Hit Efficiencies

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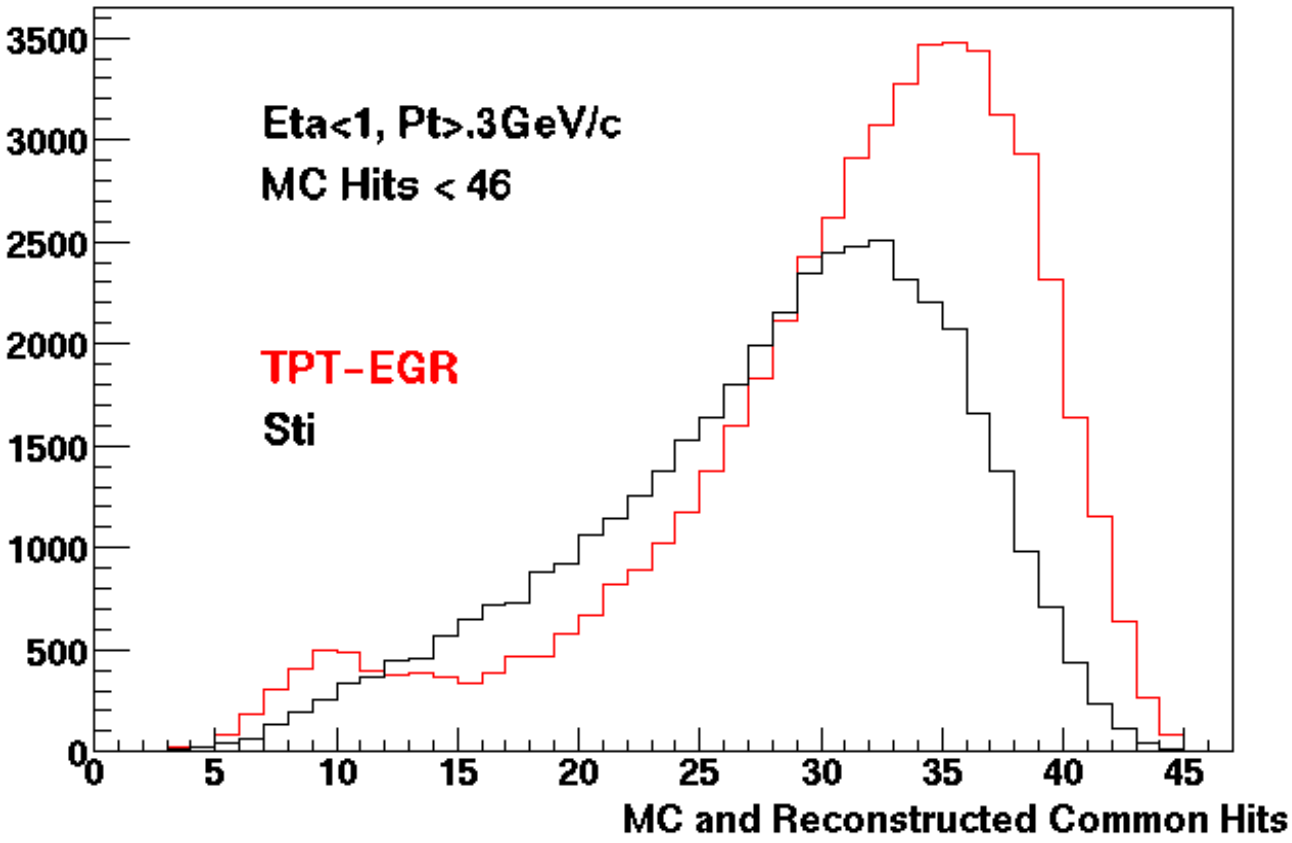
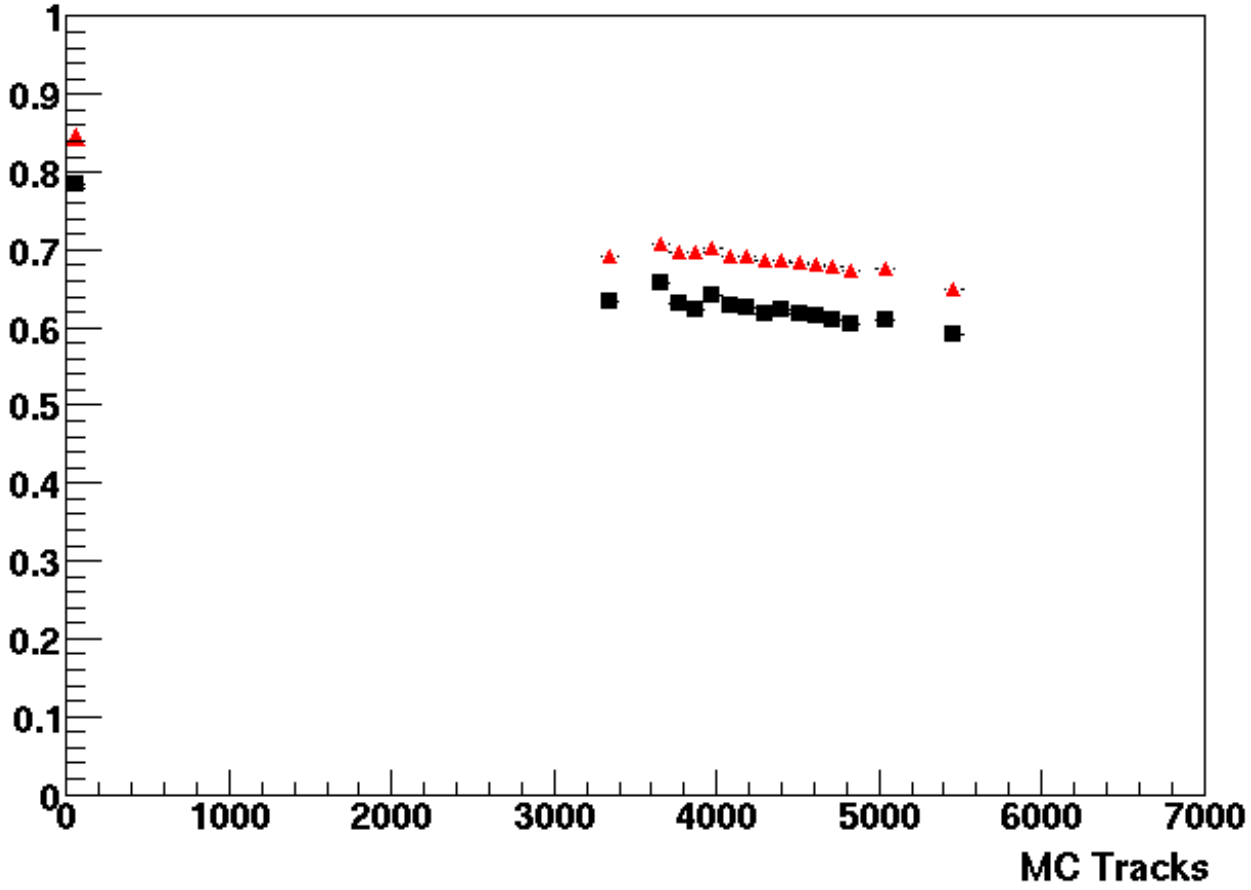
Introduction and Definitions

- Hit Efficiencies
  - Eta, Phi, Pt distributions
  - Association Maker on MC Data
- Matched Tracks: reconstructed tracks with >3 hits in common with a MC Track
- Common Hits: hits matched between Detector hits and MC hit collections
- MC Hits: Hits on Matched MC Track

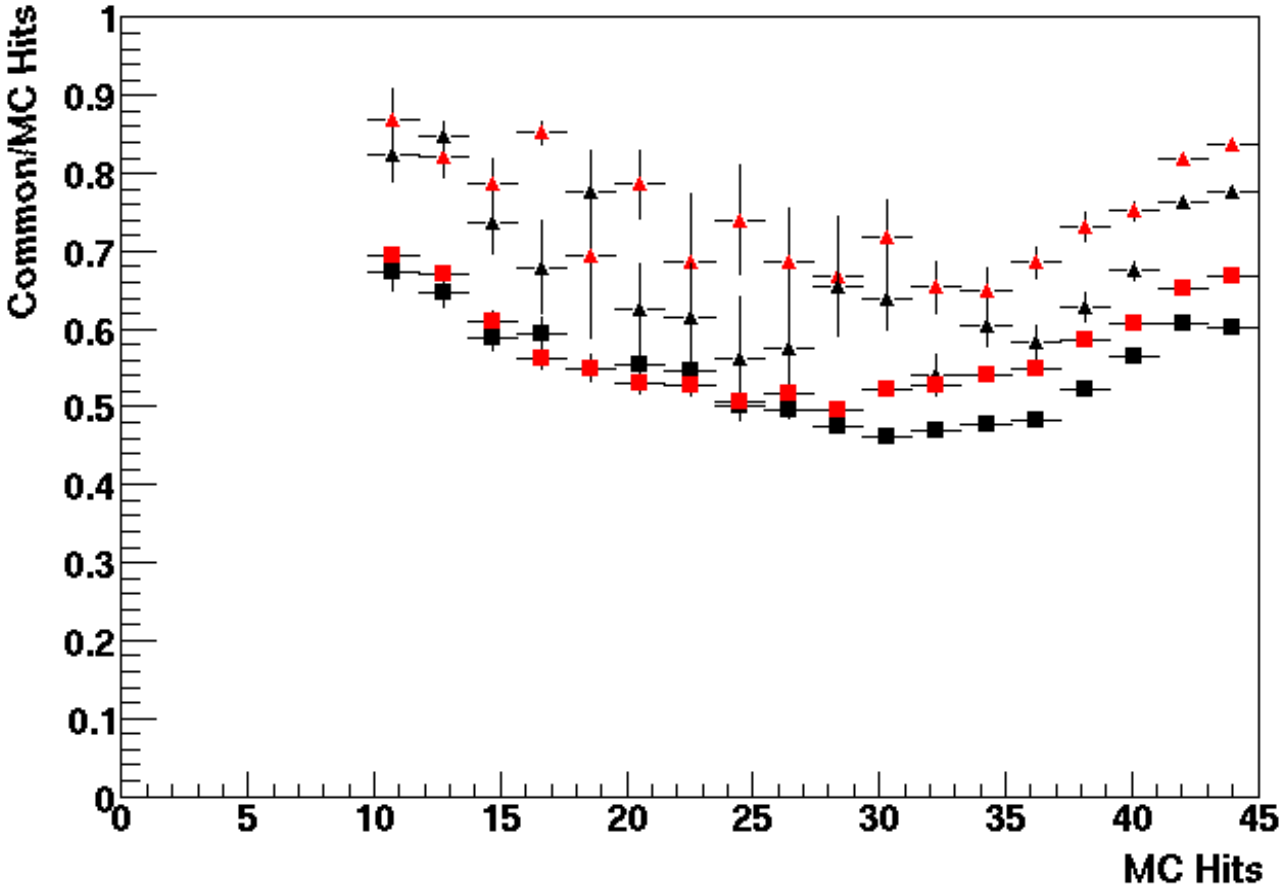
Common Hit Distributions



Hit Efficiency



Hit Efficiency 2



TPT-EGR PP

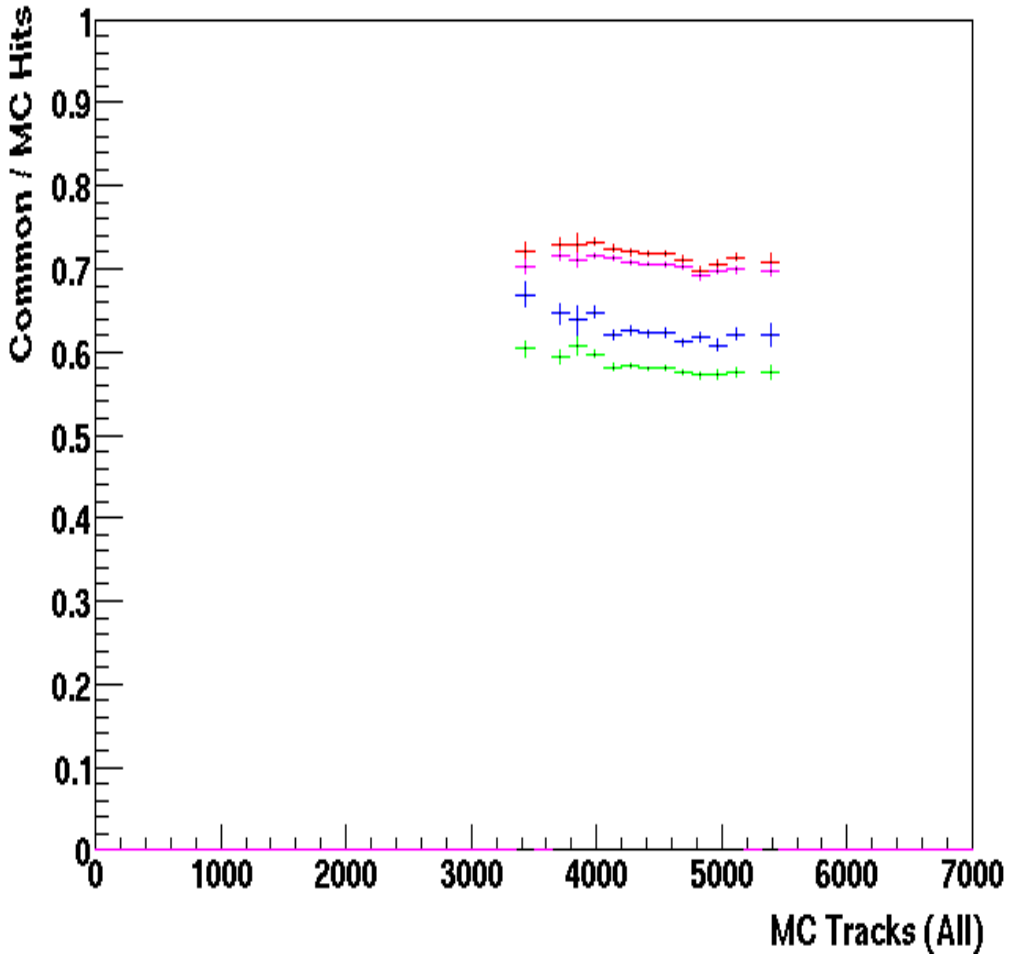
STI PP

TPT-EGR Central

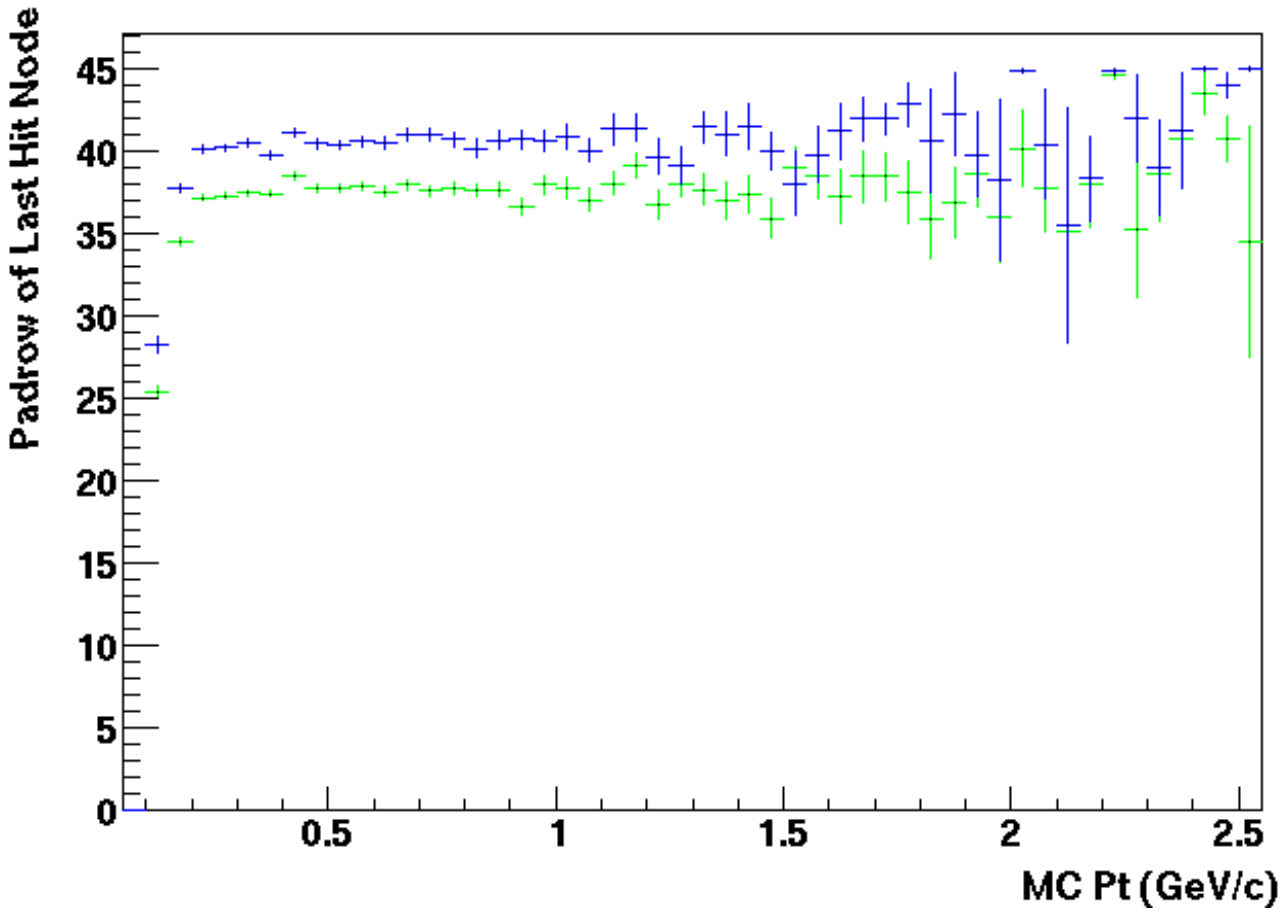
STI Central

Hit Efficiency 1

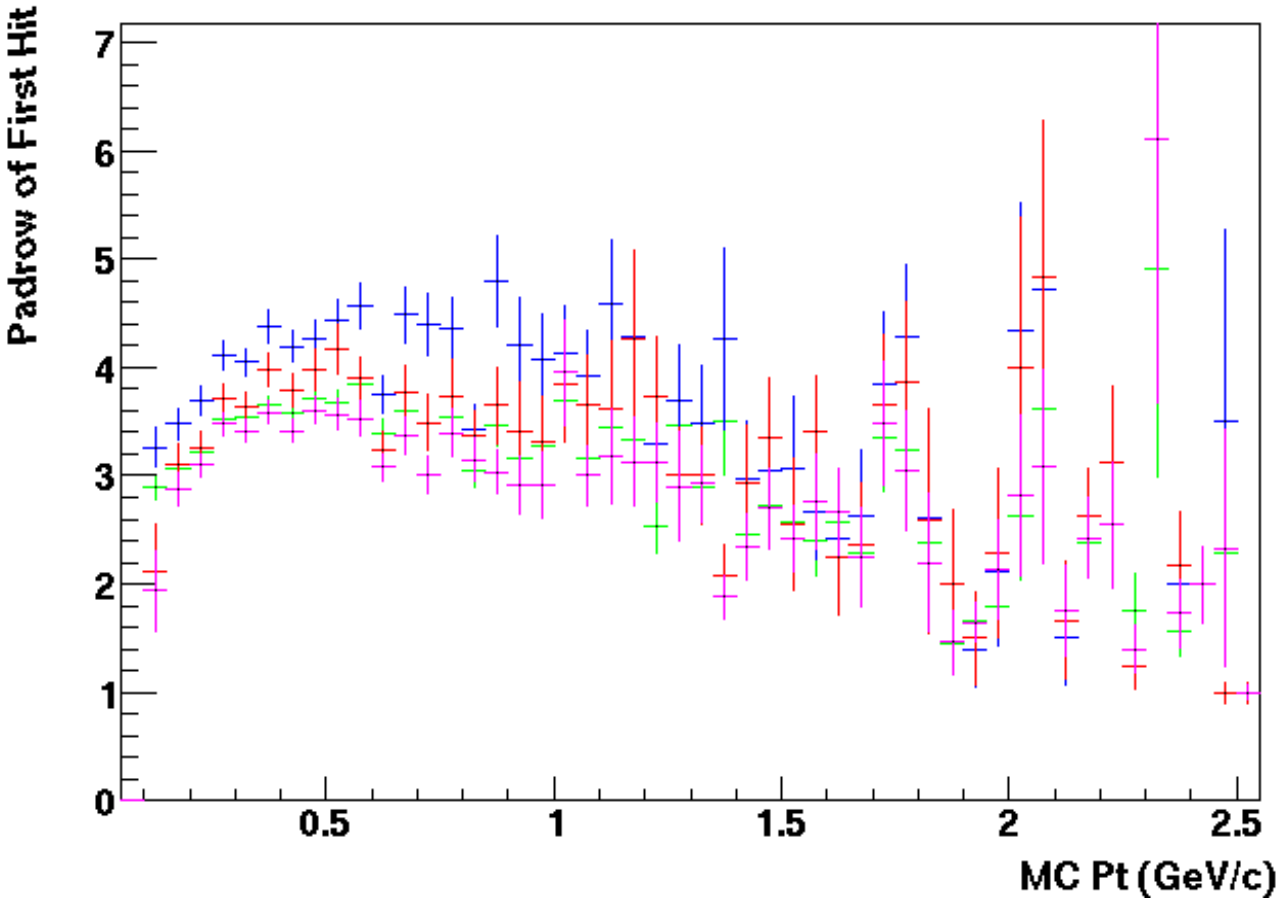
- Common Hits/ MC Hits
  - No Cut
  - -.5< η <.5
  - hit>24
  - -.5< η <.5, hit>24



Last Padrow on Track

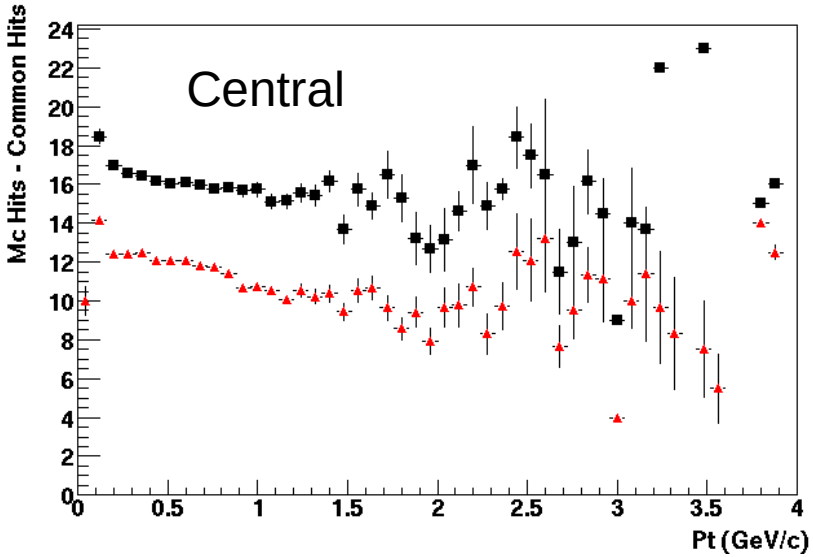


First Padrow on Track

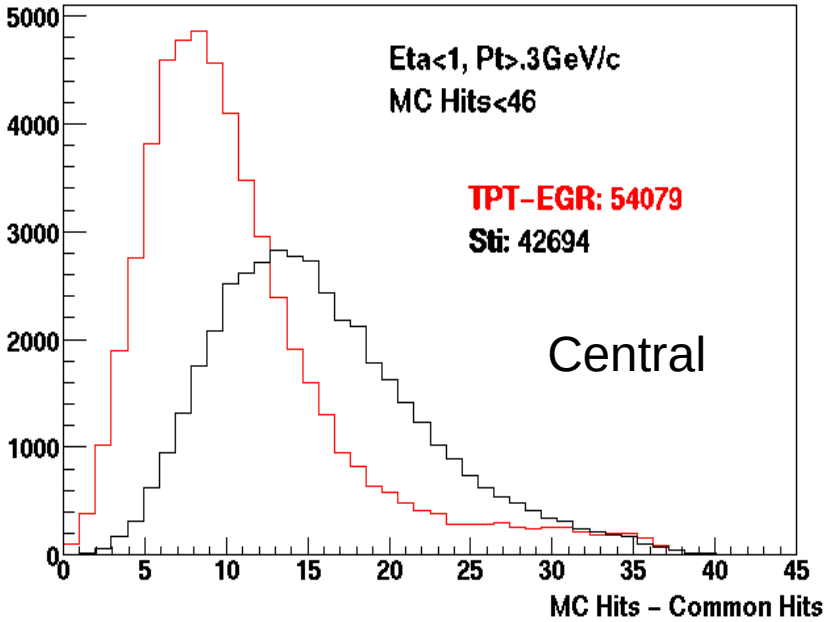


Missed Hits

- Missed Hits = MC Hits – Common Hits (lower is better)



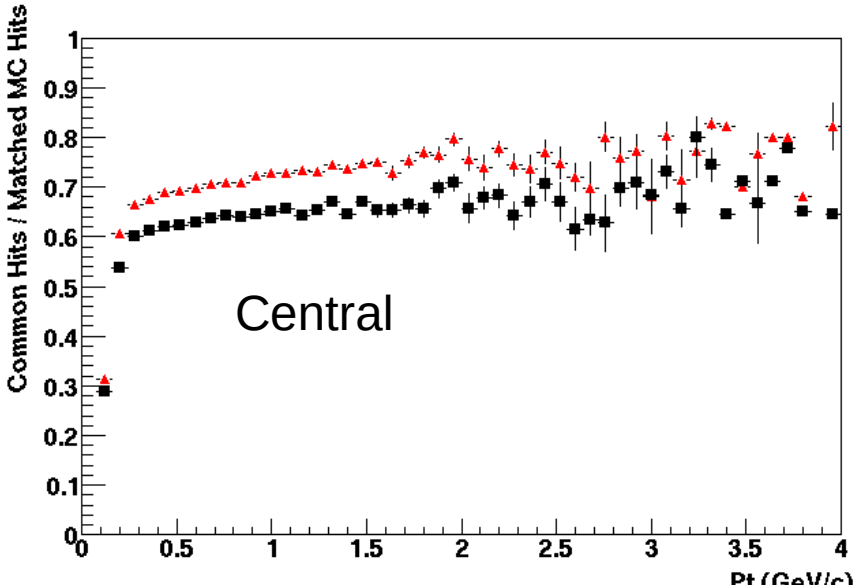
Profile Plot is deceptive; not gaussian distribution.

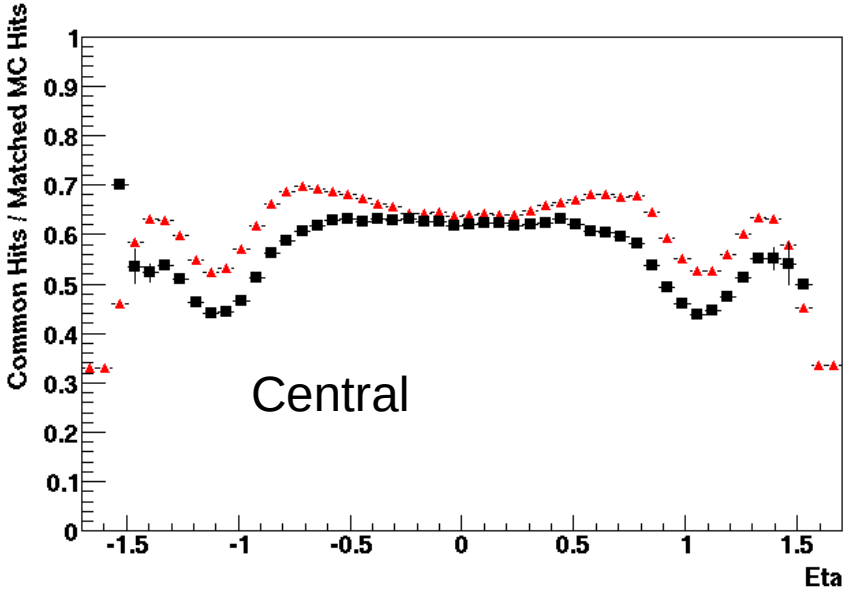


Better to plot an “efficiency” for finding MC Hits….

Hit Efficiency 3

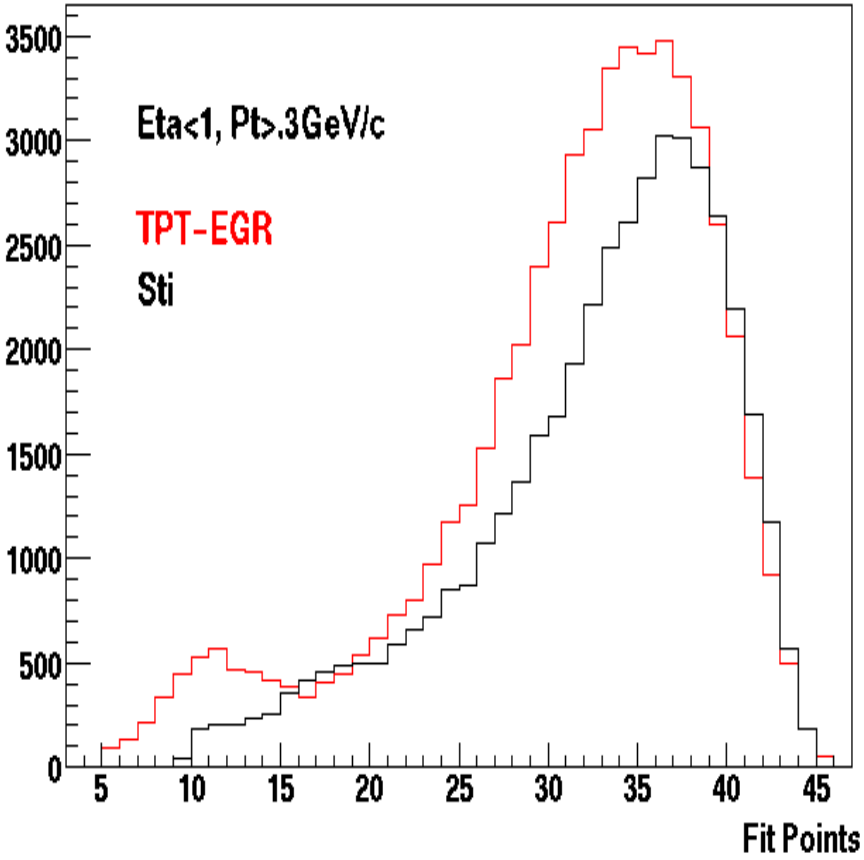
- Common / MC Hits vs. Pt & Eta

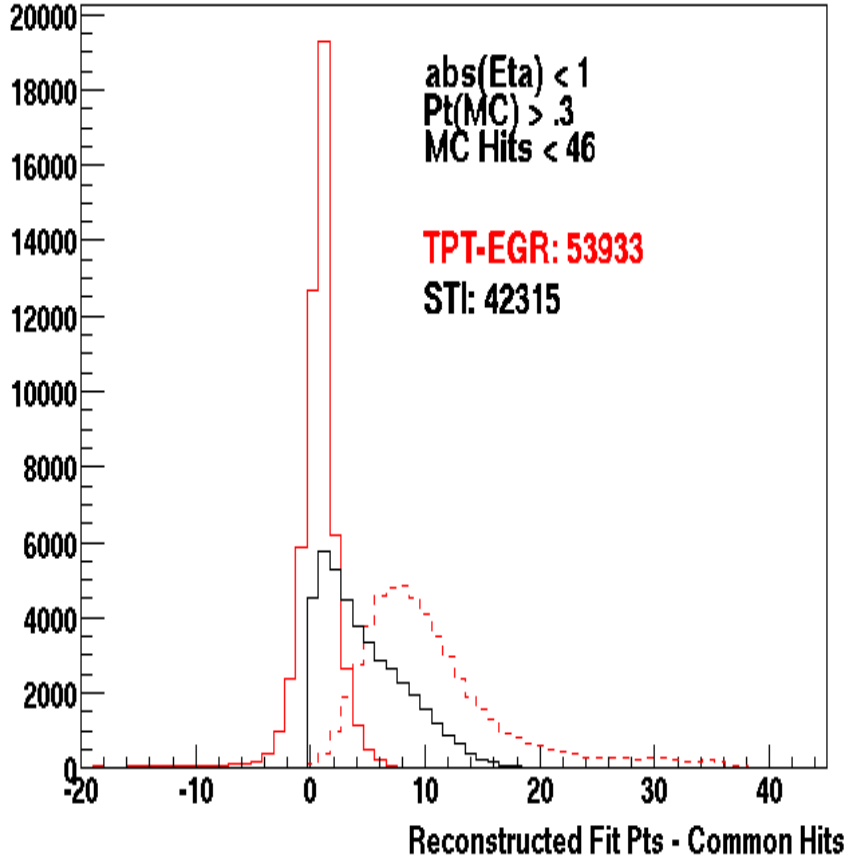




Fit Point Definition Difference

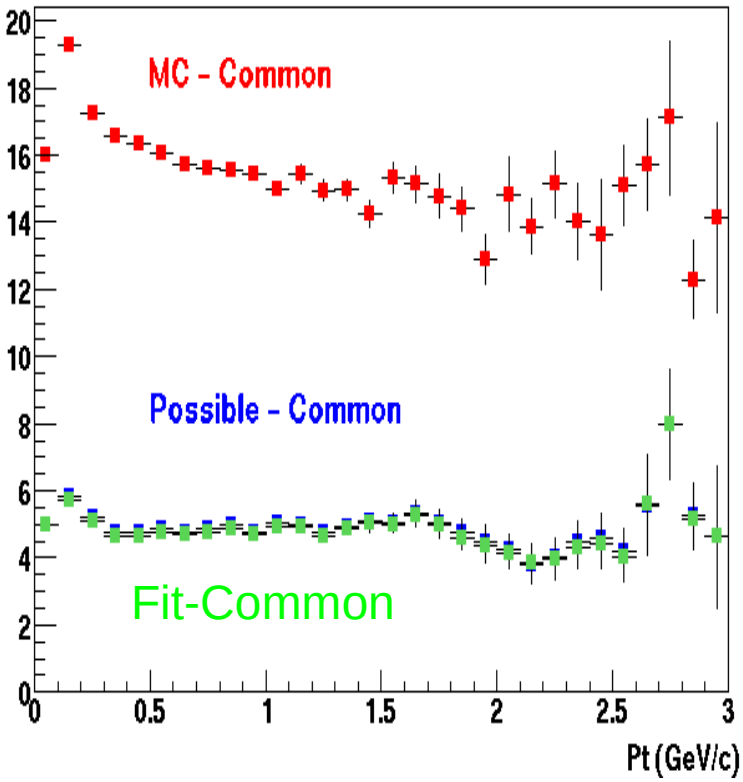
TPT-EGR does not use every hit associated with the track for the final fit. STI uses **all** hits found in the track fit. Cuts on ‘Fit Points’ will behave differently for ITTF & TPT-EGR.



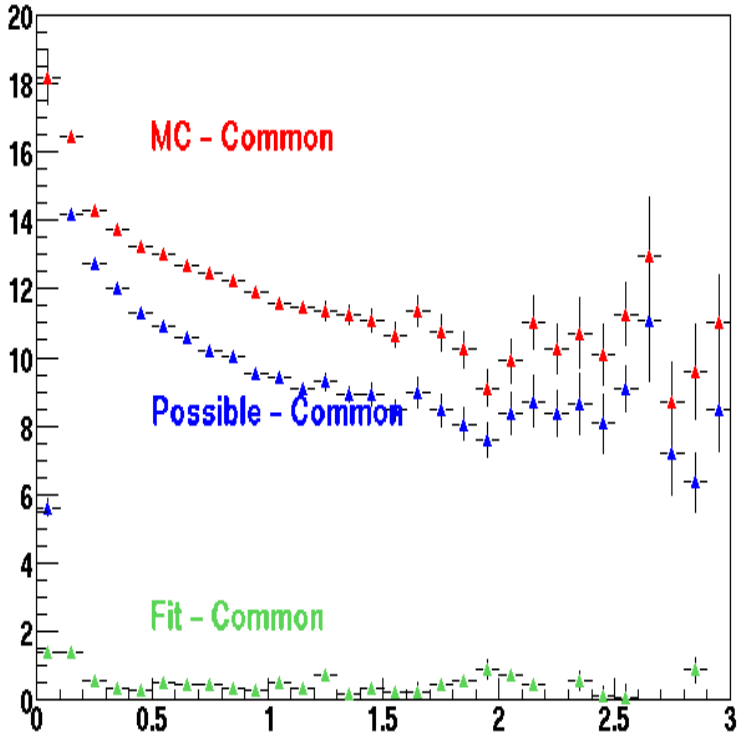


Fit, Possible, MC and Common

STI



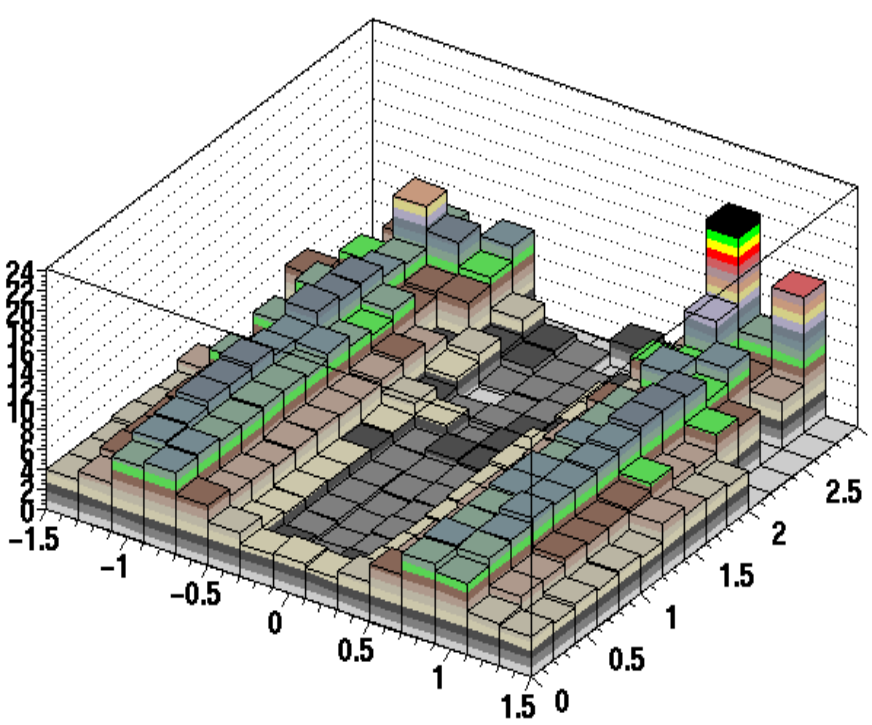
TPT-EGR

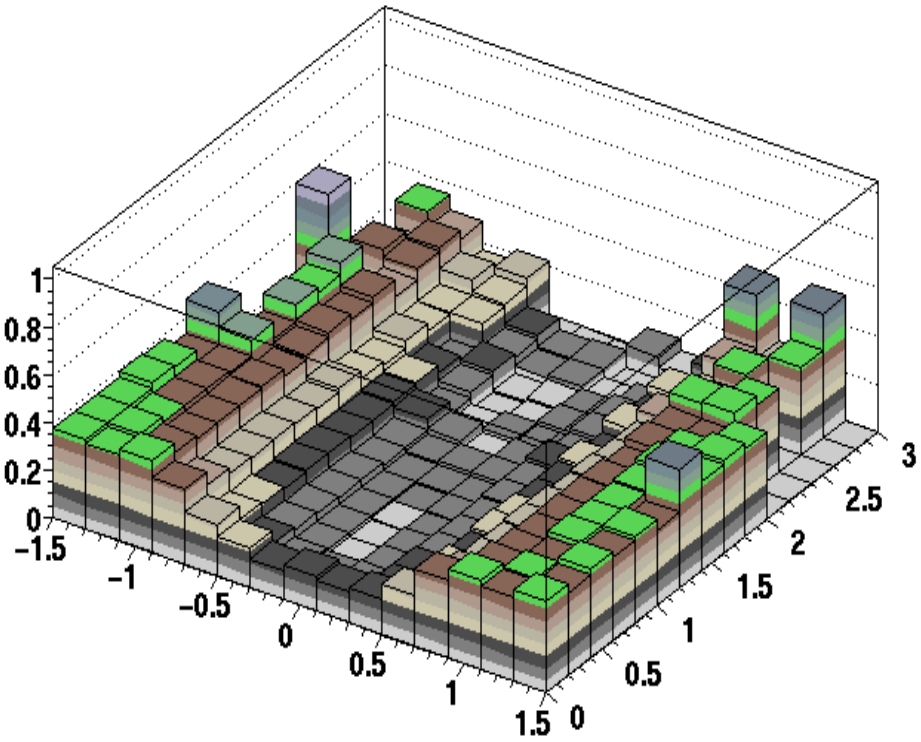


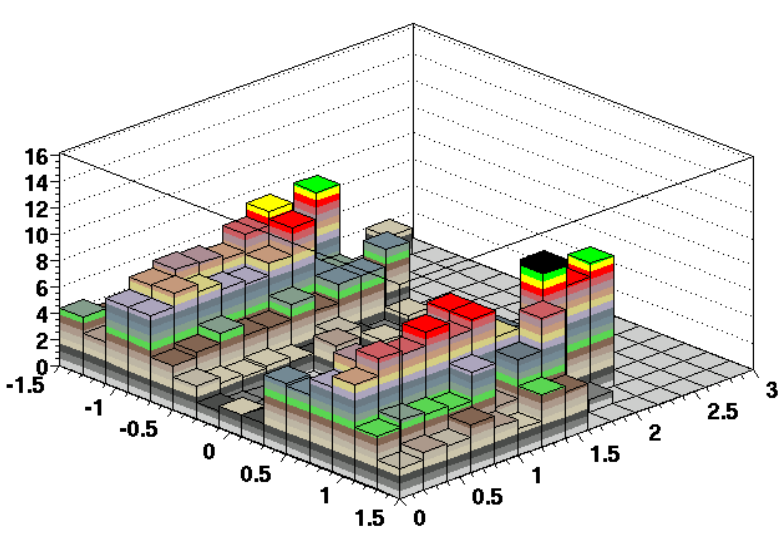
Hit Contamination

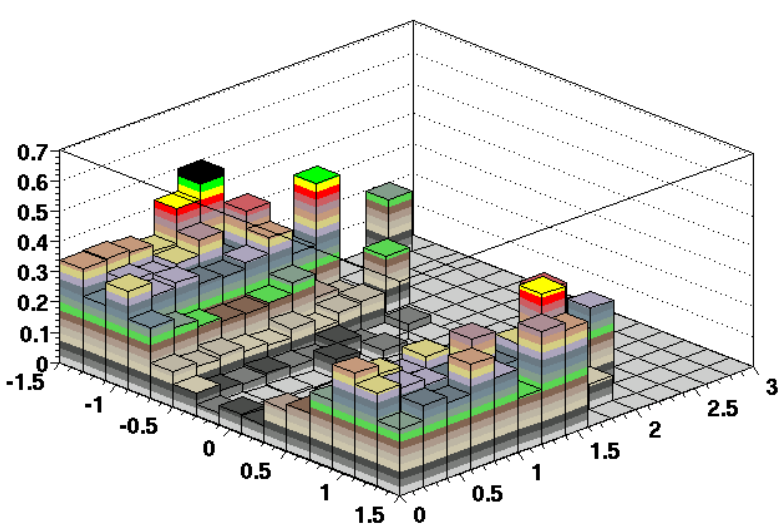
- Hits not from the Matched MC Track:

  Fit Points – Common Hits






16
14
12
10
8
6
4
2
0
-1.5
-1
-0.5
0
0.5
1
1.5
0
0.5
1
1.5
2
2.5
3


0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
-1.5
-1
-0.5
0
0.5
1
1.5
0
0.5
1
1.5
2
2.5
3

Conclusions

- Similar qualitative performance to TPT-EGR, systematically lower efficiency (NOT TUNED!)
- Higher rate of hit loss