

Fun4All Calorimeter Plots: Implementation of MIP energy cut on individual tower energies

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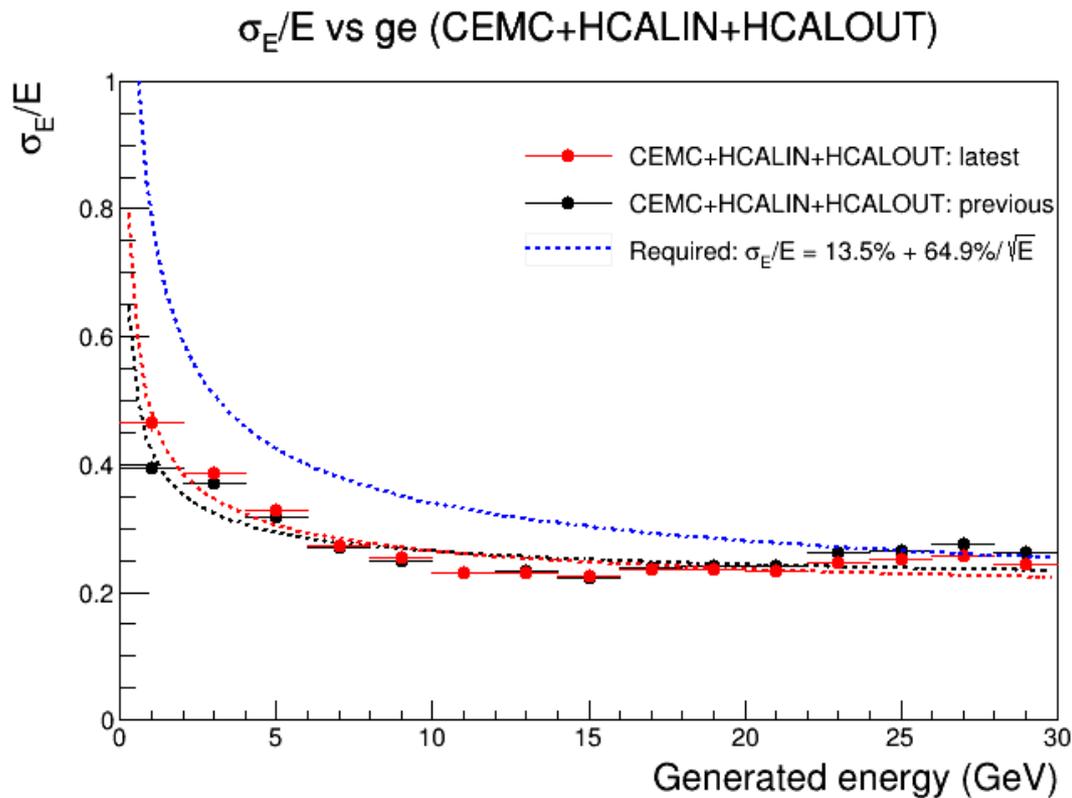
- Implementation of theta-dependent energy cut on individual tower energies of:
 - 0-30 GeV pions: energy resolution plots

Specifications:

SIMULATION & ANALYSIS DETAILS FOR PION:

- Particles: pi-
- Events: 100000 (0-30 GeV), 50000(0-10GeV)
- **NEW** pseudorapidity cuts on calorimeters:
 - Pion:
 - CEMC, HCALIN, HCALOUT: $\eta = -0.98$ to 0.99
 - FEMC, FHCAL: $\eta = 1.32$ to 3.14
- The theta dependent energy obtained from muons implemented on the emcals and energy resolution compared with previous results.

Theta dependent energy cut implemented on individual tower energies of pion: Barrel Resolution (CEMC+HCALIN+HCALOUT)



$$\sigma_E/E = 16.5\% + 31.3\%/ \sqrt{E}$$

Previous case:

Individual tower energy cut on CEMC: 200 MeV (To remove the calibration problem faced in higher energies)

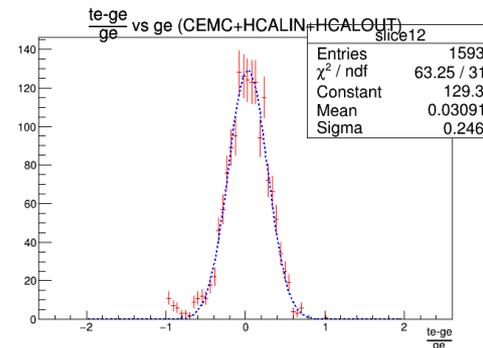
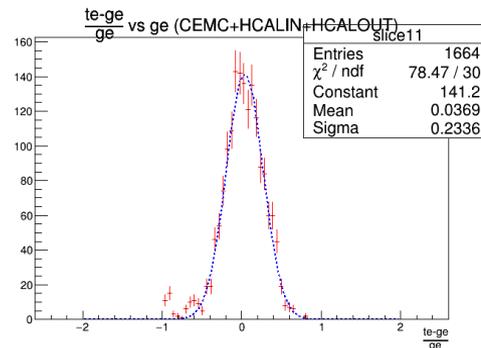
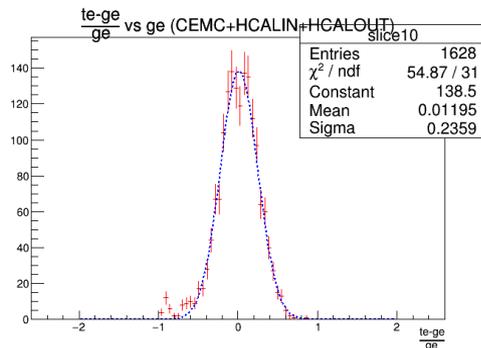
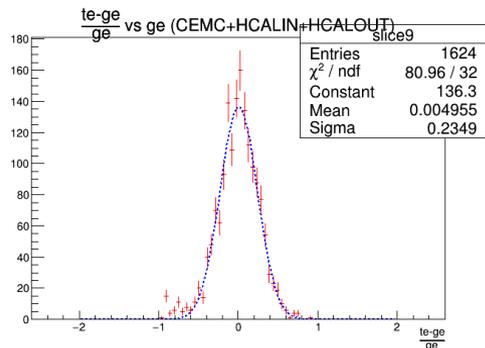
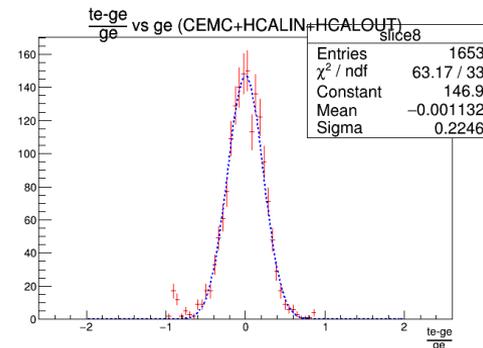
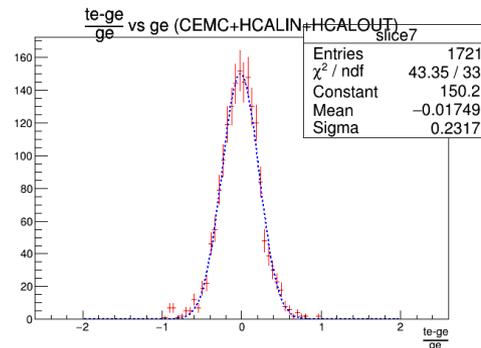
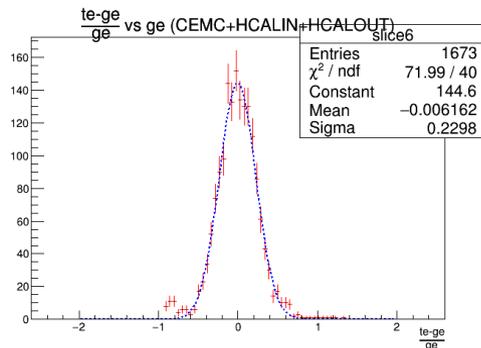
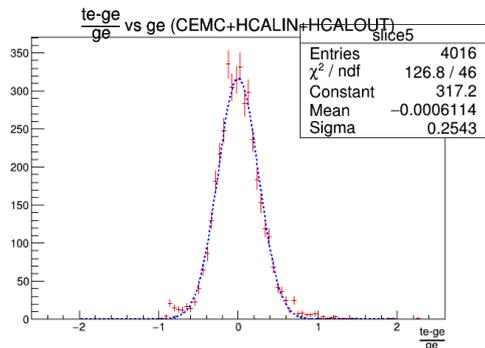
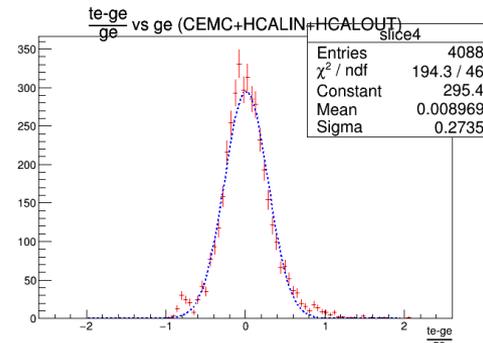
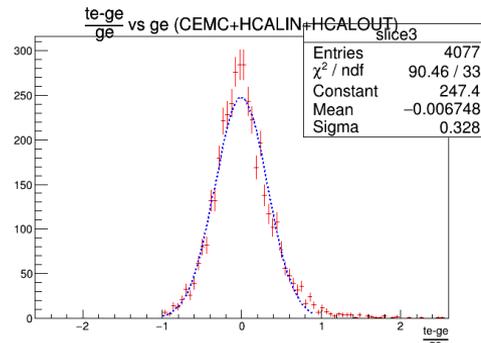
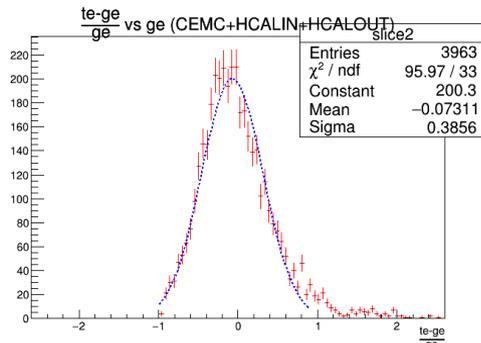
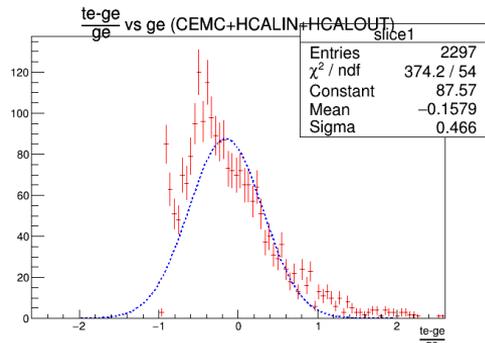
+
Agg tower energy cut on CEMC: 0 (to remove zeroes)

Latest result:

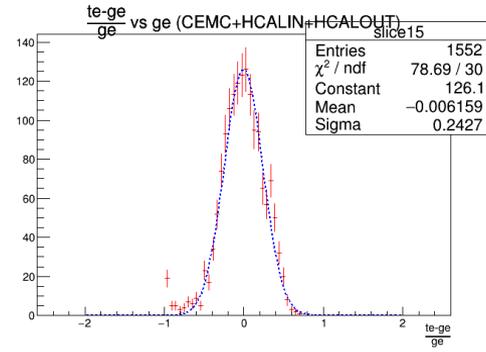
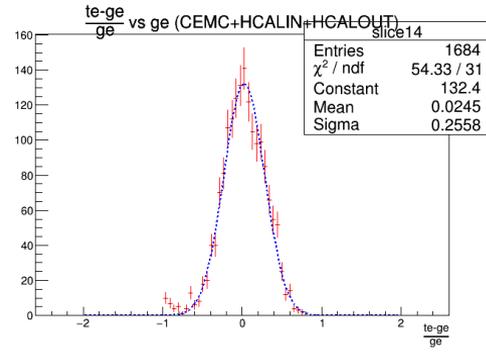
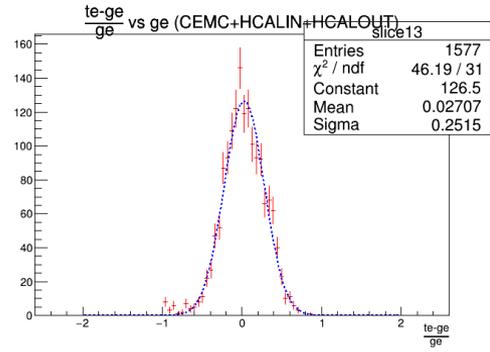
Individual tower energy cut on CEMC: theta-dependent energy cut

+
Agg tower energy cut on CEMC: 0

CEMC+HCALIN+HCALOUT: Gaussian fits

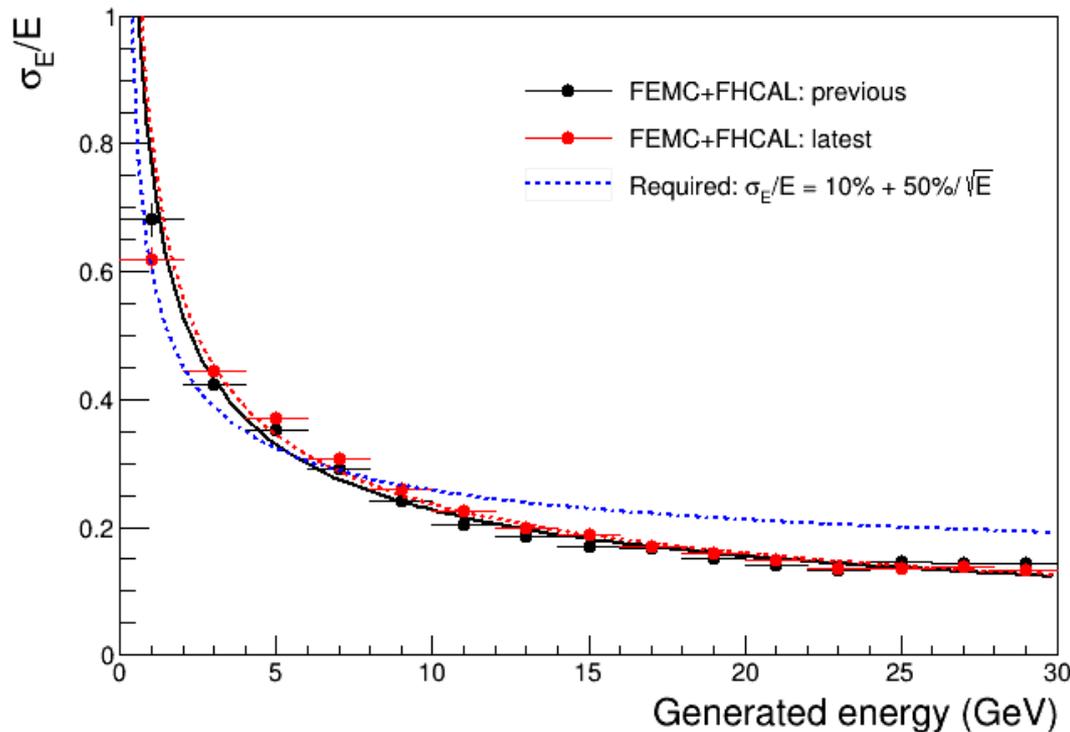


CEMC+HCALIN+HCALOUT: gaussian fits



Theta dependent energy cut implemented on individual tower energies of pion: Forward Resolution (FEMC+FHCAL)

σ_E/E vs ge (FEMC+FHCAL)



$$\sigma_E/E = -2.6\% + 83\%/\sqrt{E}$$

Previous case:

Individual tower energy cut on FEMC:
No cut

(This cut only worsens the resolution)

+

Agg tower energy cut on FEMC: 100
MeV

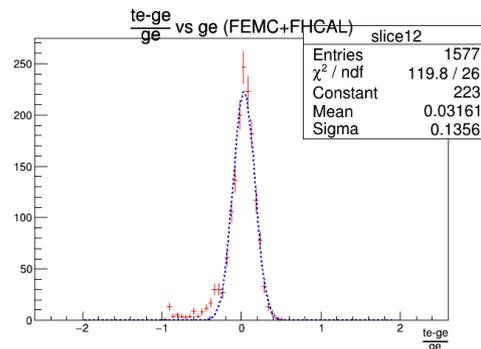
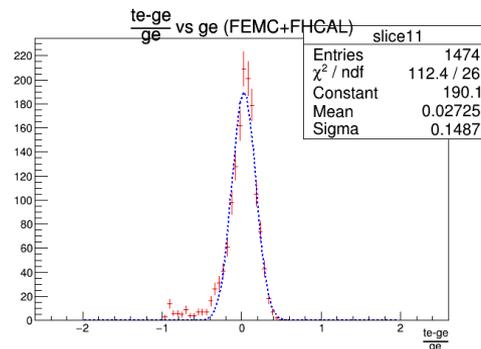
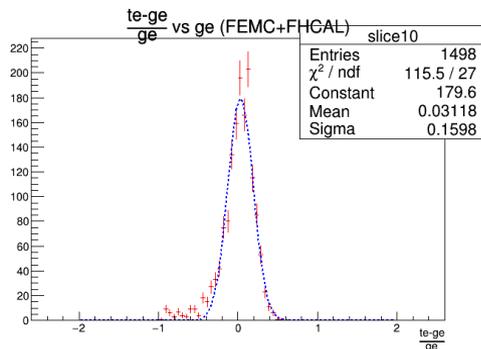
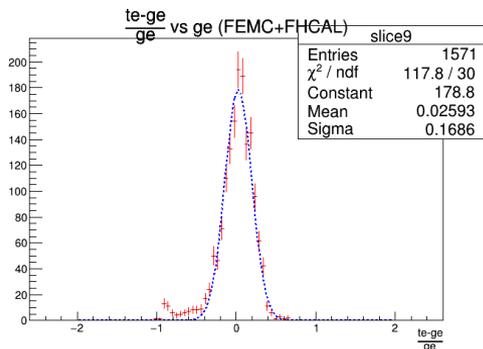
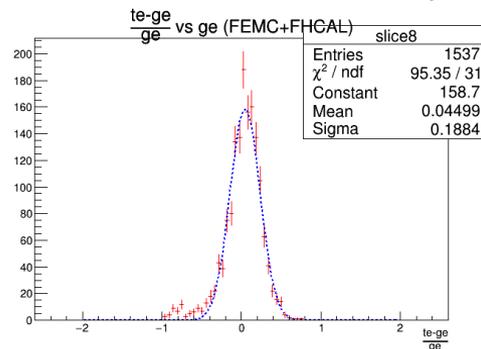
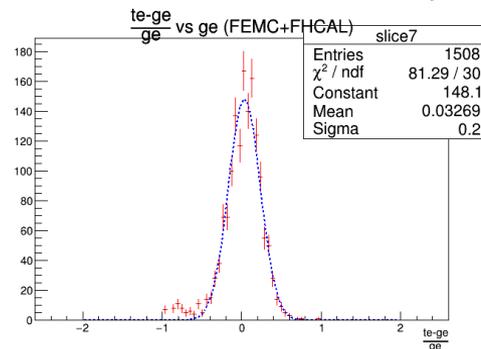
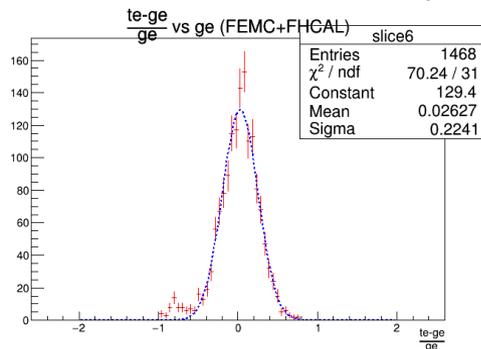
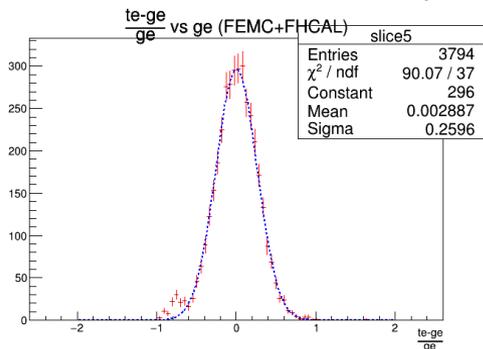
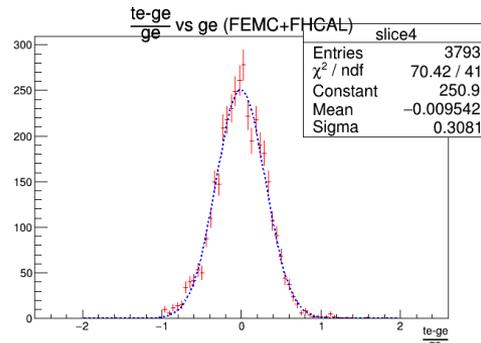
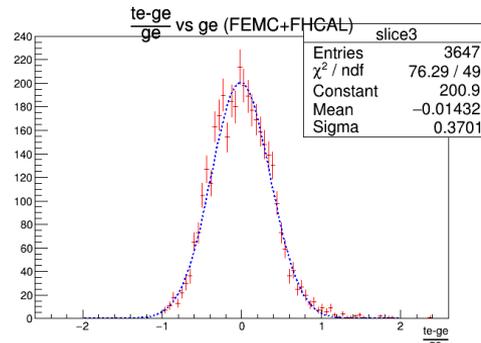
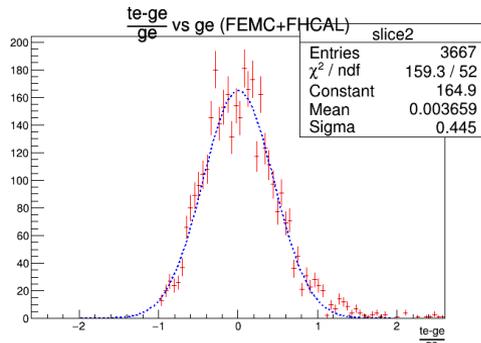
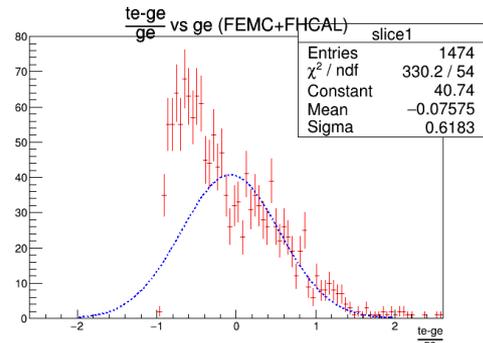
Latest result:

Agg tower energy cut on FEMC:
Theta dependent energy cut obtained
from muon energy parameterization

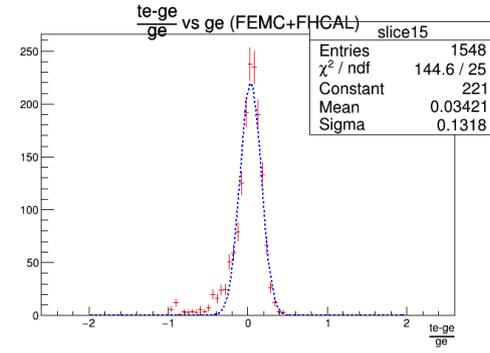
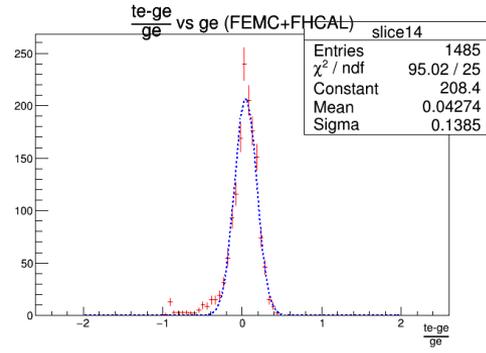
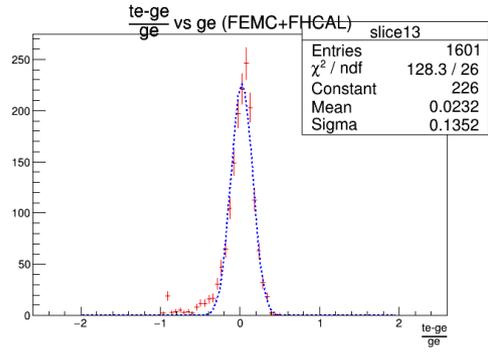
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Agg tower energy cut on FEMC: 0

FEMC+FHGAL: Gaussian fits



FEMC+FHGAL: gaussian fits



THE END