

TPC Calibration and Performance in LHC15n pp reference

Carsten Klein
Goethe Universität Frankfurt

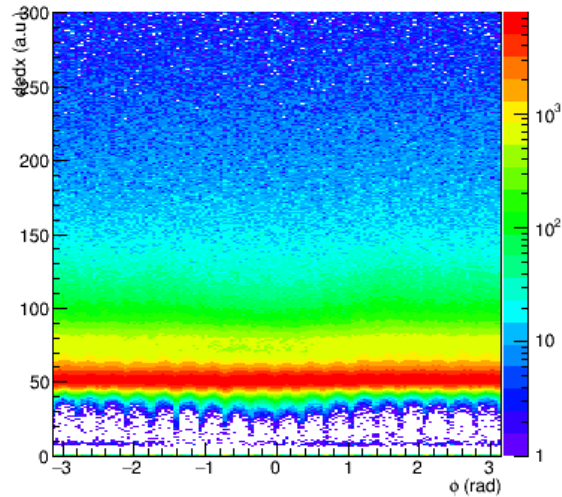


Position of the mean MIP

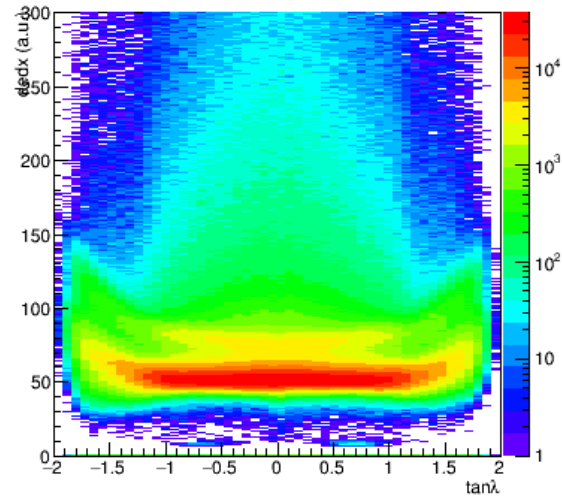
Run 244416 – IR 100 kHz

Mon Nov 23 02:22:47 CET 2015
AliRoot: v5-07-11a-1
AliPhysics: vAN-20151122-1

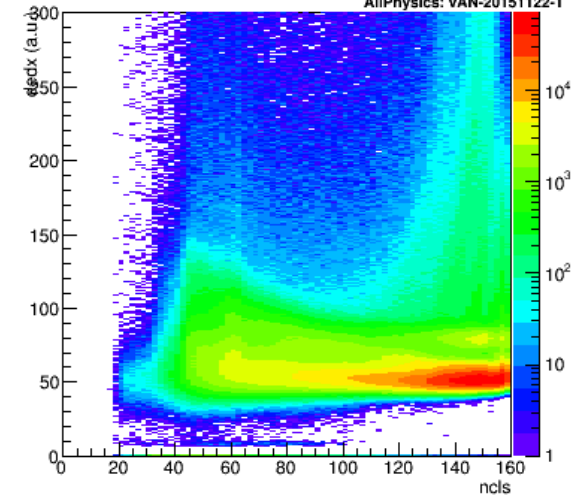
dedx (a.u.) vs ϕ (rad)



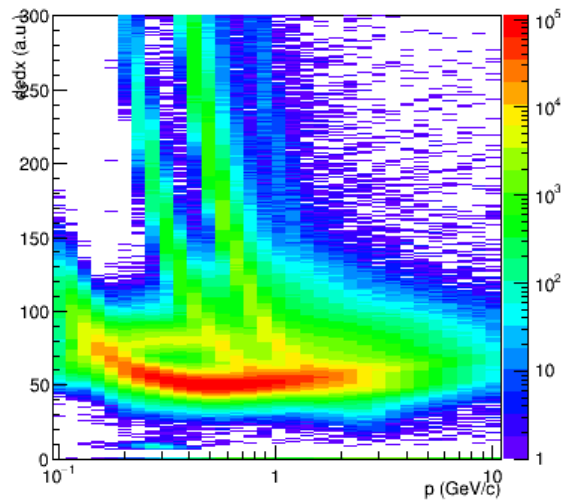
dedx (a.u.) vs $\tan\lambda$



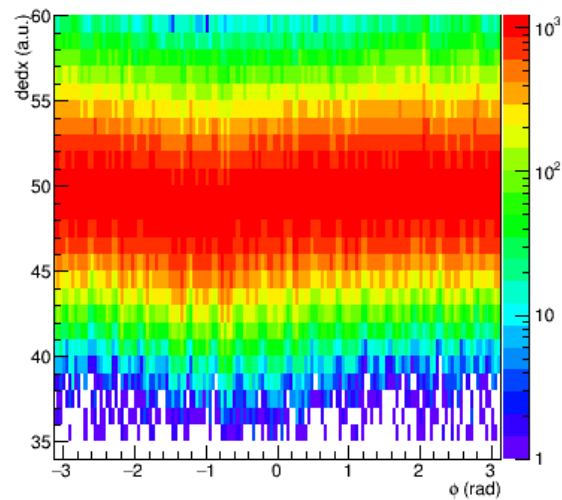
dedx (a.u.) vs ncls



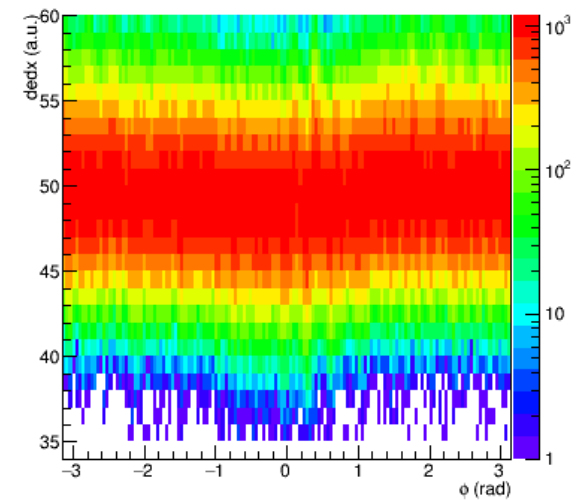
dedx (a.u.) vs p (GeV/c)



dedx (a.u.) vs ϕ (rad) (mips_A)



dedx (a.u.) vs ϕ (rad) (mips_C)

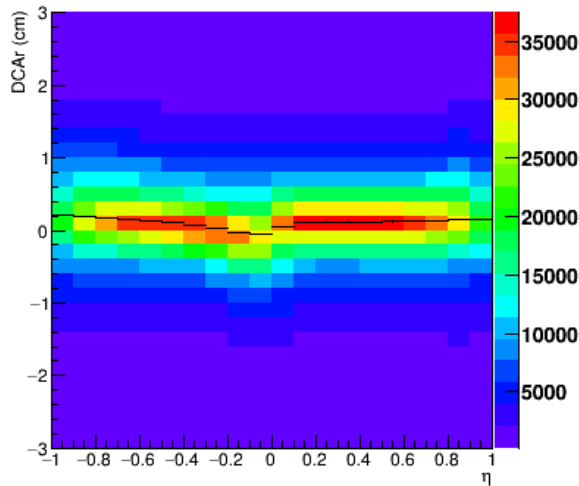


- Mean MIP position at 50 → Good
- Small phi modulation → Not very good

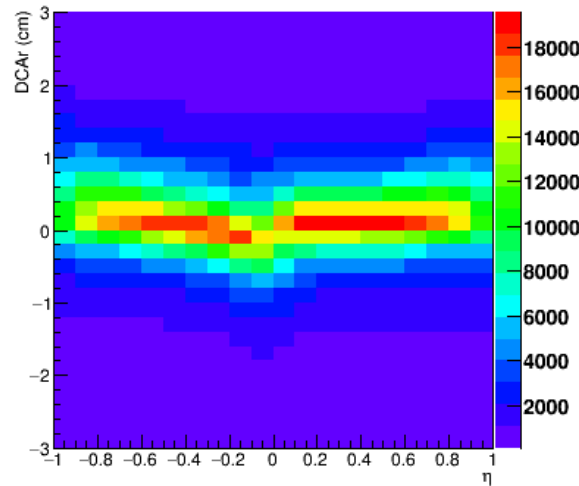
DCA vs eta

Run 244421 – IR 50 kHz

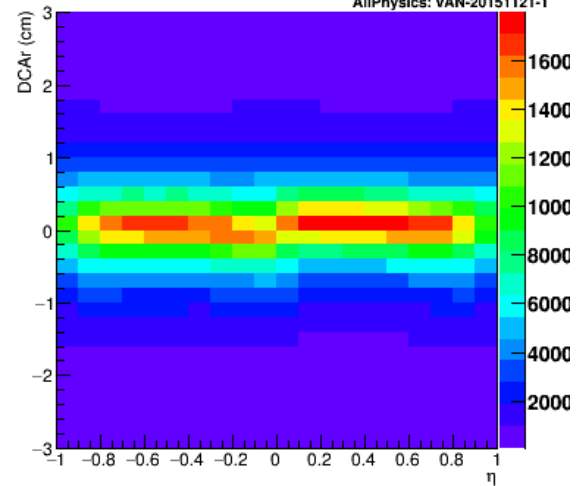
DCA_r vs η



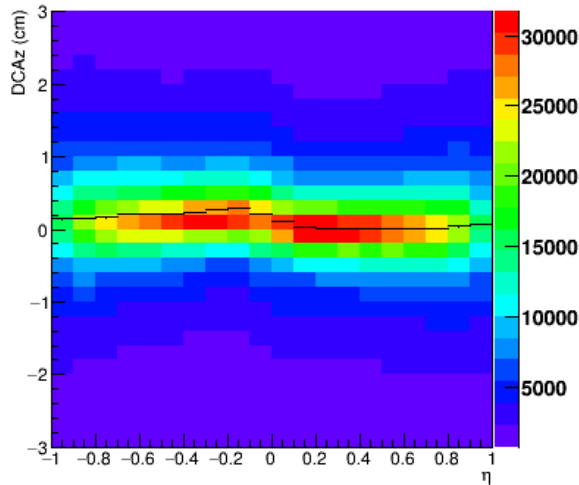
DCA_r vs η of pos. charged tracks



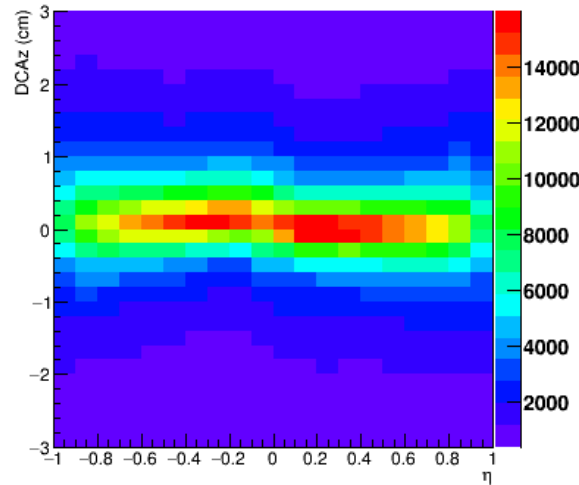
DCA_r vs η of neg. charged tracks



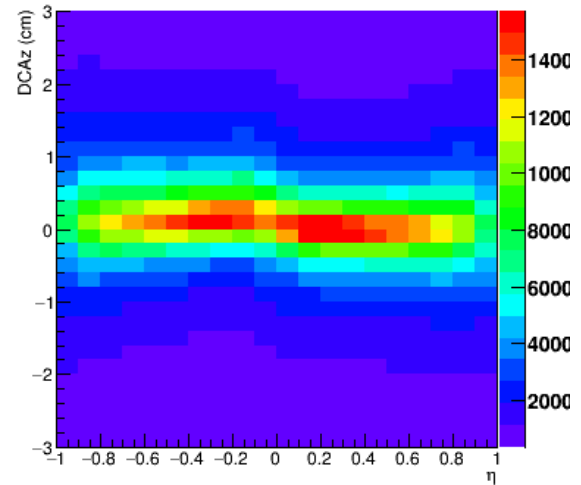
DCA_z vs η



DCA_z vs η of pos. charged tracks



DCA_z vs η of neg. charged tracks



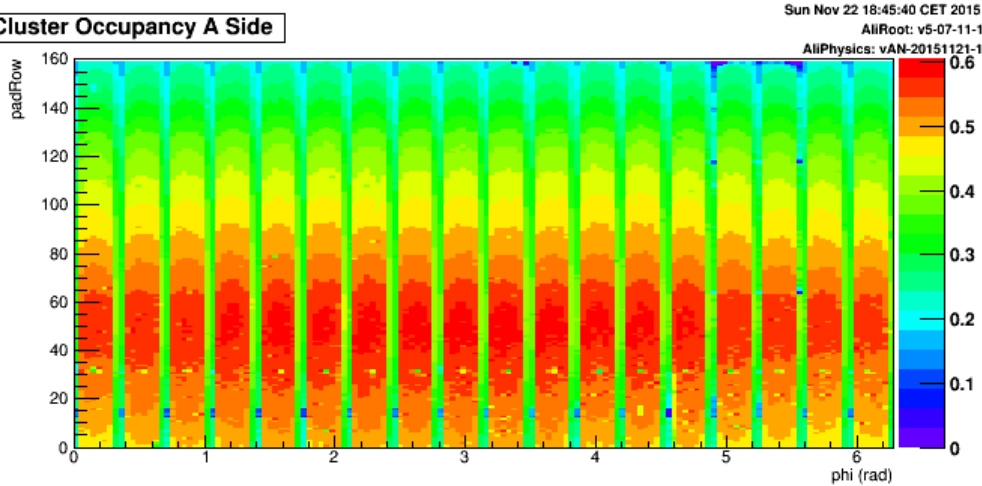
- DCA_z shows step at $\eta = 0$ → Improvements in the v_{drift} calibration possible

Cluster Occupancy – Space Charge Distortions

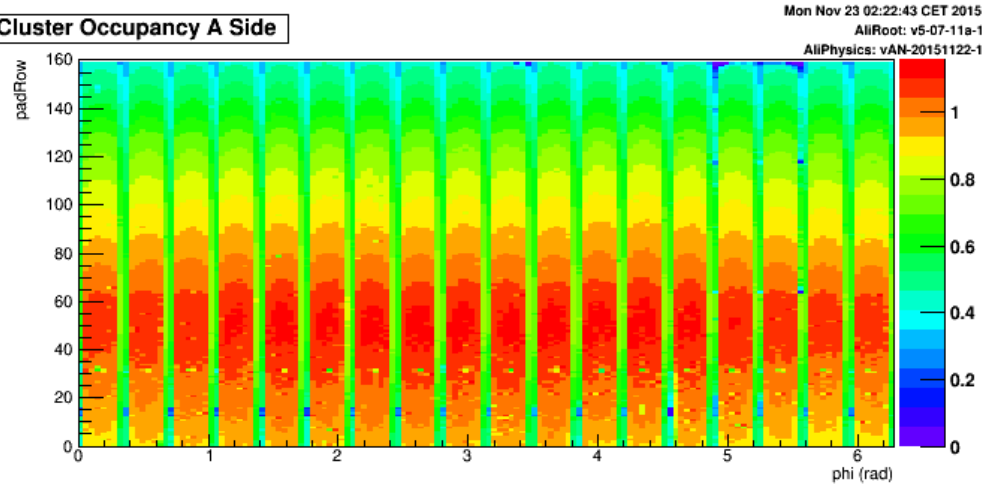
Run 24442 - IR 50 kHz

Run 244416 - IR 100 kHz

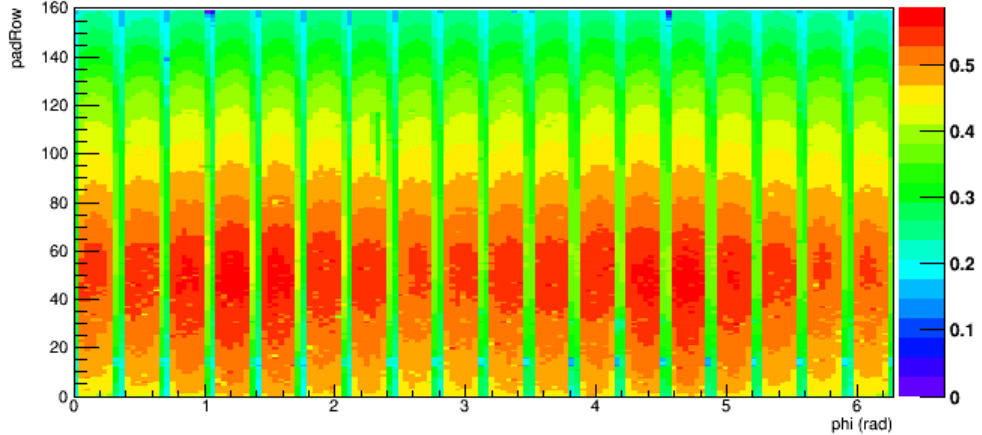
Cluster Occupancy A Side



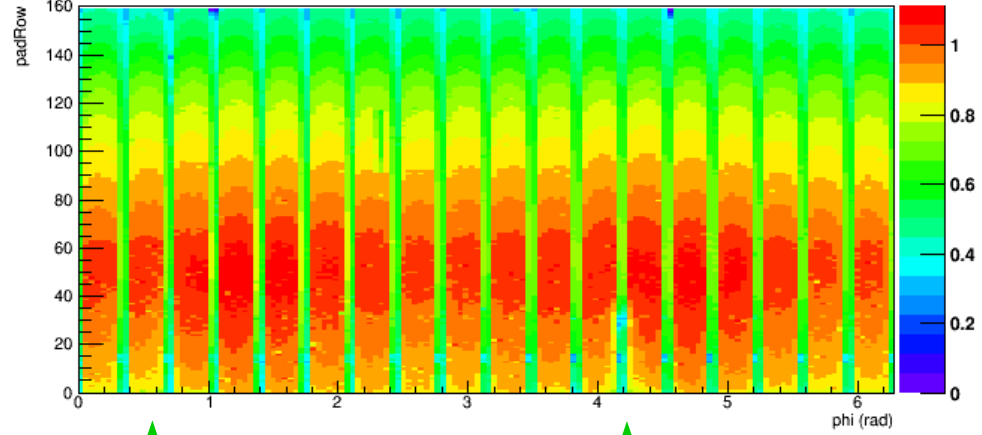
Cluster Occupancy A Side



Cluster Occupancy C Side



Cluster Occupancy C Side

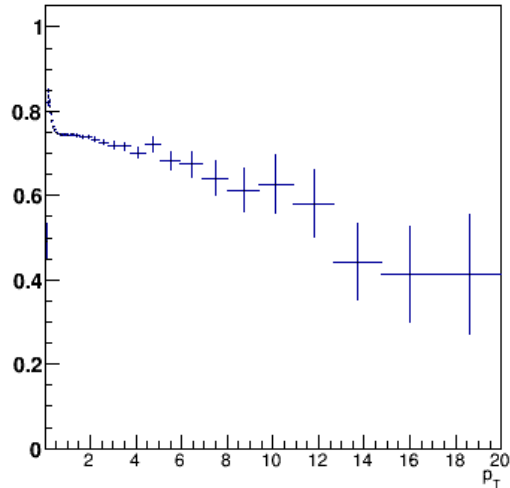


↑ ↑
Distortions

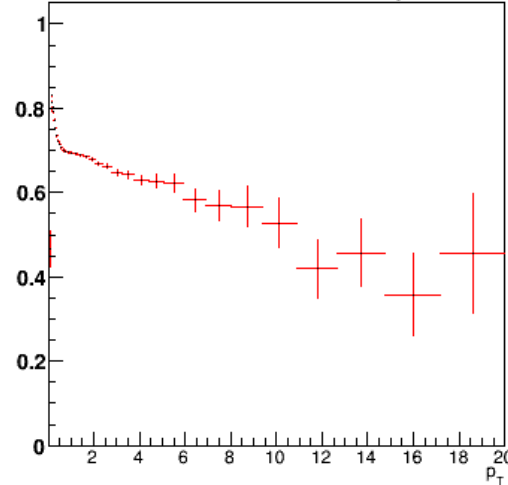
TPC-ITS Matching Efficiency

Run 244416 – IR 100 kHz

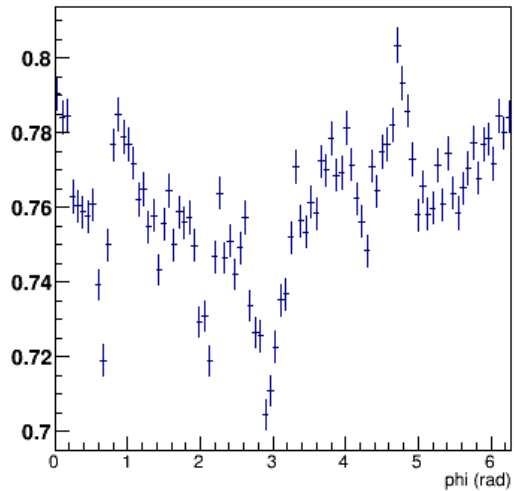
TPC-ITS Matching Efficiency (A)



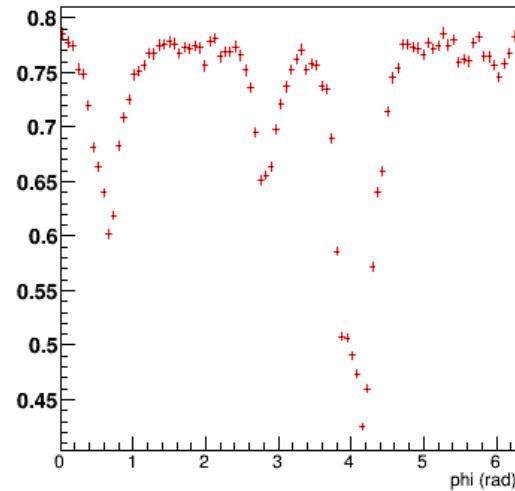
TPC-ITS Matching Efficiency (C) Mon Nov 23 02:22:48 CET 2015
AliRoot: v5-07-11a-1
AliPhysics: vAN-20151122-1



TPC-ITS Matching Efficiency (A)



TPC-ITS Matching Efficiency (C)



- Huge ϕ modulation, especially at the C-Side
- Distorted tracks in TPC do not match to ITS tracks
- Bigger drop in efficiency for higher interaction rate
- Dips at $\phi=4$ and $\phi=0.5$ come from TPC
- Dip at $\phi=3$ probably comes from ITS, one halfstave was off from SDD; needs to be rechecked

Summary

- Until now only 3 runs in the QA due to a bug in the reconstruction (AliESDtrackcuts)
- Higher interaction rate leads to more space charge distortions in the TPC
- Calibration procedure via a correction map in preparation
- PID calibration looks reasonable, small phi modulation
- V-drift calibration improvable