Calibration of BCAL with Cosmic Data

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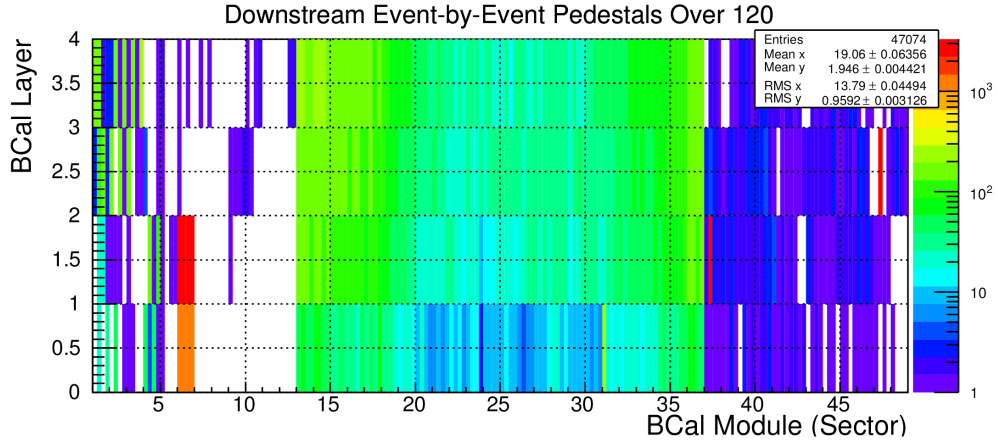
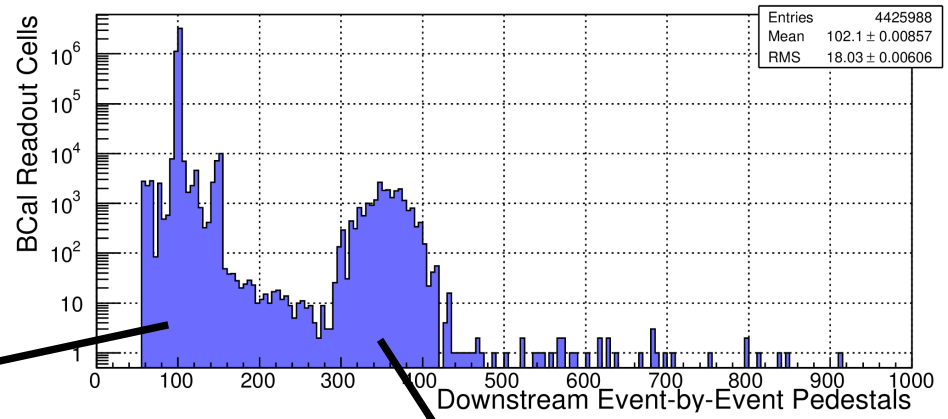
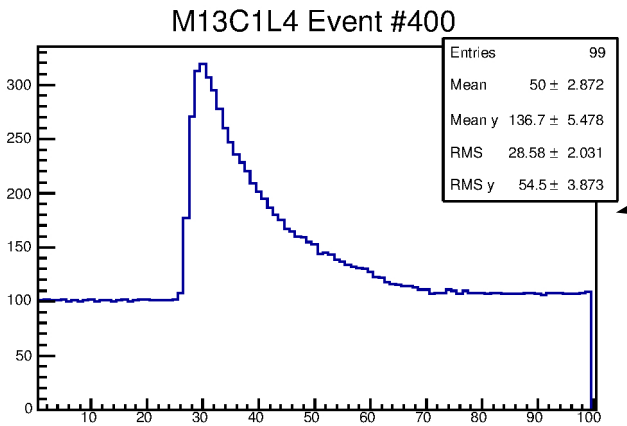
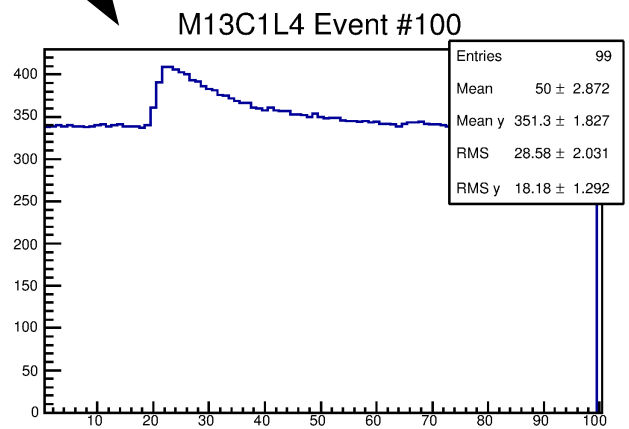
Pedestals in Cosmic Runs:





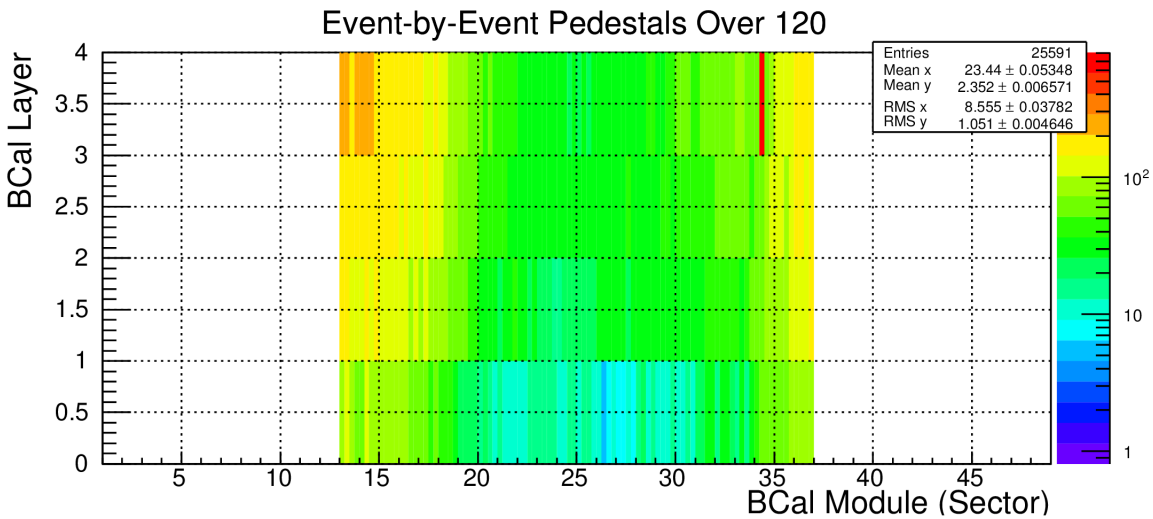


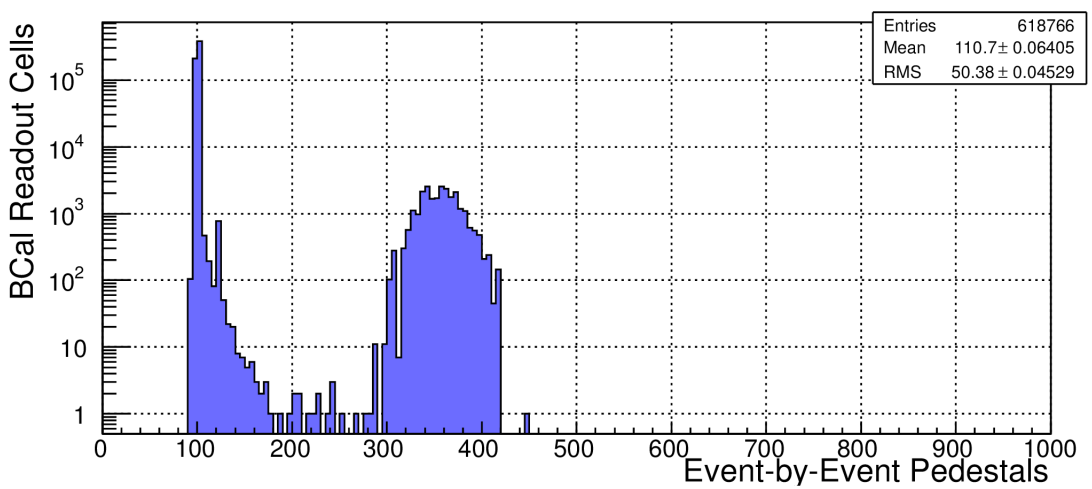


Looks like it's a real pedestal instability

Whole statistics includes the runs:

455, 456, 538, 546, 553, 557, 558, 3081, 3086, 3127, 3132, 3133, 3166, 3217, 3235, 3297, 4020, 4030, 4031, 7134, 7216, 7217, 7218, 7229,
9009, 9012, 9019, 9036, 9037, 9038, 9040, 9044, 9045, 9048, 9050



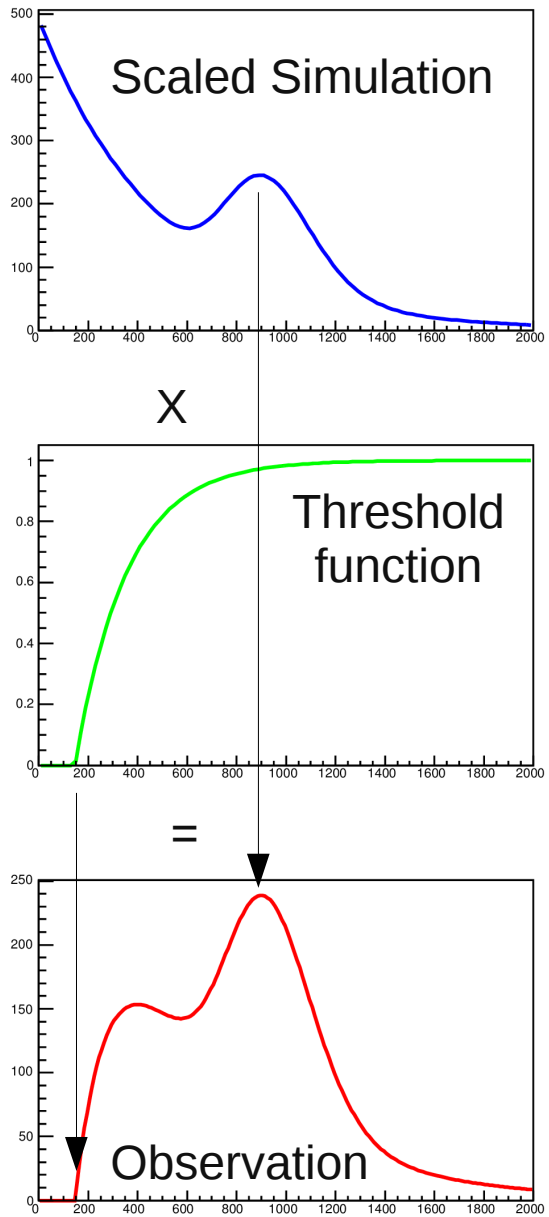


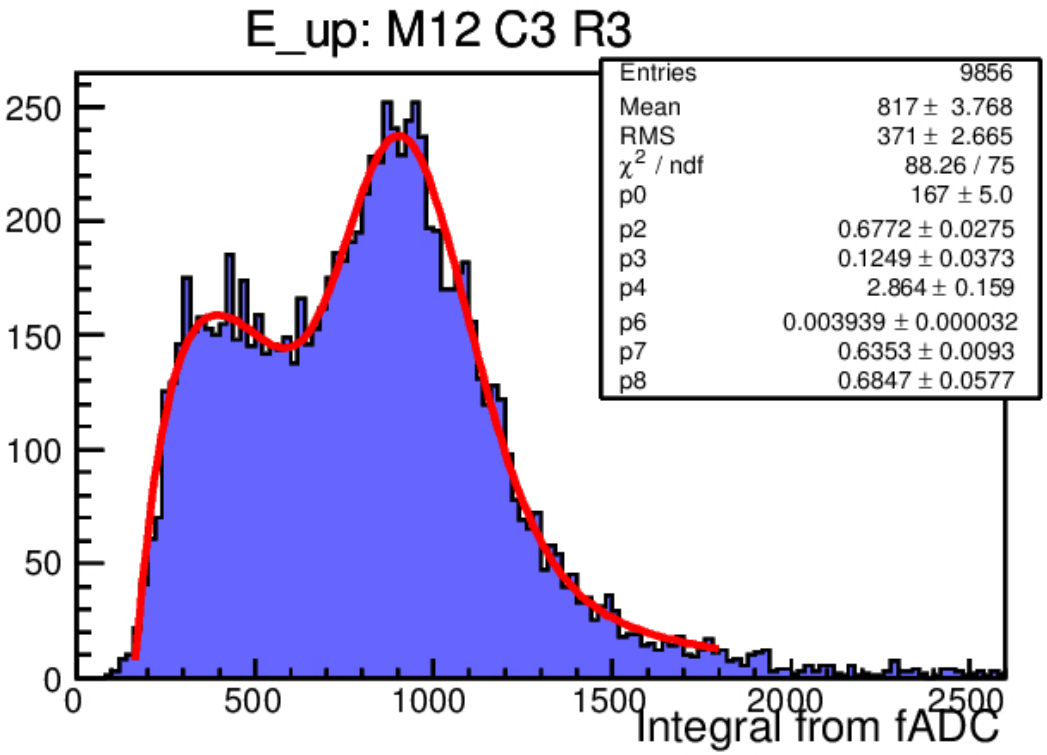
Now, for these “red” runs only (very last ones before the beam time)

For the following analysis, “Ped<300” cut was used

Comparison of the energy deposited in the fibers from BCAL simulation with the collected spectra

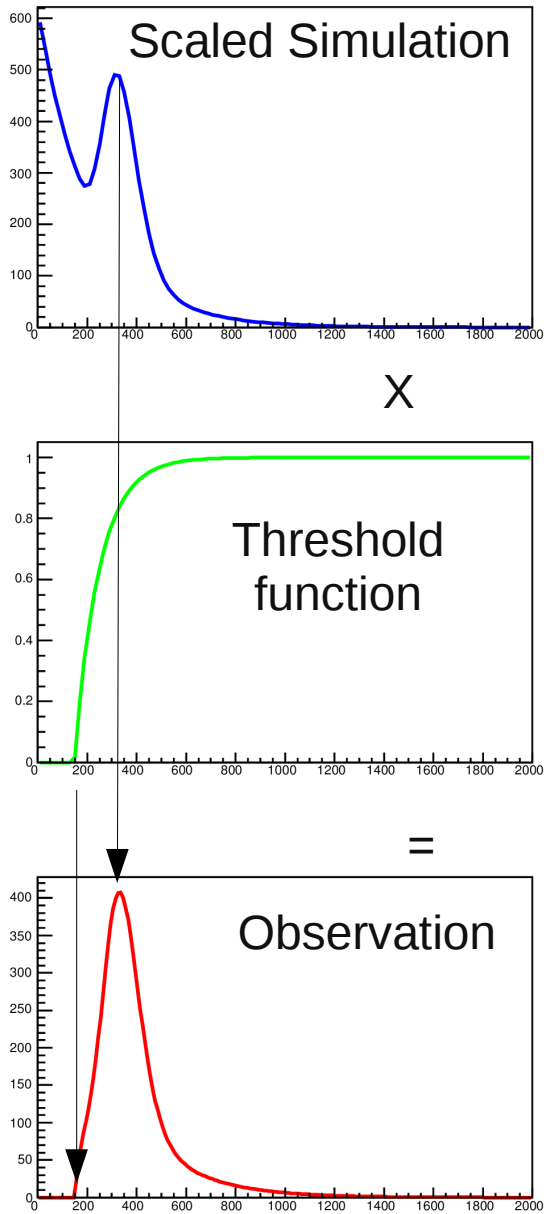
Case #1 (the “good one”):

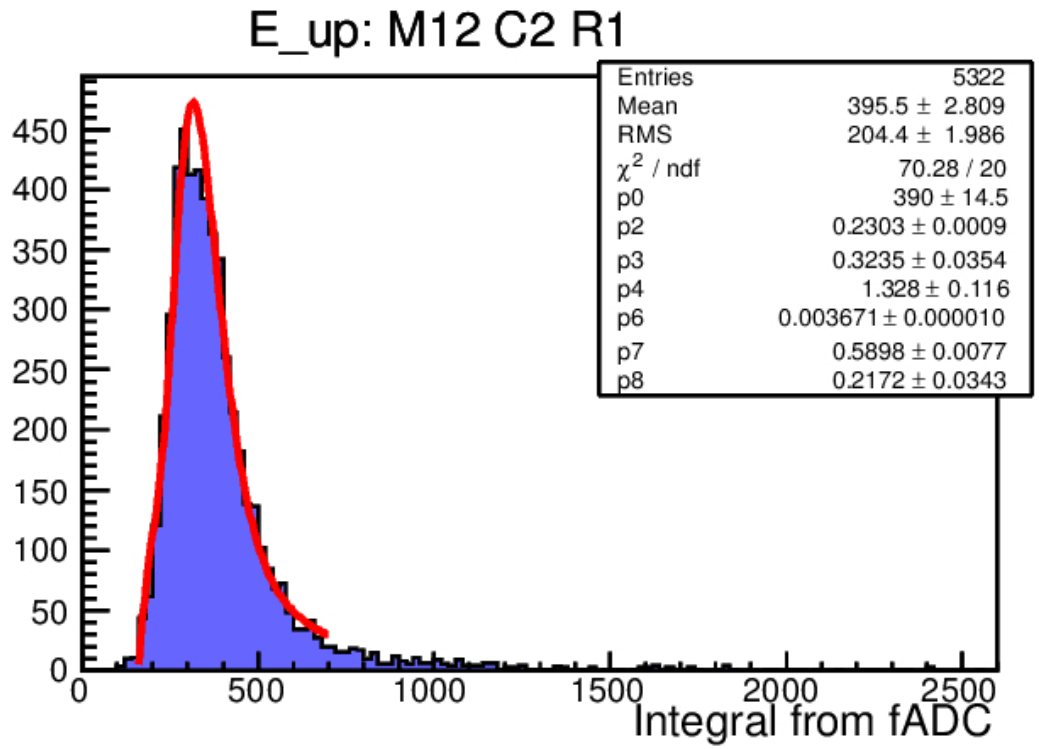




Easy to extract fADC-to-MeV calibration and hardware threshold (in attenuated-MeV)

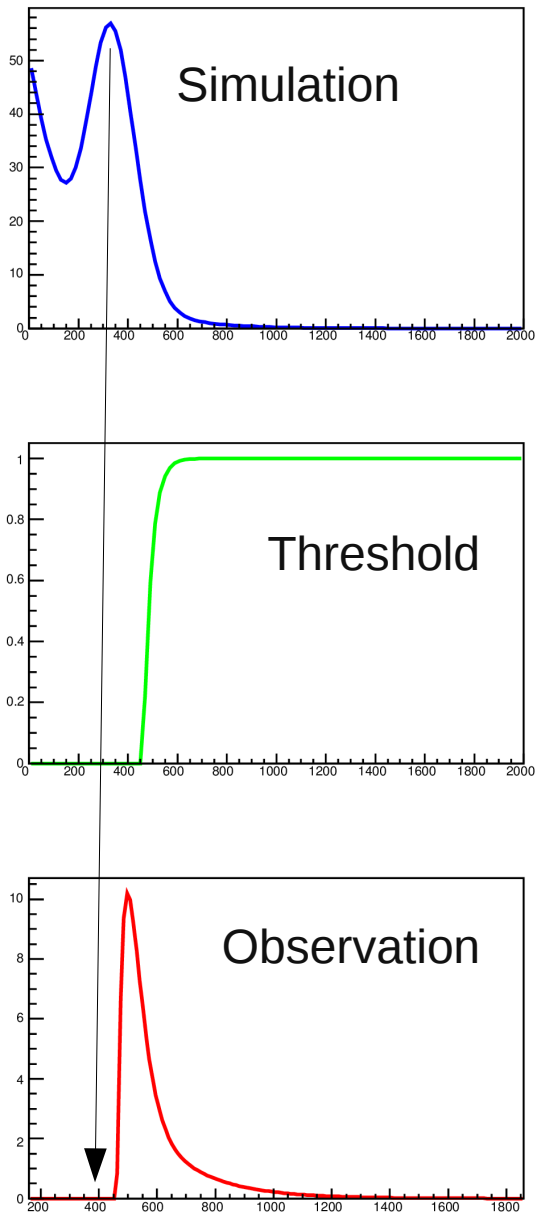
Case #2 (more difficult)
Threshold is very close to the left edge of the peak:

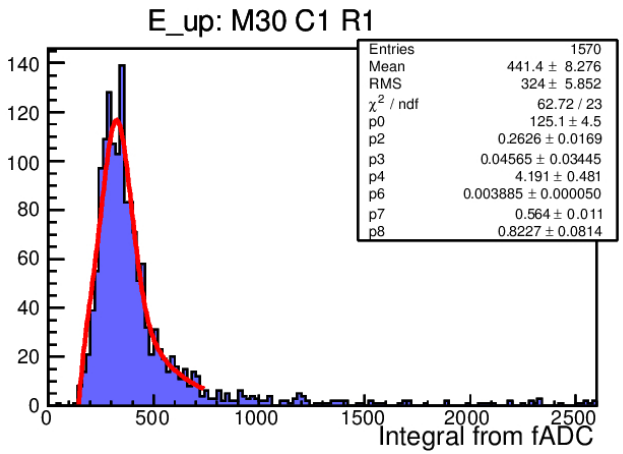


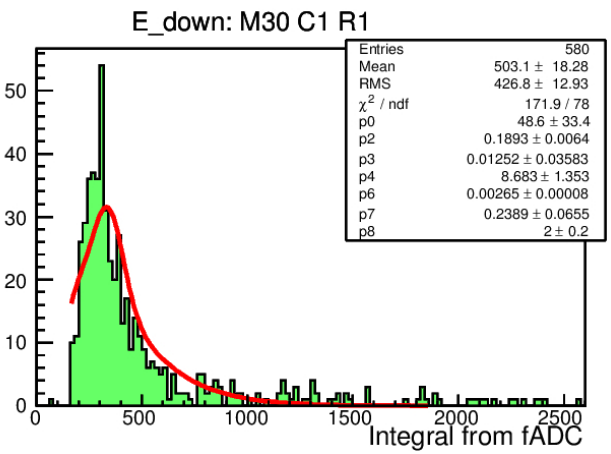


Still do-able...

Case #3 (very difficult)
Threshold is inside the peak:



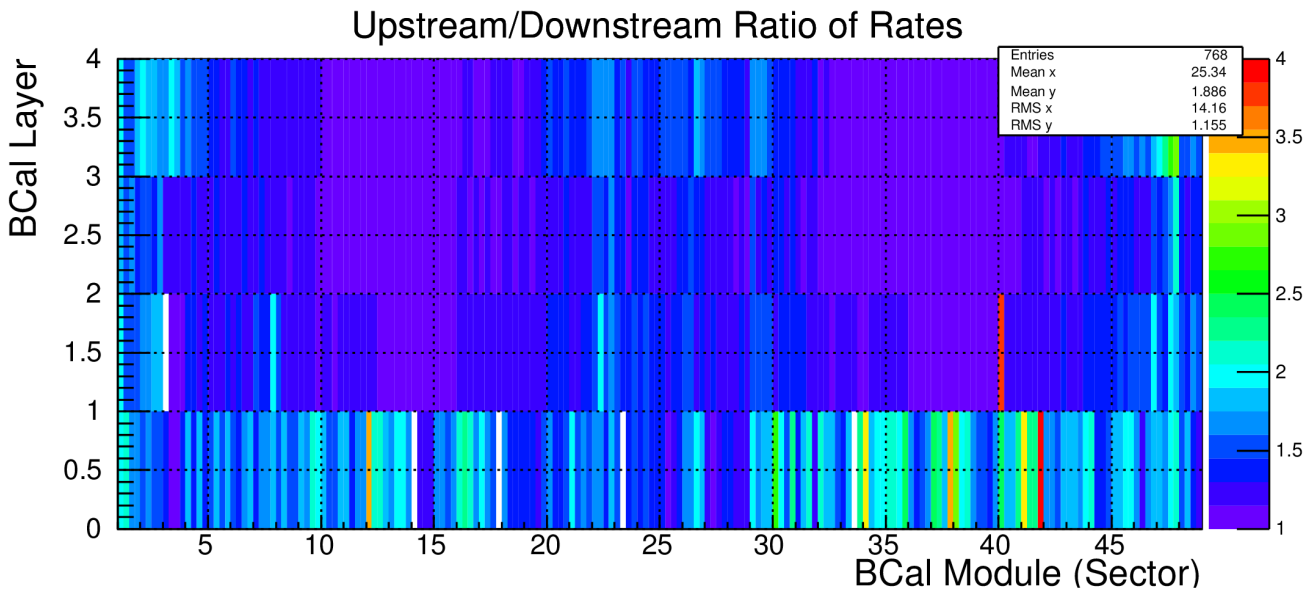


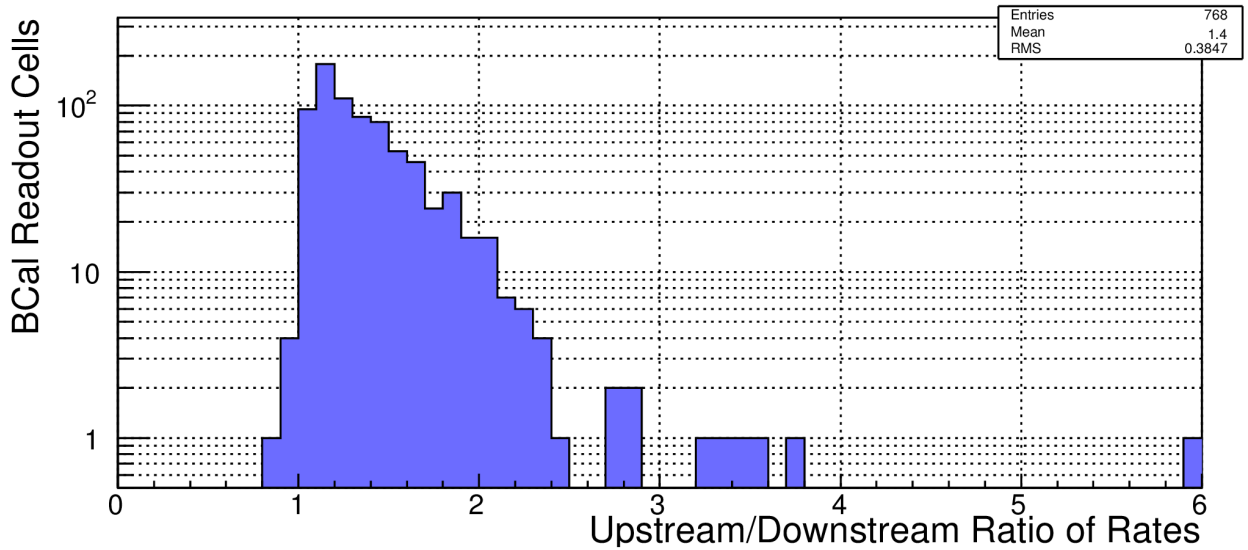


Pretty hard to extract both calibration and threshold..
(I didn't say “impossible” :)

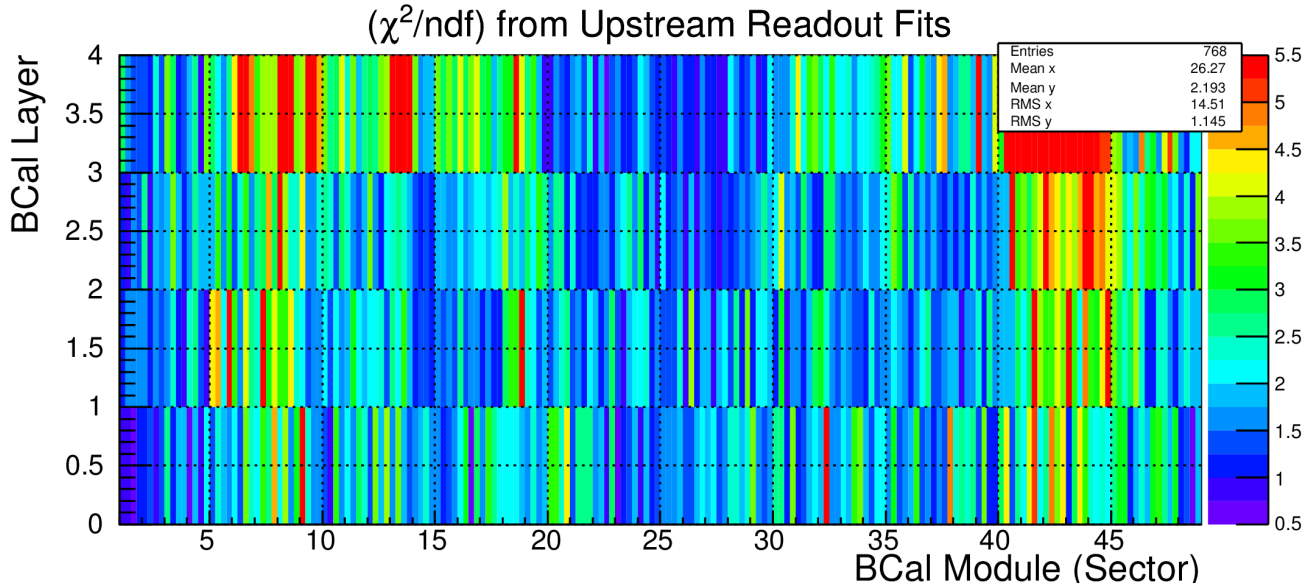
Indication of the problem:
Distorted upstream/downstream ratio
Of events in histograms (viz., rates)

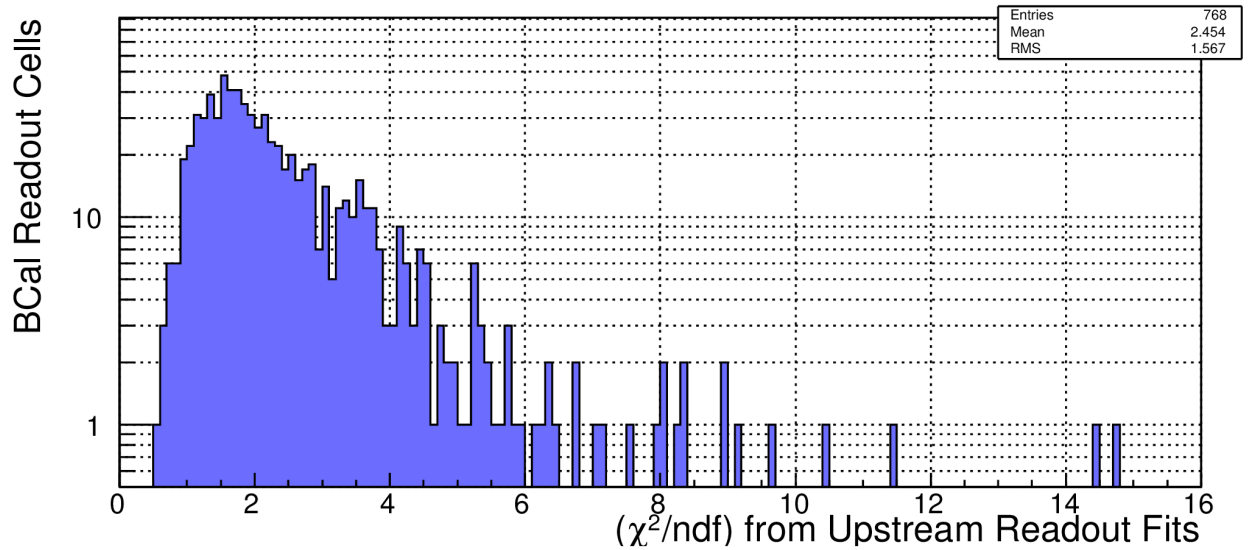
Ratios:


Upstream/Downstream Ratio of Rates
Entries 768
Mean x 25.34
Mean y 1.886
RMS x 14.16
RMS y 1.155
BCal Layer
BCal Module (Sector)

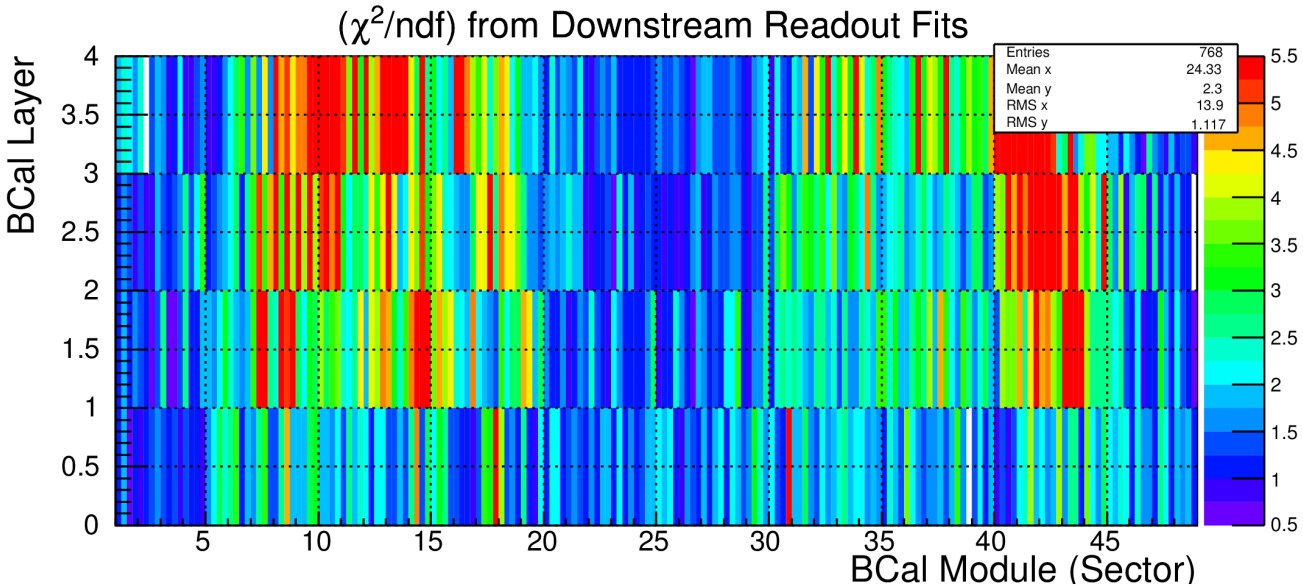

Entries 768
Mean 1.4
RMS 0.3847
BCal Readout Cells
Upstream/Downstream Ratio of Rates

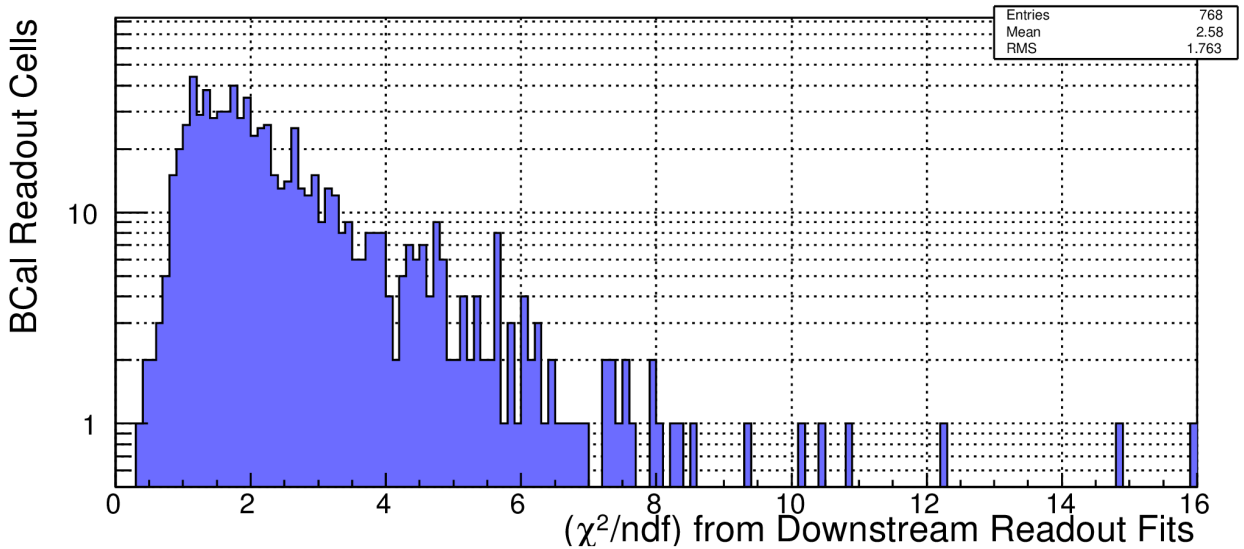
Quality of the fitting (Upstream spectra):



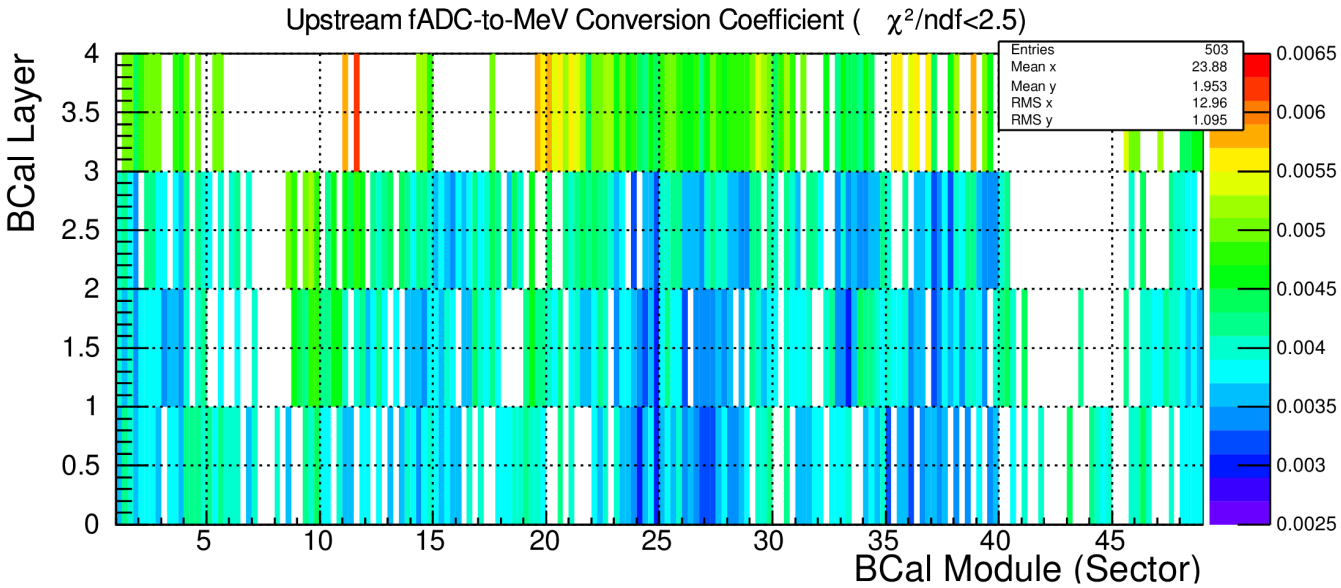


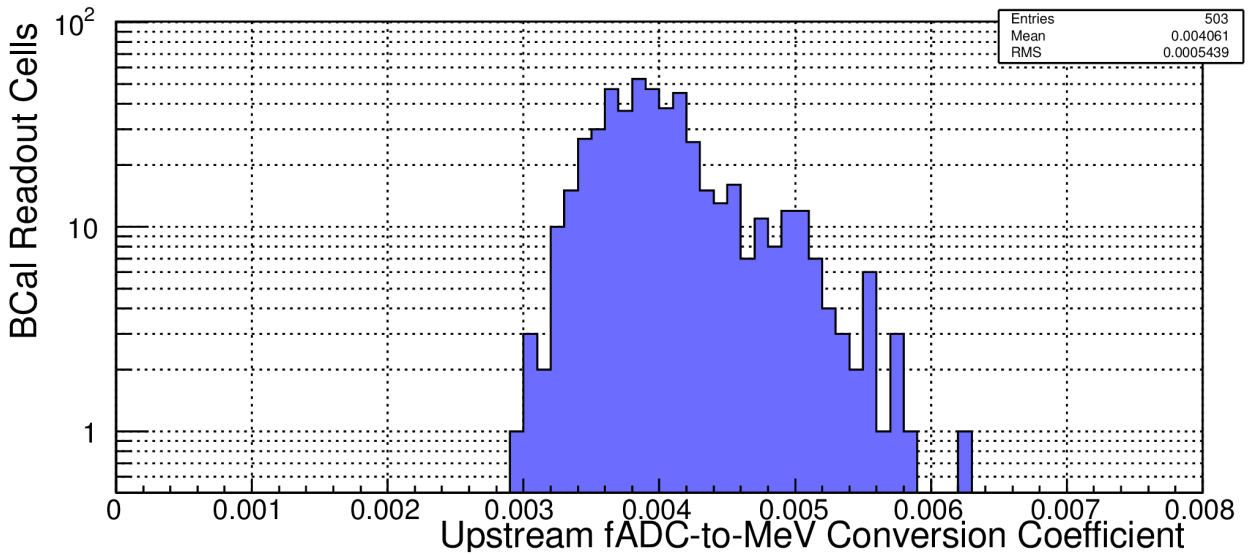
Quality of the fitting (Downstream spectra):



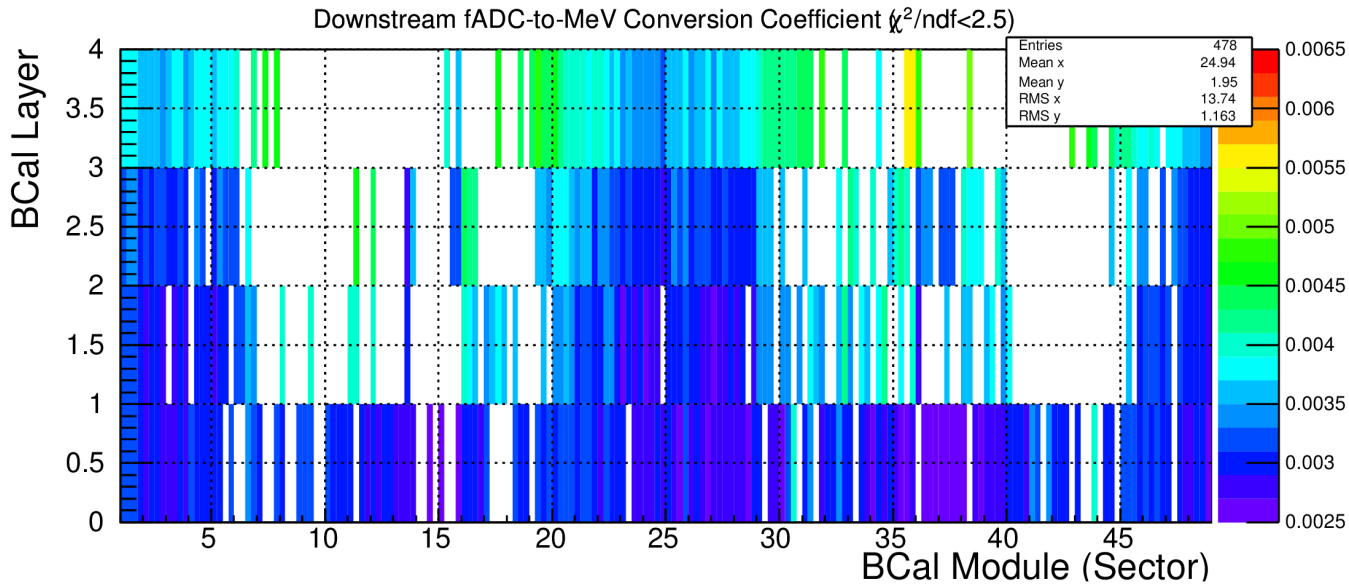


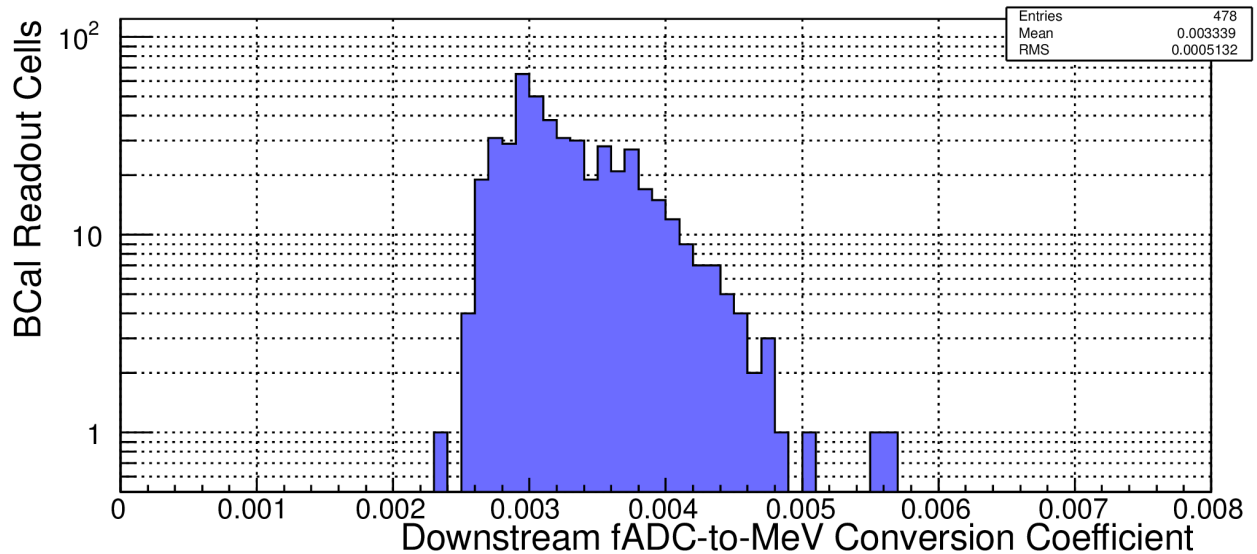
Upstream Readout Calibration Coefficients:



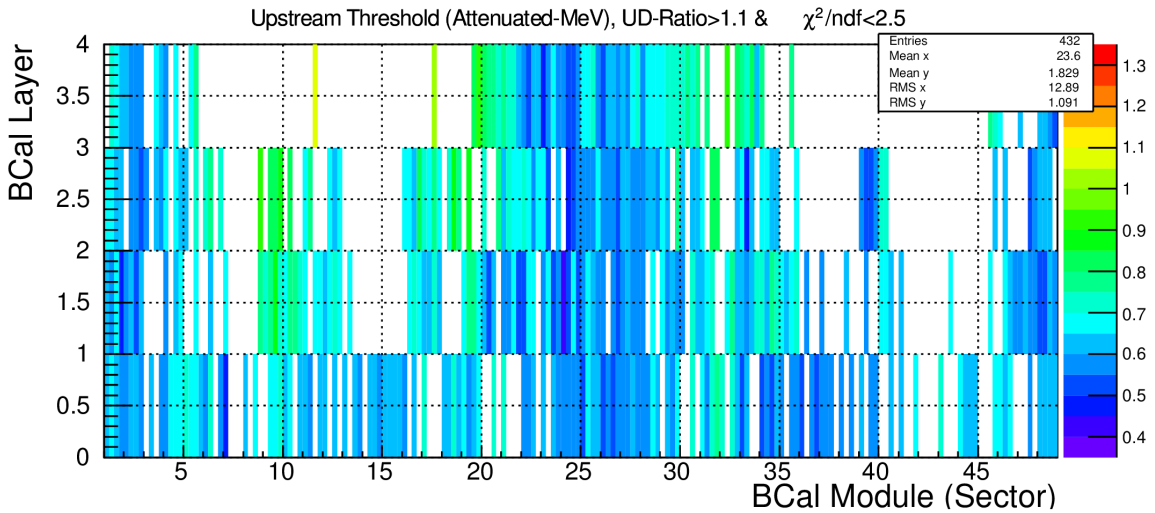


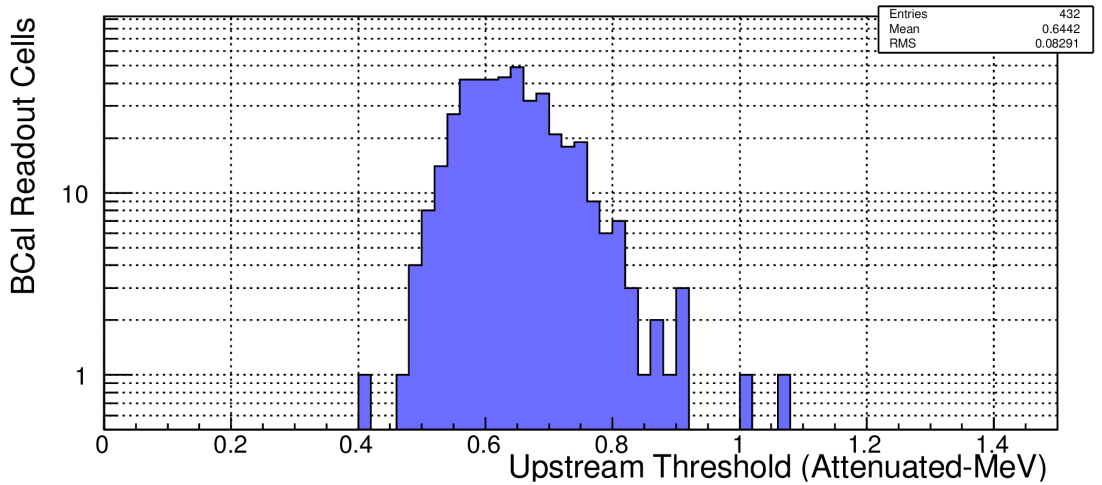
Downstream Readout Calibration Coefficients:





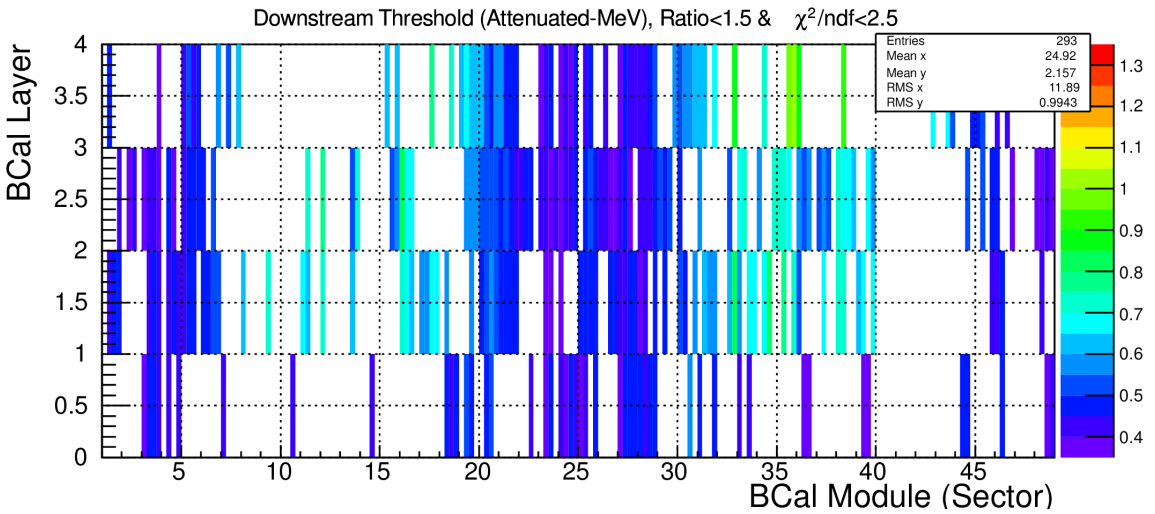
Upstream Thresholds:

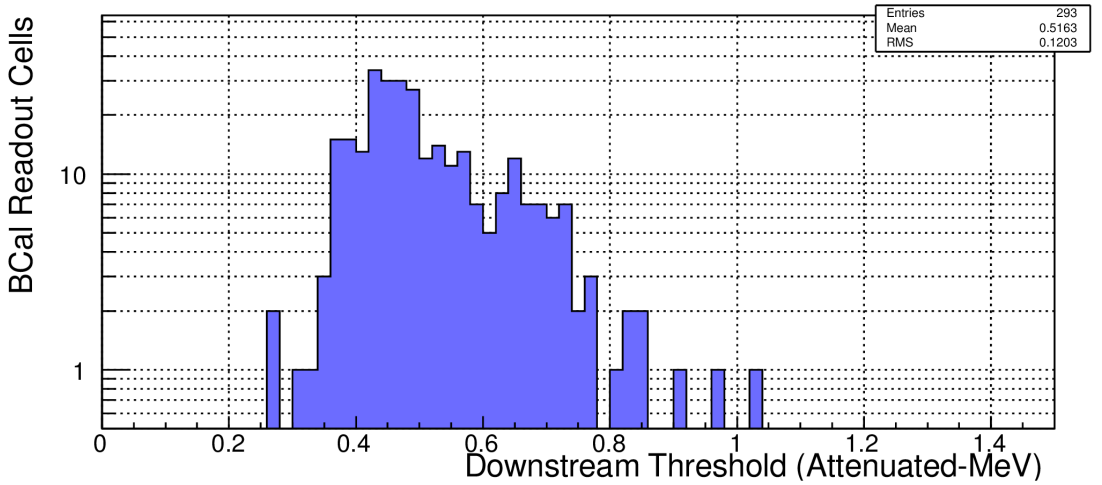




NB: This is energy Deposited in the FIBERS (attenuated-MeV)

Downstream Thresholds:





NB: This is energy Deposited in the FIBERS (attenuated-MeV)

Work is still in progress...