CEPC Jet&Clusters

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New tutorial based in 25.1

- https://code.ihep.ac.cn/zhangkl/cepcsw_tutorial
- For CEPCSW env, sample, analysis
- Please share to new comers.

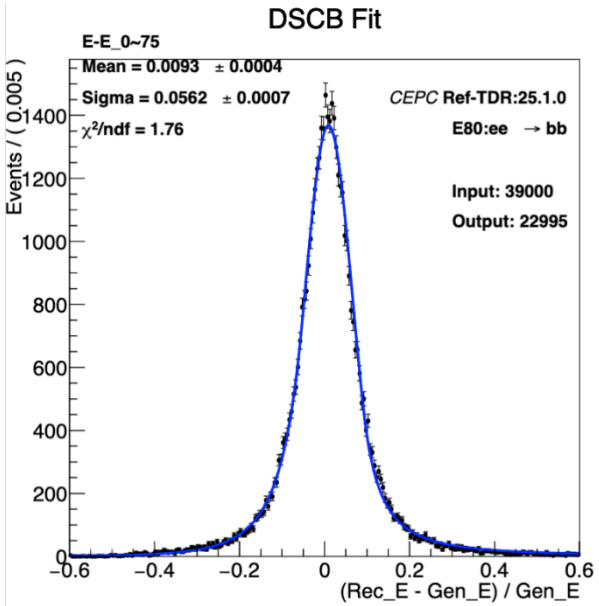
CEPWSW latest

- Latest Release 25.1.1
- Memory usage:
  - sim, digi, trk ~6GB. rec: 8GB.
  - New samples are generated in different step to reduce memory usage.

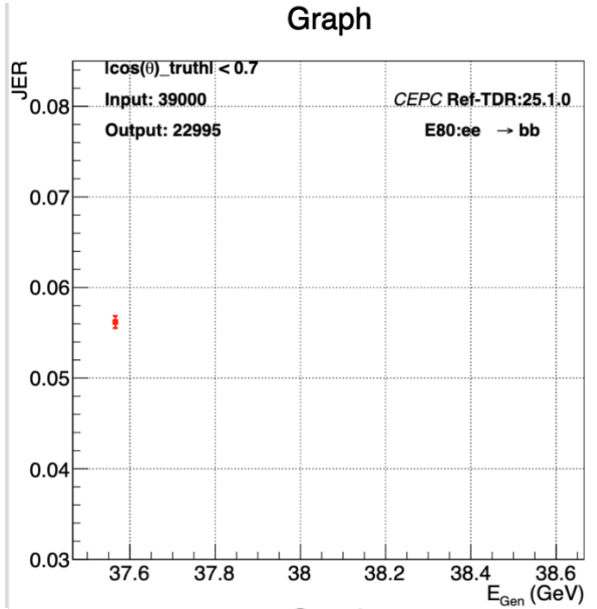
- Path:
  - /cefs/higgs/zhangkl/Production/2501
  - /cefs/higgs/zhangkl/Production/2501/eeqq
  - Current sample with Endcap calorimeter, with ISR.
  - Last week, samples are generated wiout out ISR. Now fixed.

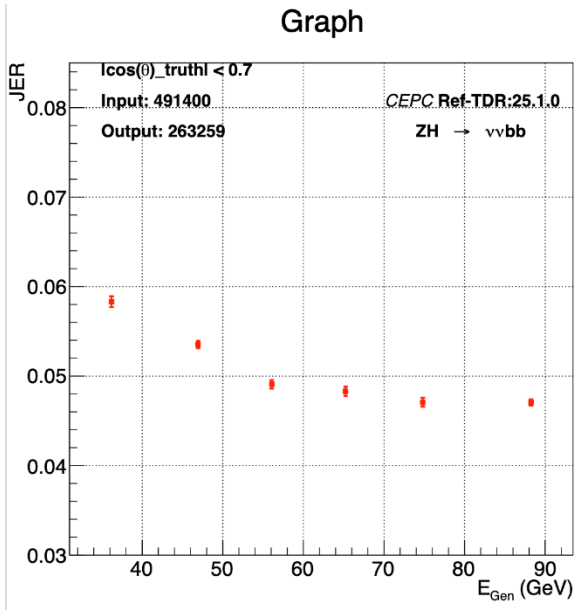
- Cefs now ~1.2PB free.

JER/JES on ee->bb, 80GeV

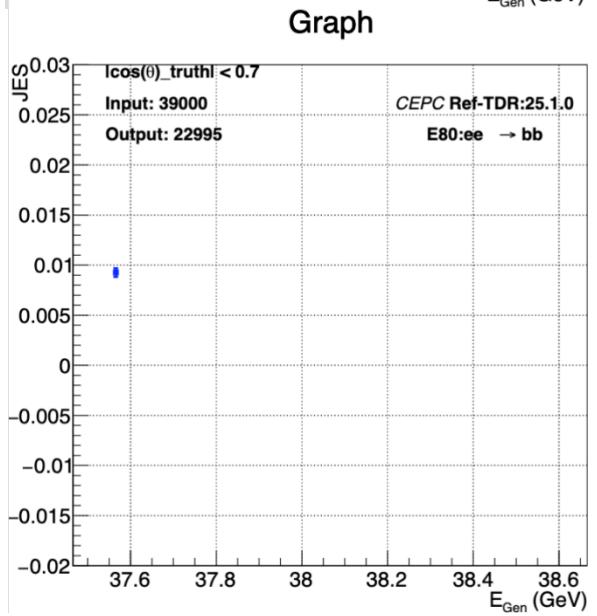


JER~5.6%





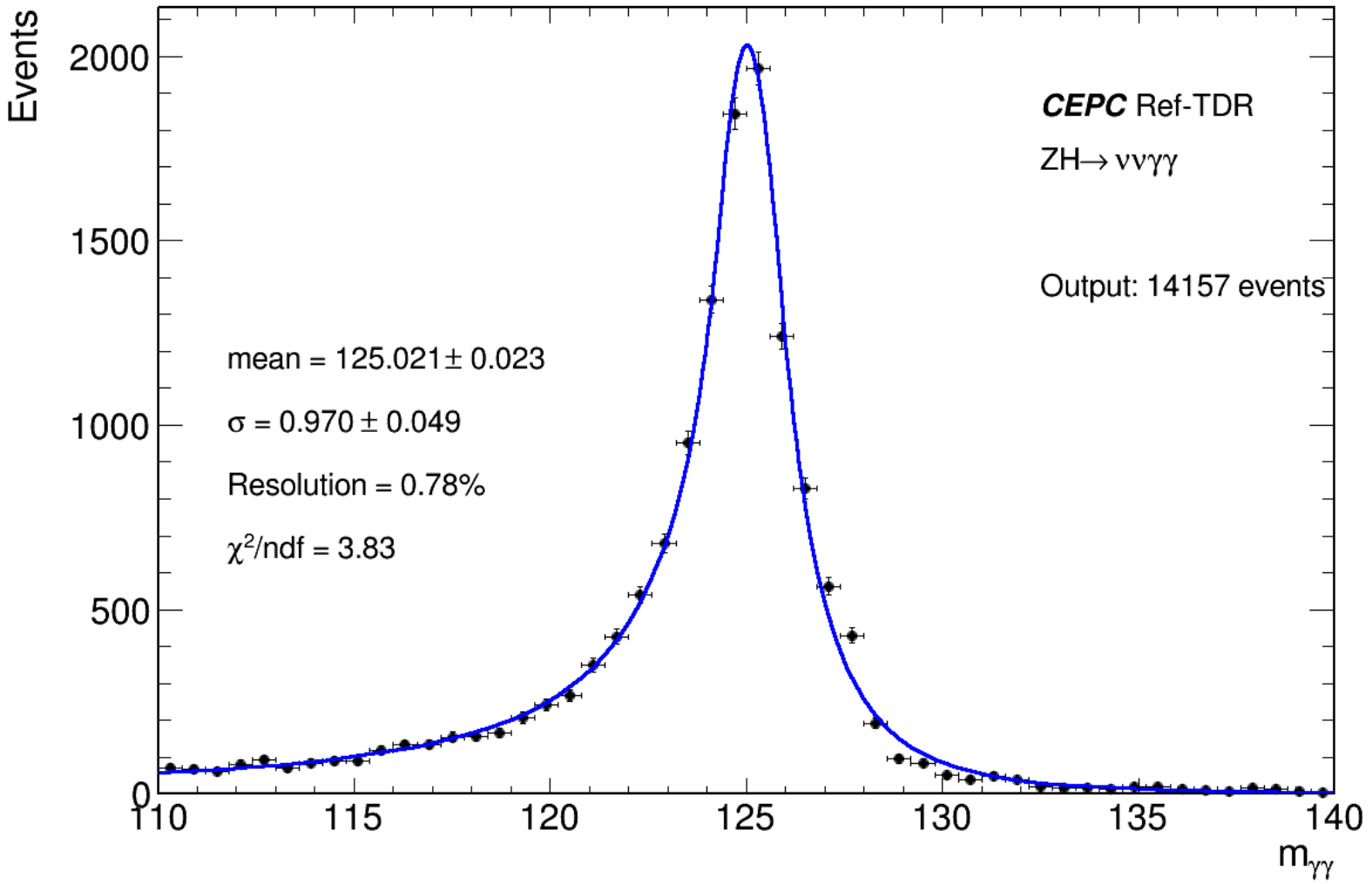
H->bb, 40GeV ~5.6%.



Backups

M_yy resolution

Barrel + Endcap



JER/JES on ZH->vvbb

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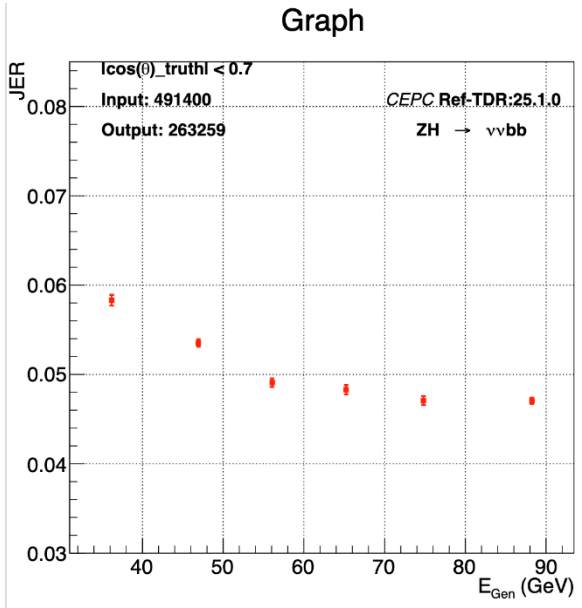
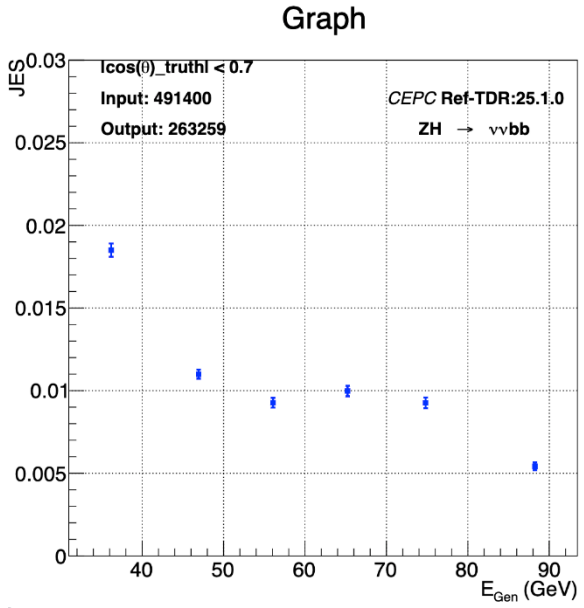
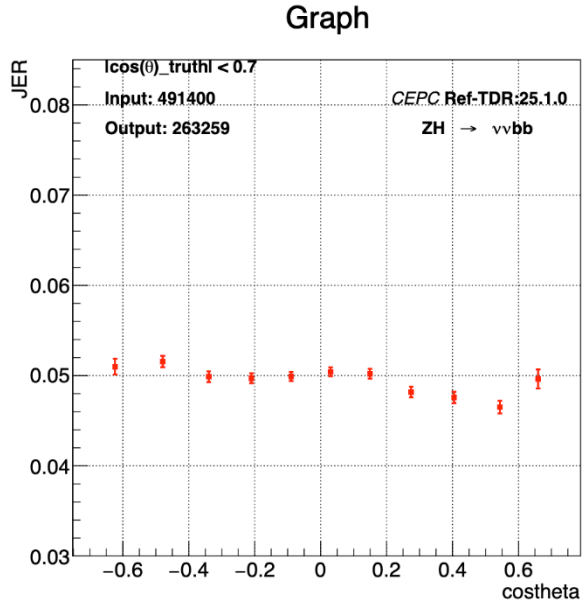
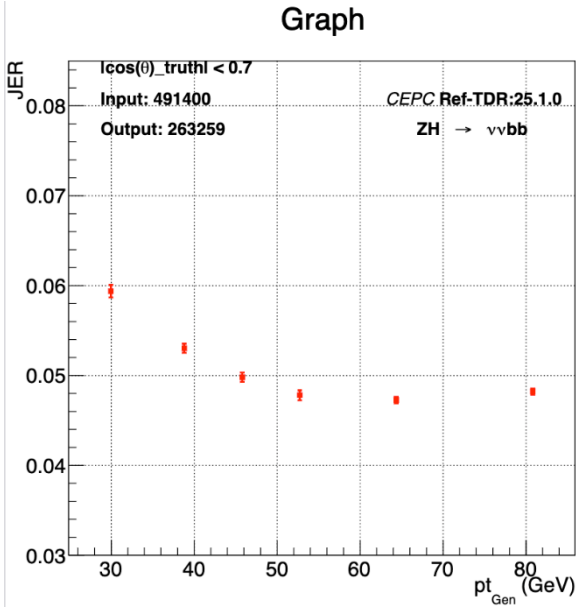
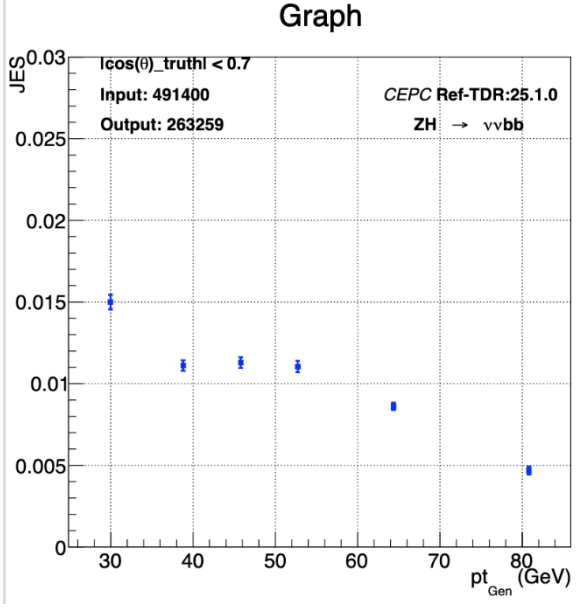










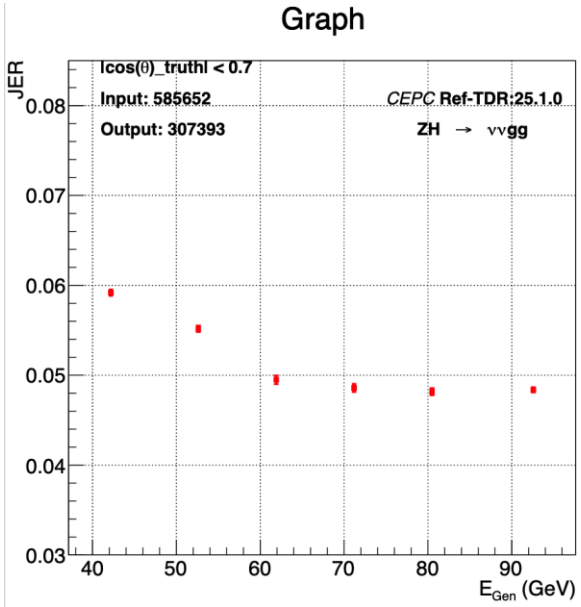
With Endcap, the JER E=70GeV bump disappears.

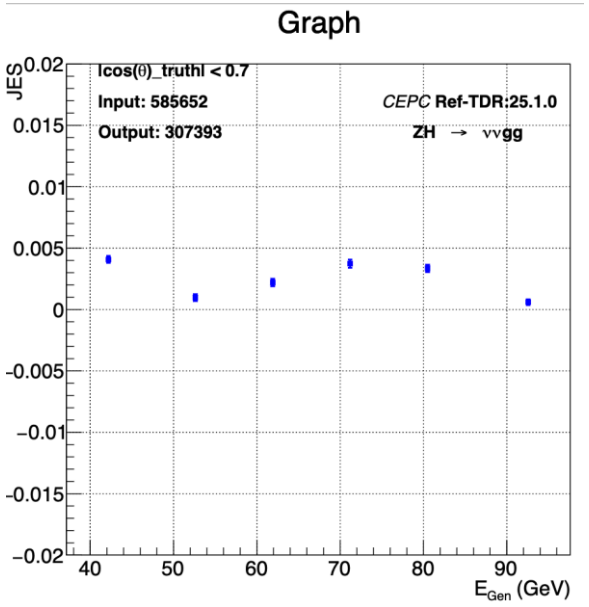
Possible reason: high energy bb jets has large width extend to endcap?

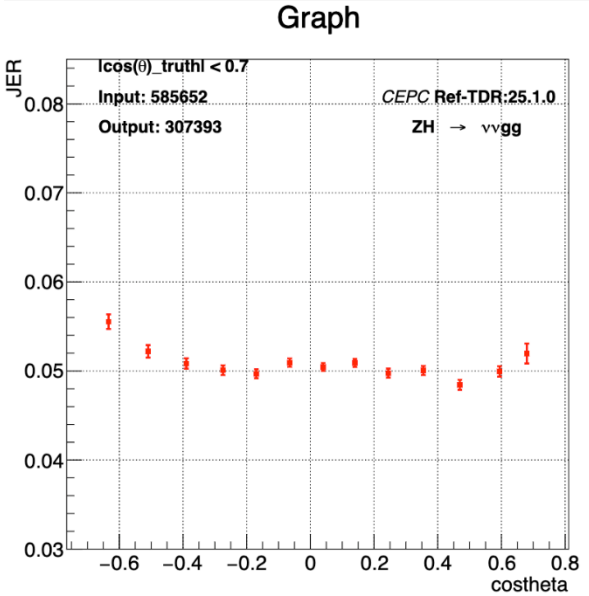
Still under tuning.

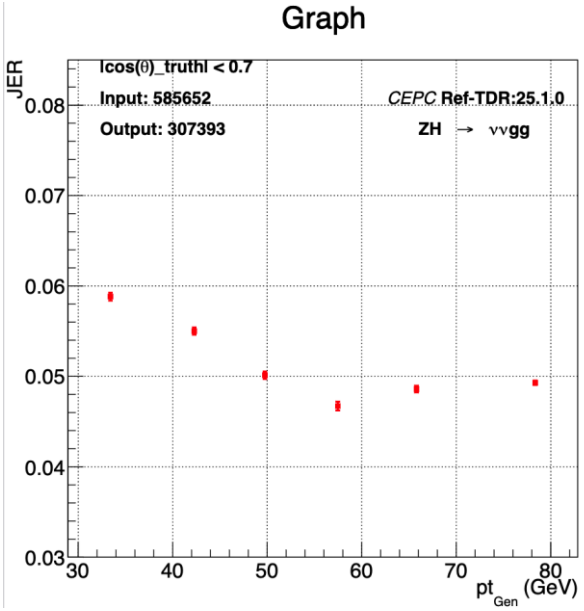
JER/JES on ZH->vvgg

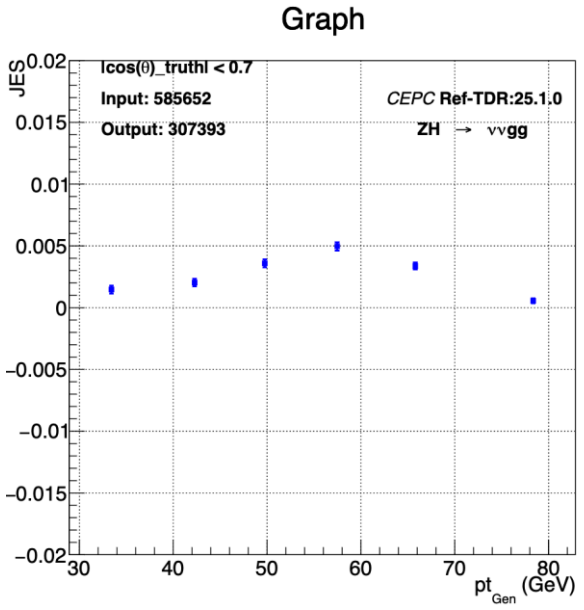
@Yingqi











Current JES for bb and gg are positive. Will use recalibration to fix the scale issue.

The Jet performance are in expectation and ready for TDR document.

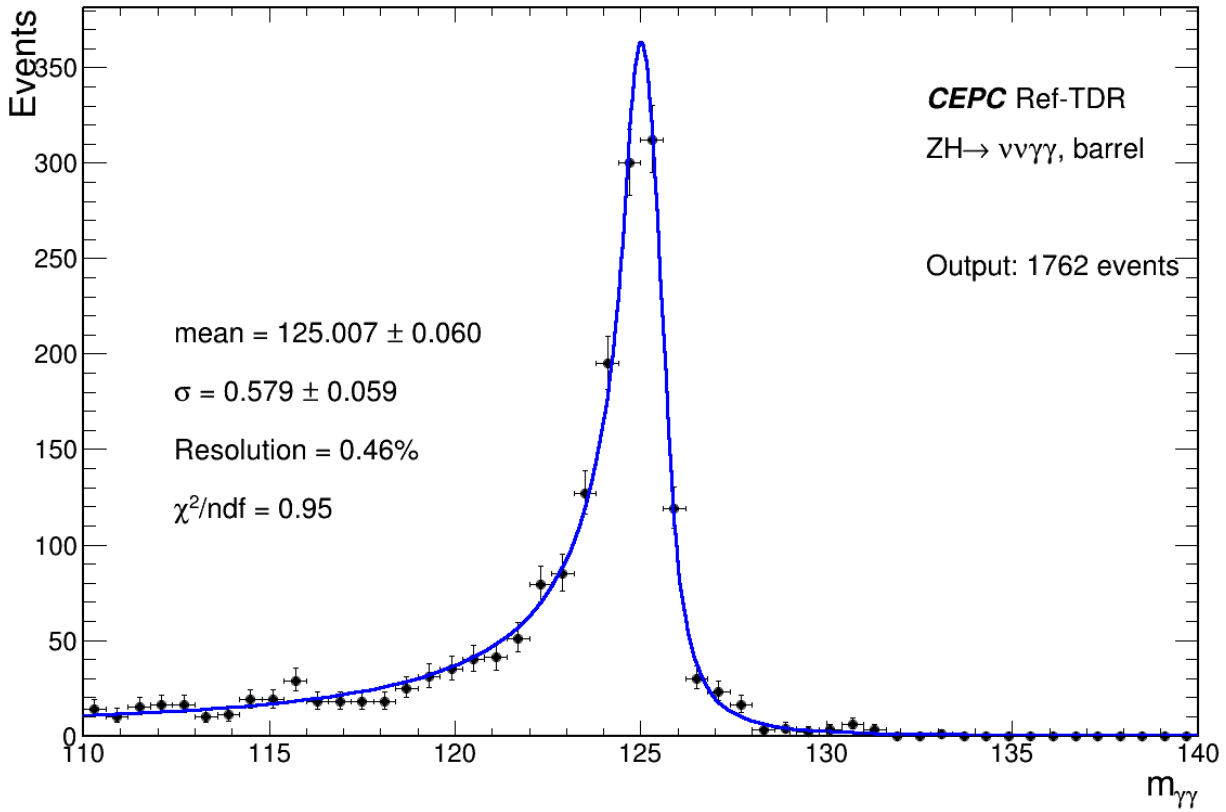
Endcap quick study

- In RefTDR, barrel calo and endcap calo are continuous.
- Overlap and both contribute to ~cos theta 0.75-0.85 region.
- Angular specified study is undertaking in mono-photon gun study @Reda
  - Jet has large width so impossible to tag endcap only performance
  - Endcap shows *better* resolution and *different* scale factors other than barrel.
  - Photon convention rate (~30%) high in endcap than barrel (9%) due to material budget.
  - May need further tuning and validation.

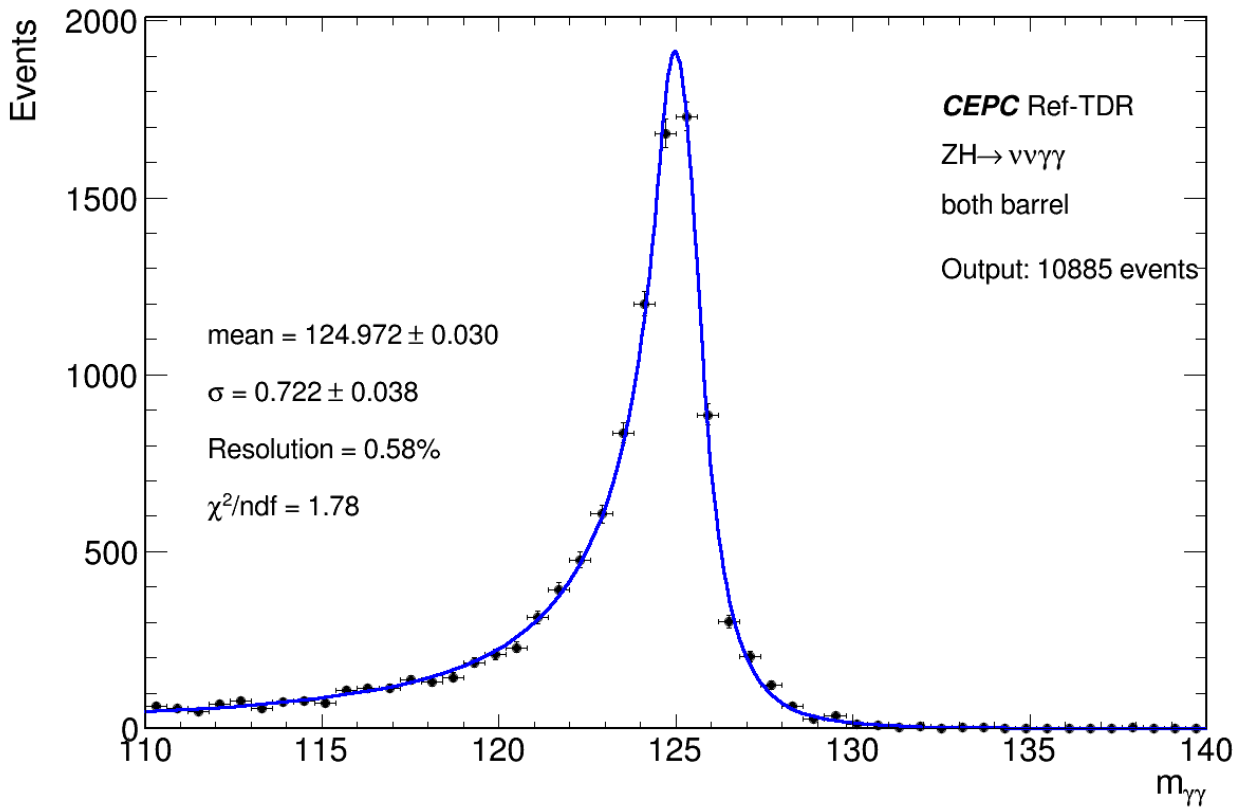
Barrel resolution

Both y1, y2 costheta<0.85

Before tdr25.1, only barrel



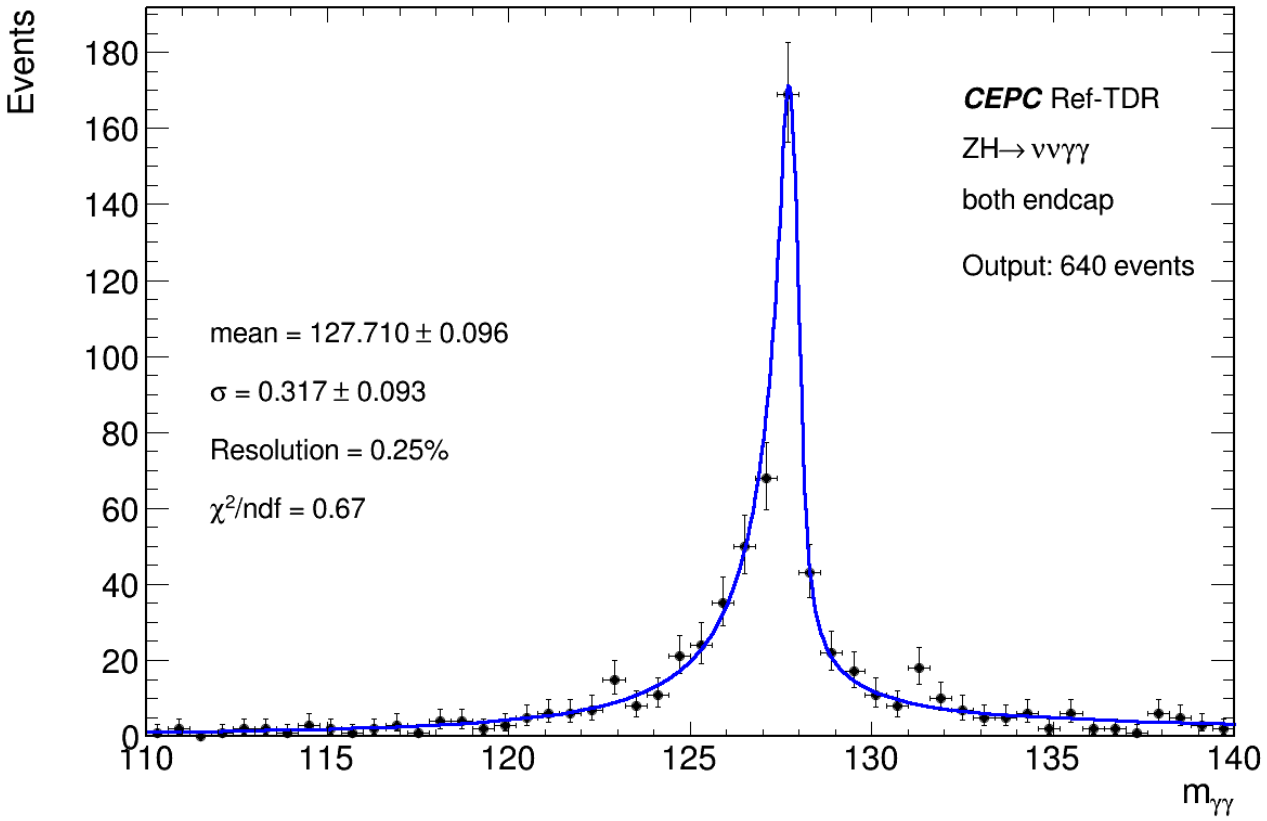
Latest



From PFA group, barrel BMR reduced from 3.8% to 4.2%. Also found in diphoton channel. By 25%.

Endcap resolution

Both y1, y2 costheta>0.85

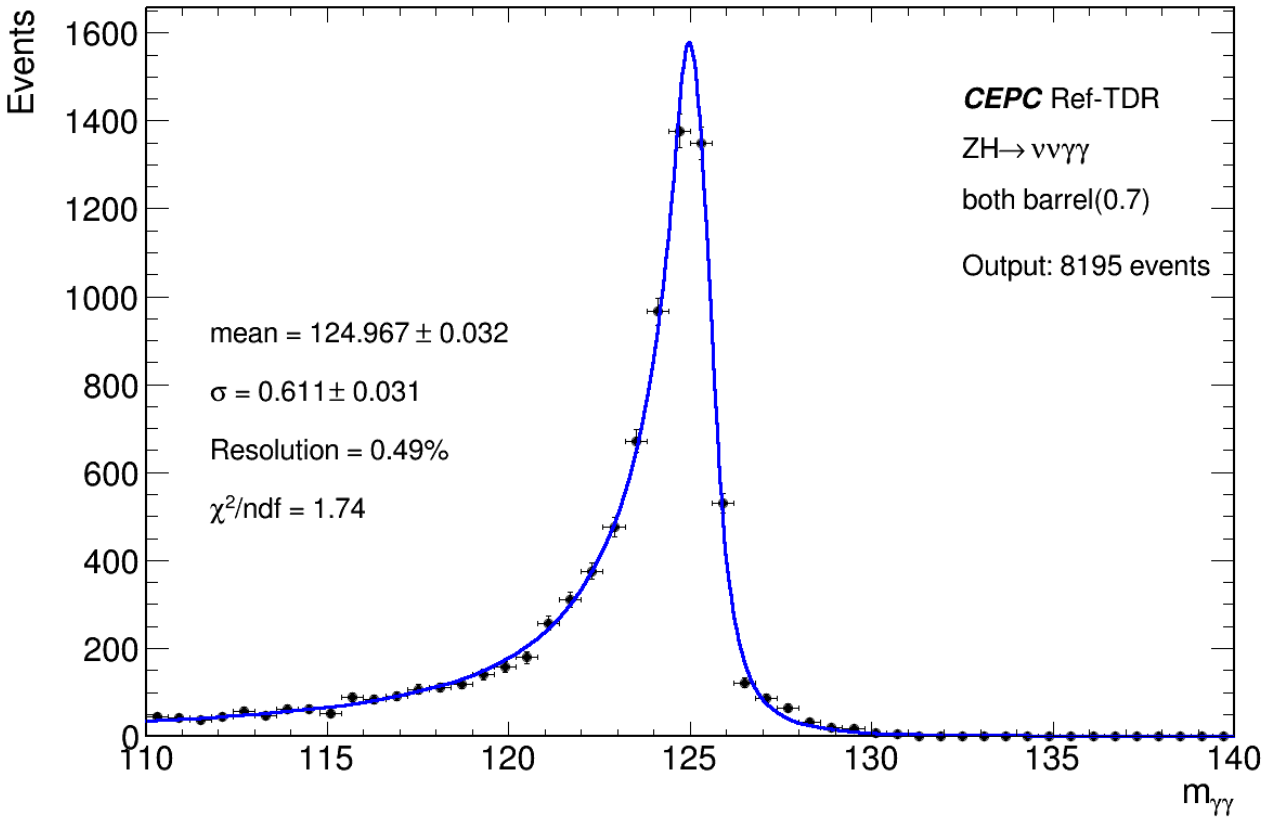


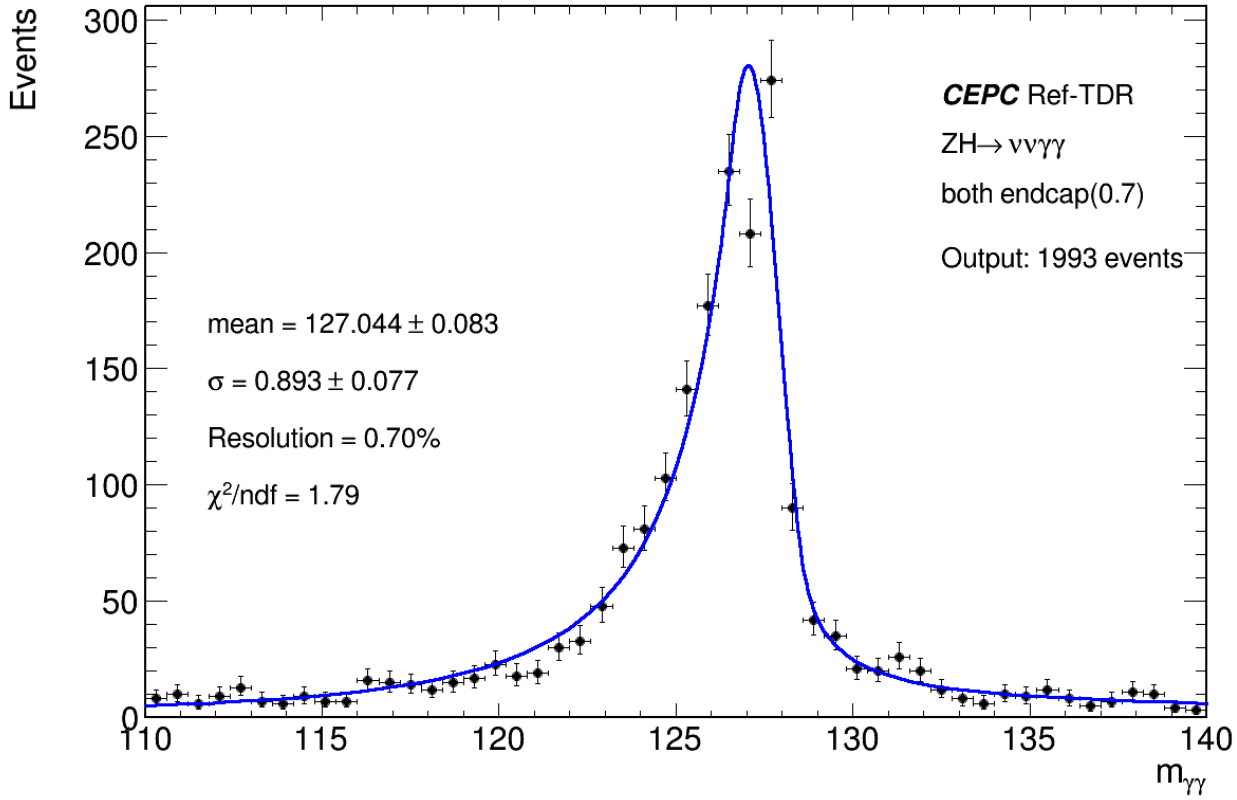
- Endcap with better resolution.
  - Better than barrel
- Right side tail
- Mean value->Calibration.
- We have endcaps. But may need further validations.

Angle at costheta 0.7

Past no endcap	0.46%
Now barrel (<0.85)	0.58%
Now barrel (<0.7)	0.49%

Now Endcap (>0.85)	0.25%
Now Endcap (>0.7)	0.70%





The “crack” region (both barrel calo and endcap calo contributed) need further study.