

# Status report

04/10/2020

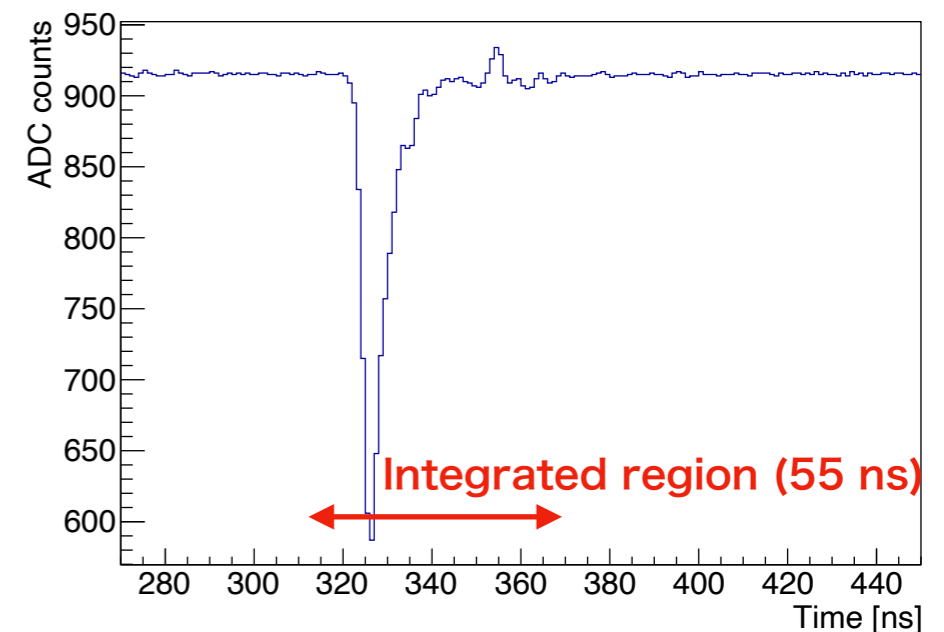
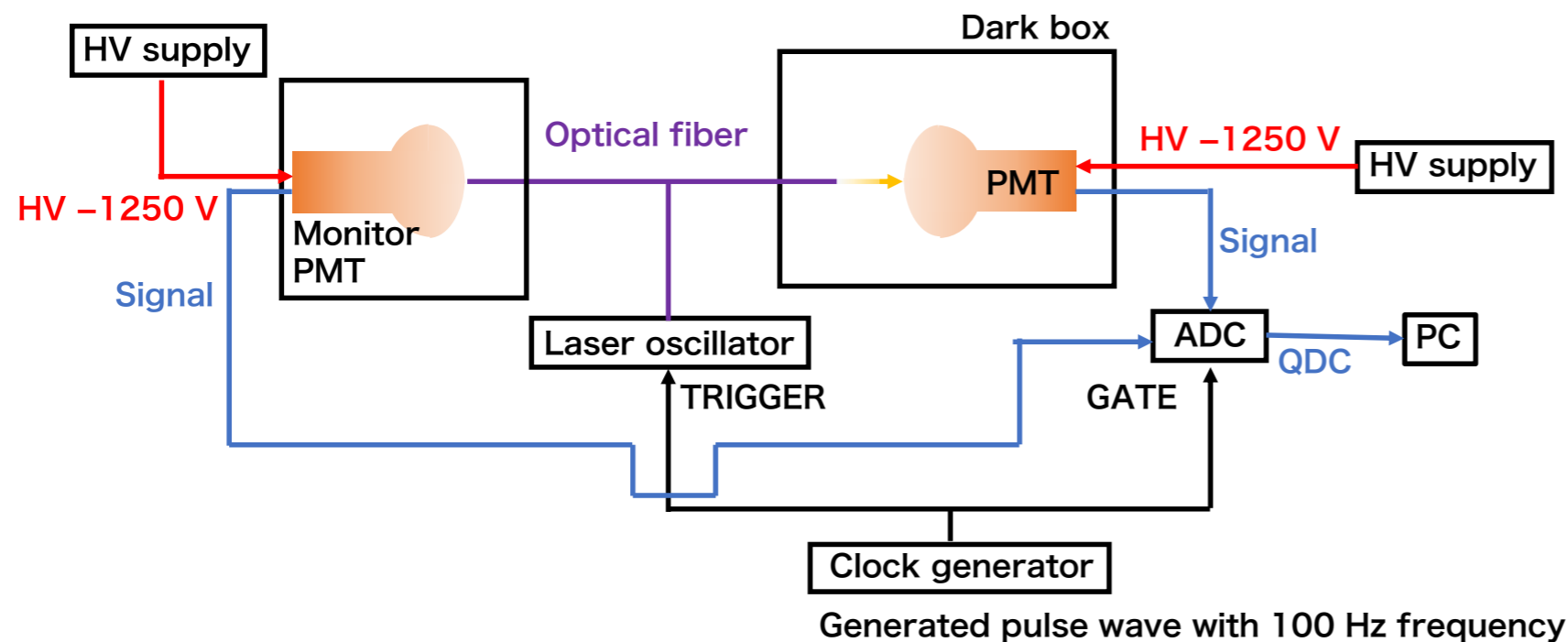
Michitaka Inomoto

# Magnetic field effects

- To measure magnetic field dependence of relative efficiency, I checked correlation between  $\mu$  of Poisson distribution and mean of monitor PMT integrated charge.

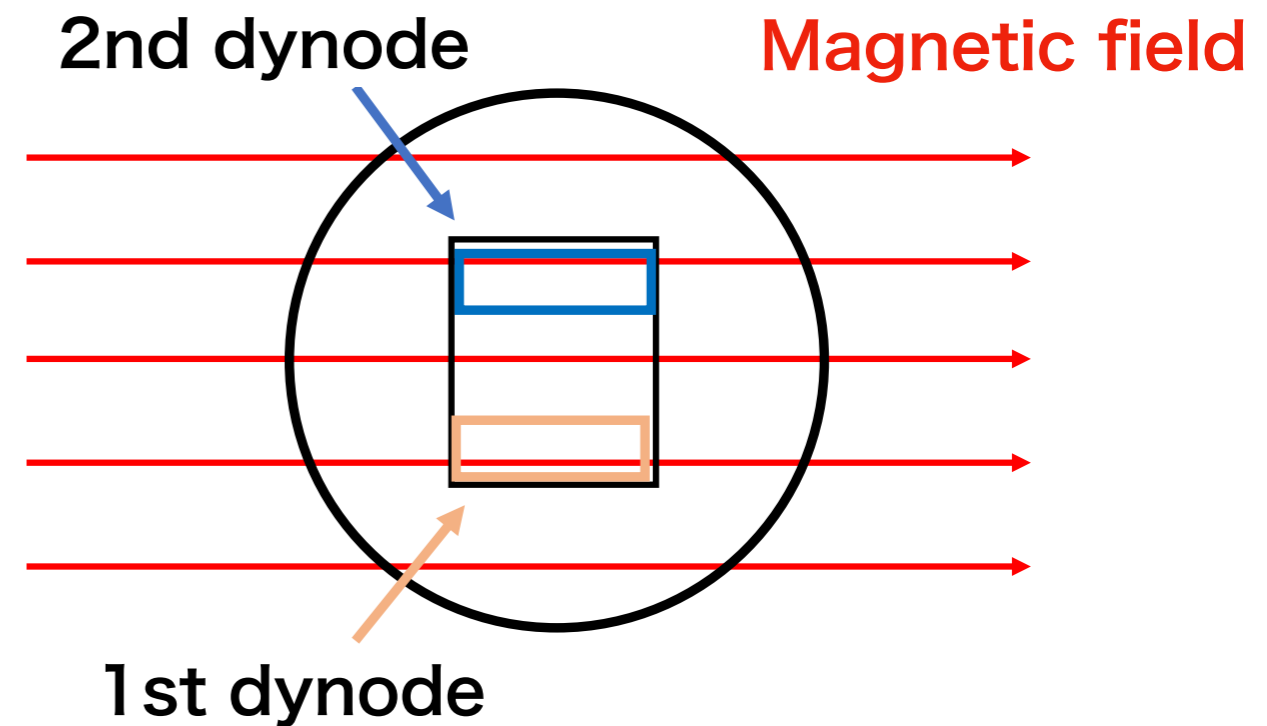
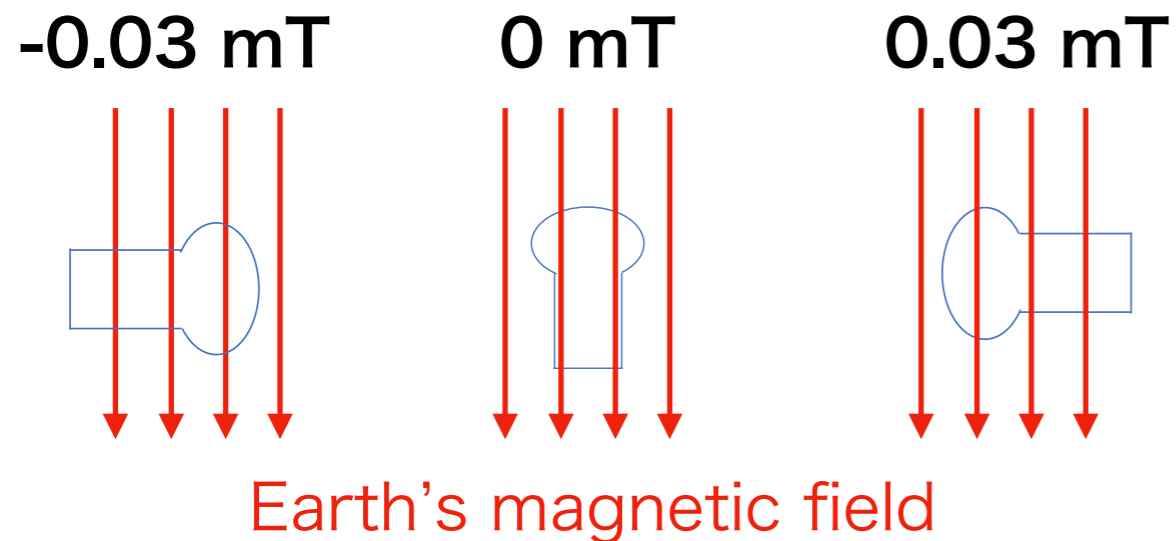
$$\text{Relative efficiency} = \frac{\text{Mean of 3-inch PMT p.e. } (\mu \text{ of Poisson distribution})}{\text{Mean of Monitor PMT integrated charge}}$$

- I used another 3-inch PMT as the monitor PMT.



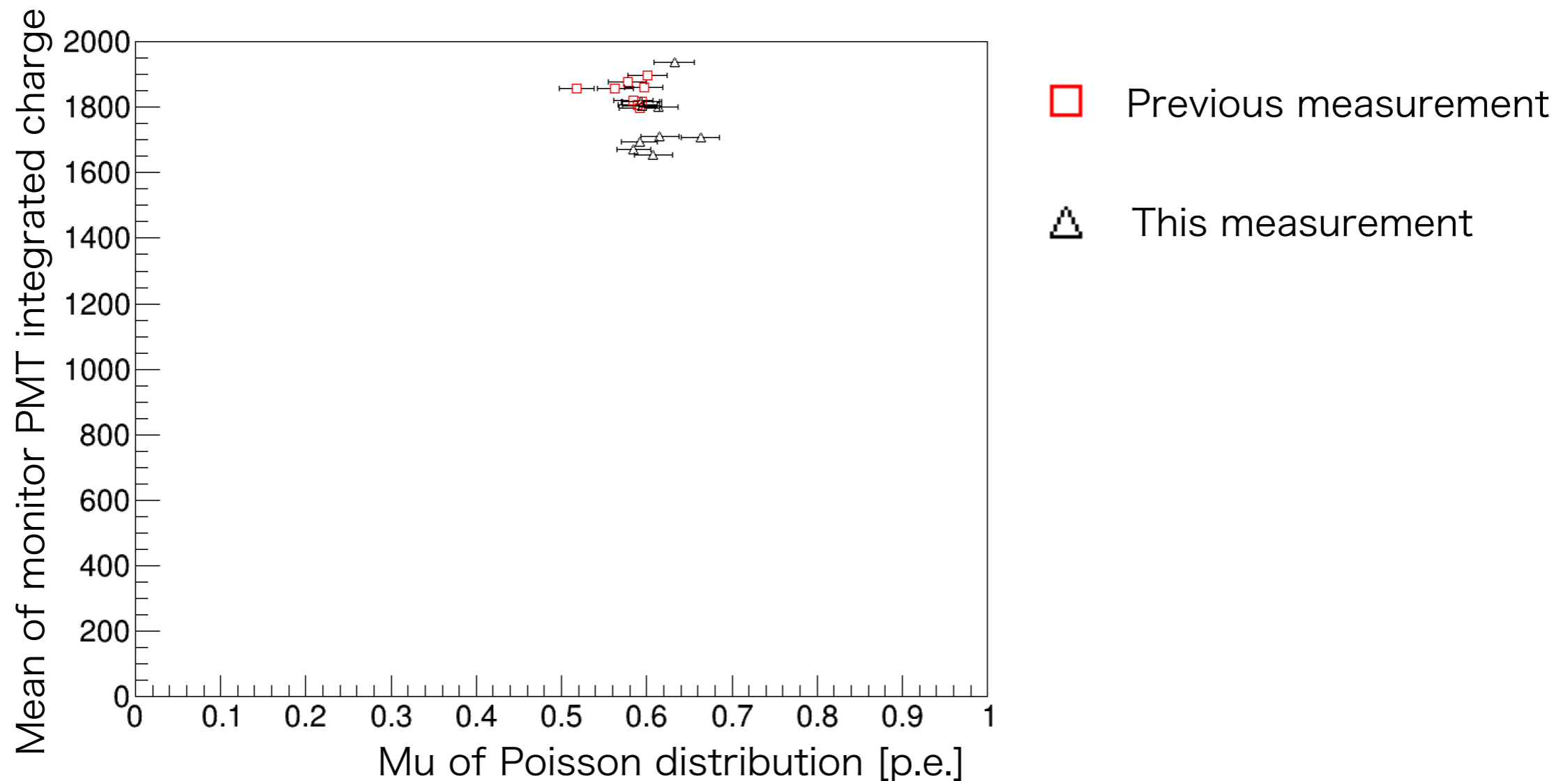
# Magnetic field effects

- I checked the correlation of the 3-inch PMT.
- I measured the relative efficiency in three types of PMT's angles to Earth's magnetic field.
  - The angles :  $-90^\circ$ ,  $0^\circ$ ,  $90^\circ$
- Earth's magnetic field in the laboratory was about 0.03 mT.



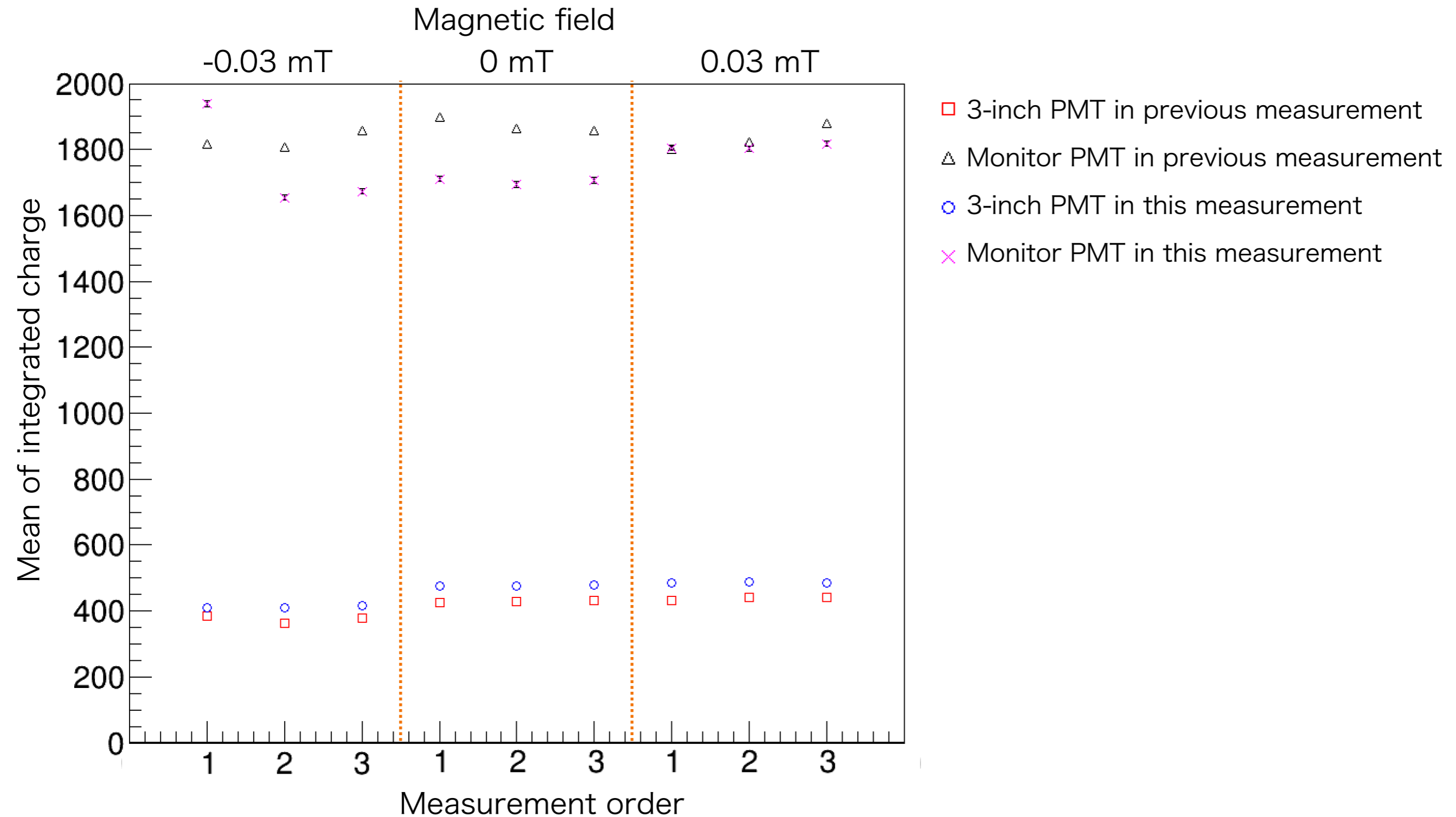
# The correlation

- I checked correlation between  $\mu$  of Poisson distribution and mean of monitor PMT integrated charge.
- There was no correlation seen in those.
  - These plots have similar  $\mu$ , but different value of the mean.



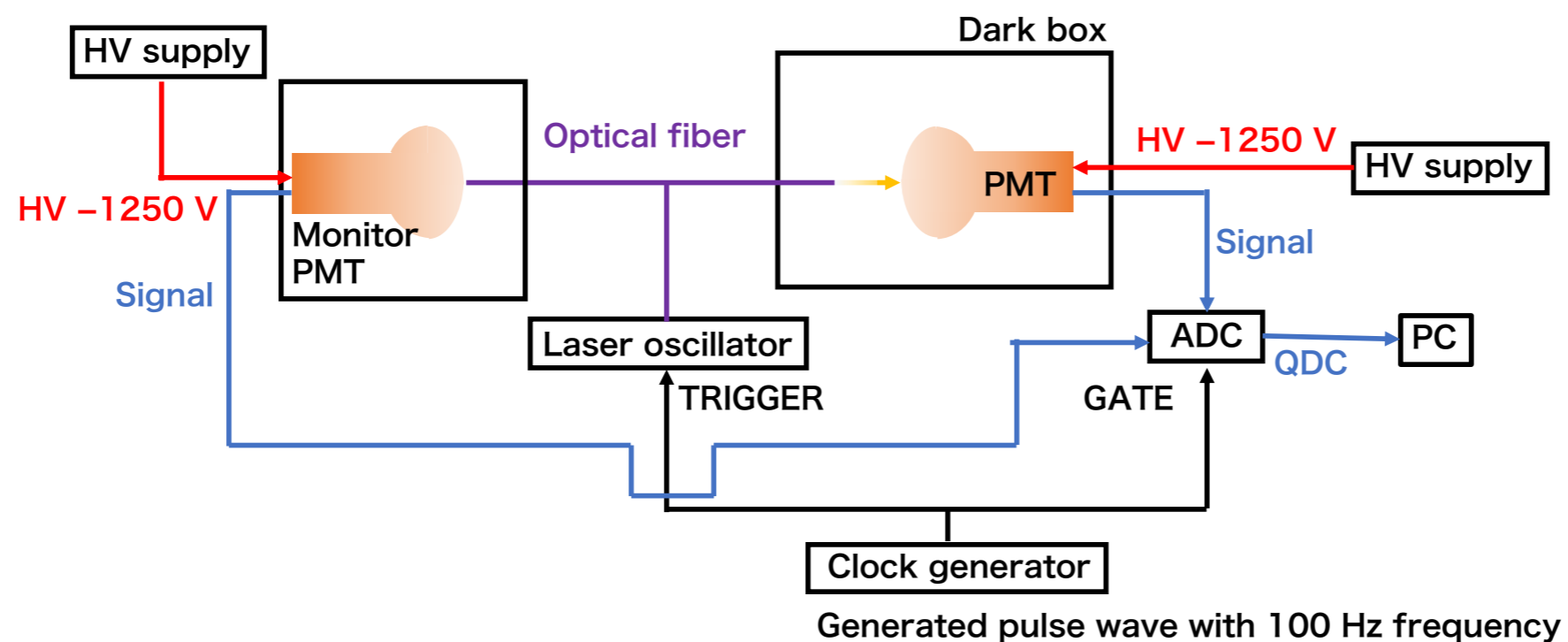
# Light intensity

- I checked the stability of light intensity.
- The variation in each PMT was about 20%.

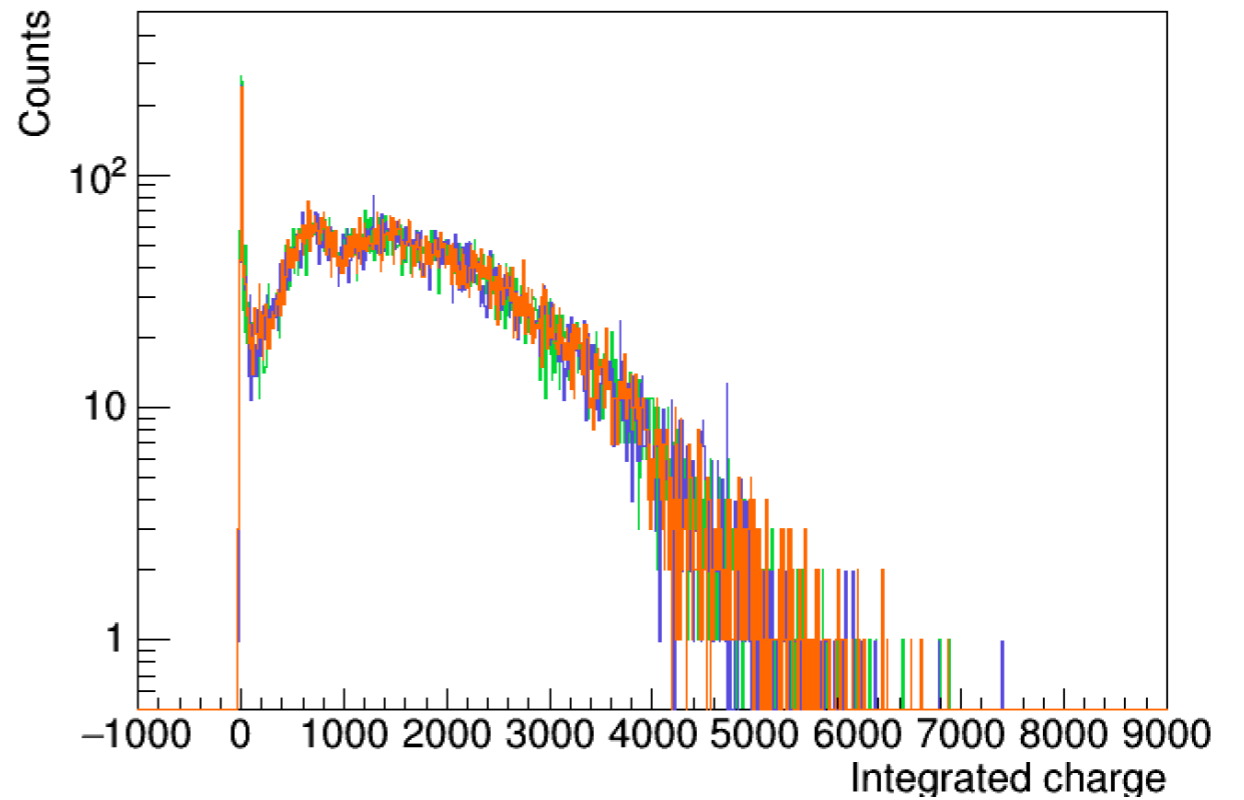
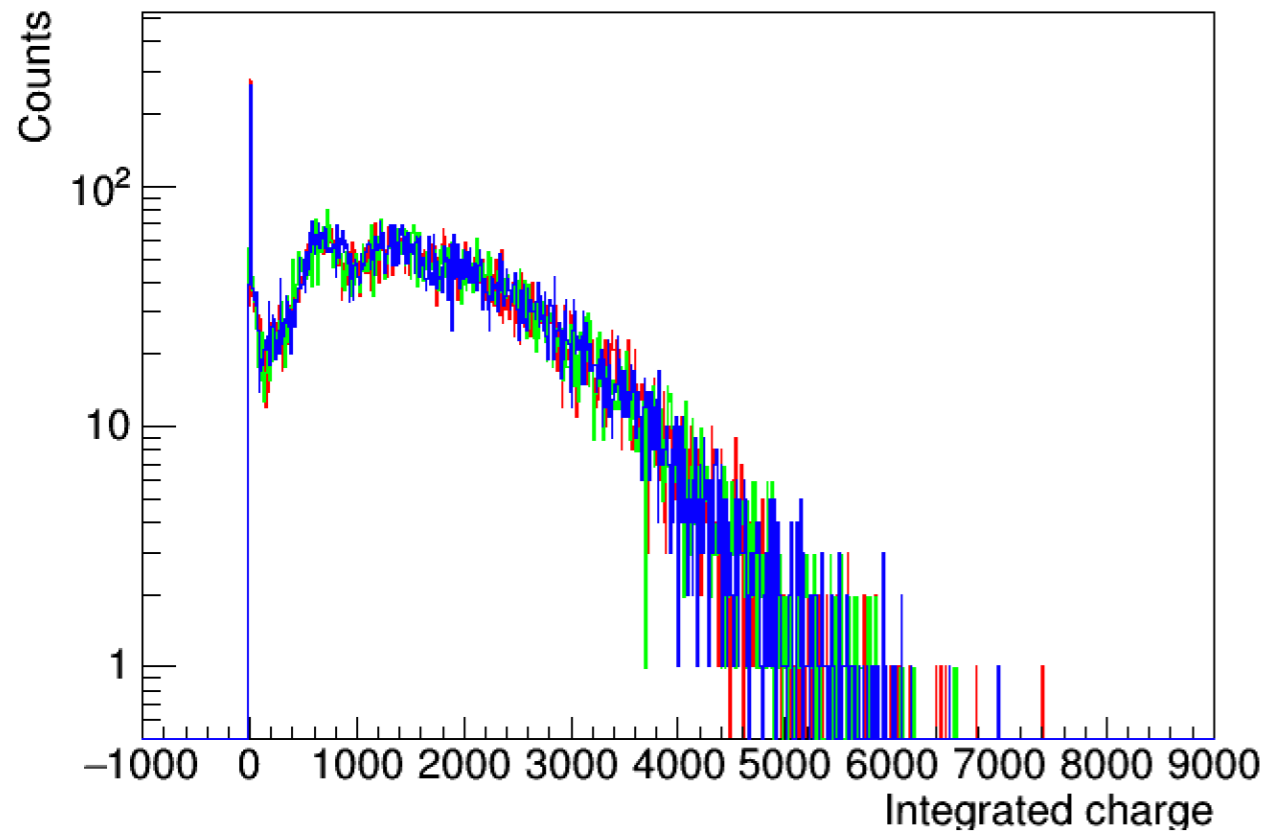
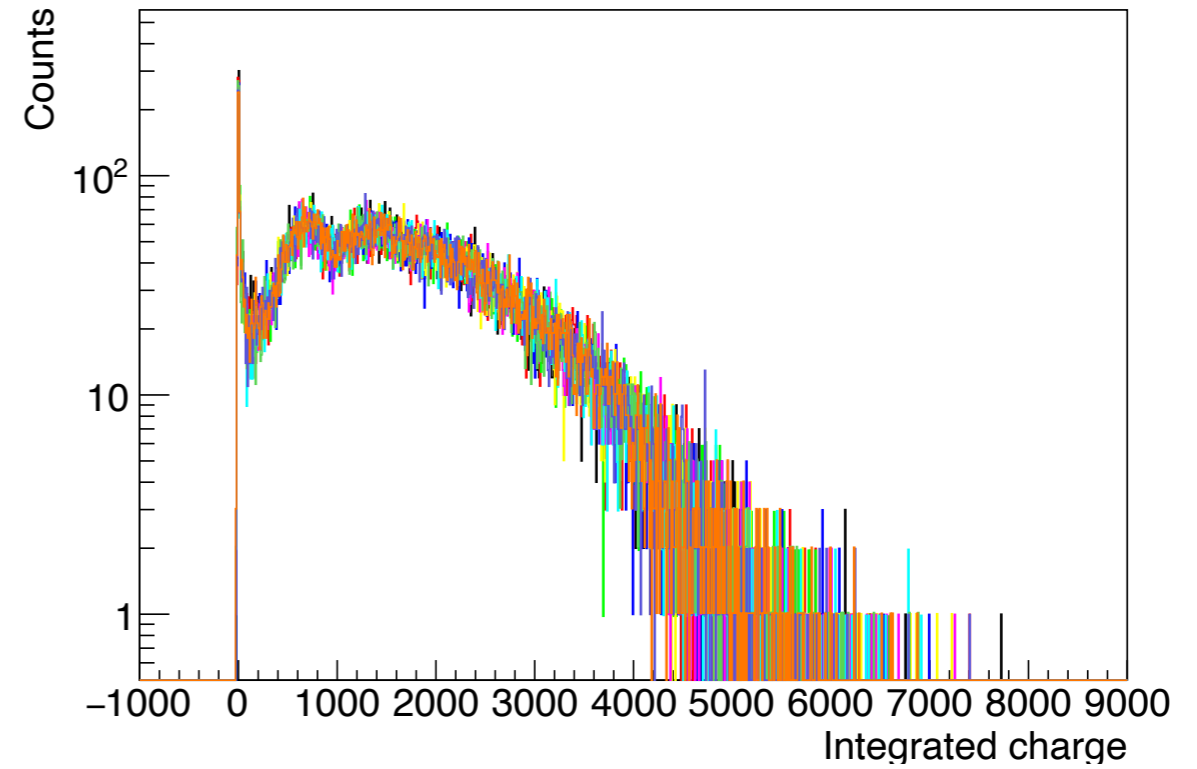
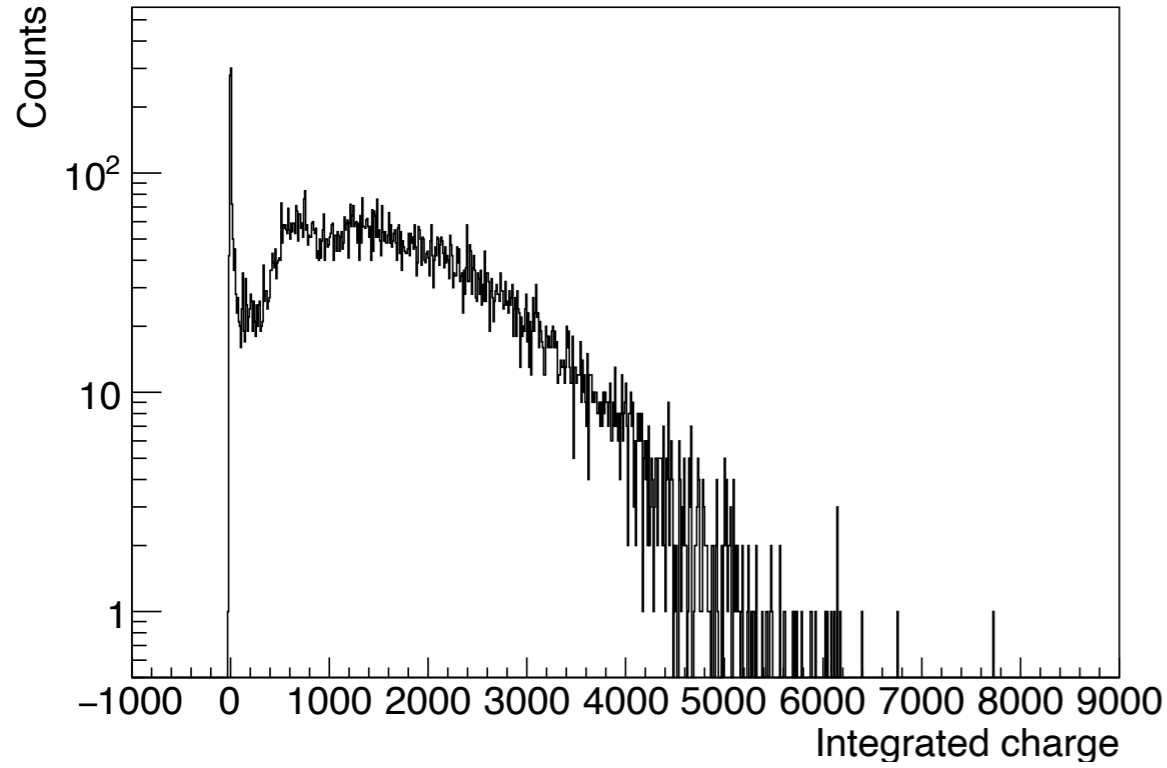


# Laser stability

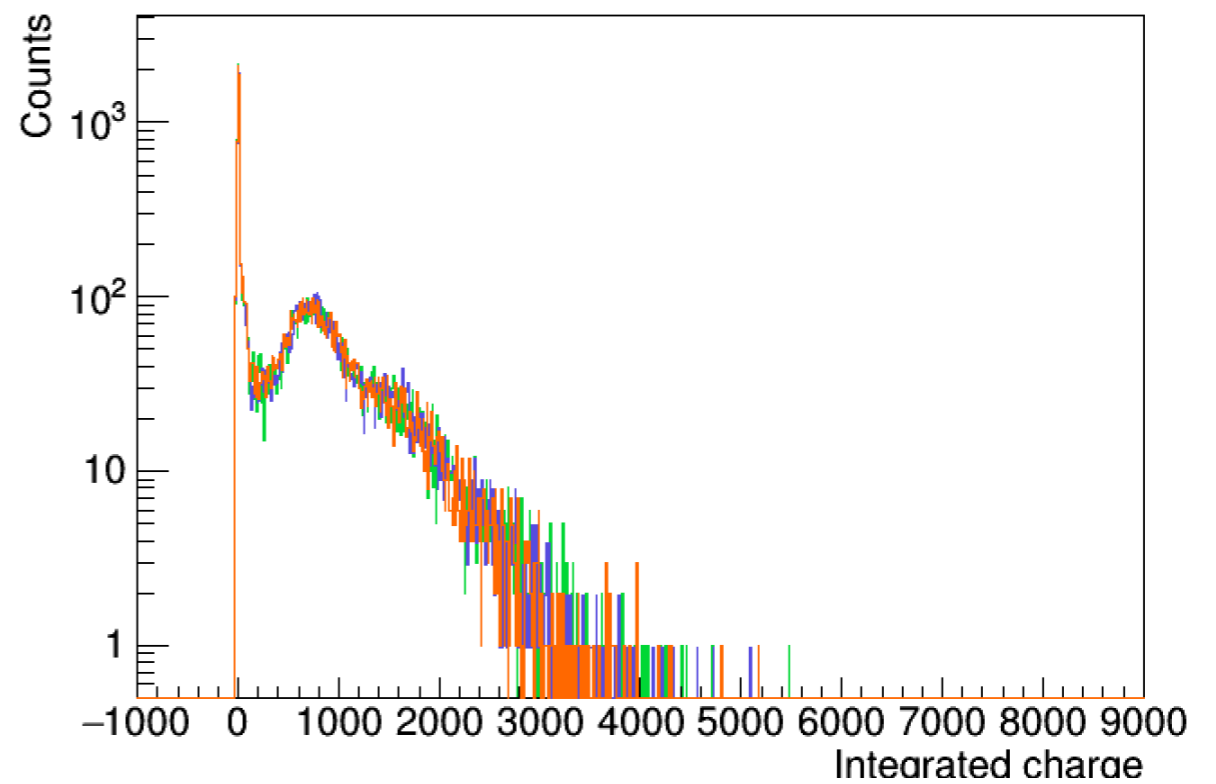
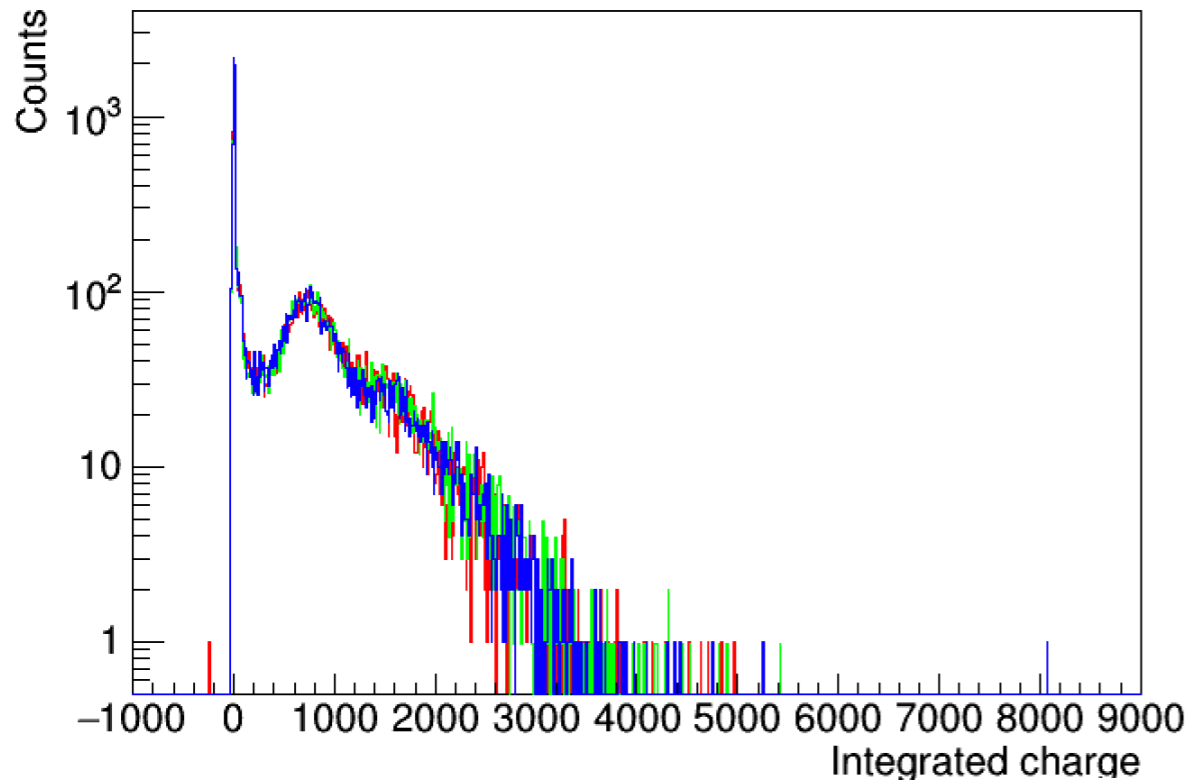
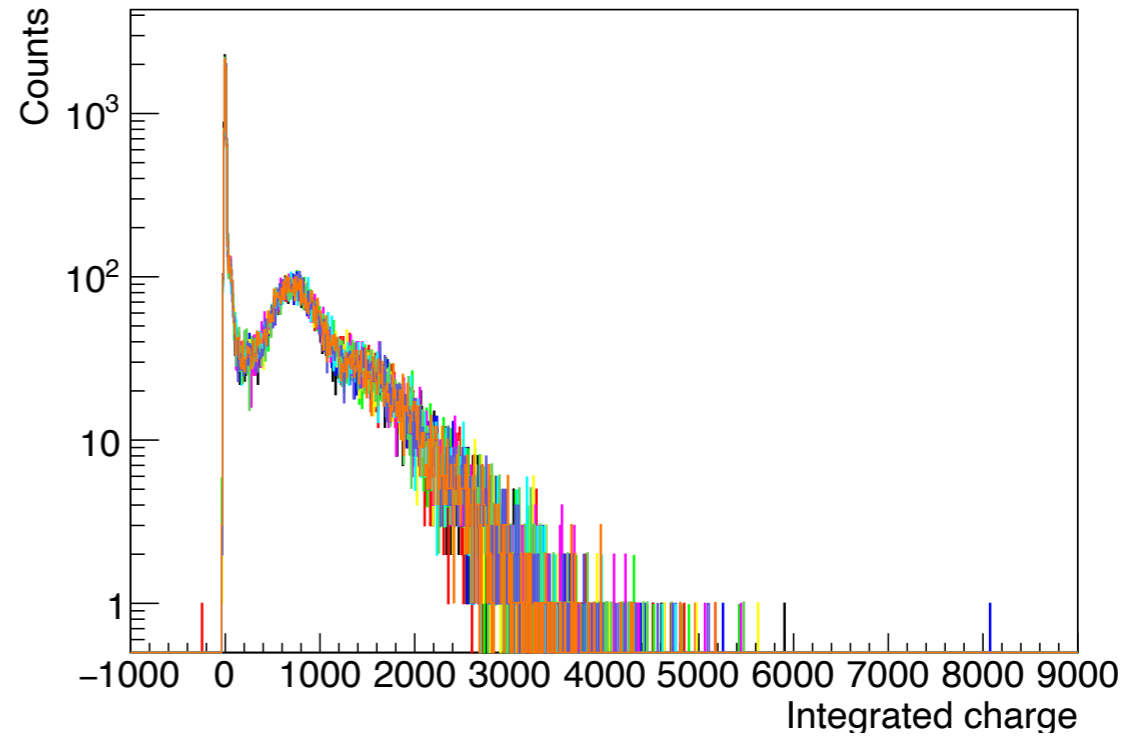
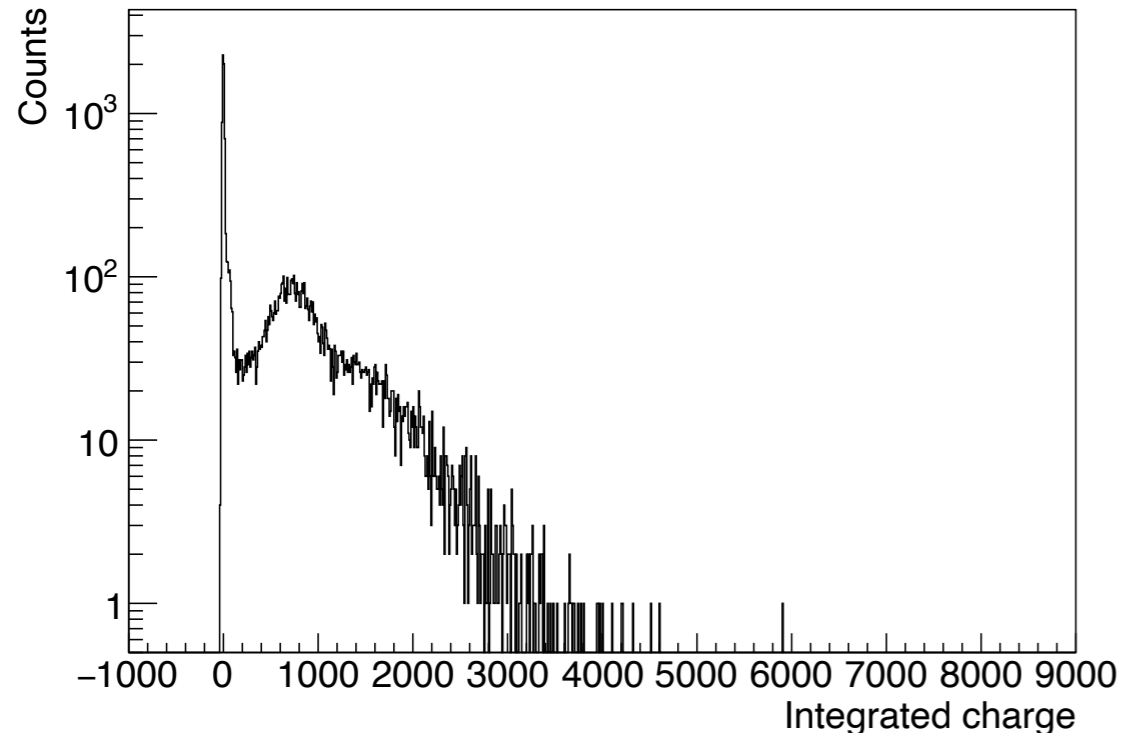
- I measured time dependence of light intensity two times.
- I fixed two dark boxes.
- I used another 3-inch PMT as the monitor PMT.



# Monitor PMT in 1st measurement

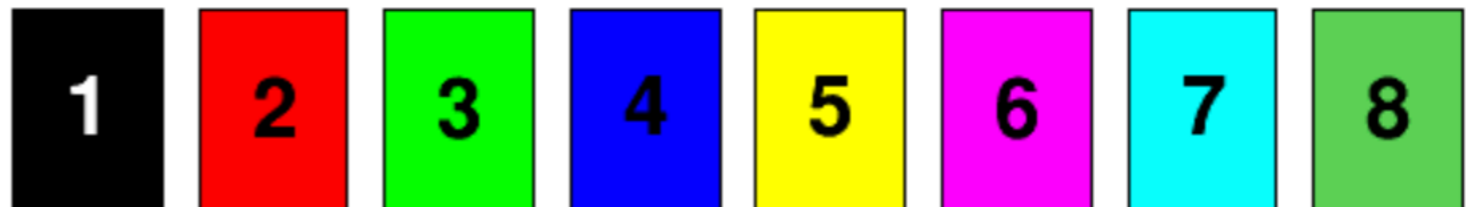
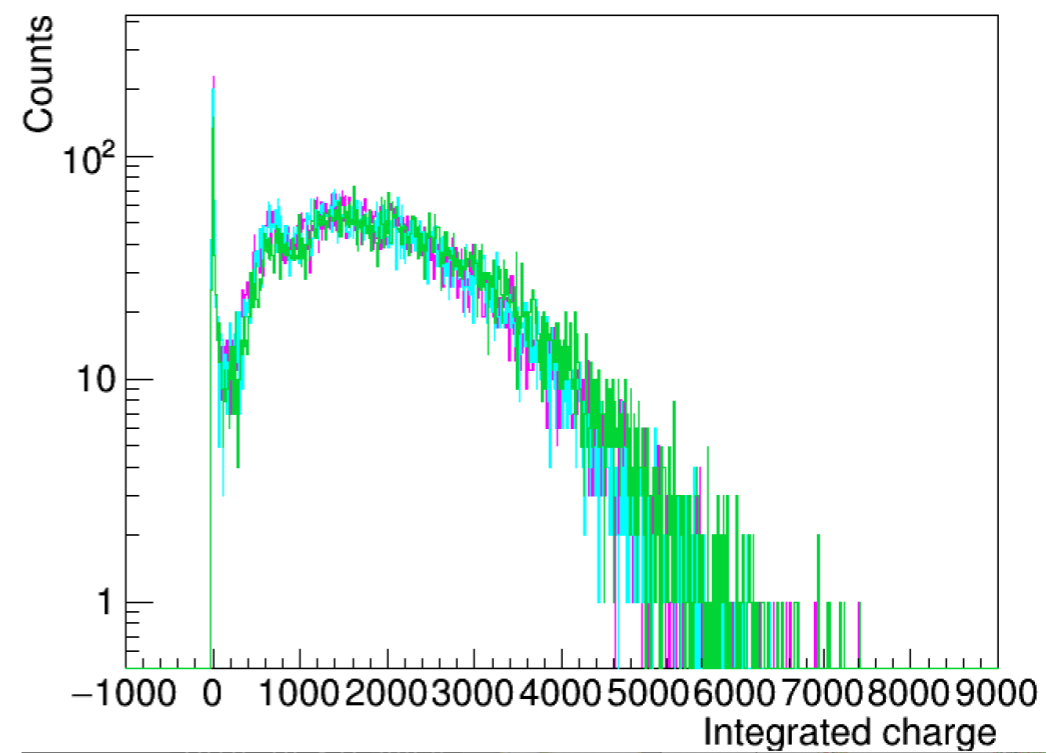
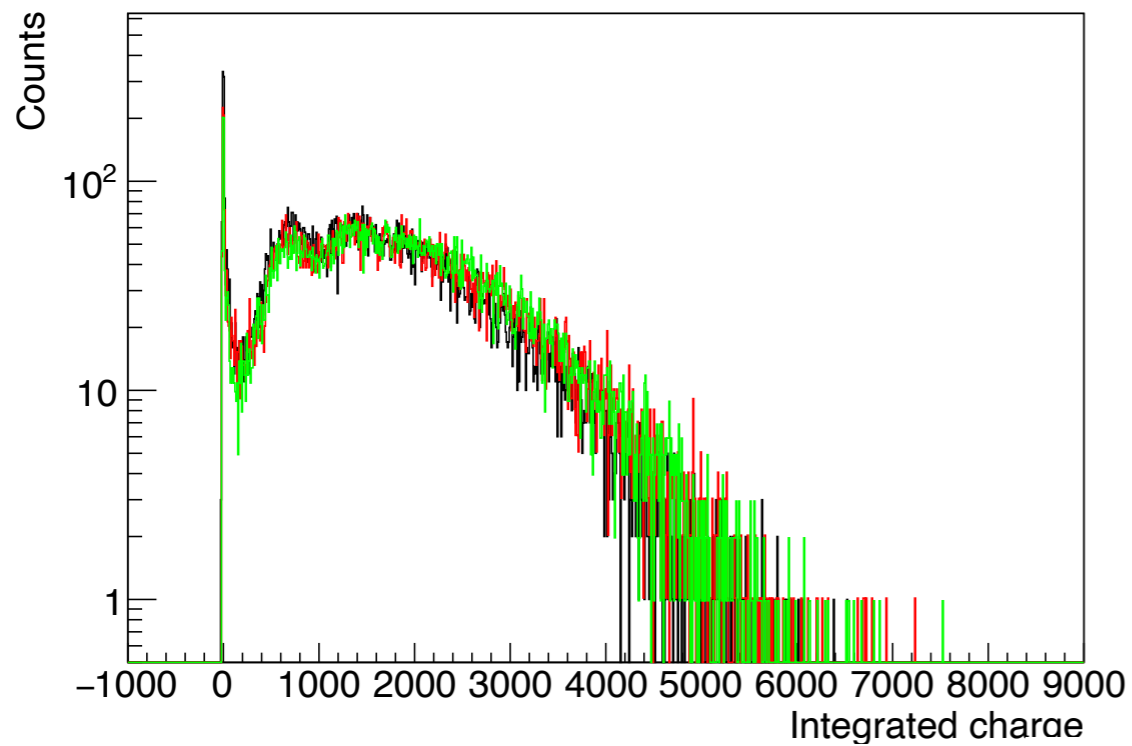
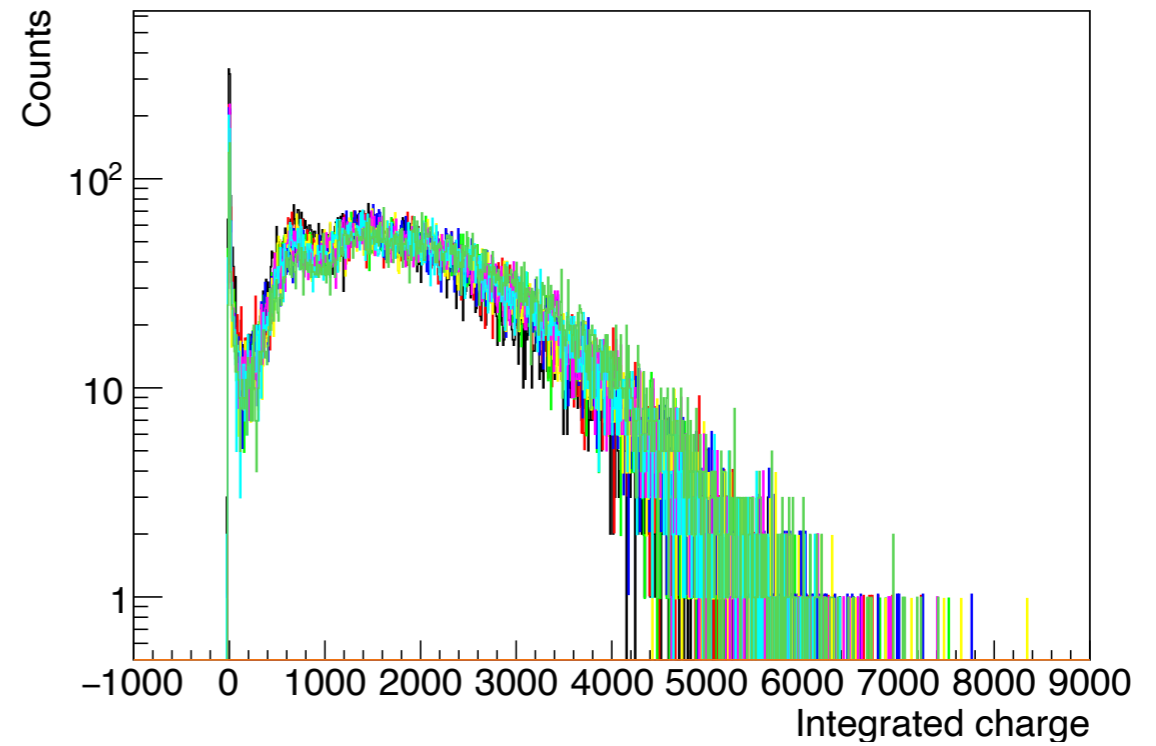
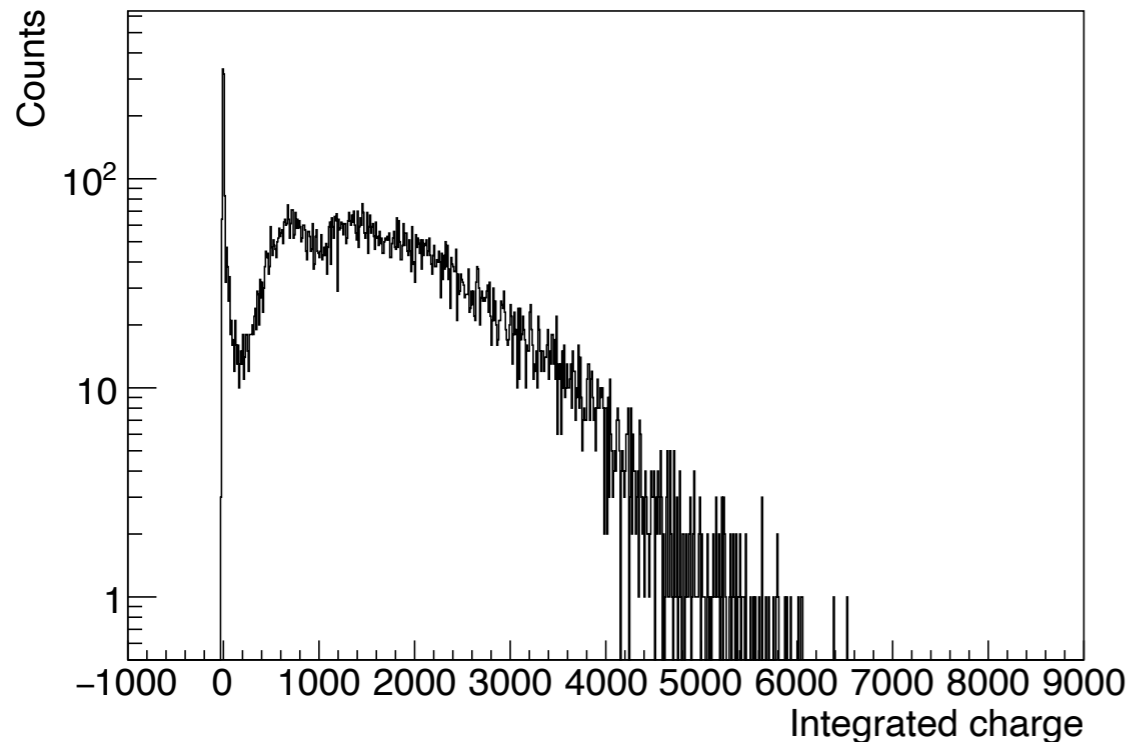


# 3-inch PMT in 1st measurement

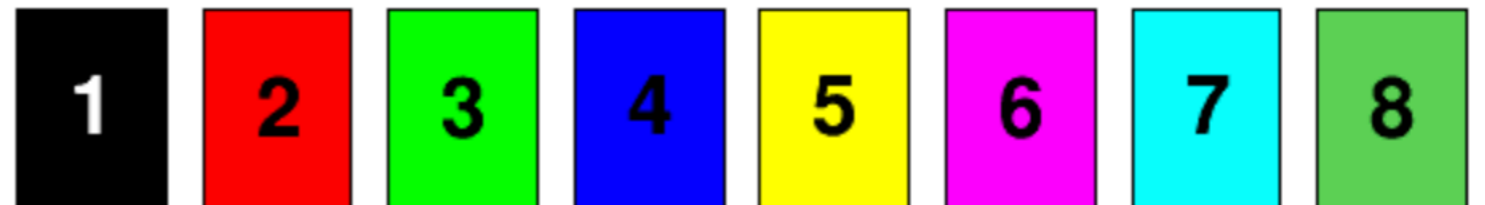
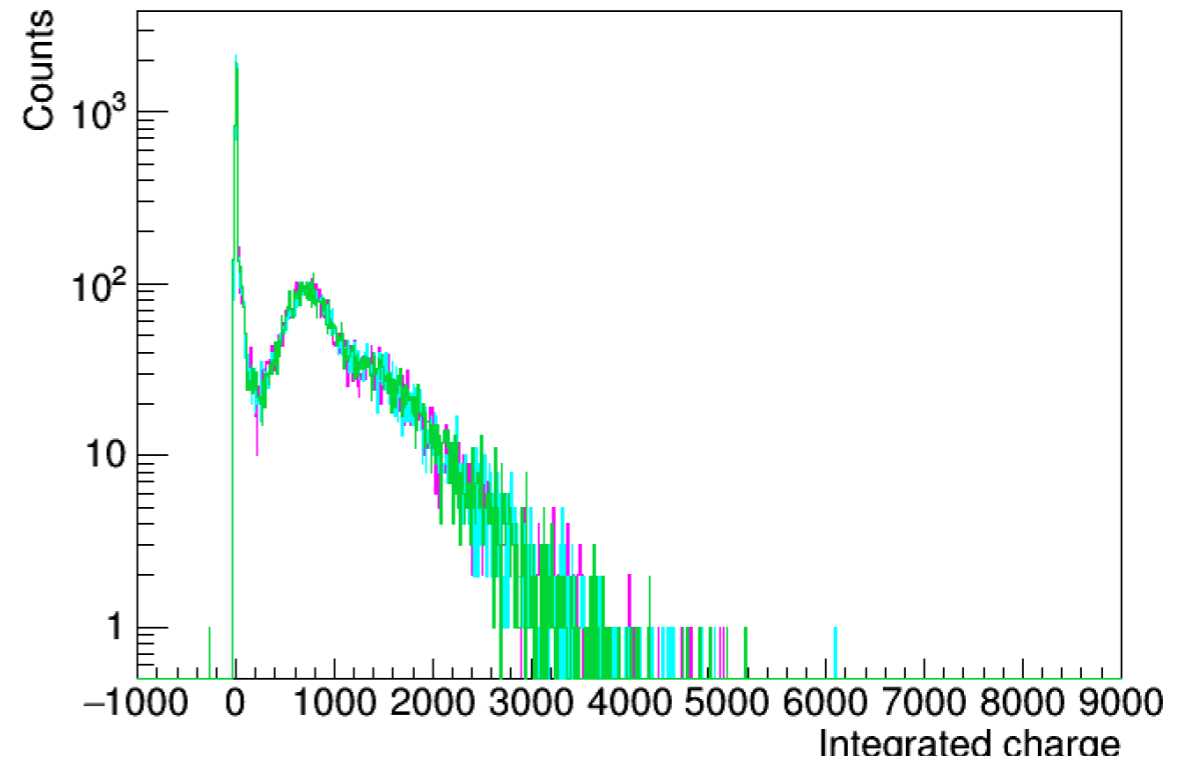
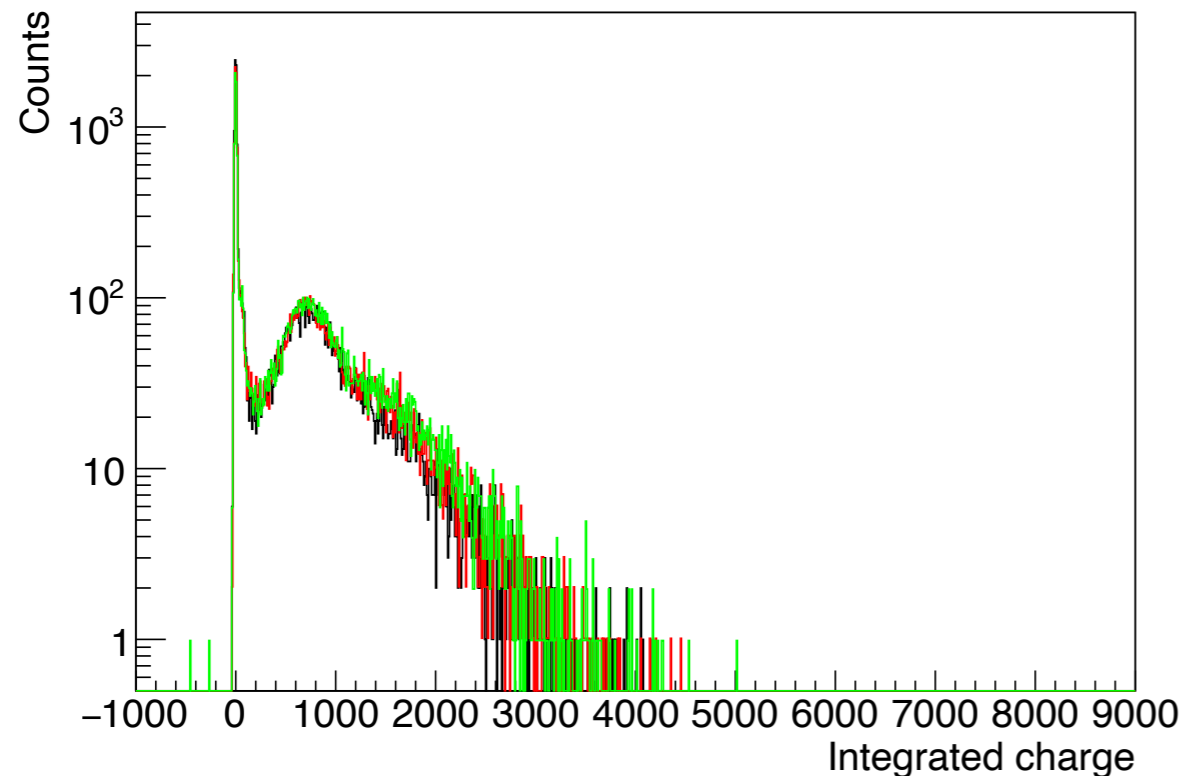
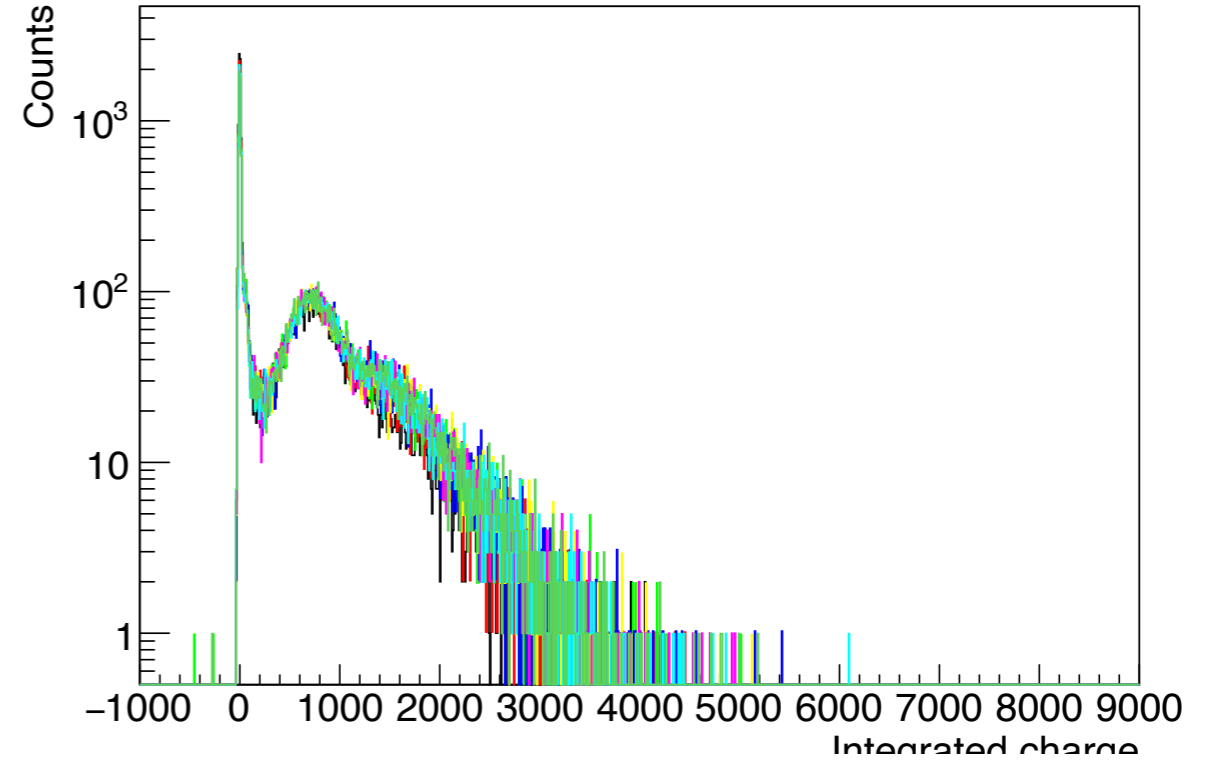
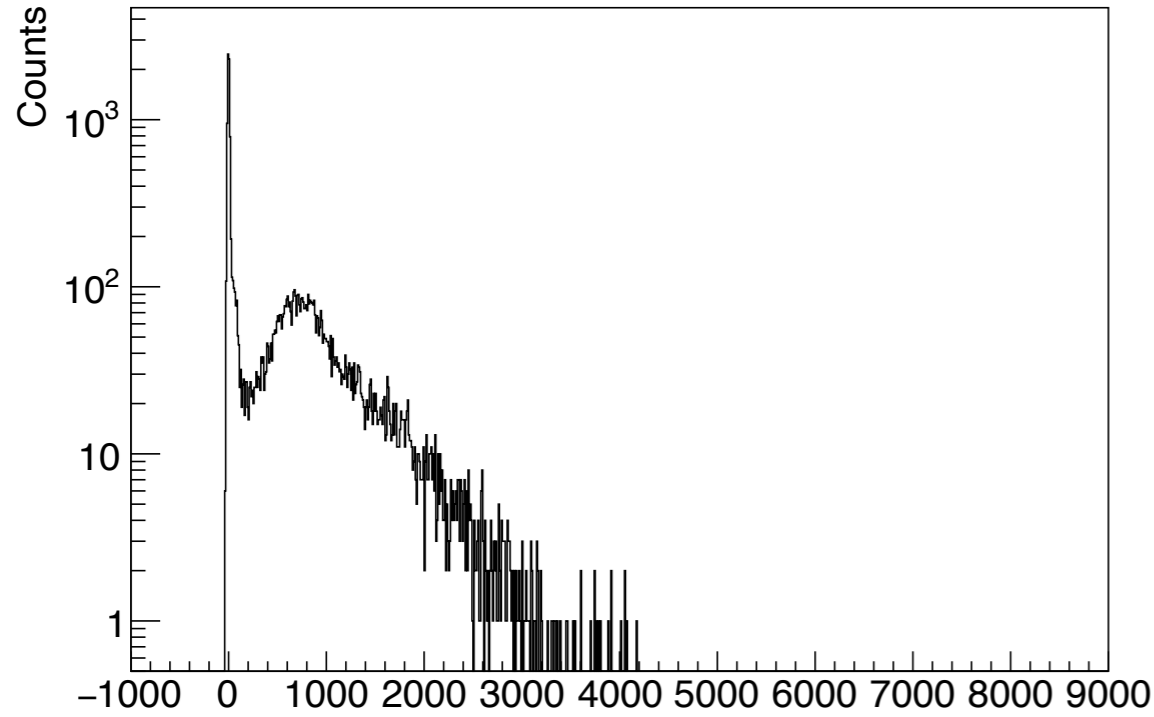




# Monitor PMT in 2nd measurement



# 3-inch PMT in 2nd measurement

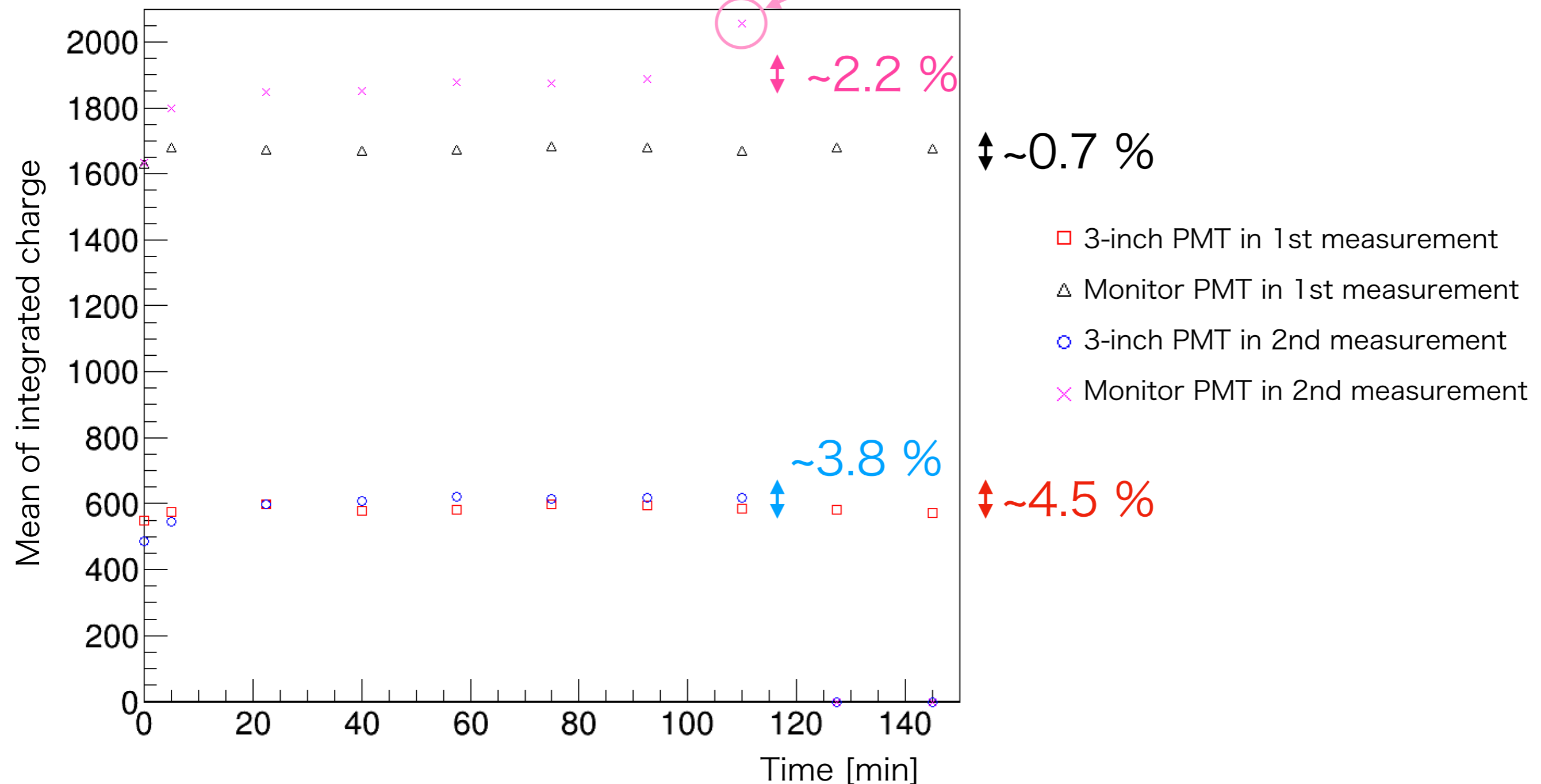


# Magnetic field effects

- I checked time dependence of light intensity two times.
- Light intensity was stable.

This plot has different value.

- I touched laser fiber at this measurement.



# To do

- I will fix two boxes and laser fiber.
- I will change the magnitude of the magnetic field with coil.
- I will measure the relative efficiency.