

TPC QA

- Introduction
- Current status
- Further development and Outlook

Introduction

- TPC QA components (PWG1/TPC)
 - AliPerformanceTPC (general reconstruction QA)
 - AliPerformanceDCA (impact parameters monitoring)
 - AliPerformanceDEdx (energy loss monitoring)
 - AliPerformanceMatch (TPC + ITS, TPC + TRD matching)
 - AliTPCPerformanceSummary (generation of trend information, Michael Knichel)
- Only for MC
 - AliPerformanceRes (track reconstruction in MC)
 - AliPerformanceEff (track rec. efficiency in MC)
 - AliPerformanceMC (tracking algorithms monitoring using MC track references)

AliPerformanceTPC

- General TPC information (runs on PWG1 train)
 - THnSparseF *fTPCEventHisto;
(Xv:Yv:Zv:mult:multP:multN:vertStatus)
 - THnSparseF *fTPCTrackHisto;
(nClust:chi2PerClust:nClust/nFindableClust:DCAr:DCAz:eta:phi:pt:charge)
- Committed extension
 - New information added on cluster level
 - THnSparseF *fTPCCLustHisto; //-> padRow:phi:TPCSide
 - AliESDfriend and geometry initialization required to fill this information

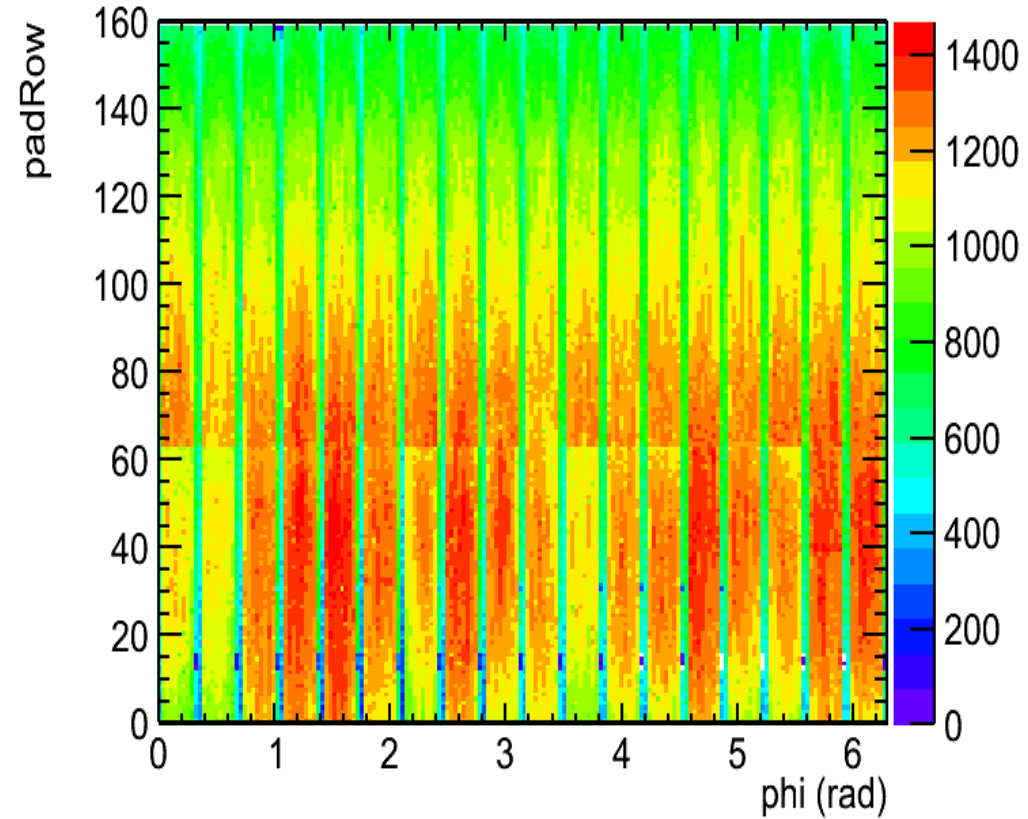
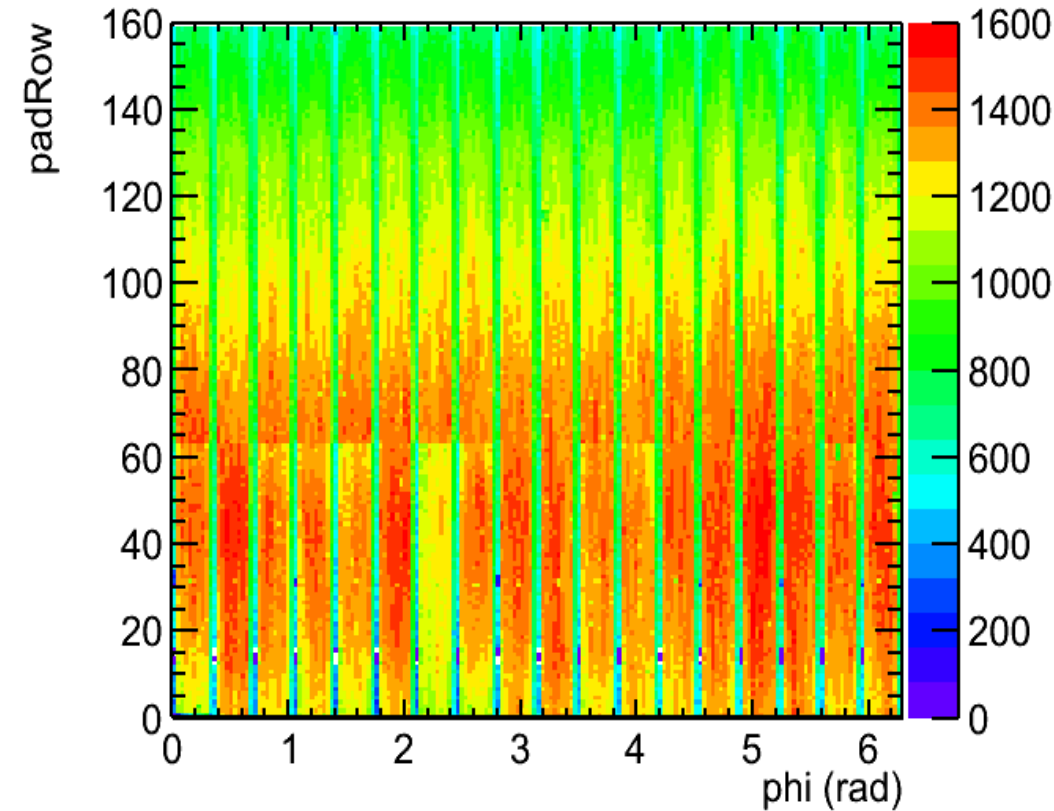
TPC cluster map – run 117220

TPC A-side

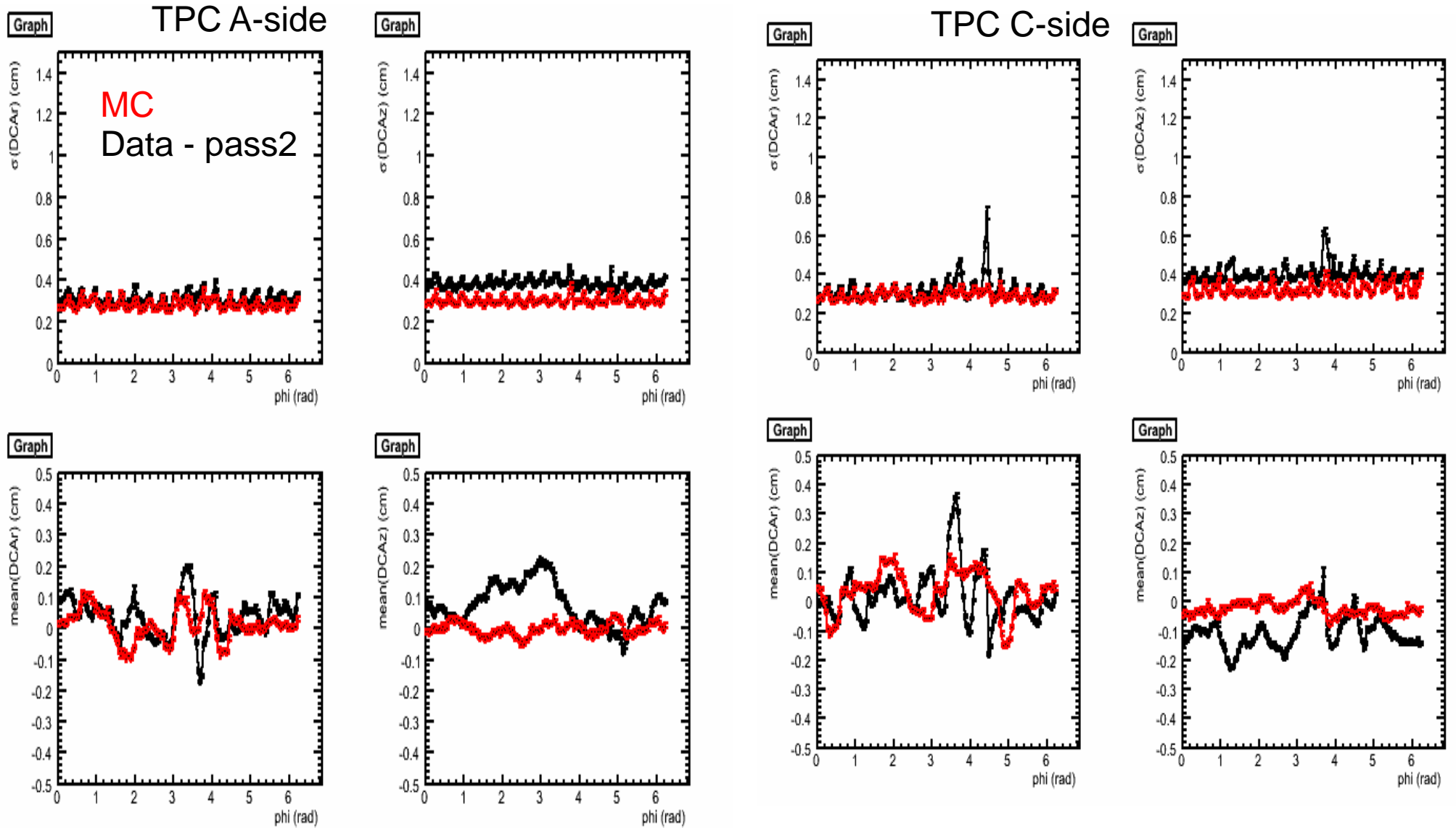
TPC C-side

padRow:phi:TPCSide projection phi (rad)padRow

padRow:phi:TPCSide projection phi (rad)padRow



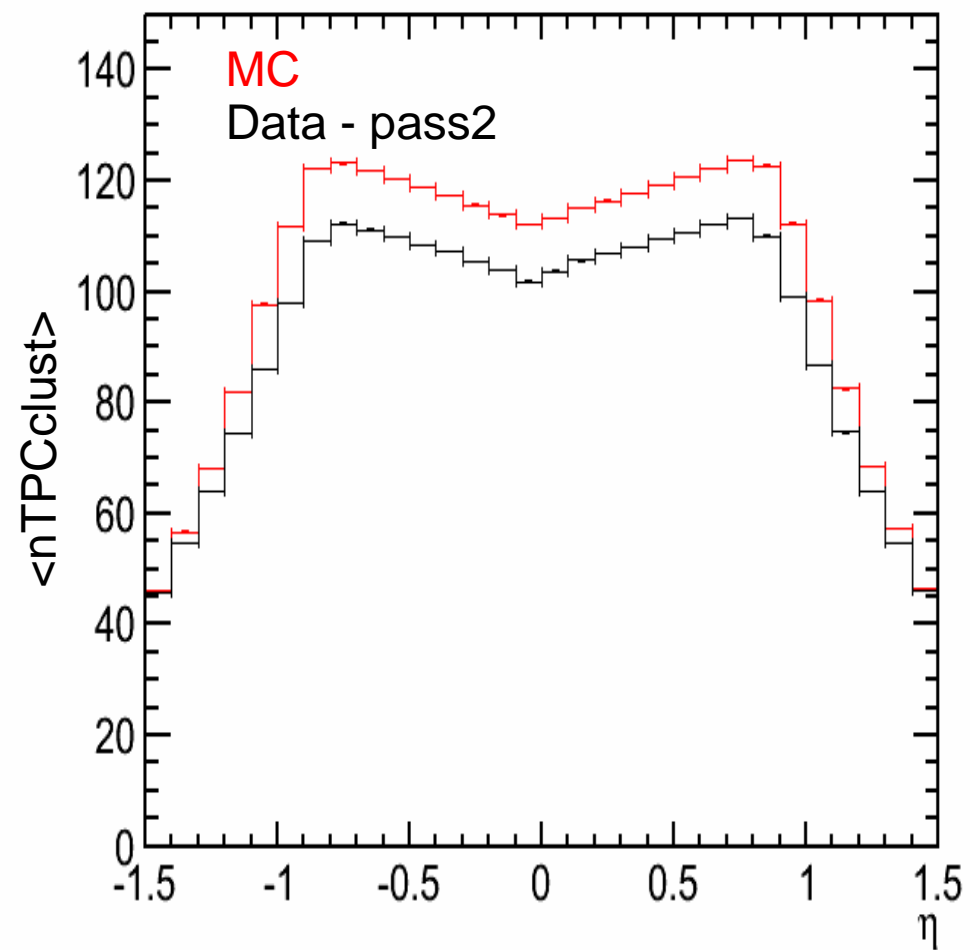
TPC DCA - run 117220



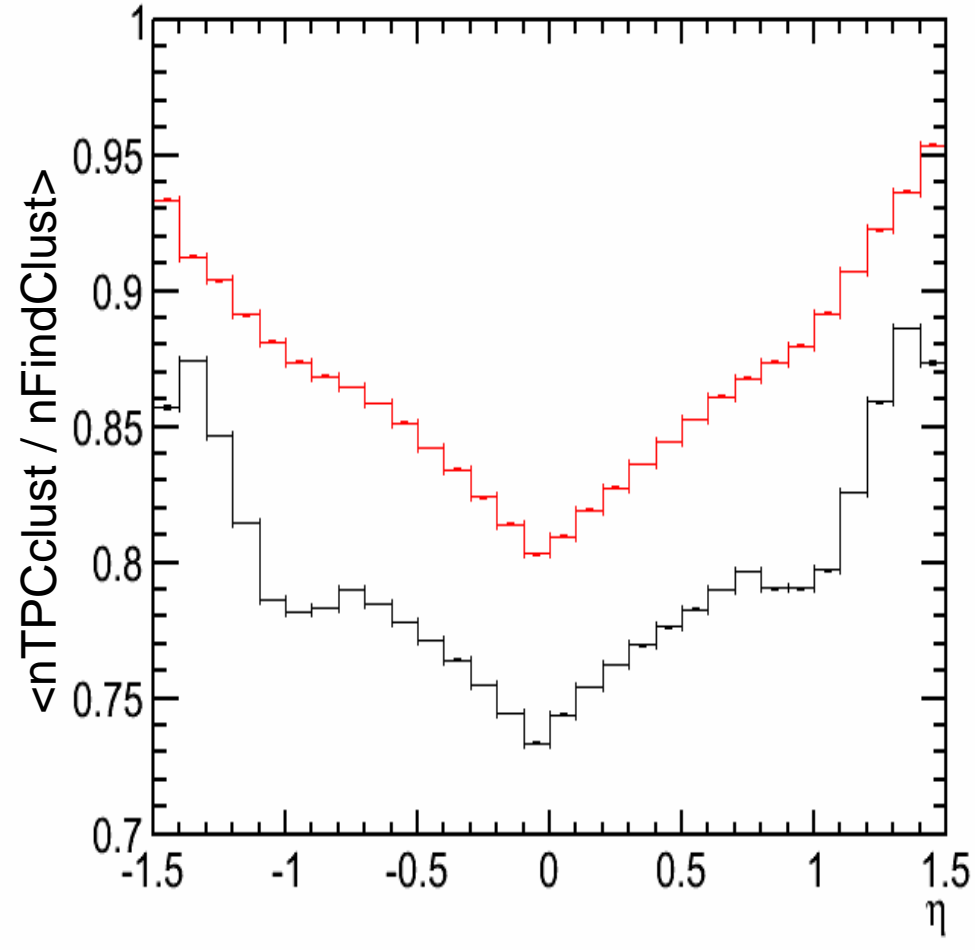
Reasonable TPC calibration in pass2.

TPC track clusters - run 117220

nClust:chi2PerClust:nClust/nFindableClust:DCAr:DCAz:eta:phi:pt:charge projection η nClust



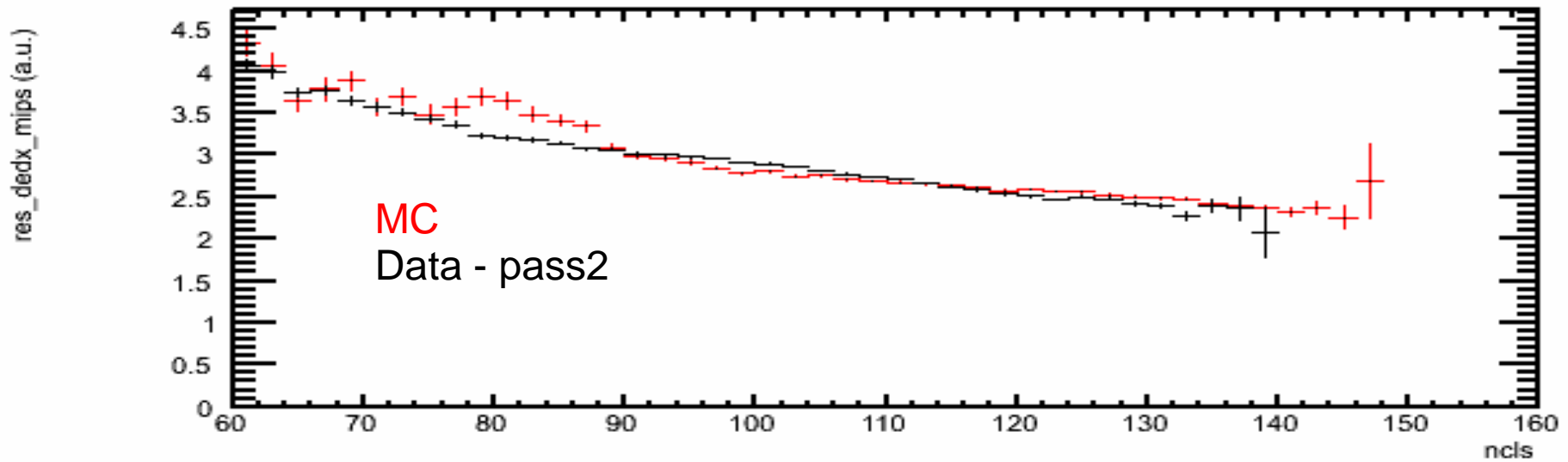
nClust:chi2PerClust:nClust/nFindableClust:DCAr:DCAz:eta:phi:pt:charge projection η nClust/nFindableClust



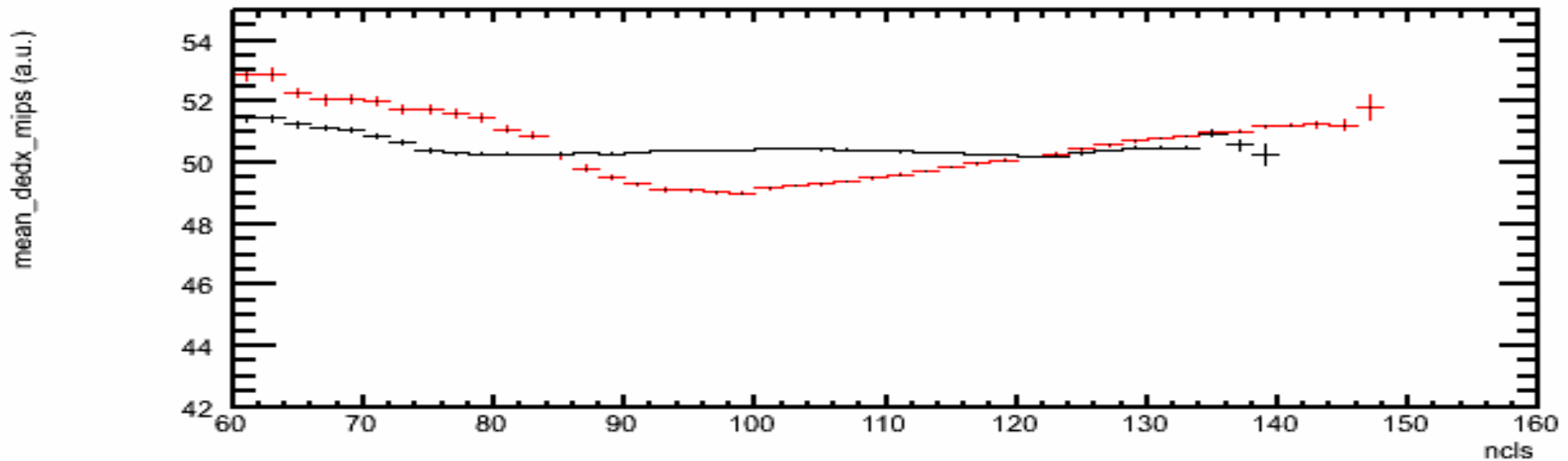
Lower gain in LHC10 period.

TPC dEdx - run 117220

res_dedx_mips (a.u.) vs ncls



mean_dedx_mips (a.u.) vs ncls



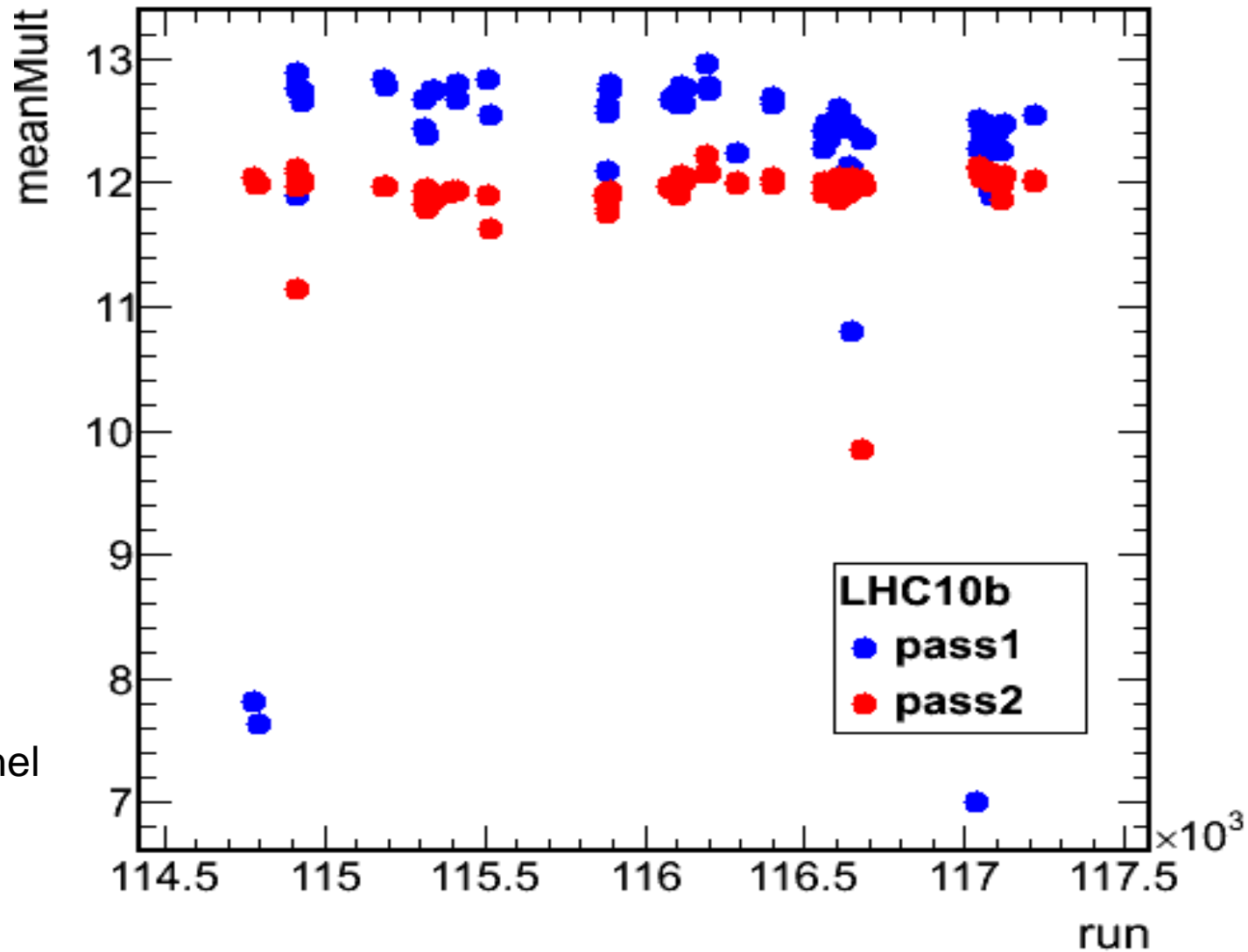
AliPerformanceMatch

- TPC+ITS and TPC+TRD matching information (Not yet in production on PWG1 train)
- Matching residuals and pulls
- Matching efficiency w.r.t TPC
 - THnSparseF *fResolHisto; //->
res_y:res_z:res_phi:res_lambda:res_pt:y:z:phi:eta:pt:isRec
 - THnSparseF *fPullHisto; //->
pull_y:pull_z:pull_snp:pull_tgl:pull_1pt:y:z:snp:tgl:1pt:isRec
 - THnSparseF *fTrackingEffHisto; //->
match:y:z:snp:tgl:phi:pt:ITSclusters

AliTPCPerformanceSummary

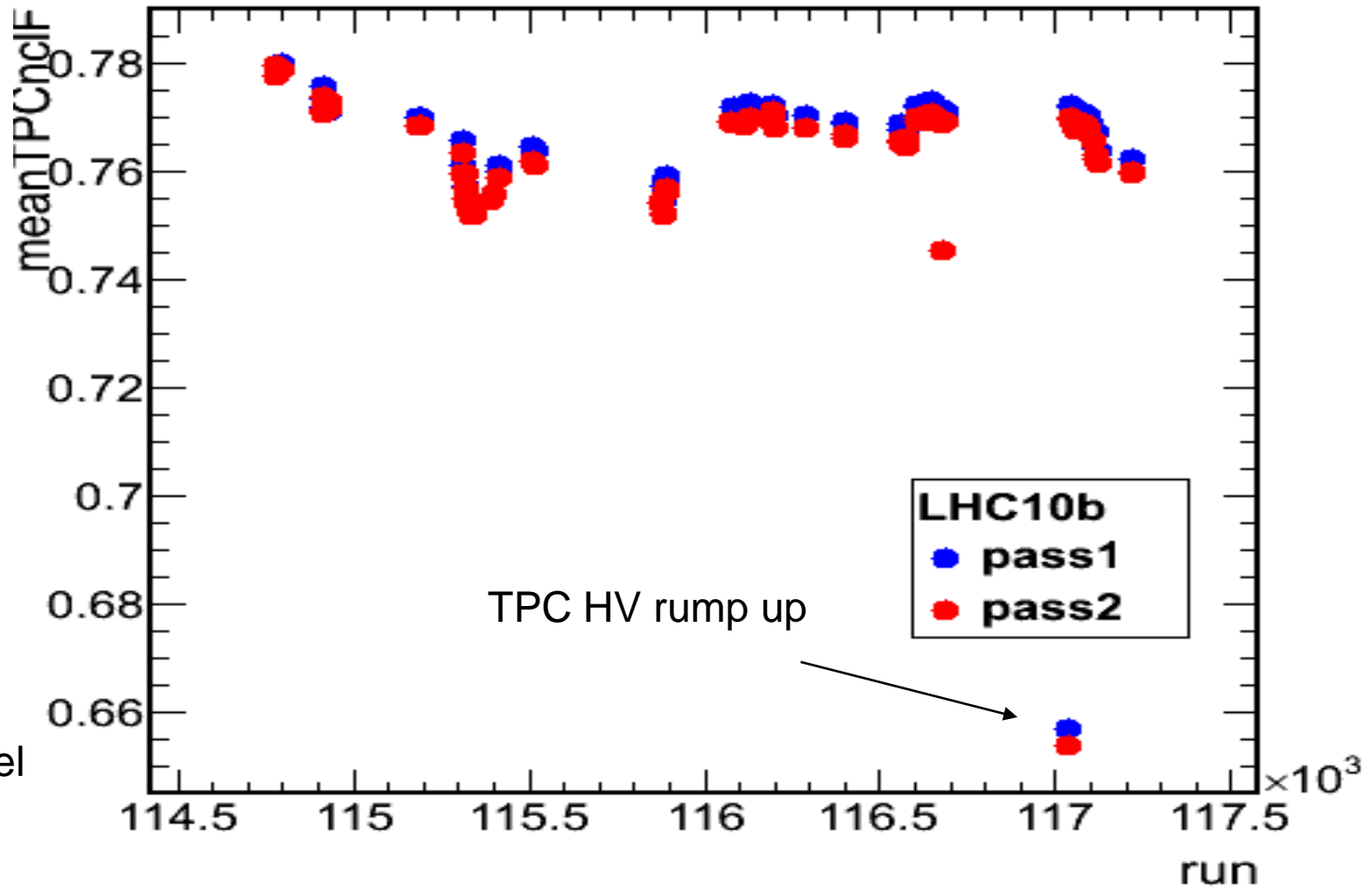
- Generation of trend information (run by run)
- Correlates and analyses information from several TPC QA components to get trend observables
 - AliPerformanceTPC and AliPerformanceDEdx components at the moment
- Stores trend observables in the output trees (root files)
- Makes trend graphs using list of trees (run-wise)

Trend information – mean primary track multiplicity vs run number



Michael Knichel

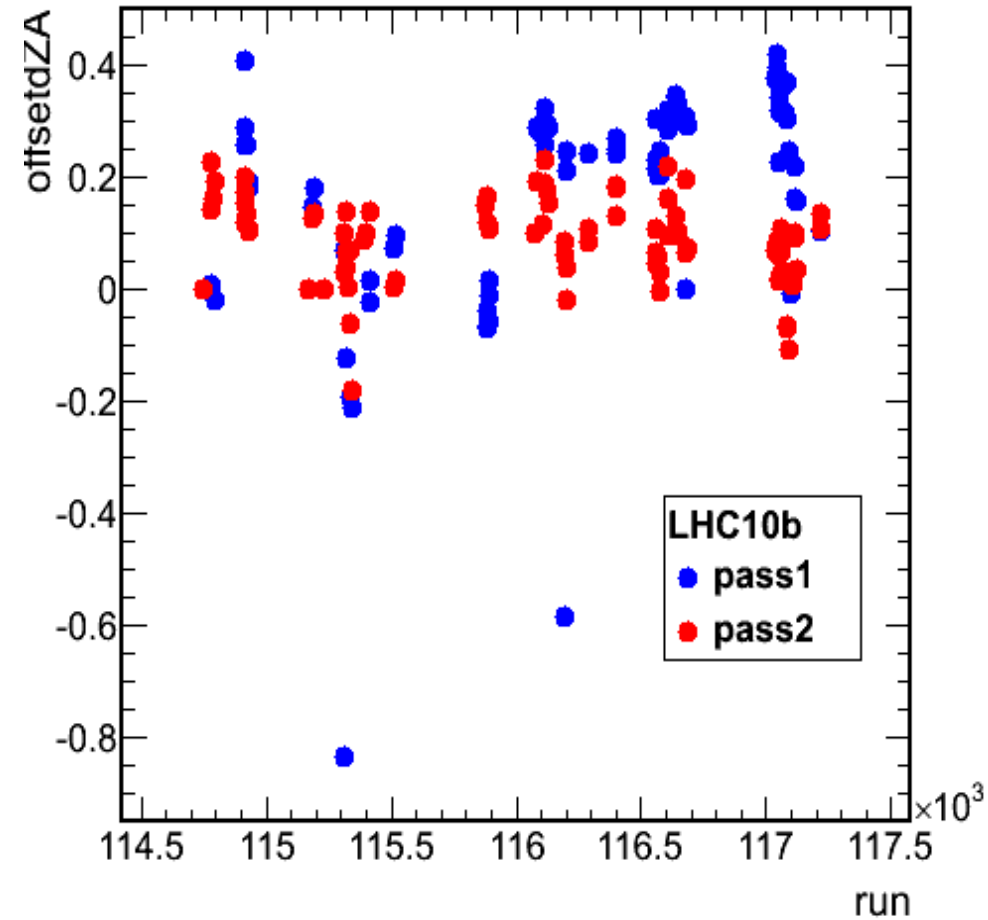
Trend information – $\langle n_{\text{TPCclusters}} / n_{\text{FindableTPC}} \rangle$ vs run number



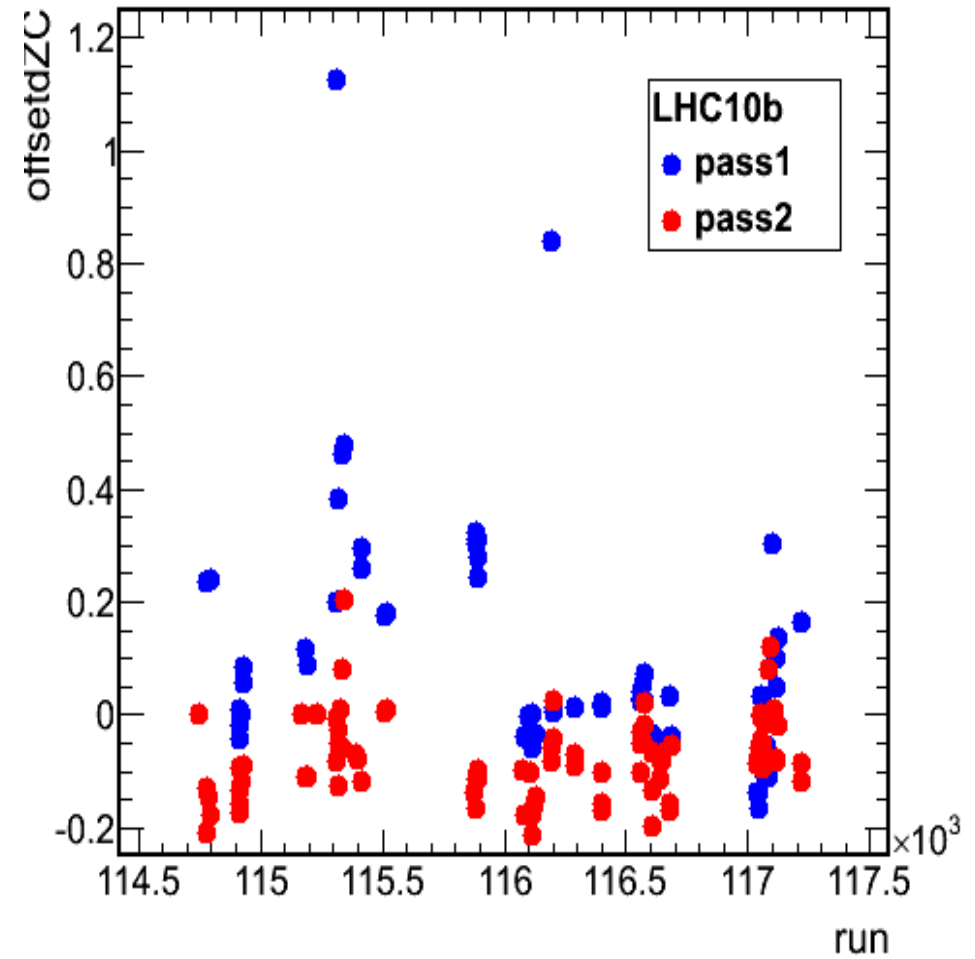
Michael Knichel

Trend information – DCAz (TPC A/C sides) vs run number

TPC A-side



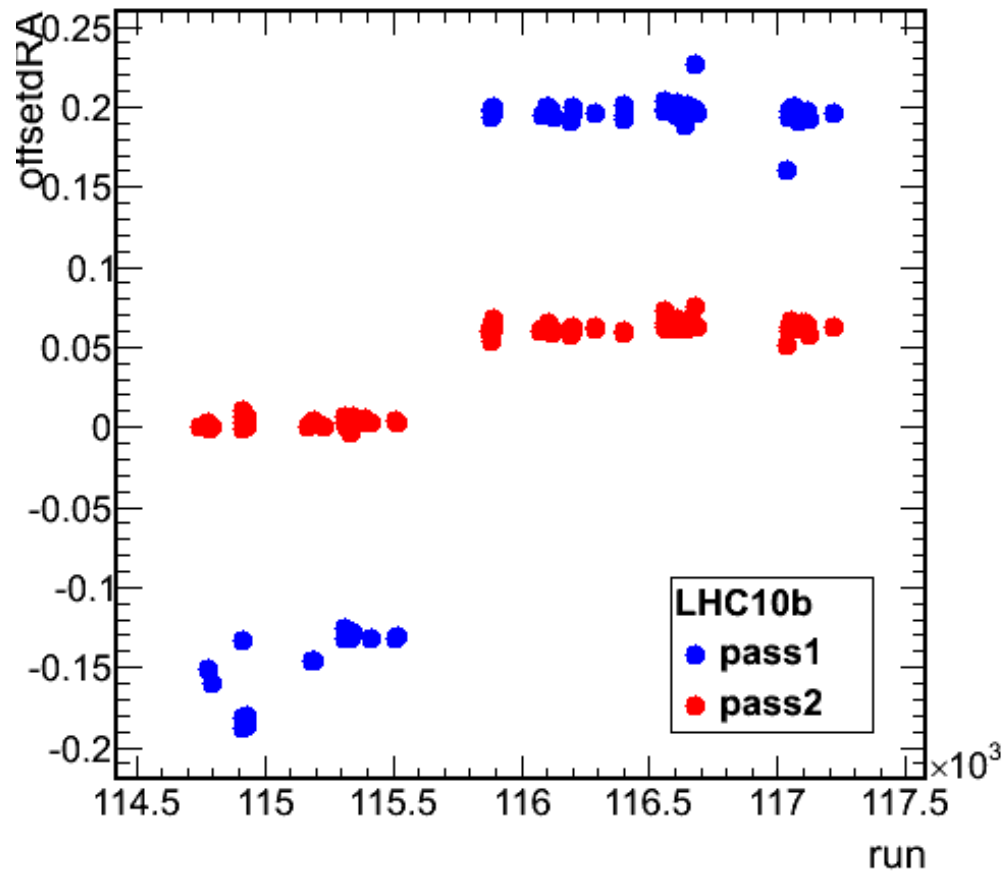
TPC C-side



Michael Knichel

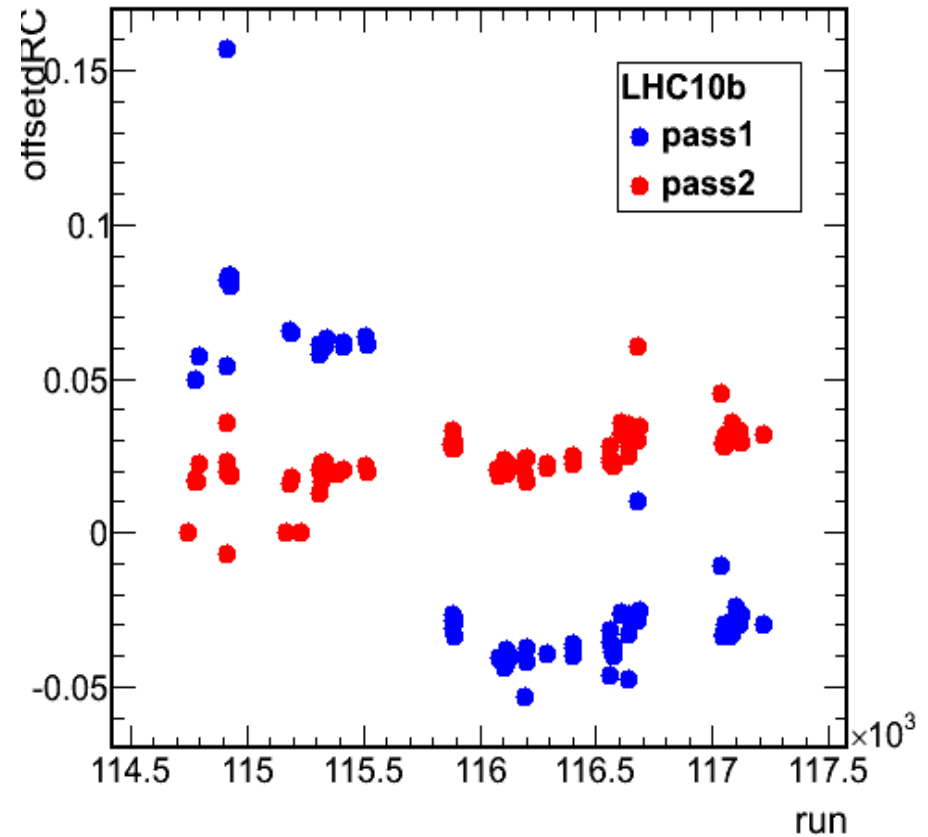
Trend information – DCAr (TPC A/C sides) vs run number

TPC A-side



Michael Knichel

TPC C-side



Jacek Otwinowski

Further development and Outlook

- Maintenance of TPC QA components to reduce memory consumption (big runs)
- Activate AliPerformanceMatch component to run on PWG1 train
- Extract more trend information including TPC+ITS and TPC+TRD matching information
- Automatic run validation (QA on grid)
 - Use trend information on GRID
 - Reference values should be available on GRID