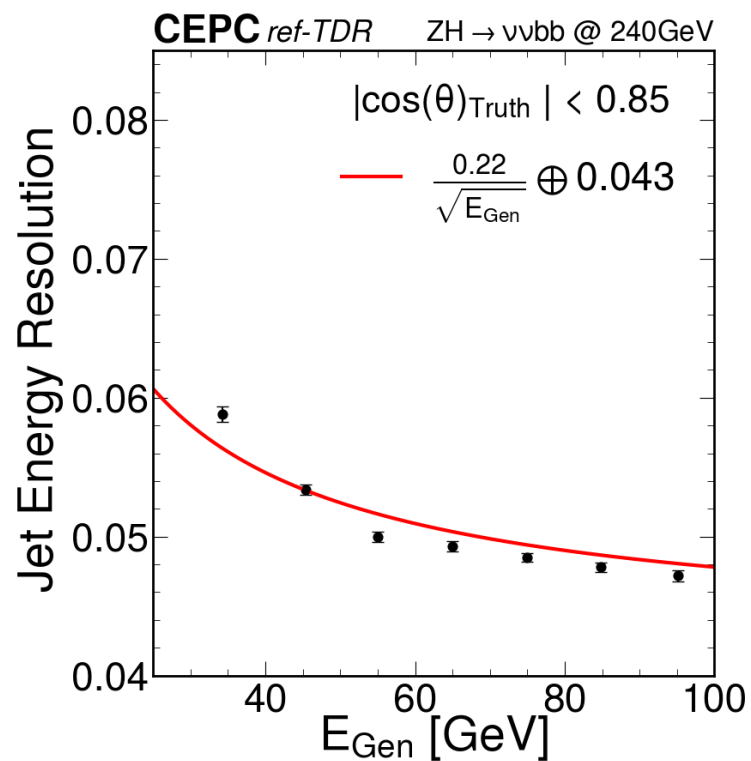


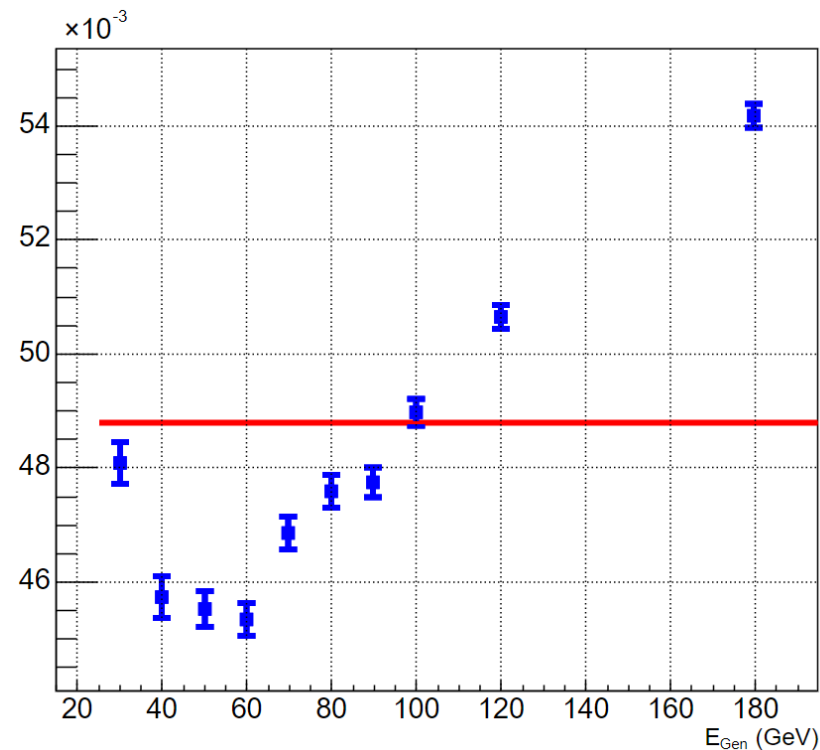
JER Check

Hao Zhu / 06Jun2025

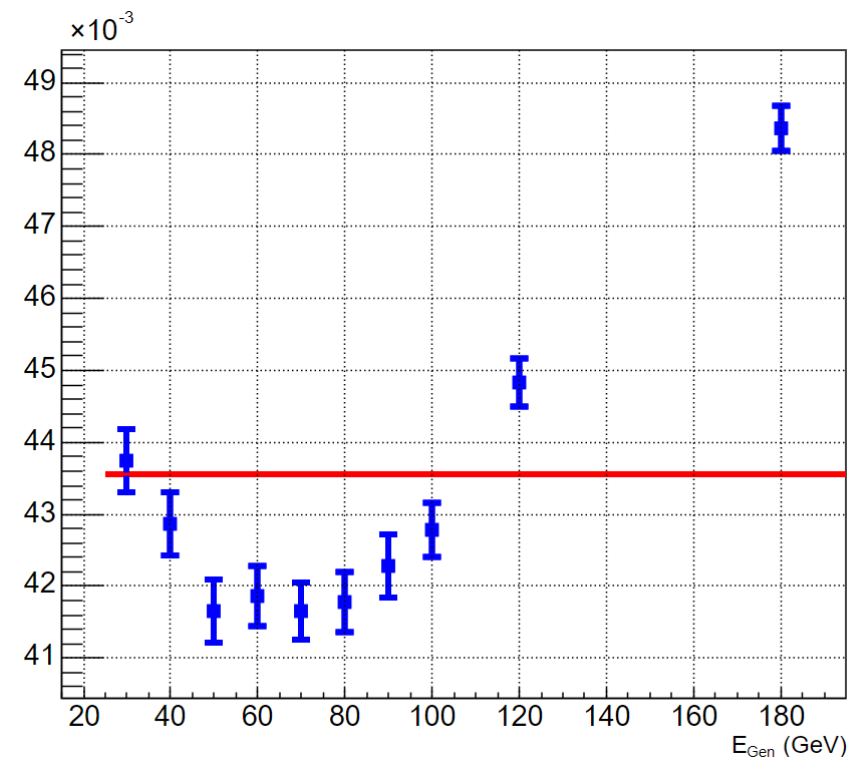
JER Result



ZHbb Result

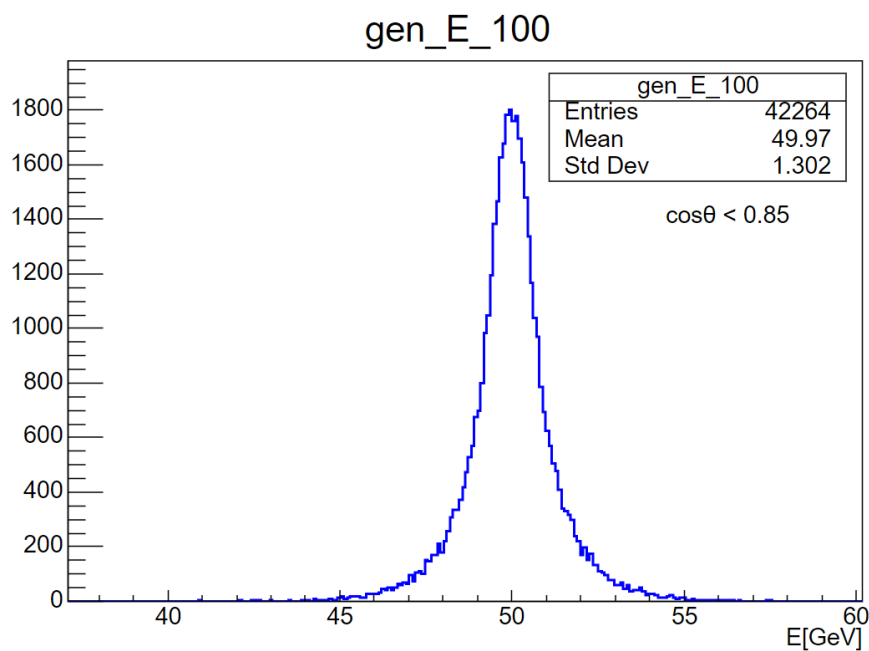


eeuu Result

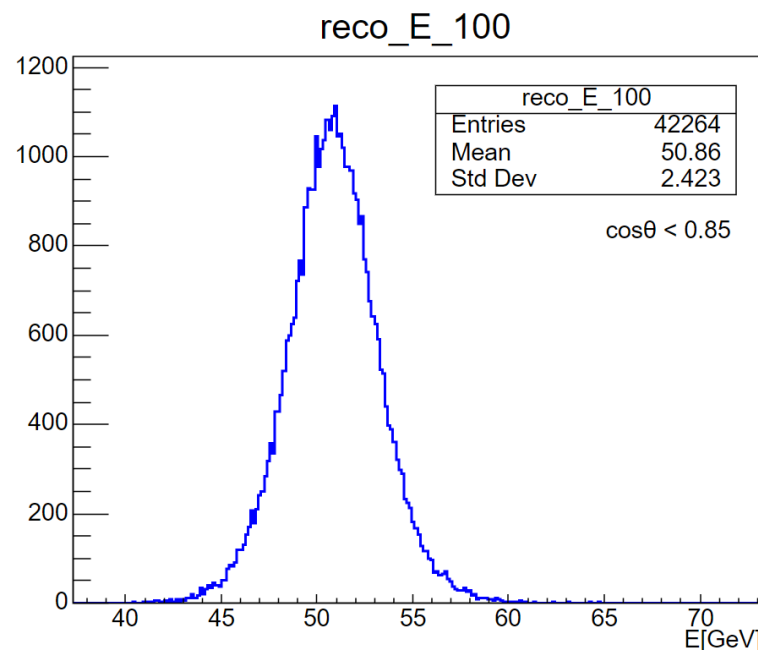


eeuu Result
(with extra cuts)

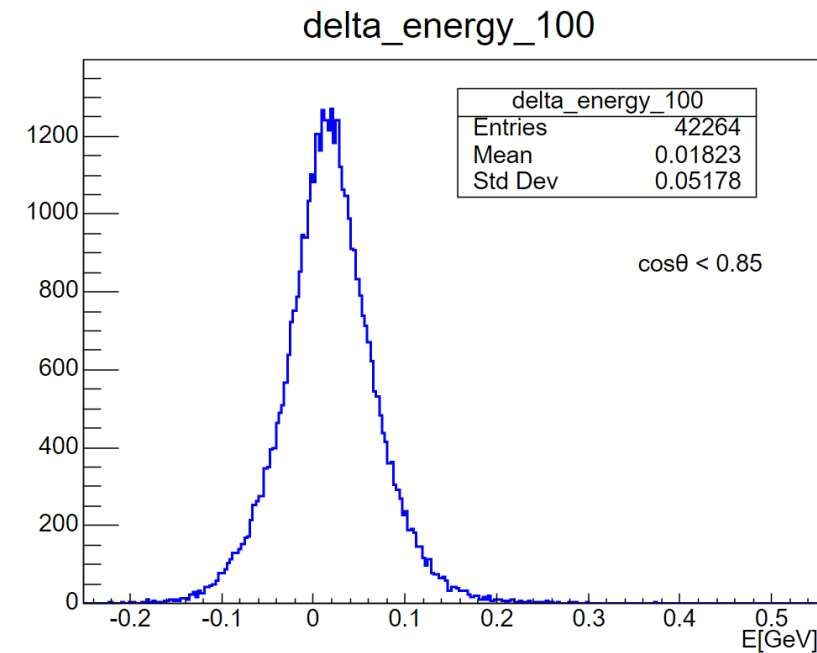
JER Calculation



Truth Jet Energy



Reco Jet Energy



(Reco – Truth)/Truth

- JER value = sigma value of DSCB fit about (Reco – Truth)/Truth Histogram

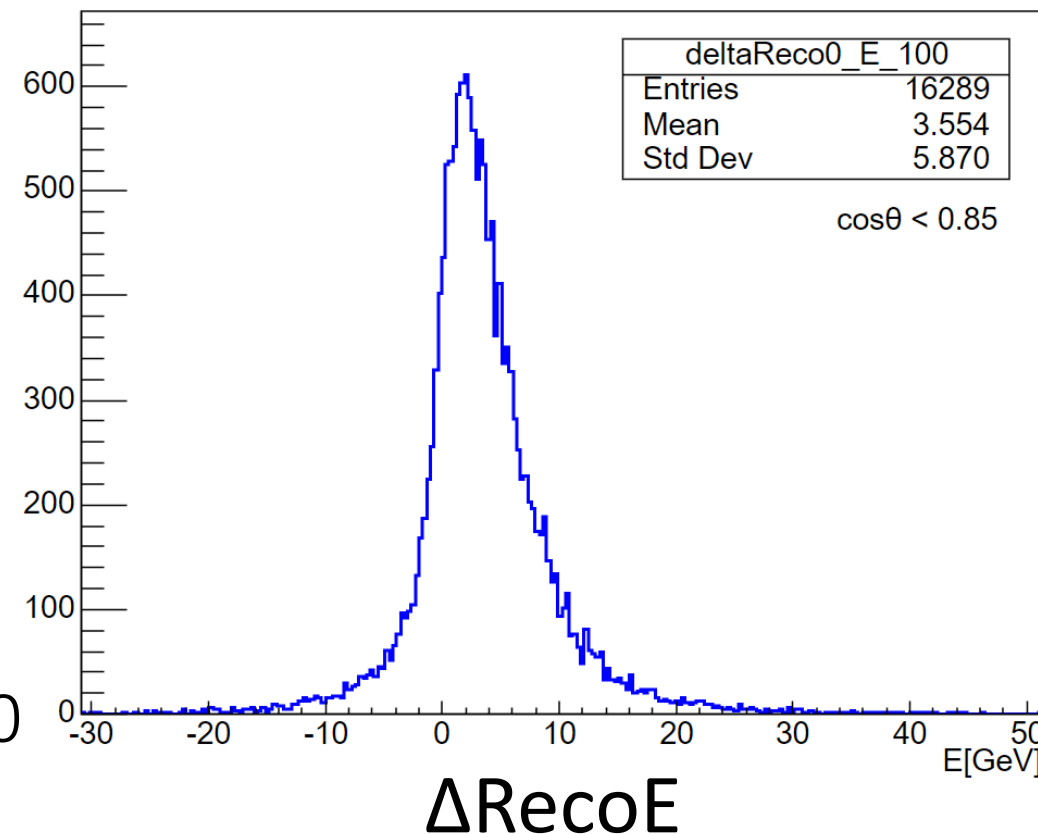
Cut for Jet Energy

Basic Cut:

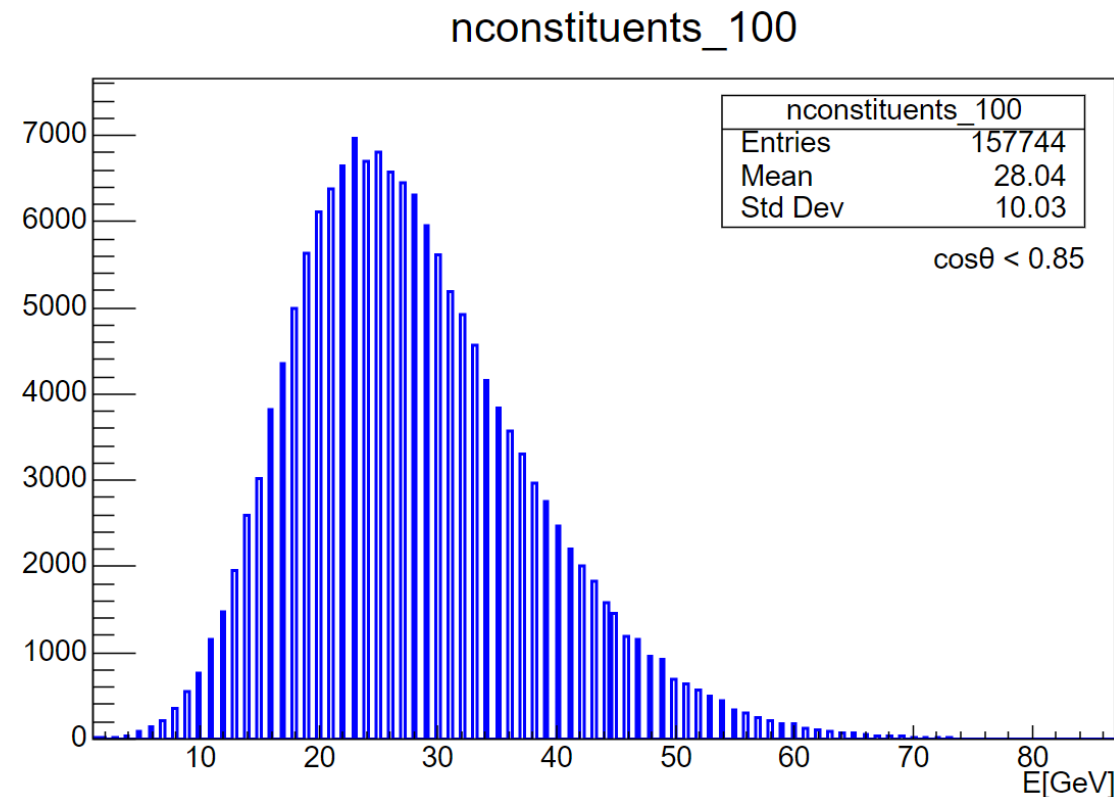
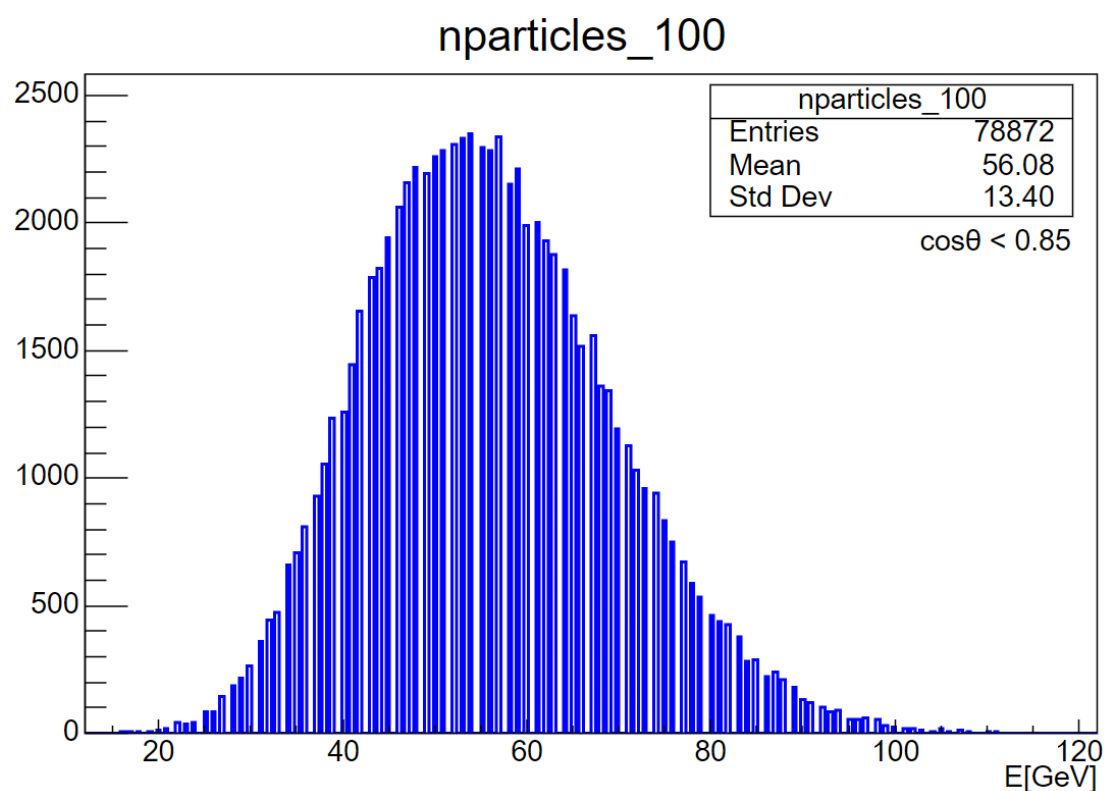
- $dR < 0.4$
- $\text{jet1_ID} \neq \text{jet2_ID}$
- $\cos\theta < 0.85$ (barrel)

Extra Cut for Jet Energy:

- Remove entry when
 $|\text{jet1_RecoE} - \text{jet2_RecoE}| > \text{mean} - E_{\text{total}}/20$



Cut for Jet Component



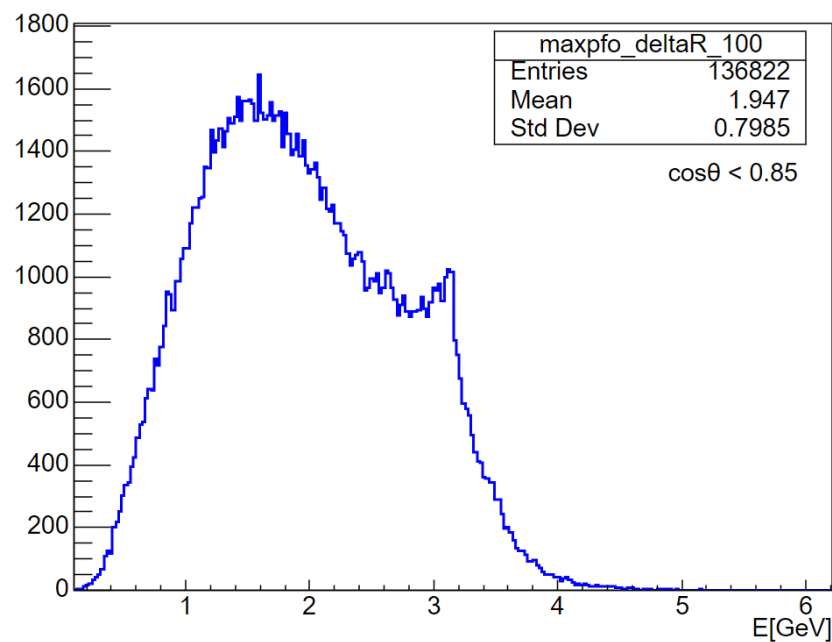
Extra Cut for Jet Component :

- Remove entry when nparticles or nconstituents $> \text{mean} \pm 2 \cdot \text{sigma}$

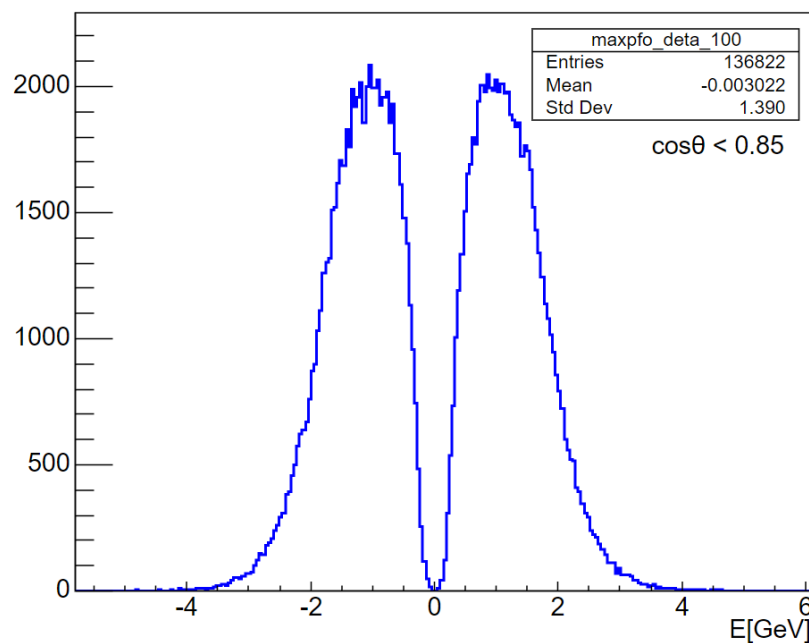
Cut for Jet Shape

Extra Cut for Jet Component :

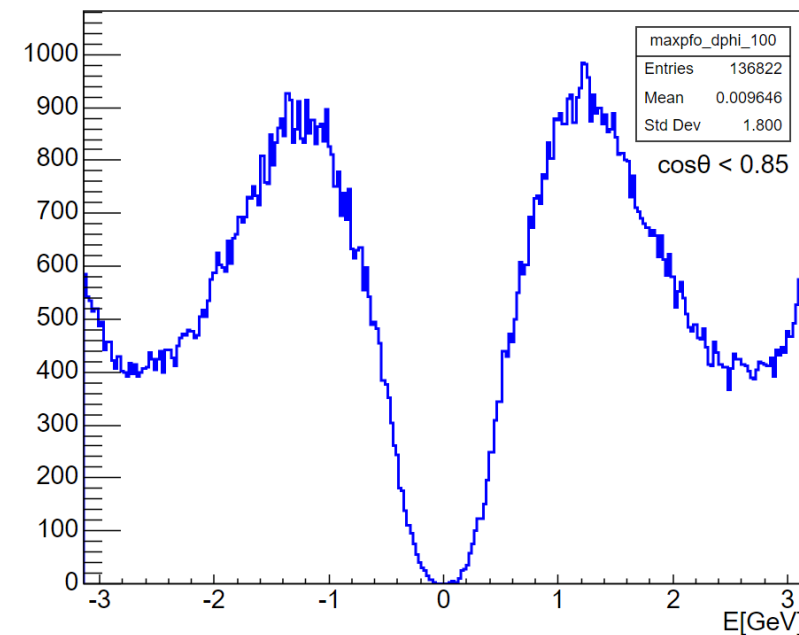
- Remove entry when max dR、 d η 、 d ϕ value is too large



max dR



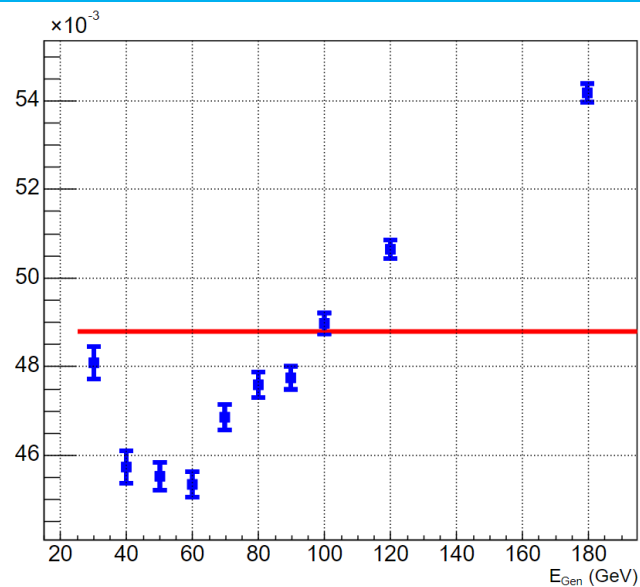
max d η



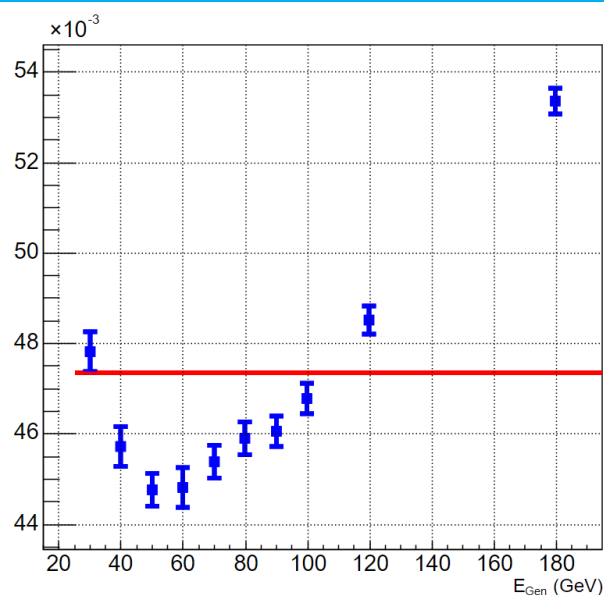
max d ϕ

BackUp

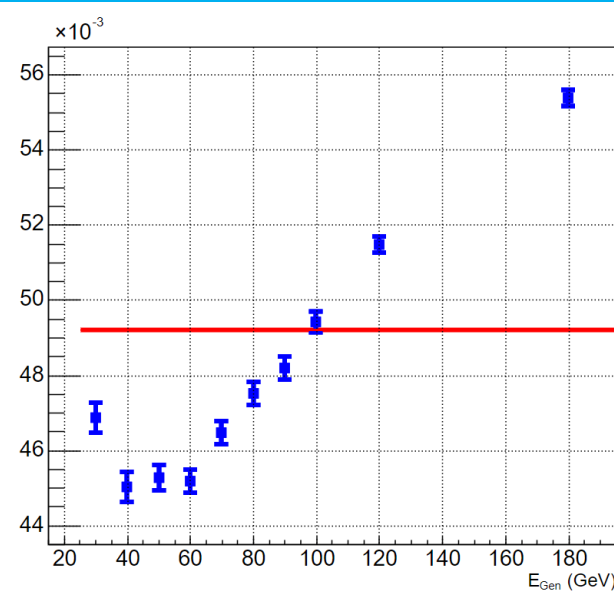
JER Performance after Cut



basic cut



energy cut

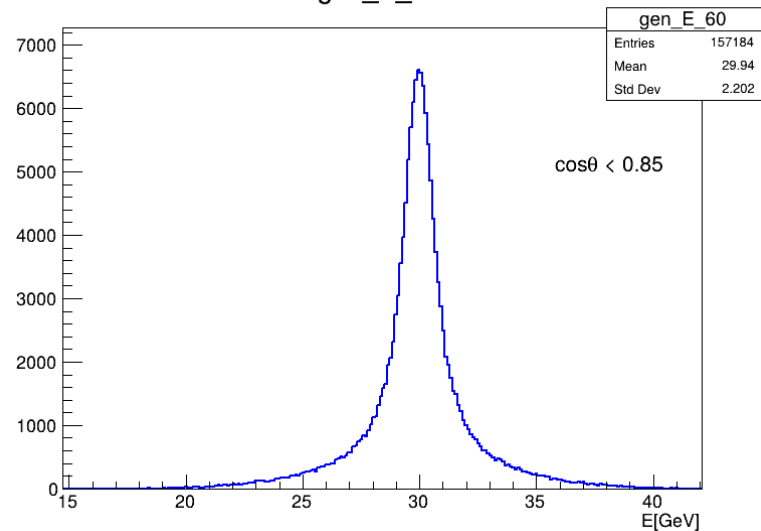


component cut

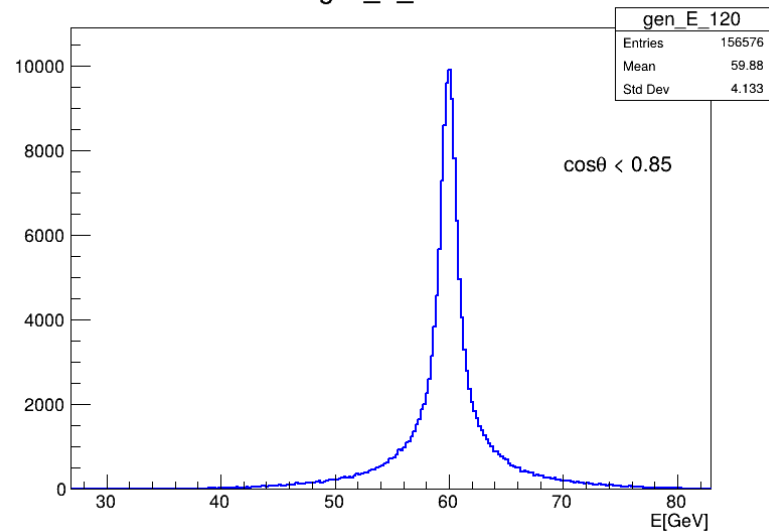
shape cut

Energy Plot

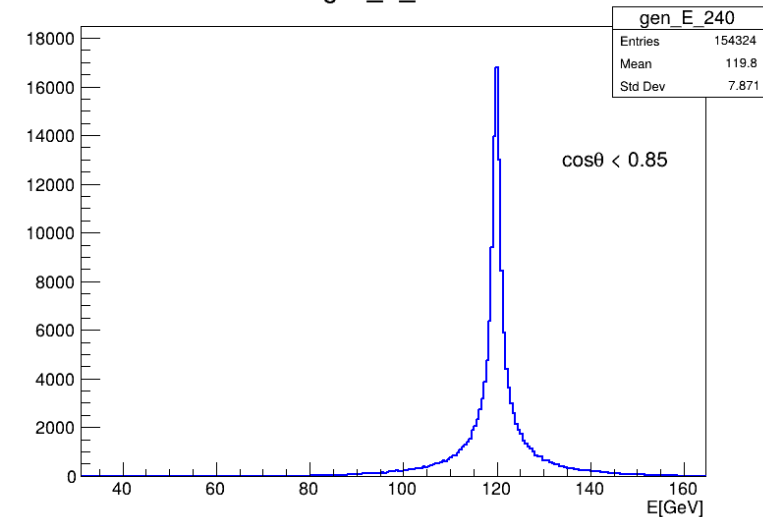
gen_E_60



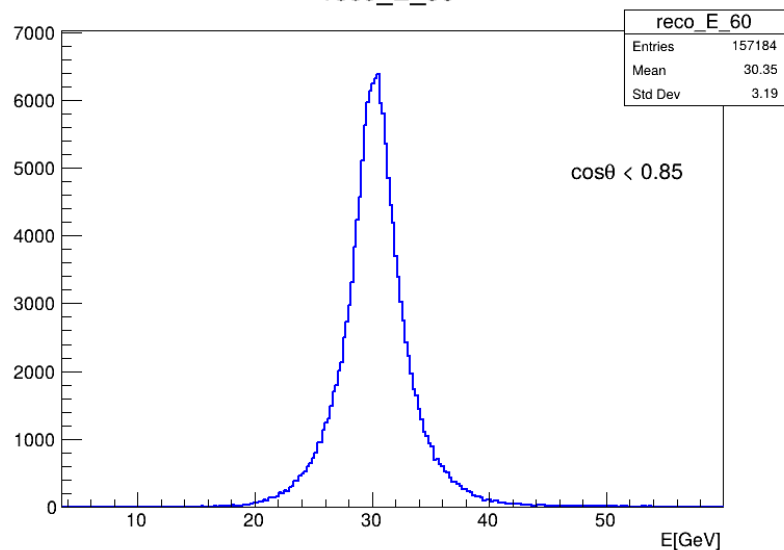
gen_E_120



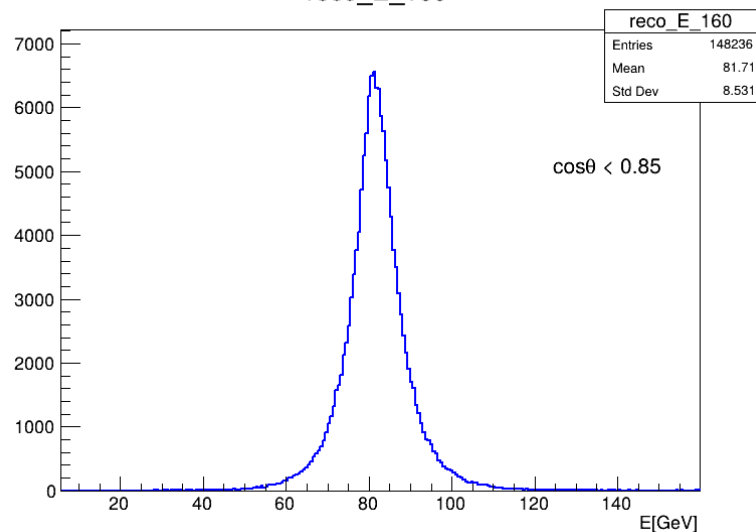
gen_E_240



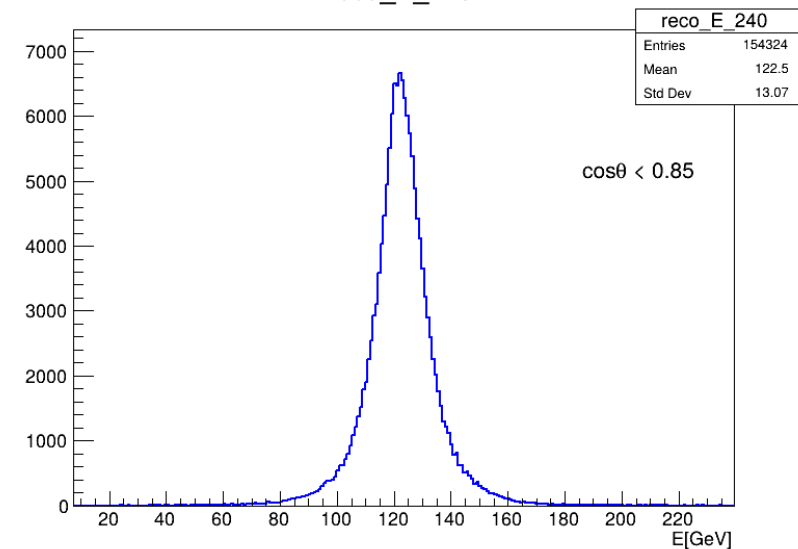
reco_E_60



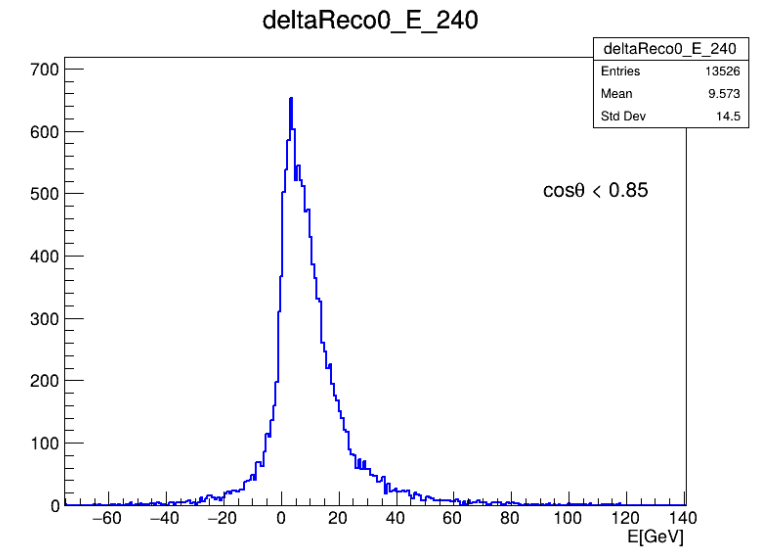
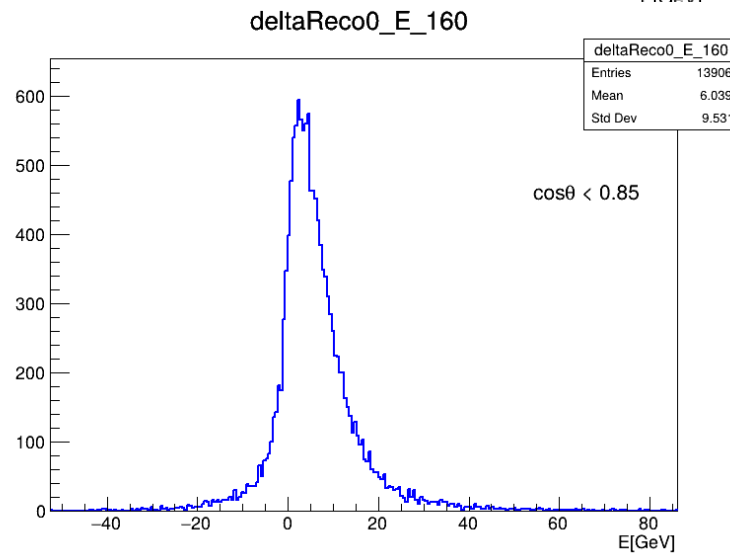
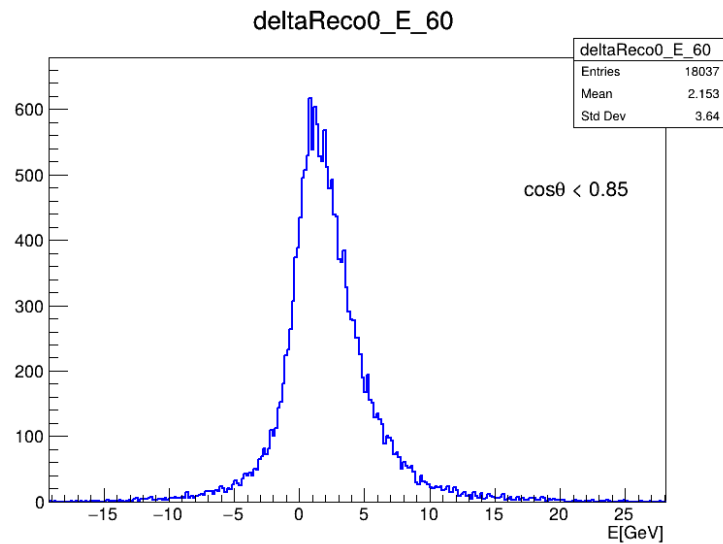
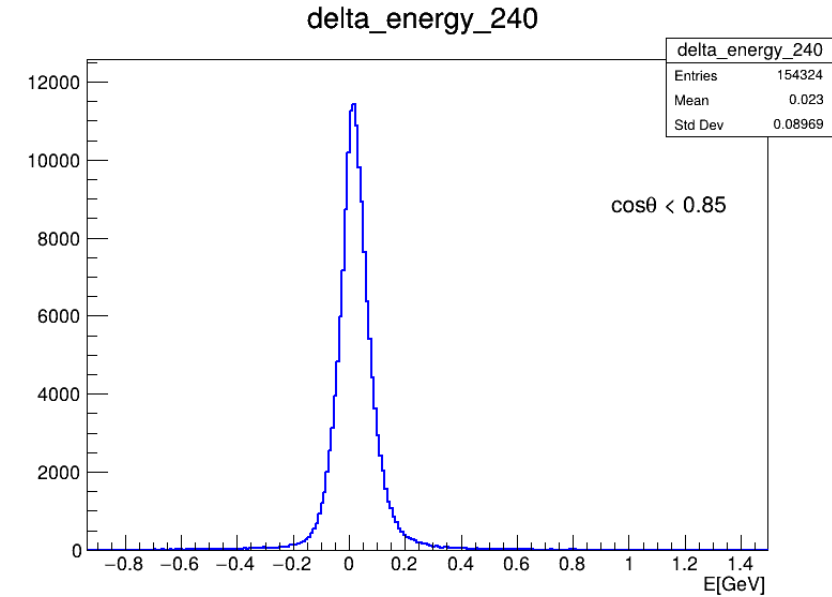
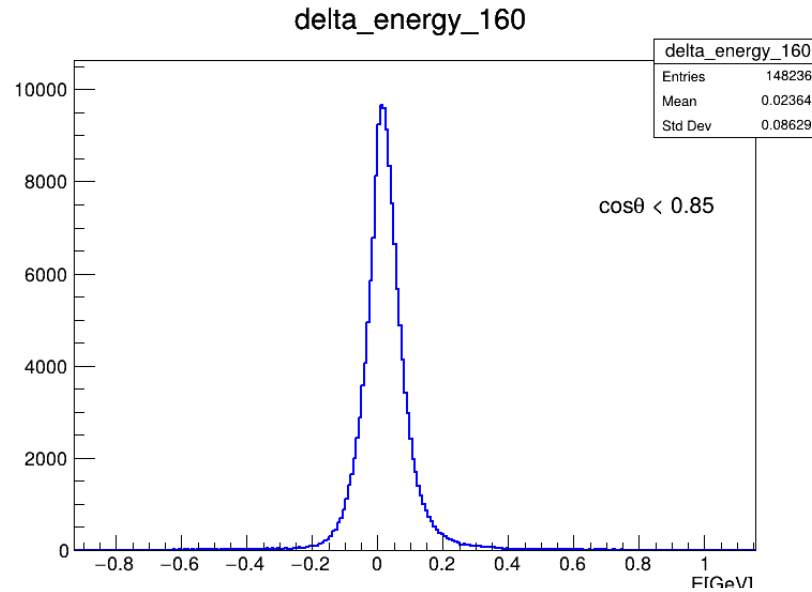
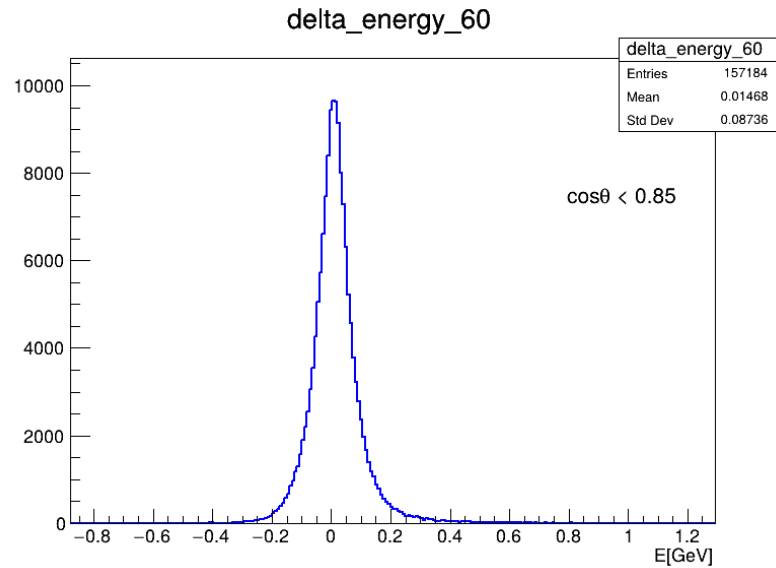
reco_E_160



reco_E_240

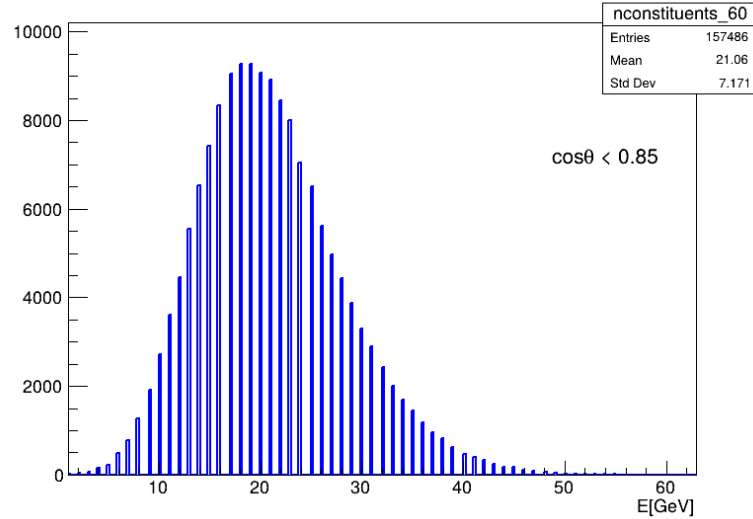


Energy Plot

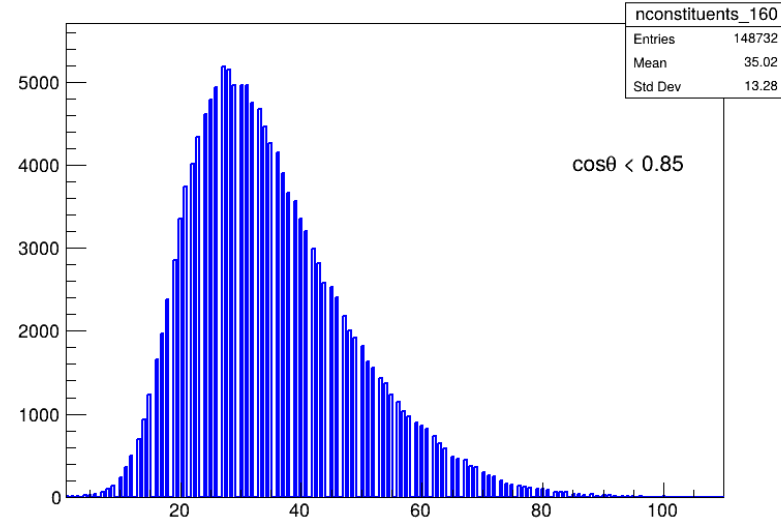


Component Plot

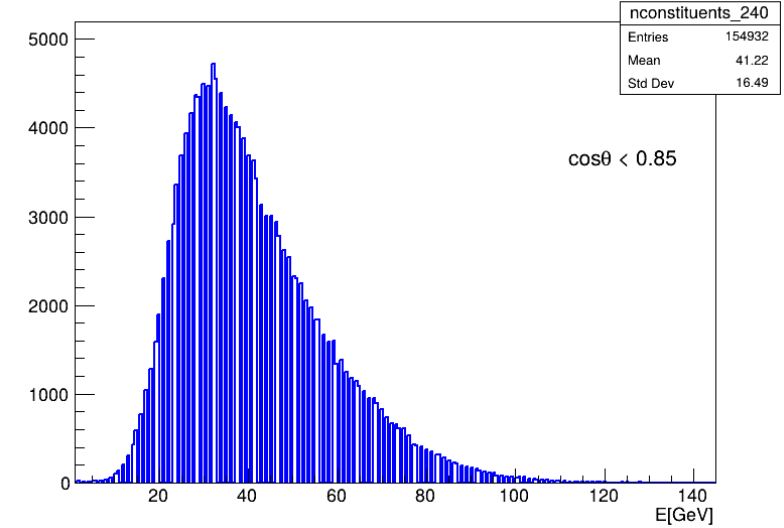
nconstituents_60



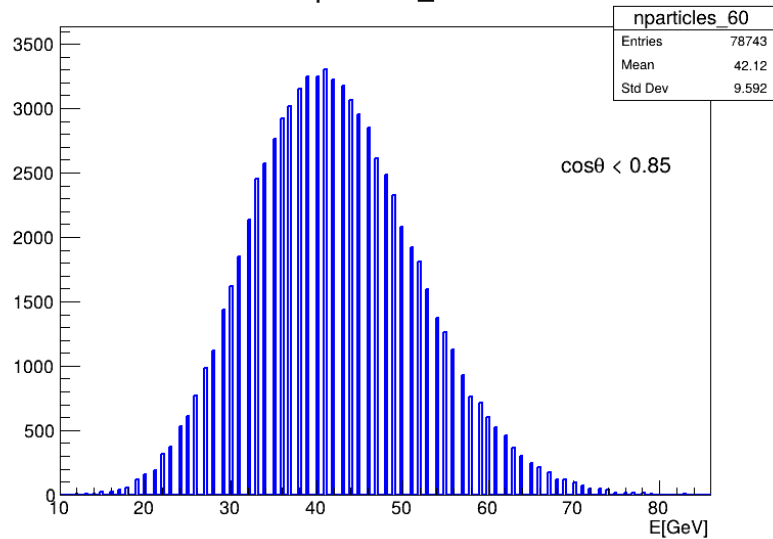
nconstituents_160



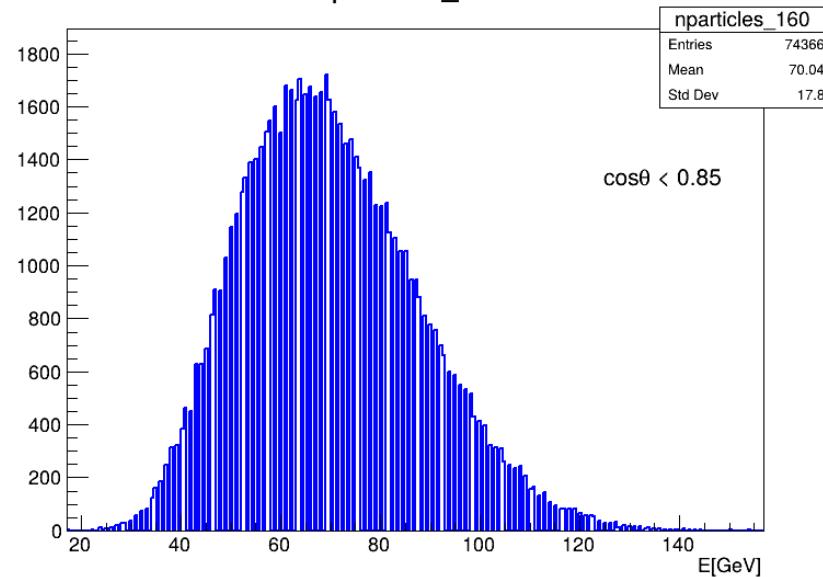
nconstituents_240



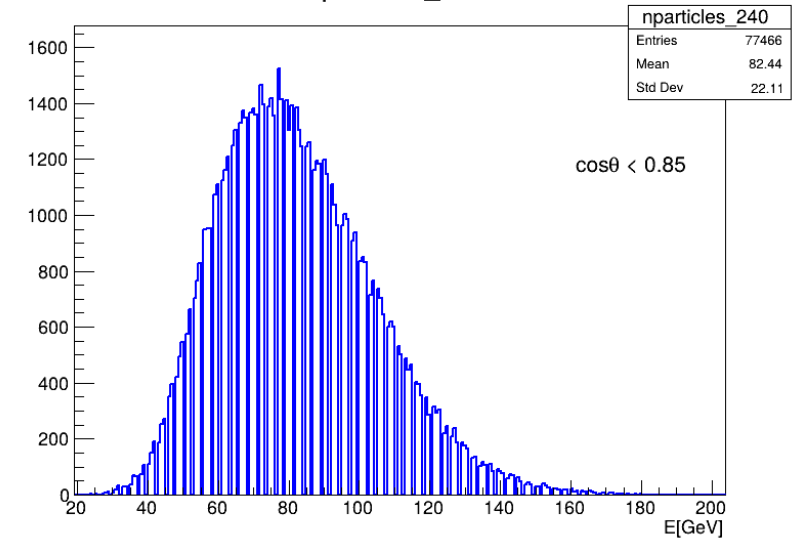
nparticles_60



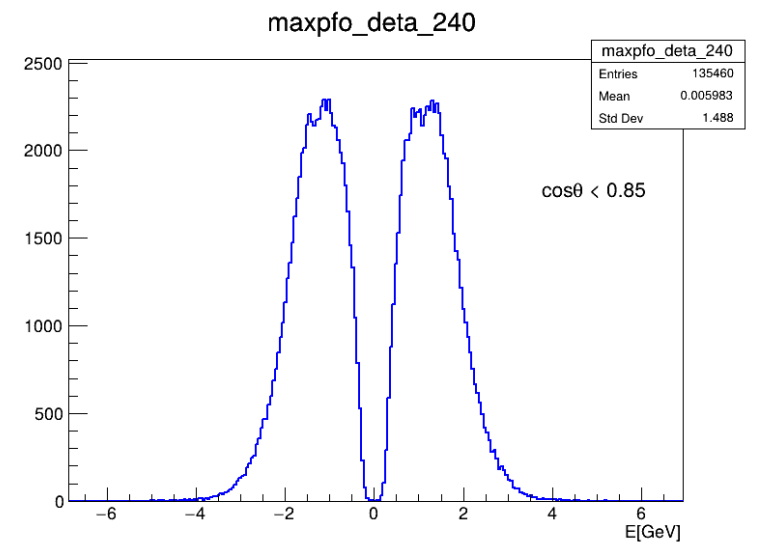
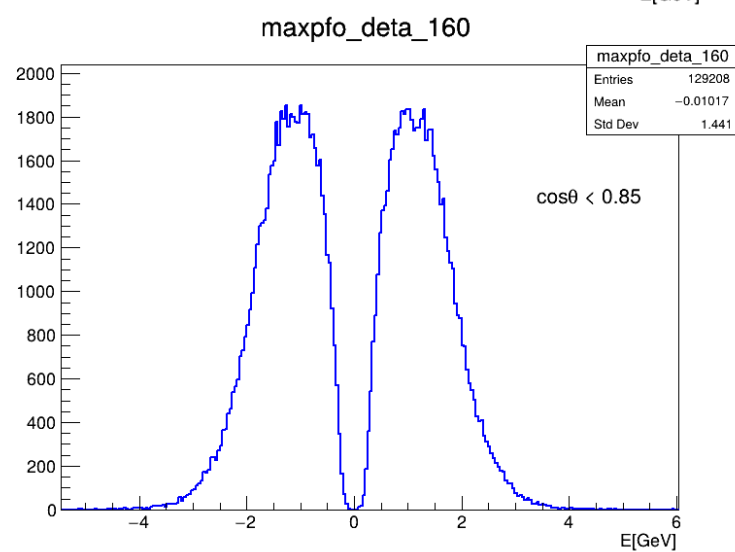
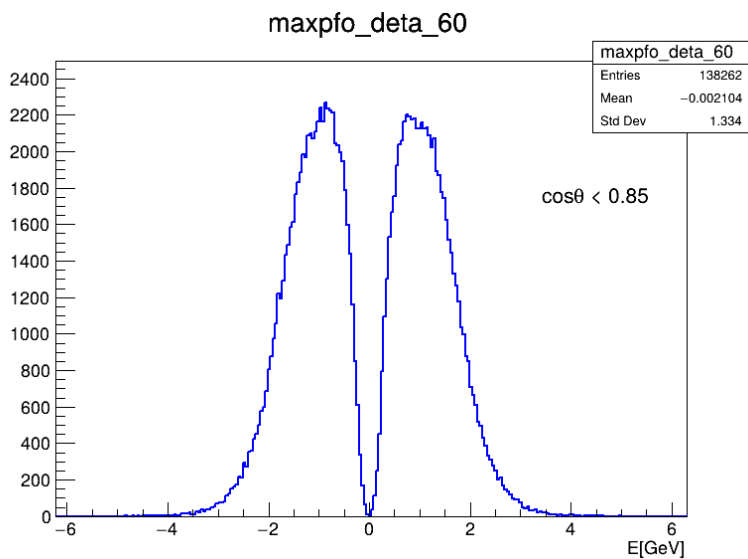
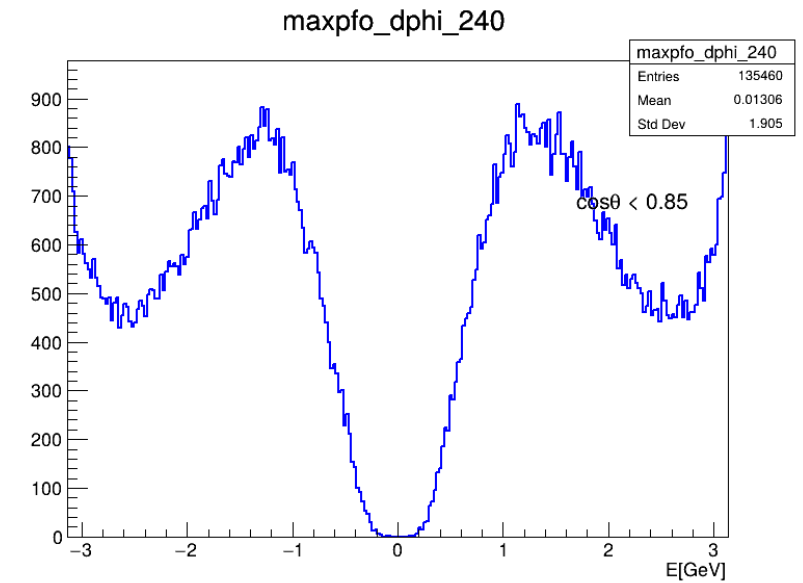
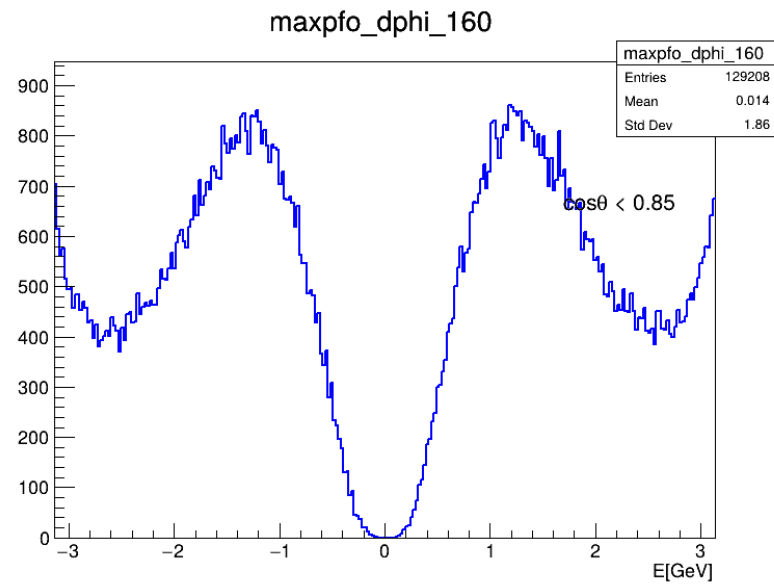
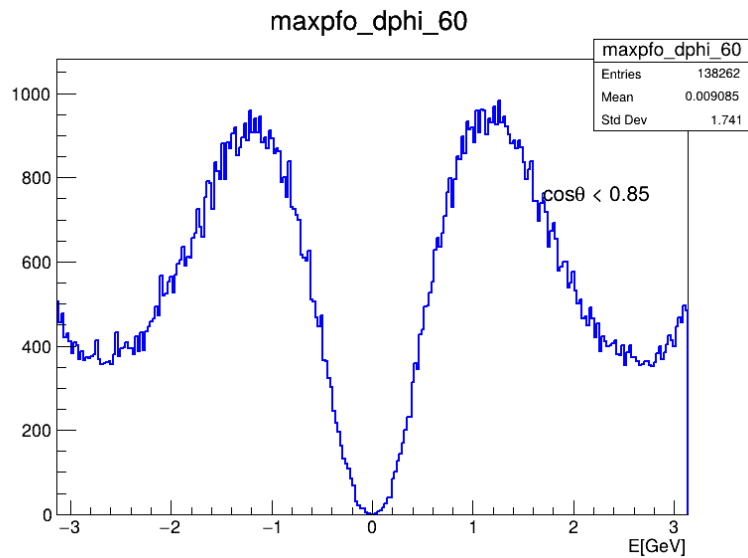
nparticles_160



nparticles_240

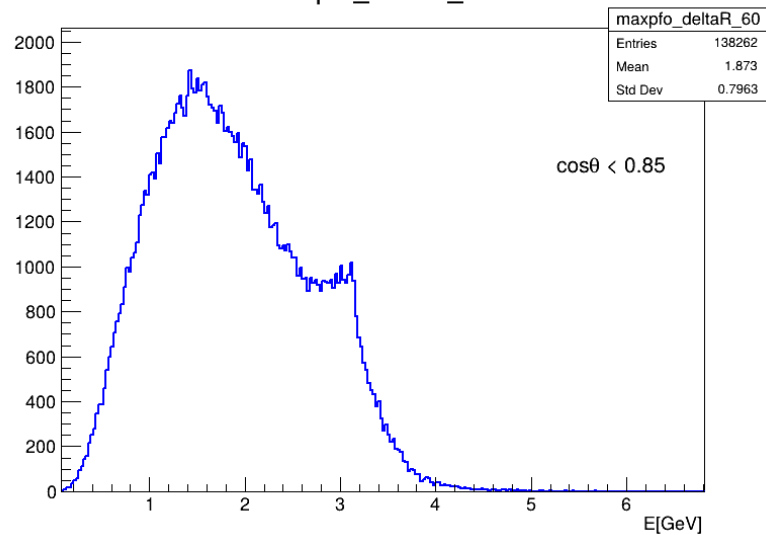


Shape Plot

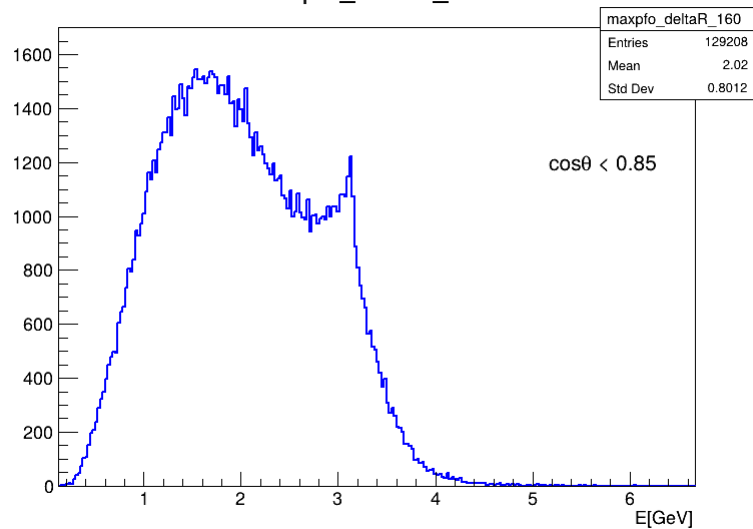


Shape Plot

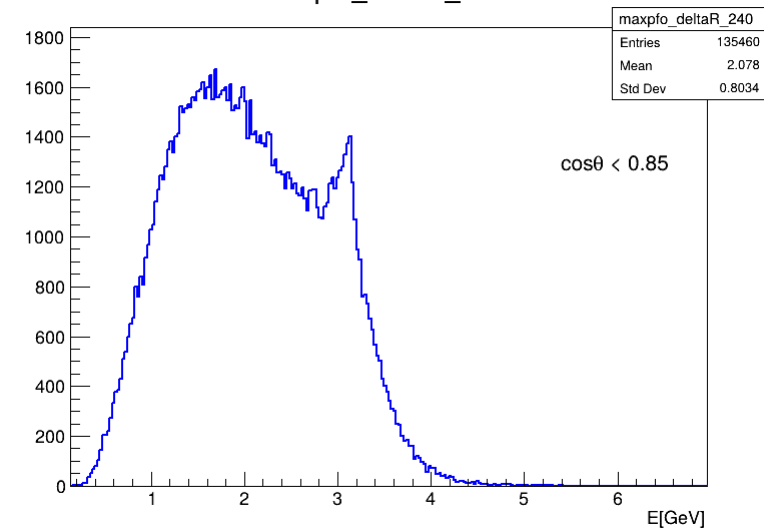
maxpfo_deltaR_60



maxpfo_deltaR_160

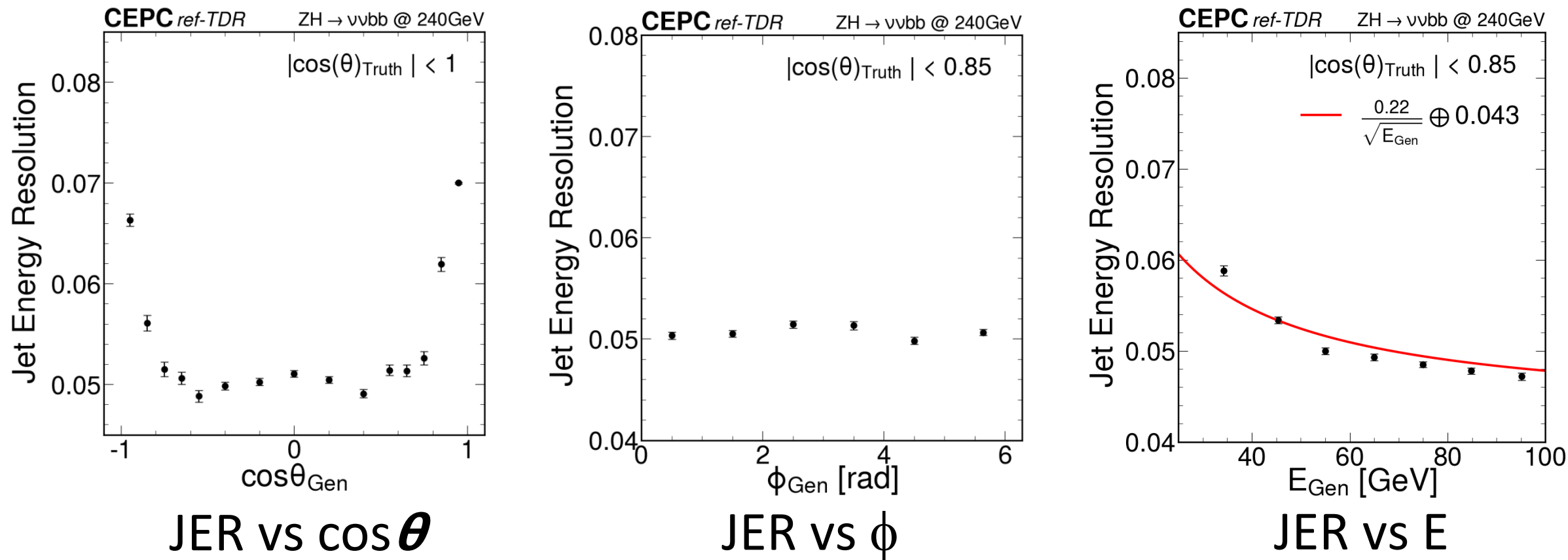


maxpfo_deltaR_240



Cut for Jet Energy

Figure 15.13, updated



- $\sim 5\%$ in the barrel region, slightly worse in the endcap

JAR

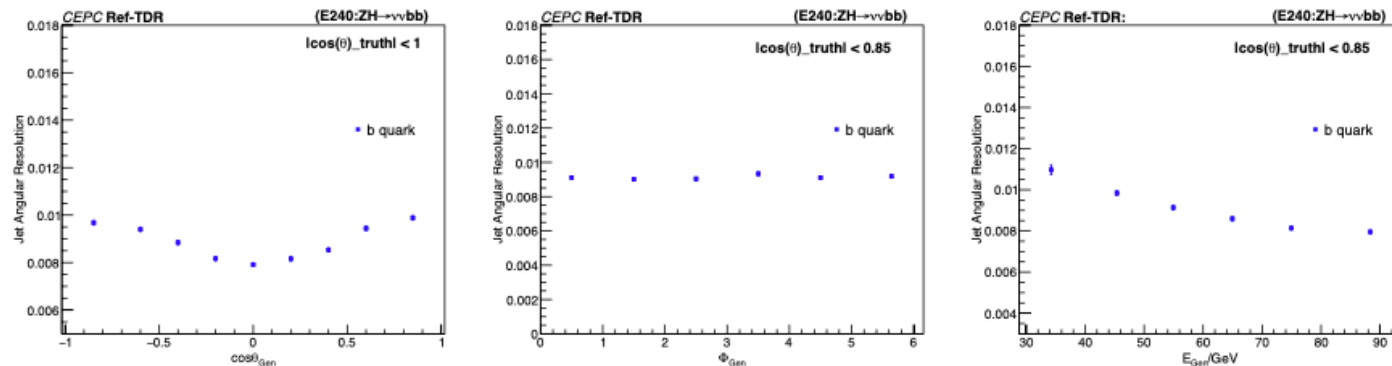


Figure 1.17: θ_{jet} resolution as functions of the $\cos\theta_{Gen}$ (left), the azimuth angle (middle), and the GenJet energy (right) for the $ZH \rightarrow \nu\nu bb$ process. The errors shown are only statistical.

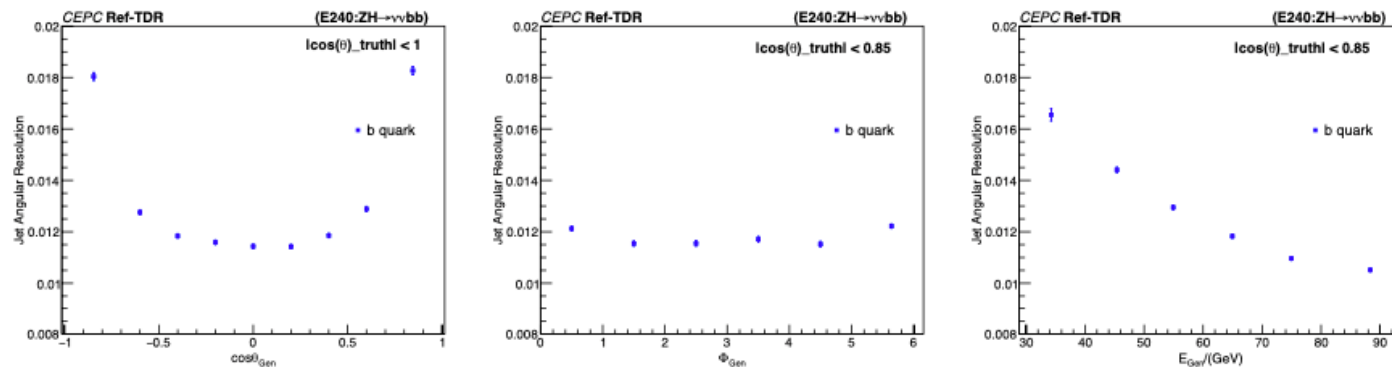


Figure 1.18: ϕ_{jet} resolution as functions of the $\cos\theta_{Gen}$ (left), the azimuth angle (middle), and the GenJet energy (right) for the $ZH \rightarrow \nu\nu bb$ process. The errors shown are only statistical.