



HF jets analysis

10.02.2020 ALICE@IFJ meeting

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Outline



1. What was done in analysis
2. CERN activities
3. Plans for next week

- 1. What was done in analysis**
2. CERN activities
3. Plans for next week

What was done

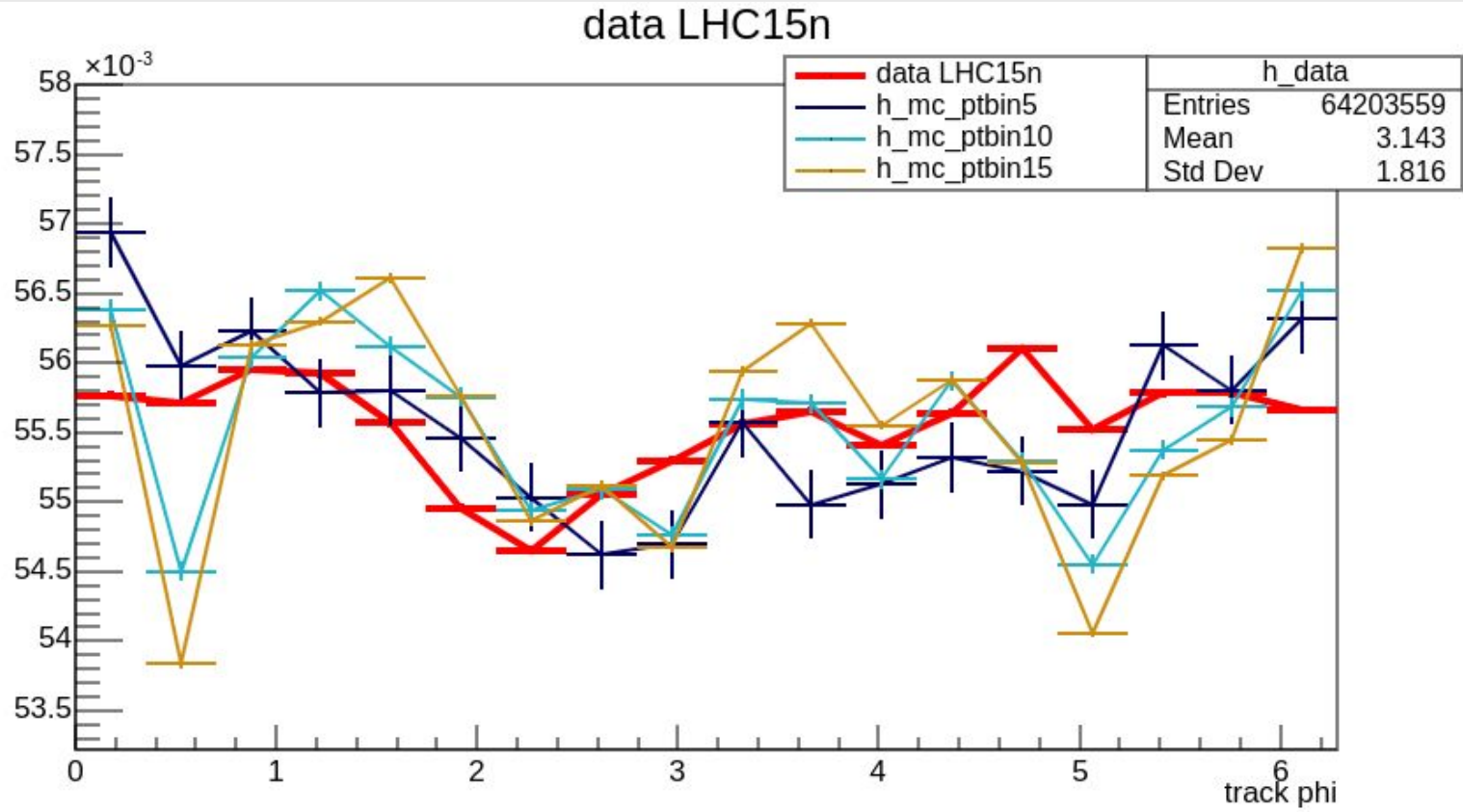


1. comparison of phi distribution with MC
 - in MC the periodic dependence on TPC sectors is much more pronounced

Comparison of phi distr. with MC (18 bins)

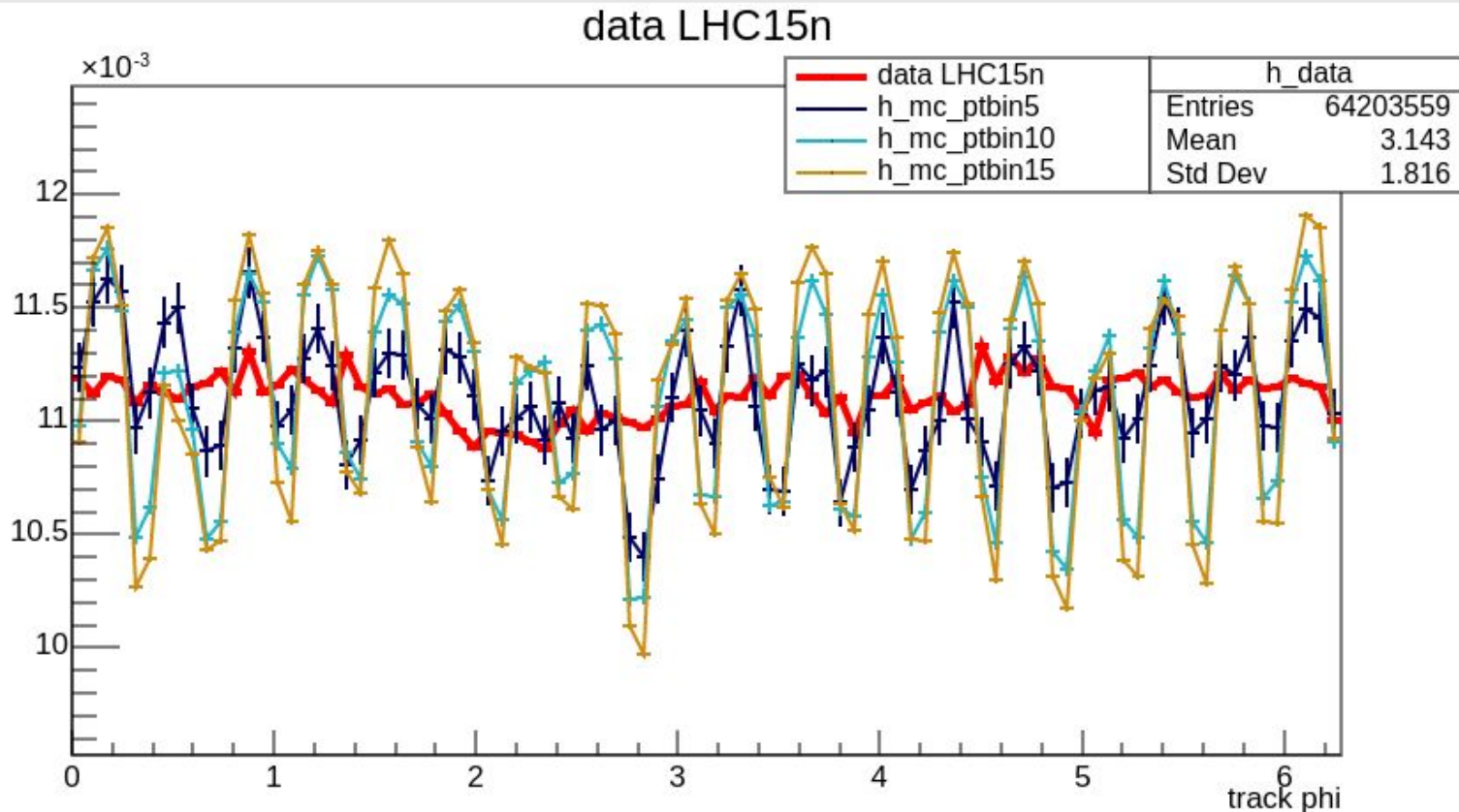


something strange ...



Comparison of phi distr. with MC (90 bins)

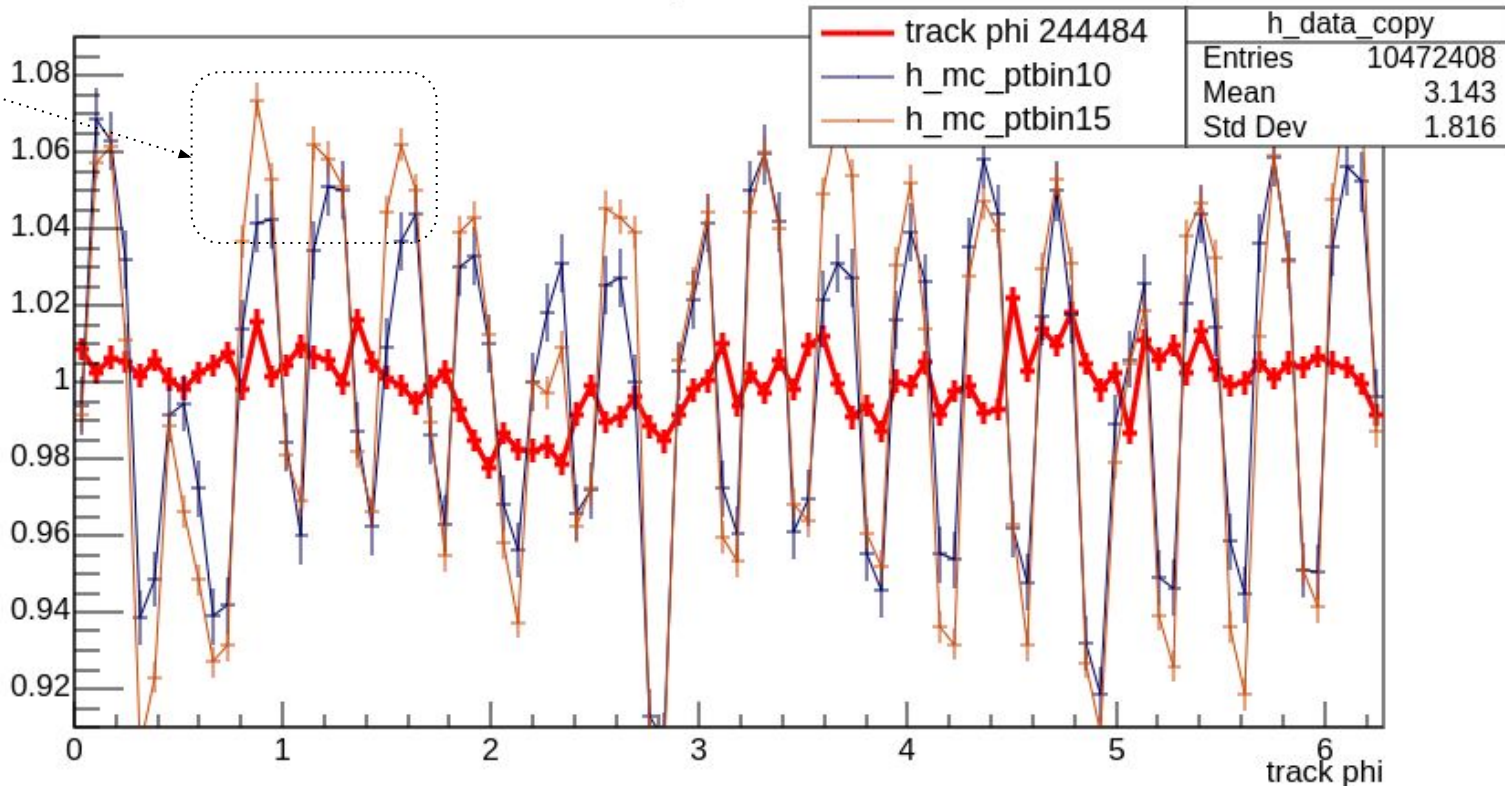
with more bins:
clear TPC
sectors structure



Comparison of phi distr. with MC (single run)

track phi 244484

stat. errors much below periodic dependence



What was done

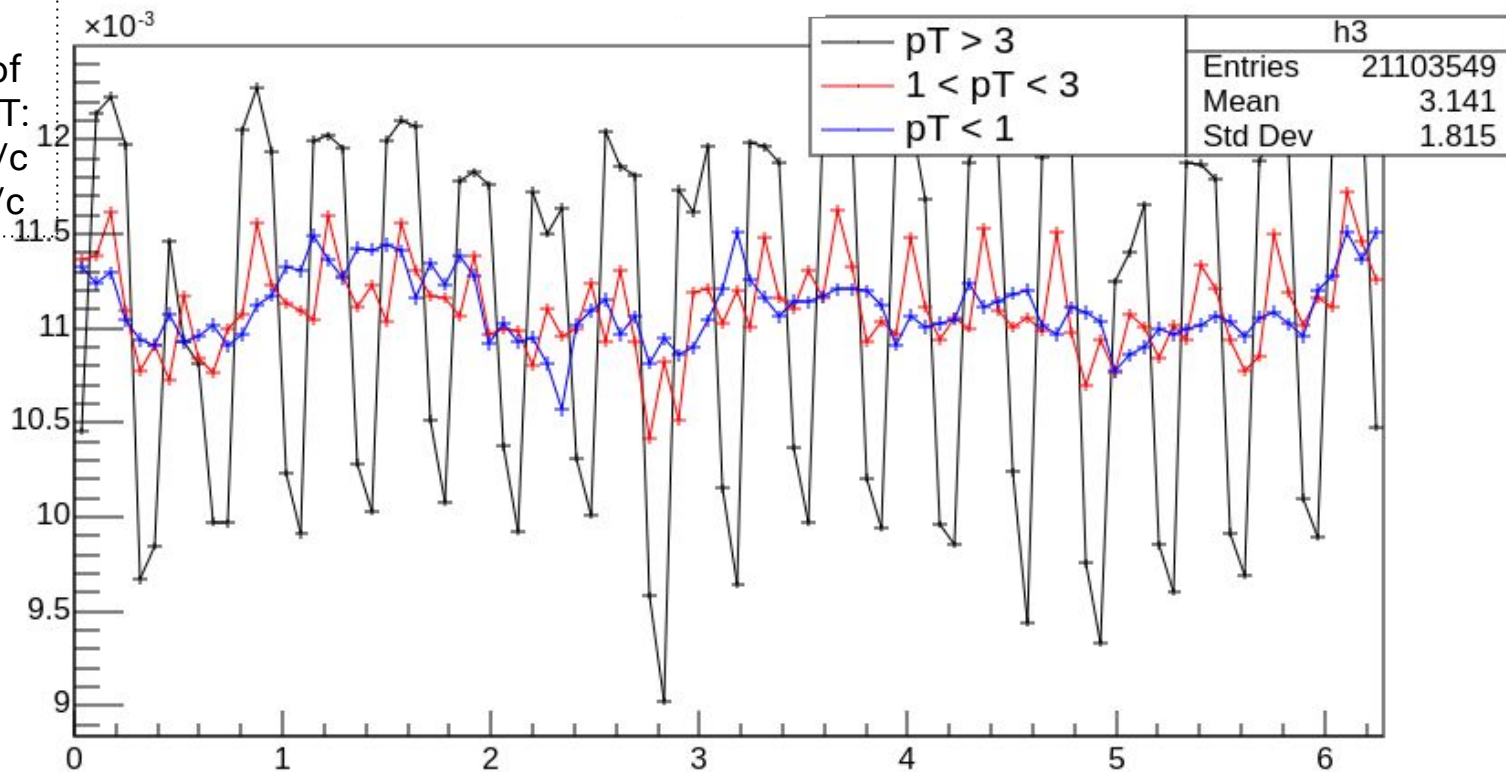


1. comparison of phi distribution with MC

- in MC the periodic dependence on TPC sectors is much more pronounced
- the amplitude of oscillations depends on p_T - largest for straight tracks with high p_T

Comparison of phi distr. with MC

MC, ptbin15,
strong dependence of
amplitude on track pT:
> 10% for pT > 3GeV/c
< 4% for pT < 1GeV/c
but almost no
structure



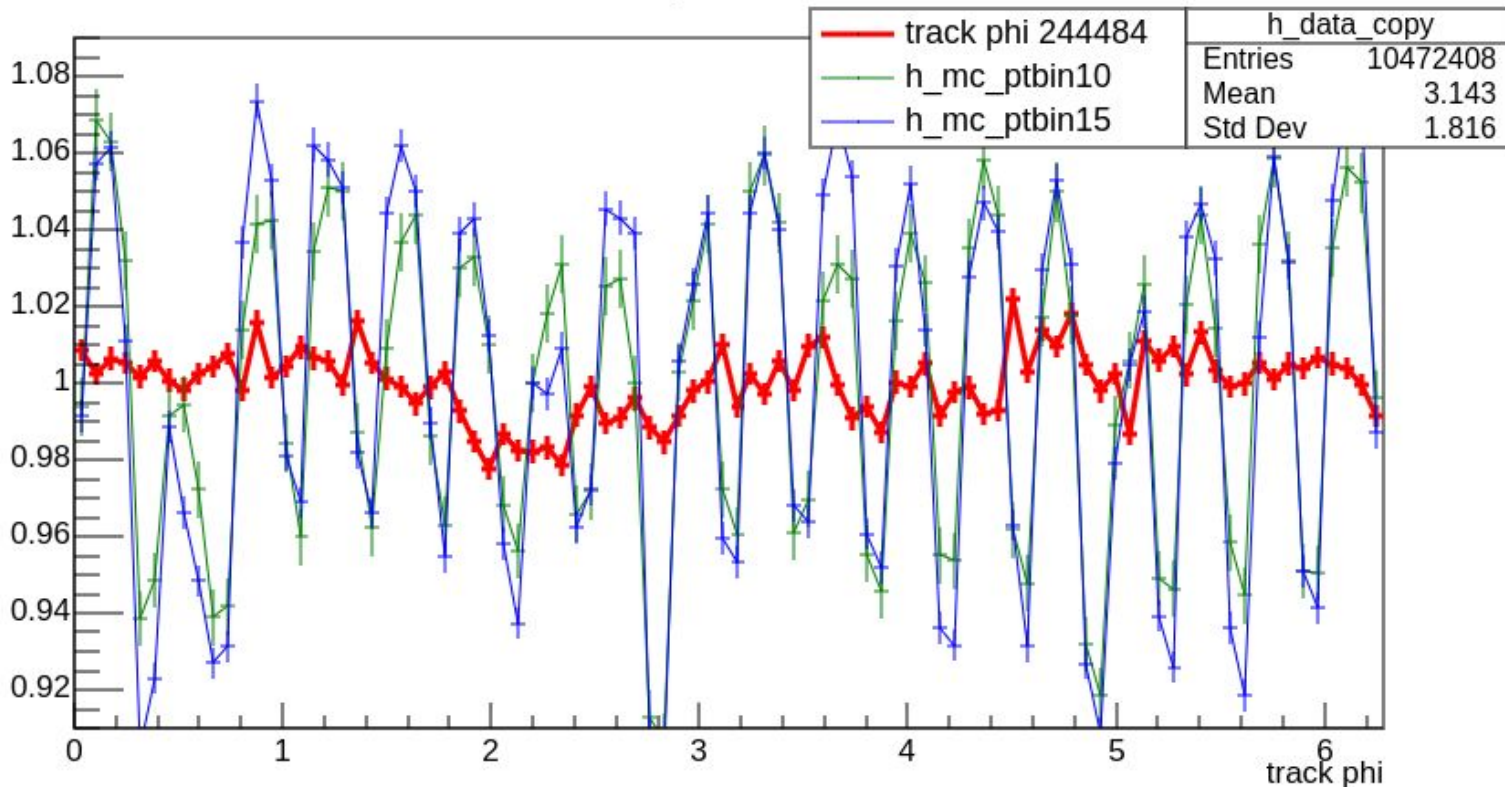
1. comparison of phi distribution with MC

- in MC the periodic dependence on TPC sectors is much more pronounced
- the amplitude of oscillations depends on pT - largest for straight tracks with high pT
- direct & precise comparison would require well reproduced track spectra or great statistics for various track pT ranges (see 244484 & 244540)

Comparison of phi distr. with MC

exemplary run
all track pT

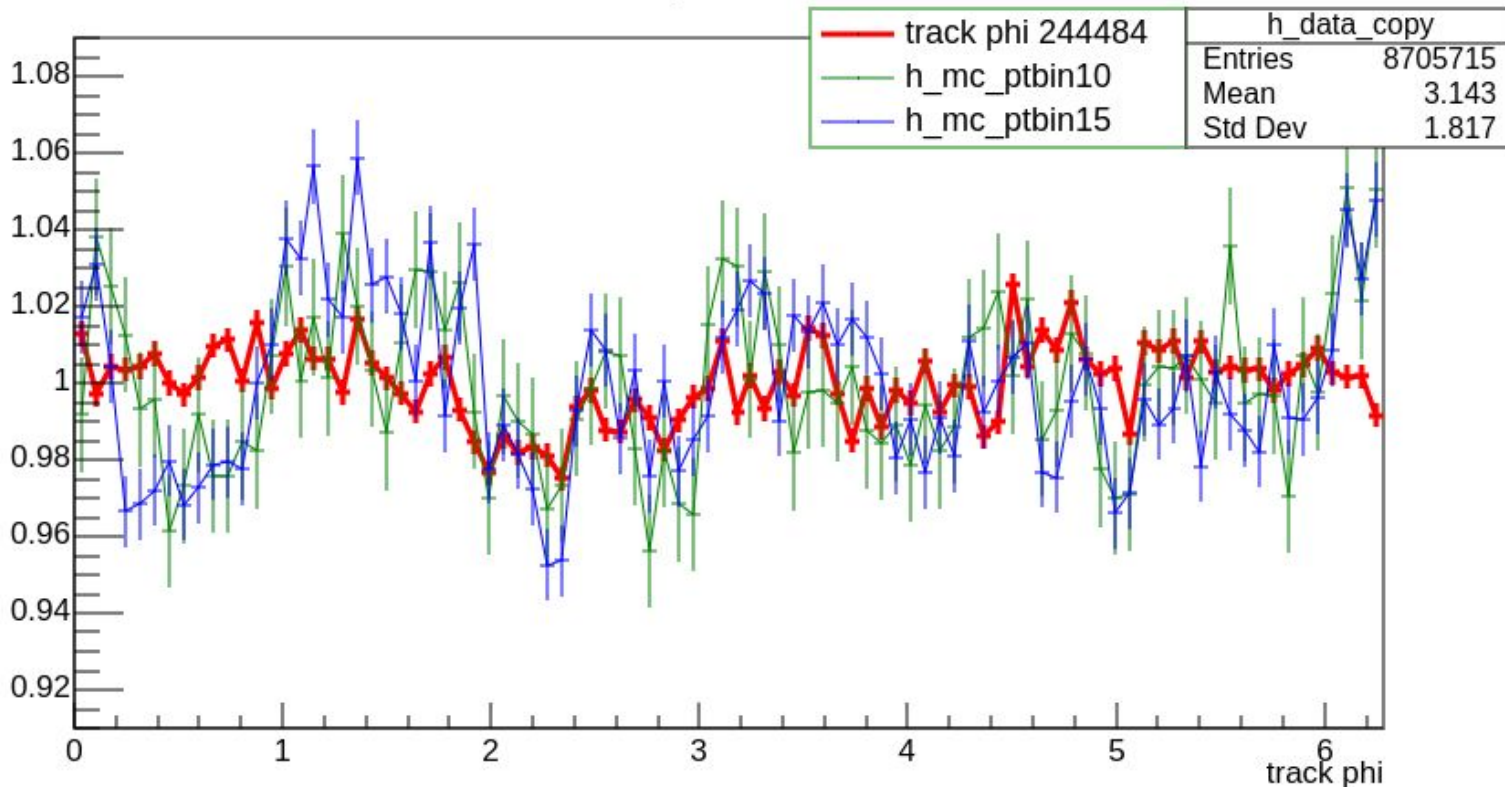
track phi 244484



Comparison of phi distr. with MC

exemplary run
track $p_T < 1\text{ GeV}$

track phi 244484



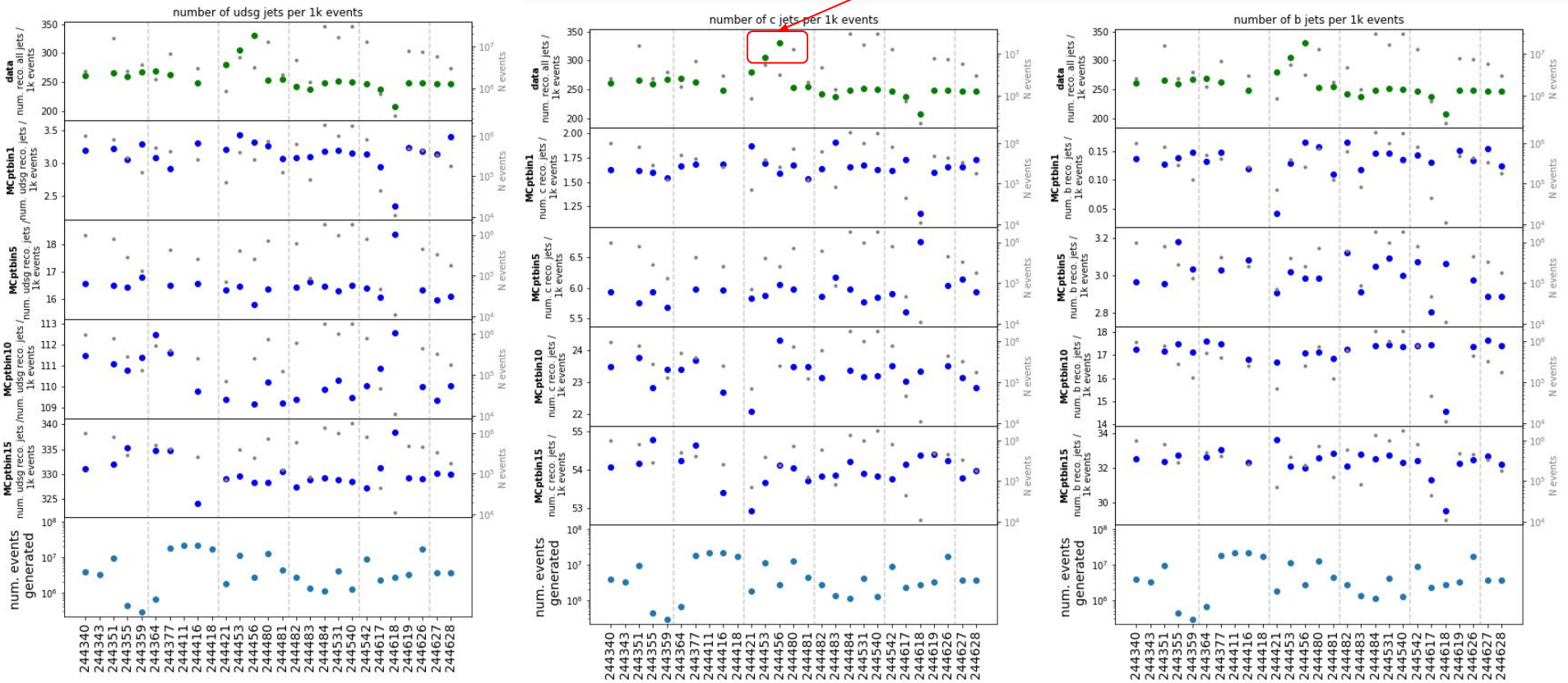
1. comparison of phi distribution with MC

- in MC the periodic dependence on TPC sectors is much more pronounced
- the amplitude of oscillations depends on pT - largest for straight tracks with high pT
- direct & precise comparison would require well reproduced track spectra or great statistics for various track pT ranges (see 244484 & 244540)
- very rough reproduction in general

2.

Reminder: run-wise QA (number of jets)

stable no. jets / event in runs
1 run (244456) with 40% more jets



What was done



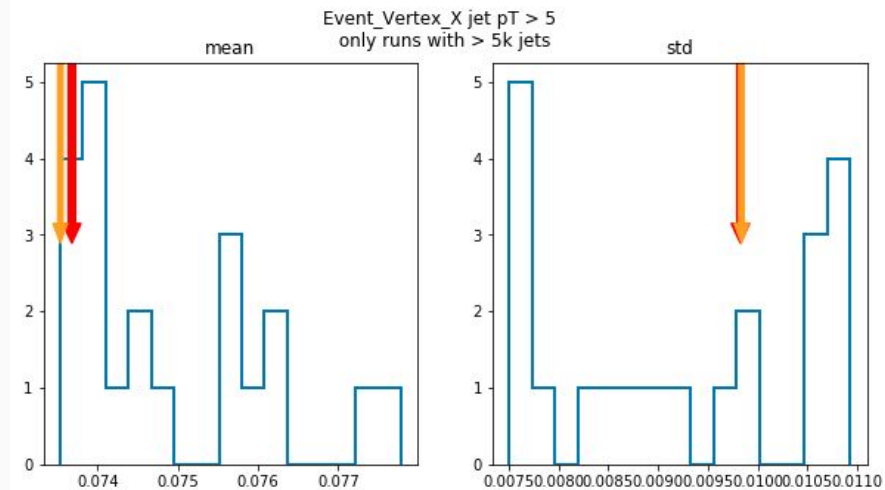
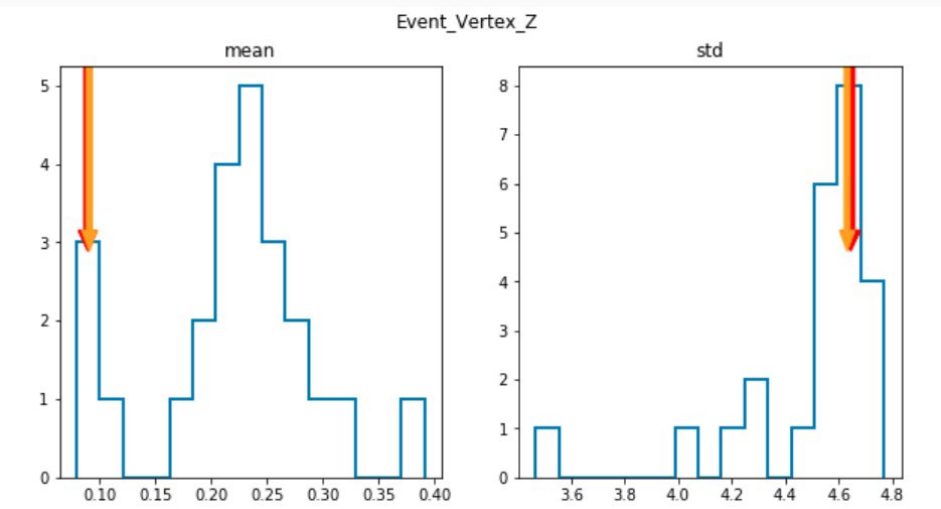
1. comparison of phi distribution with MC: (...)
2. QA of 244456 & 244453
 - logbook & RCT:
 - both belong to the same fill
 - rather low ratio of non-interacting / interacting bunches
 - following detectors were off in '56: MCH, MTR, PHS
 - triggers look the same
 - nothing more
 - global event properties:
 - small deviations in mean Event Vertex X & Z
 - event vertex Y, multiplicity as well as jet pT/phi/Eta/Area/Ntracks/Nsv fully within typical values of mean / stddev

What was done

we don't really have run statistics for such studies ...

rather small deviations and towards zero

- maybe "better" vertex X & Z together results in better acceptance? but not visible e.g. in jet eta ...



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 - small deviations in mean Event Vertex X & Z
 - event vertex Y, multiplicity as well as jet pT/phi/Eta/Area/Ntracks/Nsv fully within typical values of mean / stddev
 - All in all, no serious objections found
 - Finally runs '53 + '56 constitute to 2.3 + 3.6% = 5.9% of LHC15n jet statistics

What was done



1. comparison of phi distribution with MC: (...)
2. QA of 244456 & 244453: (...)
3. ALICE approaches to small size of pp@5.02 TeV reference:
 - just usage of 5.02 TeV:
 - <https://arxiv.org/pdf/1606.08197.pdf> "J/Psi suppression at forward y in PbPb"
 - <https://arxiv.org/pdf/1910.07678.pdf> "Production of pi/K/p in PbPb" (abstract)
 - <https://arxiv.org/pdf/1802.09145.pdf> "pT spectra & RAA of charged particles in pp/pPb/PP"
 - scaled pp@7 TeV:
 - <https://arxiv.org/pdf/1609.03898.pdf> "e⁻ b hadrons in pPb" (sec. 6), no pp@5.02 ref. at that time
 - <https://arxiv.org/pdf/1804.09083.pdf> "various D production in PbPb" (sec. 4), also FONLL for 5.02 used for higher pT
 - other:
 - <https://arxiv.org/pdf/1805.04387.pdf> "Y suppression at forward y in PbPb" (sec. 4), interpolation of ALICE & LHCb bottomium data at 2.76, 7 & 8 TeV
 - <https://arxiv.org/pdf/1809.10922.pdf> " Λ_c^+ production in Pb-Pb...", reference from p+Pb measurement of Λ_c^+

Another data period with pp@5.02TeV



17p											ESDs			Output
Production	Description	Col.	Status	Run Range	Runs	Chunks	Size	Chunks	%	Size	%	Events	Size	
LHC17p_VdM	LHC period LHC17p - Full production, VdM scan runs, ALIROOT-7634	pp	Completed	282026 - 282027	2	684	1.006 TB	684	100%	344.9 GB	33%	4,384,193	426.5 GB	
LHC17p_pass1_CENT_woSDD	LHC period LHC17p - Full production pass 1, CENT trigger selection, without SDD, ALIROOT-7582	pp	Completed	282008 - 282343	42	301,167	503.8 TB	300,463	100%	51.18 TB	10%	396,530,021	66.84 TB	
LHC17p_pass1_CENT_wSDD	LHC period LHC17p - Full production pass 1, CENT trigger selection, with SDD, ALIROOT-7582	pp	Completed	282008 - 282343	42	301,167	503.8 TB	300,783	100%	51.73 TB	10%	396,923,297	67.86 TB	
LHC17p_pass1_FAST	LHC period LHC17p - Full production pass 1, FAST trigger selection, without SDD, ALIROOT-7582	pp	Completed	282008 - 282343	42	301,167	503.8 TB	301,063	100%	92.71 TB	18%	781,811,750	115.4 TB	
LHC17p_muon_calor_pass1	LHC period LHC17p - Muon+Calorimeters reconstruction pass 1, ALIROOT-7583	pp	Completed	282008 - 282343	42	301,167	503.8 TB	300,845	100%	29.73 TB	5%	1,178,239,939	40.91 TB	

Production	17q	Description	Col.	Status	Run Range	Runs	Chunks	Size	Chunks	%	Size	%	Events	Size
LHC17q_pass1_CENT_woSDD	LHC period LHC17q - Full production pass 1, CENT trigger selection, without SDD, ALIROOT-7599	pp	Completed	282365 - 282441	15	58,234	86.47 TB	58,214	100%	14.86 TB	17%	60,063,309	18.62 TB	
LHC17q_pass1_CENT_wSDD	LHC period LHC17q - Full production pass 1, CENT trigger selection, with SDD, ALIROOT-7599	pp	Completed	282365 - 282441	15	58,234	86.47 TB	58,213	100%	15.04 TB	17%	60,062,531	18.87 TB	
LHC17q_pass1_FAST	LHC period LHC17q - Full production pass 1, FAST trigger selection, without SDD, ALIROOT-7599	pp	Completed	282365 - 282441	15	58,234	86.47 TB	58,231	100%	17.49 TB	20%	83,972,738	21.63 TB	
LHC17q_muon_calor_pass1	LHC period LHC17q - Muon+Calorimeters reconstruction pass 1, ALIROOT-7600	pp	Completed	282365 - 282441	15	58,234	86.47 TB	58,233	100%	3.657 TB	4%	144,036,841	5.301 TB	
LHC17q_cpass1_pass1	LHC period LHC17q - CPass1 (reconstruction) for pass 1, ALIROOT-7599	pp	Completed	282365 - 282441	15	58,234	86.47 TB	57,655	99%	2.782 TB	3%	24,490,880	3.384 TB	

- LHC17p + LHC17q
- 860k (pass1_FAST) events compared to 180k in LHC15n
- strange productions, no vanilla passX ? which should I use?

Outline



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- 2. CERN activities**
3. Plans for next week

- 2nd half (ABCD) of FV0 closed
 - removal of the anodised surface around the connectors reduces the ripple (aka non-optical signal picking) by a factor of 2-3, down to ~4-5 mV for 300 MIPs in neighbouring unit
 - 1st half will be probably also opened again
- muon spectra measurements on going
 - new electronics (digitizer, coincidence circuit, also additional scintillators) arrived from Mexico with Ruben
 - 1st half (EFGH) - measured with two additional scintillators to select vertical muons
 - 2nd half (ABCD) - 6 channels measured simultaneously



Questions & plans for next week



1. 244456 & 244453 - keep for now, but discard if needed?
2. another period with pp@5.02 TeV: LHC17p & LHC17q ?
we can stick to LHC15n for now, but later they will need to be used (N jets with $p_T > 50\text{GeV}/c$ in data is below 500)
FAST production means no trust in TPC, but was somehow used in <https://arxiv.org/pdf/1909.09718.pdf>
3. Determination of lower edge of studied p_T range for better consistency e.g. $p_T = 10\text{-}20\text{ GeV}/c$?
we will not go below 5, and probably not below 10
don't remove them completely but for checks 10 GeV/c cut is ok
4. Plans for summer: CernComputingSchool in Krk is ok, beyond rather FIT and conferences ()
5. Plans for next week?
 - IP mean & stddev as a function of p_T , ratio MC/data
 - QA of 244456, '53: check physicsSelection cuts and their efficiencies, also if Nevents is correct

BACKUP



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lower_edges=( 5 7 9 12 16 21 28 36 45 57 | 70 85 99 115 132 150 169 190 212 235)
higher_edges=( 7 9 12 16 21 28 36 45 57 70 | 85 99 115 132 150 169 190 212 235 -1)
```

momentum dispersion:
$$p_T D = \frac{\sqrt{\sum_{i \in jet} p_{T,i}^2}}{\sum_{i \in jet} p_{T,i}}$$

angularity:

