

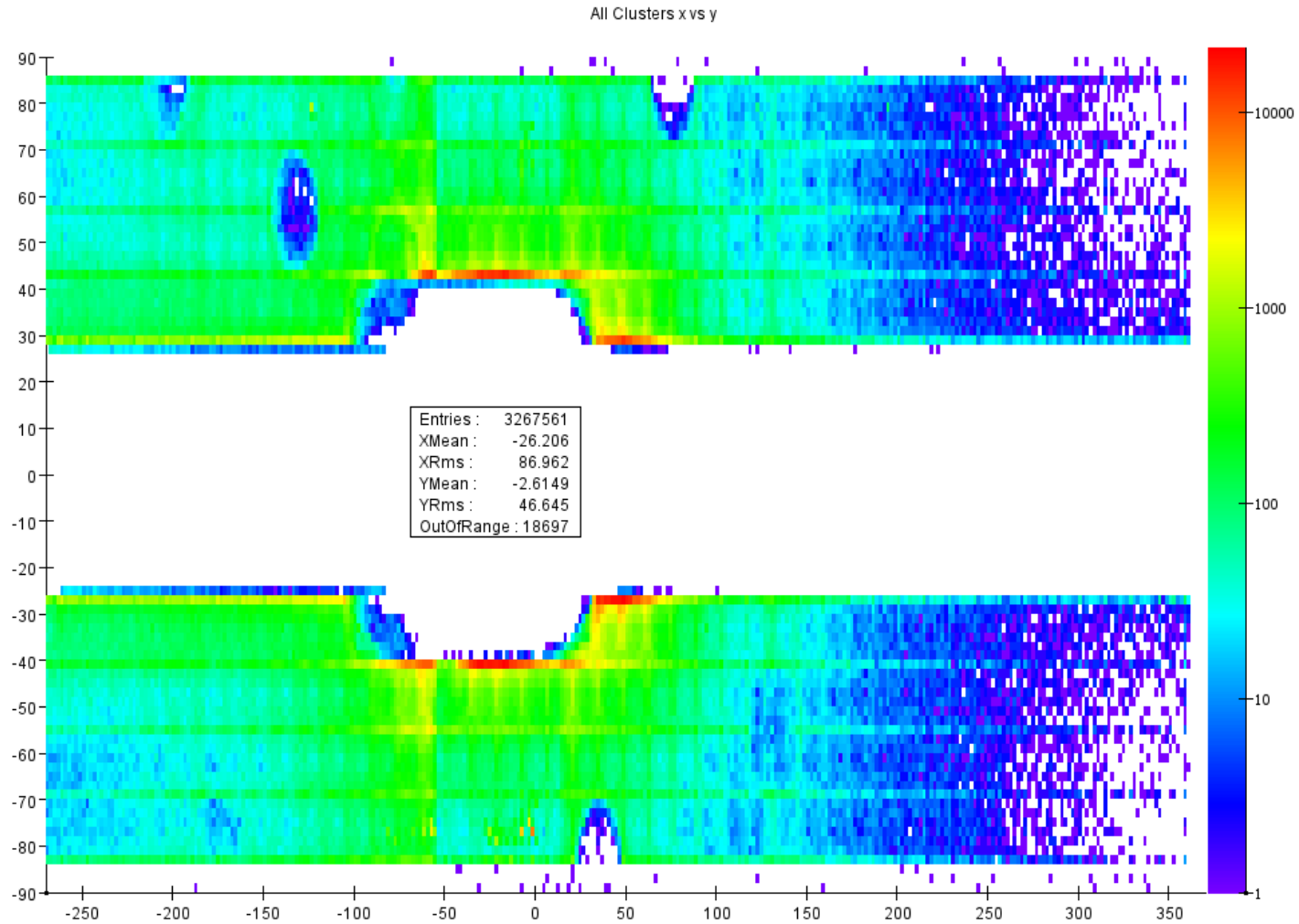
2021 FEE Calibration

Norman Graf (SLAC)
HPS Weekly Meeting
November 15, 2022

Pass0 Reconstruction

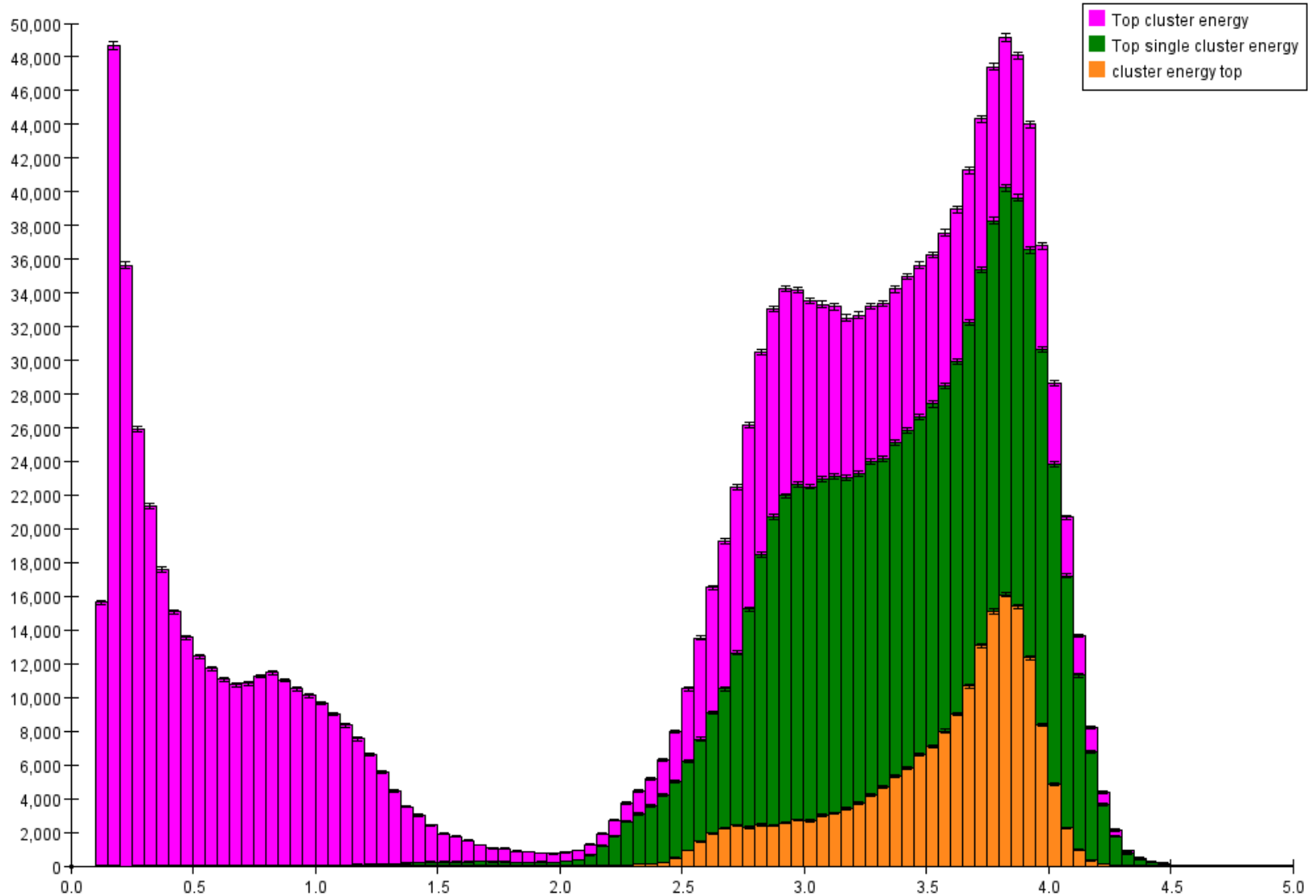
- Have released interim detectors for 2019/2021
- Will process some sample partitions from each of the “good” runs in each period
 - Similar to what was done previously
- Start characterizing performance!
- Analyze FEEs from 2021
 - Dedicated FEE run 14168
 - HPS_Run2021Pass0_v1
 - hps-java 5.2-SNAPSHOT

Single Cluster X vs Y



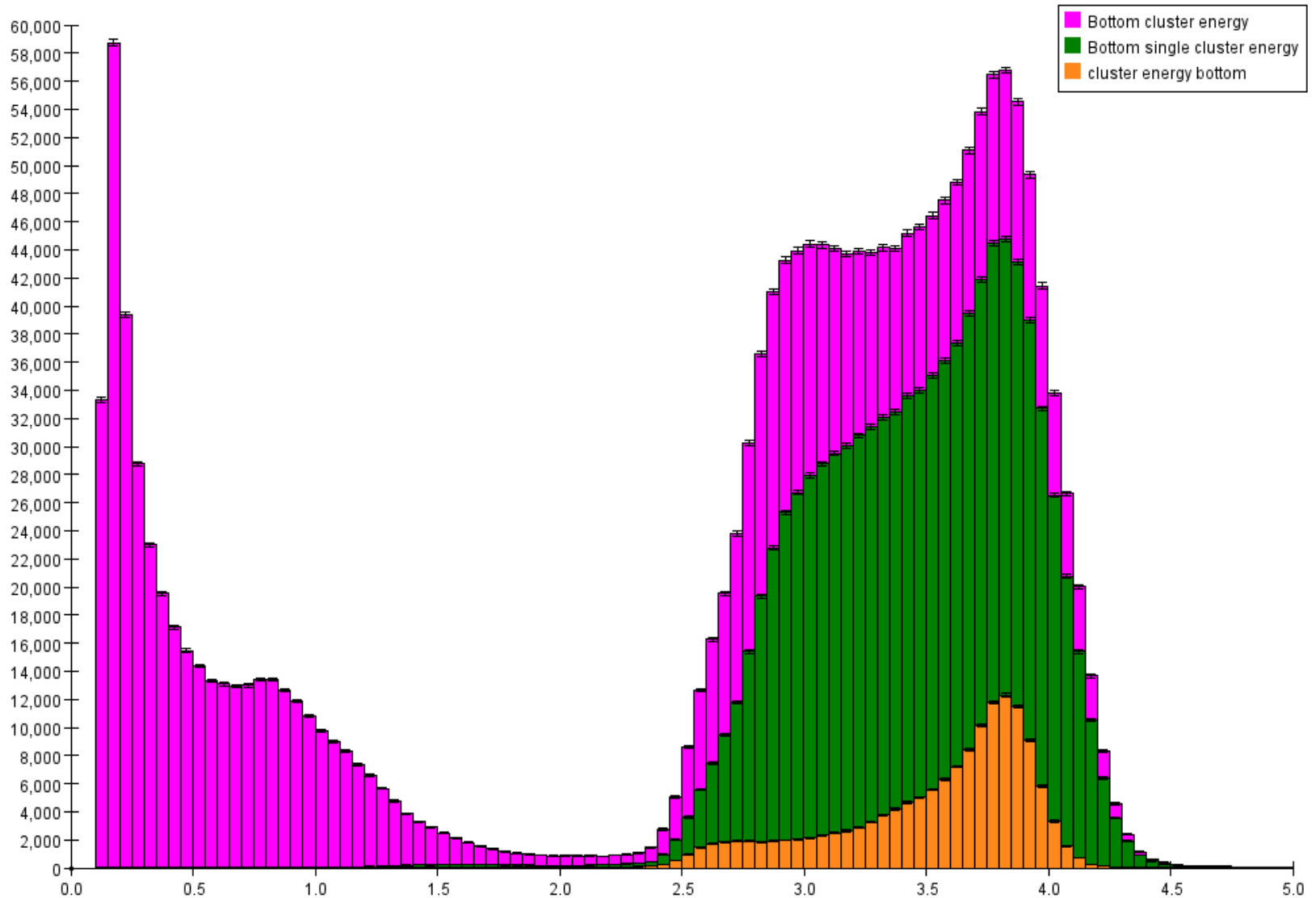
Cluster Energy Top

Top cluster energy - Top single cluster energy - cluster energy top



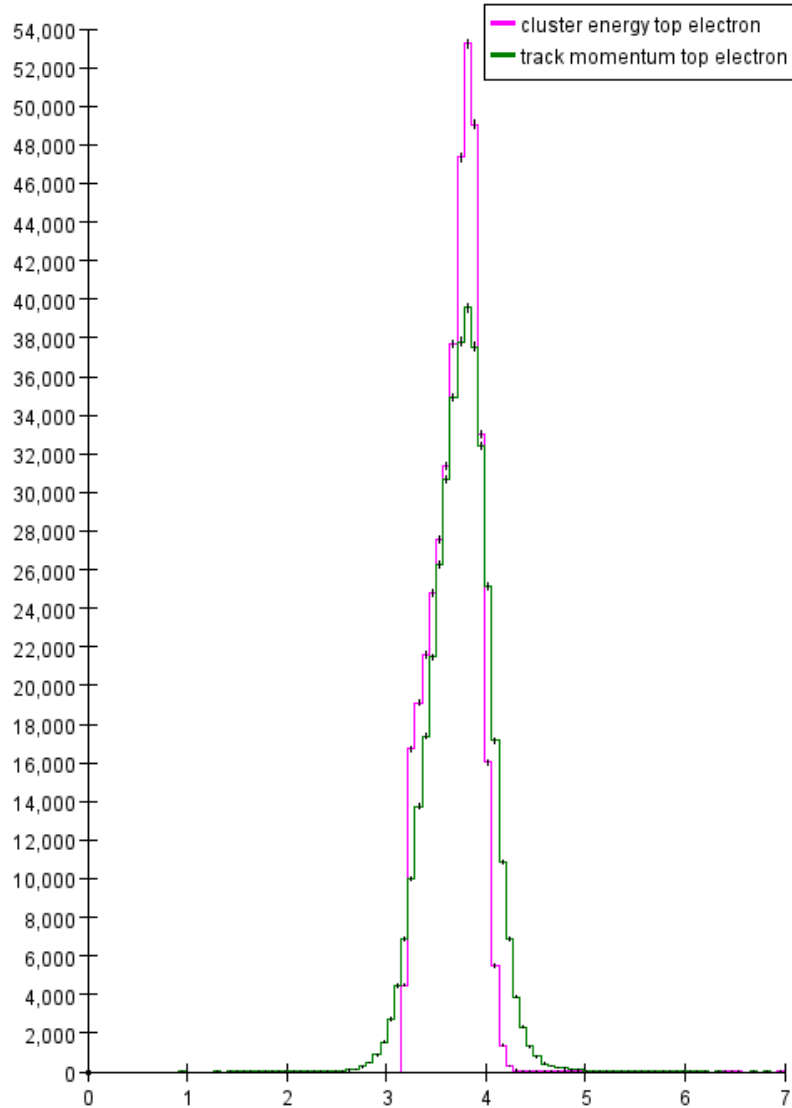
Cluster Energy Bottom

Bottom cluster energy - Bottom single cluster energy - cluster energy bottom

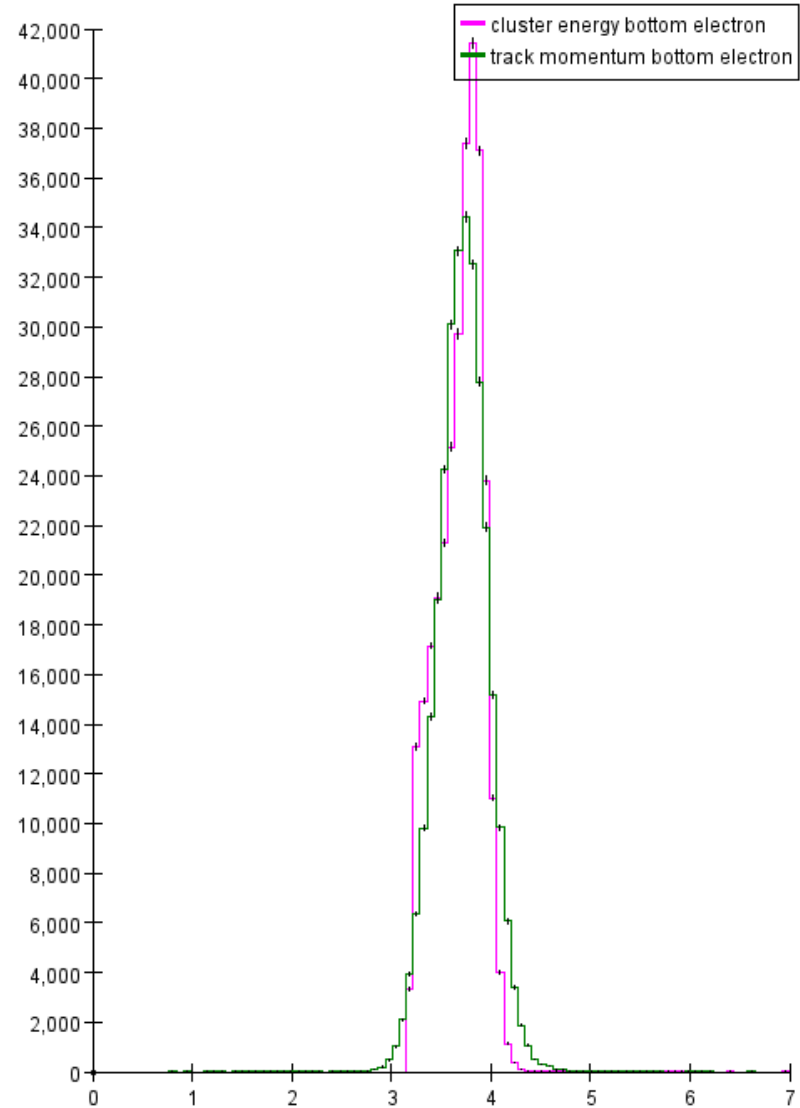


Cluster Energy / Track Momentum

hps_014168_FeeVertexAnalysis_20221115.aida

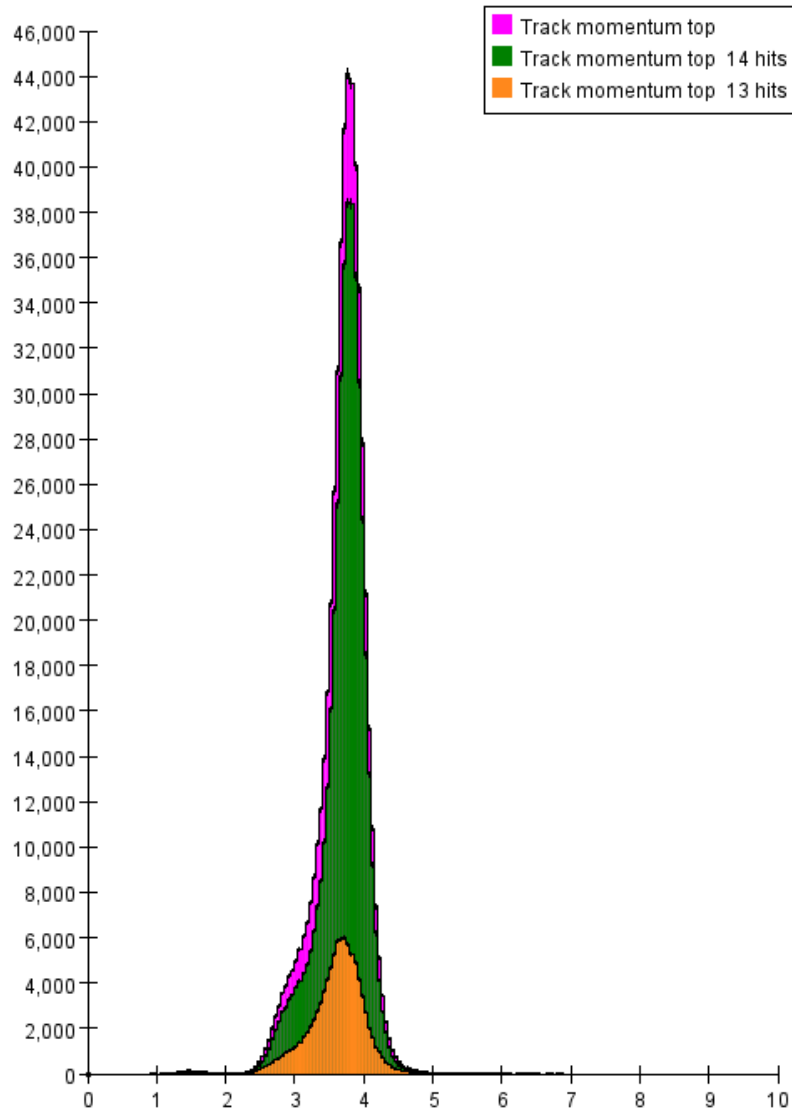


hps_014168_FeeVertexAnalysis_20221115.aida

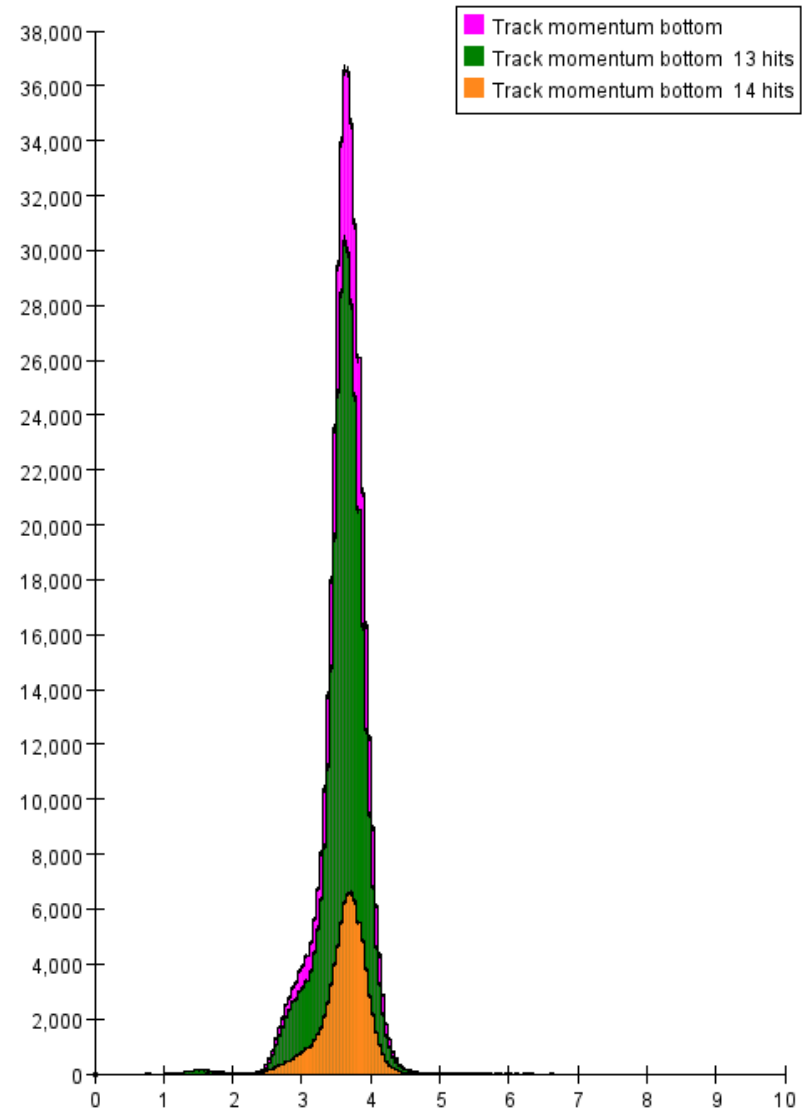


FEE KF Track Momenta (≥ 13 hits)

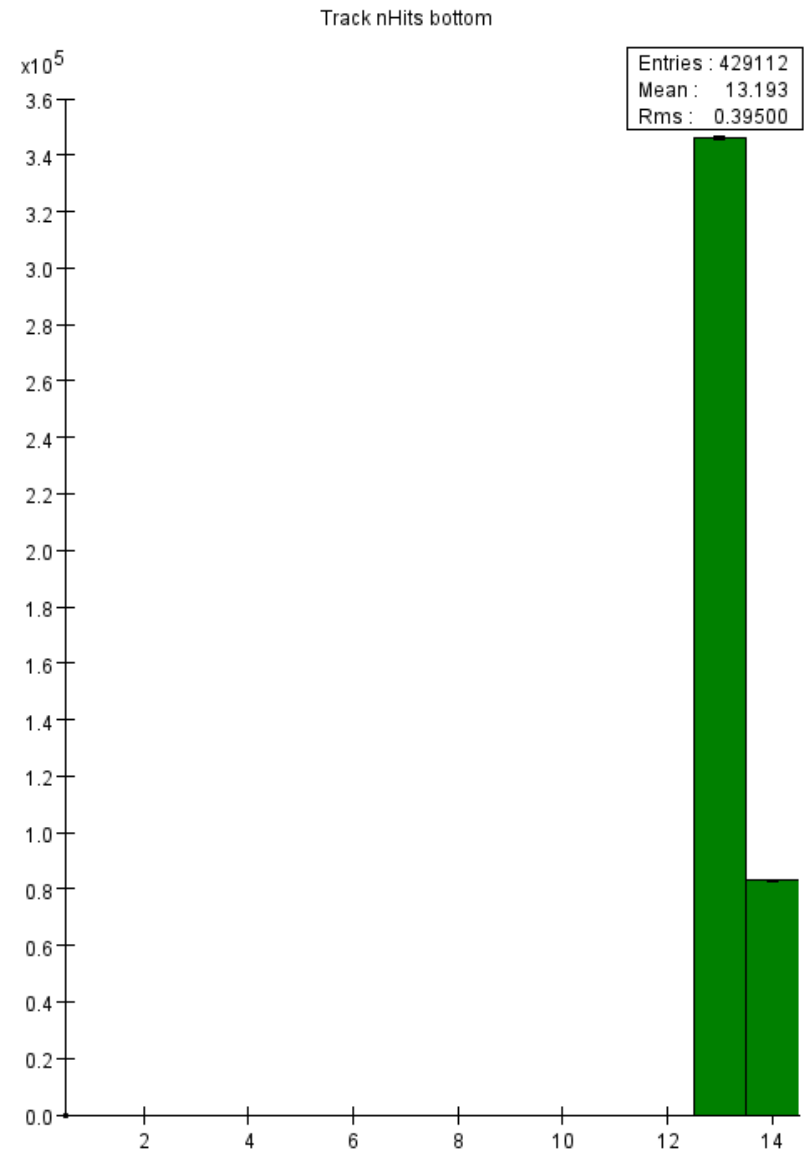
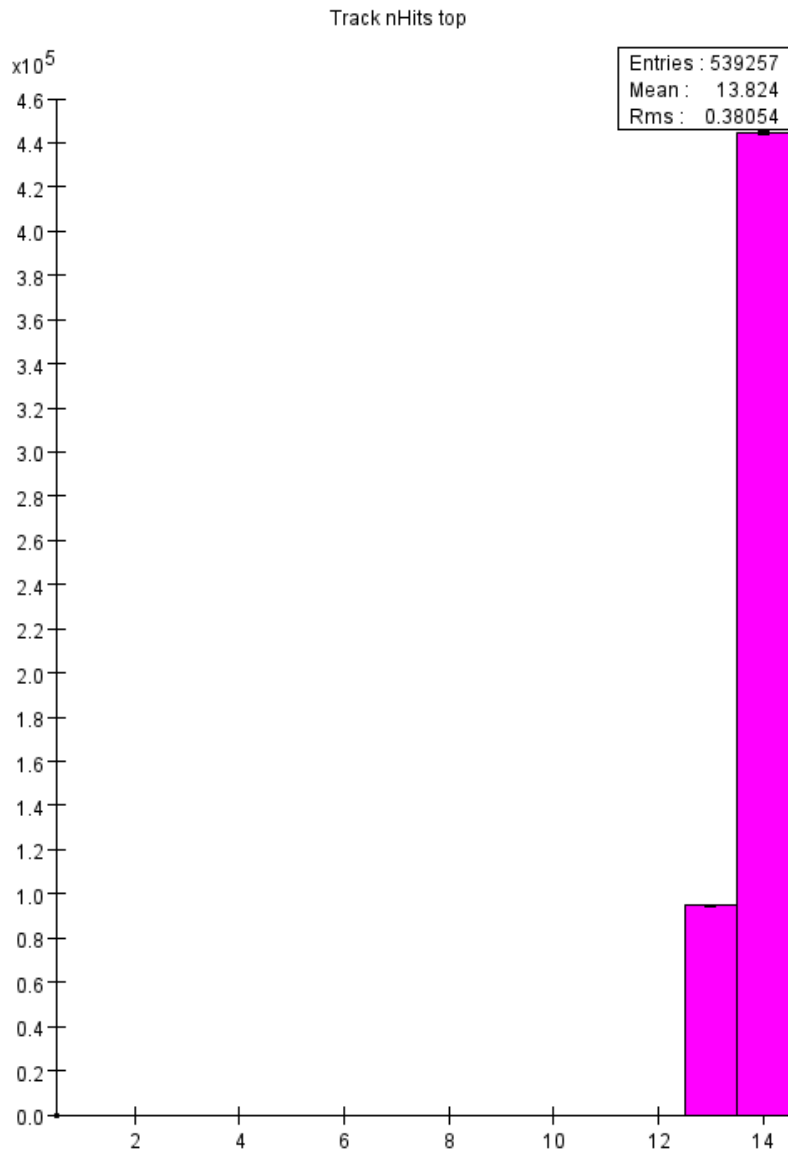
hps_014168_FEEAnalysis_20221115.aida - FinalStateParticles_KF - kf



hps_014168_FEEAnalysis_20221115.aida - FinalStateParticles_KF - kf

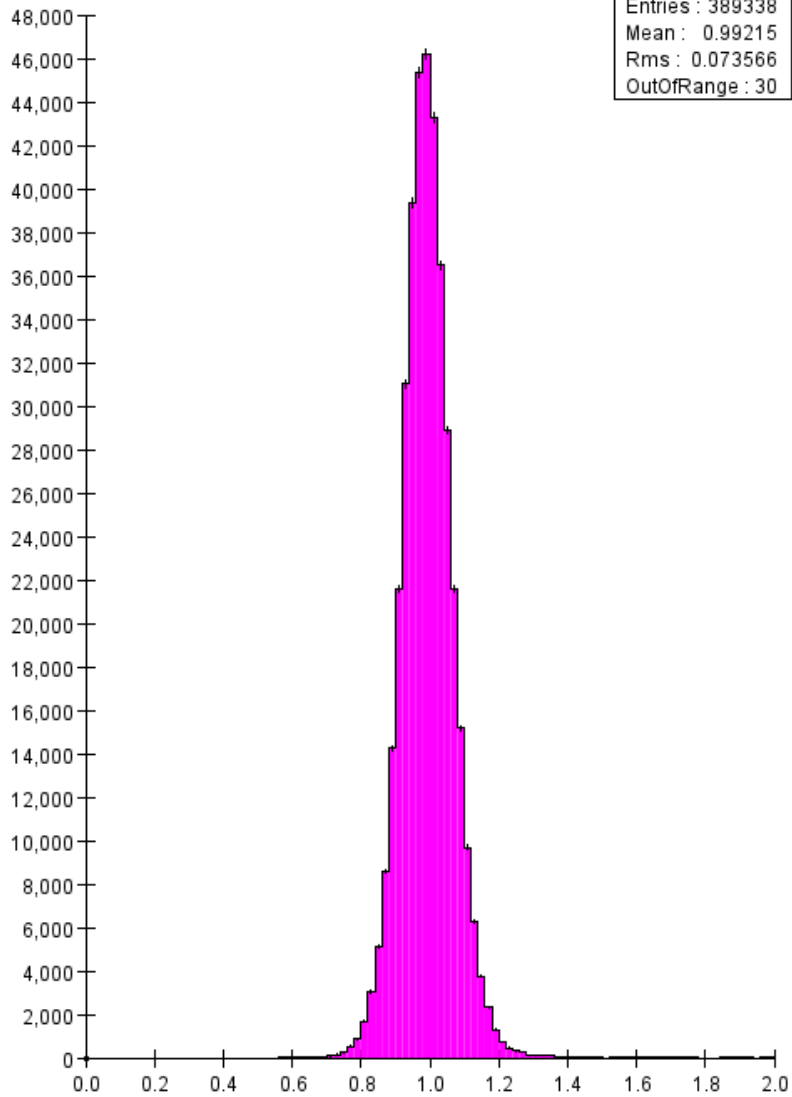


Track Nhits

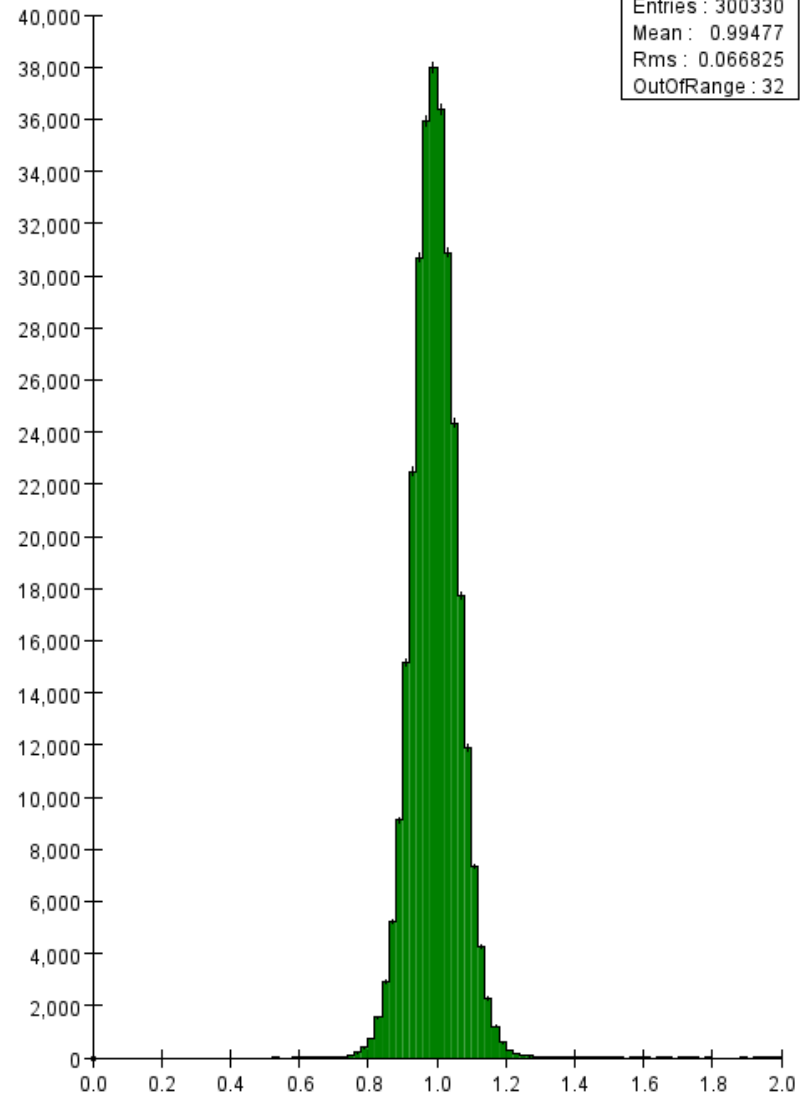


E/p

E over P top electron

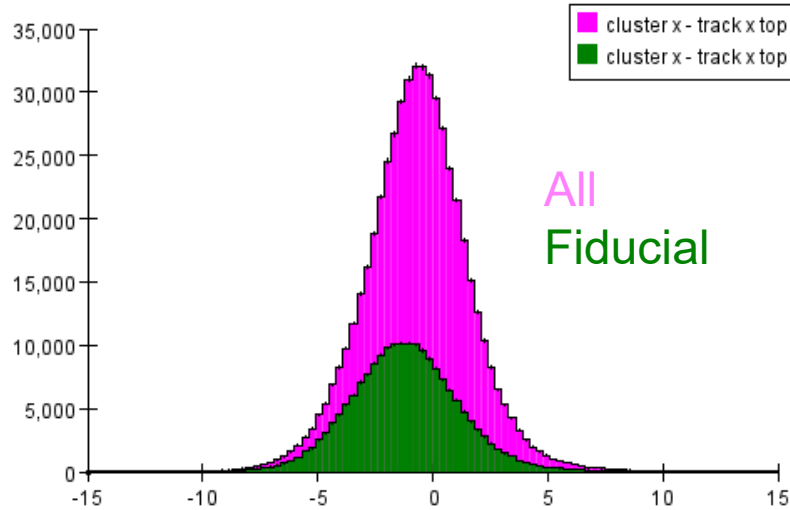


E over P bottom electron

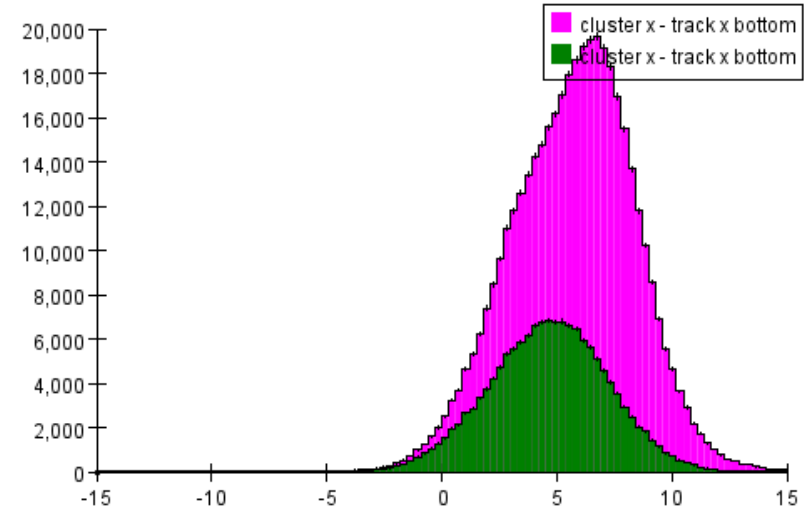


Cluster – Track Position X & Y

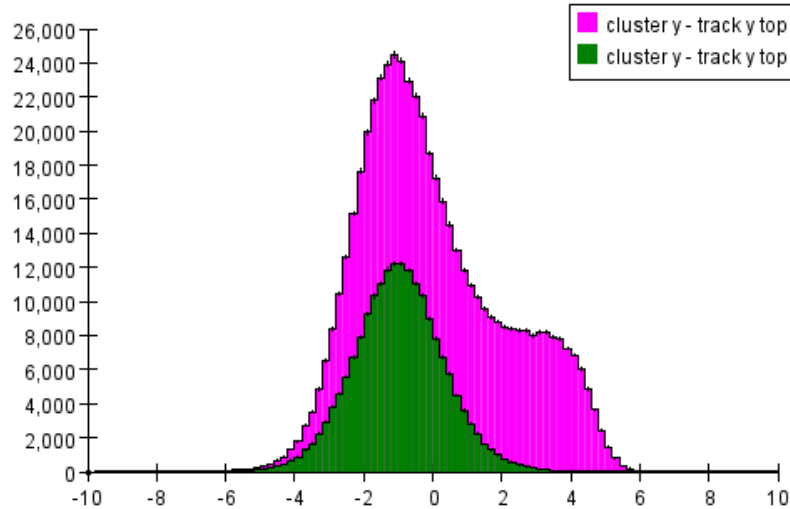
cluster x - track x top - cluster x - track x top



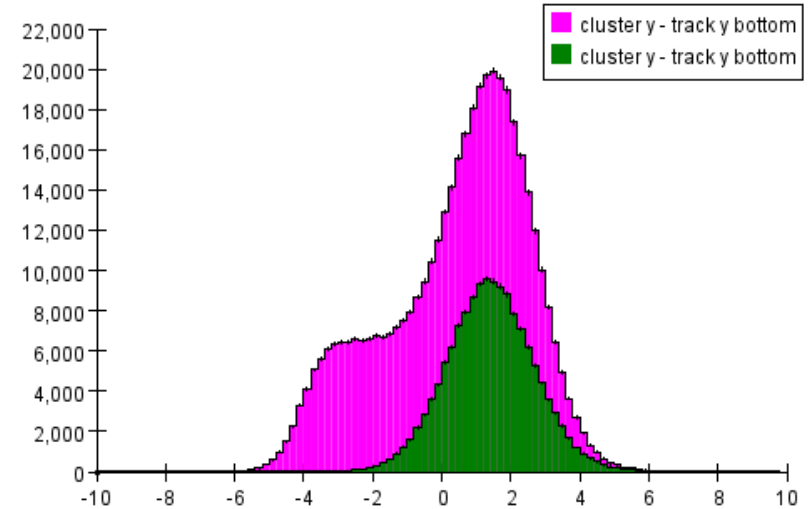
cluster x - track x bottom - cluster x - track x bottom



cluster y - track y top - cluster y - track y top

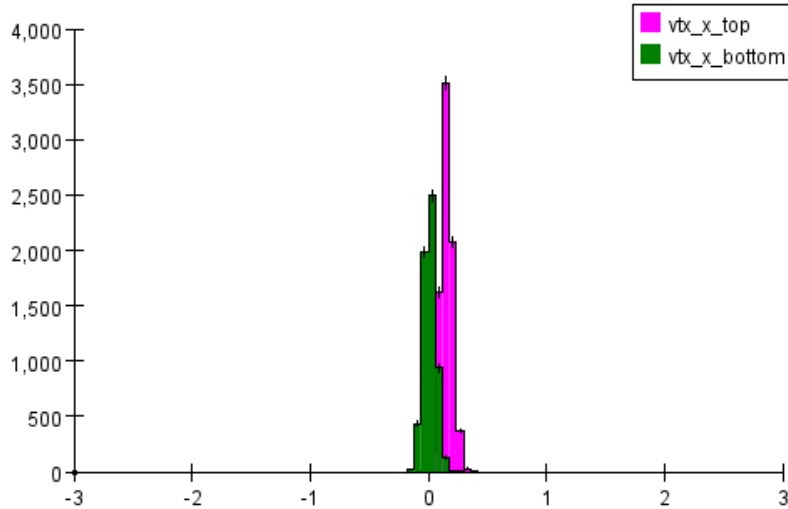


cluster y - track y bottom - cluster y - track y bottom

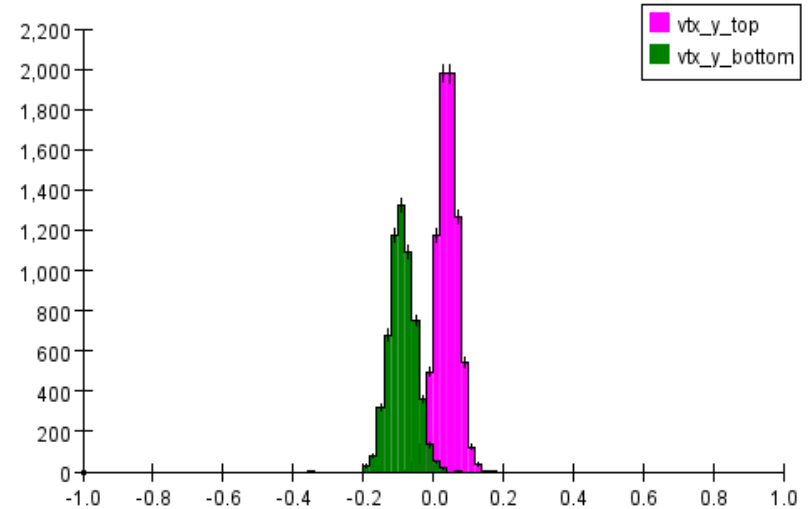


Top-only & Bottom-only Vertexing

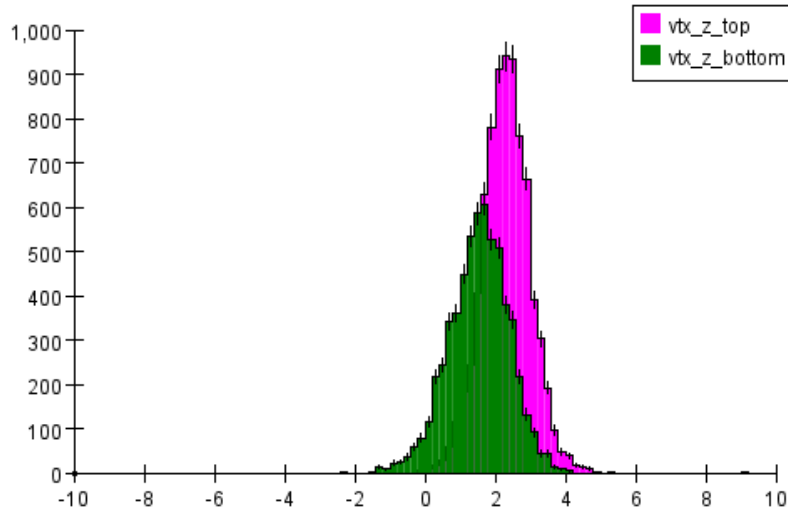
hps_014168_FeeVertexAnalysis_20221115.aida - MultiEventVtx



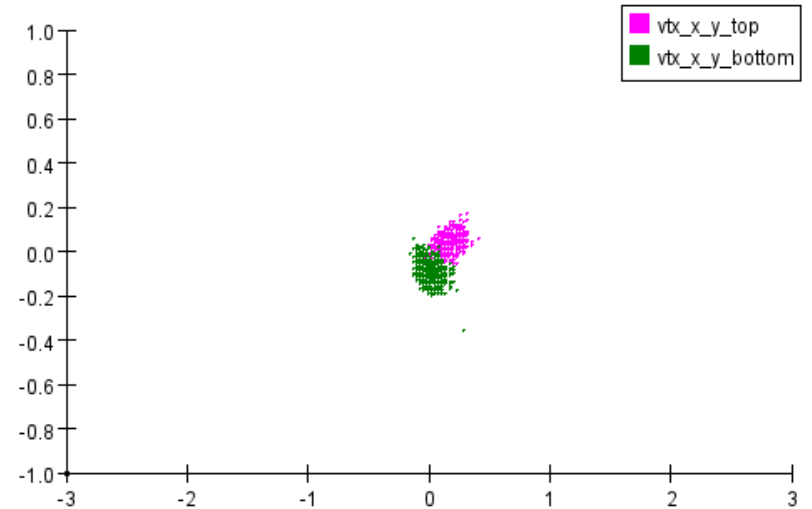
hps_014168_FeeVertexAnalysis_20221115.aida - MultiEventVtx



hps_014168_FeeVertexAnalysis_20221115.aida - MultiEventVtx



hps_014168_FeeVertexAnalysis_20221115.aida - MultiEventVtx



Summary of FEEs in Run 14168

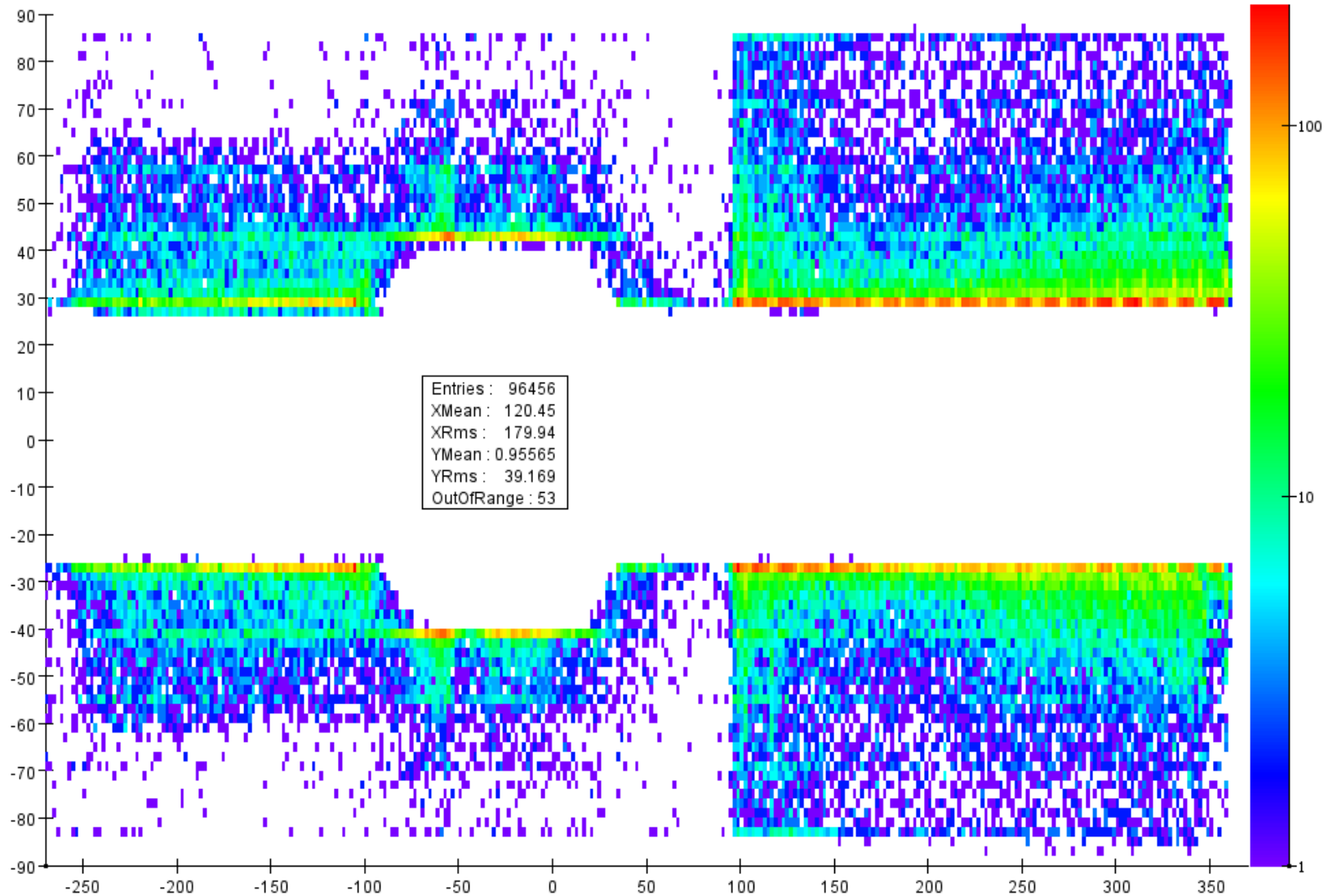
- Cluster energy and track momenta appear to be OK at beam energy.
- E/p for tracks associated with fiducial clusters is consistent with 1
- Track-cluster X positions show large (up to 5mm), excursions from zero, opposite in top and bottom
 - Checking yaw with Møllers
- Track-cluster Y positions show substantial (~1.3mm) excursions from zero, opposite in top and bottom
 - Checking opening angle with Møllers

Next Steps

- Analyze single-pass FEEs at 1.92GeV
- Proceed to usual suspects: WABs & tridents to check linearity of E/p
- Use Møllers to study SVT global position
 - Fix cluster-track matching
 - Fix vertexing agreement at target
 - Figure out where target is!
- Use tridents to figure out where beam and target are.
- Repeat for 2109 (except for Møllers)
- Start systematic studies of conditions as a function of time/run number in the data

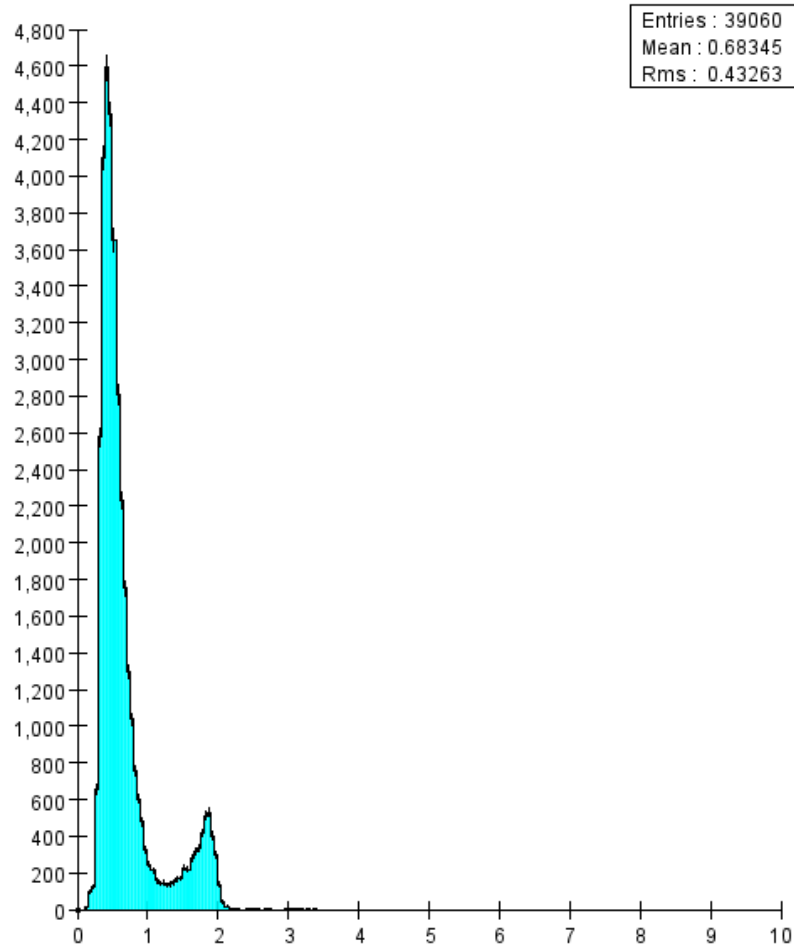
Run 14654 1.92 GeV Physics Run

All clusters x vs y

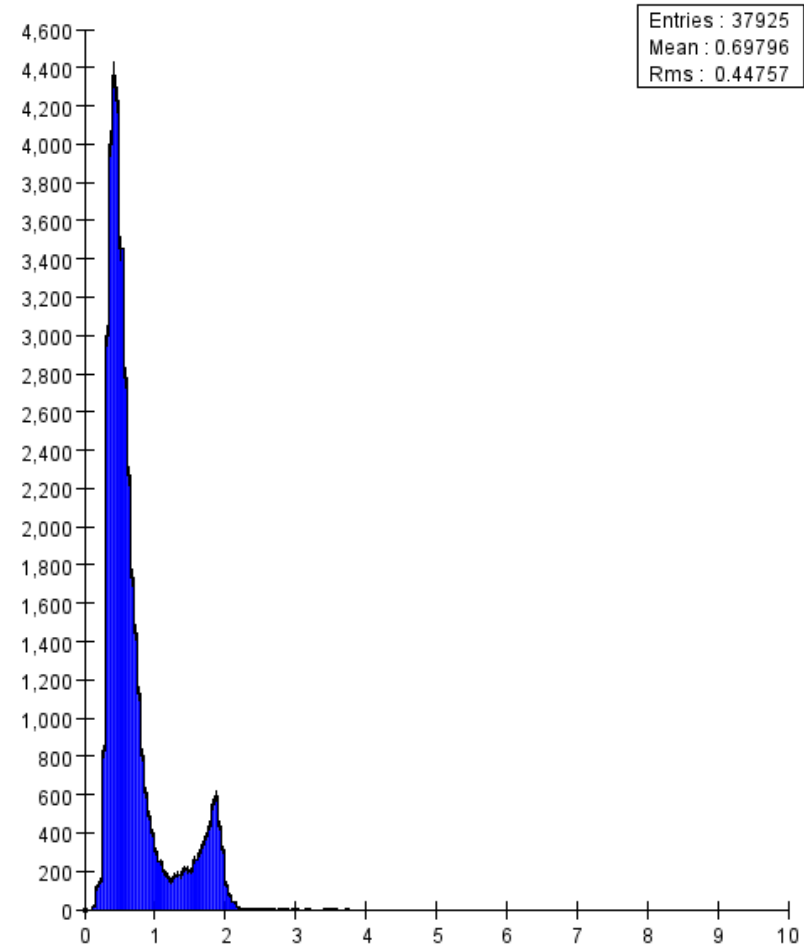


Run 14654 1.92 GeV Physics Run

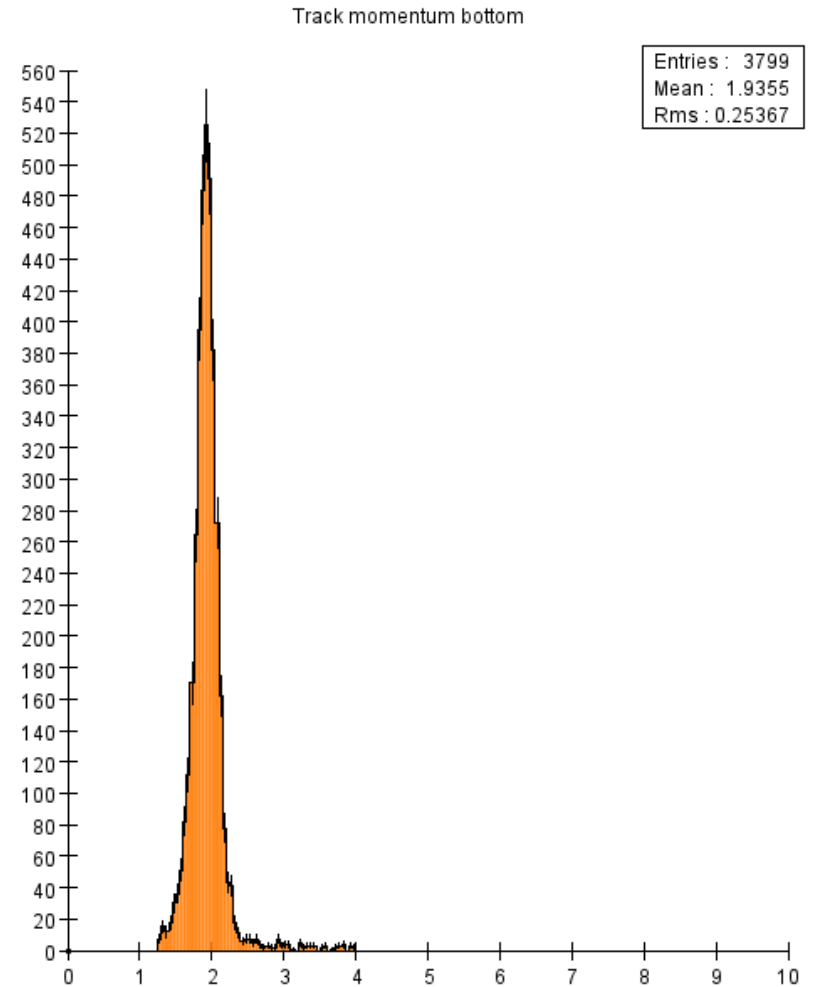
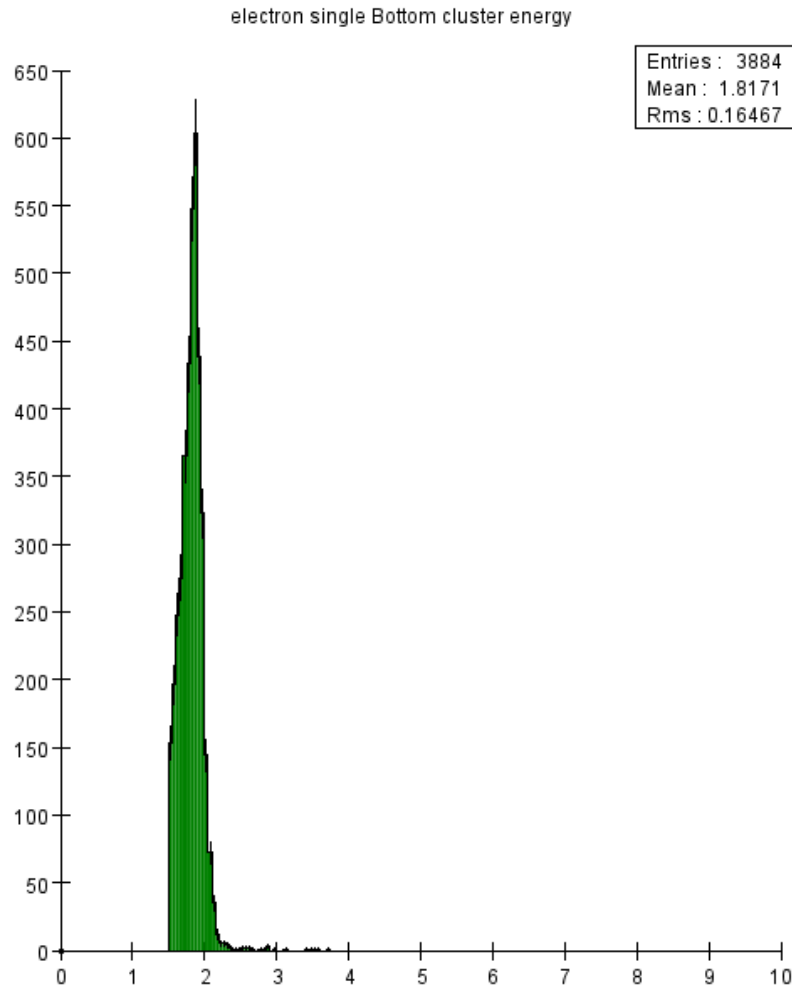
Top cluster energy



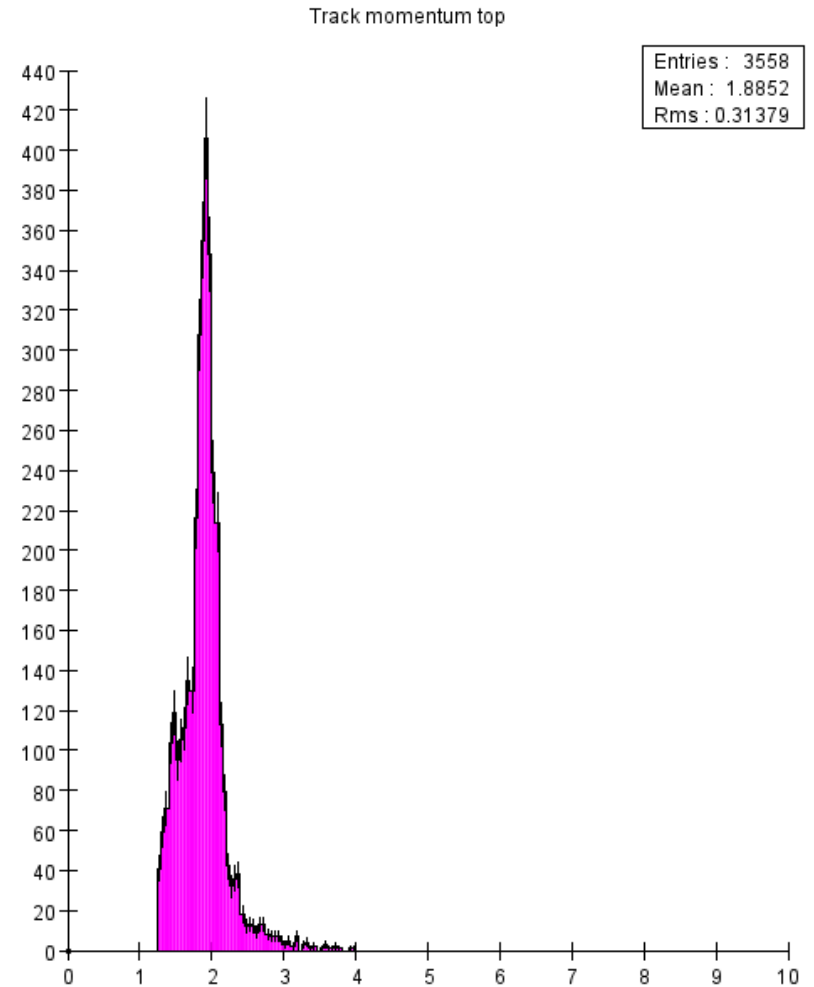
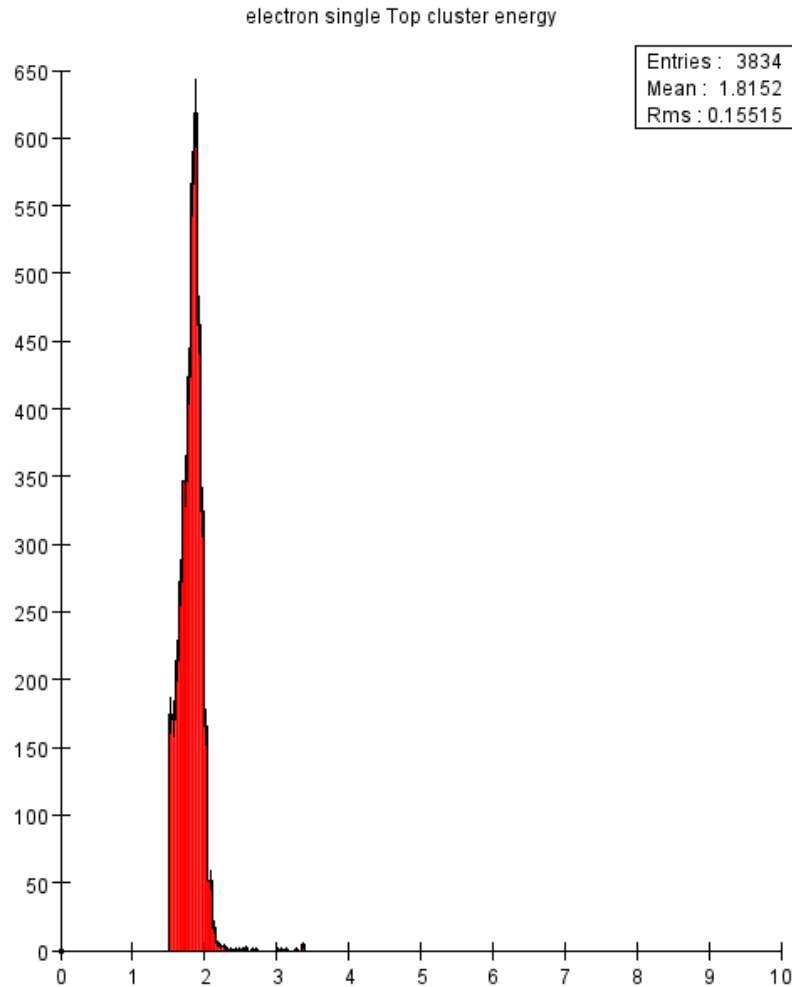
Bottom cluster energy



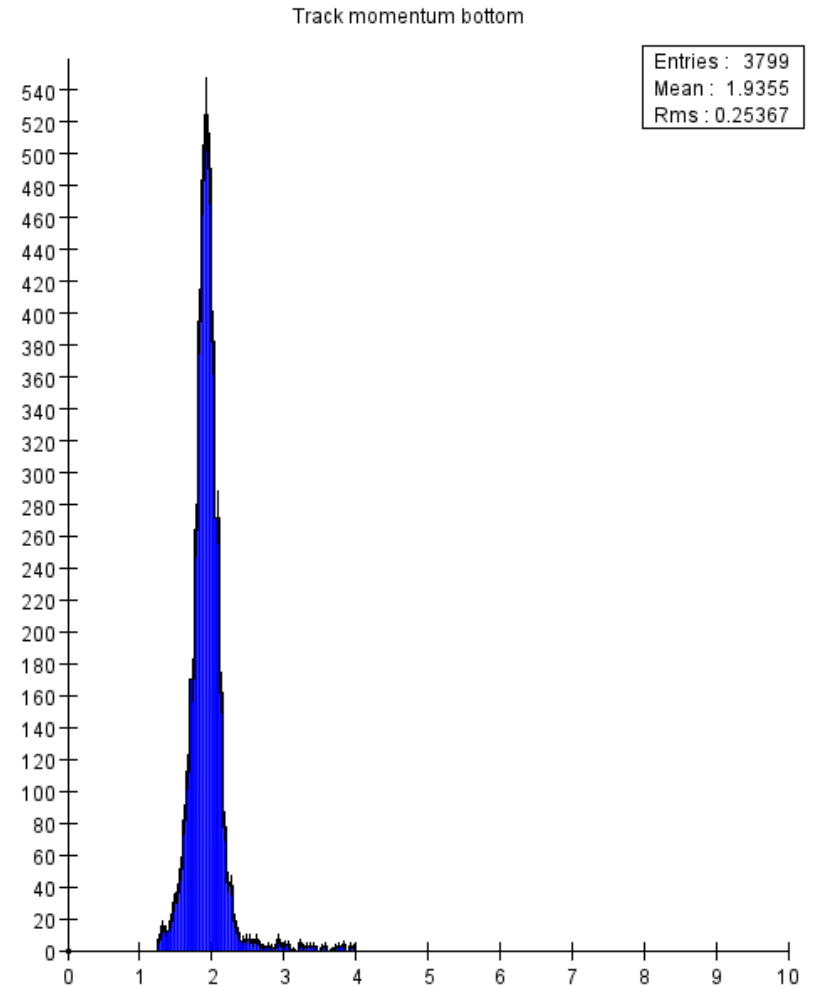
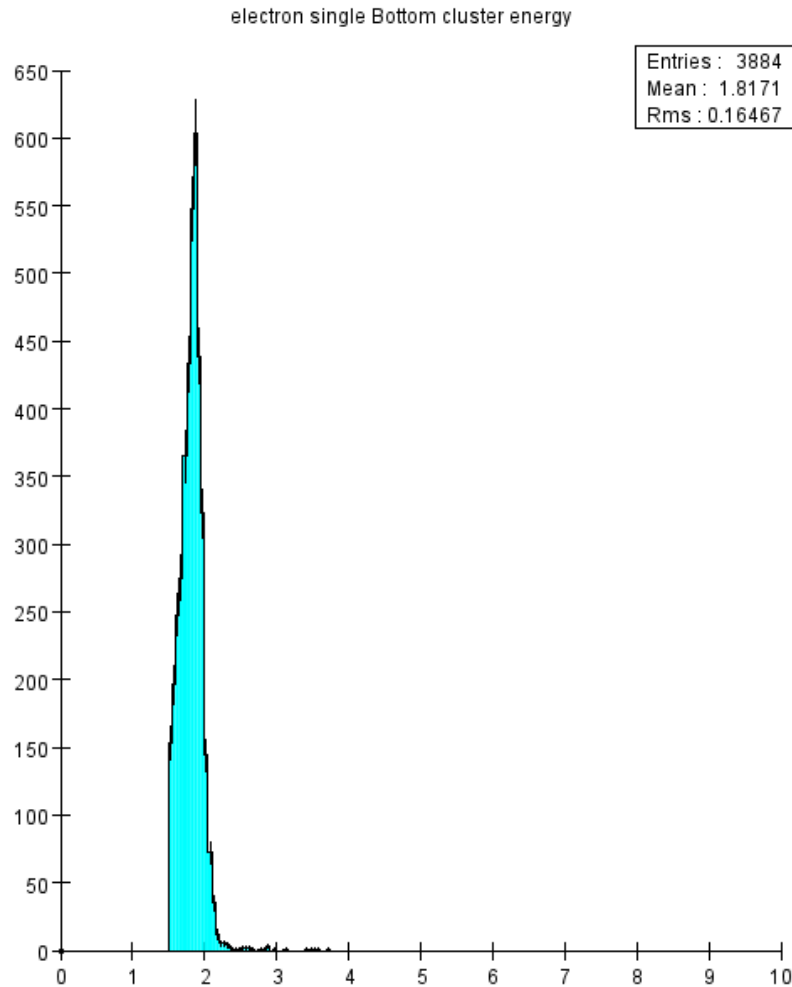
Run 14654 1.92 GeV Physics Run



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Run 14654 1.92 GeV Physics Run

