Some slides

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ACO meeting

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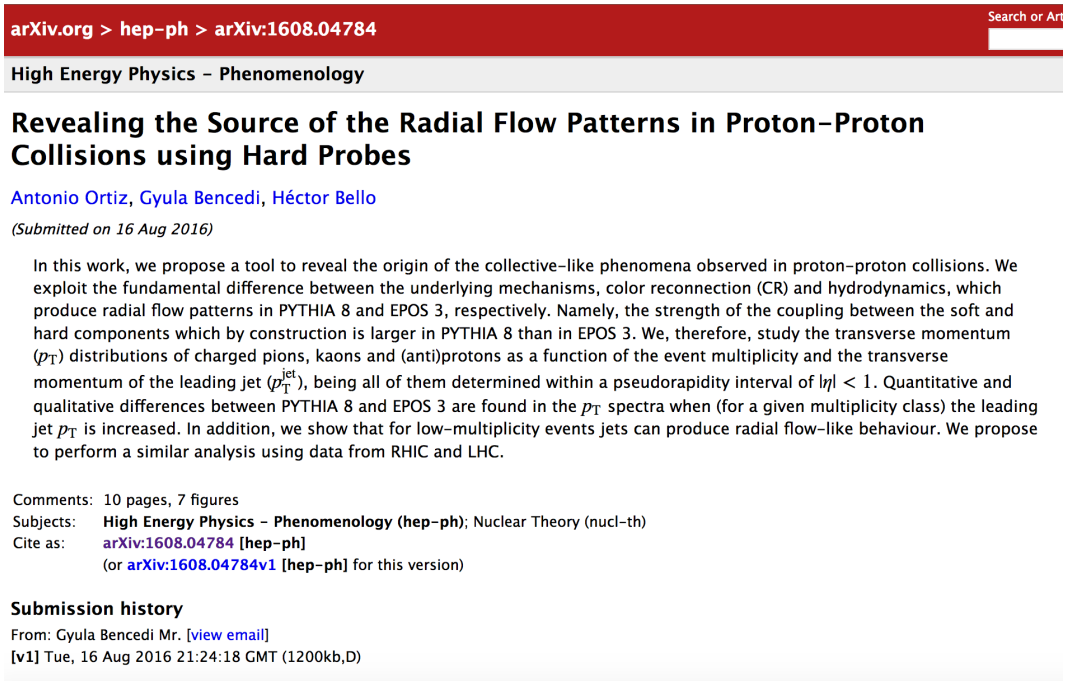
Outline

- Arxiv submited also paper to EPJ C
- Work on TPC only tracks comparison data / MC



arXiv.org > hep-ph > arXiv:1608.04784 Search or Art

High Energy Physics - Phenomenology

Revealing the Source of the Radial Flow Patterns in Proton-Proton Collisions using Hard Probes

Antonio Ortiz, Gyula Bencedi, Héctor Bello

(Submitted on 16 Aug 2016)

In this work, we propose a tool to reveal the origin of the collective-like phenomena observed in proton-proton collisions. We exploit the fundamental difference between the underlying mechanisms, color reconnection (CR) and hydrodynamics, which produce radial flow patterns in PYTHIA 8 and EPOS 3, respectively. Namely, the strength of the coupling between the soft and hard components which by construction is larger in PYTHIA 8 than in EPOS 3. We, therefore, study the transverse momentum (p_{T}) distributions of charged pions, kaons and (anti)protons as a function of the event multiplicity and the transverse momentum of the leading jet ($p_{\mathrm{T}}^{\mathrm{jet}}$), being all of them determined within a pseudorapidity interval of $|\eta| < 1$. Quantitative and qualitative differences between PYTHIA 8 and EPOS 3 are found in the p_{T} spectra when (for a given multiplicity class) the leading jet p_{T} is increased. In addition, we show that for low-multiplicity events jets can produce radial flow-like behaviour. We propose to perform a similar analysis using data from RHIC and LHC.

Comments: 10 pages, 7 figures
Subjects: **High Energy Physics - Phenomenology (hep-ph)**; Nuclear Theory (nucl-th)
Cite as: **arXiv:1608.04784 [hep-ph]**
(or **arXiv:1608.04784v1 [hep-ph]** for this version)

Submission history

From: Gyula Bencedi Mr. [view email]
[v1] Tue, 16 Aug 2016 21:24:18 GMT (1200kb,D)

Analysis and run selection

Software: Aliroot:v5-07-20 Aliphysics:vAN-20160204
Event shape classes: (PWGLF/SPECTRA/Spherocity)
Analysis macros: AddTransverseEventShapeTask.C
AliAnaTransverseEventShapeTask.cxx
AliAnaTransverseEventShapeTask.h

LHC15f pass2: (44.6 mill of evts) (after all ev selection)
LHC15g3a3 Monash Tune (43.2 mill of evts) (after all ev selection)
good runs*:
226500, 226495, 226483, 226476, 226472, 226468, 226466,
226452, 226445, 226444, 226225, 226220, 226170, 226062,
225768, 225766, 225763, 225762, 225757, 225753, 225719,
225717, 225716, 225710, 225709, 225708, 225707, 225705,
225587, 225586, 225579, 225578, 225576, 225322, 225315,
225314, 225313, 225310, 225309, 225307, 225305, 225106,
225052, 225051, 225050, 225043, 225041, 225037, 225035,
225031, 225026

(*) http://twiki.cern.ch/twiki/bin/viewauth/ALICE/PWGLF13TeVanalysis

Event, track and physics selection

Event Selection

Trigger: KINT7
Rejection of AliESDEvent::IsIncompleteDAQ
Vertex selection
SPD Pile-up rejection
Background rejection
Multivertex Pile-up rejection
low diagonal cut OFO &V0M applied
Vertex conditions for 2015 data (NEW added) (this reduce the sample of evts)

https://twiki.cern.ch/twiki/bin/view/ALICE/PWGPPEvSelRun2pp

**https://twiki.cern.ch/twiki/bin/view/ALICE/AliceHMTFCodeSnippets#Physics_Selection

Physics Selection

- MinNCrossedRowsTPC = 120; *
- MinRatioCrossedRowsOverFindableClustersTPC=0.8;
- MaxFractionSharedTPCCluster = 0.4;
- Maxchi2perTPCcl=4.;
- Max dcaz ITSTPC=2.0;
- SetDCAToVertex2D(kFALSE);
- SetRequireSigmaToVertex(kFALSE);
- RequireTPCRefit(kTRUE);
- RequireITSRefit(kTRUE);
- AcceptKinkDaughters(kFALSE);
- MaxDCAToVertexXYPtDep("0.0182+0.0350/pt^1.01"); *
- SetMaxChi2TPCConstrainedGlobal(36.);

Track selection taken for each analysis

- So Analysis, Hybrid-track cuts for primary charged particles with $|\eta|<0.8$ and $0.15<p_T<10$ GeV/c.
- $\langle p_T \rangle$ Analysis, Golden-track cuts with $|\eta|<0.8$ and $0.15<p_T<10$ GeV/c.
- Multiplicity:
  - Reference multiplicity selection with $|\eta|<0.8$
  - V0M percentil selection

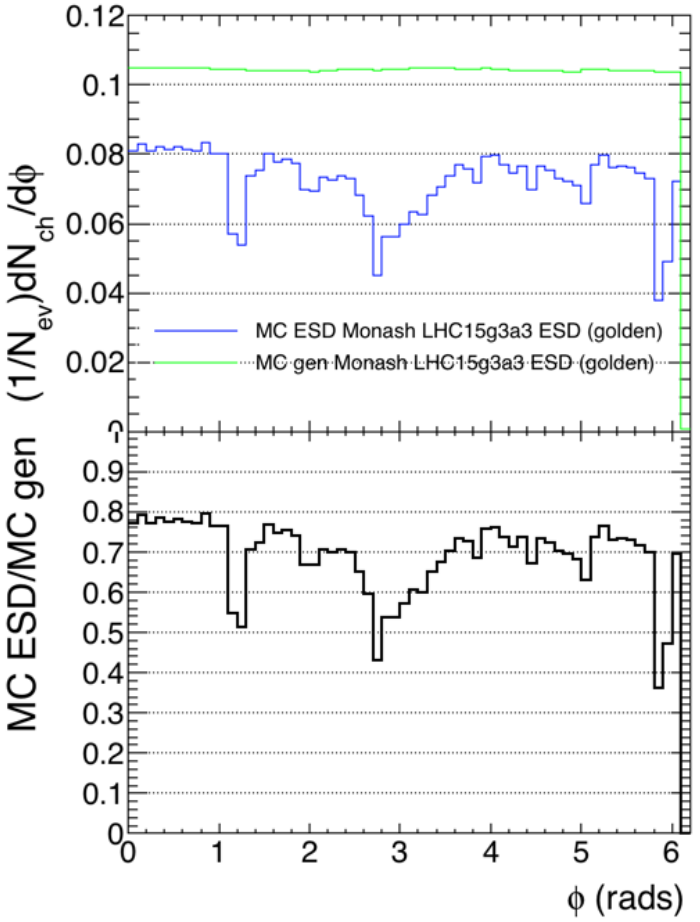
To study MC/DATA dependence for different cuts: ITSTPC2011 golden DATA vs MC NEW

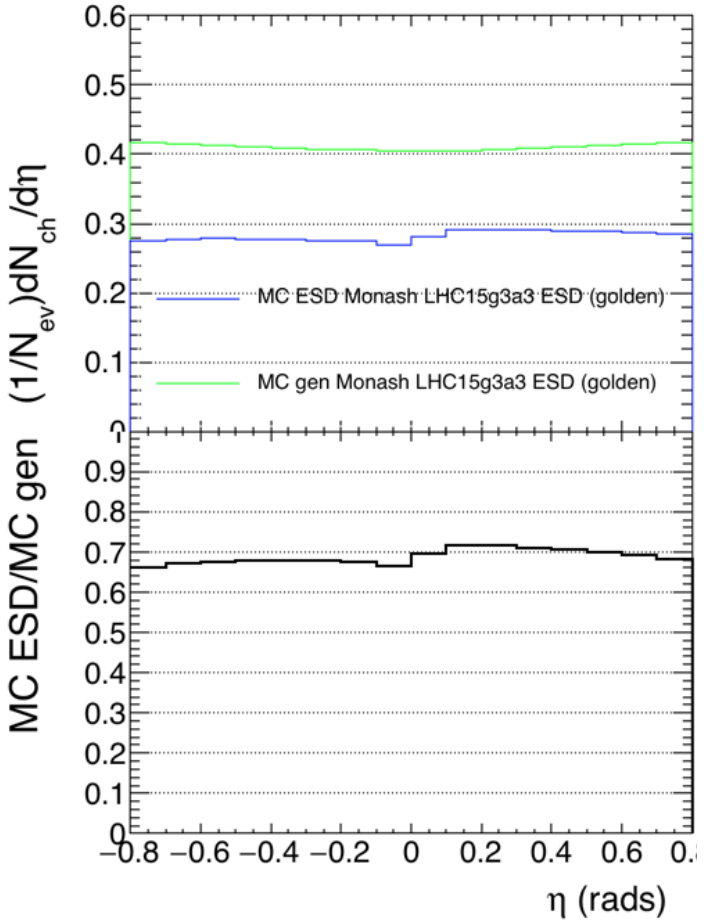
ITSTPC2011 golden

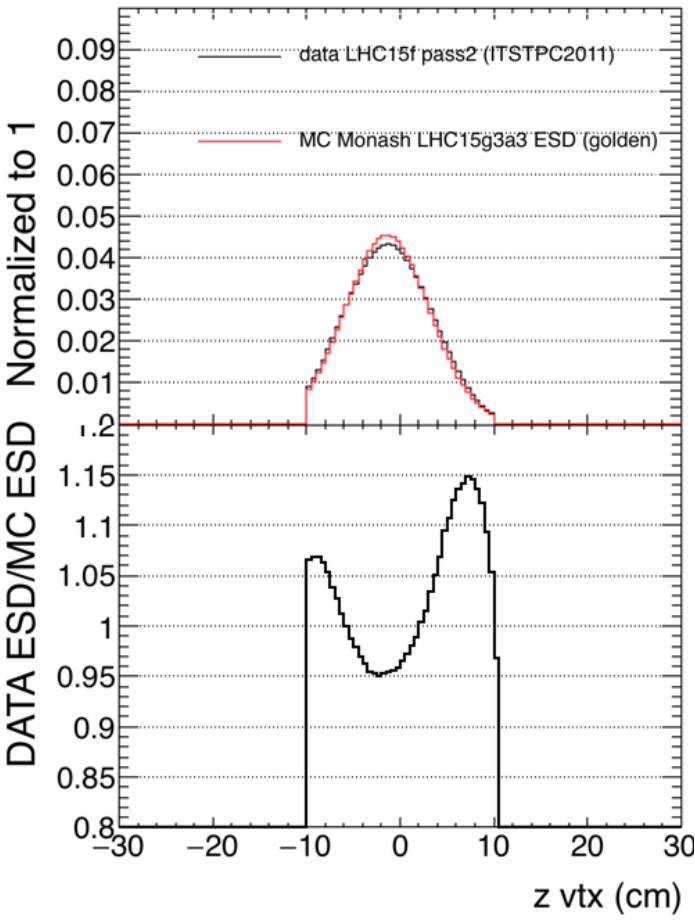
```
AliAnalysisFilter* trackFilterGolden = new AliAnalysisFilter("trackFilter");

    AliESDtrackCuts* esdTrackCuts = new AliESDtrackCuts("AliESDtrackCuts");
      esdTrackCuts->SetRequireTPCRefit(kTRUE);
      esdTrackCuts->SetAcceptKinkDaughters(kFALSE);
      esdTrackCuts->SetMinNCrossedRowsTPC(120);
      esdTrackCuts->SetMinRatioCrossedRowsOverFindableClustersTPC(0.8);
      esdTrackCuts->SetMaxChi2PerClusterTPC(4.0);
      esdTrackCuts->SetMaxFractionSharedTPCClusters(0.4);
      esdTrackCuts->SetRequireITSRefit(kTRUE);
      esdTrackCuts->SetClusterRequirementITS(AliESDtrackCuts::kSPD,AliESDtrackCuts::kAny);
      esdTrackCuts->SetMaxChi2PerClusterITS(36.);
      esdTrackCuts->SetDCAToVertex2D(kFALSE);
      esdTrackCuts->SetRequireSigmaToVertex(kFALSE);
      esdTrackCuts->SetMaxDCAToVertexZ(2.0);
      esdTrackCuts->SetMaxDCAToVertexXYPtDep("0.0182+0.0350/pt^1.01");
      esdTrackCuts->SetMaxChi2TPCConstrainedGlobal(36.);
  trackFilterGolden->AddCuts(esdTrackCuts);
```

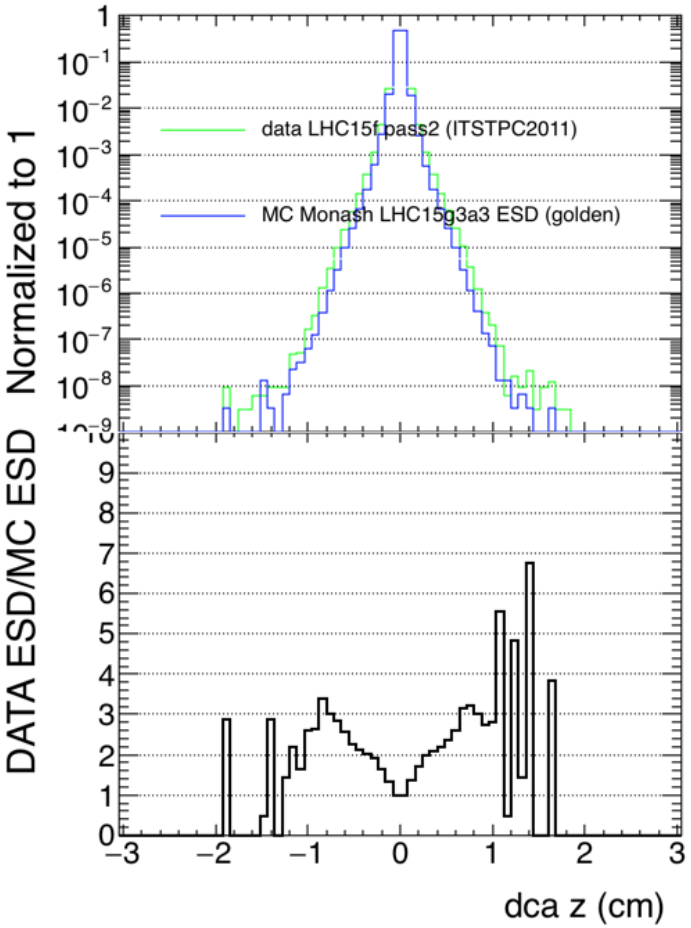
To study MC/DATA dependence for different cuts: -ITSTPC2011 golden DATA vs MC

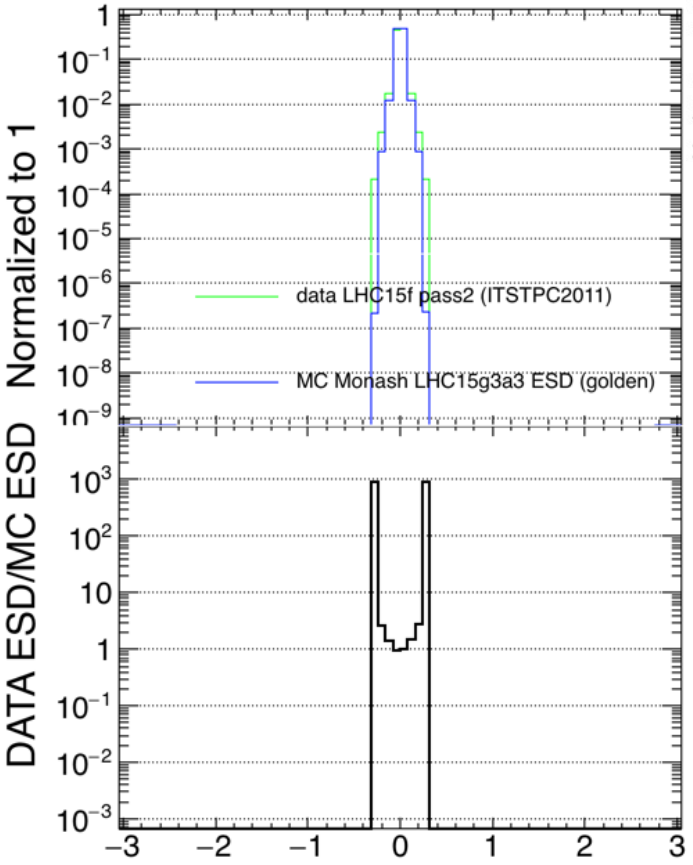


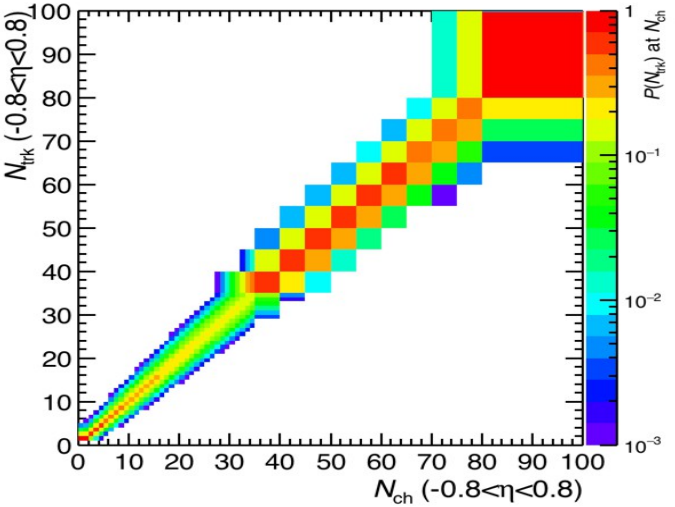




To study MC/DATA dependence for different cuts: -ITSTPC2011 vs golden







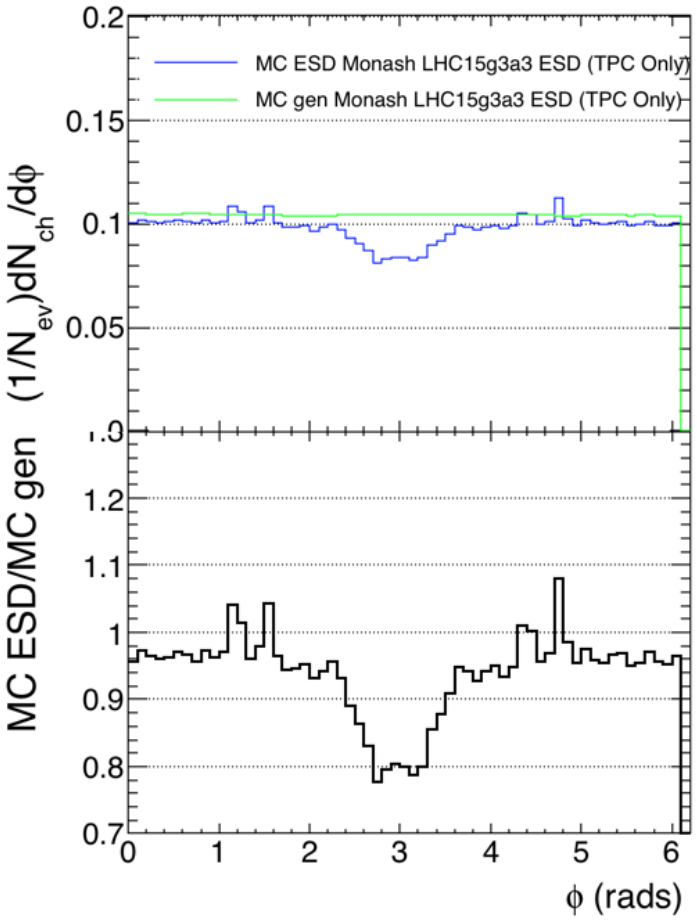

```
const Int_t multbins = 47;
Double_t
nchBins[multbins+1]={ 0,1,2
,3,4,5,6,7,8,9,10,11,12,13,
14,15,16,17,18,19,20,21,22,
23,24,25,26,27,28,29,30,31,
32,33,34,35,40,45,50,55,60,
65,70,75,80,100,120,140 };
```

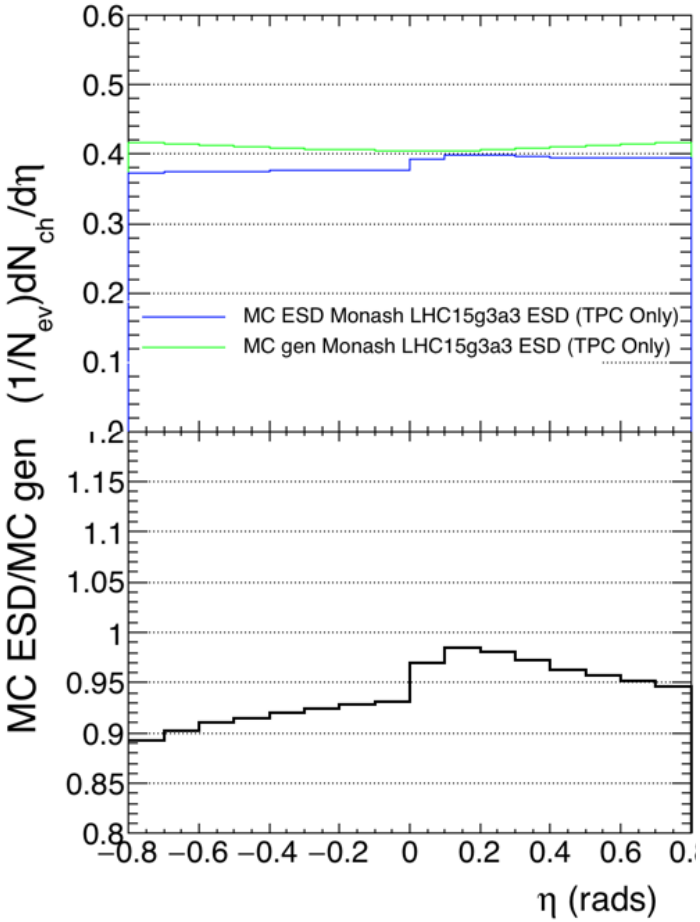
To study MC/DATA dependence for different cuts: TPC Only DATA vs MC NEW

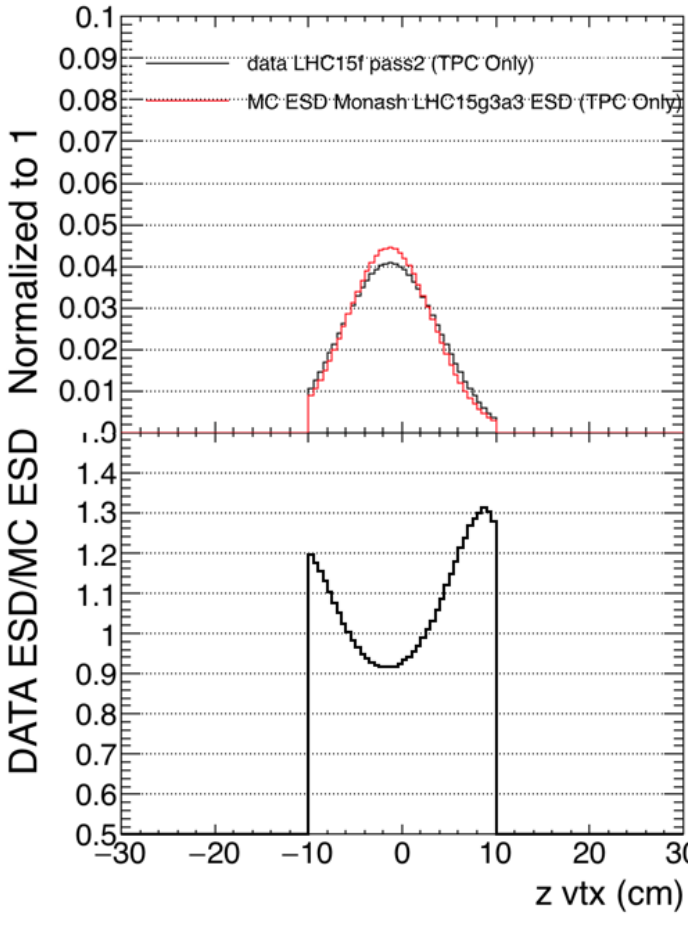
TPC Only cuts

```
AliAnalysisFilter* trackFilterTPCOnly = new AliAnalysisFilter("trackFilter");
      AliESDtrackCuts* esdTrackCuts = new
AliESDtrackCuts("AliESDtrackCuts");
            esdTrackCuts->SetAcceptKinkDaughters(kFALSE);
            esdTrackCuts->SetMinNClustersTPC(70);
            esdTrackCuts->SetMaxChi2PerClusterTPC(4);
            esdTrackCuts->SetDCAToVertex2D(kTRUE);
            esdTrackCuts->SetRequireSigmaToVertex(kFALSE);
            esdTrackCuts->SetMaxDCAToVertexZ(3.2);
            esdTrackCuts->SetMaxDCAToVertexXY(2.4);
       trackFilterTPCOnly->AddCuts(esdTrackCuts);
```

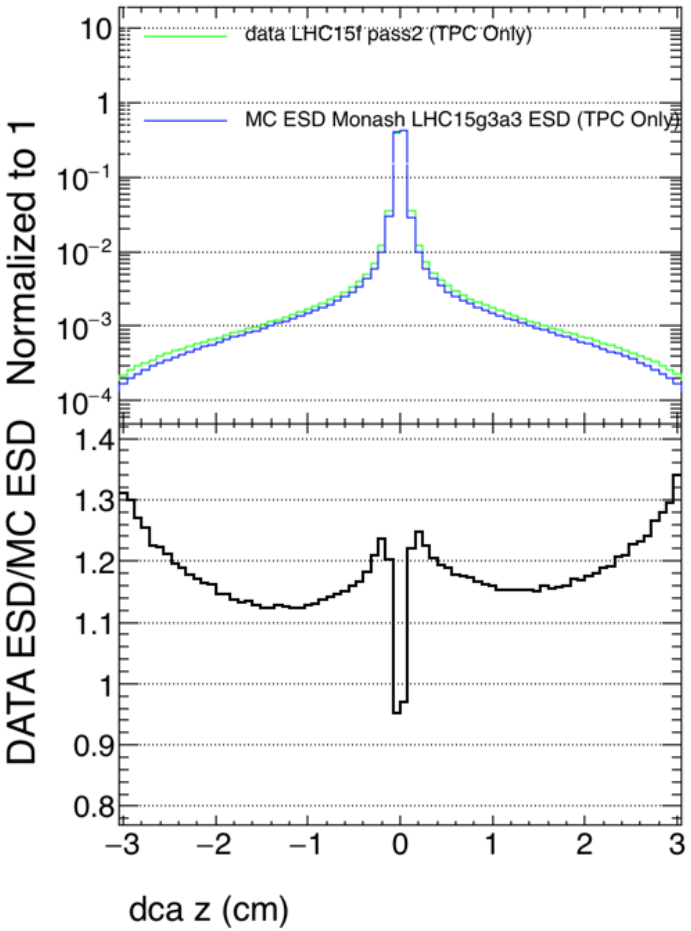
To study MC/DATA dependence for different cuts: TPC Only DATA vs MC NEW

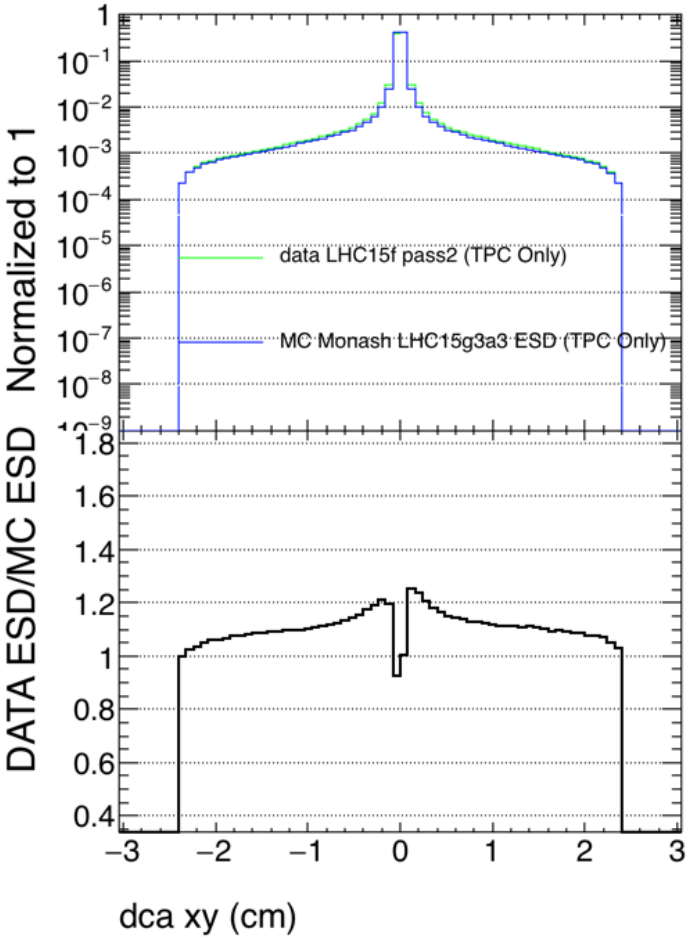


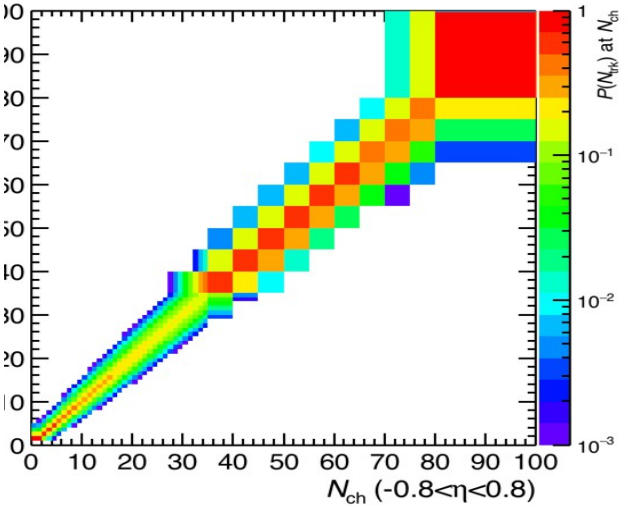




To study MC/DATA dependence for different cuts: -TPC Only Data vs MC NEW








```
const Int_t multbins = 47;
Double_t
nchBins[multbins+1]={ 0,1,2
,3,4,5,6,7,8,9,10,11,12,13,
14,15,16,17,18,19,20,21,22,
23,24,25,26,27,28,29,30,31,
32,33,34,35,40,45,50,55,60,
65,70,75,80,100,120,140 };
```

To do for continue

same comparison DATA/MC:

-golden ITSTPC2011cuts (done)

-TPC only cuts (done)

-Hybrid cuts (data ready, MC under grid)