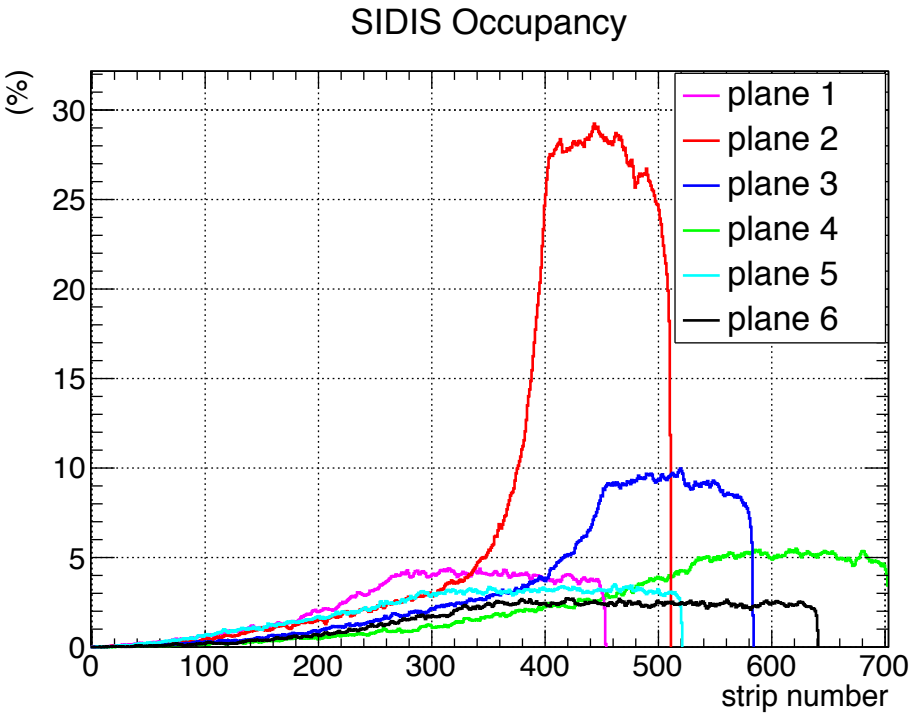
SoLID Tracking

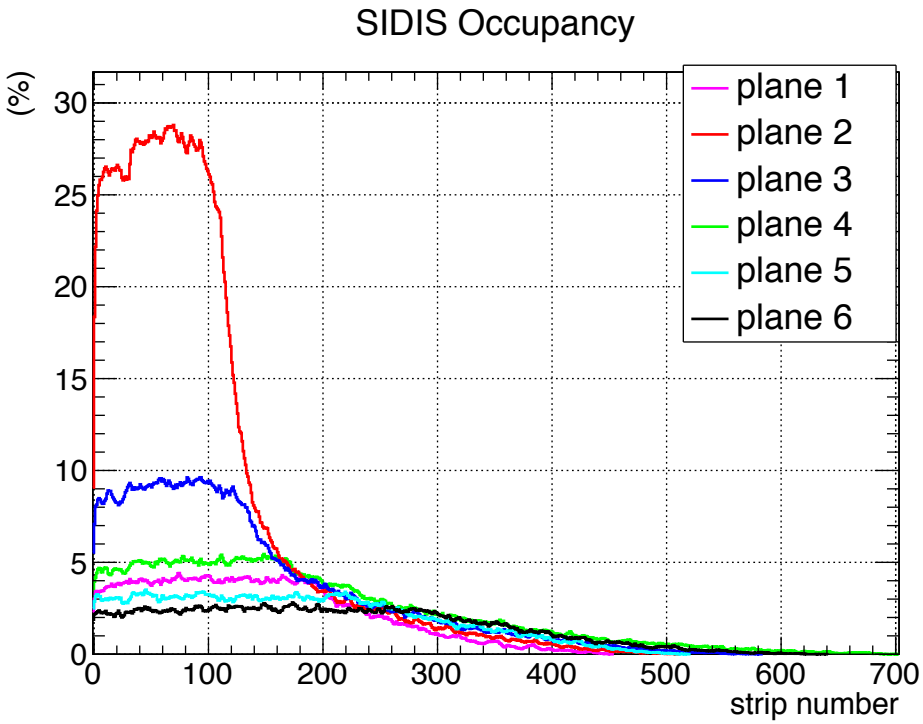
Weizhi Xiong

04/04/2017

SIDIS occupancy update

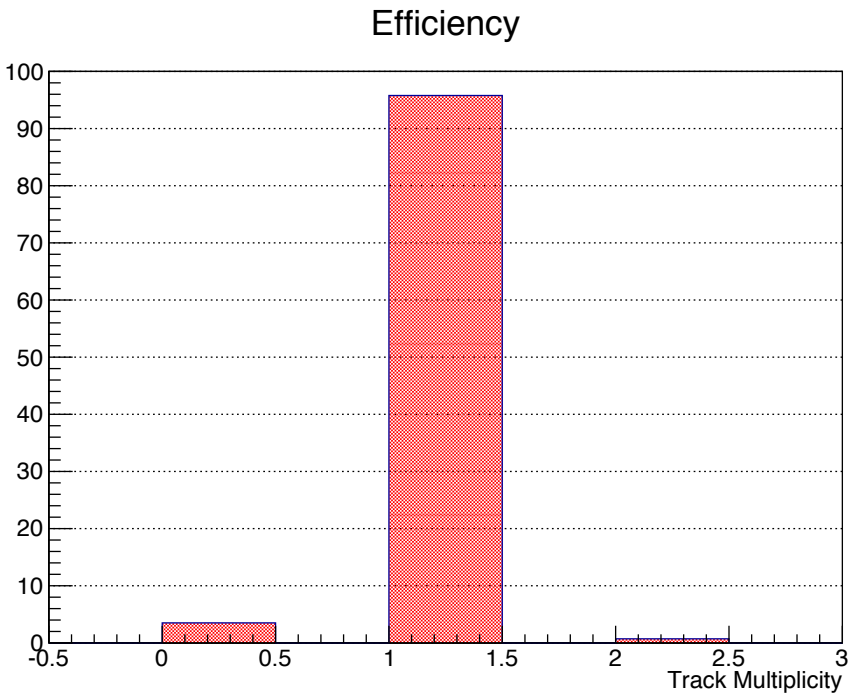
- Main difference compare to previous result is the use of the standard form for the GEM signal
- 4 sigma pedestal cut (pedestal sigma = 20.7)
- 2.37 | 7.98 | 3.40 | 2.24 | 2.03 | 1.52 (in %)

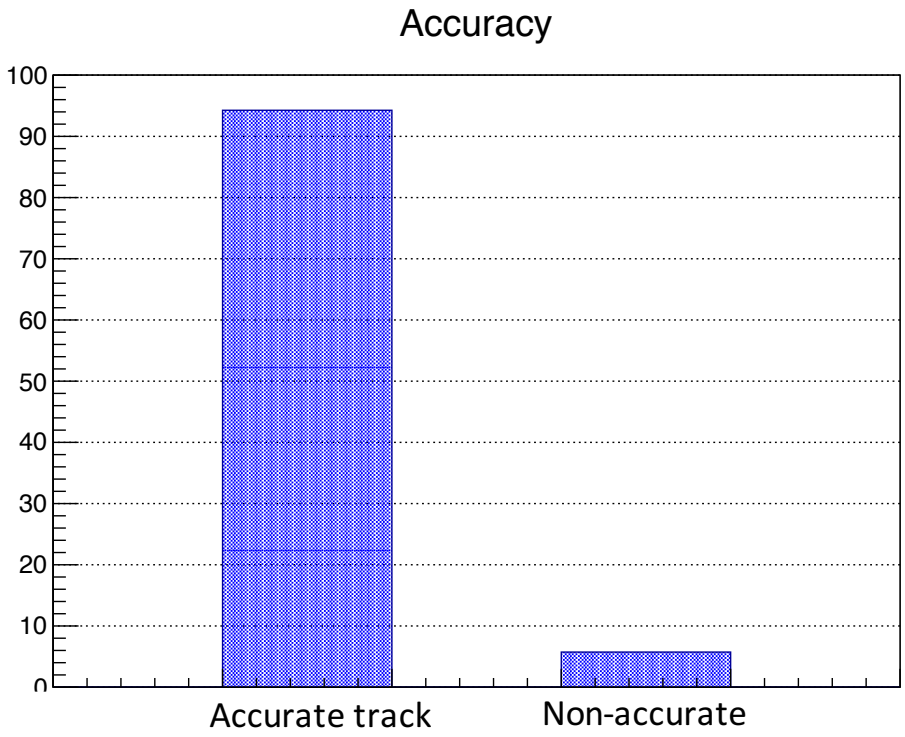




SIDIS efficiency and accuracy (FA)

- Single electron track (generated by eDIS generator) satisfy the FA trigger condition on EC
- Weighted by the DIS cross section

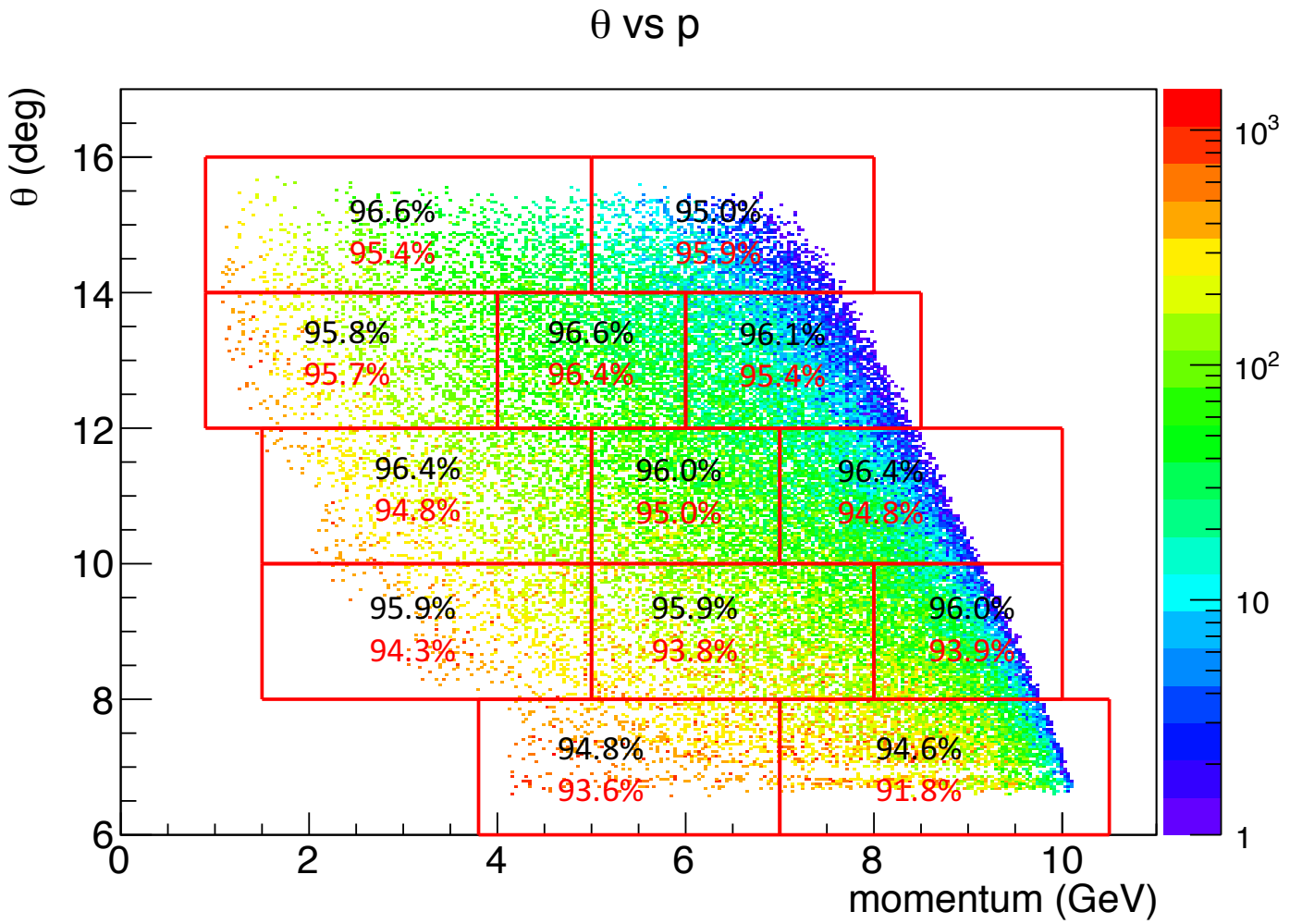




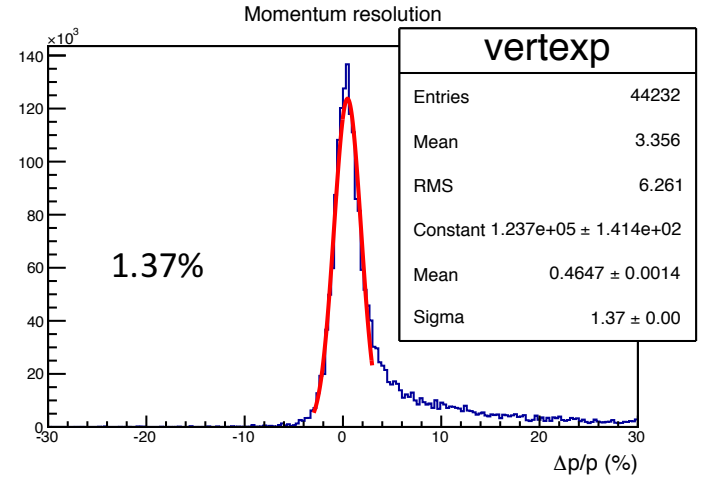
SIDIS efficiency and accuracy (FA)

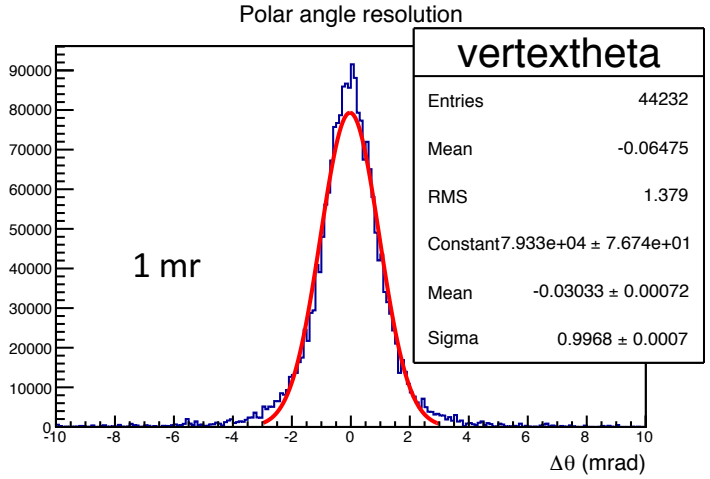
Black number for efficiency

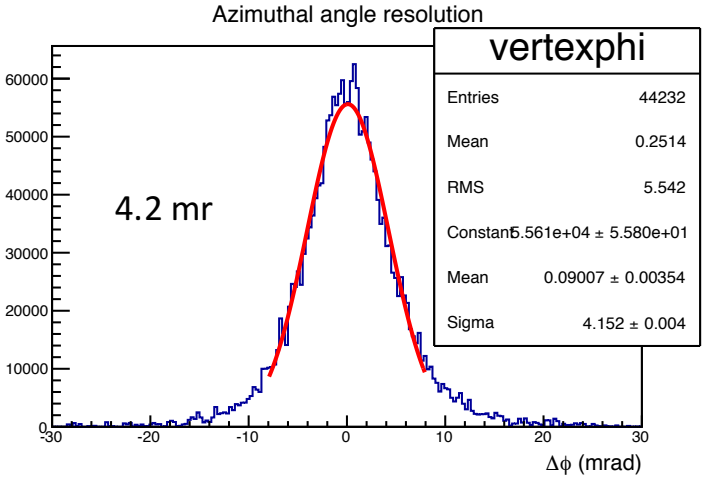
Rad number for accuracy

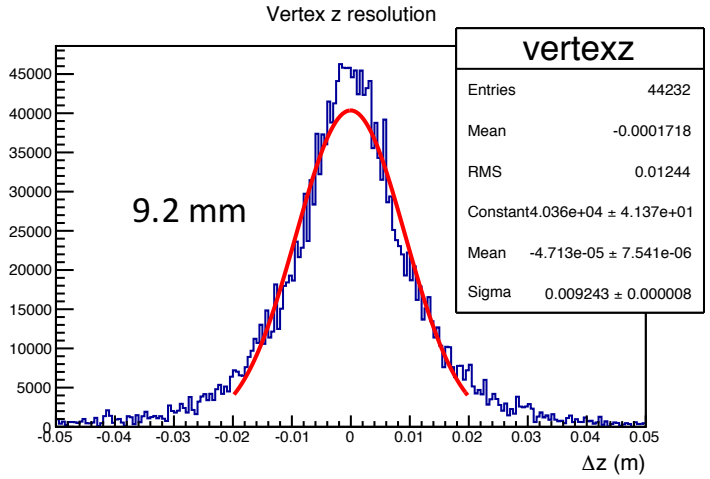


SIDIS Resolution (FA)



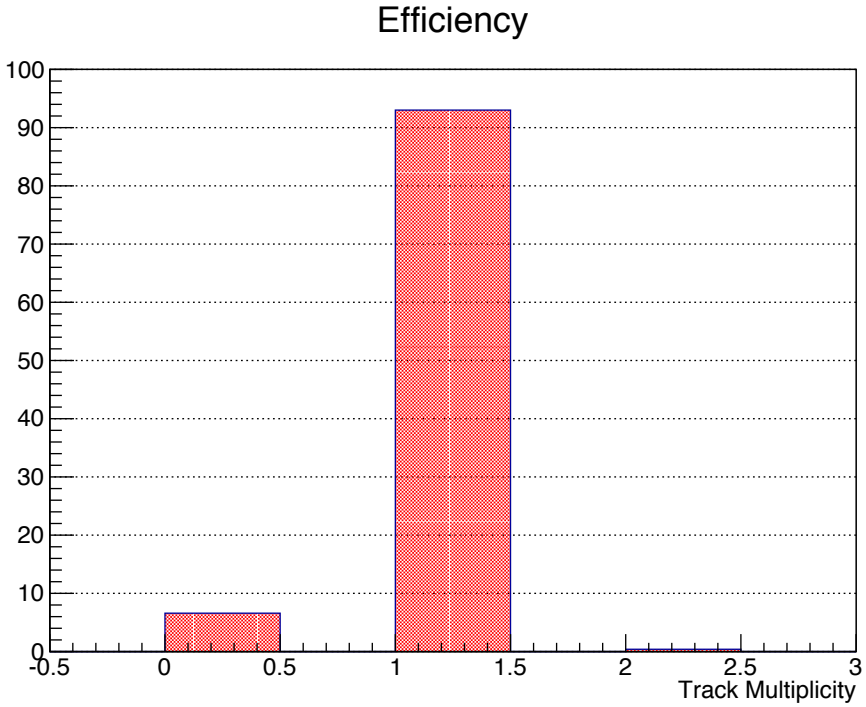


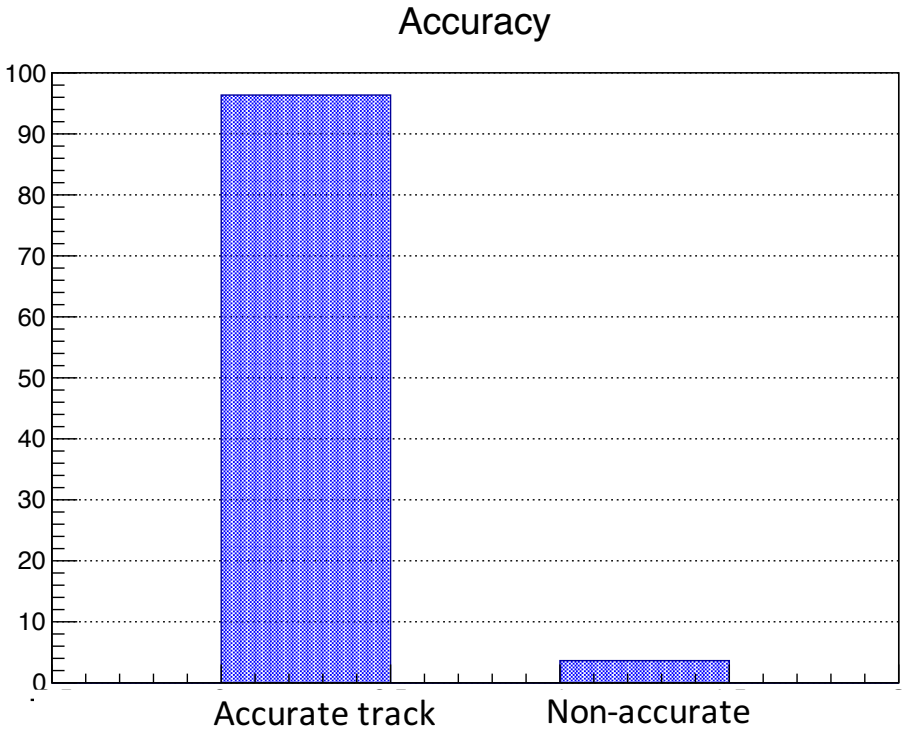




SIDIS efficiency and accuracy (LA)

- Single electron track (generated by eDIS generator) satisfy the LA trigger condition on EC
- Weighted by the DIS cross section

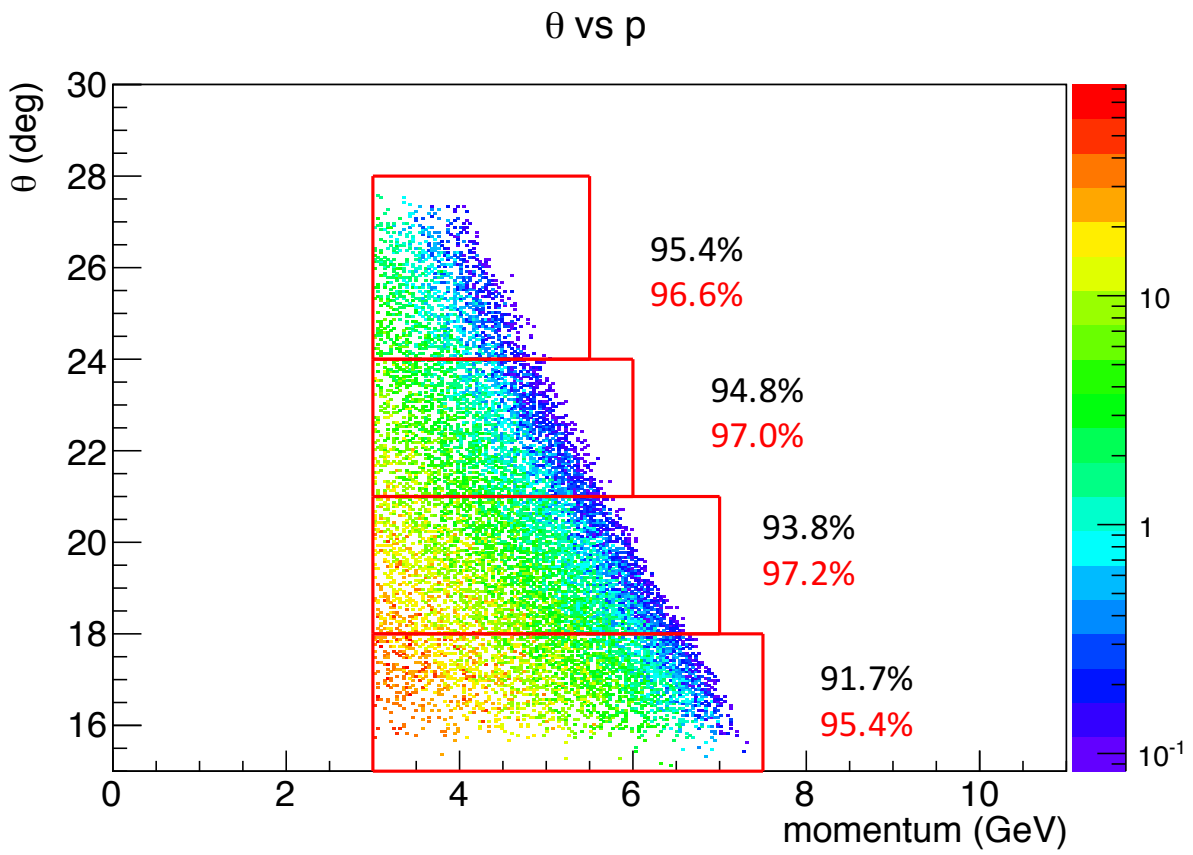




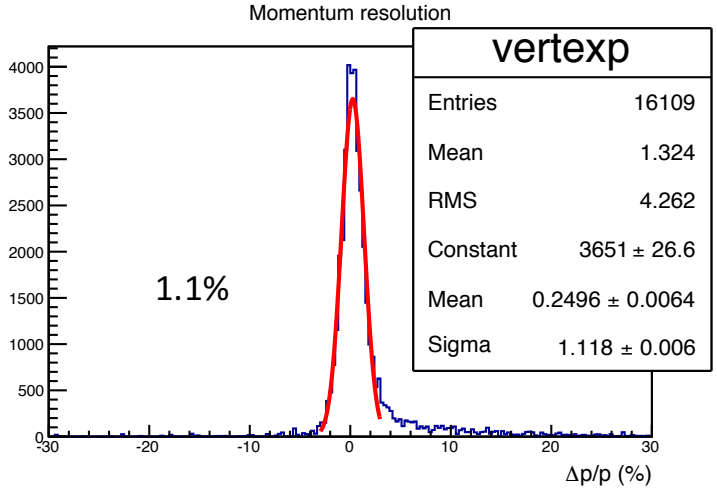
SIDIS efficiency and accuracy (FA)

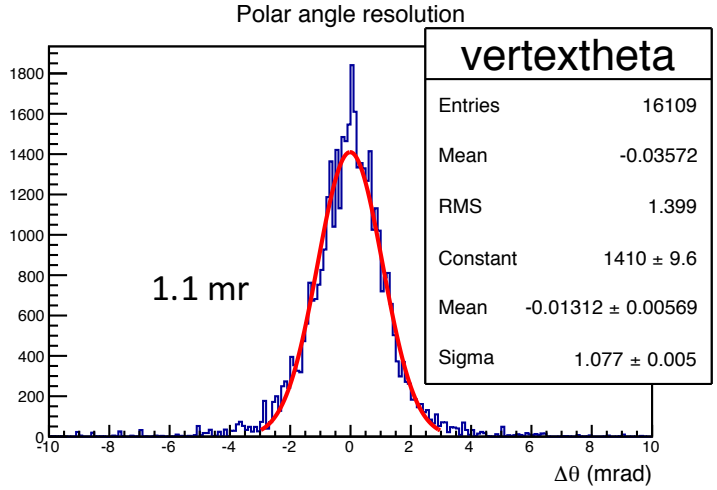
Black number for efficiency

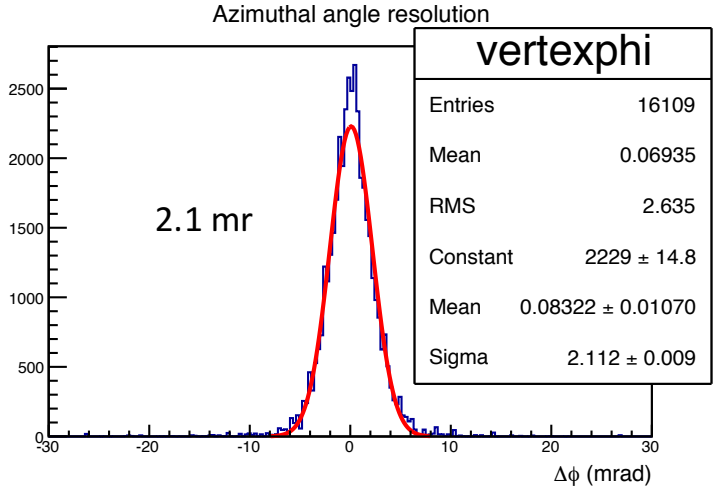
Rad number for accuracy

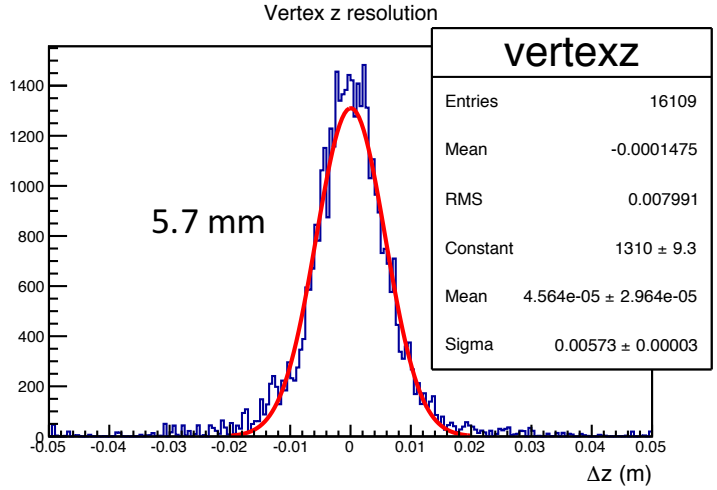


SIDIS Resolution (LA)



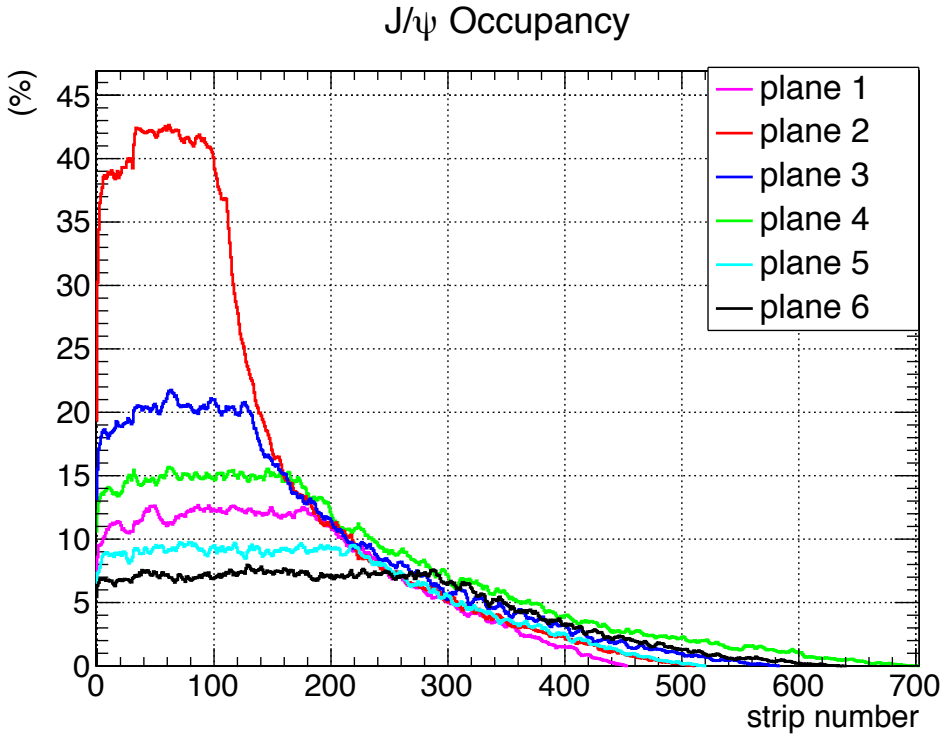


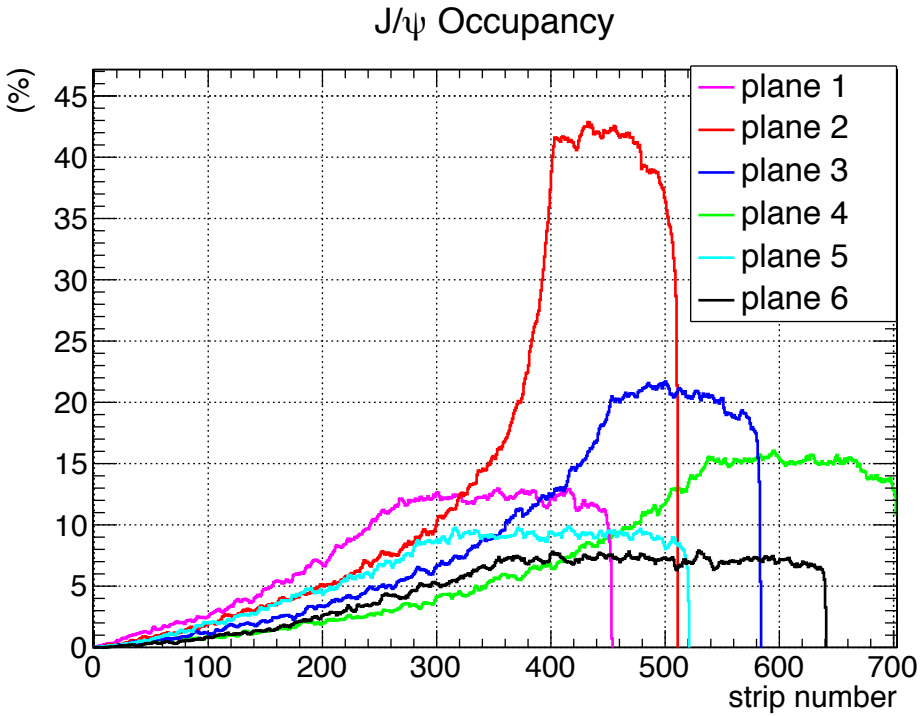




JPsi occupancy update

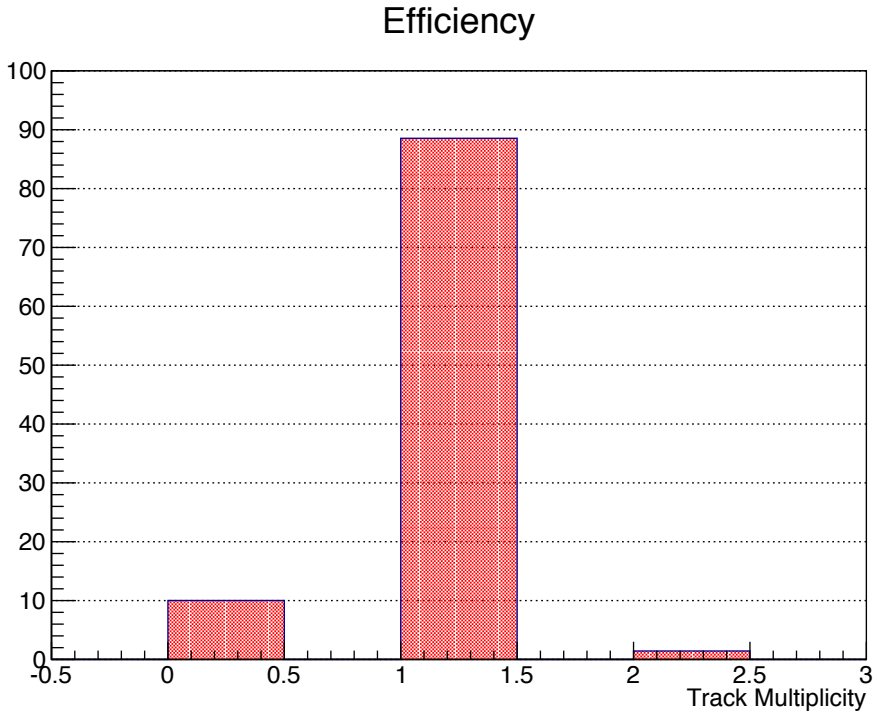
- Main difference compare to previous result is the use of the standard form for the GEM signal
- 4 sigma pedestal cut (pedestal sigma = 20.7)
- 7.68 (4.65)| 14.4 (9.28) | 8.82 (5.49) | 7.00 (4.30) | 5.92 (3.78) | 4.58 (2.95) (in %), number in parenthesis after noise cut using 3 samples

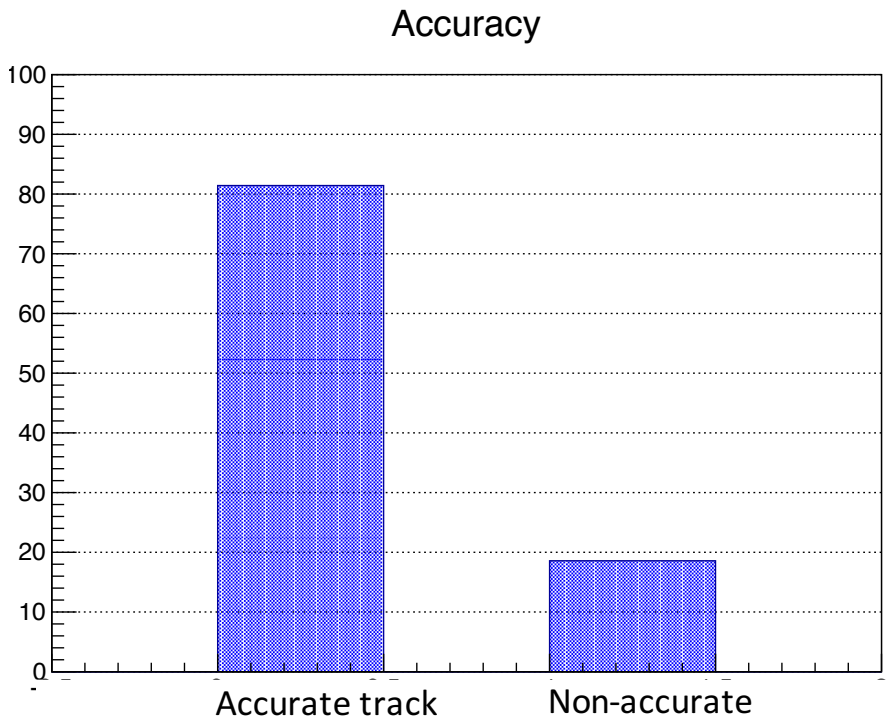




JPsi efficiency and accuracy (FA)

- Single electron track (generated by eDIS generator) with energy deposition > 0.6 GeV on EC
- Weighted by cross section

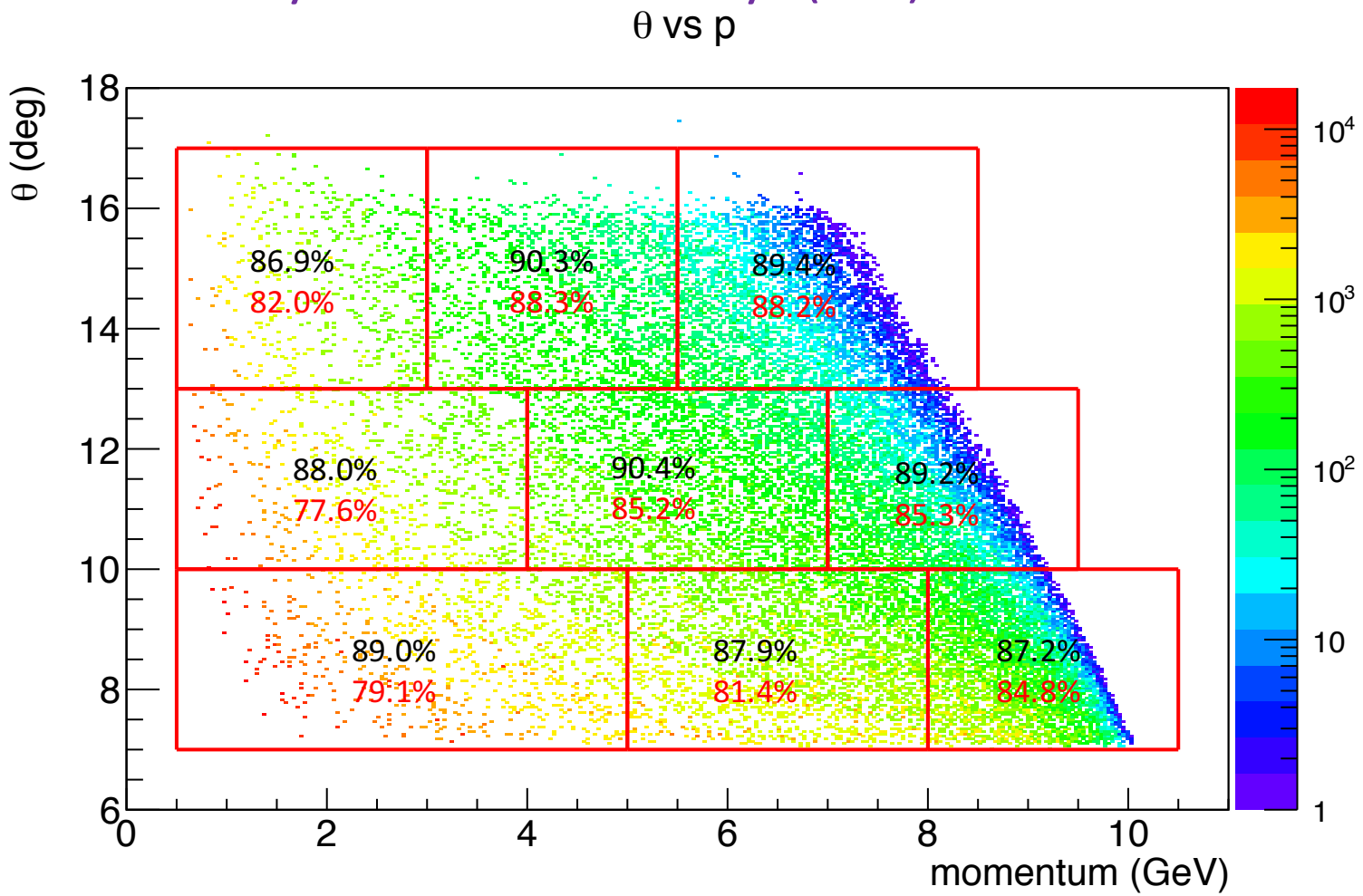




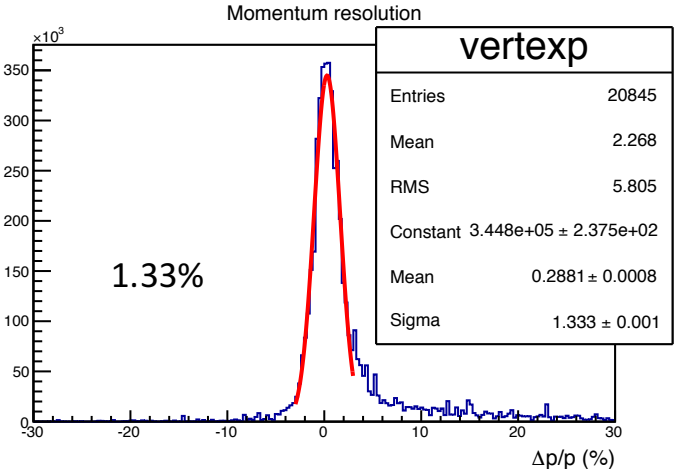
JPsi efficiency and accuracy (FA)

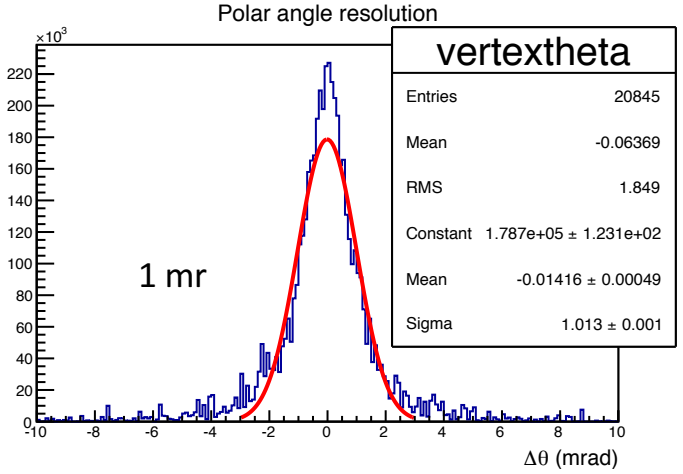
Black number for efficiency

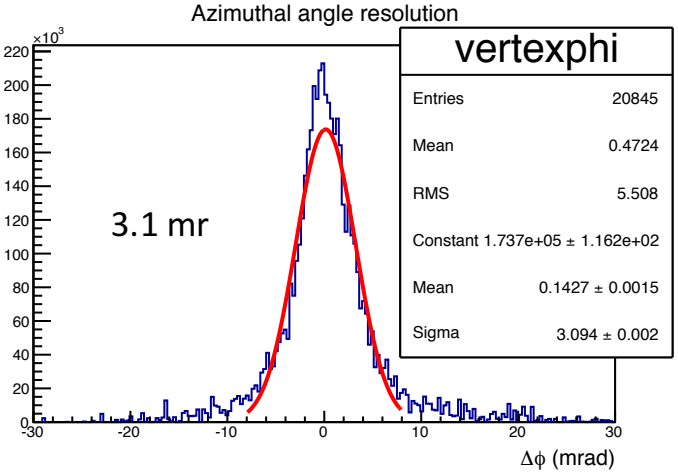
Rad number for accuracy

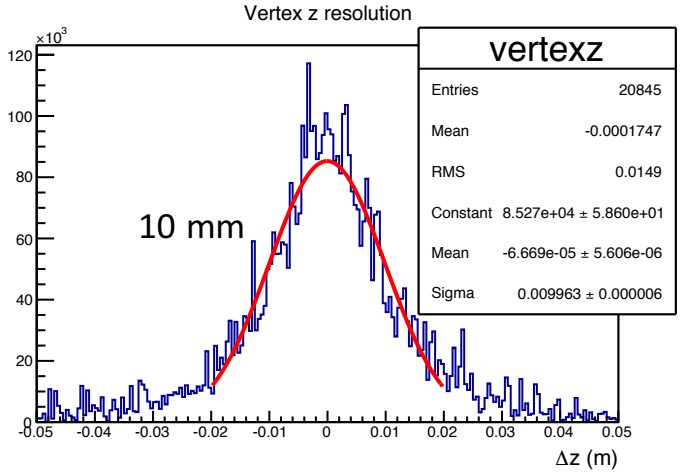


JPsi Resolution (FA)



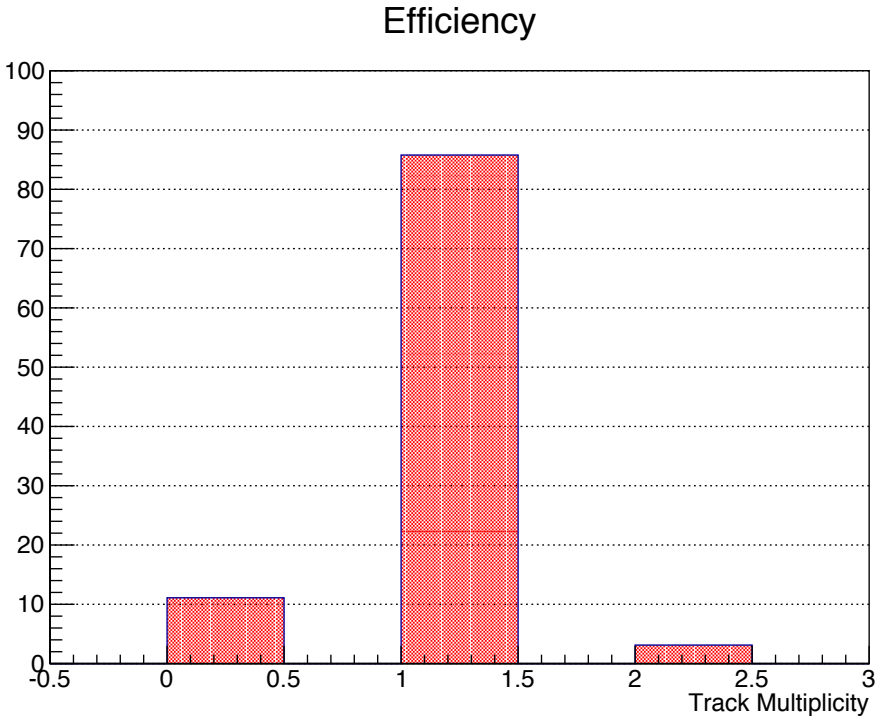


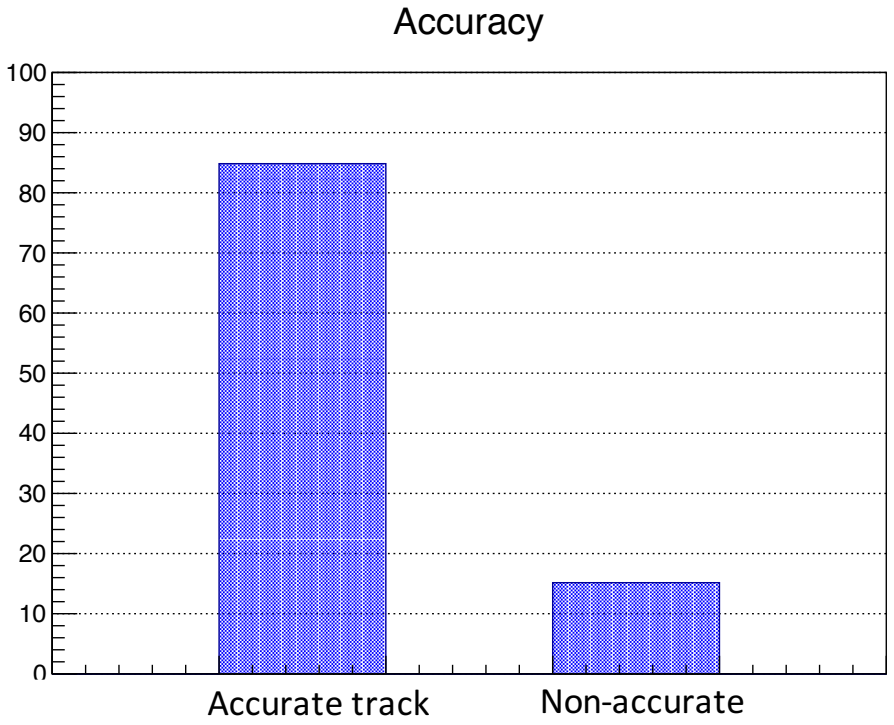




JPsi efficiency and accuracy (LA)

- Single electron track (generated by eDIS generator) satisfy energy deposition > 0.6 GeV on EC
- Weighted by cross section

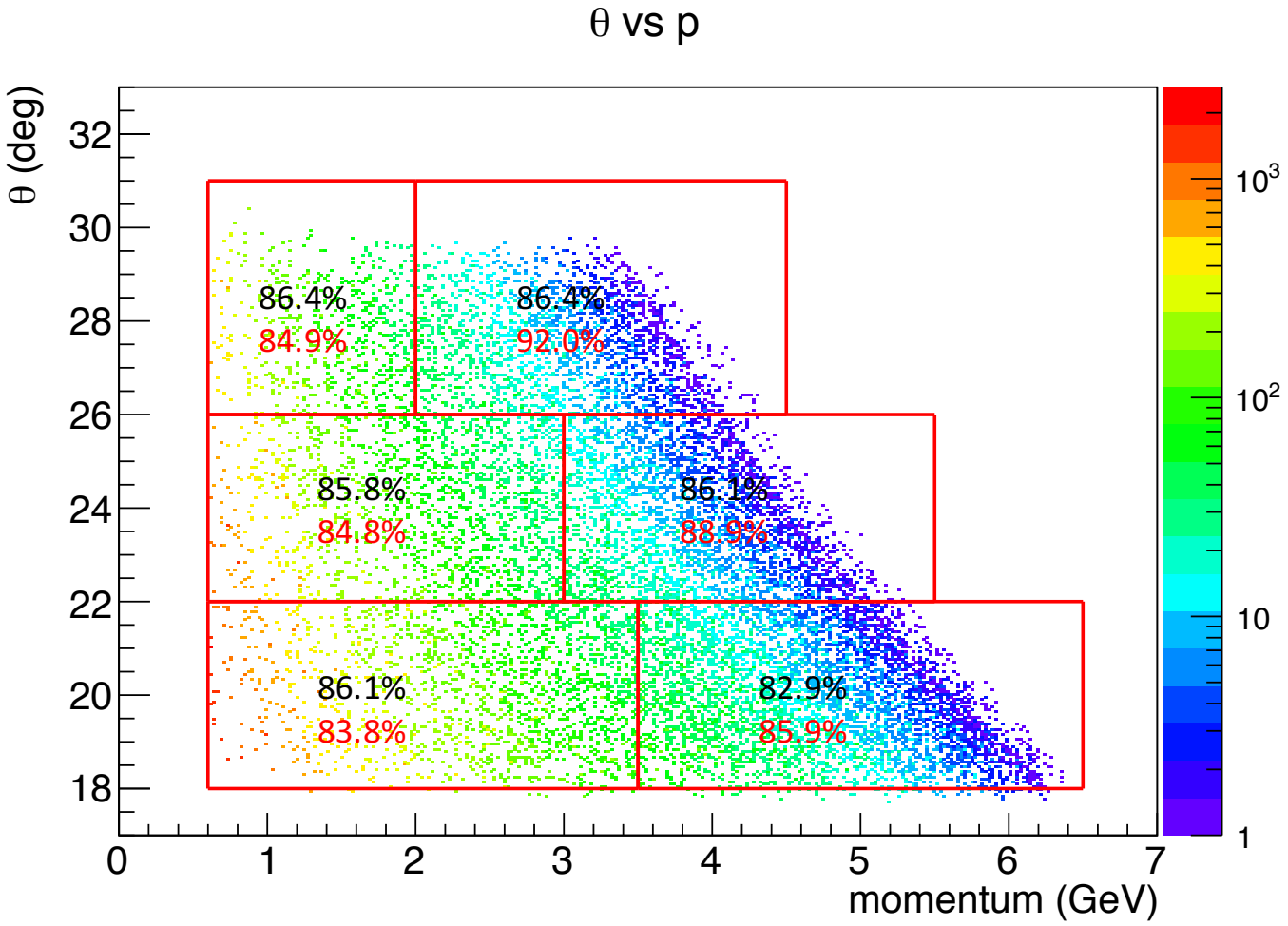




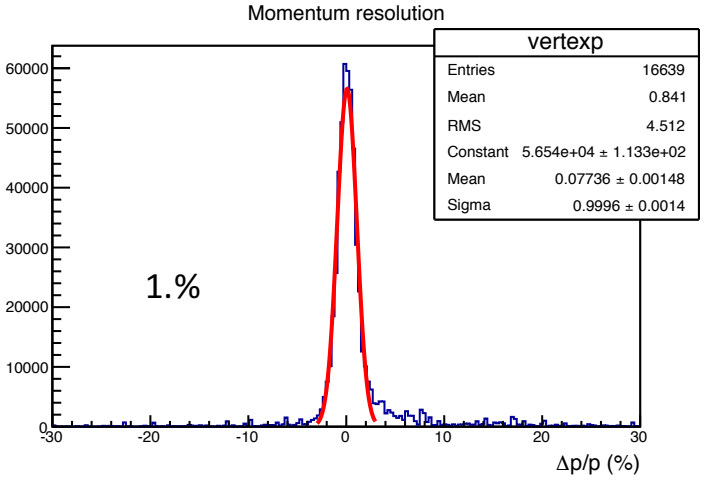
JPsi efficiency and accuracy (FA)

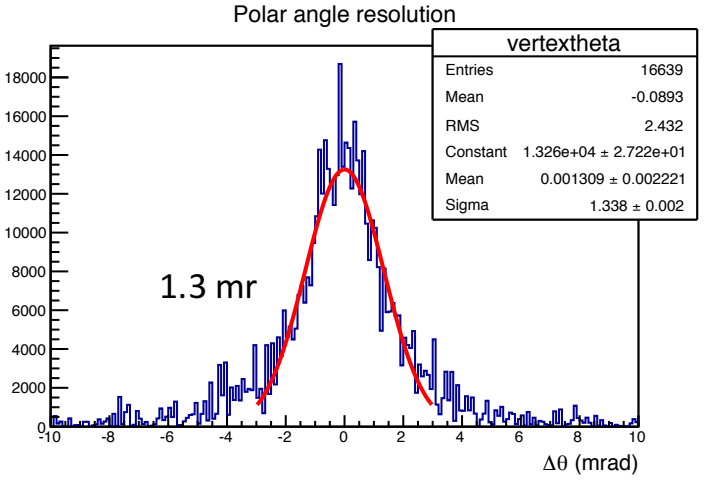
Black number for efficiency

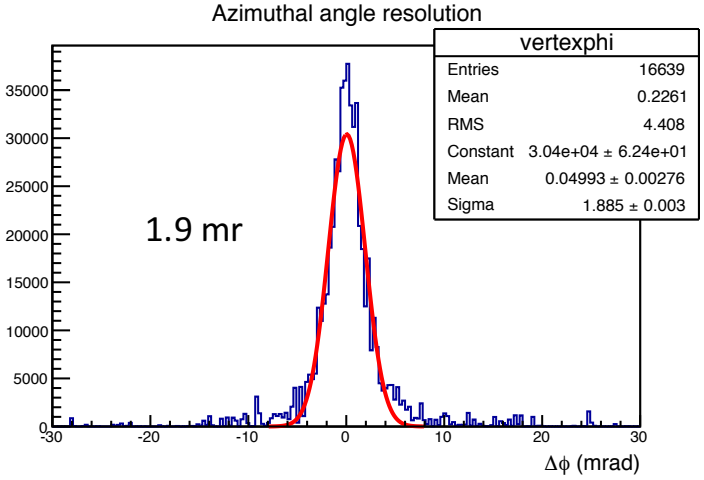
Rad number for accuracy

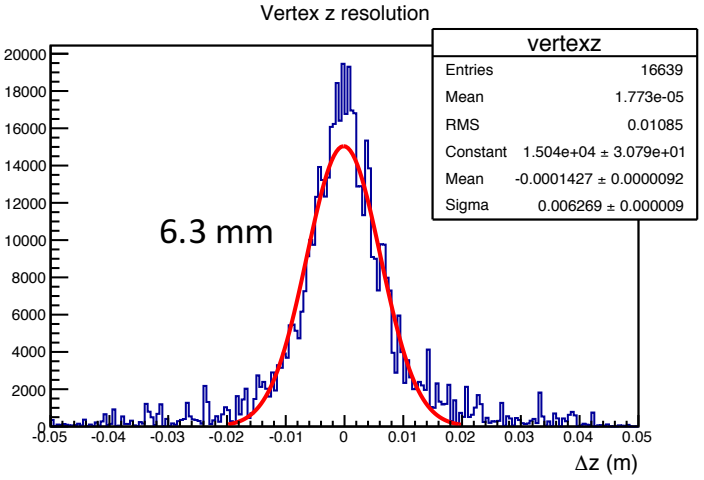


JPsi Resolution (LA)

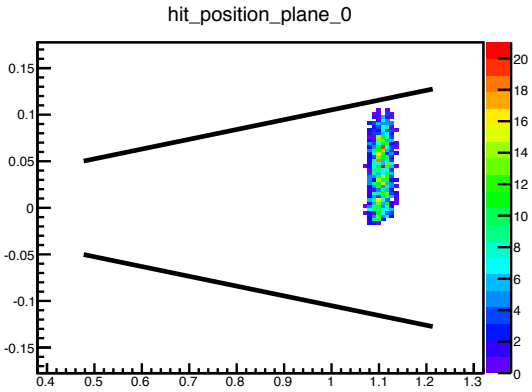


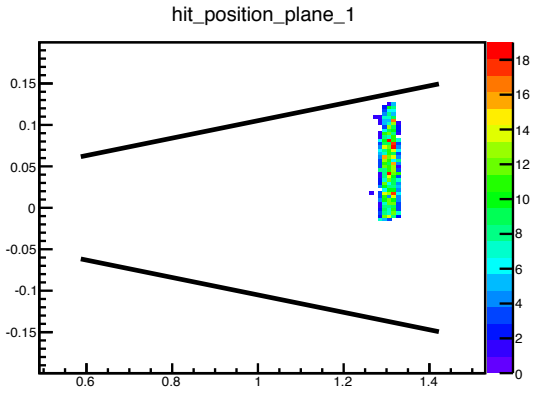


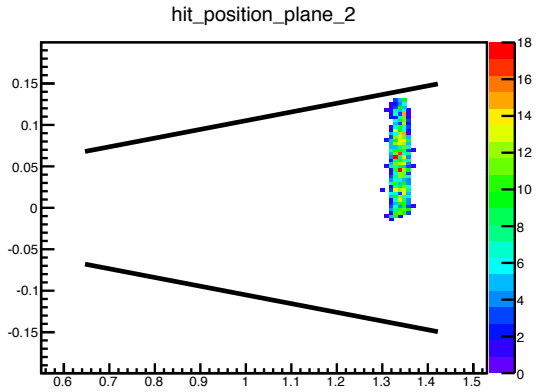


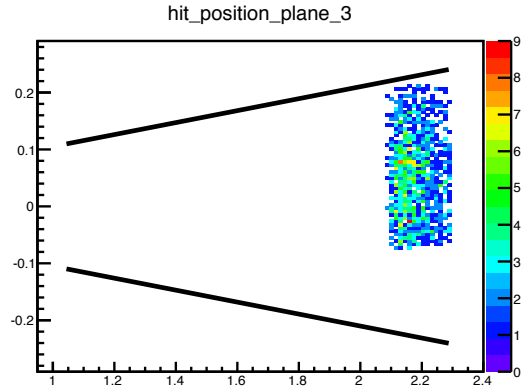


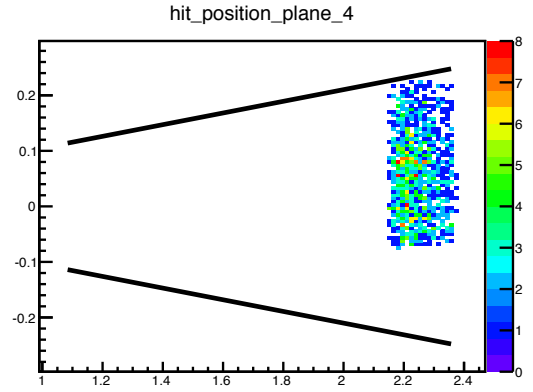
PVDIS tracking in high radial field









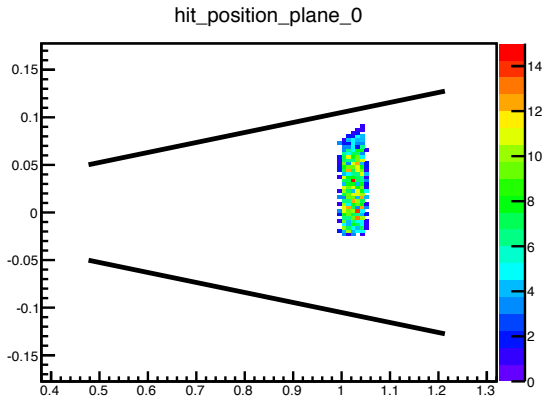


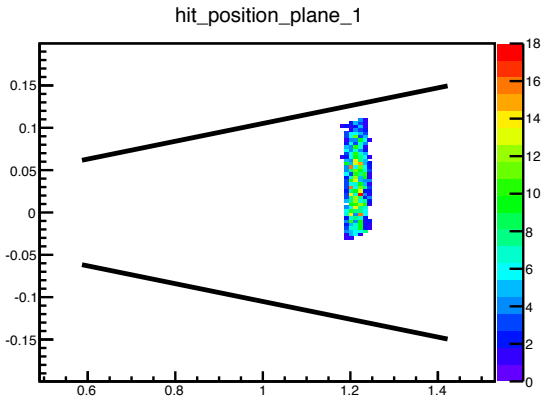
Apply the cut:
drdz > 0.69 + 0.00035*vz + 5e-7*vz^2

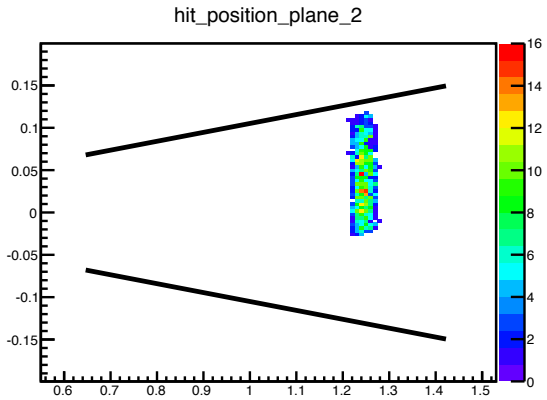
vz is the vertex z in mm
drdz is the delta r / delta z for two hits on GEM (picking one on the first and one on the last in this case)

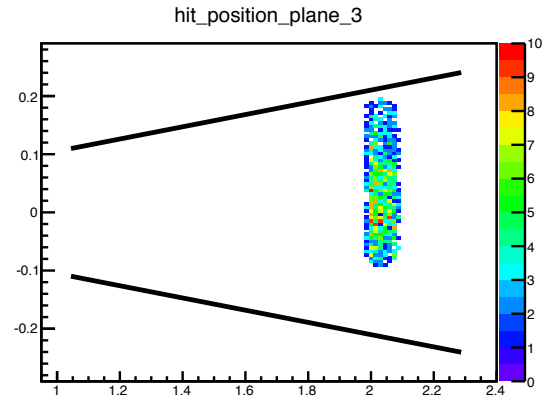
Need more statistics

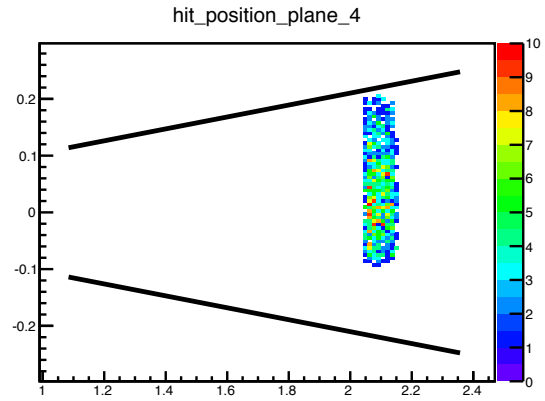
PVDIS tracking in high radial field







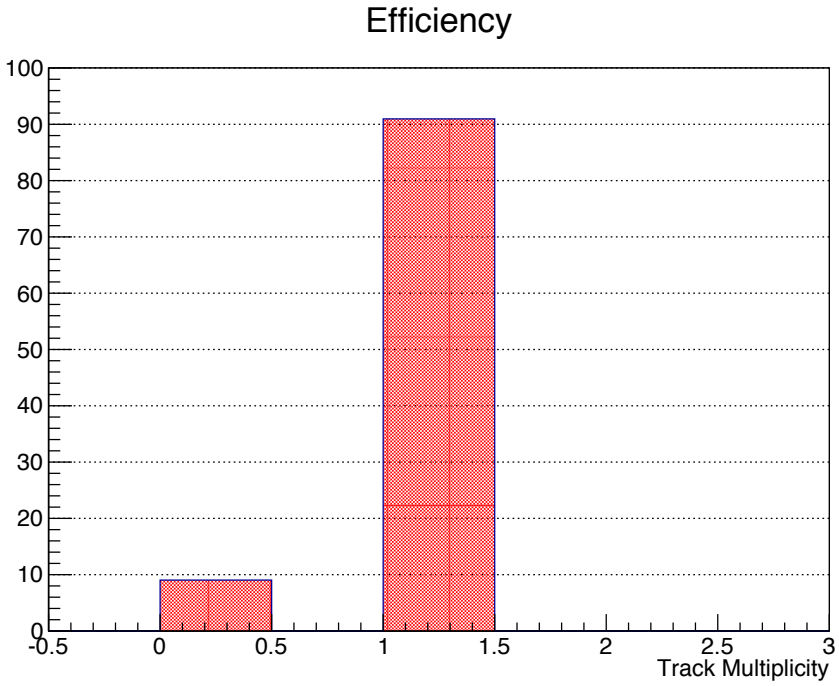




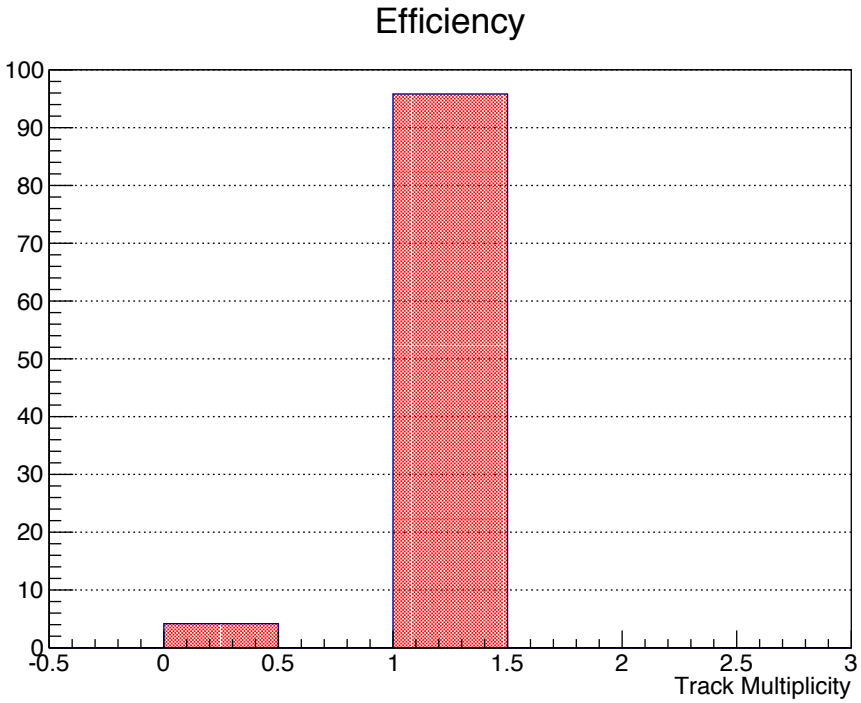
As comparison, select a region that is close enough to the region in the previous page, and look at how that tracking efficiency, accuracy, resolution differ

To select neighboring region
1.05 m <R < 1m on first GEM, and
2.05m < R < 2.15m on last GEM

High radial field region 0% background

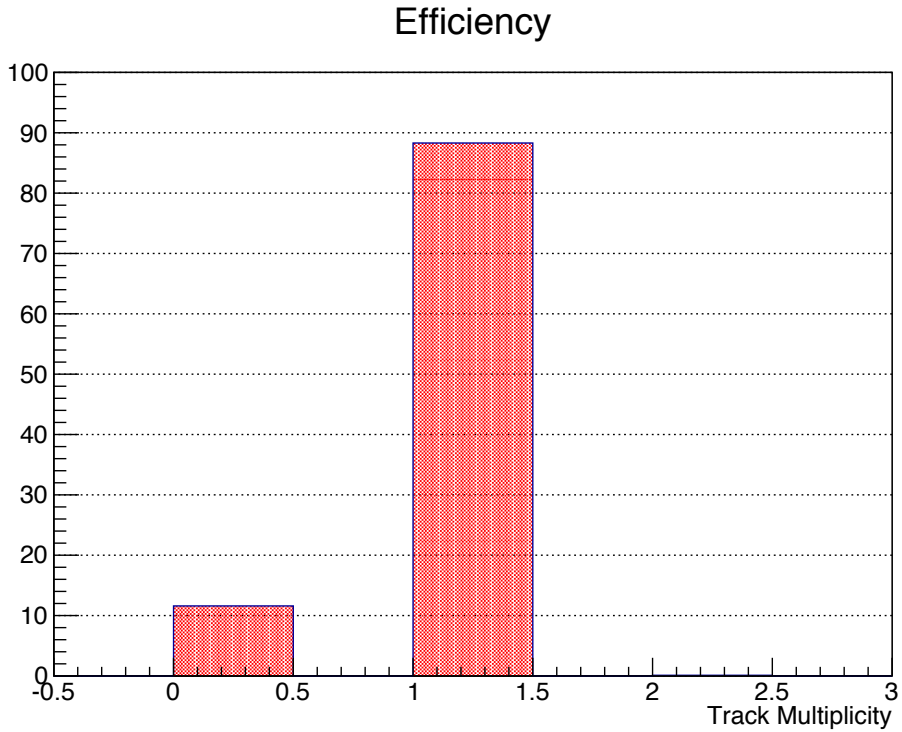


Neighboring region 0% background

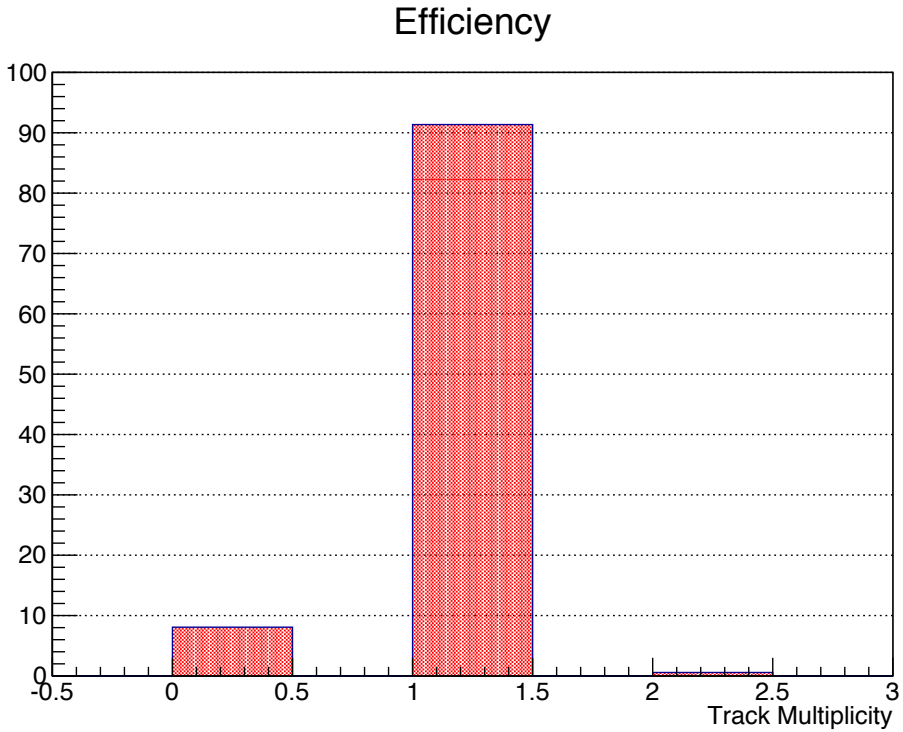


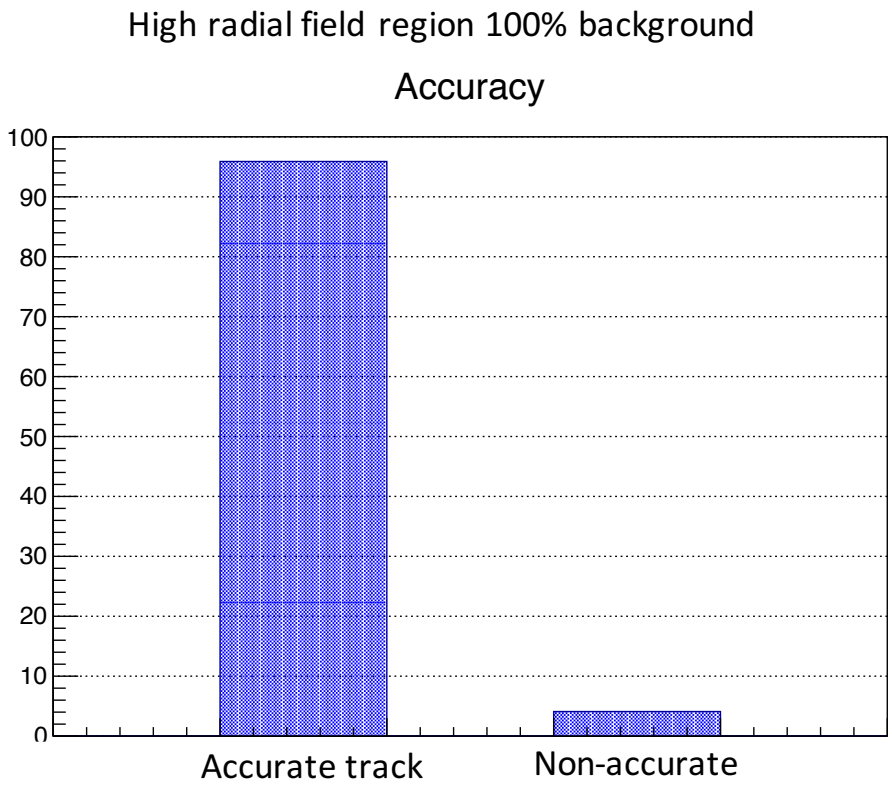
Might be able to deal with this if the step size in the propagation is smaller, currently using 20 cm as initial step to ensure a better speed.

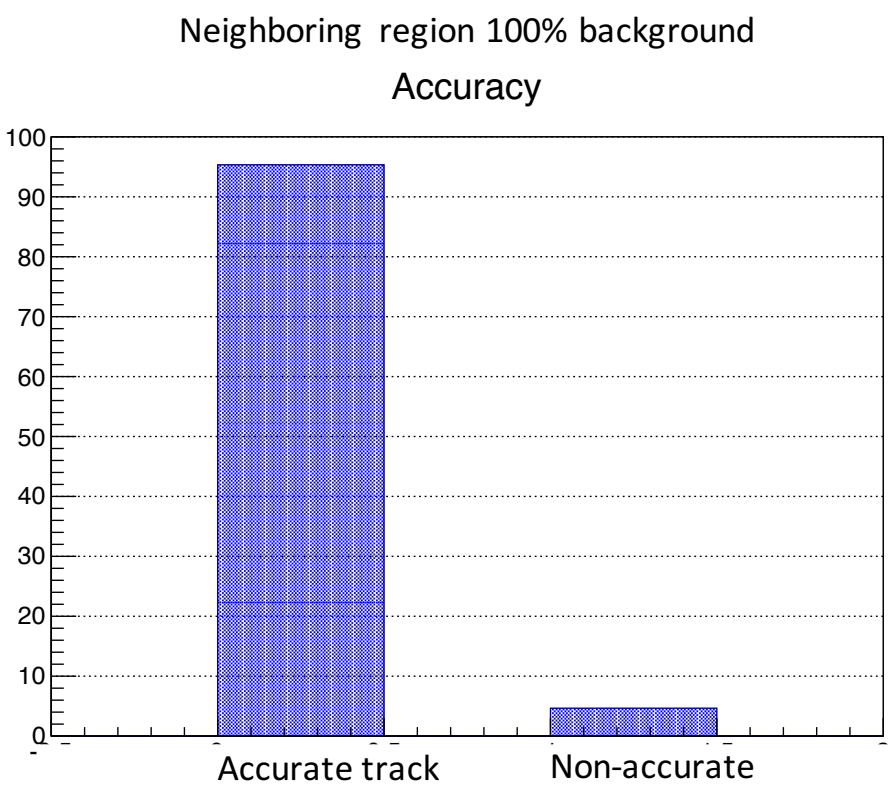
High radial field region 100% background



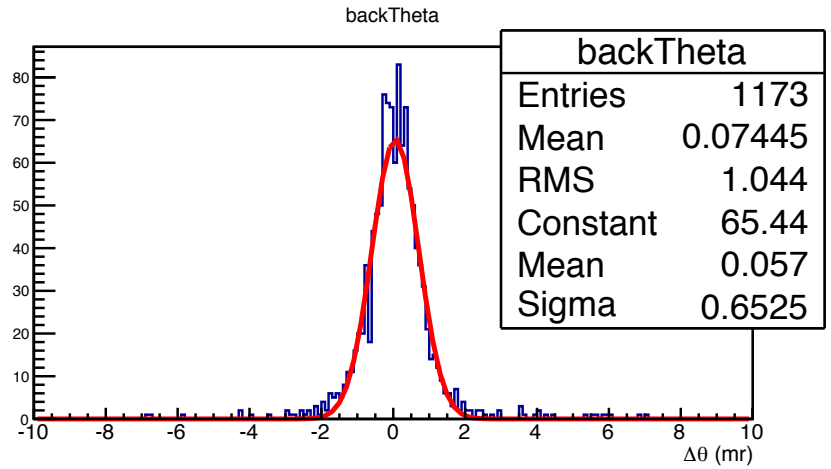
Neighboring region 100% background

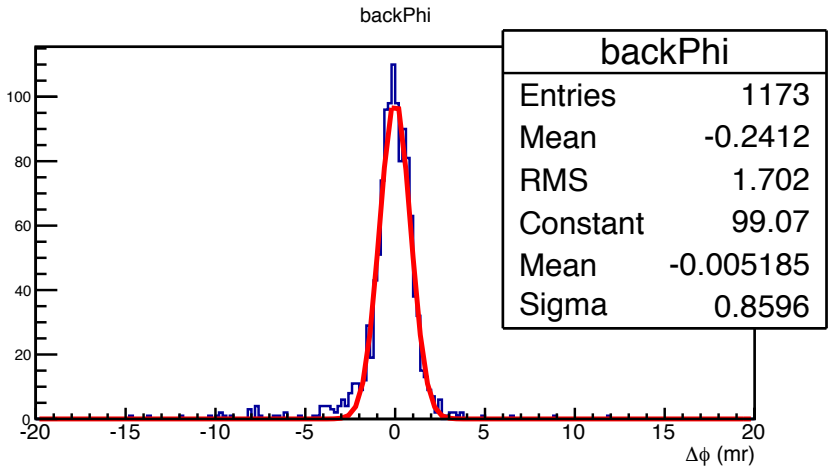


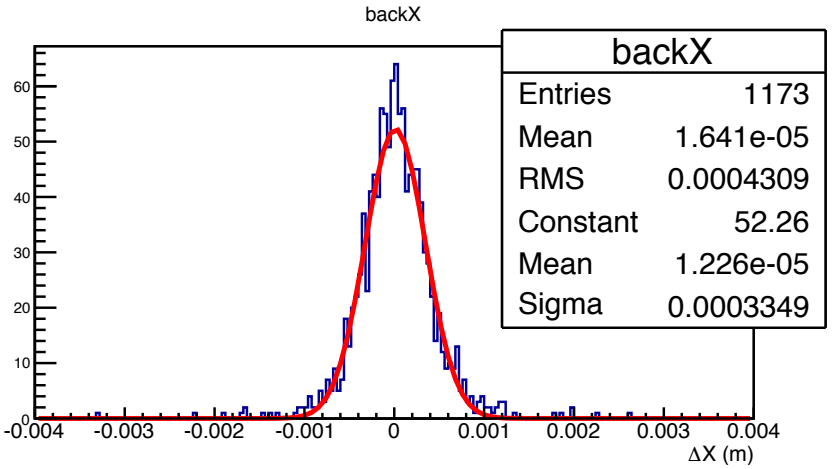

High radial field region 100% background
Accuracy
100
90
80
70
60
50
40
30
20
10
0
Accurate track
Non-accurate

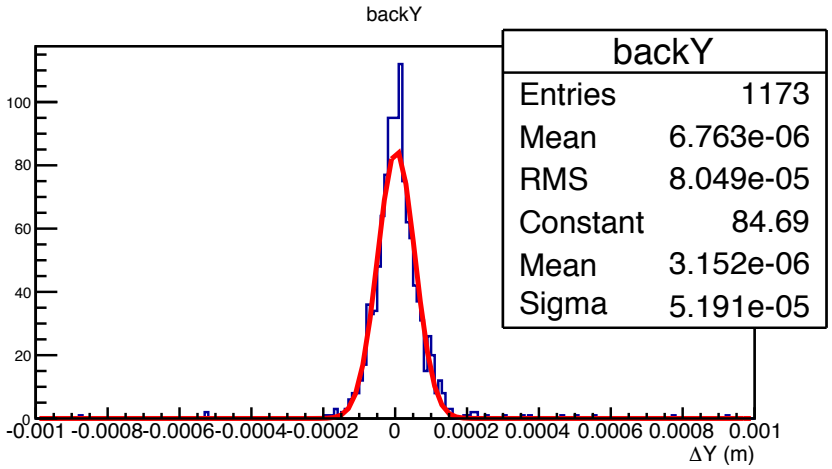

Neighboring region 100% background
Accuracy
100
90
80
70
60
50
40
30
20
10
0
Accurate track
Non-accurate

High radial field region 0% background









Neighboring region 0% background