Threshold Trimming Runs

Threshold trimming algorithm

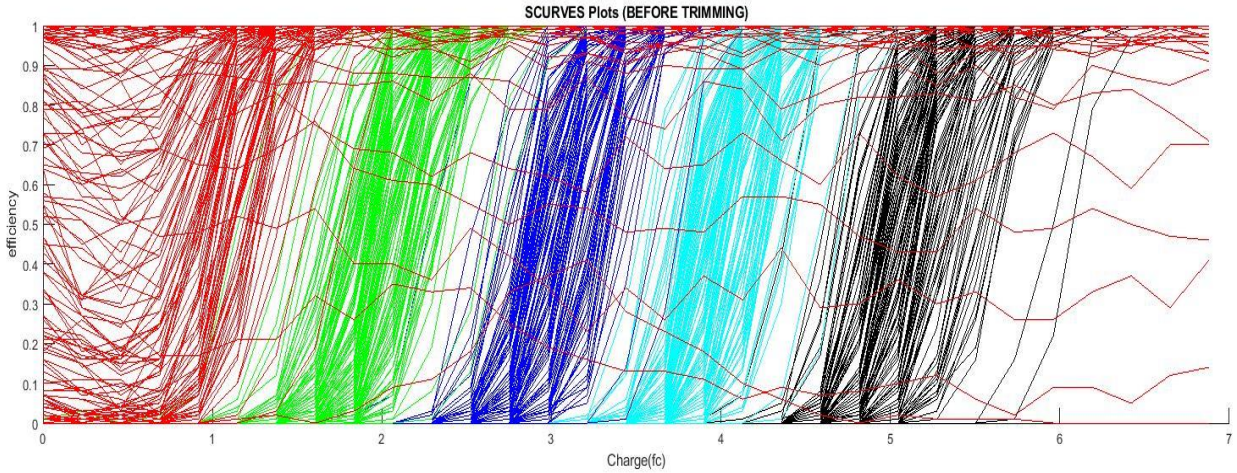
- Clear all trim_dac values to 0 for all the channels.
- Perform scurve for all channels to get Mean_threshold & Mean_enc values @ Arm_dac= 2fC.
- Starting from ch0, get trim_dac vs. Threshold curve and use linear fit to get trim_dac value which gives Threshold of 2fC.
- Repeat this for all 128 channels and get trim_dac values from curve fitting method.
- Repeat scurve all channels post trimming to compare the results.

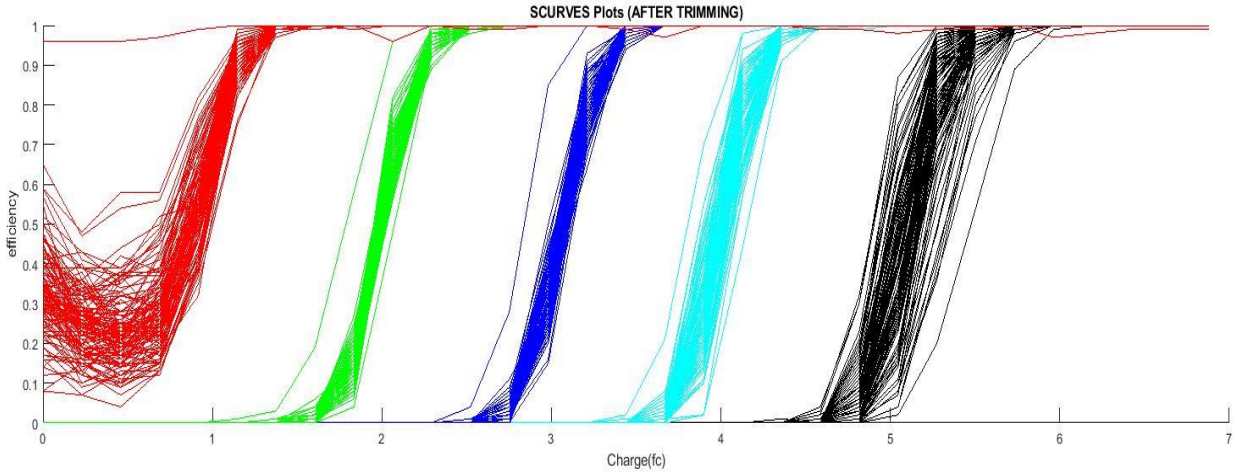
Run1

1. Performed s-curves at [5fC, 4fC,3fC,2fC,1fC] before trimming of dacs .
2. Set Arming_dac = 2fC for threshold trimming routine and performed trimming.
3. Repeated s-curves at [5fC, 4fC,3fC,2fC,1fC] after threshold trimming to compare the results.

Scurve plots before & after trimming

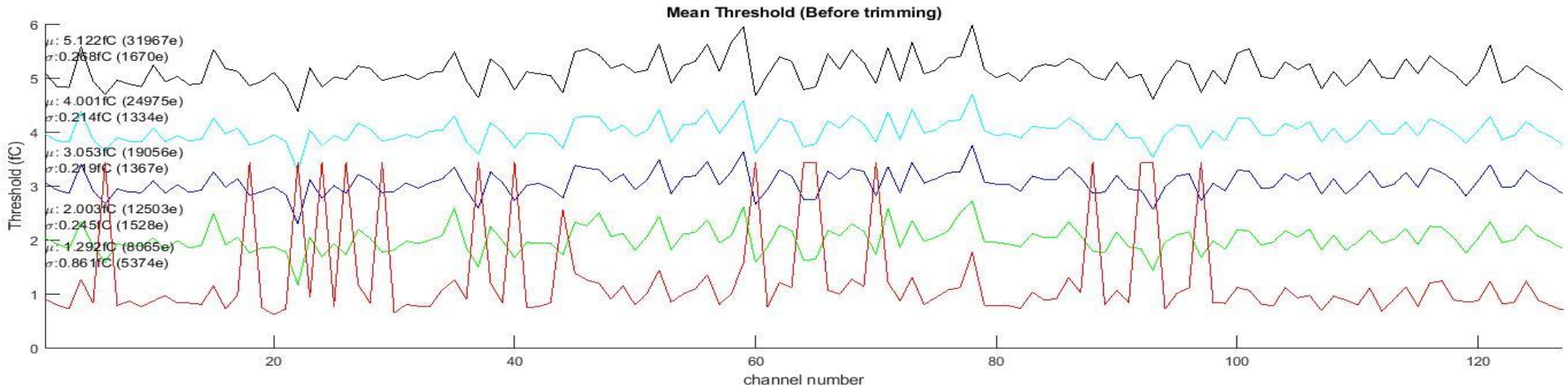
25,HG

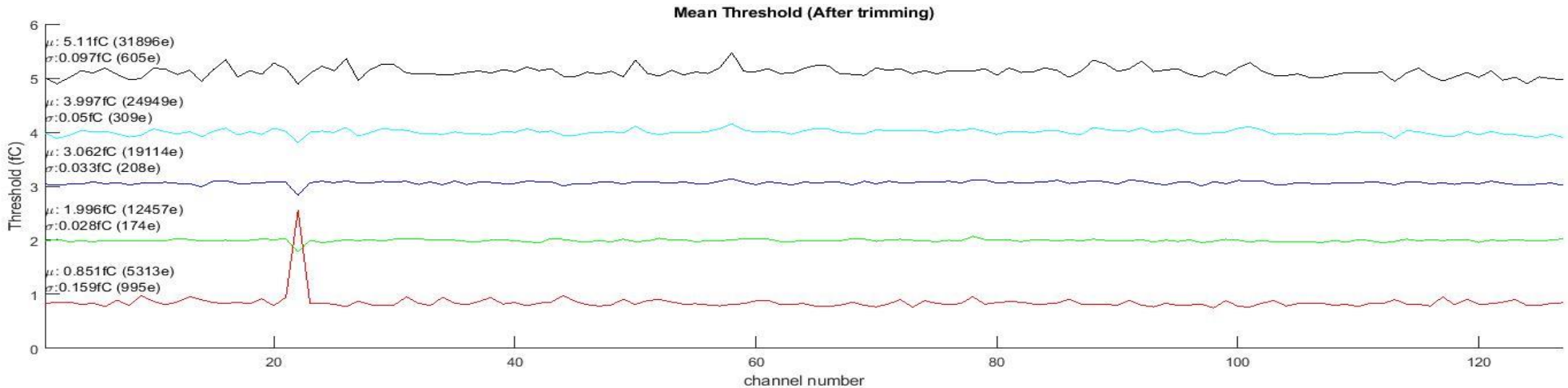




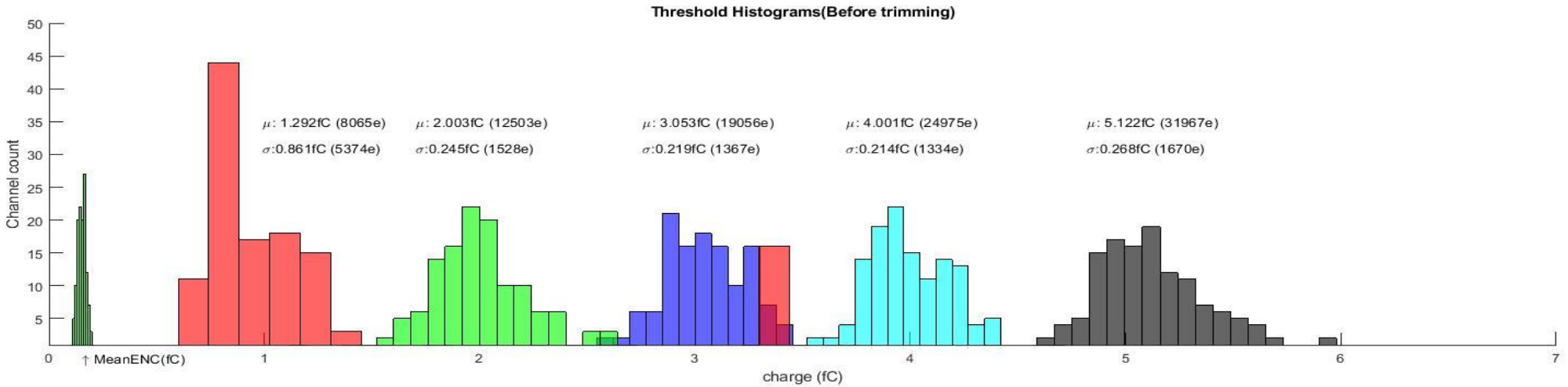
We used Arming_Th =[1,2,3,4,5]fC for extracting different s-curves.

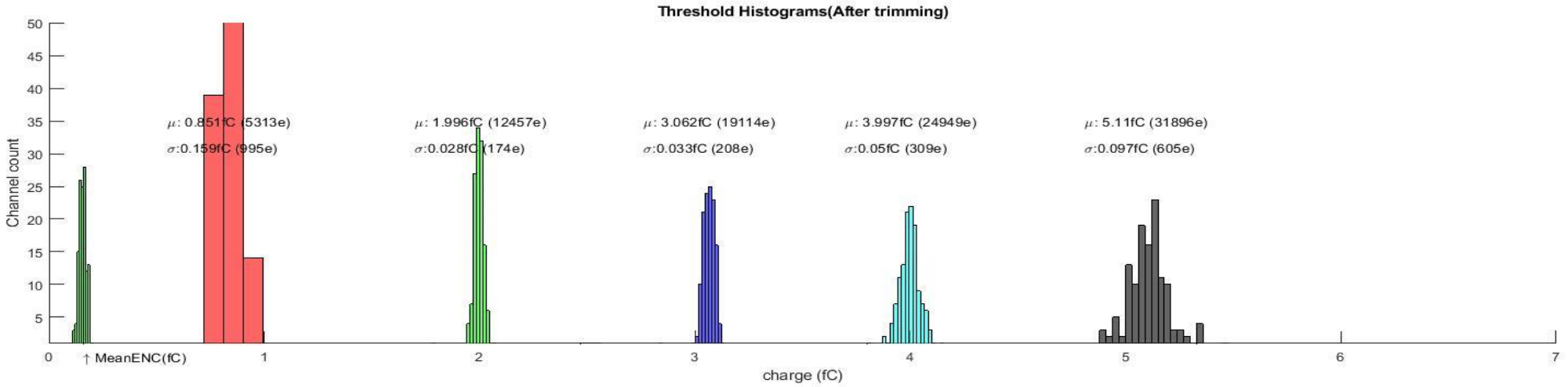
Threshold plots comparison



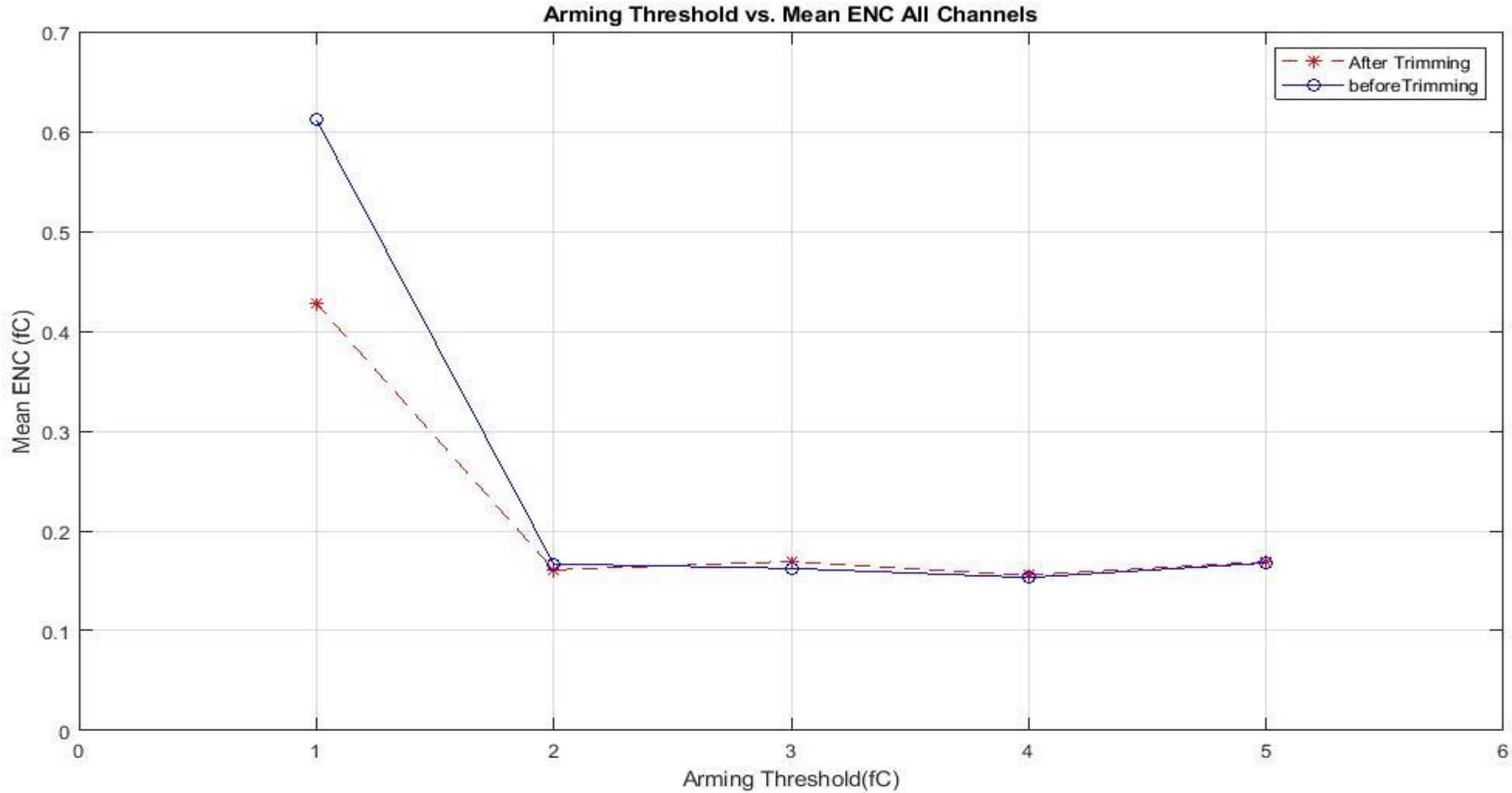


Threshold histograms comparison

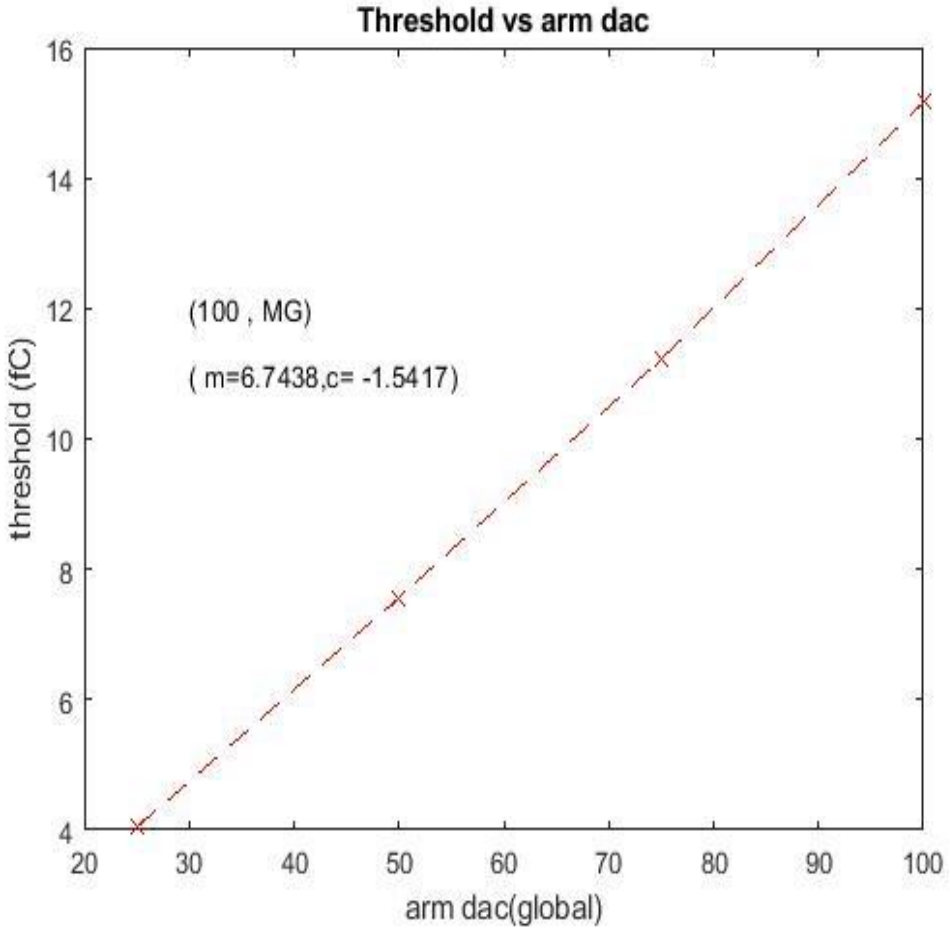


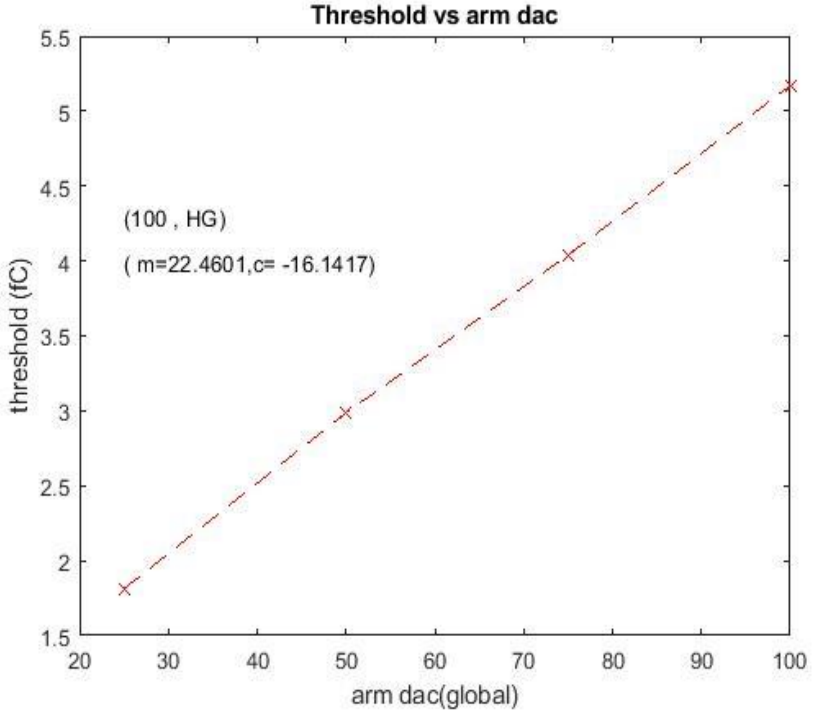


Arming Threshold(Arm_dac) vs. ENC plot



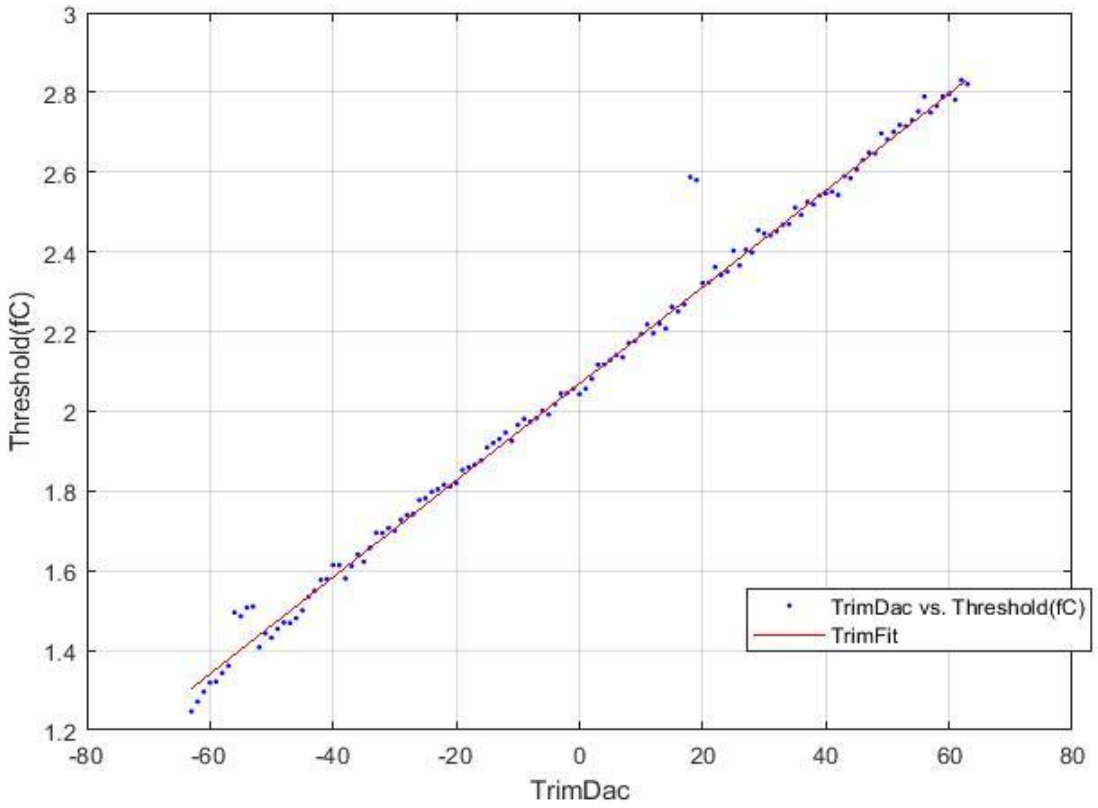
Arm_dac to fC





1. Set Arm_dac=0
2. Run scurve all channels.
3. Calculate mean threshold
4. Increment arm_dac
5. Loop 2 to 4 until arm_dac =100
6. Removed outliers and fitted the curve with linear fit model to get fC for arm dac steps.
7. Arm_dac = m * (fC) + c;

Trim_dac Plot



Arming_th = 2fC (Target)

- Threshold(0, 1) = 1.260113 Trim_dac(0, 1) = -60.000000
- Threshold(0, 2) = 1.328815 Trim_dac(0, 2) = -59.000000
- Threshold(0, 3) = 1.324516 Trim_dac(0, 3) = -58.000000
- Threshold(0, 4) = 1.340350 Trim_dac(0, 4) = -57.000000
- Threshold(0, 5) = 1.358092 Trim_dac(0, 5) = -56.000000
- Threshold(0, 6) = 1.370995 Trim_dac(0, 6) = -55.000000
- Threshold(0, 7) = 1.369780 Trim_dac(0, 7) = -54.000000
- Threshold(0, 8) = 1.519009 Trim_dac(0, 8) = -53.000000
- Threshold(0, 9) = 1.412037 Trim_dac(0, 9) = -52.000000
- Threshold(0, 10) = 1.411097 Trim_dac(0, 10) = -51.000000
- Threshold(0, 11) = 1.447466 Trim_dac(0, 11) = -50.000000
- Threshold(0, 12) = 1.466397 Trim_dac(0, 12) = -49.000000
- Threshold(0, 13) = 1.478327 Trim_dac(0, 13) = -48.000000
- Threshold(0, 14) = 1.501430 Trim_dac(0, 14) = -47.000000
- Threshold(0, 15) = 1.495310 Trim_dac(0, 15) = -46.000000
- Threshold(0, 16) = 1.521623 Trim_dac(0, 16) = -45.000000
- Threshold(0, 17) = 1.538304 Trim_dac(0, 17) = -44.000000
- Threshold(0, 18) = 1.526790 Trim_dac(0, 18) = -43.000000
- Threshold(0, 19) = 1.546116 Trim_dac(0, 19) = -42.000000
- Threshold(0, 20) = 1.559583 Trim_dac(0, 20) = -41.000000
- Threshold(0, 21) = 1.588315 Trim_dac(0, 21) = -40.000000
- Threshold(0, 22) = 1.587793 Trim_dac(0, 22) = -39.000000
- Threshold(0, 23) = 1.605849 Trim_dac(0, 23) = -38.000000
- Threshold(0, 24) = 1.632482 Trim_dac(0, 24) = -37.000000
- Threshold(0, 25) = 1.624997 Trim_dac(0, 25) = -36.000000