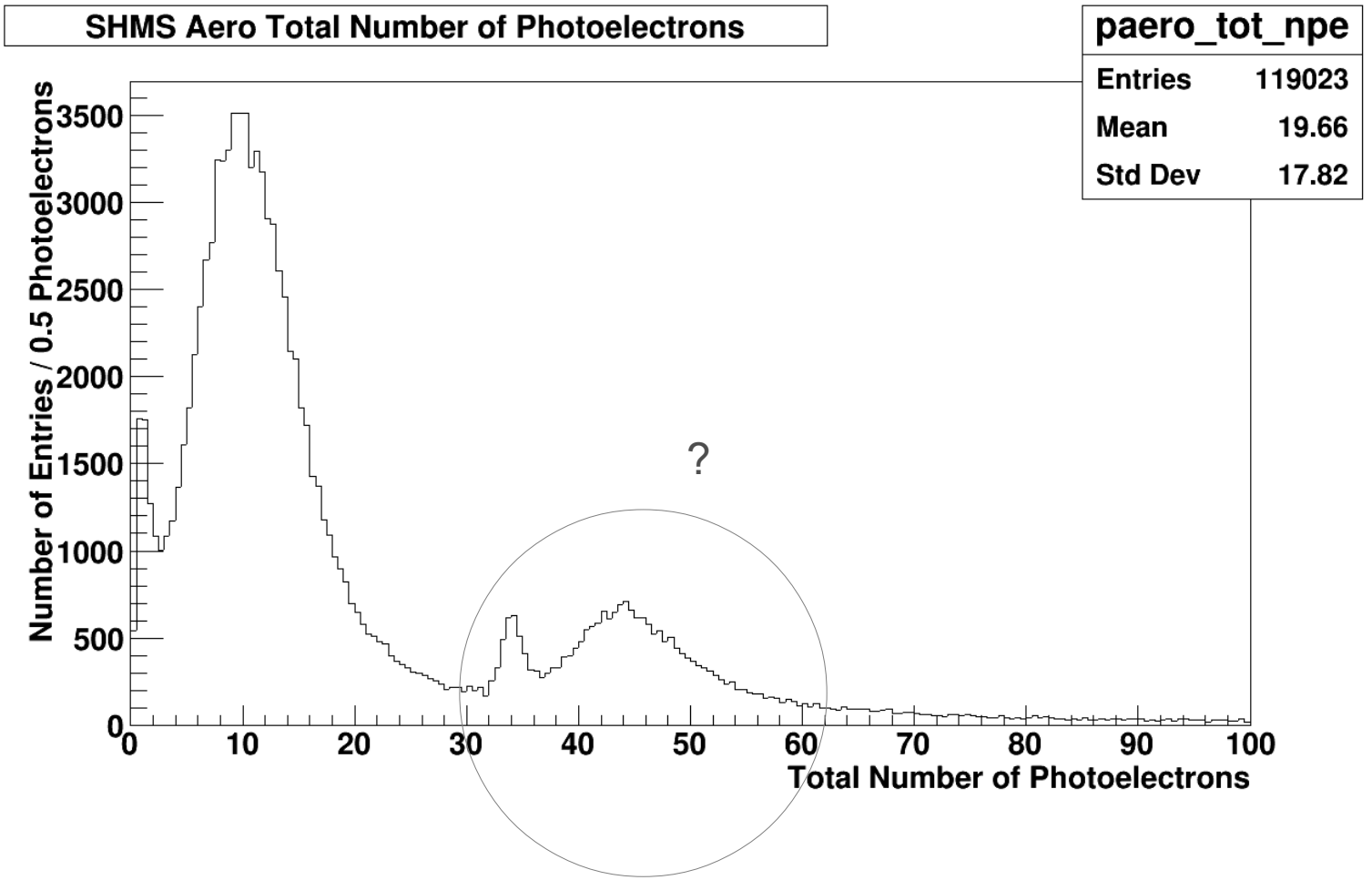
SHMS Aerogel Update
10/4/2017

Overnight run #1204 (standard settings)

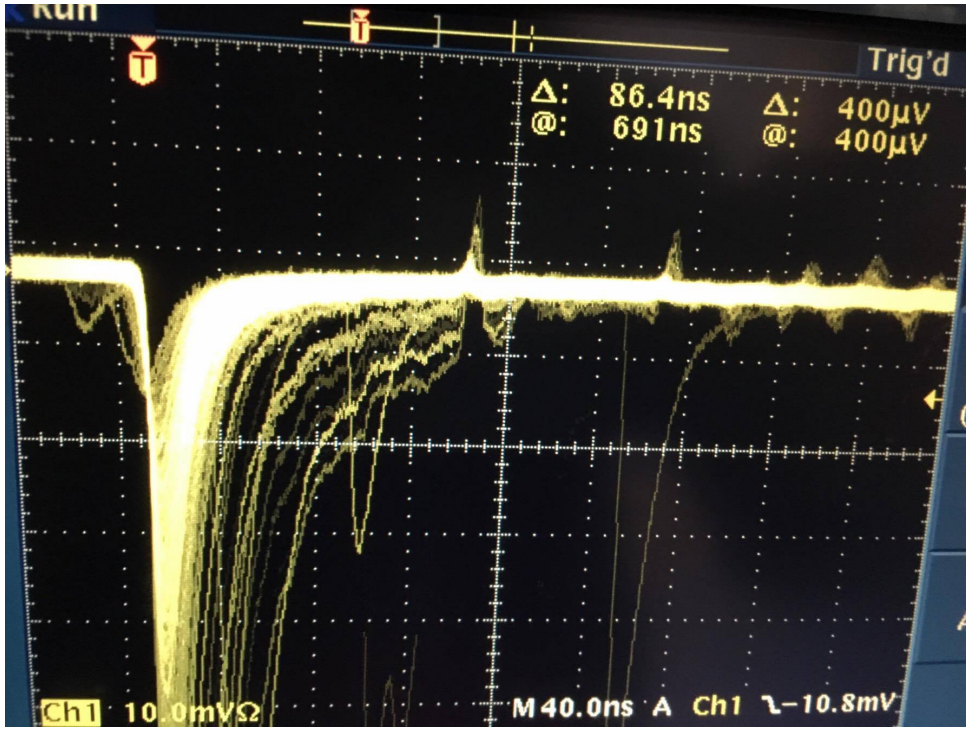


Actions made:

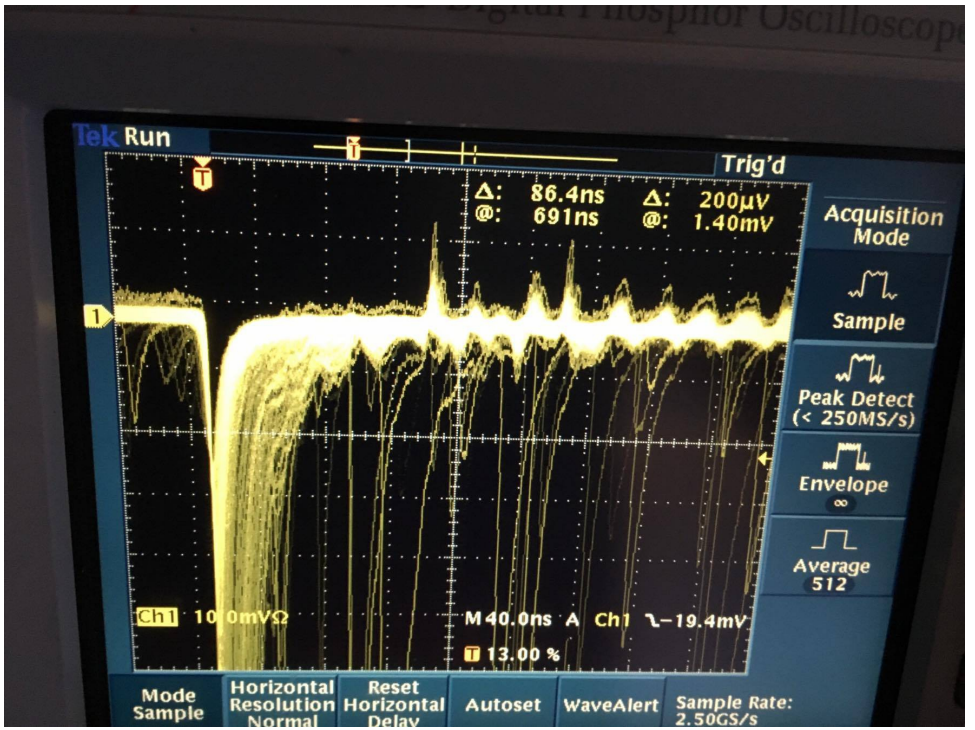
1) Discovered that ch#6(negative) was noisy (Main contribute to additional P.E. peak in spectra).
2) Checked with the scope ch#6 and other channels. No visible problems.
3) Swapped bases for ch#6 and ch#7 (both negative) and took a short cosmic run.
4) Problem disappeared, the bases swapped back, took overnight run.
5) At the next day morning ch#6(neg) shown the same behavior. Also ch#1(pos) and ch#5(pos) appeared to be noisy.
6) HV cabels swapped for the bases.
7) The nominal voltages changed using HV GUI for swapped channels so the PMT got same HV as it should be.
8) During that operation noticed that HV module had strange behavior.
    (Example: the voltages "flow" for few or tens of volts around nominal value)
    This behavior did not disappear after software and hardware reboot of HV crate
    Another detectors that connected to another HV card in the same crate looked normal
    Spare HV card was found (CAEN Mod.A1535SP Ser.n 597)
    SHMS aerogel HV connected to the spare card
    HV Ch#0 and Ch#7 connected to output #14 and #15 (outputs #0 and #7 not working)
    Checked that all HV works.
    Set the software and hardware voltage Maximum
    Put hardware interlock to card CAEN Mod.A1535SP Ser.n 587 (previous one)
9) Cables checked with pulser.
10) Started new overnight cosmic run.
11) Discovered no changes in spectra (noise, additional P.E. Peaks).
12) Set HV 50V below nominal-----> No changes.
13) Turned off HV for rear PMT`s at the TOF plane----> No changes.
14) Took overweekend run.
15) Unfortunately the run was corrupted because of DAQ problems.

PMT#6(Negative) could cause the problem itself ?

Ch#5 Negative



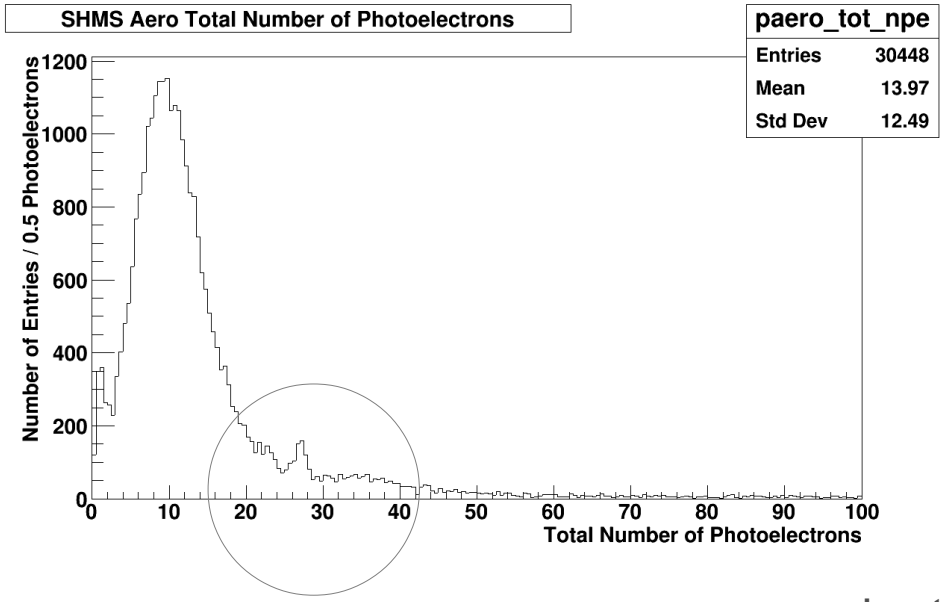
Ch#6 Negative



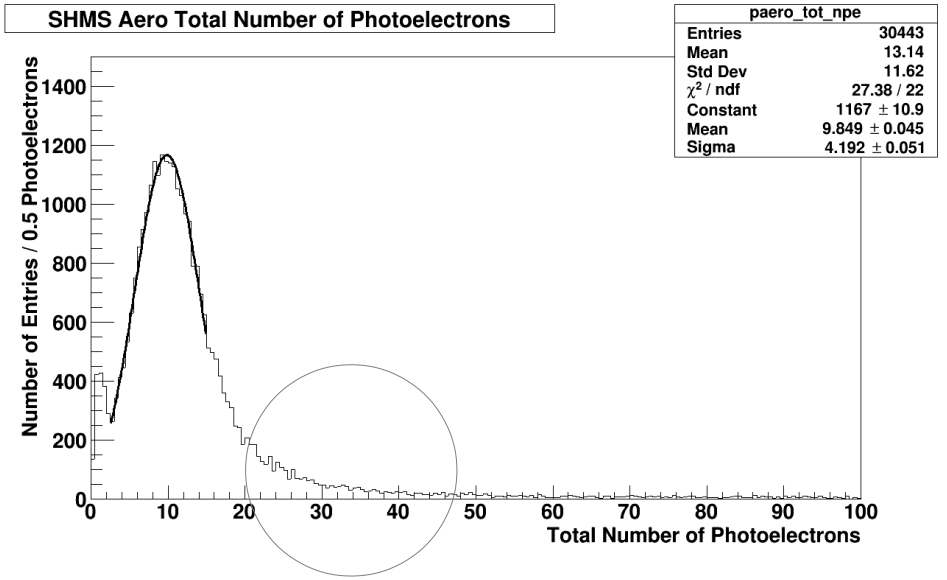
With Eric`s help new version HCANA was installed.

BOOM !

Old analyzer version

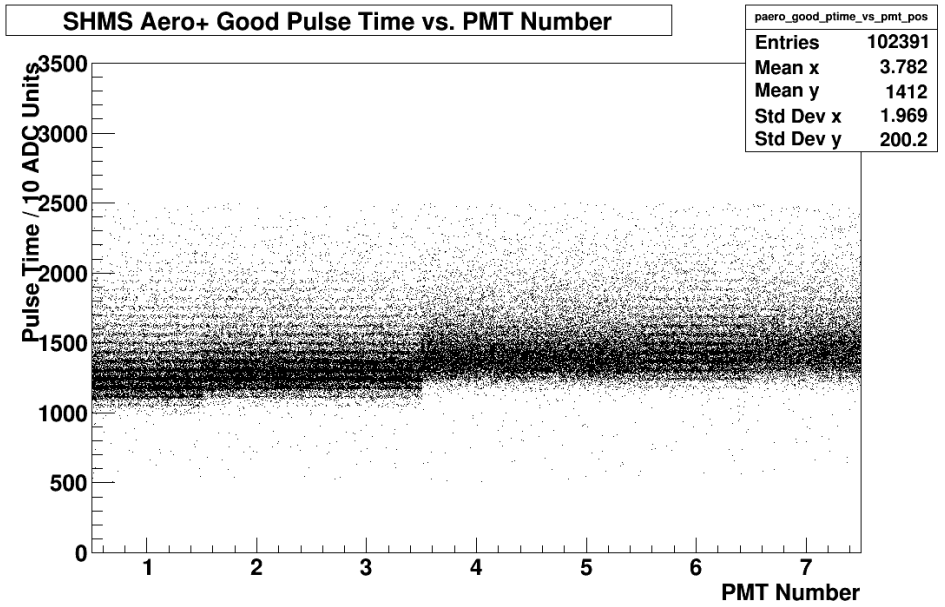


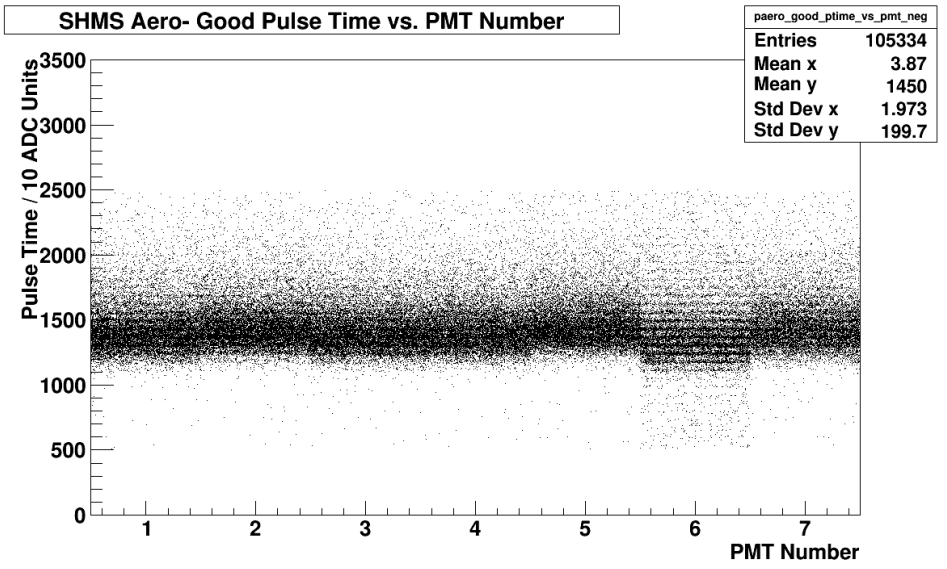
Current analyzer version

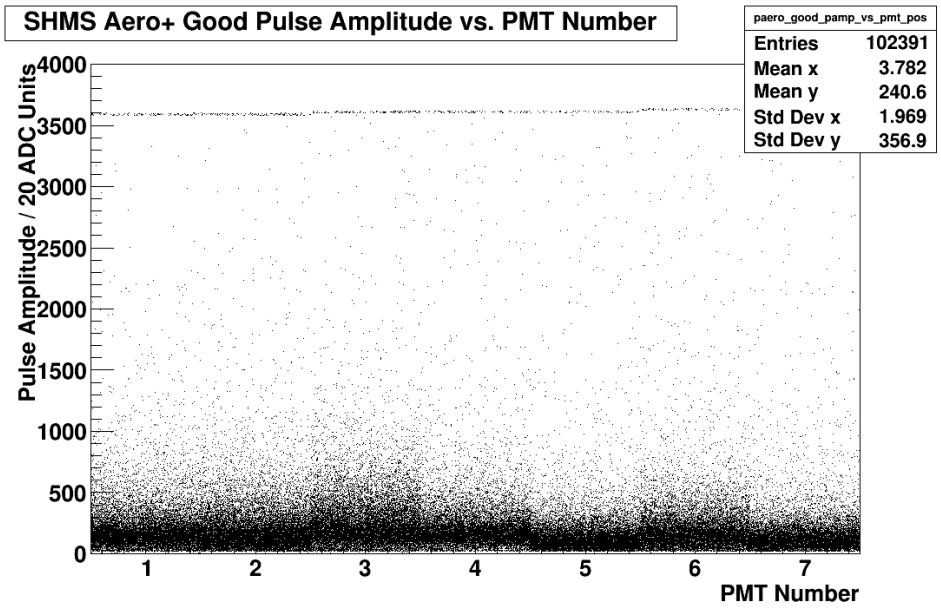


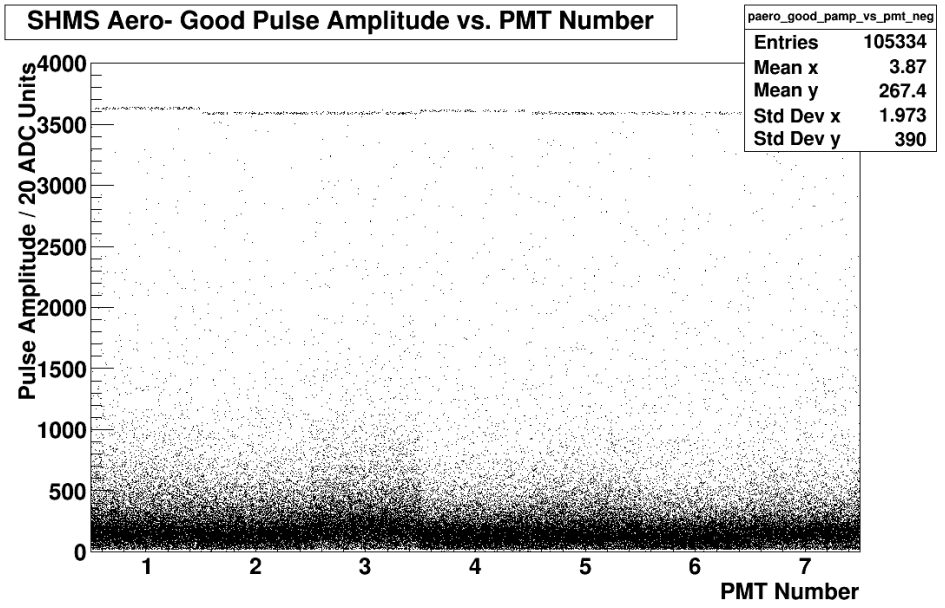
same short cosmic run 1227

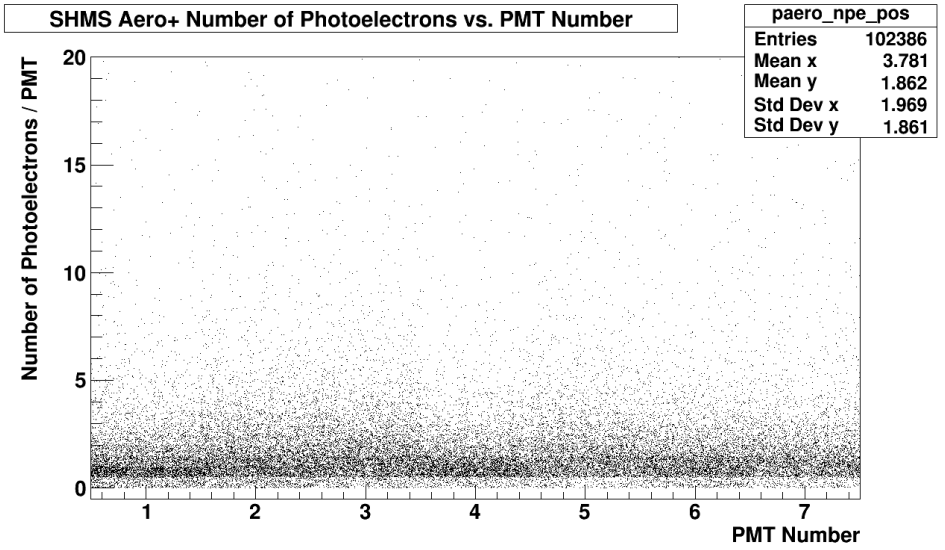
Eric : “ FlashADC 250 decoder had problem in old version of Analyzer.
Some pedestals was corrupted and have not been subtracted.”

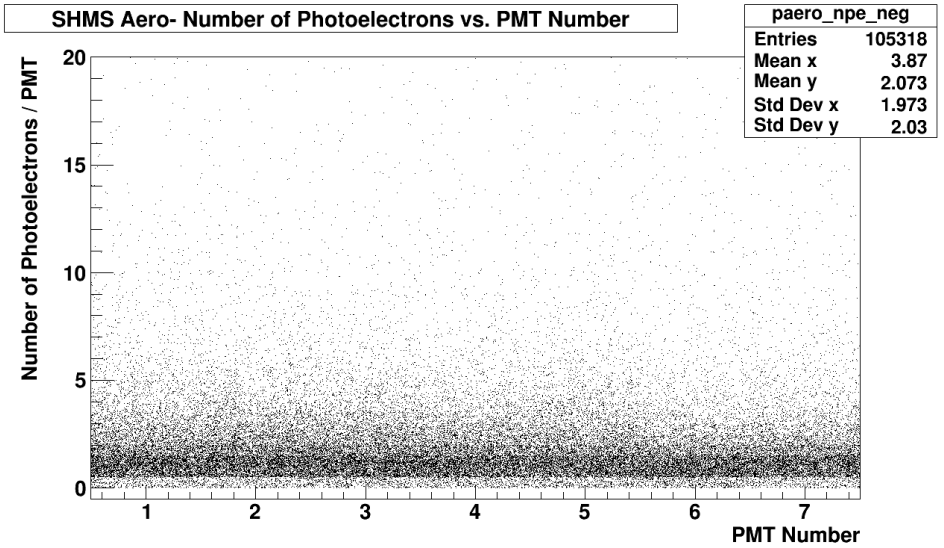

SHMS Aero+ Good Pulse Time vs. PMT Number
paero_good_ptime_vs_pmt_pos
Entries 102391
Mean x 3.782
Mean y 1412
Std Dev x 1.969
Std Dev y 200.2
Pulse Time / 10 ADC Units
PMT Number

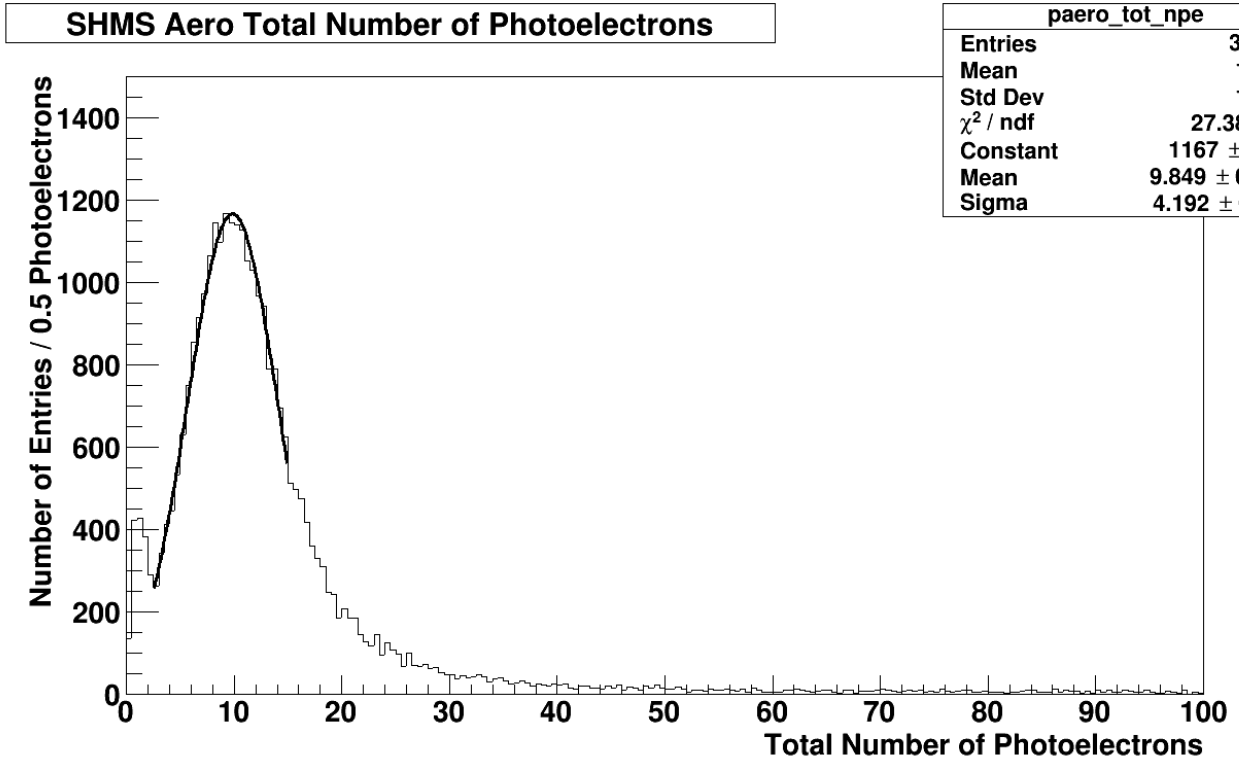

SHMS Aero- Good Pulse Time vs. PMT Number
paero_good_ptime_vs_pmt_neg
Entries 105334
Mean x 3.87
Mean y 1450
Std Dev x 1.973
Std Dev y 199.7
Pulse Time / 10 ADC Units
PMT Number


SHMS Aero+ Good Pulse Amplitude vs. PMT Number
paero_good_pamp_vs_pmt_pos
Entries 102391
Mean x 3.782
Mean y 240.6
Std Dev x 1.969
Std Dev y 356.9
Pulse Amplitude / 20 ADC Units
PMT Number


SHMS Aero- Good Pulse Amplitude vs. PMT Number
paero_good_pamp_vs_pmt_neg
Entries 105334
Mean x 3.87
Mean y 267.4
Std Dev x 1.973
Std Dev y 390
Pulse Amplitude / 20 ADC Units
PMT Number







Conclusions:

1)Total P.E. Spectra looks good with new analyzer

2)Ch#6(Negative) still questionable

Could the change of this PMT with spare before physic run solve problems ?

3)Need long (2 day) run to figure this out