

# **Simulation of Luminosity Monitor**

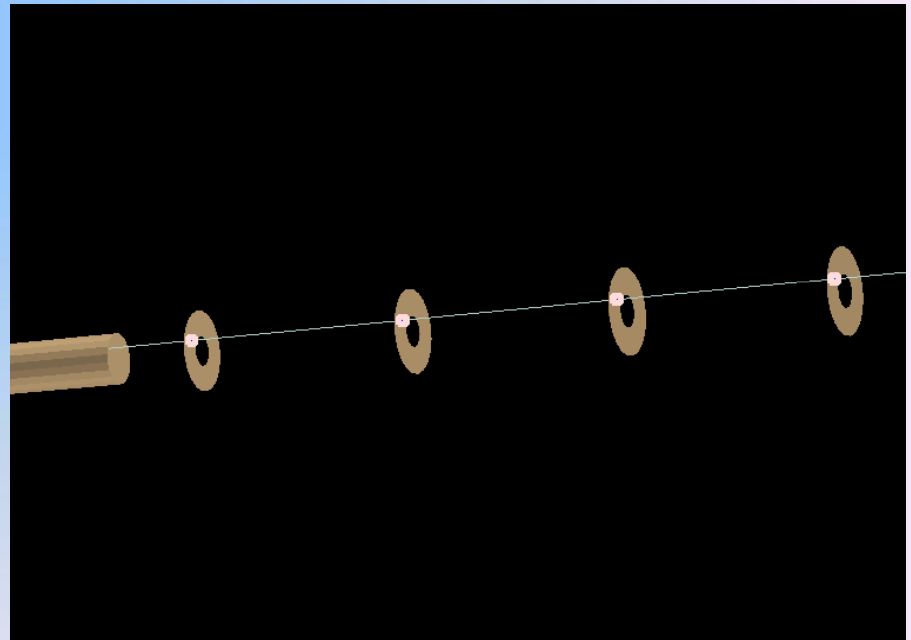
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**GSI, Darmstadt**

**Lumi Meet , Mainz**  
**25<sup>th</sup> Nov. 2009**

# Geometry used for Simulation



- 4 Silicon disks starting at 10.7m from IP
- Theta coverage 3-8 mrad (0.2- 0.46 deg)
- 50 cm gap in between
- 150/300  $\mu\text{m}$  thick
- 50 $\mu$  pitch (for Digi)



# XY Dist. of hits in 1<sup>st</sup> Det Plane

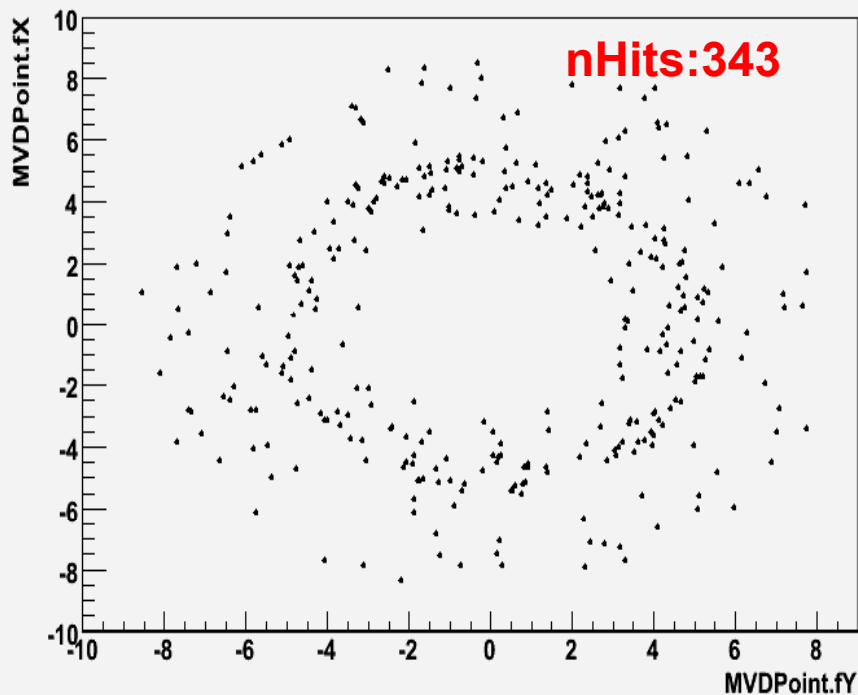


Box Generator for pbar: momentum 2GeV/c; theta **0.3 deg** (5.2 mrad)

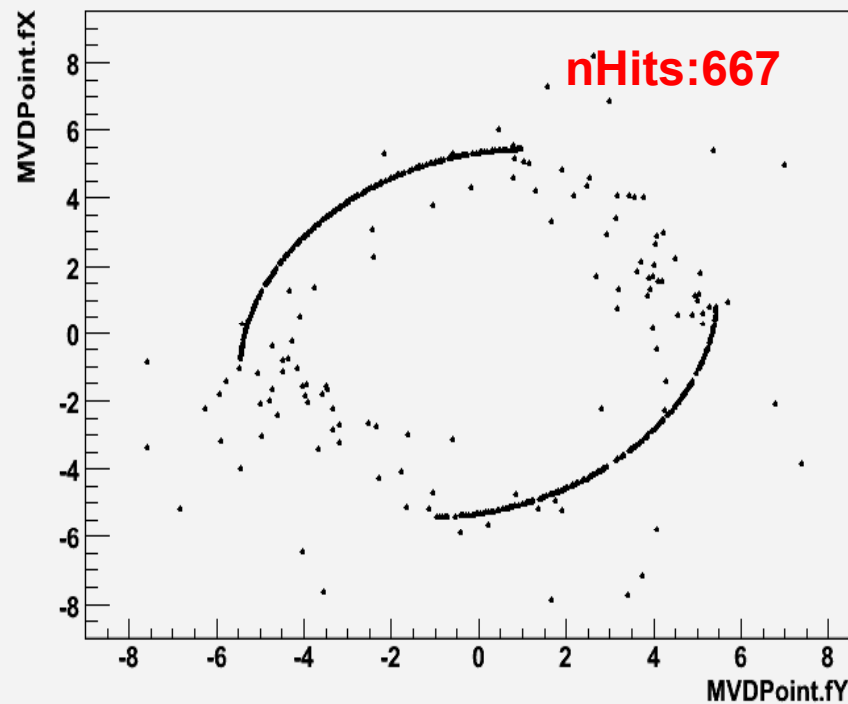
**Without Magnetic Field**  $n_{\text{Events}} = 1000$

**With Solenoid Magnetic Field**

MVDPPoint.fX: MVDPPoint.fY { MVDPPoint.fZ < 1080 && MCTrack.fPdgCode[MVDPPoint.fTrackID] == -2212 }



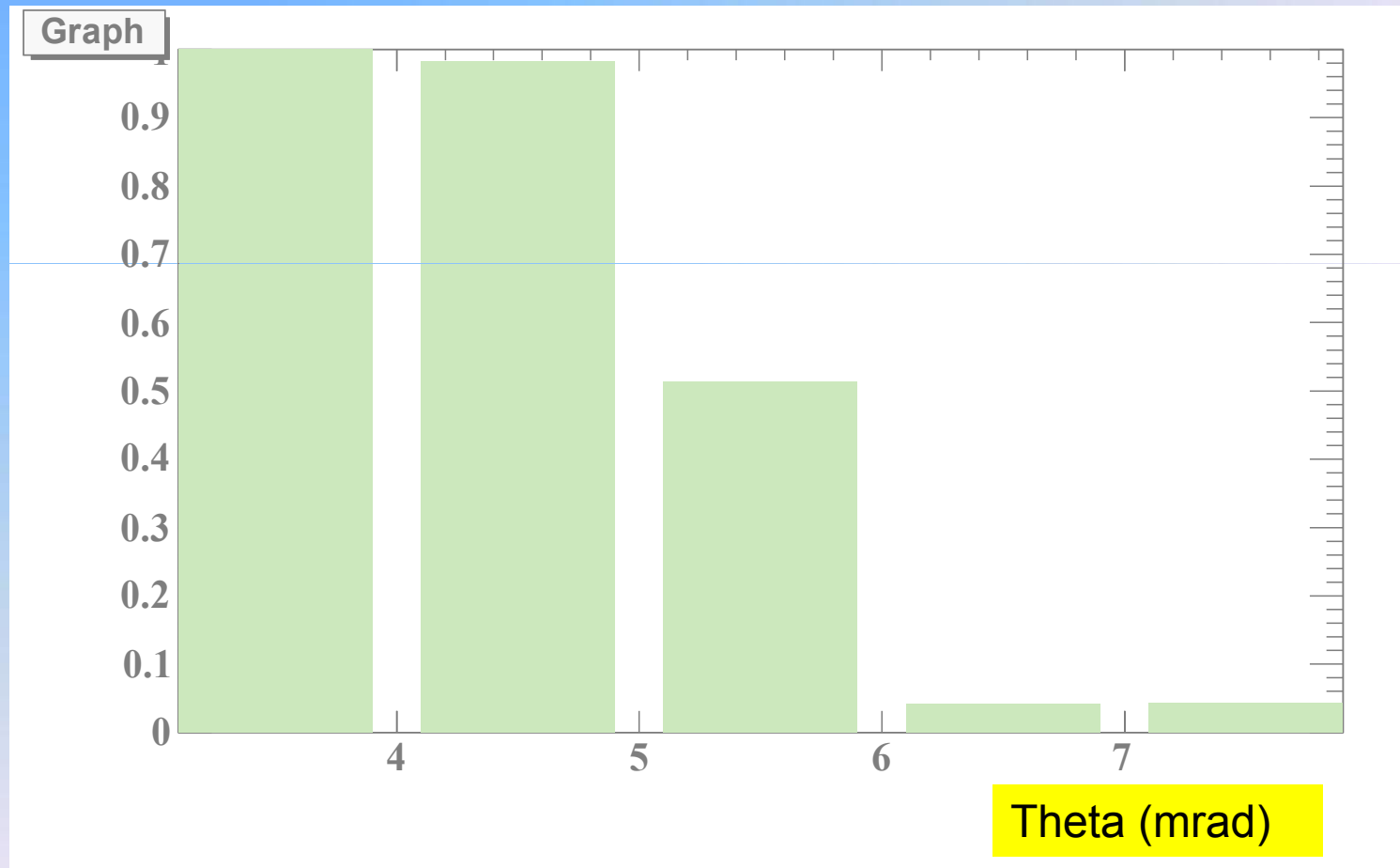
MVDPPoint.fX: MVDPPoint.fY { MVDPPoint.fZ < 1080 && MCTrack.fPdgCode[MVDPPoint.fTrackID] == -2212 }



# Relative Acceptance



Box Generator for  $p\bar{p}$ : momentum 2GeV/c



# XY Dist. Of hits in 1<sup>st</sup> Det Plane

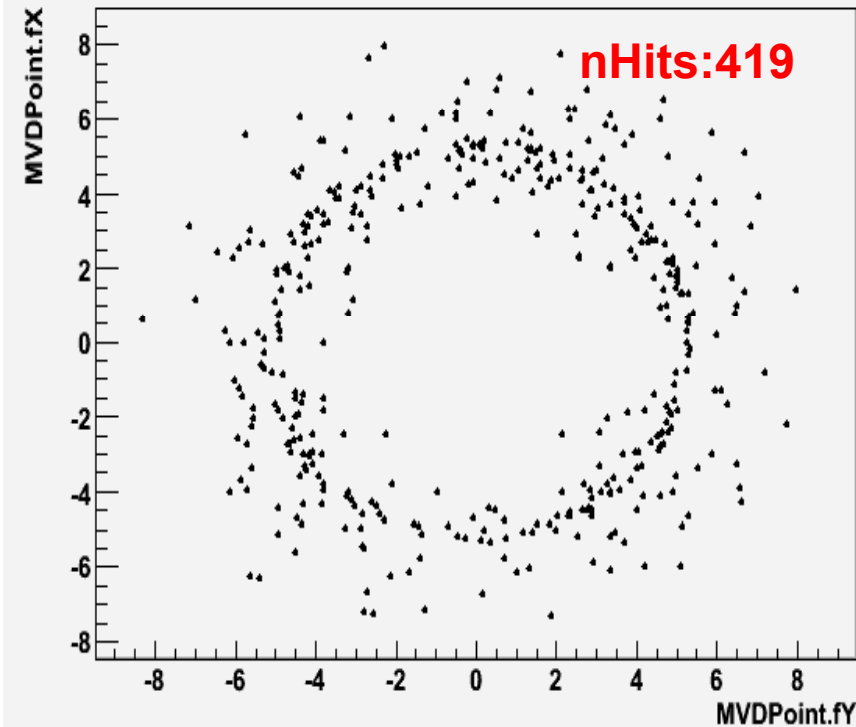


Box Generator for pbar: momentum 6.2GeV/c; theta 0.3 deg (5.2 mrad)

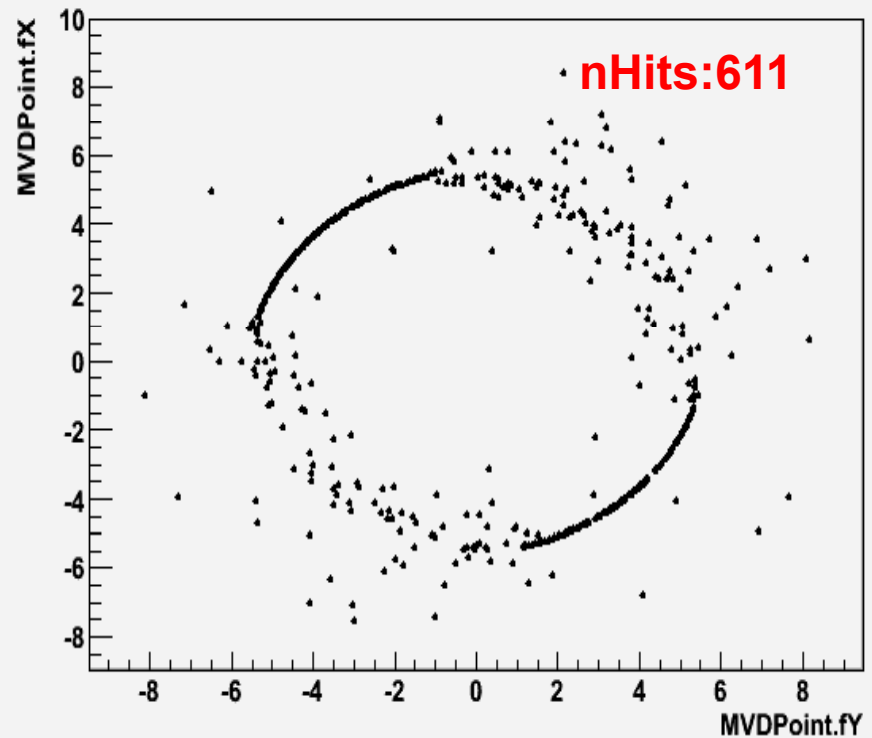
Without Magnetic Field

With Solenoid Magnetic Field

MVDPPoint.fX: MVDPPoint.fY {MVDPPoint.fZ<1080 && MCTrack.fPdgCode[MVDPPoint.fTrackID]==-2212}



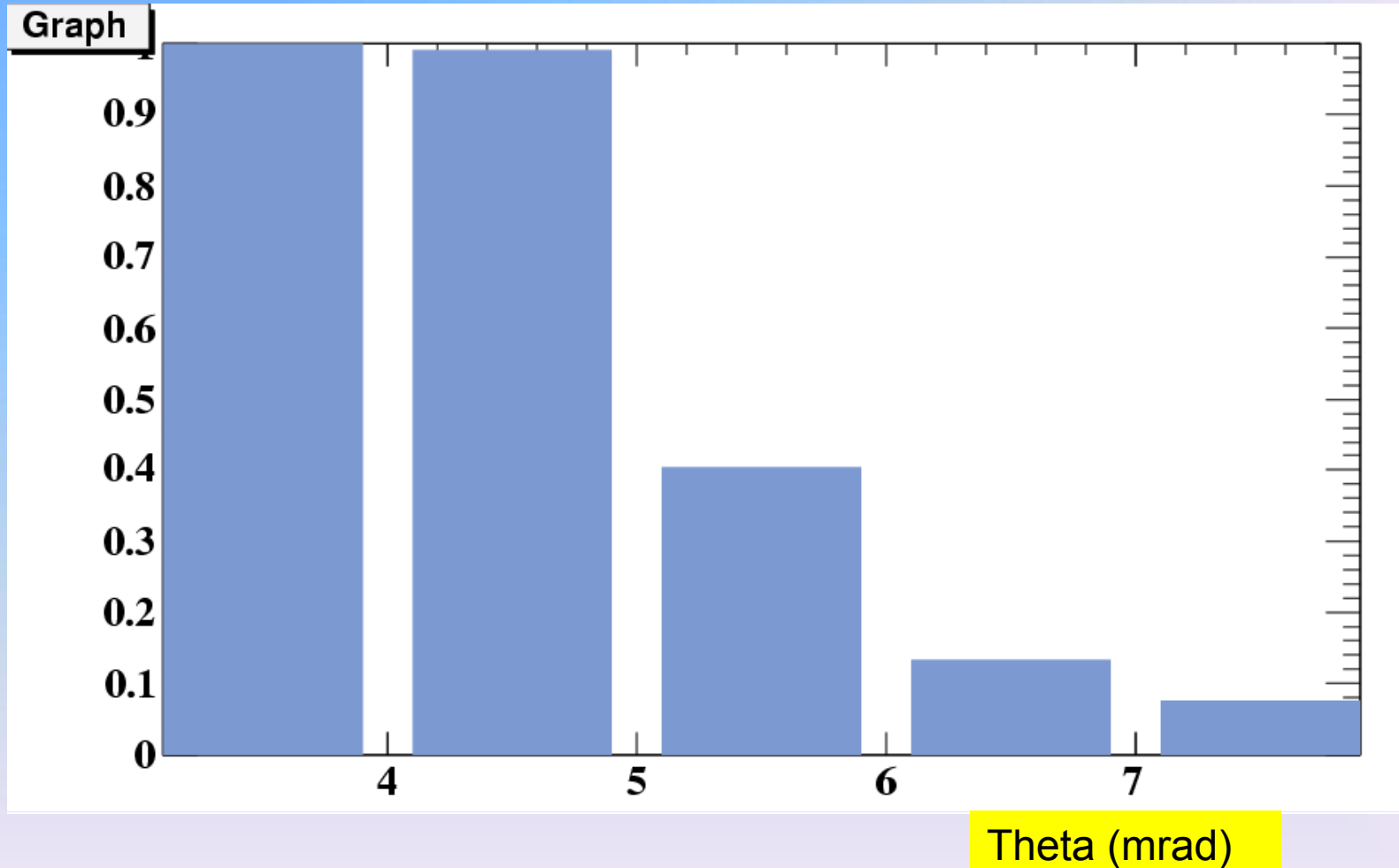
MVDPPoint.fX: MVDPPoint.fY {MVDPPoint.fZ<1080 && MCTrack.fPdgCode[MVDPPoint.fTrackID]==-2212}



# Relative Acceptance



Box Generator for pbar: momentum 6.2GeV/c



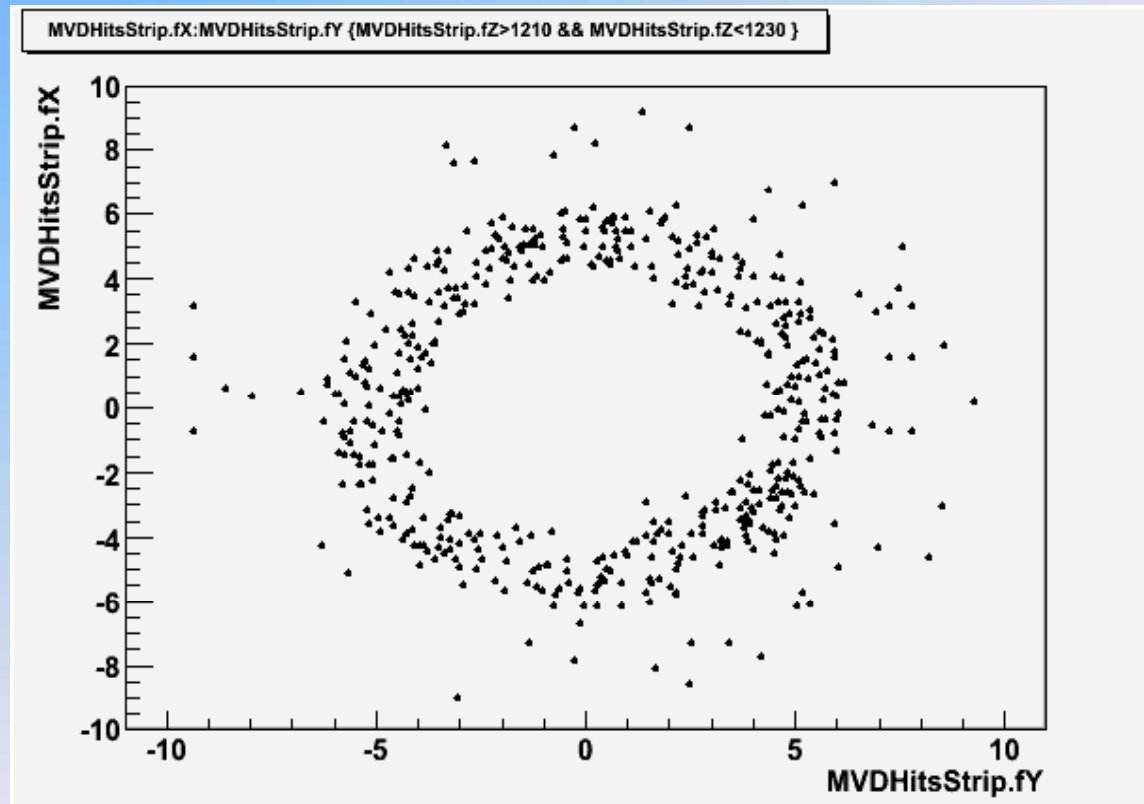
# Strip Hits in 1<sup>st</sup> Det Plane



Box Generator for pbar: momentum 6.2GeV/c; theta 3 -5 mrad

**With Solenoid Magnetic Field**

nEvents=2000  
nHits=525  
Acc= 26%



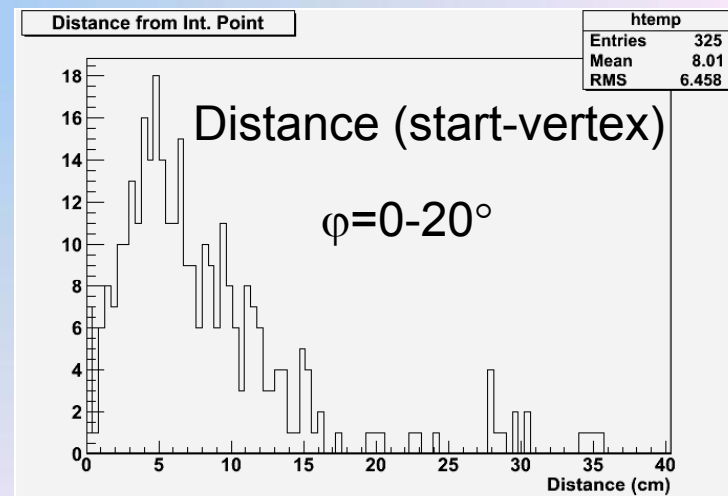
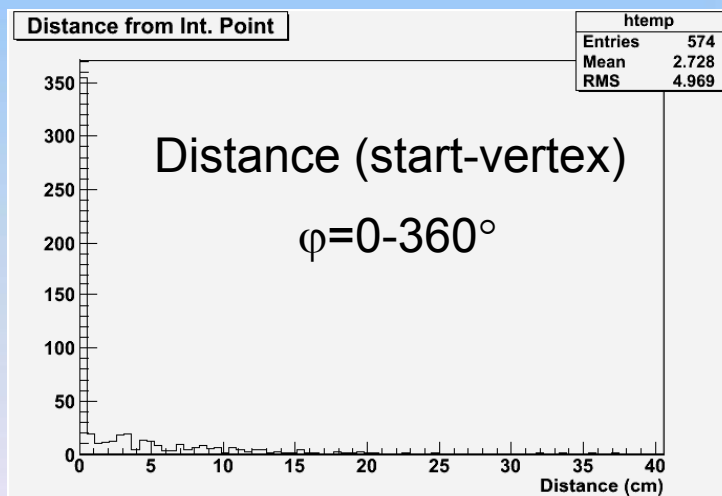
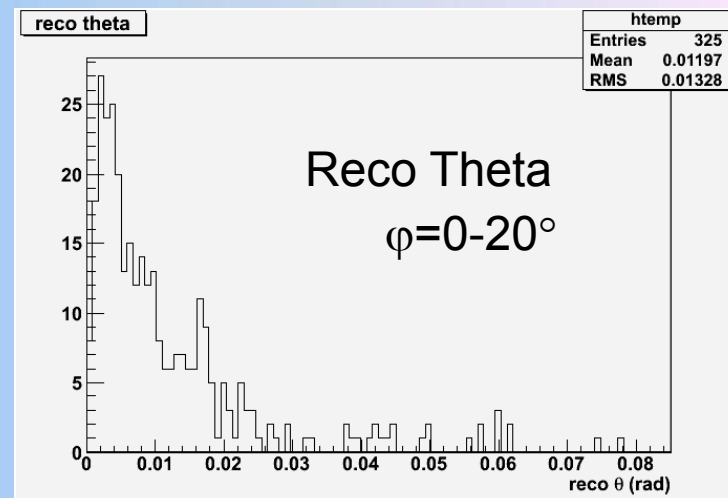
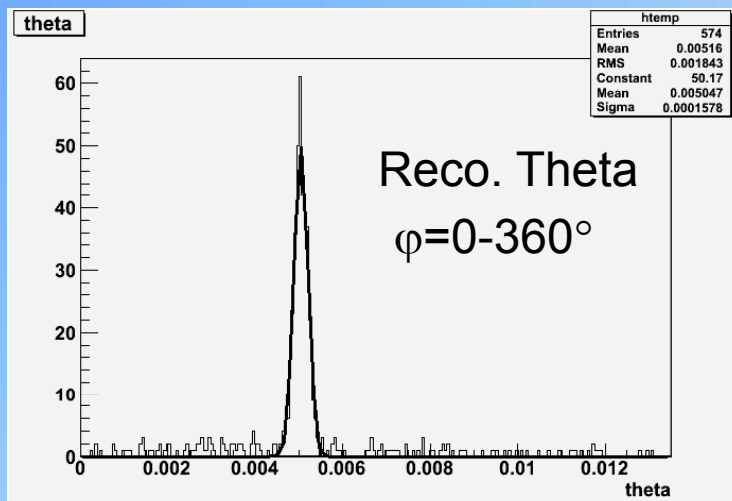
# Theta and Distance (After 3DTrackFit)



**Box  
Generator:**

**6.2Gev/c  
mom**

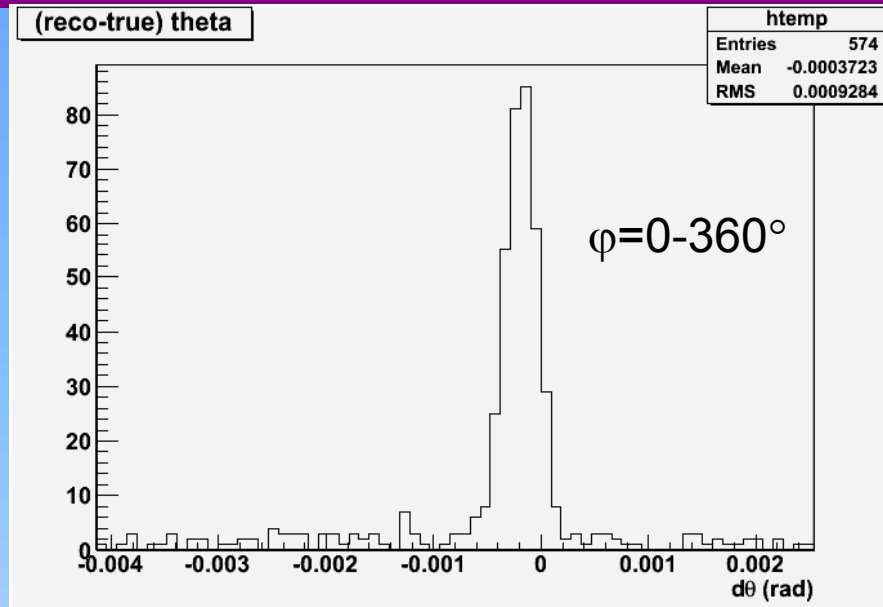
**Theta:  
0.3 deg**



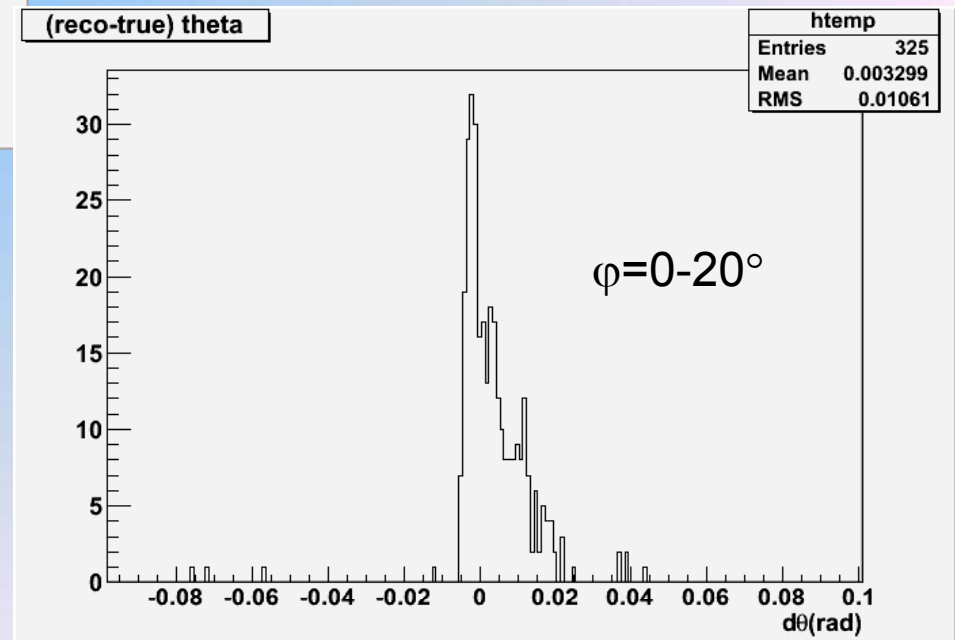
**With  
sloenoid  
magnetic  
field**



# Reco-MCTrue Theta



nEvents: 1000



## Summary:

- **Simulation - Hit Reconstruction- Track Fitting – could complete**
- **Studied MCPoint and Reco Track Distribution with Box Generator**
- **Initial study reveals:**
  - **Bad reconstruction of tracks in certain phi region with solenoid magnetic field**

## Future Plan:

- **Study the Theta resolution for different momentum and different pitch**
- **Adding both Solenoid and Dipole Magnetic Field**
- **Study with DPM generator**
- **Study of possible Backgrounds**