

Tracking Efficiency Task - Run 12 pp Embedding

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Motivation

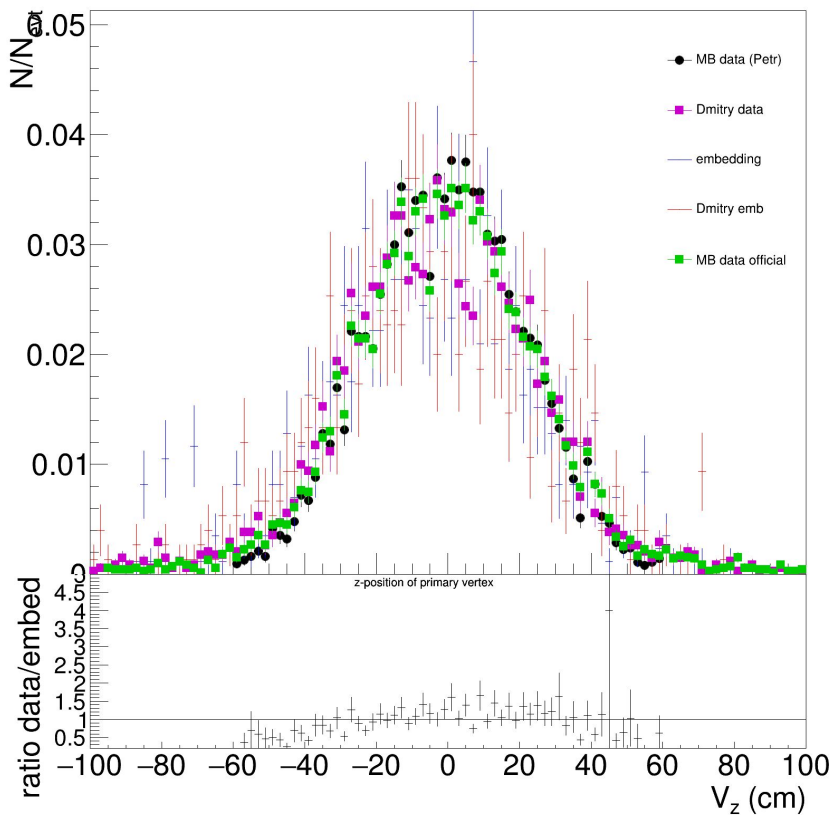
https://drupal.star.bnl.gov/STAR/system/files/tracking_efficiency_uncertainty_2_0.pdf

- 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
- Main focus will be on 2014 Au+Au
- Comparing to MB data from official MuDsts (SL12d) and new production done by Petr from raw data (in SL12d_embed)
- Not shown in plots: Petr's production in SL13b_embed (consistent with Dmitry and this analysis)
- No significant difference between corresponding picoDst and MuDst files

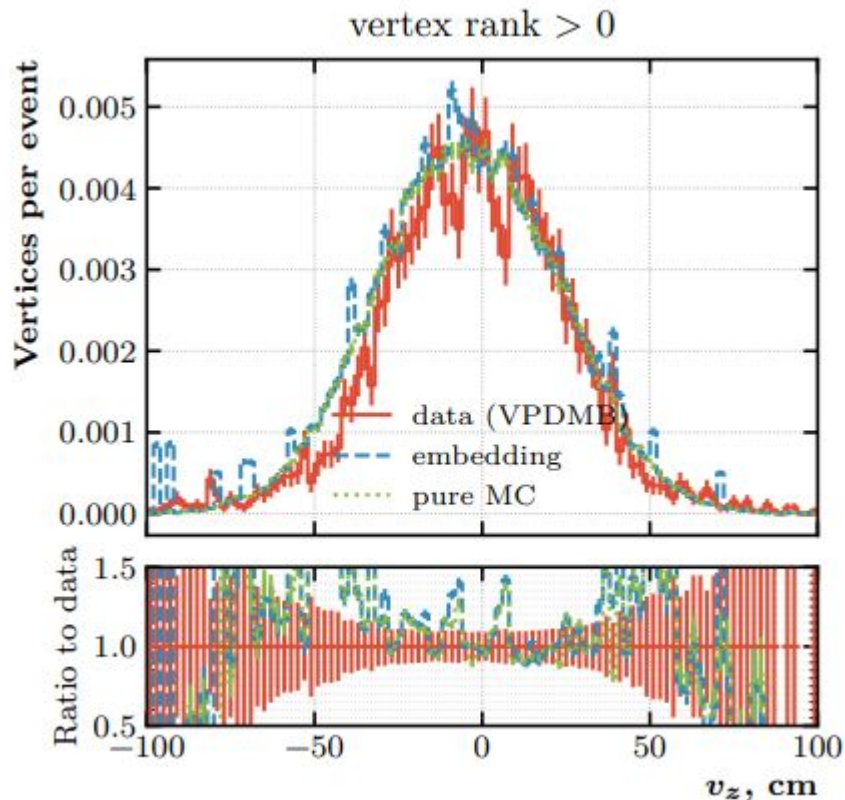
Analysis

- Embedding: simulated Pythia 6 (STAR tune) pp events embedded into zero bias pp data run 13059025
- Data: Official picoDst/MuDst production from run 13059025, VPDMB-nobsmd trigger
- **DbV20130212 pp2012b AgML mtdDat btof fmsDat VFPPVnoCTB useBTOF4Vtx beamline BEmcChkStat Corr4 OSpaceZ2 OGridLeak3D -hitfilt and PicoVtxMode:PicoVtxVpdOrDefault TpcVpdVzDiffCut:6 PicoCovMtxMode:PicoCovMtxWrite PicoBEmcSmdMode:PicoBEmcSmdWrite**
- Dmitry's data: "This was done using the respective options from the official production plus the TpxRaw and TpxClu options to enable the offline hit reconstruction."
- Petr's data: reproduced from daq files using SL12d_embed (and SL13b_embed libraries)
- Plots only from a small sample (~100-1000 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
- $n_{\text{HitsFit}} > 12$, $n_{\text{HitsFit}}/n_{\text{HitsMax}} > 0.51$, 1 hit in outer TPC
- DCA < 2 cm if track $p_T < 0.5$ GeV
(2.5 cm - $p_T \cdot (1 \text{ cm/GeV})$) if $0.5 \text{ GeV} \leq \text{track } p_T < 1.5 \text{ GeV}$
1 cm if $1.5 \text{ GeV} \leq \text{track } p_T$

Vertex distribution



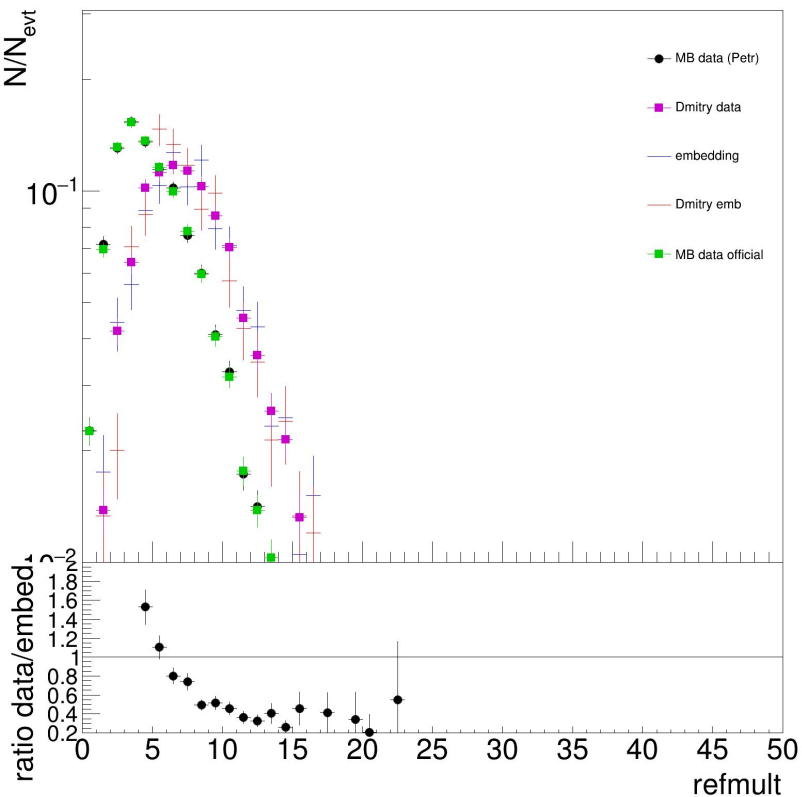
Looks consistent at first glance



Dmitry's AN

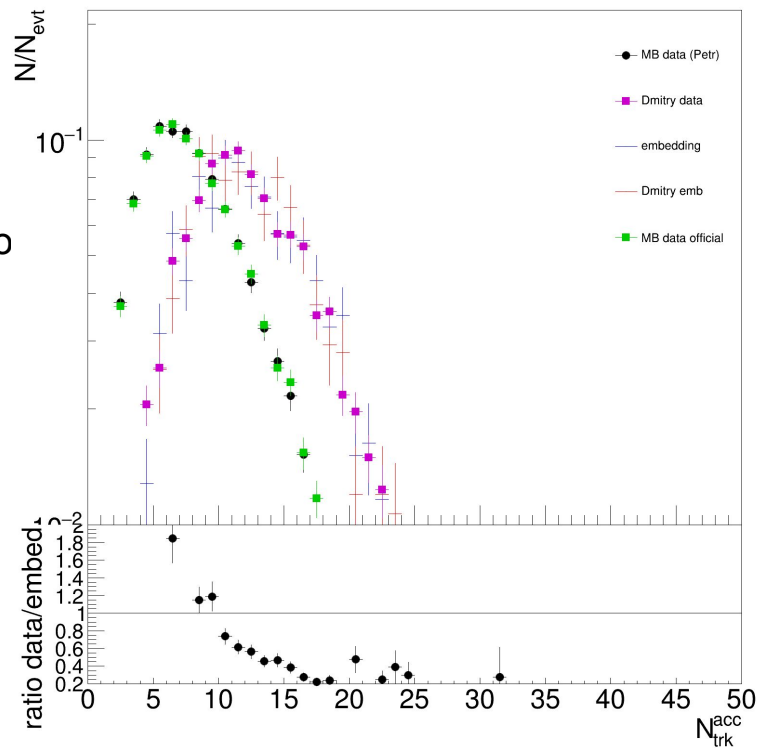
Clear discrepancy between data production in SL12d (official/Petr) and SL13b (Dmitry)

Refmult



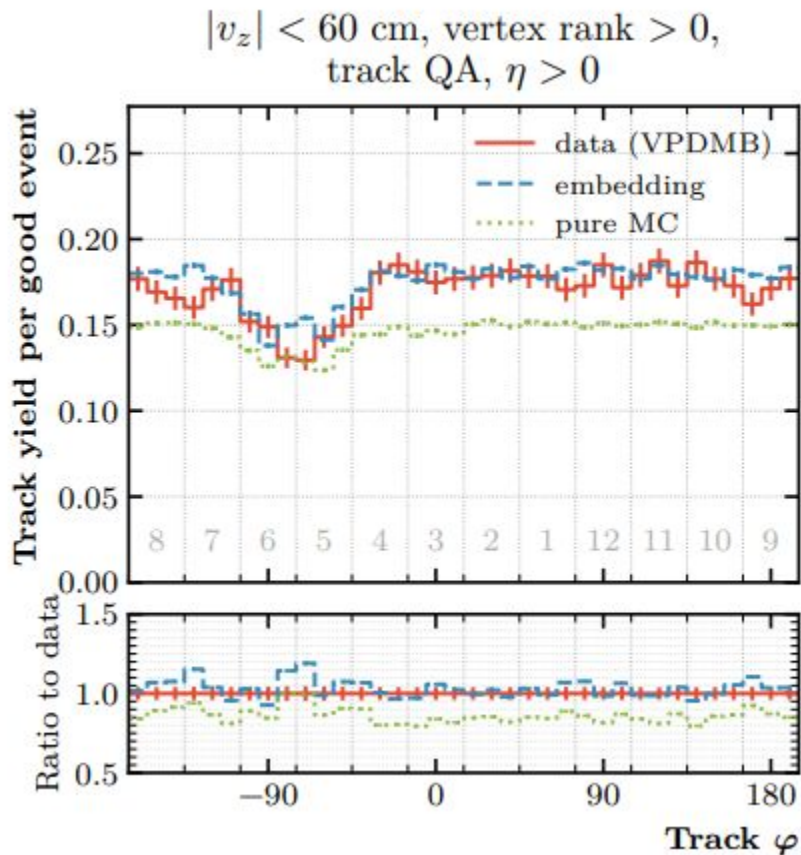
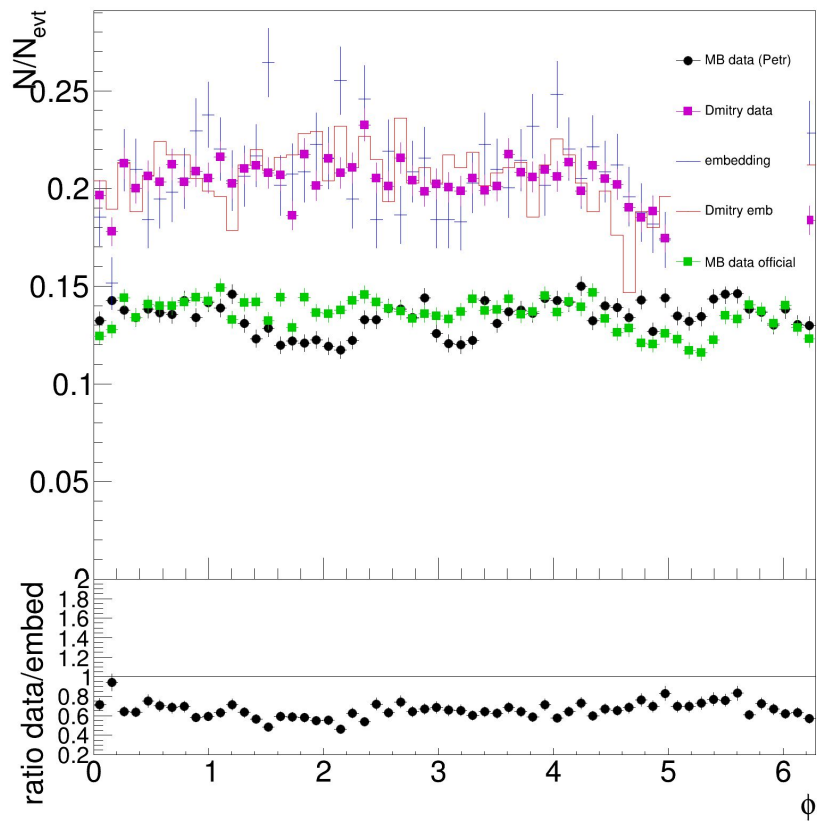
N_{trk} accepted

Identical code (except no trigger selection in emb)



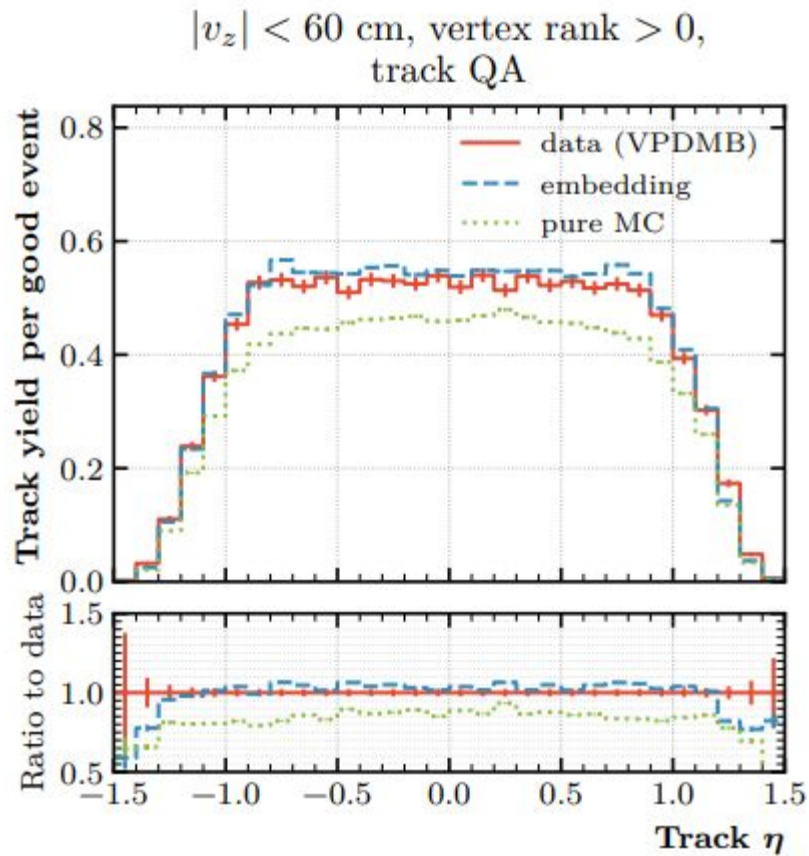
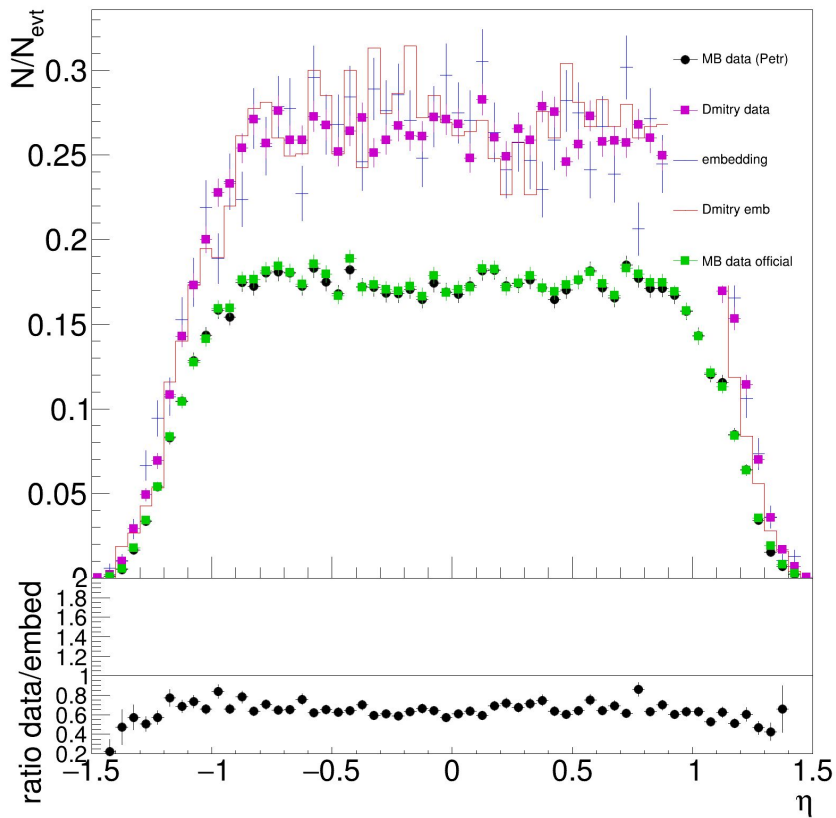
Phi

Clear discrepancy, but similar shape -
maybe driven by the refmult/Ntrk
discrepancy



Eta

Clear discrepancy between data and emb,
but similar shape - maybe driven by the
refmult/Ntrk discrepancy



p_T spectrum

MB spectrum slightly softer, effect of refmult/Ntrk seen

