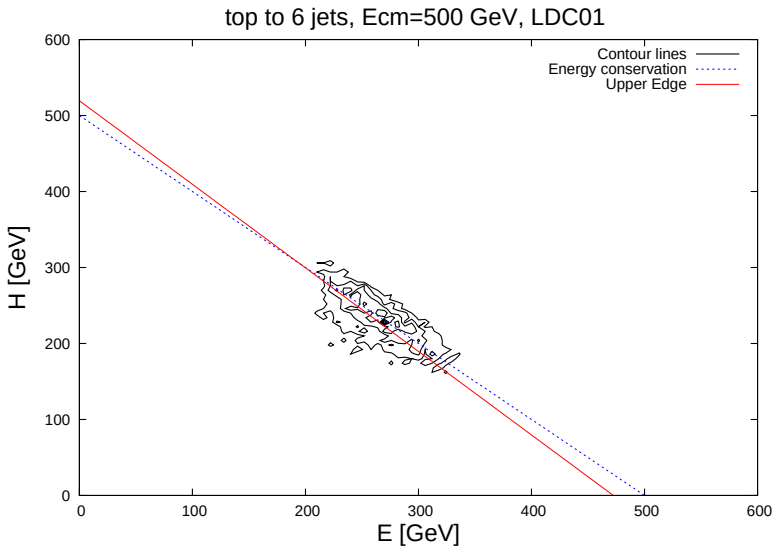
# Calorimeter Calibration

## Two approaches

Conservation of $E_{\mathrm{CM}}$

- Require $E_{\mathrm{ECAL}} + E_{\mathrm{HCAL}} = E_{\mathrm{CM}}$ for e.g. ttbar events
- Problem: Missing $E$
- Tune coeffs to “rotate” cloud
- Implemented in Calibprocessor




Seperate Calibration of ECAL and HCAL

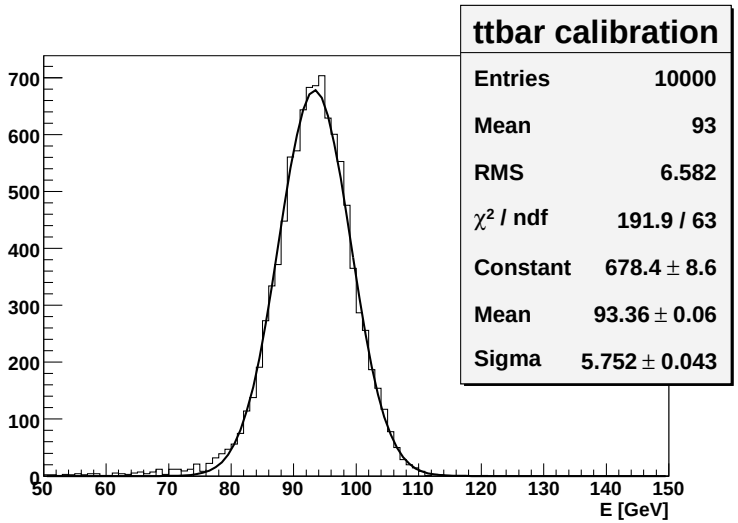
- Use e.g. single $\gamma$’s for ECAL and $K_L^0$ for HCAL
- Divide Monte Carlo Energy by visible Energy
- Caution: Containment

# Comparison on $Z \rightarrow uds$

## Energy Conservation (LDC01_06Sc_p01)

Only Sum of Calorimetric Energy used, no PFlow

$$c_1 = 50.9089$$
$$c_1 = 101.806$$
$$c_1 = 31.5764$$




$\mu = 93.36$GeV, $\sigma = 5.75$ GeV, $\frac{\sigma}{\mu} = 6.1\%$

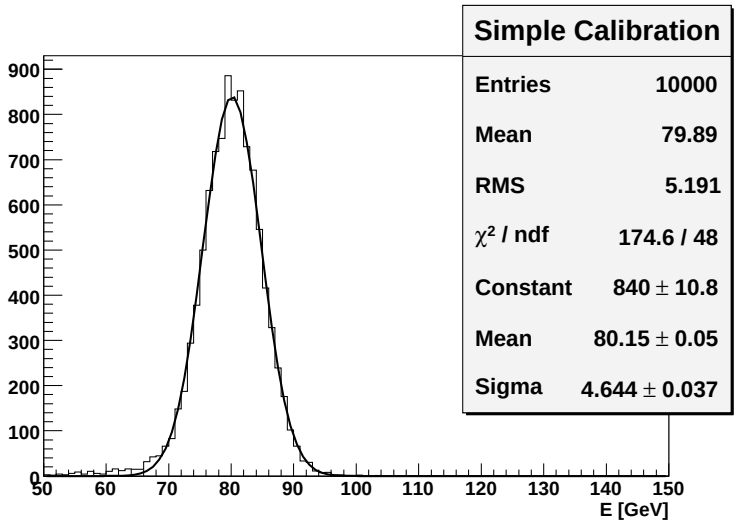
500 GeV $t\bar{t}$ Full detector

# Comparison on $Z \rightarrow uds$

## Single Particle Calibration (LDC01_06Sc_p01)

Only Sum of Calorimetric Energy used, no PFlow

$$c_1 = 41.4774$$
$$c_1 = 84.0371$$
$$c_1 = 29.909$$

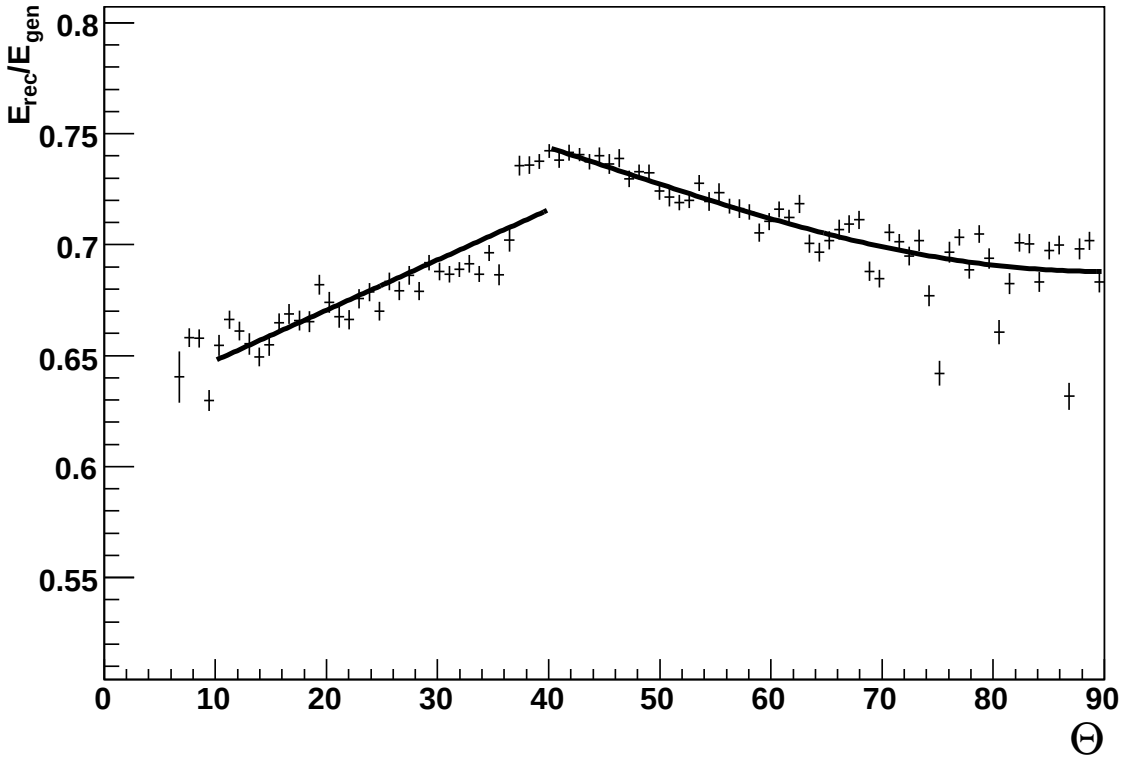



$\mu = 80.15\text{GeV}, \sigma = 4.64\ \text{GeV}, \frac{\sigma}{\mu} = 5.8\%$

$\gamma$: 50, 100 GeV; $K_L^0$ 50 GeV; $80^\circ < \Theta < 100^\circ$

# Angular dependency of $E_{rec}/E_{gen}$

Ratio of $E_{rec}/E_{gen}$ depends also on $\Theta$, geometric effect



# last Slide

- Where do the large differences between first and second approach come from?
- Calibration methods are sensitive to angular cuts. (Where do i calibrate)
- Energy dependency
- Containment
- The Energy conservation method seems to work better.