

TPC MC Reco and Truth Comparison for TPC Bad Channel Table on and off

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- I plotted MC Reco and MC Truth differences for the variables primary vertex z position, track total momentum, trk transverse momentum, track polar angle, number of tracks in the event, number of TPC hits in the event.

- The plots were created for three cases:

- TPC Bad Channel Table was turned on in the TPC Digitizer and TPC Reco package
- The Table was turned on in the TPC Digitizer but not in the TPC Reco package
- The Table was turned off both in the TPCDigitizer and in the TPC Reco package

The plots for three cases were put in a same histogram

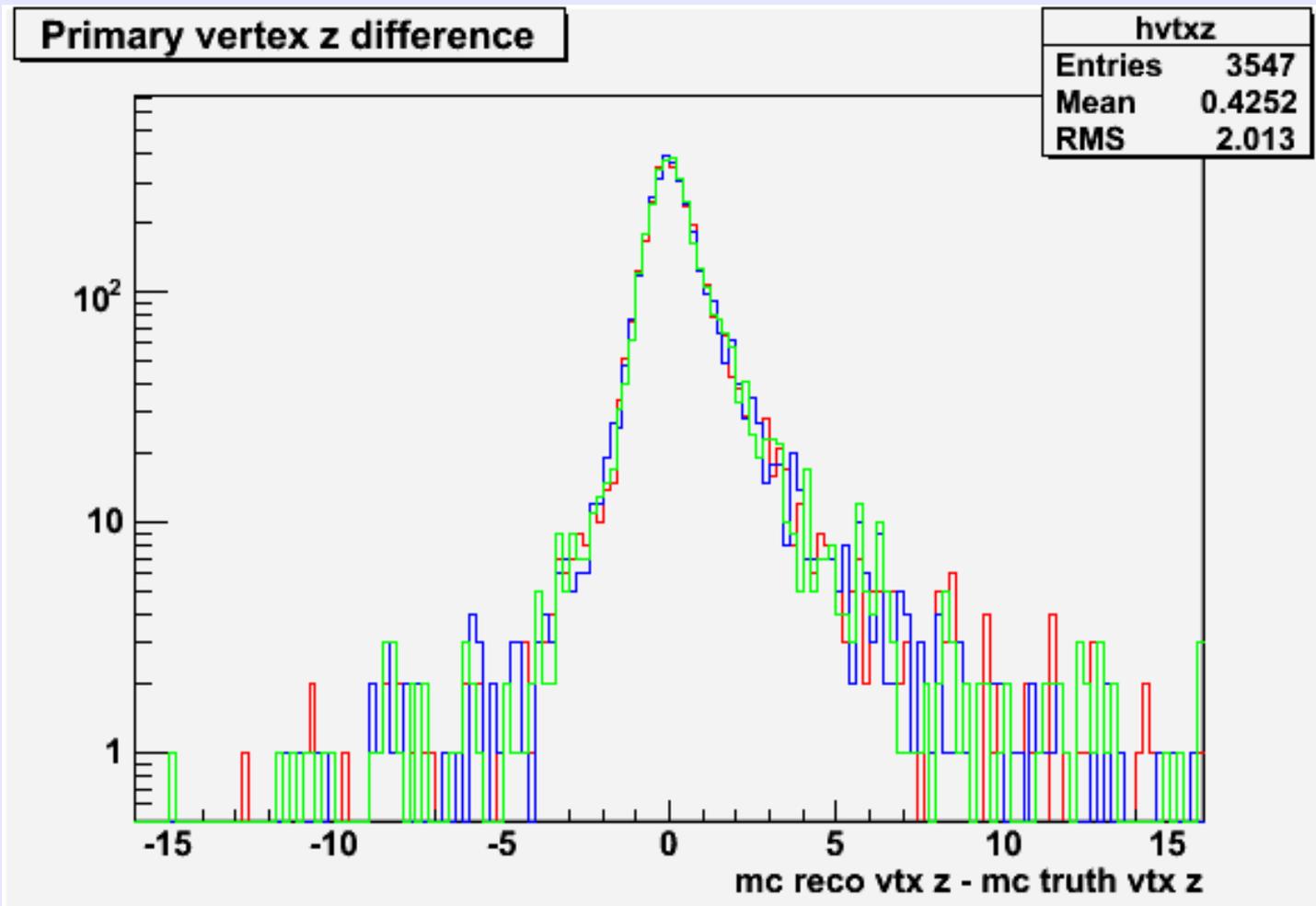
Red plot corresponds to the 1st case

Green plot corresponds to the 2nd case

Blue plot correspond to the 3rd case

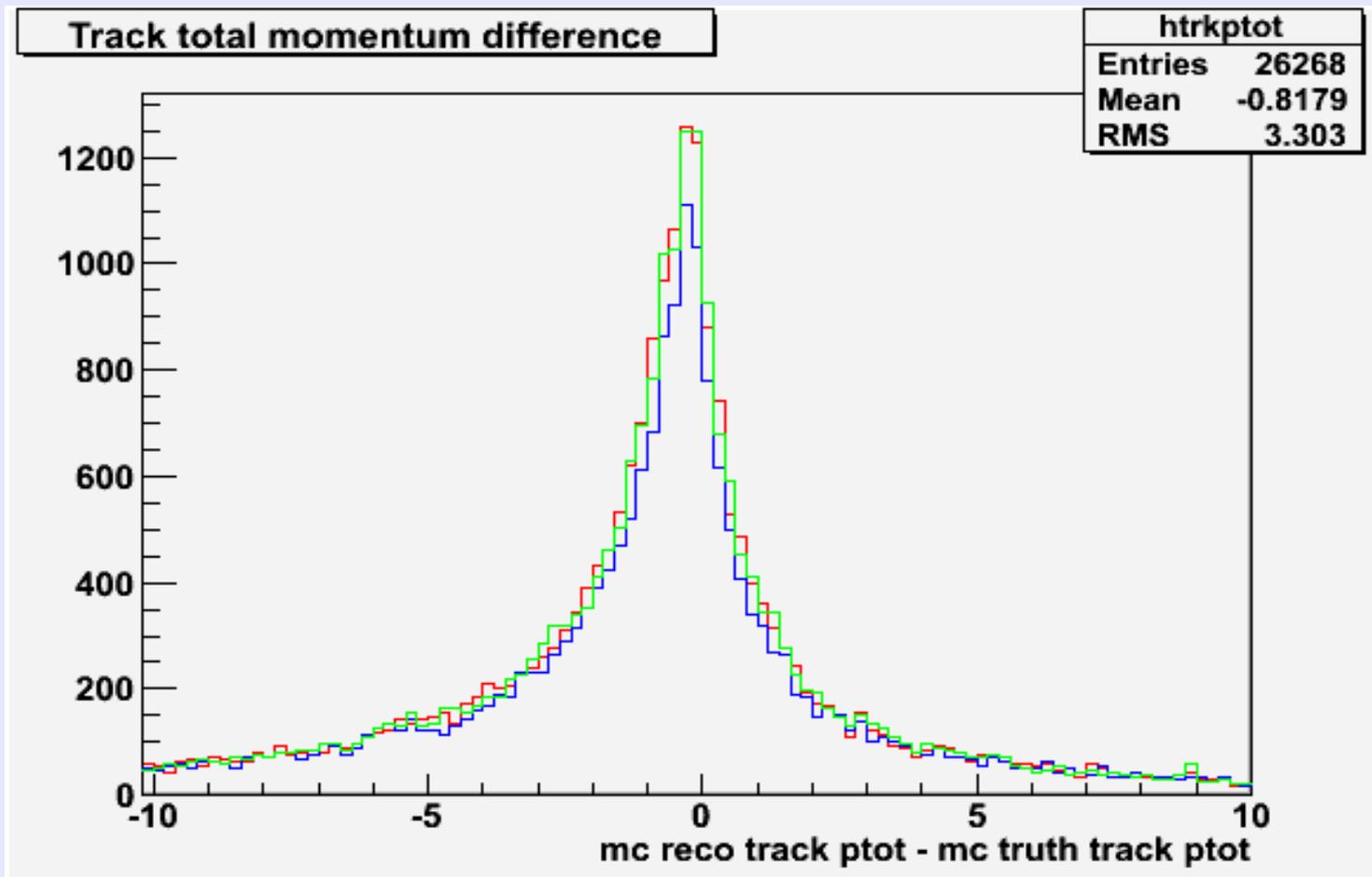
- I also plotted distribution of the variables for the real data for two cases:

- The Table ON in the TPC Reco
- The Table OFF in the TPC Reco



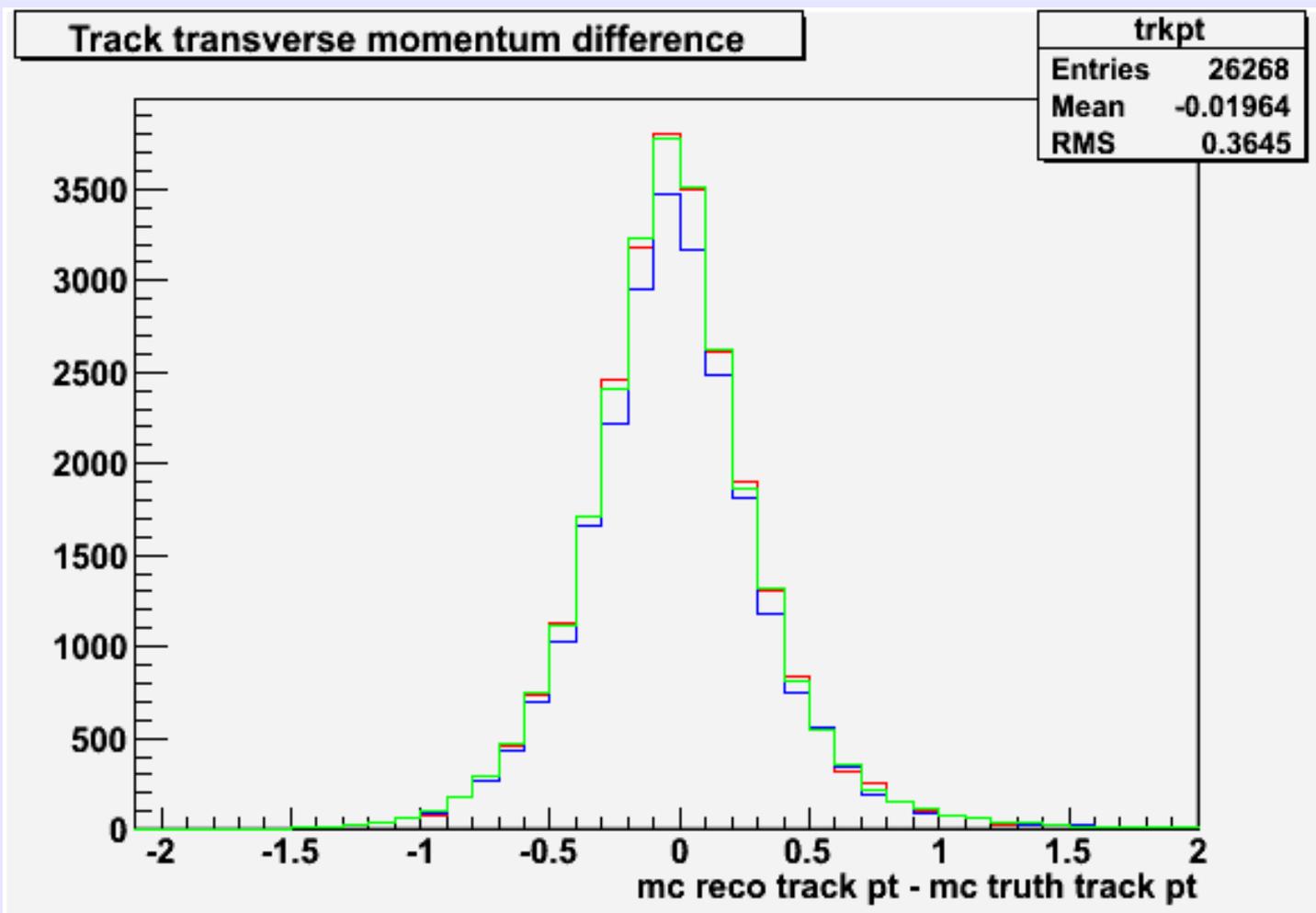
Red- The Table ON in TPCDigitizer, ON in TPC Reco
 Green- The Table ON in TPCDigitizer but OFF in TPC Reco
 Blue- The Table OFF in TPCDigitizer, OFF in TPCReco

Red- 1 st case:	3547 primary vertices	mean value = 0.5065
Green- 2 nd case:	3543 primary vertices	mean value = 0.4662
Blue- 3 rd case:	3548 primary vertices	mean value = 0.4882



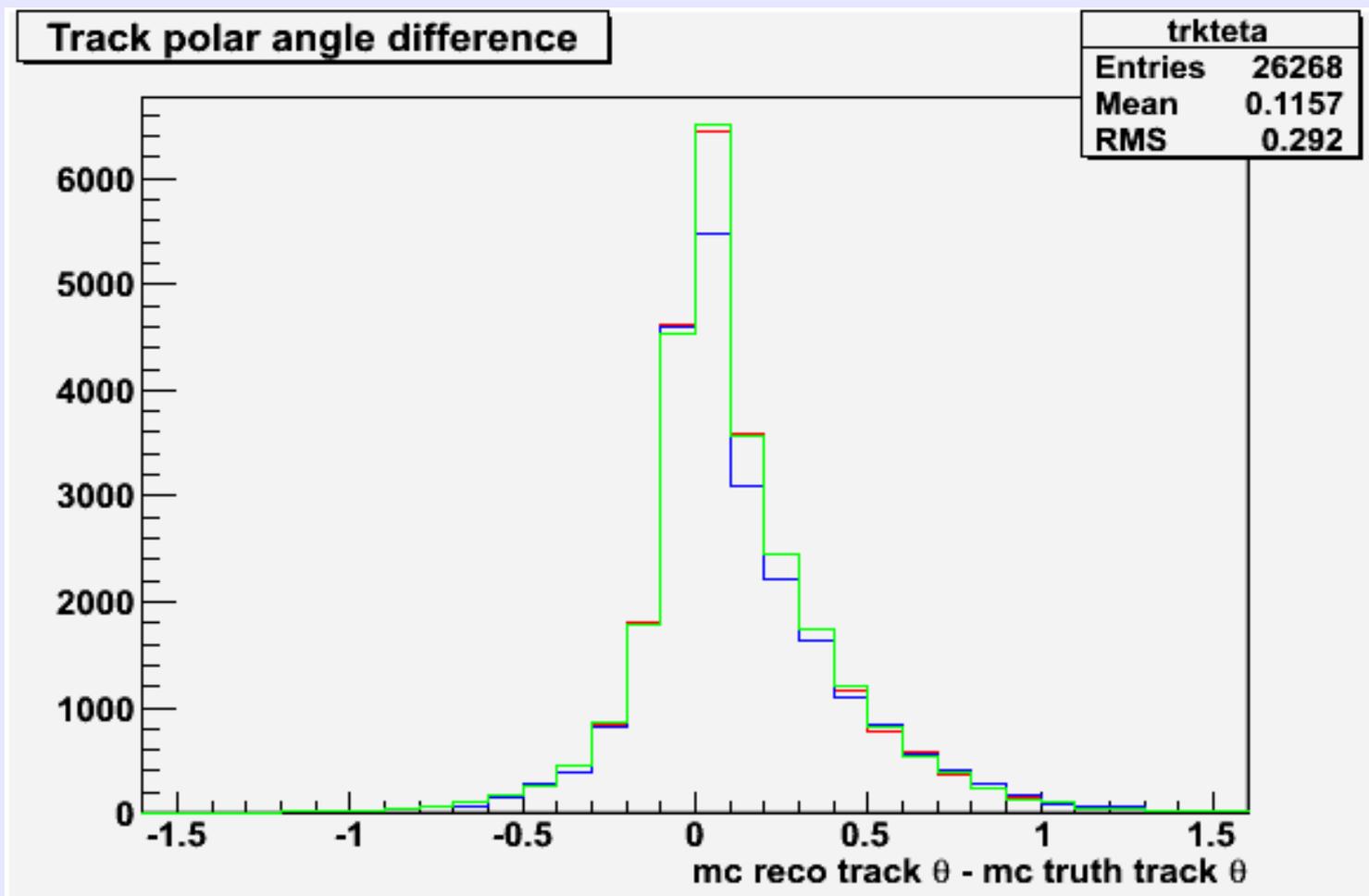
Red- The Table ON in TPCDigitizer, ON in TPC Reco
 Green- The Table ON in TPCDigitizer but OFF in TPC Reco
 Blue- The Table OFF in TPCDigitizer, OFF in TPCReco

Red- 1st case: 26268 tracks mean value = -1.519
 Green- 2nd case: 26258 tracks mean value = -1.527
 Blue- 3rd case: 24393 tracks mean value = -1.316



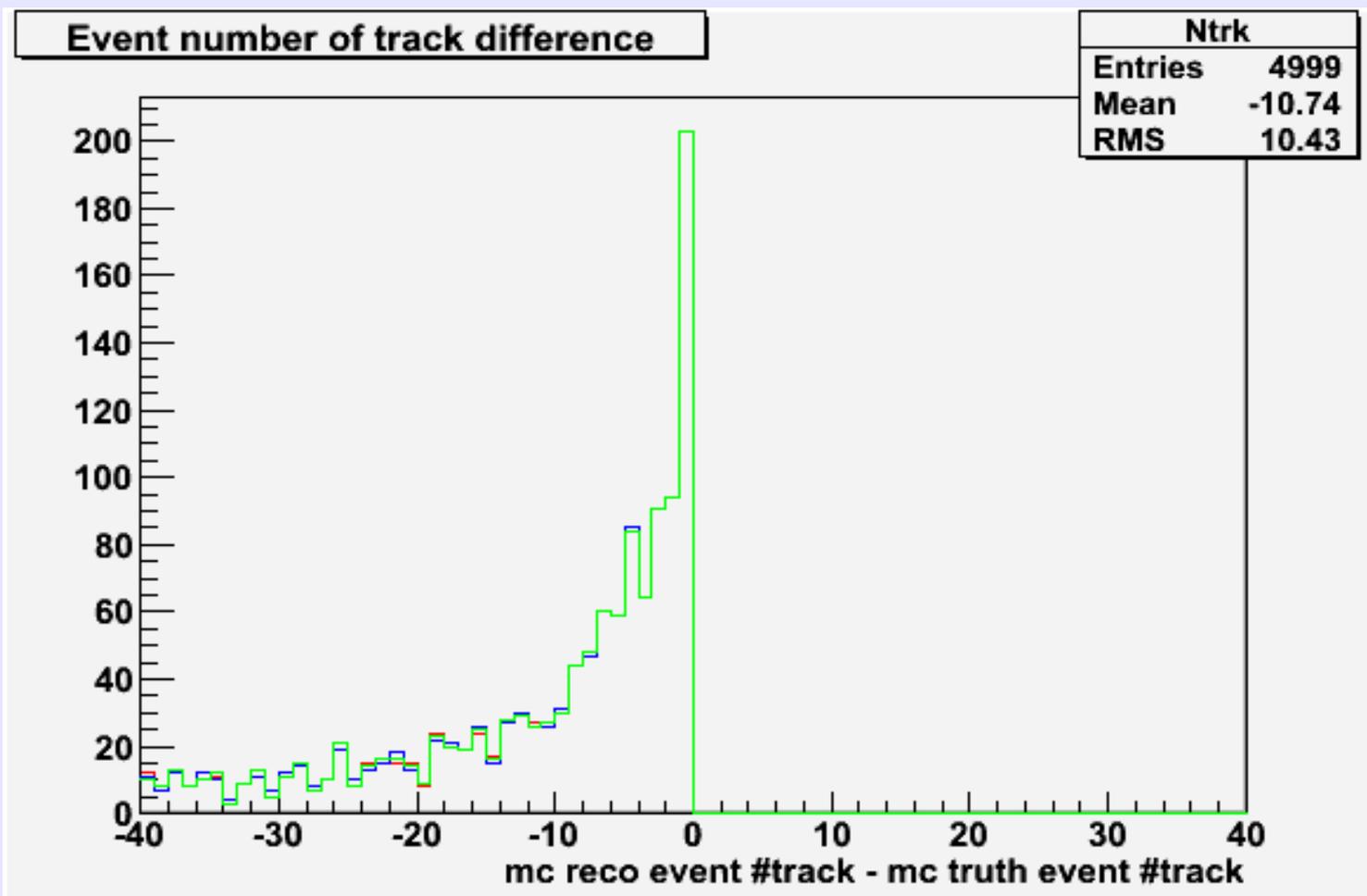
Red- The Table ON in TPCDigitizer, ON in TPC Reco
 Green- The Table ON in TPCDigitizer but OFF in TPC Reco
 Blue- The Table OFF in TPCDigitizer, OFF in TPCReco

Red- 1st case: 26268 tracks mean value = 0.006886
 Green- 2nd case: 26258 tracks mean value = 0.004994
 Blue- 3rd case: 24393 tracks mean value = 0.005316



Red- The Table ON in TPCDigitizer, ON in TPC Reco
 Green- The Table ON in TPCDigitizer but OFF in TPC Reco
 Blue- The Table OFF in TPCDigitizer, OFF in TPCReco

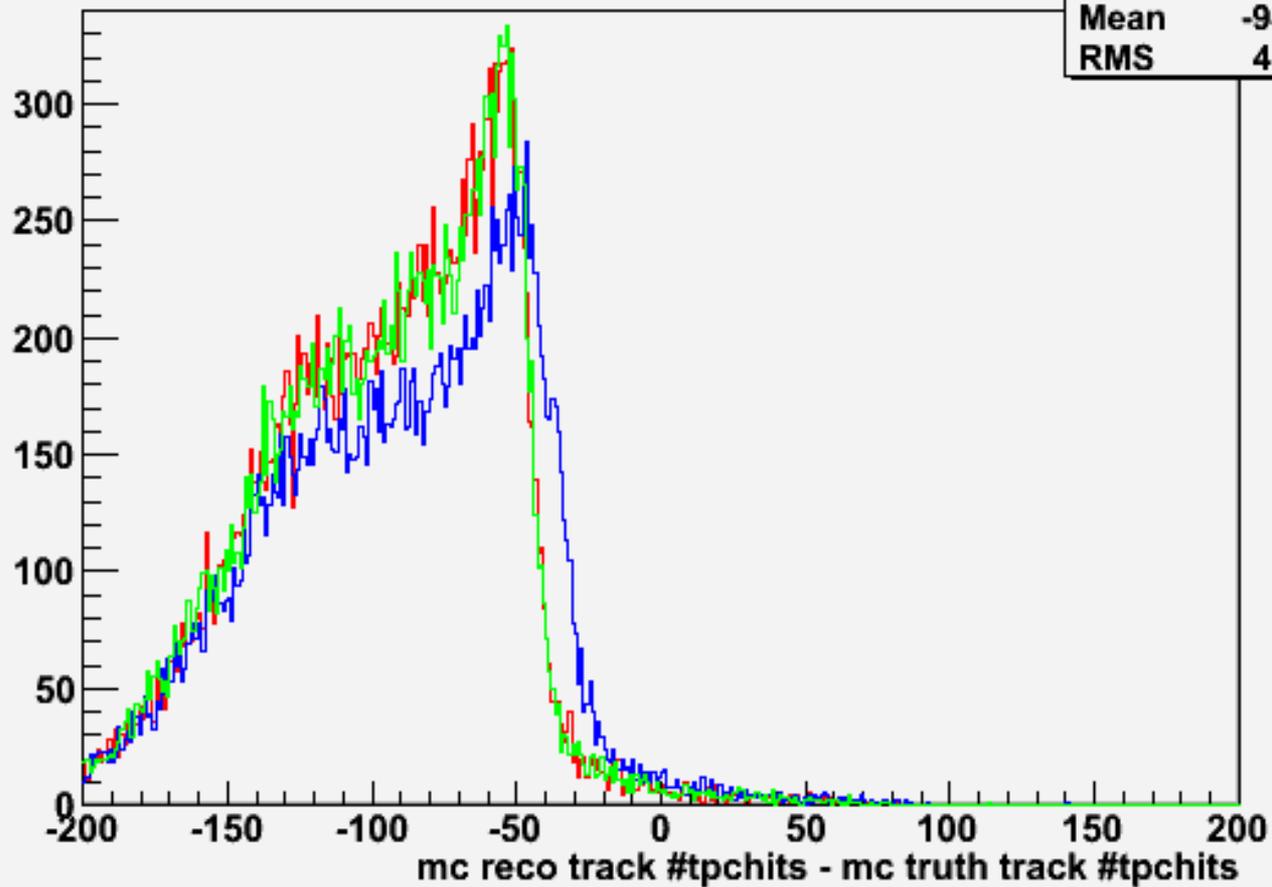
Red- 1st case: 26268 tracks mean value = 0.1160
 Green- 2nd case: 26258 tracks mean value = 0.1151
 Blue- 3rd case: 24393 tracks mean value = 0.1236



Red- The Table ON in TPCDigitizer, ON in TPC Reco
 Green- The Table ON in TPCDigitizer but OFF in TPC Reco
 Blue- The Table OFF in TPCDigitizer, OFF in TPCReco

Red- 1st case: 4999 events mean value = -10.74
 Green- 2nd case: 4999 events mean value = -10.71
 Blue- 3rd case: 4999 events mean value = -10.71

Track number of tpc hits difference



Red- The Table ON in TPCDigitizer, ON in TPC Reco
Green- The Table ON in TPCDigitizer but OFF in TPC Reco
Blue- The Table OFF in TPCDigitizer, OFF in TPCReco

Red- 1st case: 26268 tracks mean value = -94.95
Green- 2nd case: 26258 tracks mean value = -95.01
Blue- 3rd case: 24393 tracks mean value = -89.81

REAL DATA run 15860

RED plot – The table is turned on
BLUE plot – The table is turned off

If turned on:

Total number of events : 4965
Total number of tracks : 35092
Total number of TPC hits : 1844051

If turned off

Total number of events : 4965
Total number of tracks : 34455
Total number of TPC hits: 1797375

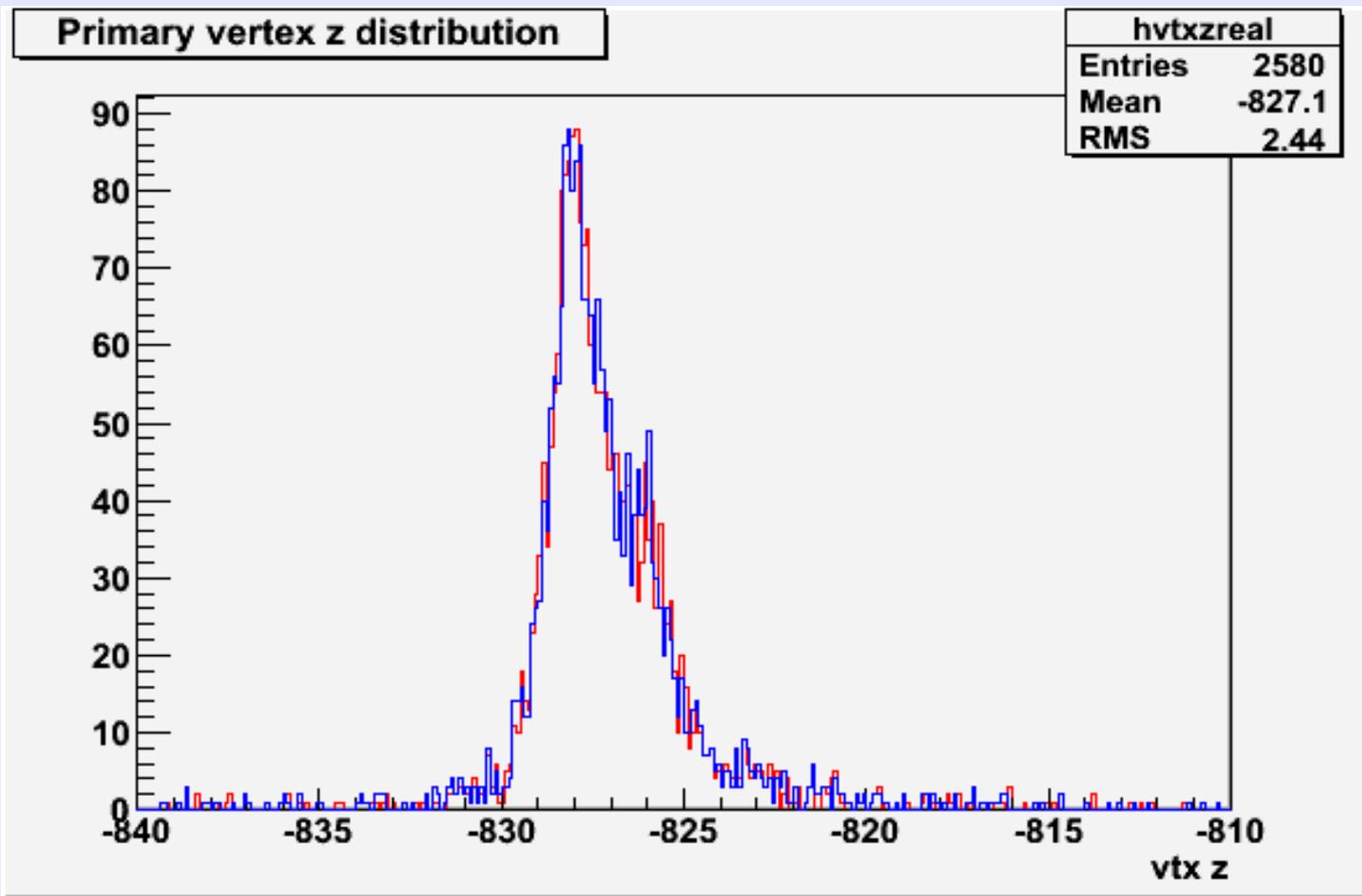


Table turned on MEAN = -827.1

Table turned off MEAN = -827.1

Track total momentum distribution

htrkptotreal	
Entries	35092
Mean	9.415
RMS	22.62

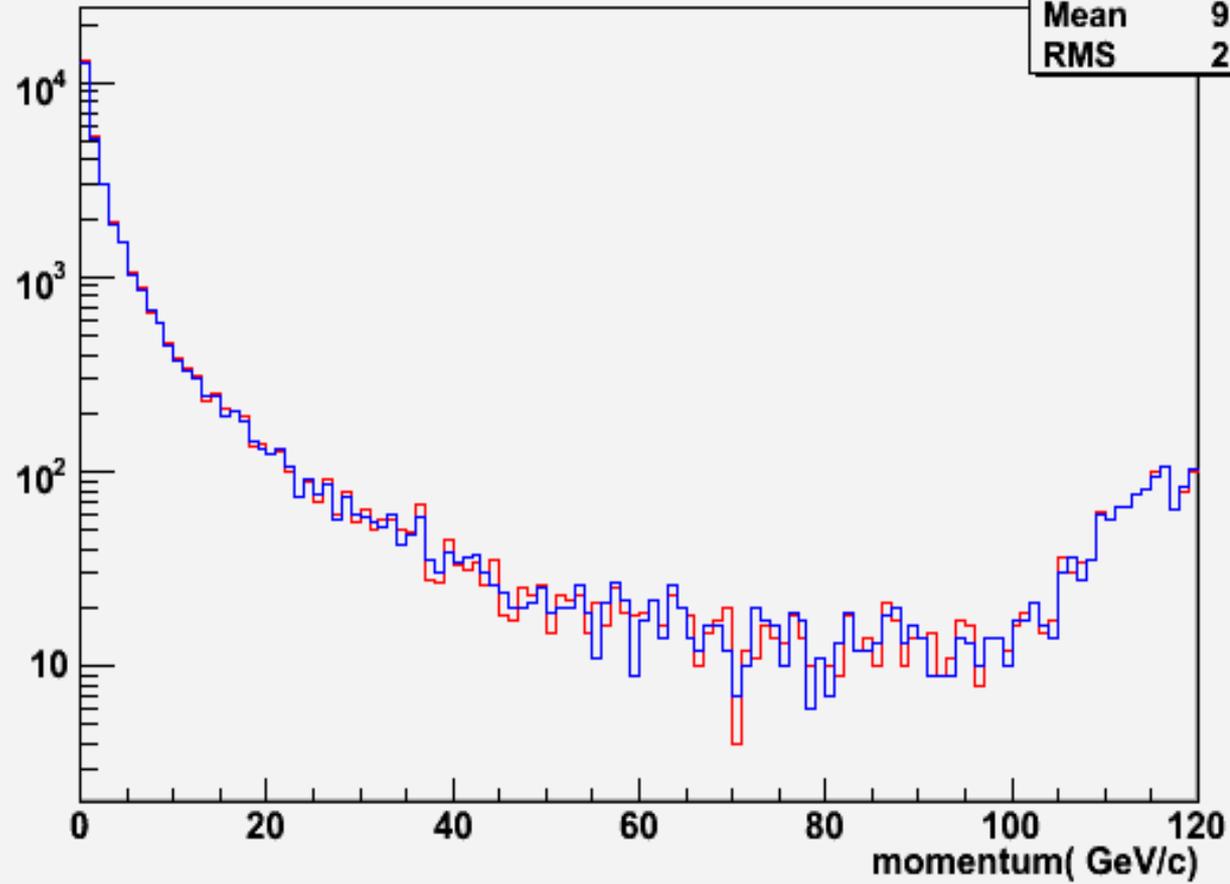


Table turned on MEAN = 9.415
Table turned off MEAN = 9.503

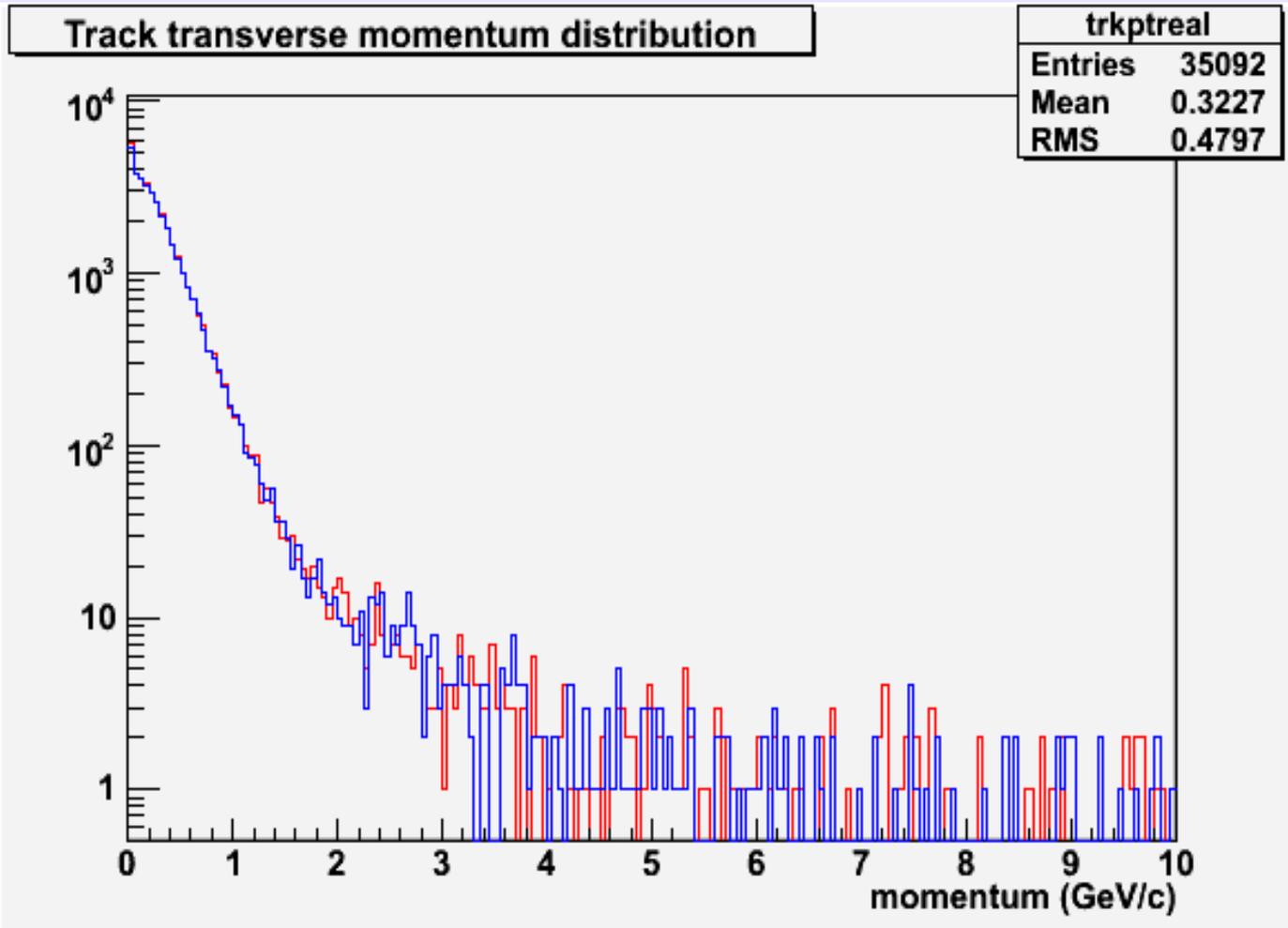


Table turned on MEAN = 0.3227
 Table turned off MEAN = 0.3259

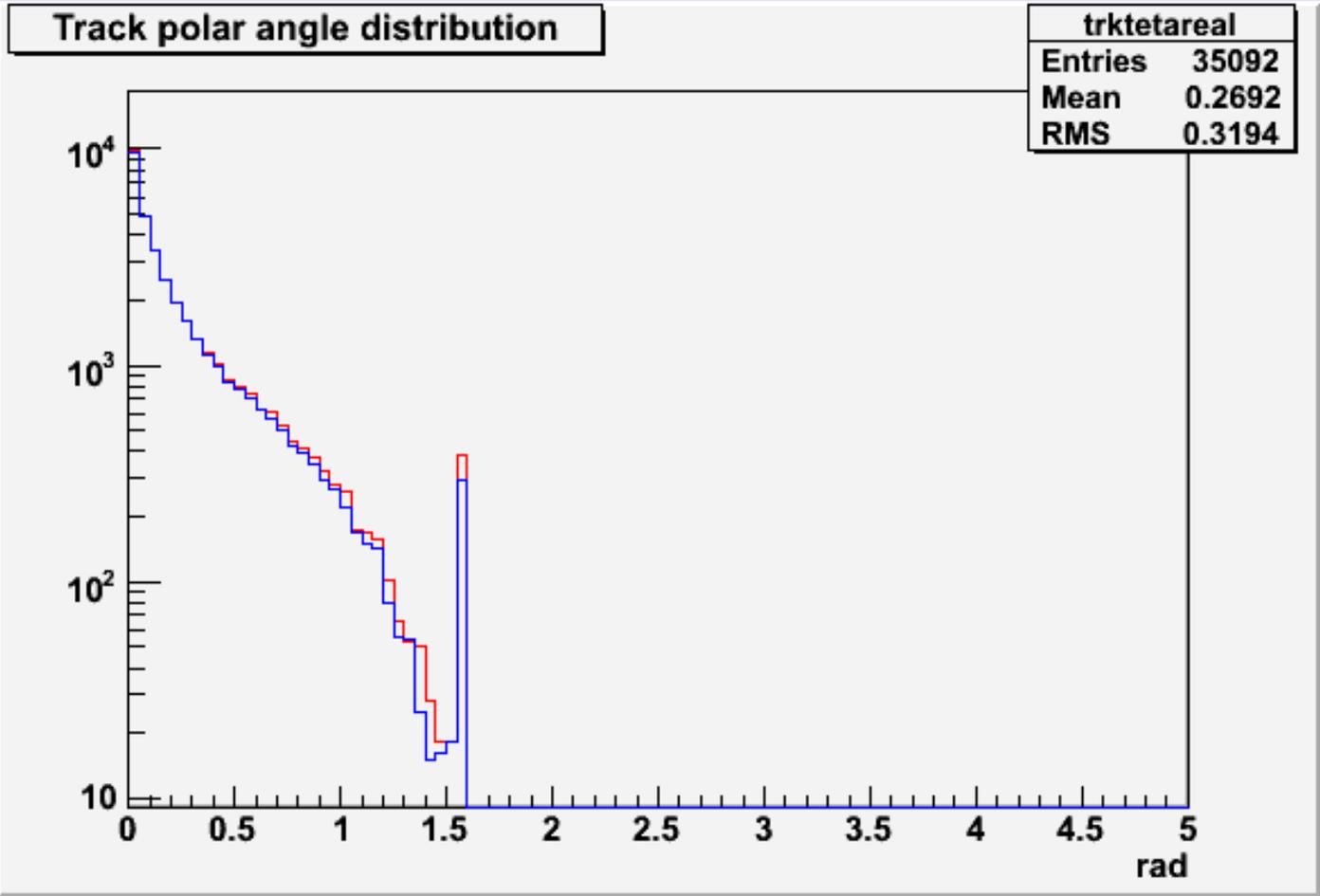


Table turned on MEAN = 0.2692
Table turned off MEAN = 0.2597

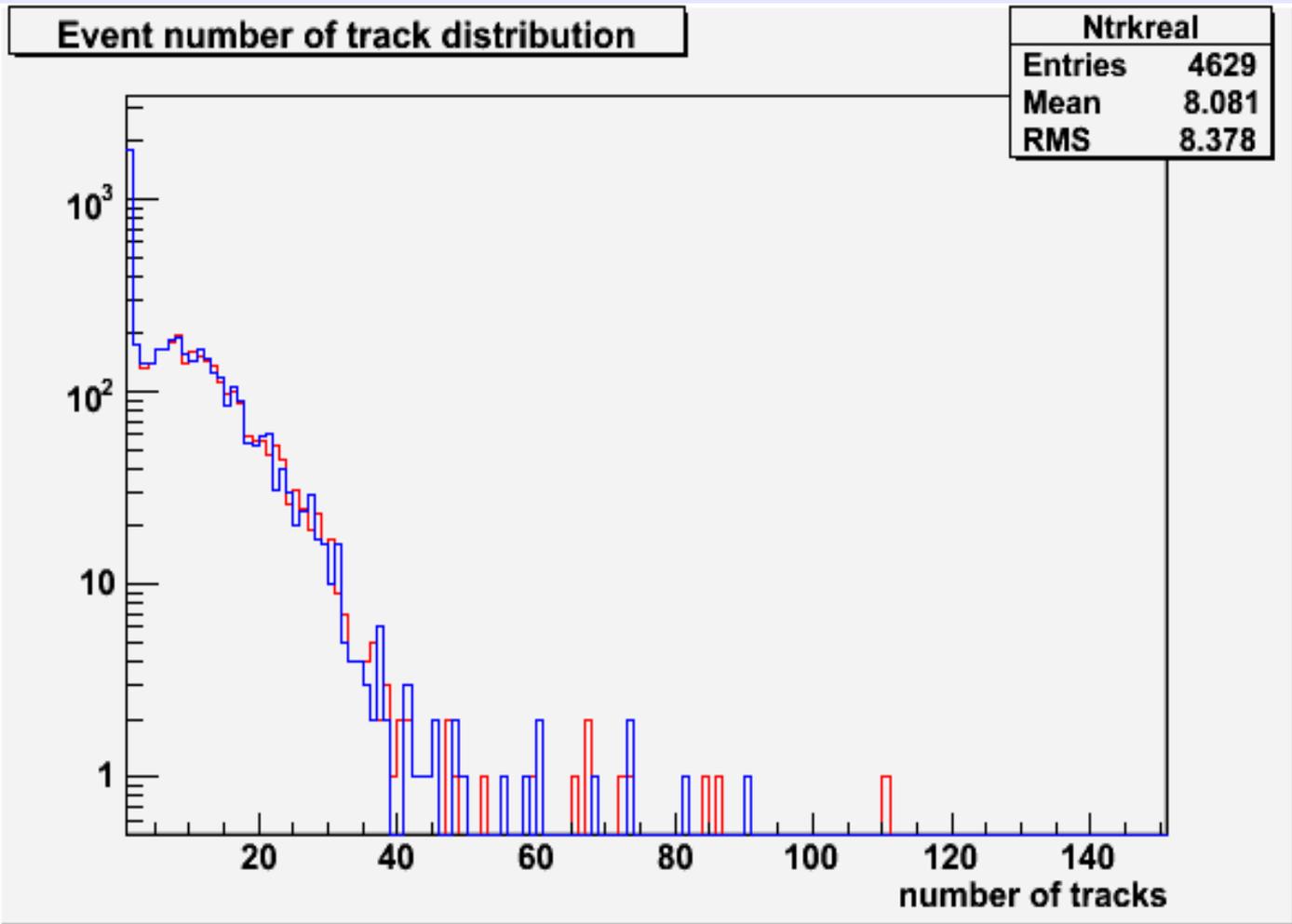


Table turned on MEAN = 7.581
 Table turned off MEAN = 7.443

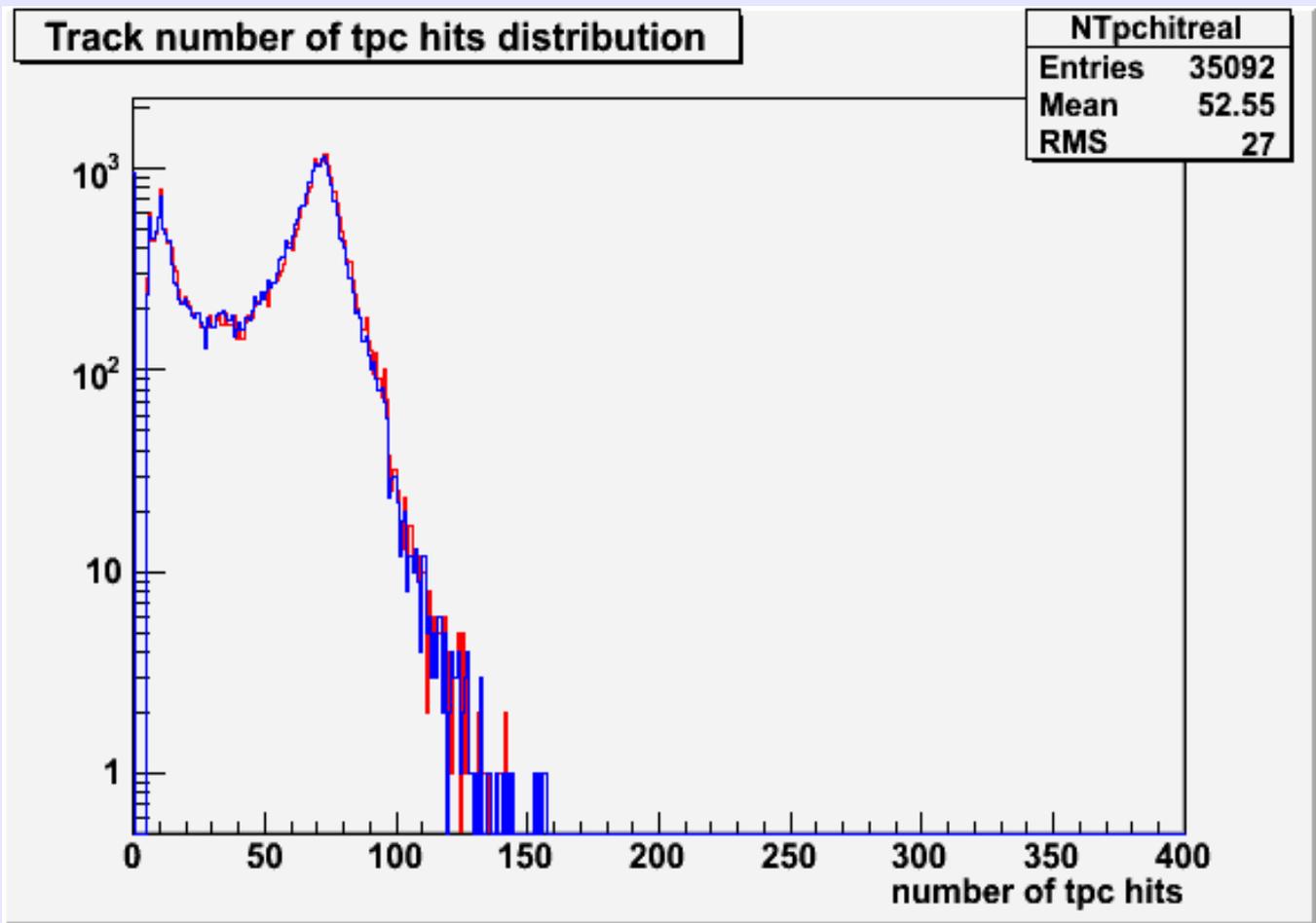


Table turned on MEAN = 52.55
Table turned off MEAN = 52.17

SUMMARY

- Generally, there is not much difference between the plots for the cases the TPC Bad Channel Table is on or off in TPC Reco and TPC Digitizer..**
- Total number of reconstructed tracks if the table turned on is 68 less than the case the table turned off over 5000 events..**
- The reason for this can be if the table turned off then fixed dead region is used, if the table turned on dead region is decided run by run..**
- For real data total number of tracks if table turned on is around 500 more than the case table is off over 5000 events.**
- For real data, the plots have little differences for table on and off.**