On-orbit calibration of the calorimeter thresholds

The set of runs with dedicated configurations (lacCalib_*, flecalib_*,fheCalib_*), has been collected during July 4-7, 2008 allowing to extract the calibration curves for LAC, FLE,FHE thresholds.

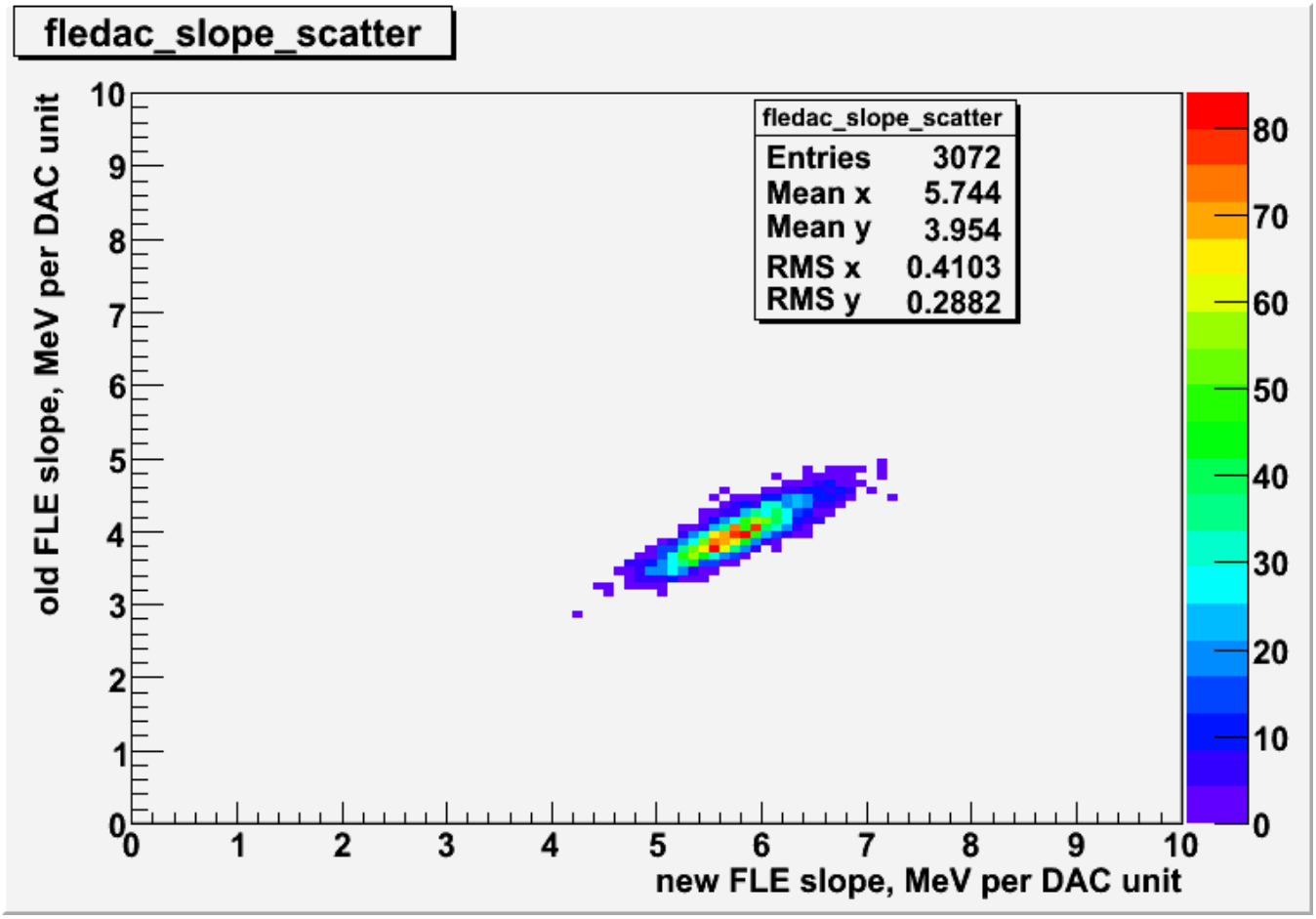
ULD thresholds were calibrated on the basis of all available runs having

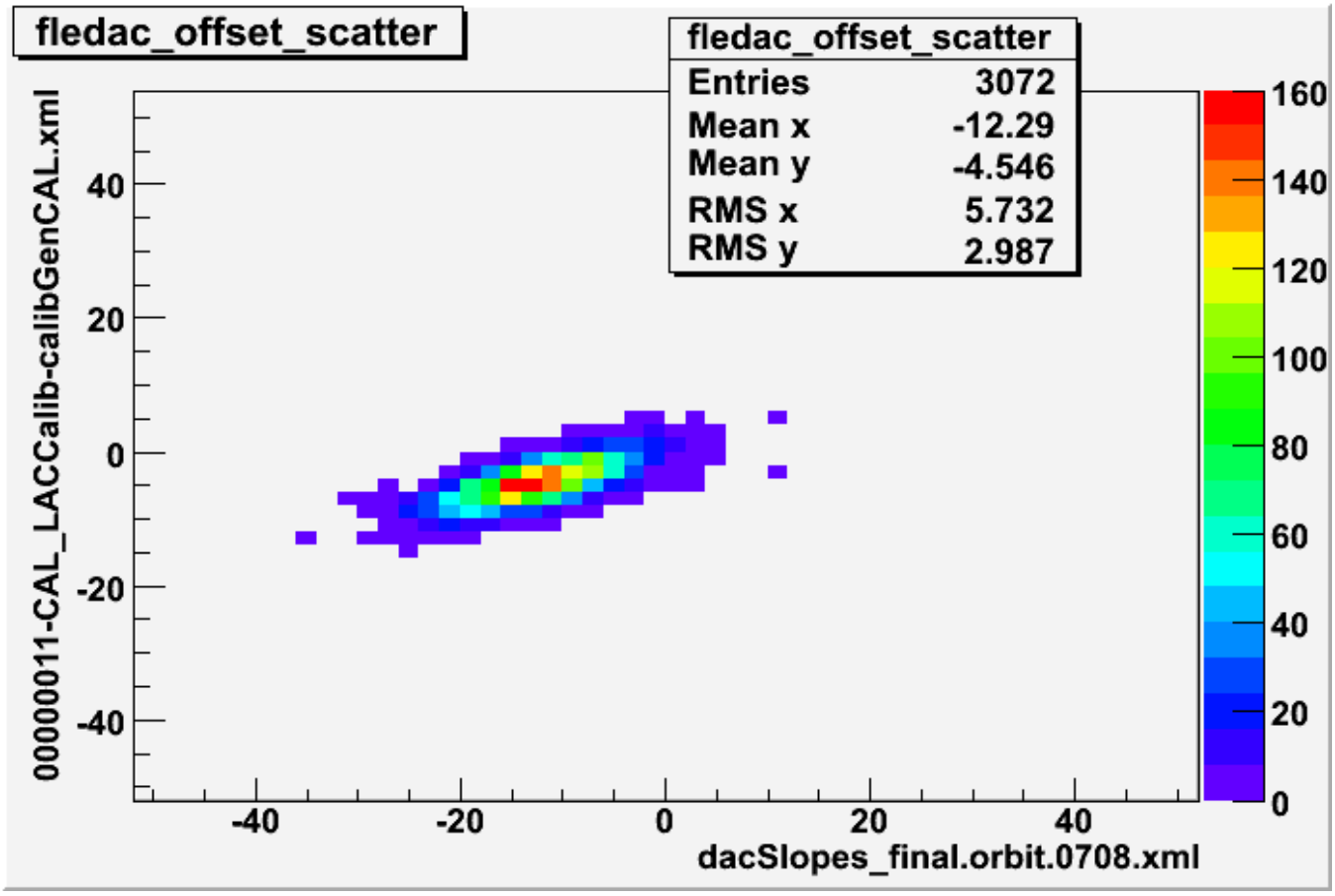
- nominal ULD settings (5% below the saturation:nomSciOps,calibOps,vetoCalib,bkgNadir,bkgPrescaled) or
- low ULD settings (10% below the saturatinconSciOps,hldCalib,conBkgNadir,conBkgPrescaled).

From the measured threshold values for low and Hi(Mid) settings and the DAC settings, knwo from configuration files, the linear model (thresh = slope*DAC+offset) was defined for each calorimeter crtystal end and each threshold type. The parameters of the linear model ("dac slopes") were stored in the xml file dacSLopes_final.orbit.0708.xml which should be used to build the updated LAT configurations for subsequent upload to the instrument.

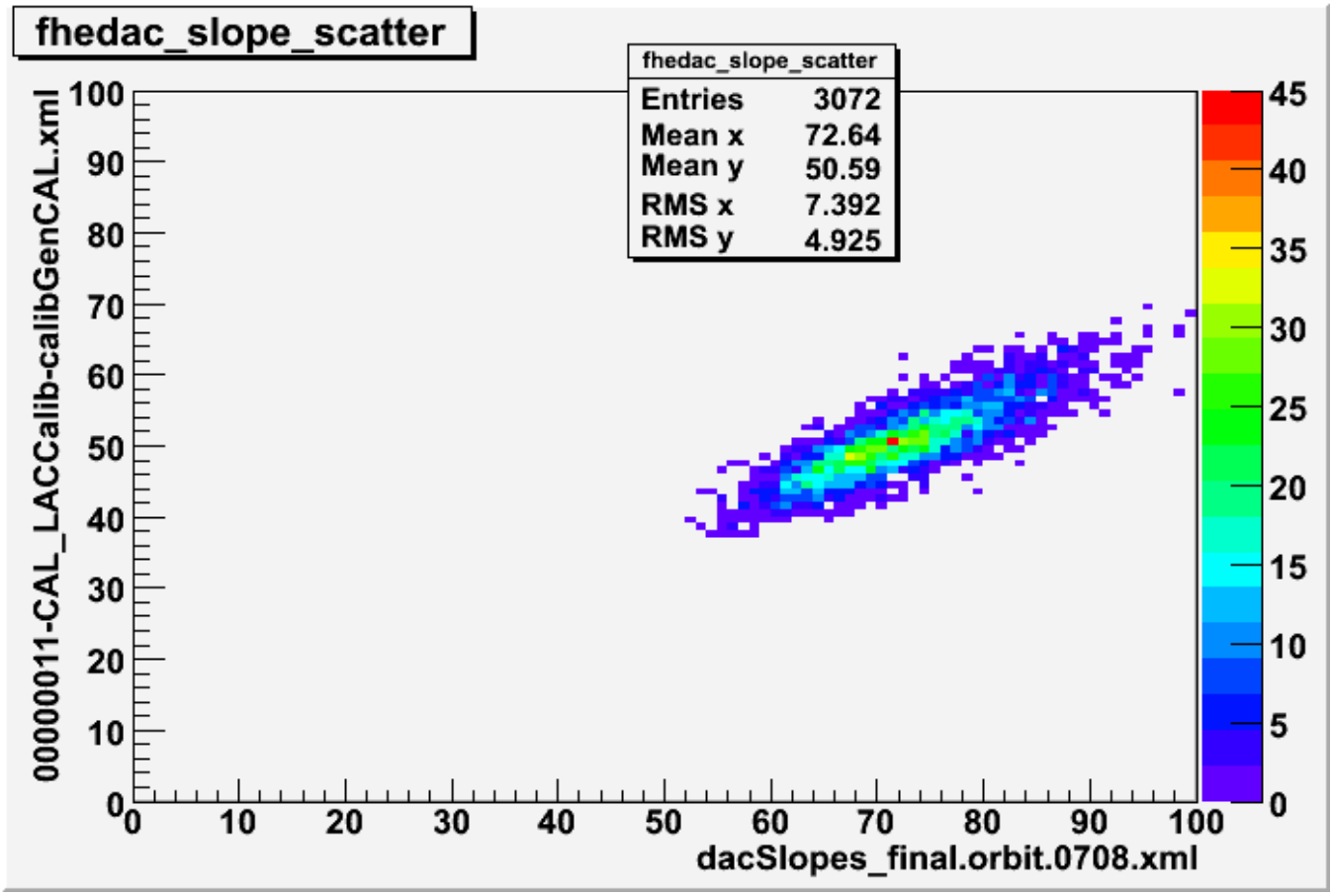
To validate the content of new dacSLopes file it was compared to the one actully in use. The results of comparizon is shown on following plots.

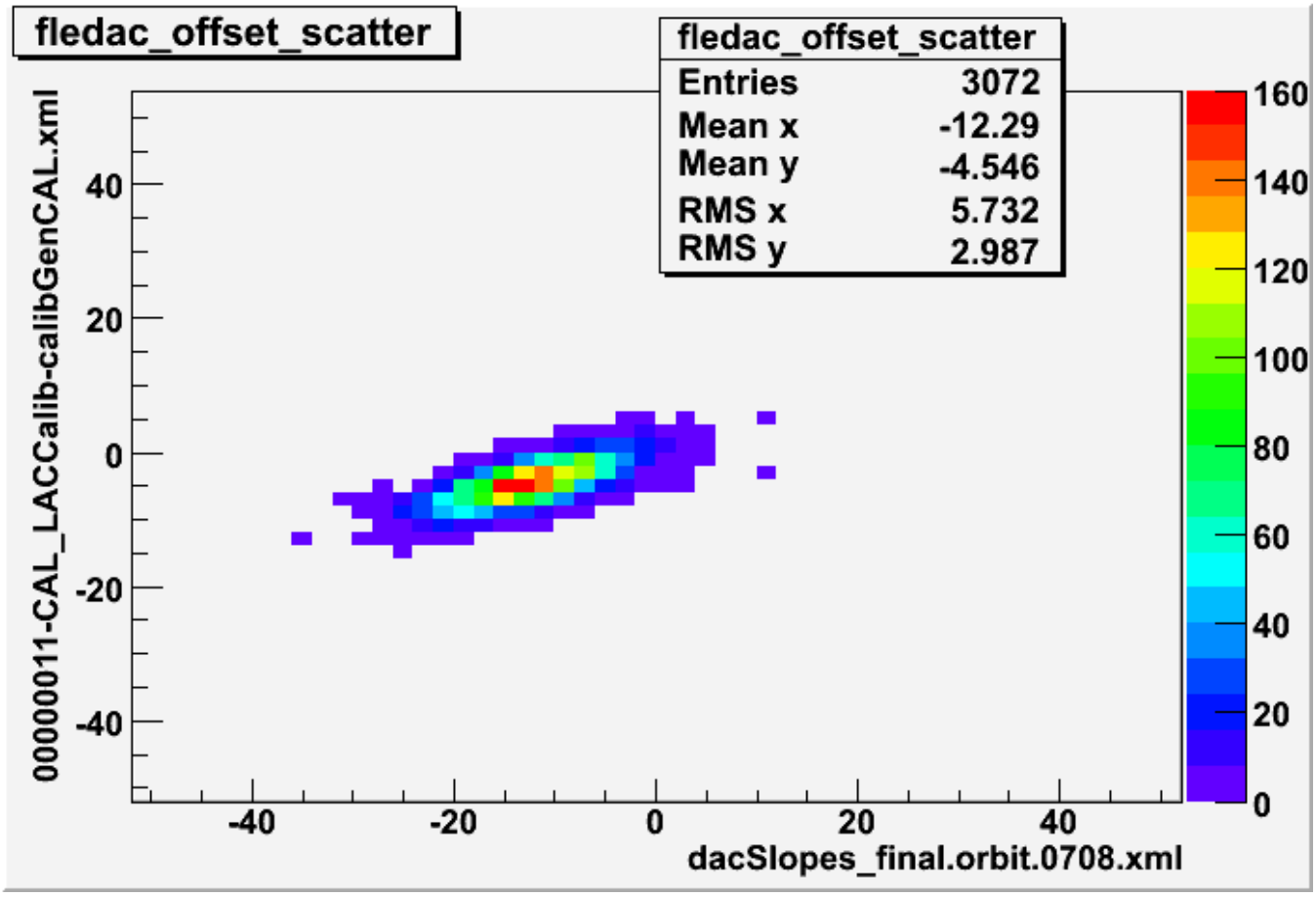
FLE linear model parameters



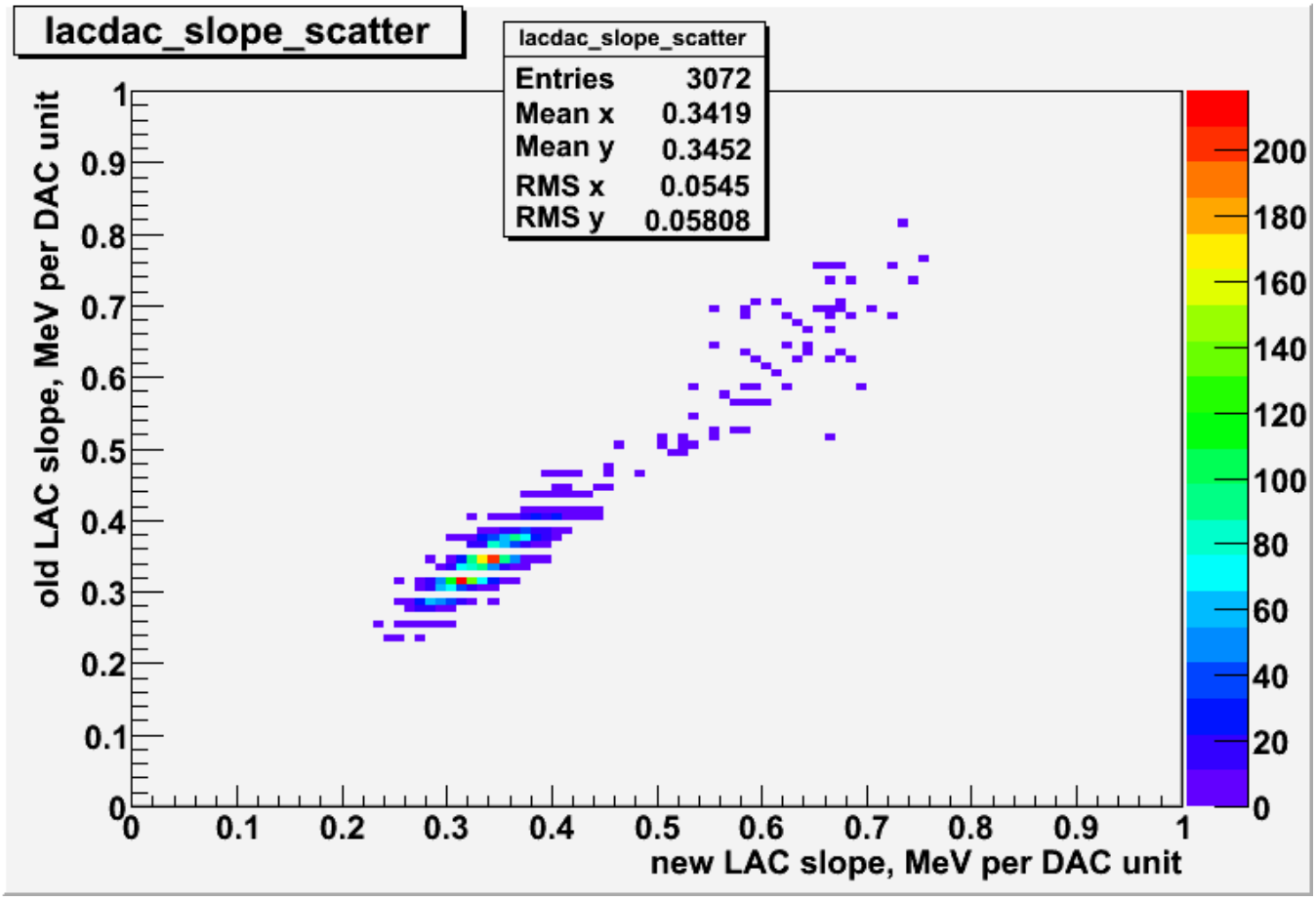


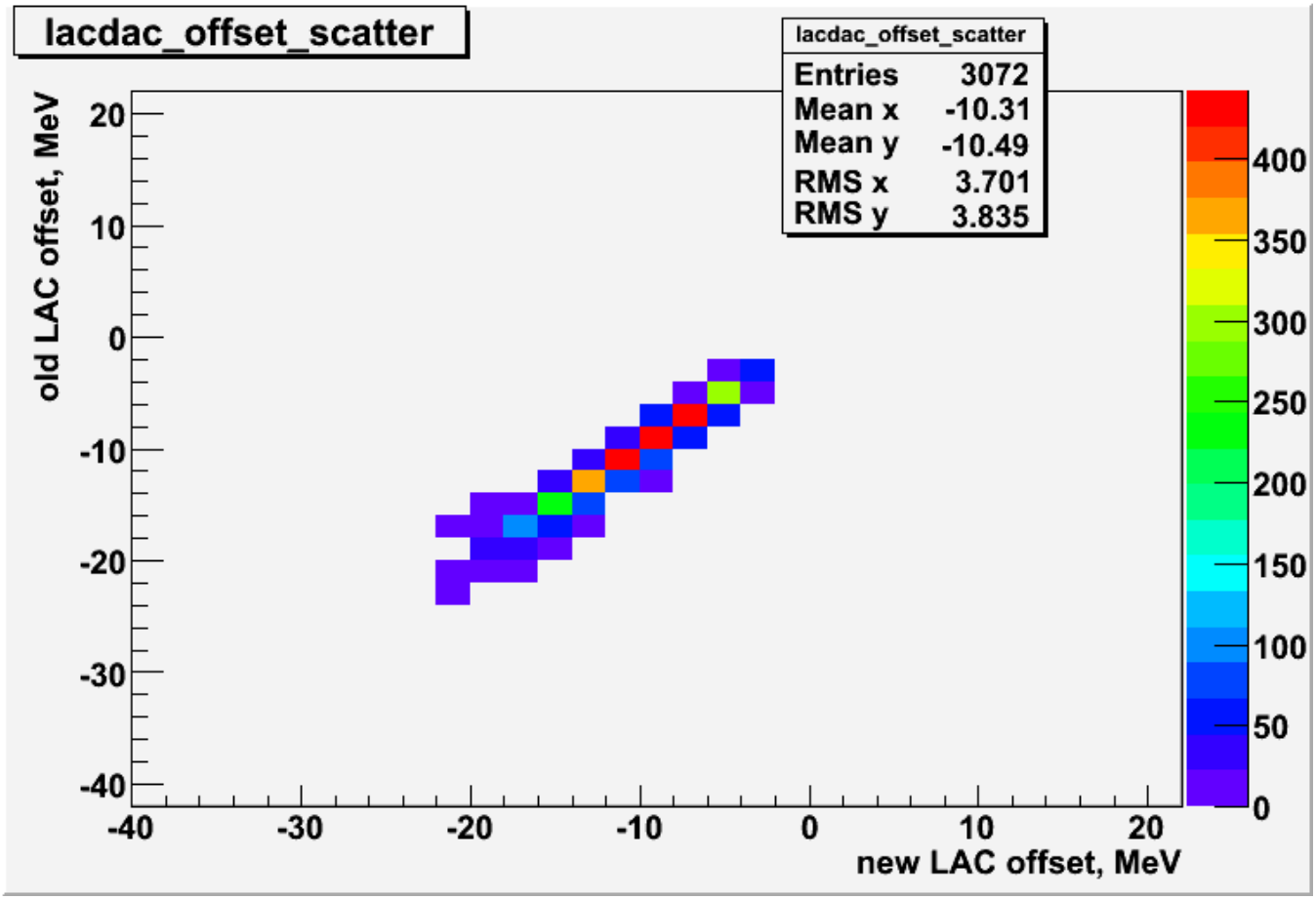
FHE linear model parameters


fhedac_slope_scatter
fhedac_slope_scatter
Entries 3072
Mean x 72.64
Mean y 50.59
RMS x 7.392
RMS y 4.925
00000011-CAL_LACCalib-calibGenCAL.xml
dacSlopes_final.orbit.0708.xml
0 10 20 30 40 50 60 70 80 90 100
0 5 10 15 20 25 30 35 40 45

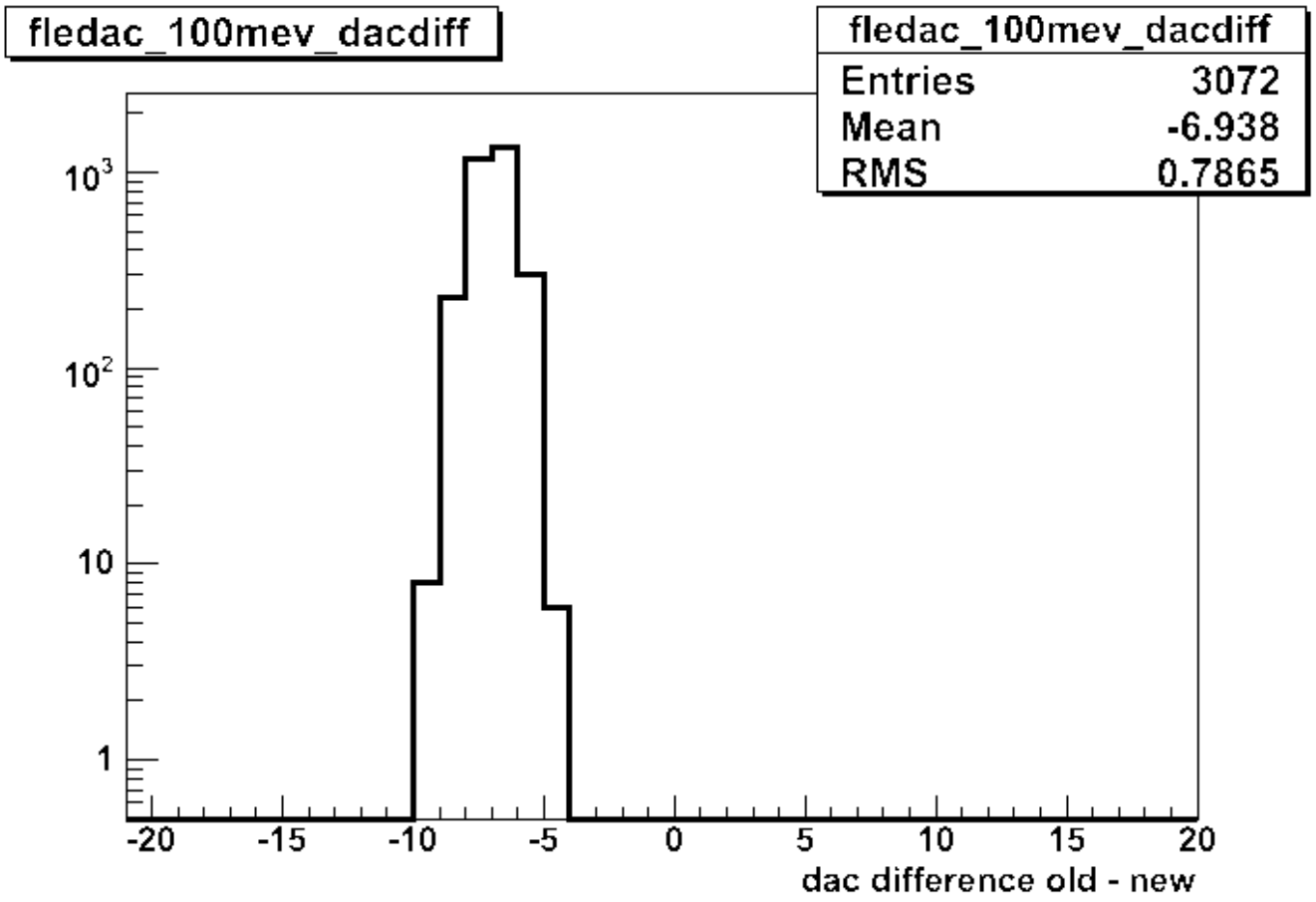


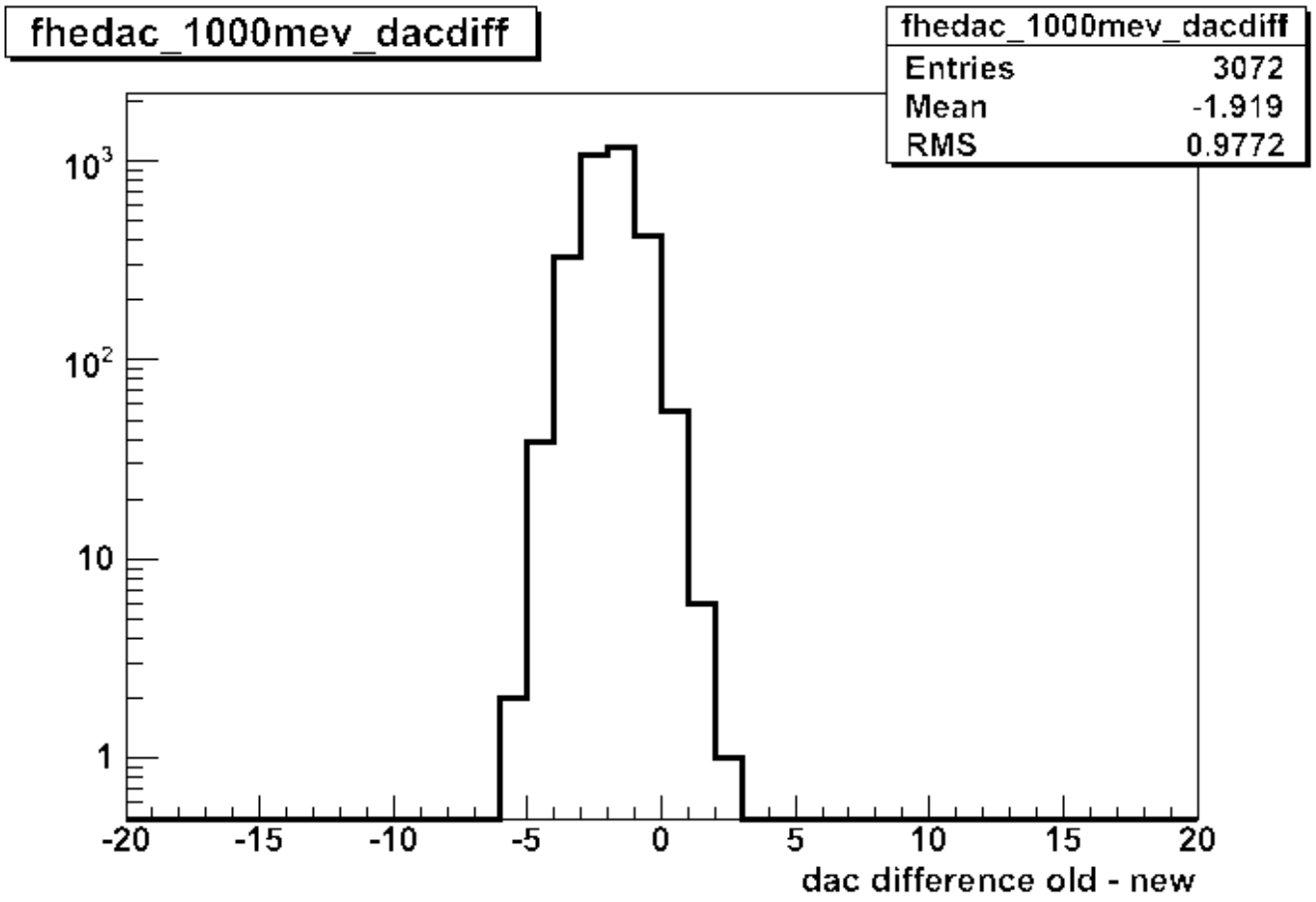
LAC linear model parameters

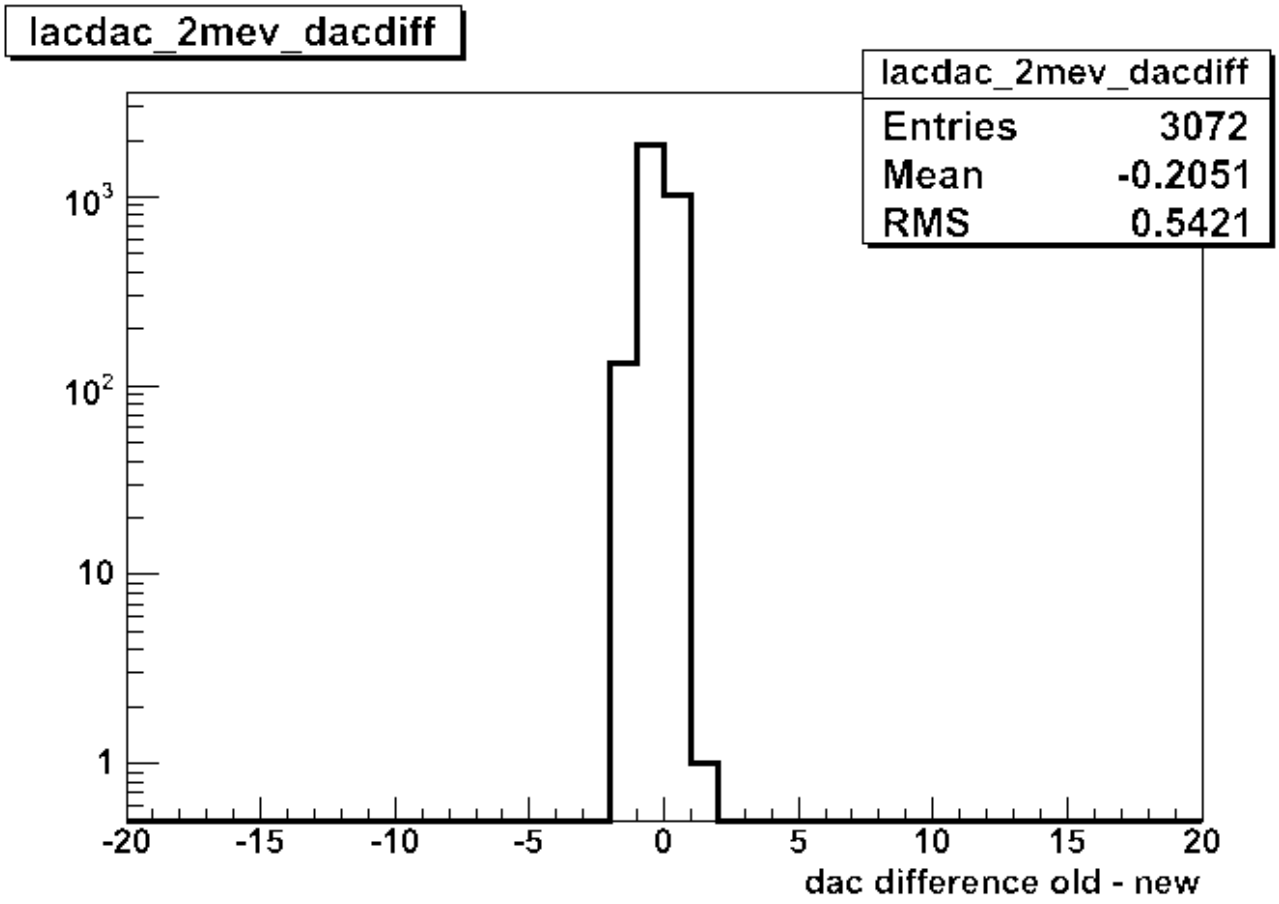

lacdac_slope_scatter
lacdac_slope_scatter
Entries 3072
Mean x 0.3419
Mean y 0.3452
RMS x 0.0545
RMS y 0.05808
old LAC slope, MeV per DAC unit
new LAC slope, MeV per DAC unit
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
0
20
40
60
80
100
120
140
160
180
200



To test new dacSlopes file the set of new dac settings for FLE, FHE and LAC was generated, the plots below show the difference between new and old dac settings.


fledac_100mev_dacdiff
fledac_100mev_dacdiff
Entries 3072
Mean -6.938
RMS 0.7865
10^3
10^2
10
1
-20
-15
-10
-5
0
5
10
15
20
dac difference old - new


fhedac_1000mev_dacdiff
fhedac_1000mev_dacdiff
Entries 3072
Mean -1.919
RMS 0.9772
10^3
10^2
10
1
-20 -15 -10 -5 0 5 10 15 20
dac difference old - new


lacdac_2mev_dacdiff
lacdac_2mev_dacdiff
Entries 3072
Mean -0.2051
RMS 0.5421
10^3
10^2
10
1
-20 -15 -10 -5 0 5 10 15 20
dac difference old - new