Sphero(i)city technicalities

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Outline

- Response normalized for So_m vs So_t for EPOS in bins of the size of 10% pc and Nch bin of size 1.
- Proyections of Spherocity for different shape
- Participation on ALICE master class

- Software
  - AliRoot: v5-08-13a-1 AliPhysics: vAN-20160716-1 ROOT: v5-34-30-alice5-alice-1
- Datasets
  - Good runs (according with RCT) LHC15f pass2
  - LHC15g3a3 (Pythia 8 - Monash 2013) anchored to LHC15f pass2
- Event selection
  - AliVEvent::kINT7, AnalysisUtils::IsSPDClusterVsTrackletBG(), IsPileupFromSPDInMultBins(), IsIncompleteDAQ()
- Vertex
  - For events with both SPD and Track vertices reconstructed, their separation along the *z*-coordinate was required to be smaller than 5 mm

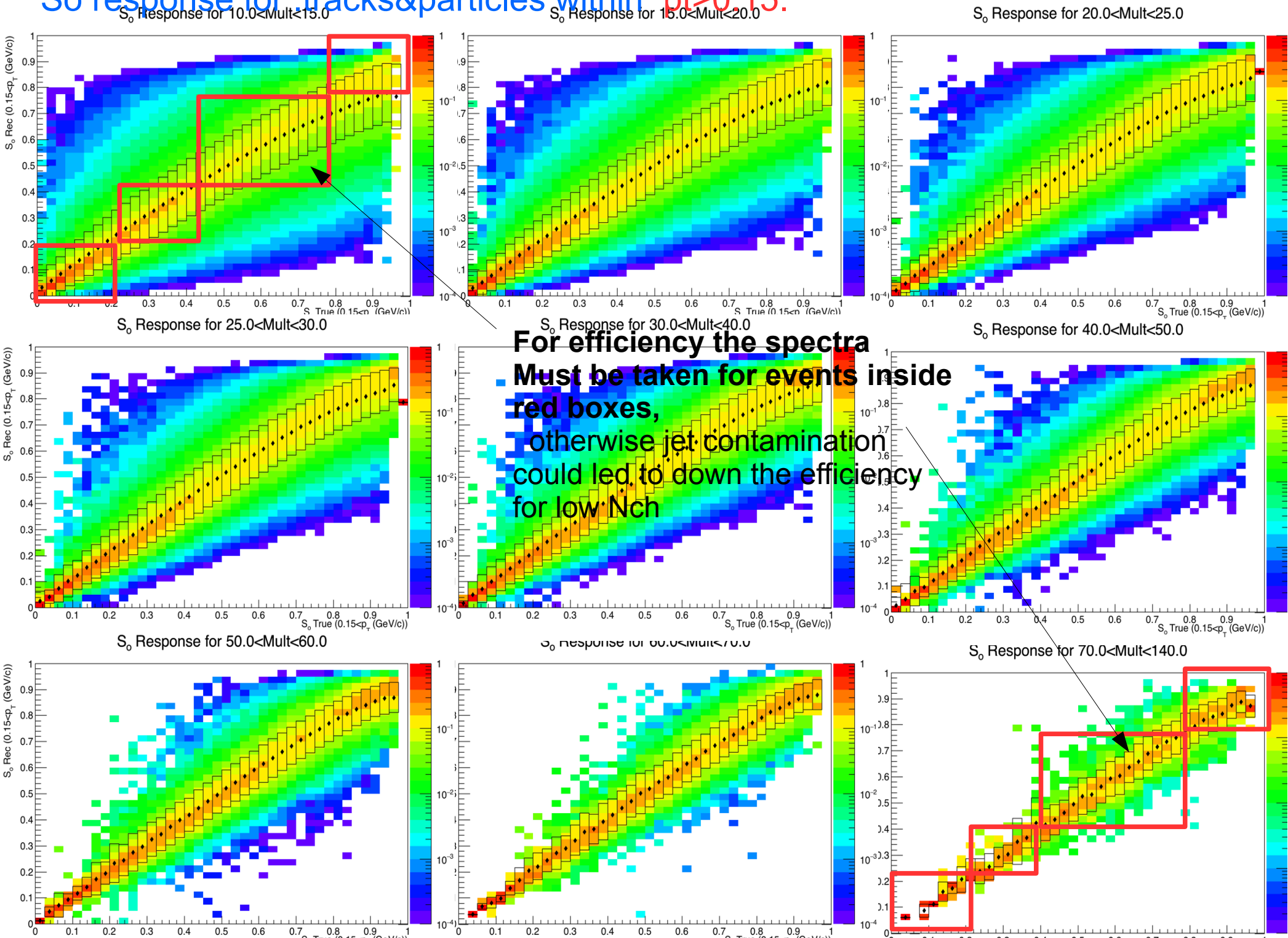
- Sphero(i)city is reconstructed using more than two tracks with transverse momentum greater than 0.15 GeV/c and within $|\eta| < 0.8$. Three sets of cuts were tested:
  - TPC: GetStandardTPCOnlyTrackCuts()+TPCrefit
  - Hybrid: CreateTrackCutsPWGJE(10001008)+CreateTrackCutsPWGJE(10011008)
  - Standard: GetStandardITSTPCTrackCuts2011(kTRUE,1)
- At the end we decided to use the TPC track cuts (global tracks which satisfy GetStandardTPCOnlyTrackCuts()+TPCrefit). More details can be found here:

  https://aliceinfo.cern.ch/Notes/node/529
- In this presentation, results for the reference estimator are discussed
  - **GetReferenceMultiplicity(fESD, AliESDtrackCuts::kTrackletsITSTPC, 0.8)**

- pp data @ 13 TeV
- Period: LHC15f pass2
- Runs: 225031 225576 225757 226476 225035 225578 225762 226483 225037 225579 225763 226495 225041 225580 225766 226500 225043 225582 225768 225050 225586 226062 225051 225587 226170 225052 225707 226220 225106 225708 226225 225305 225709 226444 225307 225710 226445 225309 225716 226452 225313 225717 226466 225314 225719 226468 225322 225753 226472
- 48 M events were analyzed
- Software: AliRoot::v5-08-13a-1, AliPhysics::vAN-20160716-1
  - According with Evgeny's talk: https://indico.cern.ch/event/489470/, using recent software version: physics selection now implements: new background + pileup cuts
- kINT7 trigger, isIncompleteDAQ
- We use the recommended vertex selection for 13 TeV pp analyses:

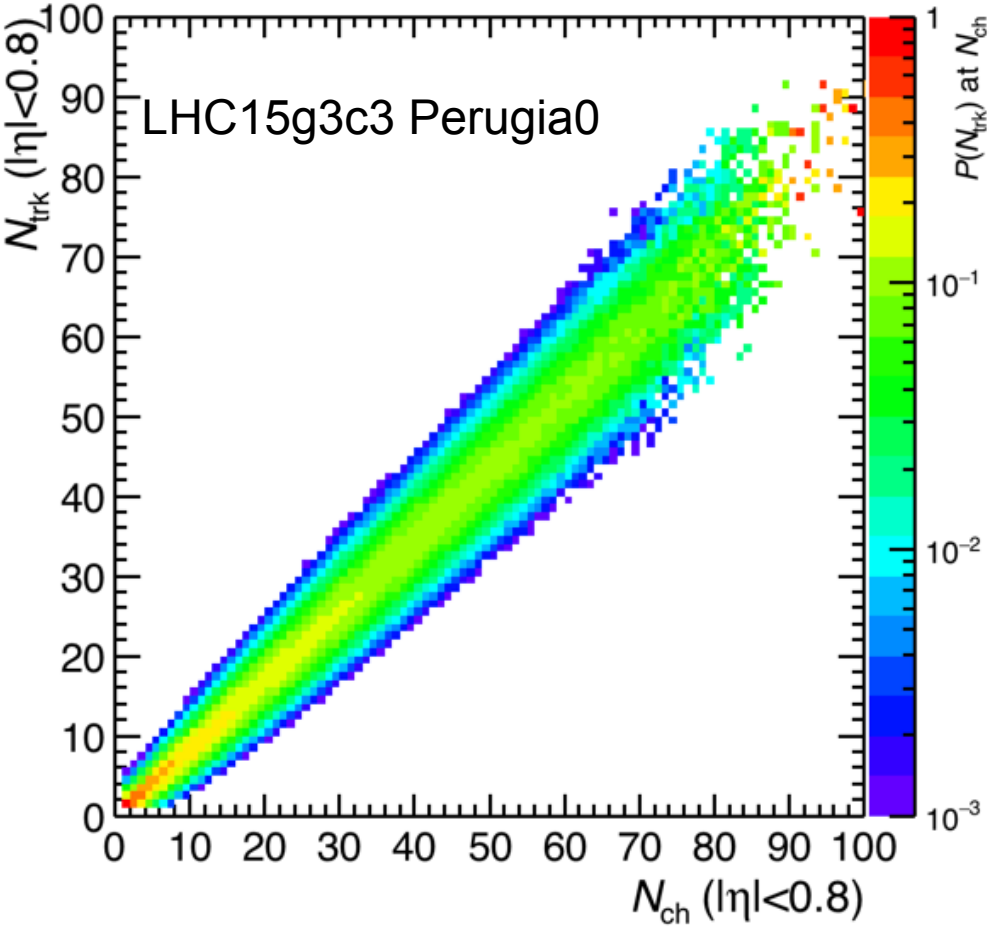
https://twiki.cern.ch/twiki/bin/view/ALICE/PWGPPEvSelRun2pp

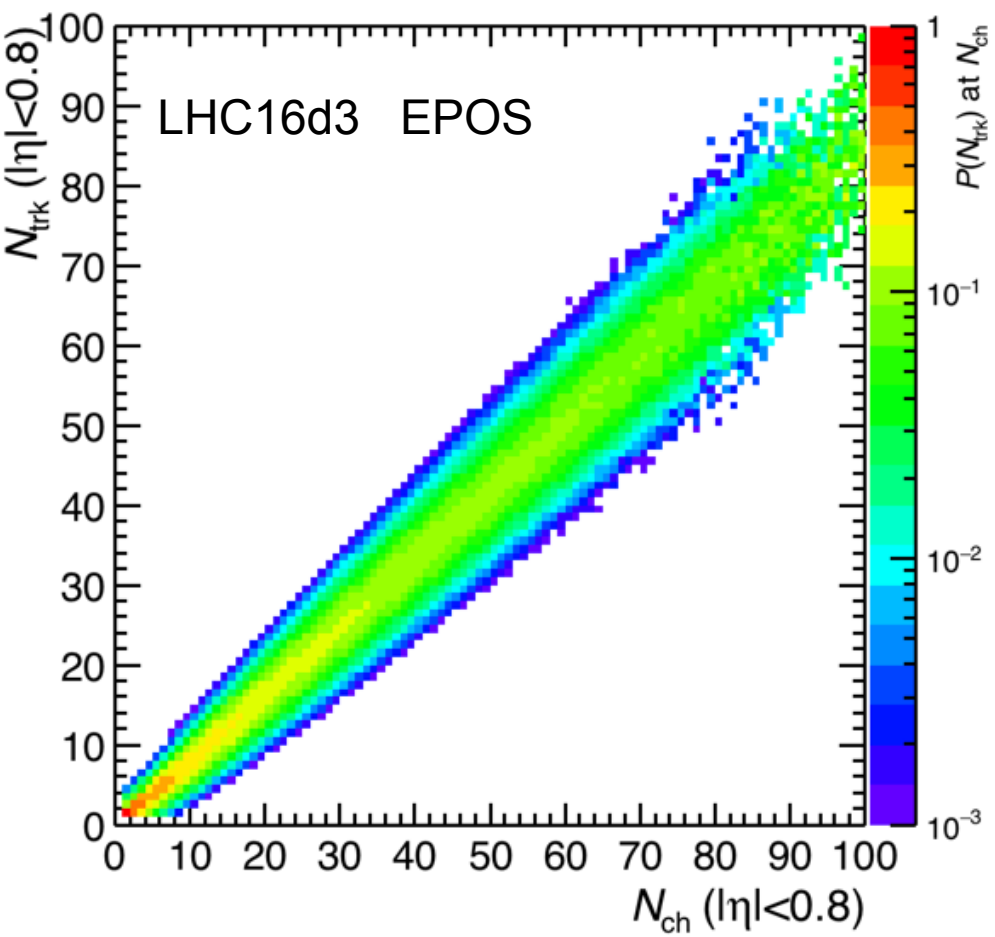
So response for tracks&particles within pt>0.15.



For efficiency the spectra Must be taken for events inside red boxes,
otherwise jet contamination could led to down the efficiency for low Nch

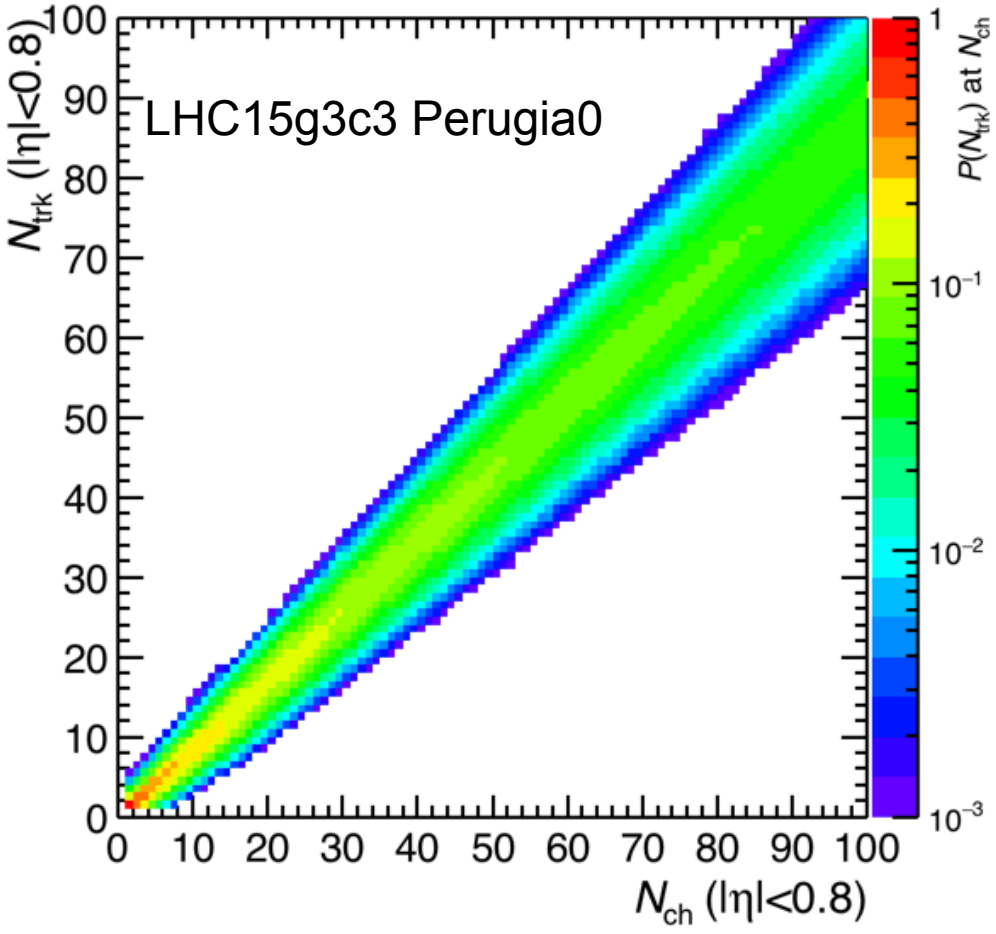
- Nch response matrix
- This was done with Perugia 0, and EPOS

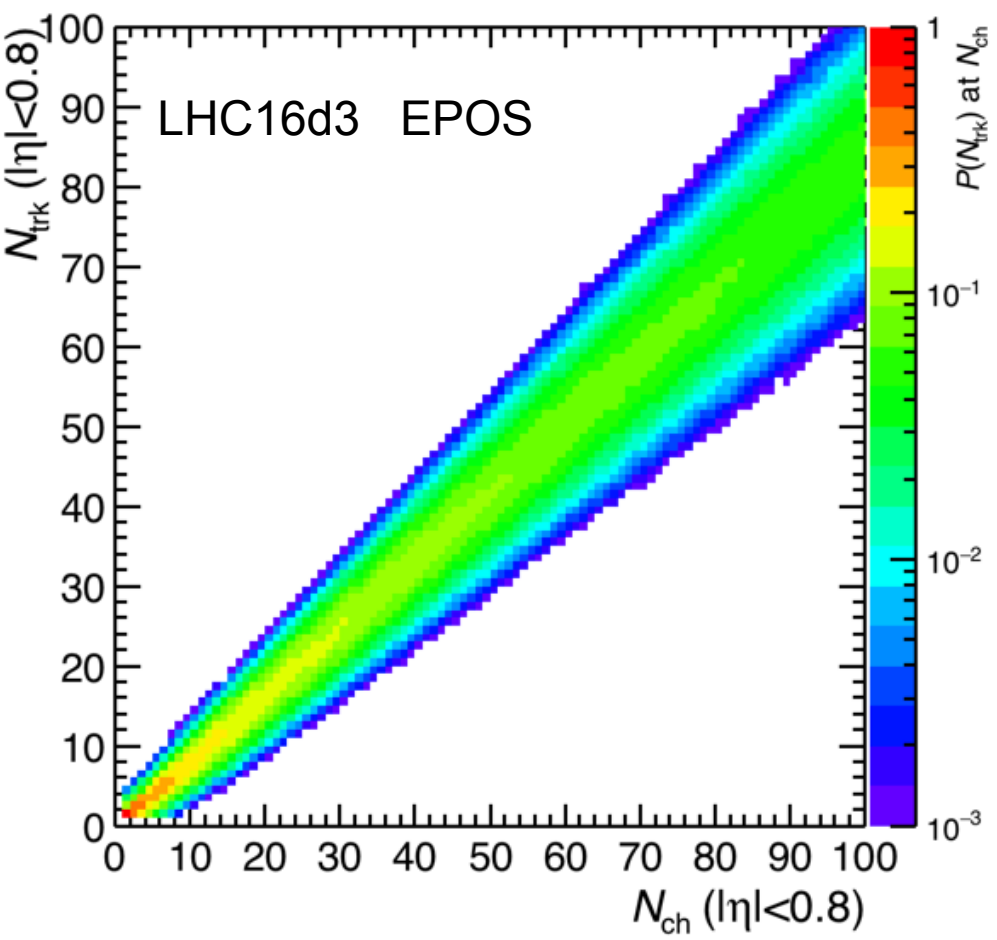




High statistics for EPOS-LHC

- Nch response matrix extrapolated
- This was done with Perugia 0, and EPOS





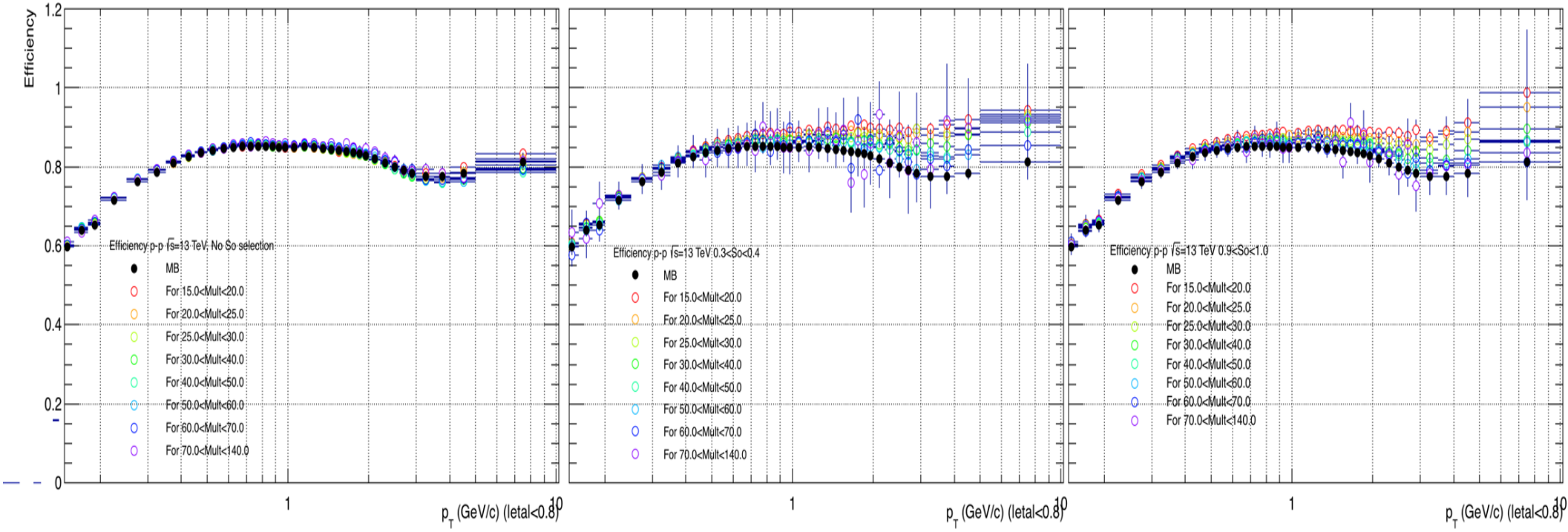
We will use EPOS-LHC for correction

- # Efficiency for EPOS-LHC (LHC16d3)

No So selection

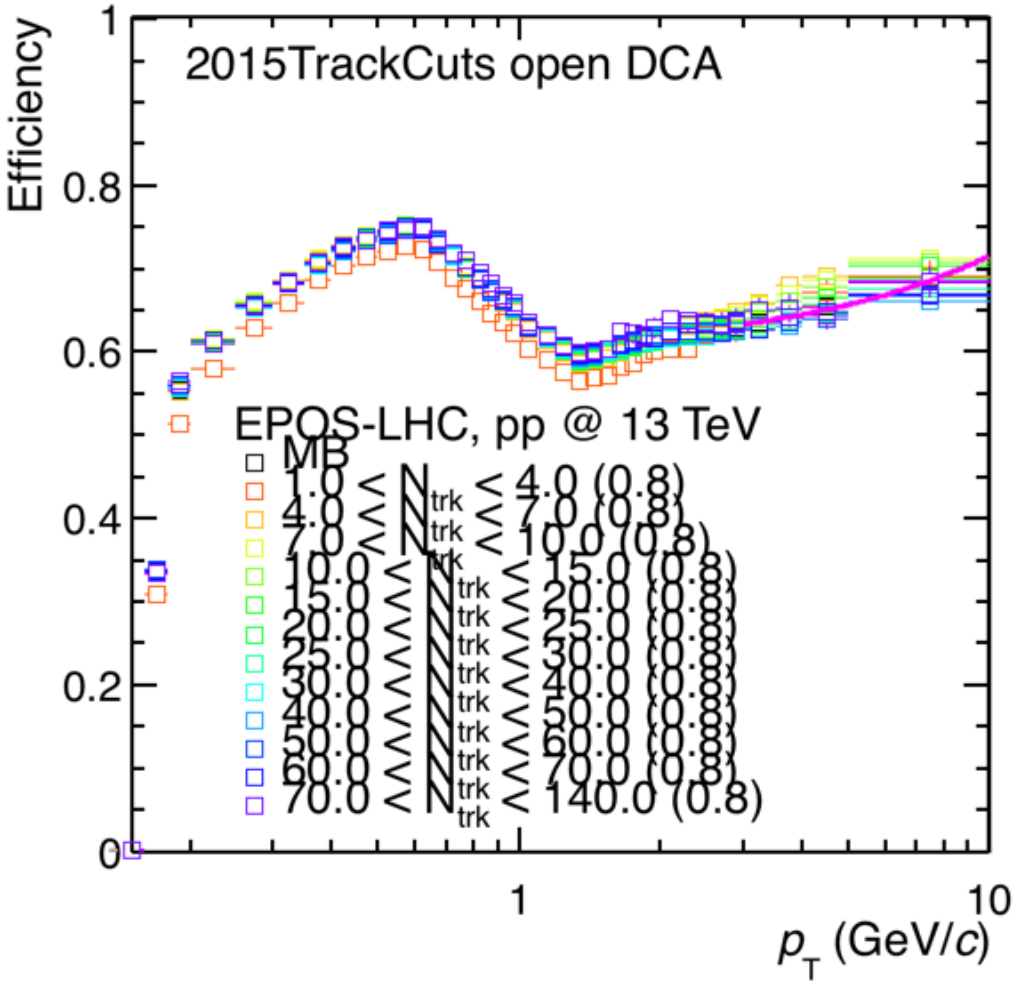
Jetty
0%< So_t & So_r<10%

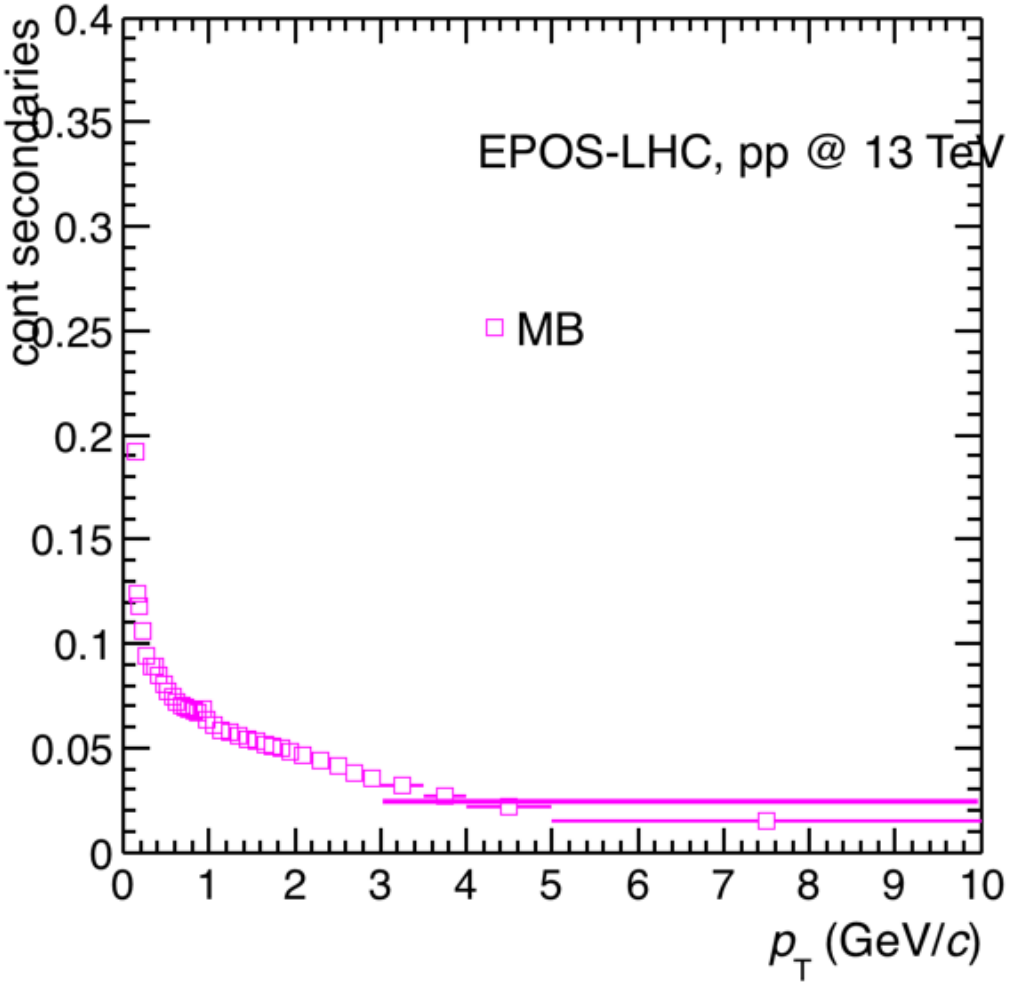
Isotropic
90%<So_t & So_r<100%



We will use MB for correction

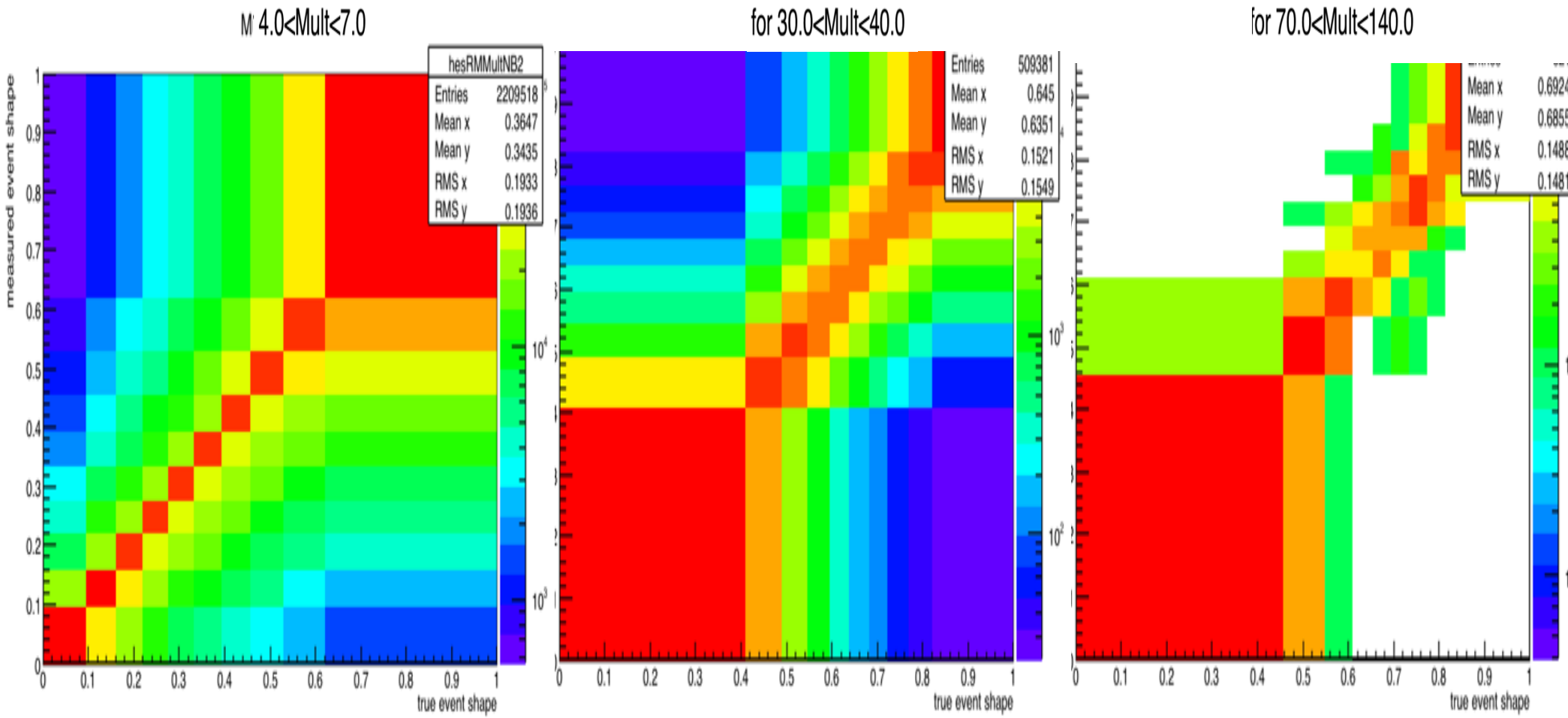
- Efficiency and secondaries for EPOS-LHC





So correlation (som vs sot in bins corresponding to 10%pc)

- This was done with Perugia 0, in order to unfold Monash as data

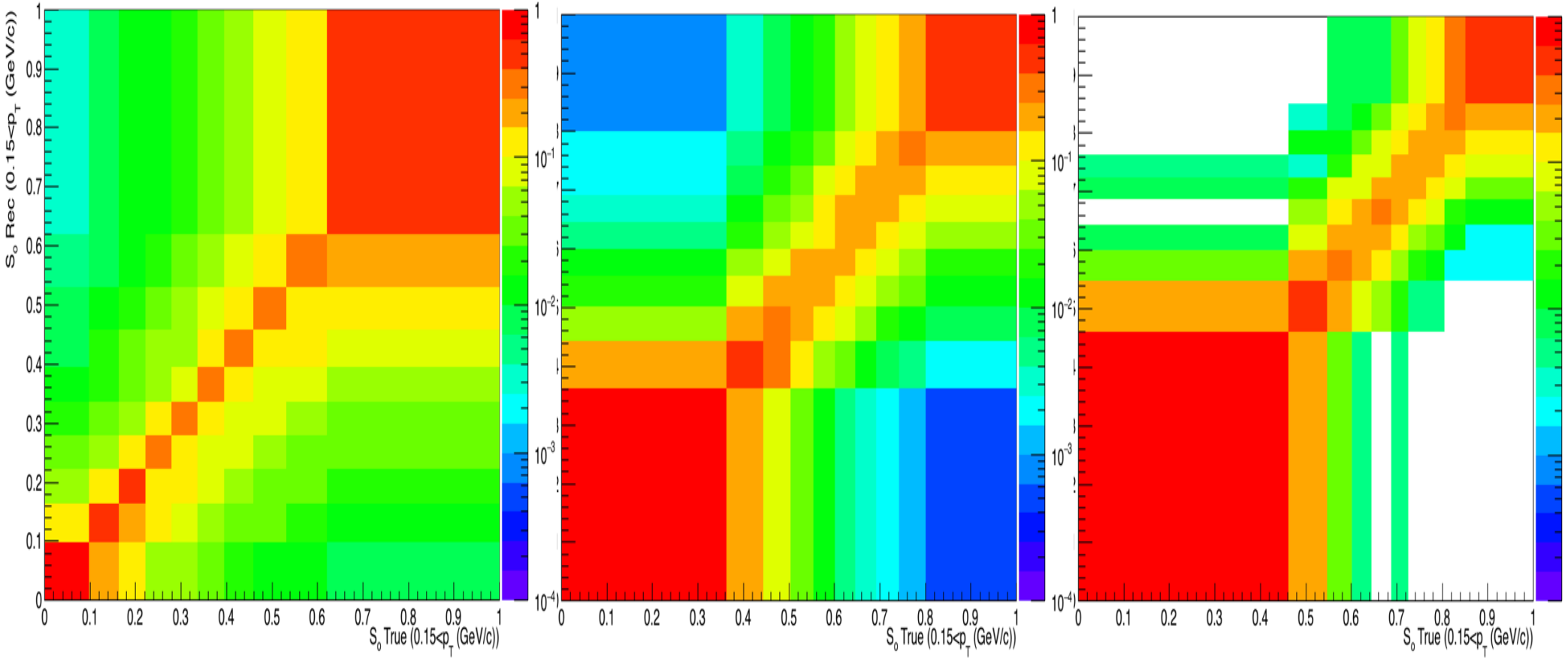


All entries to 10% of Sopc are of the same order

So response NORMALIZED (som vs sot in bins corresponding to 10%pc)

- This was done with EPOS, in order to unfold Monash as data

Nch=5 Nch=25 Nch=60



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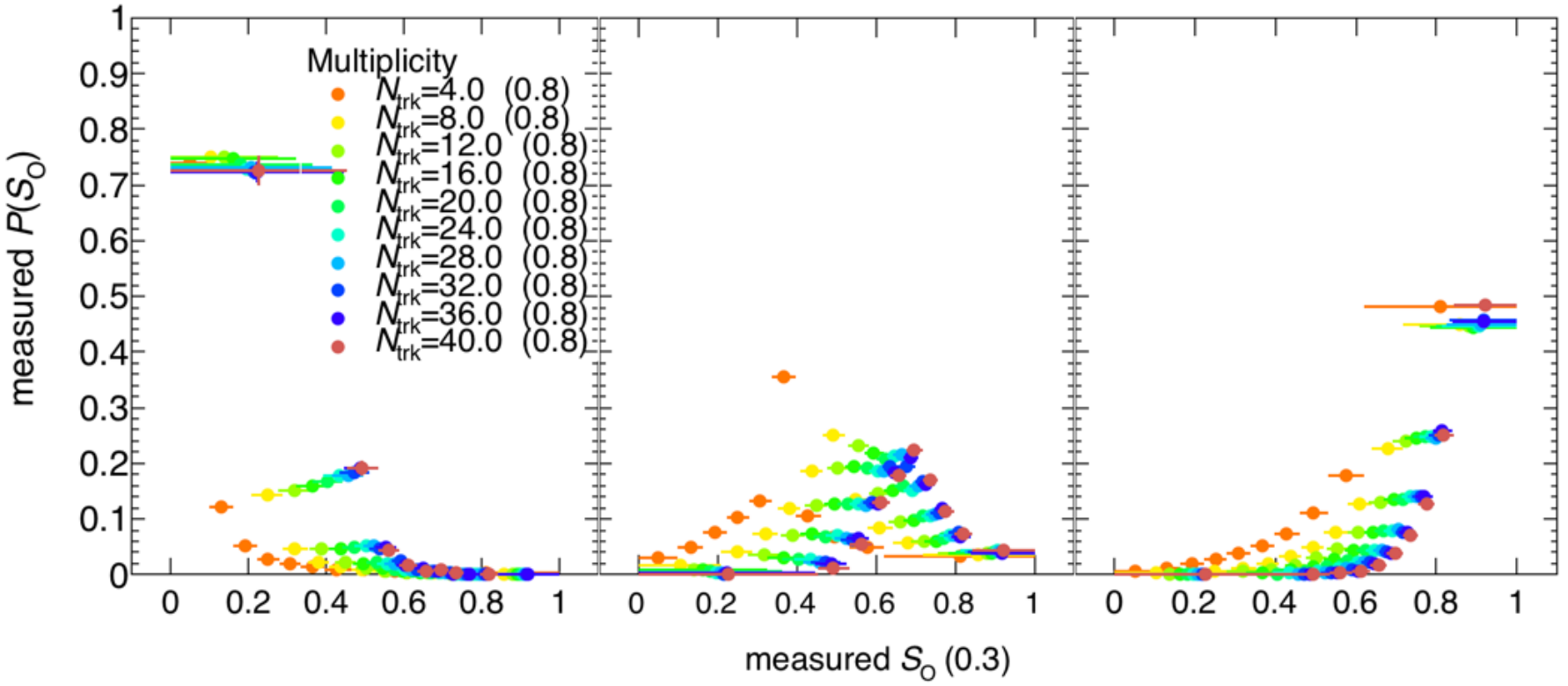
Proyections

Jetty intermediate Isotropic



Conclusions

- Spherocity response matrix and proyection for EPOS-LHC in each bin of Nch and in spherocity bins corresponding to the 10% So perc ready for corrections

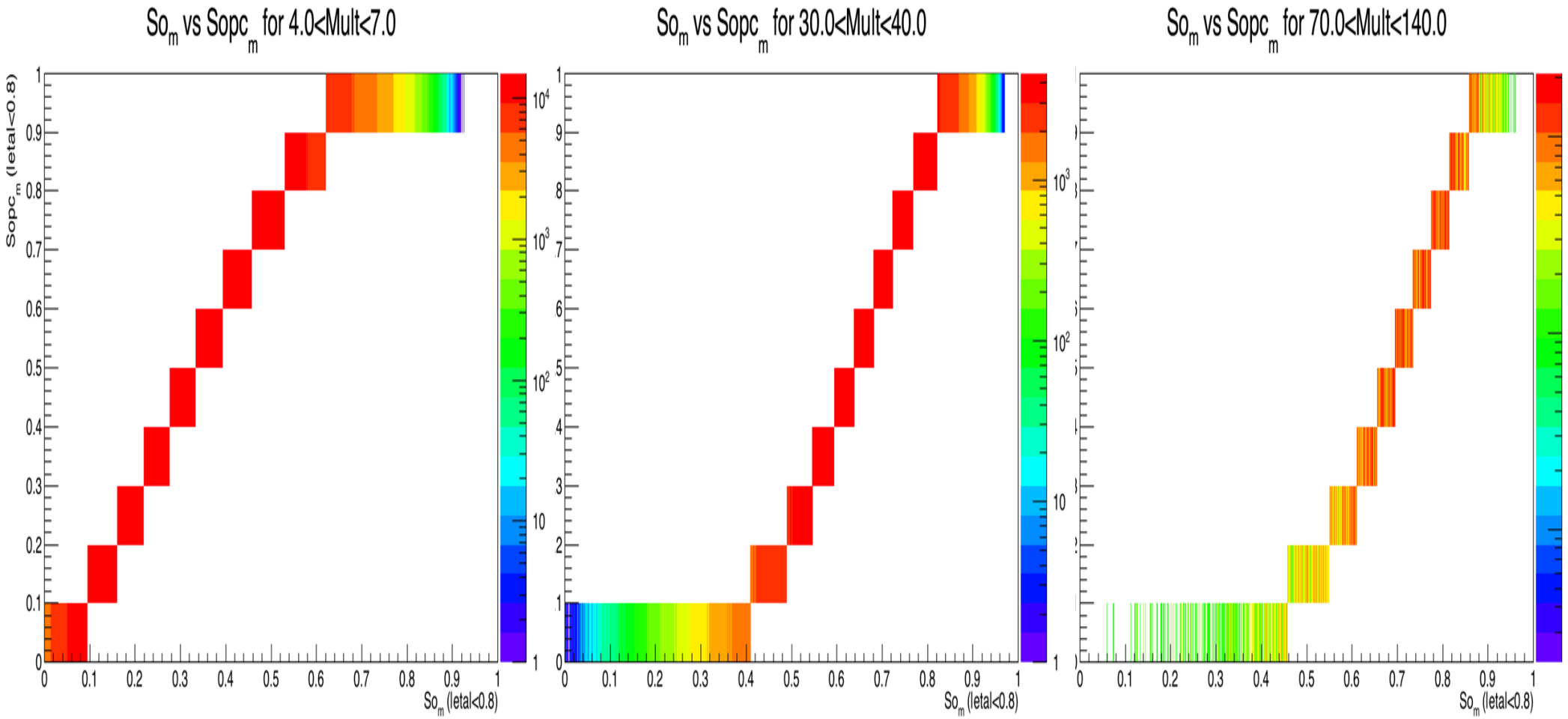
To do

- Get the <pt> spectra in So bins of Monash and unfold with EPOS-LHC.
- Do the same with data.

Backup

So response (som vs somperc)

- The idea: to get Soperc response matrix (Sopc_t vs Sopc_m)



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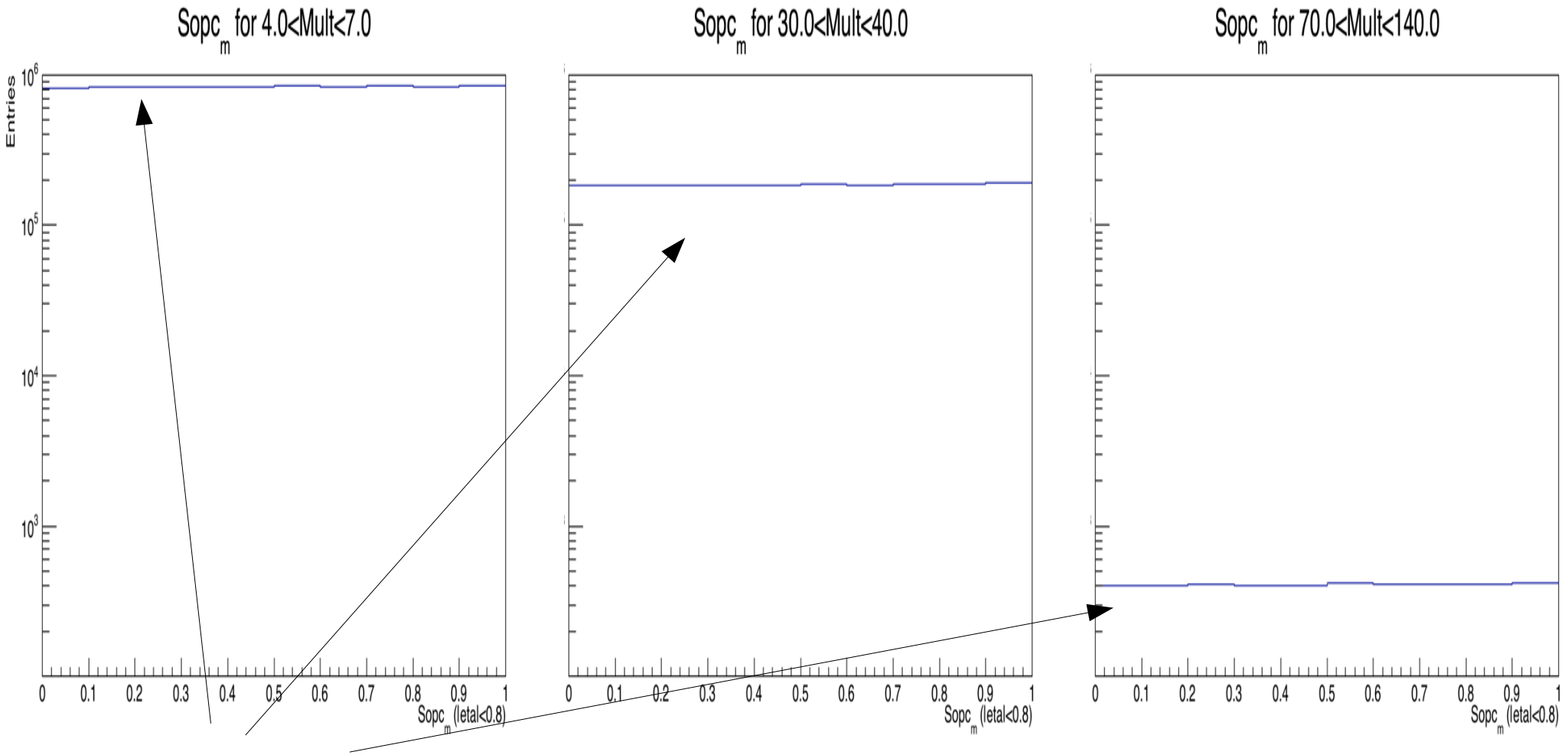

All entries to 10% of Sopc are of the same order