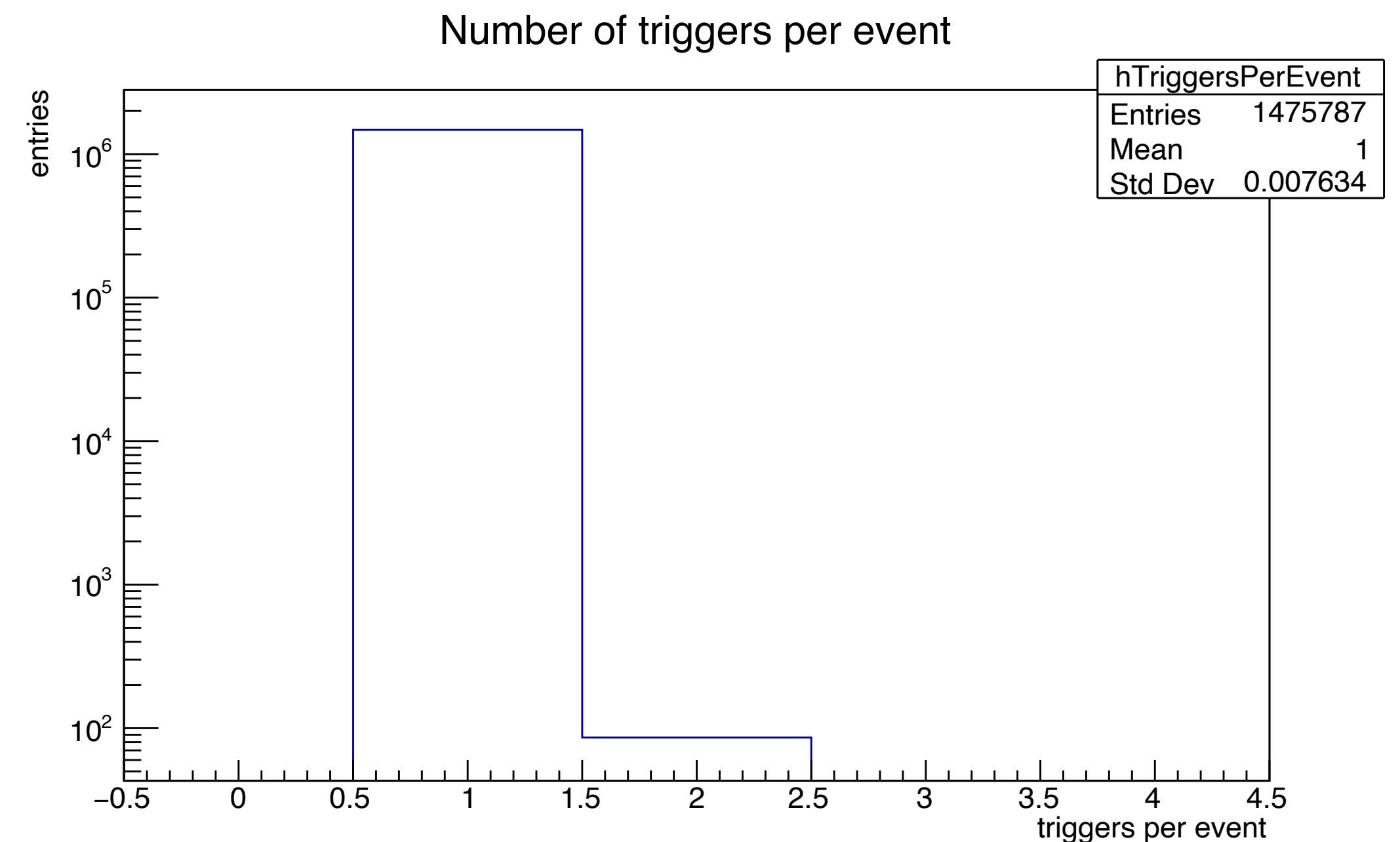


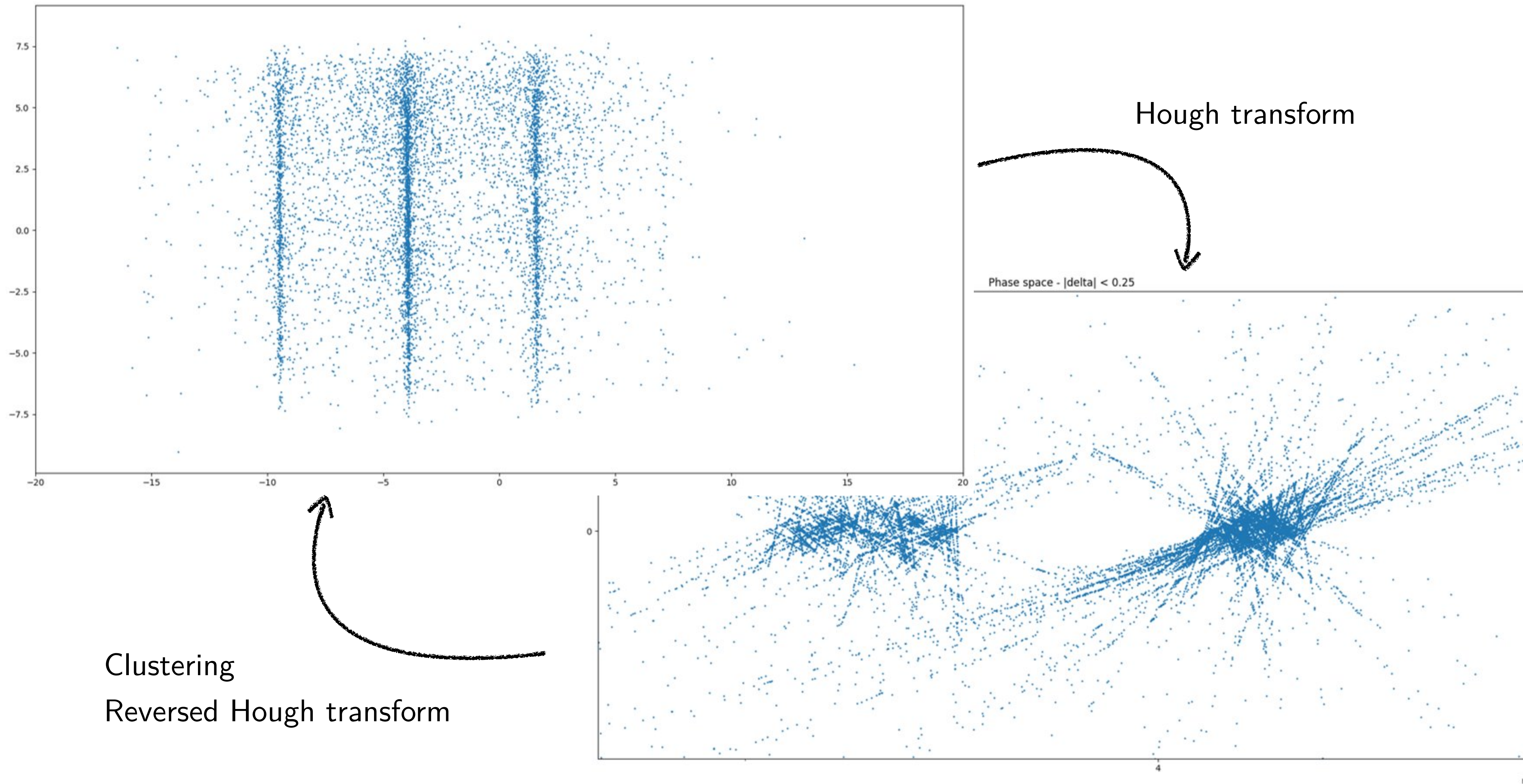
TB22 Telescope Alignment

Shan, Michal, Kirill (Tel Aviv University)

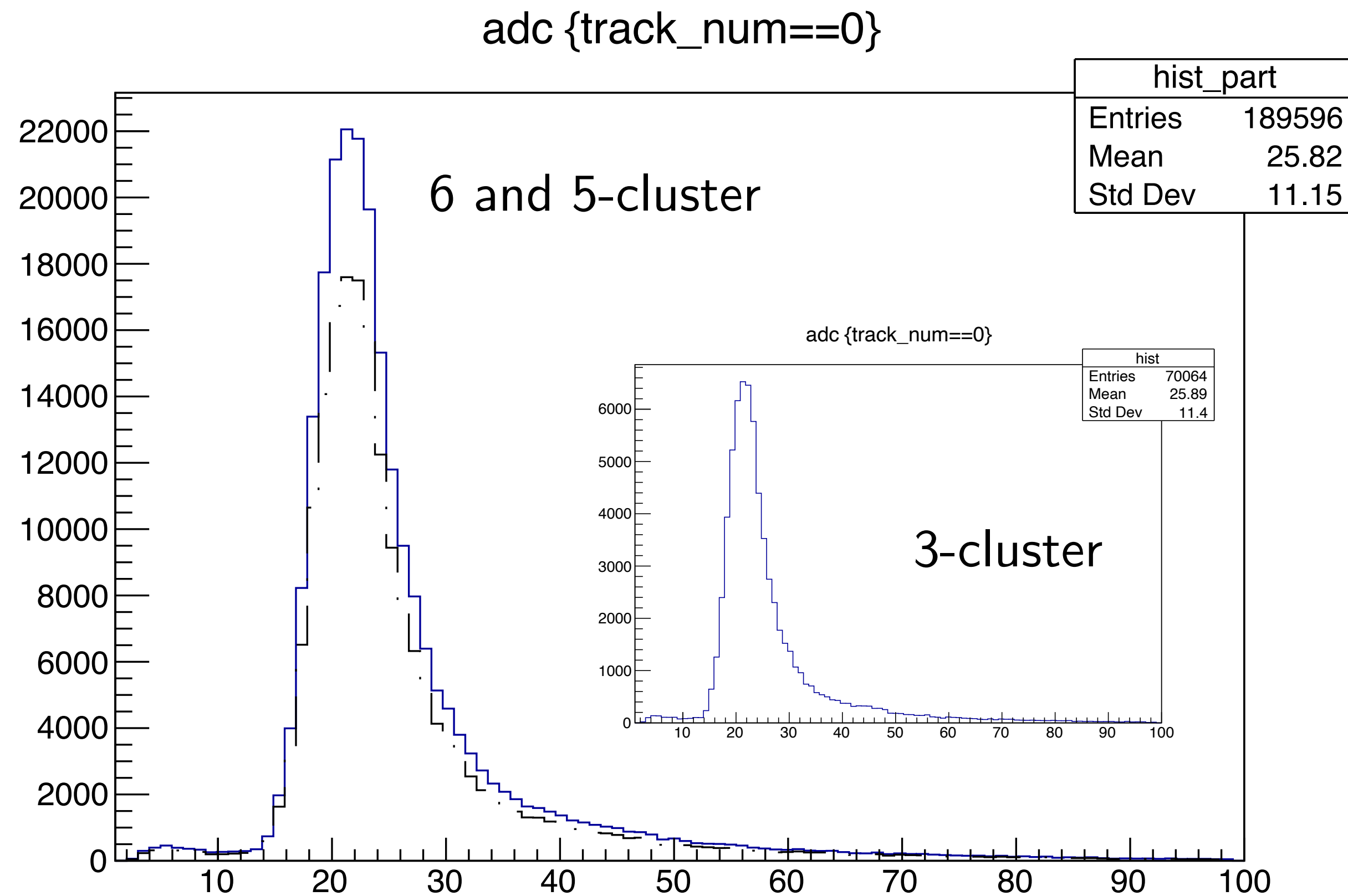
19 July 2023

- Alignment in telescope planes (finished in early April)
 - Sanity check passed (aligning adjustments are consistent)
- Alignment between telescope and sensor
 - Based on sensor edge
 - Manually done for C75 & Y1
 - Automatic alignment underway by Michal
 - Based on hit distribution
 - Itamar's method
 - Dataloader into Corryvreckan
- “Ghost” tracks
 - Tracks are not reconstructed ($>16\%$)
 - Probably not the double-track events
 - One track one trigger ($<0.1\%$)
 - Scintillator 100% efficiency

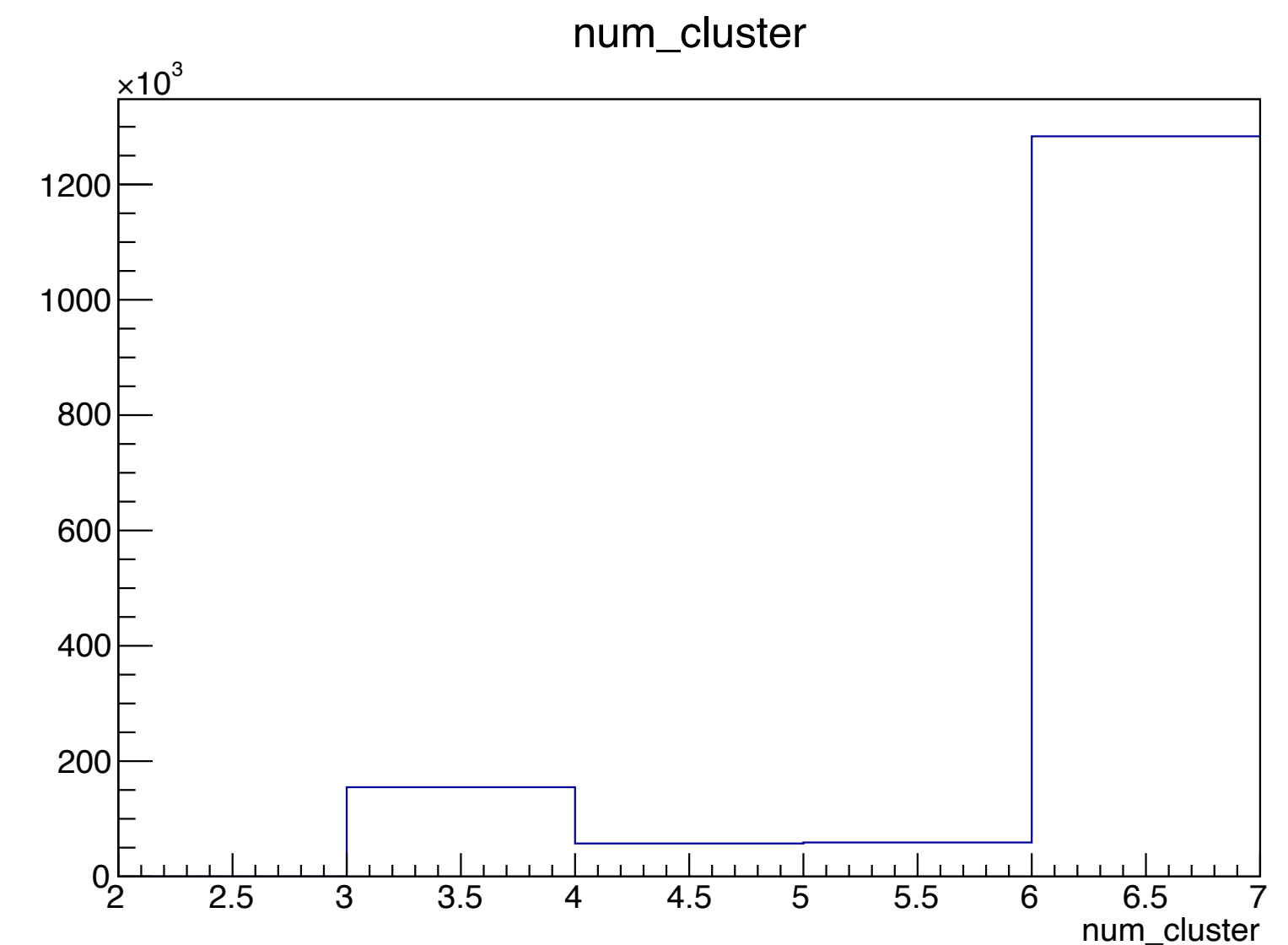




Signal with “no” electron

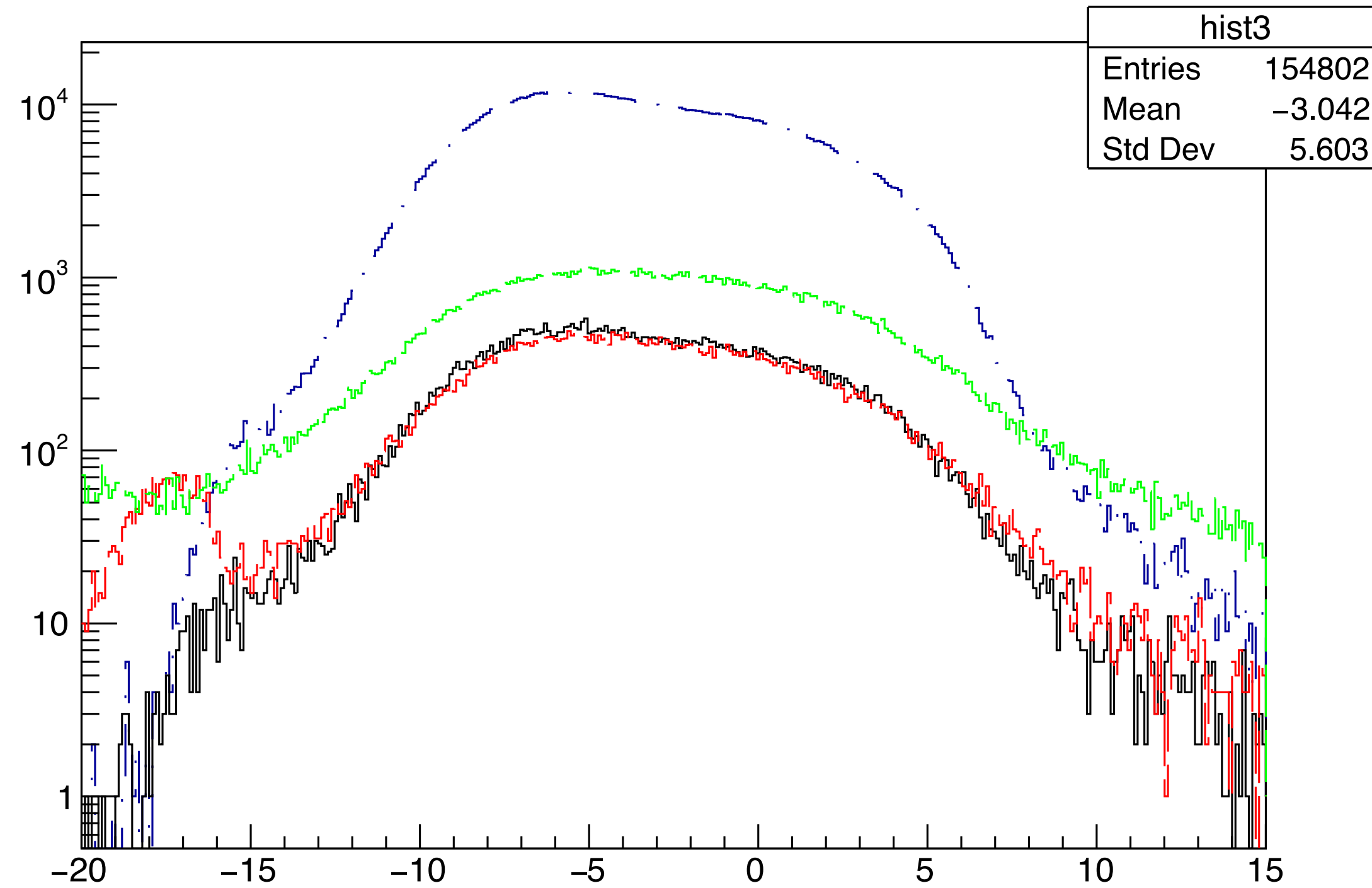


- Signal observed when there is no track reconstructed in the telescope
- About 16% of all events
- Possible cause: strong requirement for tracking: needs all six planes to reconstruct
- Some “false negatives” by loosening the requirement of tracking
 - Down to 6% when requiring 3+ planes



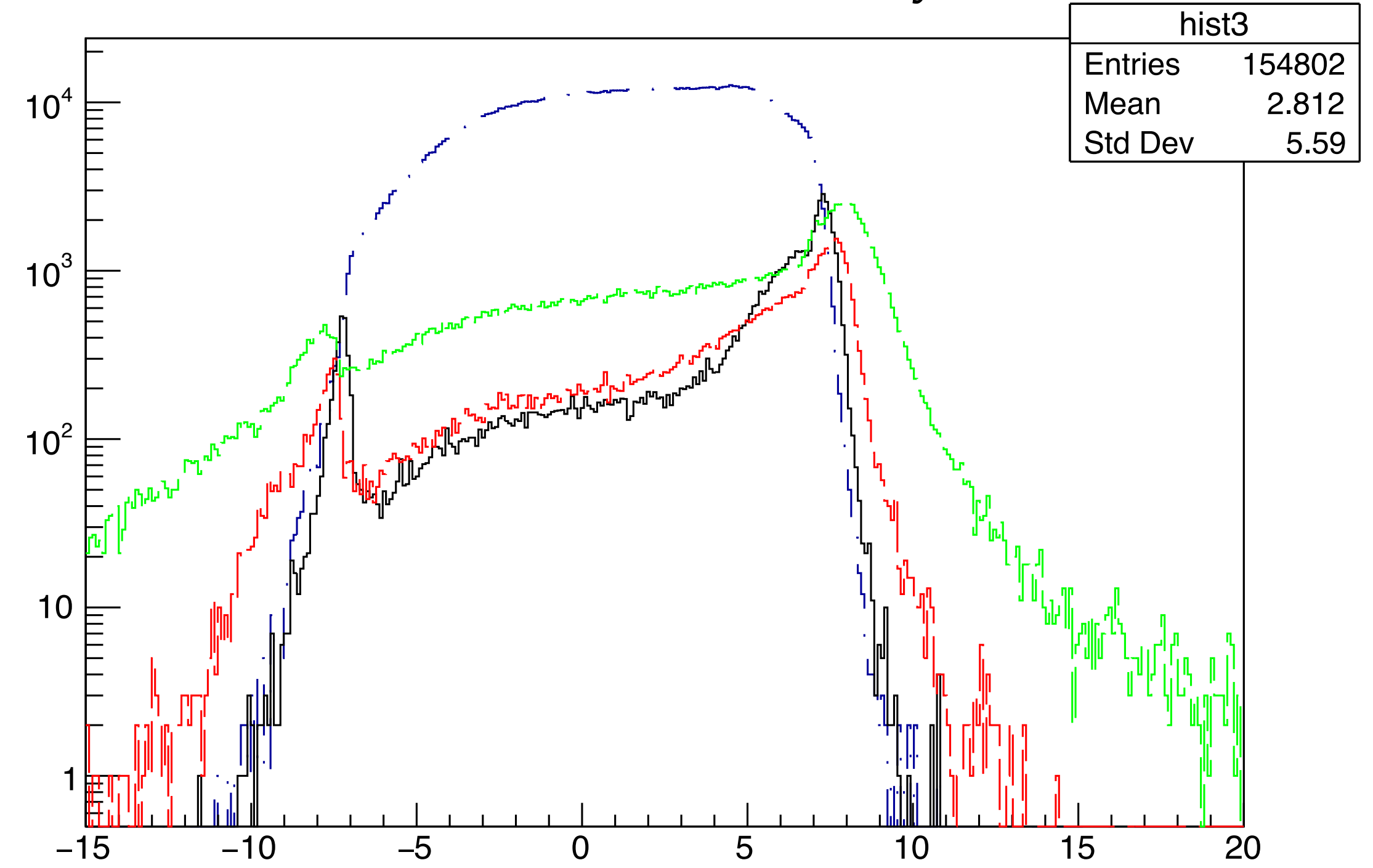
Run 4417 with fewer clusters

Position distribution x



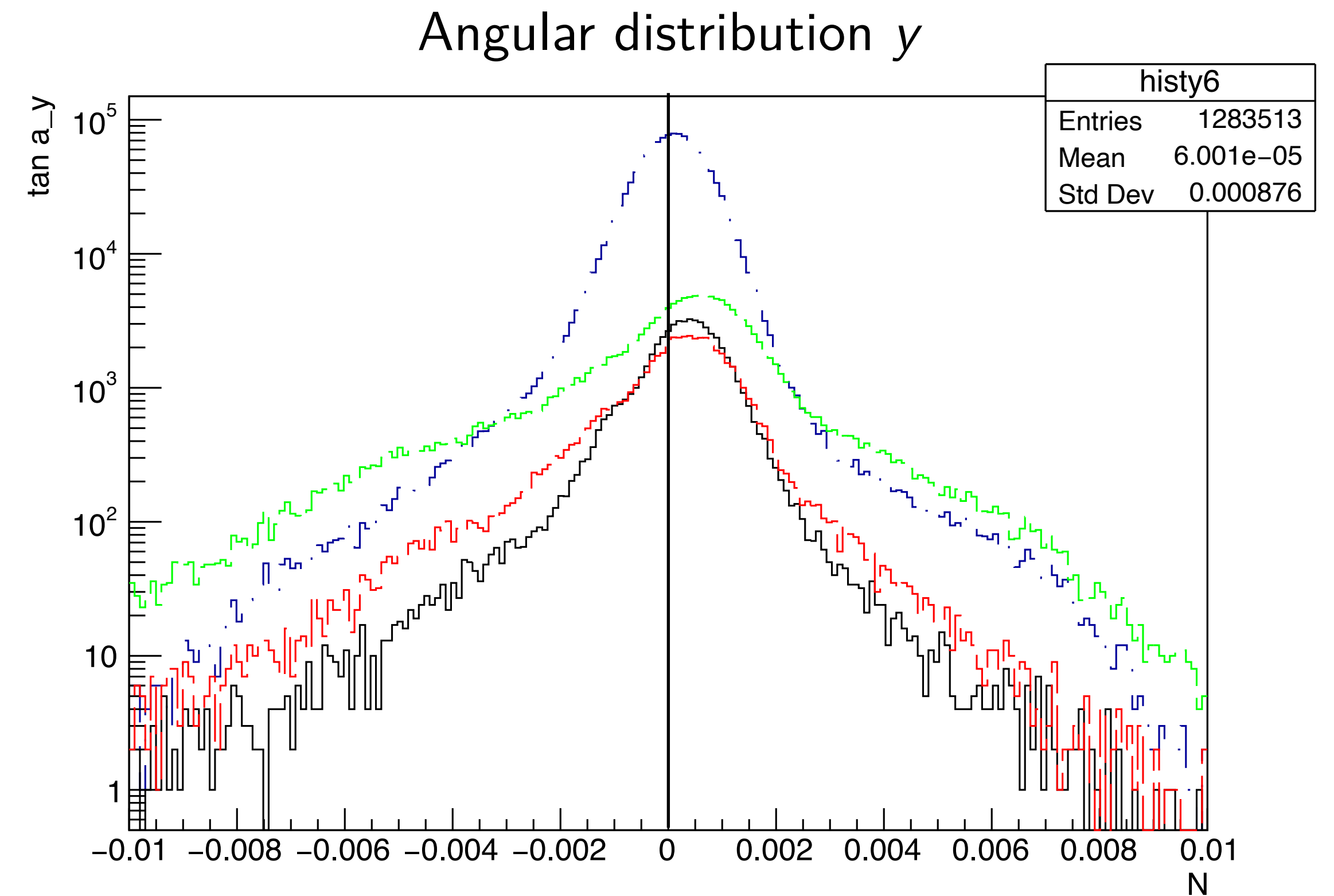
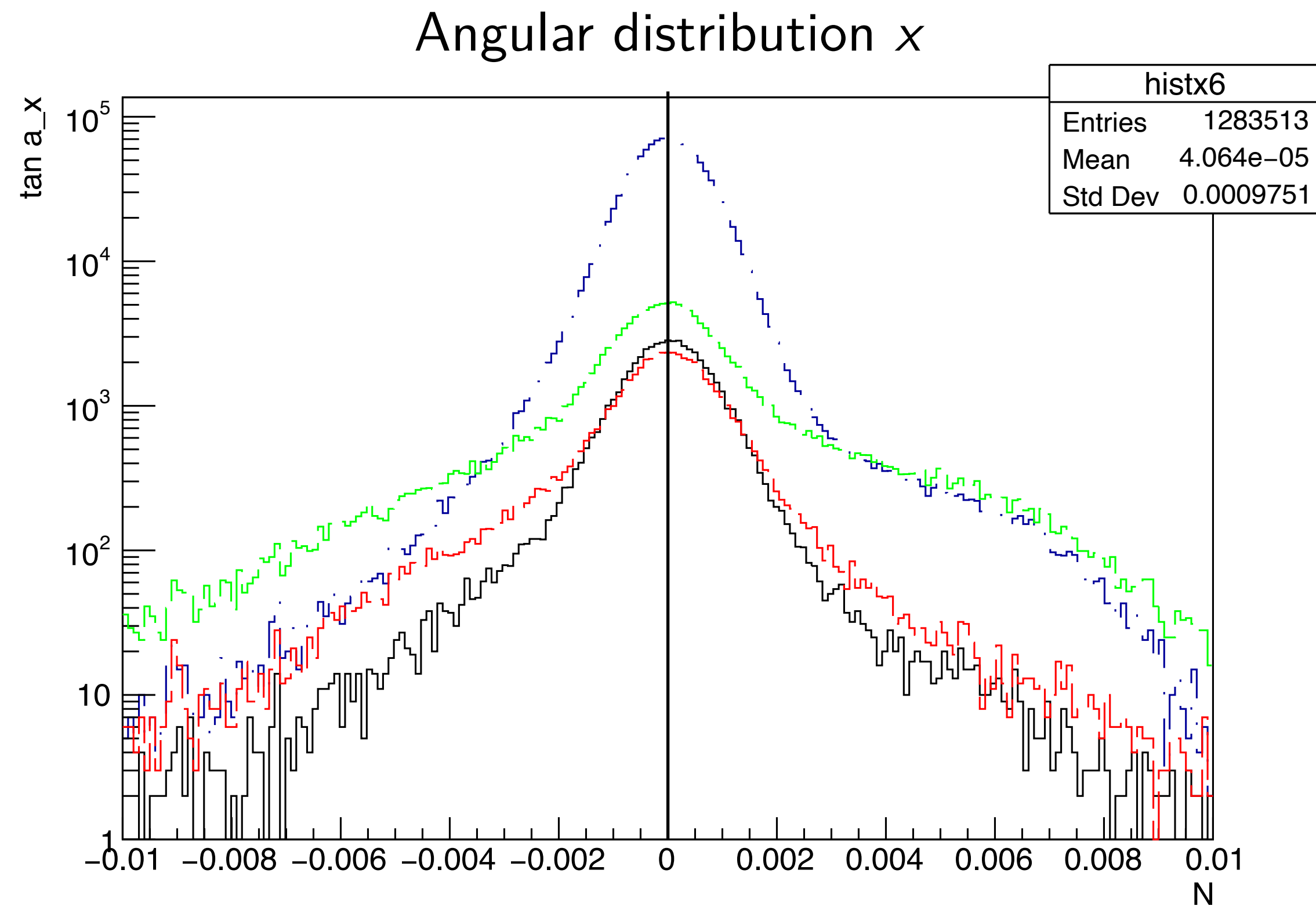
Blue: 6-cluster track
Black: 5-cluster track
Red: 4-cluster track
Green: 3-cluster track

Position distribution y



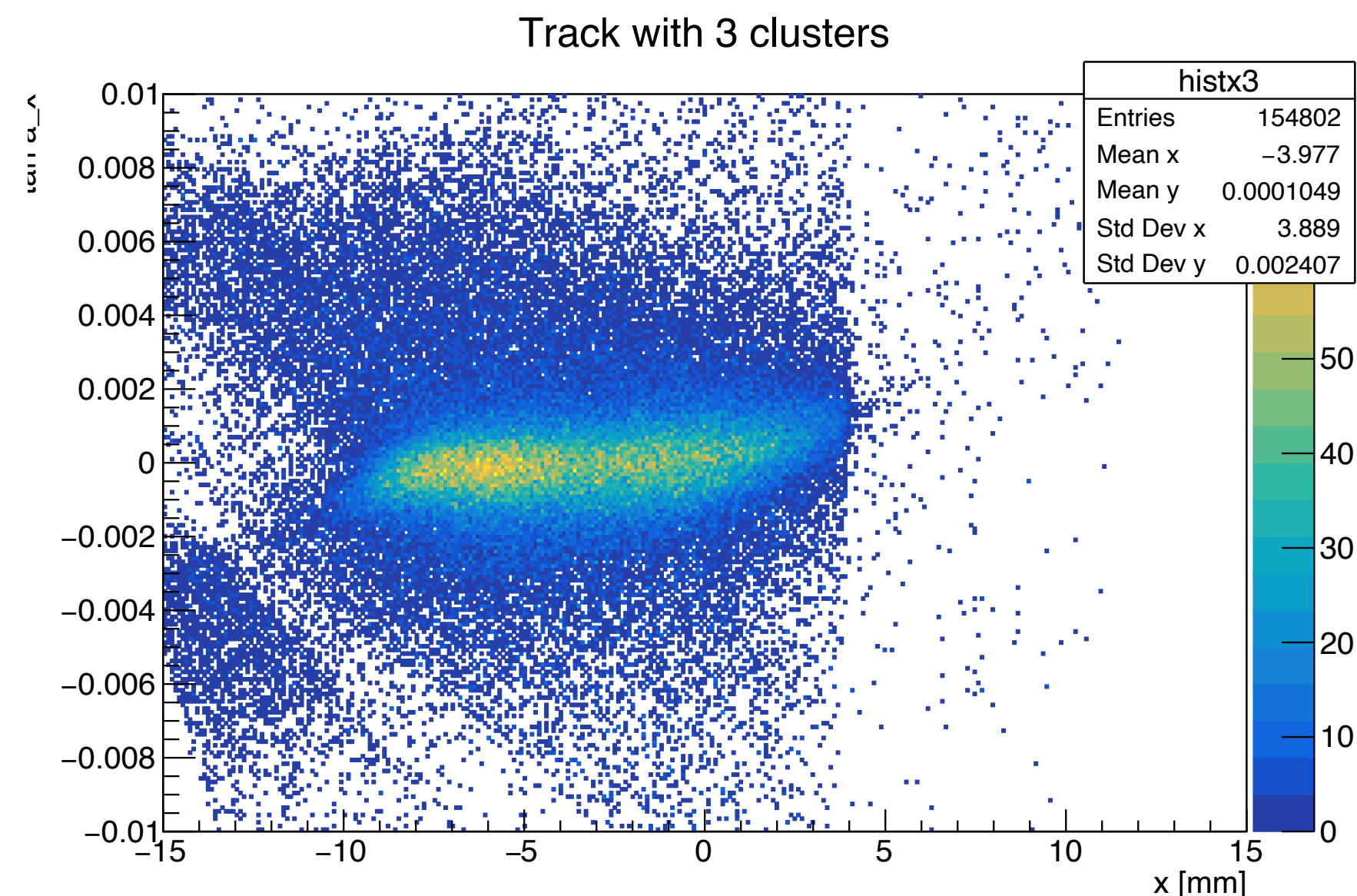
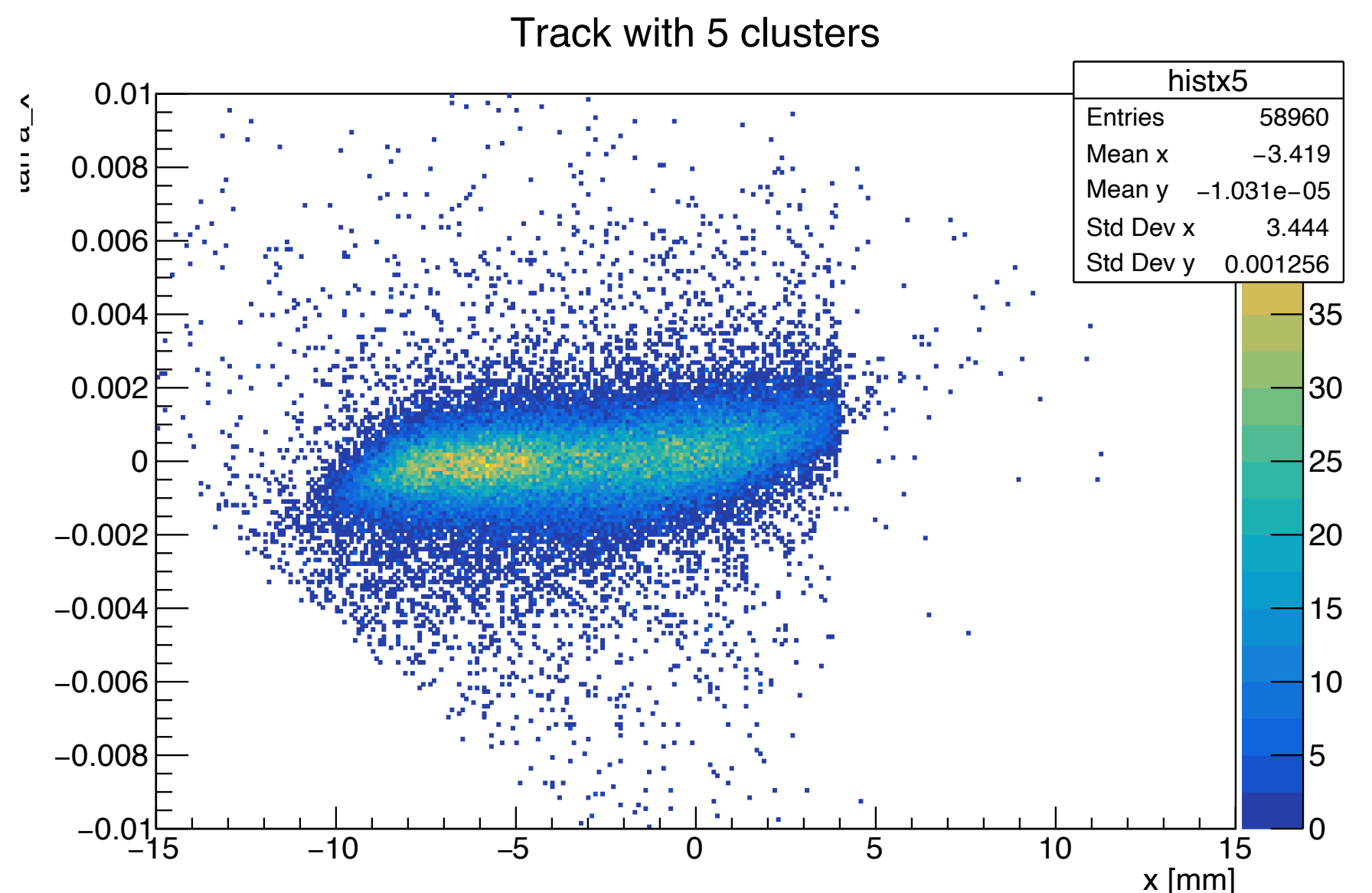
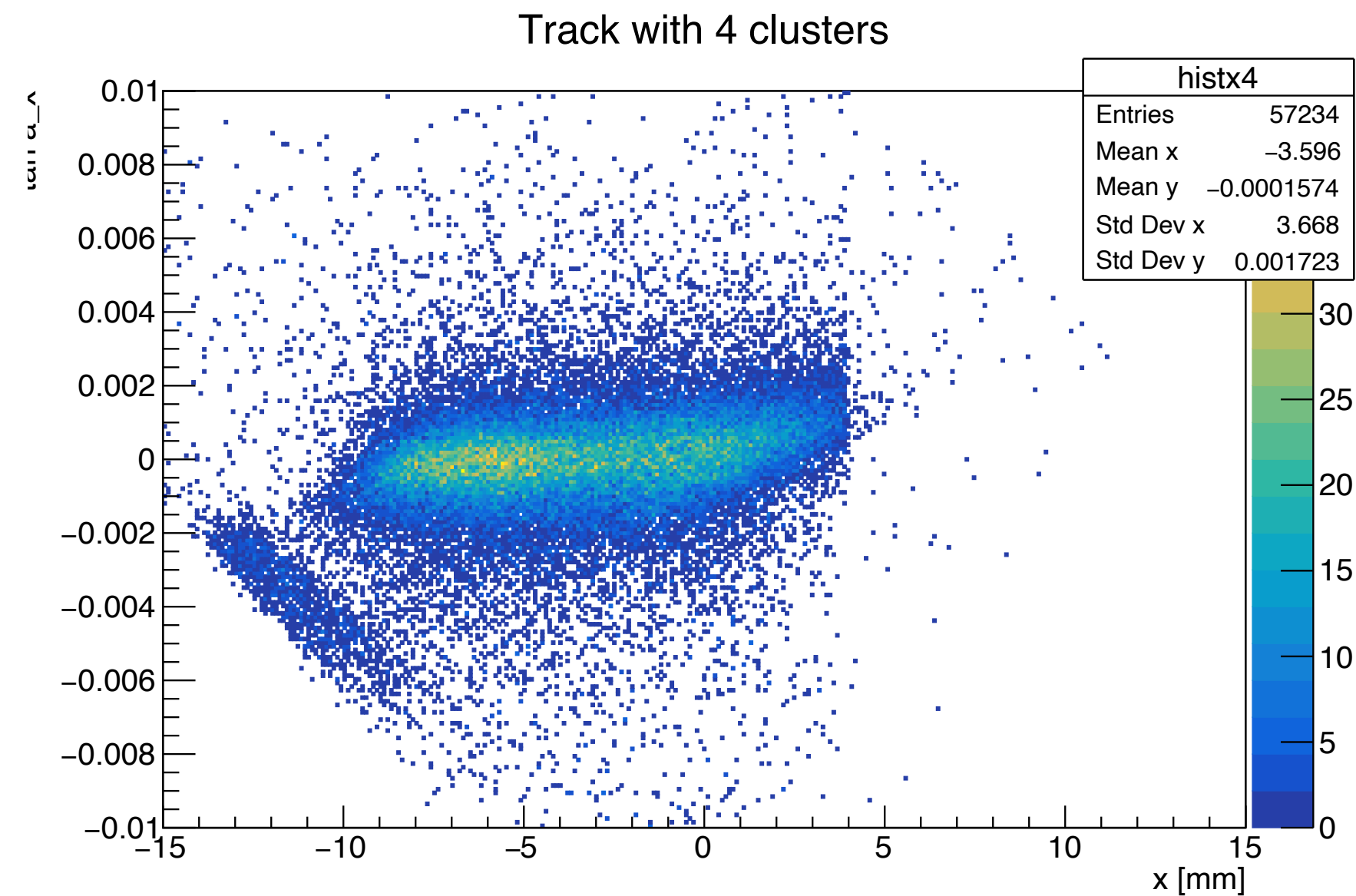
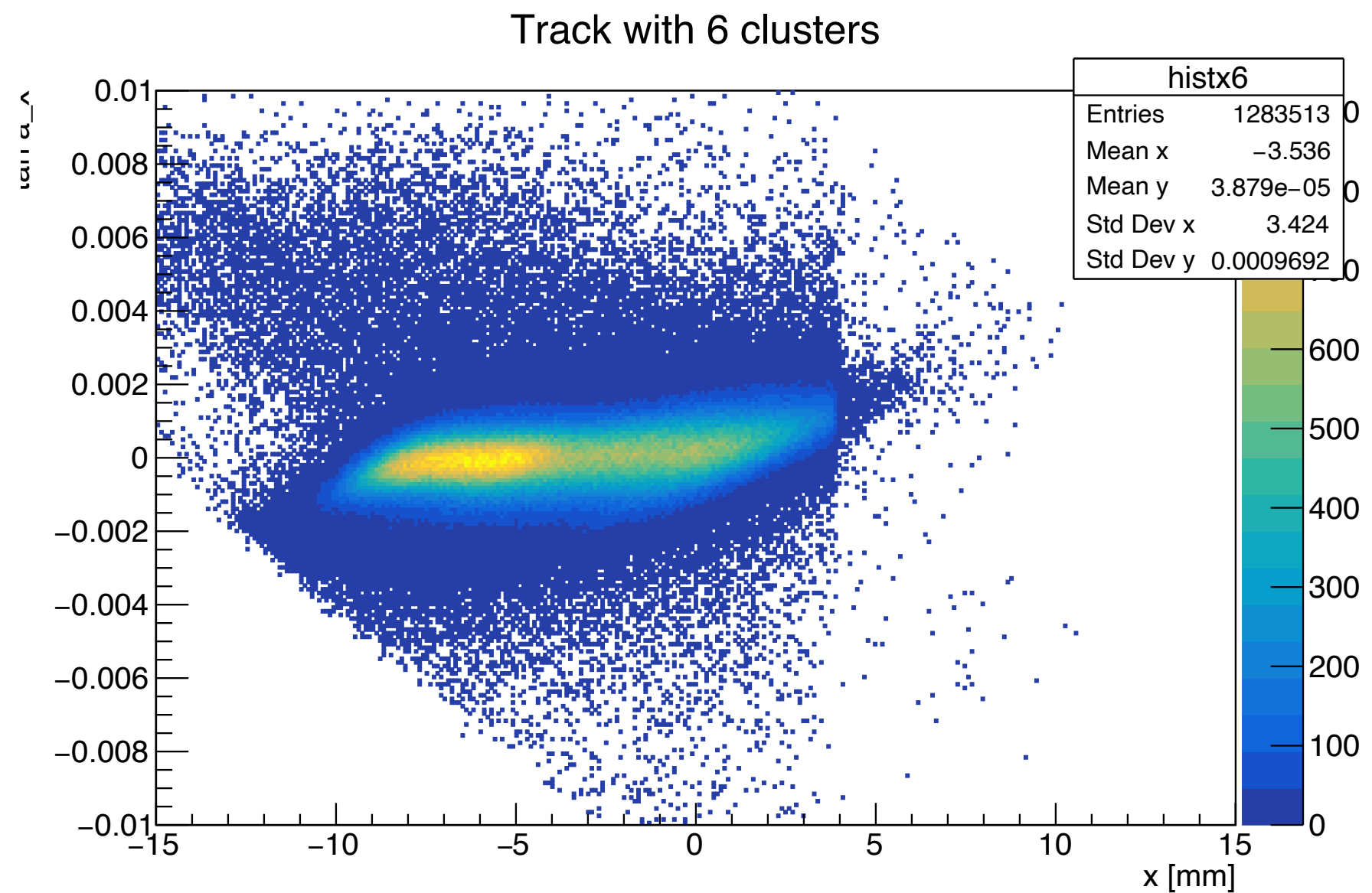
Telescope detector size: 29.9 mm x 13.8 mm
Collimator (beam) size: 12 mm x 12 mm

Incoming angle of reconstructed tracks

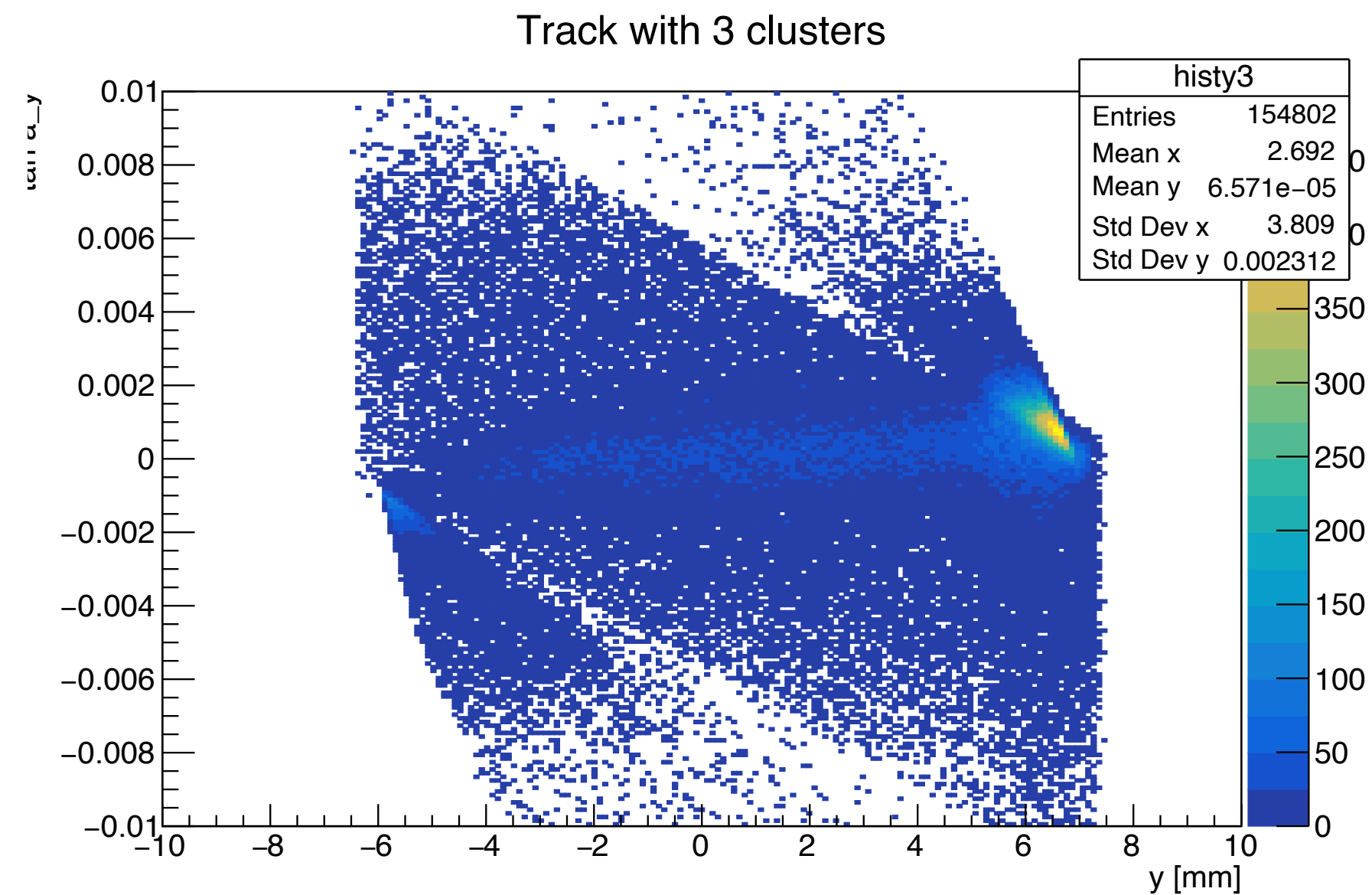
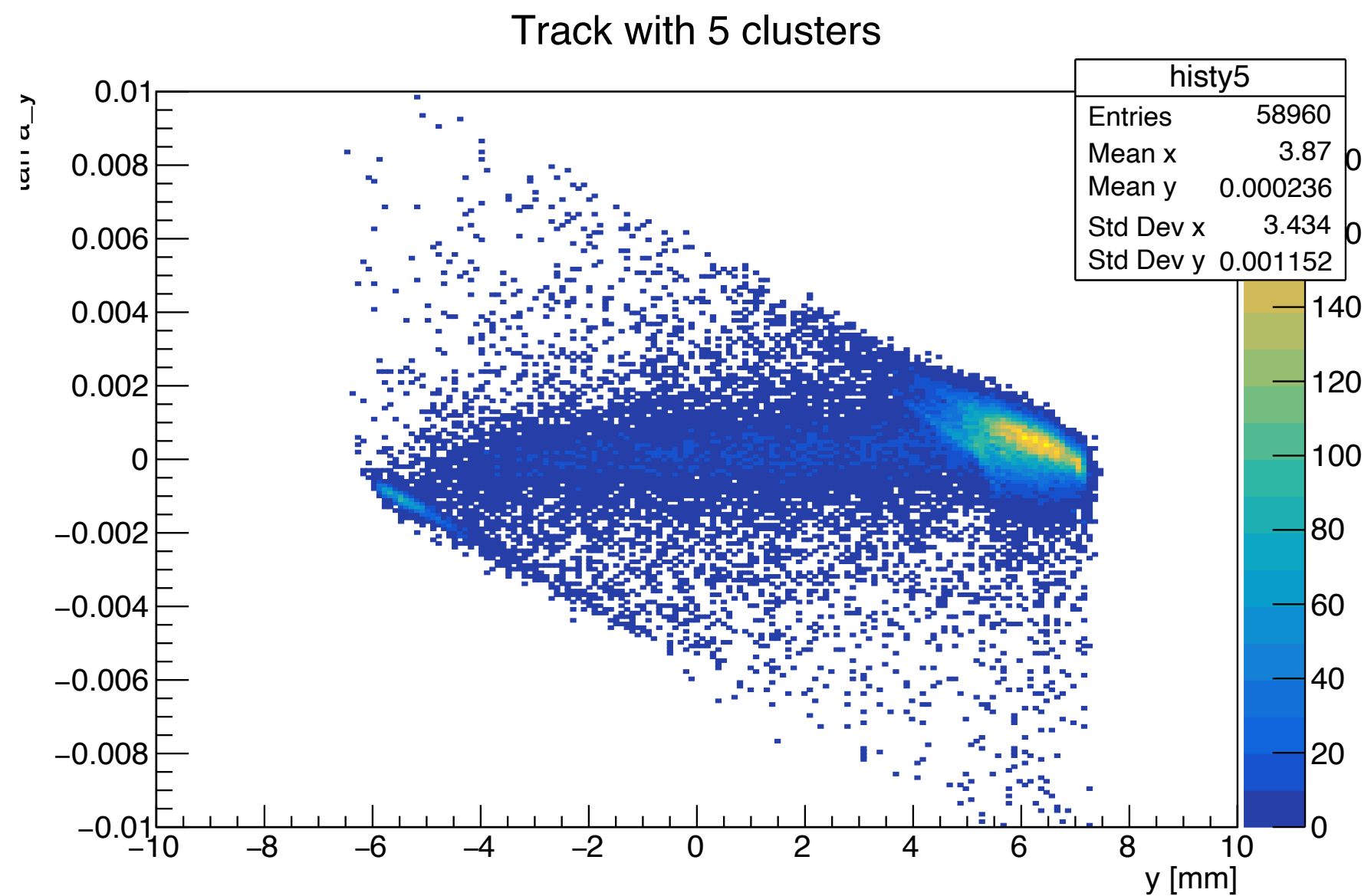
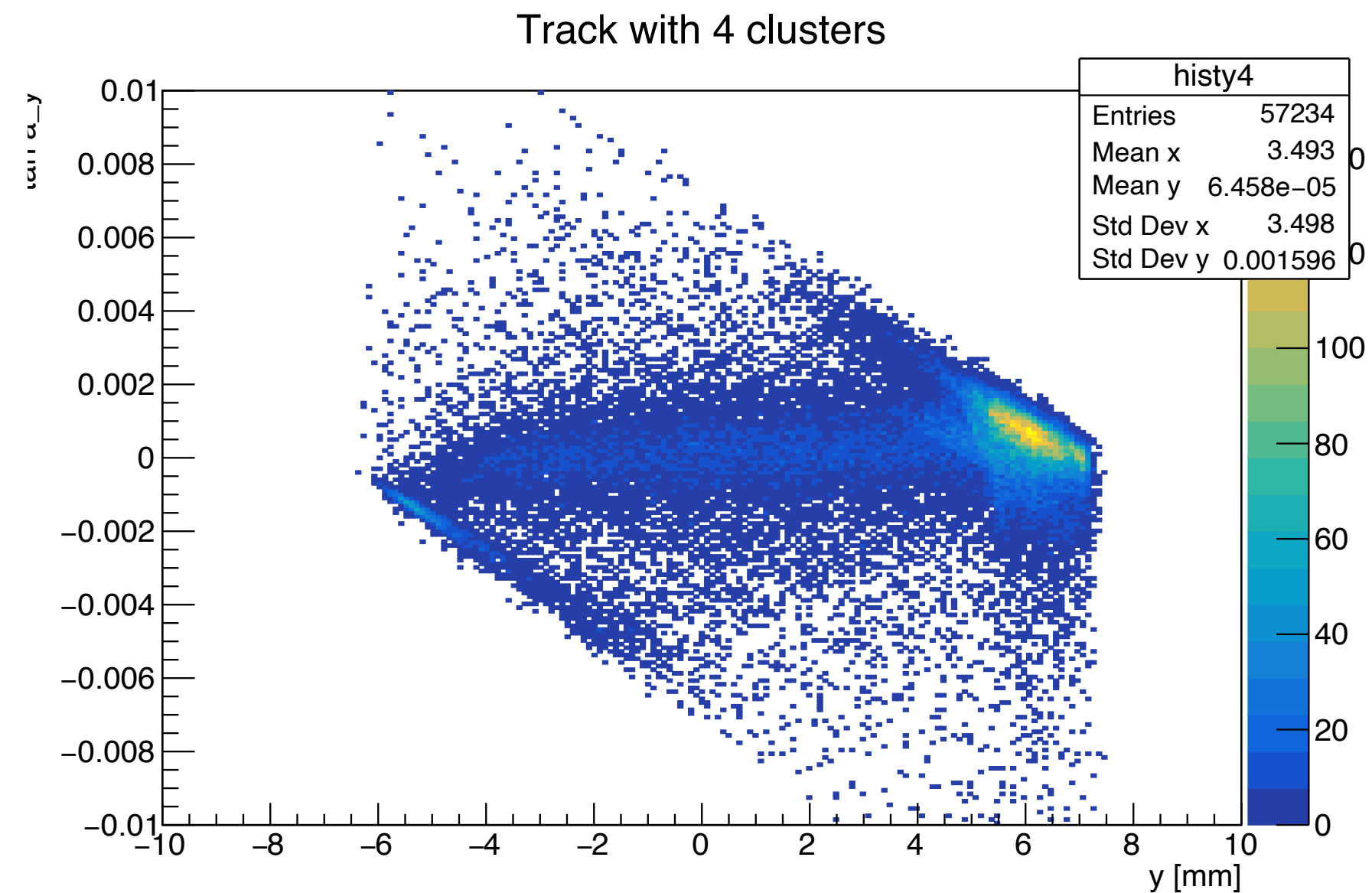
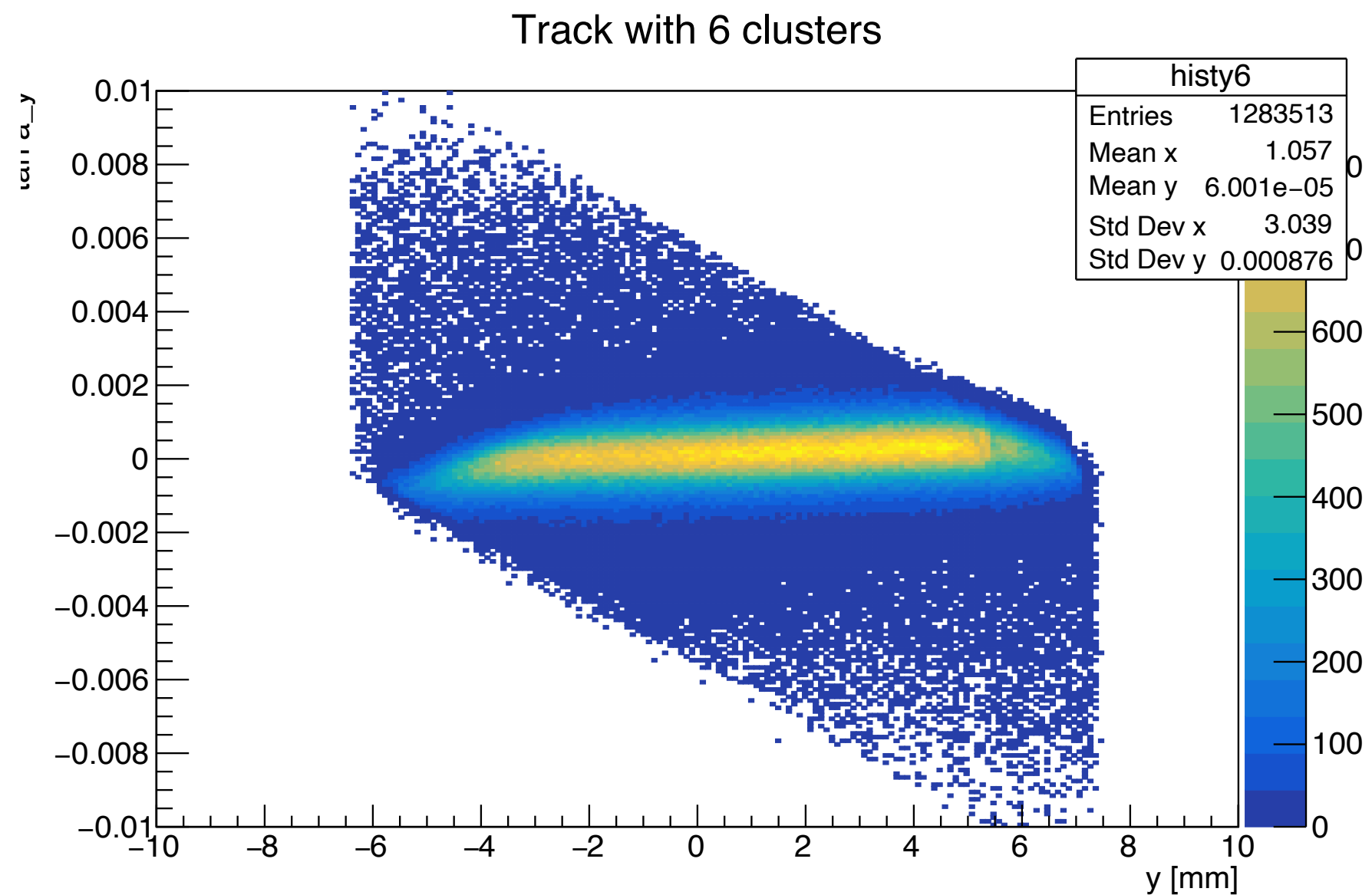


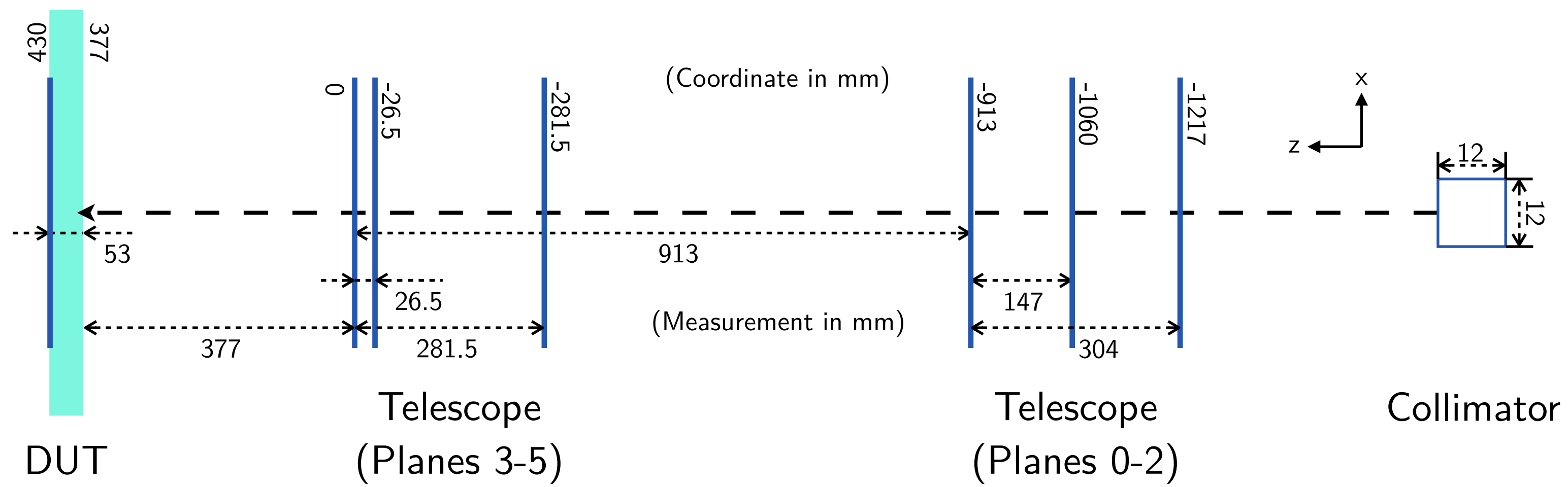
Blue: 6-cluster track
Black: 5-cluster track
Red: 4-cluster track
Green: 3-cluster track

Angle-position: x

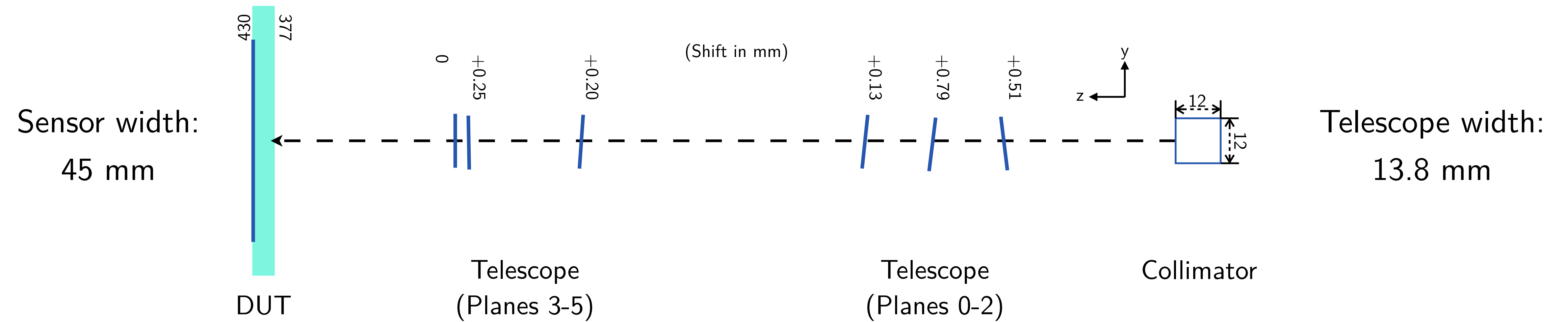
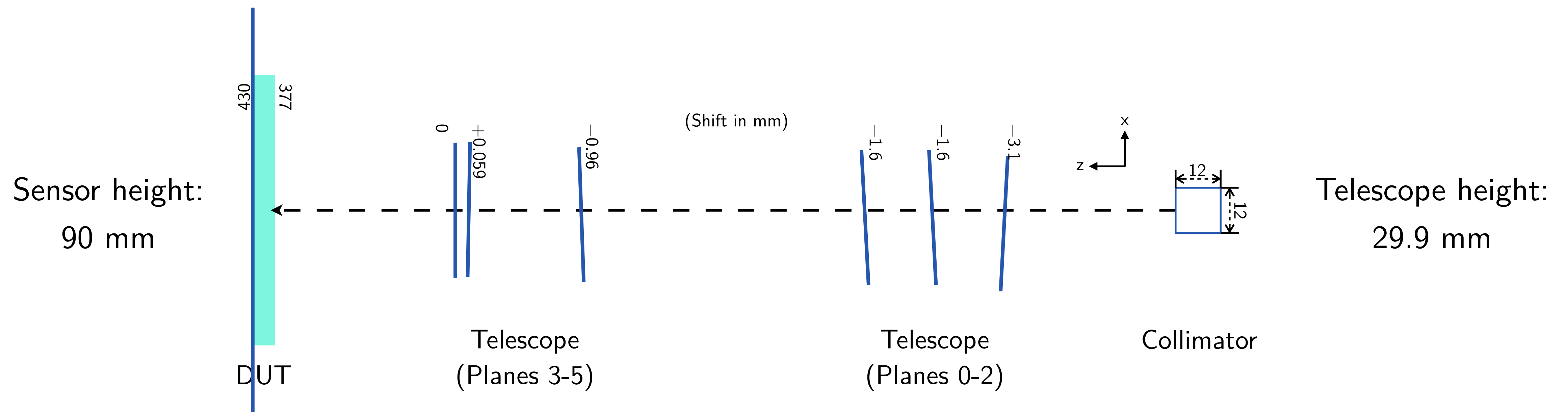


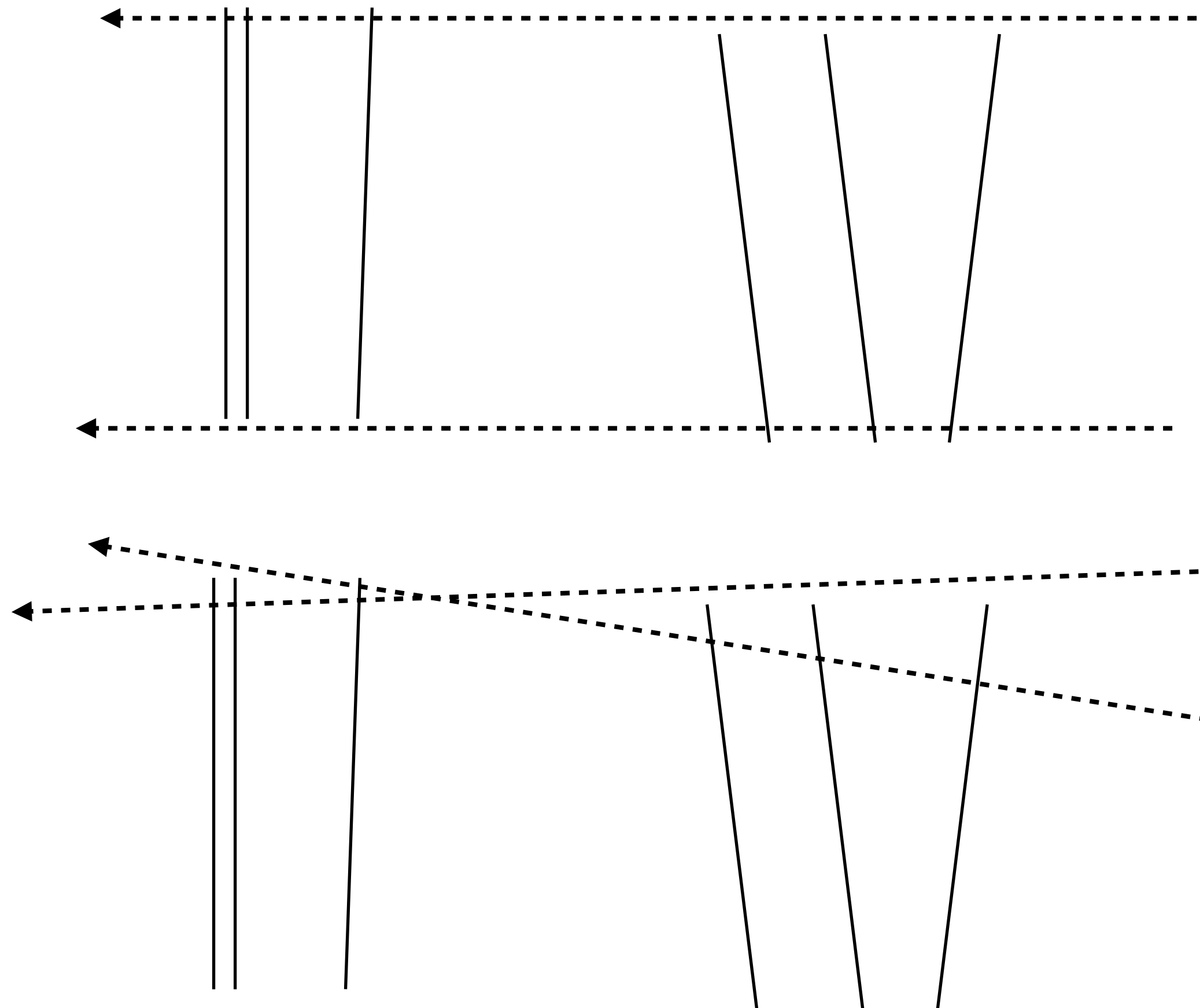
Angle-position: y





Only to the scale on z direction





Possible explanations:
Tracks on the edge
Tracks with angle

Summary

- Processed and merged telescope-sensor data limited C75 & Y1
 - Available on ISS-LUXE server: `/data3/shan/beamtest/sentel_slim/`
- More data available after automatic alignment
- “Ghost” tracks
 - Important to data analysis and automatic alignment
 - Partially reconstructed after loosening the tracking requirement
 - Tracks with 3-5 clusters are over 30% of 6-cluster tracks
 - Discarding the extra tracks as a quality cut, might worth looking into in the future