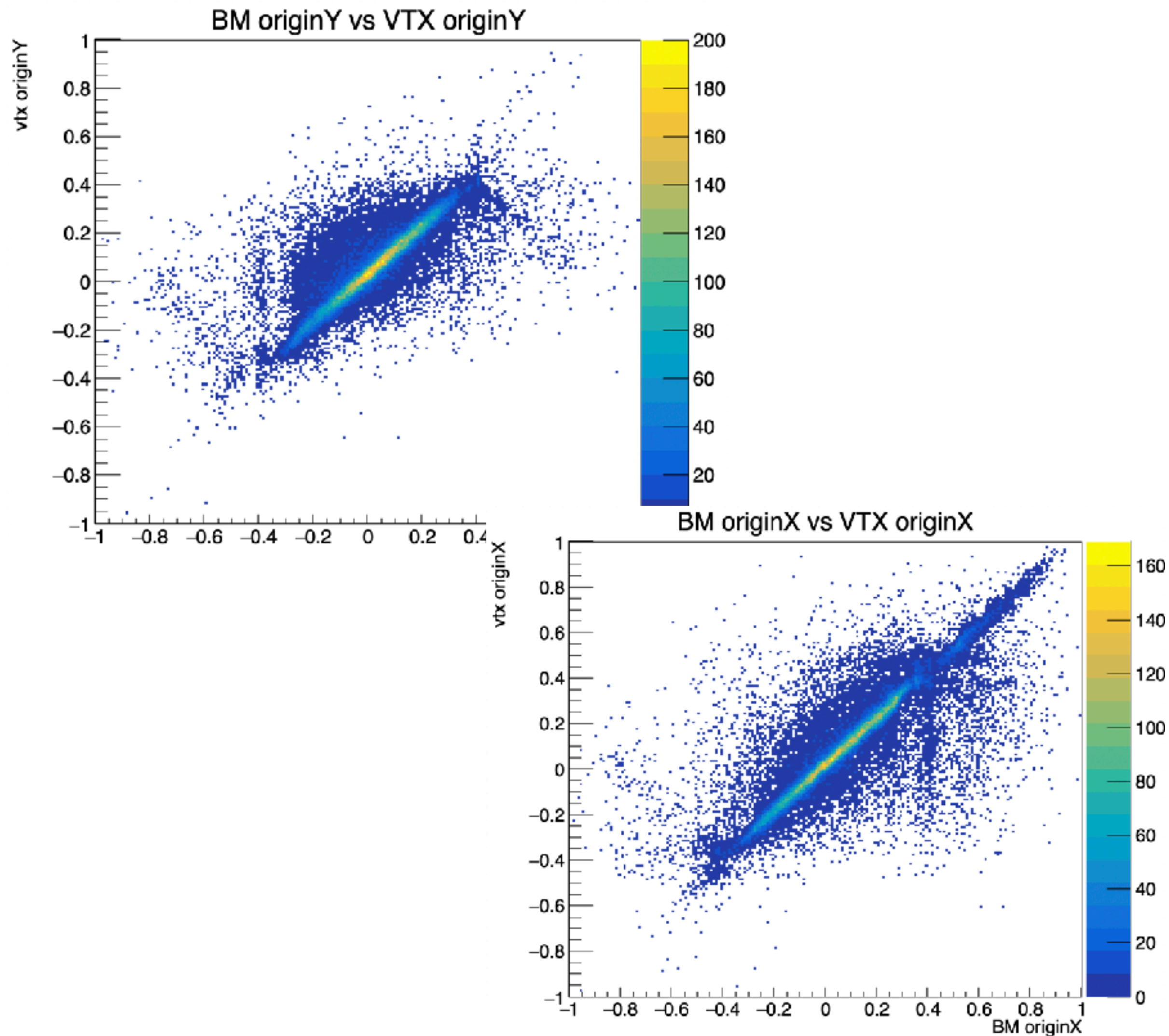# Beam Monitor @ GSI2021: fast update
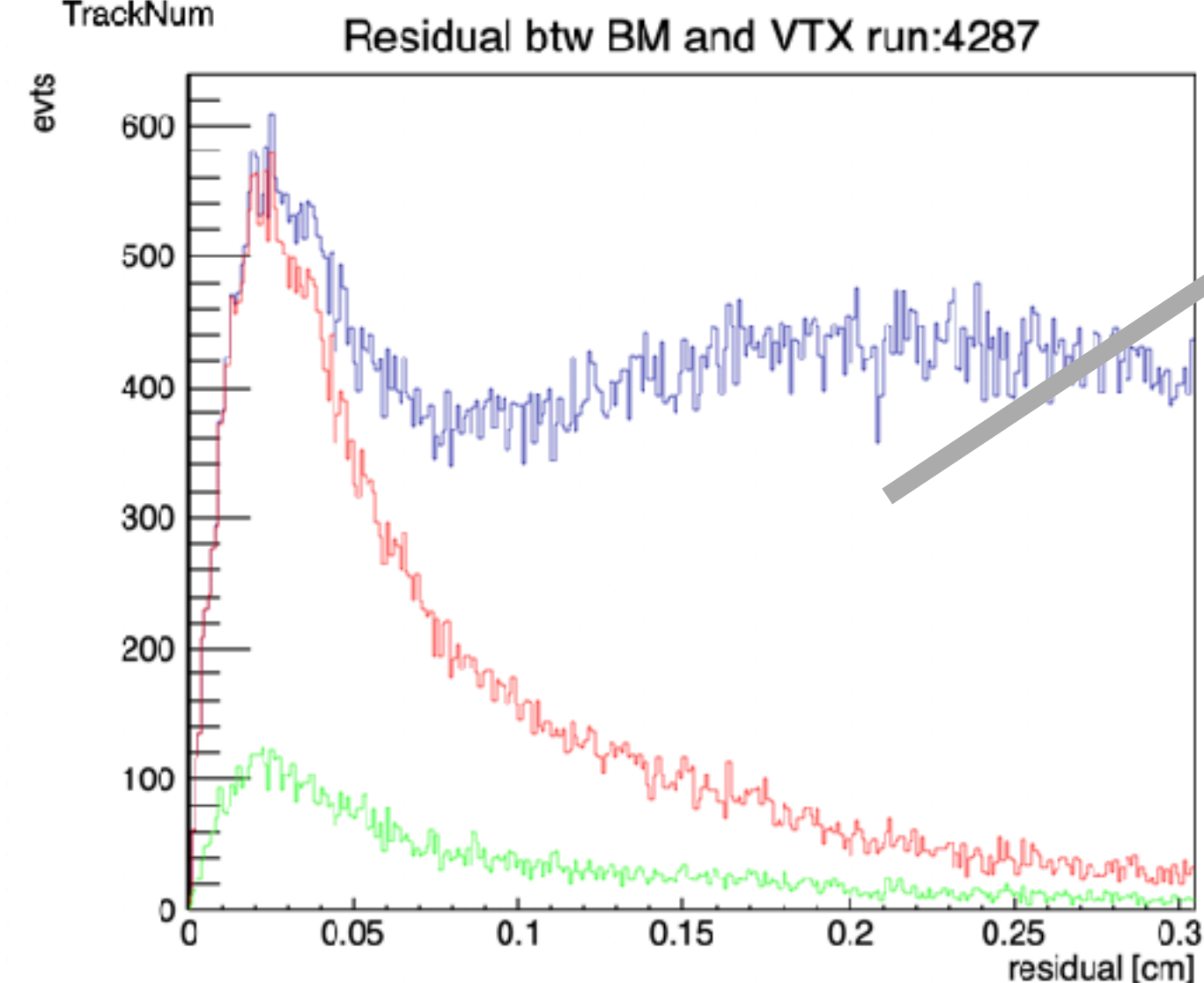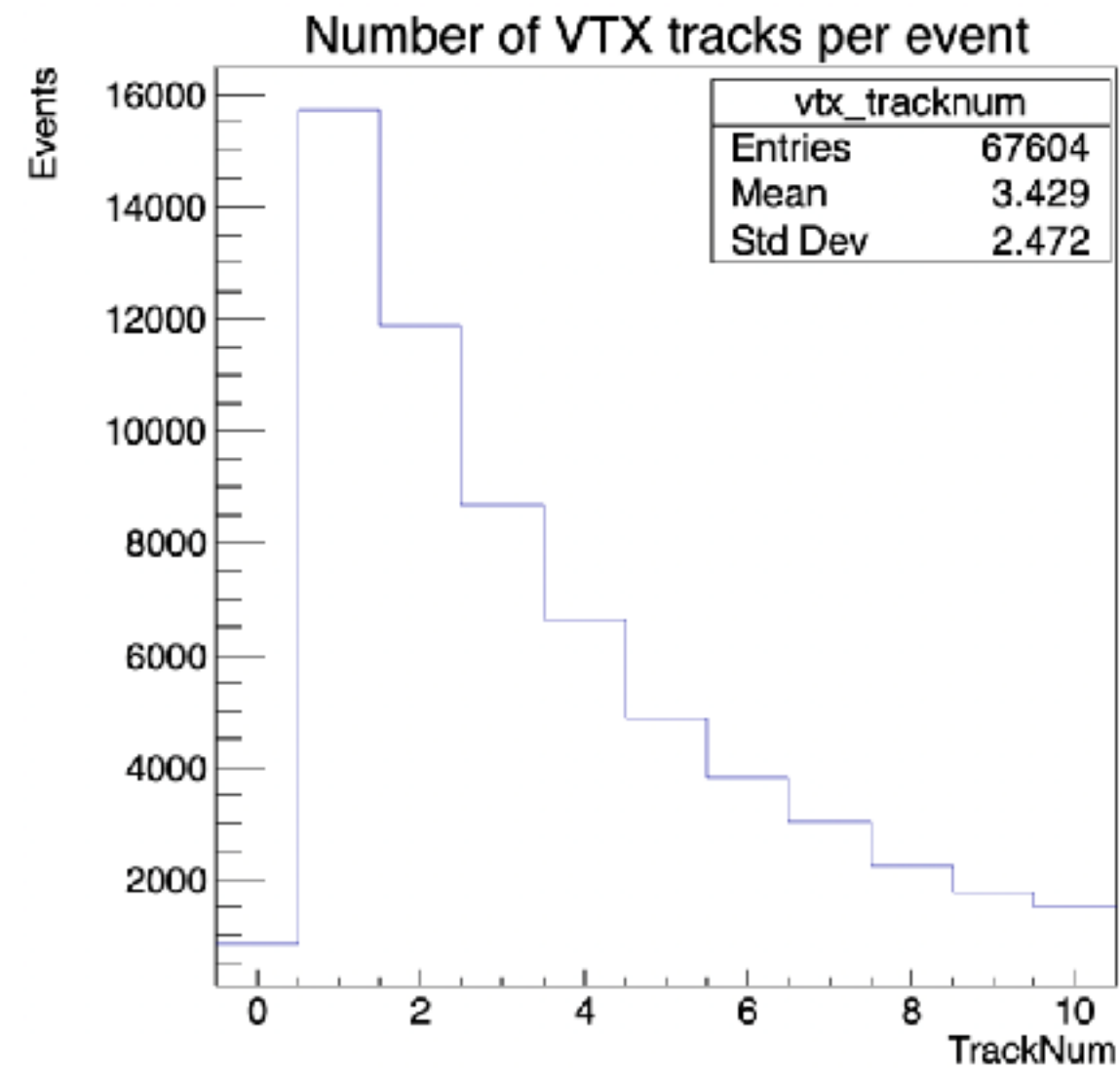
Yunsheng Dong

BM-VTX correlation (run 4287, no target)

BM originY vs VTX originY


BM originX vs VTX originX

- Run 4287: 400 MeV with VTX and no Target
  -The best run to calibrate the BM

- Clear BM-VTX correlation on both X and Y view,
  (The BM tracks have been inverted on the Y axis to be consistent with the VTX tracks, not sure if this is true also in real world)

- The correlation is maintained almost in all runs and till the end
  (However, no full data check)
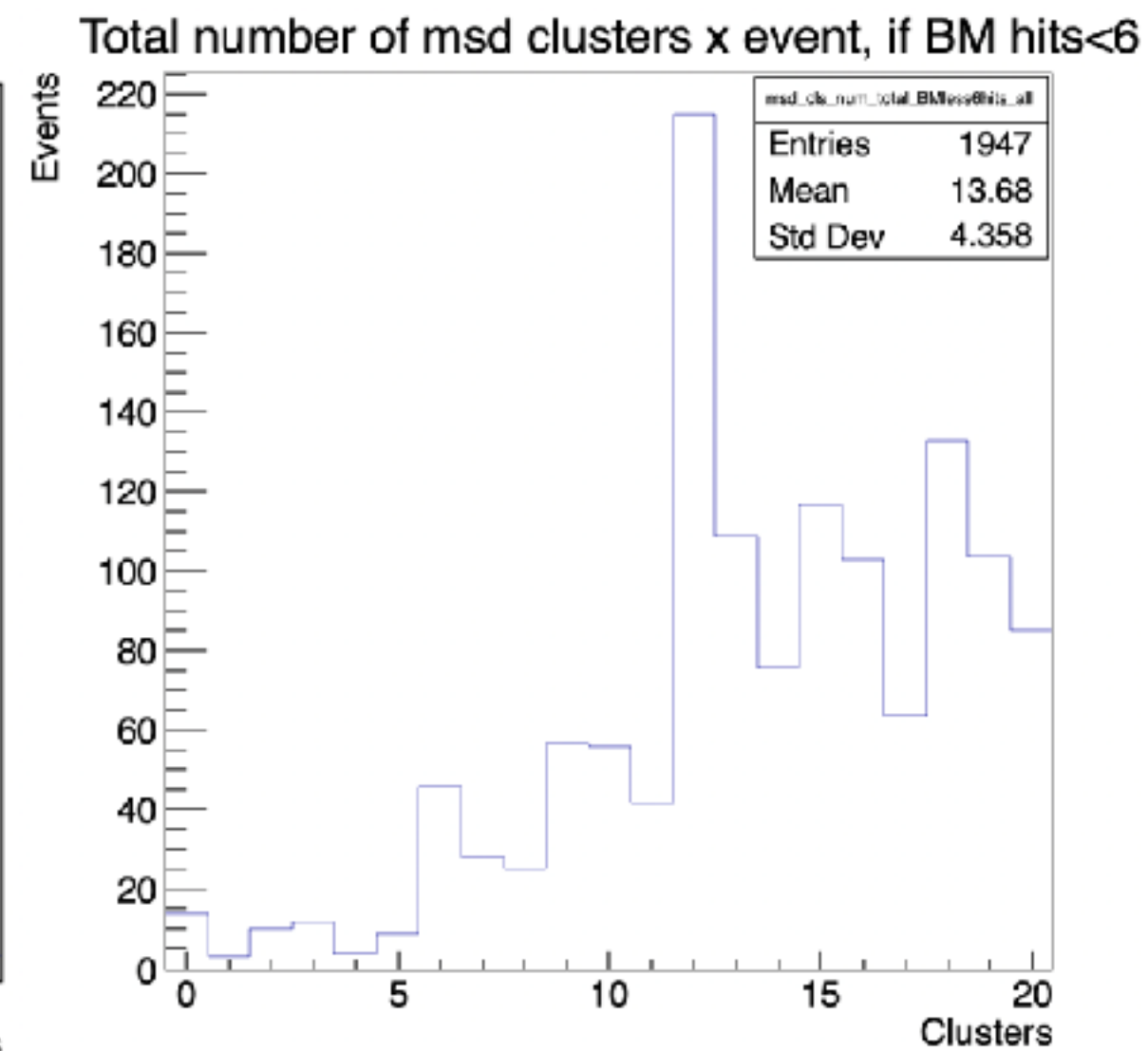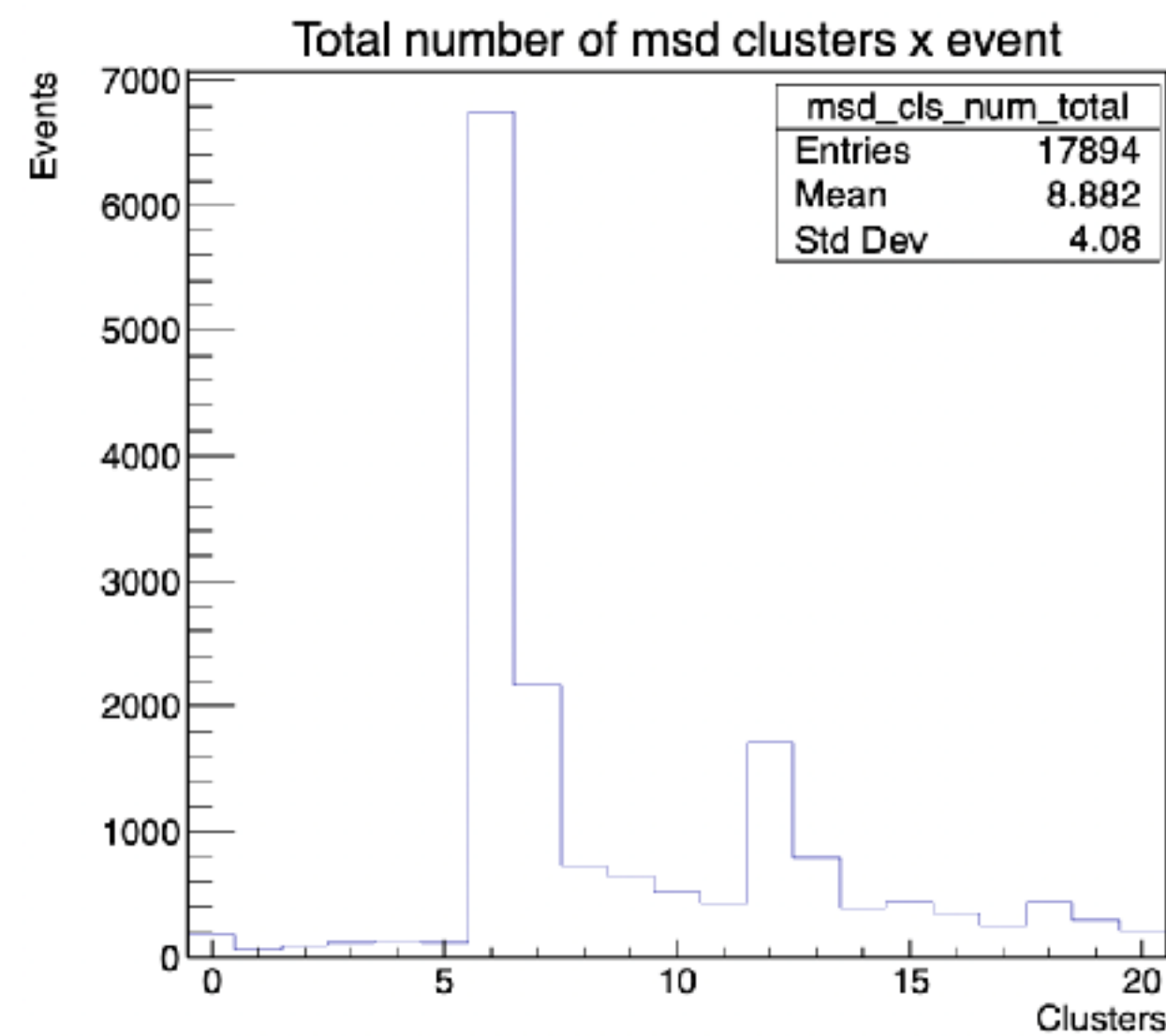
BM-VTX track selection (run 4287, no target)

Number of VTX tracks per event

vtx_tracknum	
Entries	67604
Mean	3.429
Std Dev	2.472

Residual btw BM and VTX run:4287

- The VTX pile-up is not negligible

- Use the BM to select the right VTX track/vertex:
  -align the detectors
  -select only the events with 1 BM track
  -project the BM and the VTX tracks on the target and select the VTX track that minimise the residual, defined as the difference btw BM and VTX projected tracks.

- BM and VTX residual plot:
  blue: evts with 1 BM track; the residual is calculated with all the vtx track
  green: evts with only 1 BM and 1 VTX track (clean evts)
  red: evts with 1 BM track; the residual is calculated with the vtx track that is closer to the BM track

- Possibility to use TAVTvertex::IsBmMatched() method, but it has to be fixed.
  (at the moment the BM track is reconstructed after the VT vertexing)

3

BM "strange" events
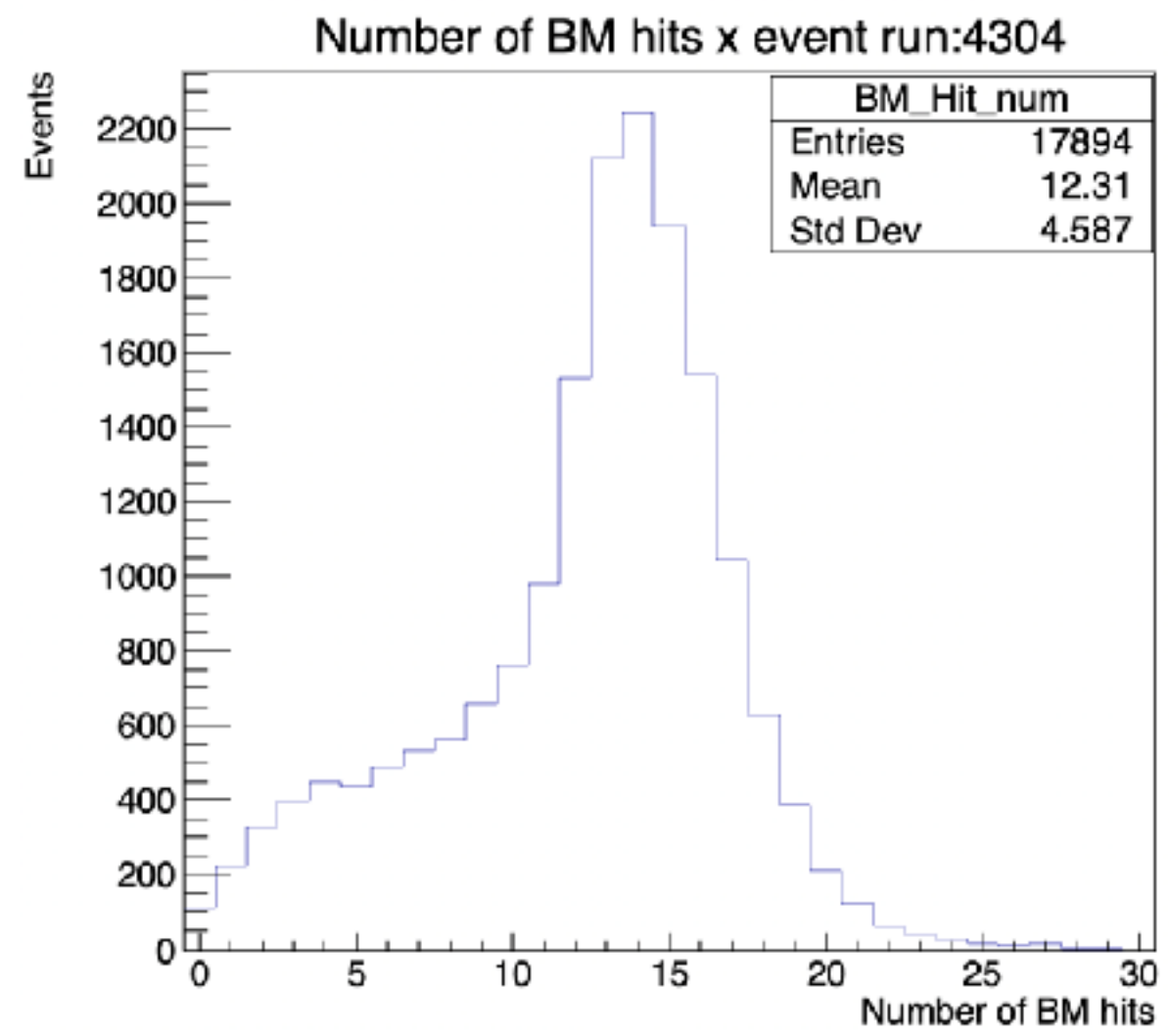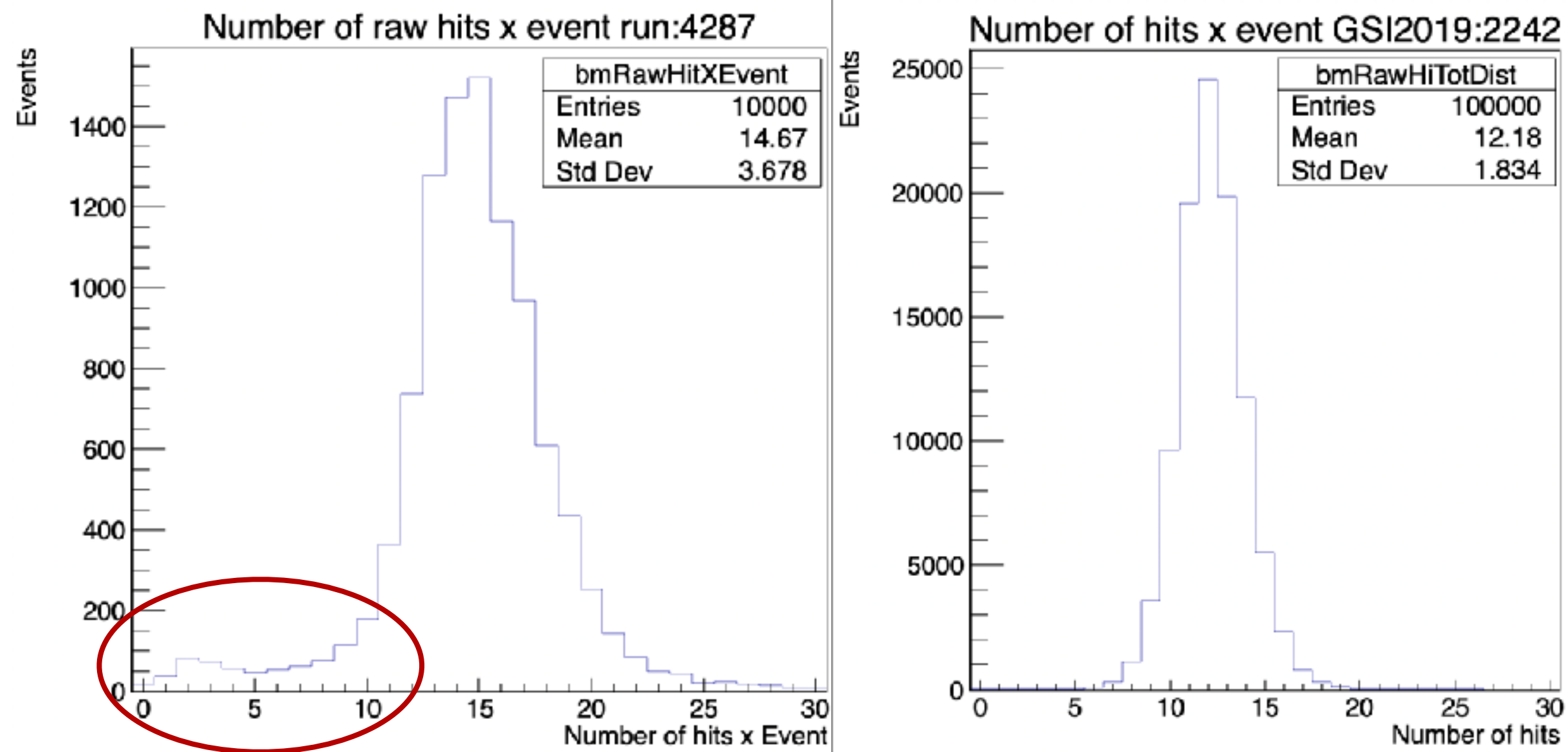
- The number of BM hits distribution shows an unusual tail in the low hits region (few %)

- Never detected in GSI 2019 or other BM stand alone data takings

- In some runs, this effect can be particularly relevant (e.g.: in 4303, 4304, 4328, 4330 the fraction of evts with less than 6 bm hits can be of ~10%)

- Not a constant effect: it can change significantly between two consecutive runs

MSD clusters in BM "strange" events

Total number of msd clusters x event

msd_cls_num_total	
Entries	17894
Mean	8.882
Std Dev	4.08

Total number of msd clusters x event, if BM hits<6

msd_cls_num_total_BMless6hits_all	
Entries	1947
Mean	13.68
Std Dev	4.358

- When the BM detect less than 6 hits, the MSD shows a higher number of hits, (apparently two tracks)

- Different hypothesis under study: incident beam instabilities, trigger effects, fragmentation somewhere before the target etc.etc.

- More investigation needed!