QA of 2018 PbPb data

ALICE Offline week, December 6th, 2018

Elena Botta for the
DPG Coordination - QA group

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Outline

- 2018 PbPb: DAQ, integrated luminosity, triggers
- 2018 PbPb: data processing
- QA workflow
- Detector QA: highlights
- Summary and conclusions

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2018 PbPb: DAQ

LHC18q: stable beams (few runs with no stable beams, not for physics)

runs: 295581 (08 Nov) - 296623 (21 Nov)

fills: 7427-7460

runs in PHYSICS_1 partition: 208

runs with duration > 5 min: **154**

LHC18r: stable beams

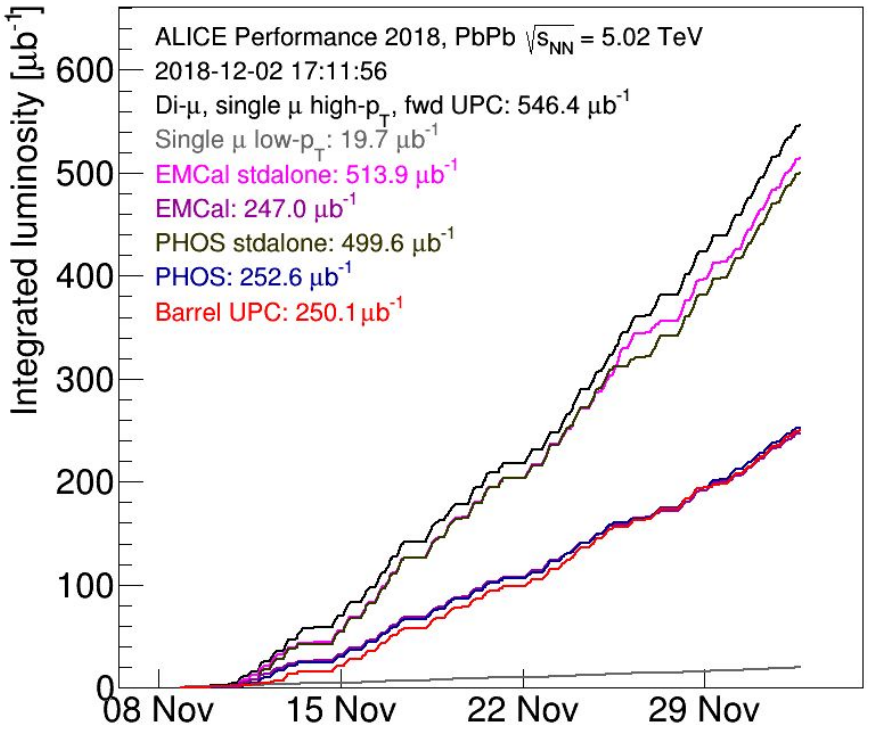
runs: 296690 (22 Nov) - 297624 (2 Dec)

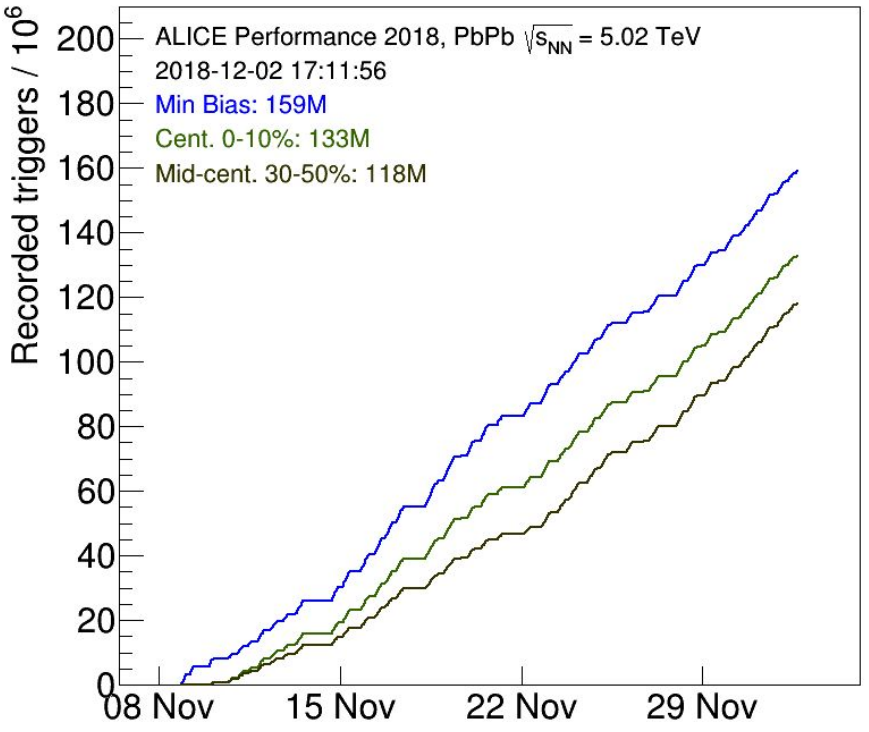
fills: 7464-7492

runs in PHYSICS_1 partition: 172

runs with duration > 5 min: **115**

2018 PbPb: integrated luminosity and triggers





https://aliqaevseos.web.cern.ch/aliqaevseos/data/2018/2018_PbPb_5TeV/lumi_PbPb.png
https://aliqaevseos.web.cern.ch/aliqaevseos/data/2018/2018_PbPb_5TeV/stat_PbPb.png

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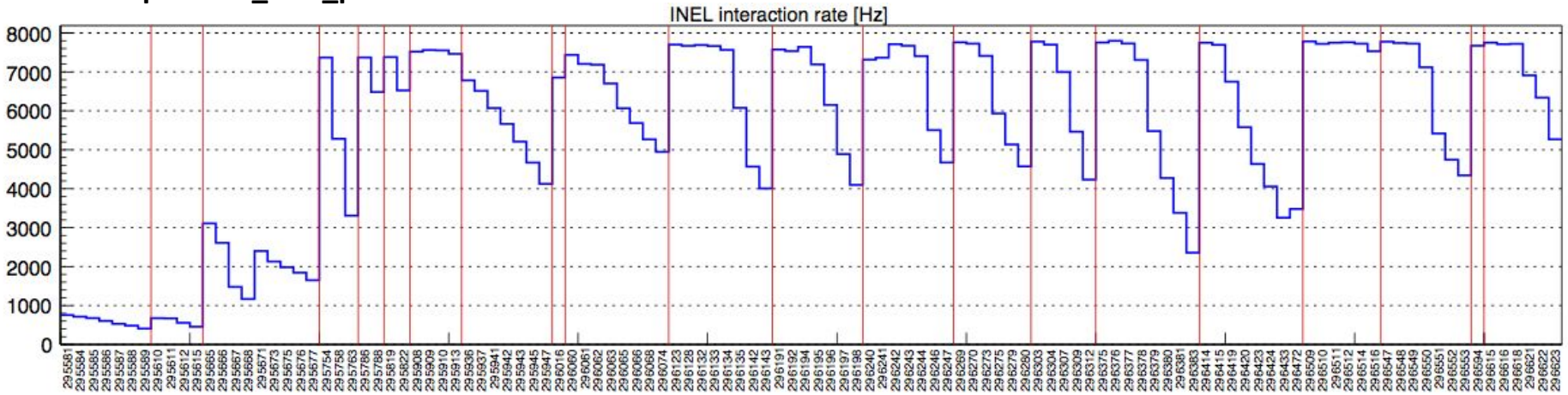
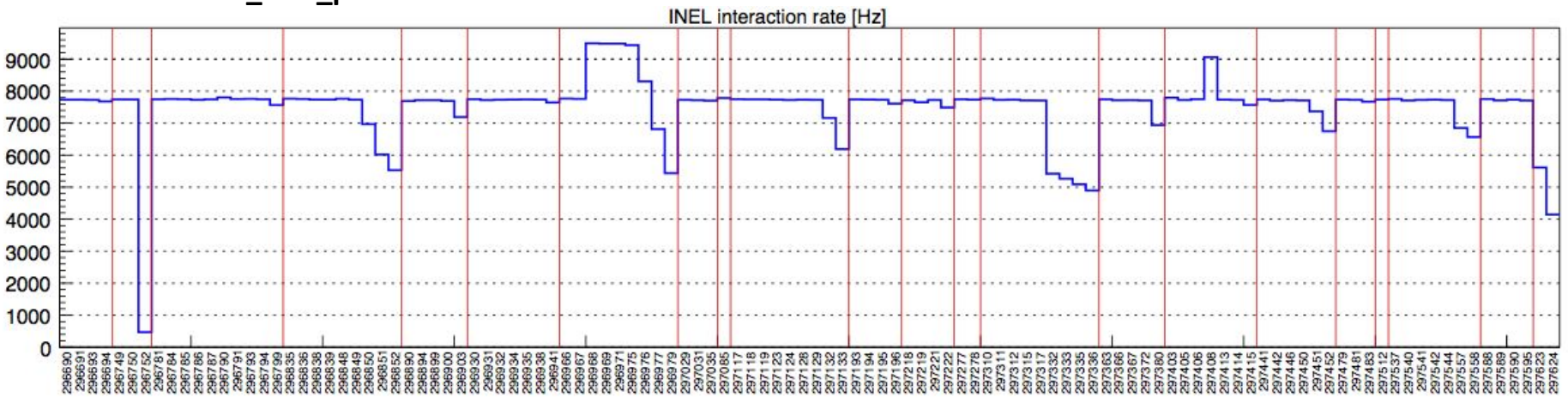
2018 PbPb: IR

LHC18q - muon_calo_pass1



LHC18r - muon_calo_pass1



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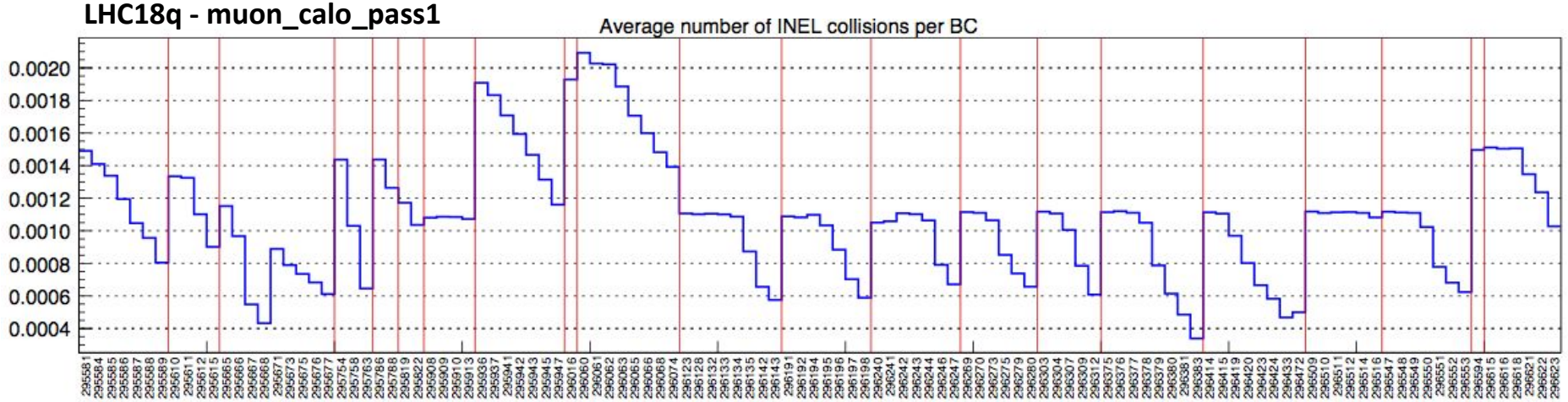
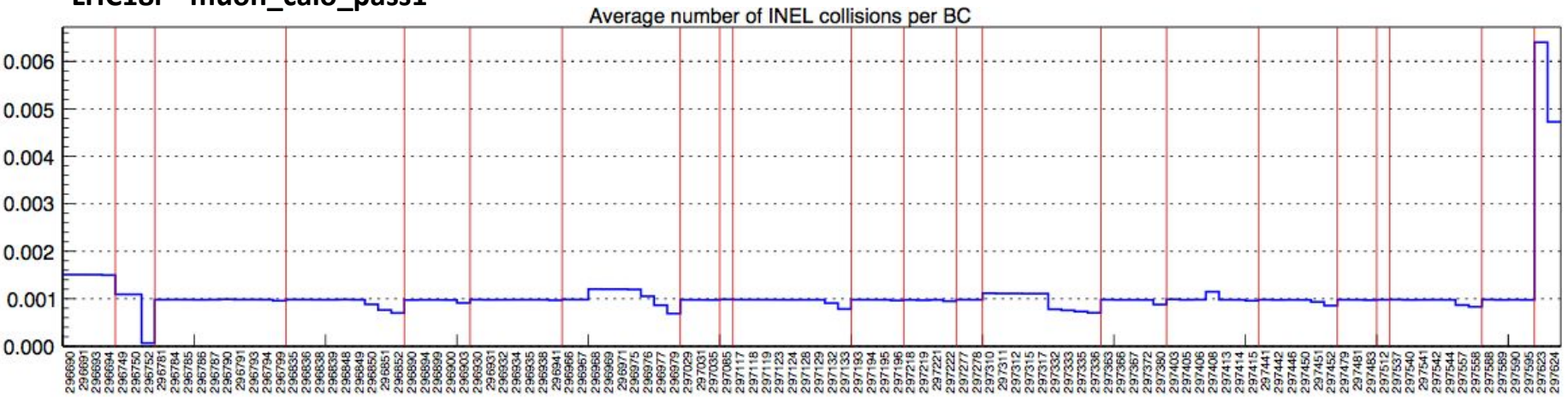
http://aliqaevs.web.cern.ch/aliqaevs/data/2018/LHC18r/muon_calo_pass1/rate.png

PbPb 2018: mu

LHC18q - muon_calo_pass1



LHC18r - muon_calo_pass1



http://aliqaevs.web.cern.ch/aliqaevs/data/2018/LHC18q/muon_calo_pass1/mu.png
http://aliqaevs.web.cern.ch/aliqaevs/data/2018/LHC18r/muon_calo_pass1/mu.png

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2018 PbPb: data processing

- good runs with duration > 5 min.

- **muon_calo_pass1**: ALIROOT-8064
  AliPhysics v5-09-41d-01-1, AliDPG prod201811-07

  LHC18q: (in part v5-09-41-1) 154 runs, 83.2 Mevents MB, 61.2 Mevents 0-10%, 46.7 Mevents 30-50%

  LHC18r: 115 runs, 75.1 Mevents MB, 71.1 Mevents 0-10%, 70.7 Mevents 30-50%

- **cpass0/cpass1**: ALIROOT-8063

  AliPhysics v5-09-41a-01-1, AliDPG prod201811-07

  LHC18q: (in part v5-09-41-1) 143 runs, 83.2 MB Mevents

  LHC18r: 100 runs, 75.1 MB Mevents

- **18q** (PbPb) **pass1_uncalibrated** ALIROOT-8113

  Fill: 7427 (LIR, 7 runs), 7443 (HIR, 7 runs)
  AliPhysics v5-09-42a-01-1, AliDPG prod201811-06

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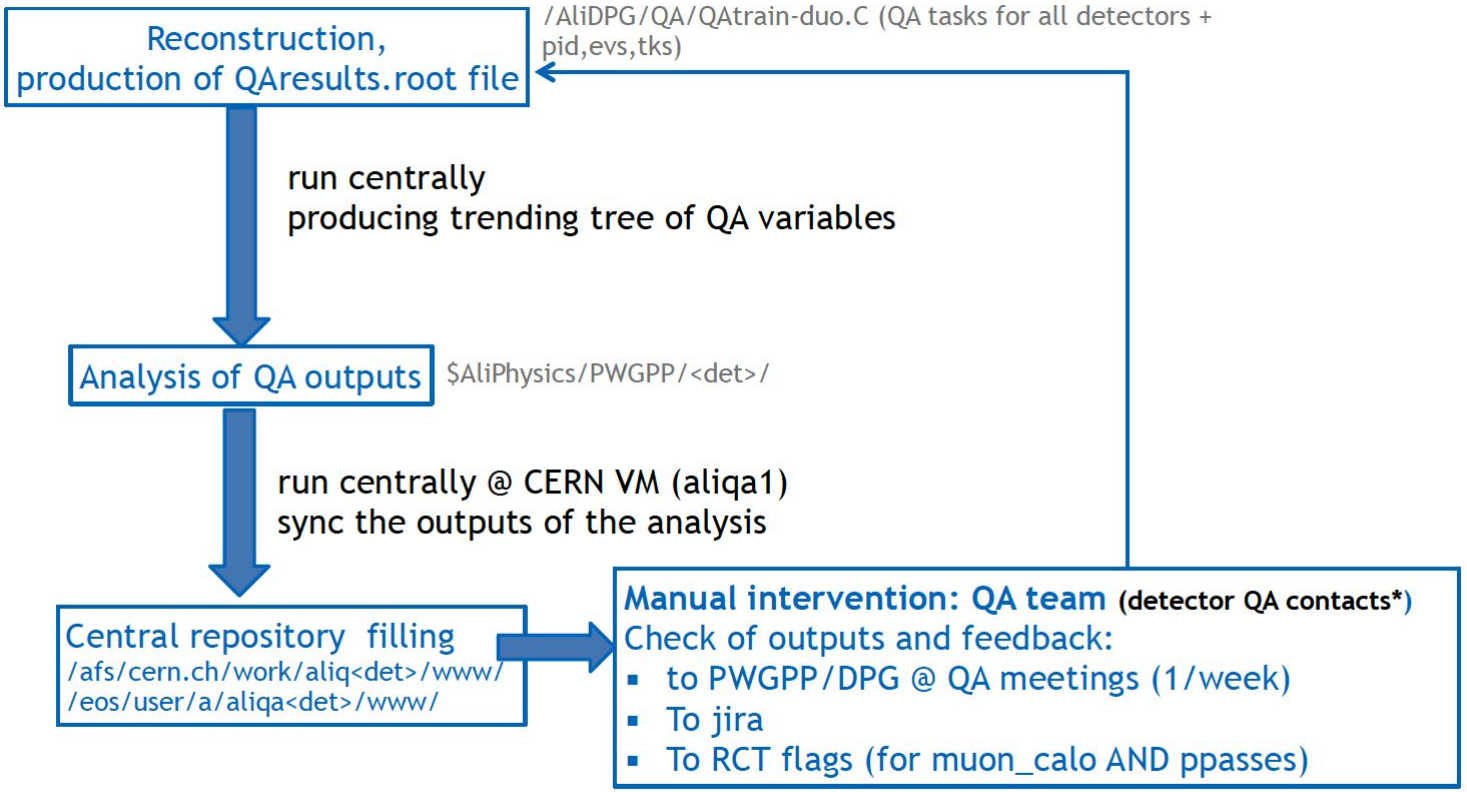
2018 PbPb: data processing

					Raw data			Reconstructed					Timing		AliRoot	»
LHC18q																
Production	Description		Status	Run Range	Runs	Chunks	Size	Chunks	%	Size	%	Events	Running	Saving	version	Err
LHC18q_muon_calo_pass1	LHC period LHC18q - Muon+Calorimeters reconstruction pass 1, ALIROOT-8064		Running	295424 - 296623	153	1,207,612	2.086 PB	1,204,620	99%	66.27 TB	3%	397,753,765	120y 254d	17y 321d	v5-09-41-1, v5-09-41a-1, v5-09-41b-1, v5-09-41d-1	
LHC18q_cpass1_pass1	LHC period LHC18q - CPass1 (reconstruction) for pass 1, ALIROOT-8063		Running	295581 - 296623	143	1,186,657	2.075 PB	1,154,829	97%	22.33 TB	1%	22,235,026	117y 134d	10y 230d	v5-09-41-1, v5-09-41a-1	
LHC18q_cpass0_pass1	LHC period LHC18q - CPass0 (reconstruction) for pass 1, ALIROOT-8063		Running	295581 - 296623	145	1,195,287	2.09 PB	1,163,071	97%	5.412 TB	0%	45,453,514	101y 296d	23y 347d	v5-09-41-1, v5-09-41a-1	
LHC18q_pass1_uncalibrated	LHC period LHC18q - Full production pass 1 uncalibrated, ALIROOT-8113		Running	295581 - 296068	14	79,839	131.9 TB	79,207	99%	77.9 TB	59%	28,913,914	147y 331d	4y 269d	v5-09-42a-1	

					Raw data			Reconstructed					Timing		AliRoot	»
LHC18r																
Production	Description		Status	Run Range	Runs	Chunks	Size	Chunks	%	Size	%	Events	Running	Saving	version	Err
LHC18r_muon_calo_pass1	LHC period LHC18r - Muon+Calorimeters reconstruction pass 1, ALIROOT-8064		Running	296690 - 297624	118	1,512,100	2.604 PB	1,482,589	98%	51.09 TB	1%	509,394,869	138y 317d	12y 55d	v5-09-41d-1	
LHC18r_cpass1_pass1	LHC period LHC18r - CPass1 (reconstruction) for pass 1, ALIROOT-8063		Running	296690 - 297624	100	1,447,079	2.589 PB	1,384,339	95%	4.09 TB	0%	10,356,685	65y 47d	6y 360d	v5-09-41a-1	
LHC18r_cpass0_pass1	LHC period LHC18r - CPass0 (reconstruction) for pass 1, ALIROOT-8063		Running	296690 - 297624	103	1,452,908	2.592 PB	1,389,936	95%	5.004 TB	0%	35,223,478	56y 333d	5y 299d	v5-09-41a-1	

QA workflow



- Thanks to Dario & Matteo for afs-eos transition as well as great support in all steps
- work on optimization of synchronisation jobs ongoing

all plots (trending and single run) available online:
http://aliqa<det>eos.web.cern.ch/aliqa<det>eos/data/2018/LHC18q (LHC18r)

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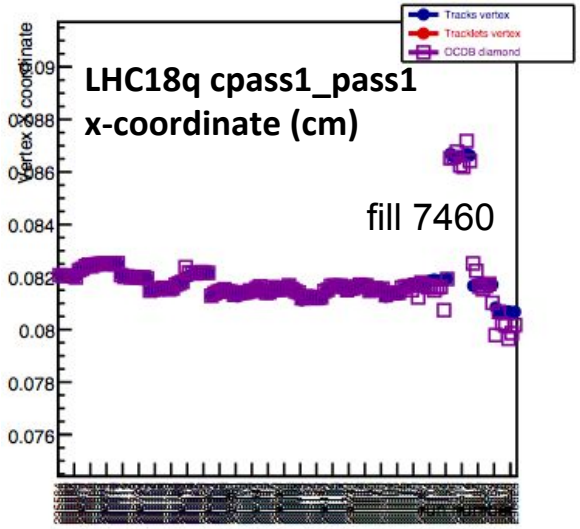
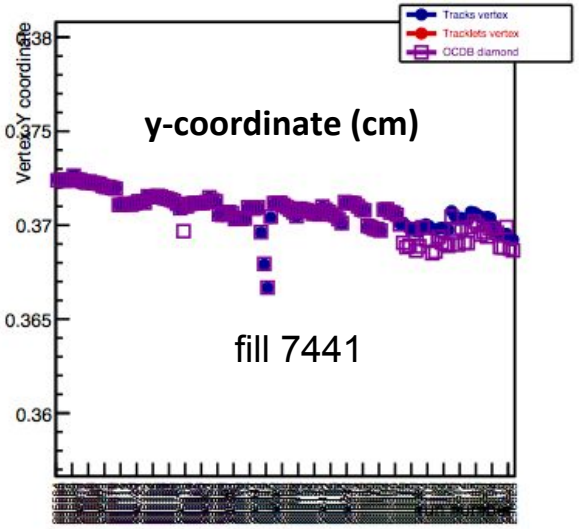
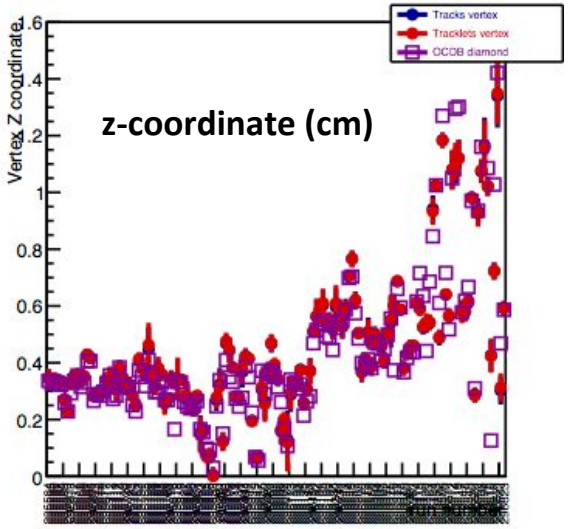
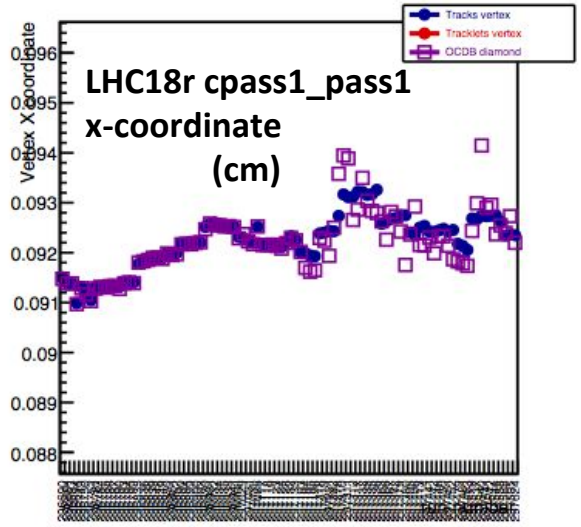
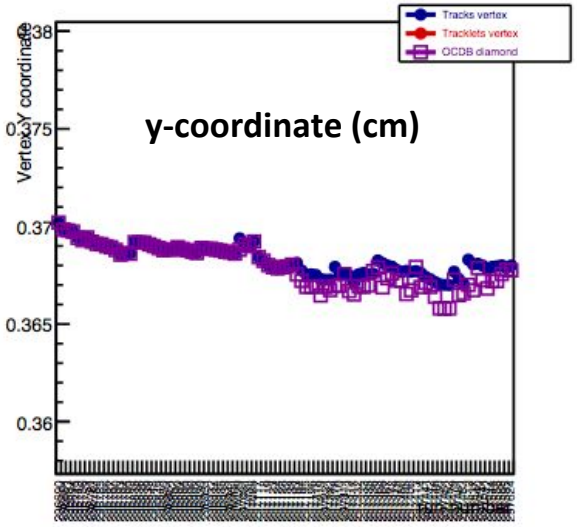
Detector QA - Vertex

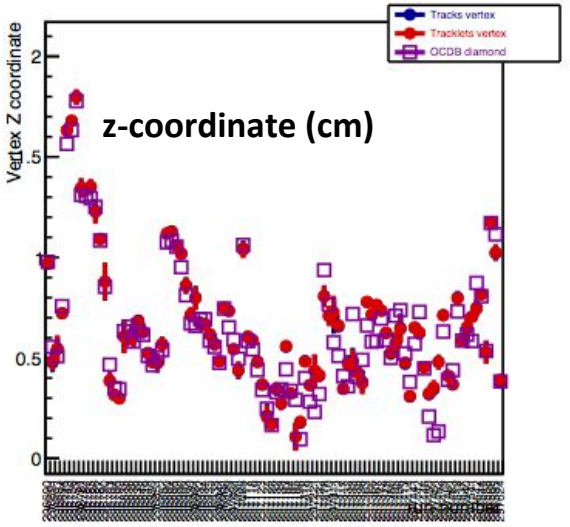












http://aliqaits.web.cern.ch/aliqaits/data/2018/LHC18q/cpass1_pass1/mergedITS_trend.pdf
http://aliqaits.web.cern.ch/aliqaits/data/2018/LHC18r/cpass1_pass1/mergedITS_trend.pdf

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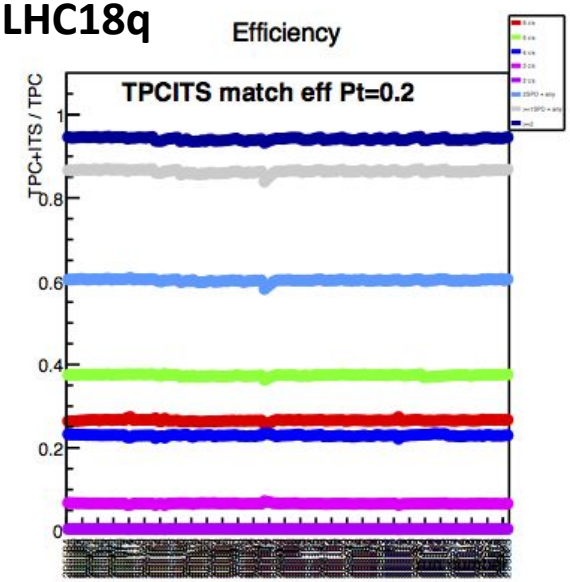
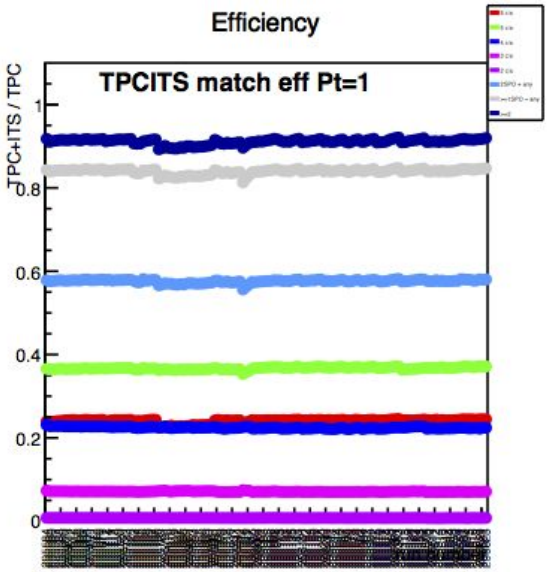
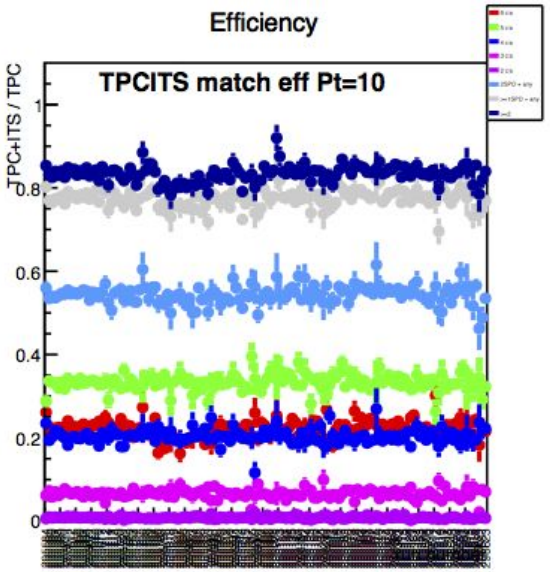
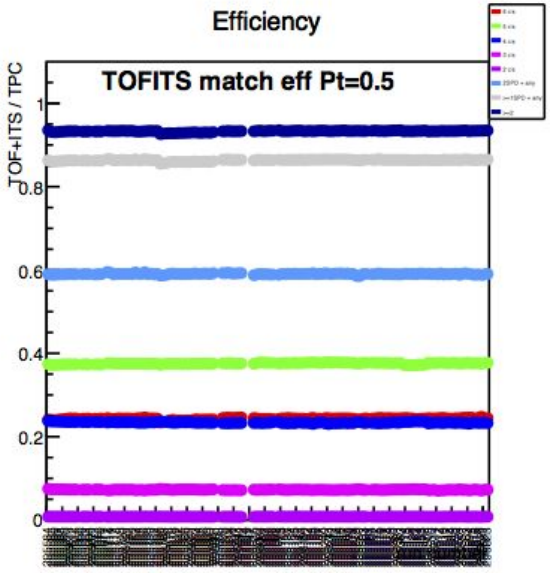
Detector QA - ITS ME

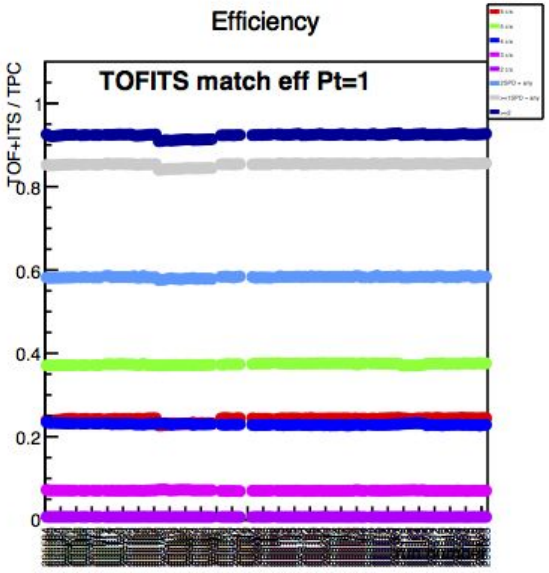
LHC18q

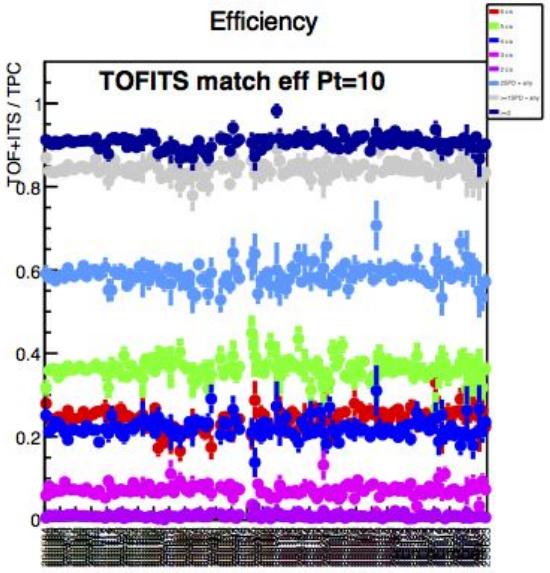




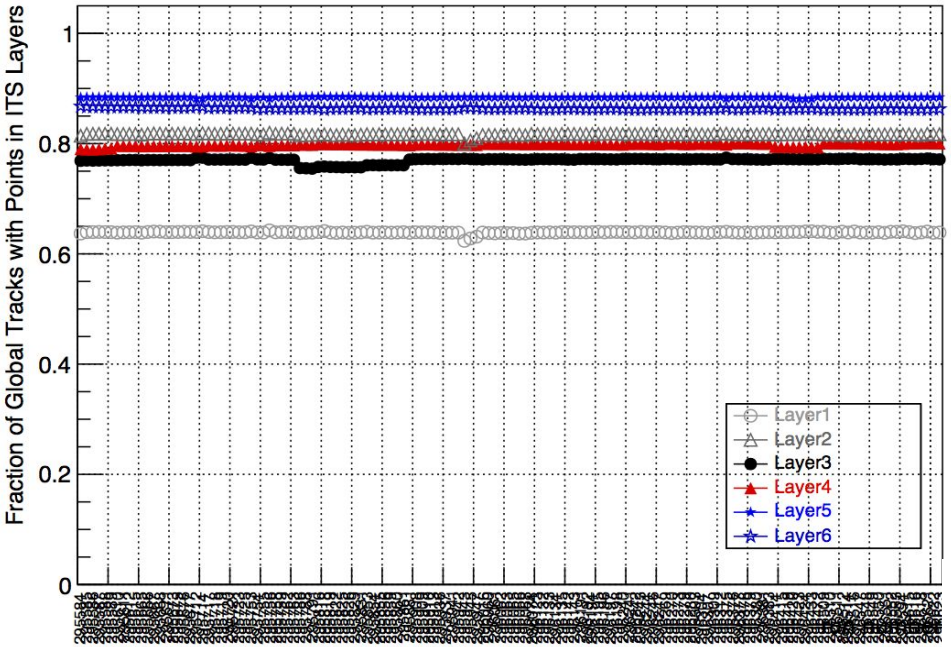




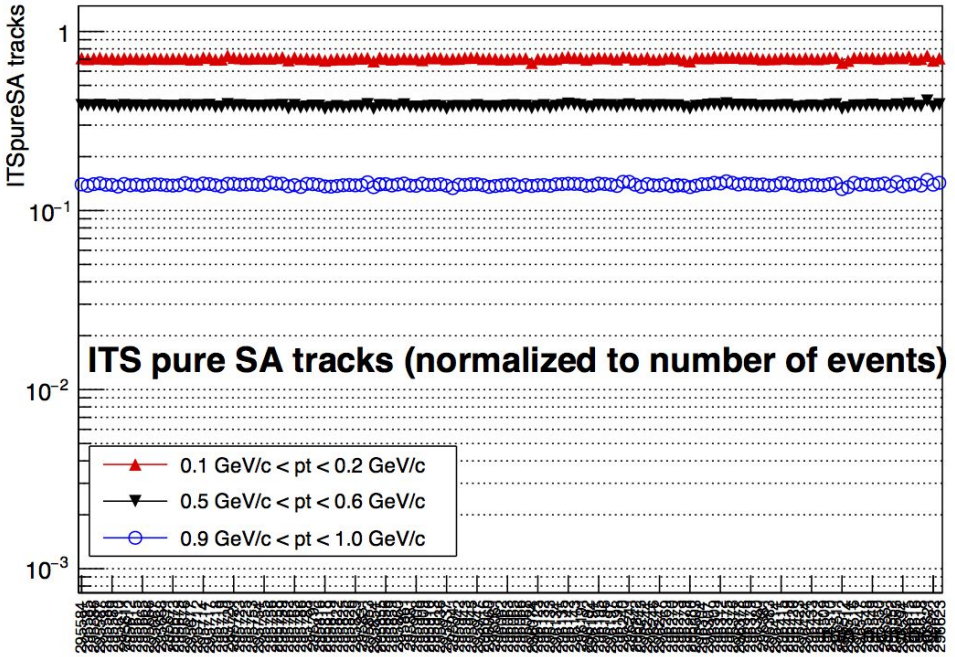




Detector QA: ITS



LHC18q



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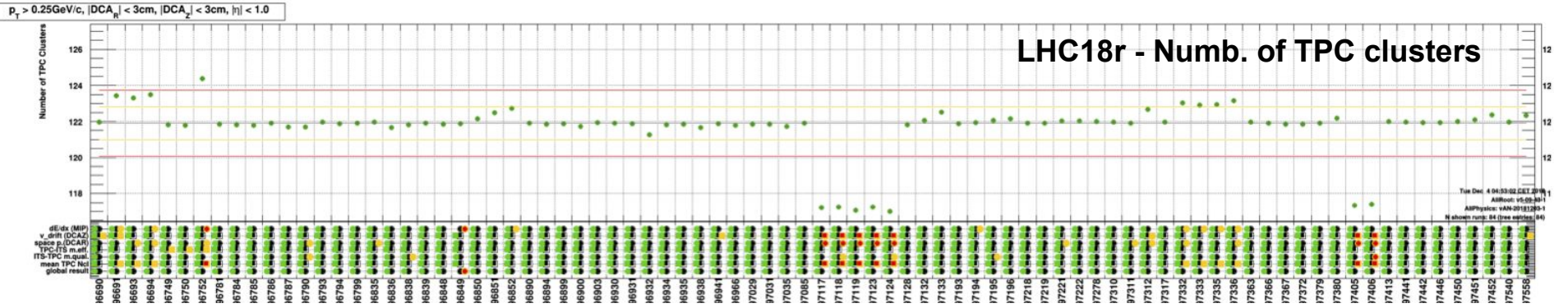
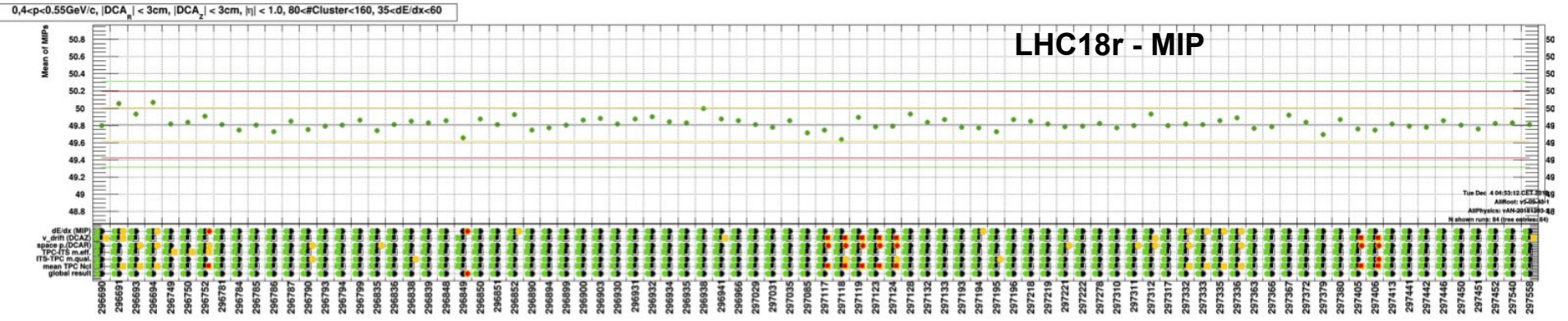
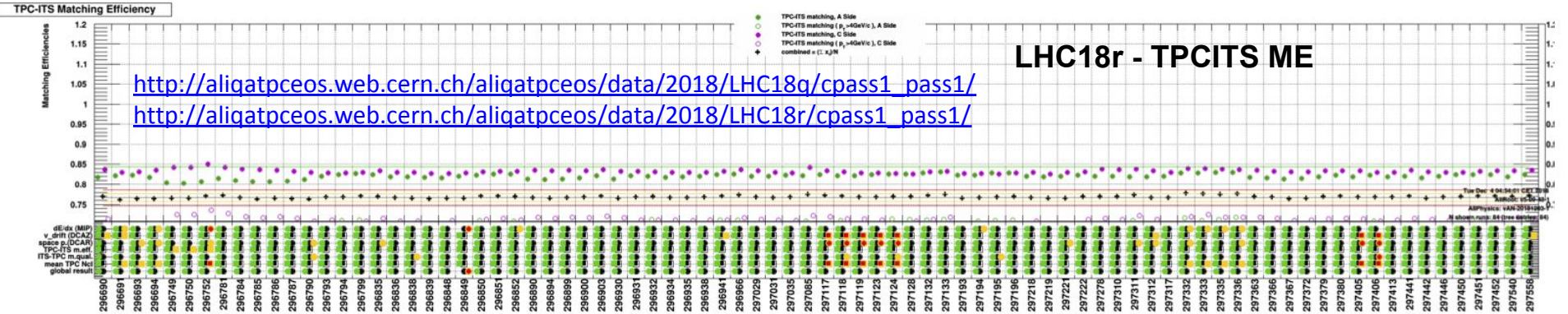
Detector QA - TPC

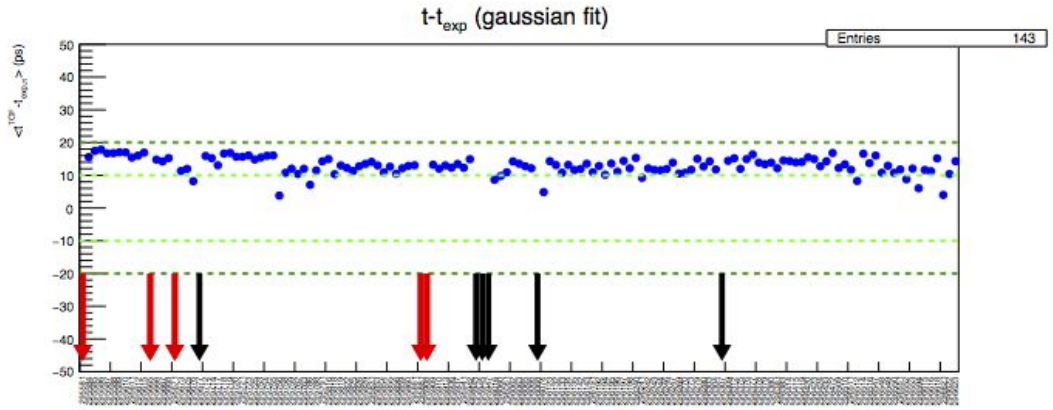






http://aliqatpceos.web.cern.ch/aliqatpceos/data/2018/LHC18q/cpass1_pass1/
http://aliqatpceos.web.cern.ch/aliqatpceos/data/2018/LHC18r/cpass1_pass1/

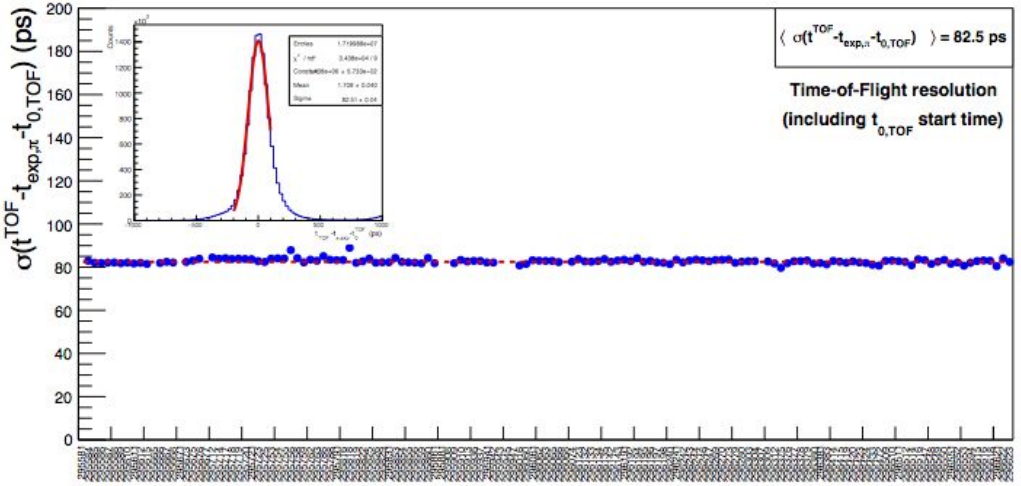
Detector QA - TOF



LHC18r
Alignment

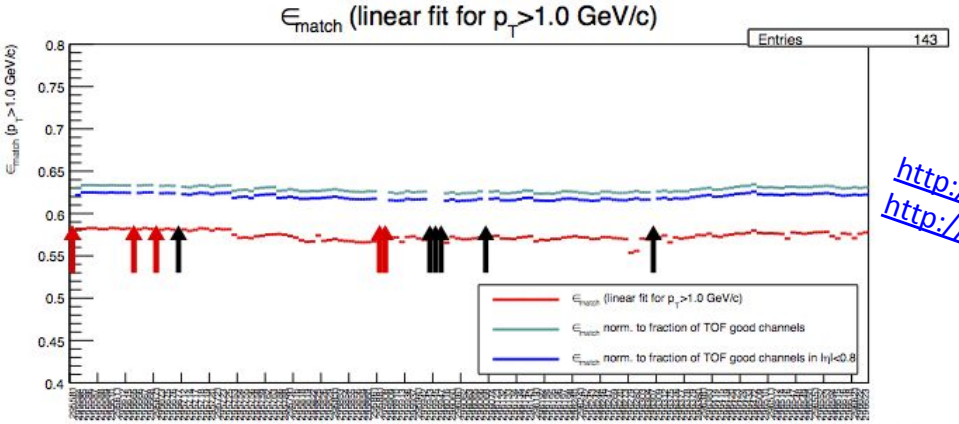
Within 20 ps for all runs. Run 295581 no events (ZDC), runs 295665, 295671, 295881, 295908 since all channels are declared inefficienty by online algorithms.

LHC18r
Time Resolution,
~82 ps also
removing $t_{0,\,TOF}$



Resolution ~ 82 ps

Detector QA - TOF

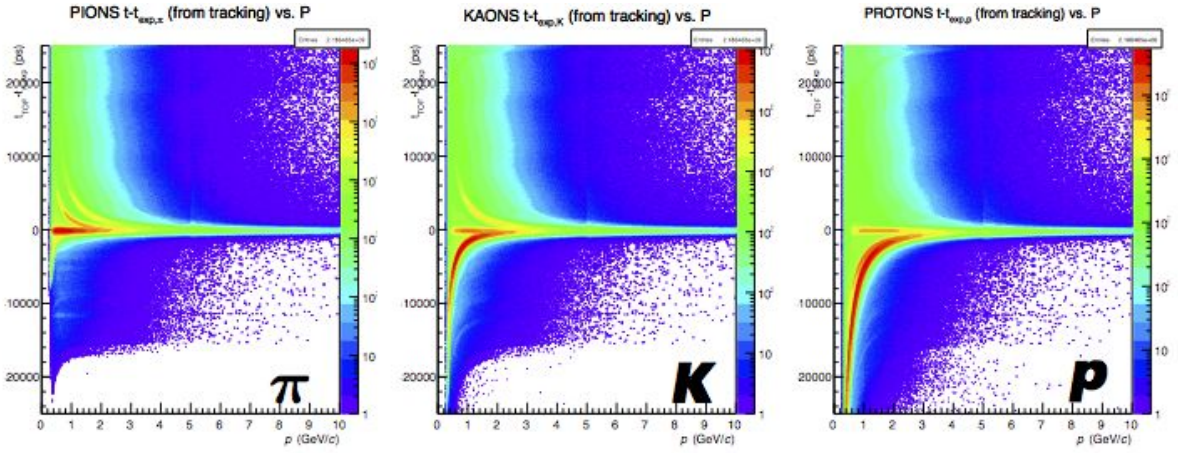


LHC18r Matching efficiency

http://aliqatofeos.web.cern.ch/aliqatofeos/data/2018/LHC18q/cpass1_pass1/
http://aliqatofeos.web.cern.ch/aliqatofeos/data/2018/LHC18r/cpass1_pass1/

Normalized ME close to the value of LHC15o (∼ 64%). Runs 295665, 295671, 295881, 295908 have no tracks matched, U.I. All channels are marked as inefficient. DQM plots are fine and so is the stability during DAQ.

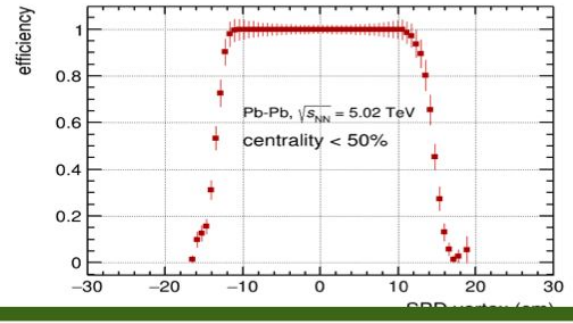
LHC18r PID performance



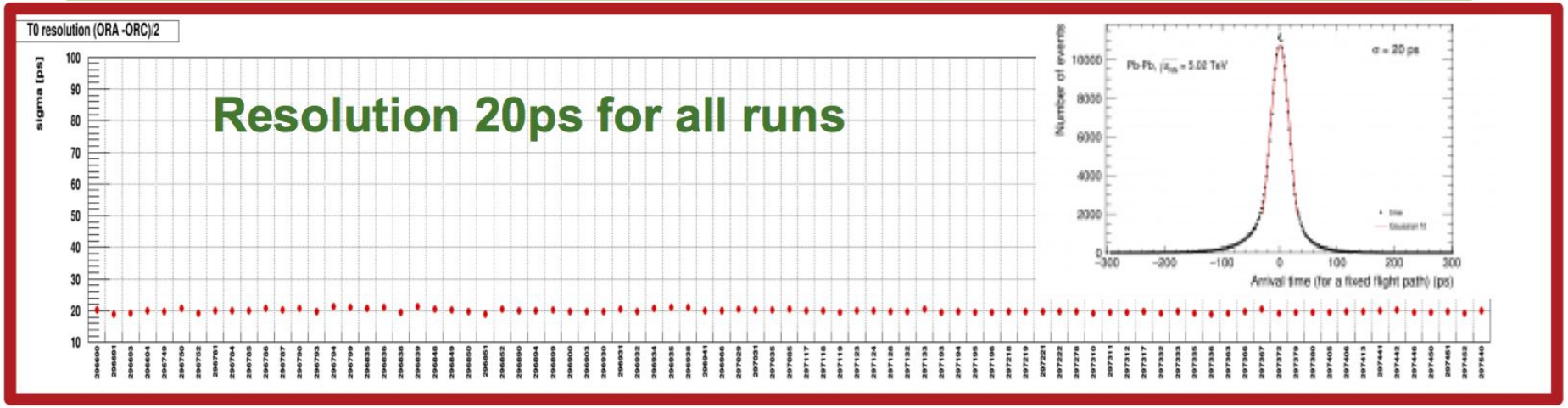
Good PID performance. Will improved after manual calibration. Fraction of miscalibrated channels ∼ $5 \cdot 10^{-5}$.

Detector QA - T0

T0 LHC18r cpass1_pass1



0TVX efficiency as a function of SPD vertex: 100% for vertex within 11cm and centrality <50%

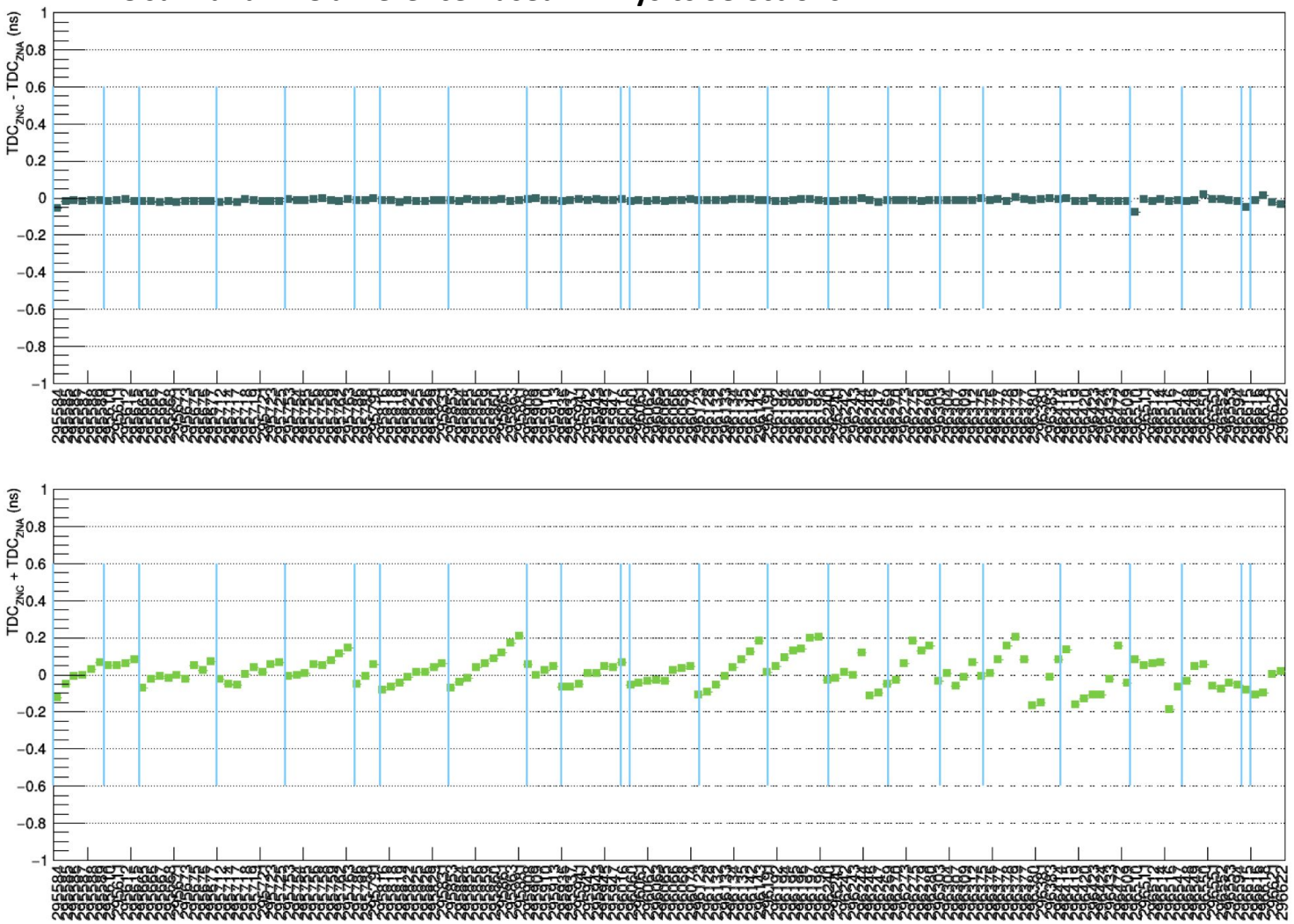


http://aliqat0eos.web.cern.ch/aliqat0eos/data/2018/LHC18q/cpass1_pass1/
http://aliqat0eos.web.cern.ch/aliqat0eos/data/2018/LHC18r/cpass1_pass1/

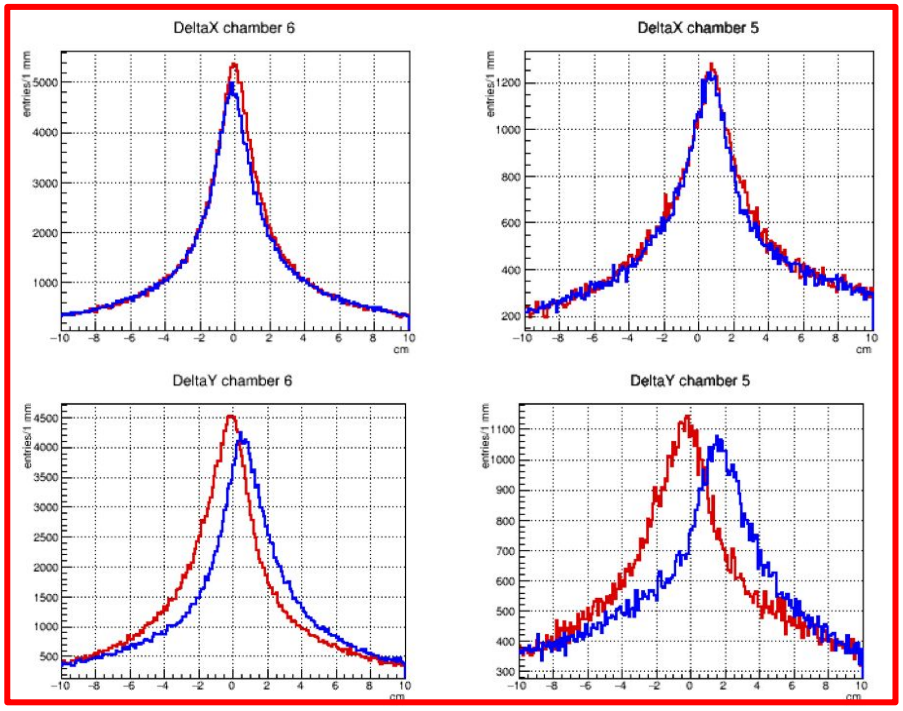
Detector QA - ZDC

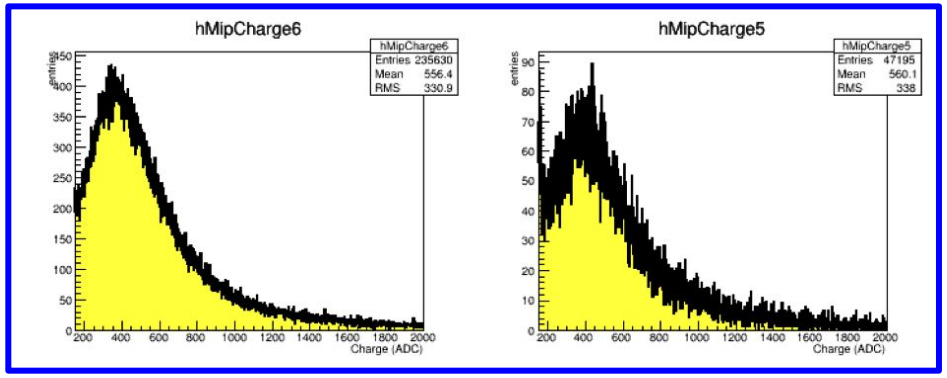
LHC18q - muon_calo

TDC sum and TDC difference - used in Physics Selections



Detector QA - HMP

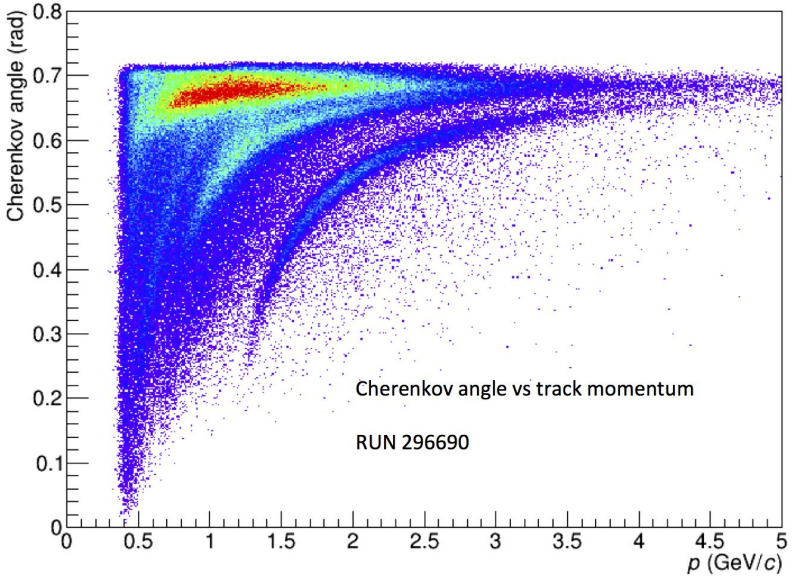




z residuals

LHC18r

(x, y) plane residuals: extrapolated tracks



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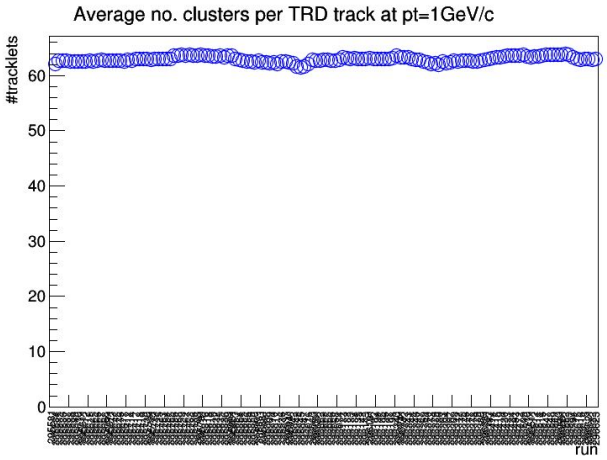
Summary

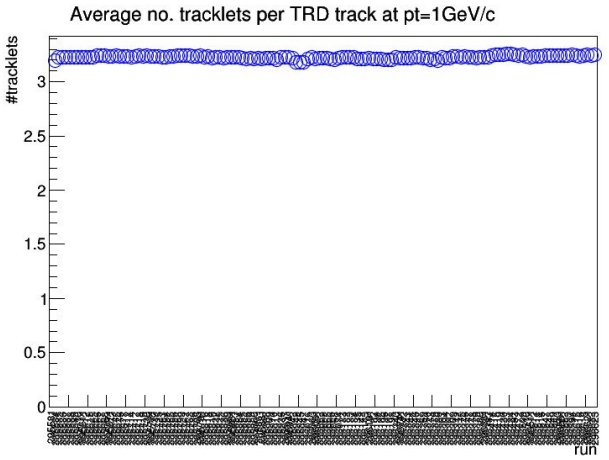
- 2018 PbPb run: success !!!
- QA activity: daily meetings, normal weekly meetings
  https://indico.cern.ch/category/3942/
- all detectors behave well (also FMD,PHS, PMD; for EMCal, MUONS, TRD see the backup slides)
- all detector QA groups have been fast reacting
- Great experience !!! Thank you to all !!!!!!

BACKUP slides

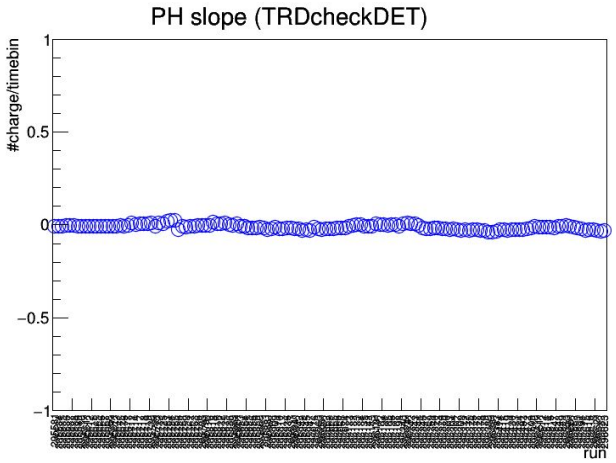
Detector QA - TRD

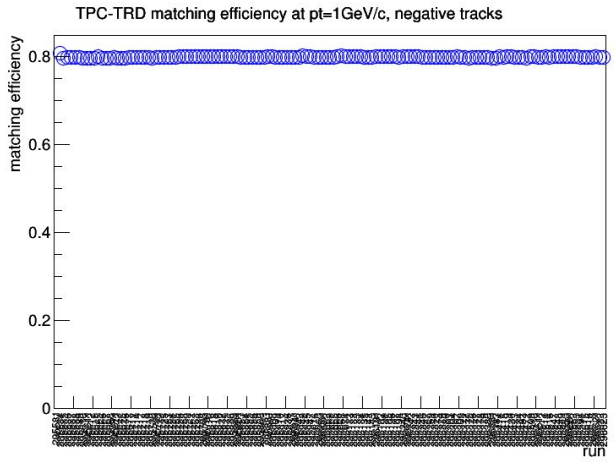
LHC18q
cpass1_pass1

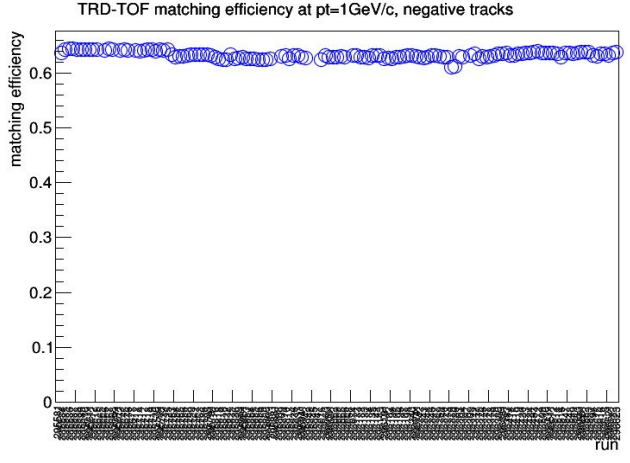




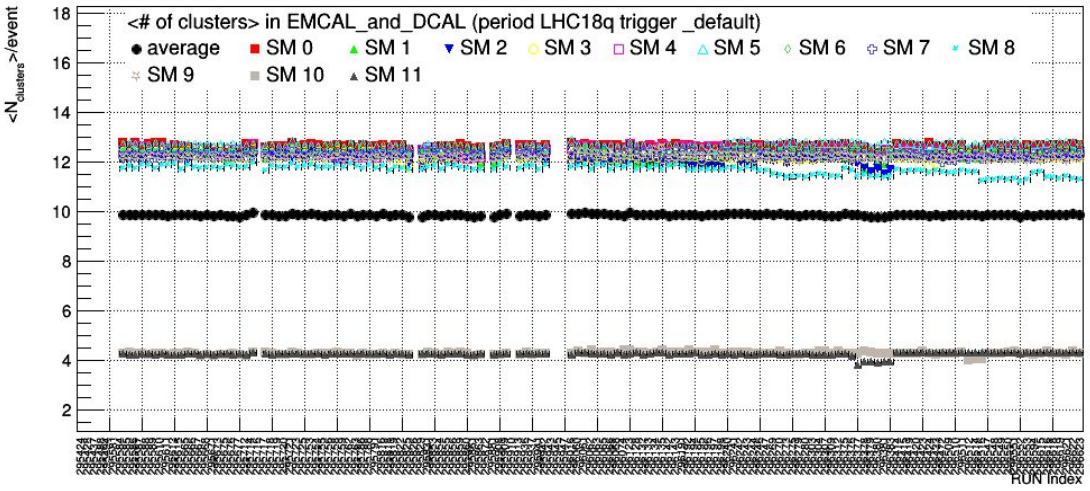
http://aliqatrdeos.web.cern.ch/aliqatrdeos/data/2018/LHC18q/cpass1_pass1/
http://aliqatrdeos.web.cern.ch/aliqatrdeos/data/2018/LHC18r/cpass1_pass1/

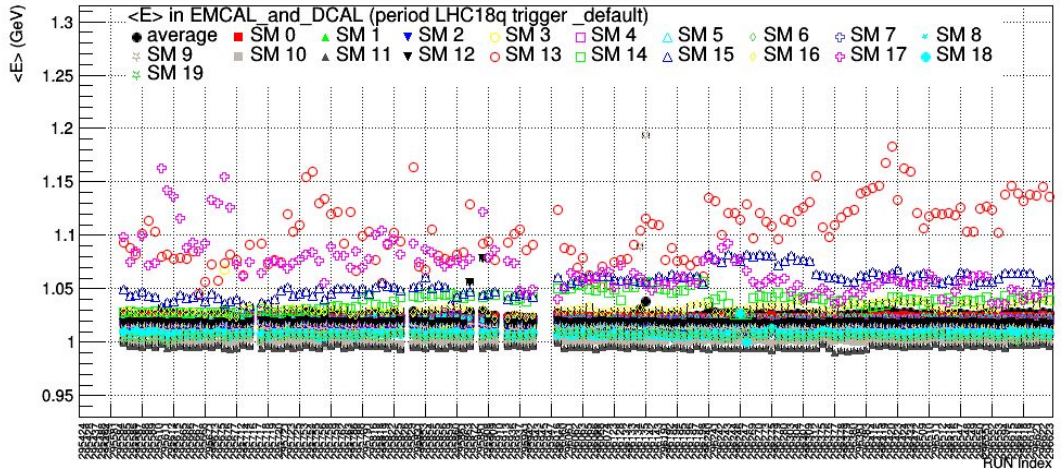


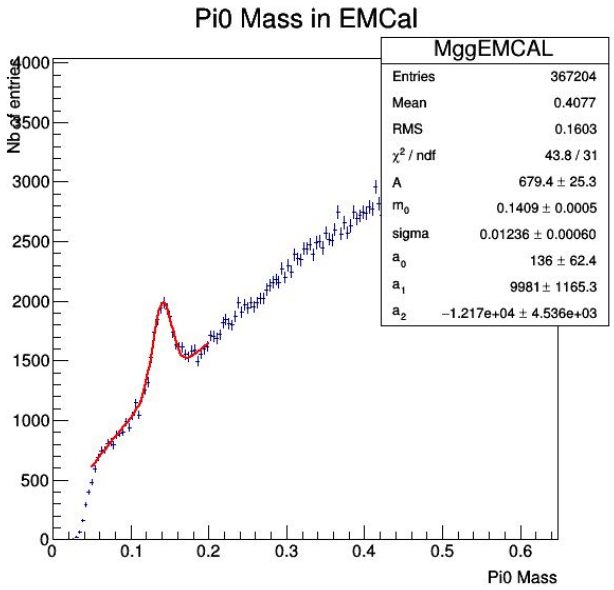




Detector QA - EMCal-DCal

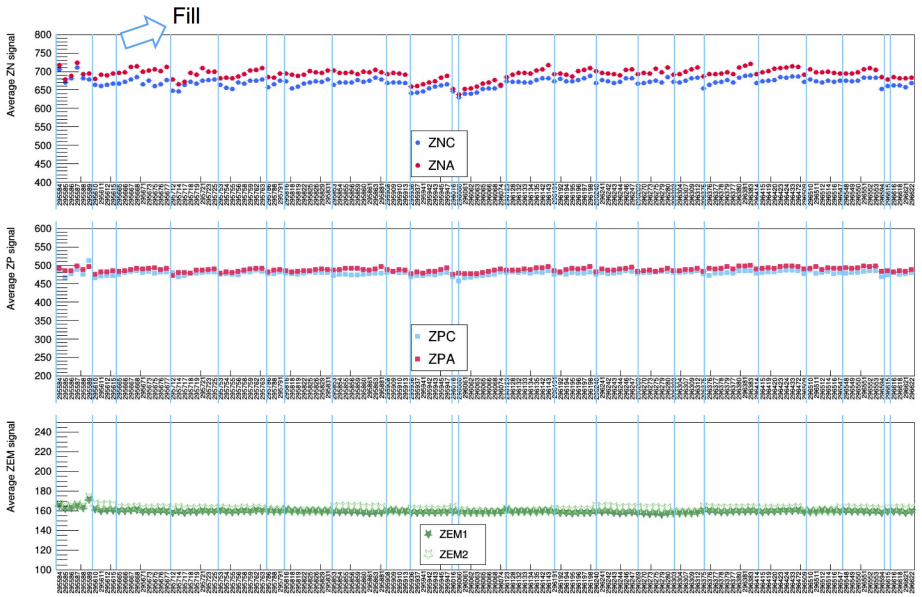






http://aliqaemceos.web.cern.ch/aliqaemceos/data/2018/LHC18q/muon_calo_pass1/
http://aliqaemceos.web.cern.ch/aliqaemceos/data/2018/LHC18r/muon_calo_pass1/

Detector QA - ZDC

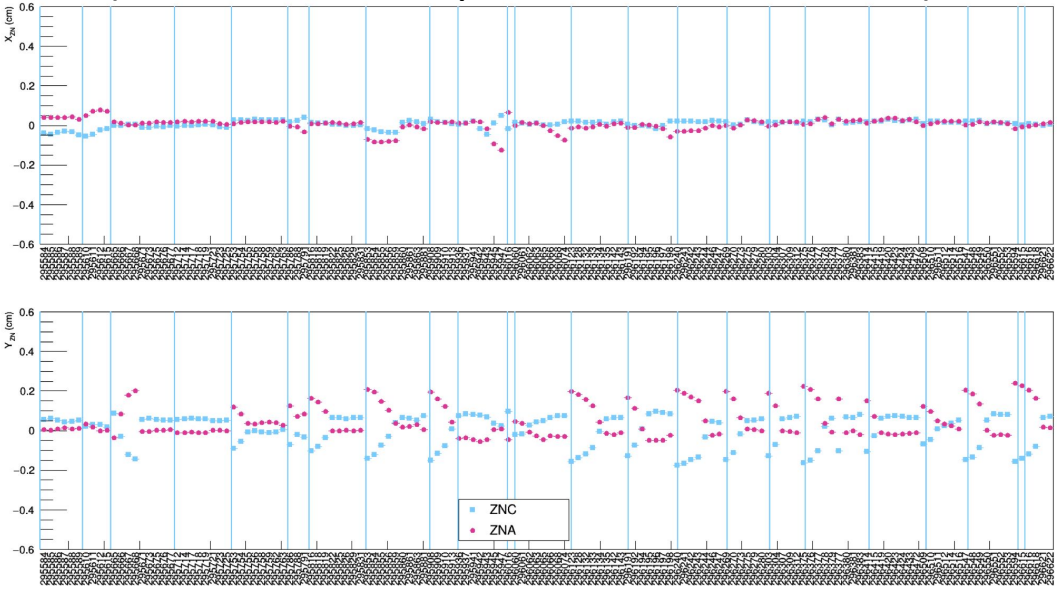


LHC18q - muon_calo

ZDC signal trend

ZN centroid coordinates

(effect due to the beam separation that varies within each fill)



Detector QA - MUON

LHC18r, LHC18q very similar

General:

- Even though some inefficienies are in MCH, the general data quality is good.

MTR efficiency:

- A little of low efficiency in the NBP RPC1405 due to local boards 155 and 177 in this period. Still good for QA.

MCH and MUON data quality:

- Number of clusters per track decreases in Fill due to HV trips in Ch3, Ch4 and Ch5.