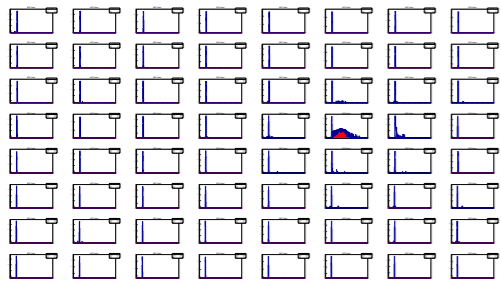


MAROC Calibration & Timing Measurement

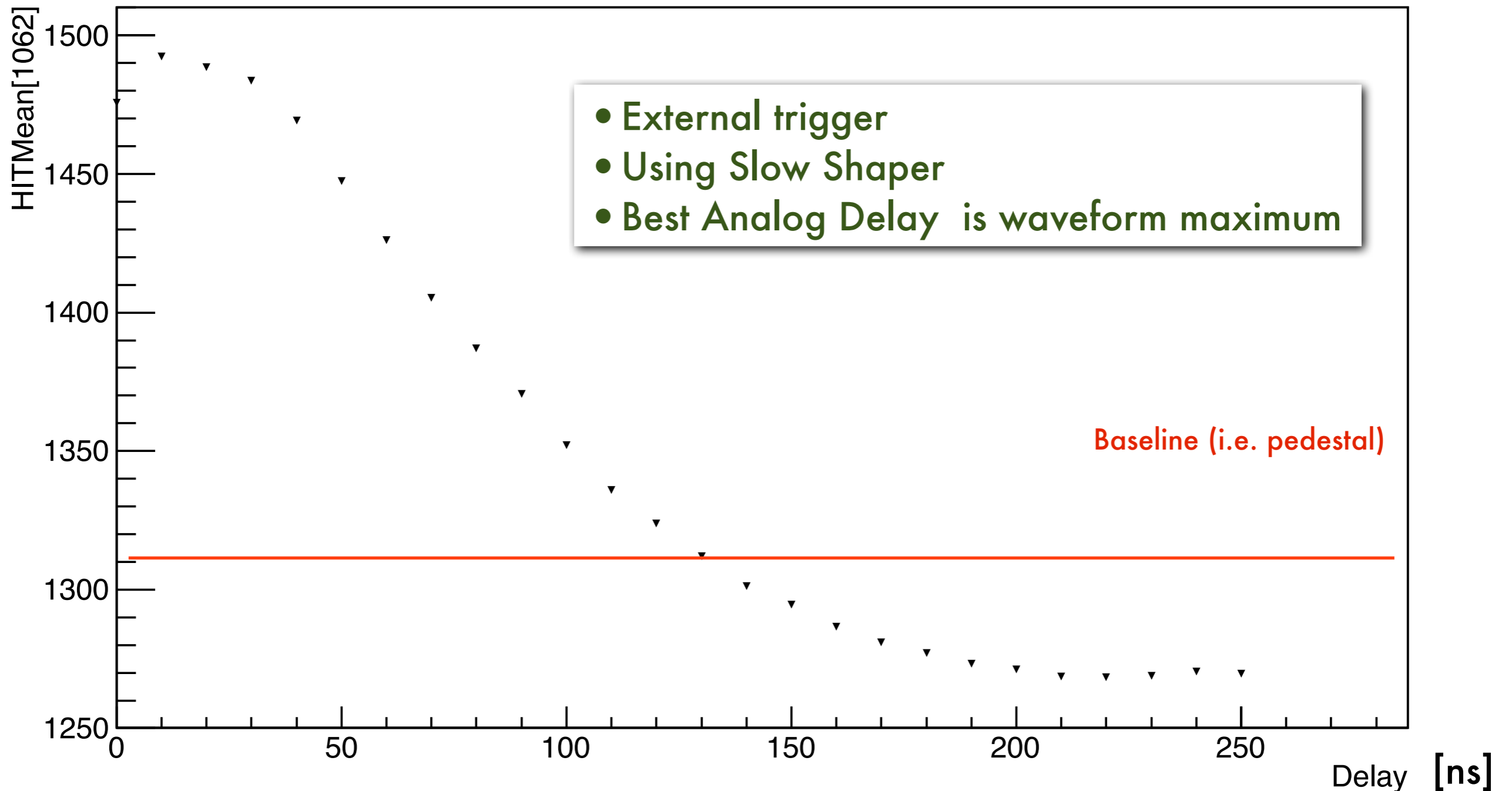
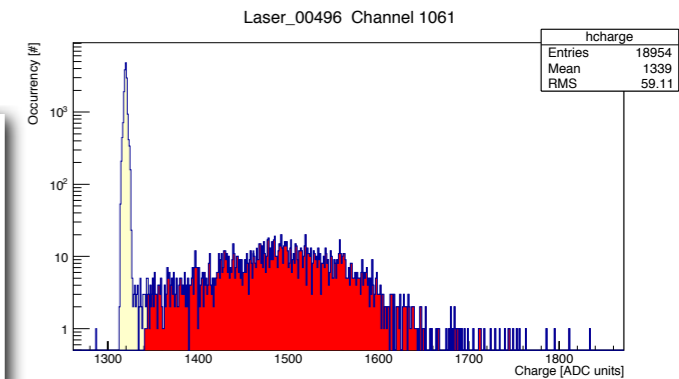
M.Turisini

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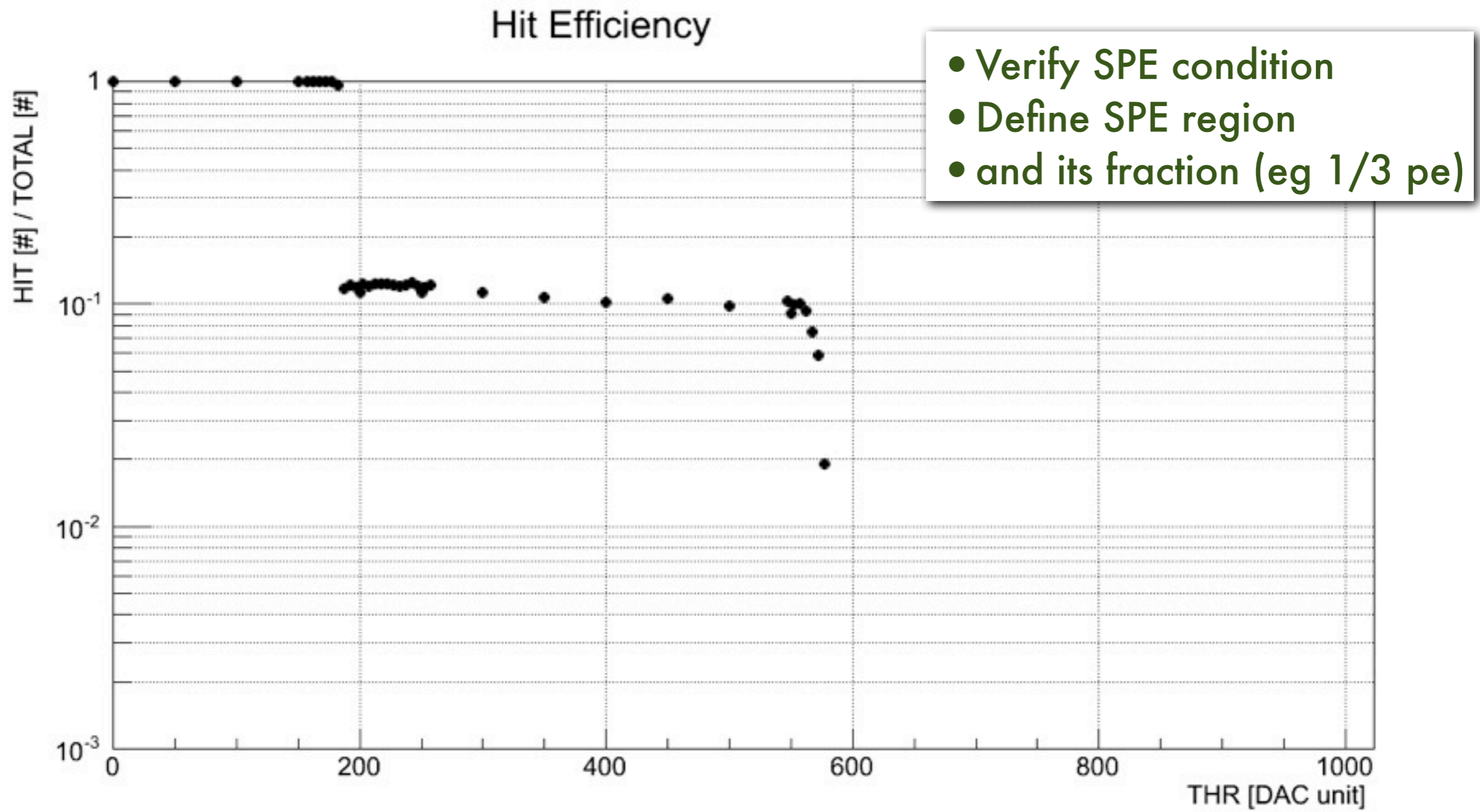
Step 1 - MAROC Analog Delay Scan



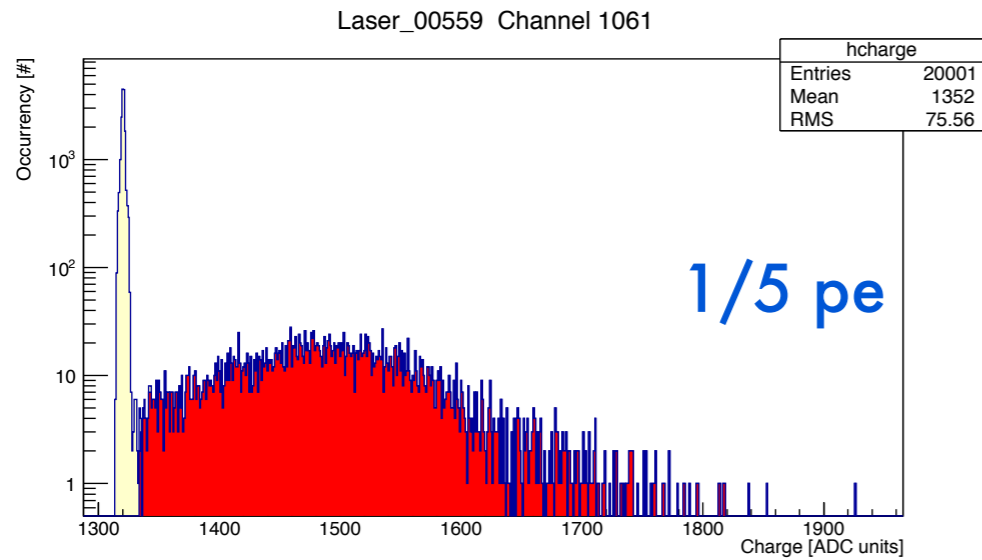
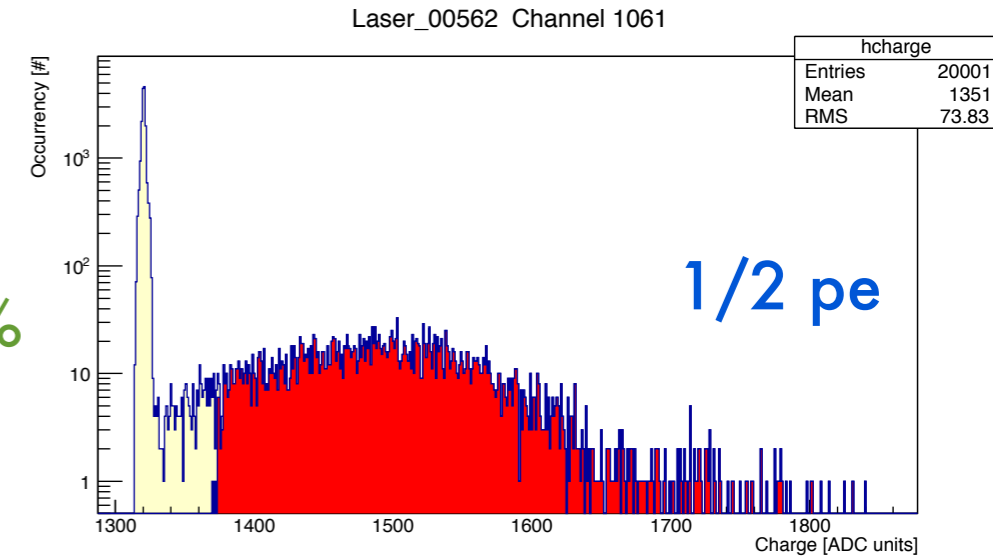
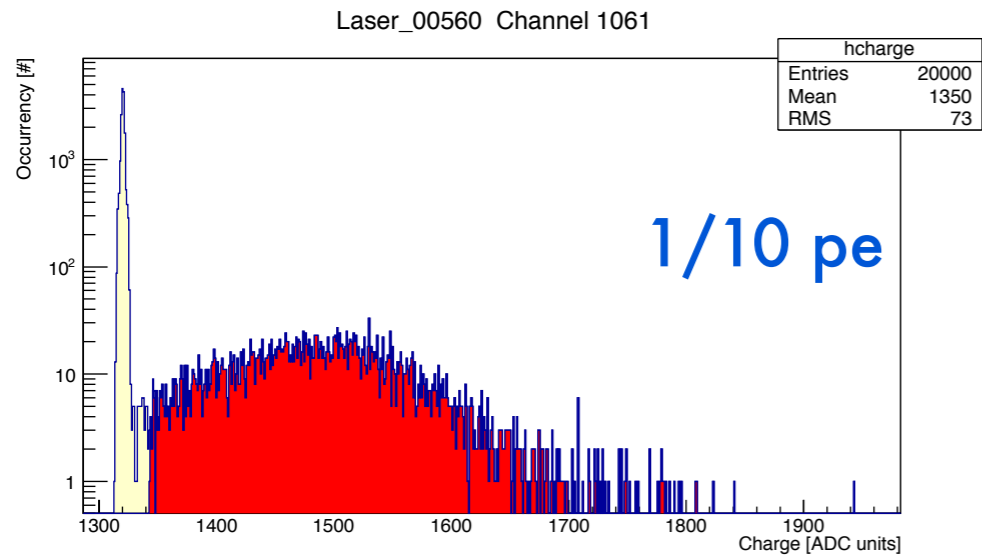
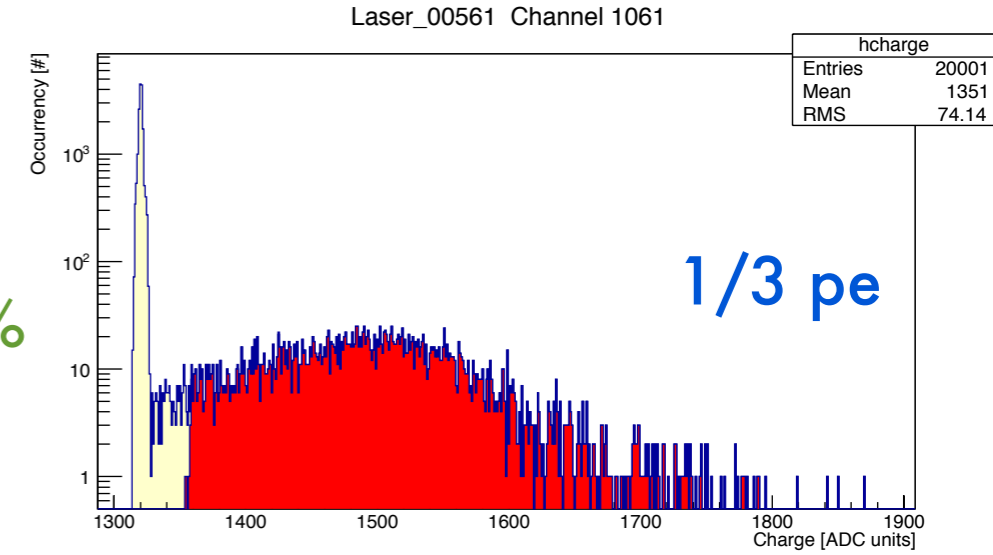
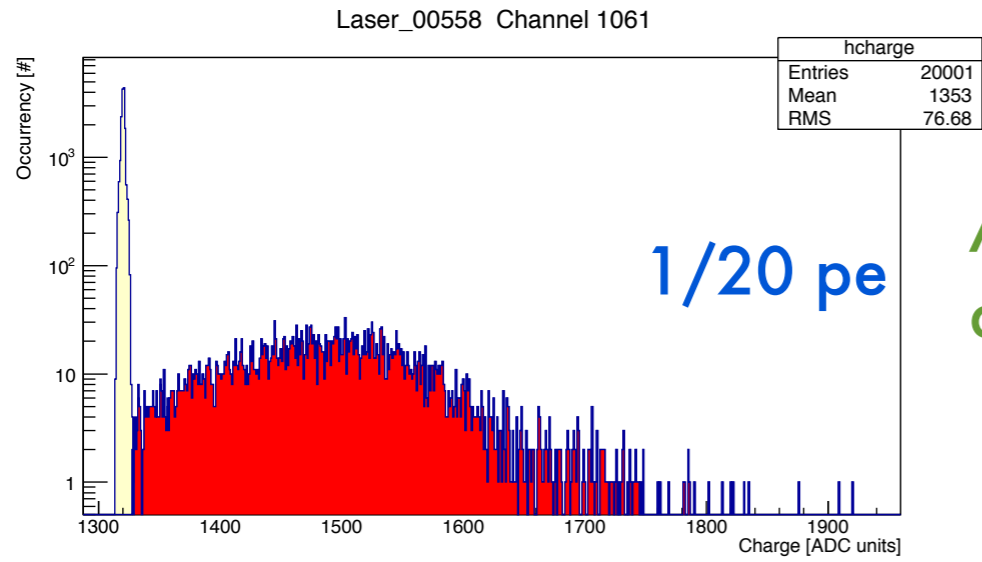
Laser 20% with two attenuation filters
HV + 1000
MAROC PreAmp Gain unitary ($g_word = 64$)



Step 2 - MAROC Binary Threshold Scan



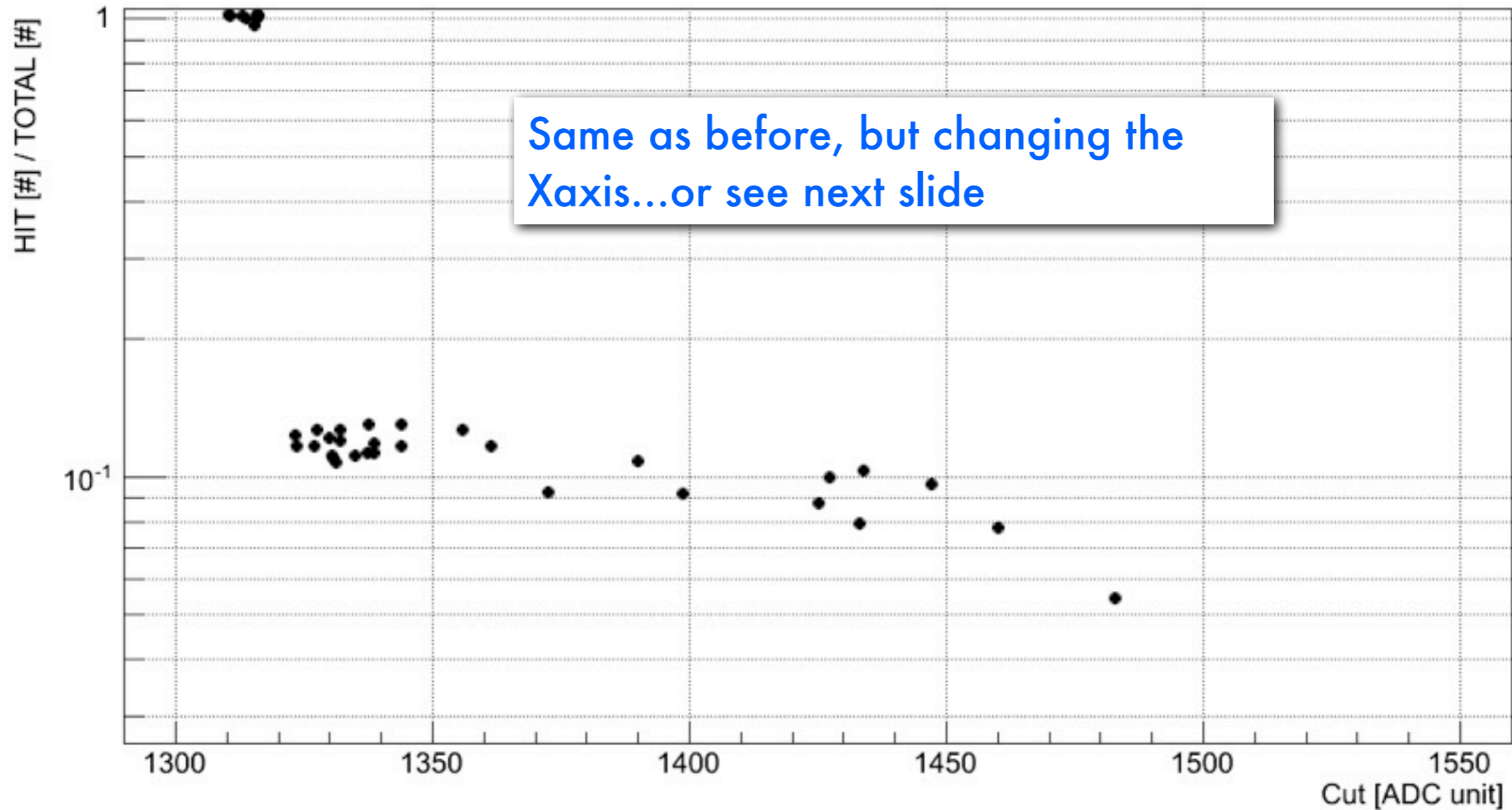
Step 2 - MAROC Binary Threshold - ADC spectra



Blue - THR [pe fraction]
Green - HIT loss [%]

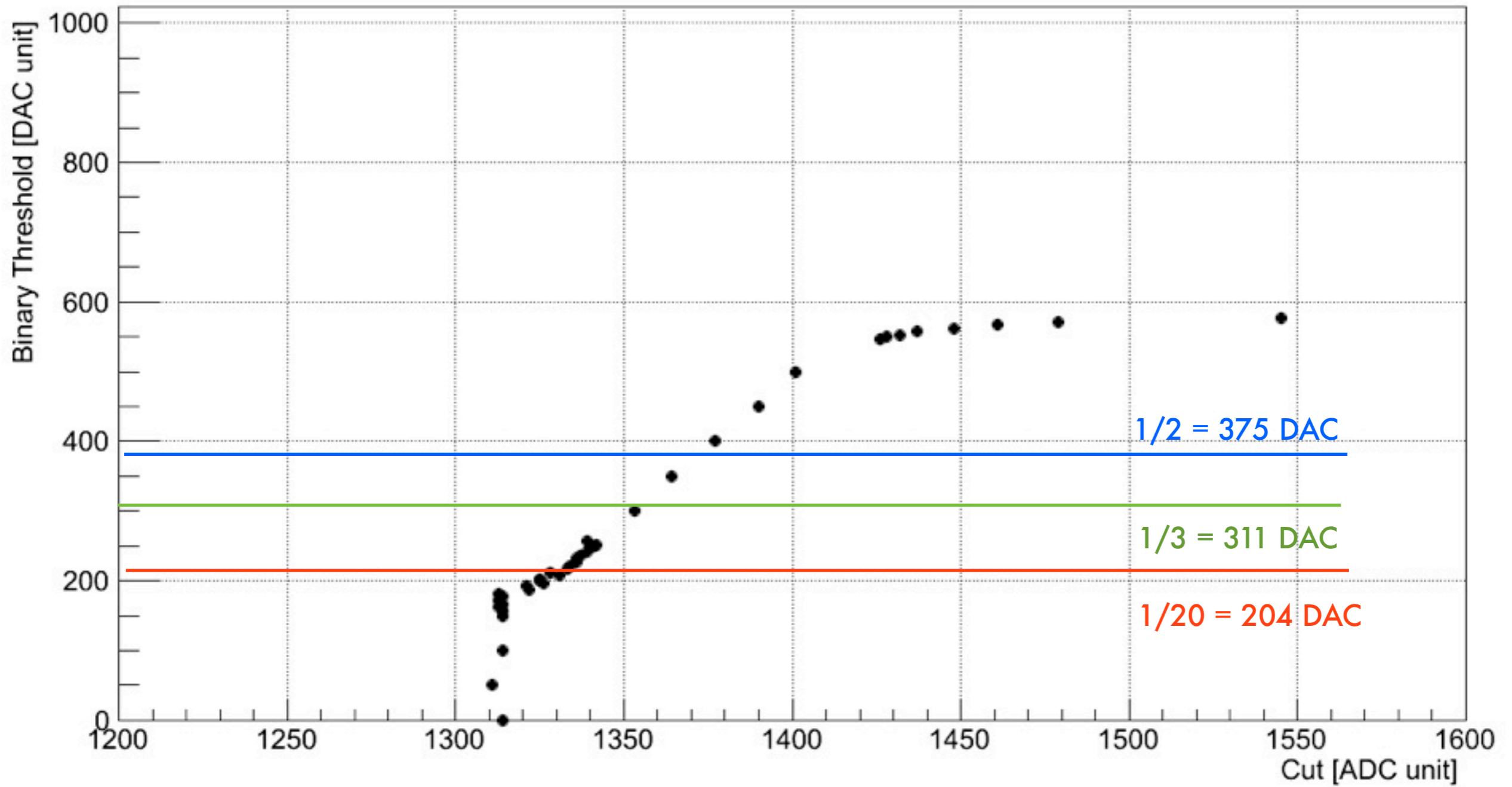
Step 2 - MAROC Binary Threshold

Single channel HIT efficiency varying THR

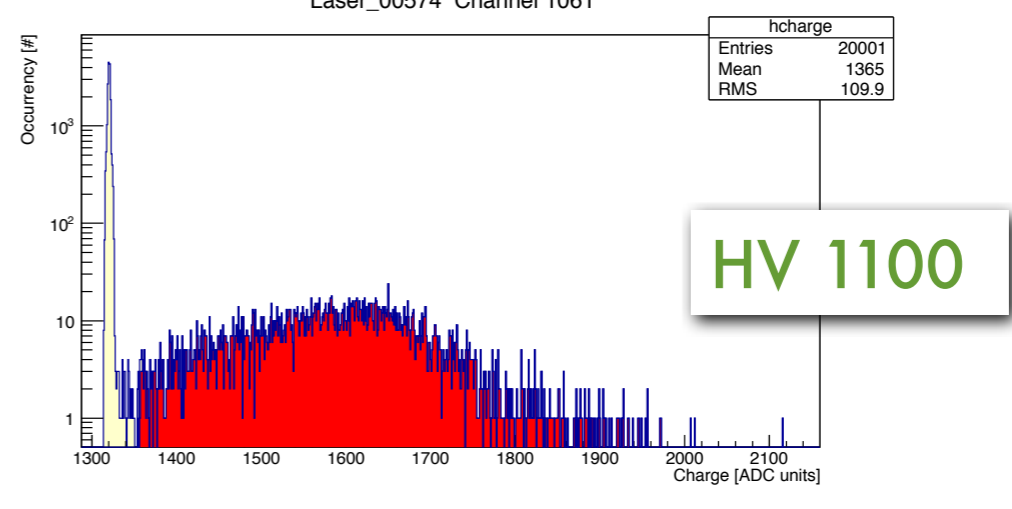
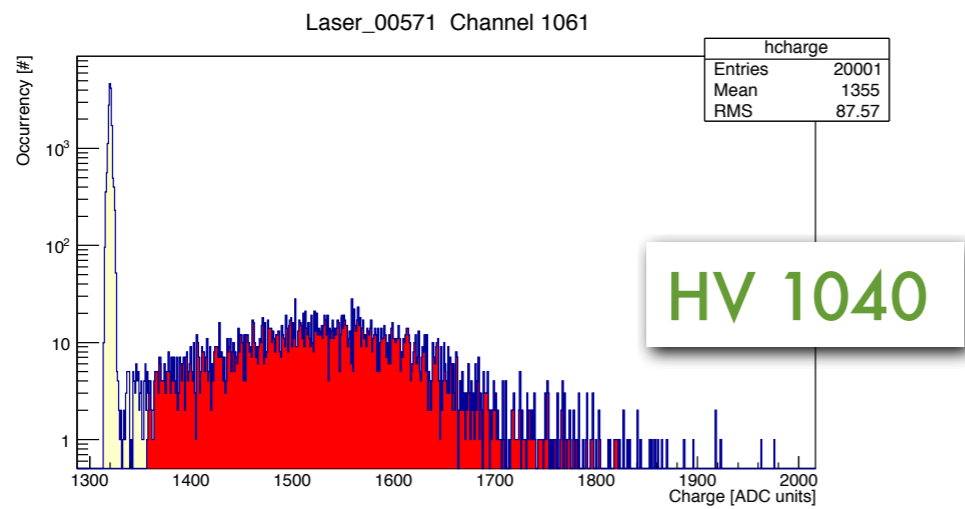
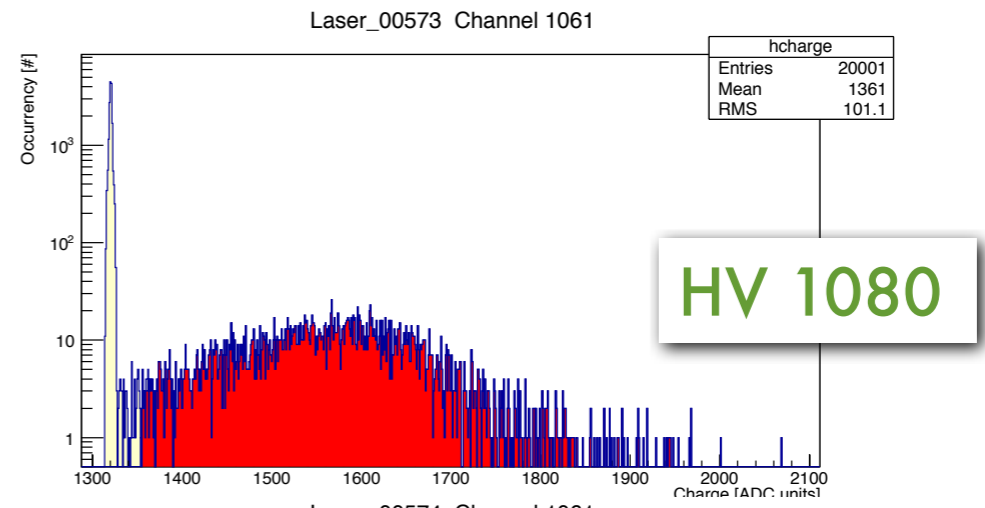
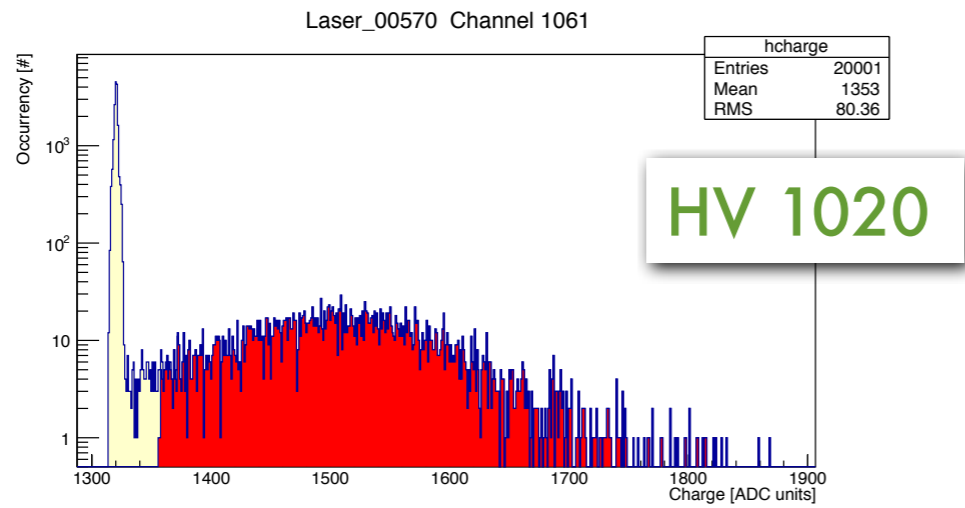
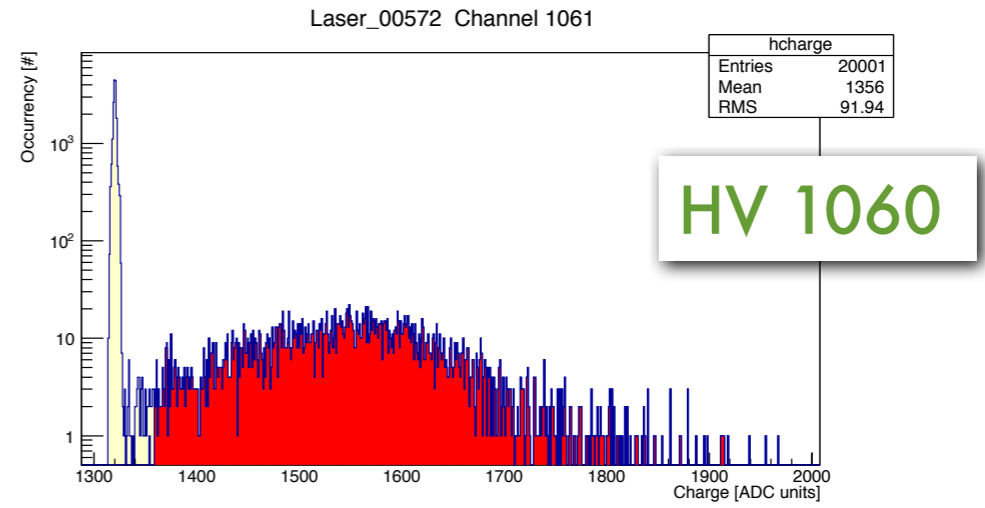
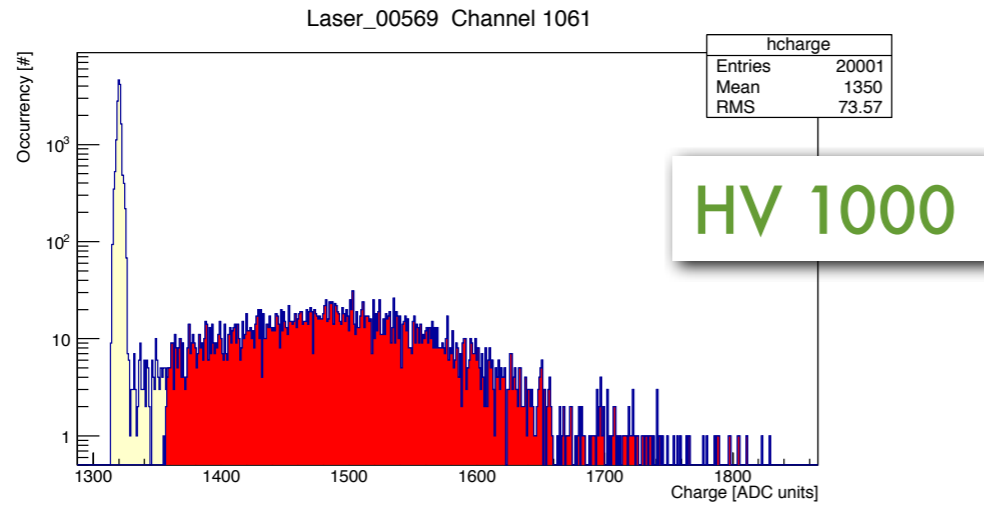


Step 2 - MAROC Binary Threshold

Binary/Analog mapping (Single channel)

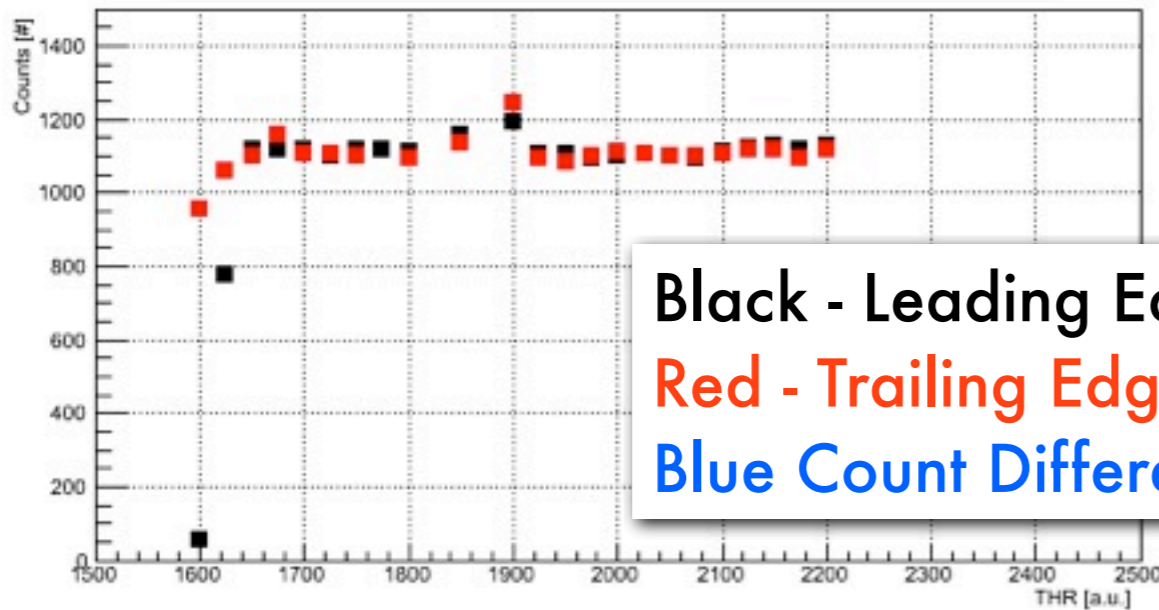


Step 3 - HV scan



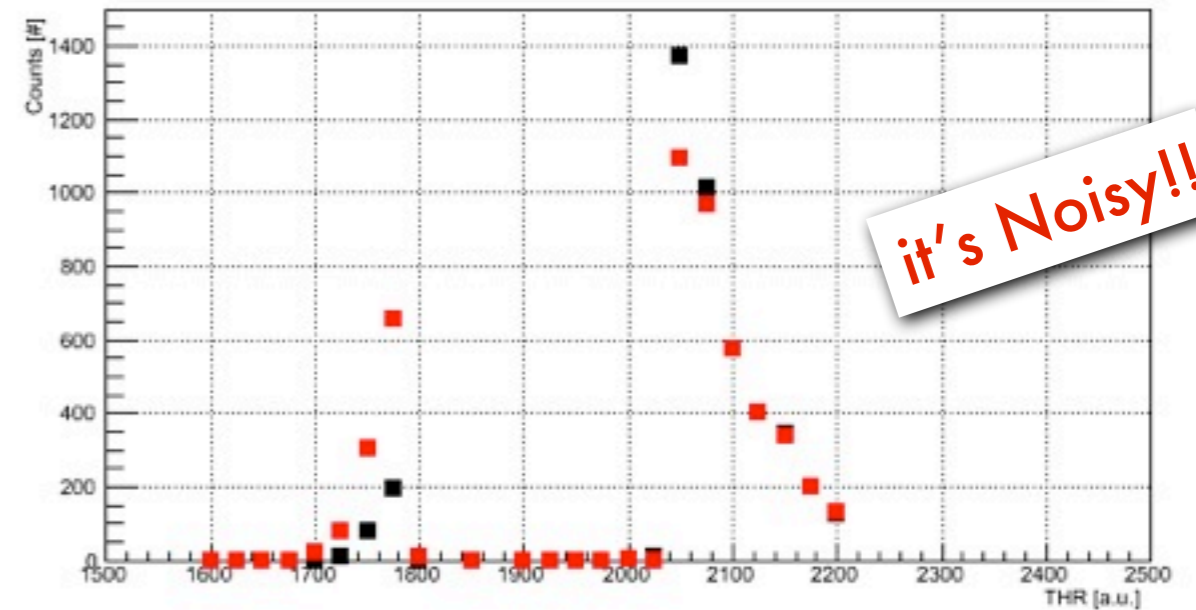
Step 4 - NINO THR scan

TRIGGER channel (reference)



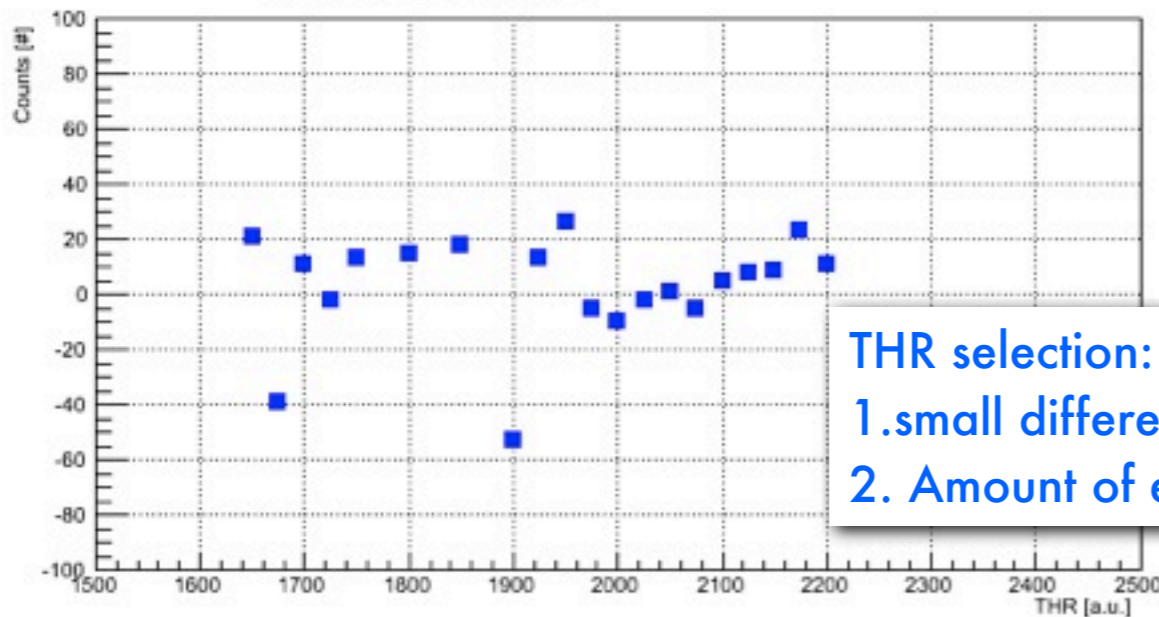
Black - Leading Edge
 Red - Trailing Edge
 Blue Count Difference

MAROC channel (binary output)



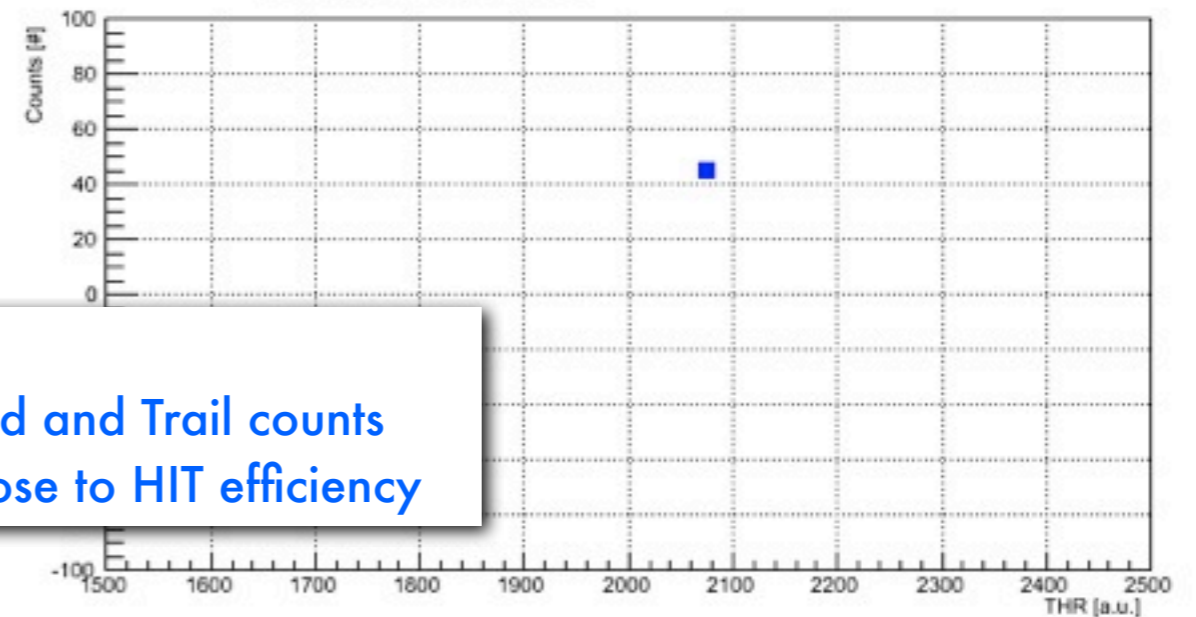
it's Noisy!!

THR value candidates



THR selection:
 1. small differences Lead and Trail counts
 2. Amount of events close to HIT efficiency

THR value candidates



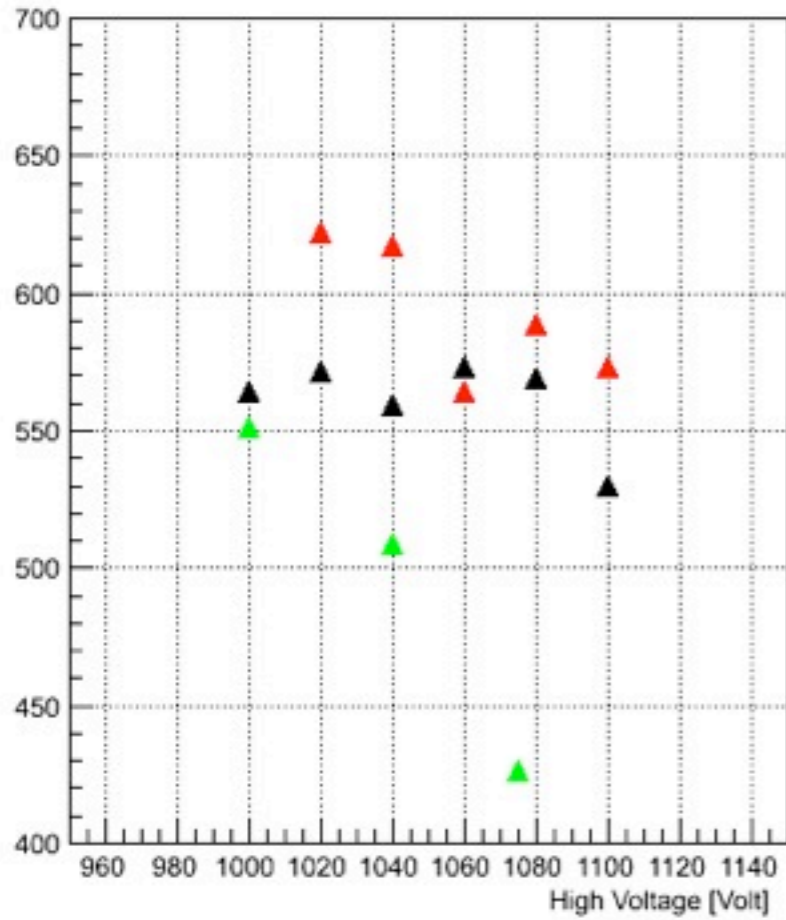
TTL

-10dB

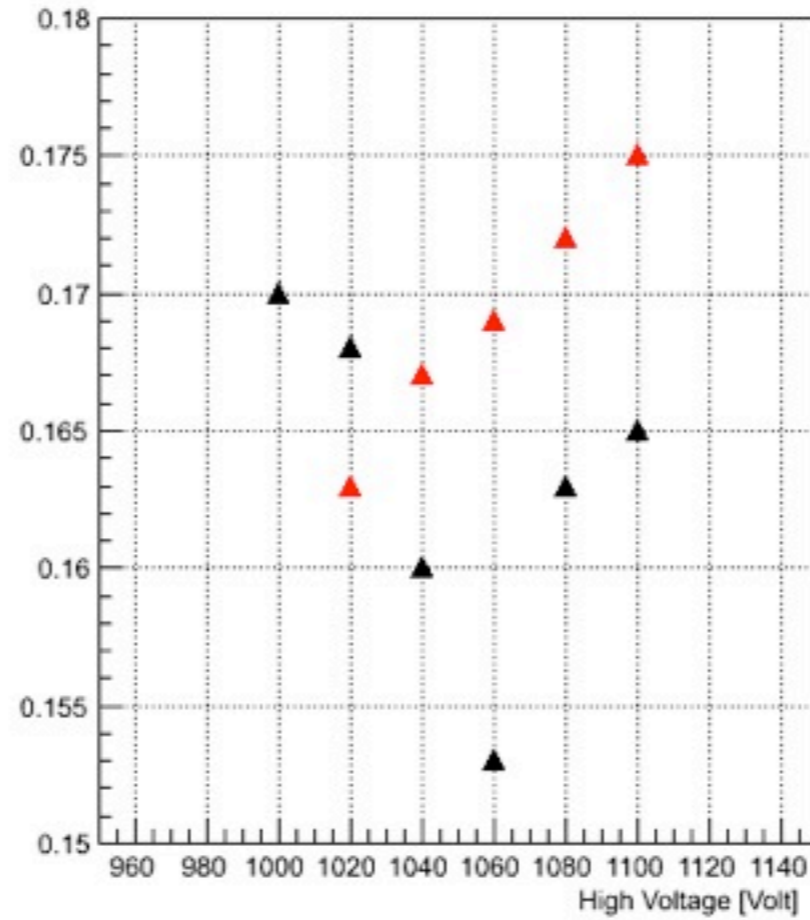
LVTTL

Time Resolution vs HV

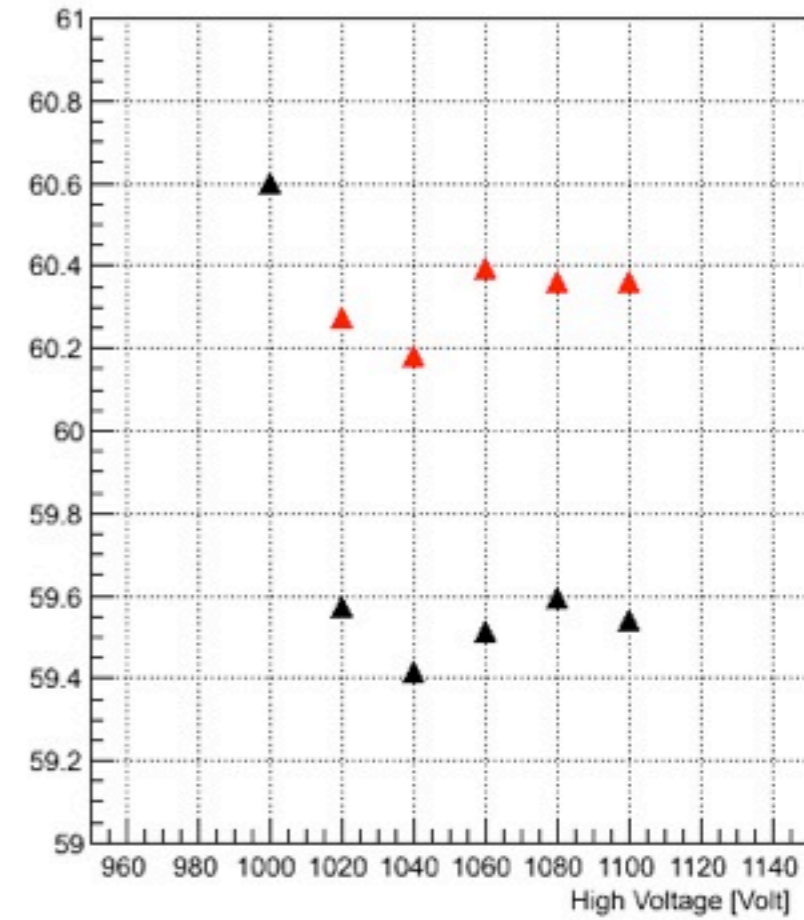
Time Resolution - Sigma [ps]



Efficiency - Hit/Total



Transit Time [ns]



Efficiency Trend at 1/3pe, correct.

Fluctuation in laser intensity?
NINO instabilities

Black - 1/20 THR

Red - 1/3 PE THR

Green - december data about 1/6 PE

Conclusion

- Revised all the calibration steps (1 channel) → Binary-Analog Map
 - Precise NINO THR scan reveals poor SNR for the not attenuated signal of MAROC binary output (inside NINO system)
 - More accurated measurements on time resolution gives worst understanding.
 - Need to discuss with P.Musico to improve the setup (attenuate also the MAROC lines before feed NINO)
 - NEXT:
 - ❖ Investigate different channels,
 - ❖ Investigate Time Over Threshold
 - ❖ Feed MAROC with SiPM
- ◆ February 2014 Thermal noise.

End

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