CGEM+ODC hough tracking

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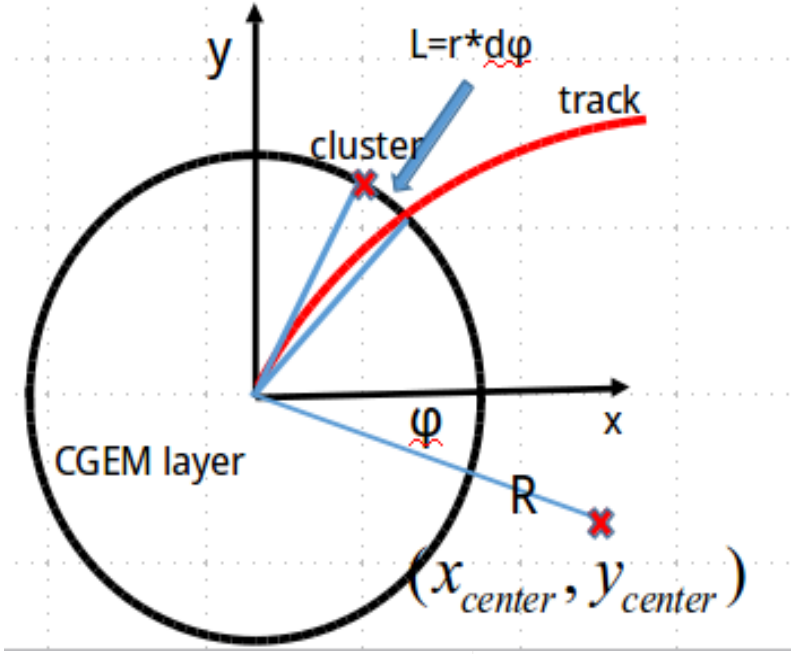
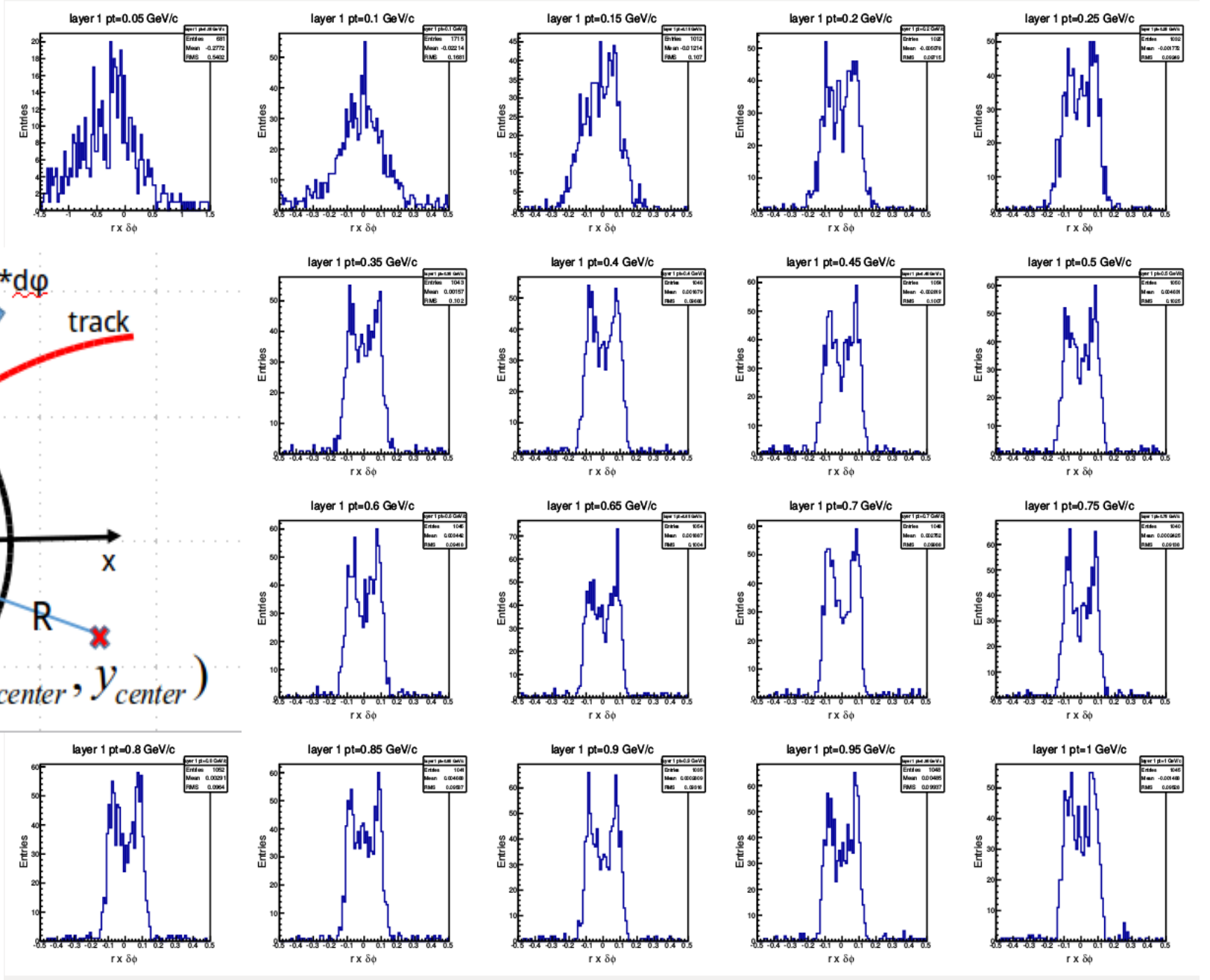
2017.07.20

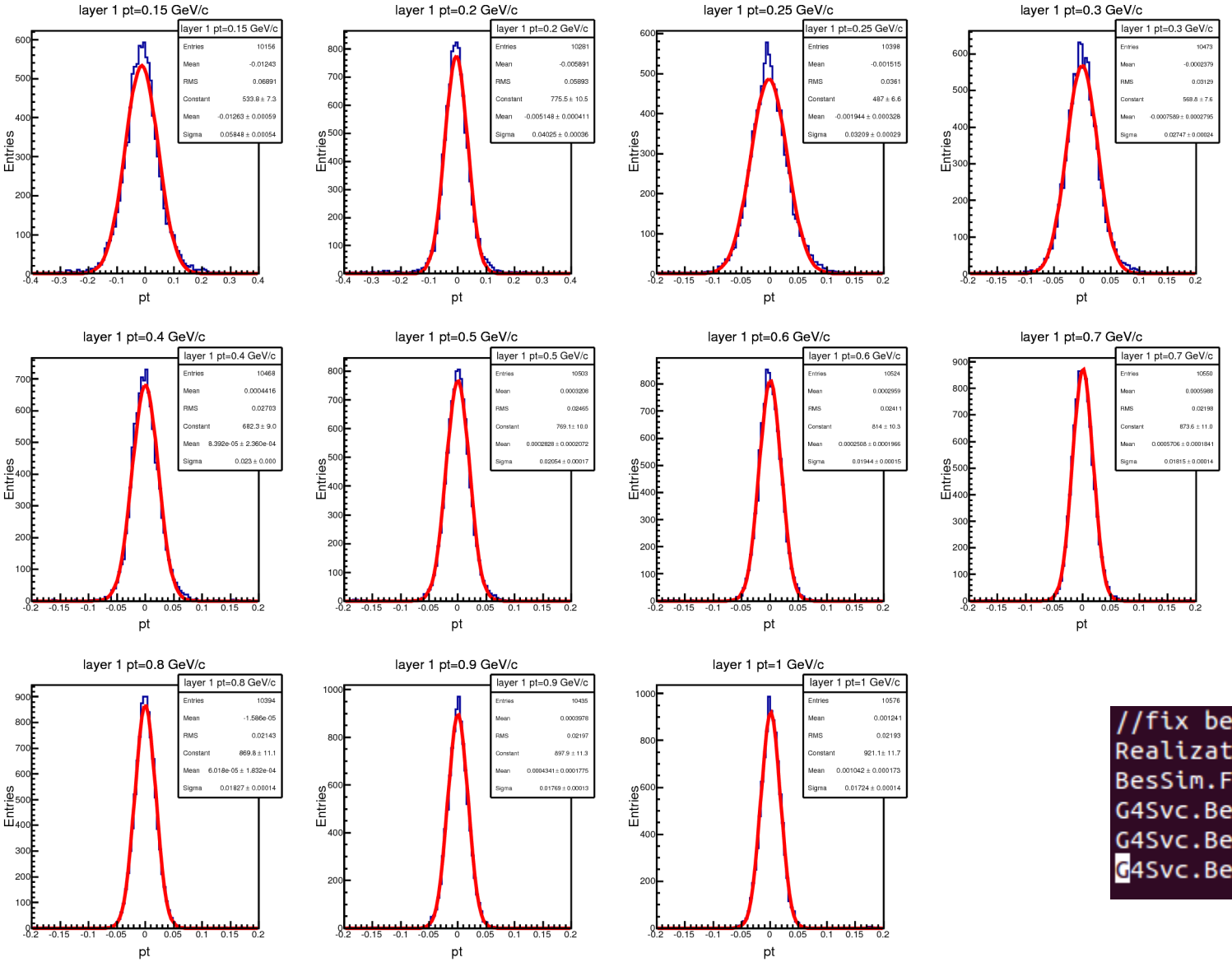
Double peak problem in 2D tracking

- 有束流弥散的 cluster 残差分布





Fixed beam （layer 1）



- 去掉束流弥散后重新模拟重建，得到的残差分布中，双峰消失了

```
//fix beam
RealizationSvc.IfReadBunch = false;
BesSim.Field = 2;
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G4Svc.BeamSizeY=0.;
G4Svc.BeamSizeZ=0.;
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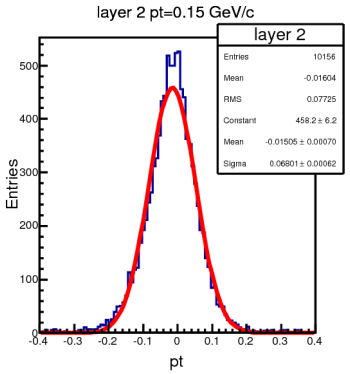
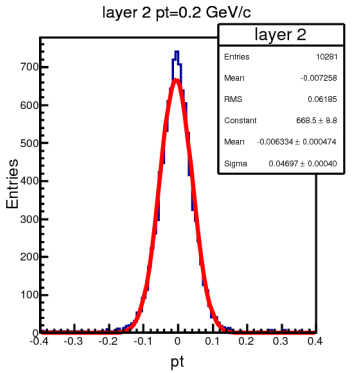
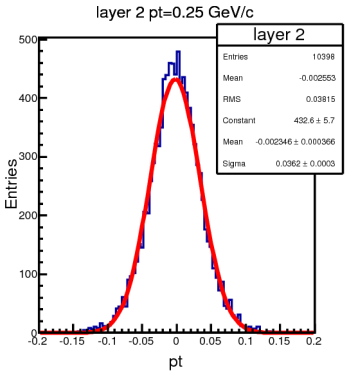
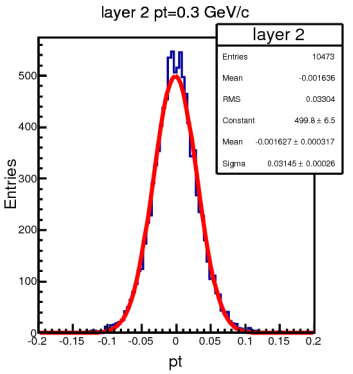
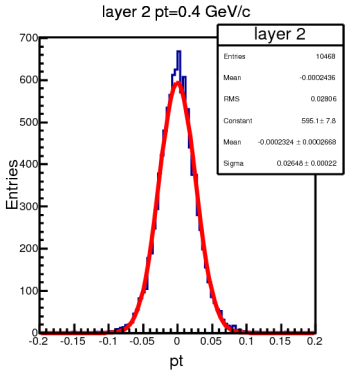
Fixed beam （layer 2）

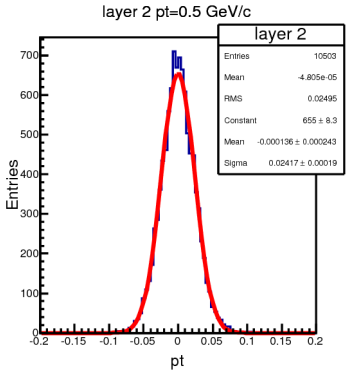


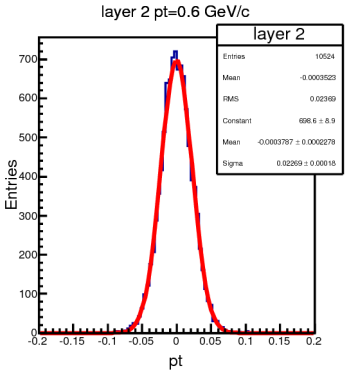


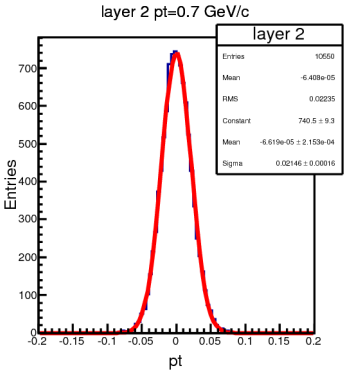


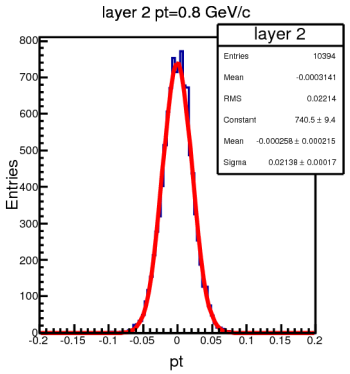


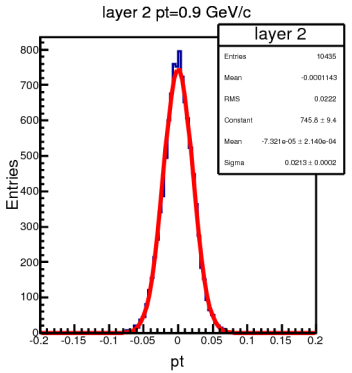


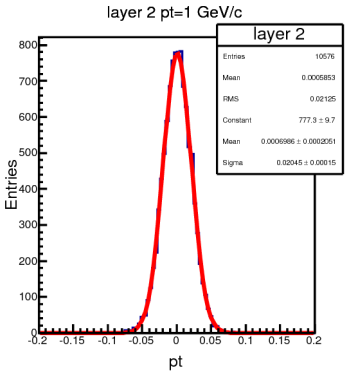




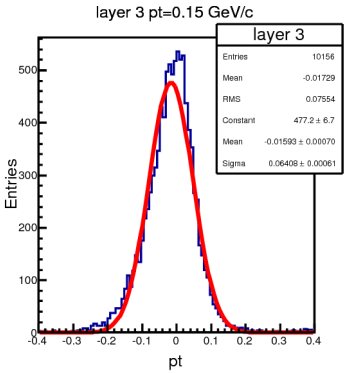


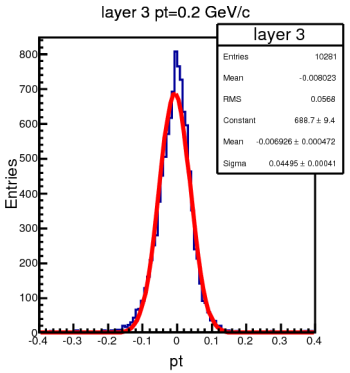


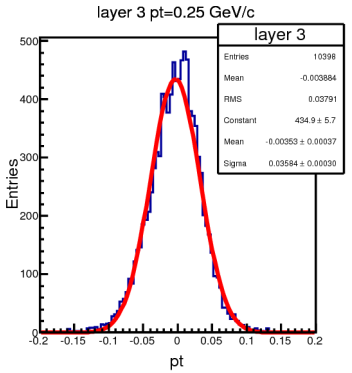


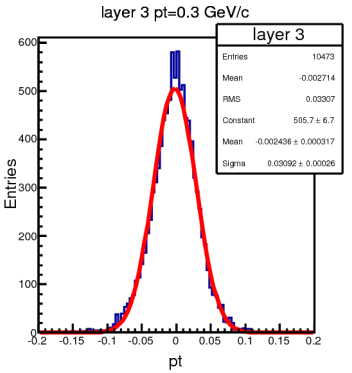


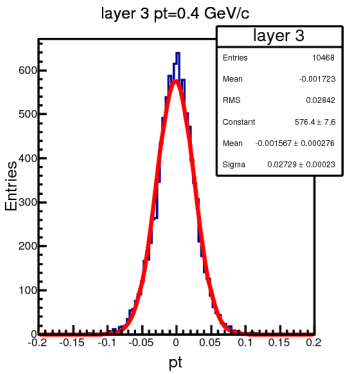
Fixed beam （layer 3）

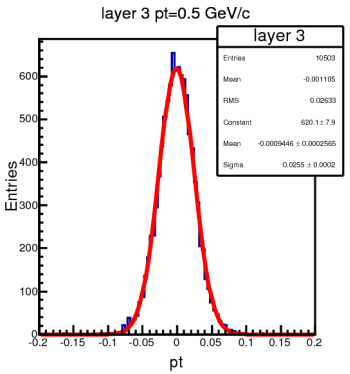


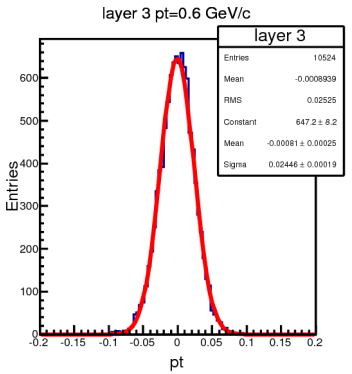


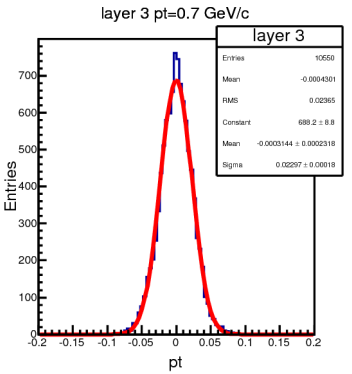


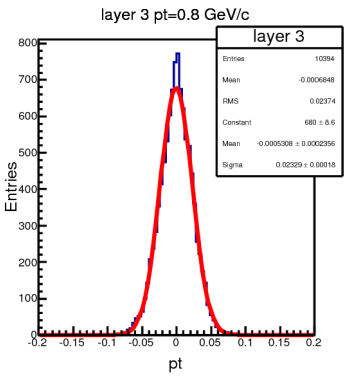


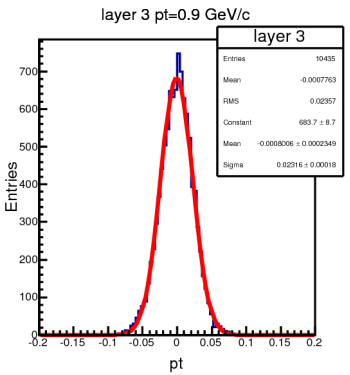


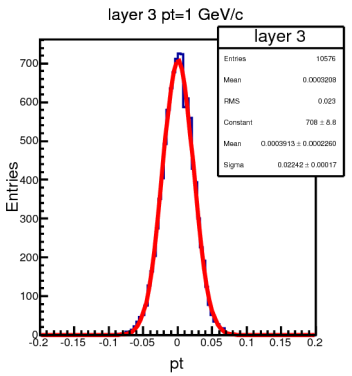






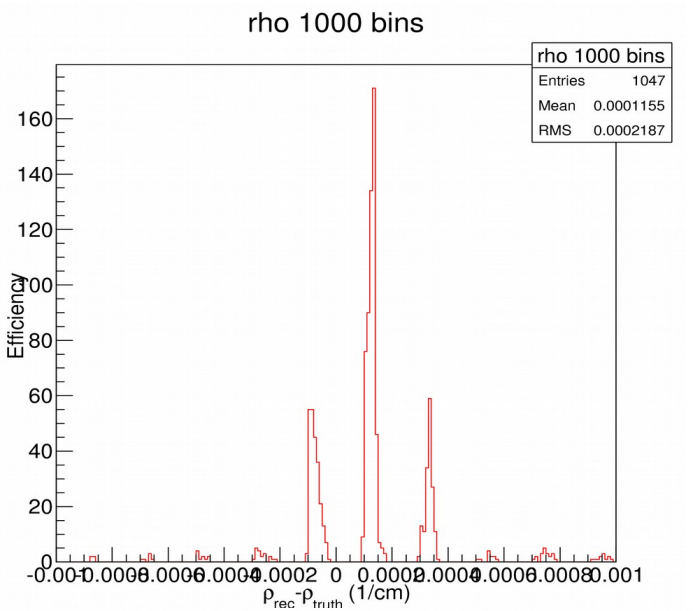


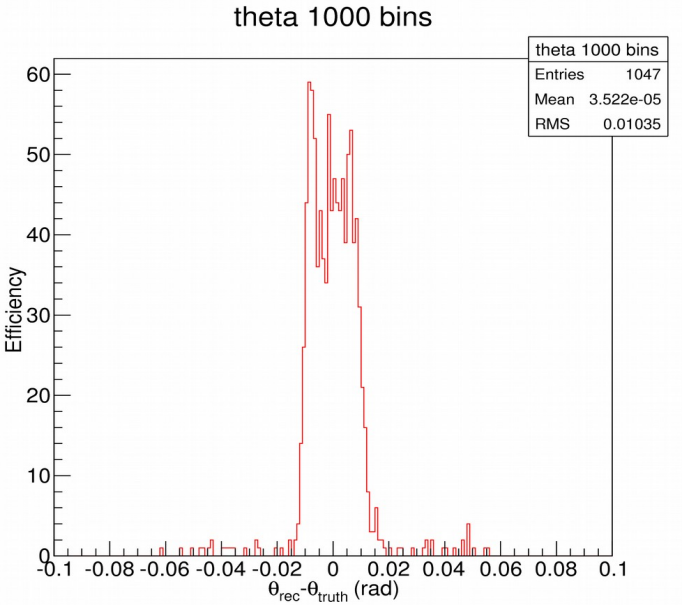


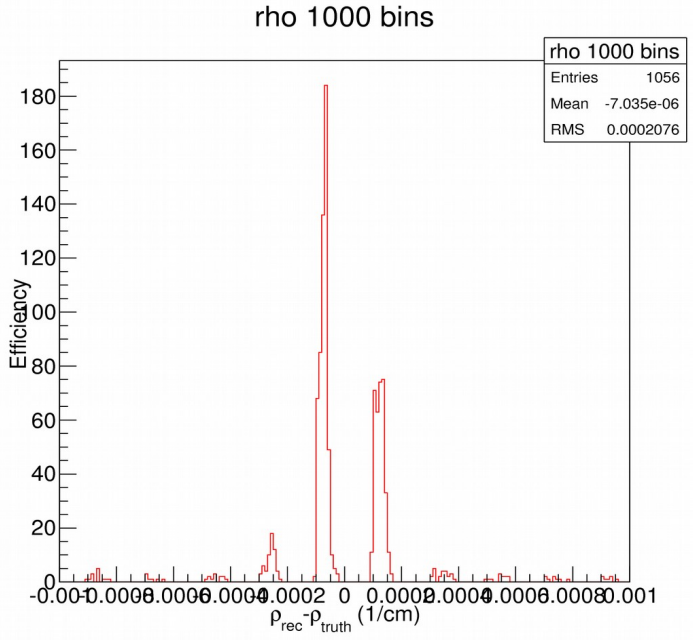


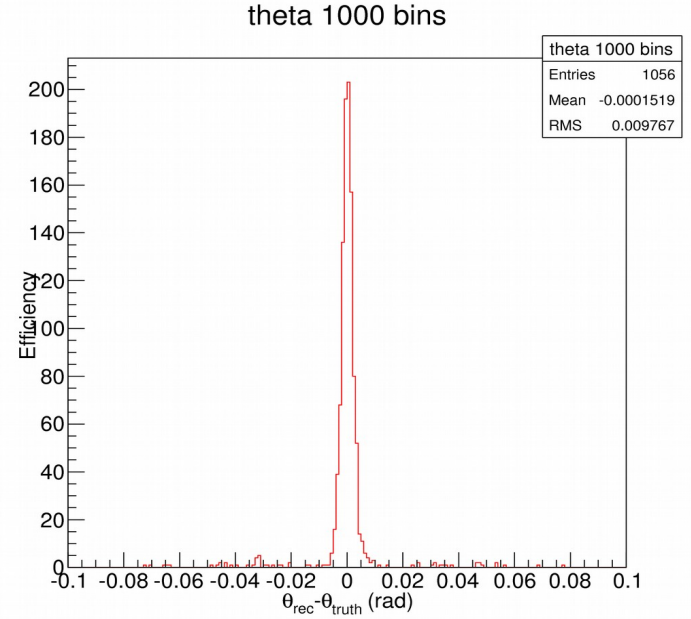
Rho and theta

- 其中 rho 是螺旋线在 xy 平面投影圆半径的倒数，
- theta 是投影圆心的方位角
- 上两个图为去掉束流 smear 之前的残差分布，下两个图是去掉束流弥散后的残差分布







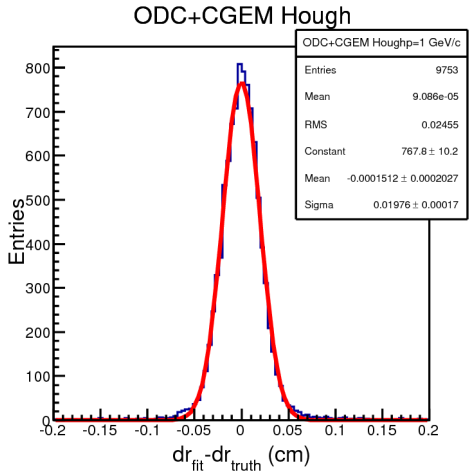


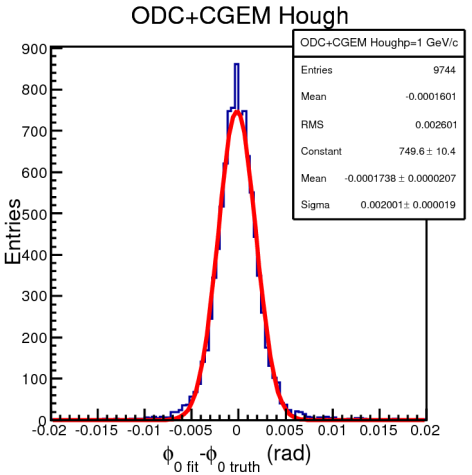
3D tracking Algorithm

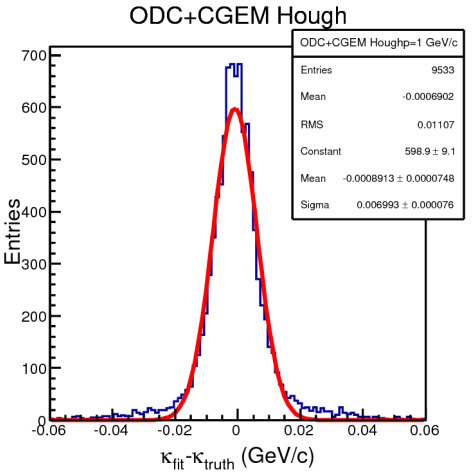
- 1.find stereo hit of ODC according to 2D track and calculate the z and s(flight length in 2D)
- 2.find CGEM clusters with z measurement
- 3.take 3 outermost to make 8 line on z-s plane
- 4.add hits and clusters one by one from outermost layer to innermost layer to fit each line, and calculate chi-square value
- 5.take the line with least chi-square to calculate the last two parameter of helix
- 6. global fitting (ignore CGEM cluster)

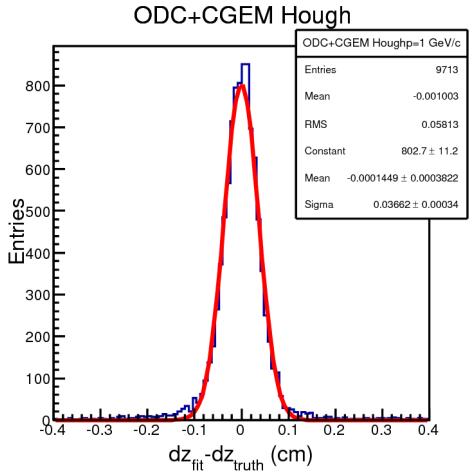
note: just valid for single track event for the moment,

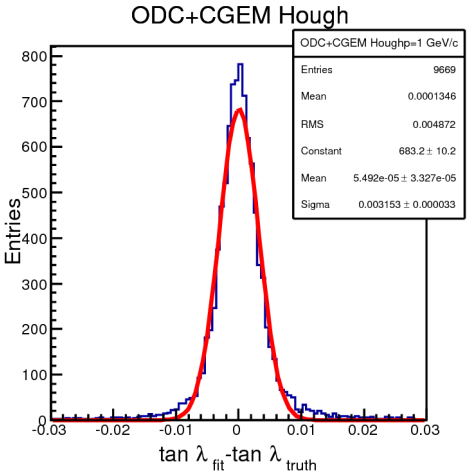
3D 寻迹后 kalman 拟合结果

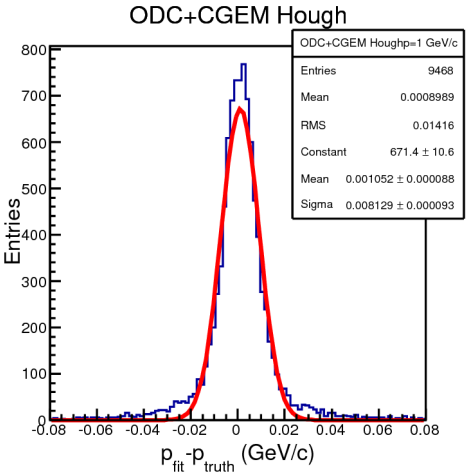
- 



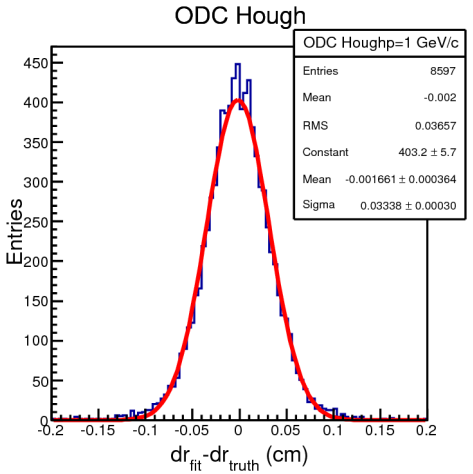


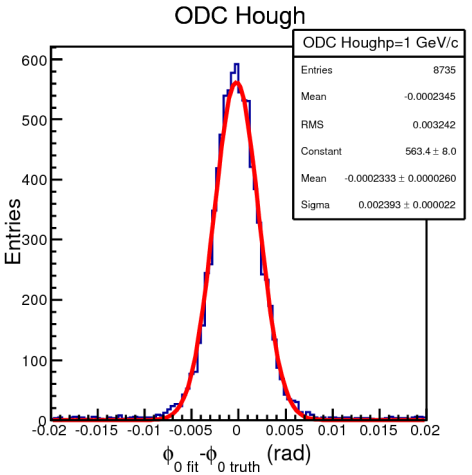


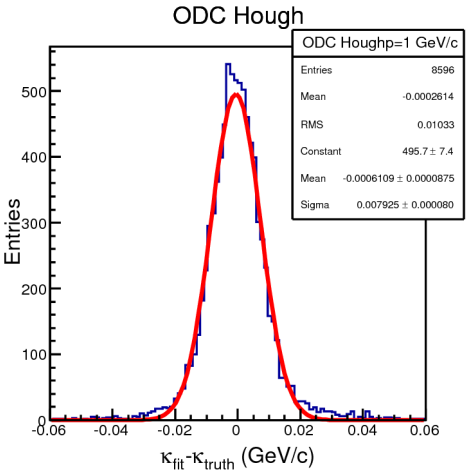


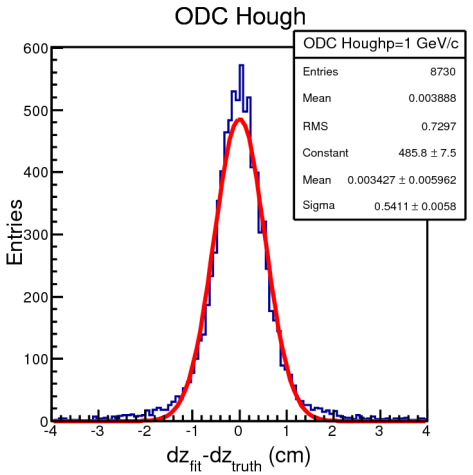


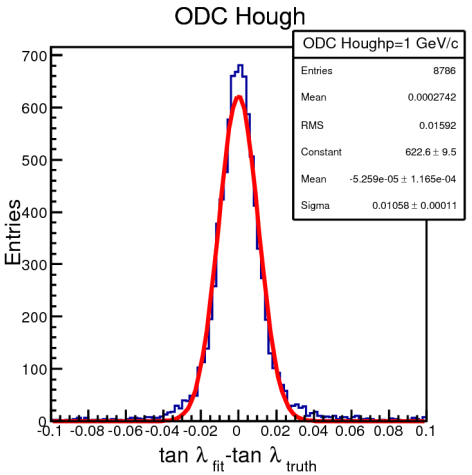
ODC 寻迹后 kalman 拟合结果

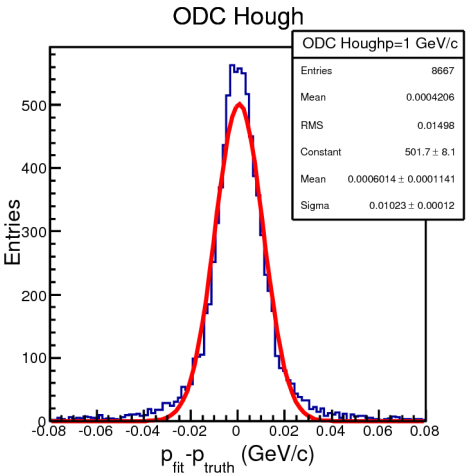
- 











老算法寻迹后 kalman 拟合结果

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