Tracking Status

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Two Bugs Found

- Occasionally, tracks found with momentum/charge opposite MC particle
  - Reflects CP symmetry in equations of motion for a charged particle
  - Seedtracker resolves this symmetry by ordering hits in |z| and having the track move from small |z| to large |z|
  - Algorithm was being fooled when a hit was added to the track that was "behind" the DCA giving a negative path length from the DCA to the hit
  - Bug fixed by failing fits if there are hits with negative path length
- Occasionally would have two tracks sharing >1 hit
  - Merging algorithm chooses between track candidates that share > 1 hit, keeping the candidate with the most hits / best χ^2
  - Merging algorithm only dealt with first track with shared hits due to some "fuzzy logic"
  - Fixed so that merging is done with all track candidates (adding one new track can now delete two or more lower ranked tracks)
- Thanks to Ron for spotting these problems!

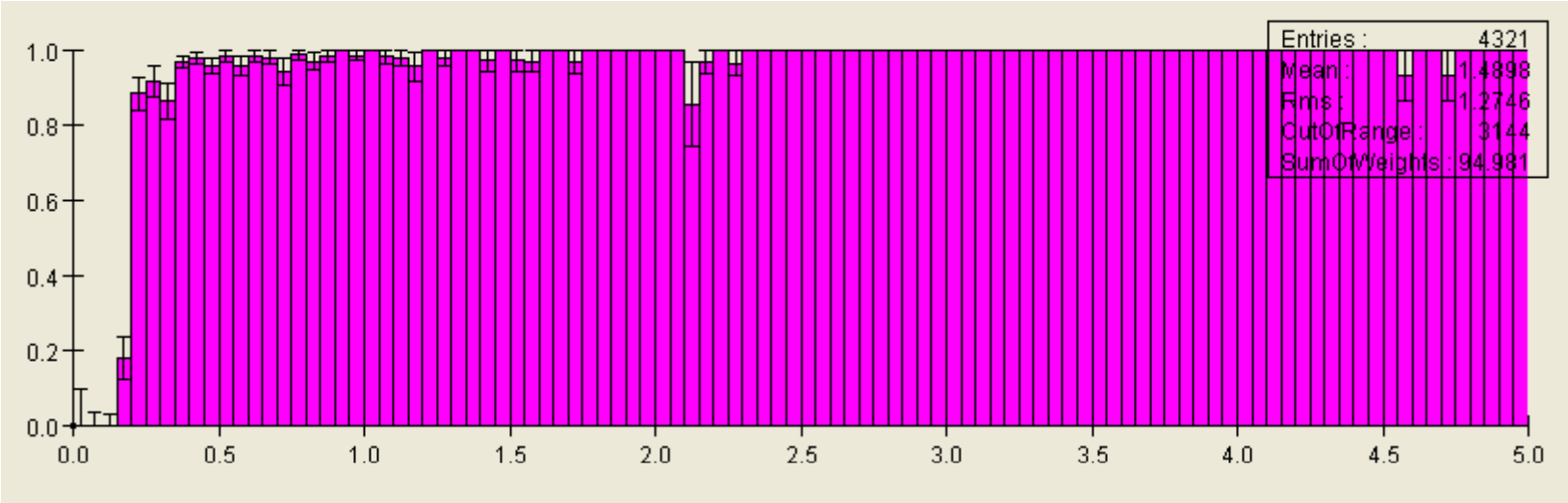
Reconstruction Driver

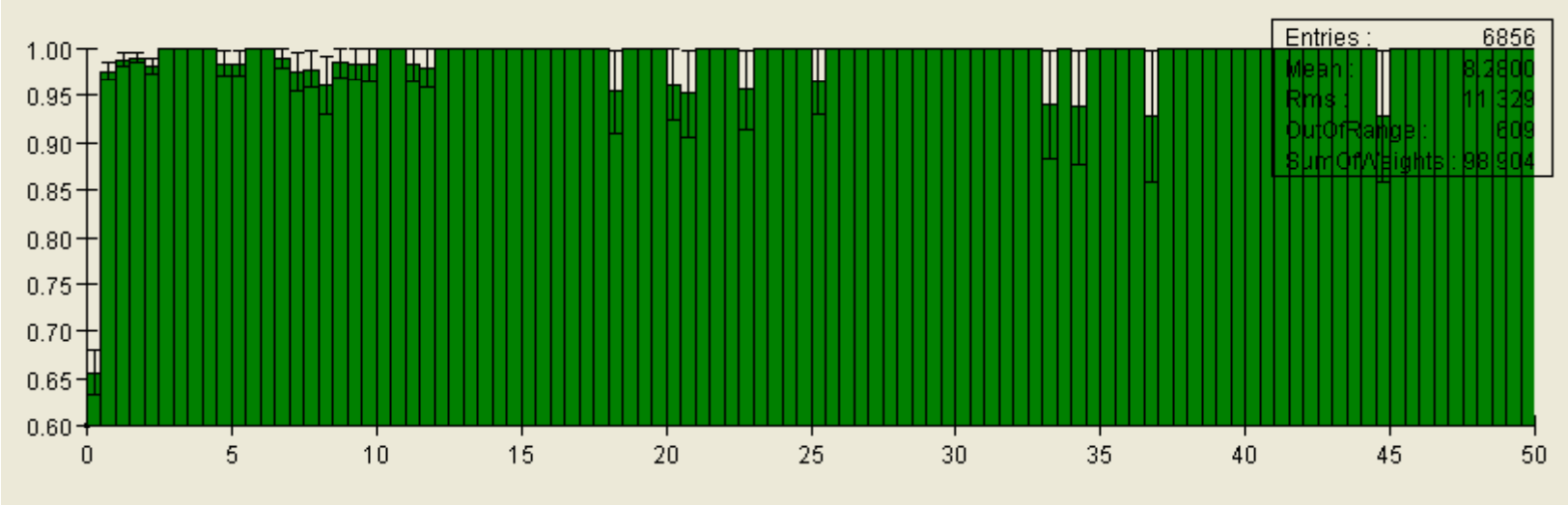
- Reconstruction driver produced for SiD02
  - Can be found at:

org.lcsim.recon.tracking.seedtracker.ReconTracking.SiD02ReconTrackingDriver

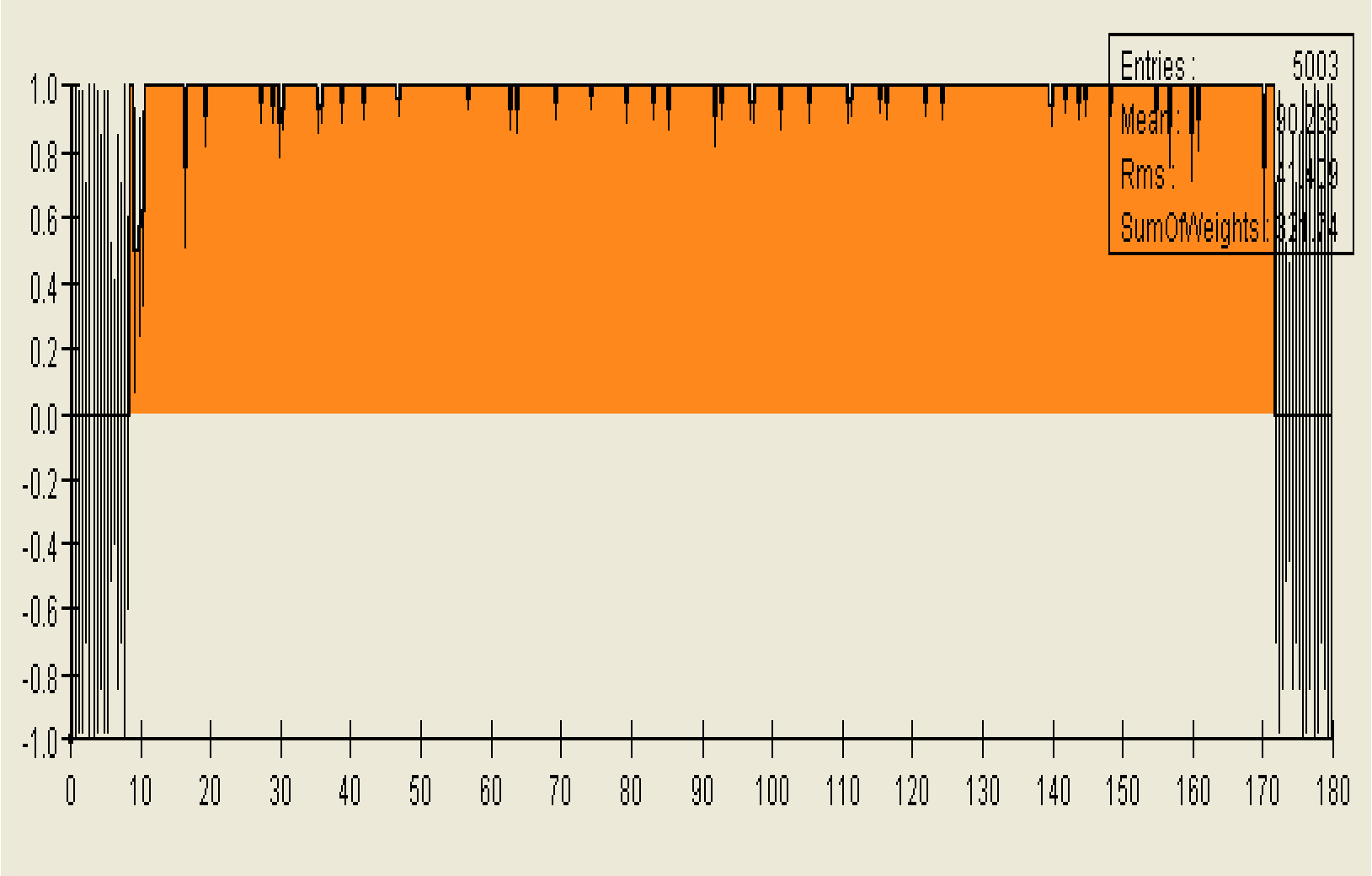
- Strategies generated using 10K ttbar events
- Uses virtual segmentation for both pixel and strip hits
  - Option exists to run with FullCCDSimulation for pixel detectors
  - Strategies built for FullCCDSimulation (includes inefficiency in pixel layers)
  - Ran out of time to properly test tracking with FullCCDSimulation
- Treats forward tracker disks as pixels
  - Only significant difference from SiD01

Efficiency vs p_T

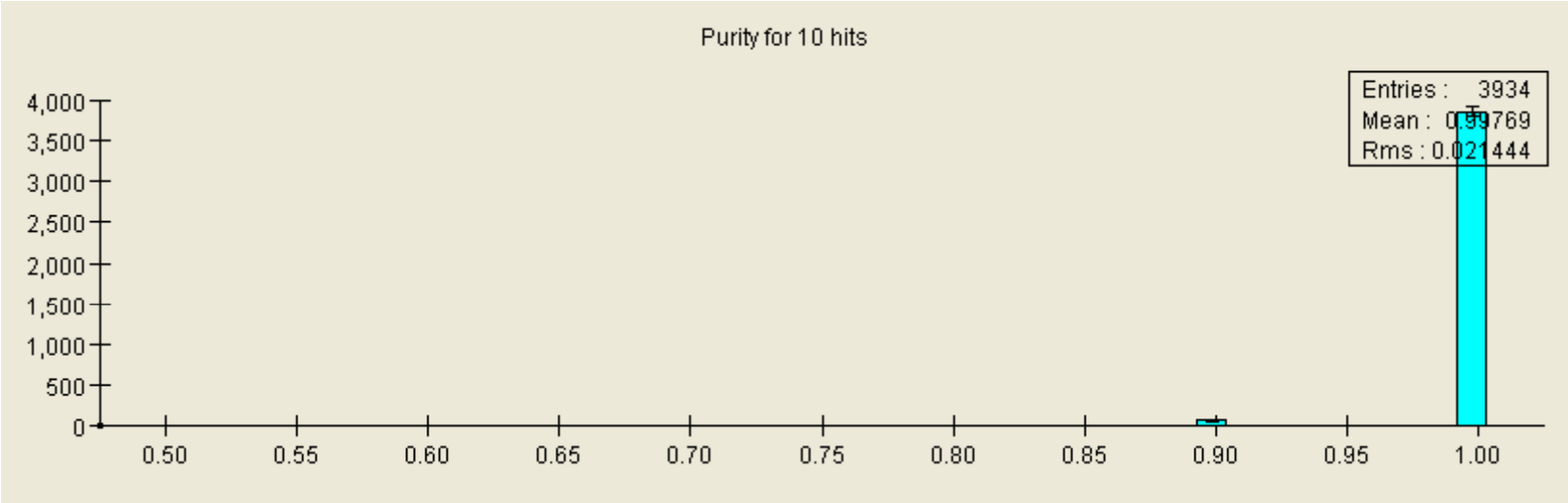


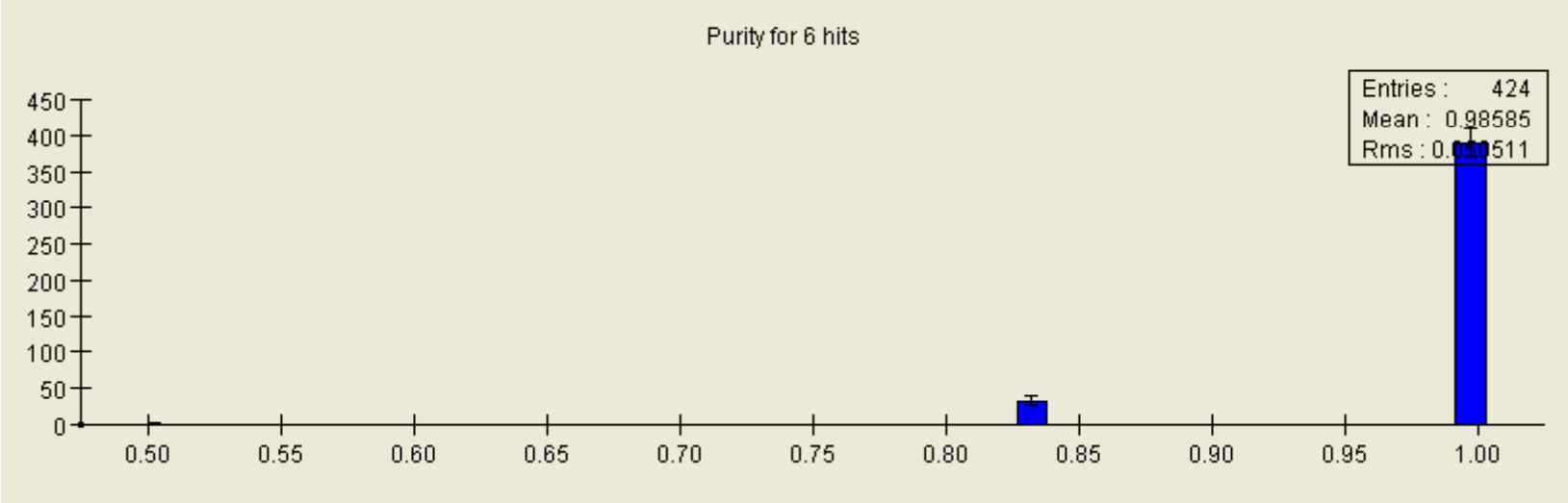
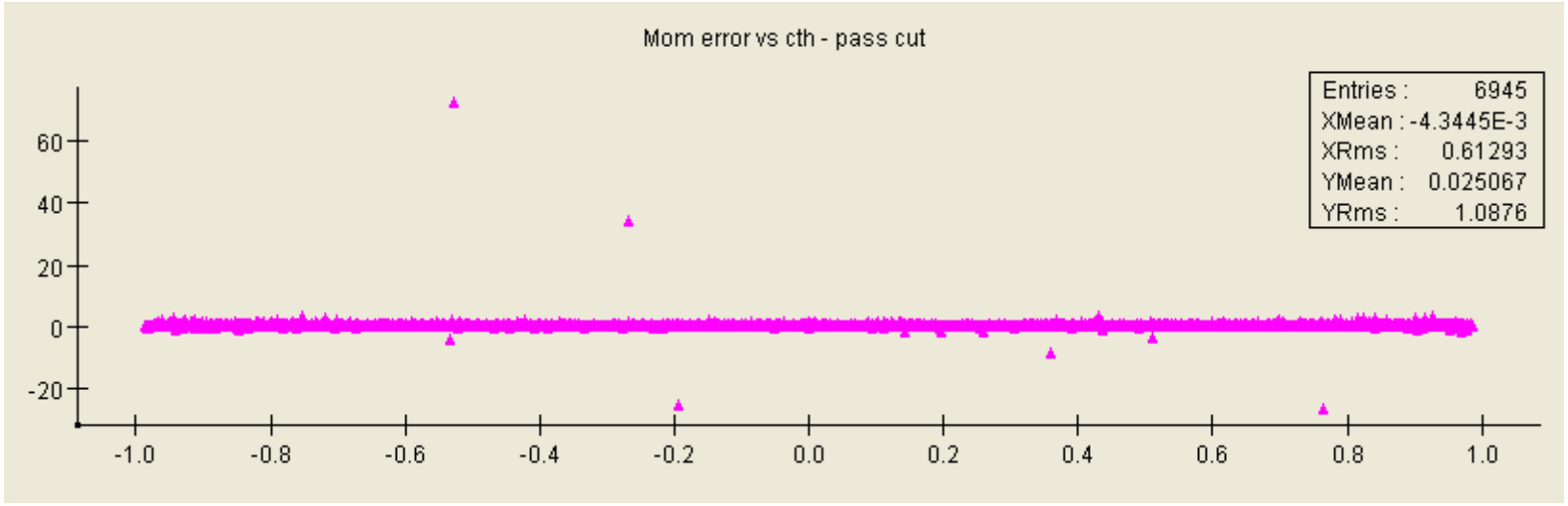


Efficiency vs θ



Purity


Purity for 10 hits
Entries : 3934
Mean : 0.99769
Rms : 0.021444
4,000
3,500
3,000
2,500
2,000
1,500
1,000
500
0
0.50
0.55
0.60
0.65
0.70
0.75
0.80
0.85
0.90
0.95
1.00


Purity for 6 hits
Entries : 424
Mean : 0.98585
450
400
350
300
250
200
150
100
50
0
0.50
0.55
0.60
0.65
0.70
0.75
0.80
0.85
0.90
0.95
1.00

Mis-Measured Tracks