Energy Weighting for CMS-HCal Upgrade

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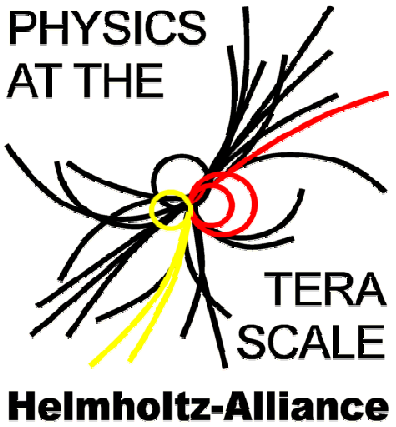
DESY-CMS Hamburg

Group Meeting
30th November 2009



Vladimir Andreev, Kerstin Borras, Isabell Melzer-Pellmann, Peter Schleper

Energy resolution, 1448, without ECal

Energy resolution, 1448, with ECal

Energy resolution, 17, without ECal

Energy resolution, 17, with ECal

Energy resolution, 1111111, without ECal

Energy resolution, 1111111, with ECal

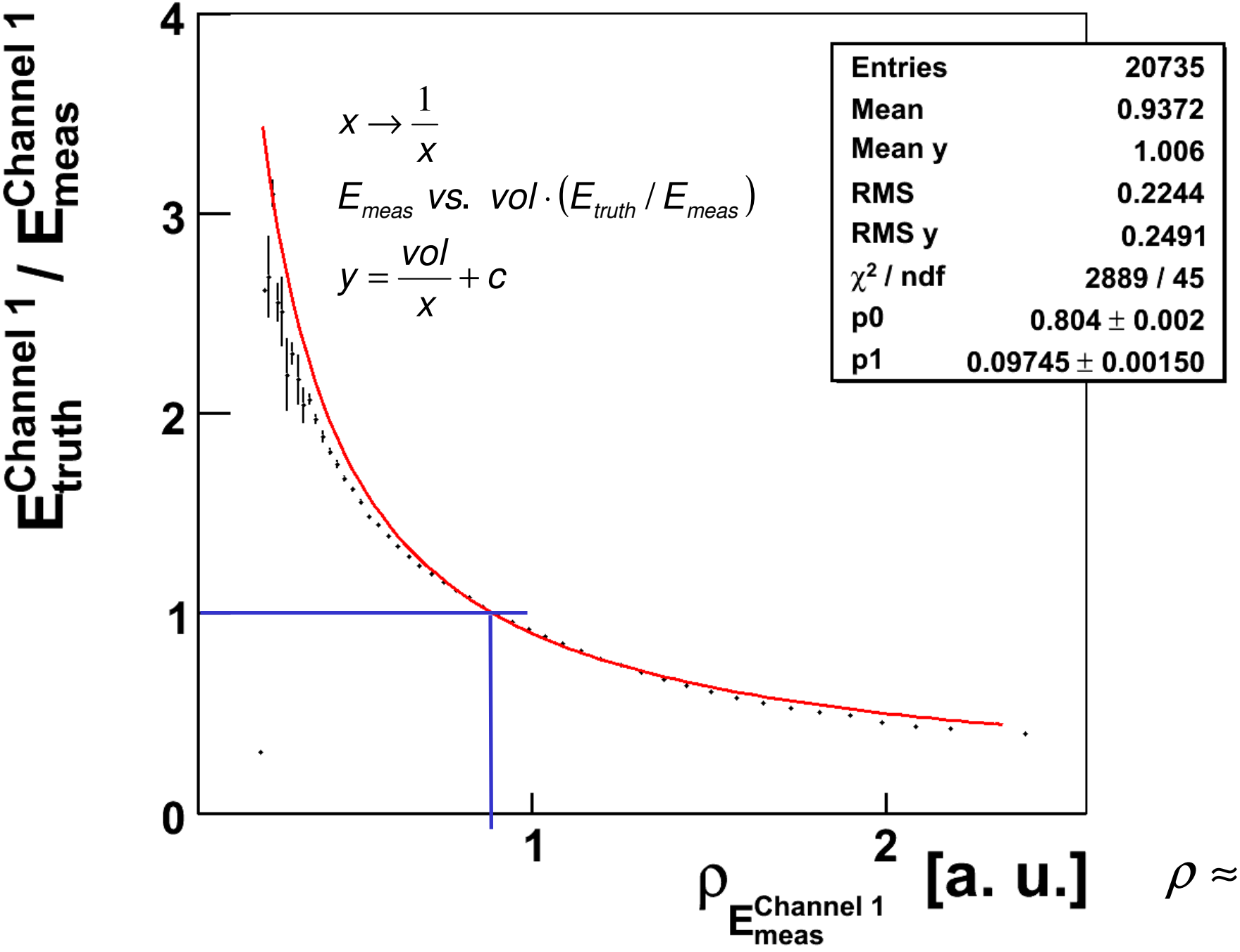
Energy resolution, 12212, without ECal

Energy resolution, 12212, with ECal

Investigate weighting function - Motivation

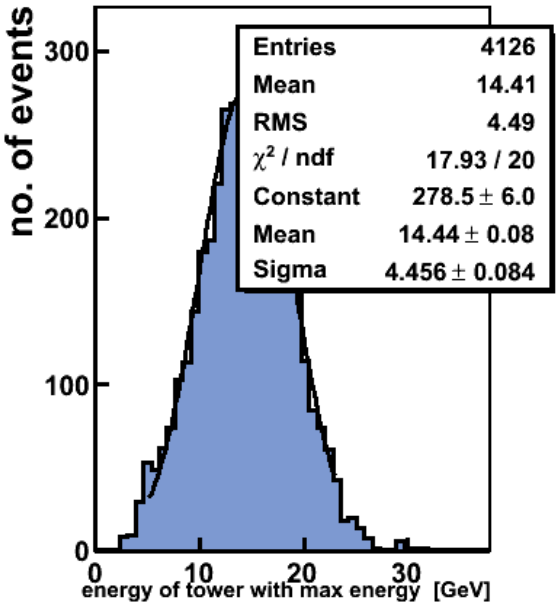
- Better results than for tabulated weighting?
  (no bias due to cuts, etc. ?)
- Understand analytical shape of weighting factors
- Have weighting function depending on shower energy
  (in analogy to the interpolated tabulated weights)

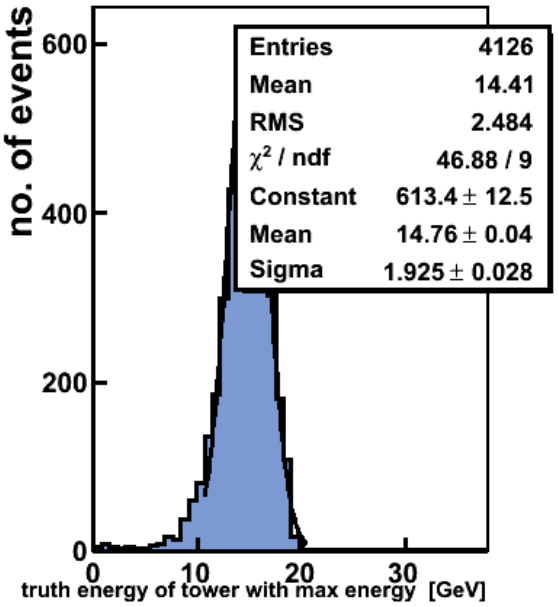
Weights, 17, without ECal, gcalor 20 GeV

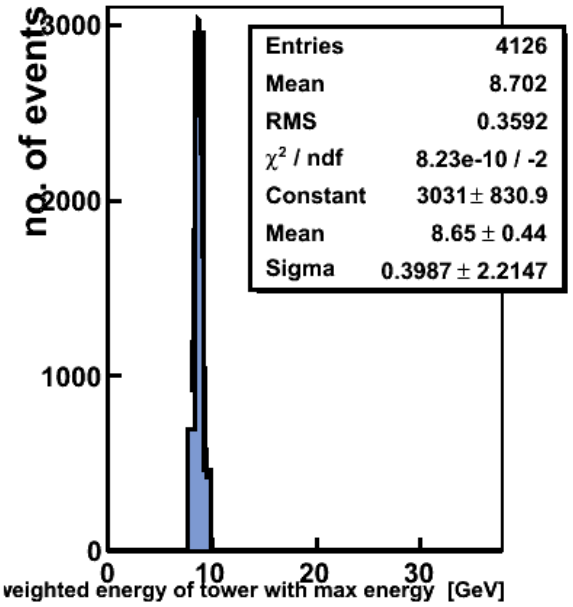


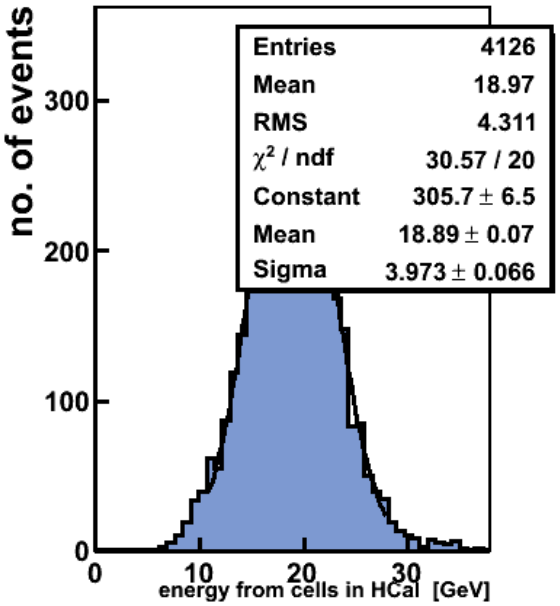
$$\rho \approx \frac{E_{meas}}{19.86}$$

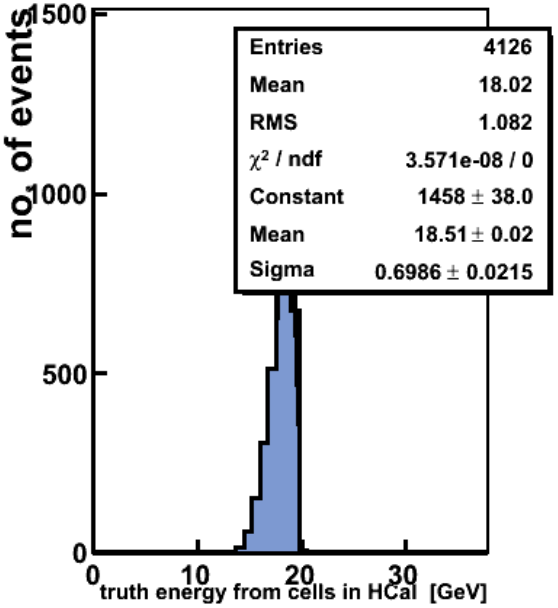
Weighitng function: 17, gcalor 20

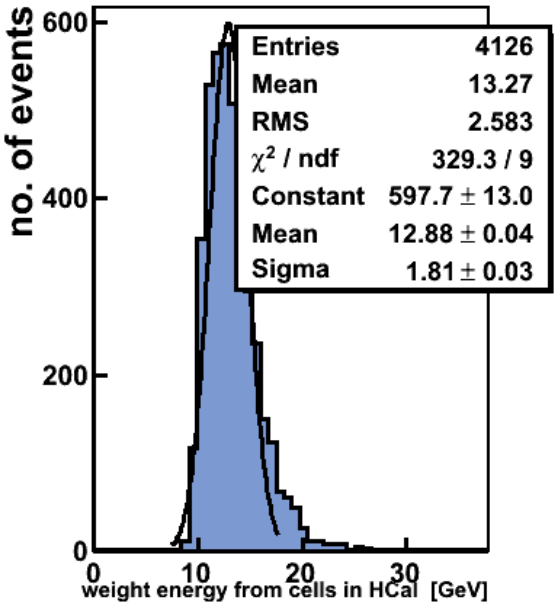




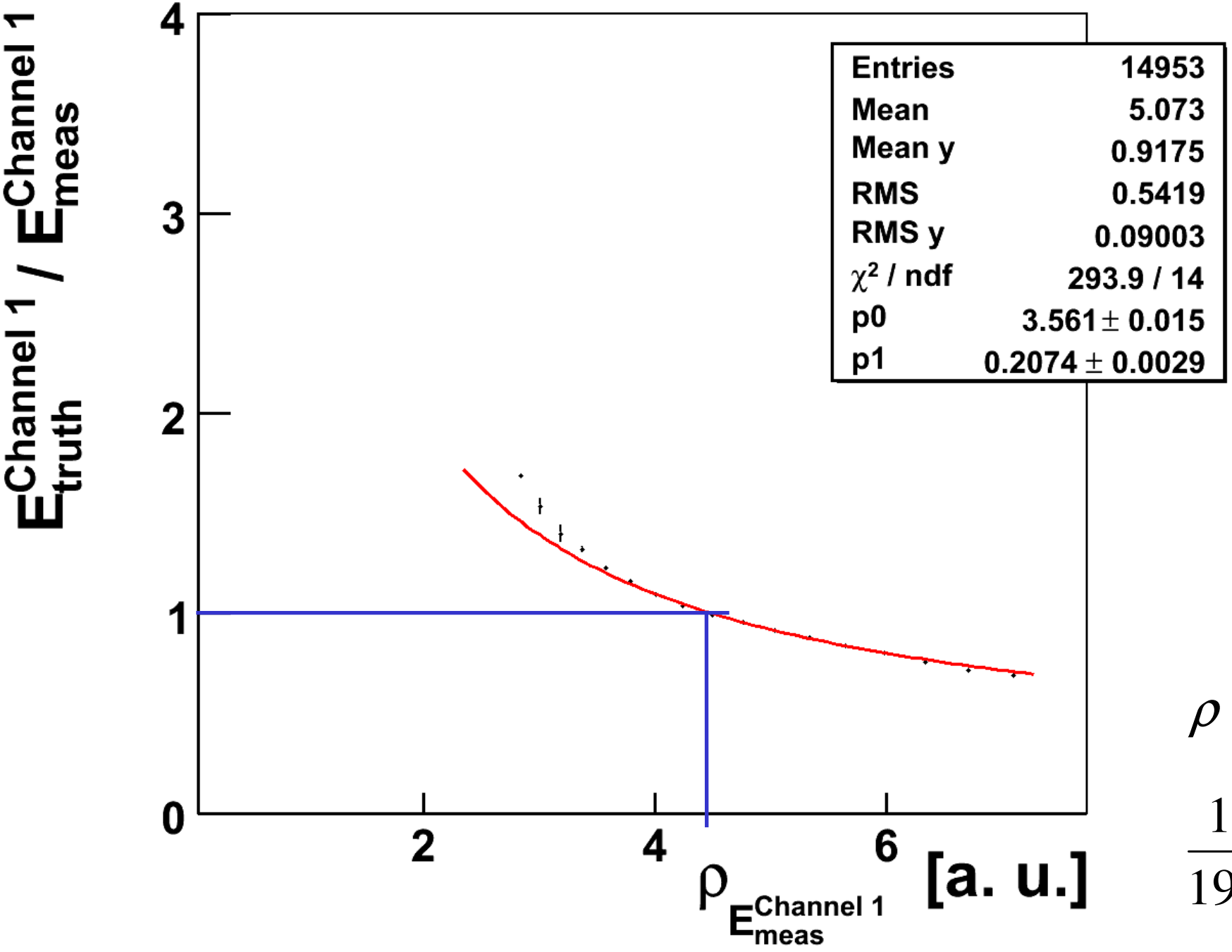








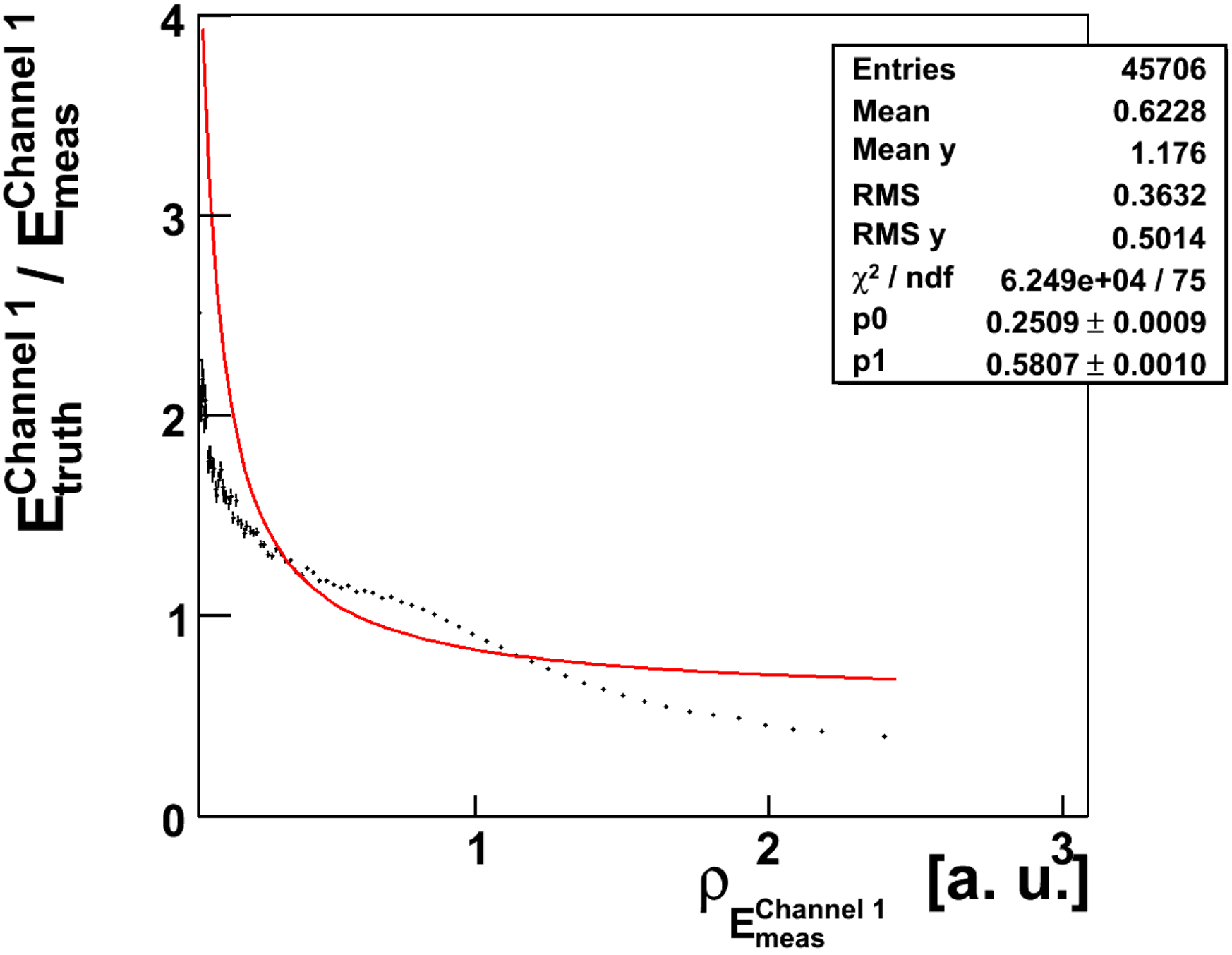
Weights, 17, without ECal, gcalor 100 GeV



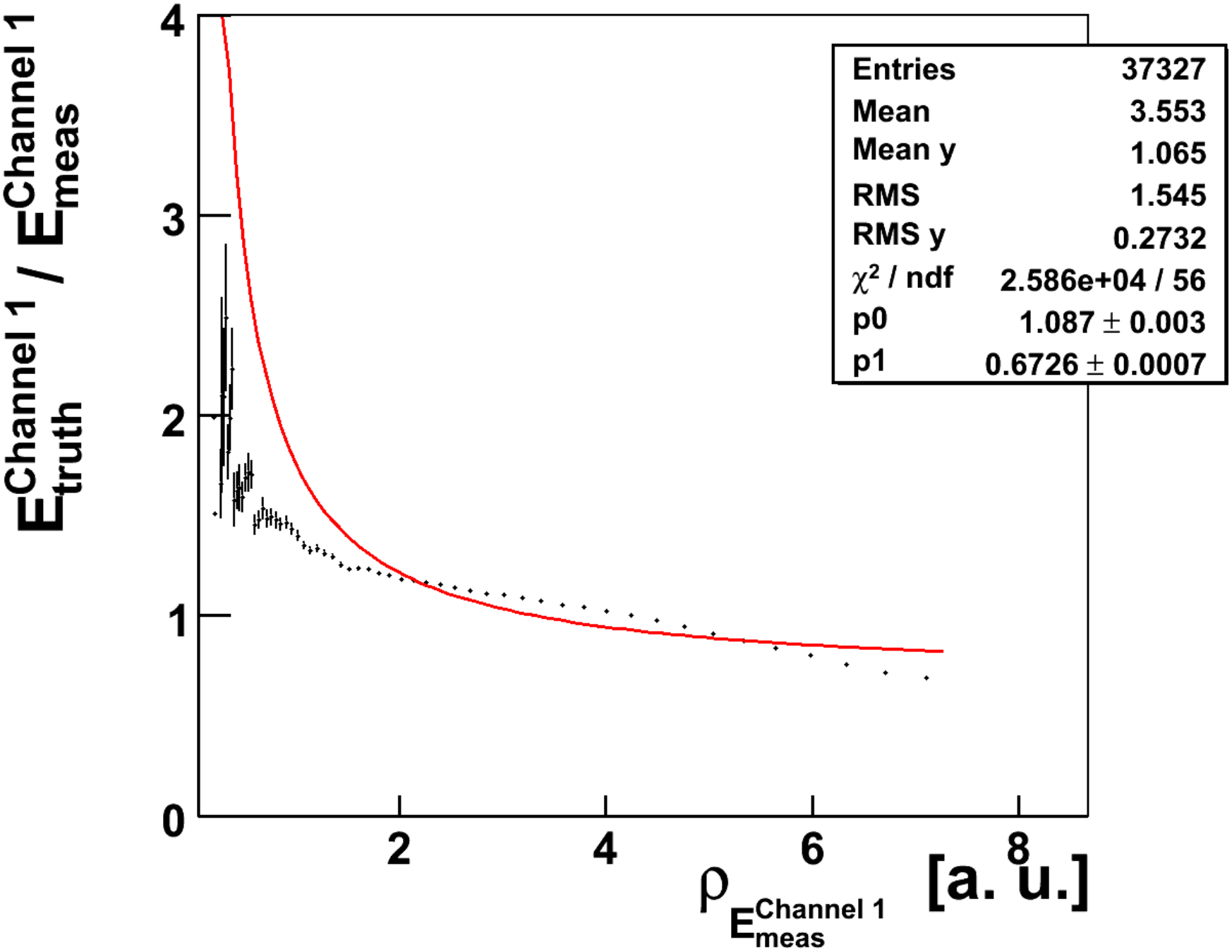
$$\rho \approx \frac{E_{meas}}{19.86}$$

$$\frac{100}{19.86} \approx 5$$

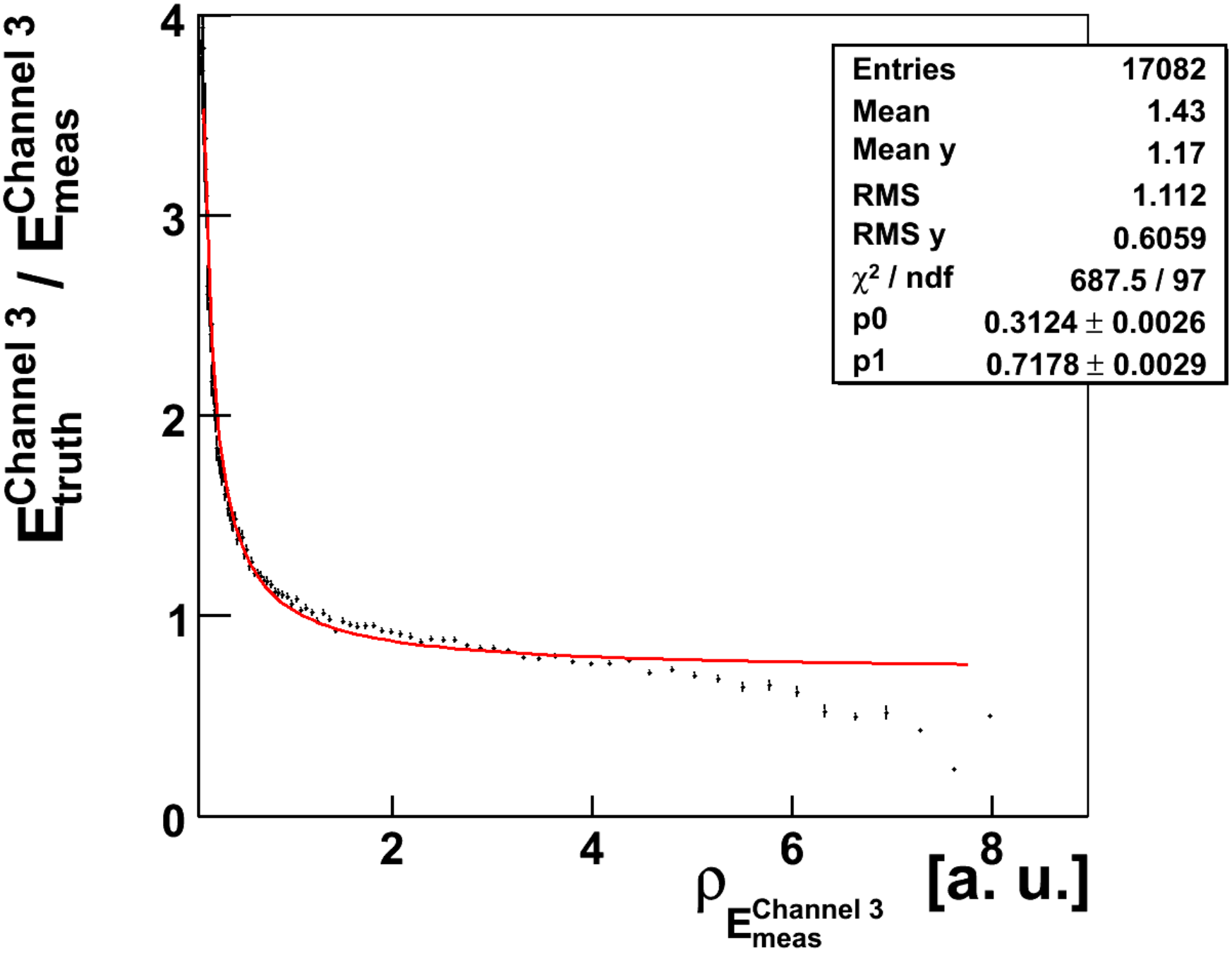
Weights, 17, with ECal, gcalor 20 GeV



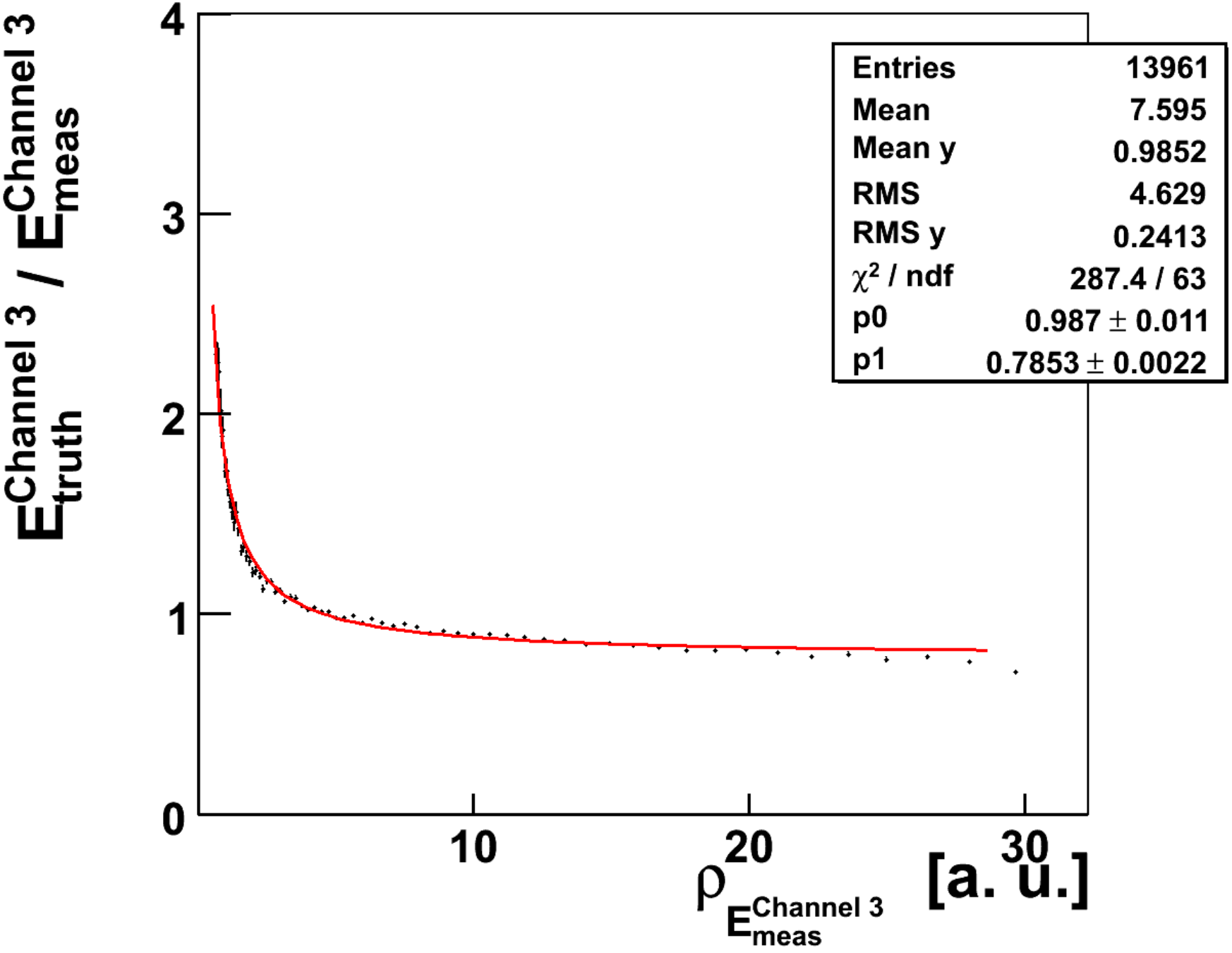
Weights, 17, with ECal, gcalor 100 GeV



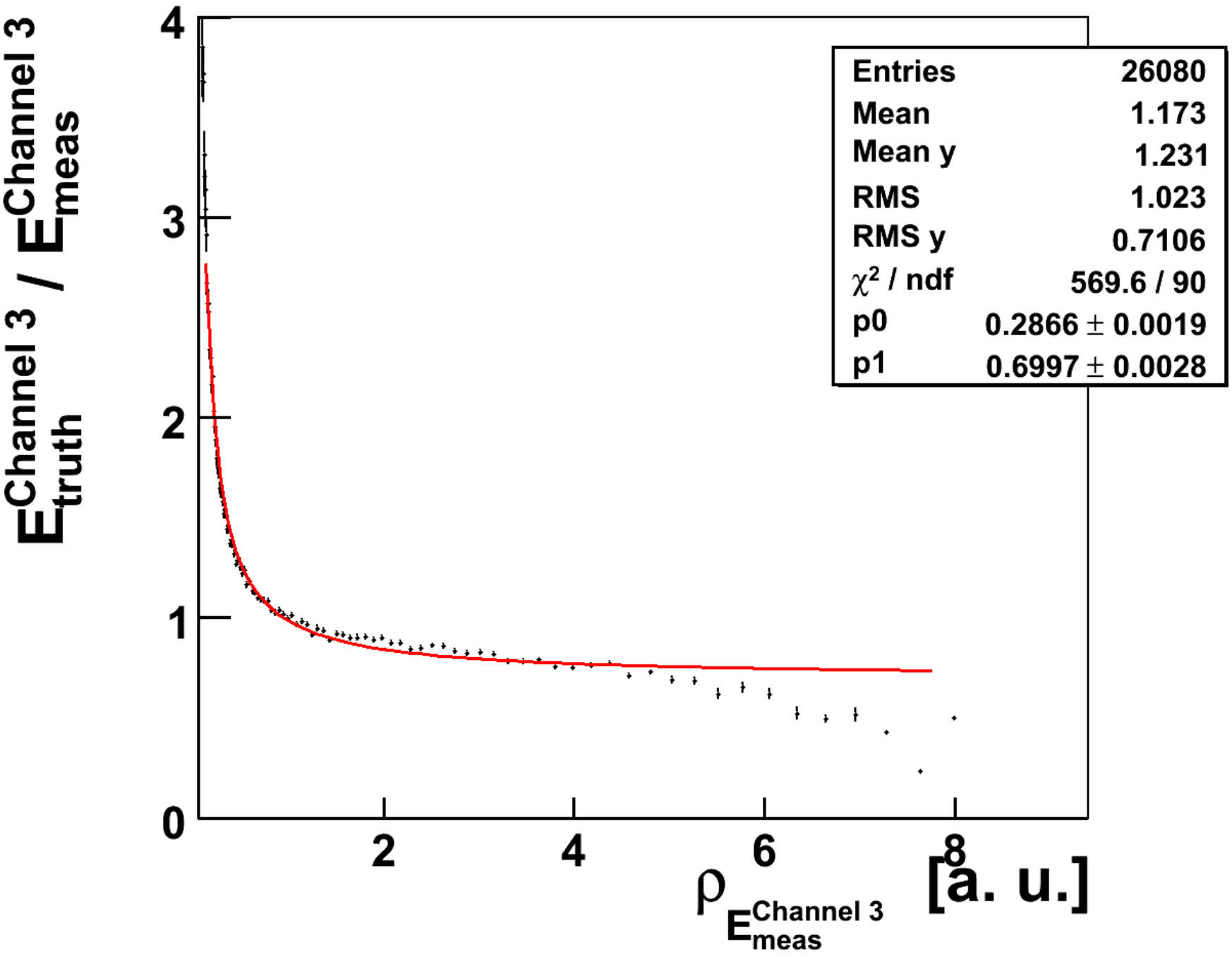
Weights, 1448, without ECal, gcalor 20 GeV, channel 3



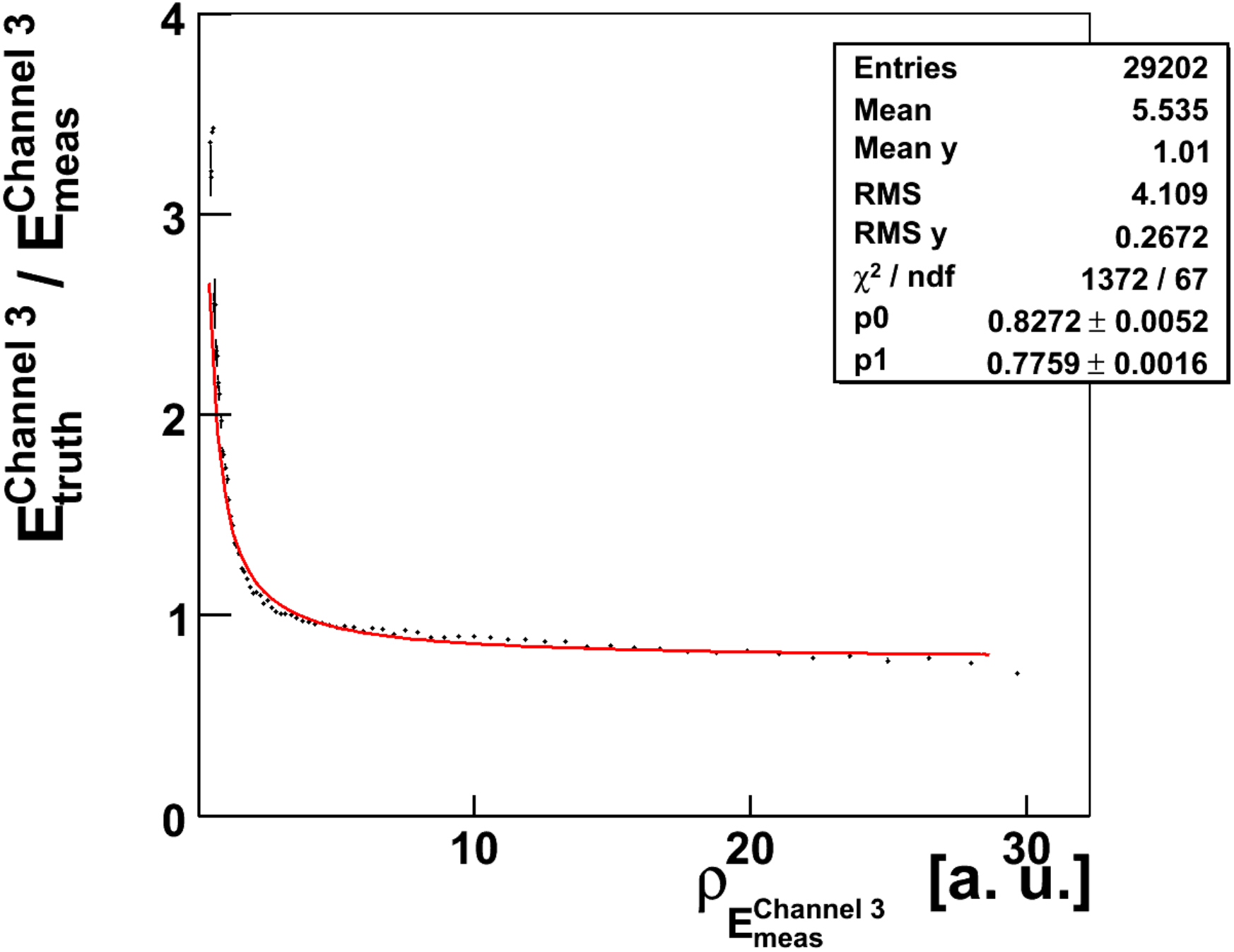
Weights, 1448, without ECal, gcalor 100 GeV, channel 3



Weights, 1448, with ECal, gcalor 20 GeV, channel 3



Weights, 1448, with ECal, gcalor 100 GeV, channel 3



To-do => in this order?

Investigation

1. Recalibration for 12212/ 17/… and with/without Ecal?
2. Jets: for Geant3 and CMSSW
   ↳ Weighting on tower level? (not cluster)
3. Fit function?
4. Simulate a channel-breakdown
5. Understand e/pi ? => official plots?

Organizational stuff

1. Mail to Chris Tully
2. Contact Munich
3. Note
4. Proceedings (3 pages)