



HF jets analysis

27.01.2020 ALICE@IFJ meeting

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Outline



1. What was done
2. Issues and questions
3. Plans for next week

- 1. What was done**
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What was done



1. Re-run analysis task on data and MC with proper and unified filterbits setting
2. run-wise QA
3. most important/apparent differences data-MC cured

Proper setting for HF



(details in backup):

filterbits: **4+9** instead of

“hybrid tracks” used in PWGJE which is filterbits **8+9**

where:

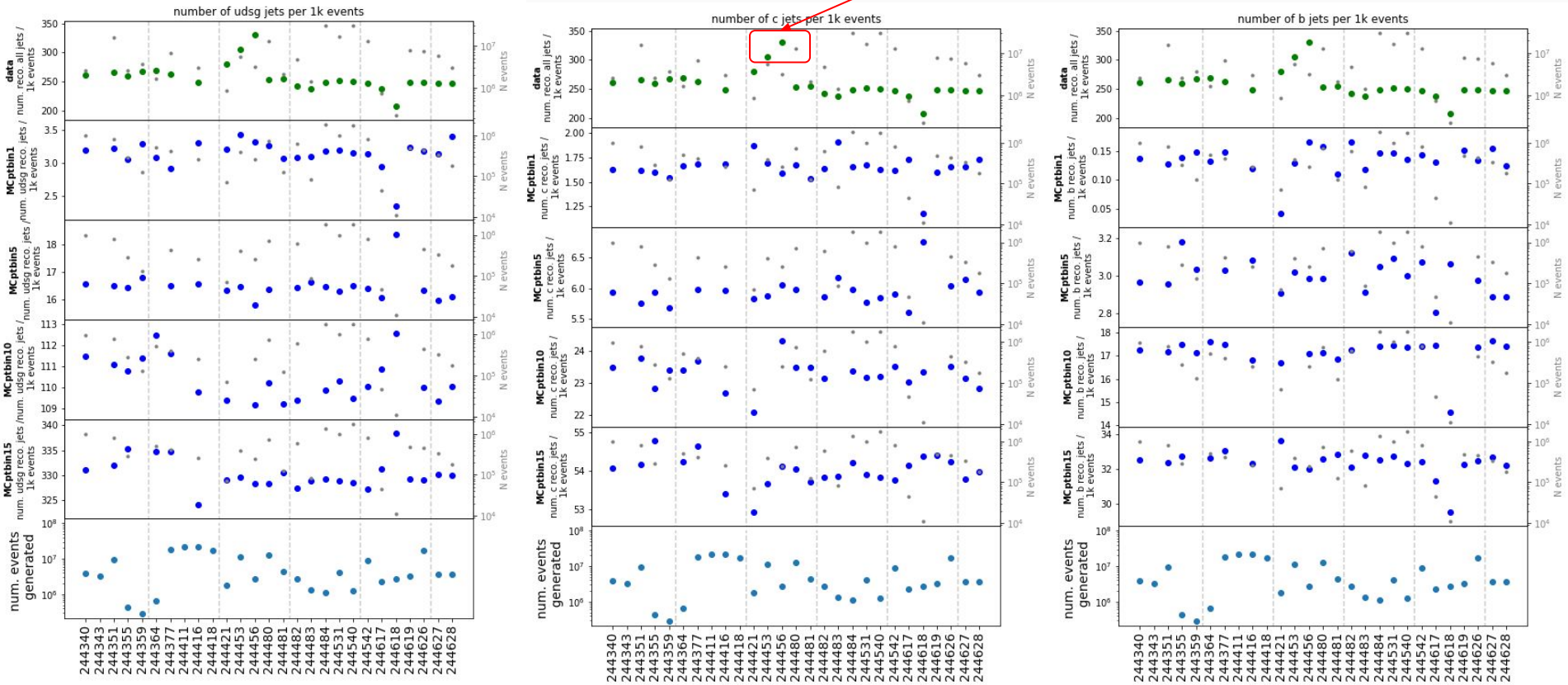
8 has std ITS-TPC cut and **SPD::kAny**,

9 has std ITS-TPC cut and **ITS refit**

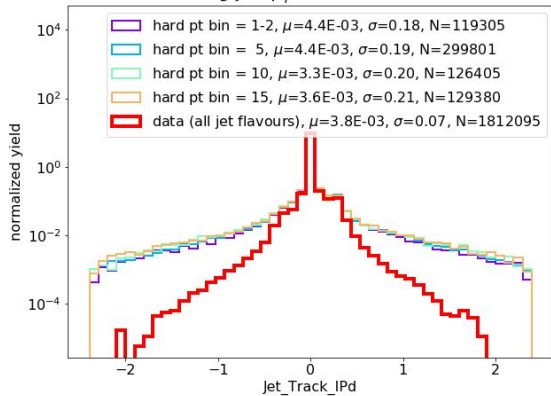
4 is similar to **8** but without “*golden chi2 cut*”

run-wise QA (number of jets)

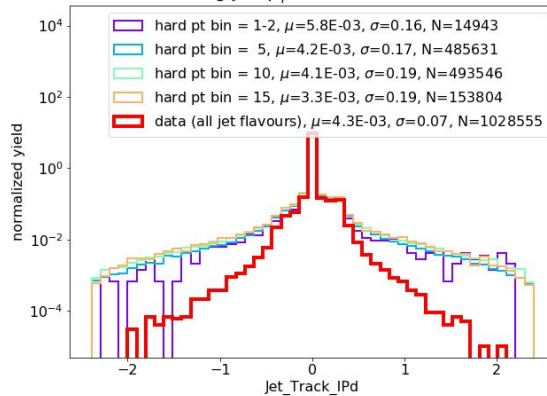
stable no. jets / event in runs
1 run (244456) with 40% more jets



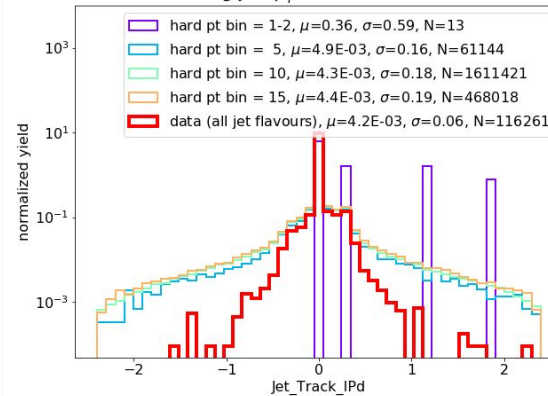
usdg jets $p_T^{jet, reco} = 5-10$ GeV



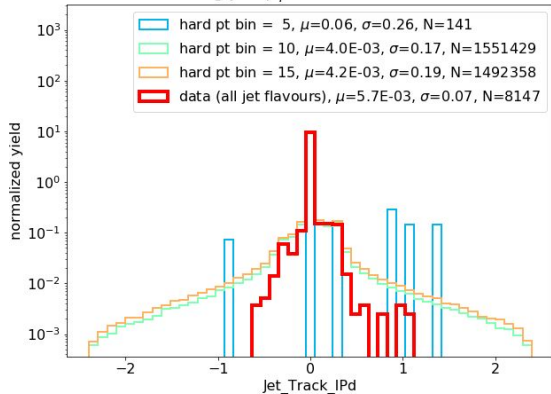
usdg jets $p_T^{jet, reco} = 10-20$ GeV



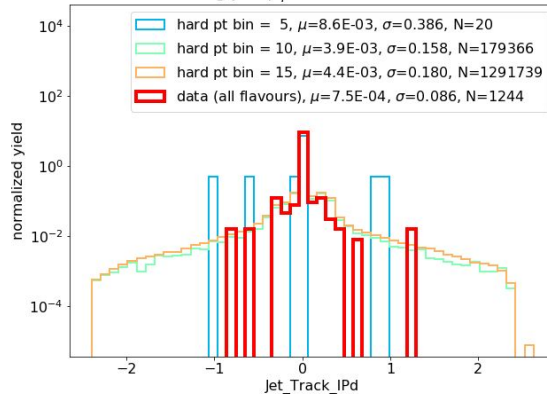
usdg jets $p_T^{jet, reco} = 20-40$ GeV



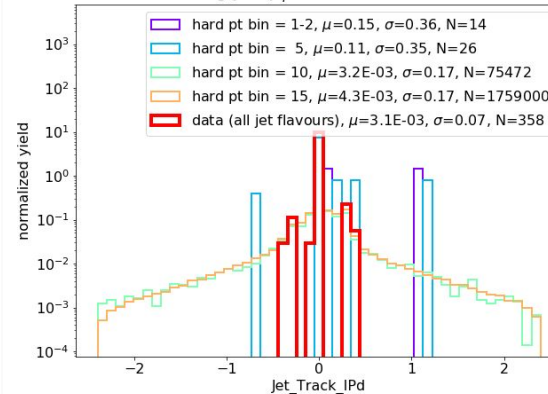
usdg jets $p_T^{jet, reco} = 40-60$ GeV



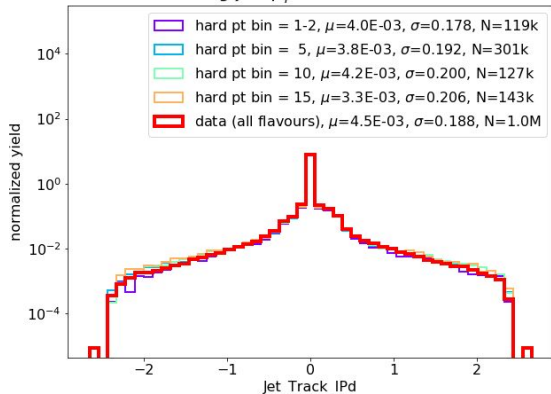
usdg jets $p_T^{jet, reco} = 60-80$ GeV



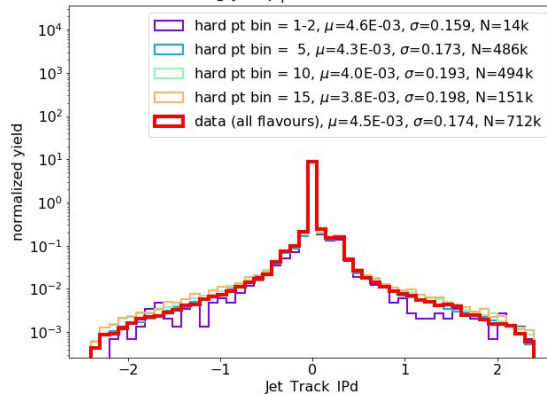
usdg jets $p_T^{jet, reco} = 80-120$ GeV



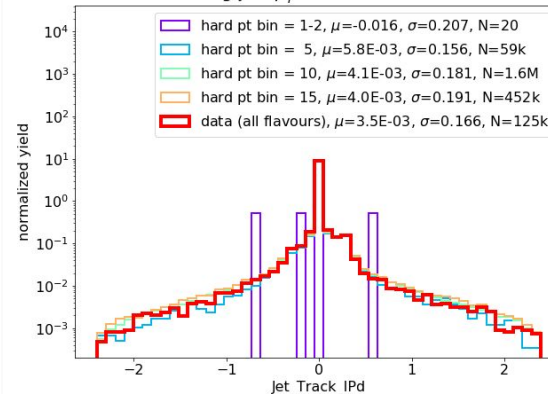
udsg jets $p_T^{jet, reco} = 5-10$ GeV



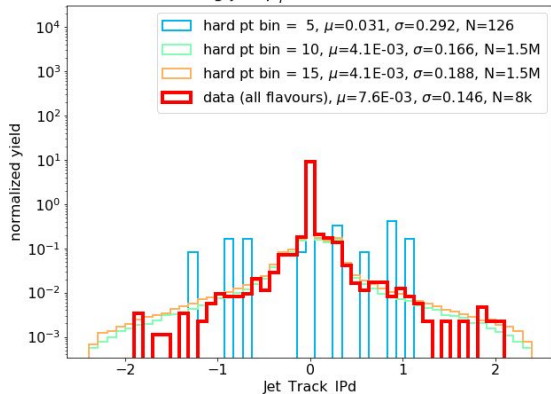
udsg jets $p_T^{jet, reco} = 10-20$ GeV



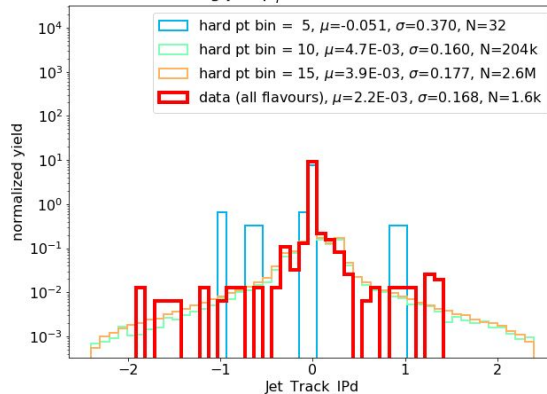
udsg jets $p_T^{jet, reco} = 20-40$ GeV



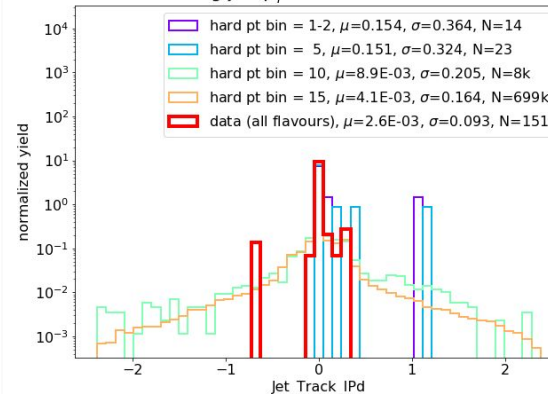
udsg jets $p_T^{jet, reco} = 40-60$ GeV

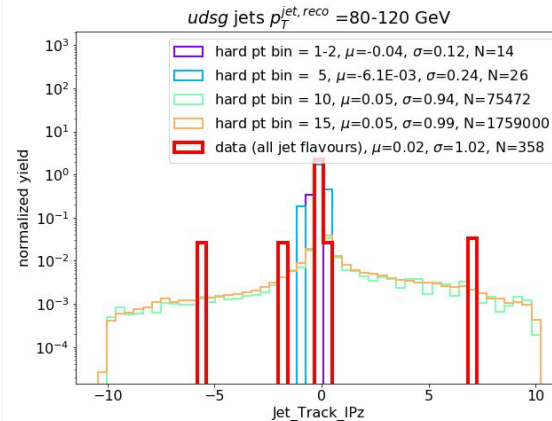
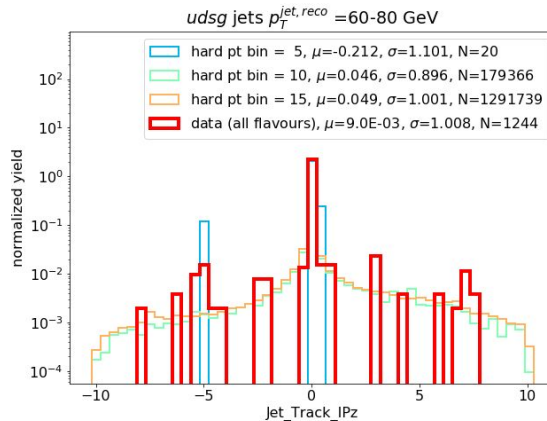
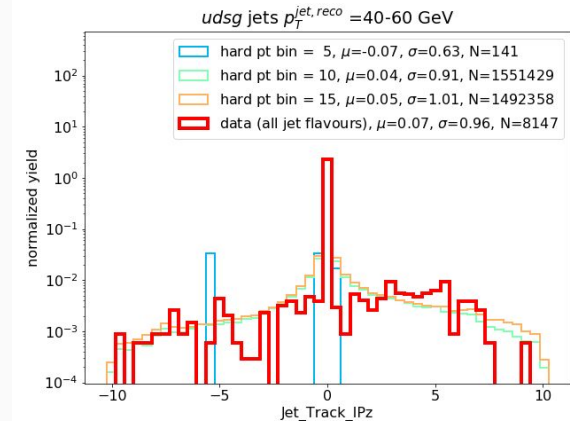
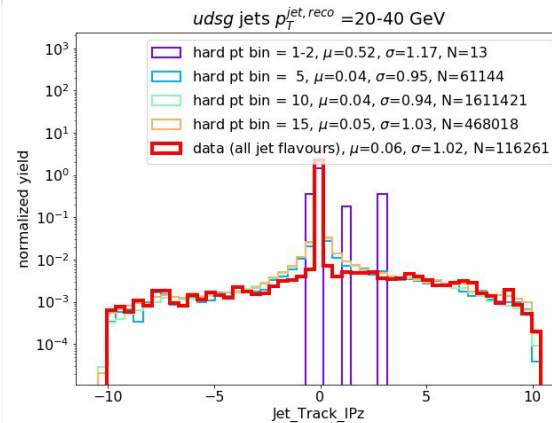
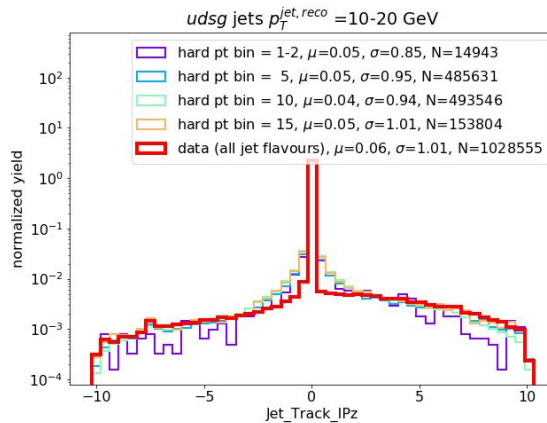
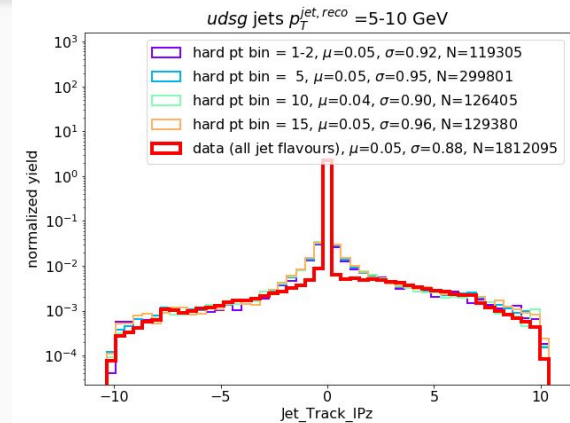


udsg jets $p_T^{jet, reco} = 60-100$ GeV

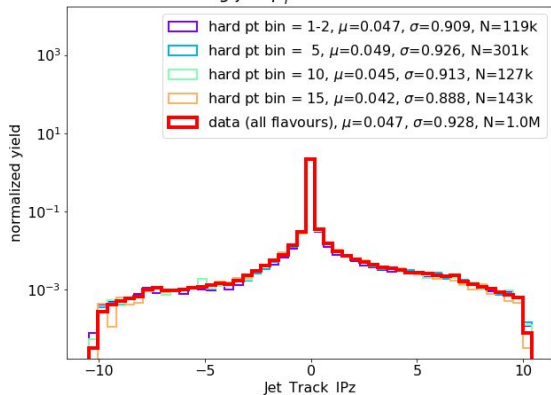


udsg jets $p_T^{jet, reco} = 100-150$ GeV

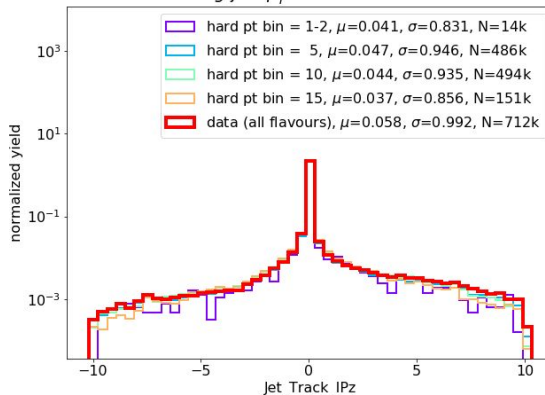




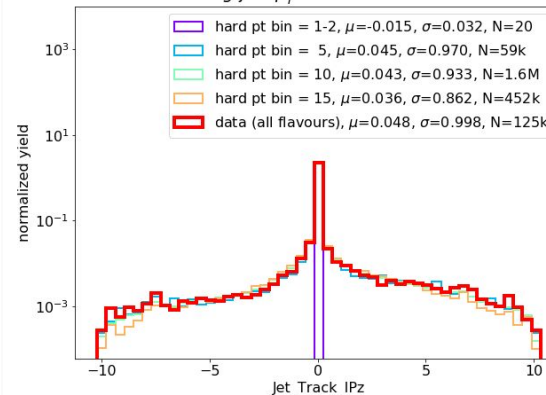
udsg jets $p_T^{jet, reco} = 5-10$ GeV



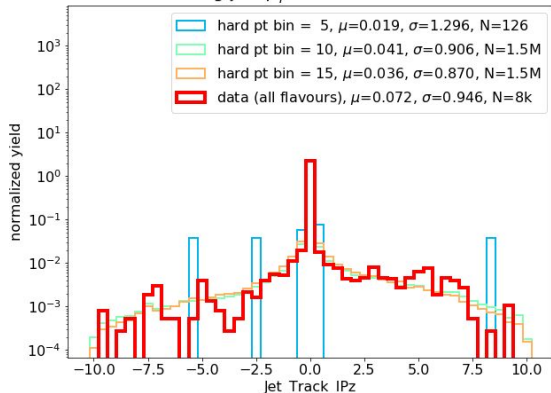
udsg jets $p_T^{jet, reco} = 10-20$ GeV



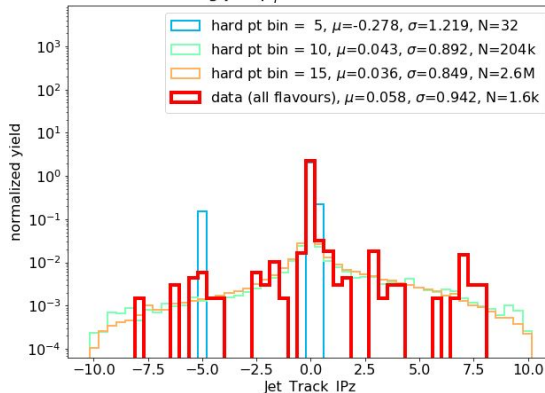
udsg jets $p_T^{jet, reco} = 20-40$ GeV



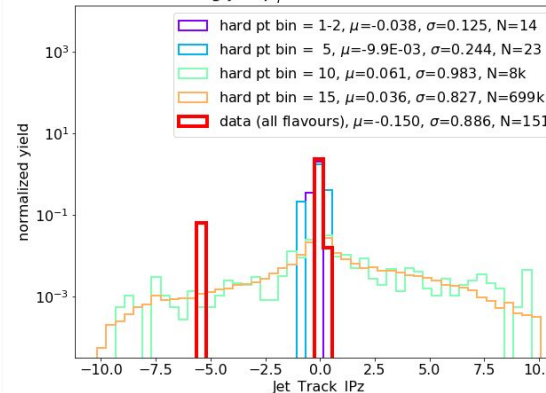
udsg jets $p_T^{jet, reco} = 40-60$ GeV



udsg jets $p_T^{jet, reco} = 60-100$ GeV

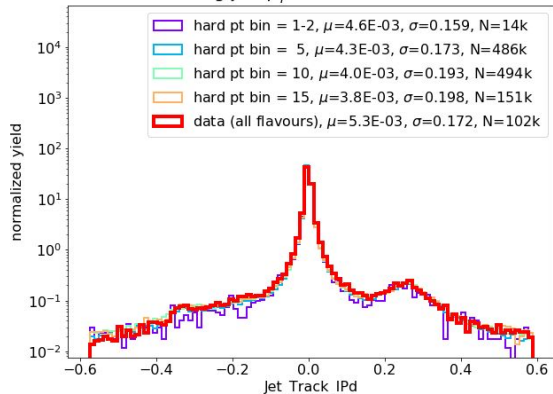


udsg jets $p_T^{jet, reco} = 100-150$ GeV

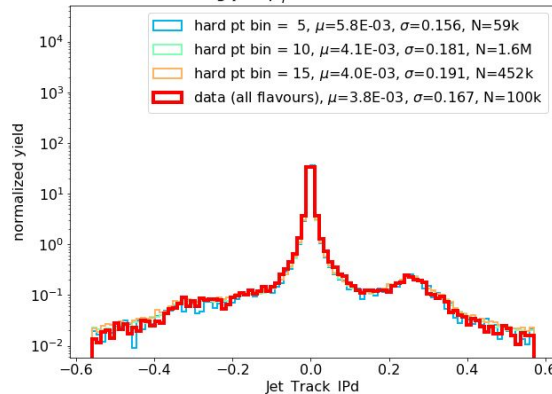


track's IPd *new* udsg vs b (zoomed)

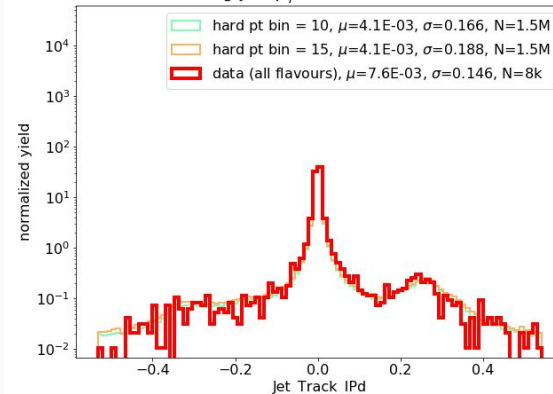
udsg jets $p_T^{jet, reco} = 10-20$ GeV



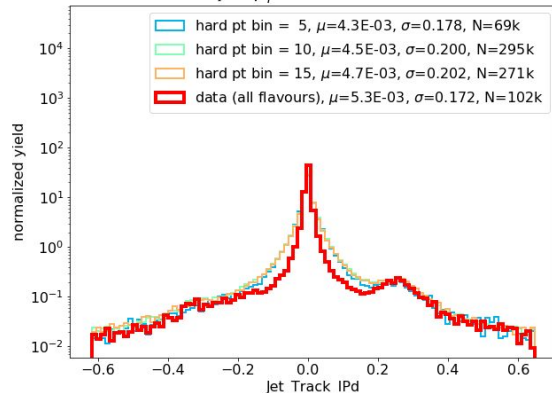
udsg jets $p_T^{jet, reco} = 20-40$ GeV



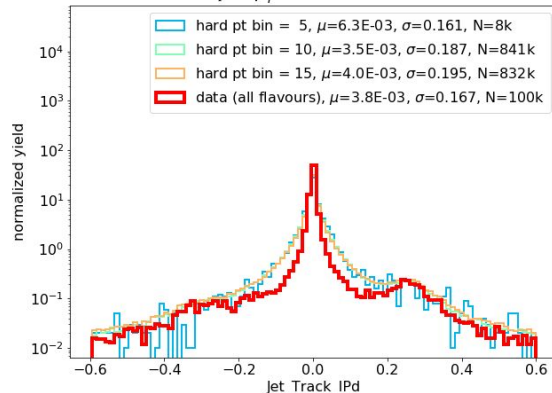
udsg jets $p_T^{jet, reco} = 40-60$ GeV



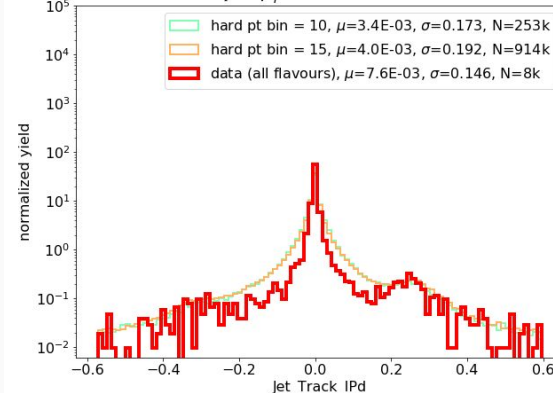
b jets $p_T^{jet, reco} = 10-20$ GeV



b jets $p_T^{jet, reco} = 20-40$ GeV



b jets $p_T^{jet, reco} = 40-60$ GeV



Plans for next week (after discussion)



1. investigate QA for 244456 (and 244453)
 - what to look for in case of unusually large num. jets?
 - check triggers settings
 - plot p_T /angular distr. of these jets, compare with rest or per run
2. study bump at IPd ~ 0.25 cm
3. check track uniformity in phi - validation for “hybrid tracks” usage
4. rather small stats of pp@5.02TeV -- what with the reference for PbPb?
check approaches in PbPb@5.02TeV papers

BACKUP



filterbits settings



sources:

<https://twiki.cern.ch/twiki/bin/viewauth/ALICE/HybridTracks>

<https://twiki.cern.ch/twiki/bin/view/ALICE/AODsets>

code:

<https://github.com/alisw/AliPhysics/blob/master/PWGJE/macros/CreateTrackCutsPWGJE.C>

<https://github.com/alisw/AliRoot/blob/master/ANALYSIS/ESDfilter/macros/AddTaskESDFilter.C>

<https://github.com/alisw/AliRoot/blob/master/ANALYSIS/ANALYSISalice/AliESDtrackCuts.cxx>

```
AliESDtrackCuts::GetStandardITSTPCTrackCuts2011(kFALSE);

// TPC
esdTrackCuts->SetMinNCrossedRowsTPC(70);
esdTrackCuts->SetMinRatioCrossedRowsOverFindableClustersTPC(0.8);
esdTrackCuts->SetMaxChi2PerClusterTPC(4);
esdTrackCuts->SetAcceptKinkDaughters(kFALSE);
esdTrackCuts->SetRequireTPCRefit(kTRUE);
// ITS
esdTrackCuts->SetRequireITSRefit(kTRUE);
esdTrackCuts->SetClusterRequirementITS(AliESDtrackCuts::kSPD, AliESDtrackCuts::kAny);
esdTrackCuts->SetMaxDCAToVertexZ(2); // overwritten
esdTrackCuts->SetDCAToVertex2D(kFALSE); // overwritten
esdTrackCuts->SetRequireSigmaToVertex(kFALSE);
esdTrackCuts->SetMaxChi2PerClusterITS(36);

esdTrackCutsH->SetMaxDCAToVertexXY(2.4);
esdTrackCutsH->SetMaxDCAToVertexZ(3.2);
esdTrackCutsH->SetDCAToVertex2D(kTRUE);
```

```
AliESDtrackCuts::GetStandardITSTPCTrackCuts2011(kFALSE);

// TPC
esdTrackCuts->SetMinNCrossedRowsTPC(70);
esdTrackCuts->SetMinRatioCrossedRowsOverFindableClustersTPC(0.8);
esdTrackCuts->SetMaxChi2PerClusterTPC(4);
esdTrackCuts->SetAcceptKinkDaughters(kFALSE);
esdTrackCuts->SetRequireTPCRefit(kTRUE);
// ITS
esdTrackCuts->SetRequireITSRefit(kTRUE);
esdTrackCuts->SetClusterRequirementITS(AliESDtrackCuts::kSPD, AliESDtrackCuts::kAny);
esdTrackCuts->SetMaxDCAToVertexZ(2); // overwritten
esdTrackCuts->SetDCAToVertex2D(kFALSE); // overwritten
esdTrackCuts->SetRequireSigmaToVertex(kFALSE);
esdTrackCuts->SetMaxChi2PerClusterITS(36);

AliESDtrackCuts* esdTrackCutsHTG = AliESDtrackCuts::GetStandardITSTPCTrackCuts2011(kFALSE);
esdTrackCutsHTG->SetMaxDCAToVertexXY(2.4);
esdTrackCutsHTG->SetMaxDCAToVertexZ(3.2);
esdTrackCutsHTG->SetDCAToVertex2D(kTRUE);
esdTrackCutsHTG->SetMaxChi2TPCConstrainedGlobal(36); // "golden Chi2 cut"
esdTrackCutsHTG->SetMaxFractionSharedTPCClusters(0.4);
```


filterbit 9



same as filterbit 8, but:

```
esdTrackCutsHTGC->SetClusterRequirementITS(AliESDtrackCuts::kSPD,AliESDtrackCuts::kOff);  
esdTrackCutsHTGC->SetRequireITSRefit(kTRUE);
```

filterbit 8 - alternative LHC10h / 2010 version



```
AliESDtrackCuts* esdTrackCutsHG0 = (AliESDtrackCuts*)jetCuts1006->Clone("JetCuts10001006");  
esdTrackCutsHG0->SetClusterRequirementITS(AliESDtrackCuts::kSPD, AliESDtrackCuts::kAny);
```

```
if(stdCutMode == 1006) {  
    bStdCutsDefined = kTRUE;  
    // TPC  
    TFormula *f1NClustersTPCLinearPtDep = new  
TFormula("f1NClustersTPCLinearPtDep", "70.+30./20.*x");  
    trackCuts->SetMinNClustersTPCLinearPtDep(f1NClustersTPCLinearPtDep, 20.);  
    trackCuts->SetMinNClustersTPC(70);  
    trackCuts->SetMaxChi2PerClusterTPC(4);  
    trackCuts->SetRequireTPCStandAlone(kTRUE); //cut on NClustersTPC and chi2TPC Iter1  
    trackCuts->SetAcceptKinkDaughters(kFALSE);  
    trackCuts->SetRequireTPCRefit(kTRUE);  
    trackCuts->SetMaxFractionSharedTPCClusters(0.4);  
    // ITS  
    trackCuts->SetRequireITSRefit(kTRUE);  
    //accept secondaries  
    trackCuts->SetMaxDCAToVertexXY(2.4);
```

```
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:

