

Sliding window cluster corrections for 10.0.1



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(with the help of many LAr people)

LAr Performance Meeting

CERN, 16-Mar-05

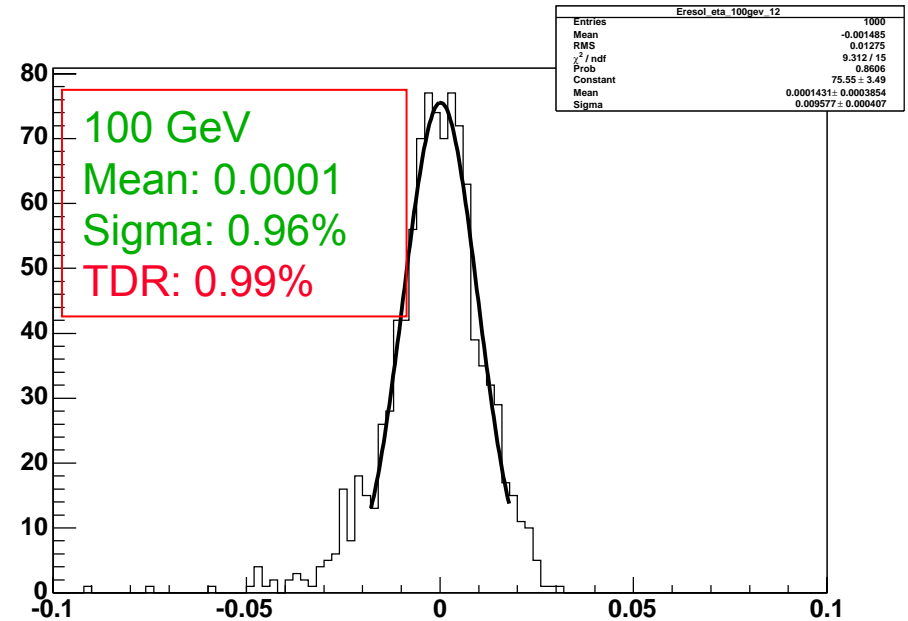
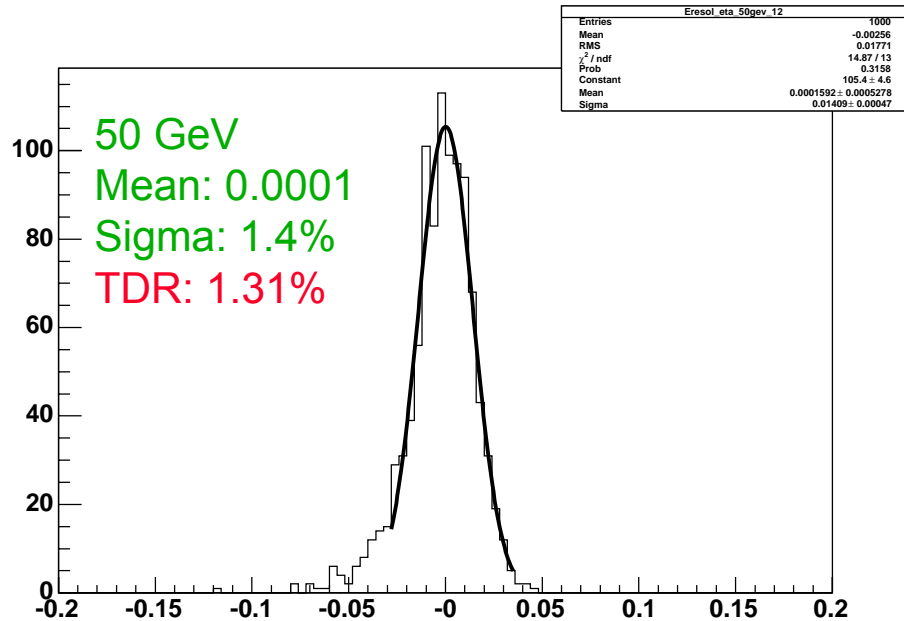
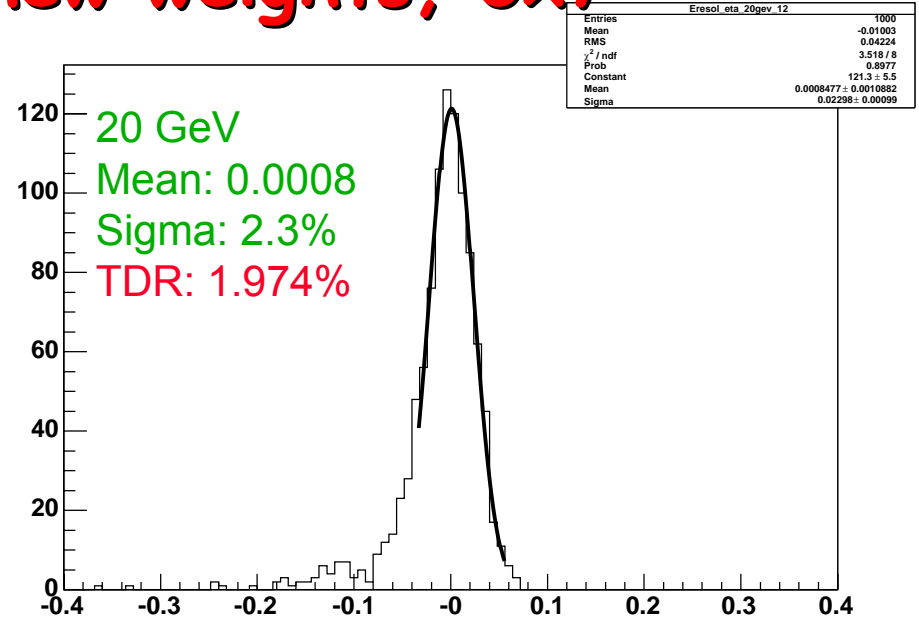
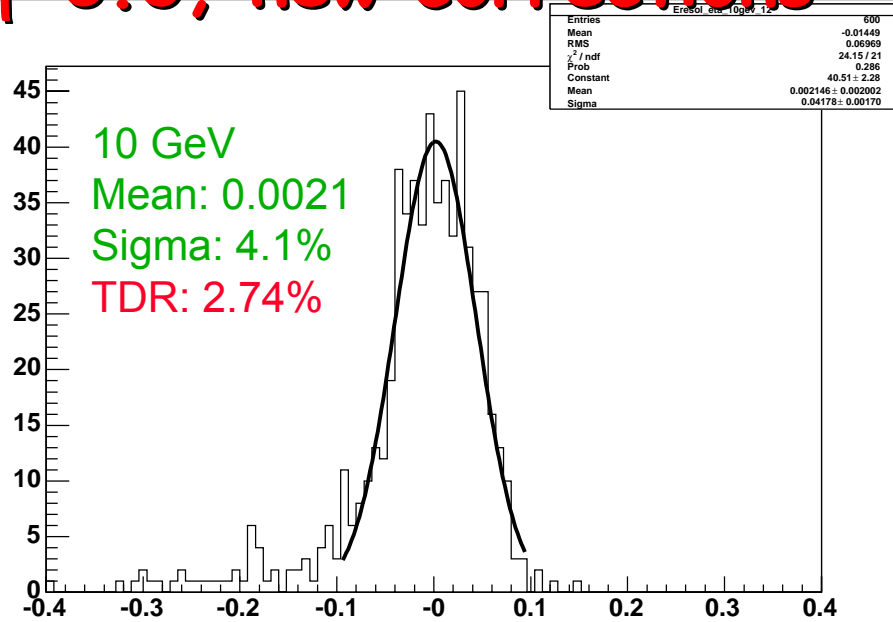
Reminders

- ◆ **10.0.0:** We have new cluster corrections but old longitudinal weights
- ◆ **10.0.1:** We want to add new cluster dependent longitudinal weights
 - Linearity is good to 2ppm from 10GeV to 1TeV
 - Resolution improves
- ◆ **Presently:** Weights are **ONLY** eta dependent and Energy independent

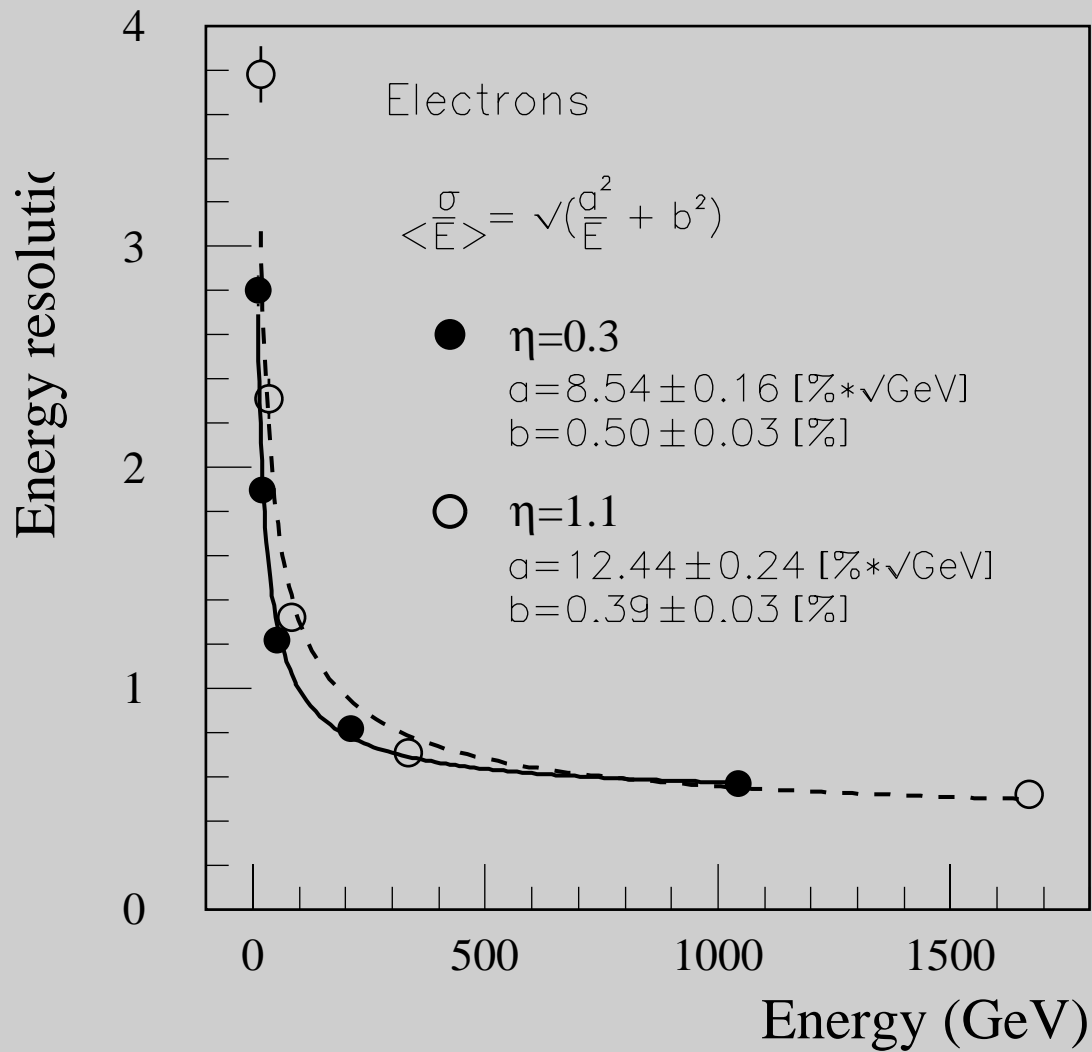
Confusion

- ◆ We have samples of DC2 electrons (8.0.x)
- ◆ We have e samples for 9.0.x Final Layout
- ◆ We have e samples for 9.0.4 Rome Layout
 - One must be careful with turn-on of charge collection effects and change in the Sampling Fractions in the EndCap.
- ◆ Bottomline:
 - 9.0.4 electrons have consistent EndCap simulation while 9.0.x with $x < 4$ don't.
 - DC2 and 9.0.x electrons have consistent Barrel simulation

9.0.x Final Layout Electrons: $\eta=0.3$, new corrections + new weights, 3x7

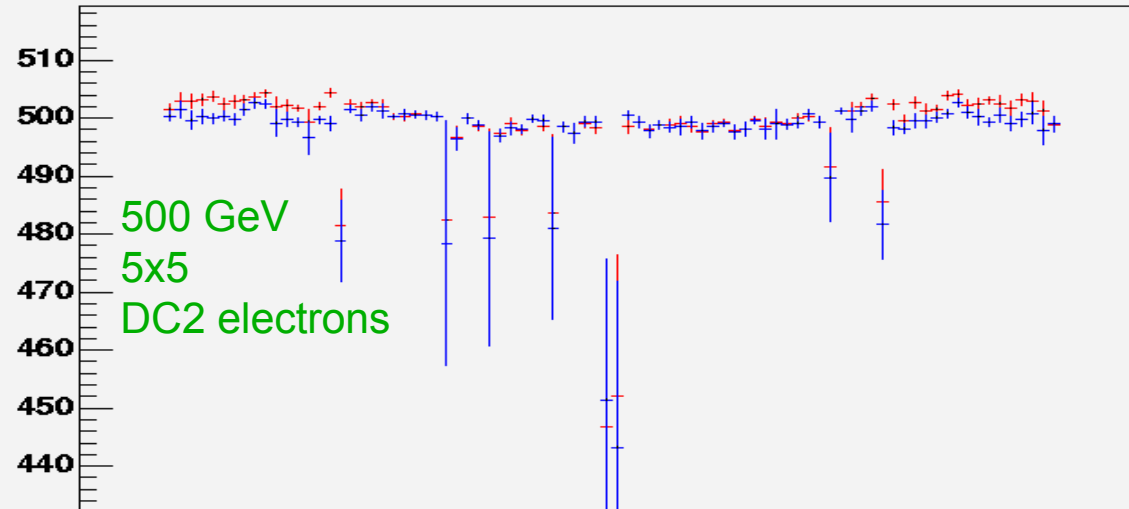


Reminder: TDR result for 3x7

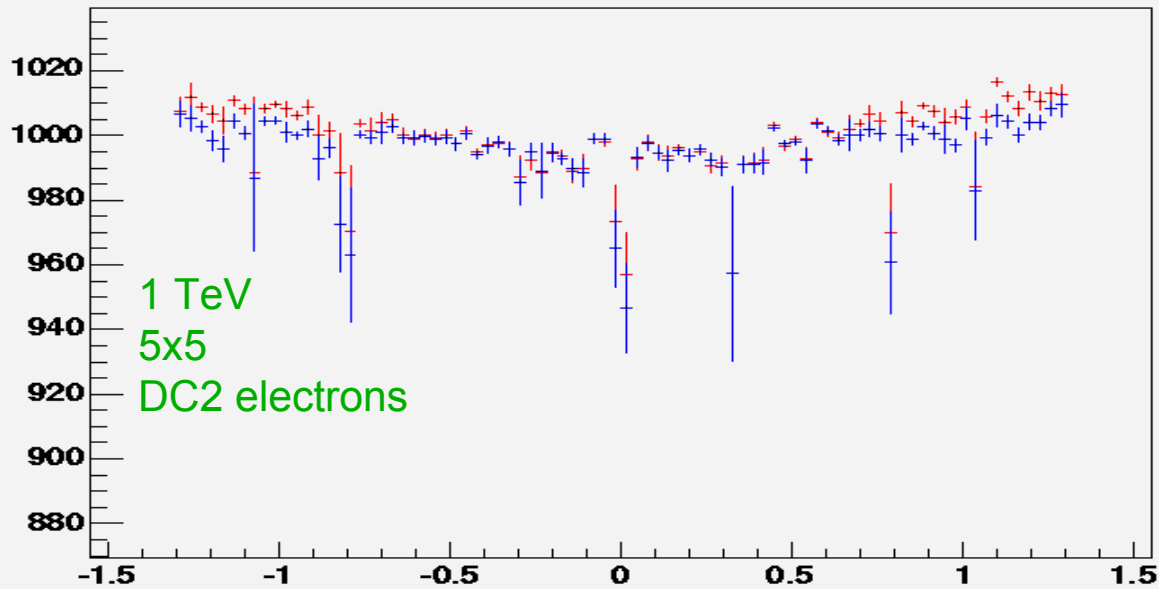


DC2 electrons with new corrections + new weights running 10.0.0 (K.Benslama)

$(eg_et/1000)*\cosh(eg_eta):eg_eta \{abs(eg_eta)<1.3\}$



$(eg_et/1000)*\cosh(eg_eta):eg_eta \{abs(eg_eta)<1.3\}$



DC2 electrons with new corrections + new weights running 10.0.0 (K.Benslama)

Barrel Only: integrated over eta, 5x5

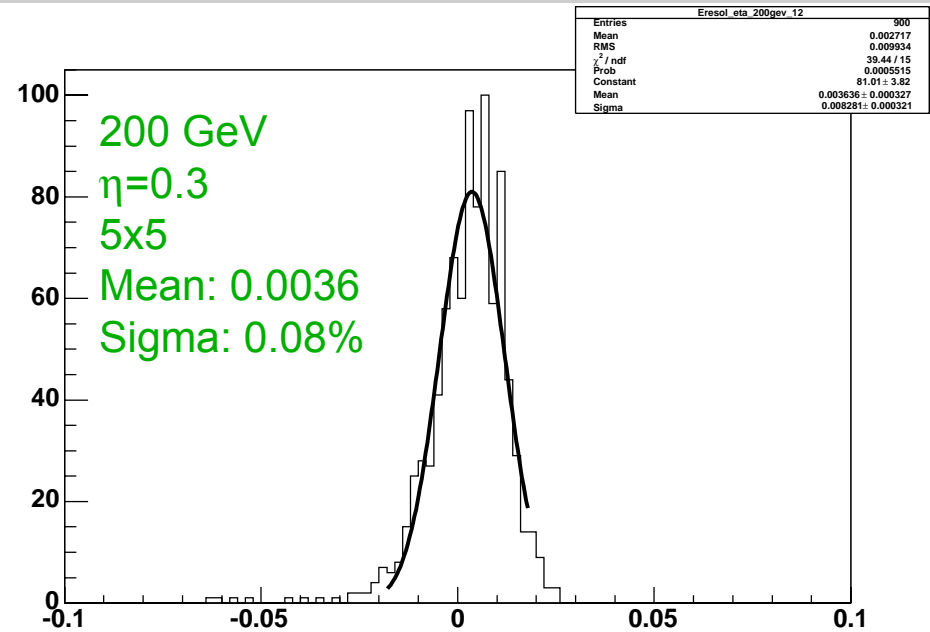
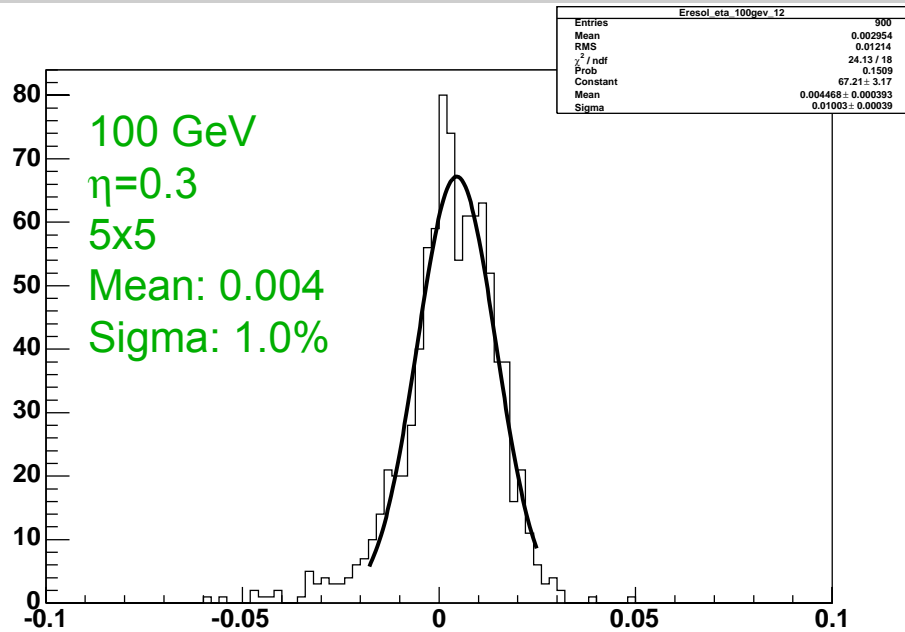
	dE/E old	σ /E old	dE/E new	σ /E new
20GeV	-1%	3.4%	-0.20%	3.5%
100GeV	0.2%	1.4%	+0.08%	1.3%
500GeV	0.2%	0.8%	+0.1%	0.73%
1TeV	0.2%	0.86%	-0.06%	0.7%

↓
Improved Linearity

↓
Improved Resolution

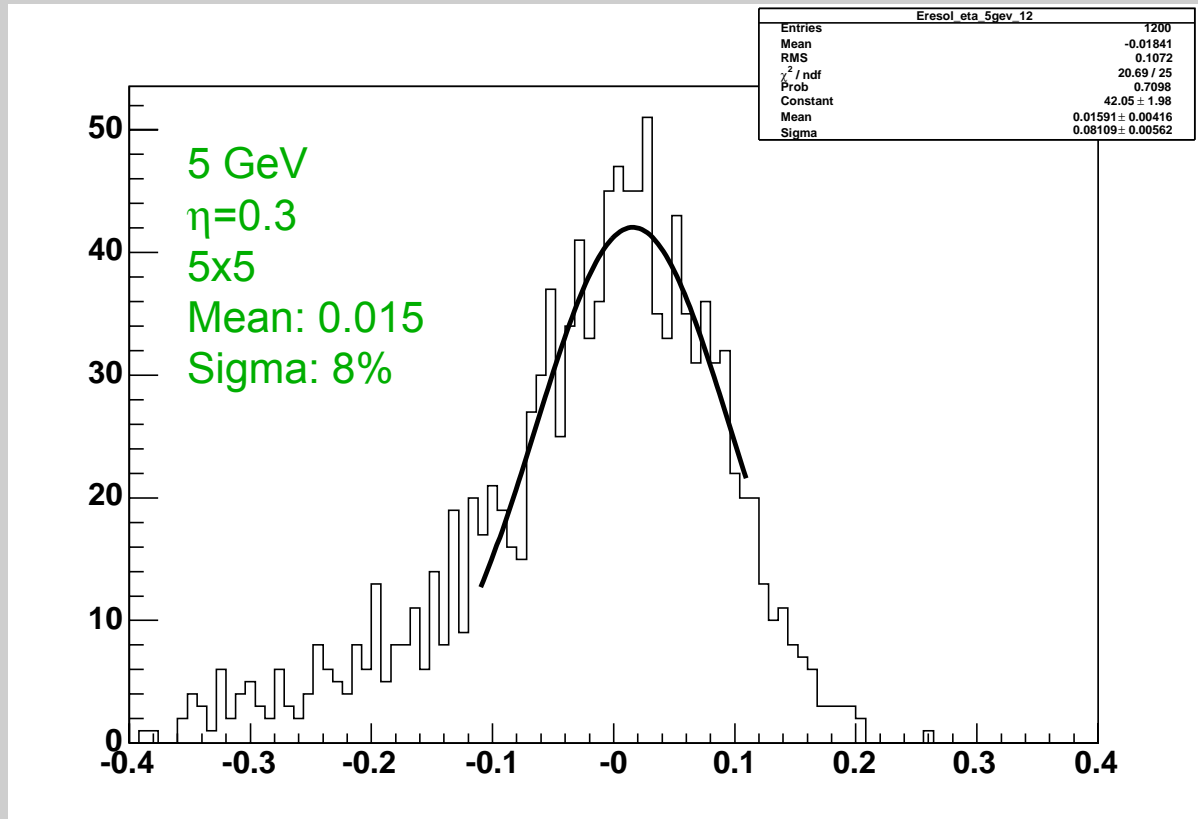
Rome 904 Electrons with new corrections and new weights: 100GeV and 200GeV

Rome Electrons produced by Neng Xu and Luis Flores (Wisconsin)



The Rome electrons are slightly overcorrected +0.4%

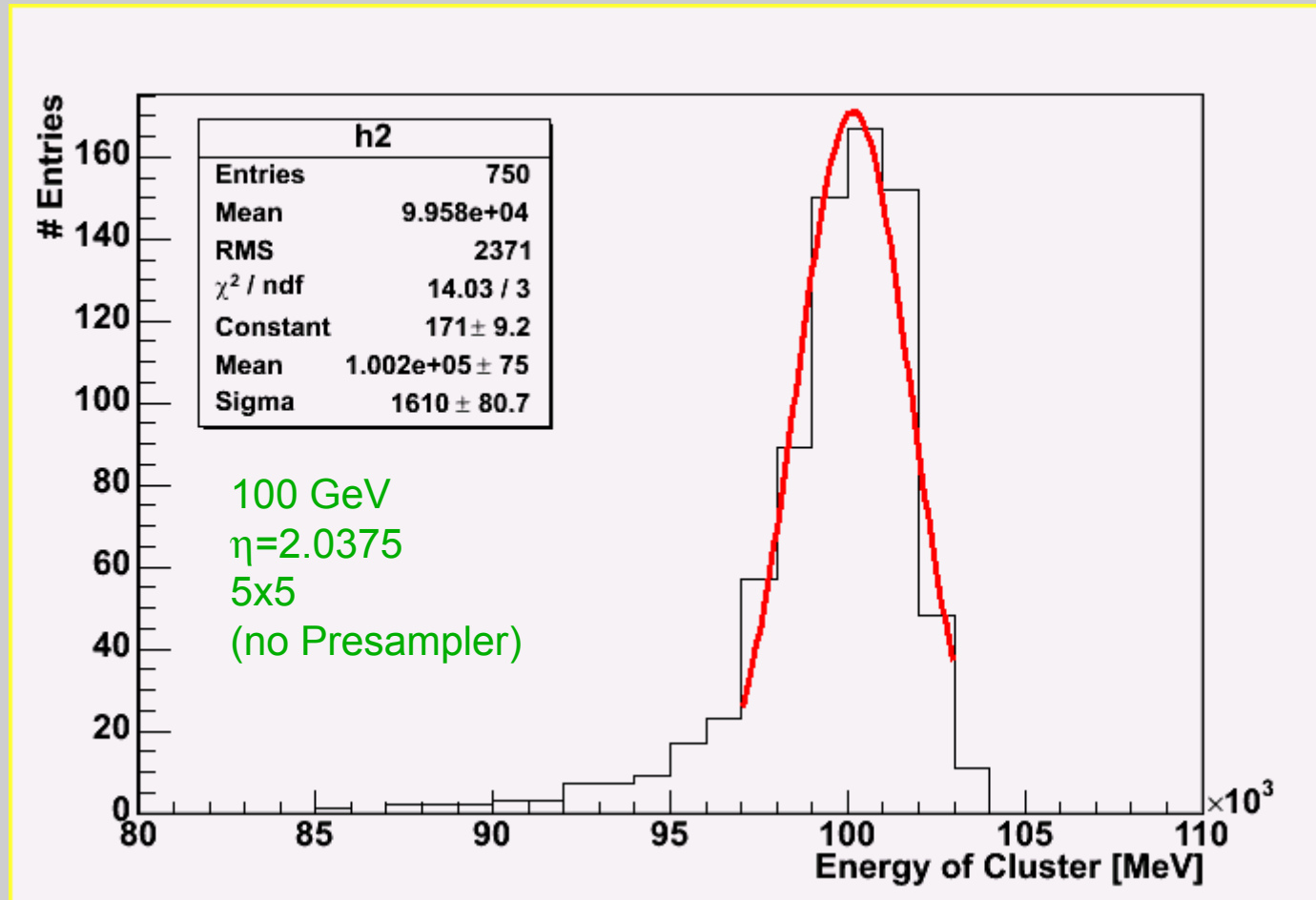
Rome 904 Electrons with new corrections and new weights: 5GeV electrons at $\eta=0.3$



Reasonable results all the way down to 5GeV!
We rediscover the DC1 result that weights work from
a few GeV to the TeV scale.

EndCap: Rome 904 Electrons with new corrections and new weights + rec10.0.0 (Karina Loureiro)

Rome Electrons produced by Neng Xu and Luis Flores (Wisconsin)



Summary

- ◆ **Barrel:** We have new Long. Weights which give ppm linearity from $\sim 10\text{GeV}$ to TeV and improved resolution.
- ◆ **EndCap:** We have new L. Weights which also seem to be performing fine, although we have done less validation than in the barrel.
- ◆ Implementation in 10.0.1 ? (for 5×5 , 3×5 and 3×7 sizes)