Tracking Efficiency Task - Run 17 pp Embedding

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Motivation

https://drupal.star.bnl.gov/STAR/system/files/tracking_efficiency_uncertainty_2_0.pdf

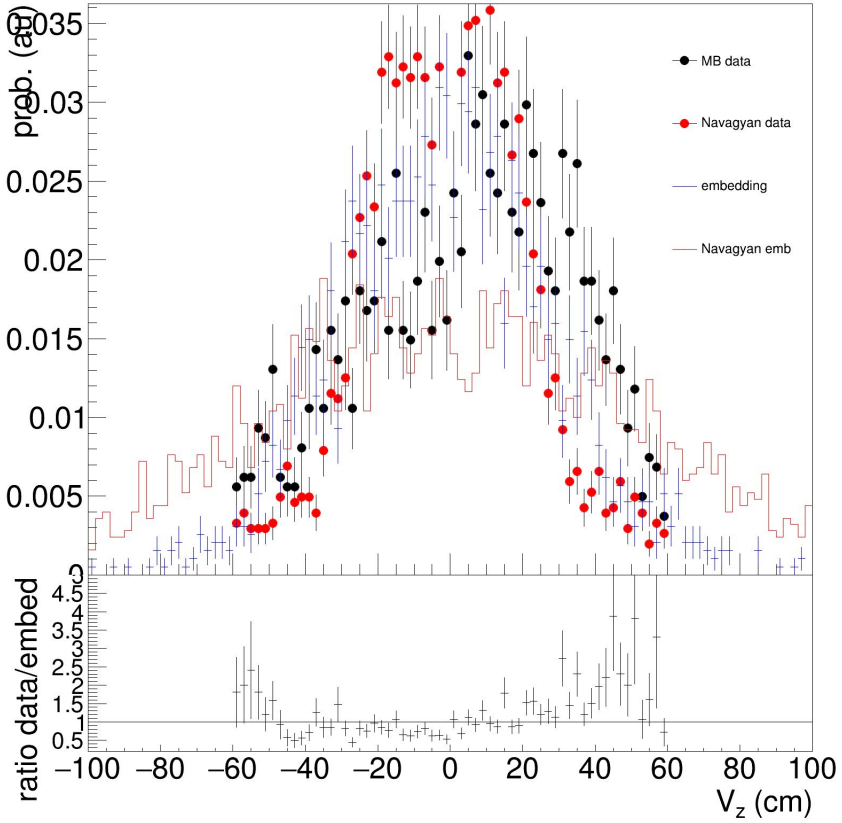
- Reproduce Dmitry Kalinkin's tracking efficiency analysis in 2012 pp to the point of confidence in the embedding code - this was done in SL13b
- Compare track-level qualities between embedding and MB data
- Differences between SL12d/SL12d_embed and SL13b_embed clear (see previous presentations at the Tracking Eff webpage)
- No significant difference between embedding and data in the same library - code works
- Main focus on 2017 pp at 510 GeV

Analysis

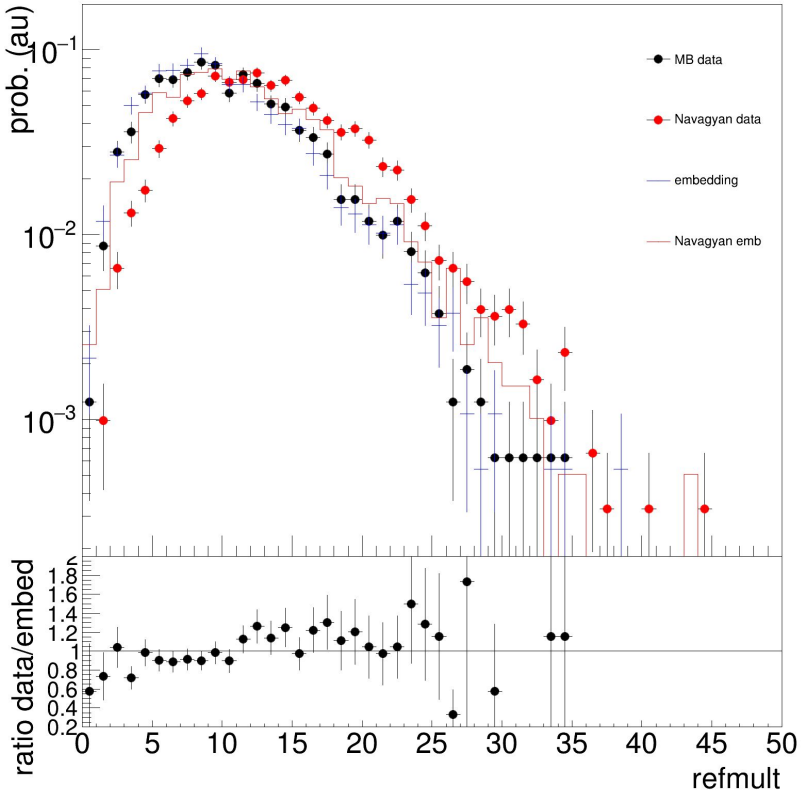
- Embedding: simulated Pythia 6 (STAR tune) 510 GeV pp events embedded into zero bias pp data run 18053104
- Data: Official picoDst/MuDst production from run 18053104, VPDMB-30 trigger (id 24/570001)
- **DbV20200225 pp2017a StiCA btof mtd mtdCalib PicoVtxDefault PicoCovMtxWrite fmsDat fmsPoint fpsDat BEmcChkStat OSpaceZ2 OGridLeakFull -evout -hitfilt**
- Navagyan embedding (Temple group): Pythia 6 (STAR tune) pThat 2-3 GeV embedded into ?zero bias pp data, runs 18054011,18059009,18059017,18059054
- Navagyan data: picoDsts from same runs as embedding
- Plots only from a small sample (~1000 events), normalized by no. of accepted events, not normalized by bin width
- $|V_Z| < 60$ cm, vertex rank > 0, highest ranking vertex
- $|\eta| < 2.5$, $p_T > 0.2$ GeV
- nHitsFit > 12, nHitsFit/nHitsMax > 0.51, 1 hit in outer TPC
- DCA < 2 cm if track pT < 0.5 GeV
  (2.5 cm − pT · (1 cm/GeV)) if 0.5 GeV ≤ track pT < 1.5 GeV
  1 cm if 1.5 GeV ≤ track pT

Vertex distribution

Looks consistent at first glance

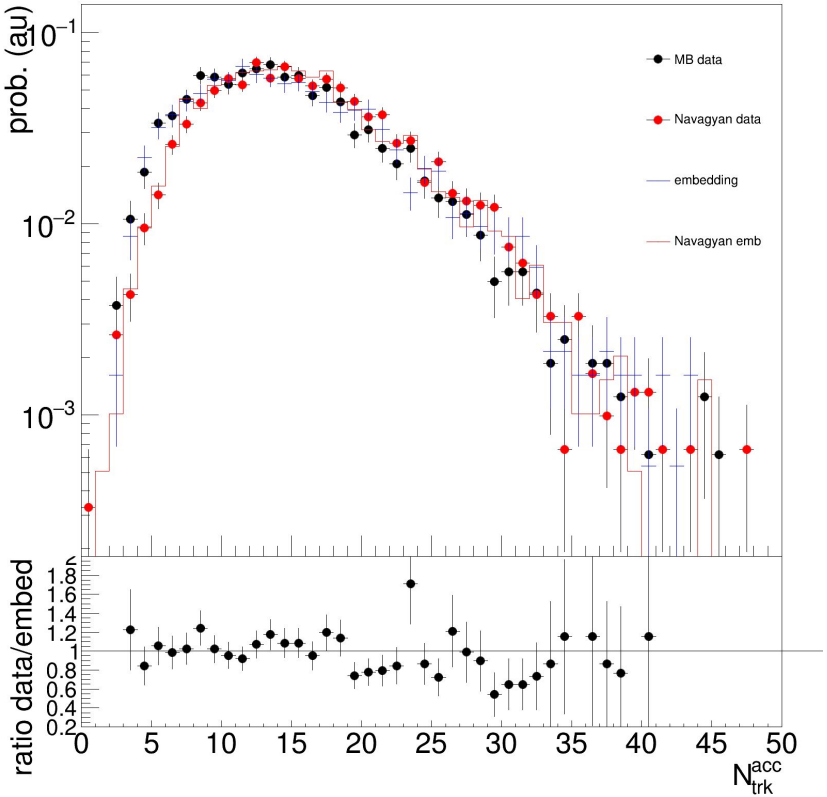


Refmult



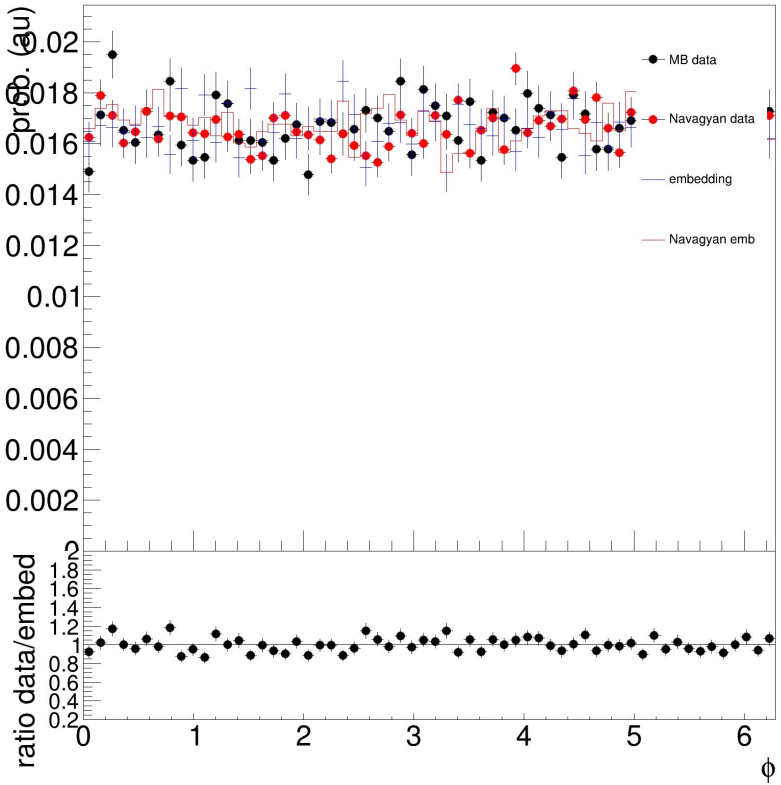
Identical code (except no trigger selection in emb)

N_{trk} accepted



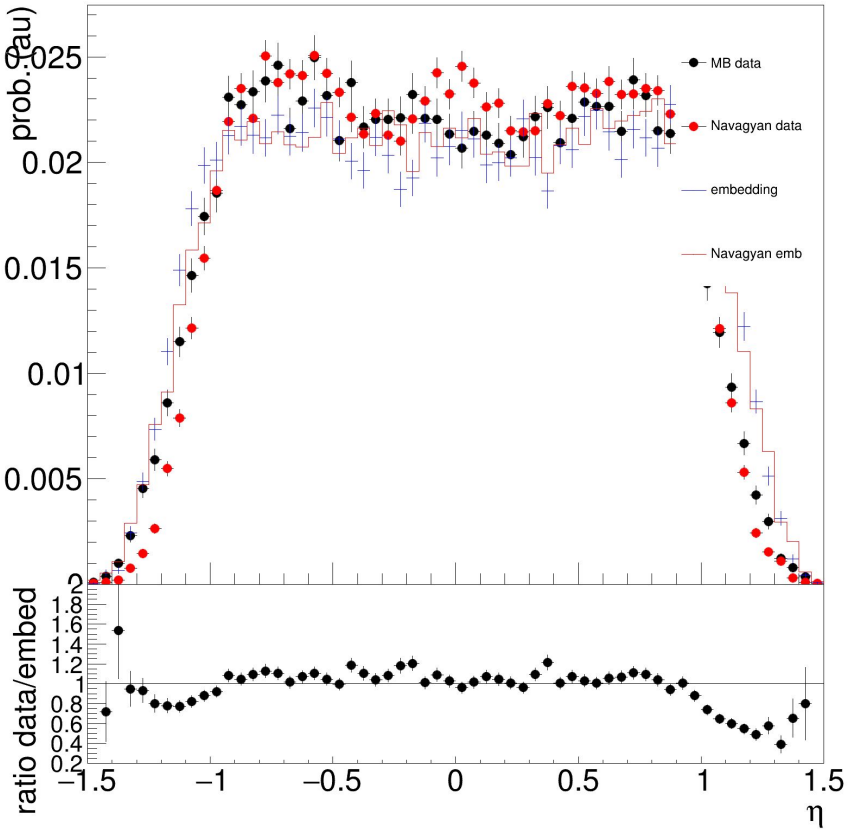
Phi

Looks consistent



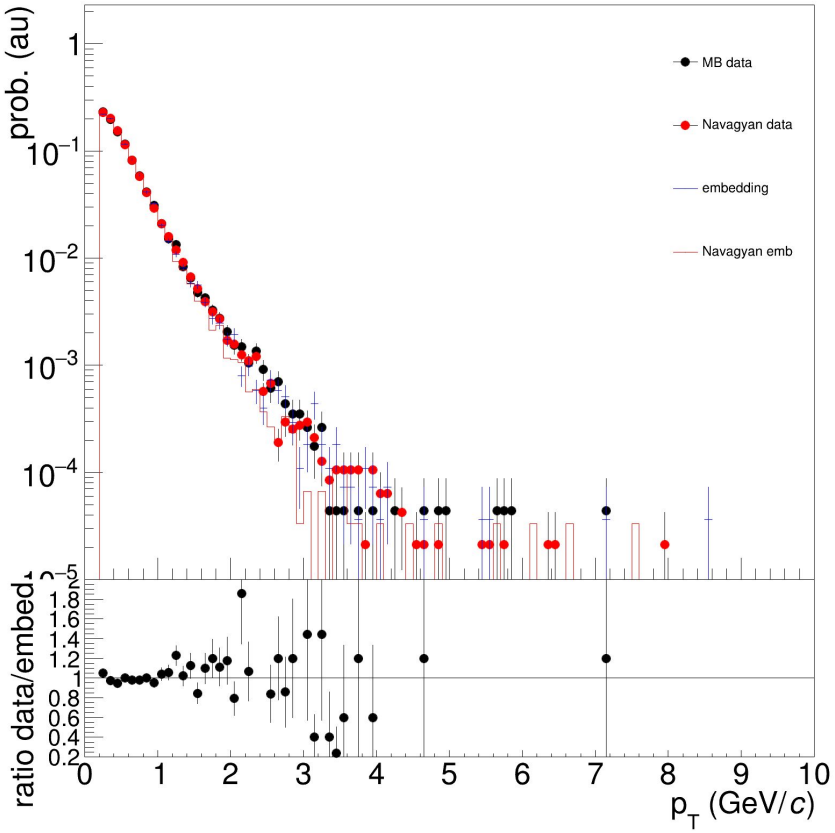
Looks consistent at midrapidity

Eta



Looks consistent

p_T spectrum



Summary

- Large statistics 510 GeV pp2017 embedding available
- Track-level quantities comparison looks consistent
- Event-level shows disagreement