Developments in STT+MVD simulation studies

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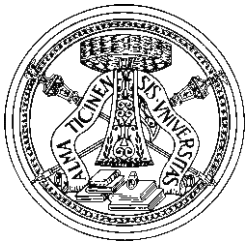
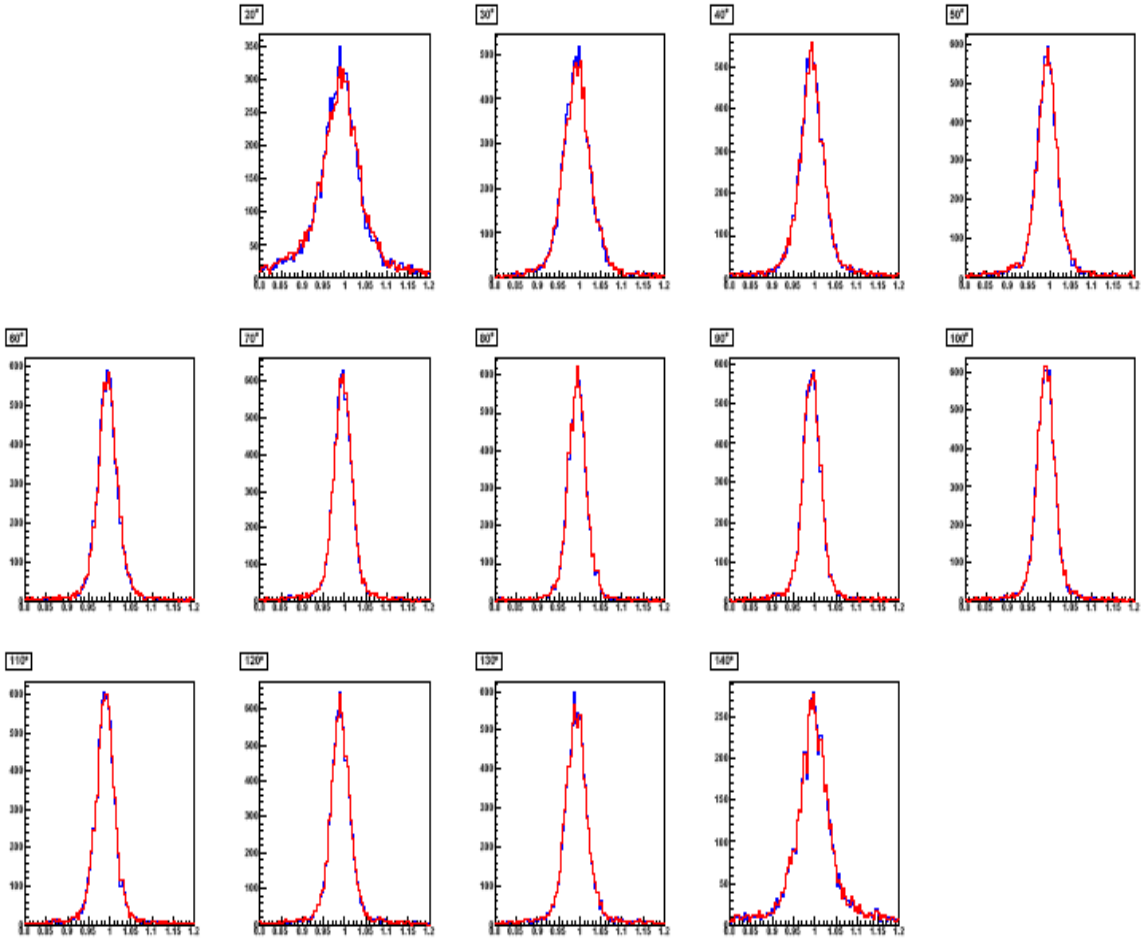
Pavia Group

PANDA Collaboration Meeting at GSI
March 2-6, 2009



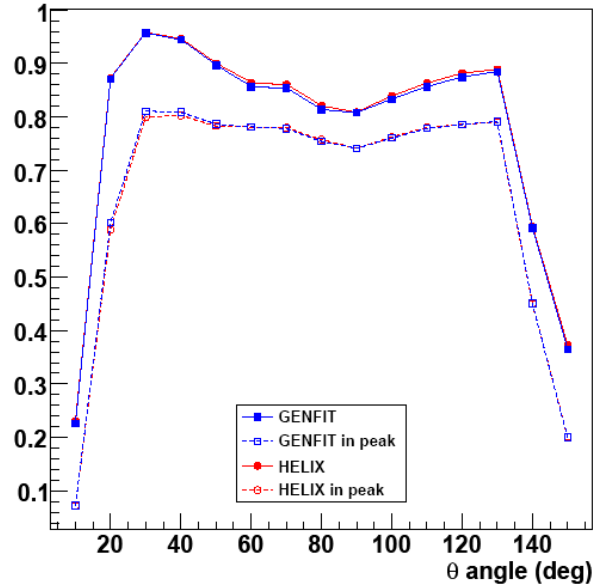
PROBLEMS IN GENFIT FOR STT + MVD

Momentum distributions (STT + MVD) @ different θ angles

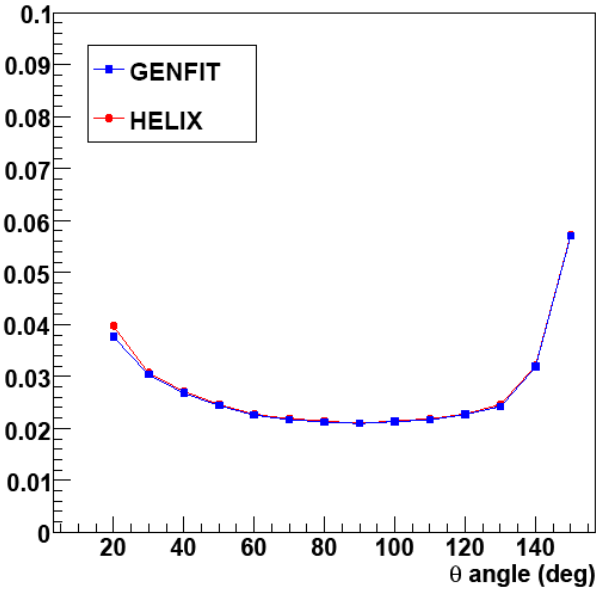


From December presentation (*STT Design Studies*)

Efficiency (STT + MVD)



Momentum Resolution (STT + MVD)



STT+MVD in genfit showed no improvements with respect to lhetrack →INVESTIGATION

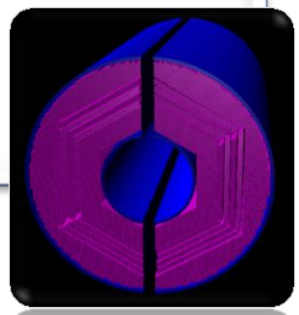
IMPROVEMENTS IN STT + MVD

Changes on:

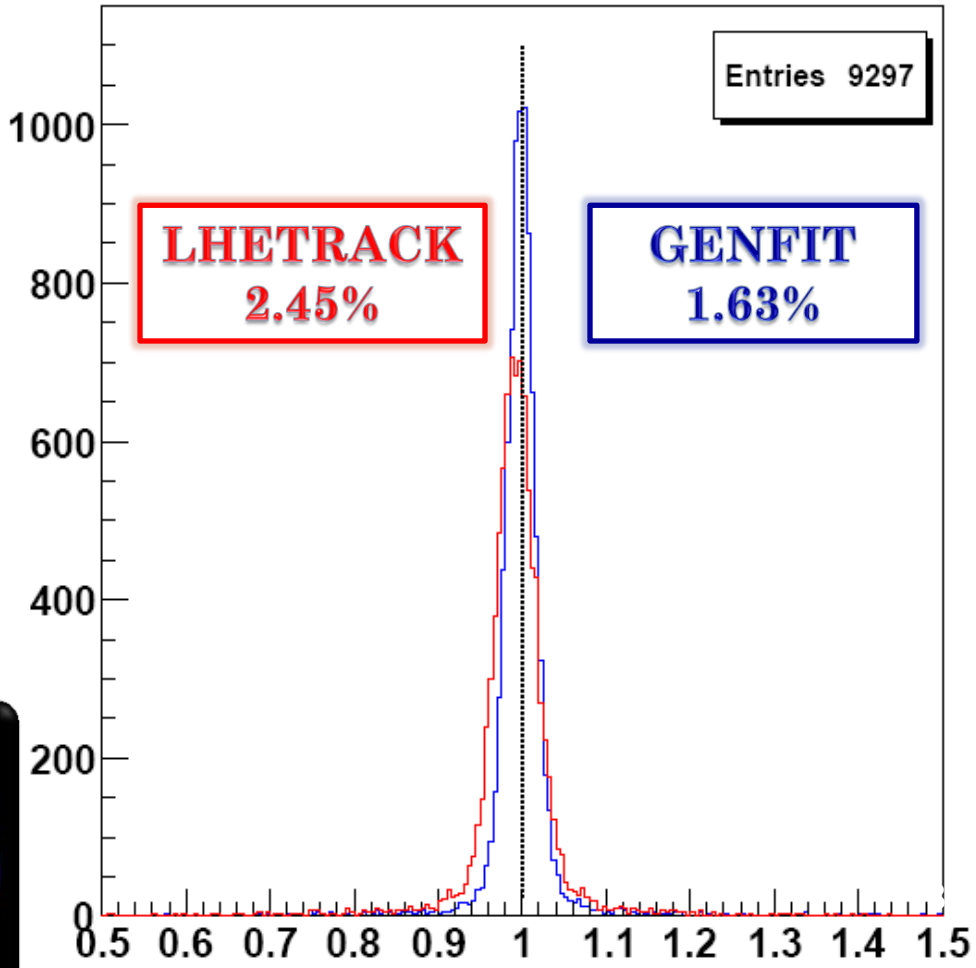
- starting position/mom errors
- MVD and STT measured point coordinates covariances
- Kalman filter planes orientation

Simulation

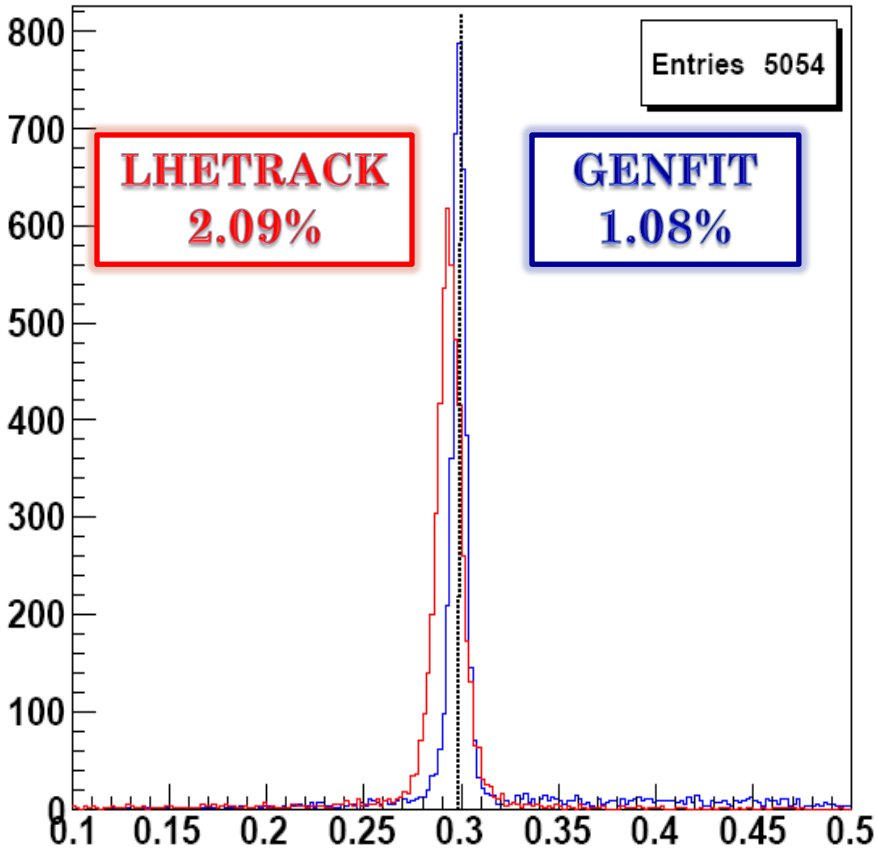
- 10000 μ^- @ 0.3, 1, 5 GeV/c
- $\phi \in$ [0°, 360°]
- $\theta \in$ [20° , 140°]
- Geometry layout:
  - new geo,
  - STT 150 cm long



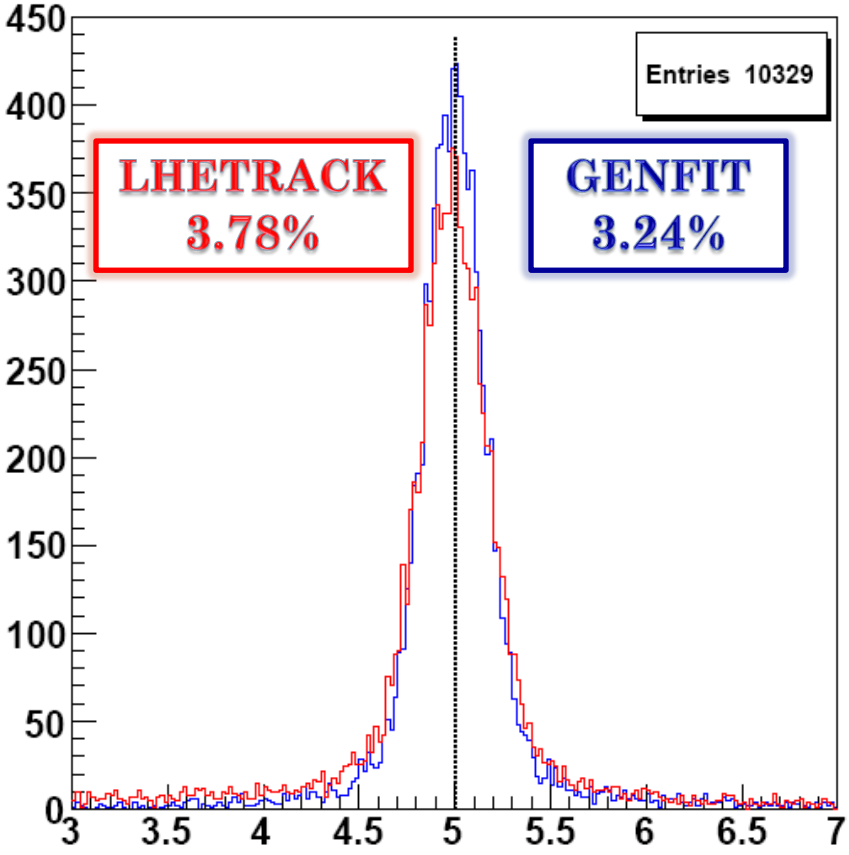
1 GeV/c



IMPROVEMENTS IN STT + MVD

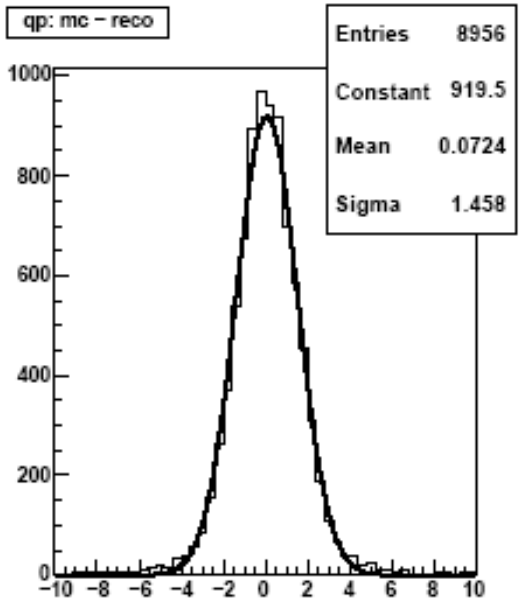


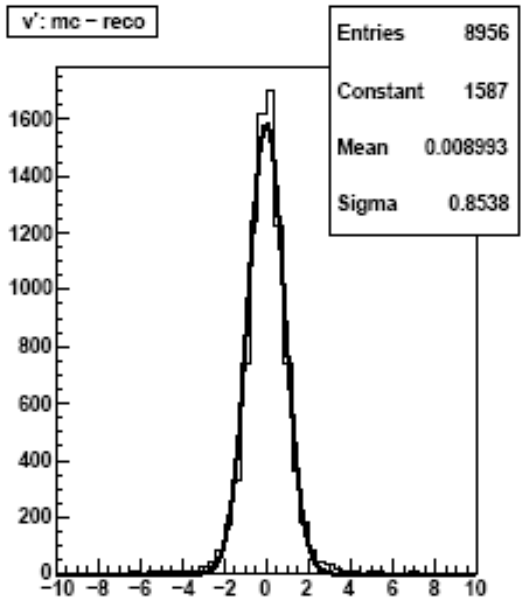
300 MeV/c

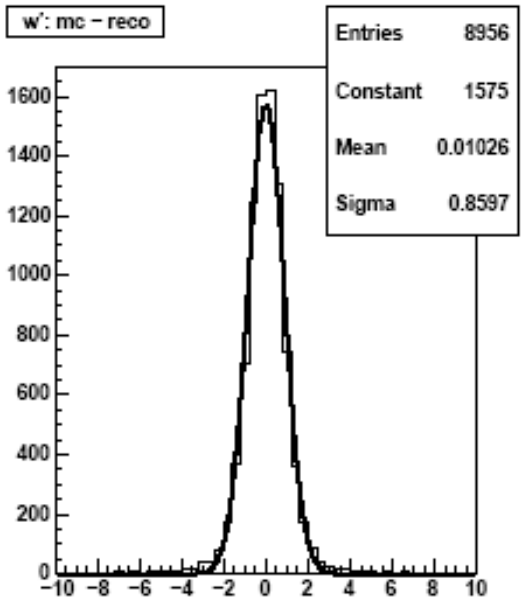


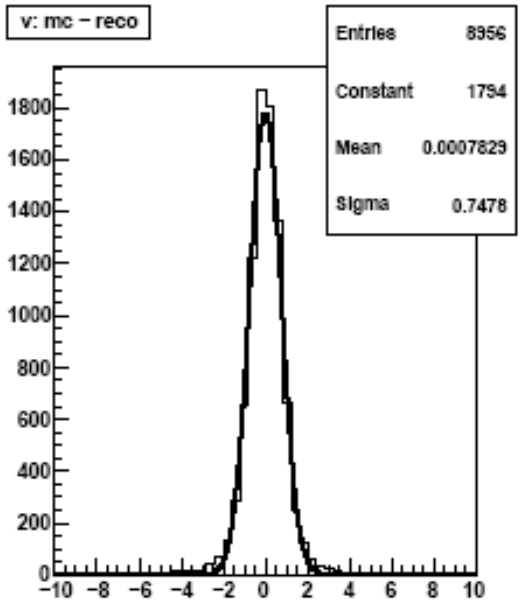
5 GeV/c

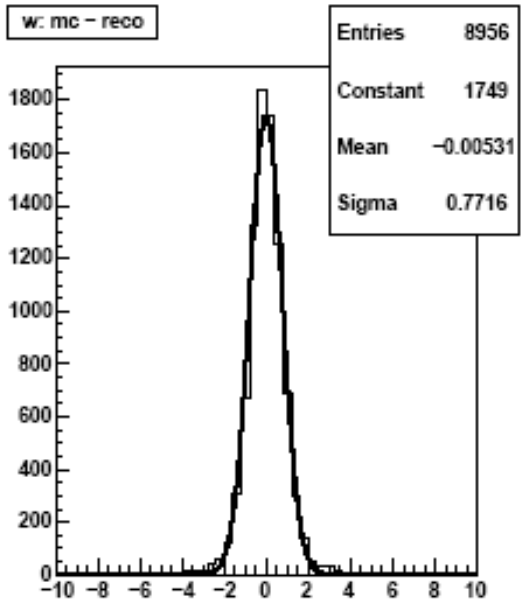
PULL DISTRIBUTIONS









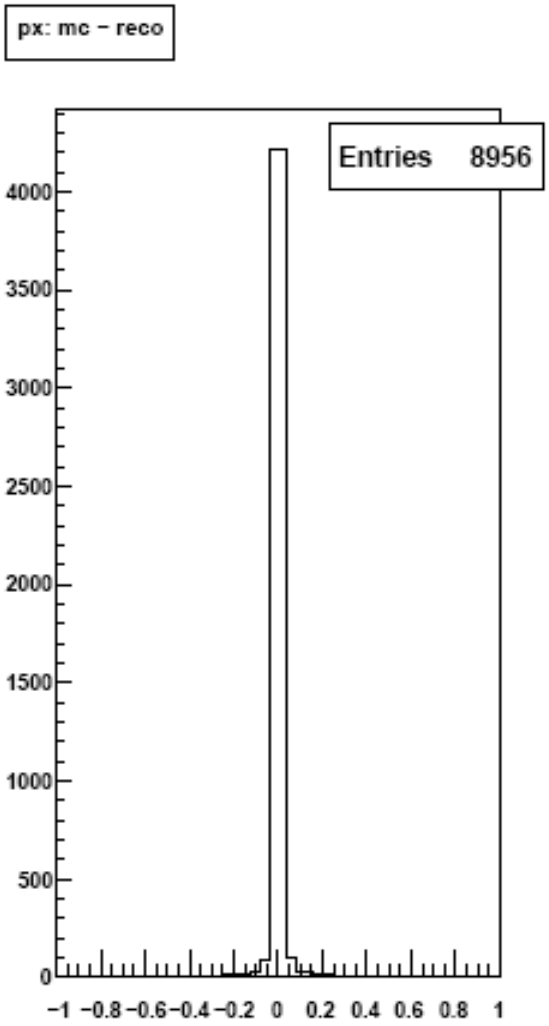


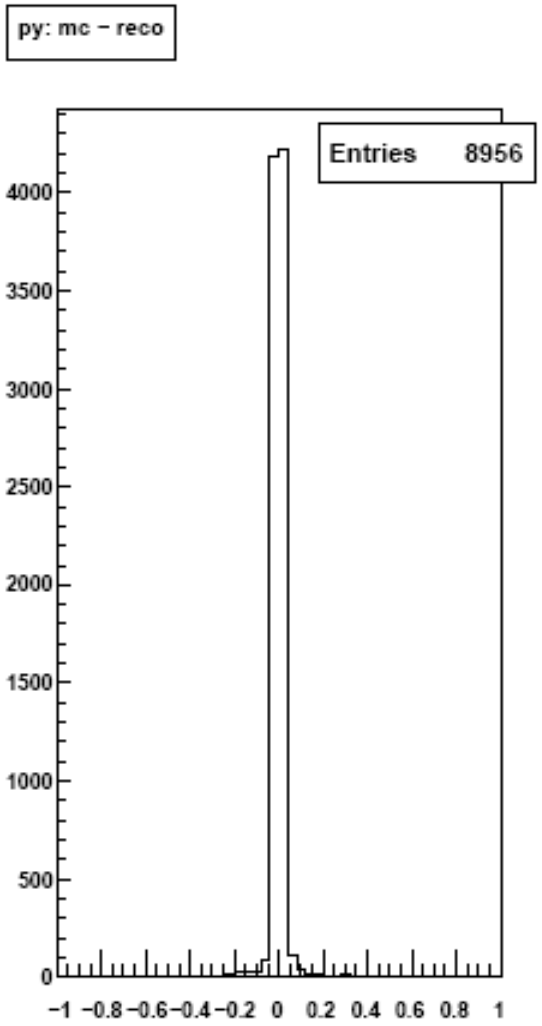
Track parameters:

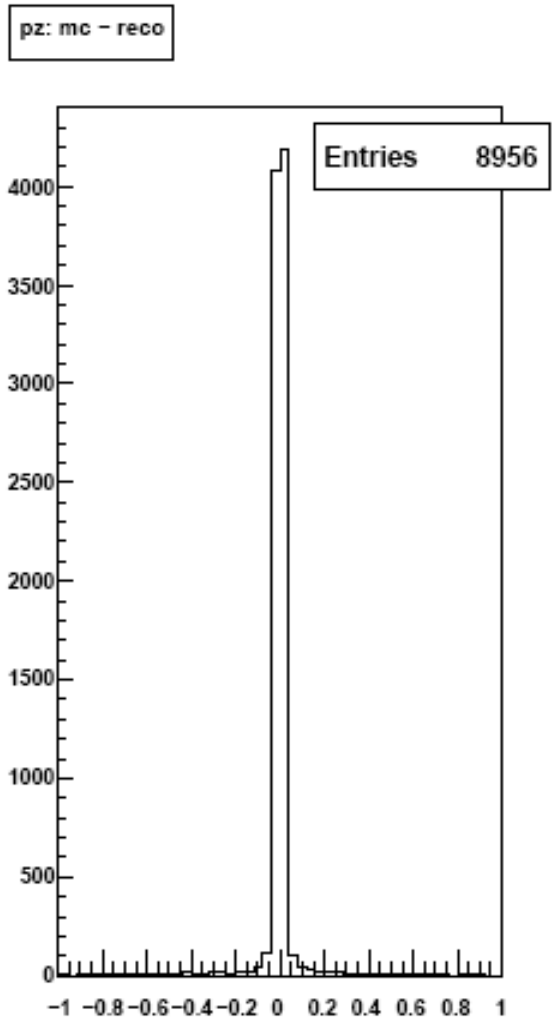
- q/p, v', w', v, w

GeaneTrackRep

Momentum Components Residuals





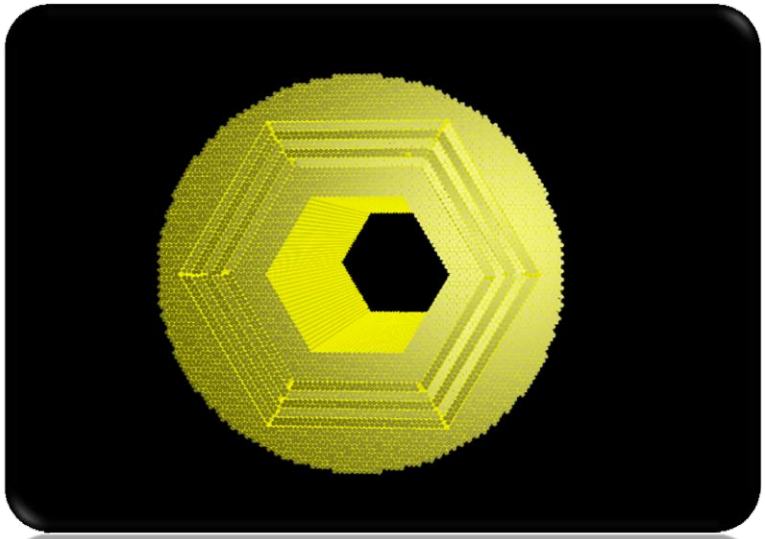


Summary

- After these changes, GENFIT tests on STT+MVD with single track events are **successful**
- Changes in STT, MVD and LHEtrack have already been uploaded in svn (**THANKS** to package developers!)
- If you wish to try it … you're welcome!

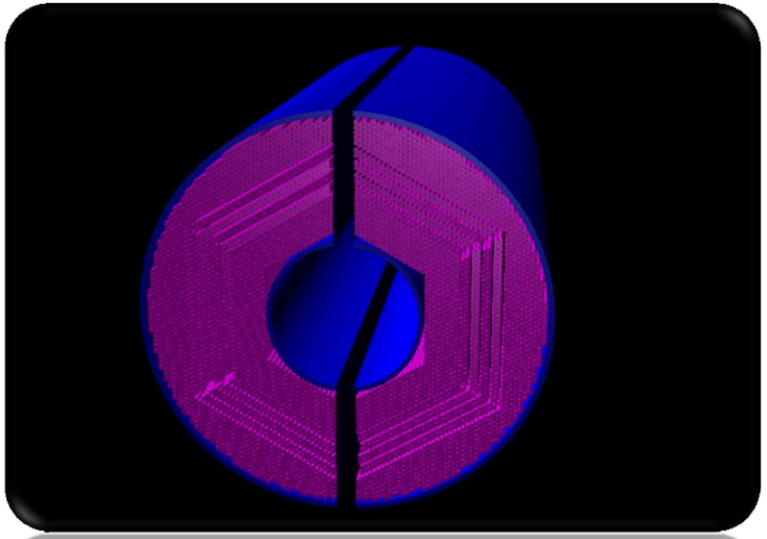
BACKUP SLIDES

GEOMETRY LAYOUTS



Differences:

- Inner and outer cylinders
- 90° rotation in ϕ
- target pipe hole
- 4 skewed double layers instead of 5



Simulation

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Studies

- STT + MVD
  - Efficiency
  - Resolution

Coordinates Residuals