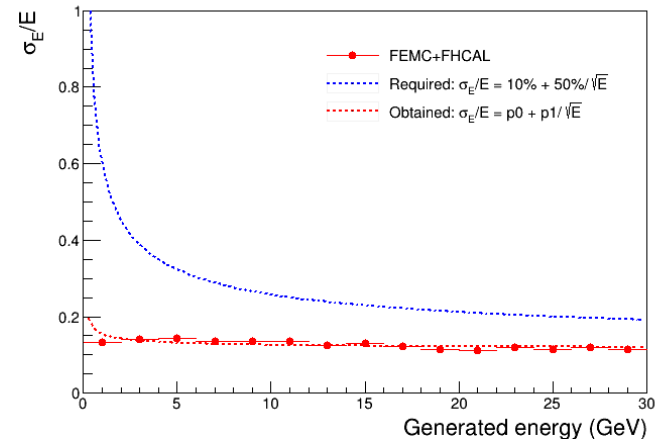
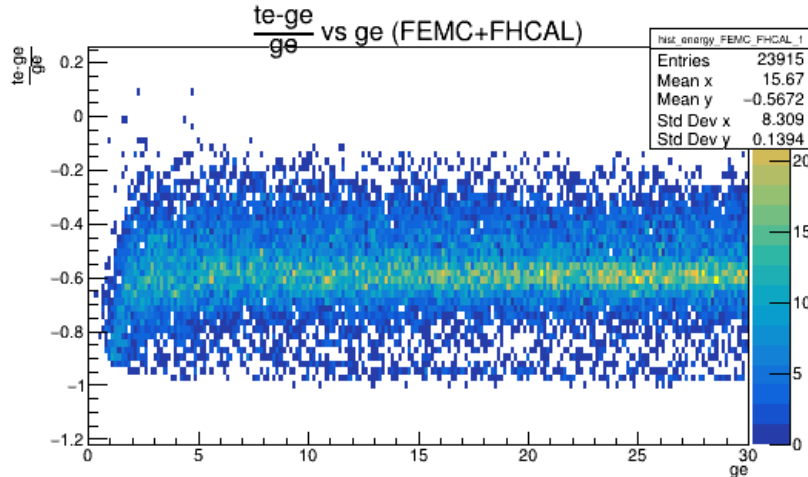
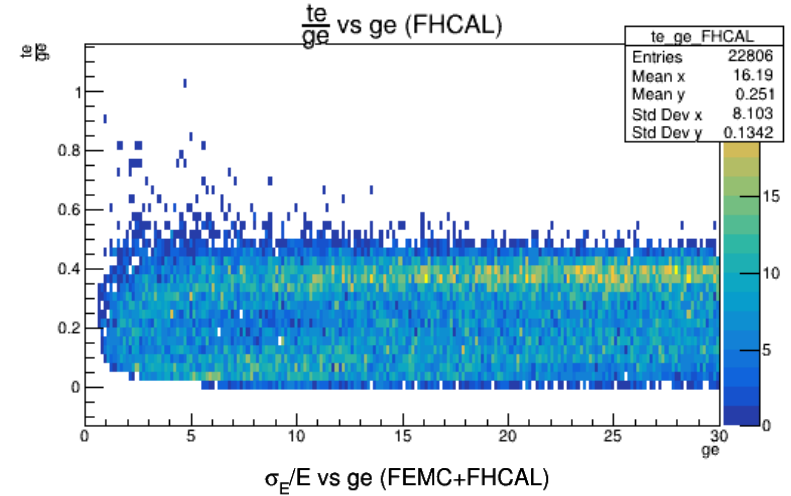
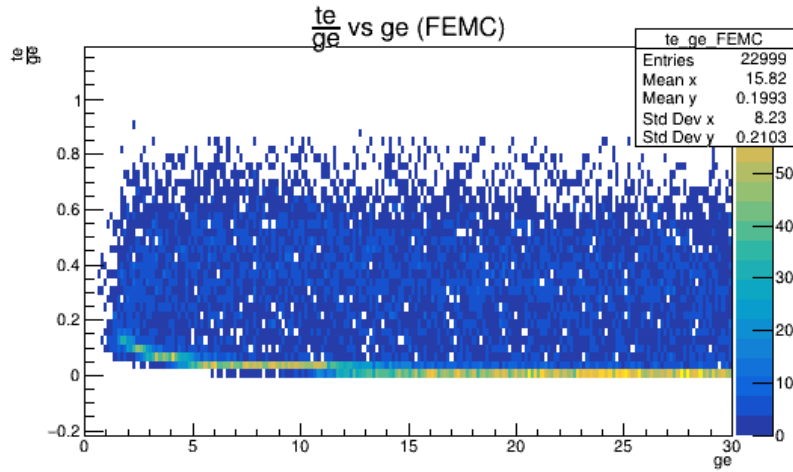


Fun4All Calorimeter Plots - Comparison of different methods of calibration (Pion: FEMC, FHCAL)

Simran
Lokesh Kumar
Panjab University, Chandigarh, INDIA

Pion Original plots:

- Tight Circular cut + 100MeV energy cut(to remove zeroes at low energy)
- $\eta=1.3$ to 3.3 (both)



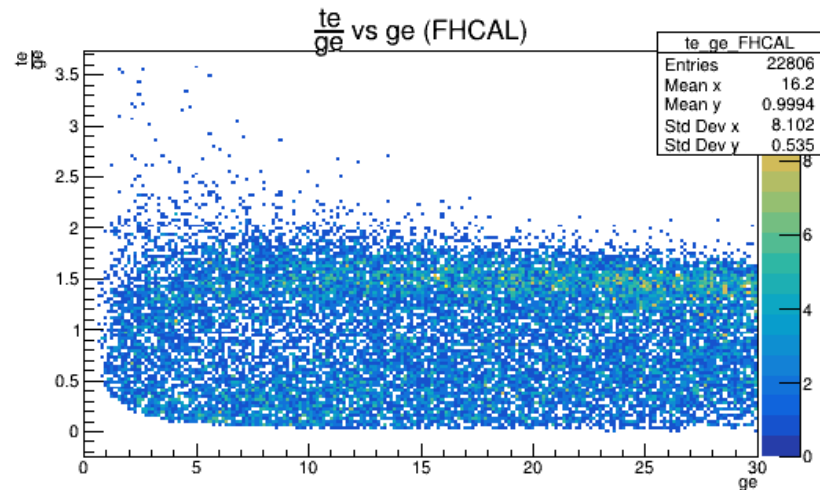
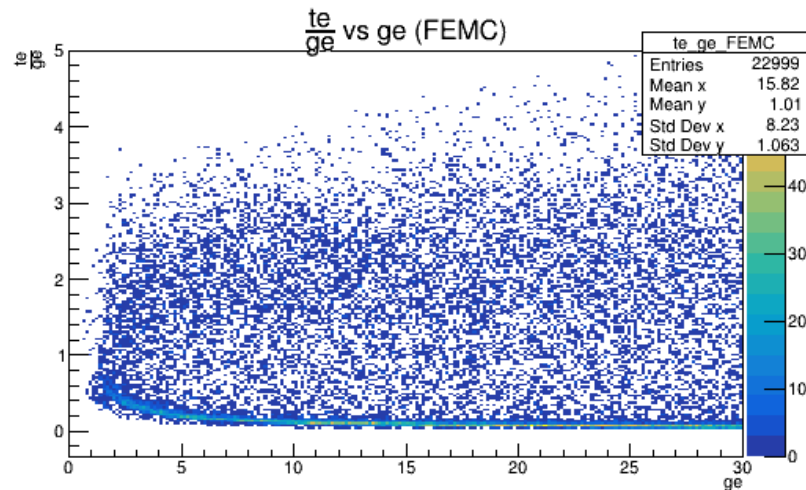
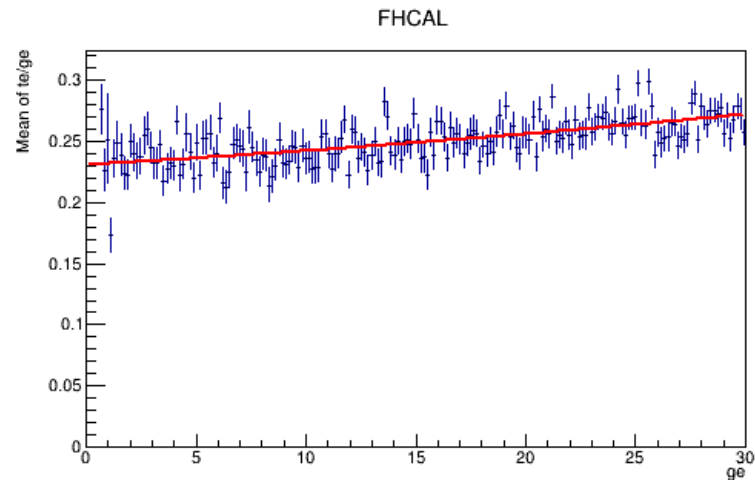
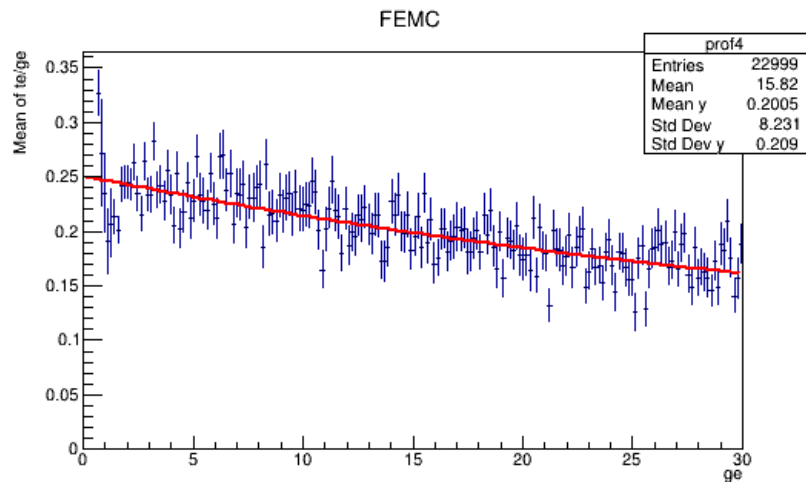
$p_0=0.112687$; $p_1=0.0417962$

Calibrating FEMC and FHCAL separately

- separately made Tprofile of FEMC and FHCAL tower energies
- tried pol2 and pol3 fitting -> both show similar behaviour with some improvement with increase in degree of the polynomial
- In slices(each of 2GeV bin width), double peaks emerge after the 3rd slice->restricted fit range after the 3rd slice to account only for the main peak (improves resolution)

Tprofile with pol2 fitting

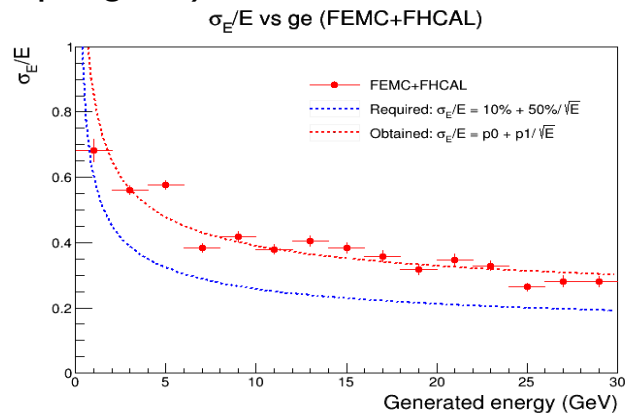
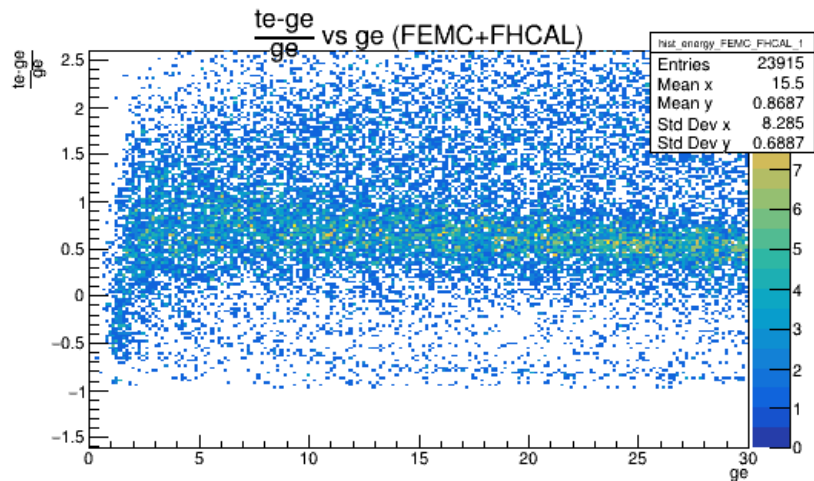
- separately calibrated FEMC and FHCAL
- $te/(p_0+p_1*ge+p_2*ge^2)$



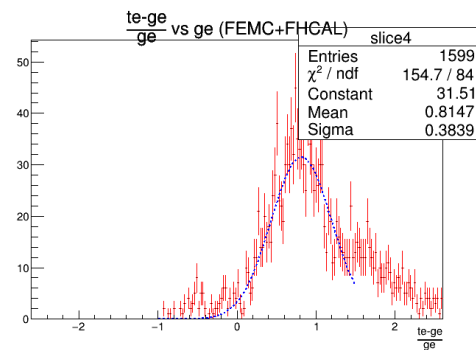
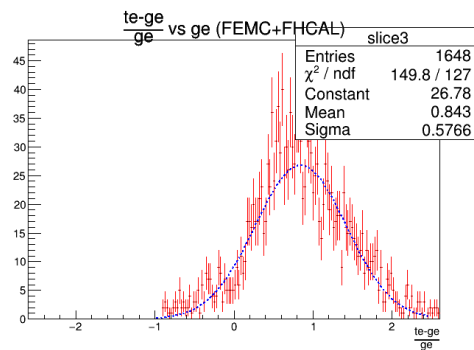
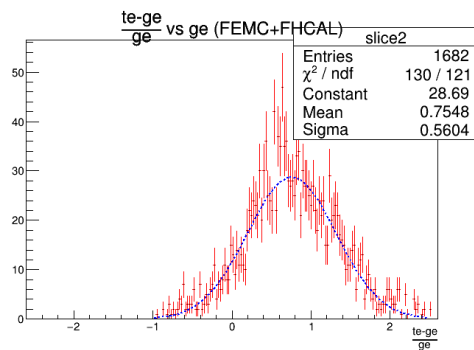
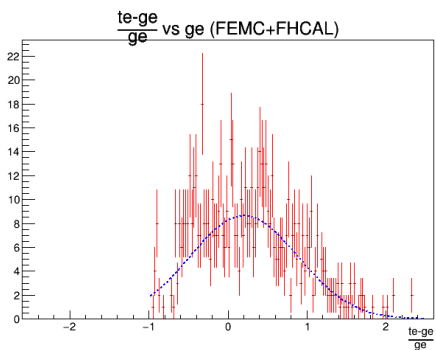
Tprofile with pol2 fitting

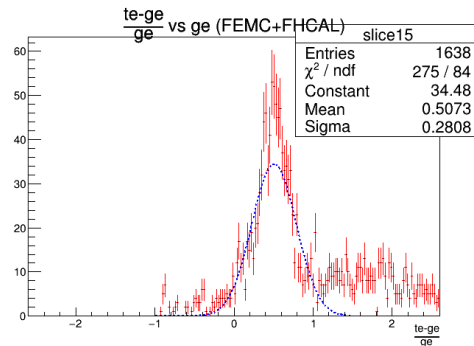
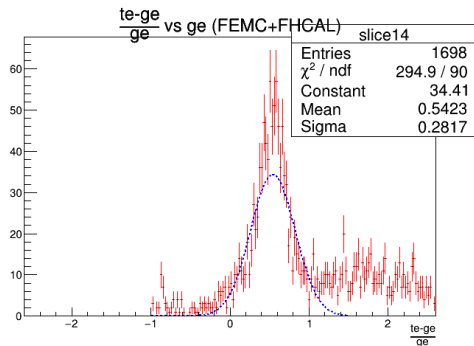
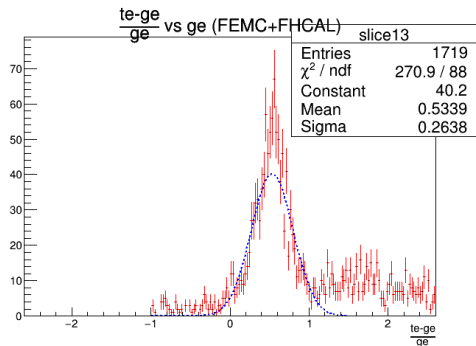
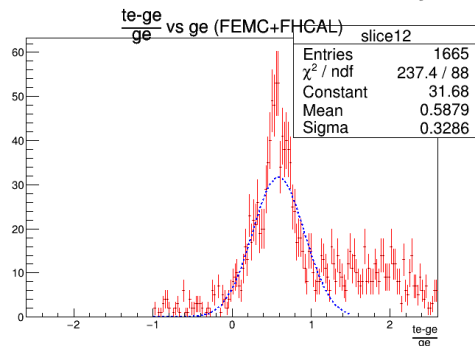
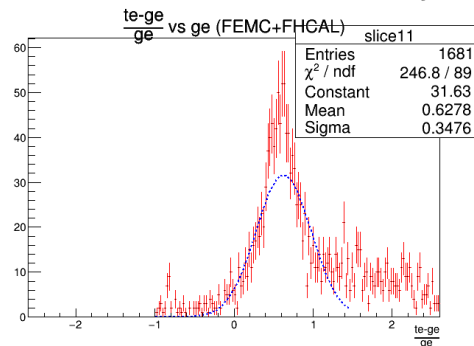
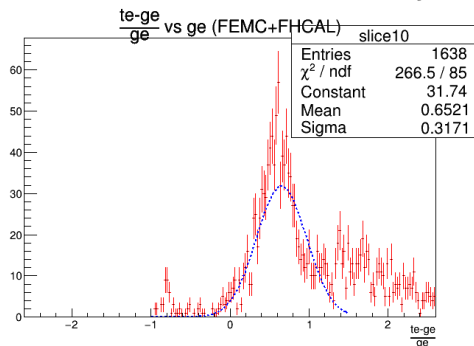
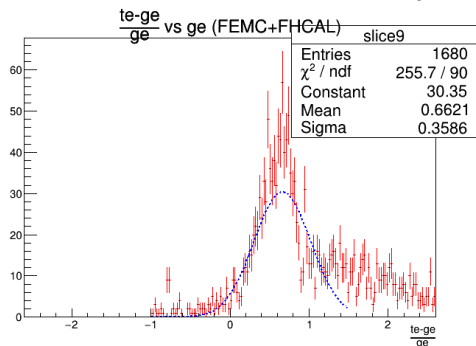
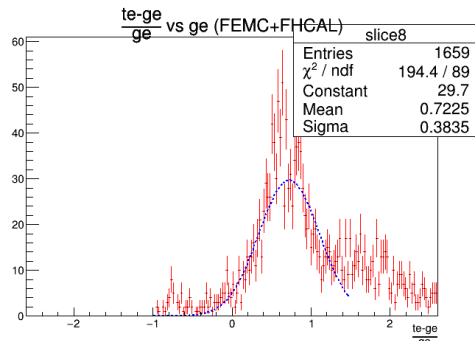
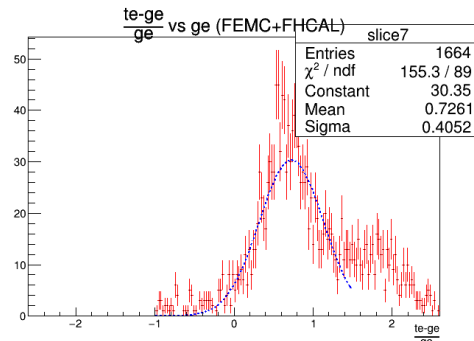
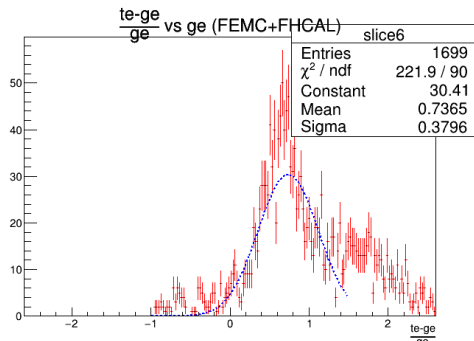
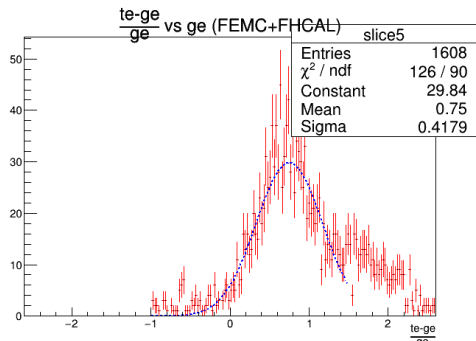
- separately calibrated FEMC and FHCAL

- $te/(p0+p1*ge+p2*ge^2)$



$p0=0.179255$; $p1=0.668411$





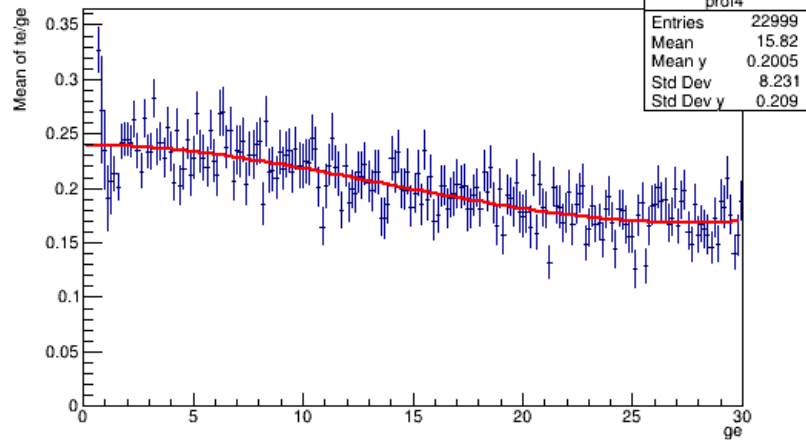
8

Tprofile with pol3 fitting

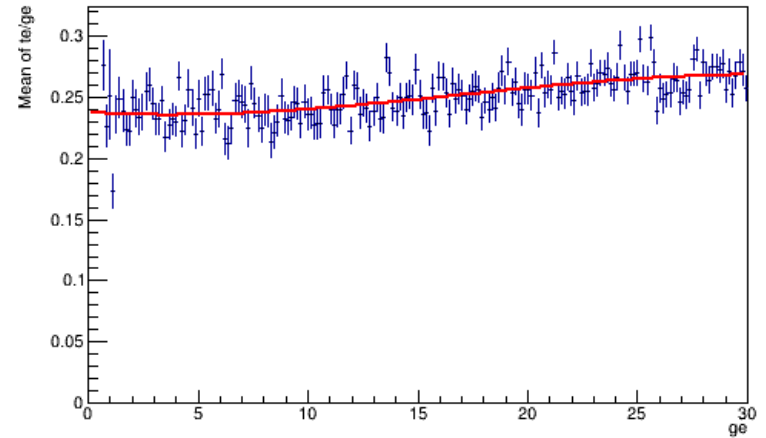
- separately calibrated FEMC and FHCAL

- $te/(p_0+p_1*ge+p_2*ge^2+p_3*ge^3)$

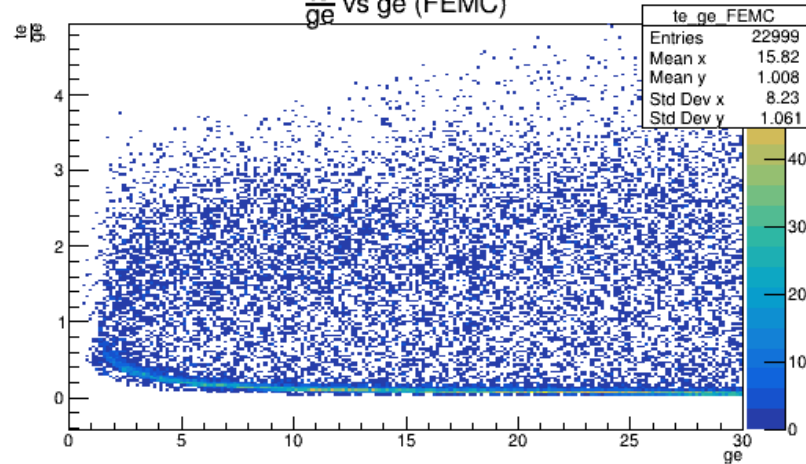
FEMC



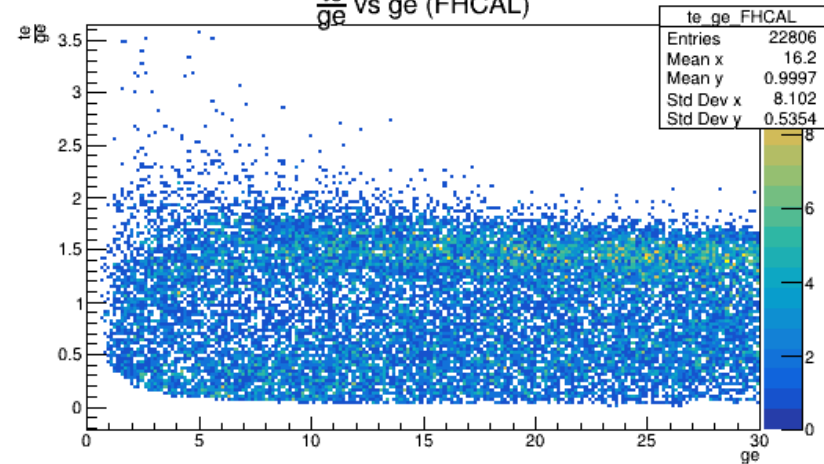
FHCAL



$\frac{te}{ge}$ vs ge (FEMC)



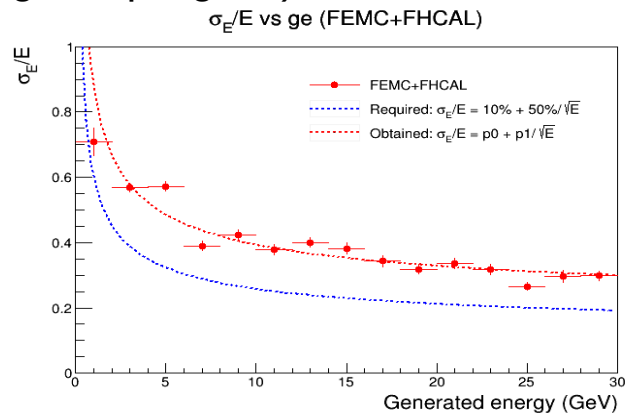
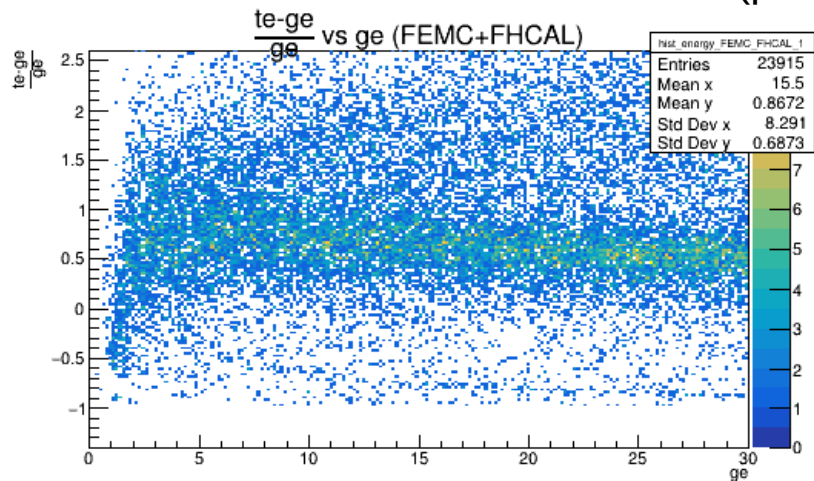
$\frac{te}{ge}$ vs ge (FHCAL)



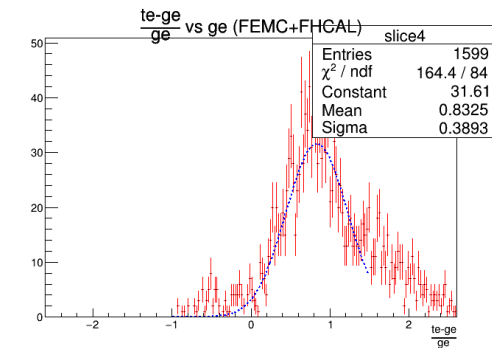
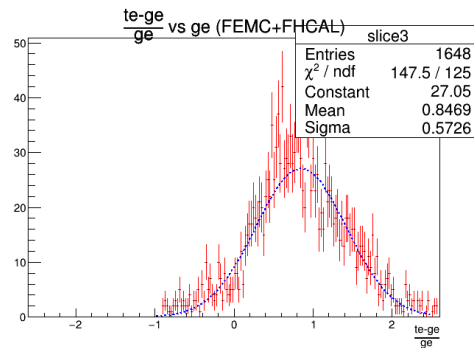
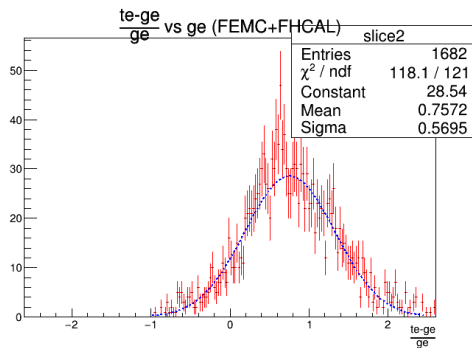
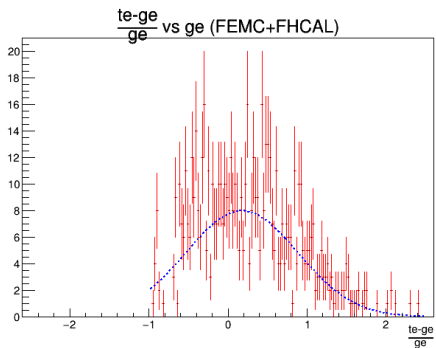
Tprofile with pol3 fitting

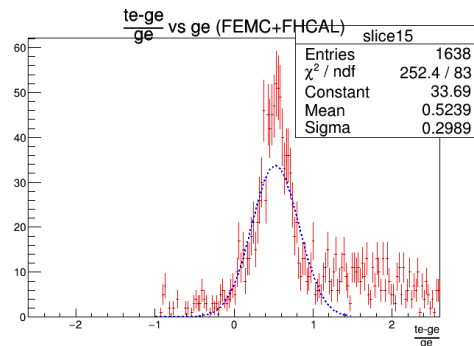
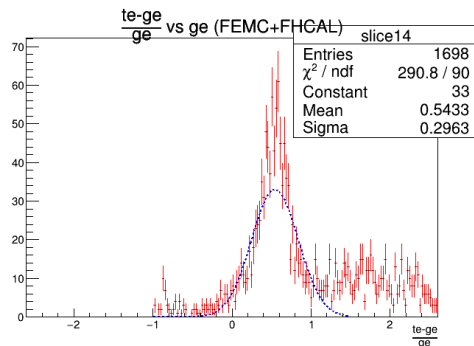
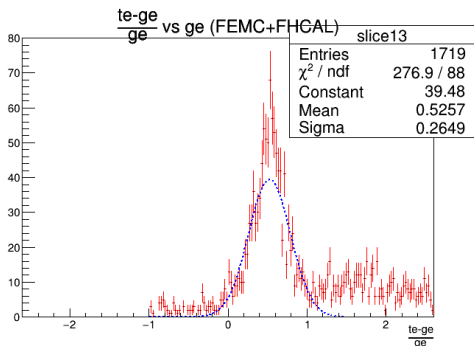
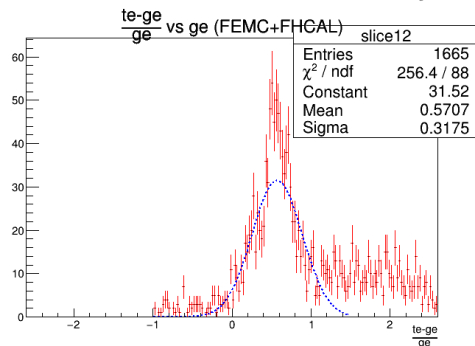
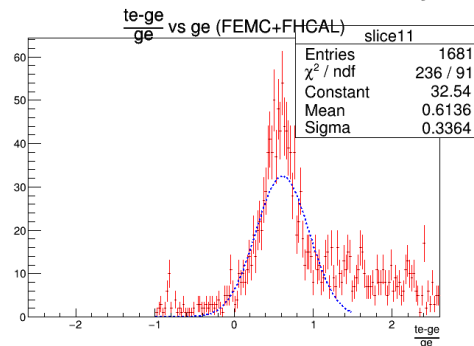
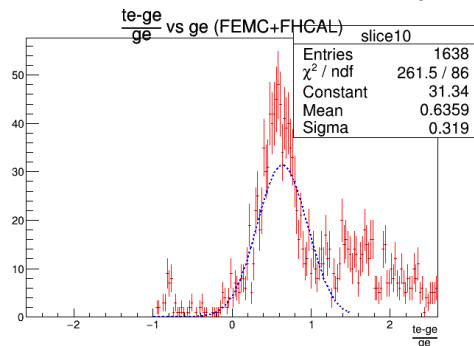
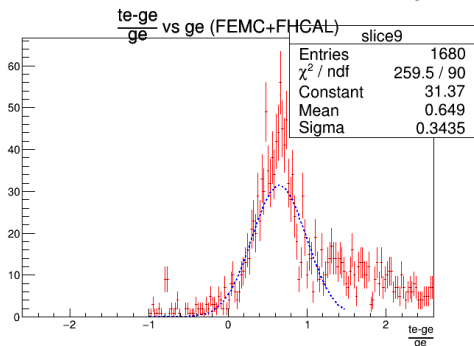
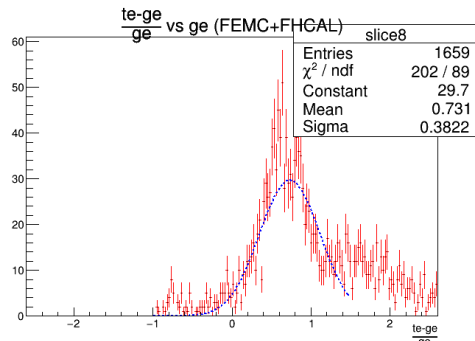
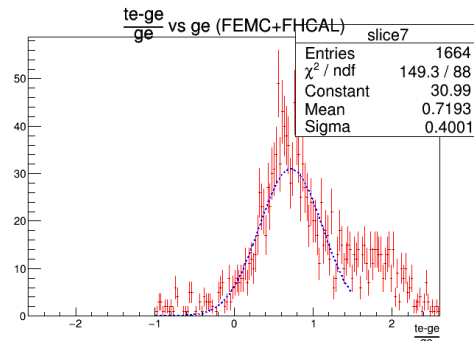
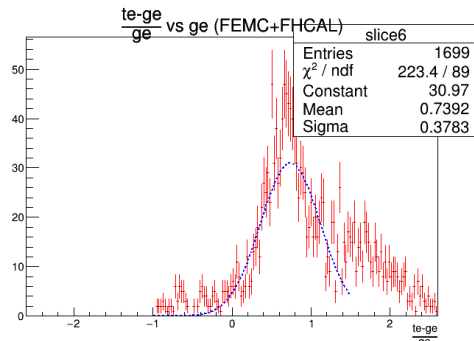
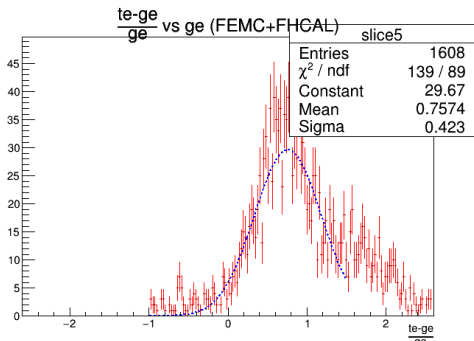
- separately calibrated FEMC and FHCAL

- $te/(p_0+p_1*ge+p_2*ge^2+p_3*ge^3)$



$p_0=0.179255$; $p_1=0.668411$





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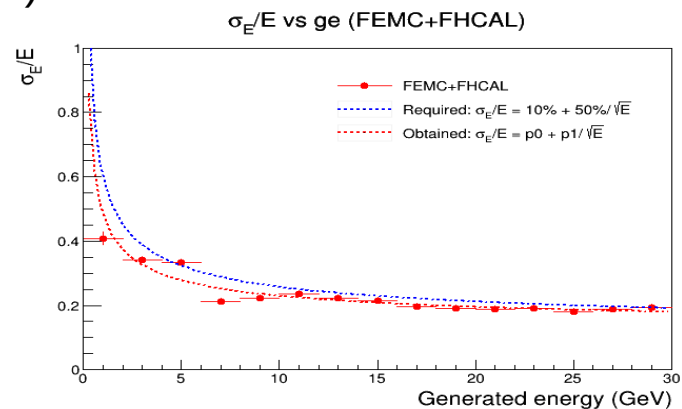
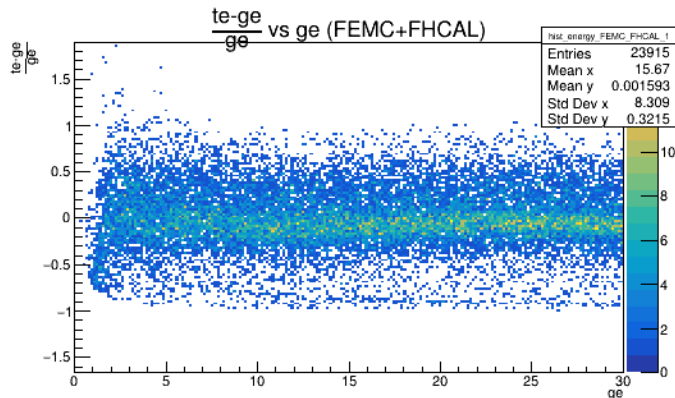
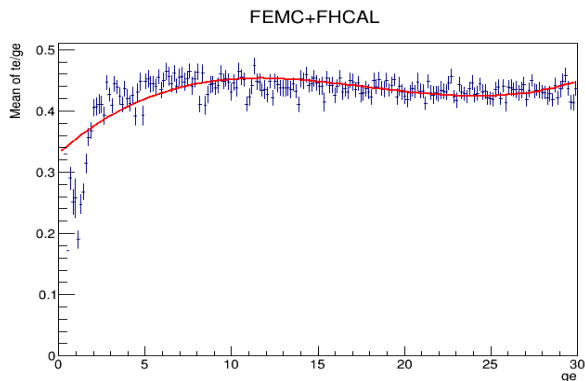
Calibrating FEMC+FHICAL energy

- Making Tprofile of FEMC+FHICAL tower energies
- tried pol3 and pol4 fitting -> both show similar behaviour with some improvement with increase in degree of the polynomial
- In slices(each of 2GeV bin width), double peaks emerge after the 3rd slice->restricted fit range after the 3rd slice to account only for the main peak (improves resolution)

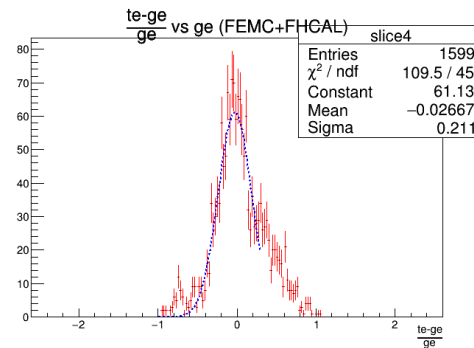
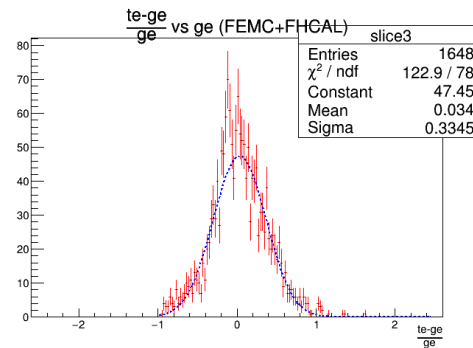
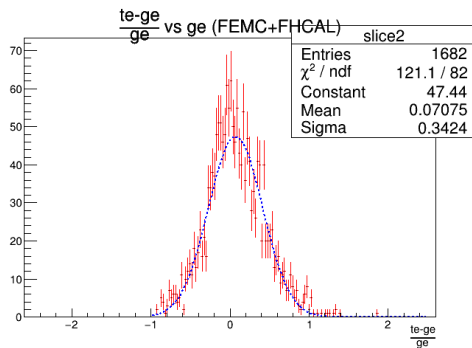
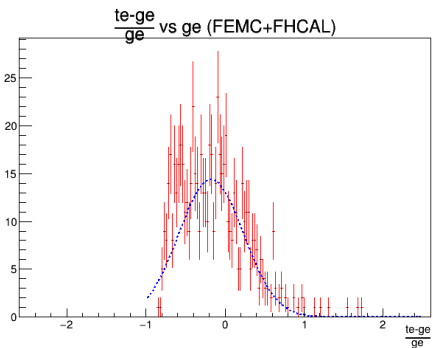
Tprofile with pol3 fitting

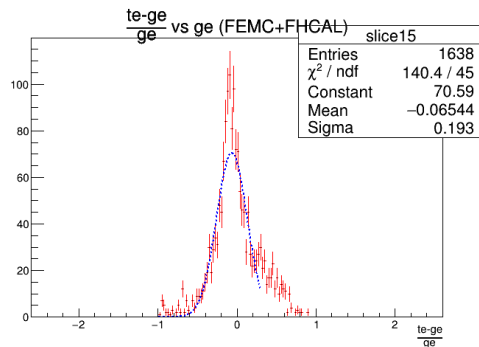
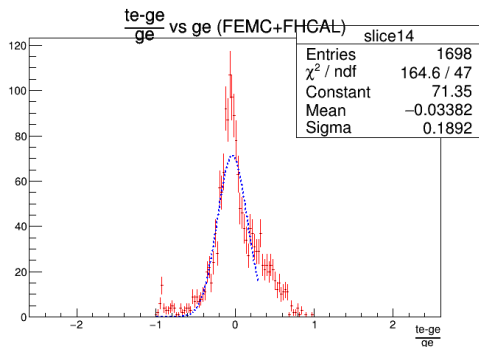
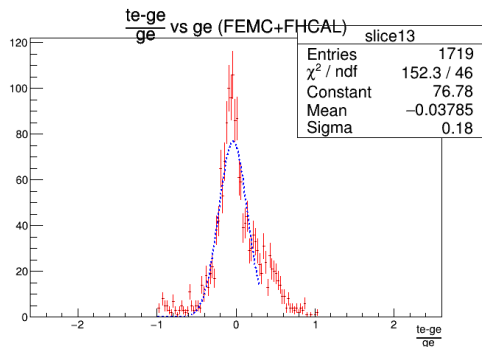
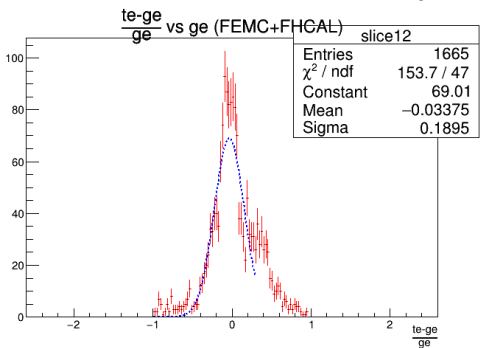
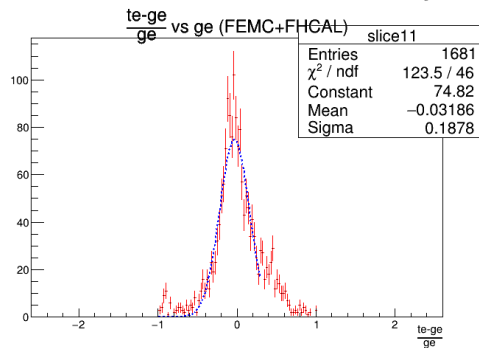
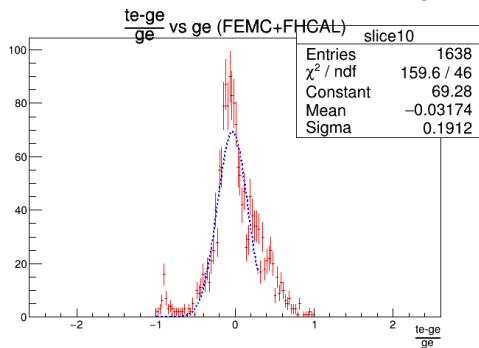
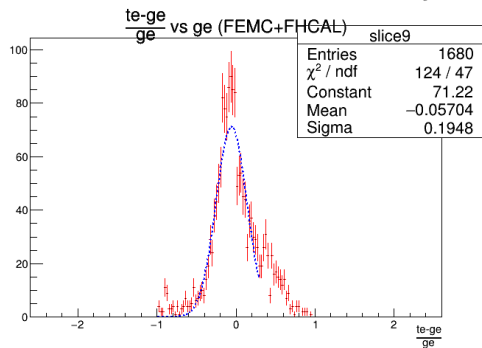
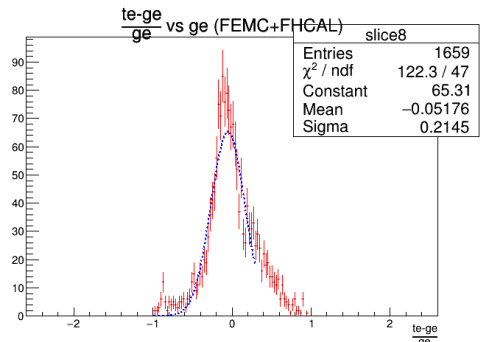
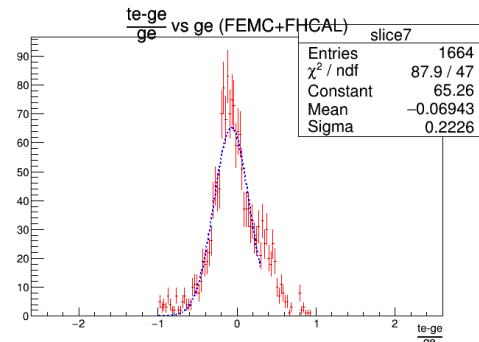
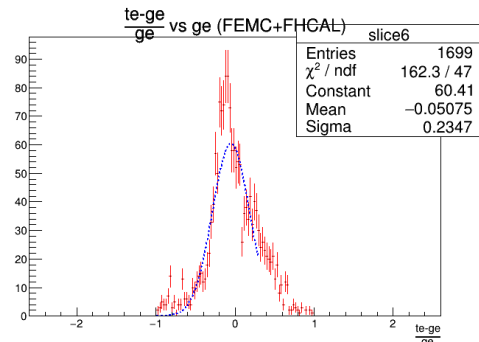
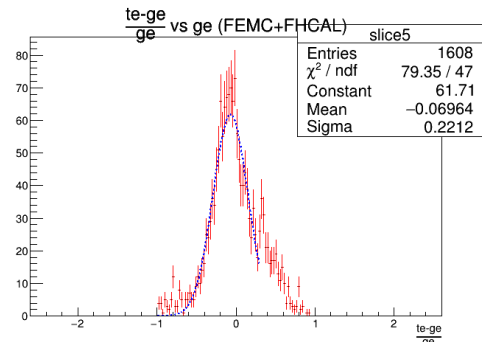
- Calibrated FEMC and FHCAL together

- $te/(p_0+p_1*ge+p_2*ge^2+p_3*ge^3)$



$p_0=0.111796$; $p_1=0.372977$



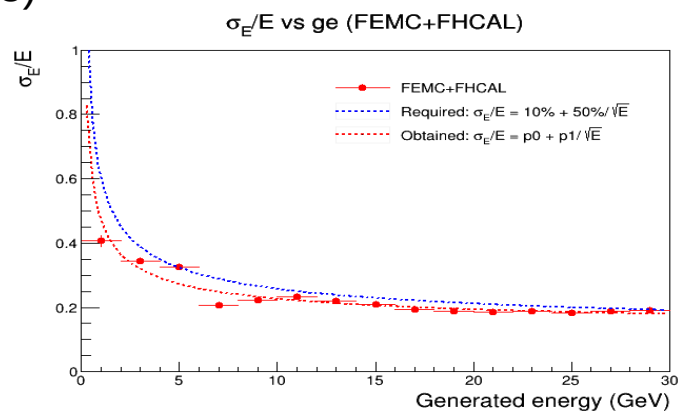
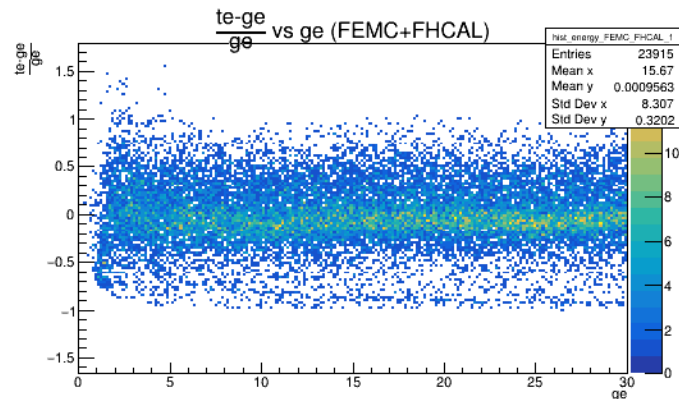
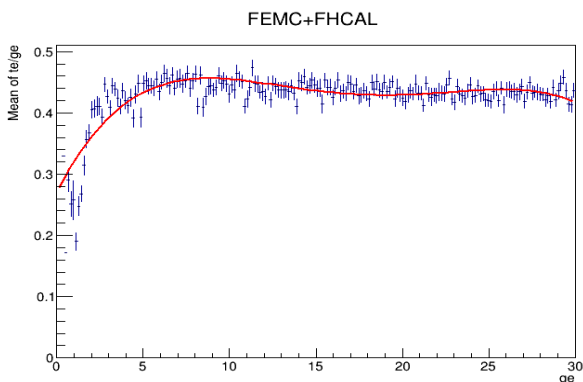


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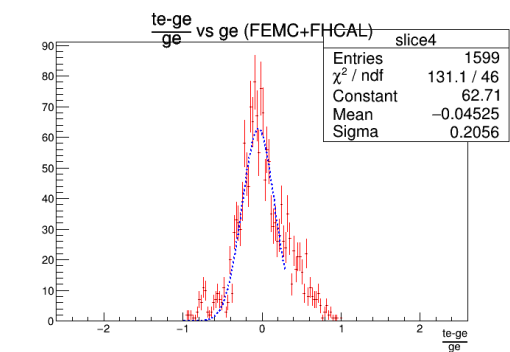
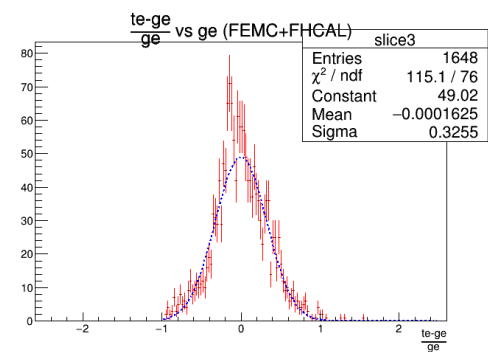
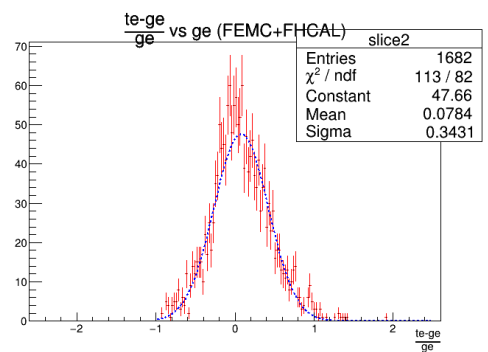
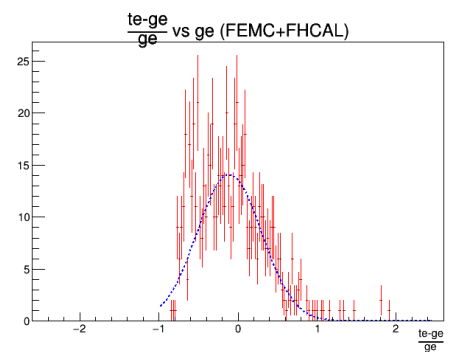
Tprofile with pol4 fitting

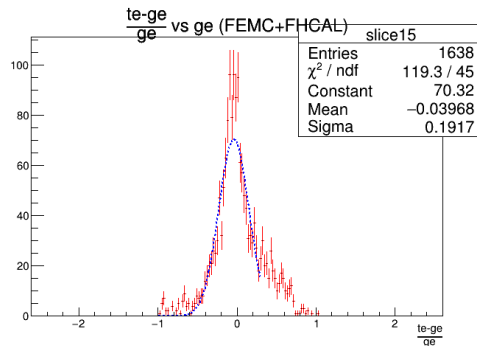
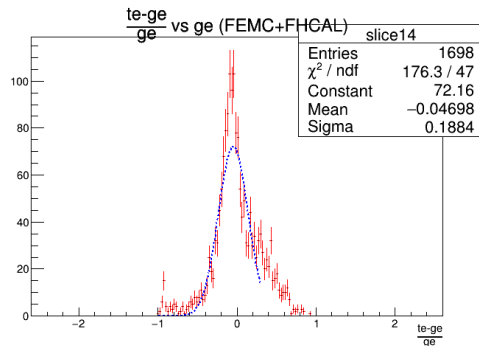
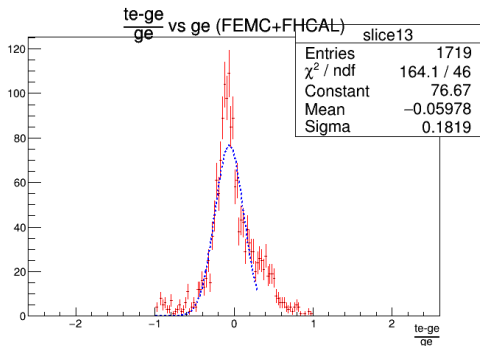
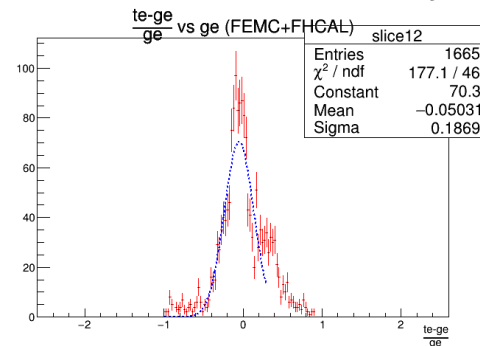
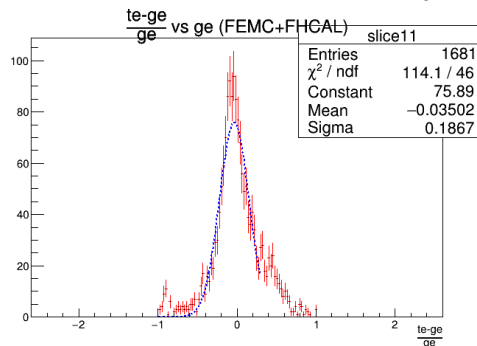
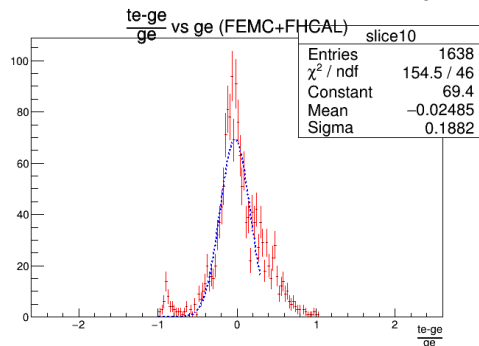
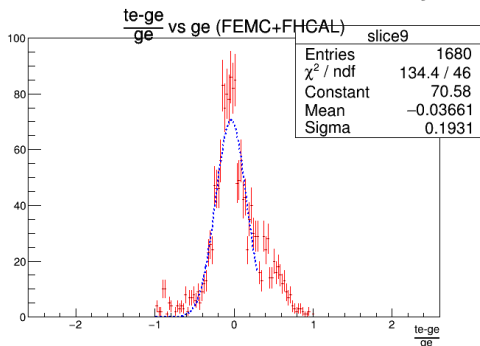
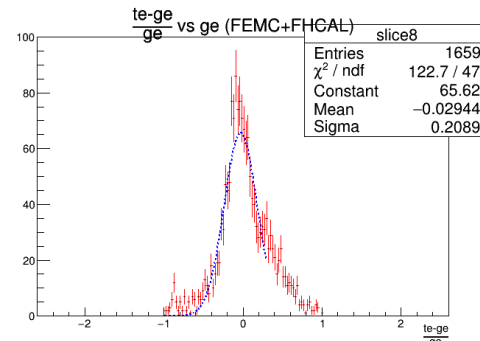
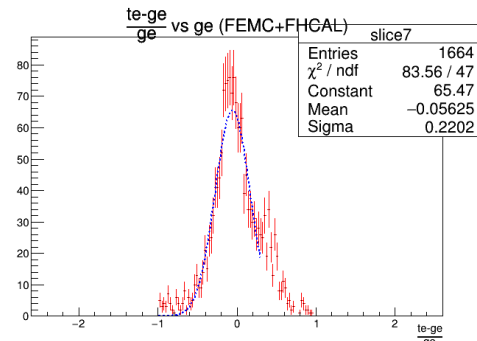
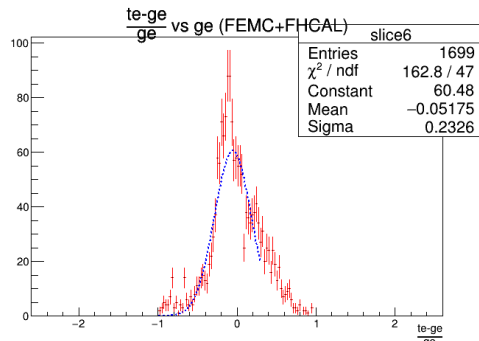
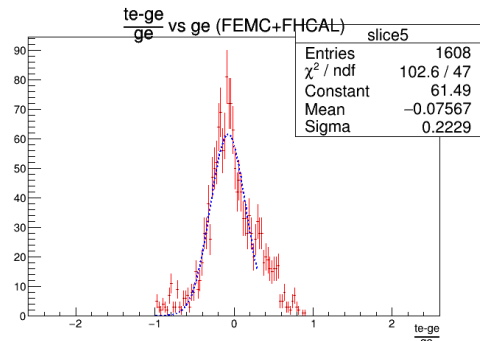
- Calibrated FEMC and FHCAL together

- $te/(p_0+p_1*ge+p_2*ge^2+p_3*ge^3)$



$p_0=0.11424$; $p_1=0.355798$





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Remarks:

- Calibration and resolution is better when FEMC+FHICAL energy is calibrated instead of calibrating them separately.
- Increasing statistics for first three slices may improve resolution at low energy.
- Mean Y taken from statistics box of tower energy plots varies if y-range is changed so, that method was not used to obtain calibration factor.
- Comments/Suggestions?