Performance of ECAL in the latest configuration

Andrei Maltsev (JINR)

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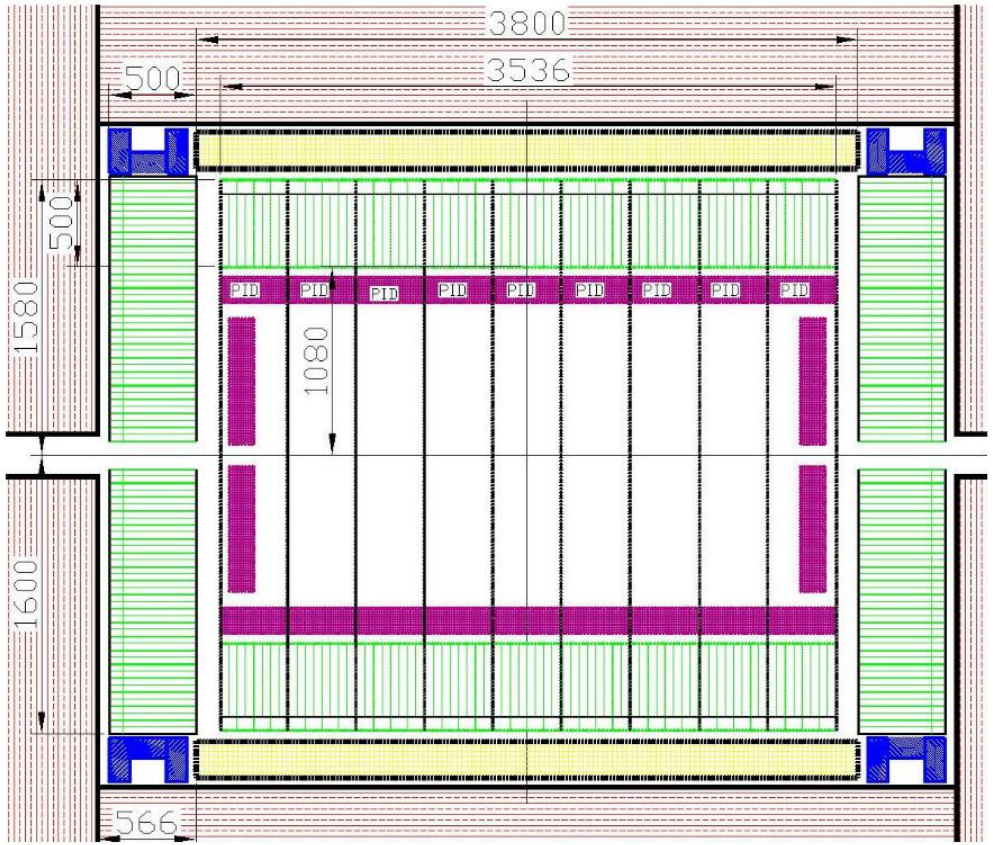
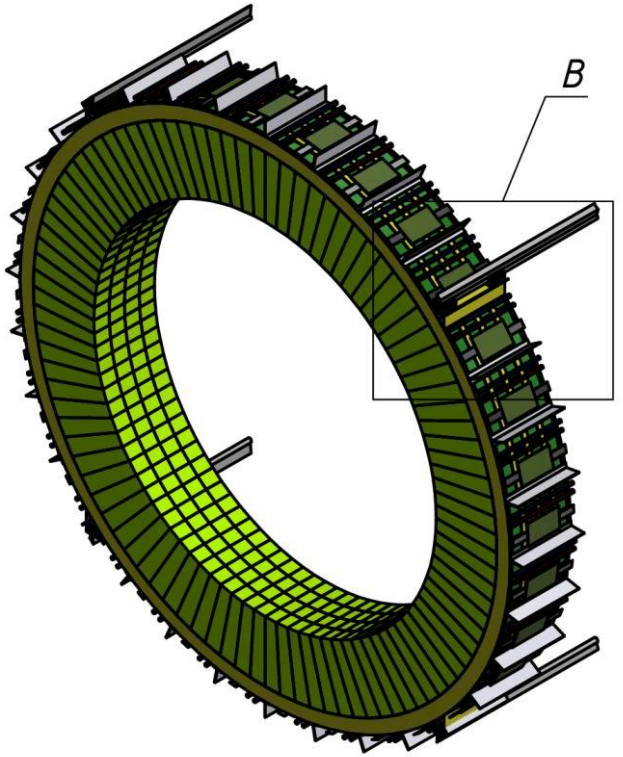
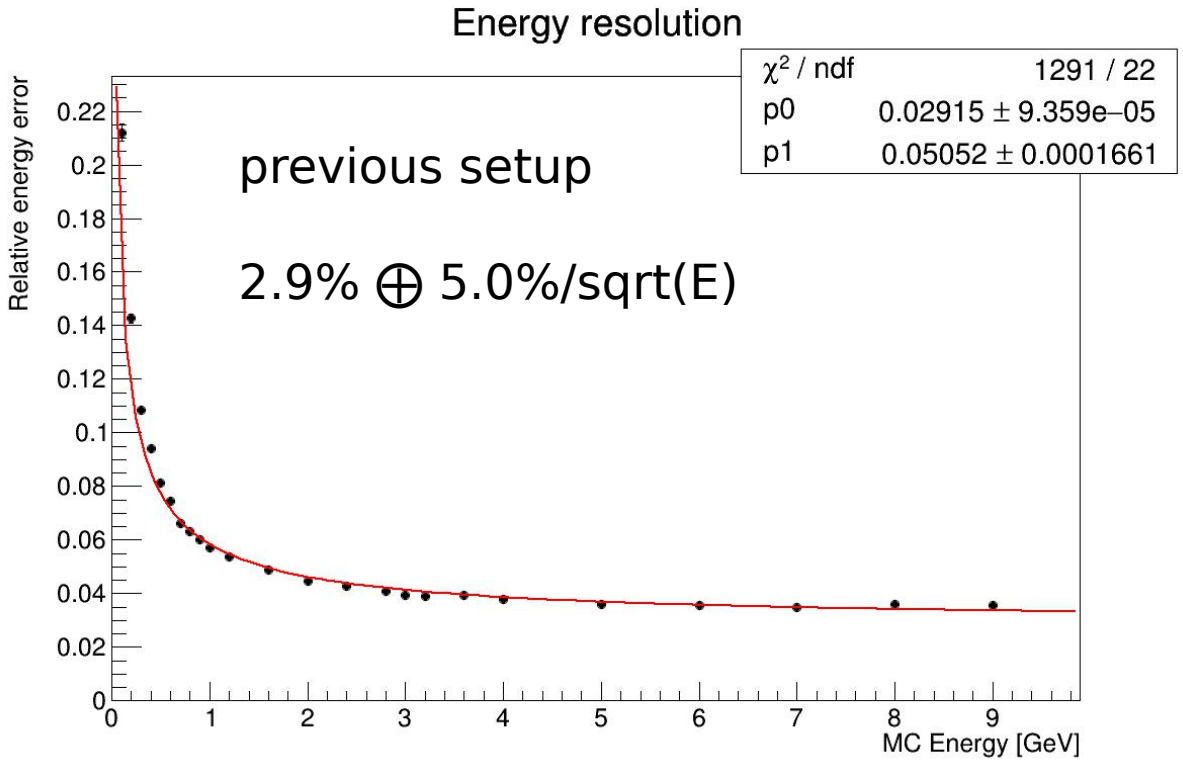
Latest configuration (TDR draft)

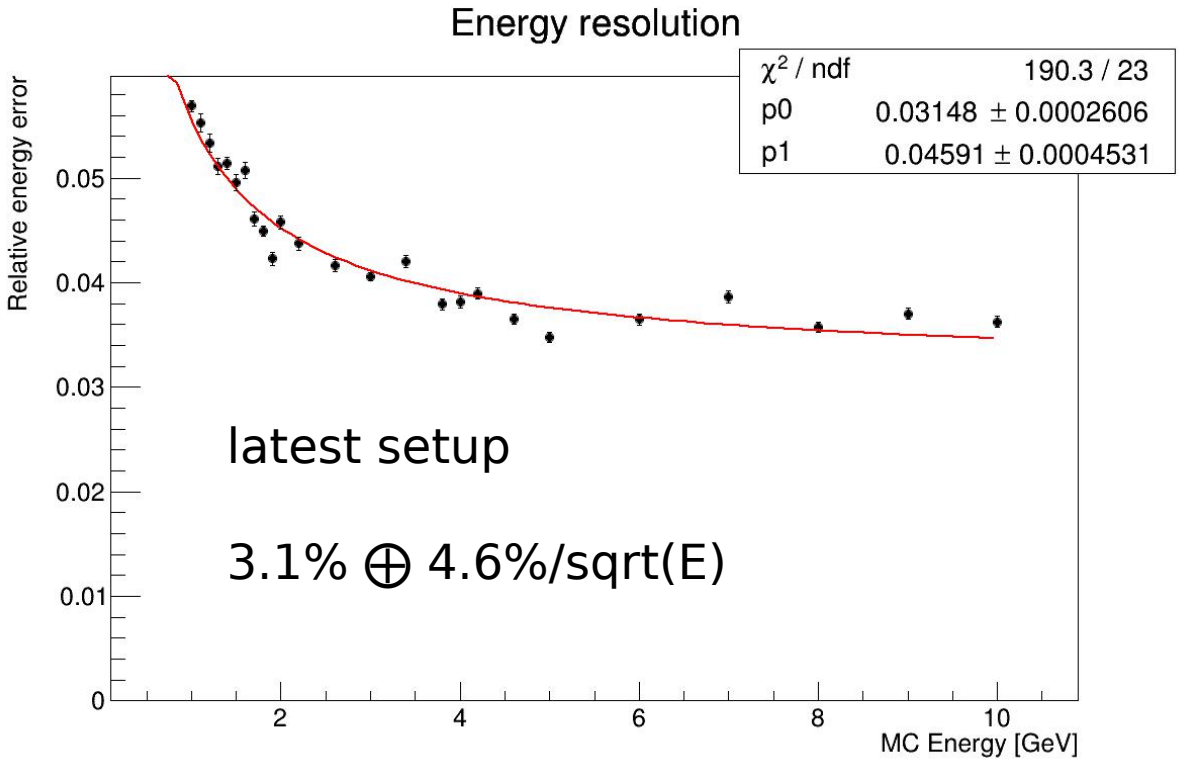




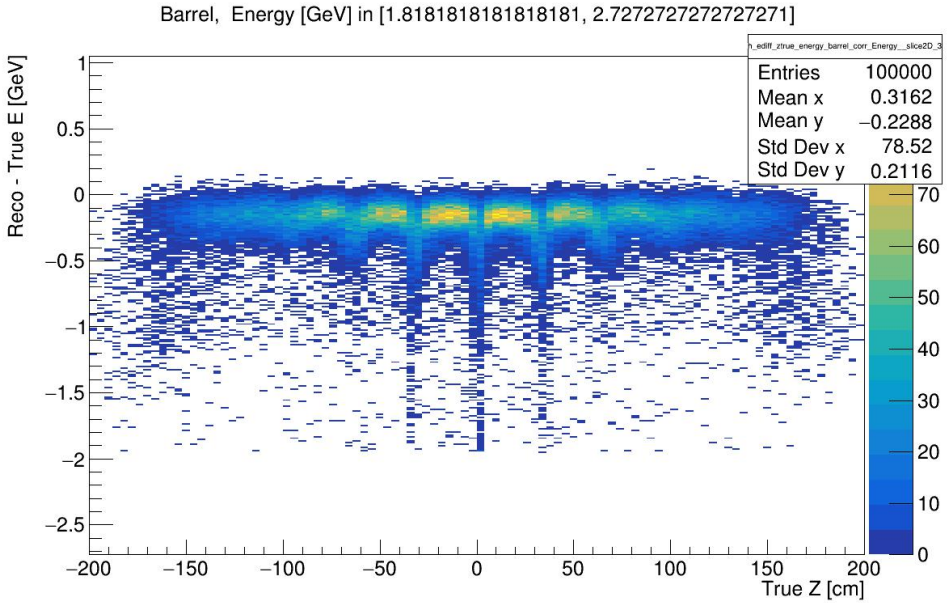
- “Z slices”
  (as opposed to φ baskets)
- cryostat outside ECAL:
  $R_{ECAL,front}$ = 1080 mm
- 190 layers
  (200 layers previously)
- cell front side dimensions:
  34×48 mm
- simulation: smearing
  Z_{PV} in [-30, 30] cm region

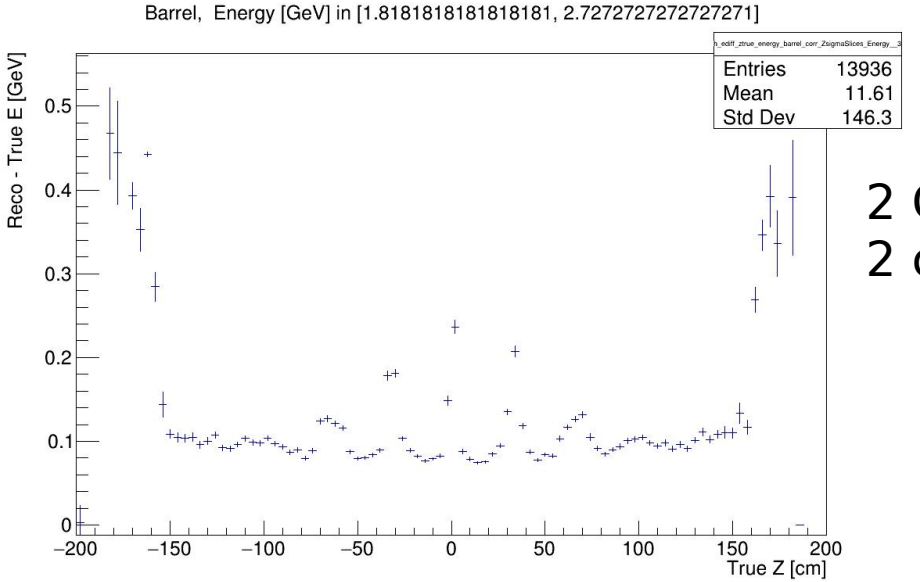
Energy resolution



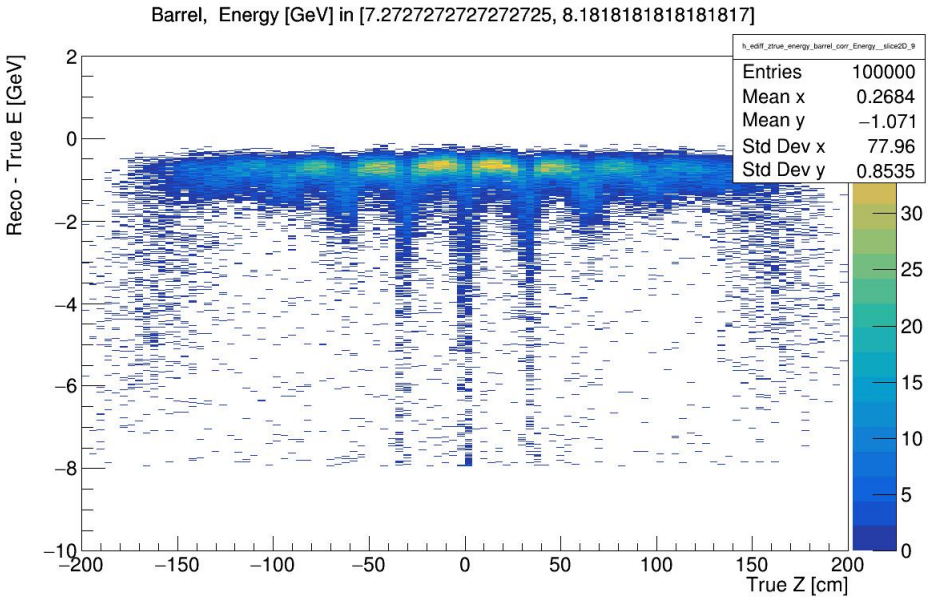


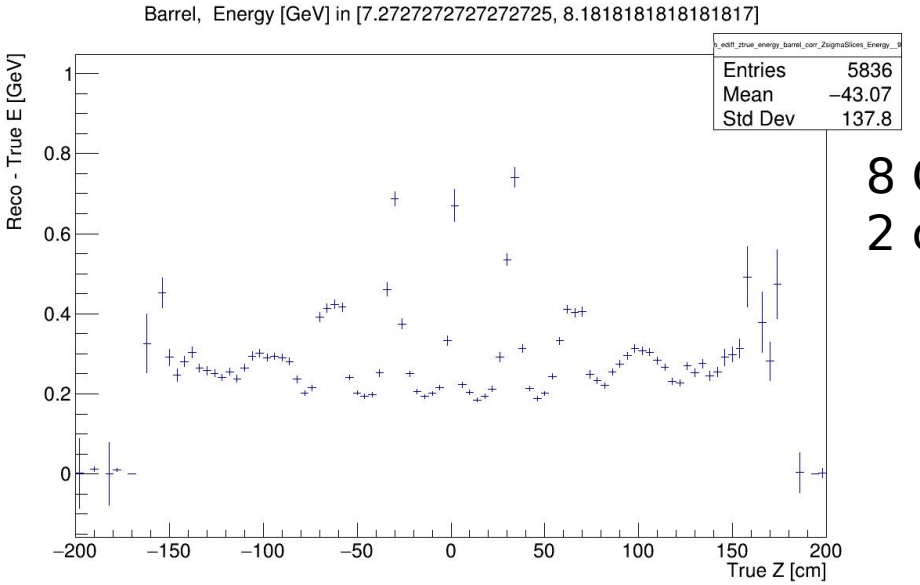
Impact of gaps between Z-slices





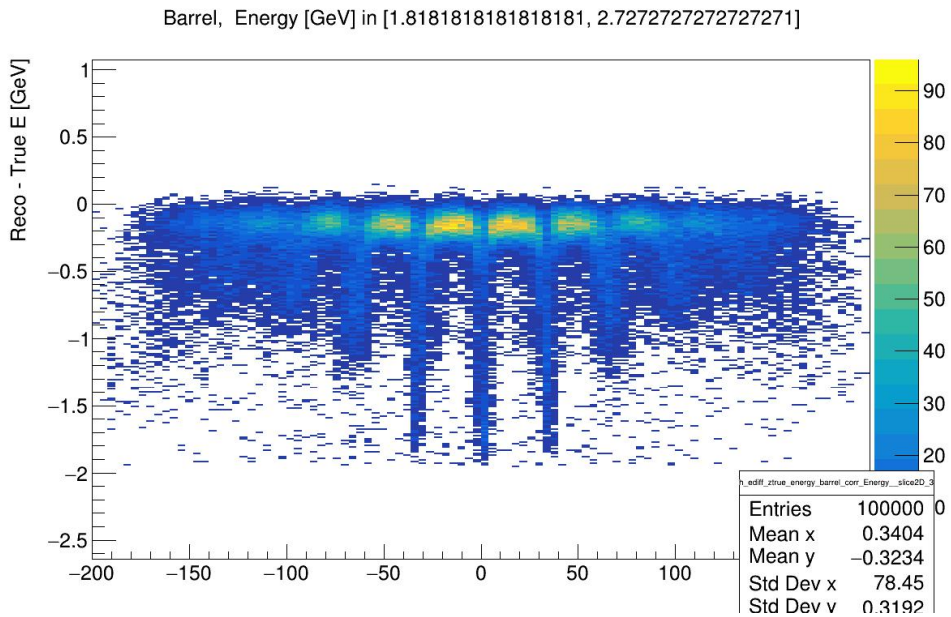
2 GeV
2 cm carbon gaps

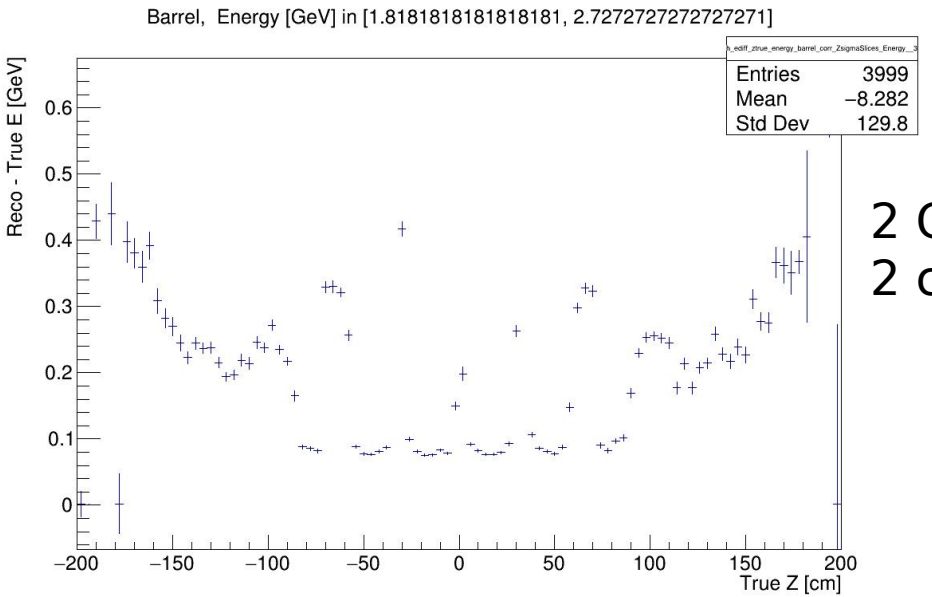




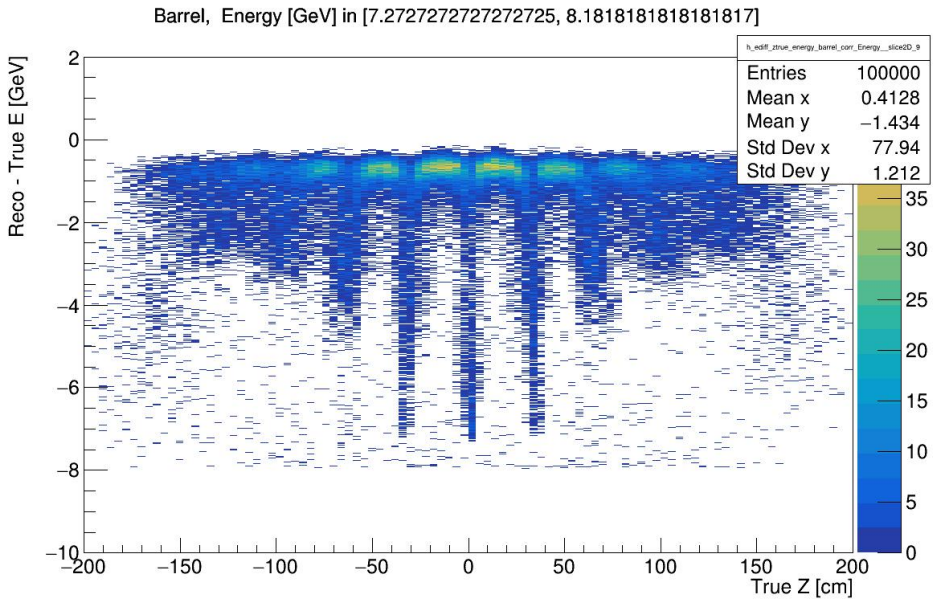
8 GeV
2 cm carbon gaps

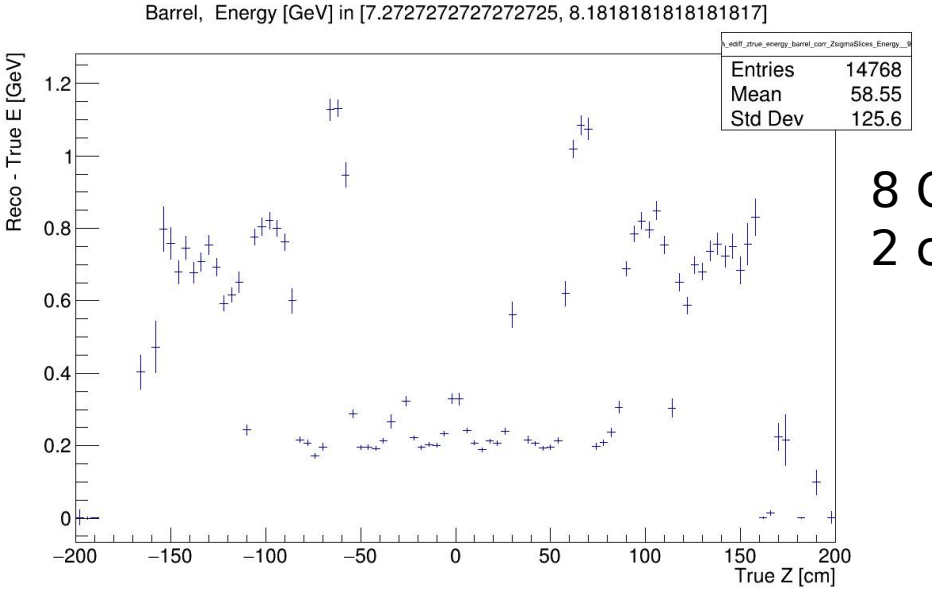
Impact of gaps between Z-slices





2 GeV
2 cm iron gaps





8 GeV
2 cm iron gaps

Conclusions

- The latest geometry version doesn't significantly impact the energy resolution, but:
- using Z slices of about 2 cm with heavy material between (iron) will worsen energy resolution significantly for photons hitting in the gap, and with large angles
- Using lighter material, e.g. carbon significantly improves the situation and allows to successfully reconstruct photon energies, although with slightly worse resolution