

# Pass1/7 vertexing issues

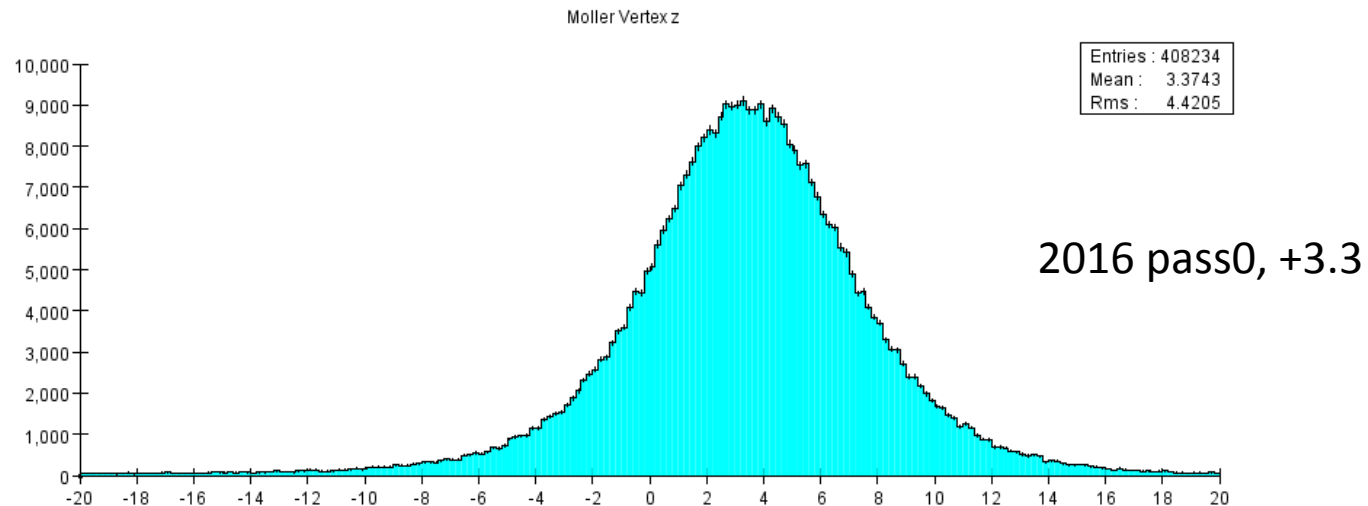
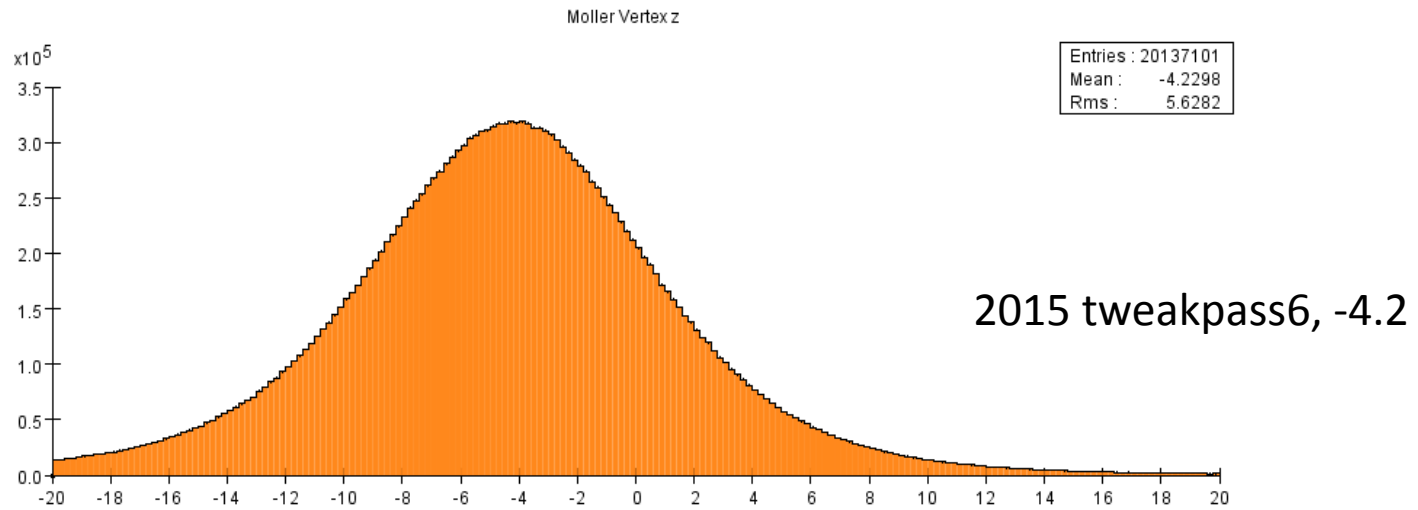
Norman Graf

HPS Software Meeting

June 14, 2017

# Where's the target?

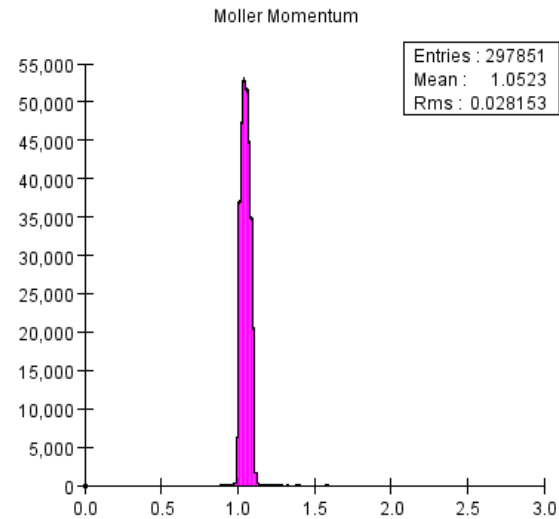
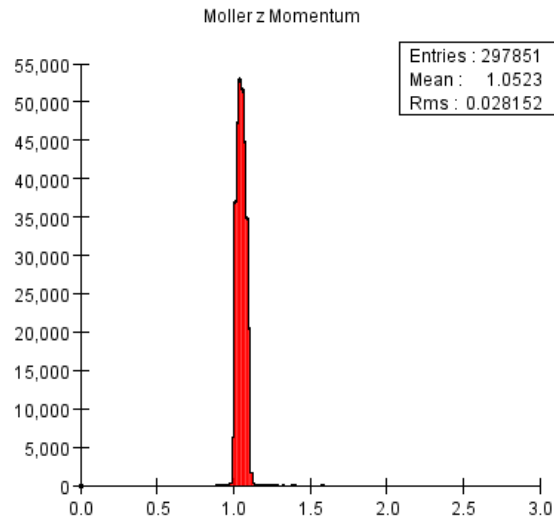
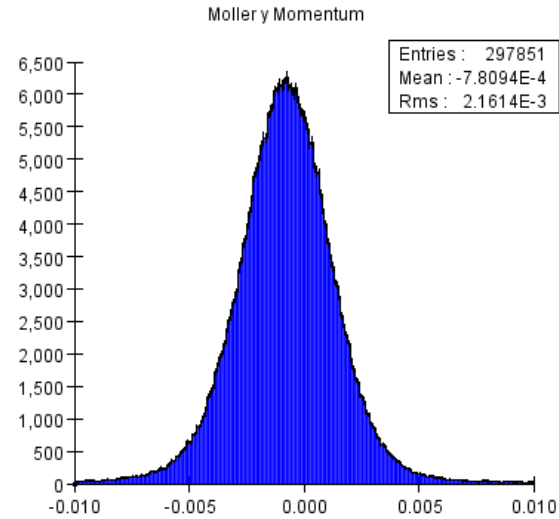
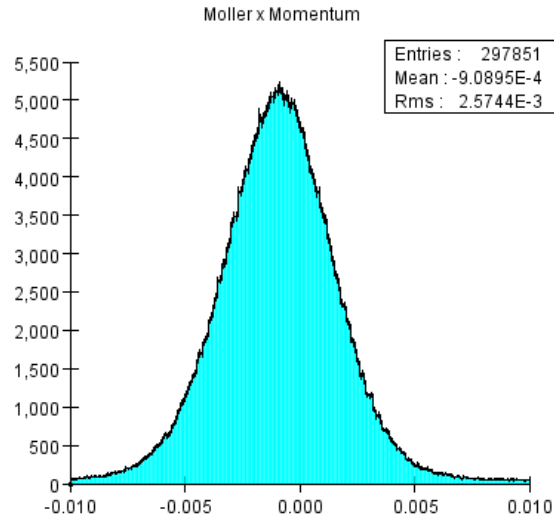
- Møller Unconstrained vertex Z position



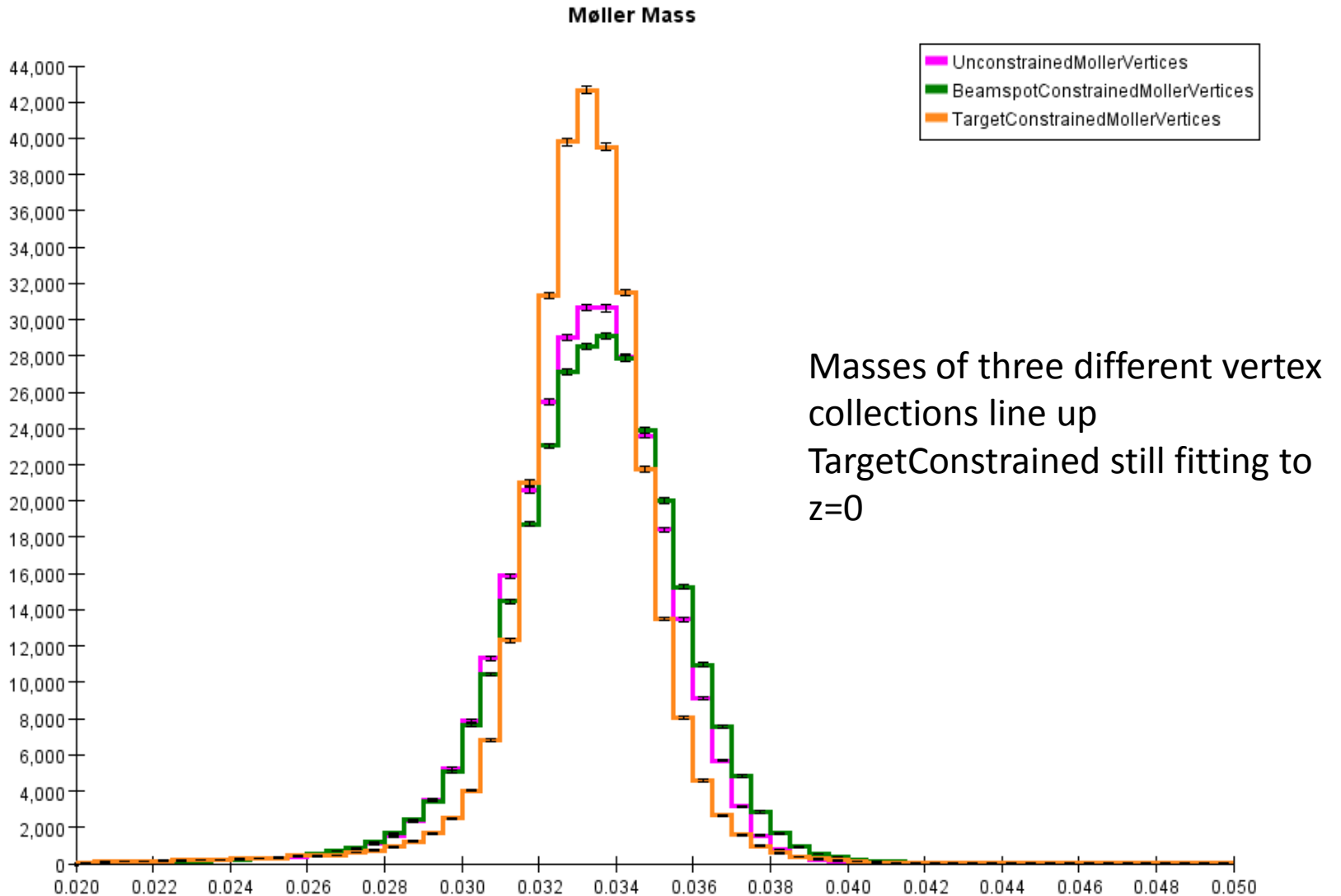
# Re-reconstruction from LCIO (iss87)

- Propose to run a partial reconstruction as pass7 of the 2015 data.
- Preserve existing calorimeter reconstruction of clusters and corrections to them.
- Preserve existing extraction of  $t_0$  and pulse heights for the SVT raw hit FADC samples and clustering of strips.
- Preserve existing found tracks.
  
- Refit GBL tracks
- Re-associate tracks with clusters
- Re-find and re-fit vertices
  
- Test on a sample of Møllers and FEEs

# Run 5772 Pass7 Møller re-reco

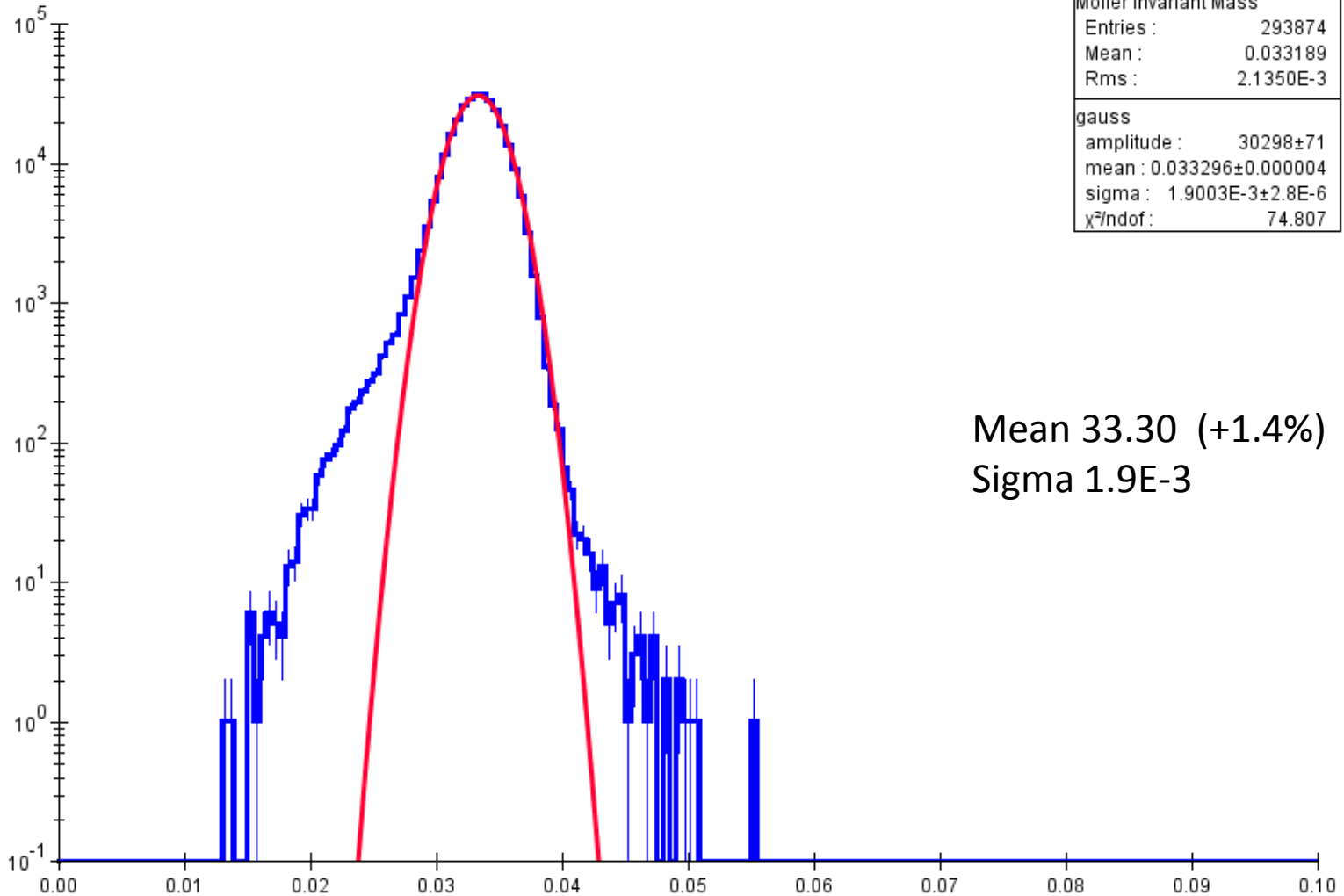


# Run 5772 Pass7 Møller re-reco



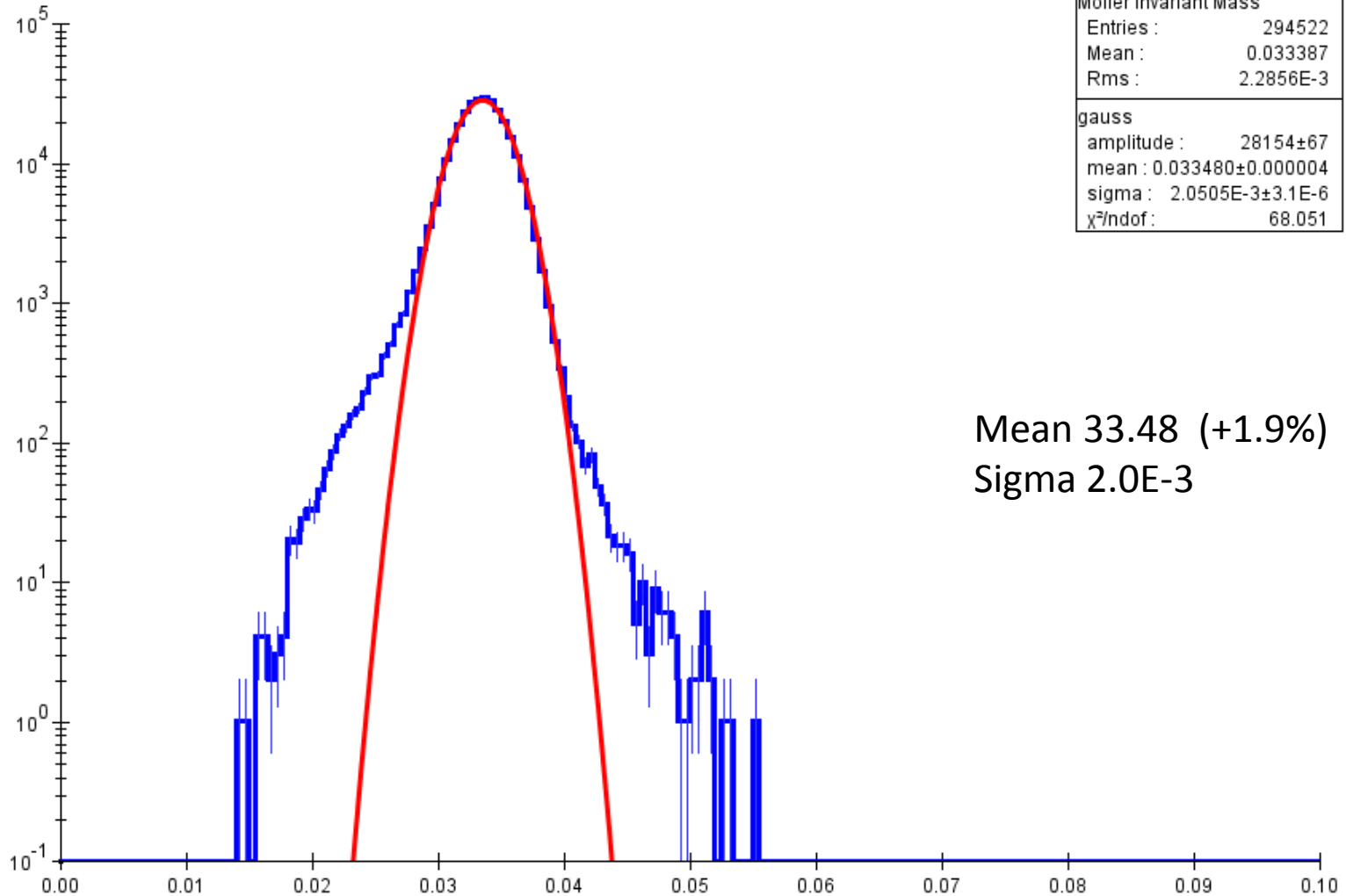
# 5772 Pass7 Unconstrained

Unconstrained Møller Mass



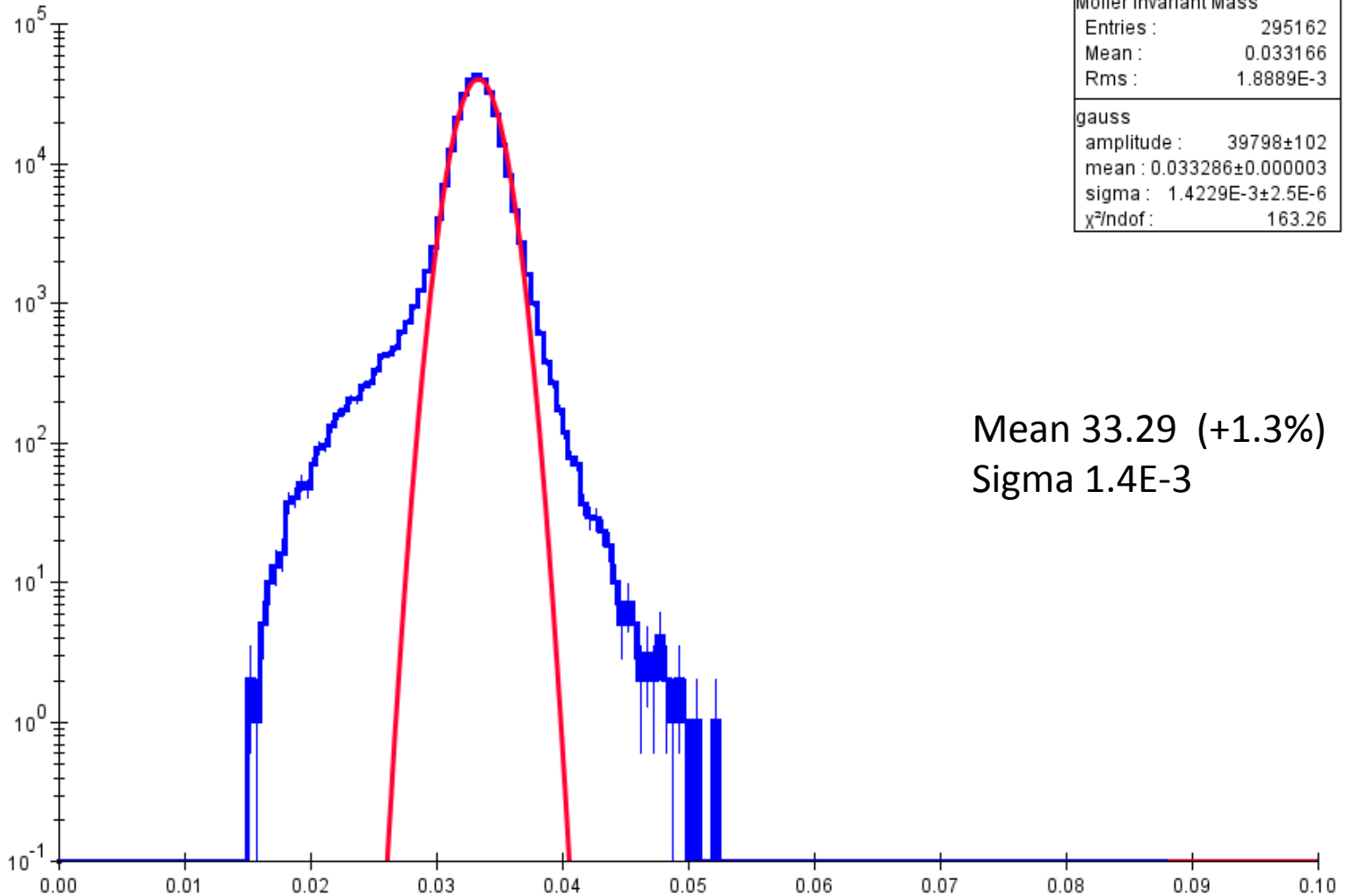
# 5772 Pass7 BeamSpotConstrained

BeamspotConstrained Møller Mass



# 5772 Pass7 TargetConstrained

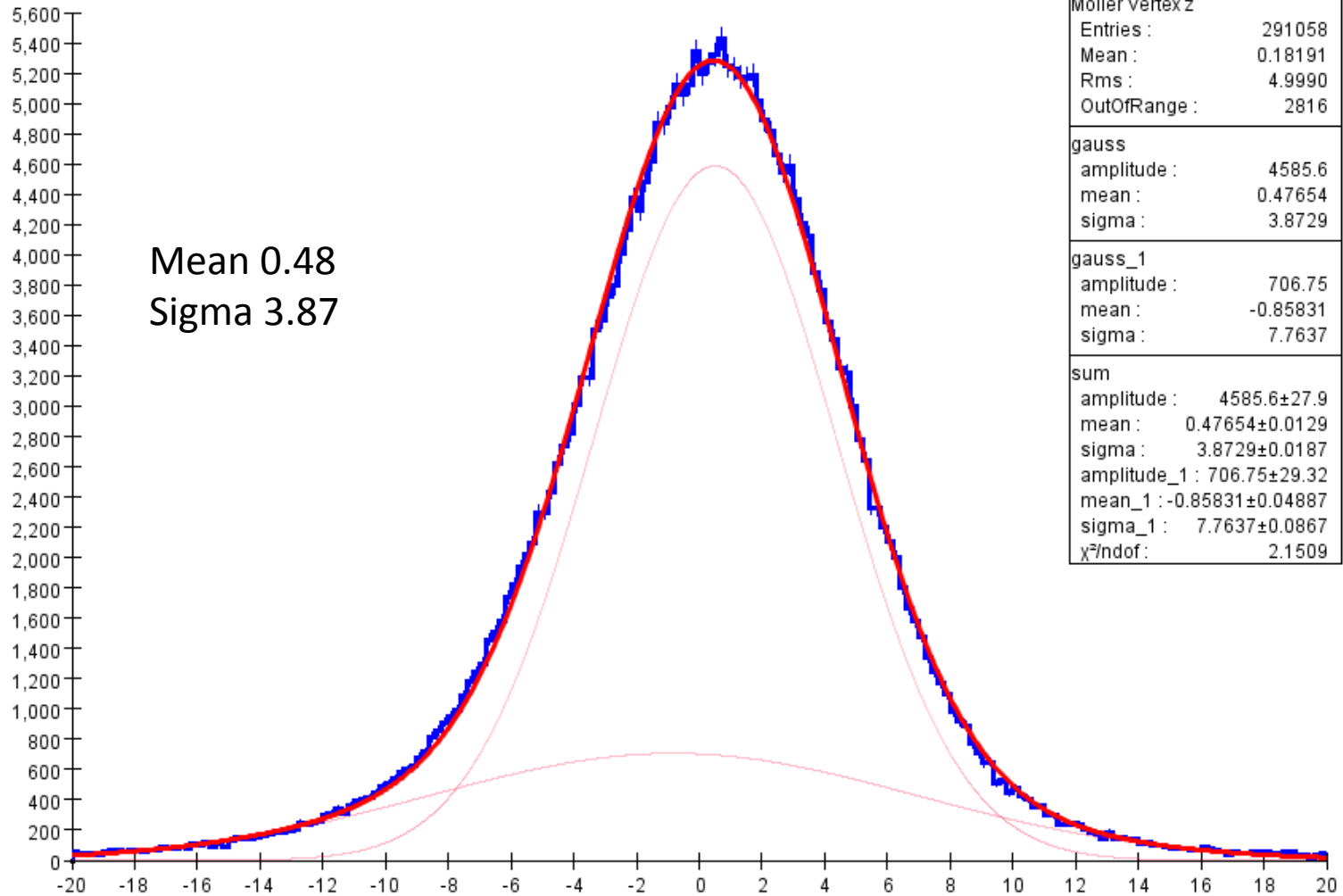
TargetConstrained Møller Mass





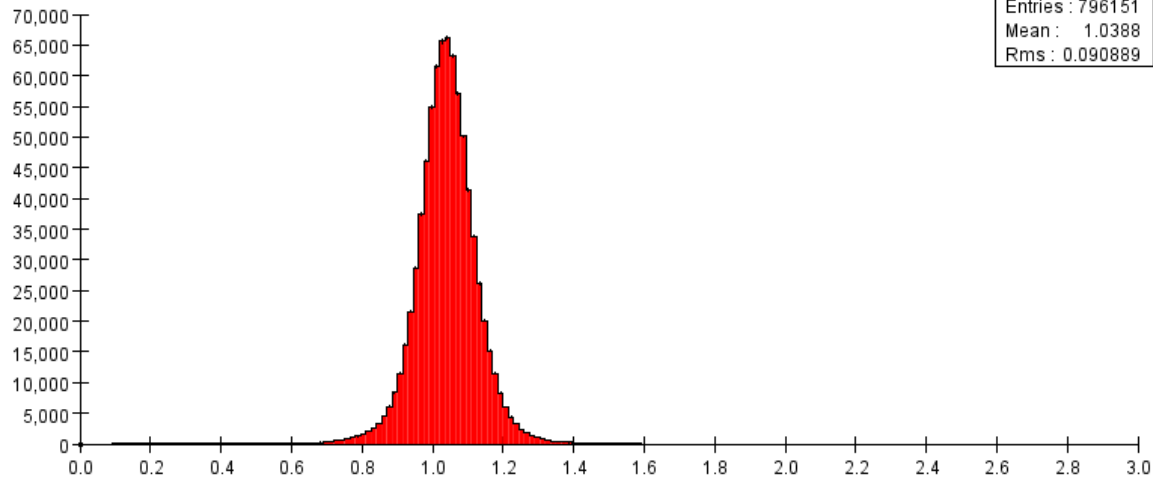
# Run 5772 Pass7 Møller re-reco

2015 Møller Unconstrained Vertex Z position

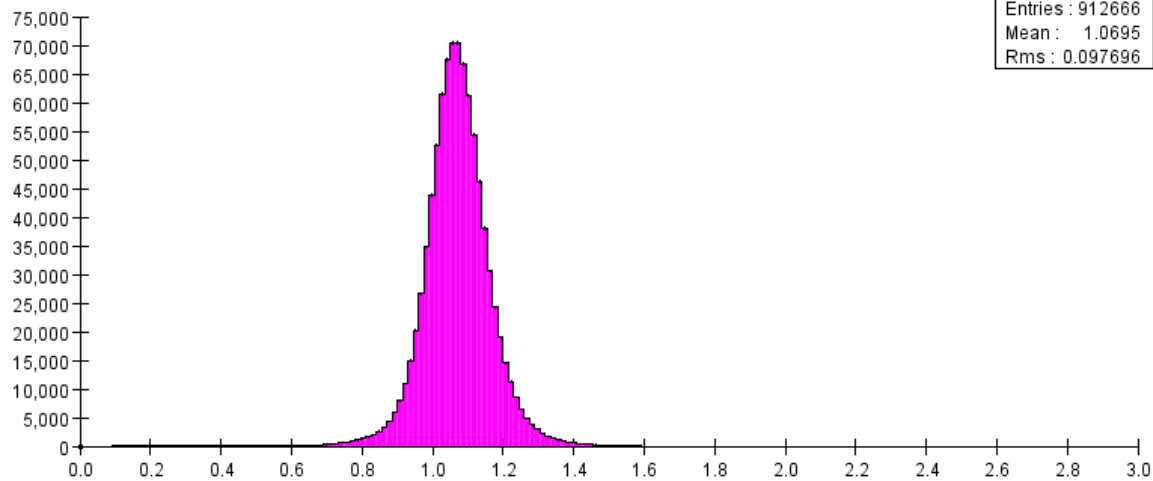


# 5772 Pass7 Fee

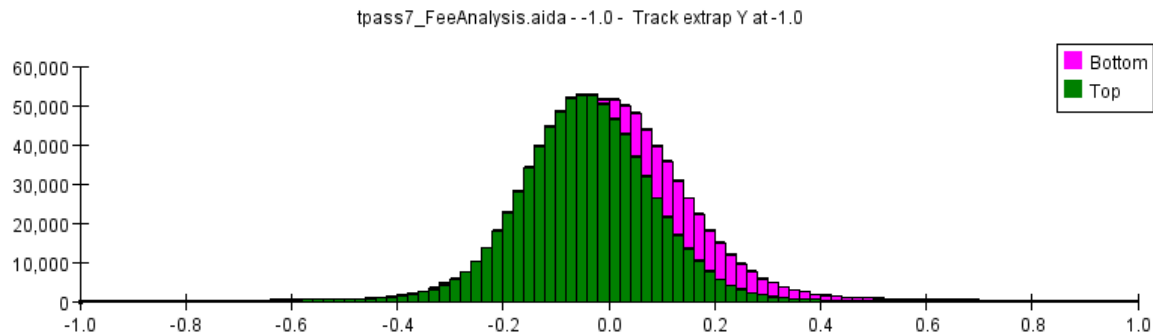
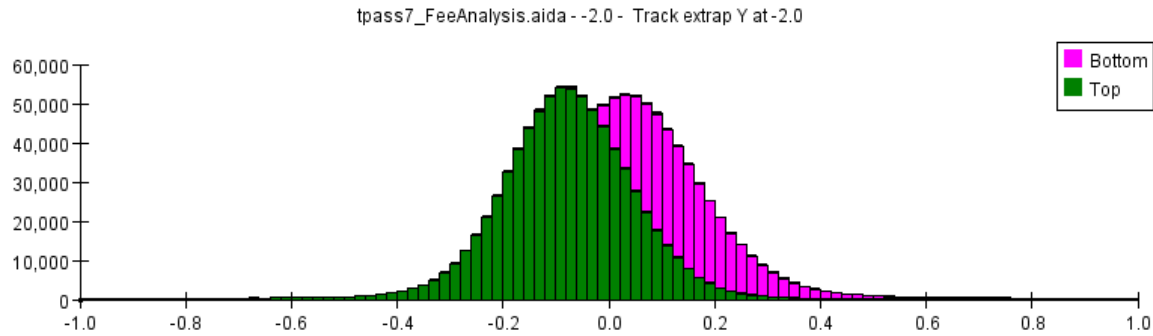
2015 tpass7 FEE Top Track Momentum



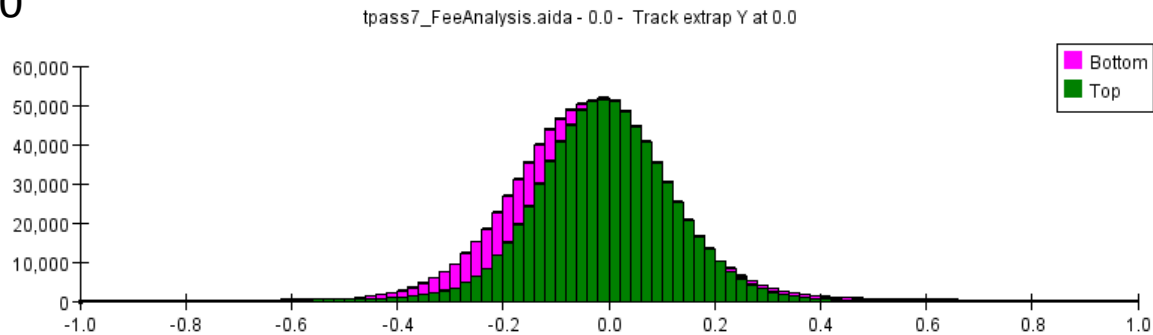
2015 tpass7 FEE Bottom Track Momentum



# 5772 Pass7 Fee

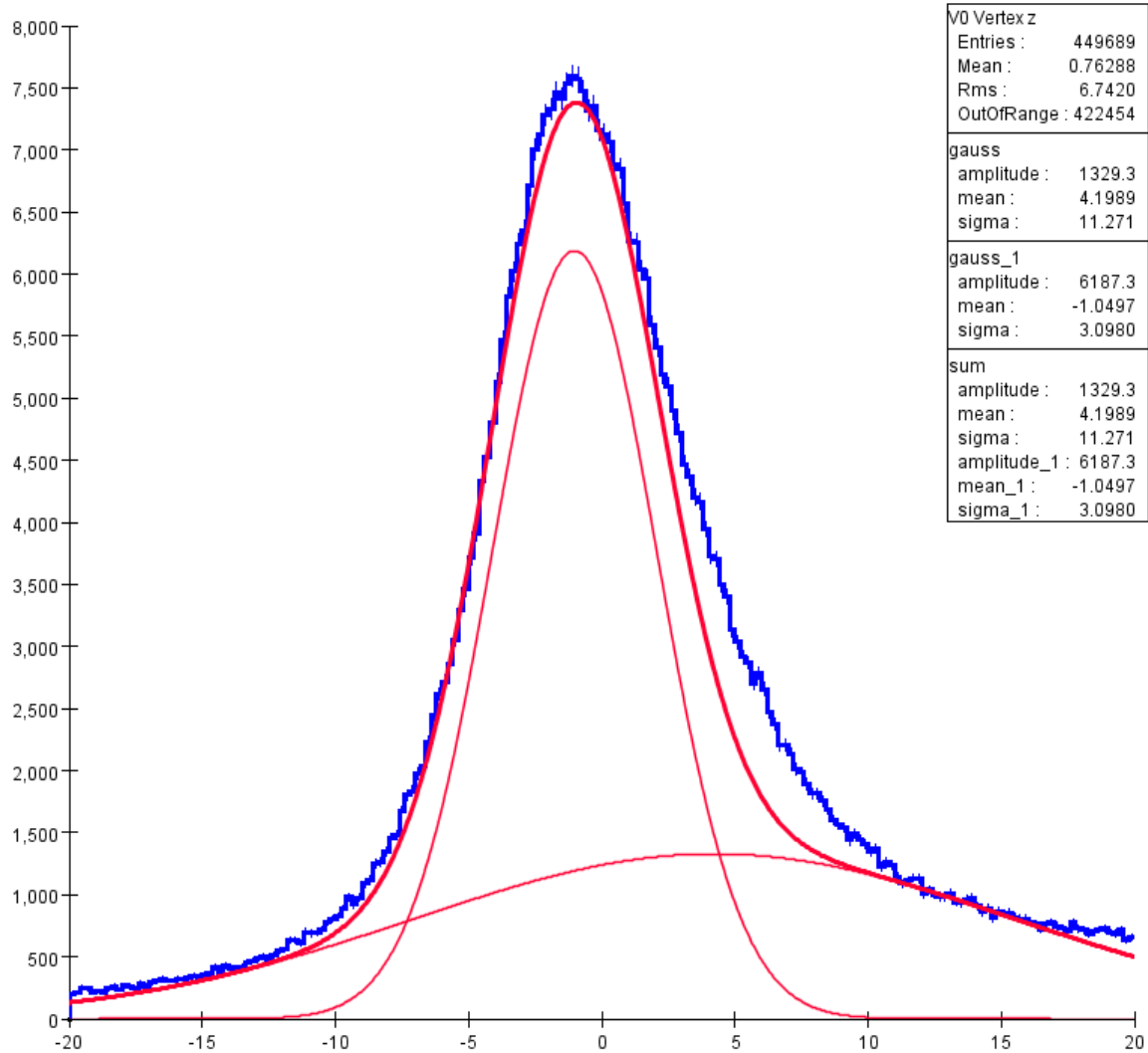


Between -1 and 0



# 2015 Pass7 V0

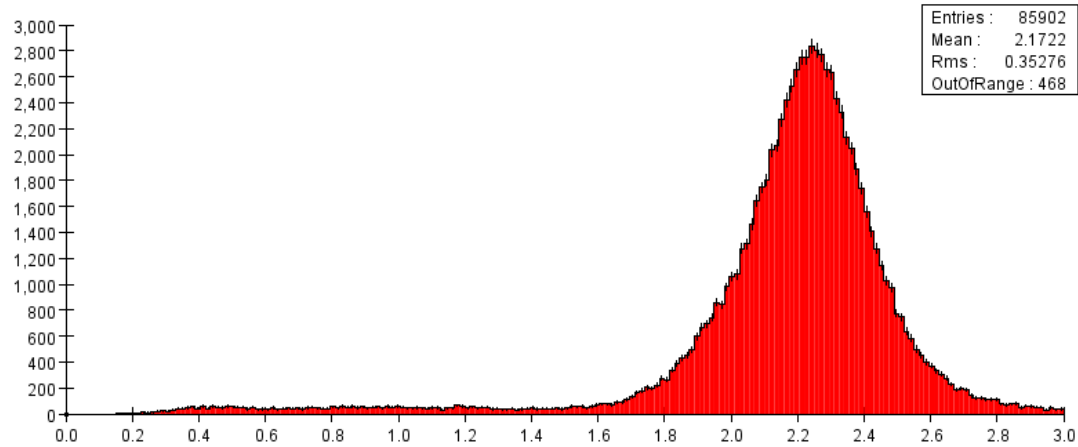
2015 tpass7 V0 Unconstrained Vertex Z



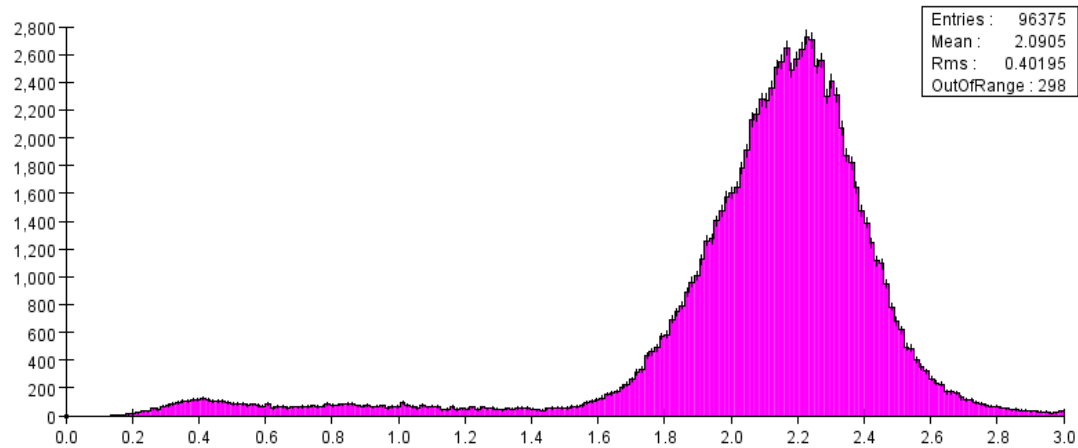
Mean -1.05

# 2016 tpass1 FEE

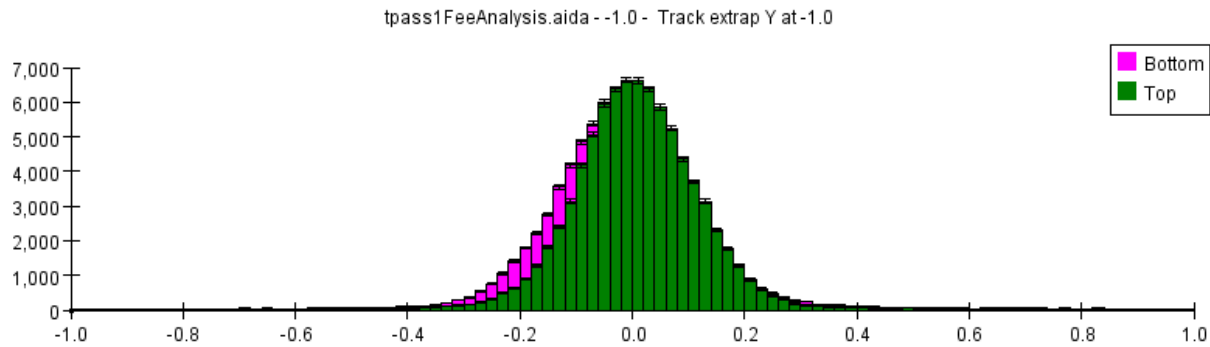
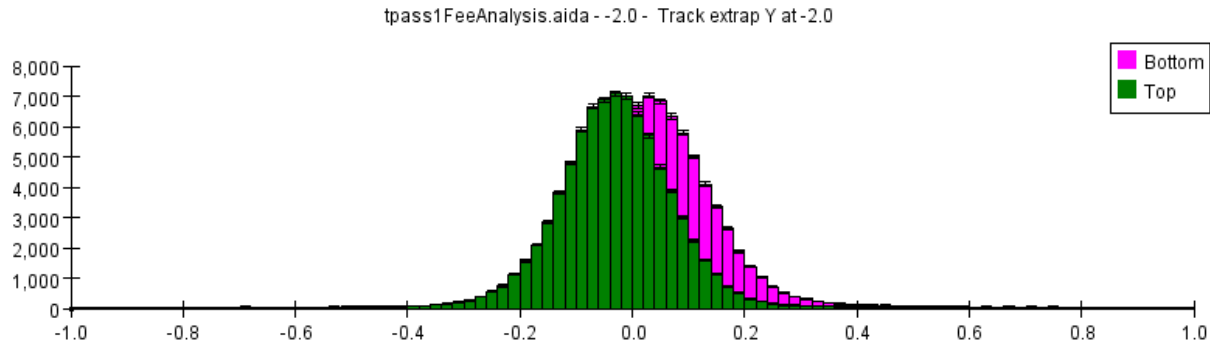
2016 tpass1 FEE Top Track Momentum



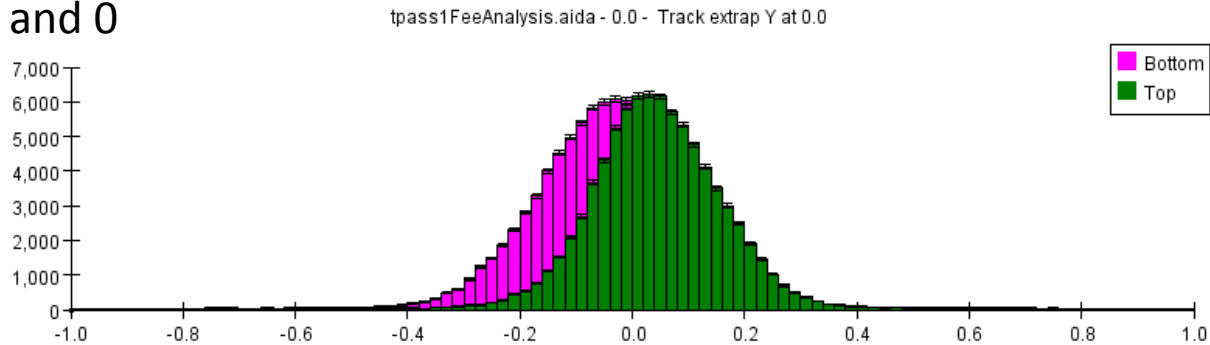
2016 tpass1 FEE Bottom Track Momentum



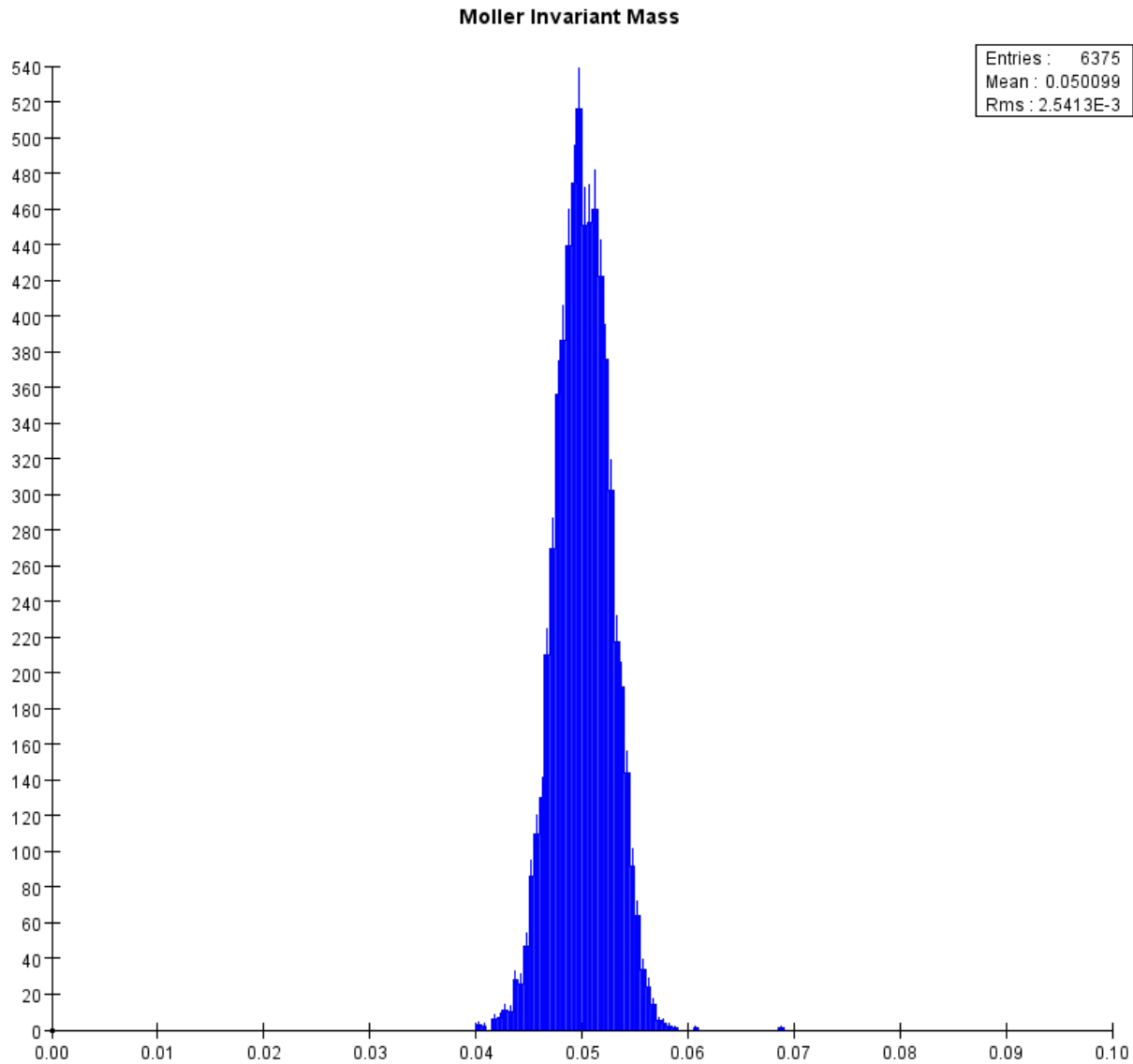
# 2016 tpass1 FEE



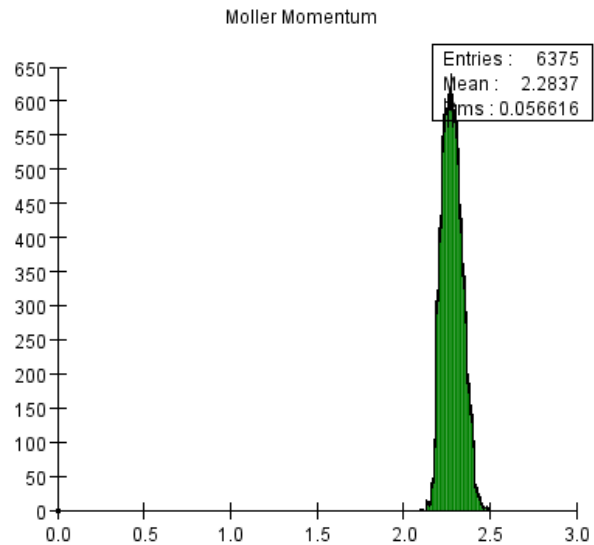
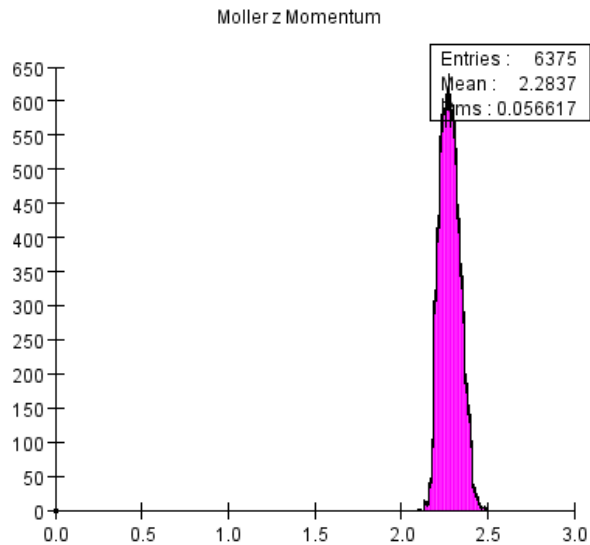
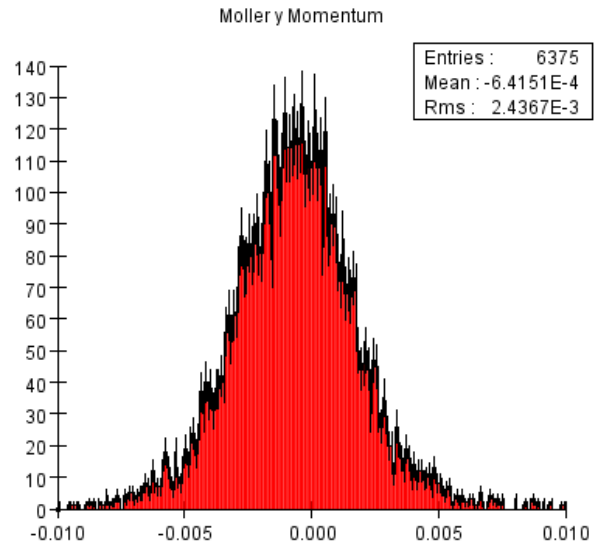
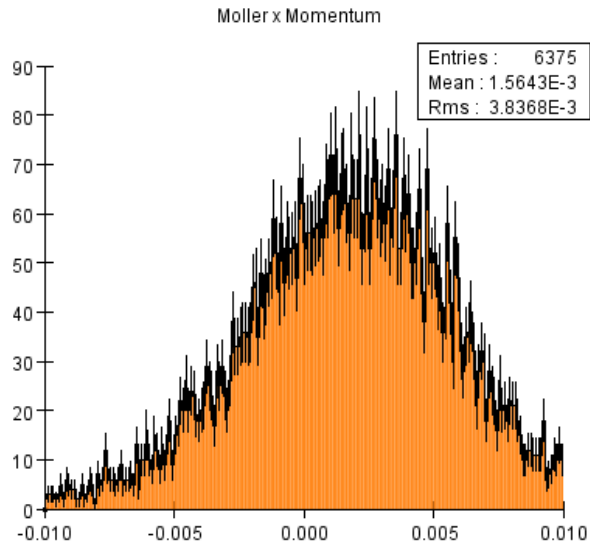
Between -1 and 0



# 2016 tpass1 Moller



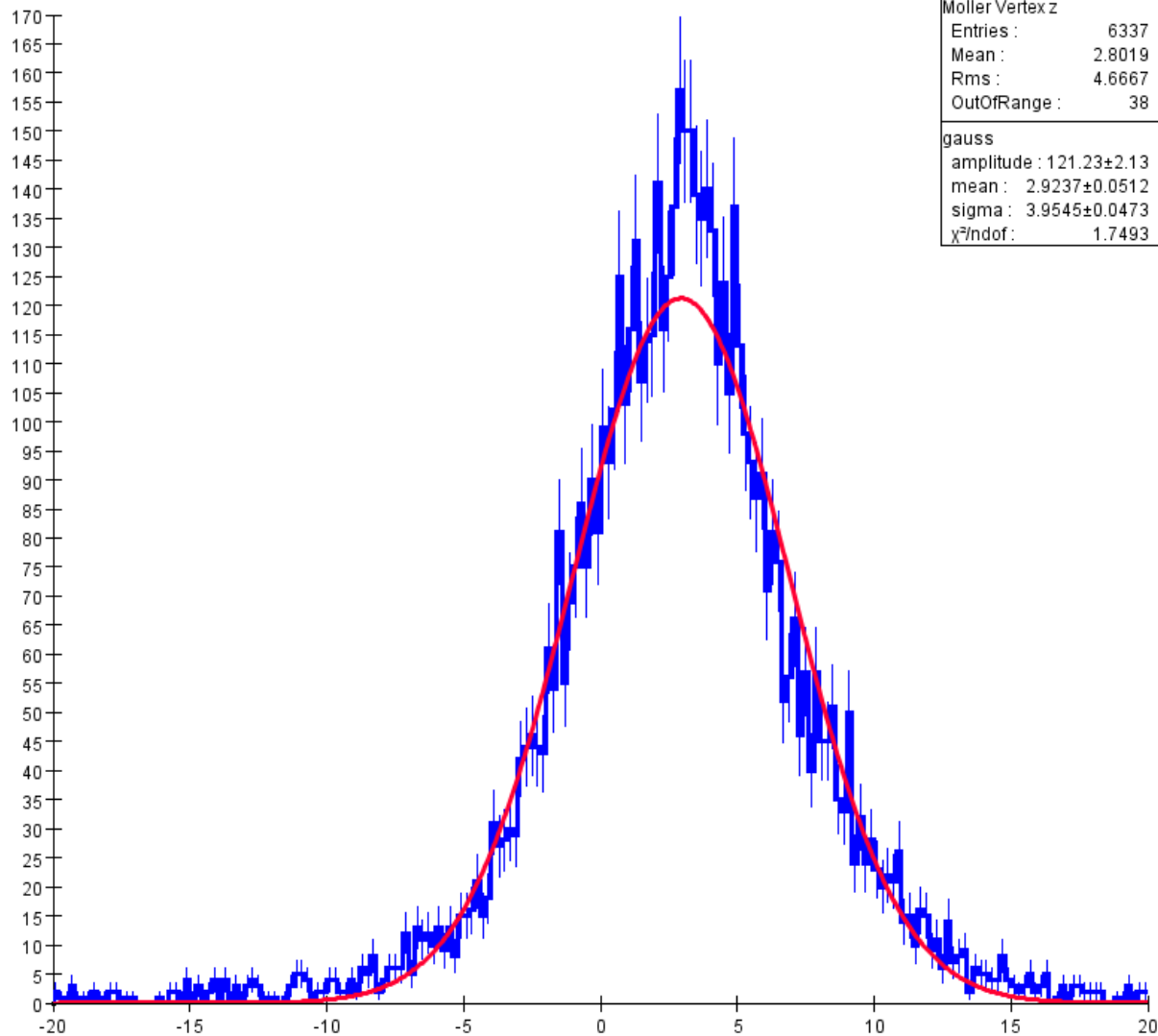
# 2016 tpass1 Moller





# 2016 tpass1 Moller

2016 tpass1 Møller Unconstrained Vertex Z Position



Mean: 2.9

# Latest

- Latest iterations appear to be converging on a target position close to  $z=0$ . Maybe slightly negative.
  - Except for 2016 Møllers from 7796 (?)
- Need to do a final comparison between evio raw reconstruction with re-reco for the 2015 data.
  - Will pass7 be from scratch (evio) or from lcio?
- tpass1 looking better with latest geometry
  - V0 analysis underway (jobs still running...)
- Still some work to be done.

# Summary

- Vertex mass calculation patched.
- Vertex position pulls for A' MC now normally distributed, should be able to adopt a significance-based cut on the vertex displacement instead of simple cut.
- Able to set average beamspot and target position for target constrained vertices
  - Still some uncertainty on the target z position
- QA ongoing using Møller, V0 and FEE samples
- Note in preparation