QA for AuAu 200 GeV Run14 PicoDst SL22c

Diptanil Roy
Hard Probes

Operational Details

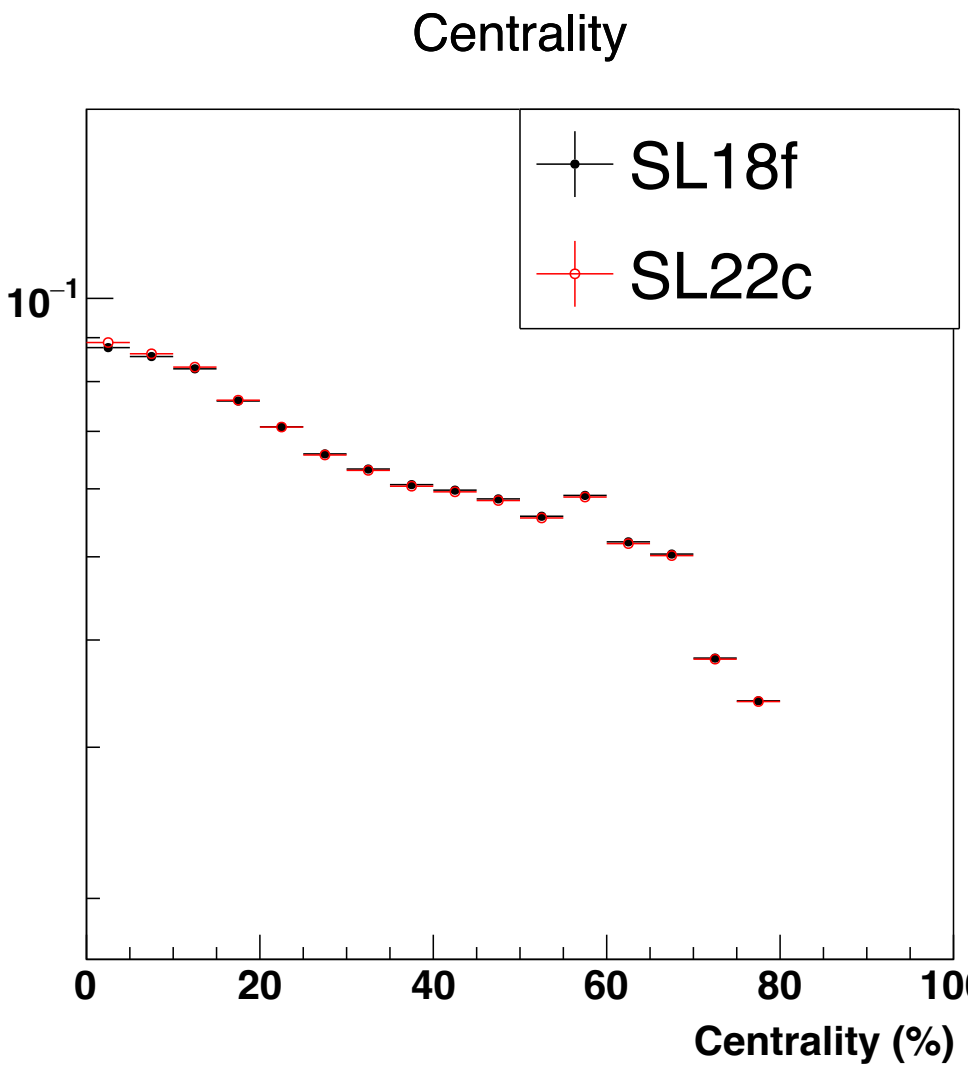
- Track-Tower Matching in PicoDsts for AuAu 200 GeV Run 14 produced with SL18f library incorrect
- Need to produce a consistent MB sample with correct information
- **SL22c** used for the latest production

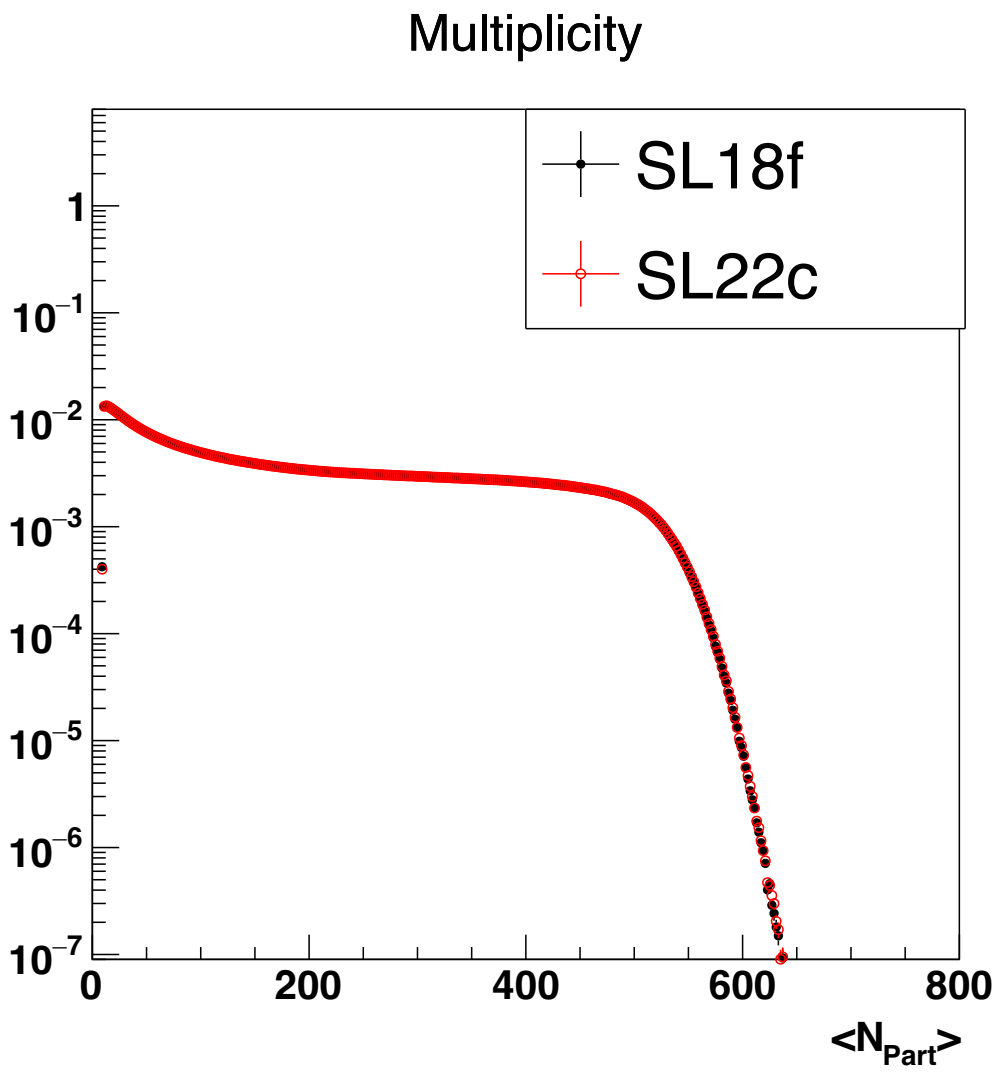
Production: P16id
Temporary filelist available at: /star/data14/GRID/NFS_FileList/AuAu_200_production_lowmid_2014_physics_P16id.SL22c.txt
Equivalent filelist in SL18f at: /gpfs01/star/pwg/droy1/STAR-Workspace/D0Analysis/AuAu/AuAu_200_production_lowmid_2014_physics_P16id.SL18f.txt

Production Parameters:
Run14 AuAu 200 GeV st_physics with HFT, P16id
mtdMatch y2014a picoDst PicoVtxMode:PicoVtxVpdOrDefault
TpcVpdVzDiffCut:3 PicoCovMtxMode:PicoCovMtxWrite

Current Test Dataset size: 25 % (260 million events) of total low and mid luminosity dataset

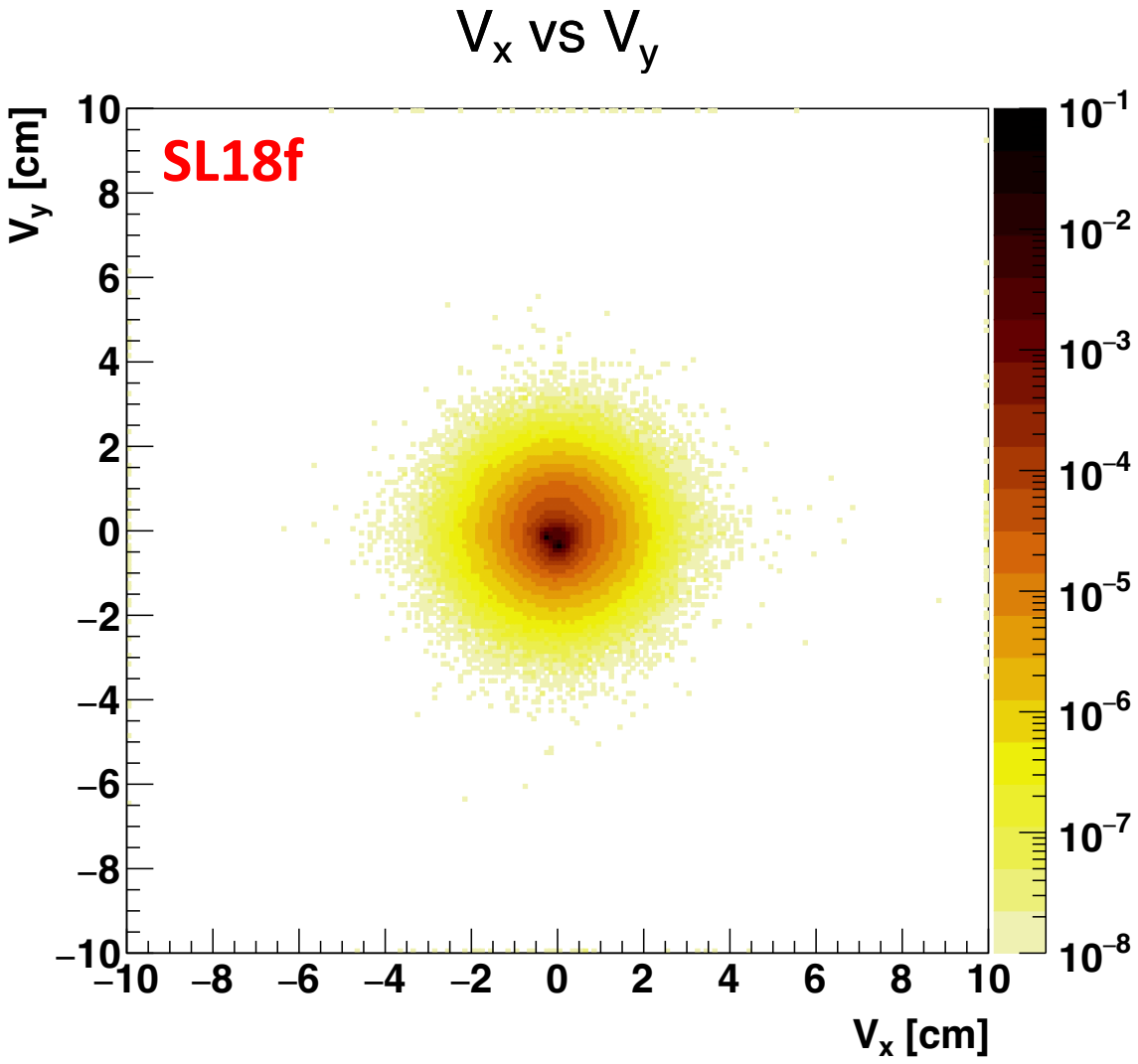
SL18f v SL22c

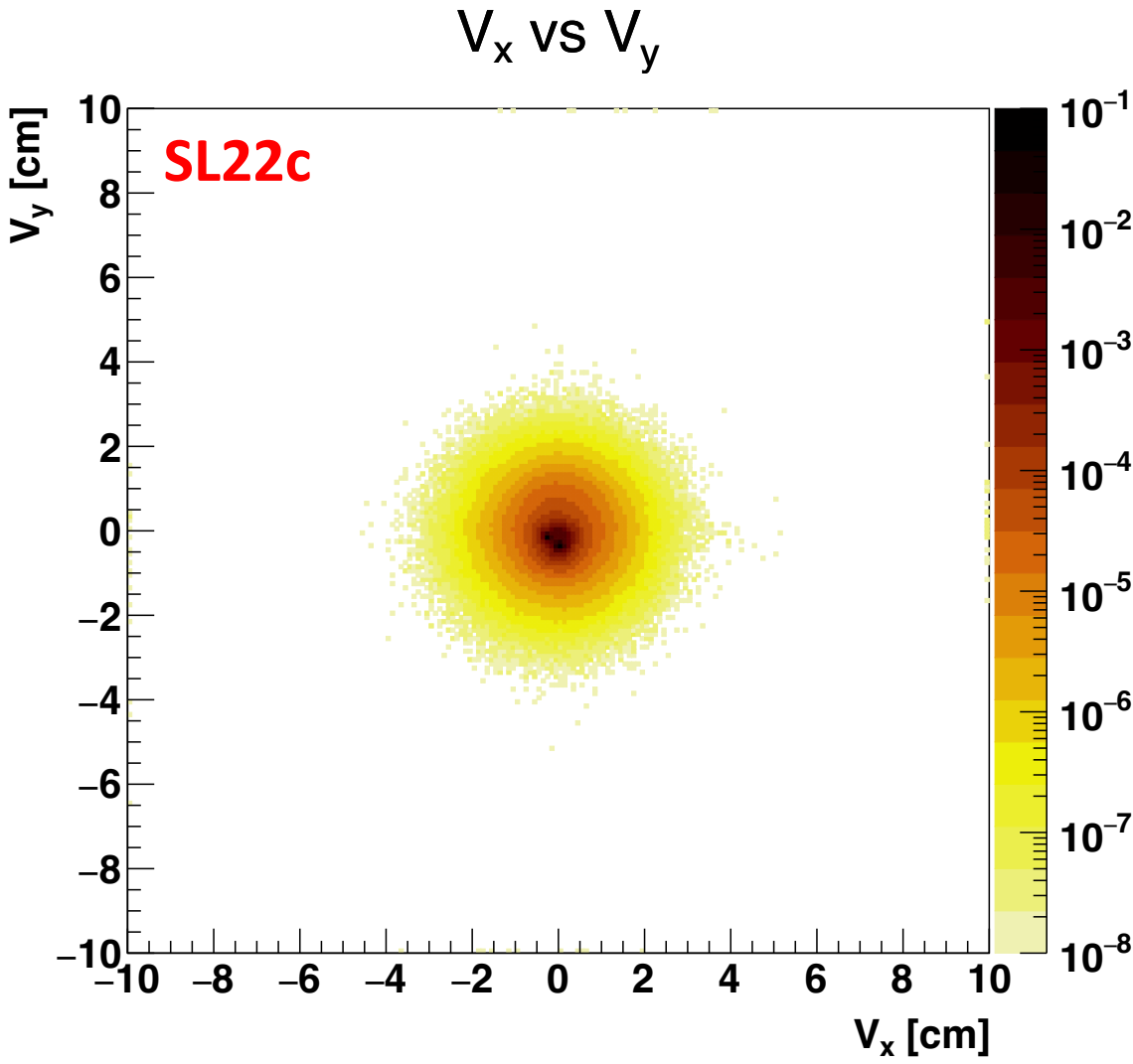




# of events normalized distributions look similar between existing and new productions

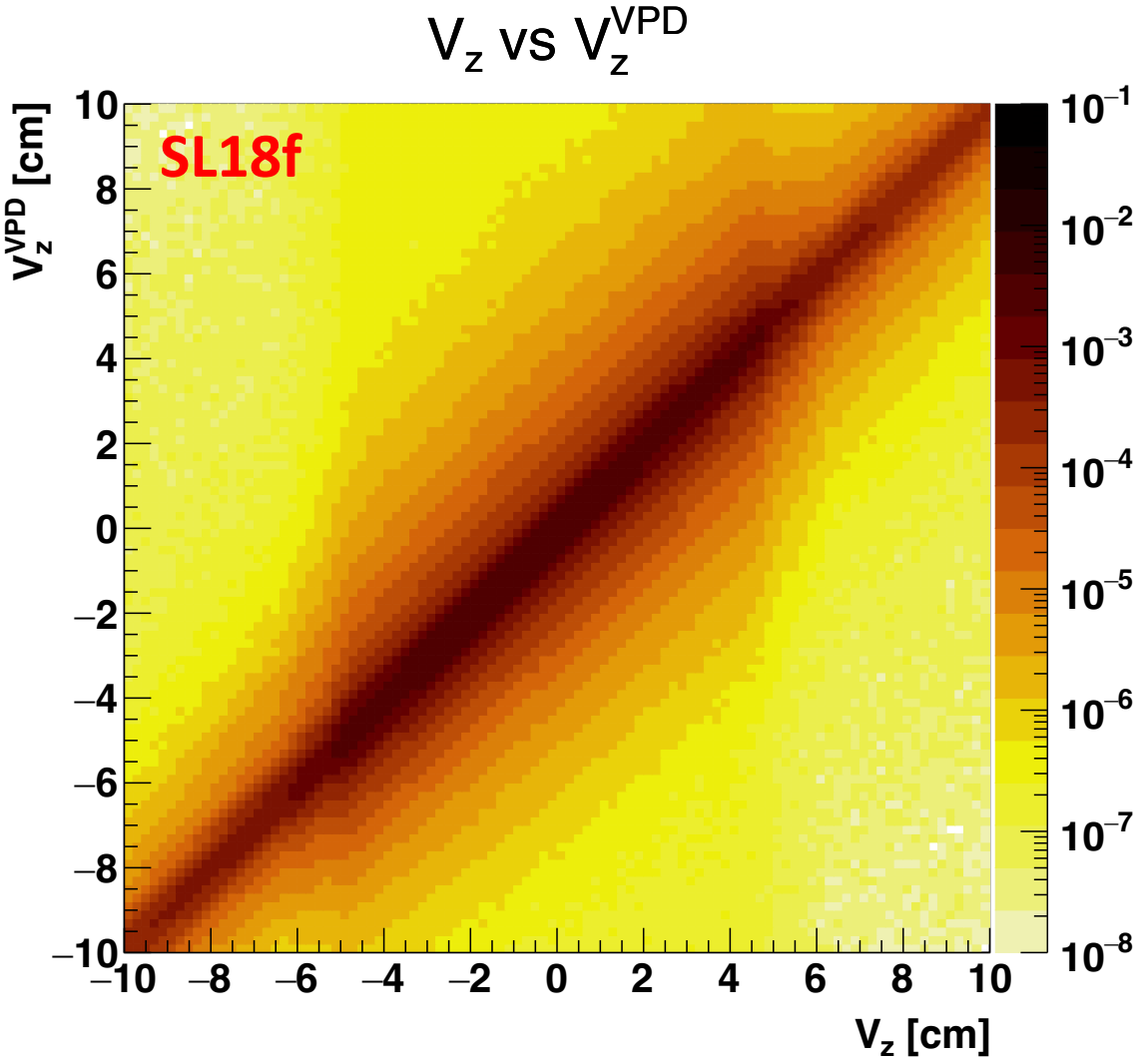
SL18f v SL22c

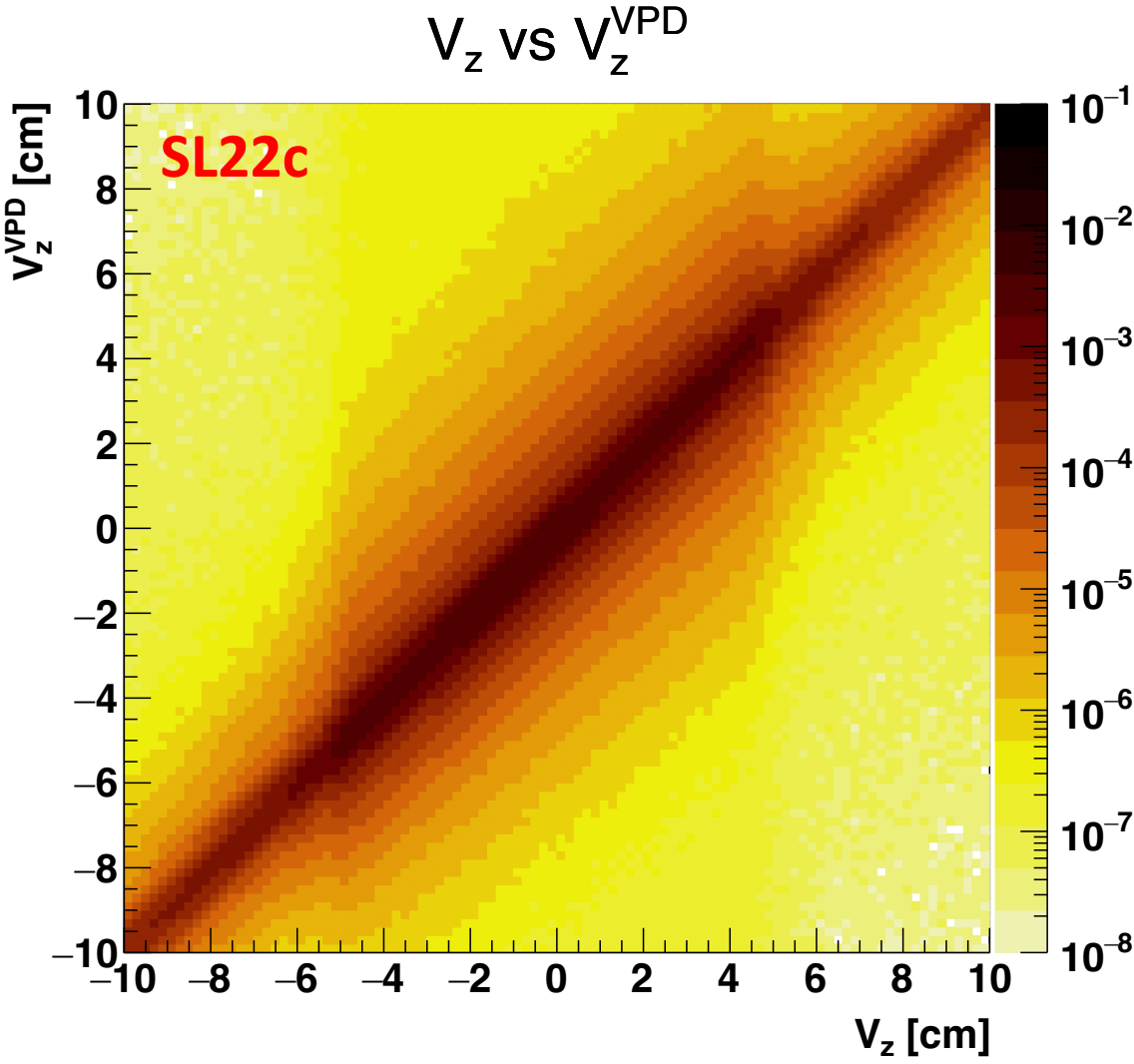




# of events normalized distributions look similar between existing and new productions

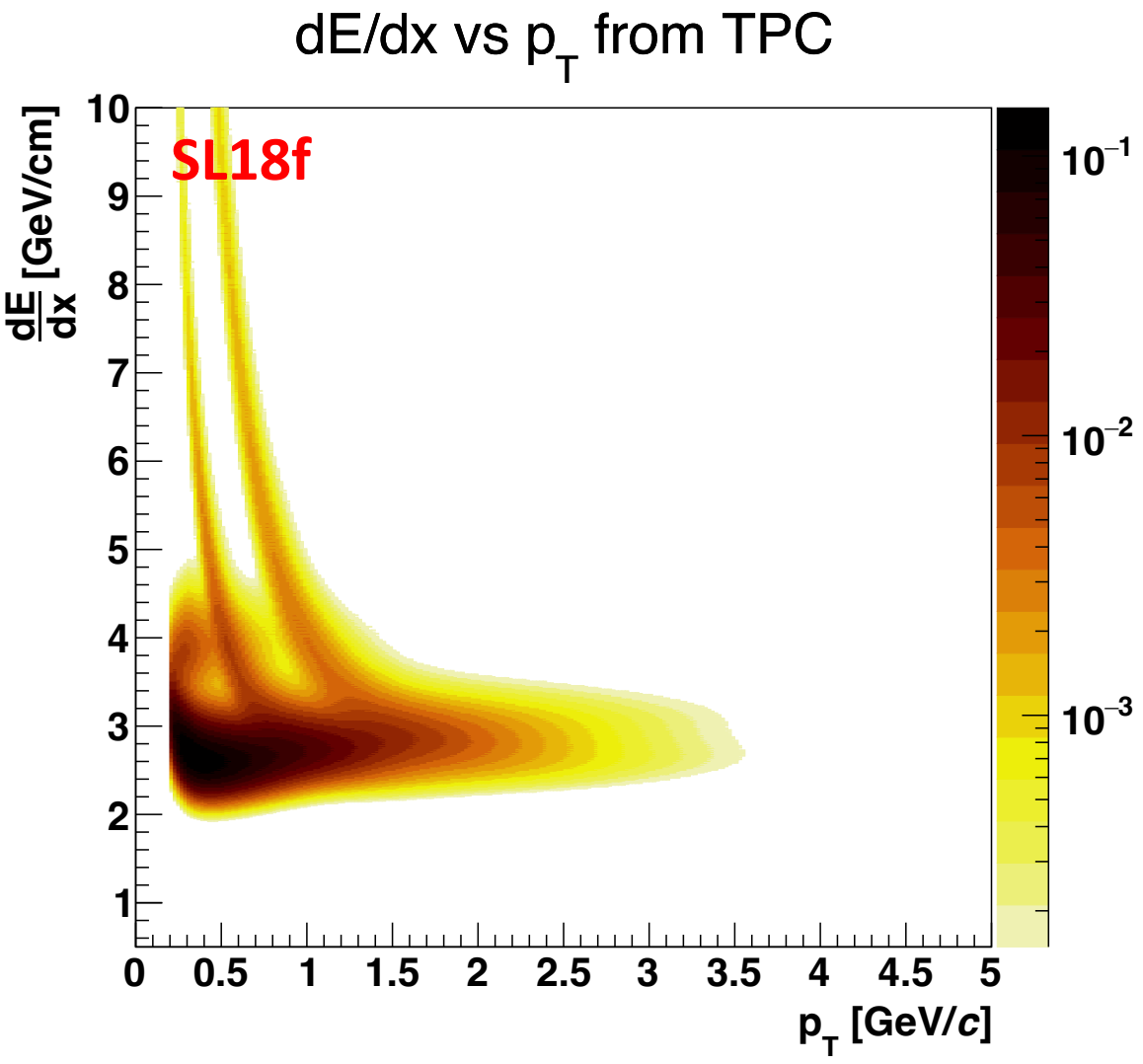
SL18f v SL22c

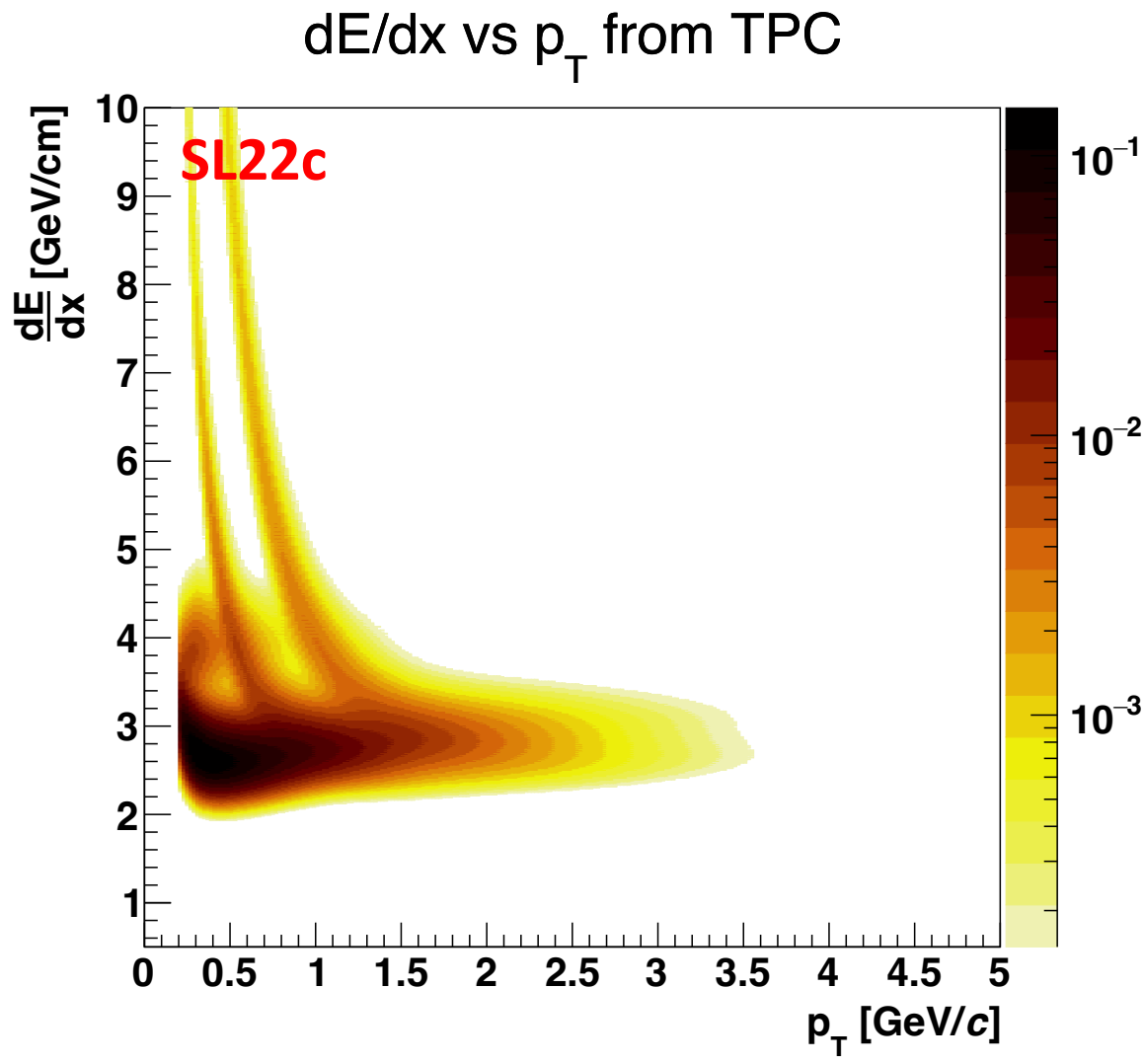




# of events normalized distributions look similar between existing and new productions

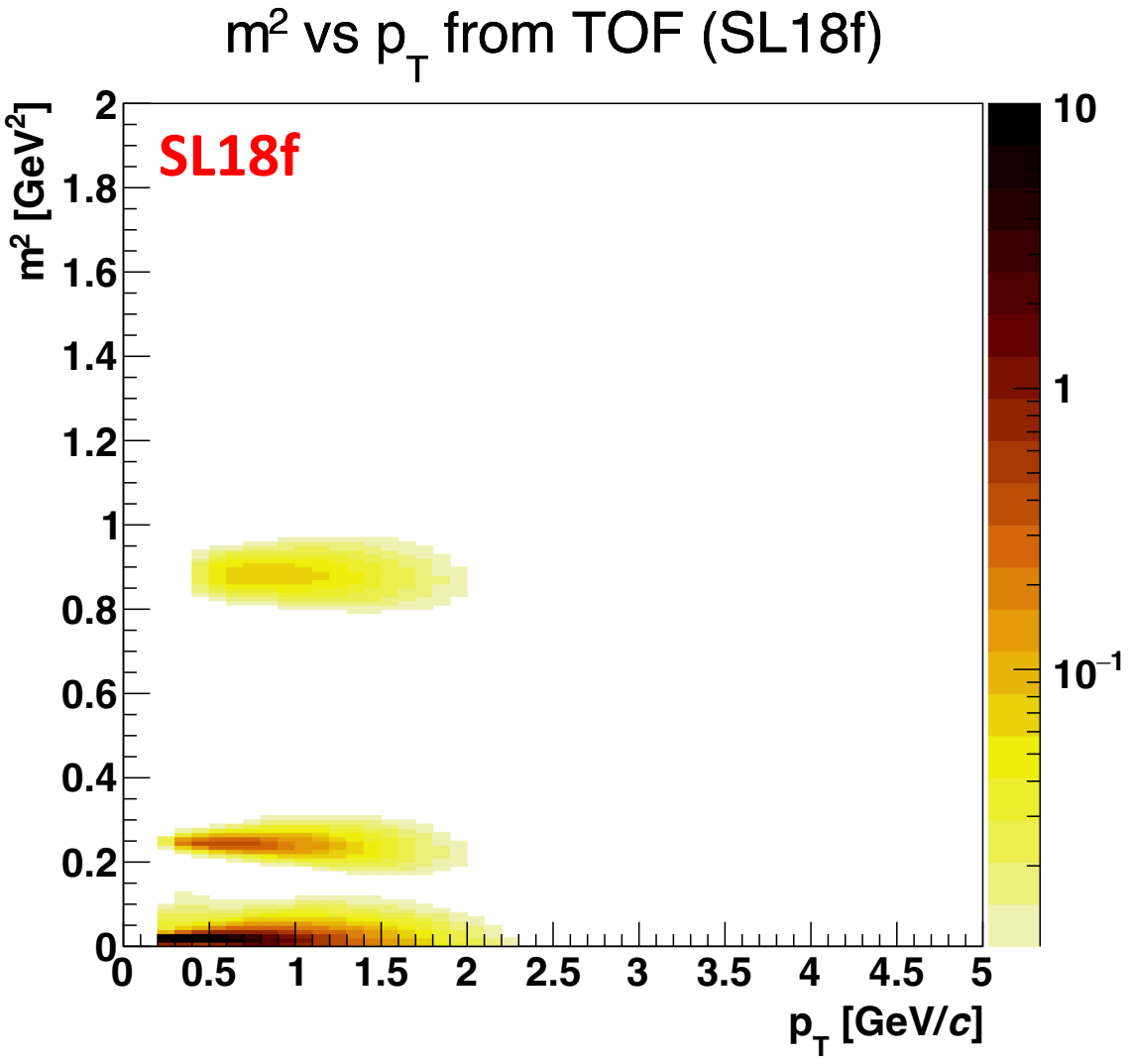
SL18f v SL22c

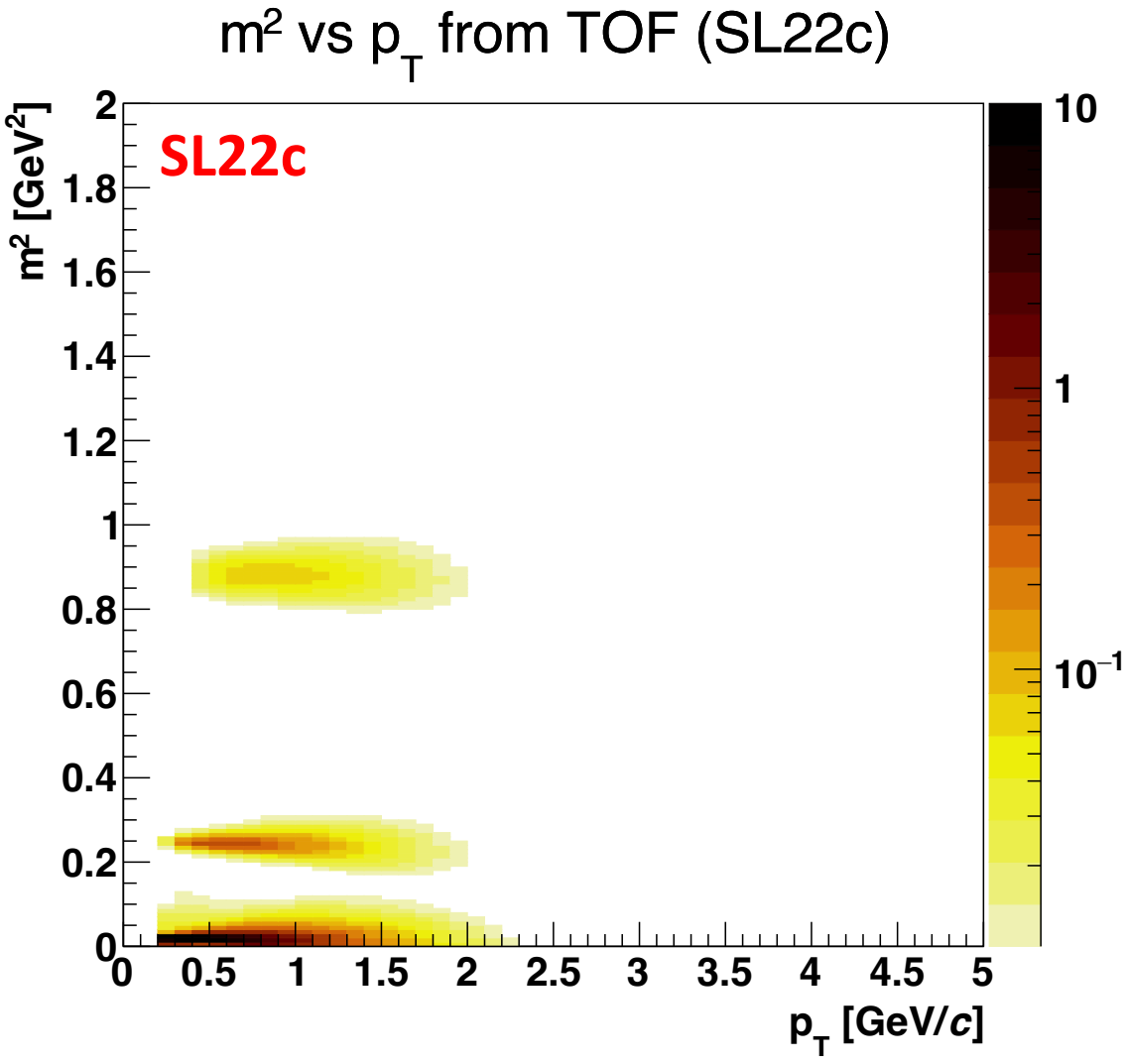




Similar bands of dE/dx from TPC in both productions

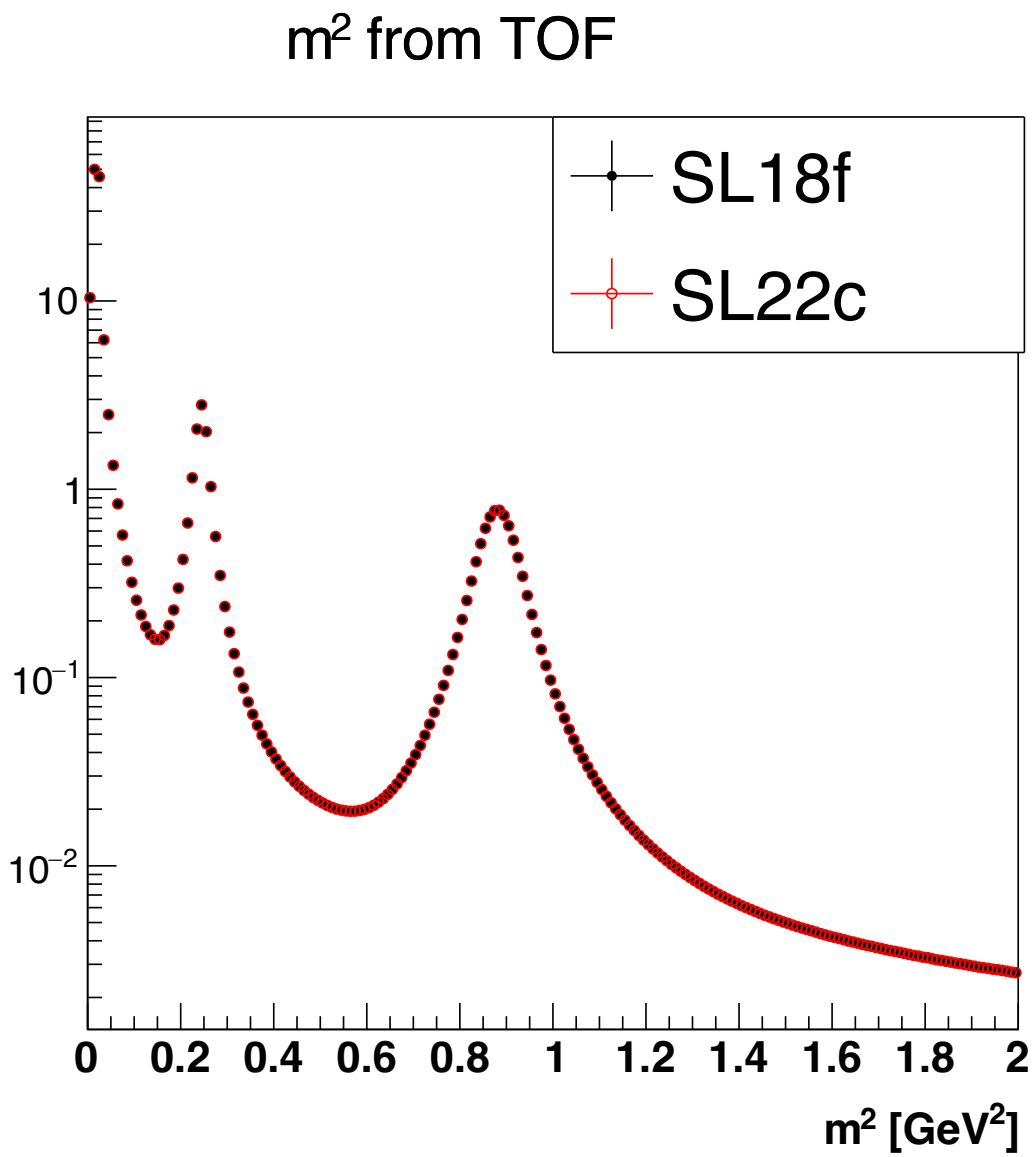
SL18f v SL22c





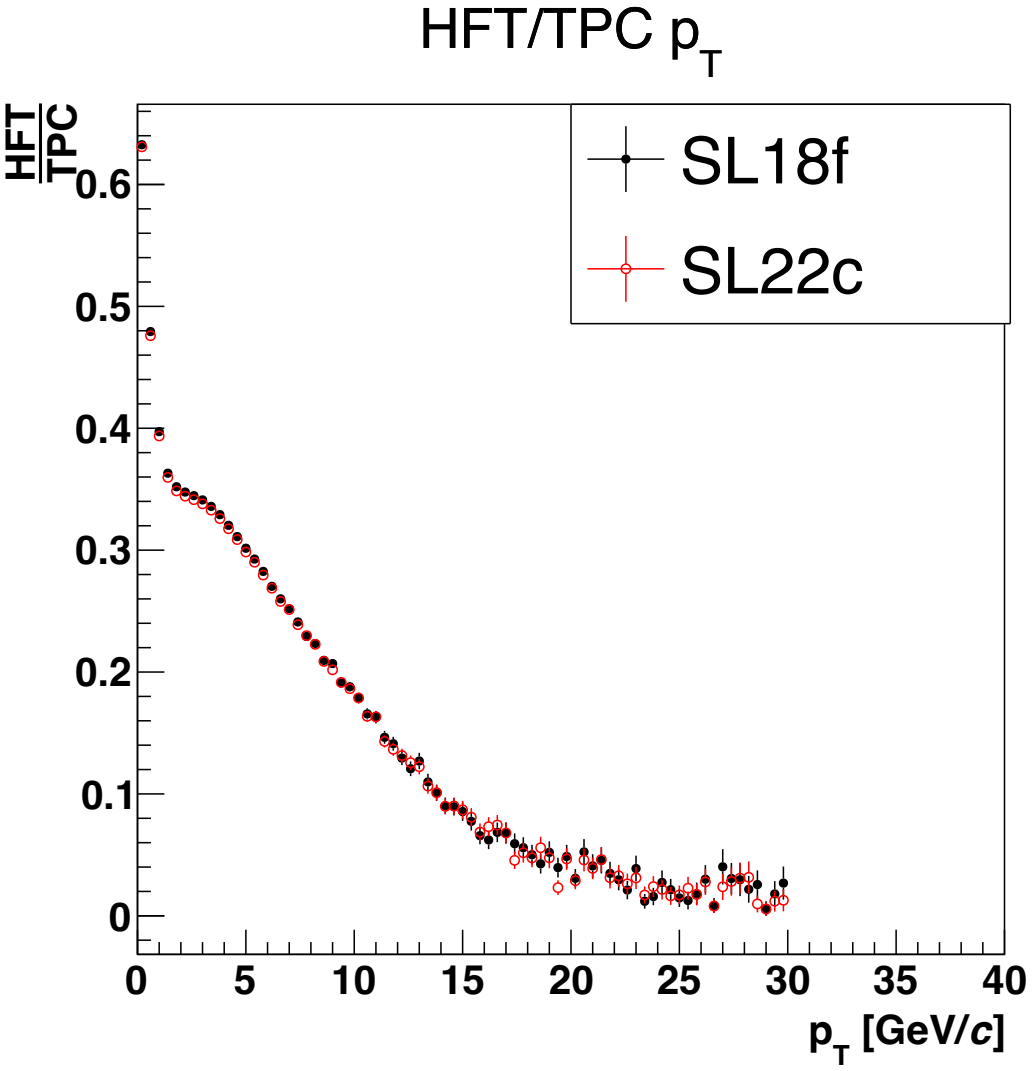
Similar bands of mass squared from TOF in both productions

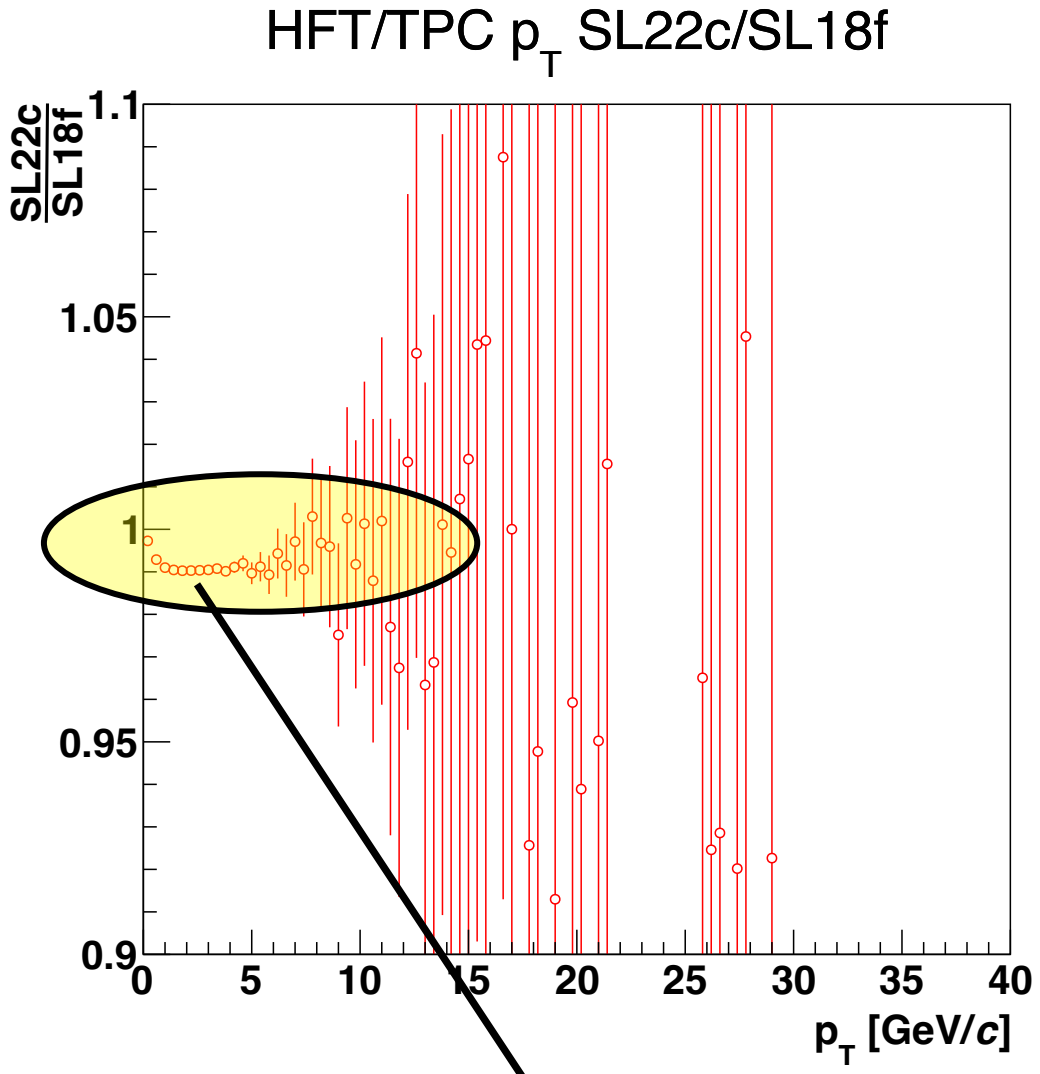
SL18f v SL22c



Similar bands of mass squared from TOF in both productions

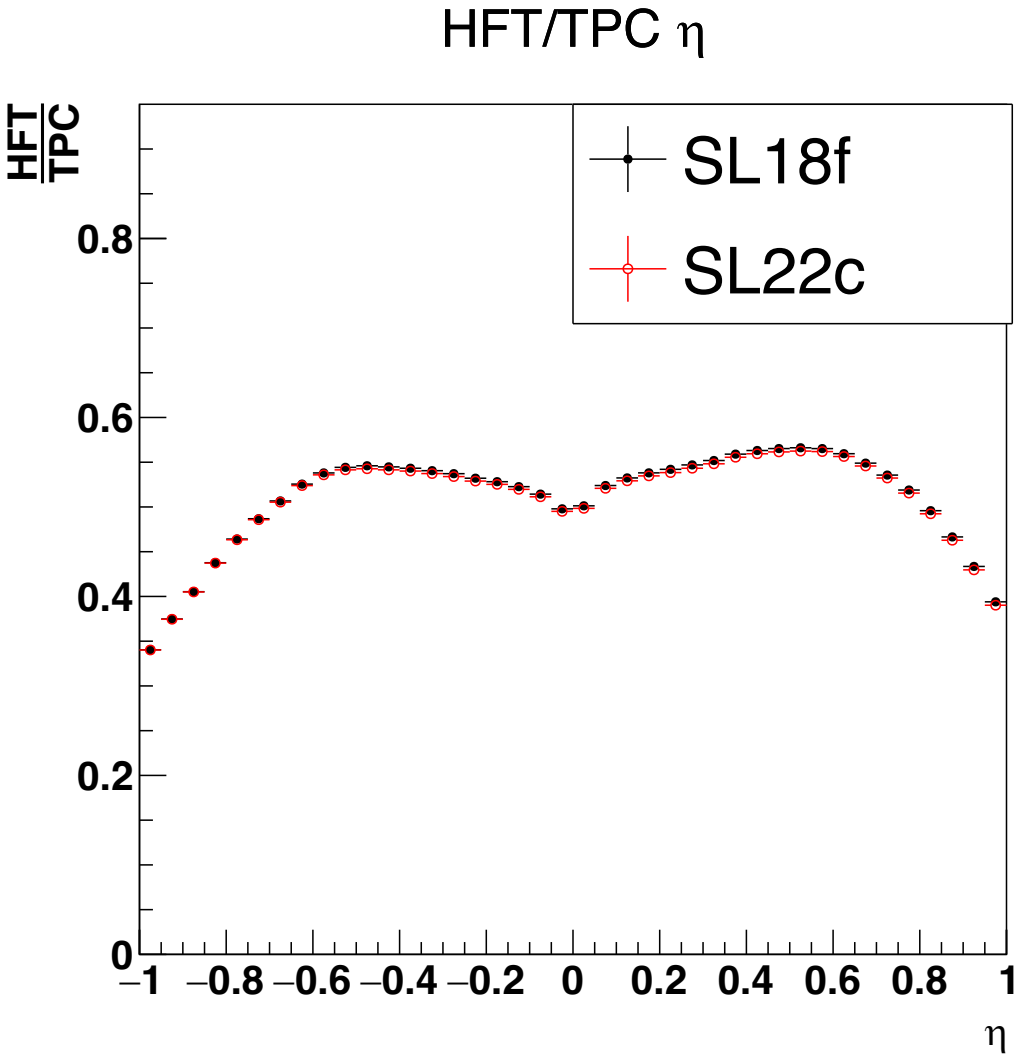
SL18f v SL22c

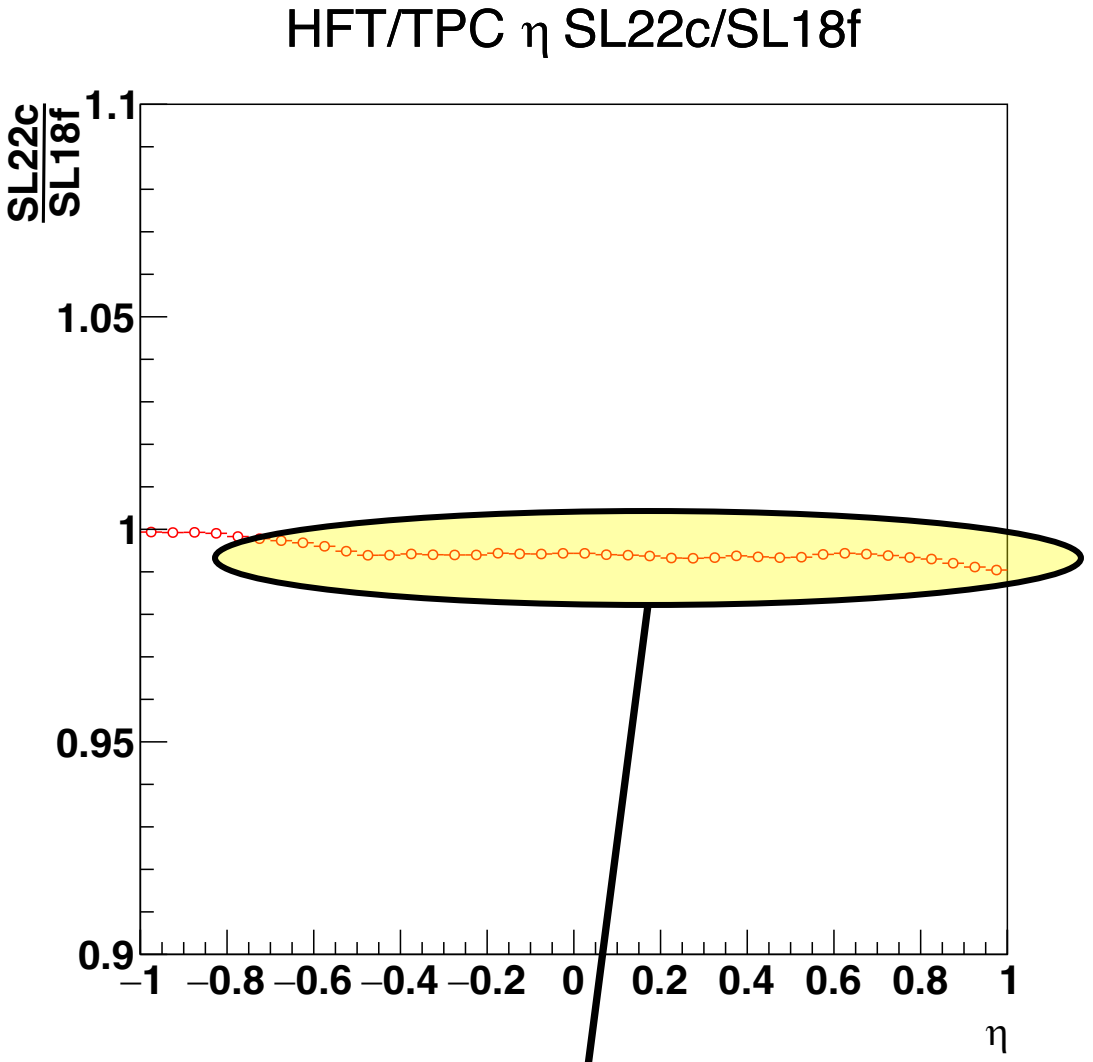




1. Left Plot: Ratio of HFT Tracks over TPC Tracks (No PID) vs p_T shows slight difference.
2. Right Plot: Double ratio of HFT Tracks over TPC Tracks between SL22c and SL18f. **Difference of 1% across p_T bins**

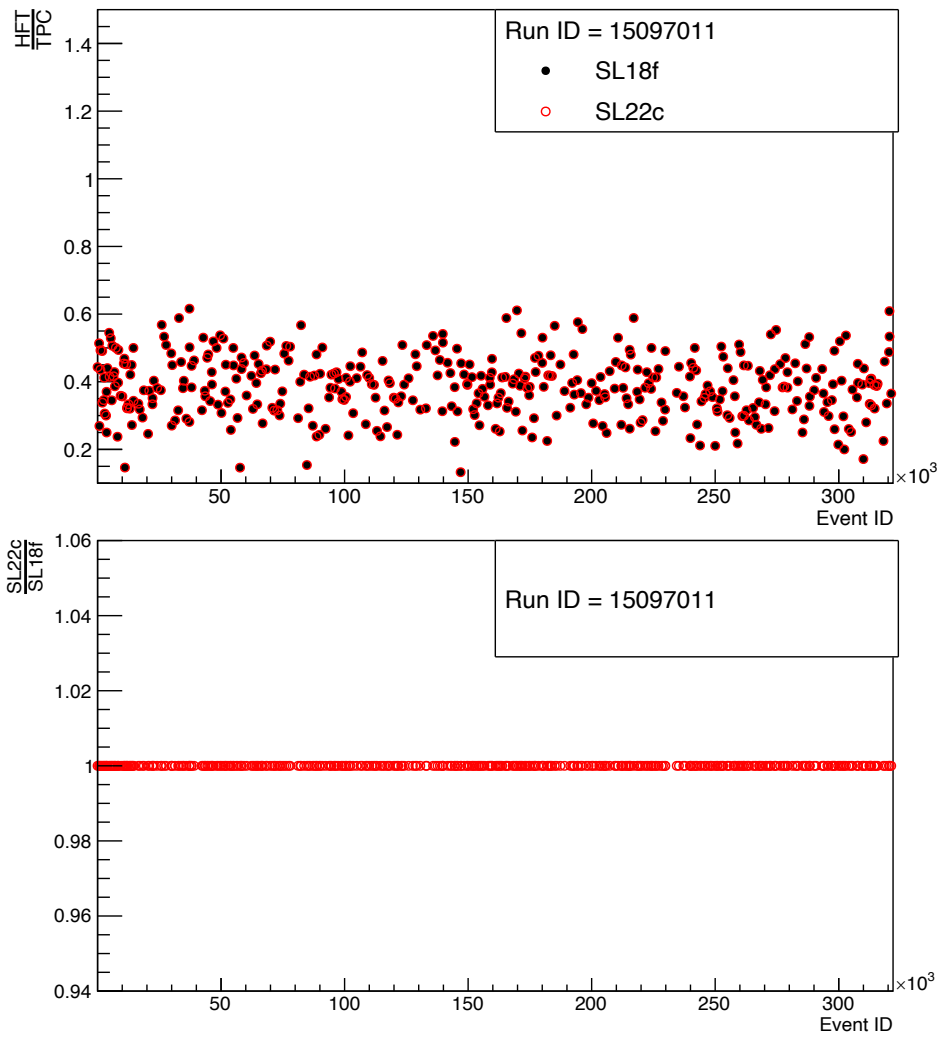
SL18f v SL22c

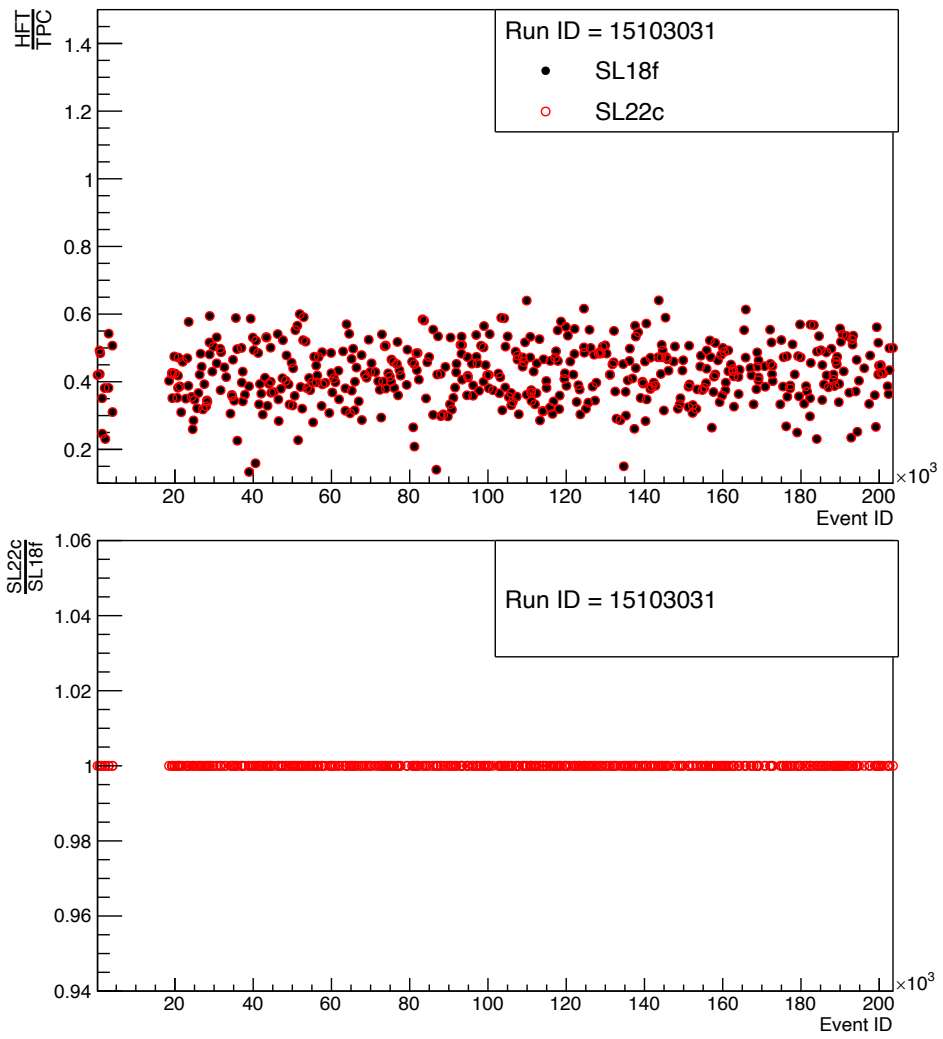




1. Left Plot: Ratio of HFT Tracks over TPC Tracks (No PID) vs η shows slight difference.
2. Right Plot: Double ratio of HFT Tracks over TPC Tracks between SL22c and SL18f. **Ratio slightly below 1 (max ~1%).**

SL18f v SL22c

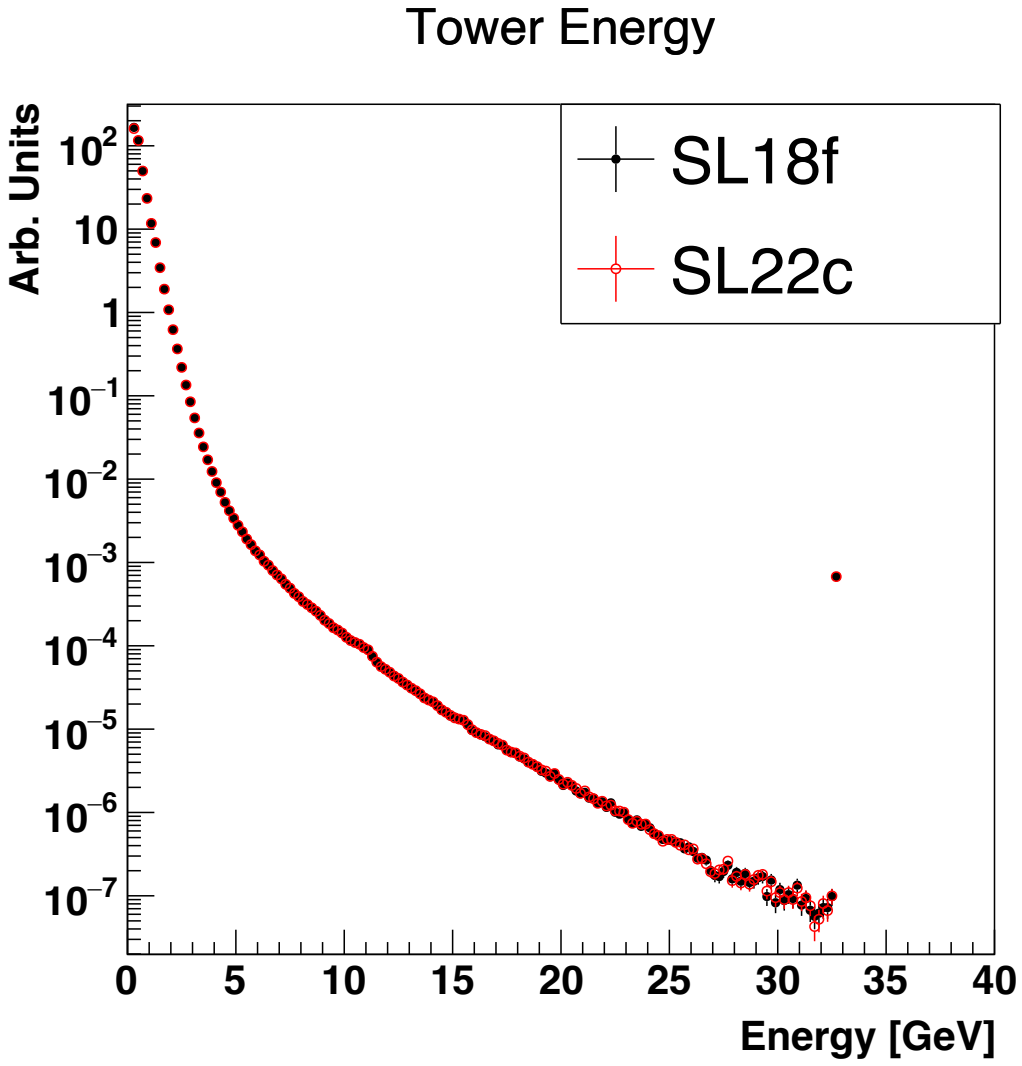


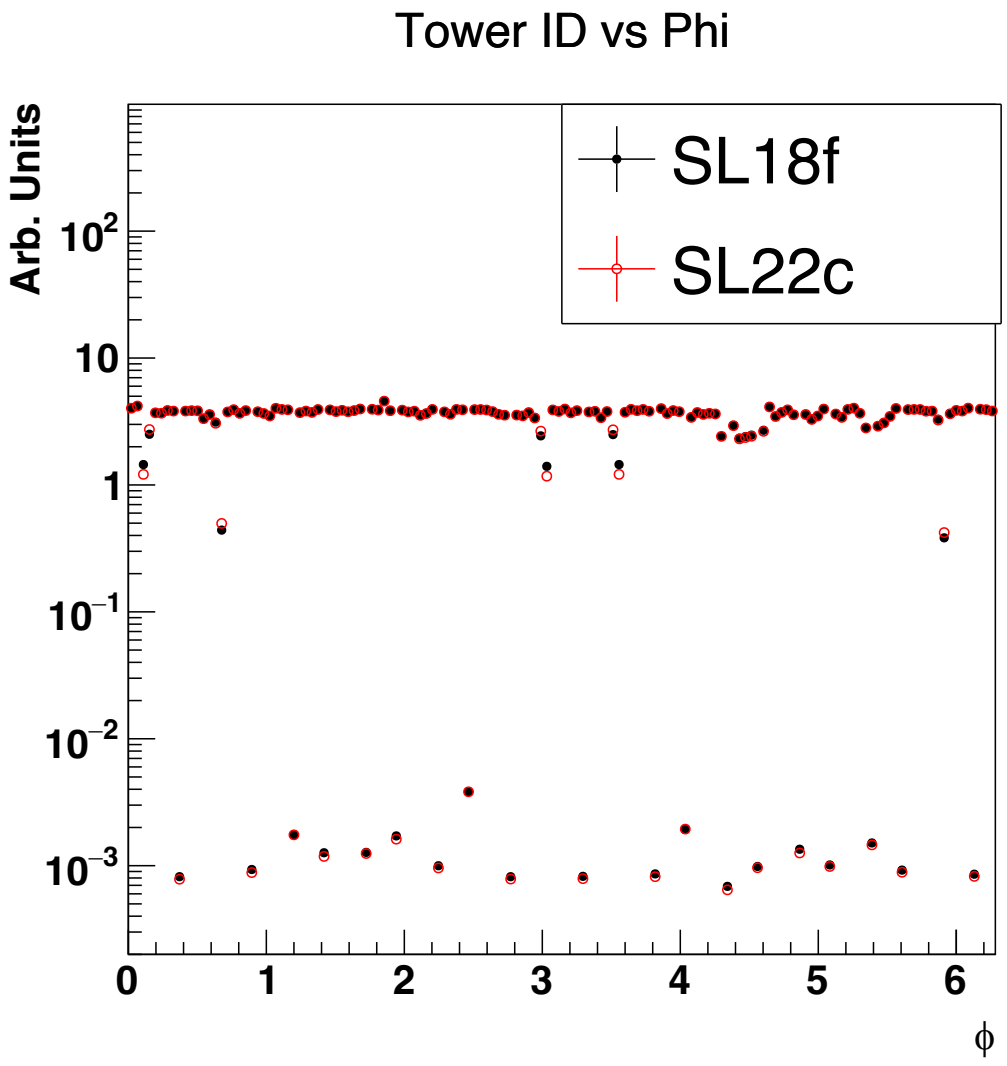


Event by event HFT/TPC ratio for the two libraries -> Identical

The difference in the earlier plots (Slide 9-10) is from slight differences in the total event set considered.

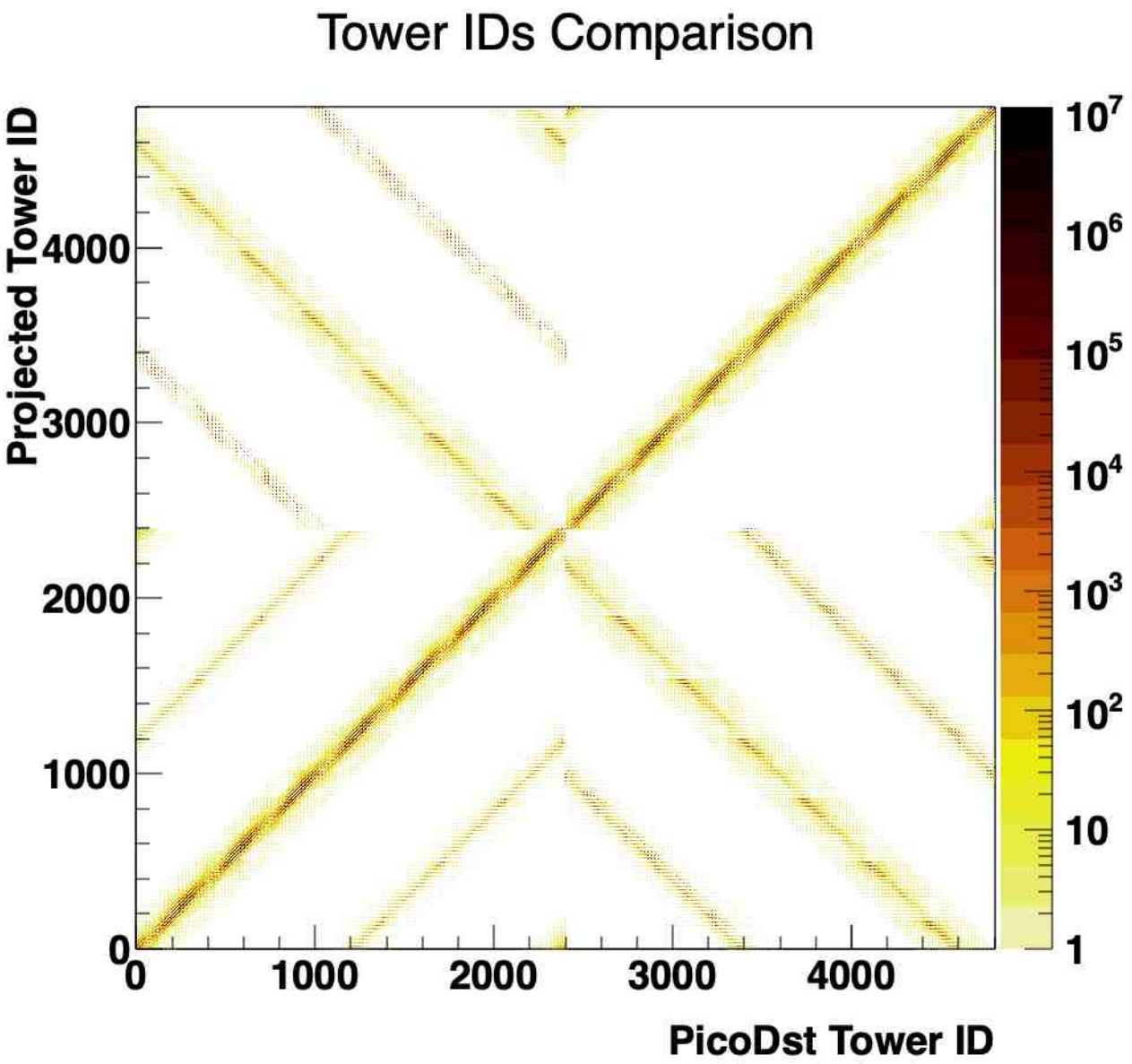
SL18f v SL22c





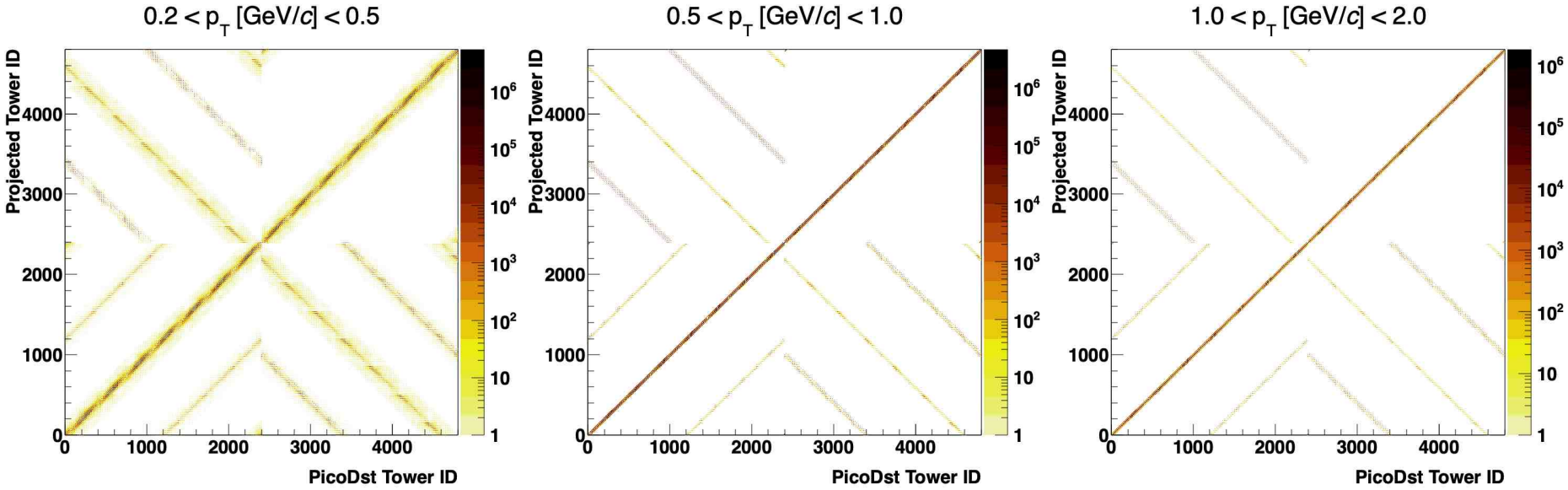
# of events normalized distributions look similar between existing and new productions

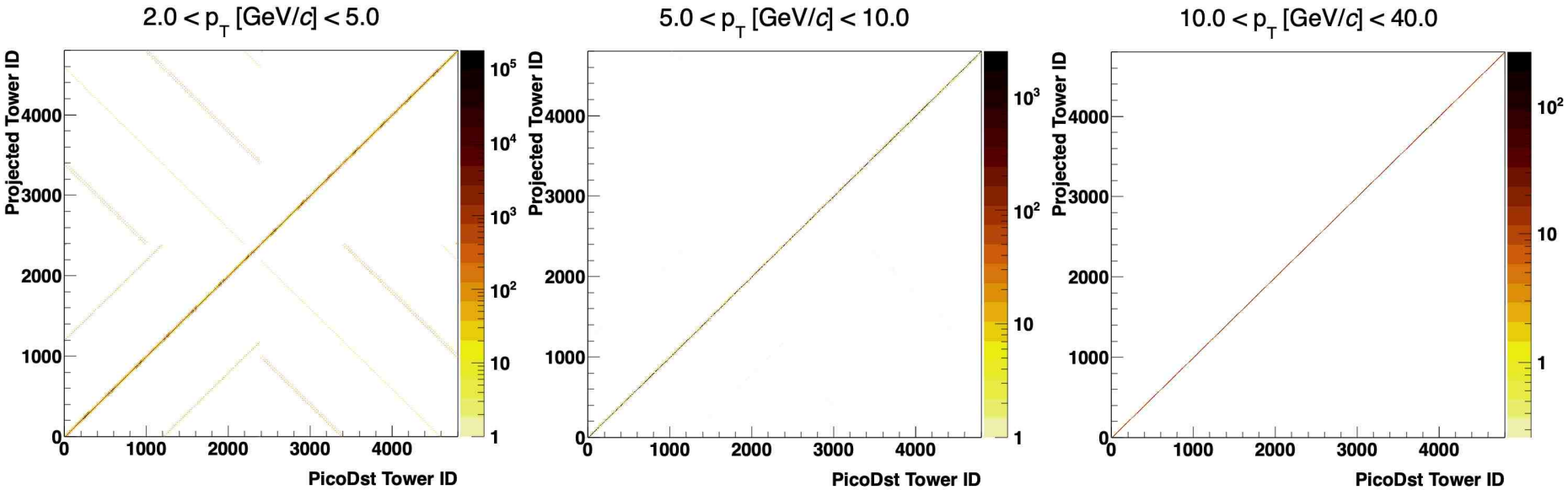
SL18f v SL22c



- In SL18f, the track-tower matching was incorrect.
- **Approximate fix**: Use DCA helix stored in picoDst to project tracks on to a tower. [**Projected Tower ID**]
- **Difference from algorithm used to do track-tower matching**: Helix from mid-point (stored in MuDst) instead of DCA used to project tracks on to tower
- **Difference is most prominent for low p_T tracks [See next slide]**

SL18f v SL22c





Difference between actual tower hit and approximate projection is acute in low p_T, and disappears at high p_T

Conclusion

- Overall, good agreement between the two productions (SL18f and SL22c) on the tracking and PID info. Tower hits look nominal as well.

- Track-tower matching information exists exists in new sample.

- Tracking between HFT and TPC are identical with the two libraries.