

# CEPC Jet&Clusters

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# CEPC sample/release



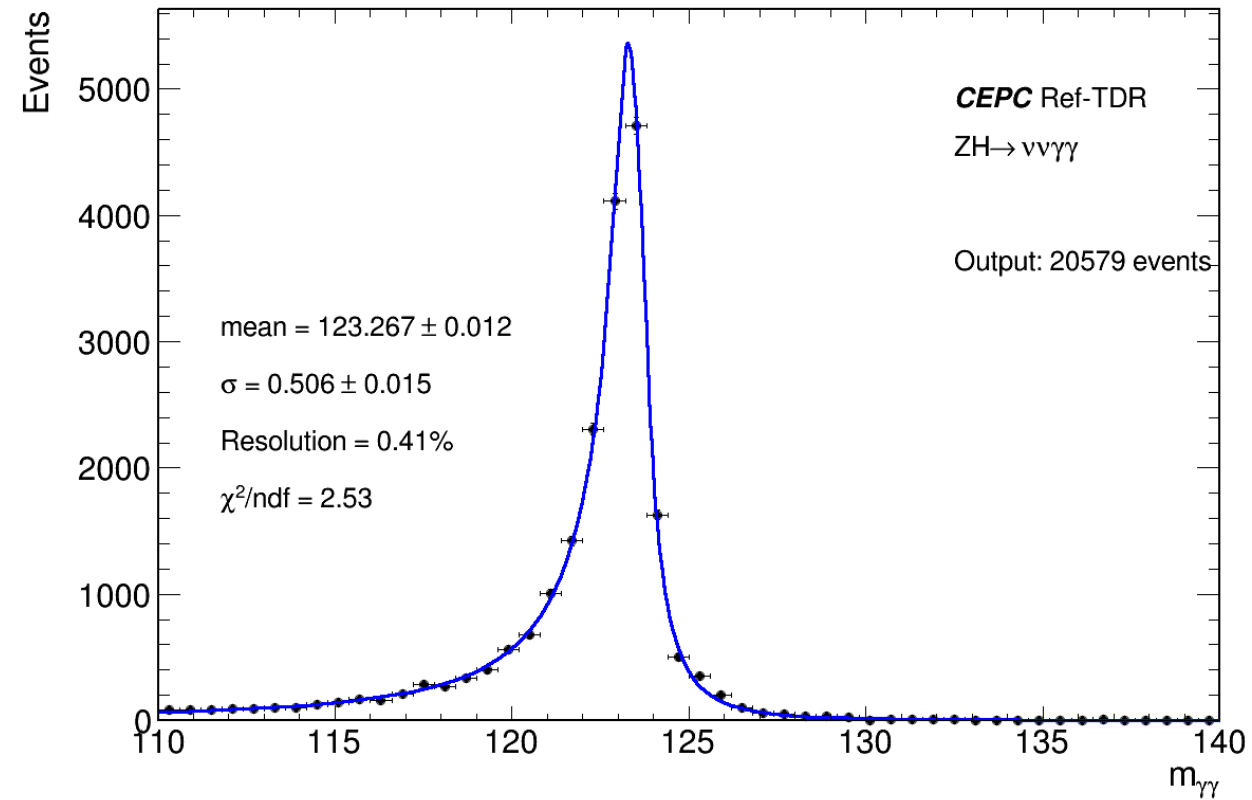
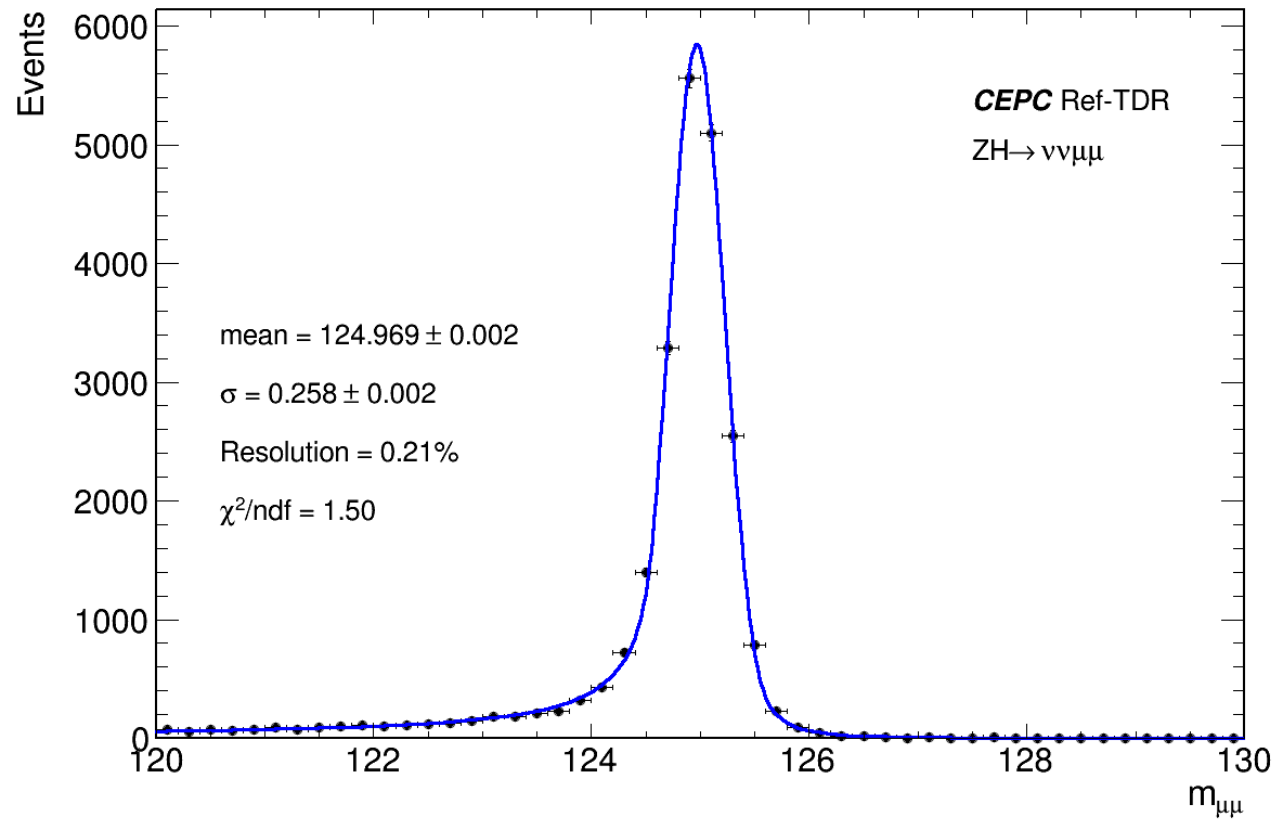
- Hcal but fixed
  - Please use fix 48bcef3d instead of 24.12.0.
- Sample under generation
  - Need 6GB memory, speed slower.
  - H->qq and Z->qq sample available under
    - /cefs/higgs/zhangkl/Production/2412/
    - /cefs/higgs/guofy/CEPCSW\_tdr24.12.1/performance/JER\_eeqq
  - Other processes and generators under study @Nazima

# Sample performance



No muon chamber information used.  
(Only tracking).  
Mass 0.2% -> Track 0.1%.

Energy 0.41%: corresponds to  $1.1\%/\sqrt{E} \oplus 0.3\%$

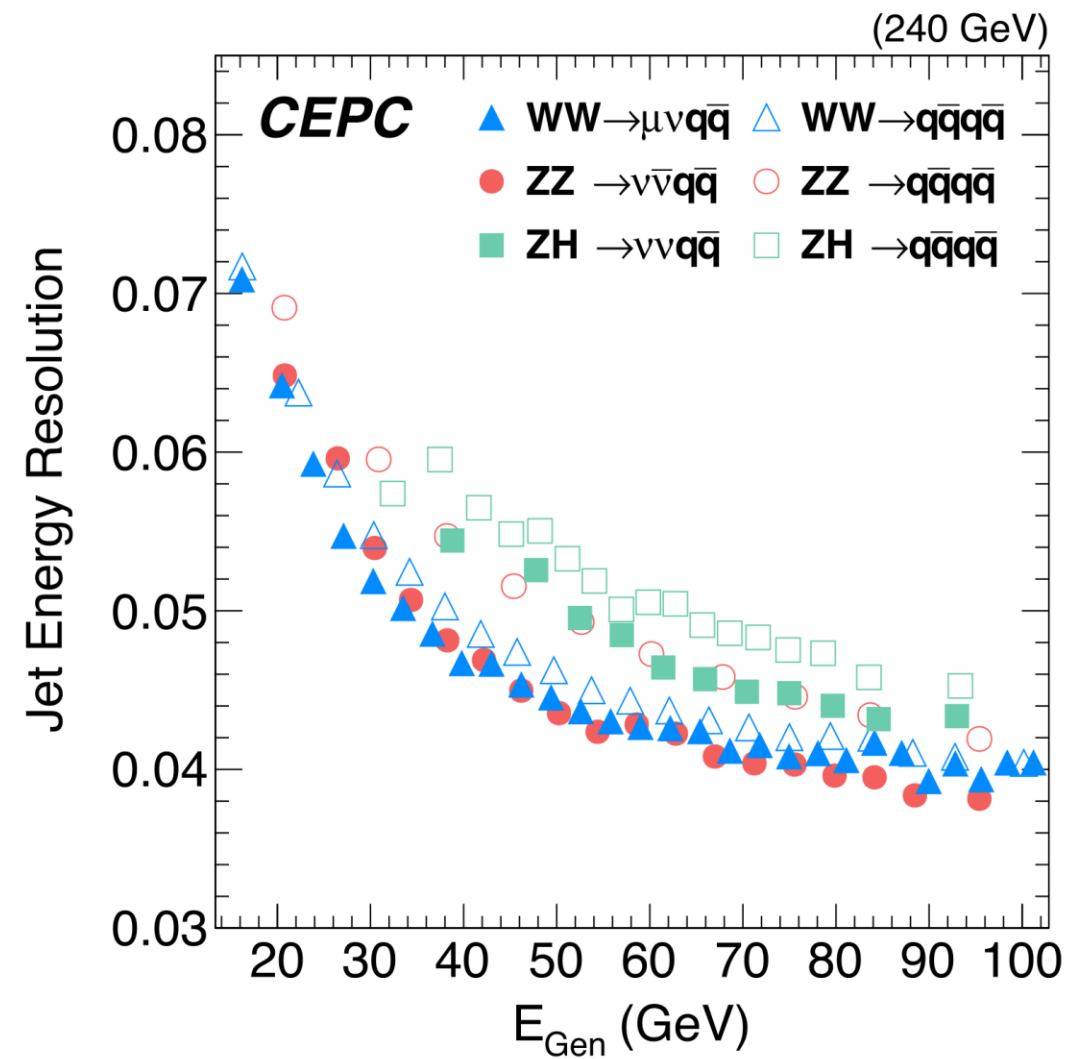
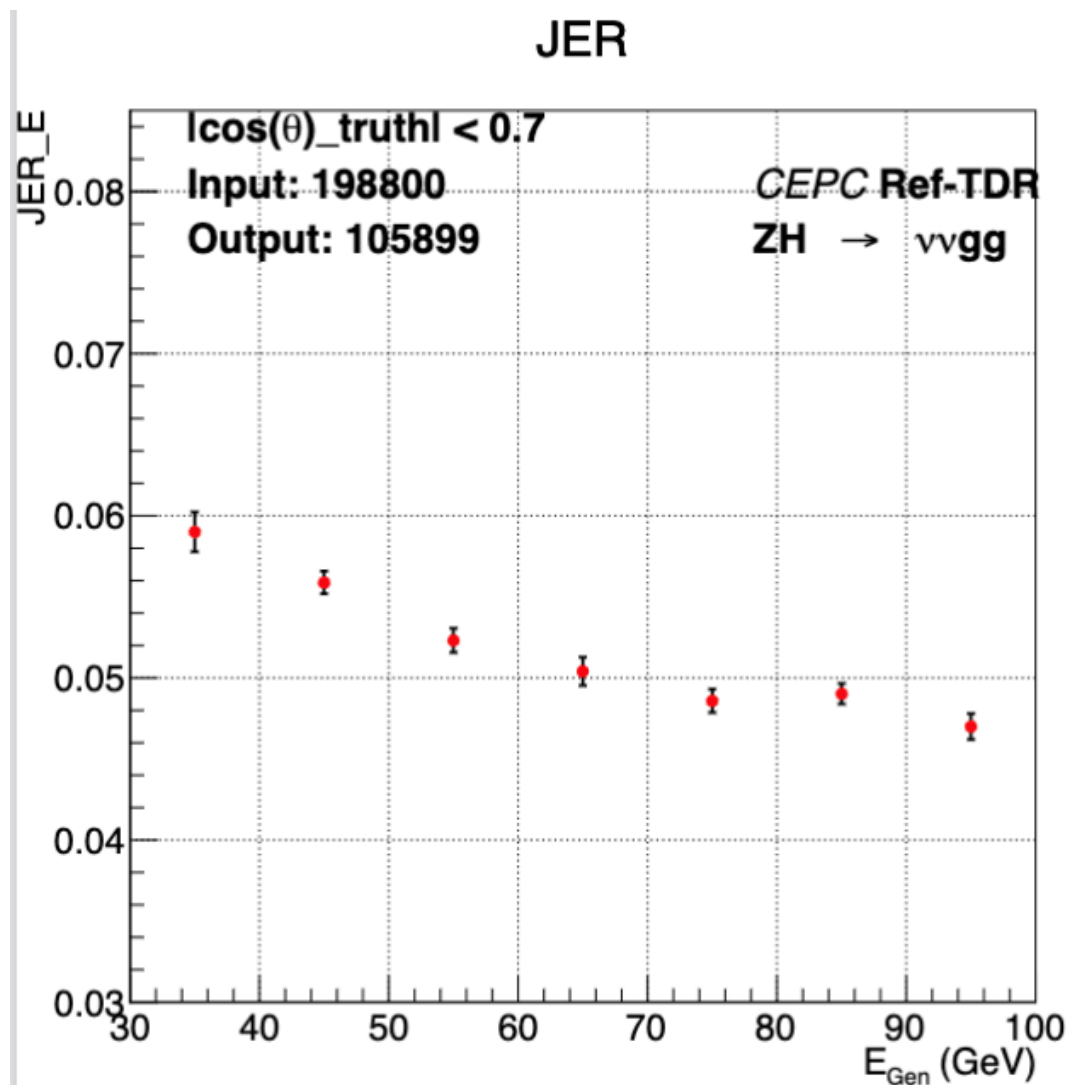


# Jet performance

@Yingqi



gg ~0.15% worse than bb since more neutral components.

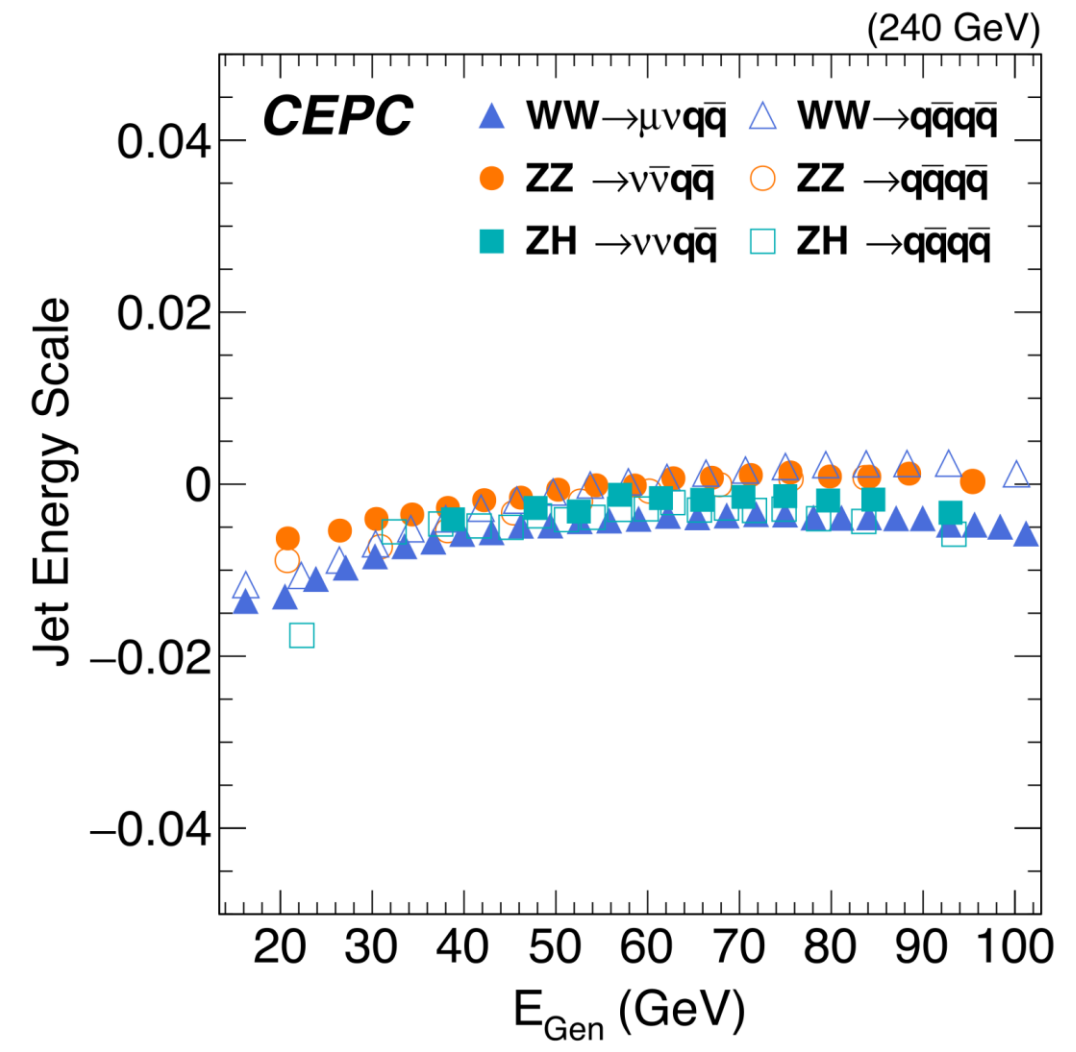
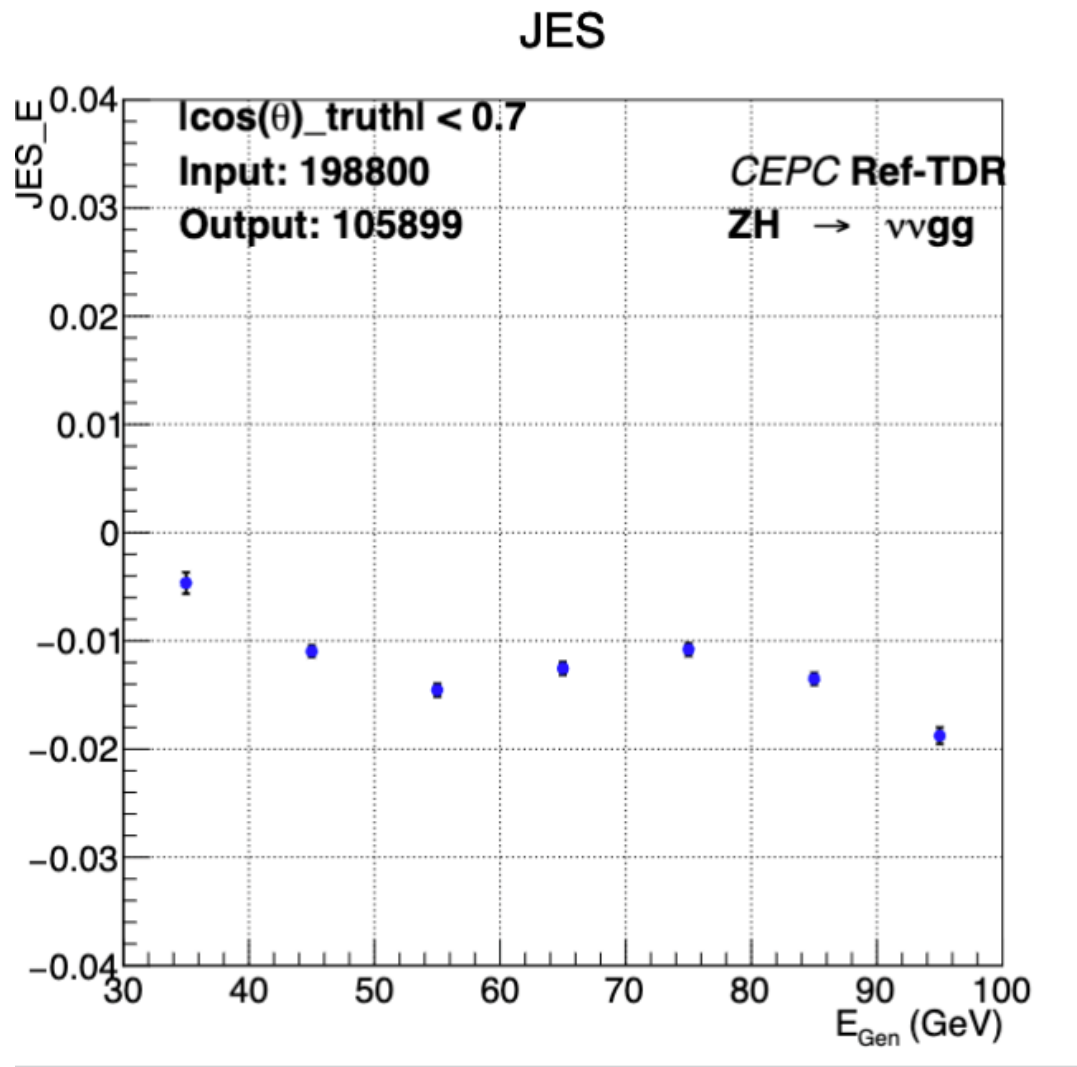


# Jet performance

@Yingqi



Updated JES different with CDR.



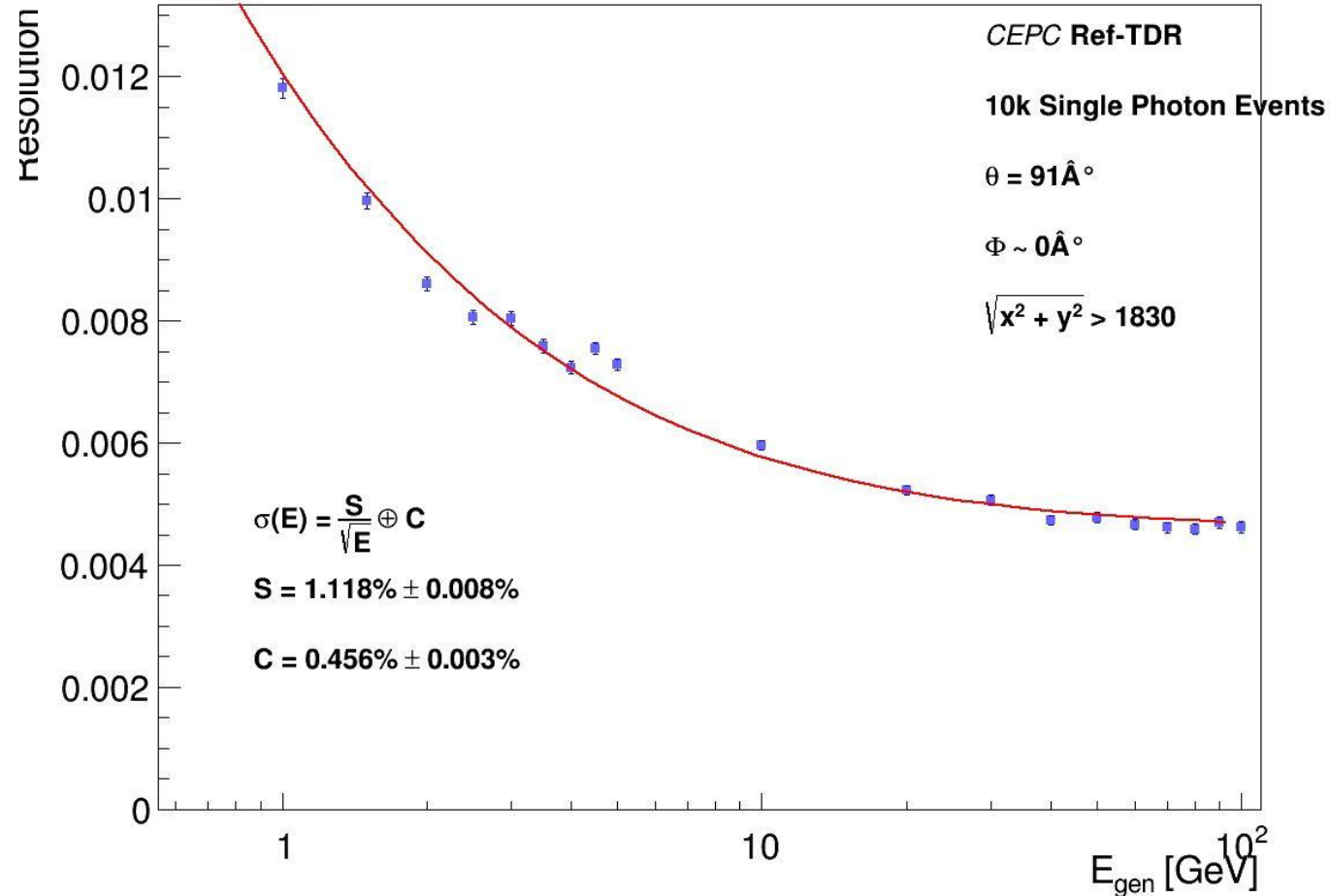
# Photon Performance

@Reda



Currently the leading 2 PFOs chosen as photons, energy shifted.  
Using  $(m_{\gamma\gamma} = 123.367)$  ~1.5%.  
Using  $Pt_{\gamma}$  ~3%.

Ecal fit curve fixed.  
Now consistent with Ecal response.



# Photon Performance

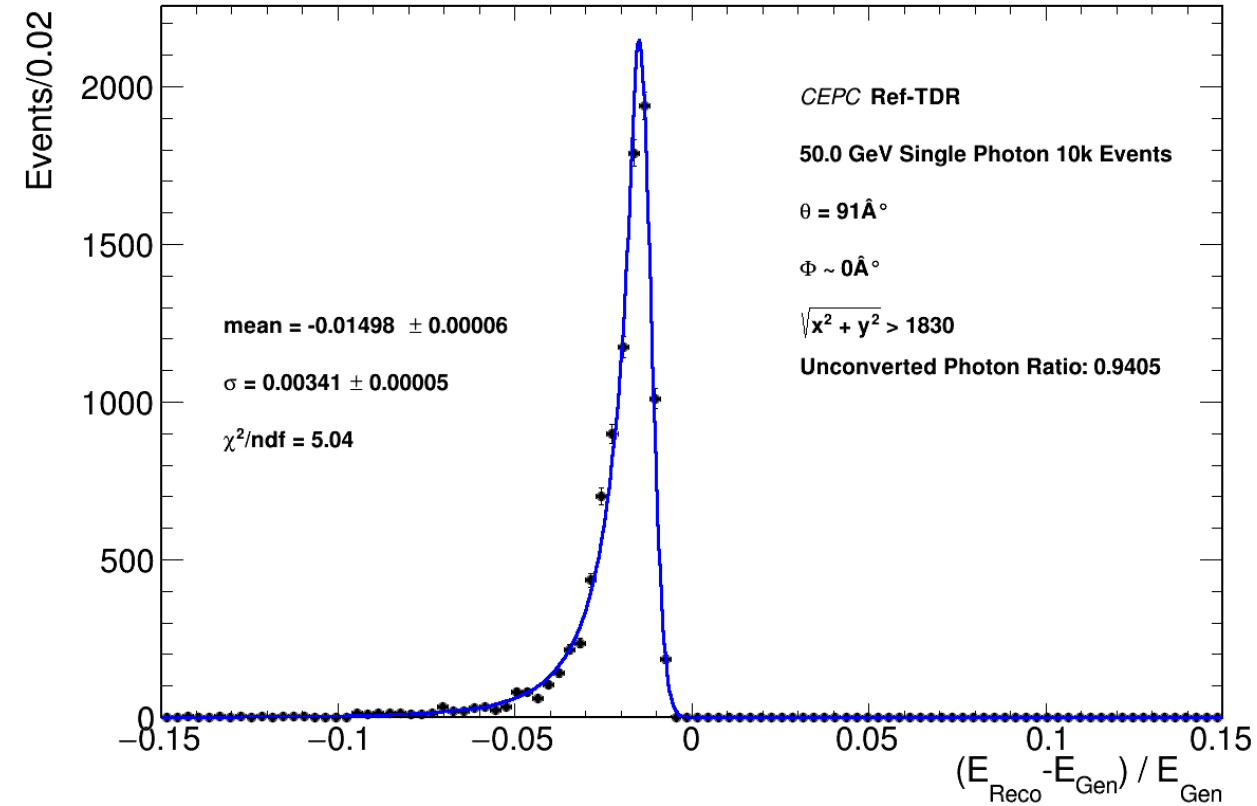
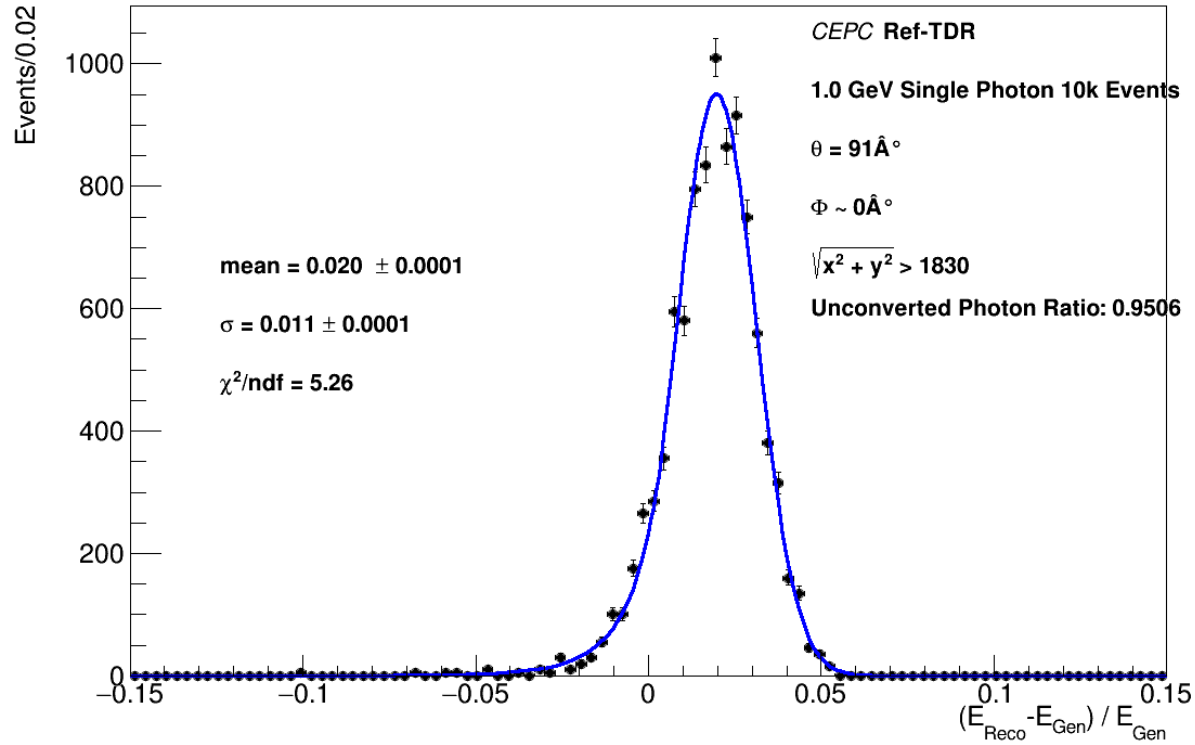
@Reda



Photon has positive energy scale in low mass region. PFA group under calibration.

As ecal scaling factor currently 1 for photon, The high energy photon loss can be Hcal energy leakage.

A RooPlot of " $(E_{\text{Reco}} - E_{\text{Gen}}) / E_{\text{Gen}}$ "



Photon energy differentials rely on different phi – (1.2% and 2.4%) Ecal model crack region. Reda working on it.

- Current Ref-TDR jet/photon performance roughly consistent with previous study, and difference is understandable.
- Jet/Photon energy scale now negative around 1.5%.
- Jet energy scale/BMR meets 4% requirement.
  - JES & JER can be better from knowing its ID and recalibration.
- Other factors, like jet flavor, jet angular, need further study with differential plot.