Ideal Track Finder

T. Randriamalala, U-Mainz. 11.05.09

Introduction and Motivation

- Goal: Handle multiple tracks per events.

- After reconstruction task, match hits at each plane to reconstruct tracks

Track finder need to be developed

Simulation

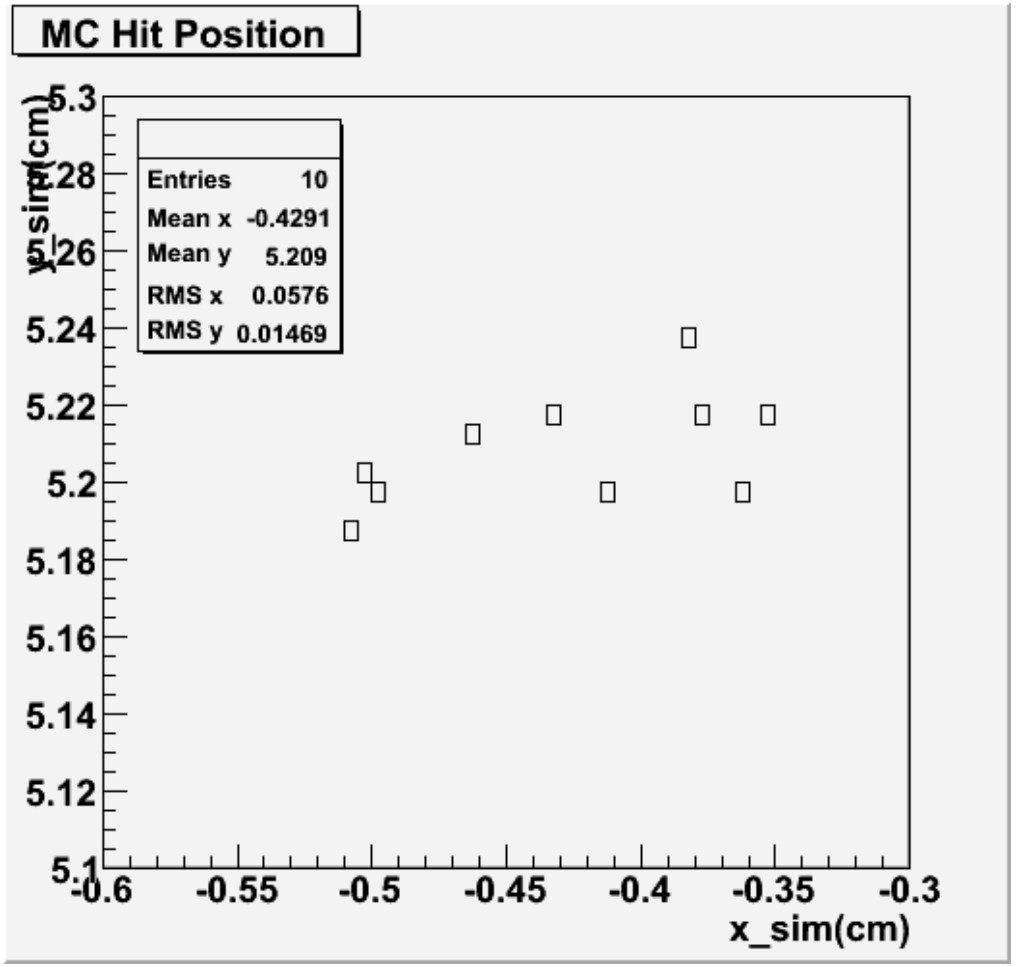
- Run 1 event with 10 tracks by using the FairBoxGenerator from the point (0,0,0)
- Azimuth angle : 1.55 to 1.60 (rad).
- Polar angle : 5 to 5.05 (mrad).

(Hit only on sensor at each plane)

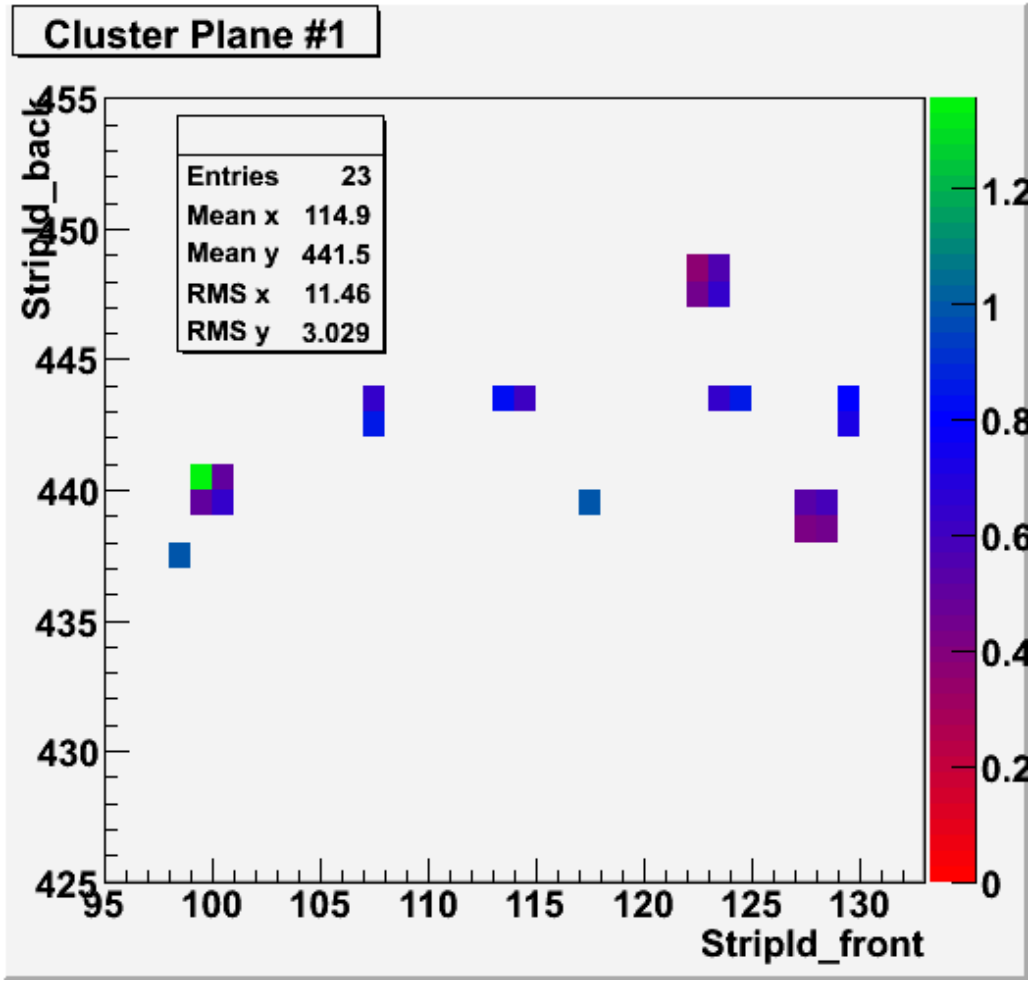
- Without magnetic field

Output Simulation

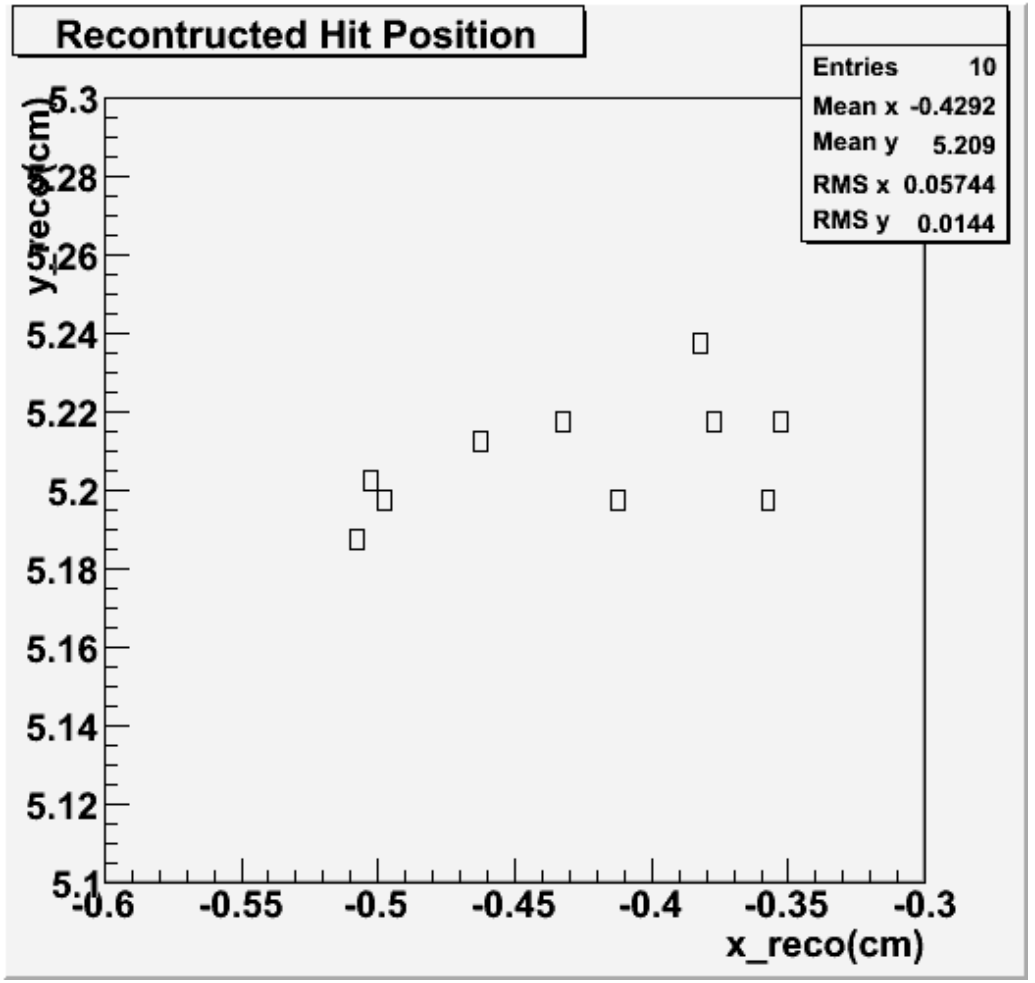
- MC hit position at the first plane



Digitization and Clusterization

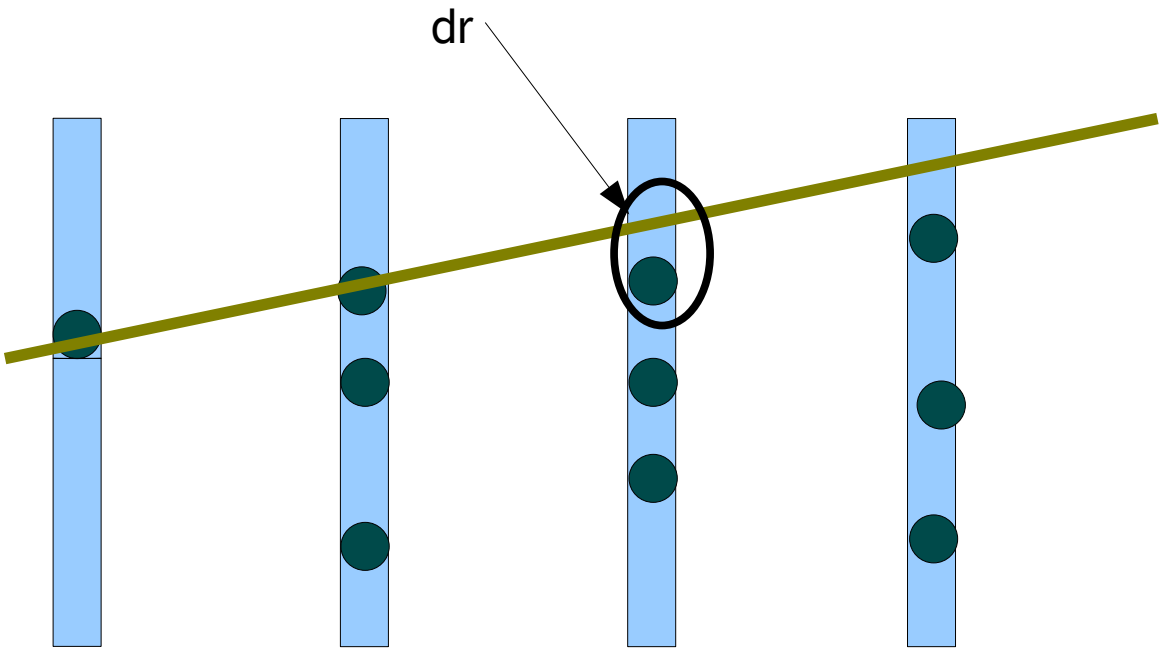


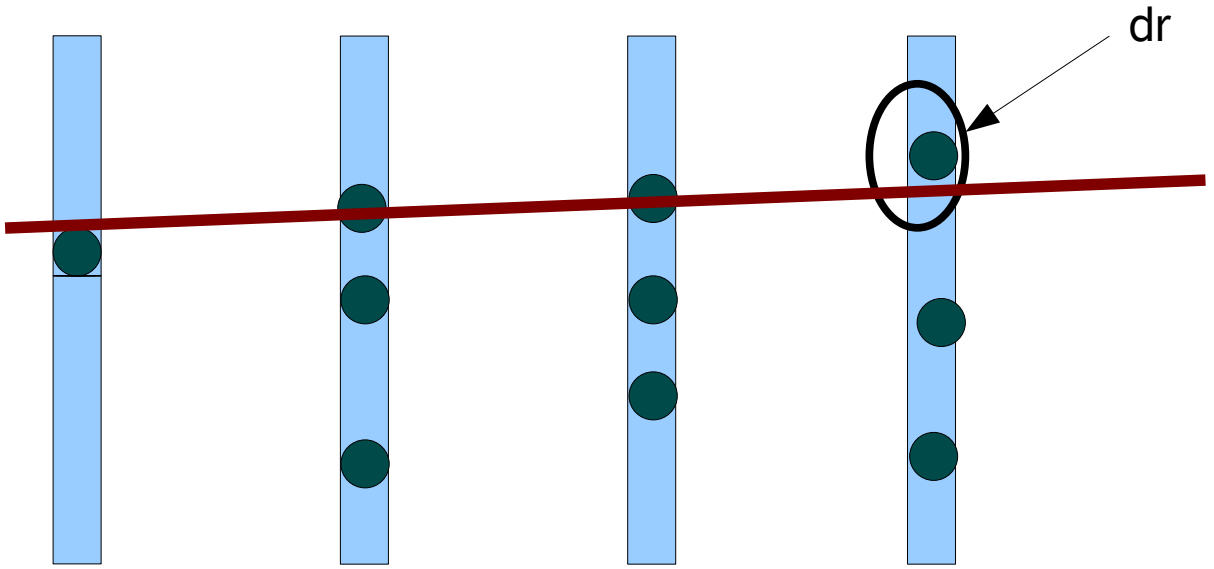
Reconstruction



“Ideal” Track Finder

- Ideal := number of the MC hits is equal to number of Reco hits.
- Match each reconstructed hit at each plane.

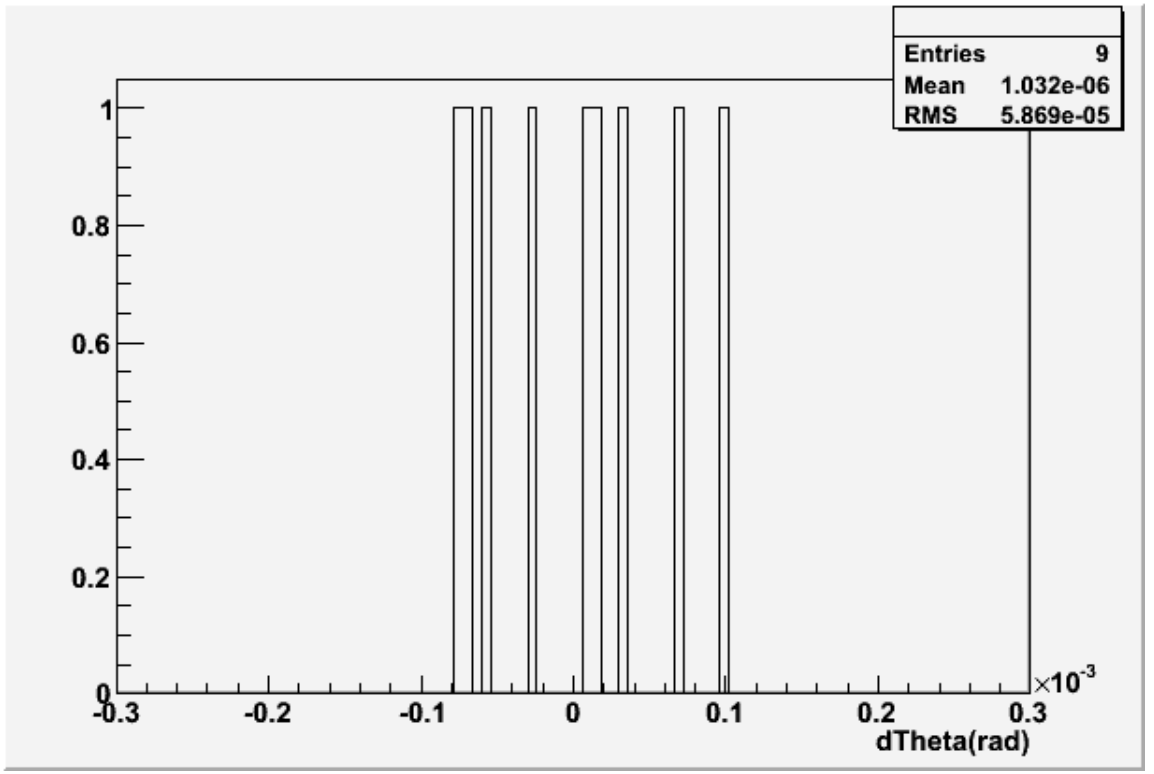




- The value of dr is the one corresponding to θ(rms) ~0.01mrad

- After macthing 4 hits, do linear fit on r vs z with the errors on r at each plane are the distance between the reconstructed hit and the line fit of 2 points in at the neighboring planes, respectively.

Results

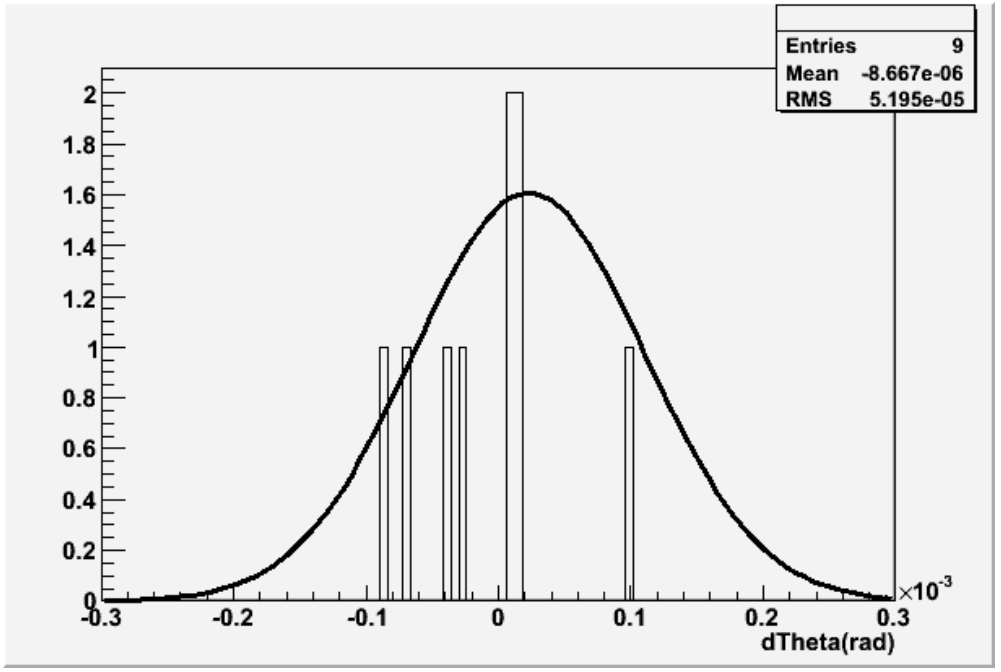


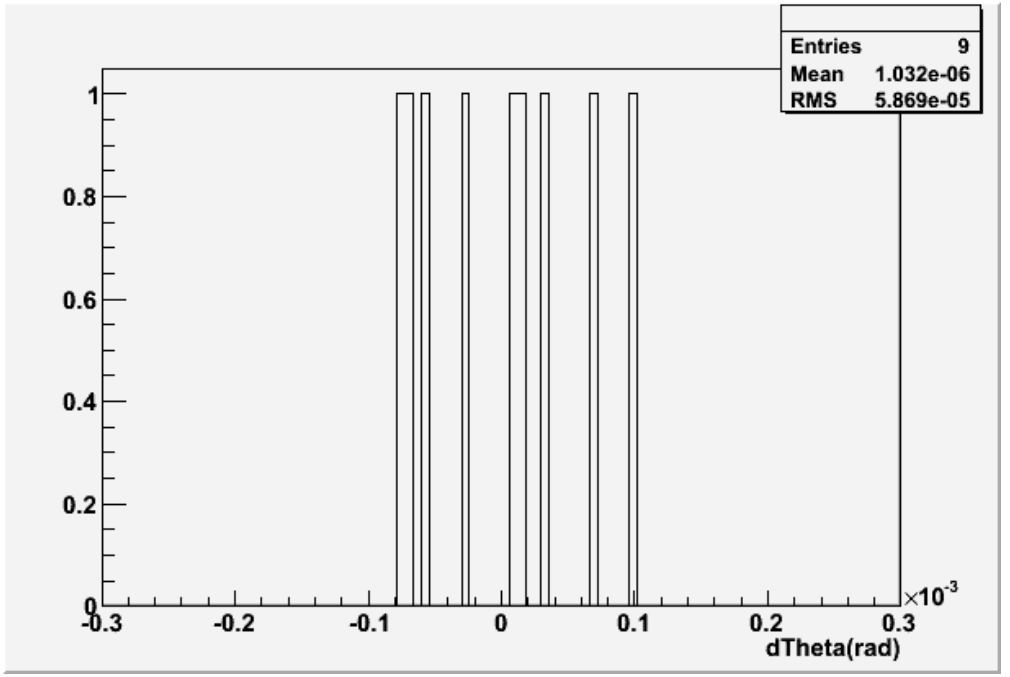
rms ~ 0.06 mrad

! one track does not reconstructed

Comparison

Errors on r equal to 0

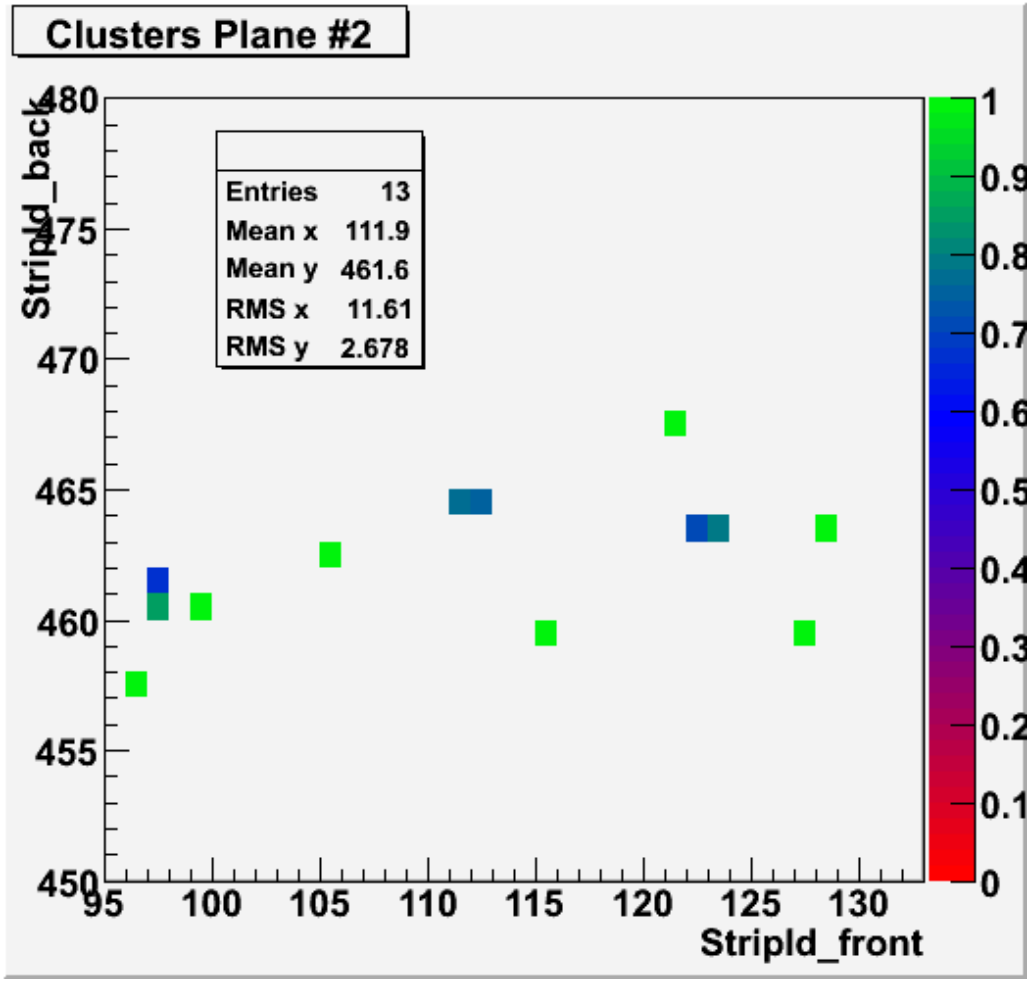


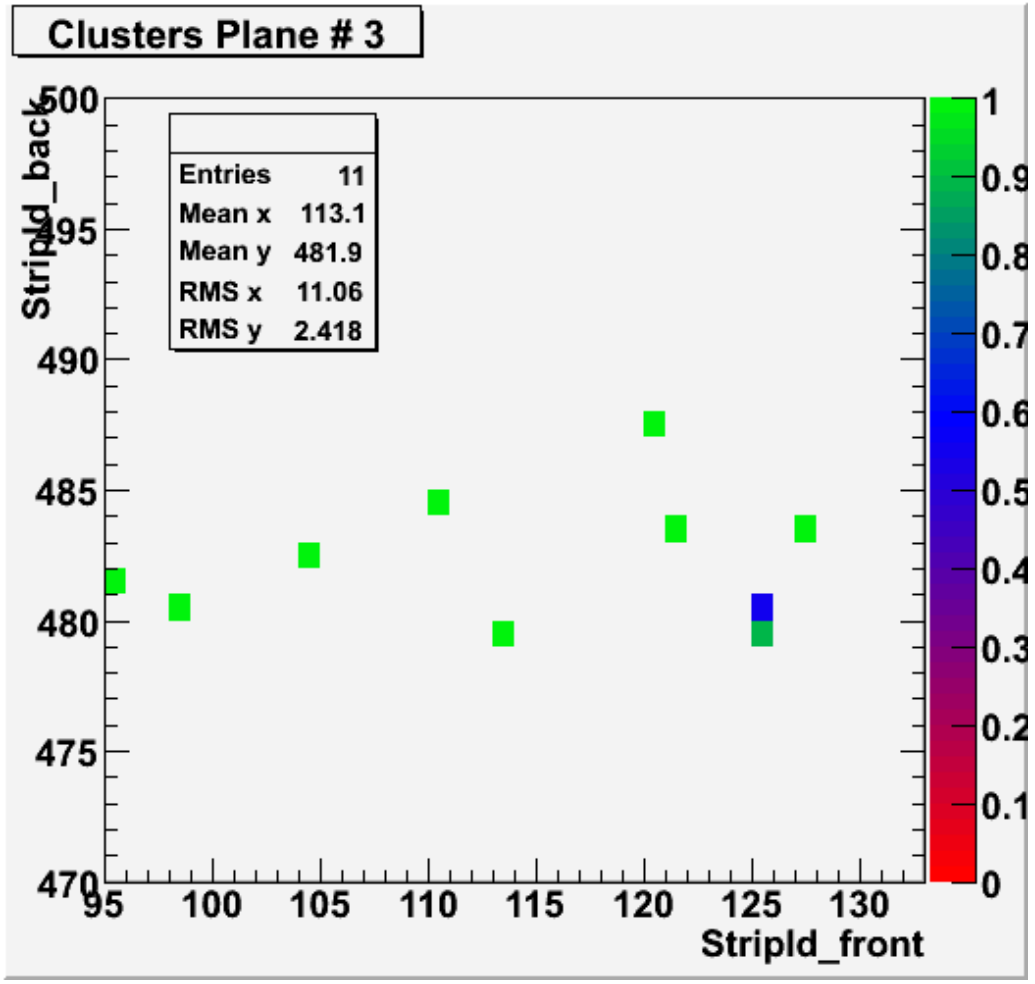


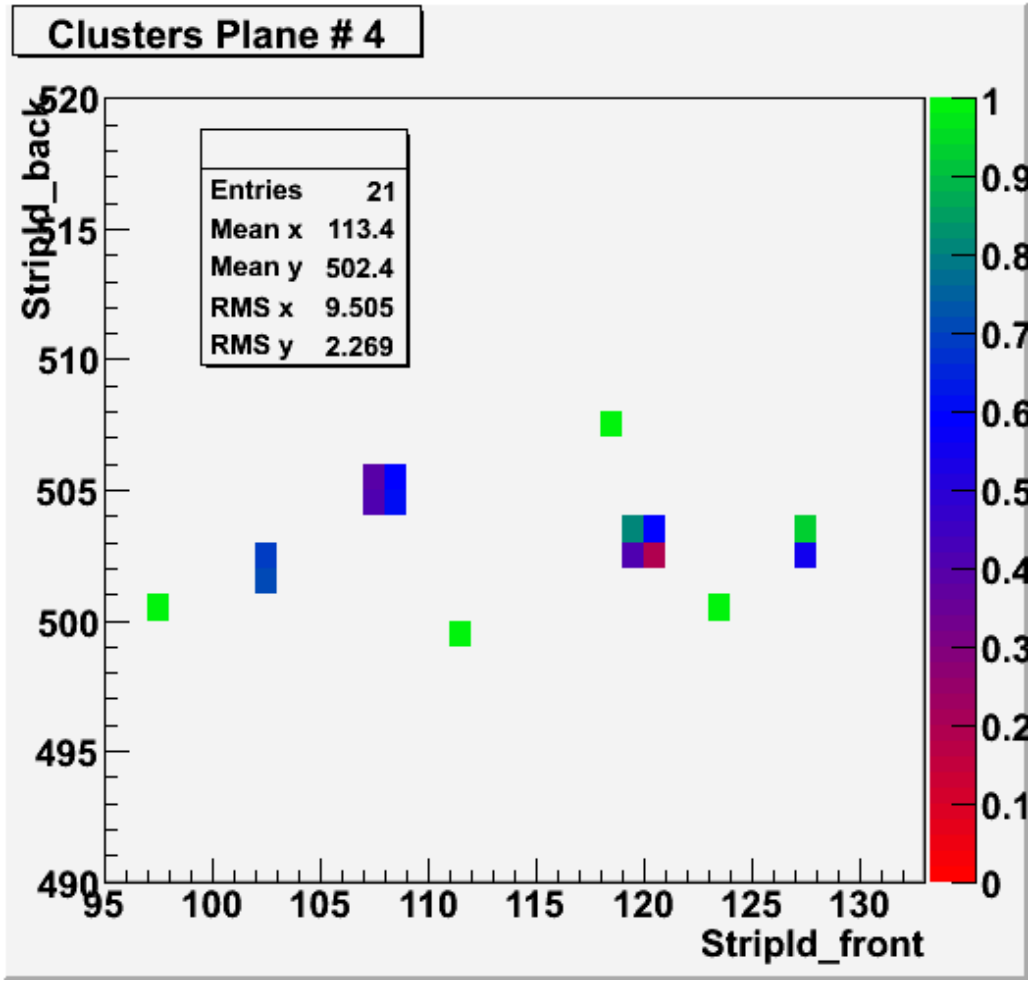
Conclusion

- An ideal track finder for multiple tracks per event is (under)development.
- Track resolution is about 0.06mrad in term of polar angle.

- Find a correct way to define the hit searcher radius.
- A real track finder !!


Clusters Plane #2
Entries 13
Mean x 111.9
Mean y 461.6
RMS x 11.61
RMS y 2.678
StripId_back
StripId_front
480
475
470
465
460
455
450
95
100
105
110
115
120
125
130
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0


Clusters Plane # 3
Entries 11
Mean x 113.1
Mean y 481.9
RMS x 11.06
RMS y 2.418
StripId_back
StripId_front
500
495
490
485
480
475
470
95
100
105
110
115
120
125
130
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0


Clusters Plane # 4
StripId_back
StripId_front
Entries 21
Mean x 113.4
Mean y 502.4
RMS x 9.505
RMS y 2.269
520
515
510
505
500
495
490
95
100
105
110
115
120
125
130
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0