

Temperature Calibration: and HCAL Hadron Resolution July 2007 CERN Runs

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The copy of this talk one can find at the <http://www.desy.de/~morgunov>

Correction constant for each termosensor

Temperature for 121 runs were written into root-trees.

Results of calibration are presented at database file:

http://www.desy.de/~morgunov/calice/temperature_correction.vec

Format: Layer, position, temperature correction in degree, if zero there is no chance to correct.

Correction constants were extracted as average for 121 runs starting from 330231 to 330853

by smoothing of temperature distributions along calorimeter layers.

Another database http://www.desy.de/~morgunov/calice/temperature_function_no_first.vec represents temperature as smoothed curve for each Y position of termosensor along layers.

Format: Run number, Y position (0:4) and three coefficients of second order polynome ($p_0 + \text{layer} * p_1 + \text{layer} * \text{layer} * p_2$).

Can be used as approximation of temperature map in any run at any position

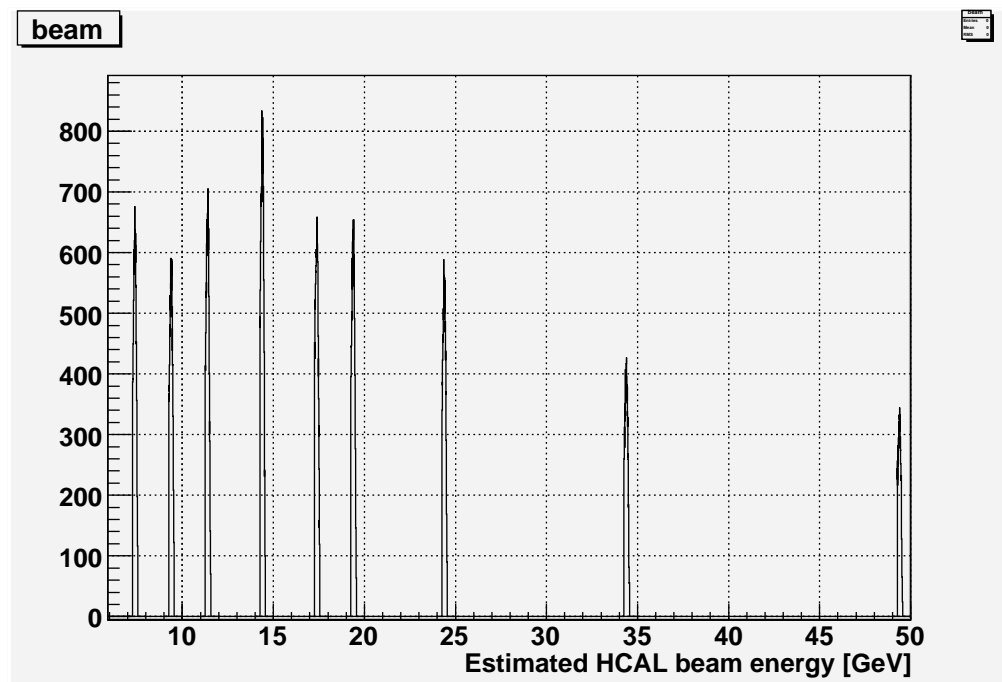
with accuracy of about 0.1 degree.

Codes to create these databases are also presented at <http://www.desy.de/~morgunov/calice>

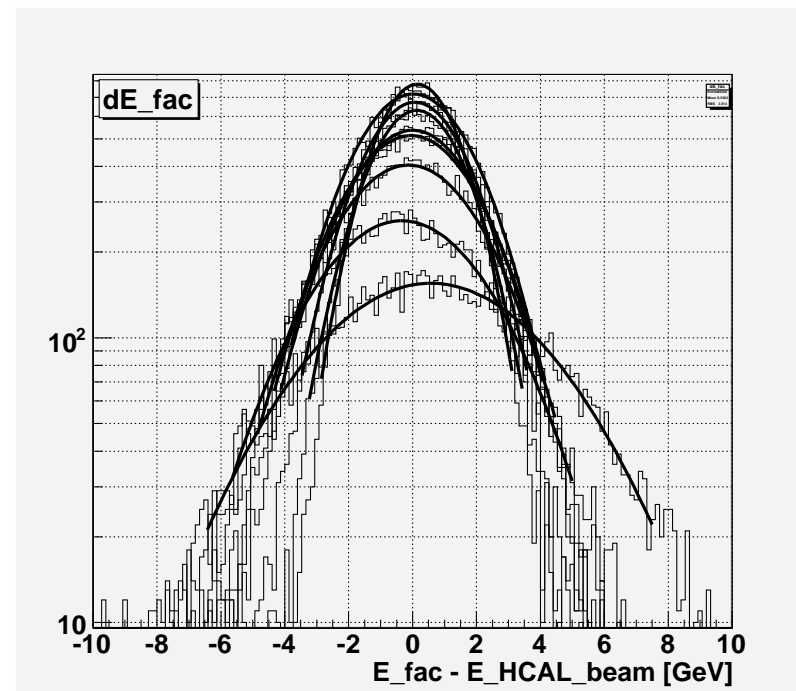
HCAL Beam and Reconstructed Energy

Event selection was rather hard:

ECAL energy is between 0.45 and 0.75 GeV; Number of hits in ECAL is between 25 and 55; TCMT energy < 1 GeV.



Energy reached HCAL was calculated using ECAL energy



Difference between reconstructed and estimated energy

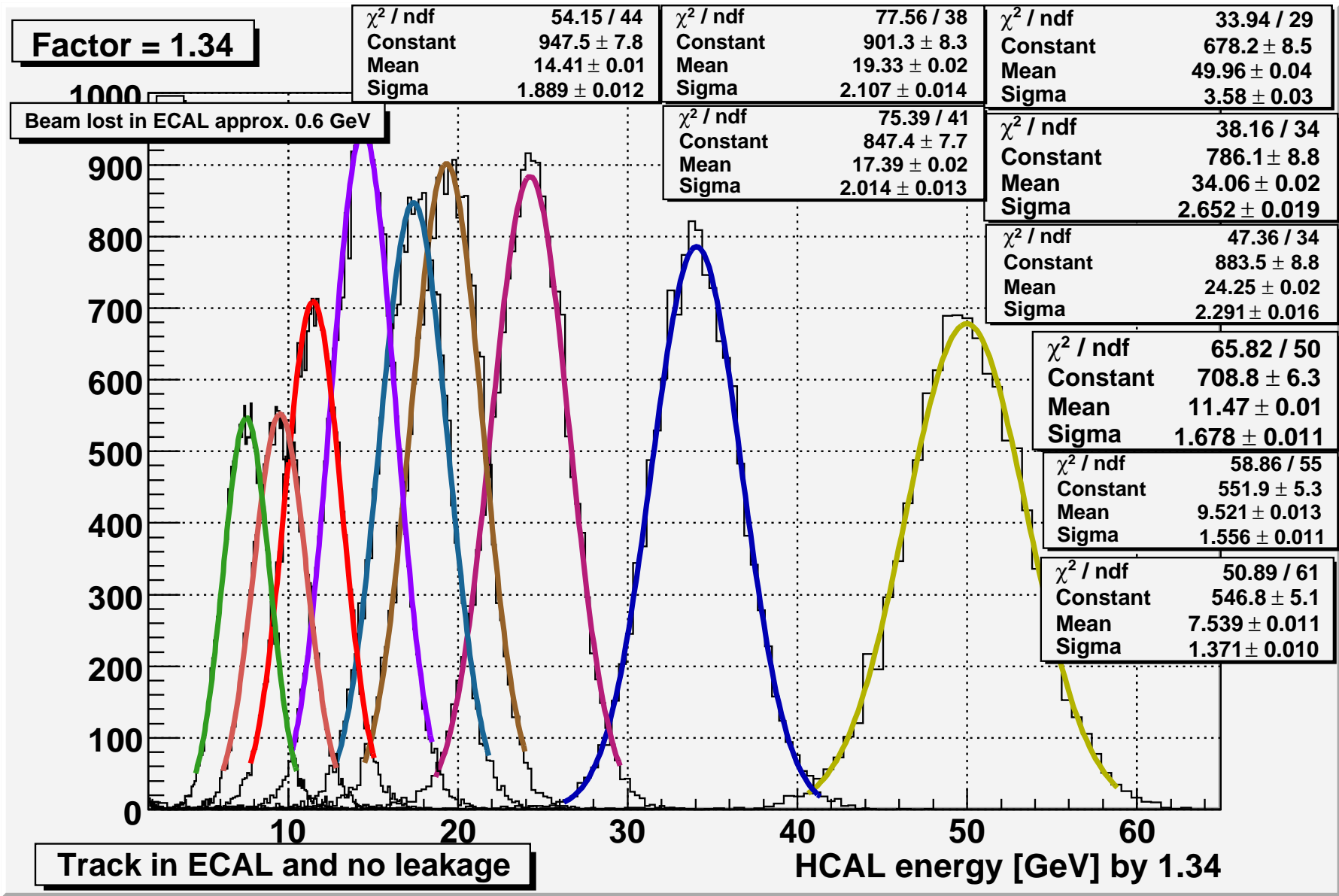
There was no any SiPM saturation correction, just ADC / muon_calibration_coefficient

Event energy was calculated as a simple sum of hit energies that over threshold.

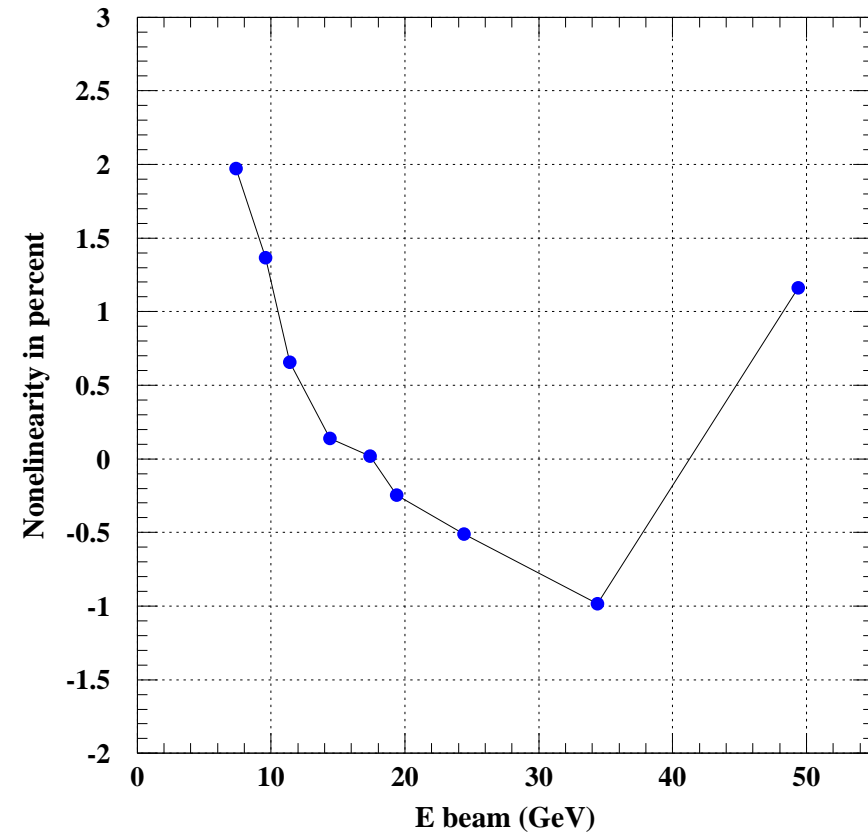
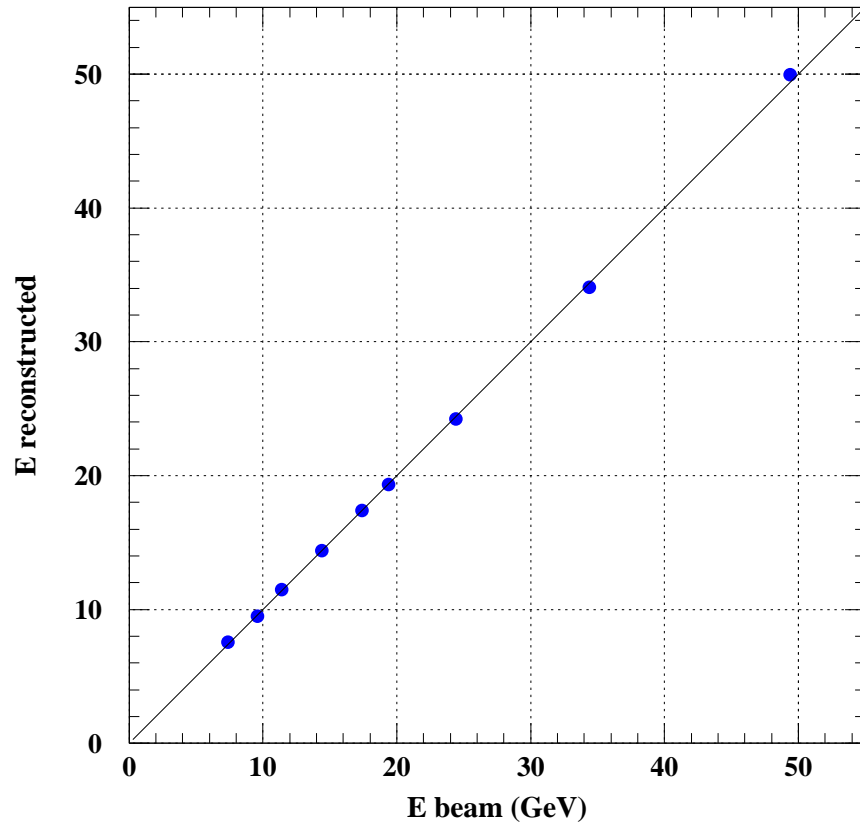
Only one correction coefficient was used for any beam energy

That is 1.34 to electromagnetic energy scale from last year runs.

Reconstructed Energies



Reconstructed Energy Linearity



Linearity is better than ± 1.5 percent

HCAL Energy Resolution

