

LCFIPlus vertexing on ttbar test sample

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Setup

❖ **ttbar samples (April)**

- ▶ 6f_ttbar, 500GeV
- ▶ ILD_I5_oI_v02 (ILD_s5_oI_v02 is underway.)

❖ **ILCSoft v01-19-06**

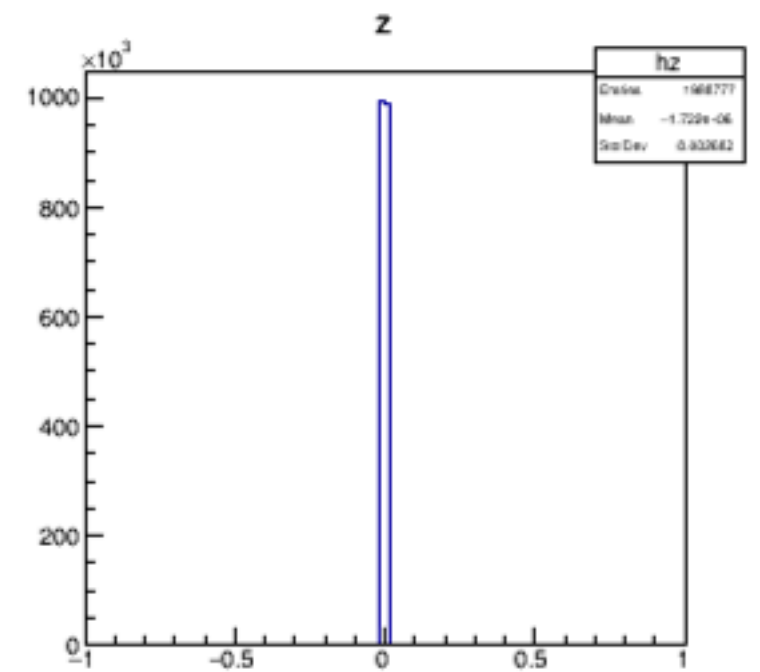
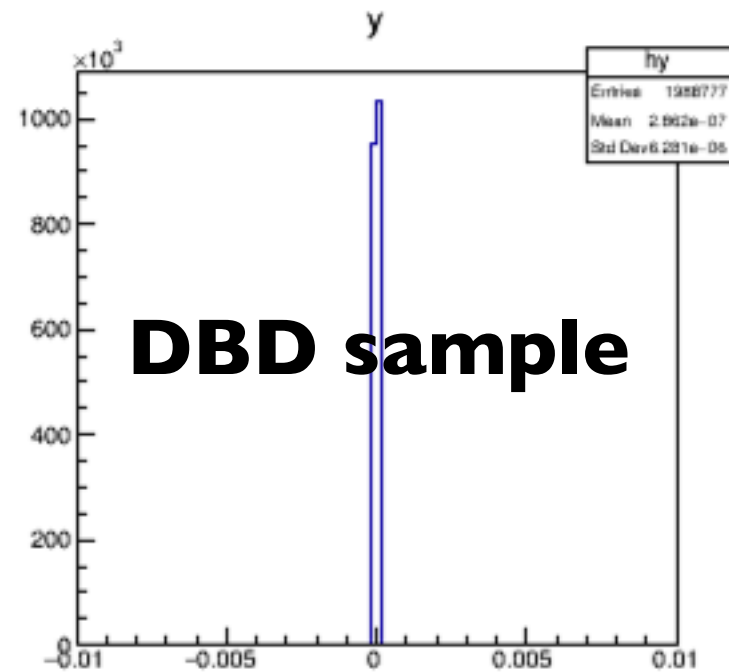
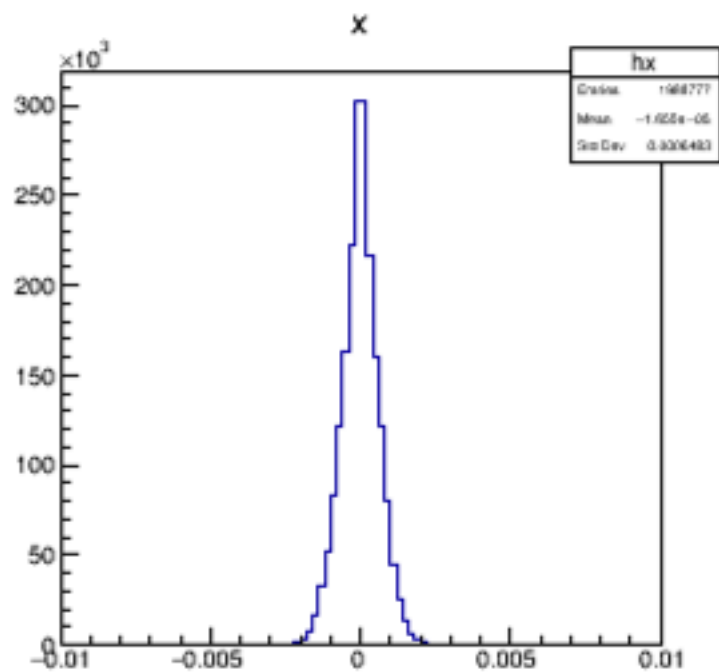
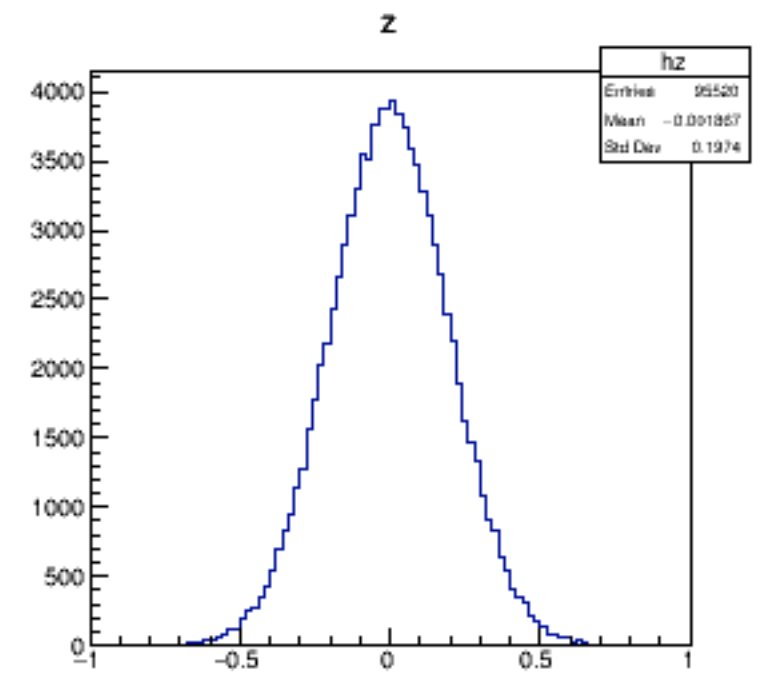
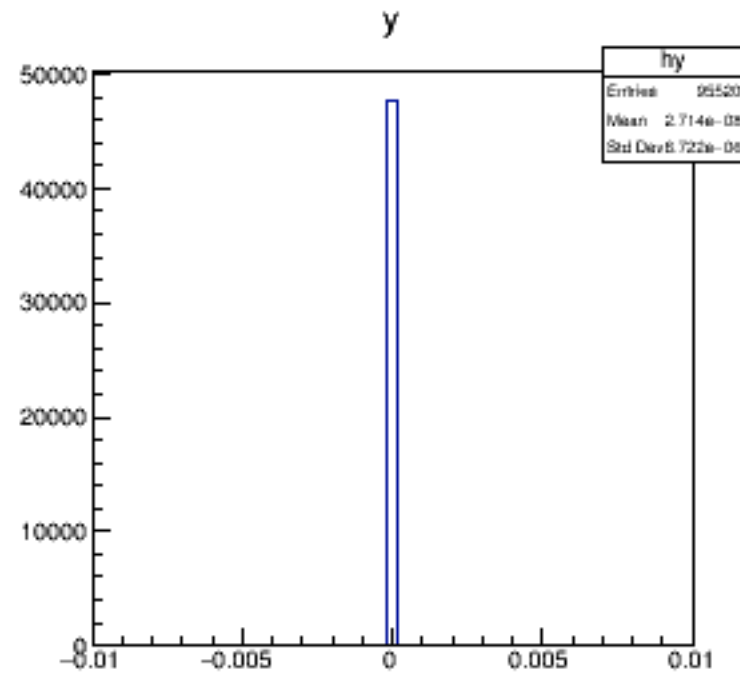
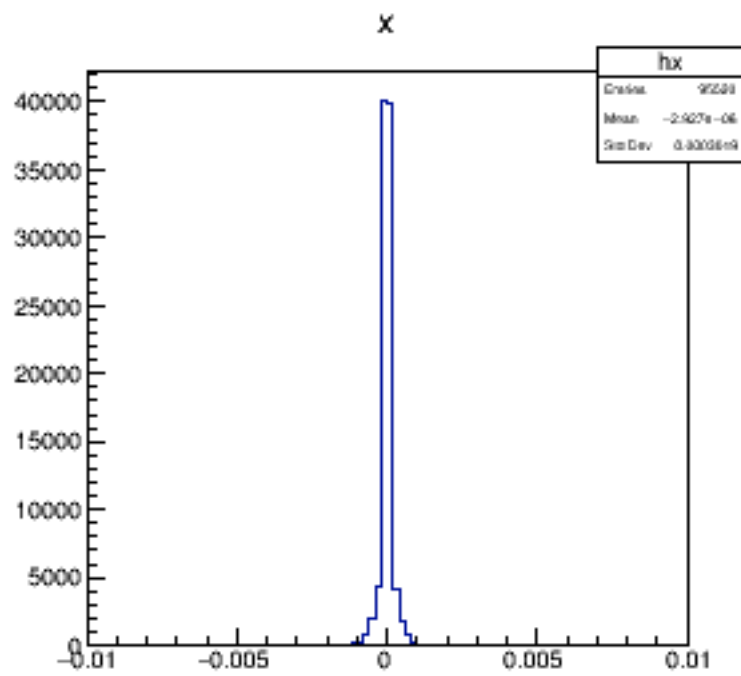
- ▶ TruthVertexFinder developed by Sviatoslav.
- ▶ Vertex rec-mc matching = compute distance (squared) and sum over all secondary vertices ($:= \text{chi}^2$) for all combinations.

e.g. Given Rec : 3 vertices, MC : 4 vertices in a event,

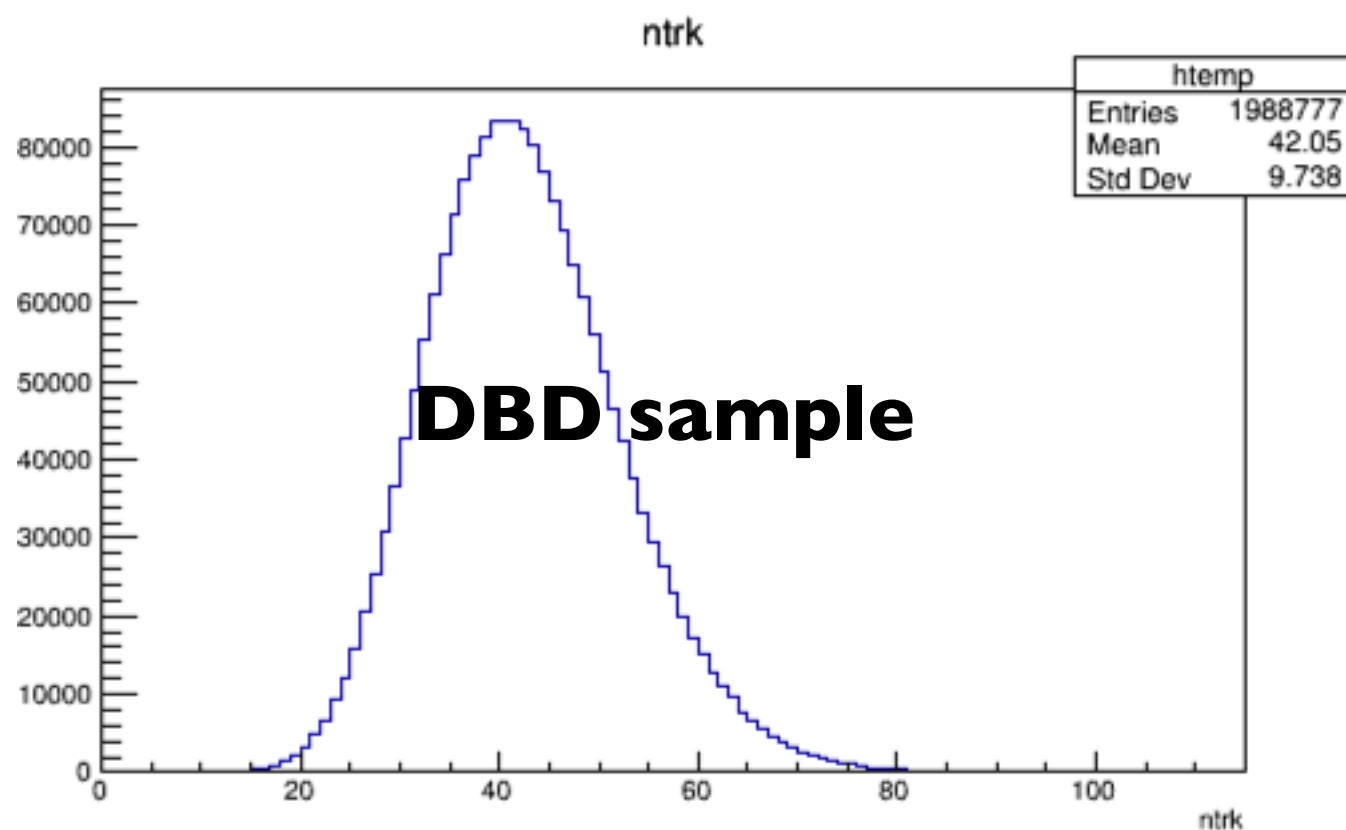
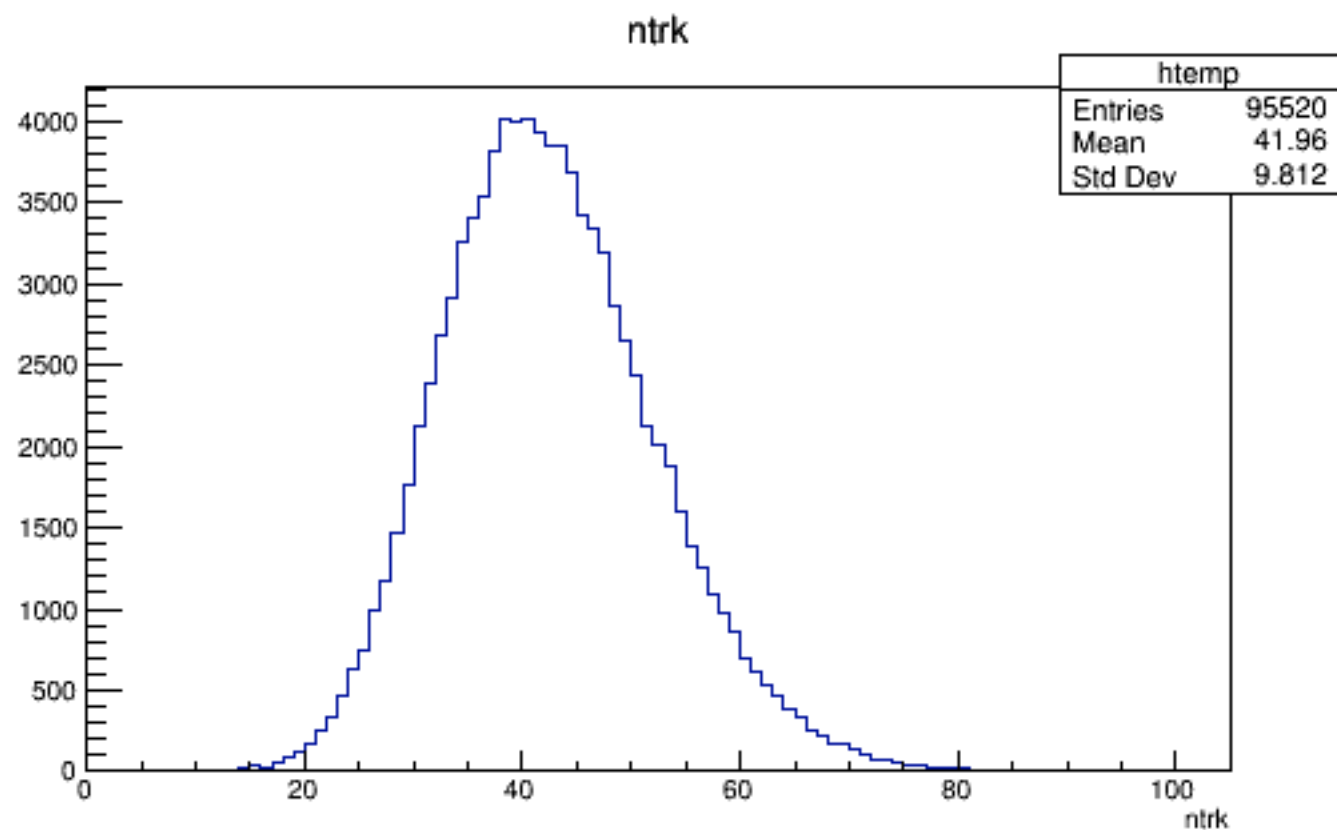
${}^4P_3 = 24$ combinations \Rightarrow find a combination having minimum chi^2 .

❖ **DBD sample (6f_ttbar) as a reference**

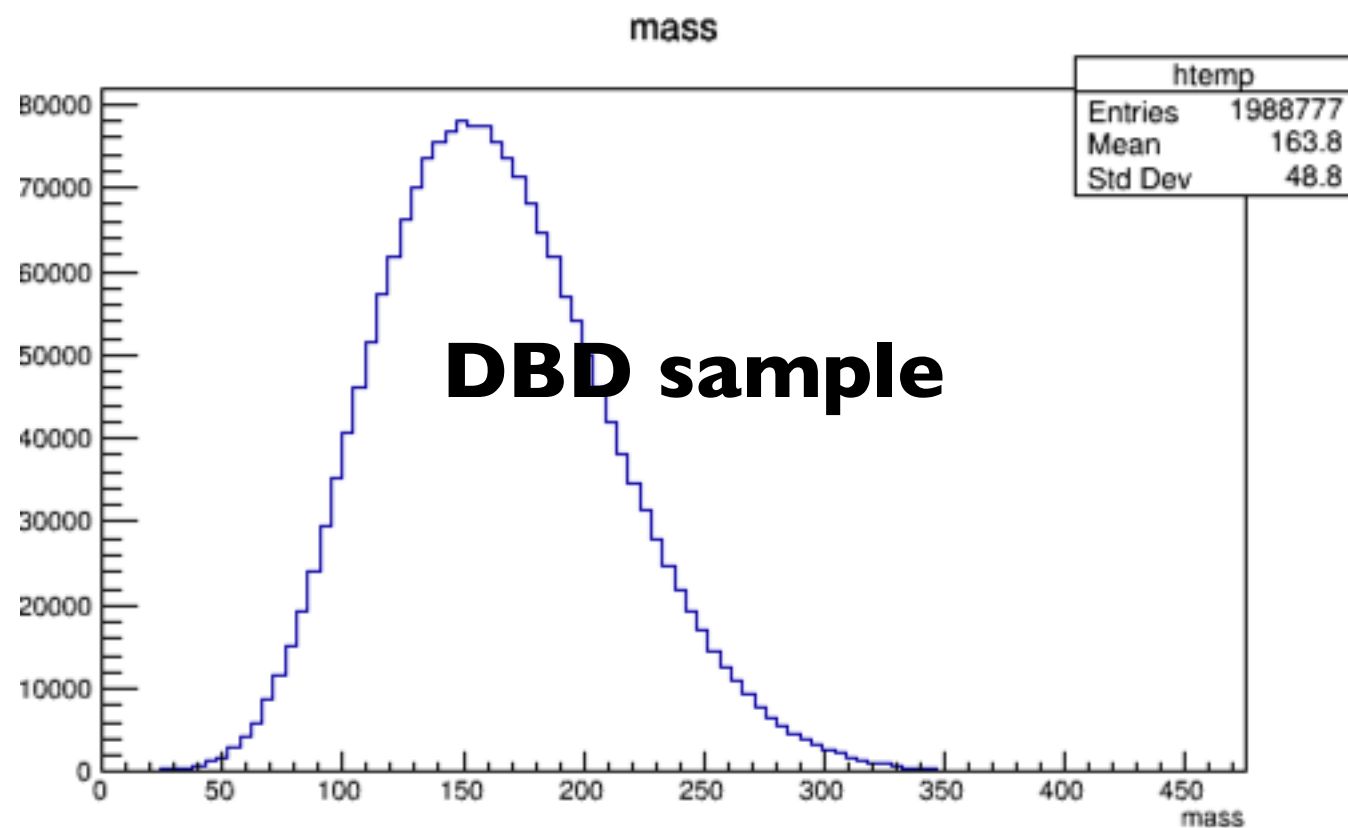
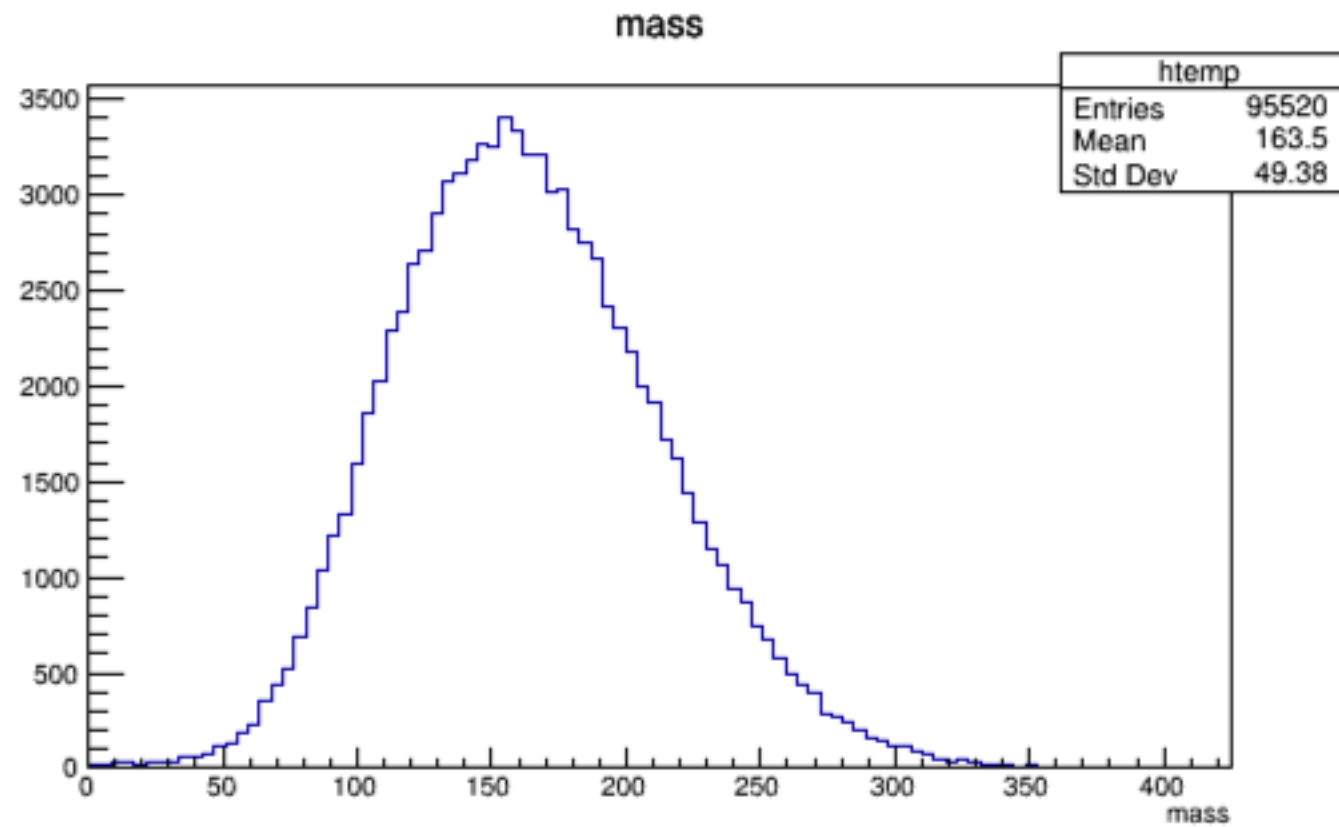
Primary vertex (position)



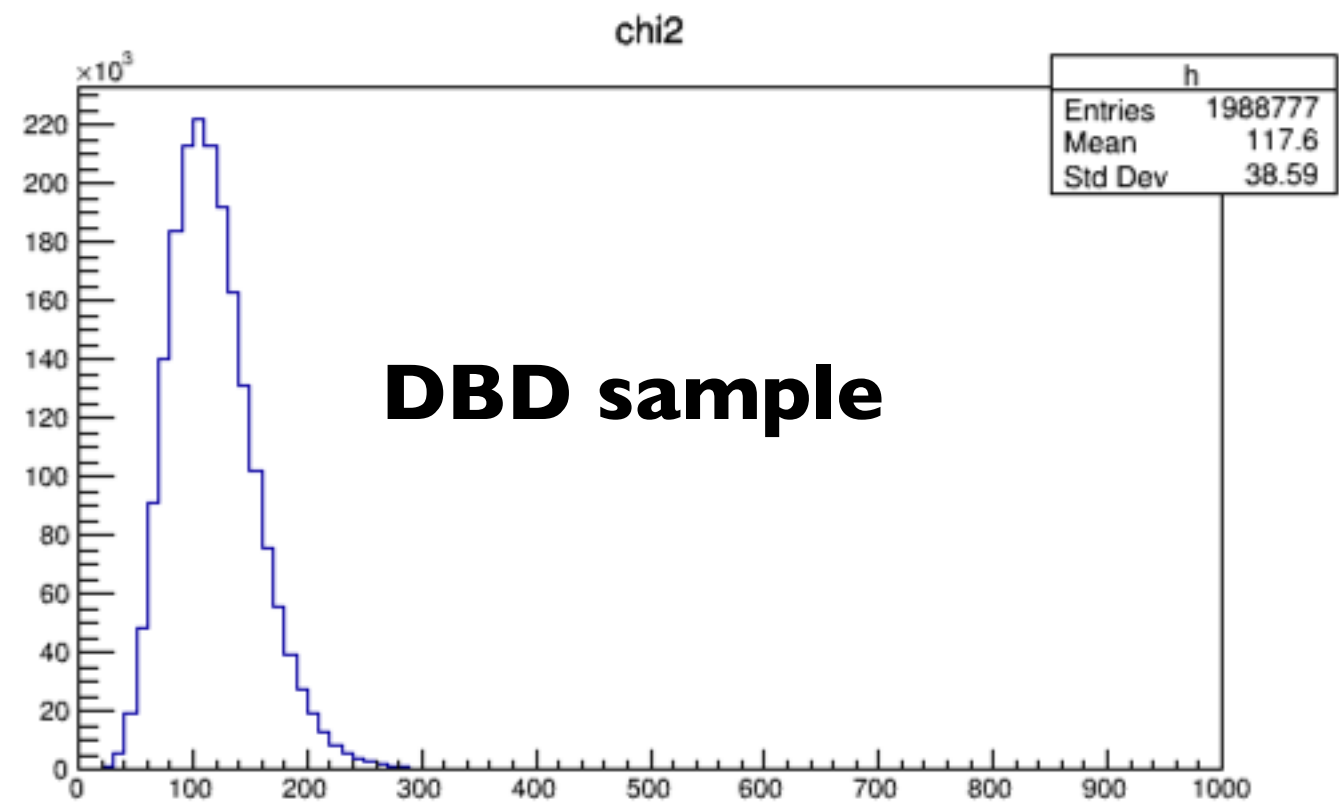
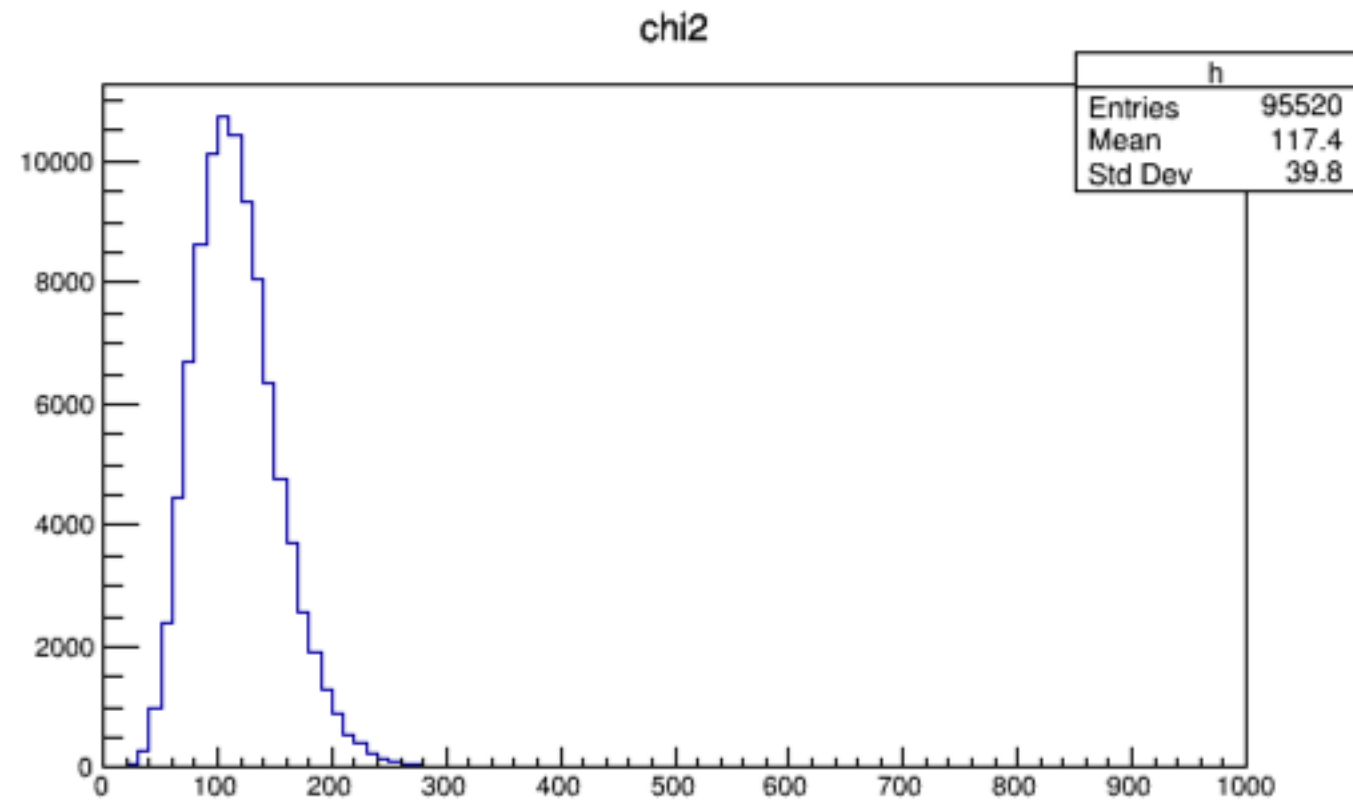
Primary vertex (# of tracks)



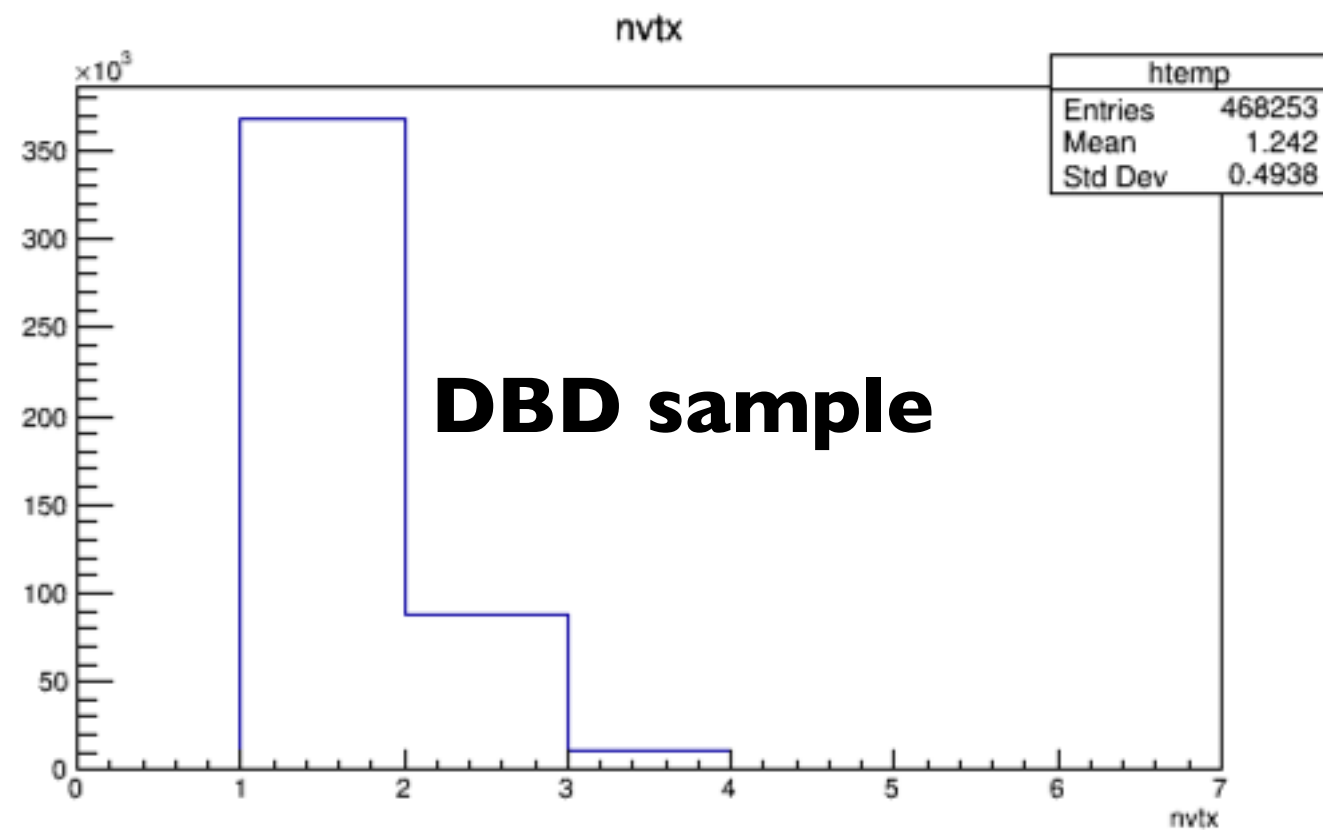
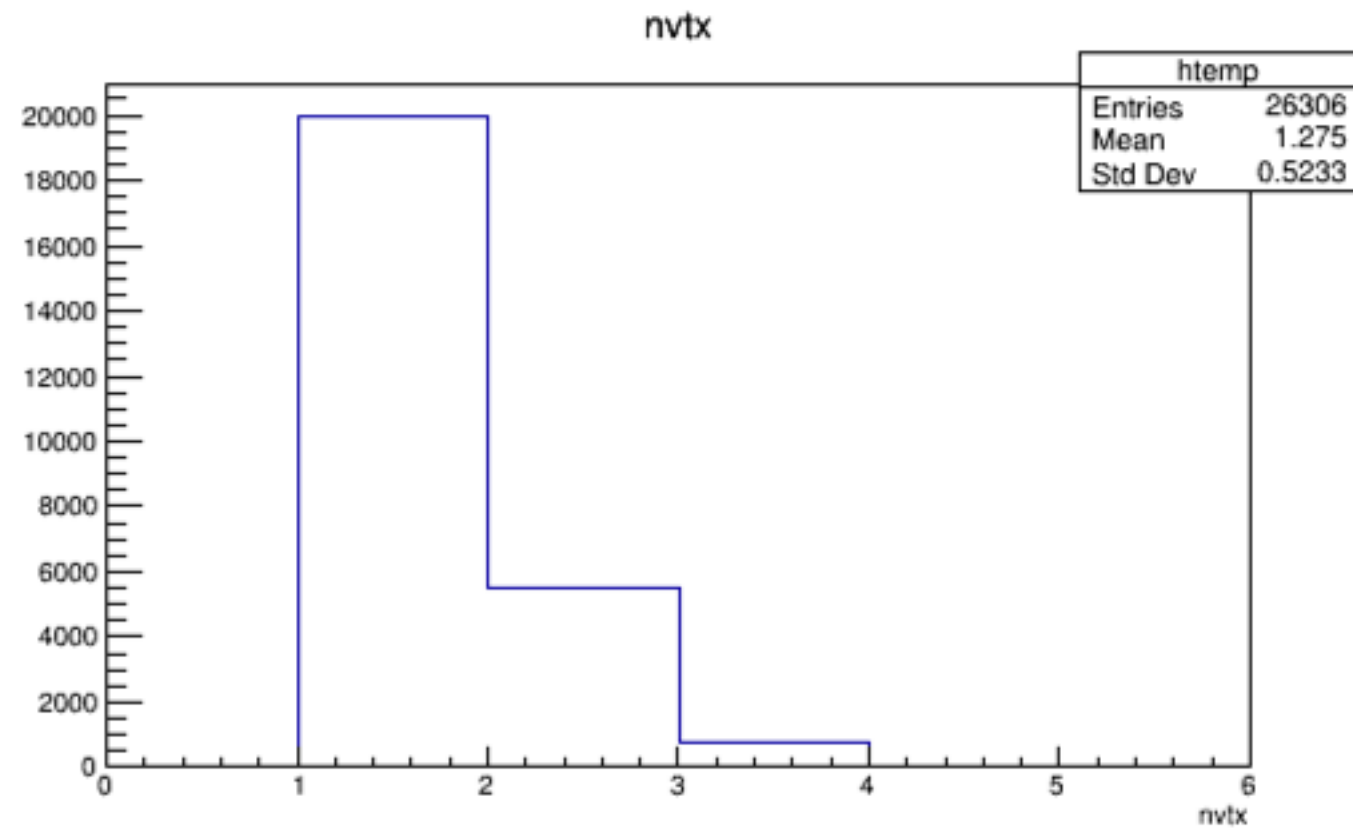
Primary vertex (vertex mass)



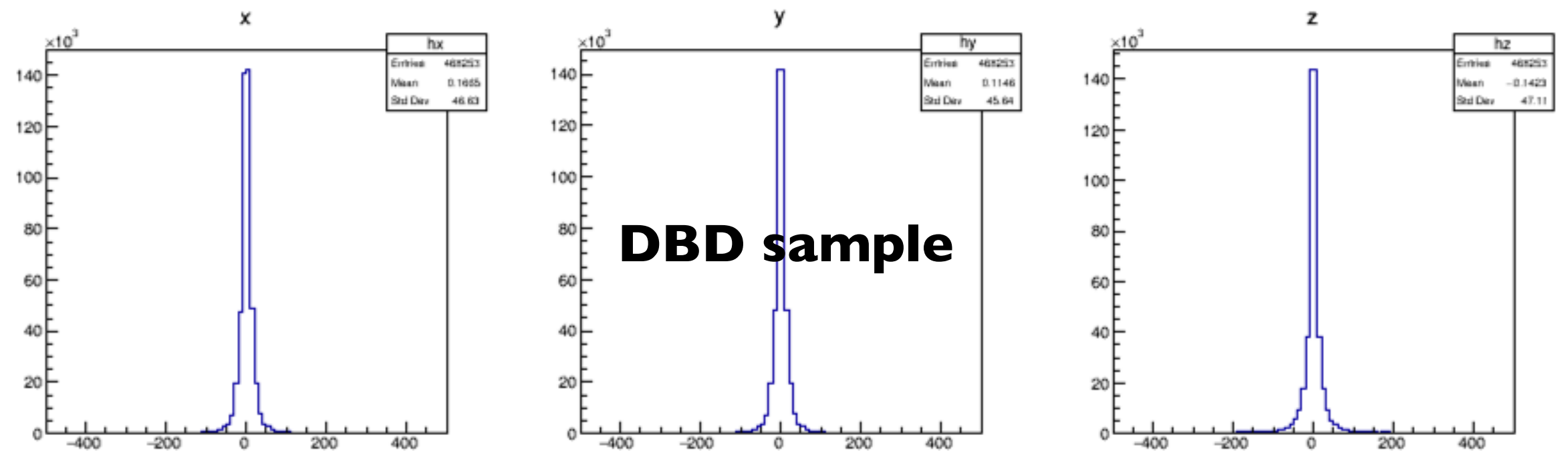
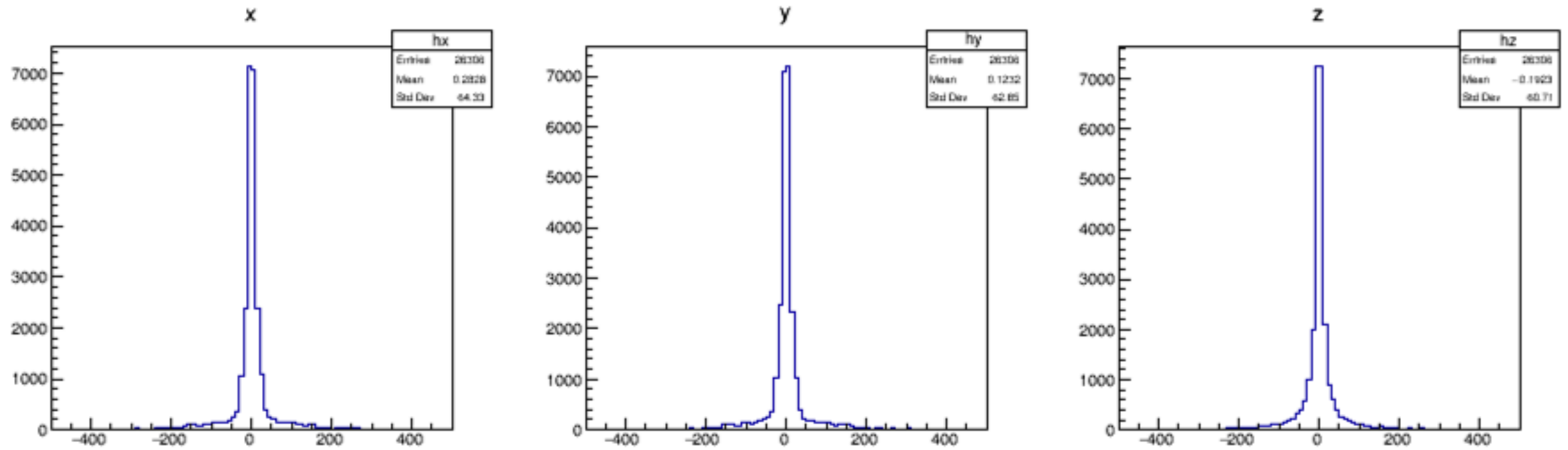
Primary vertex (chi2)



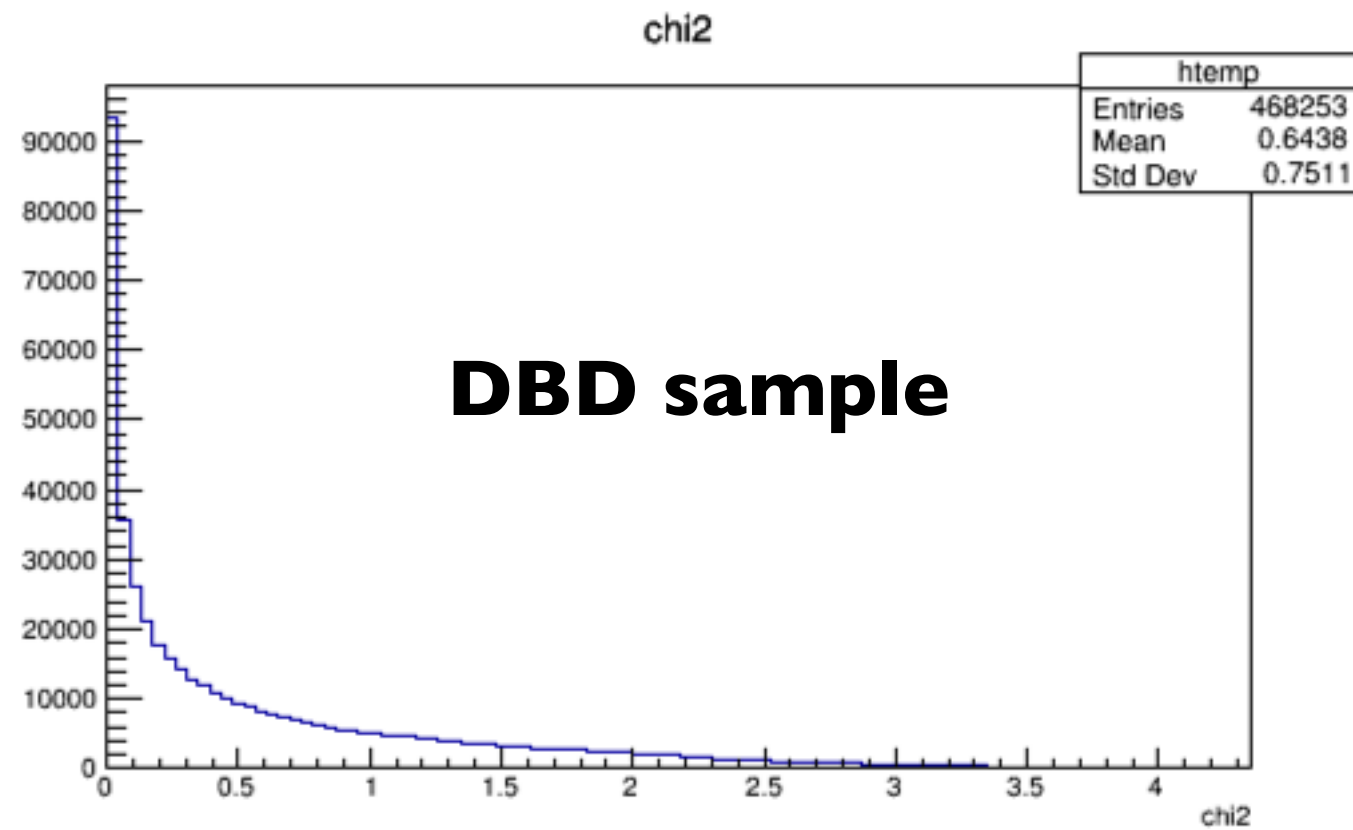
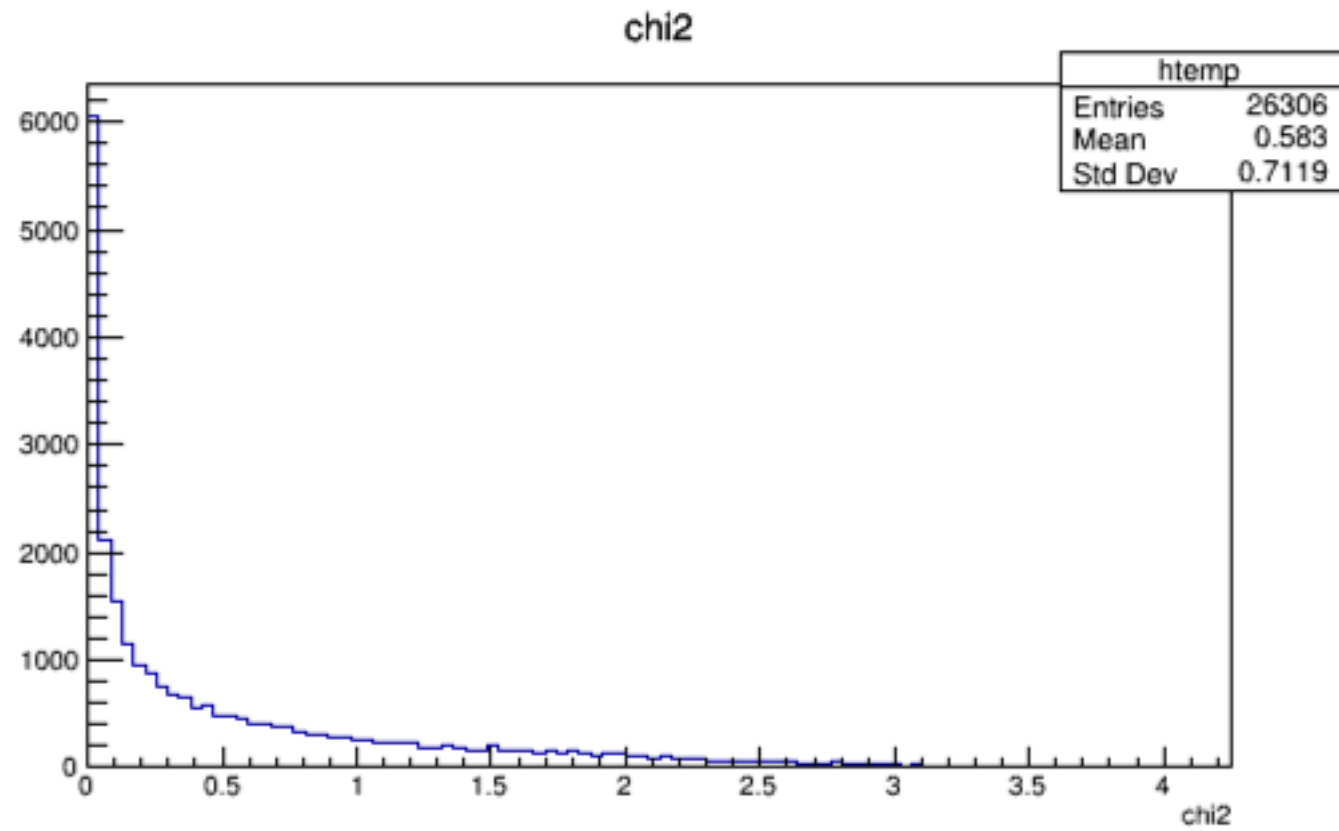
V0 vertex (# of vertices per event)



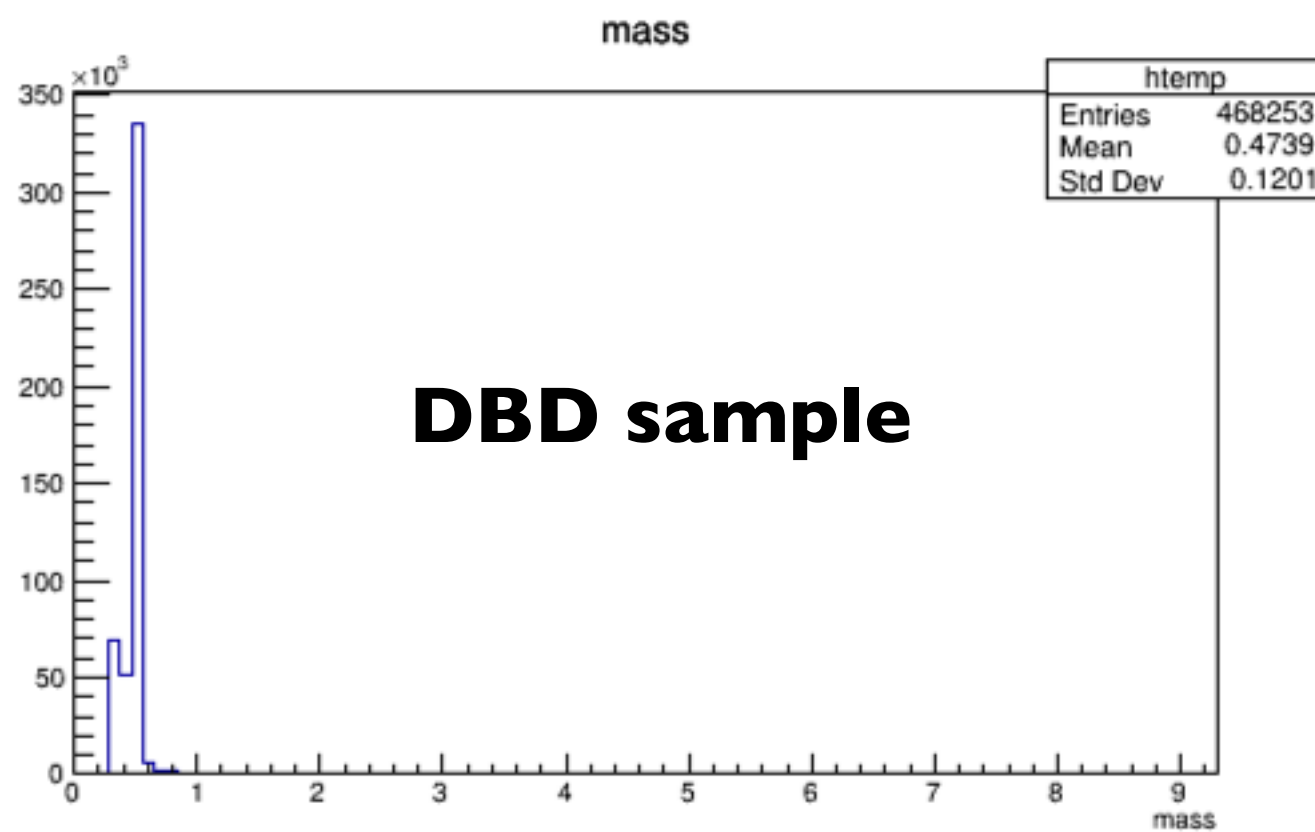
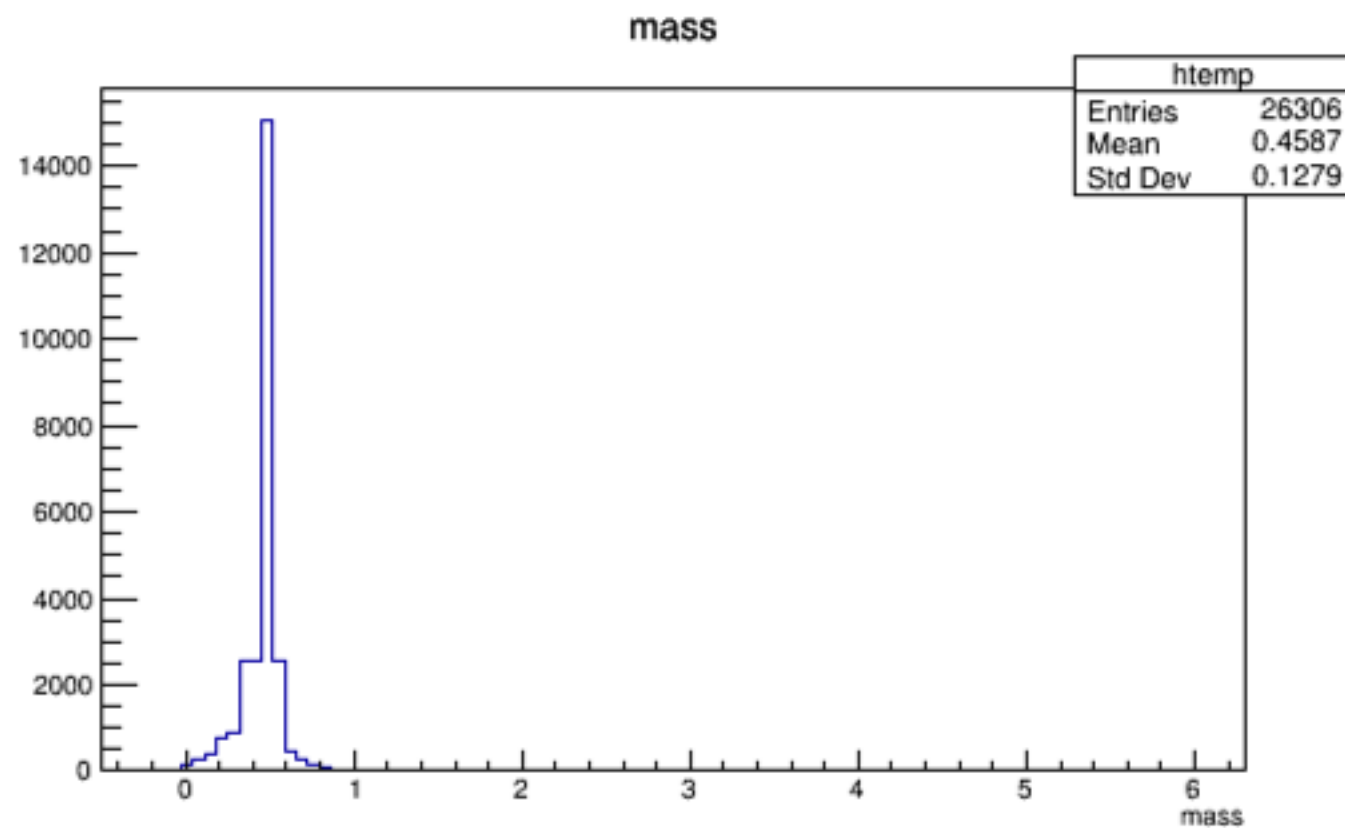
V0 vertex (position)



V0 vertex (chi2)

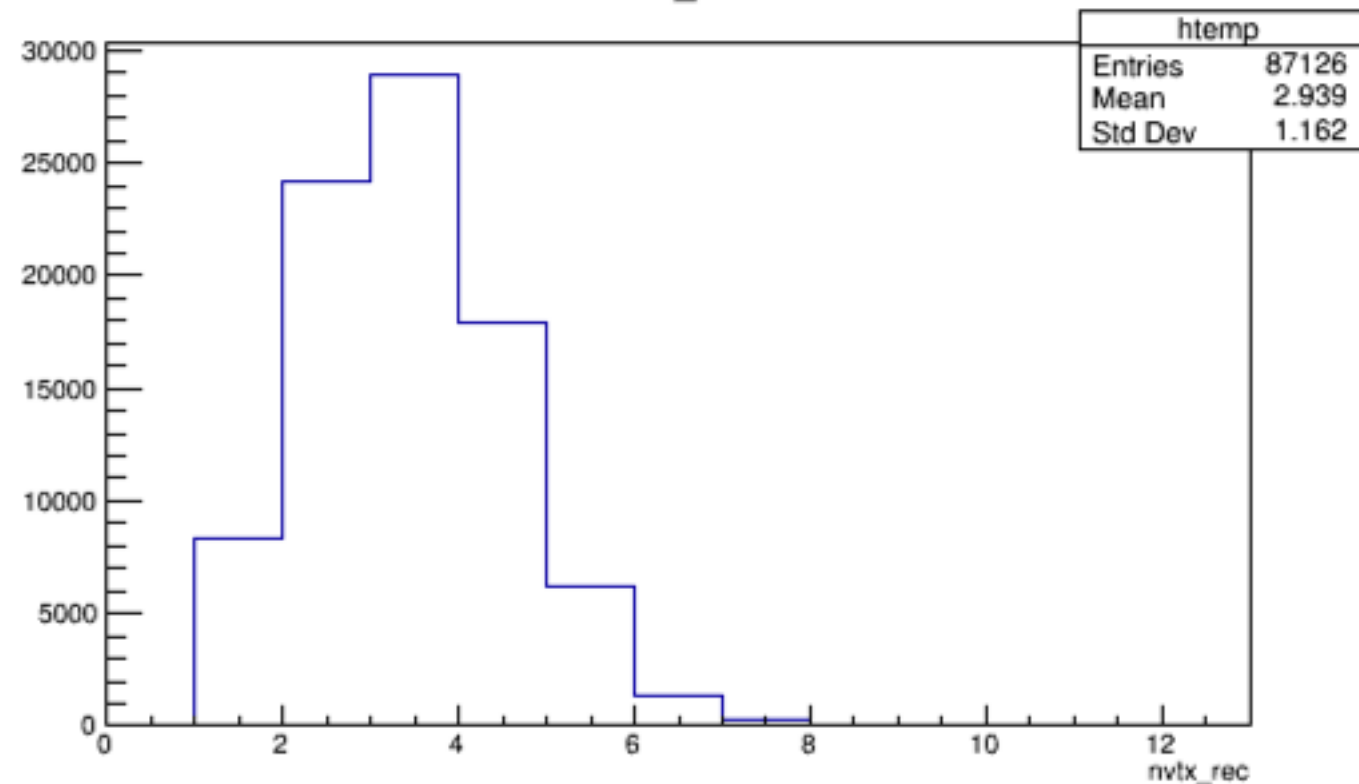


V0 vertex (mass)

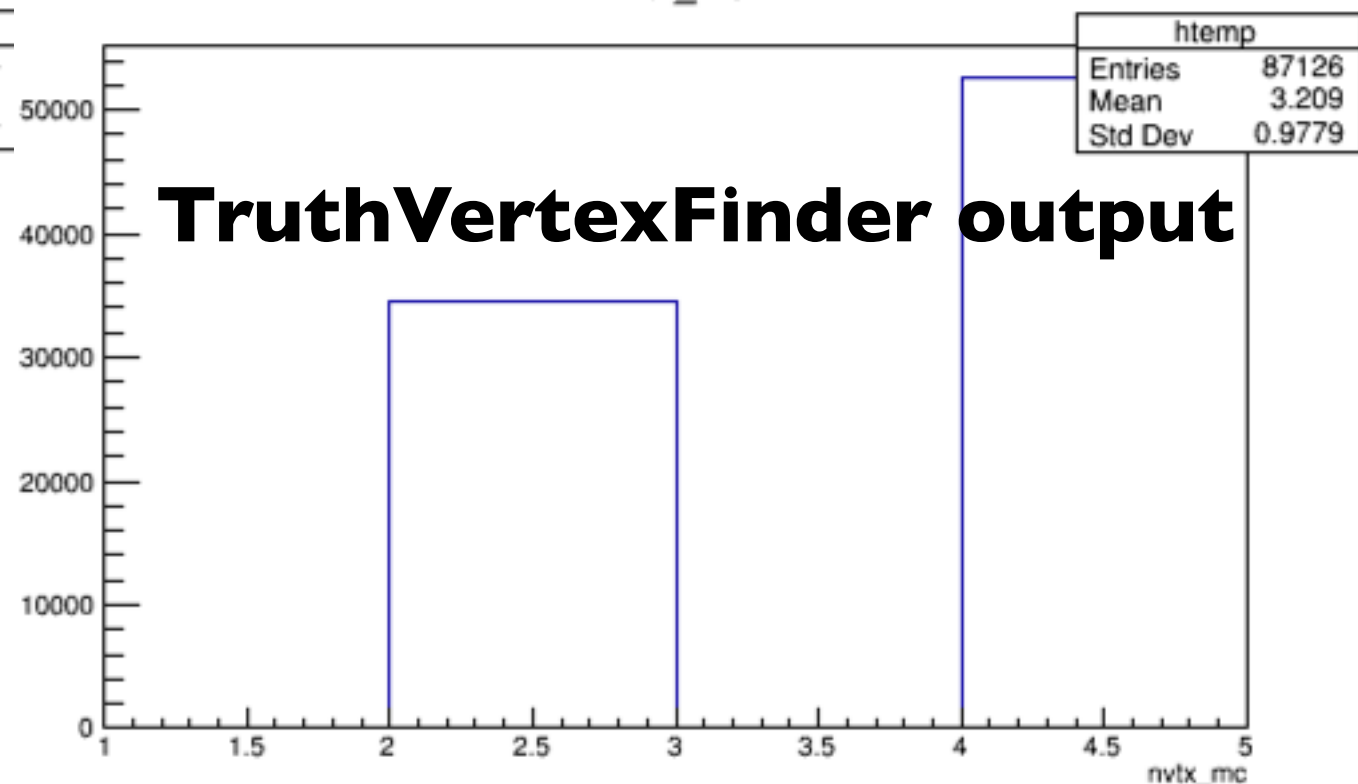


Secondary vertex (# of vertices per event)

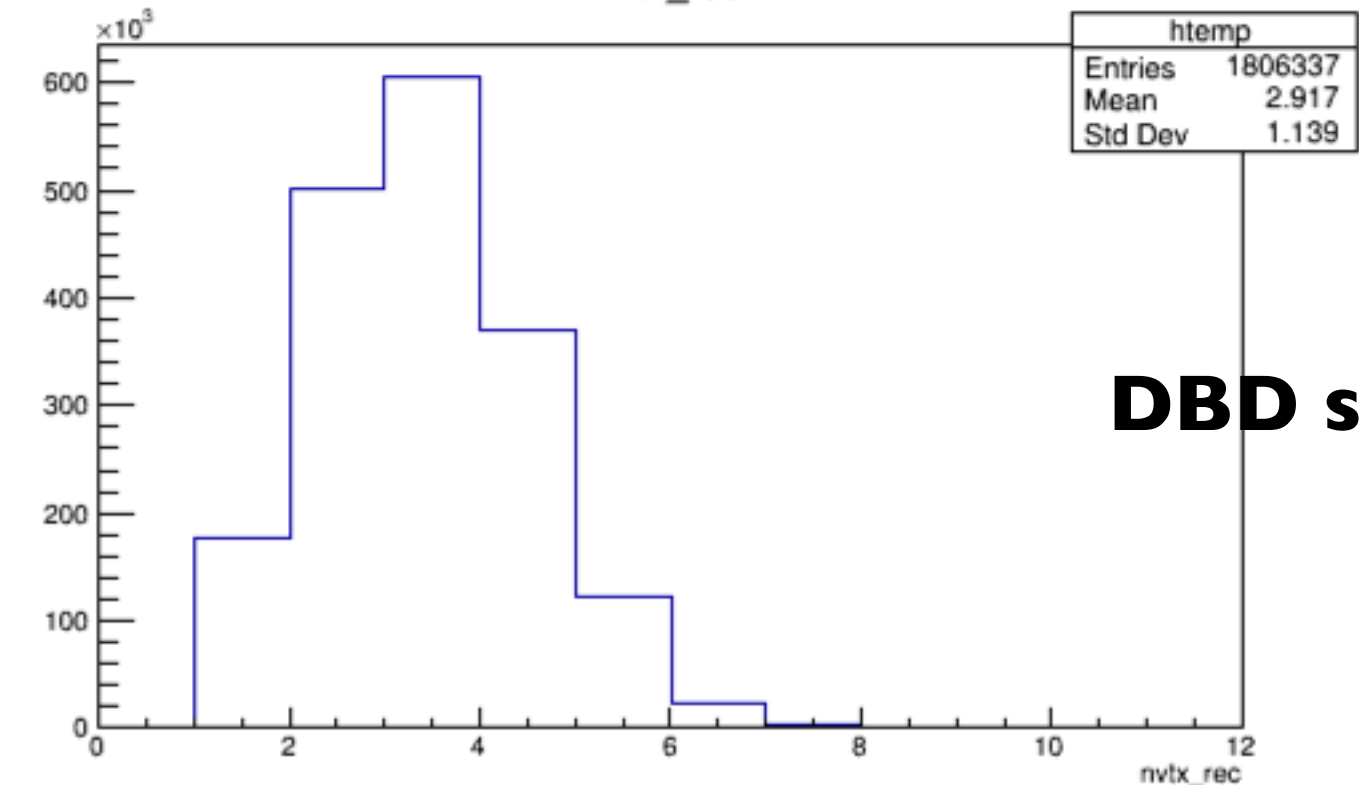
nvtx_rec



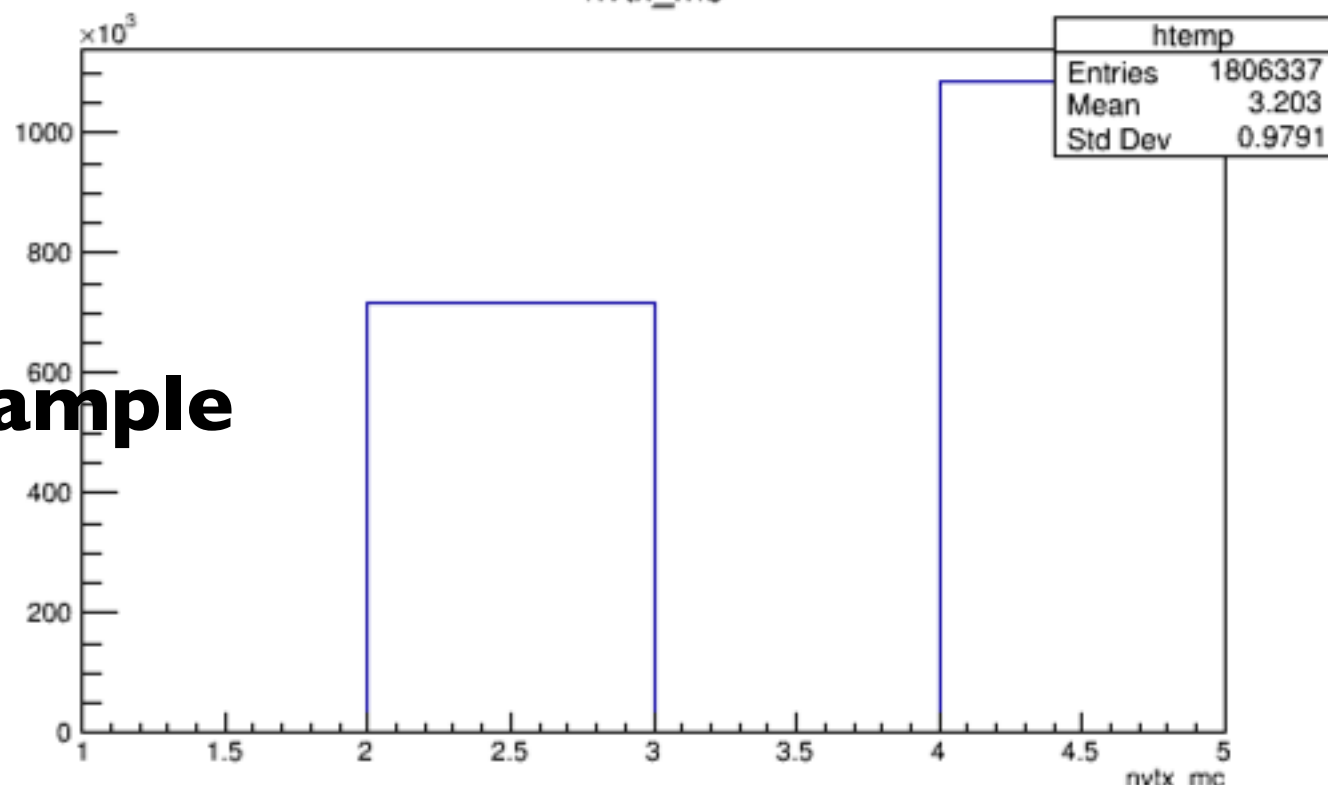
nvtx_mc



nvtx_rec

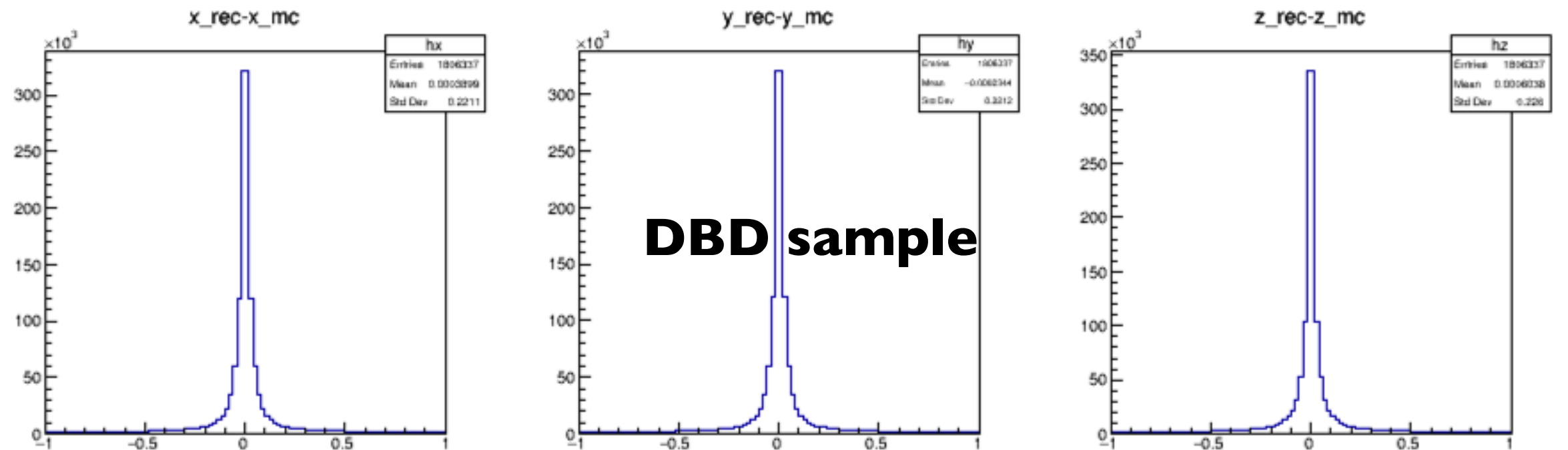
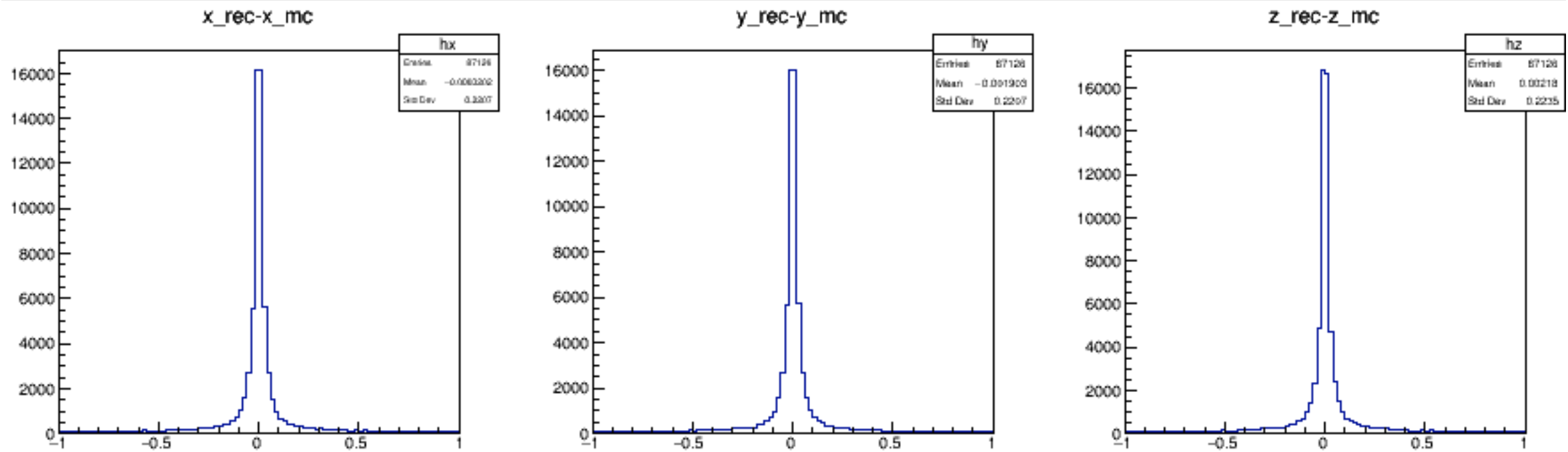


nvtx_mc



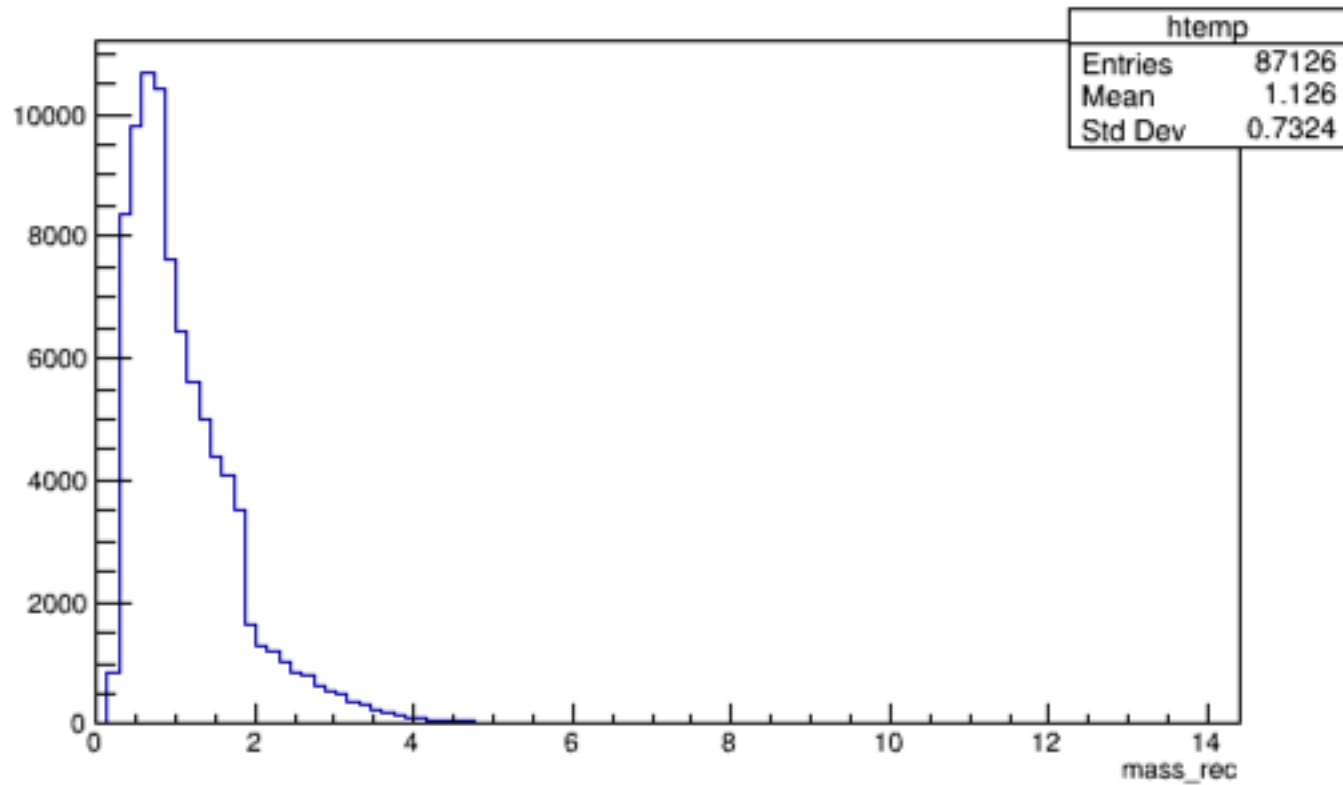
Secondary vertex (residual)

plot “matched vertices” only

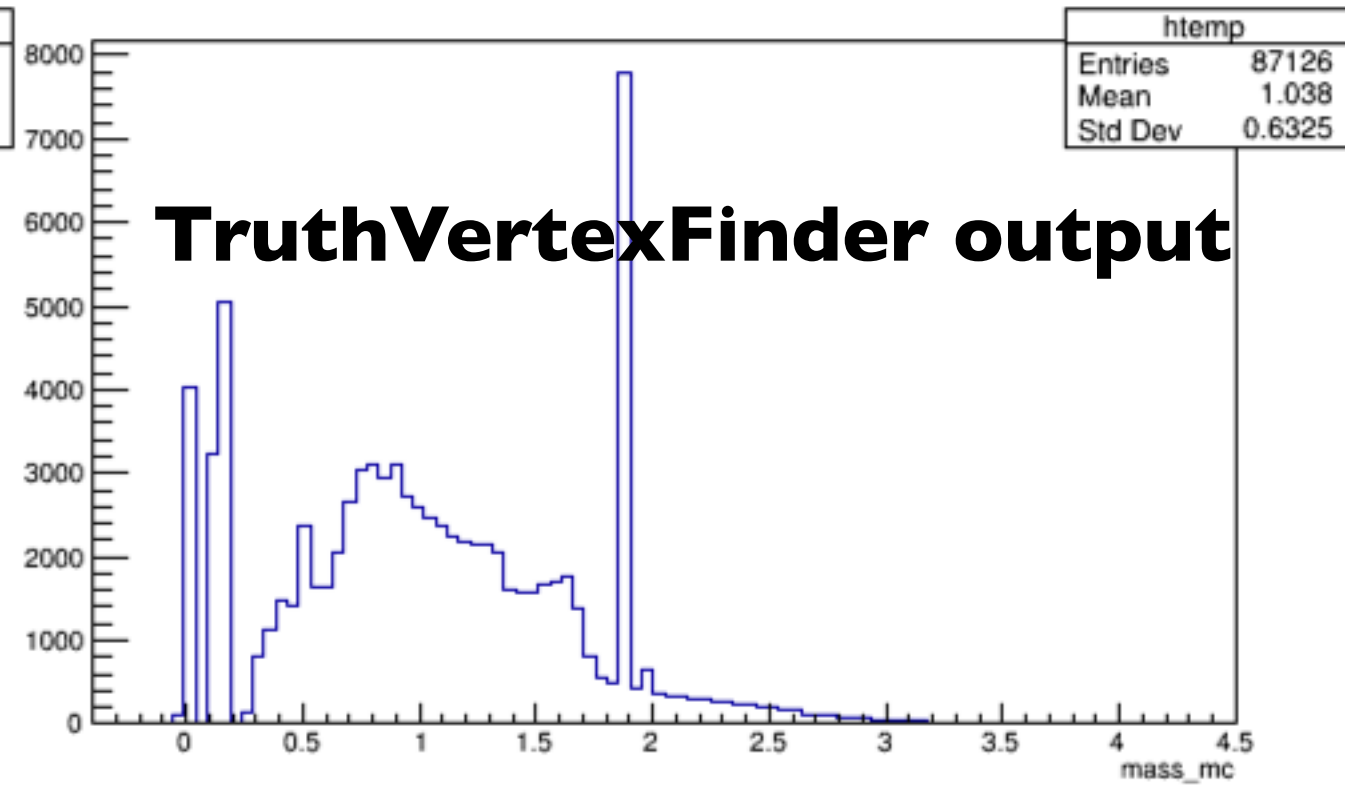


Secondary vertex (mass)

mass_rec

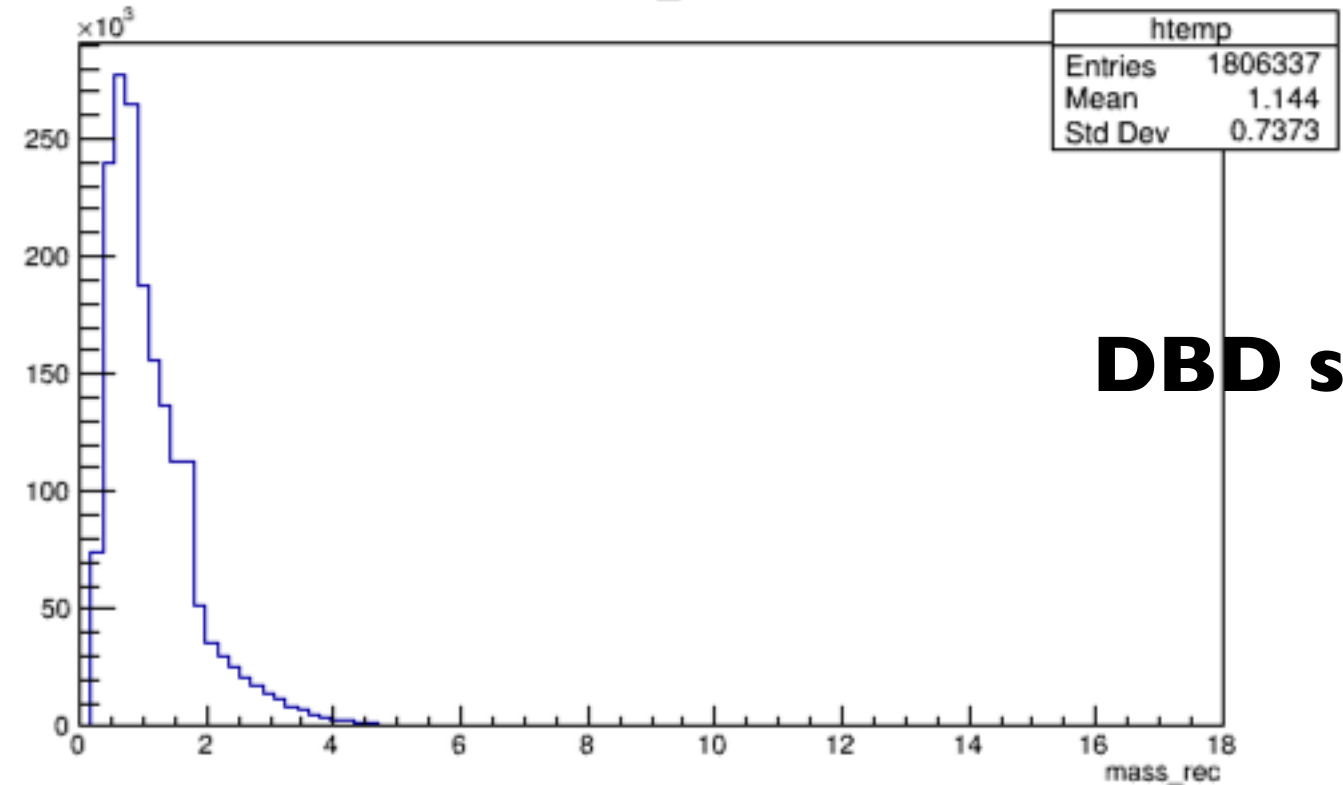


mass_mc

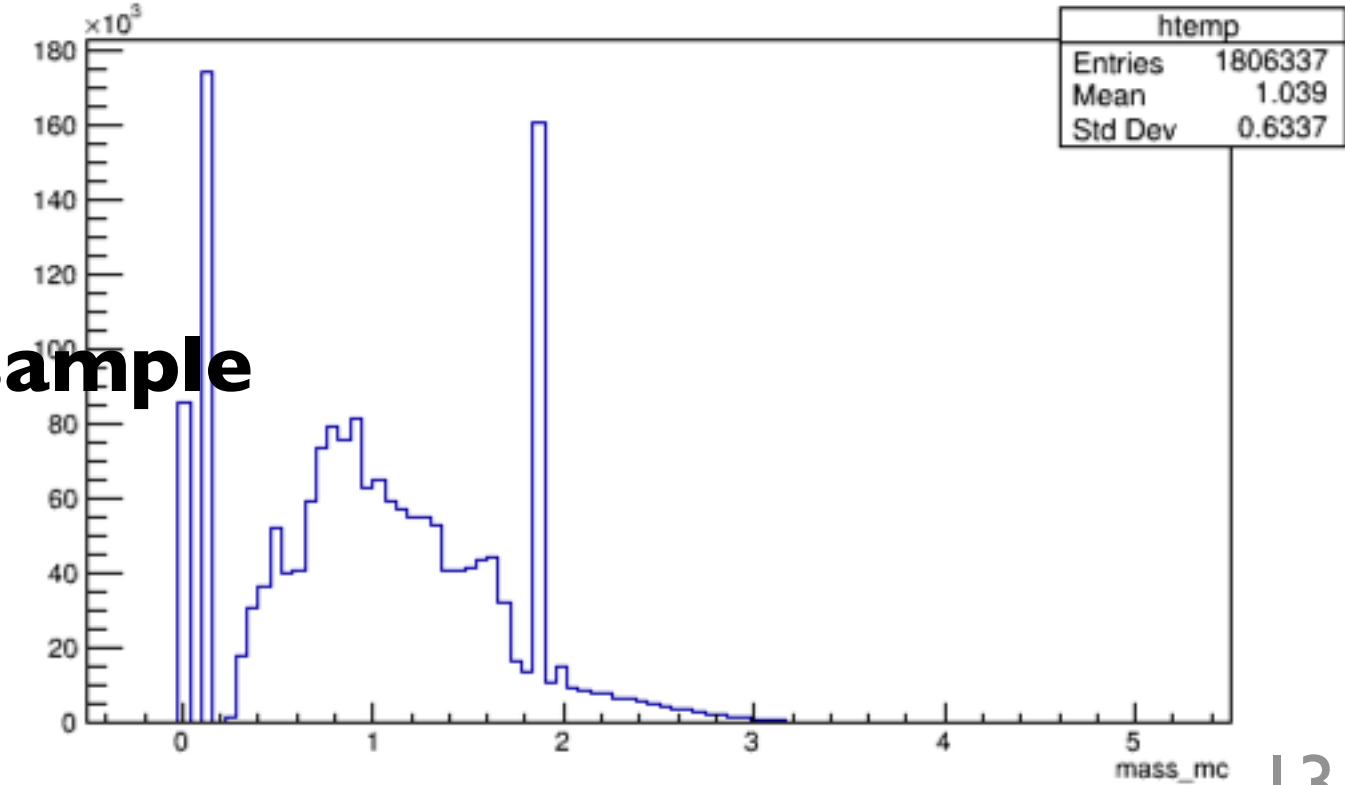


TruthVertexFinder output

mass_rec



mass_mc



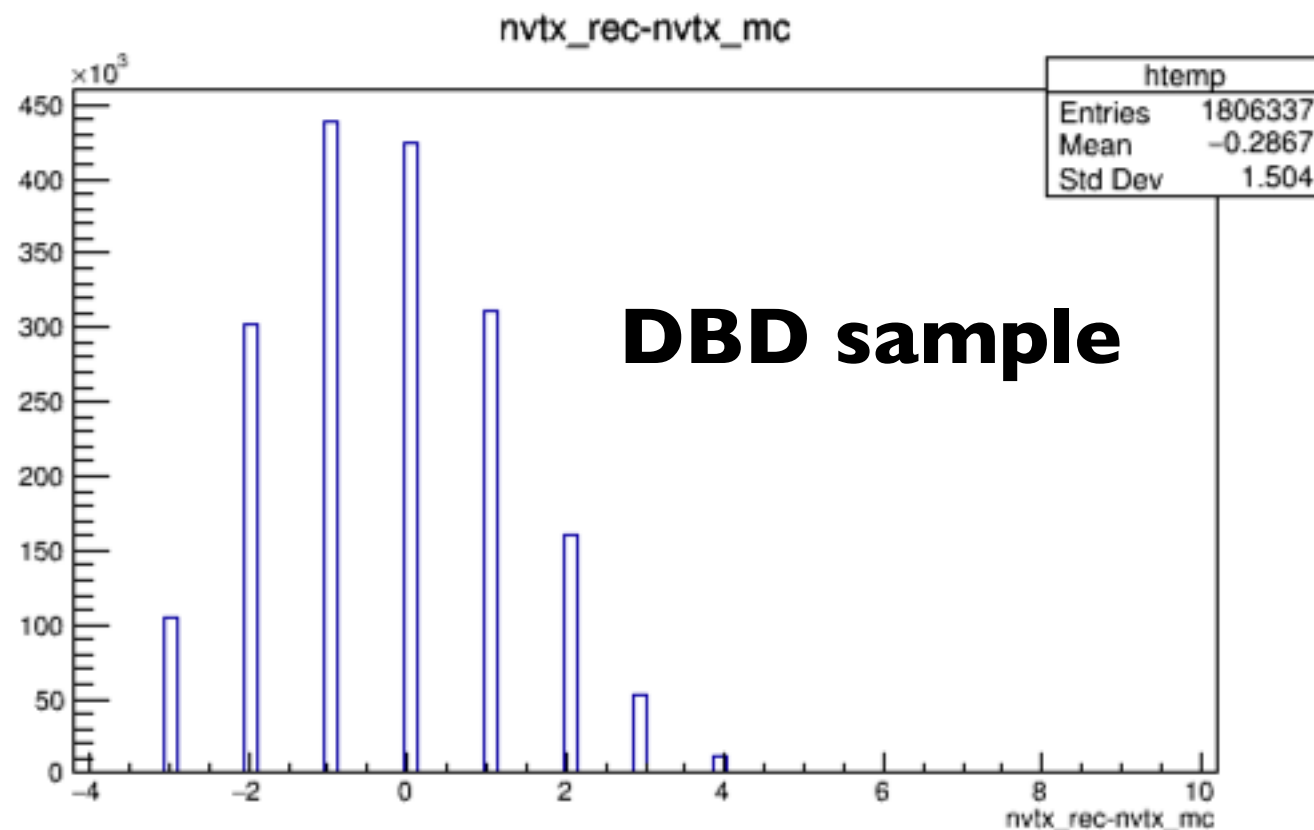
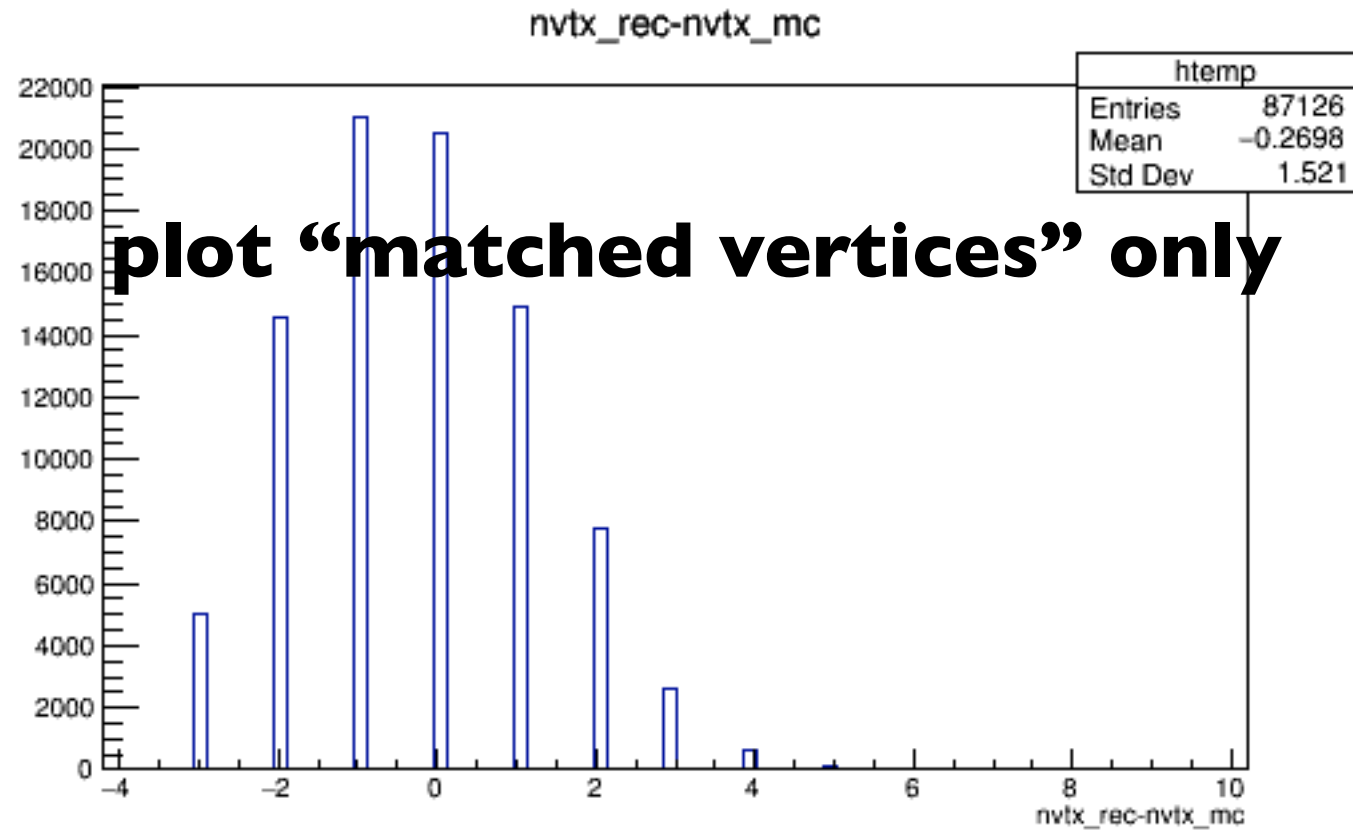
DBD sample

Conclusion/Plan

- ❖ **Difference from DBD sample must be understood**
 - ▶ Primary vertex position distribution
 - ▶ V0 vertex mass
- ❖ **Test for s5 is on-going.**
- ❖ **Need better understanding of TruthVertexFinder**
- ❖ **Any suggestions are welcome.**
 - ▶ Other plots to be checked

Backup

Secondary vertex (# of vertices per event)



Secondary vertex (mass)

