

DESY-CMS Tracker Upgrade Meeting - Phase I

Friday 18 May 2012 from 09:15 to 11:00 (Europe/Berlin)
at CMS Centre

Manage ▼

Participants Maria Aldaya; Armin Burgmeier; Luigi Calligaris; Matteo Centis Vignali; Guenter Eckerlin; D. Eckstein; Thomas Eichhorn; Joachim Erfle; David-Johannes Fischer; Erika Garutti; Ivan Glushkov; Shiraz Habib; Johannes Haller; Jan Hampe; Jens Hansen; Karsten Hansen; Thomas Hermanns; Tobias Lapsien; Andreas Meyer; Carsten Muhl; Andreas Mussgiller; Carsten Niebuhr; Jan Olzem; Hanno Perrey; Alexey Petrukhin; Daniel Pitzl; Thomas Poehlsen; Peter Schleper; Georg Steinbrueck

Chip 10 [CMS] Calibration

0. Intro

Test Beam April 2012 provided a good opportunity to calibrate chip10 under beam conditions, and test the performance of the calibration.

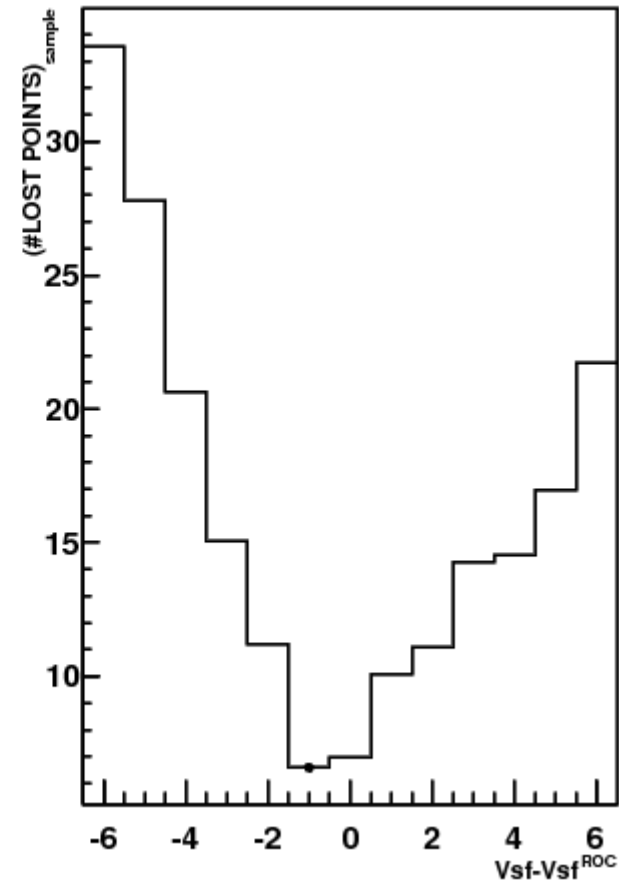
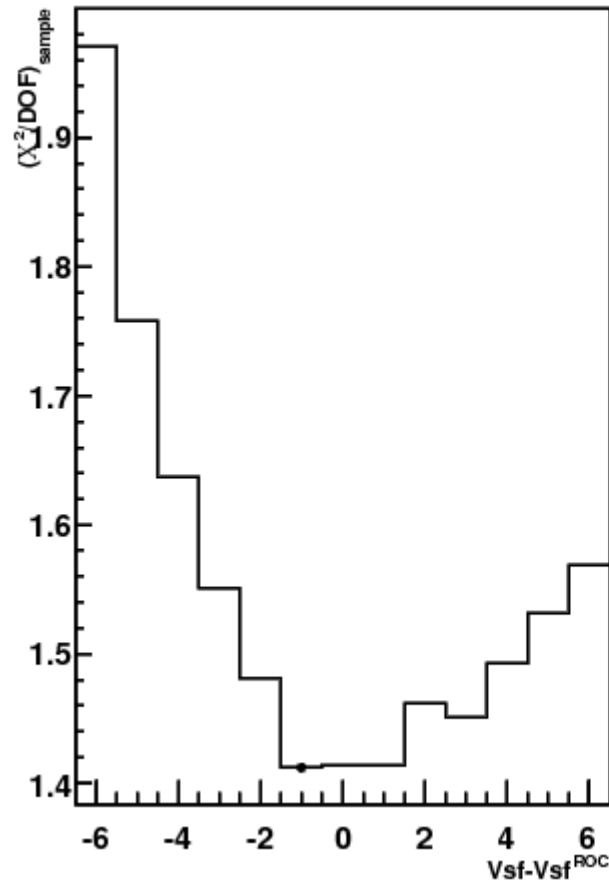
We performed Vsf, VhldDel and Vana scans to optimize linearity. *We abandoned Vana due to technical problems.*

We performed gainmap scans to determine the calibration parameters.

1. Vsf Linearity Optimization

Used 75 random pixels and found Vsf ridge @ 159

Performed Vsf scan and found optimal value @ ridge - 1 = 158

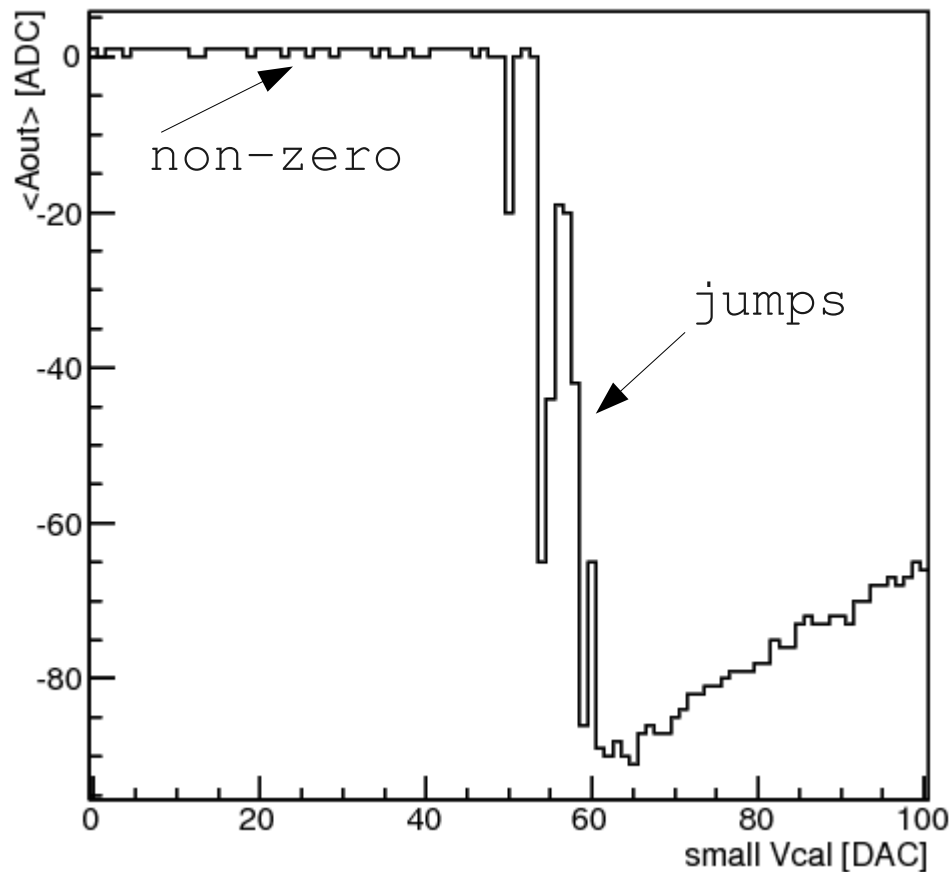


2. Gainmap & Smoothing the Threshold

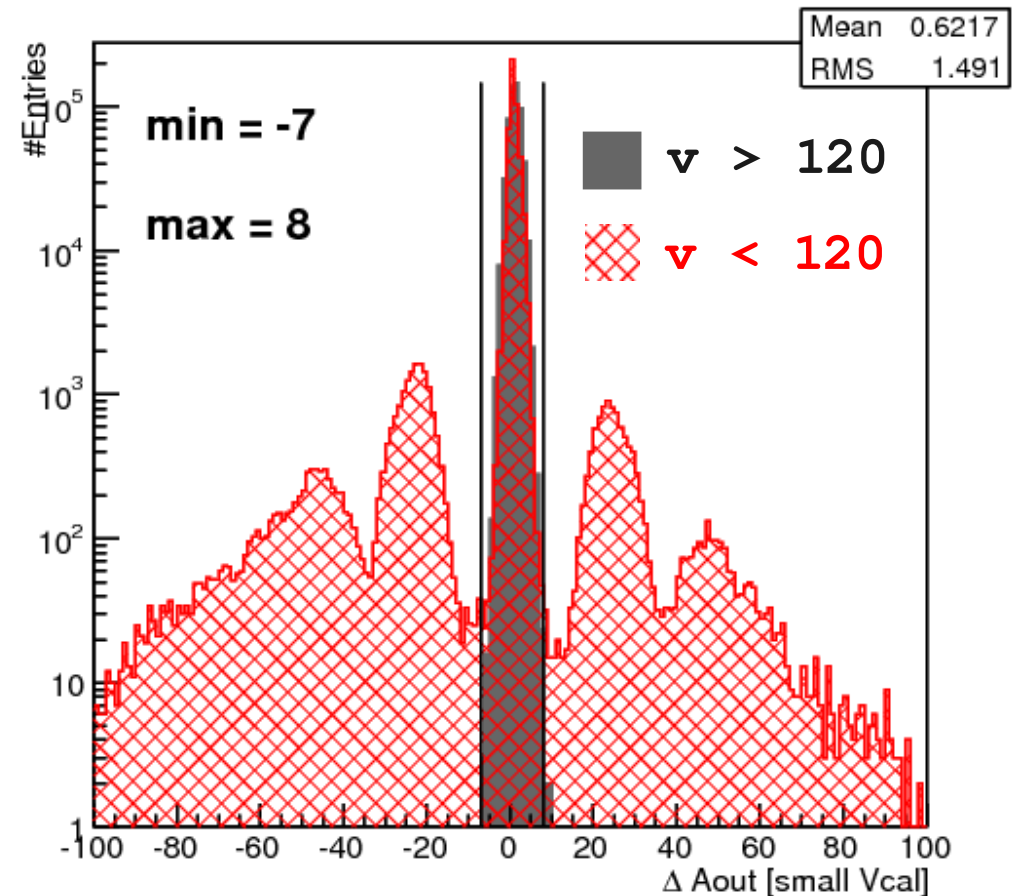
Measured Aout Vs Vcal (small,large) -> 20 min! **Hooray Hanno!**

Irregular threshold effects become apparent during gainmap calibration

gain pixel col 0, row 3



All Pixels

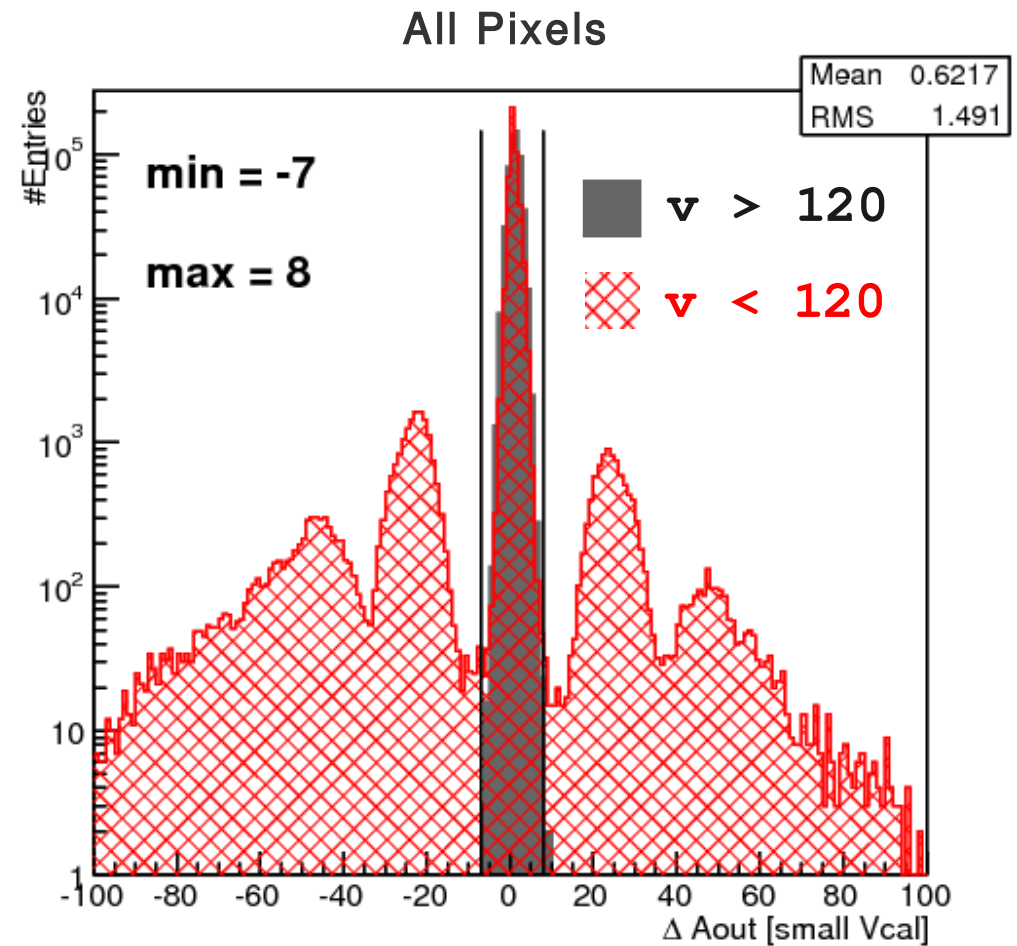
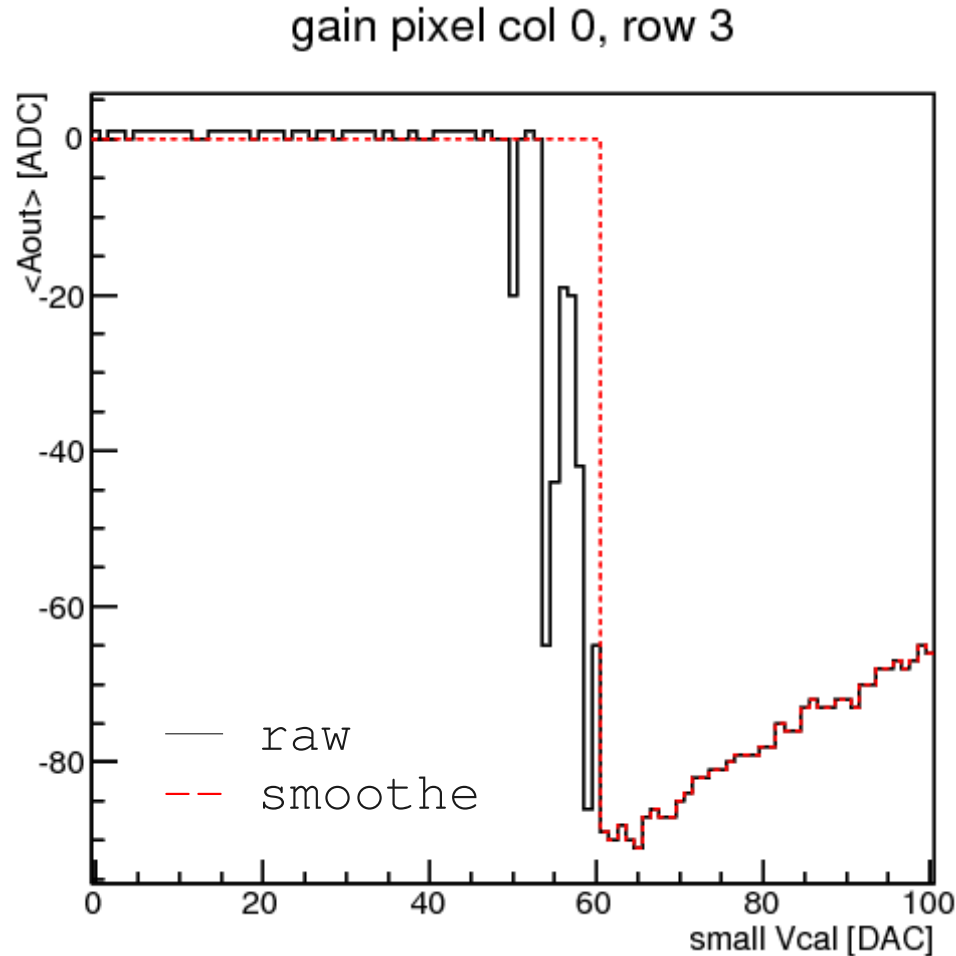


Jumps/non-zero points can mess up the gain curve.

$$\Delta Aout(i) = Aout(i+1) - Aout(i)$$

$$\text{Jump}(i) : \Delta Aout < -7 \mid \mid \Delta Aout > 8$$

2. Gainmap & Smoothing the Threshold

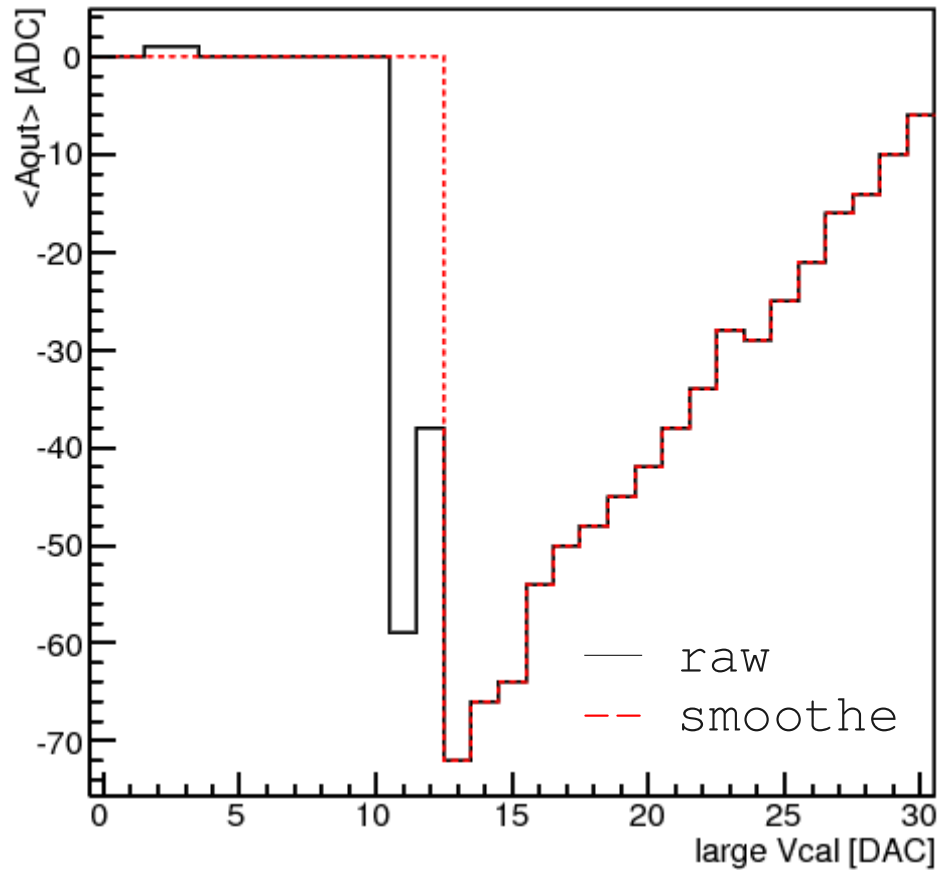


Algorithm: Find last bin with a jump, and set it and all lower bins to 0.

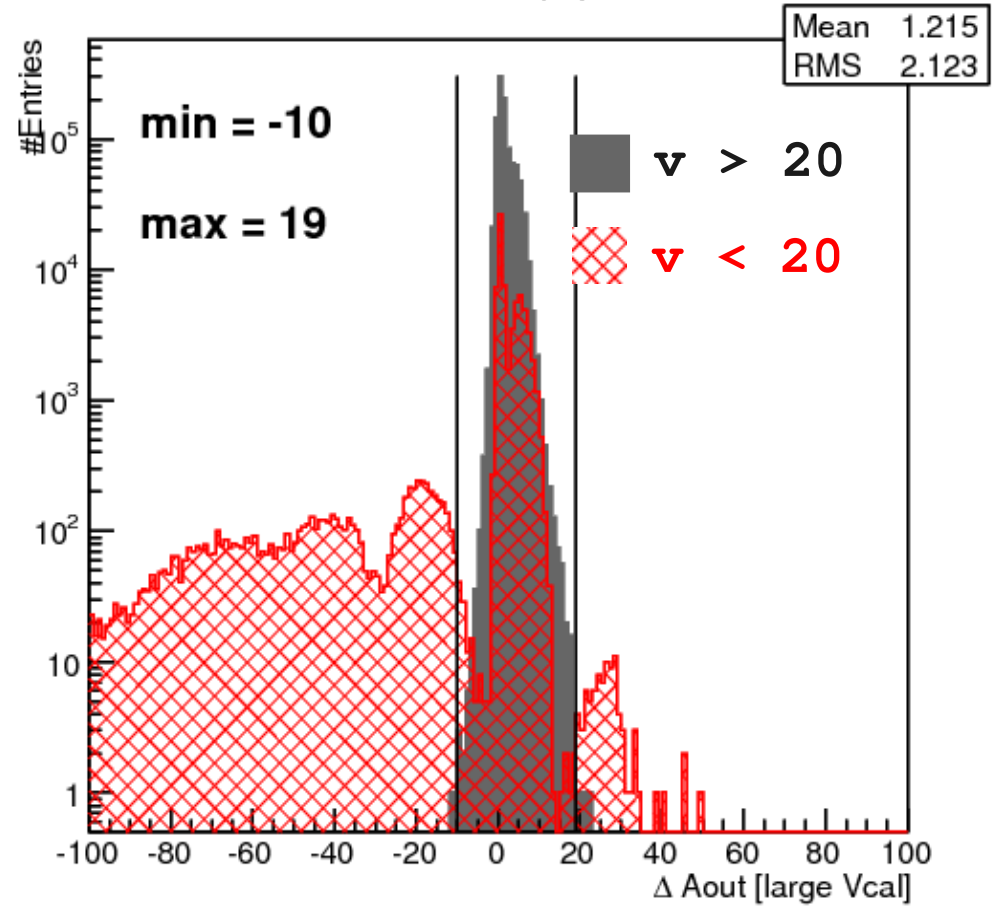
2. Gainmap & Smoothing the Threshold

Large Vcal

gain pixel col 0, row 61

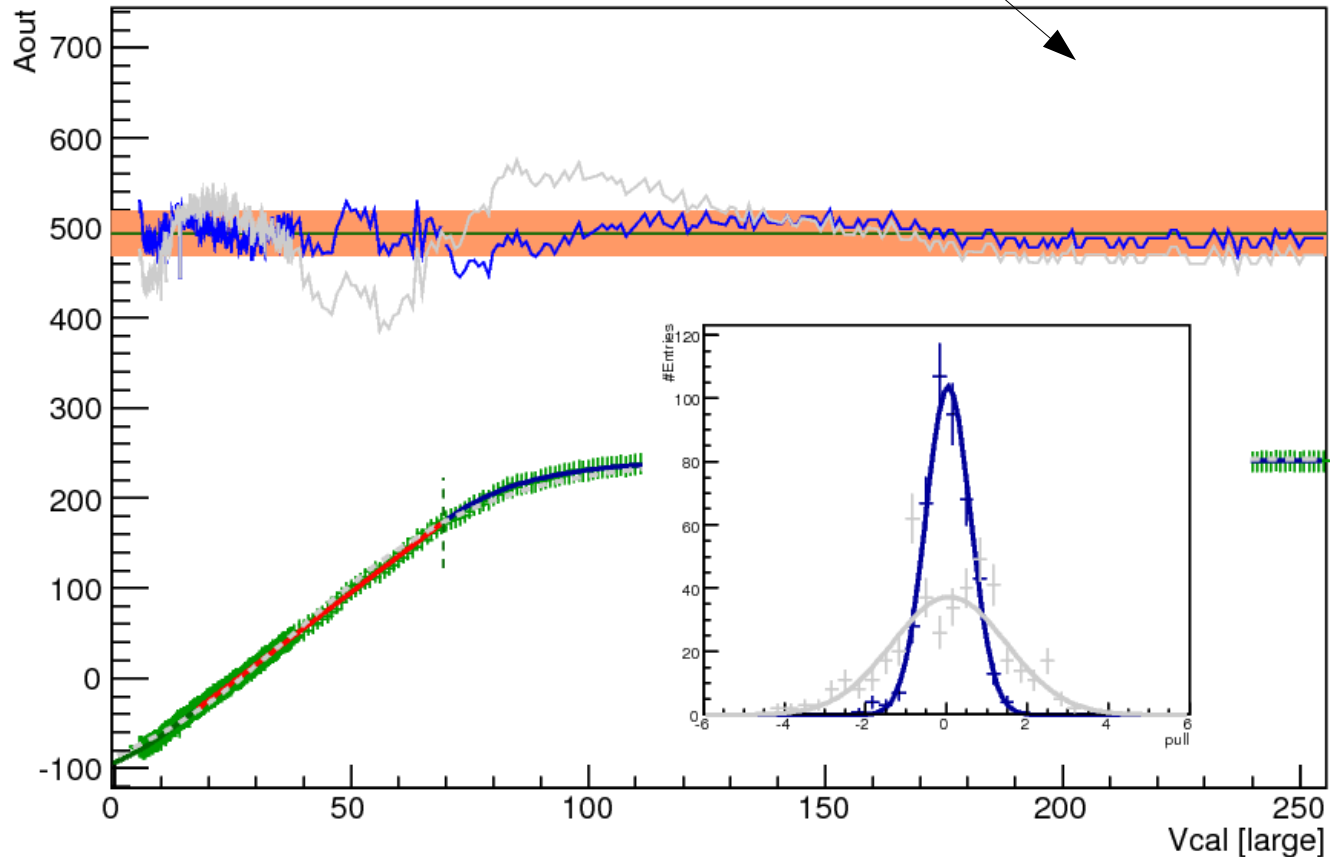


All Pixels



2. Gainmap & Smoothing the Threshold

Gainmap data for a given pixel and calibration fit used to extract calibration parameters.



Calibration parameters for chip 10's 4160 pixels extracted and used to analyze test beam data. Performance of the calibration will be shown by Daniel.