SDU Group Updates

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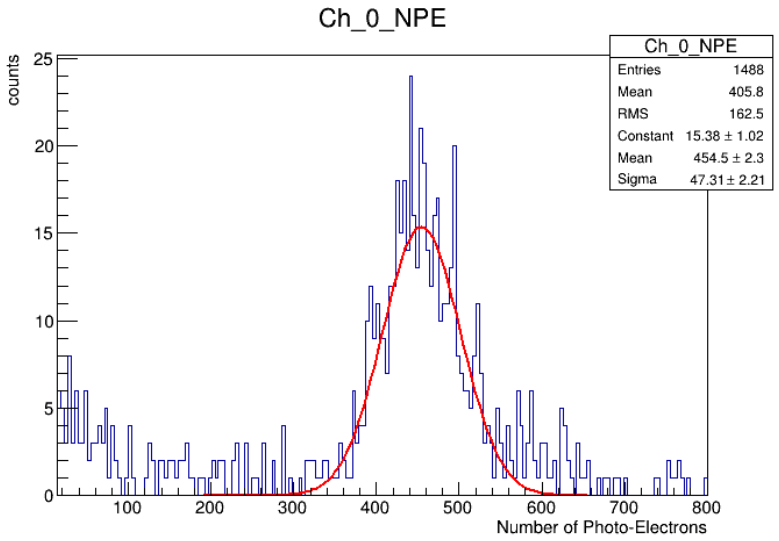
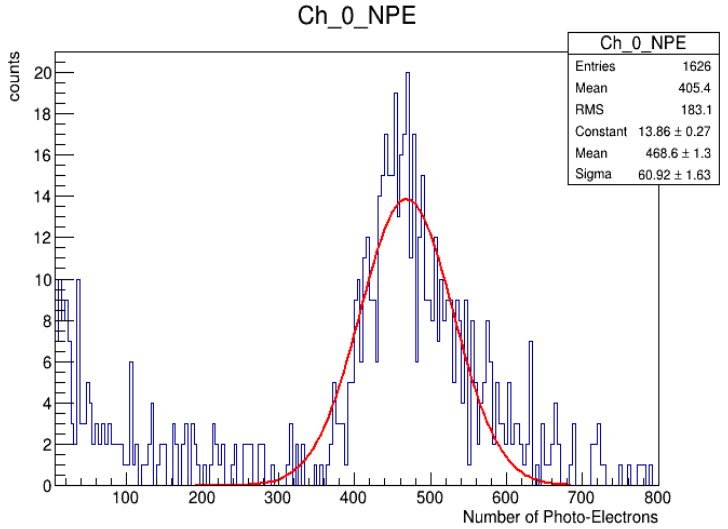
Previously

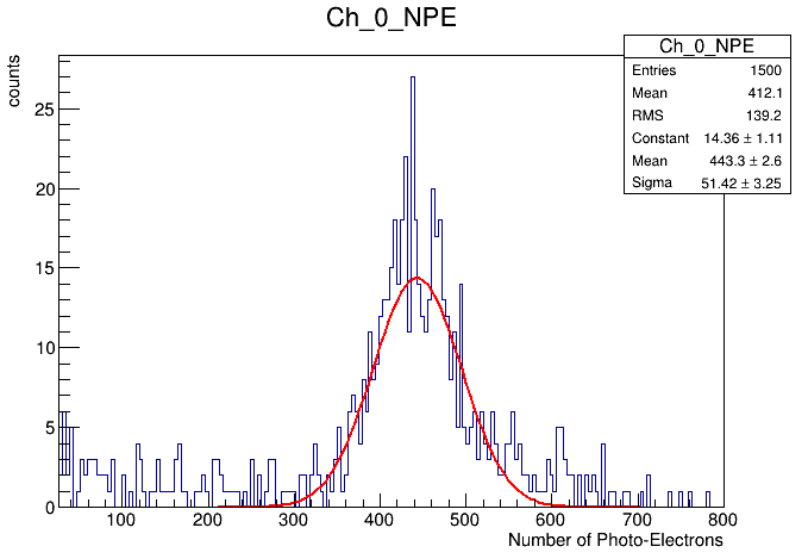
- SDU3 vertical cosmic ray light yield, 24h
- TiO2 painted and Tyvek paper wrapped
- PMT A67693



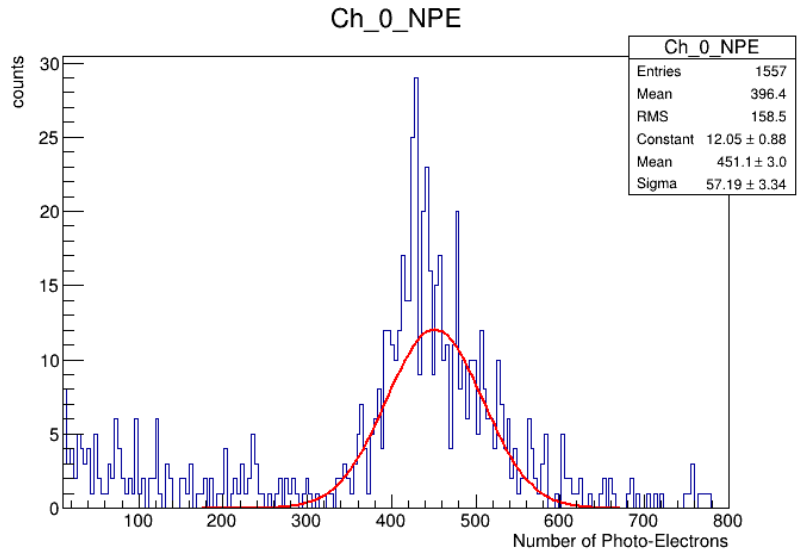
900V



1000V



1100V



1160V

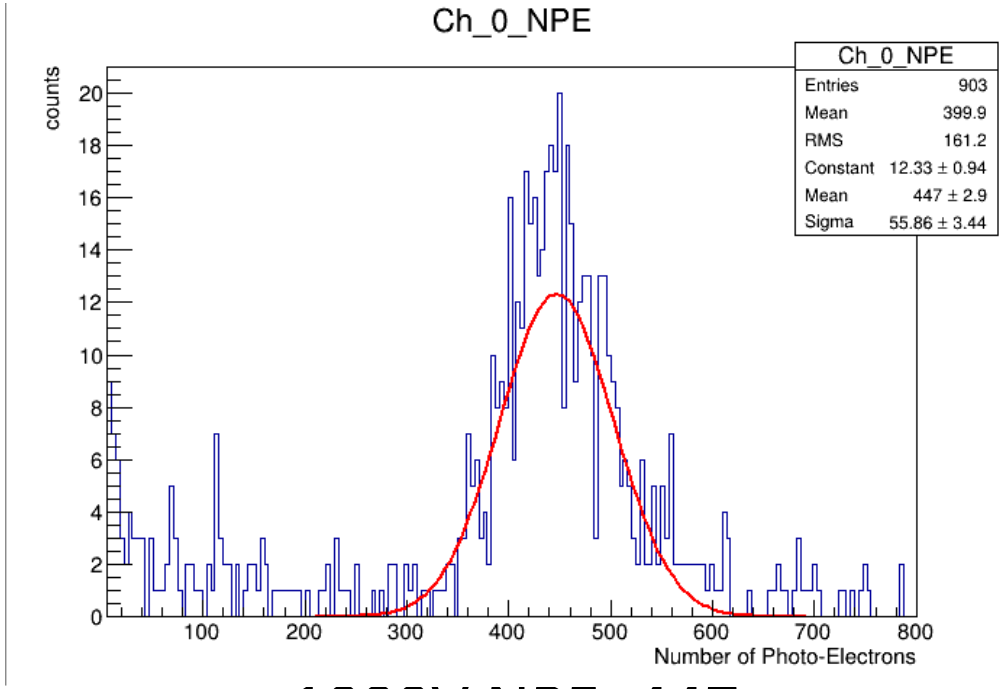
Previously

Voltage	900V	1000V	1100V	1160V
Gain	7.1e5	1.58e6	3.26e6	4.73e6
NPE	454.5	468.6	443.3	451.1

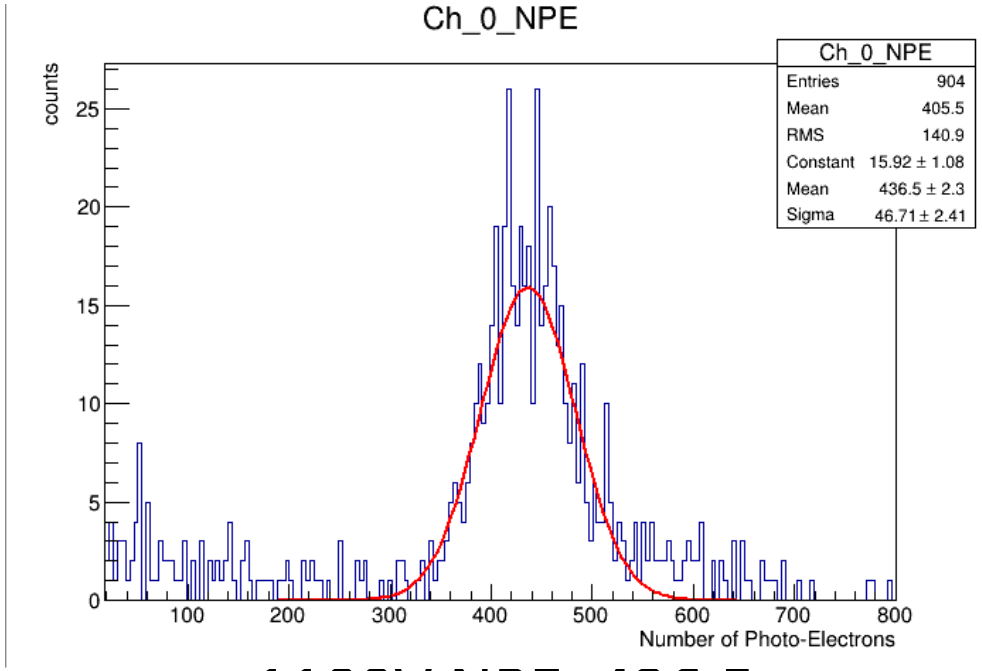
- Gaussian fit
- Gain(1100V) and Gain(1160V) are measured accurately, Gain(900V) and Gain(1000V) are extrapolated from beta and Gain(1100V)
- Similar NPE means the extrapolated gain is accurate enough
- About 10% less than one year ago(490)
- Possible light leak due to loose fixing between PMT and the fiber bundle?

SDU3 light yield re-test

- Better alignment and firmer fixing between PMT and fiber, PMT A67702



1000V NPE=447

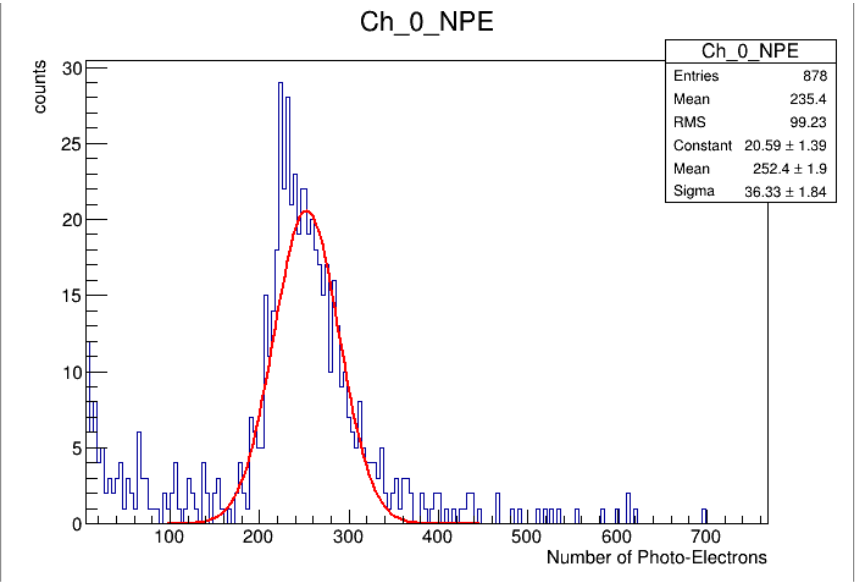


1100V NPE=436.5

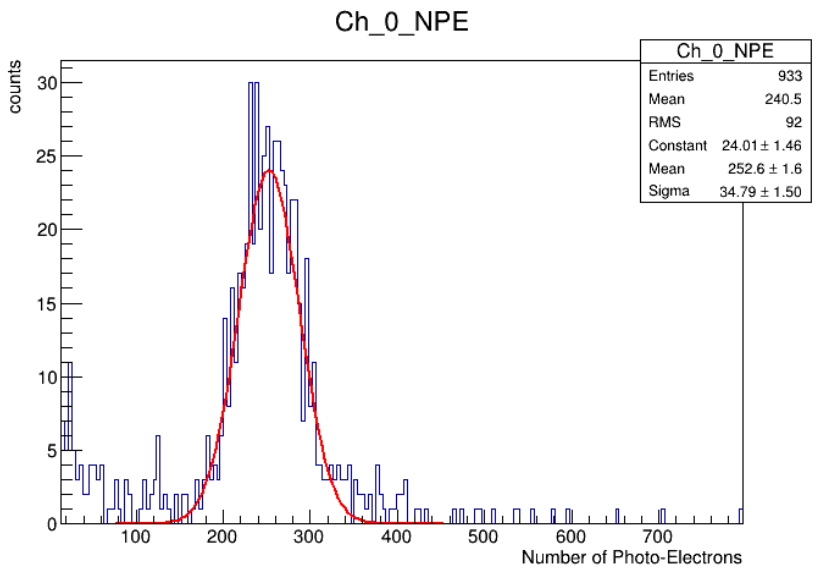
- Not due to light leak
- Probable module aging(fiber? scintillator?). Need more study

SDU4 light yield test

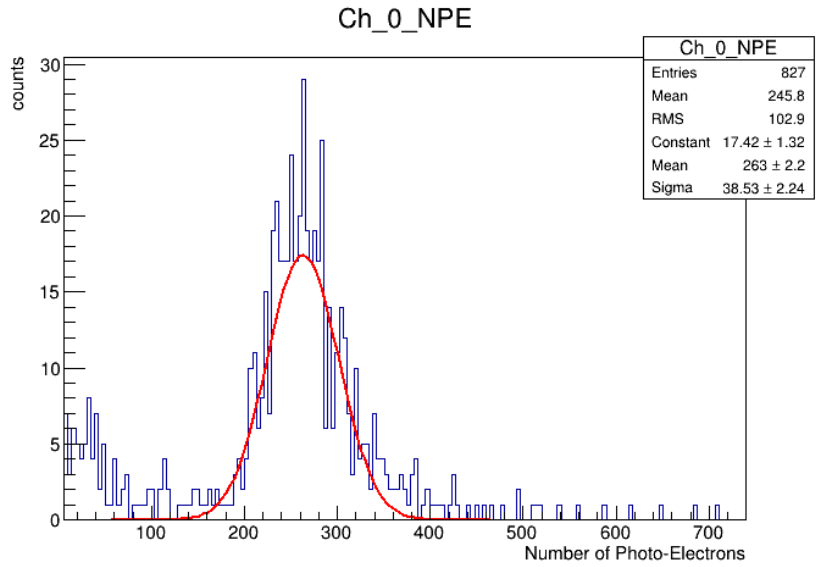
- 24h, no painting and wrapping, PMT A67702



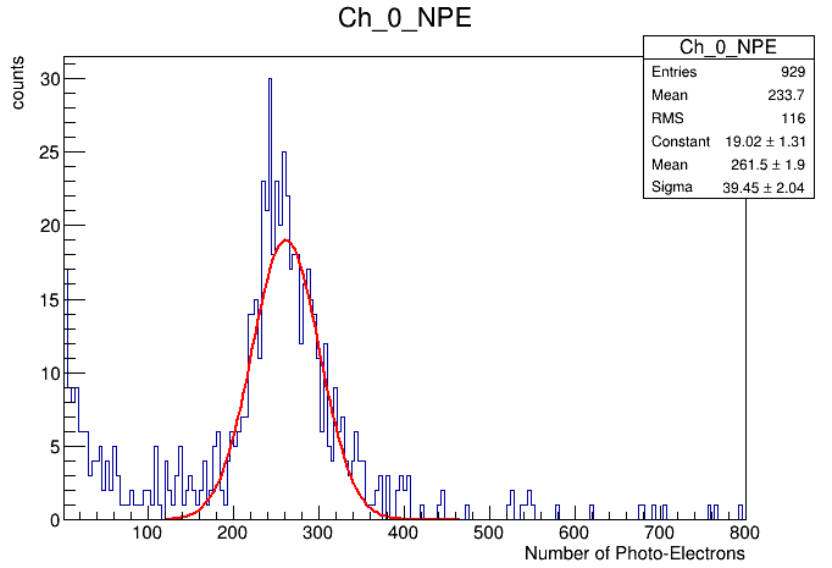
900V



1000V



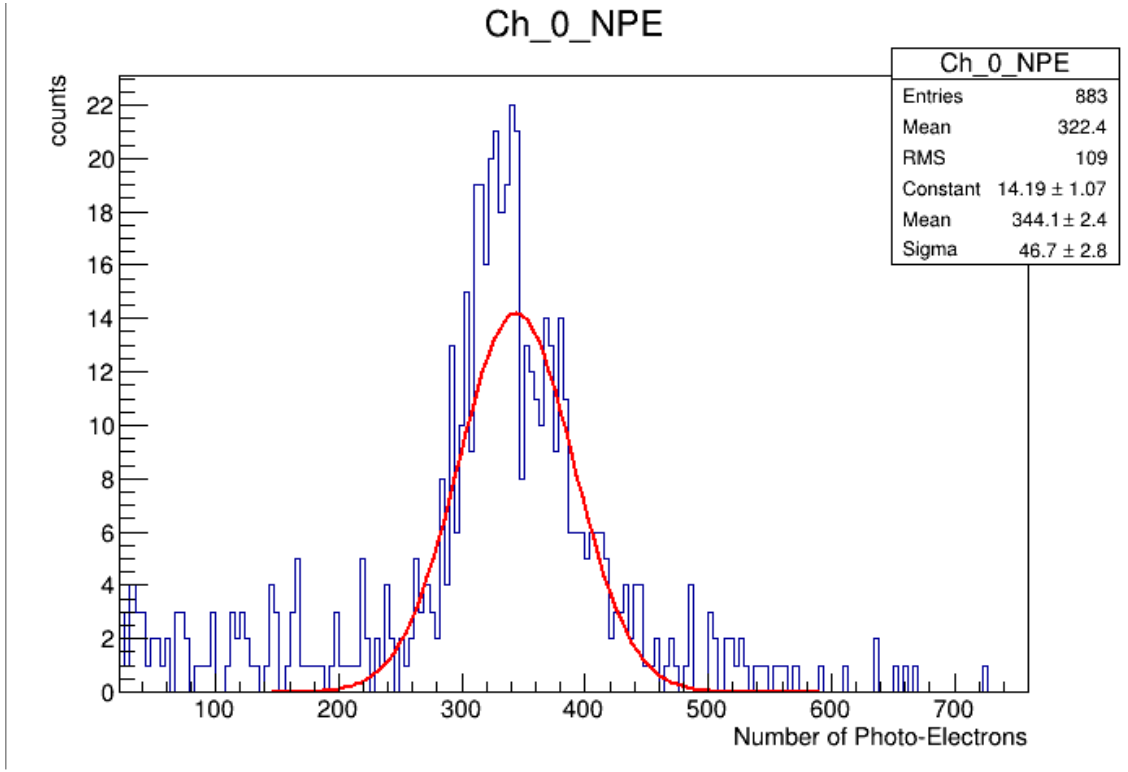
1075V



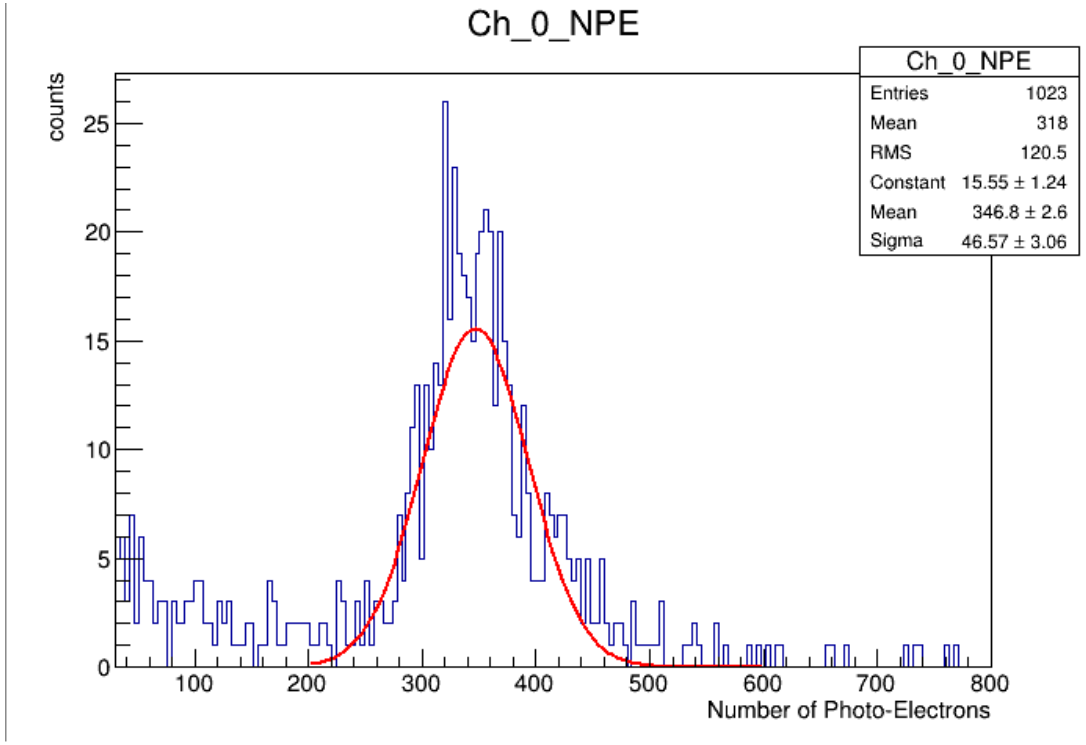
1100V

SDU4 light yield test

- 24h, Tyvek paper loosely wrapped, PMT A67702



1000V



1100V

SDU4 light yield test

Voltage	900V	1000V	1075V	1100V	1000V(Tyvek)	1100V(Tyvek)
Gain	1.54e6	3.18e6	5.07e6	6.13e6	3.18e6	6.13e6
NPE	252.4	252.6	263	261.5	344.1	346.8

- Gaussian fit
- Gain(1100V) and Gain(1075V) are measured accurately, Gain(900V) and Gain(1000V) are extrapolated from beta and Gain(1100V)
- NPE with Tyvek paper(avg:345.5) is 34.2% more than NPE without Tyvek paper(avg:257.4)

Next step

- SDU5 vertical cosmic ray light yield test(with and without Tyvek paper wrapped)
- TiO2 painting on SDU4 and SDU5
- Replace the optical fibers in SDU4 or 5, with silver-plated ones
- Horizontal cosmic ray light yield in three adjacent modules
- Plan to build SDU6