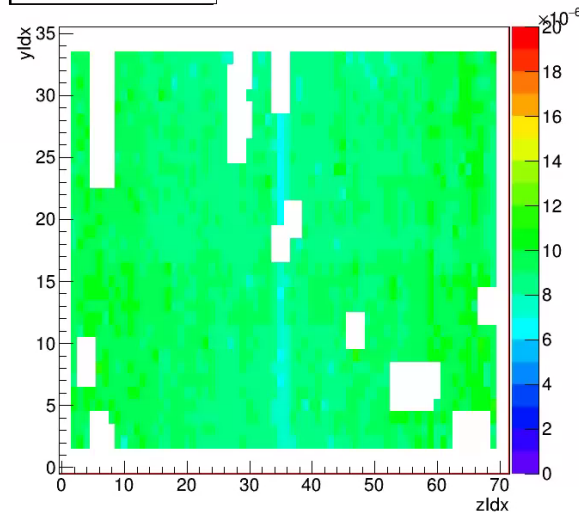
Sector0 (PbSc)



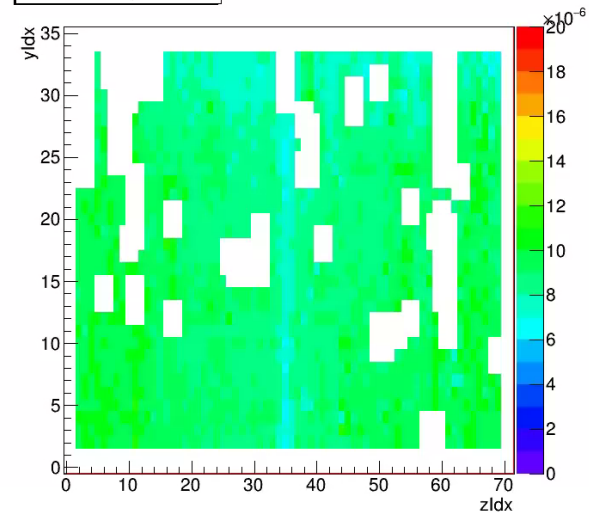
Sector1 (PbSc)



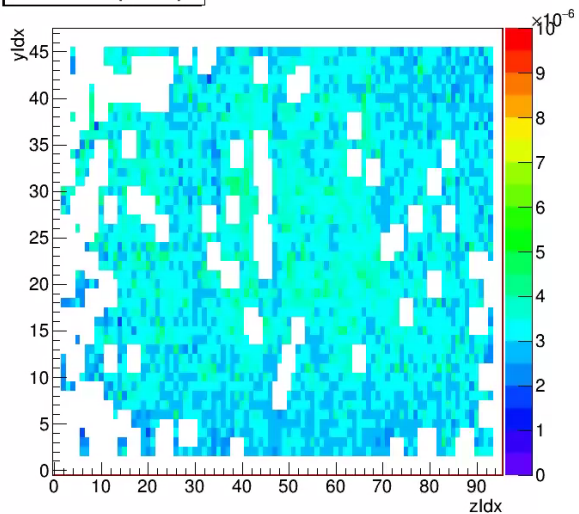
Sector2 (PbSc)



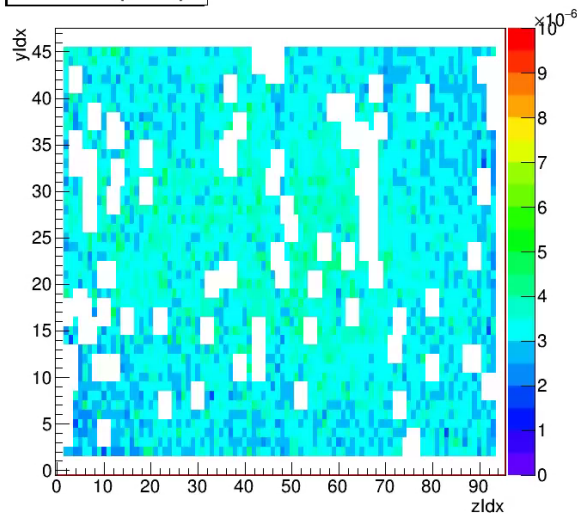
Sector3 (PbSc)



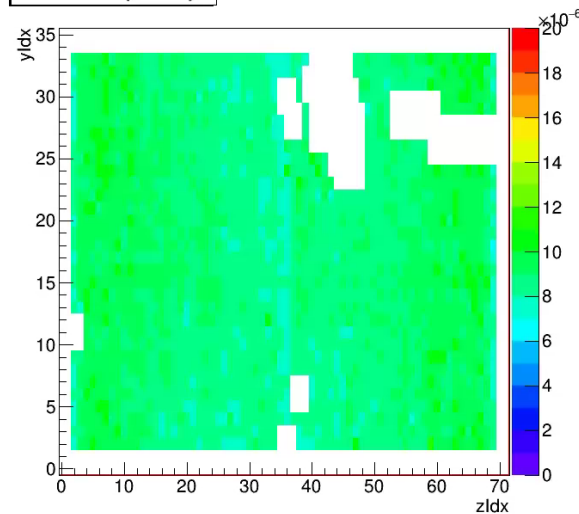
Sector4 (PbGl)



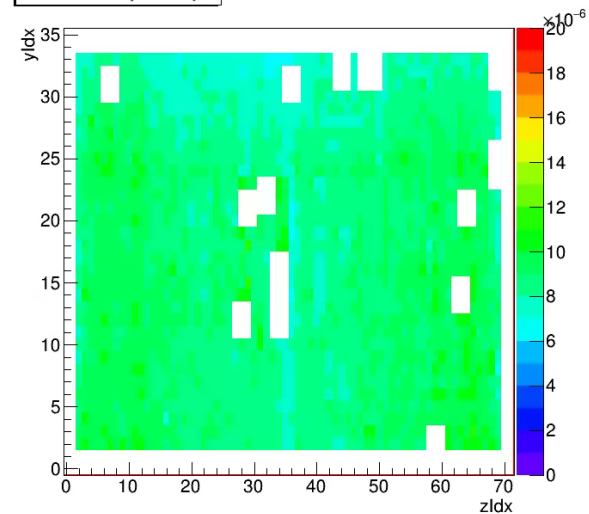
Sector5 (PbGl)



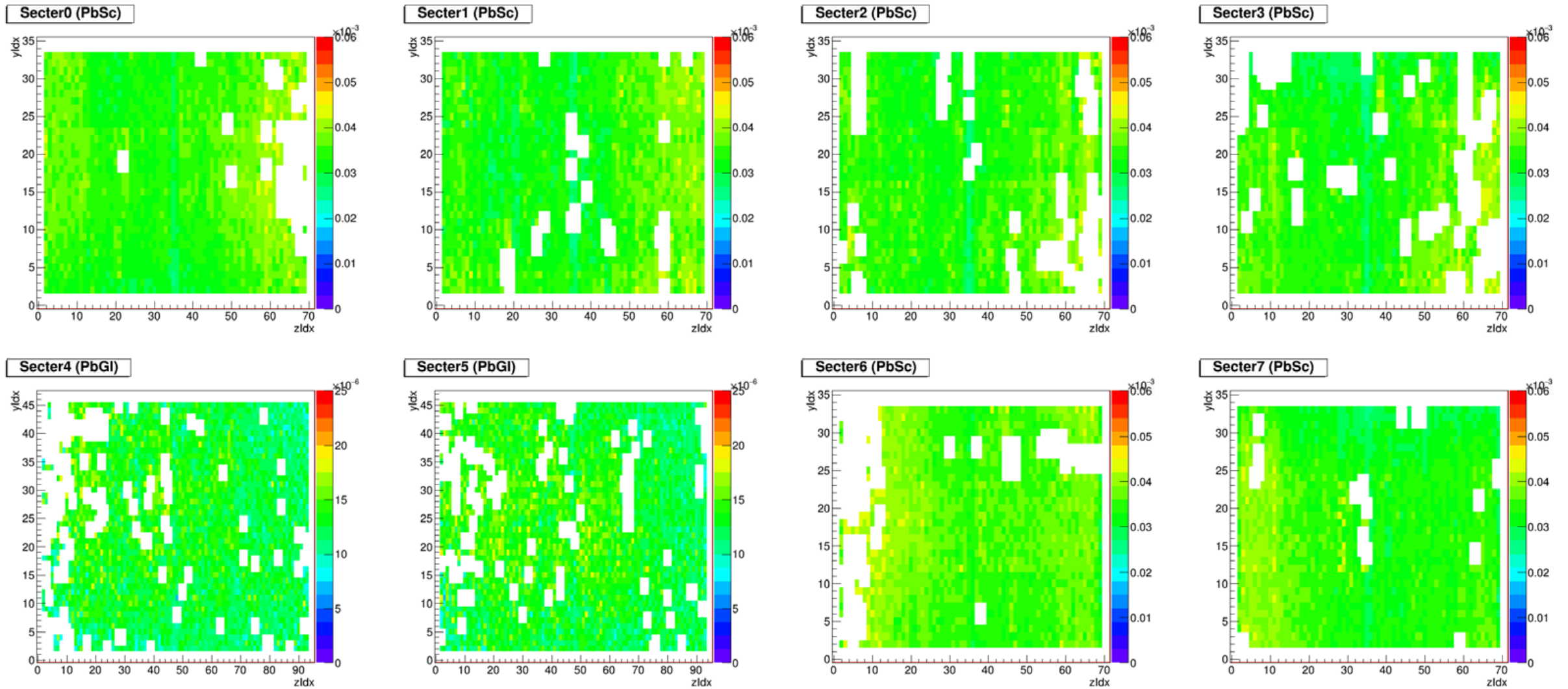
Sector6 (PbSc)



Sector7 (PbSc)

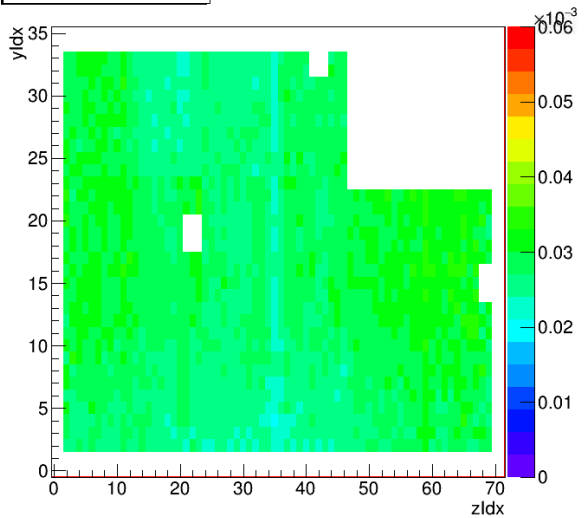


Warnmap for pp

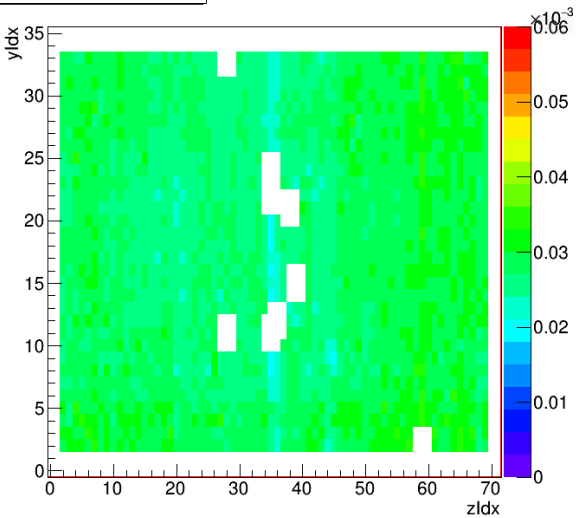


Warnmap for pAI

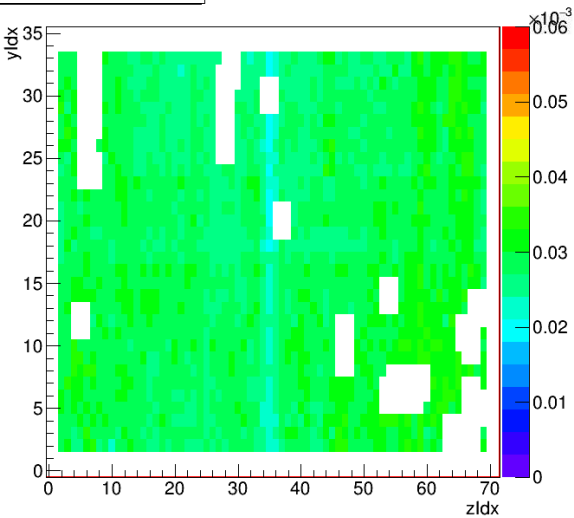
Sector0 (PbSc)



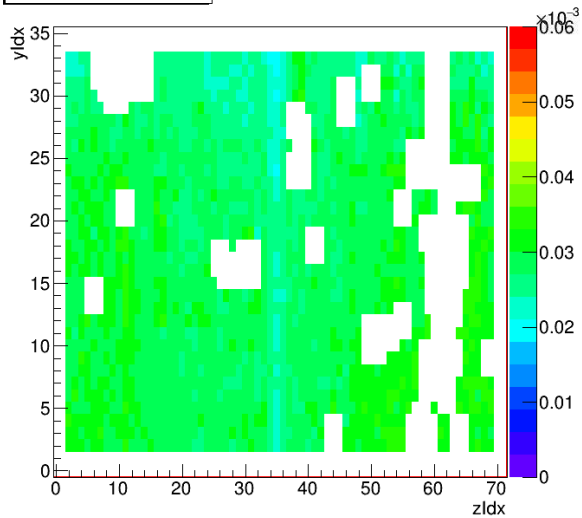
Sector1 (PbSc)



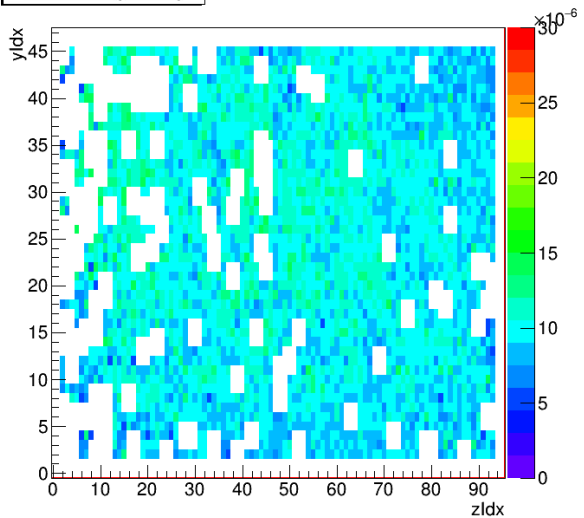
Sector2 (PbSc)



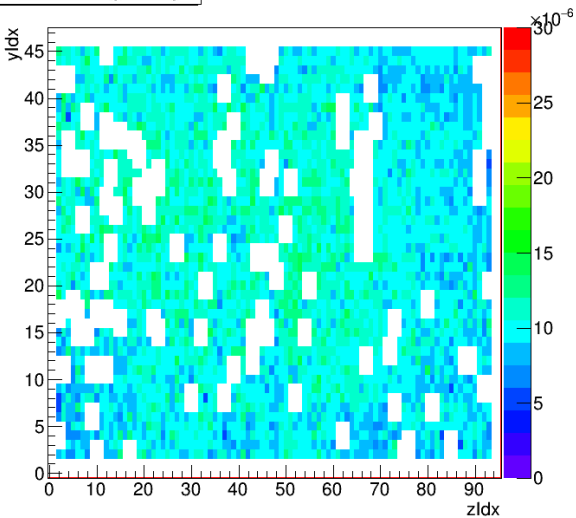
Sector3 (PbSc)



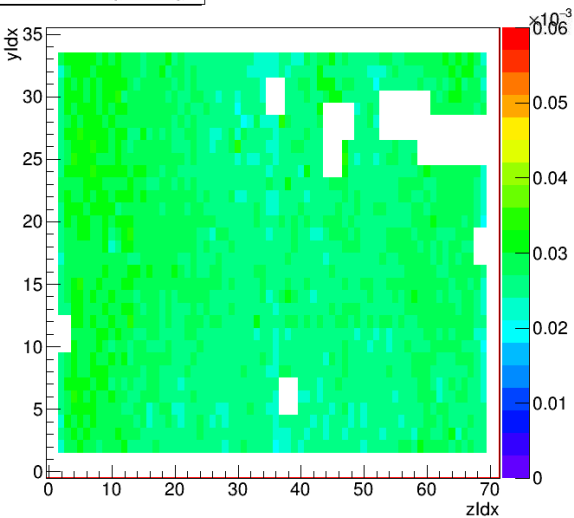
Sector4 (PbGl)



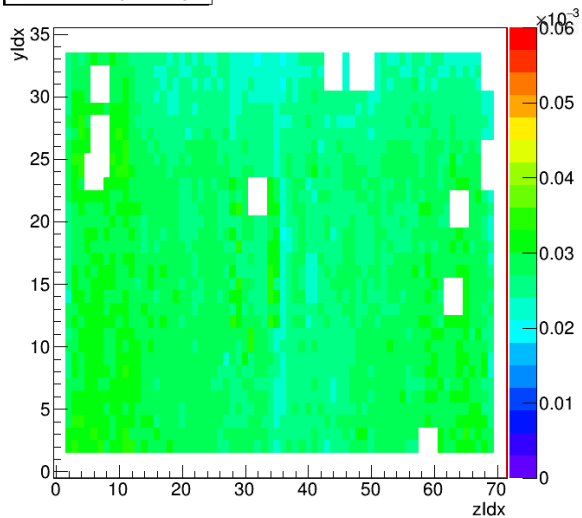
Sector5 (PbGl)



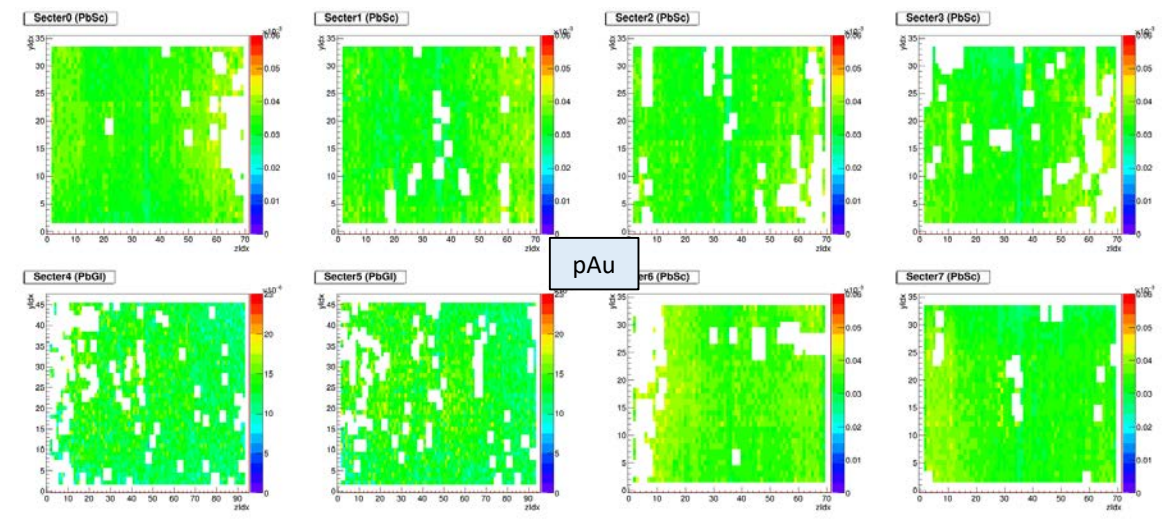
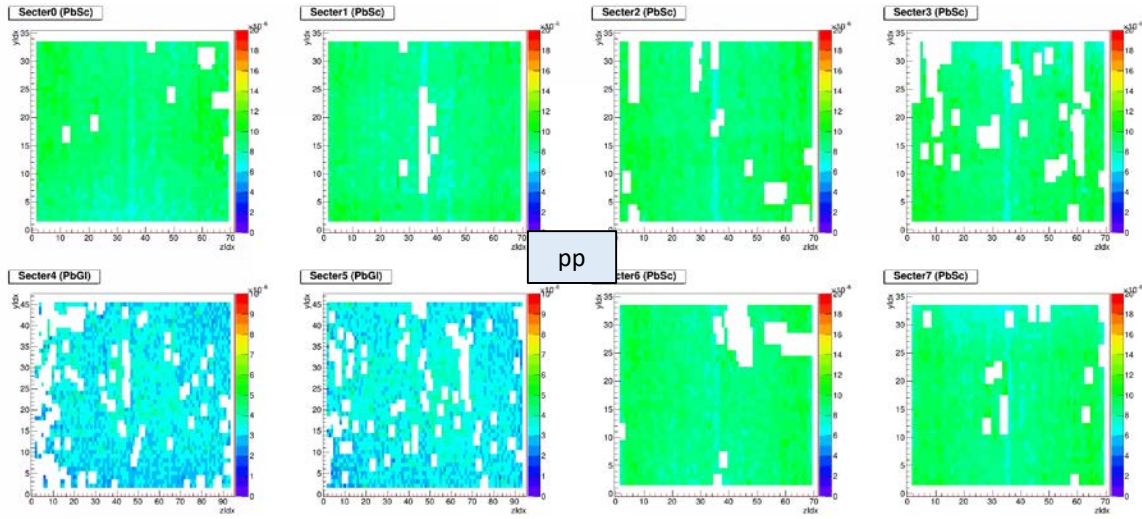
Sector6 (PbSc)



Sector7 (PbSc)

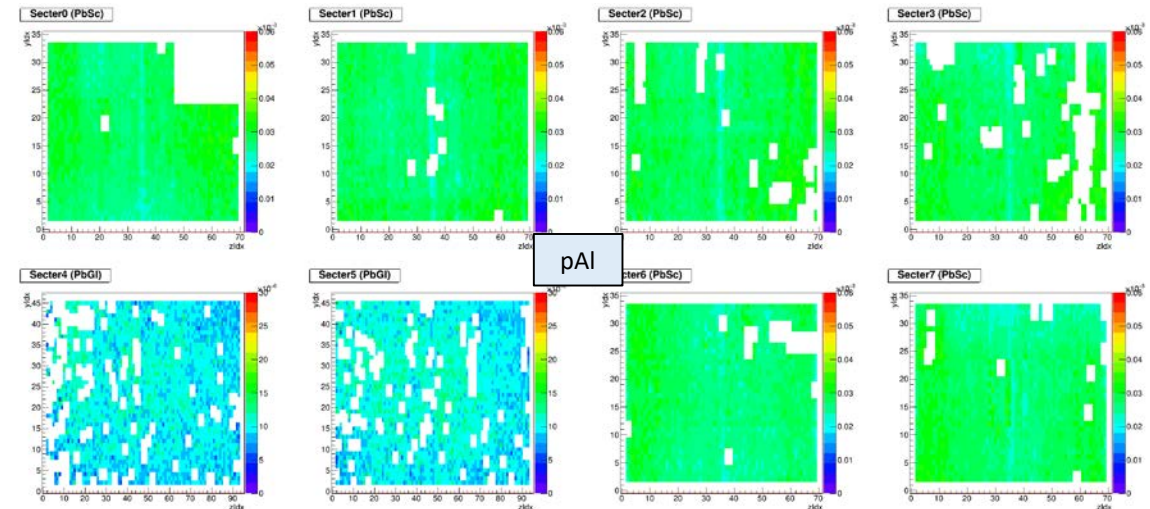


Compare with pAu



- Number of warn channel

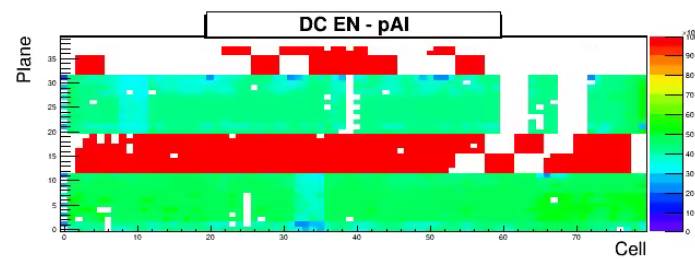
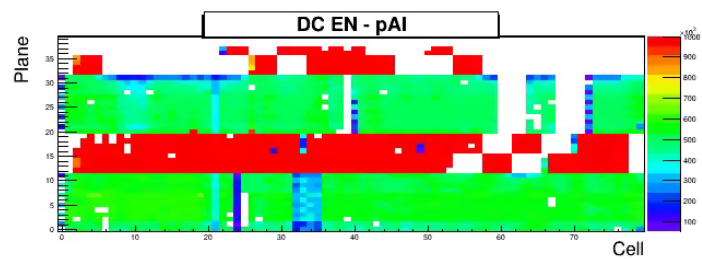
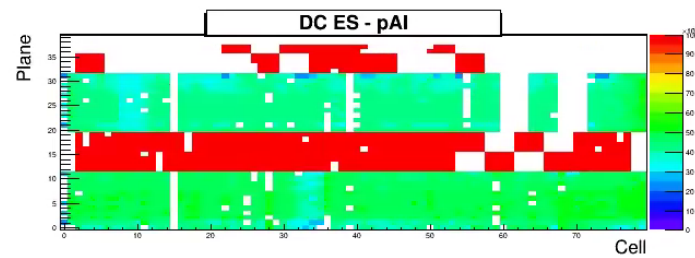
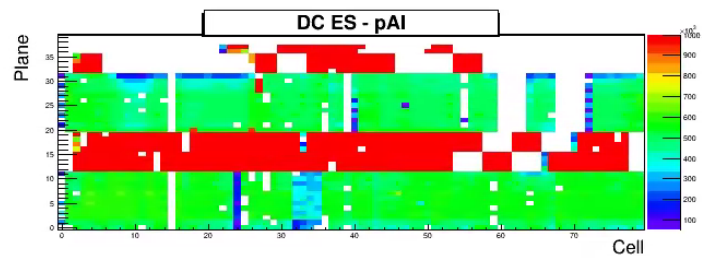
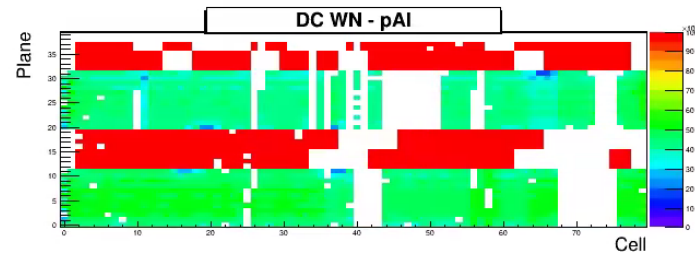
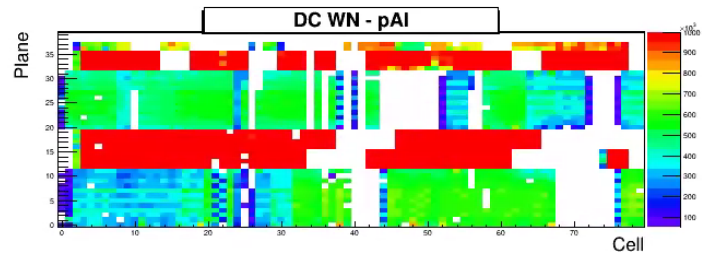
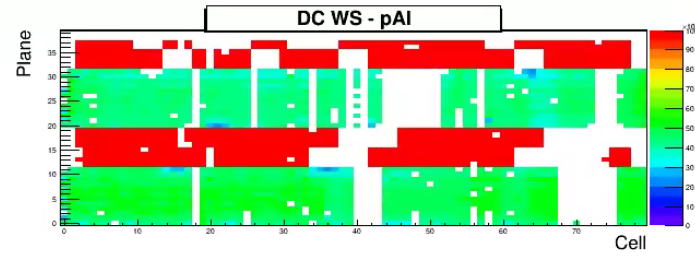
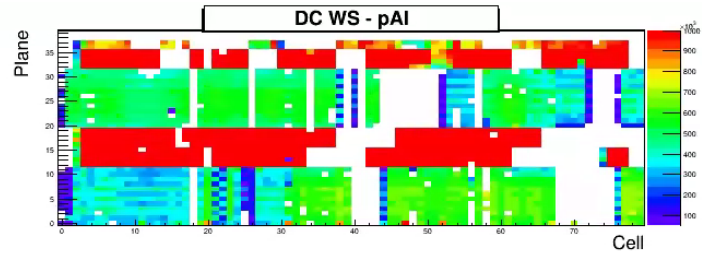
- pAu : 6874
- pp : 6338
- pp : 6501



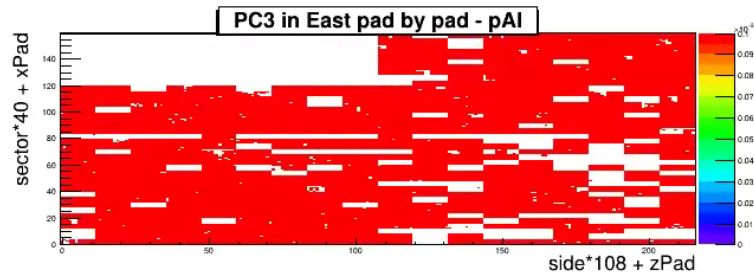
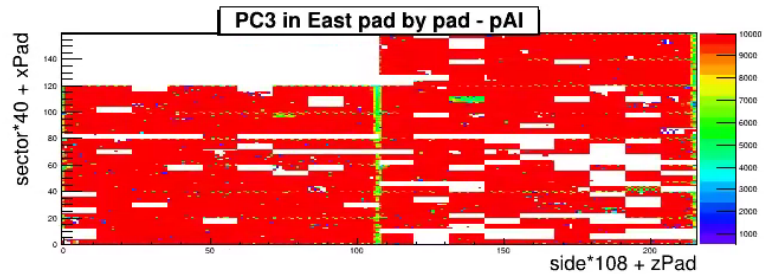
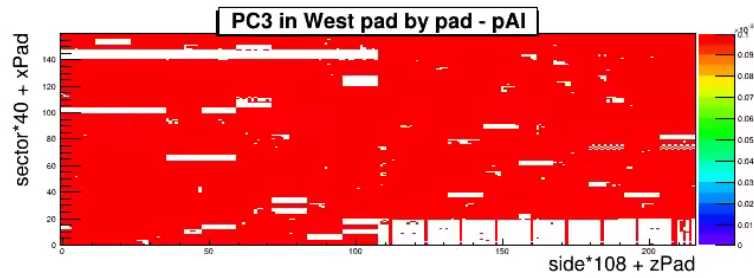
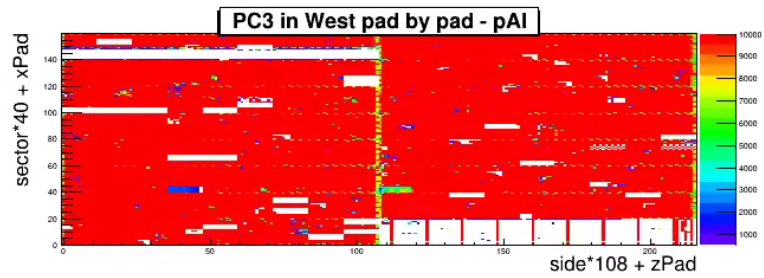
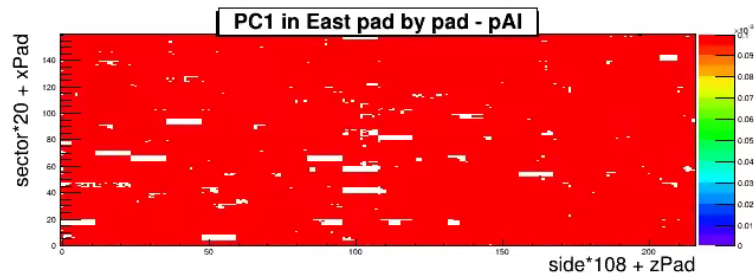
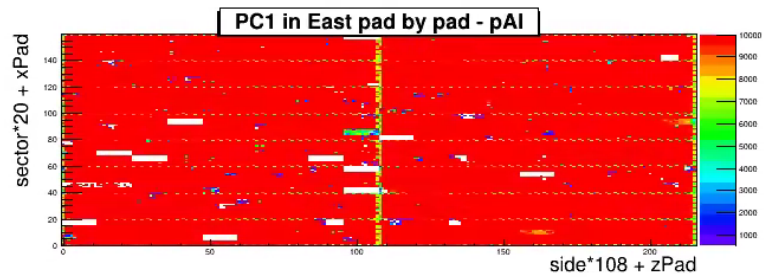
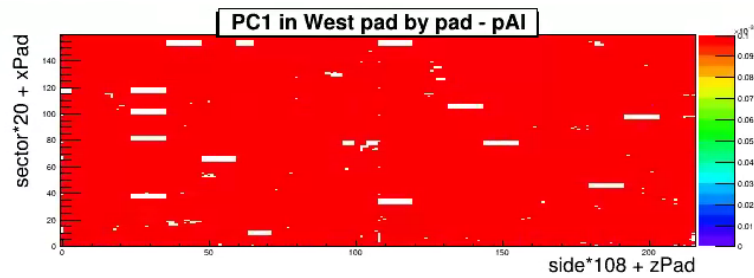
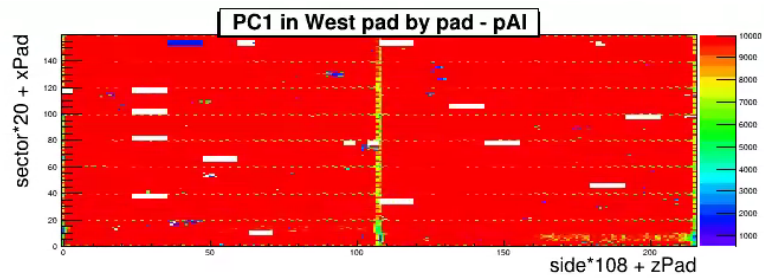
Deadmap for DC, PC, RICH

Run15 pp, pAl, pAu dataset

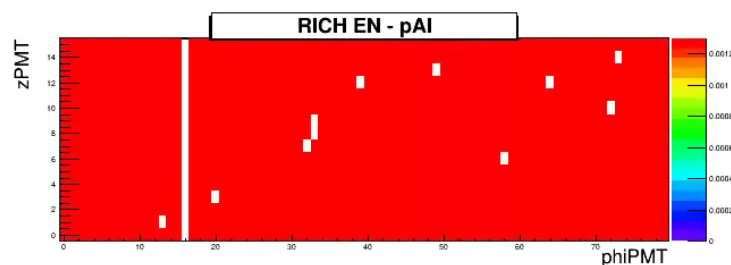
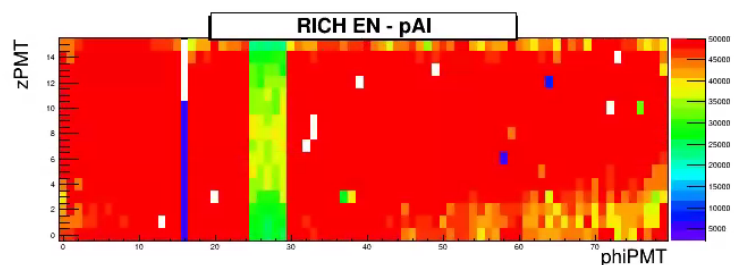
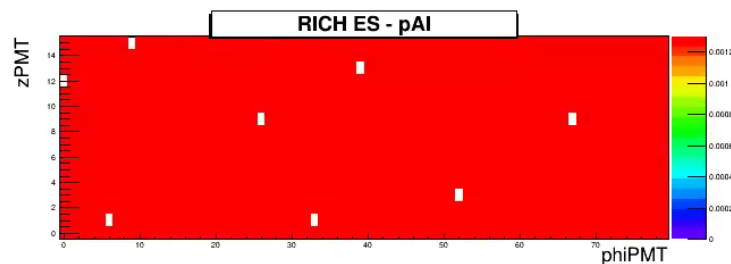
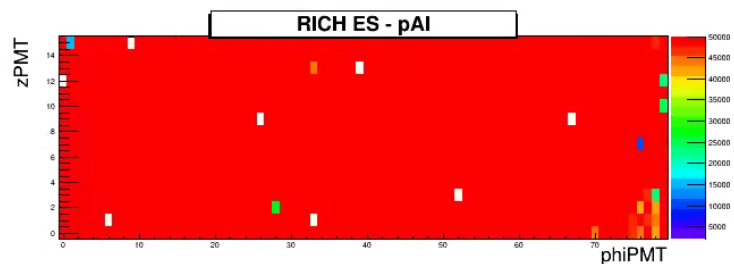
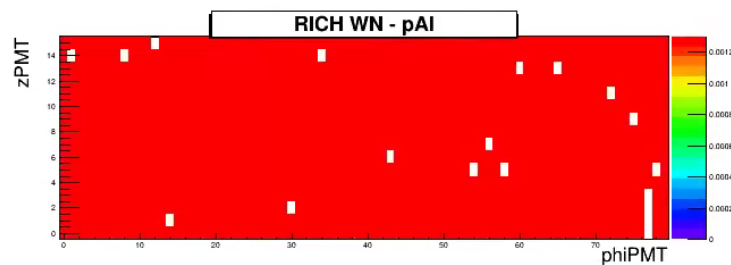
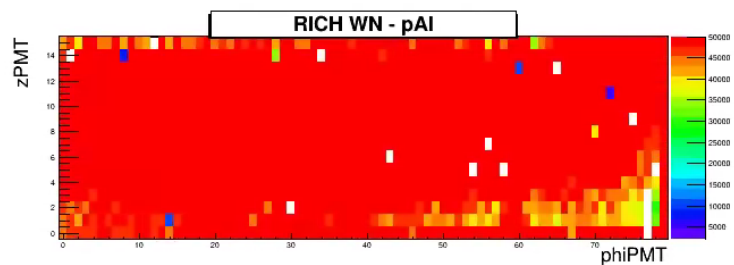
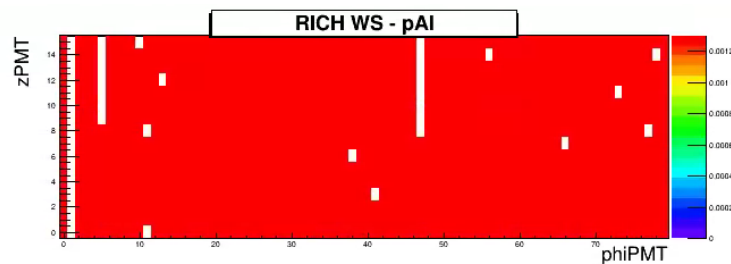
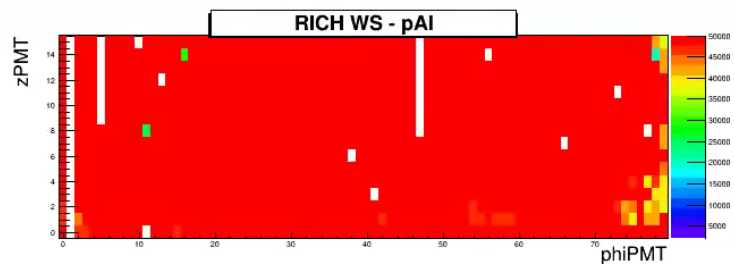
DC dead map



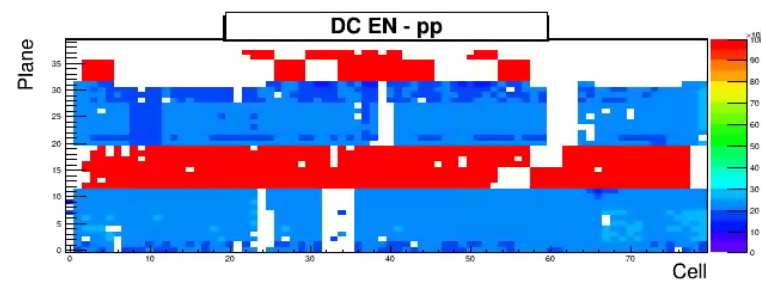
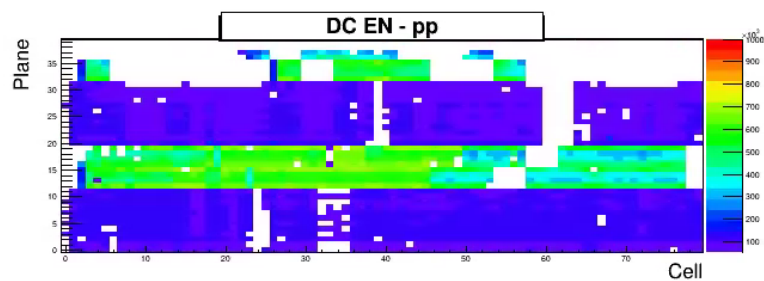
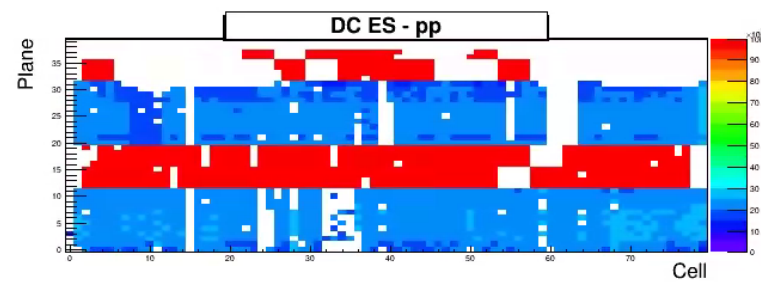
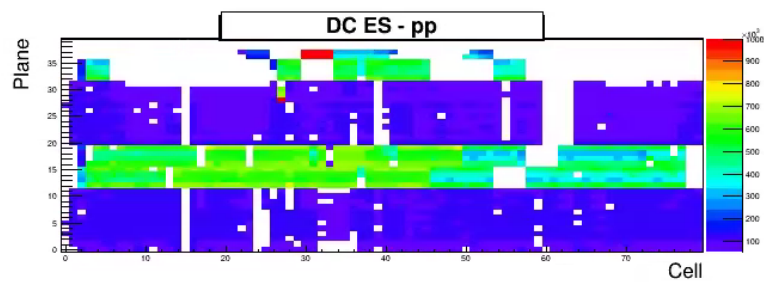
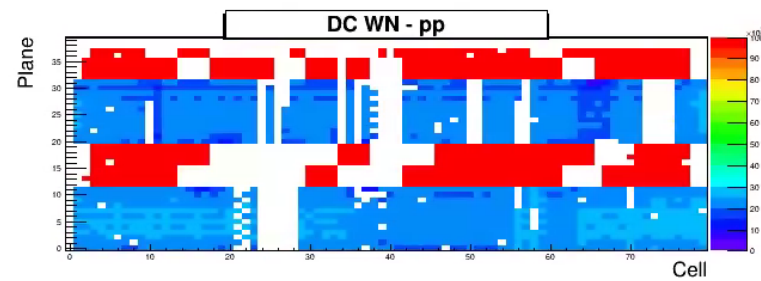
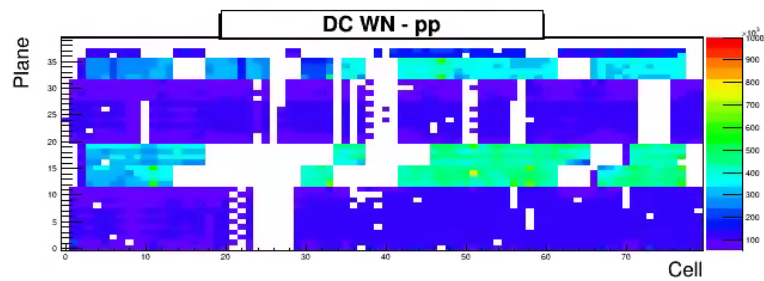
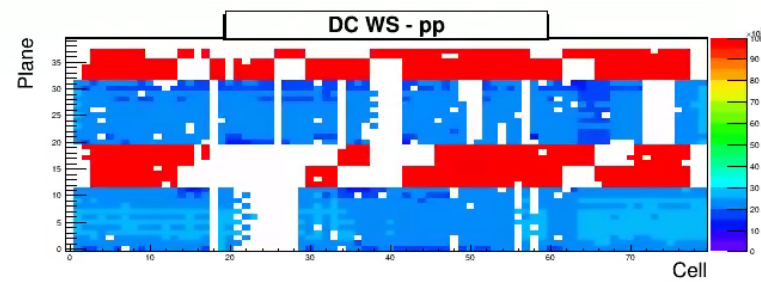
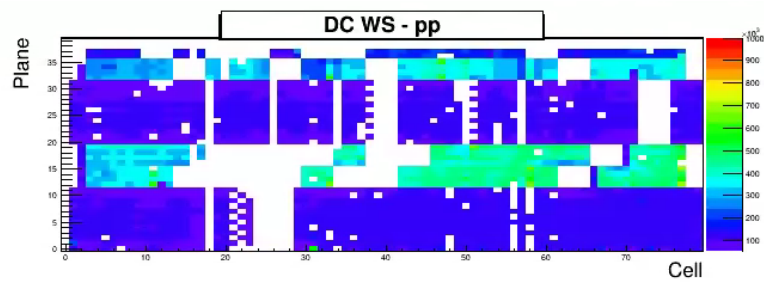
PC dead map



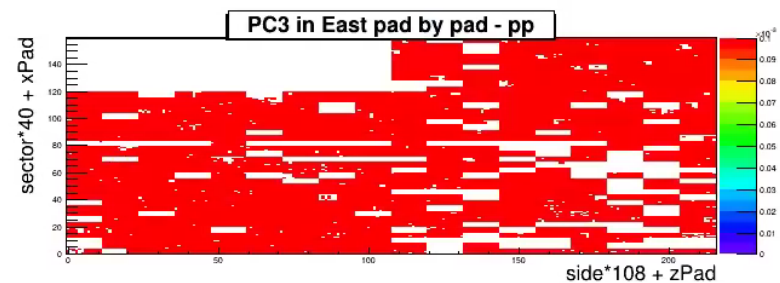
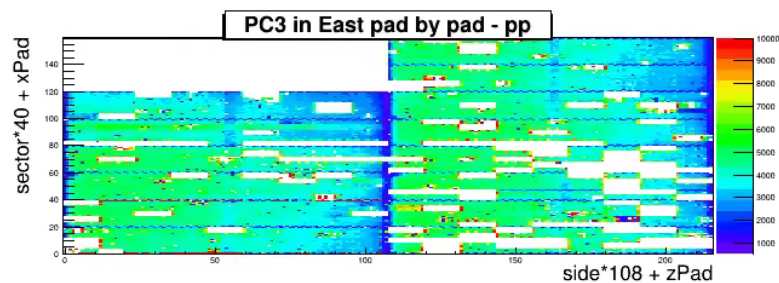
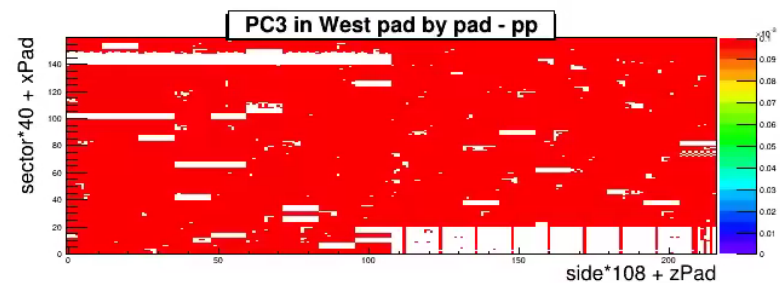
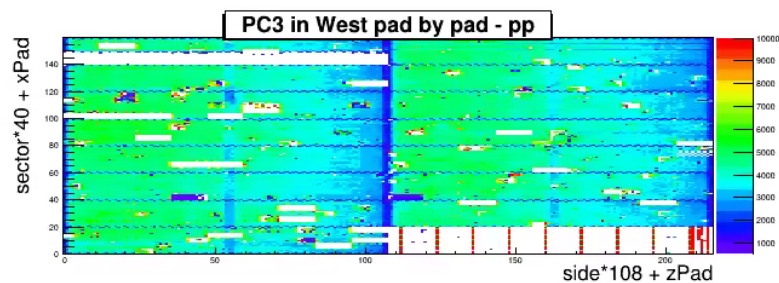
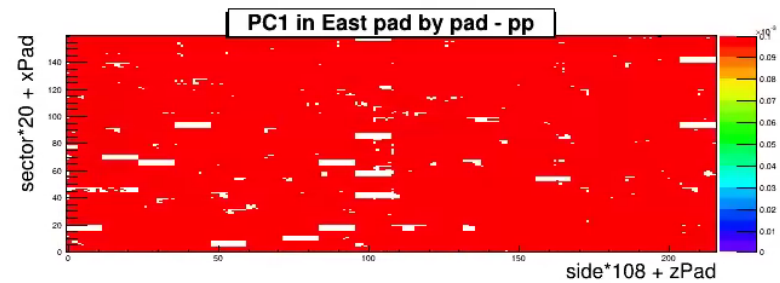
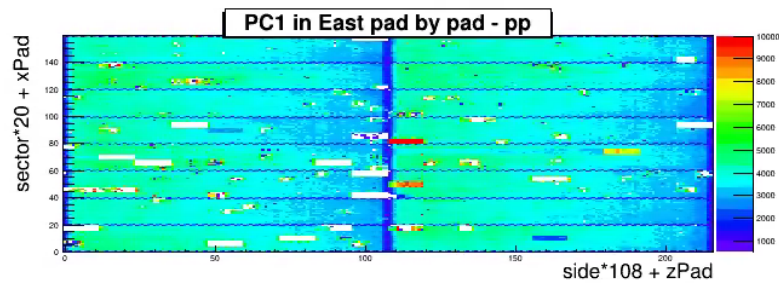
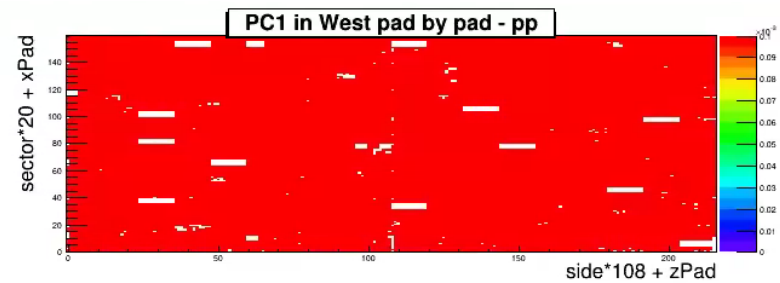
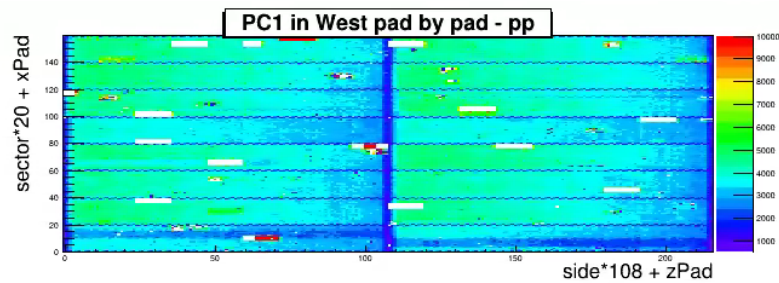
RICH dead map



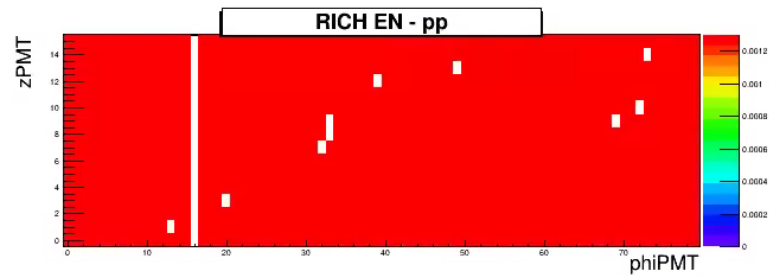
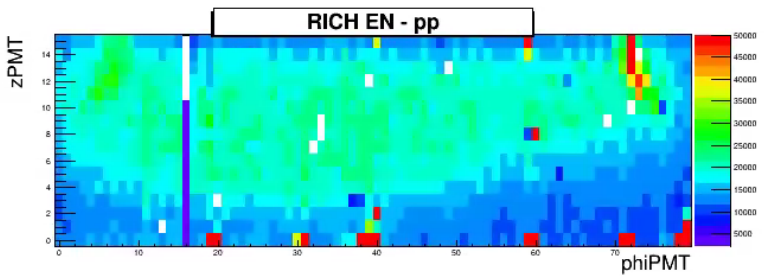
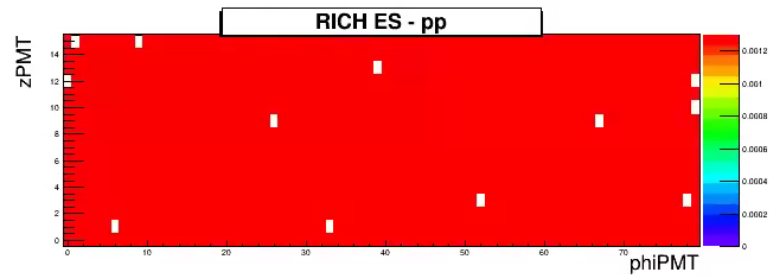
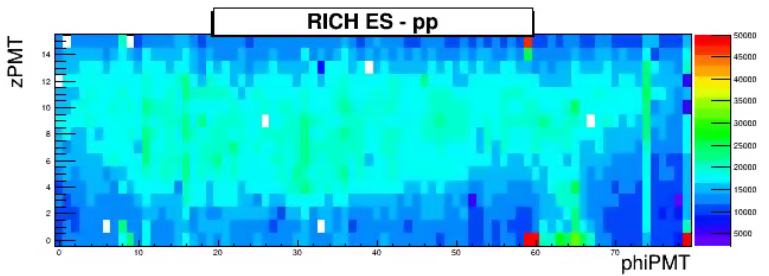
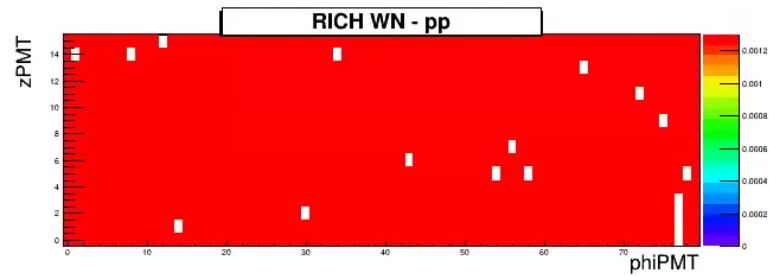
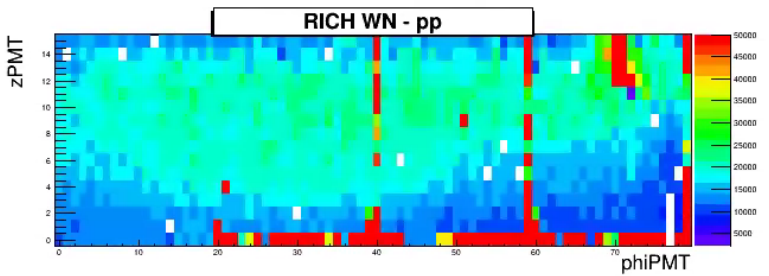
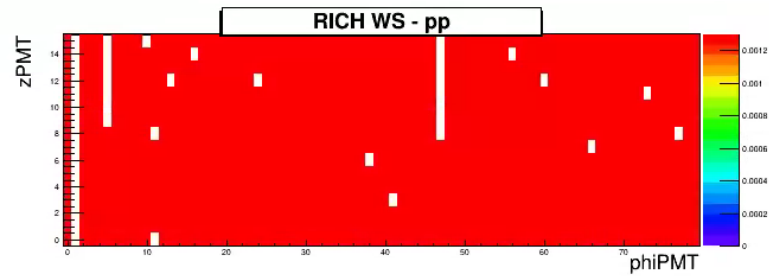
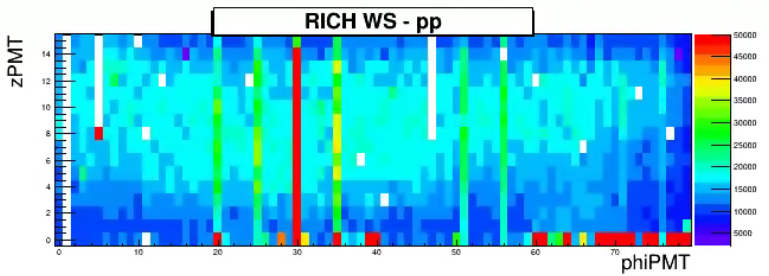
DC dead map



PC dead map



RICH dead map



Acc. X Rec. efficiency

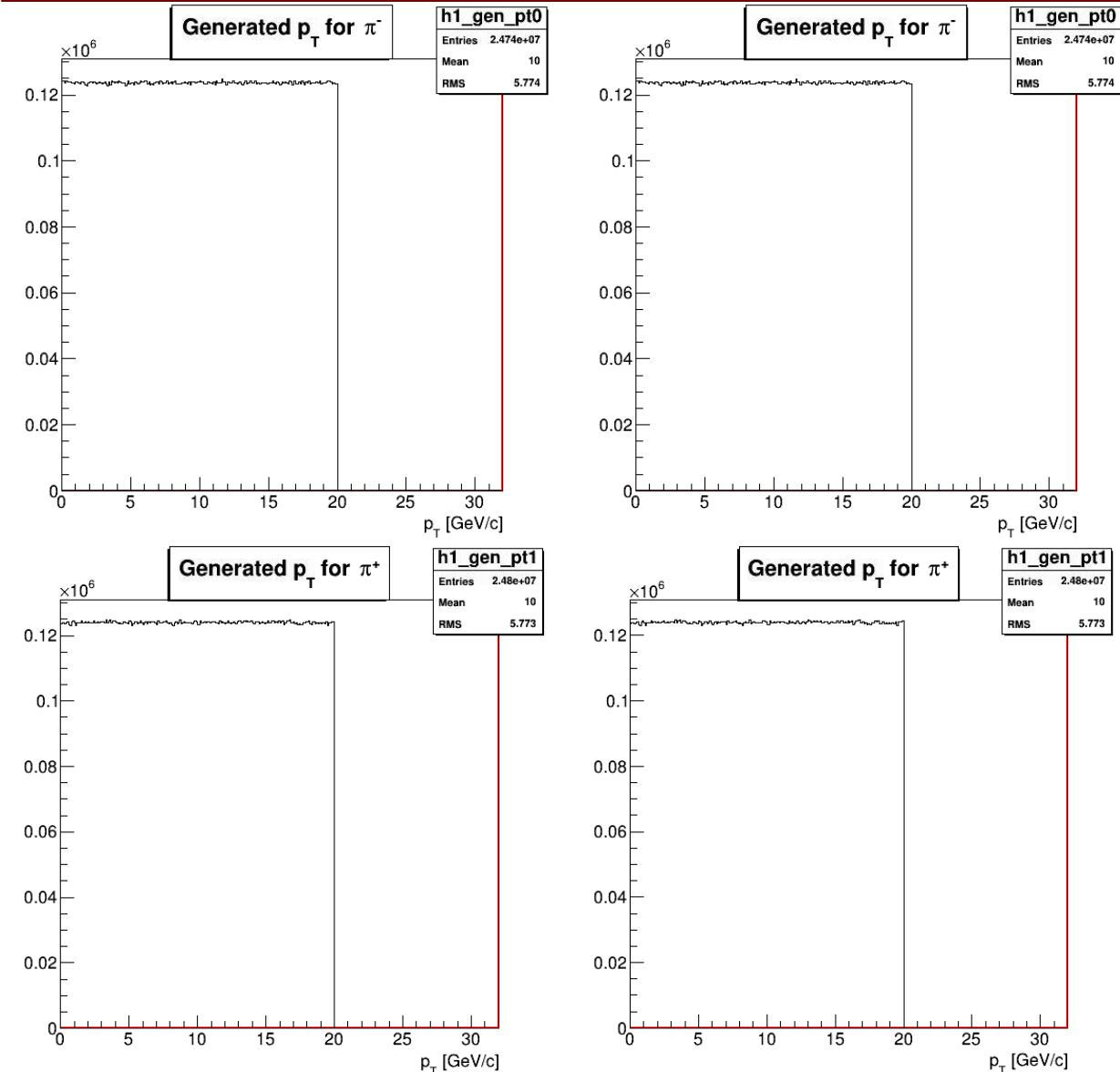
Run15 pp, pAl, pAu dataset

Single π^\pm generation (pp, pA)

- Number of π^\pm : 2,5000,000 for each charge
- $0 < \text{momentum} < 20 \text{ GeV}/c$
- $-0.5 < \text{eta} < 0.5$
- $0 < \phi < 2\pi$
- Primary Vertex = (0,0,0)

Using Run15 with dead channels of DC, PC, RICH

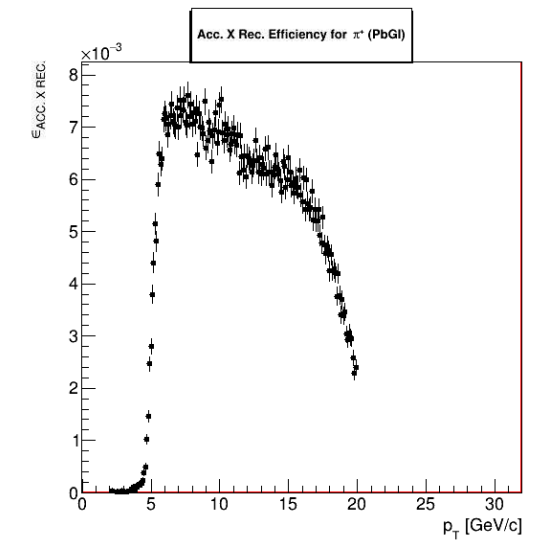
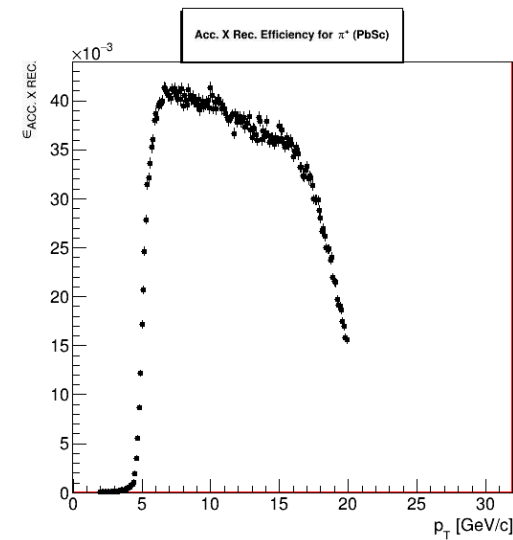
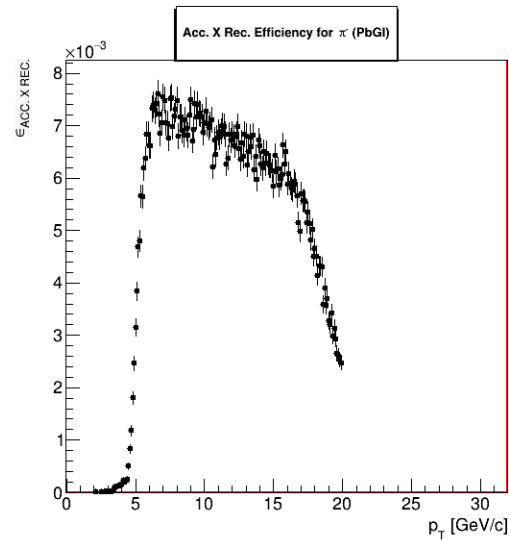
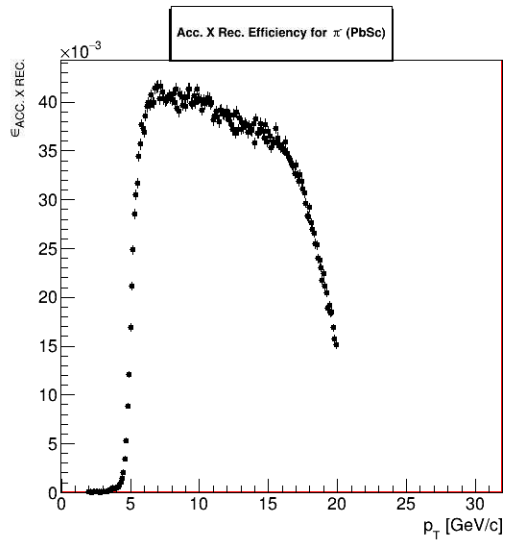
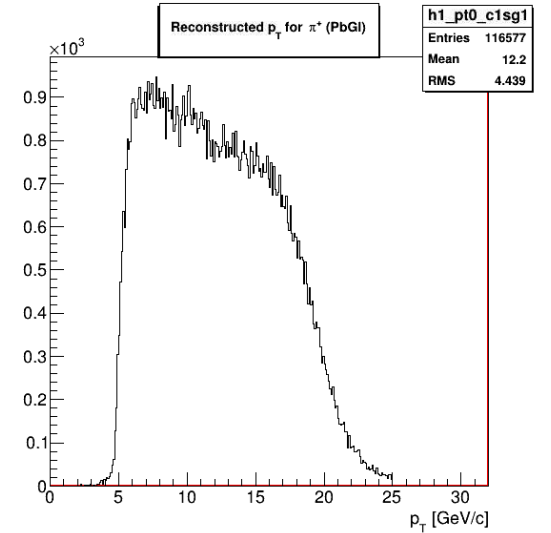
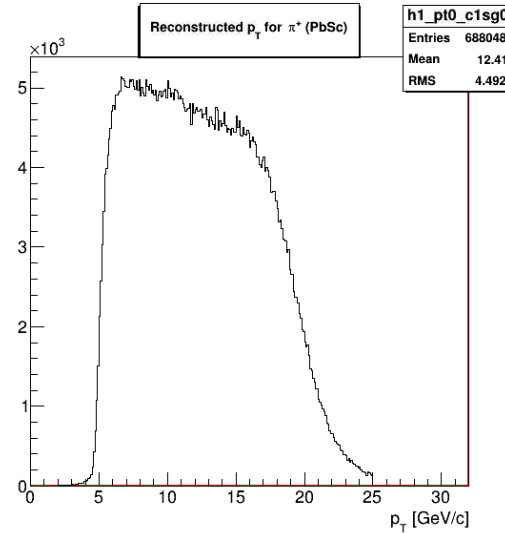
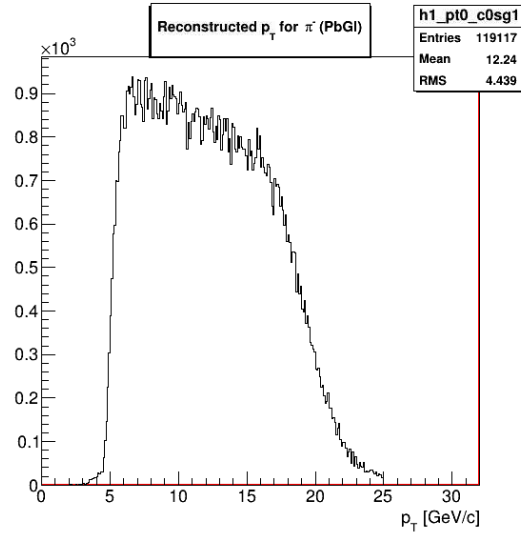
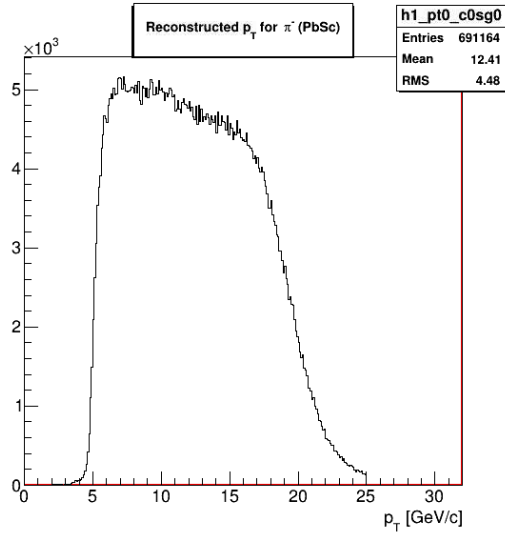
Generated pions (pp)



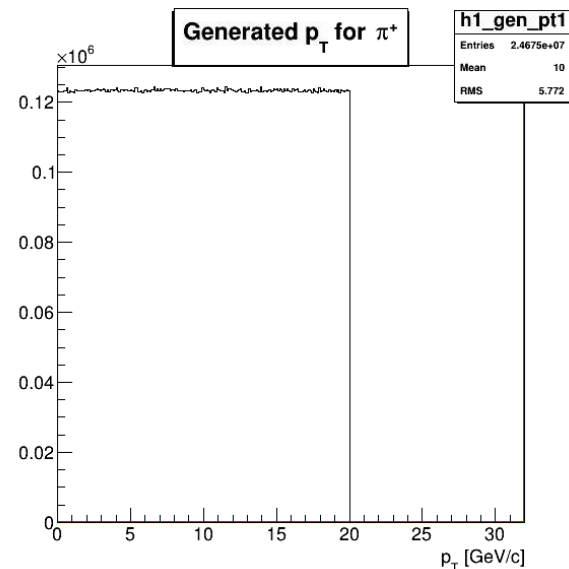
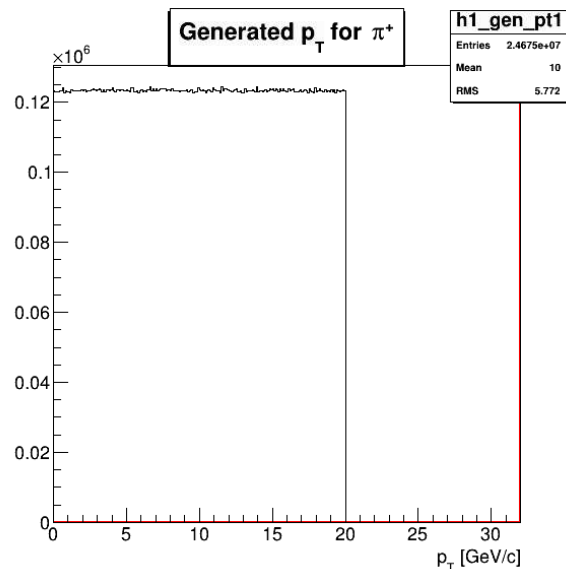
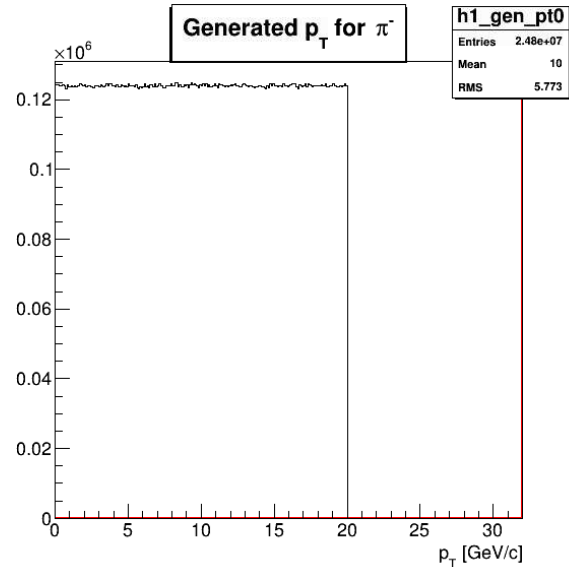
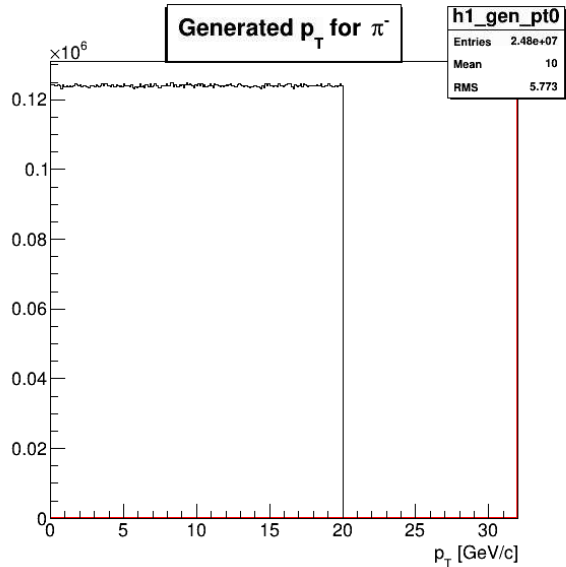
- π^\pm Identification Cuts

- I. $2 < p_T < 25$ (GeV/c)
- II. quality == 31 or 63
- III. n1 > 0
- IV. $|BBCZ| < 30$ (cm)
- V. $|DCZed| < 70$ (cm)
- VI. Shower shape (prob) < 0.1
- VII. $0.2 < emce/p < 0.8$ sect > -9000

Reconstructed pions (pp)



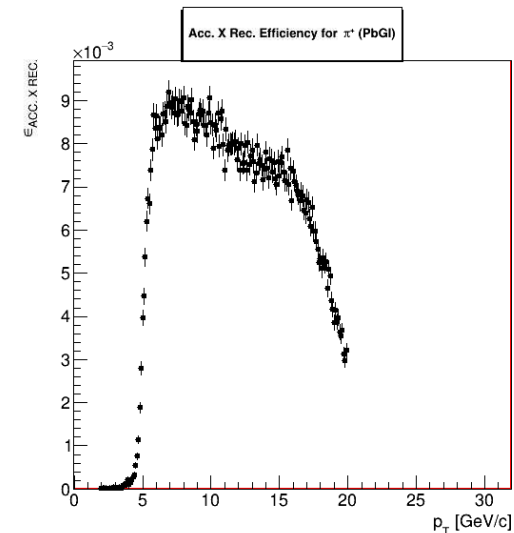
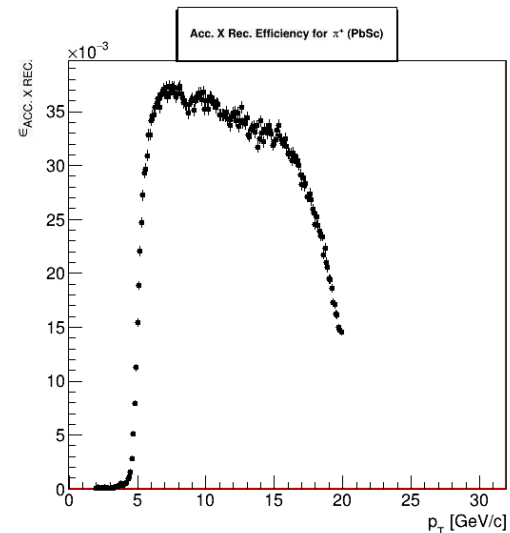
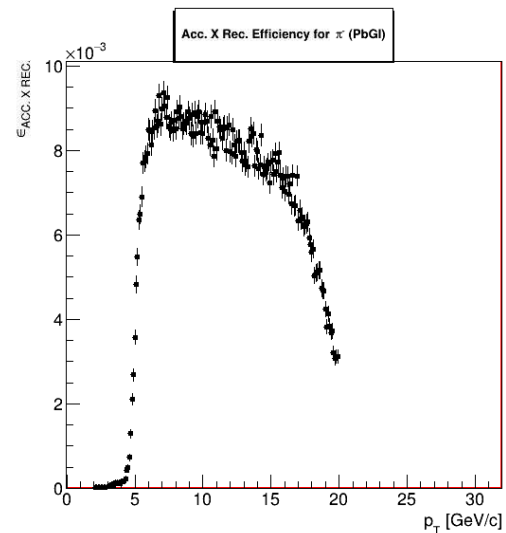
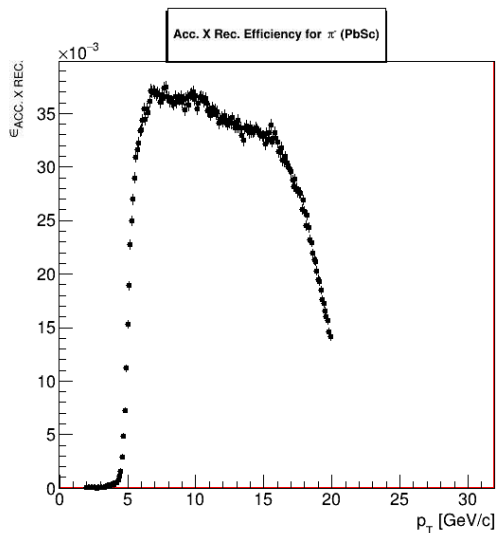
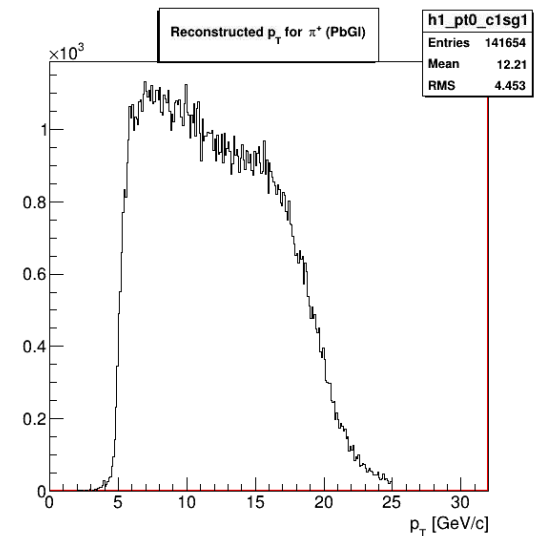
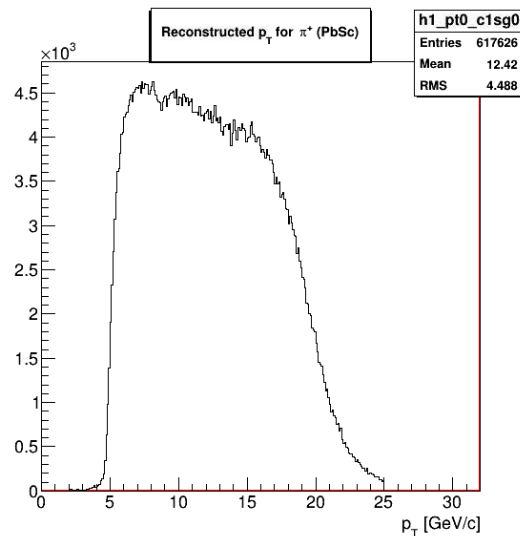
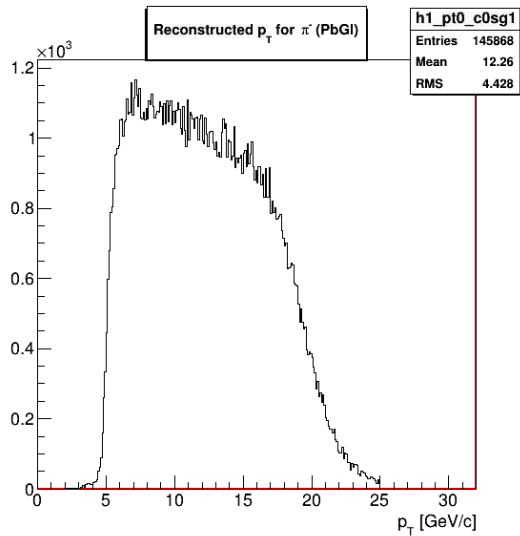
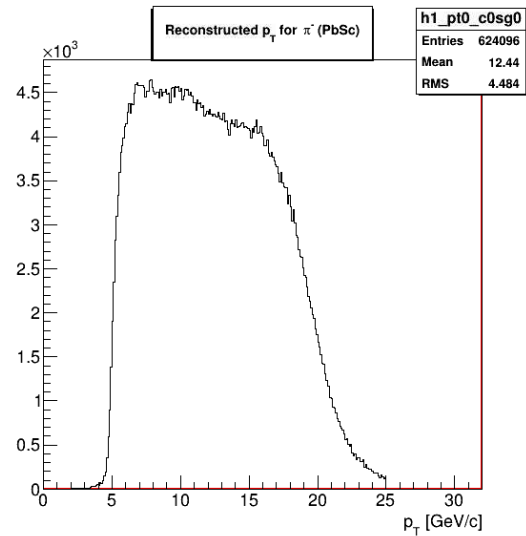
Generated pions (pAl)



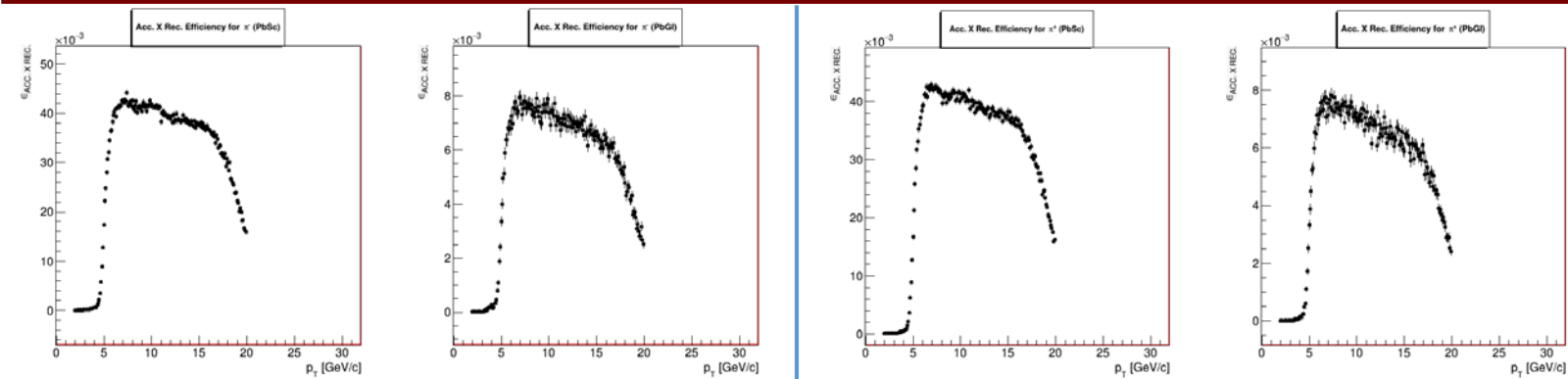
π^\pm Identification Cuts

- I. $2 < p_T < 25$ (GeV/c)
- II. quality == 31 or 63
- III. n1 > 0
- IV. $|BBCZ| < 30$ (cm)
- V. $|DCZed| < 70$ (cm)
- VI. Shower shape (prob) < 0.1
- VII. $0.2 < emce/p < 0.8$ sect > -9000

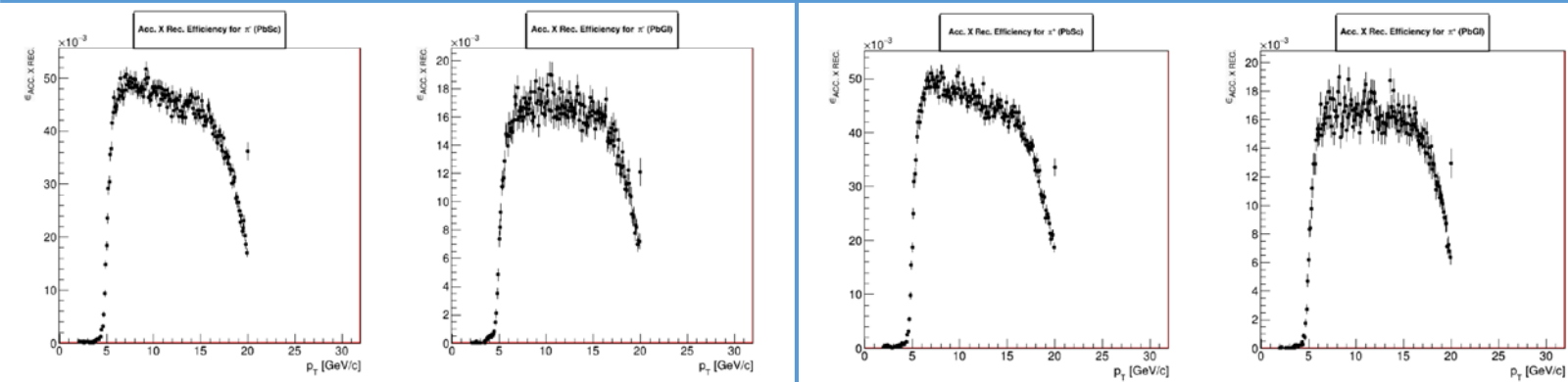
Reconstructed pions (pAl)



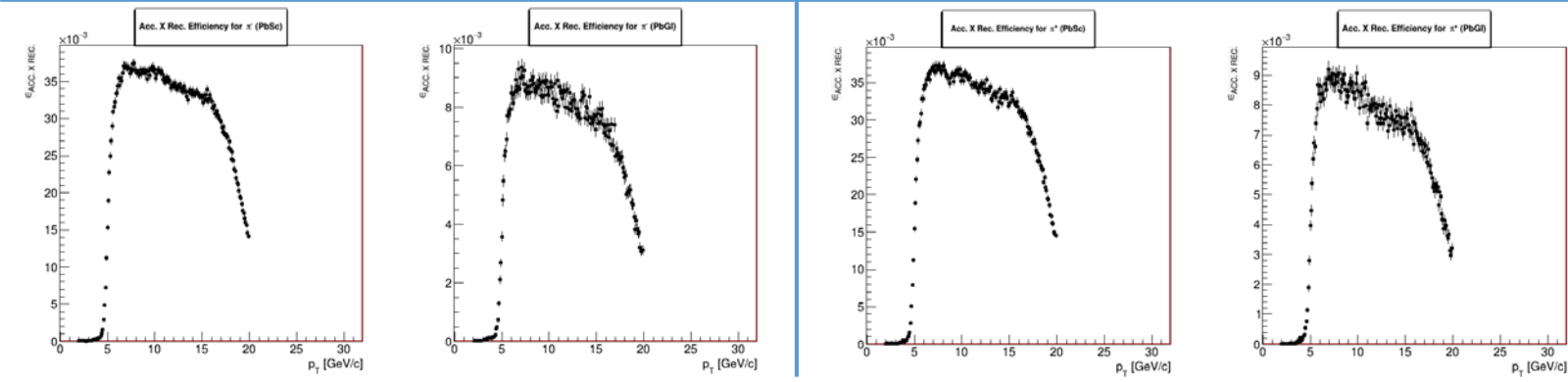
Compare with pp, pAu, pAl.



pp



pAu

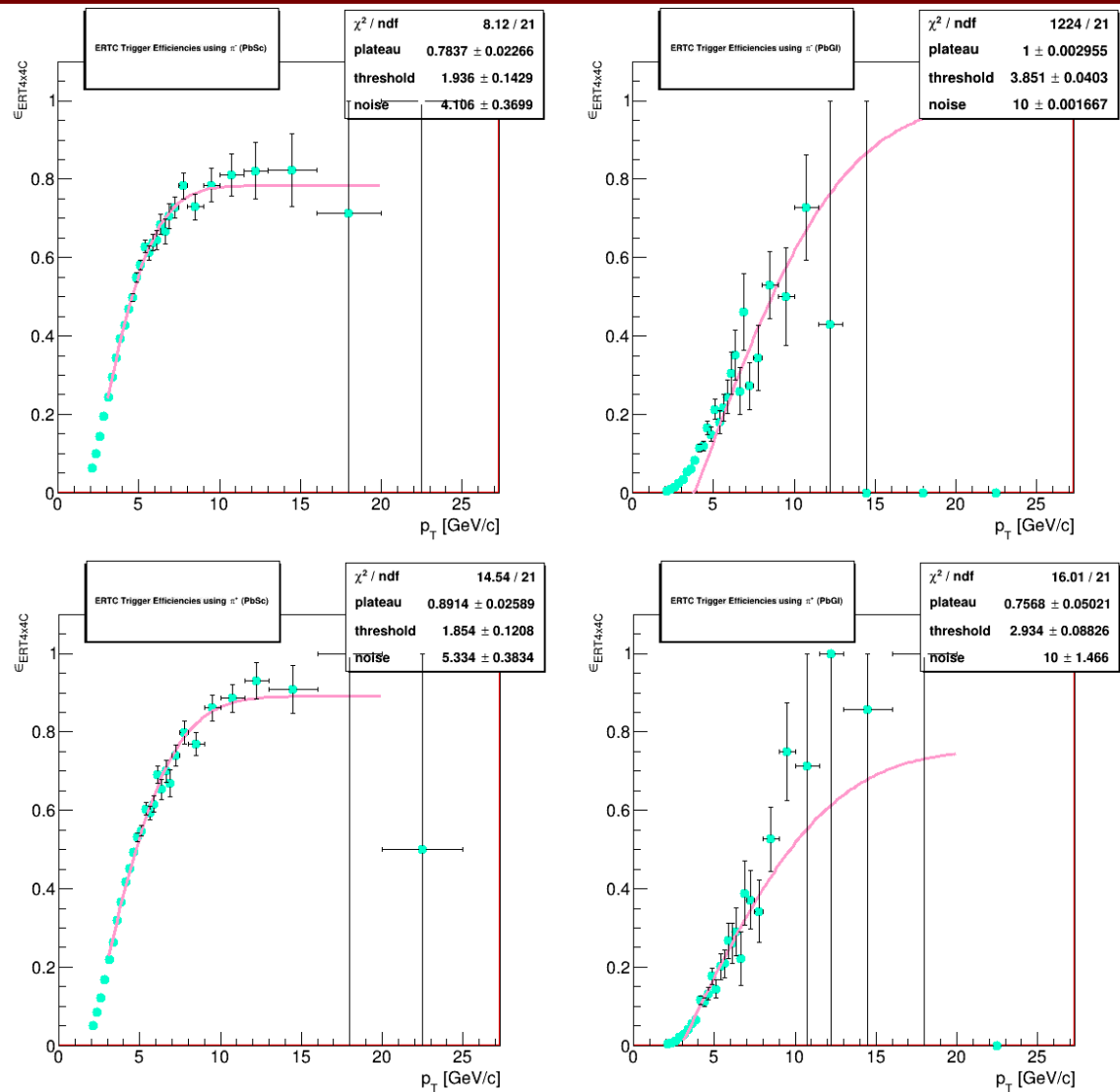


pAl

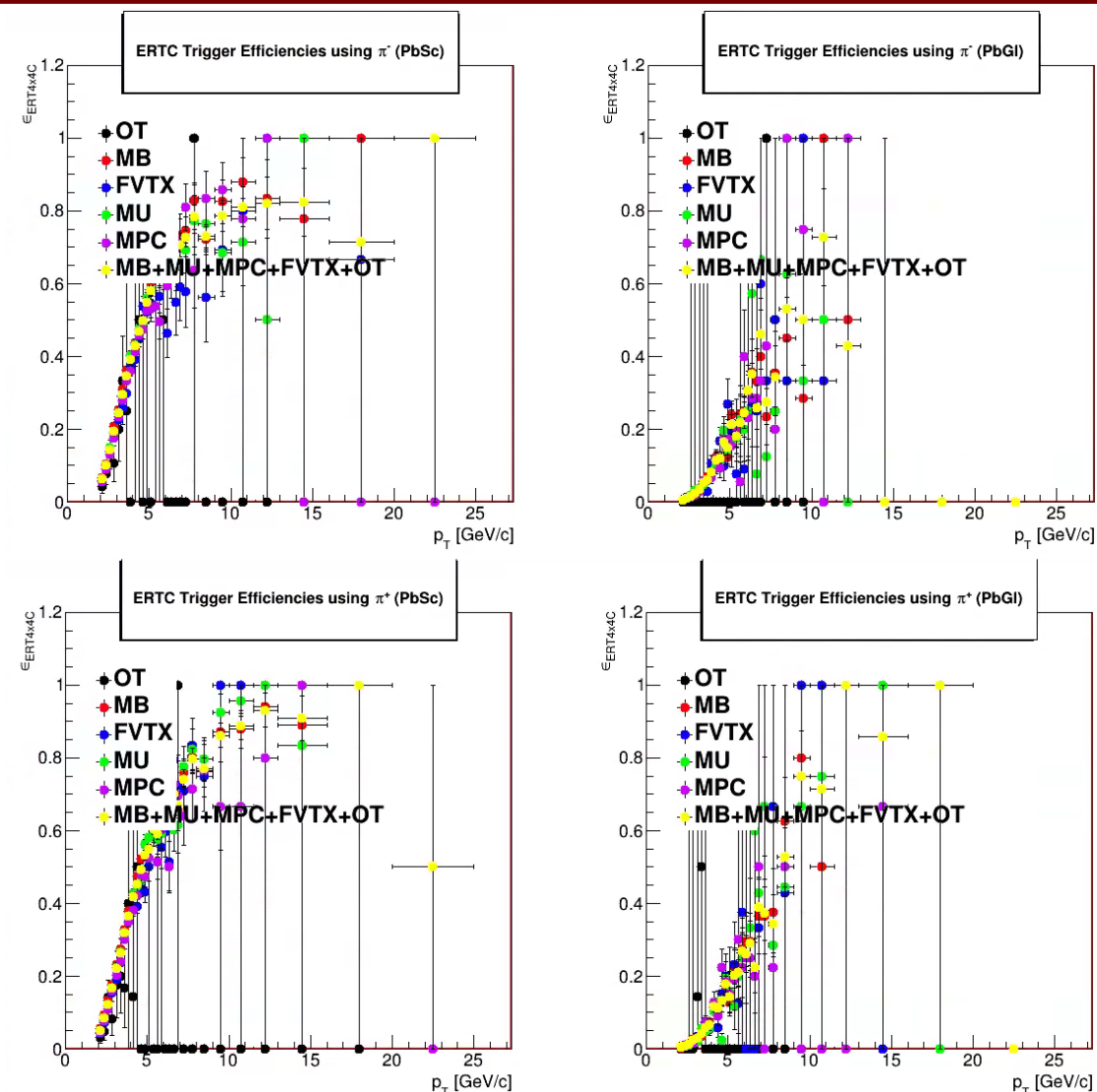
Trigger efficiency for ERT

Run15 pp, pAl, pAu dataset

ERT Trigger Efficiency with all dataset (pp)

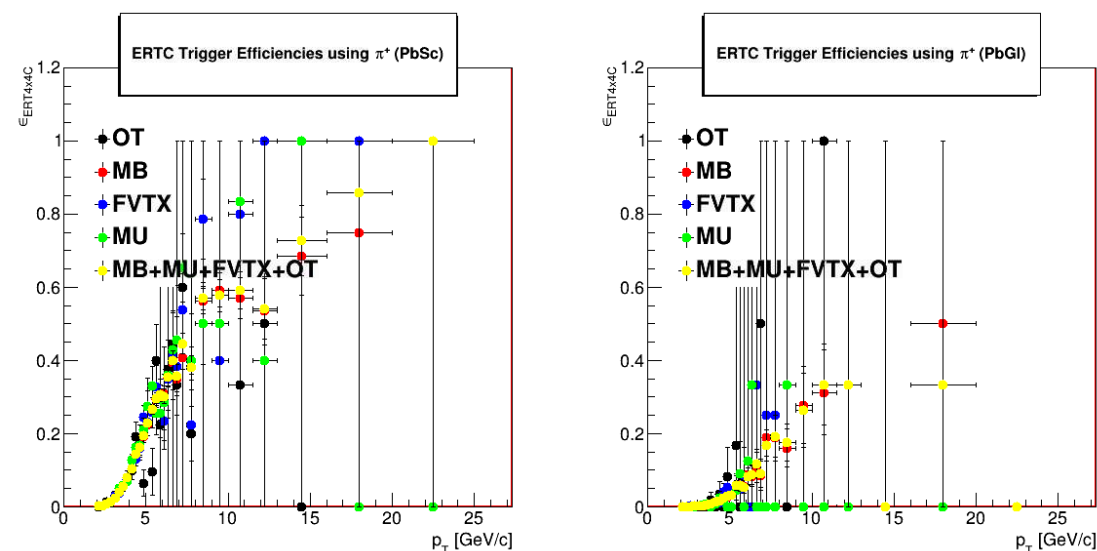
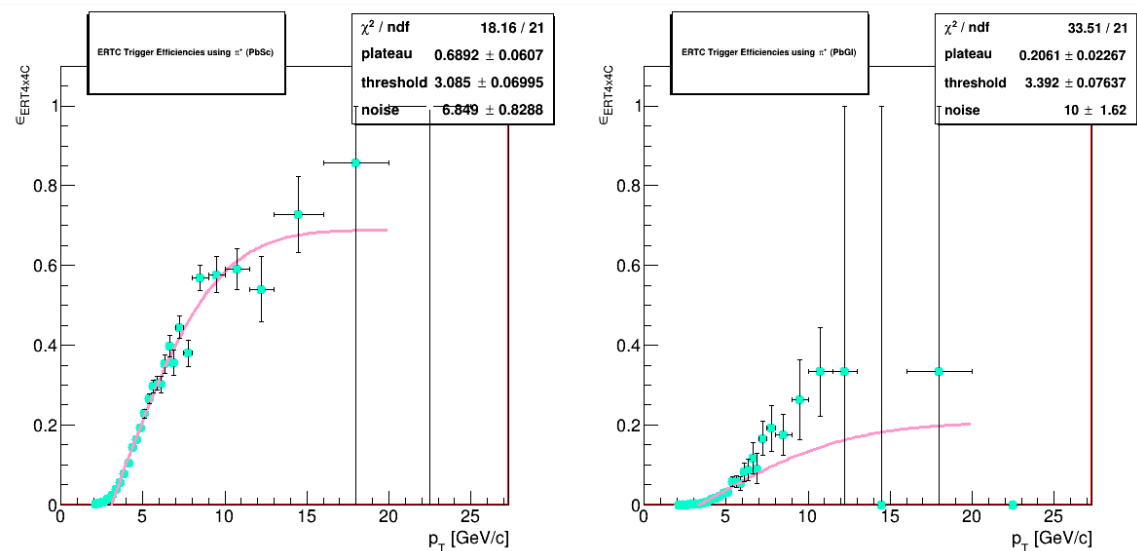
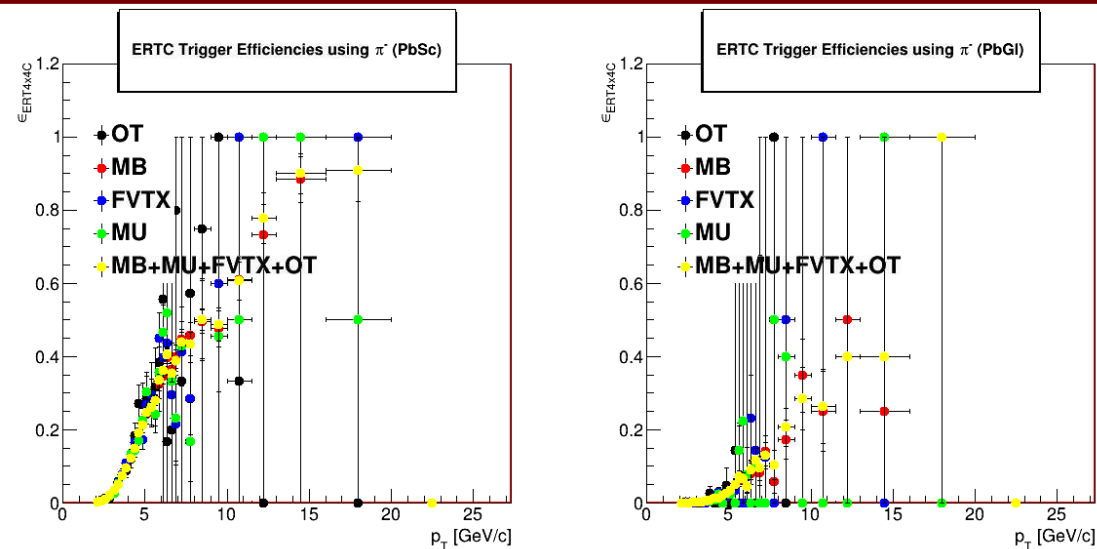
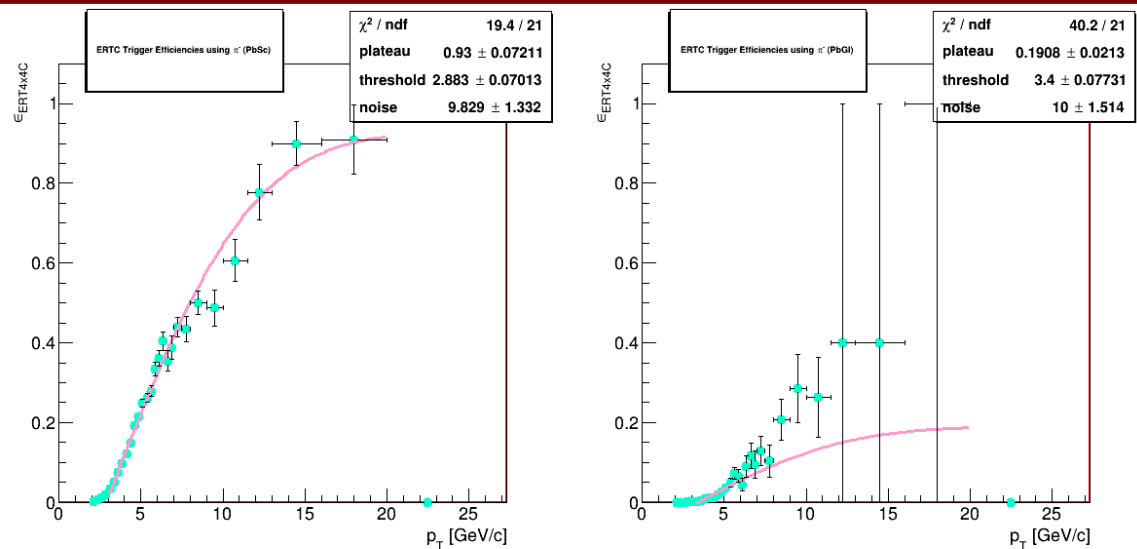


MB+MU + MPC+FVTX+OT



Comparison

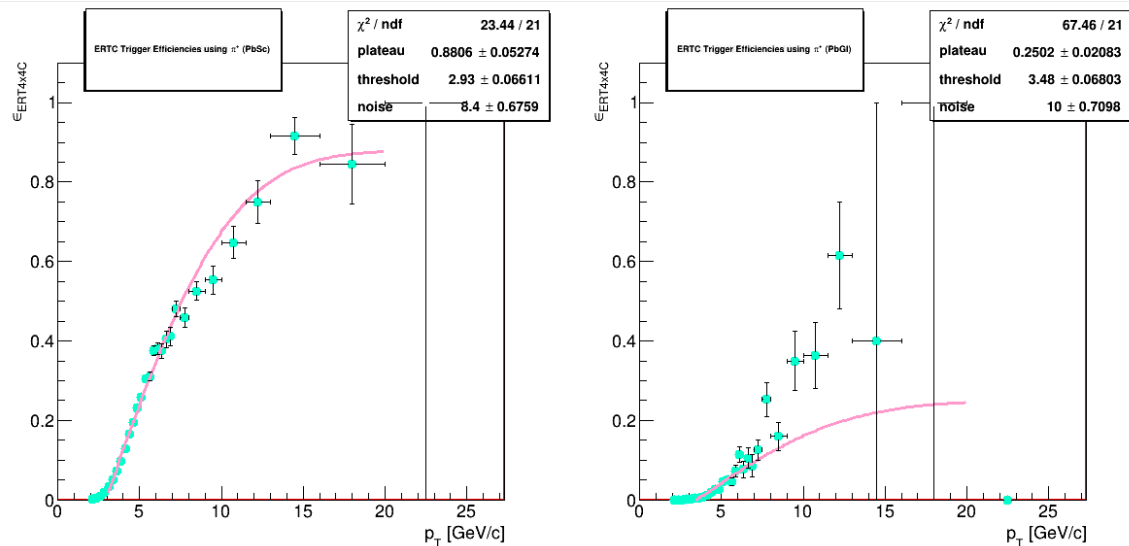
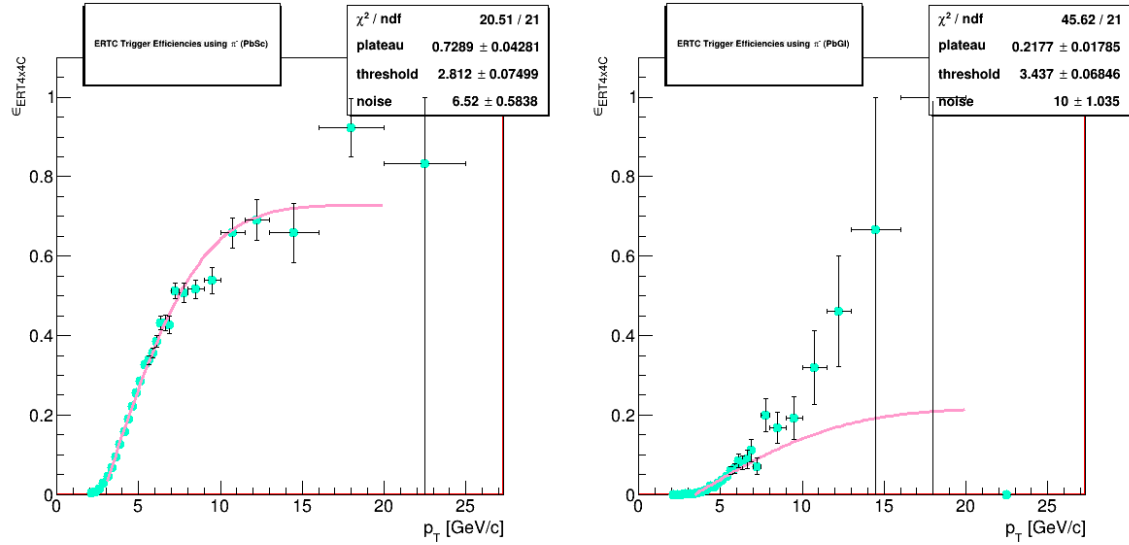
ERT Trigger Efficiency with all dataset (pAl)



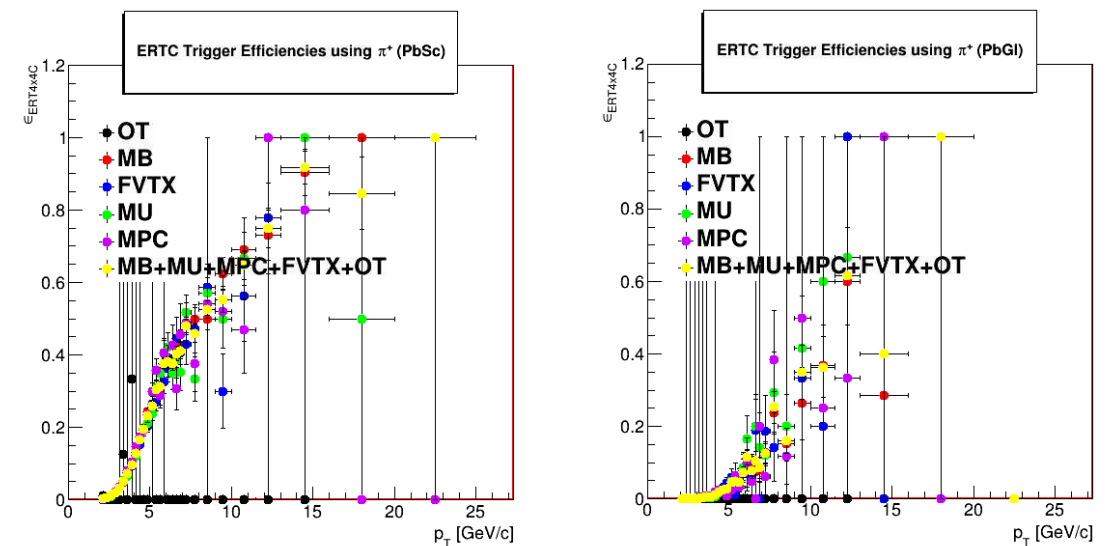
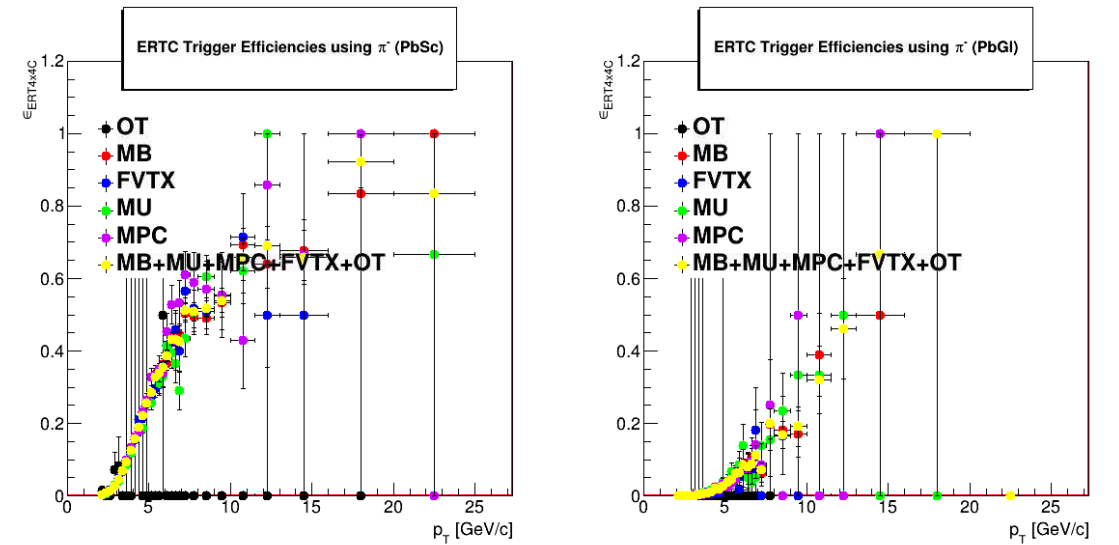
MB+MU+FVTX+OT

Comparison

ERT Trigger Efficiency with all dataset (pAu)



MB+MU + MPC+FVTX+OT



Comparison

Thank you.