

Status Report

05/31/2019

Tokyo University of Science

Michitaka Inomoto

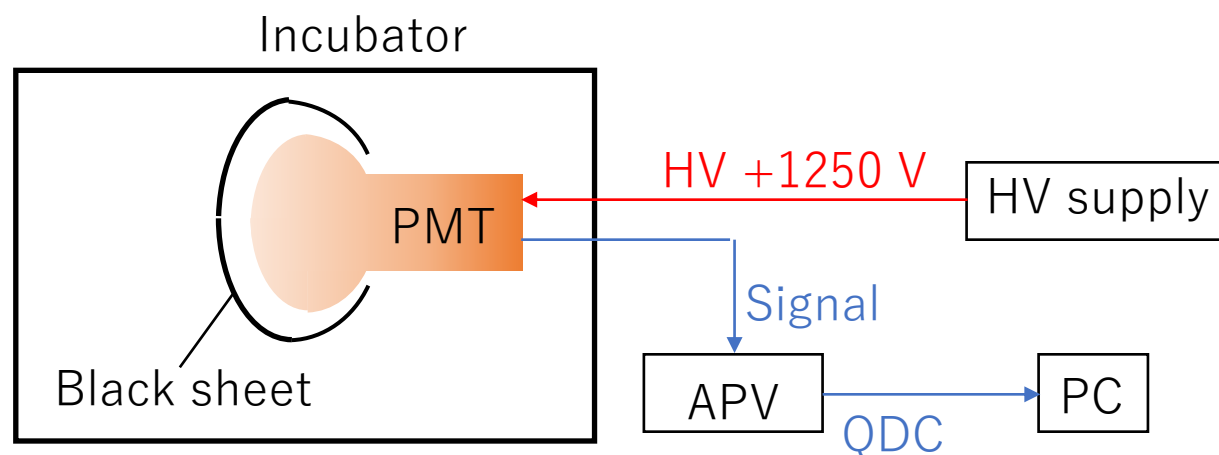
Temperature dependence

- Changed temperature (5 °C-21 °C) with the incubator, and checked changes in dark rate of HA coated PMT.

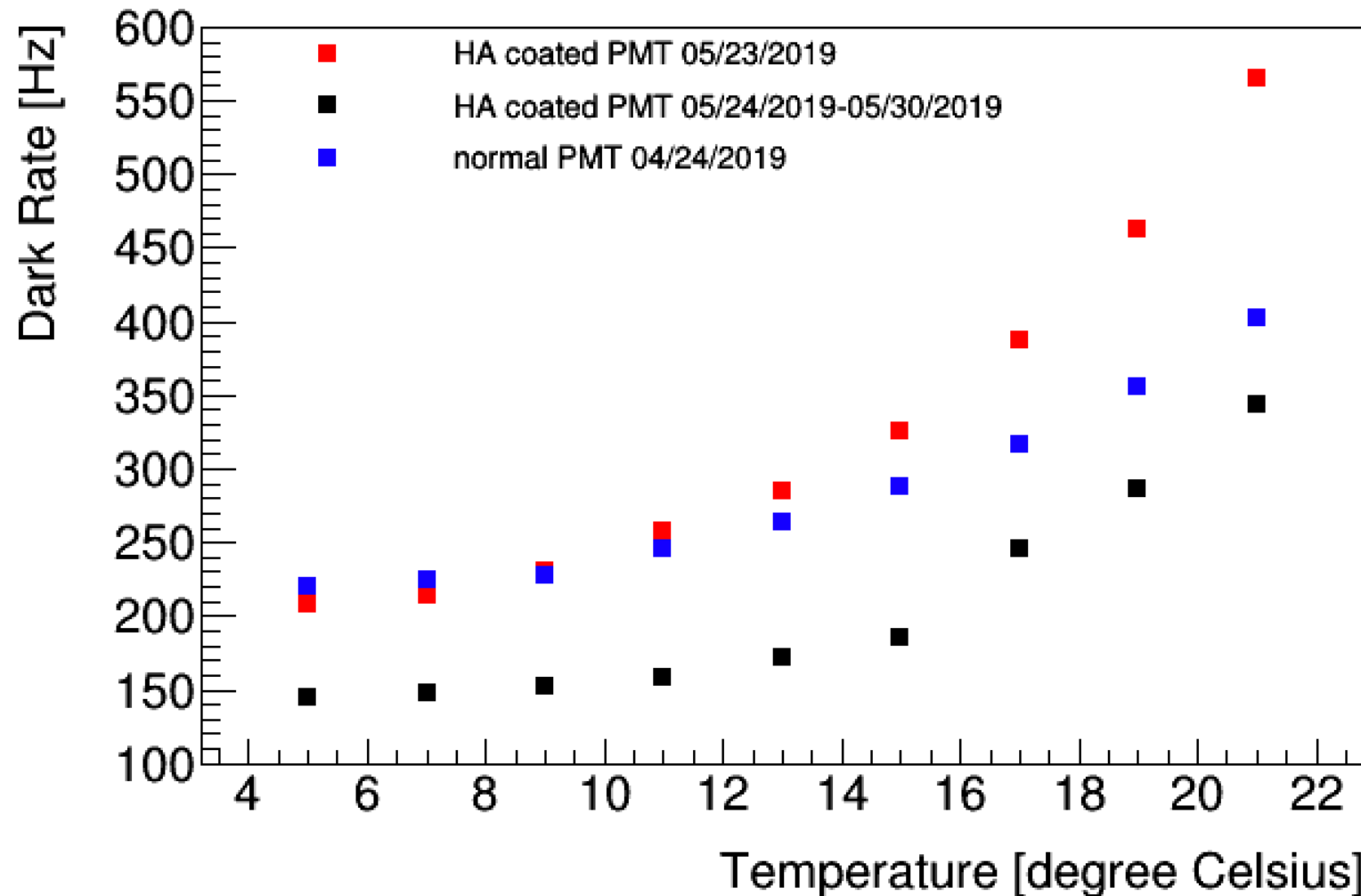
“Dark Current Rate” is defined as follows:

$$\text{Dark Current Rate} = \frac{\text{the number of PMT's signals}}{\text{Real Time (600 s)}}$$

“the number of PMT's signals” is the counts above the threshold.



Temperature dependence



Red: 1st measurement

Measurement order:

5, 7, 9, 11, 13, 15, 17, 19, 21

Black: 2nd measurement

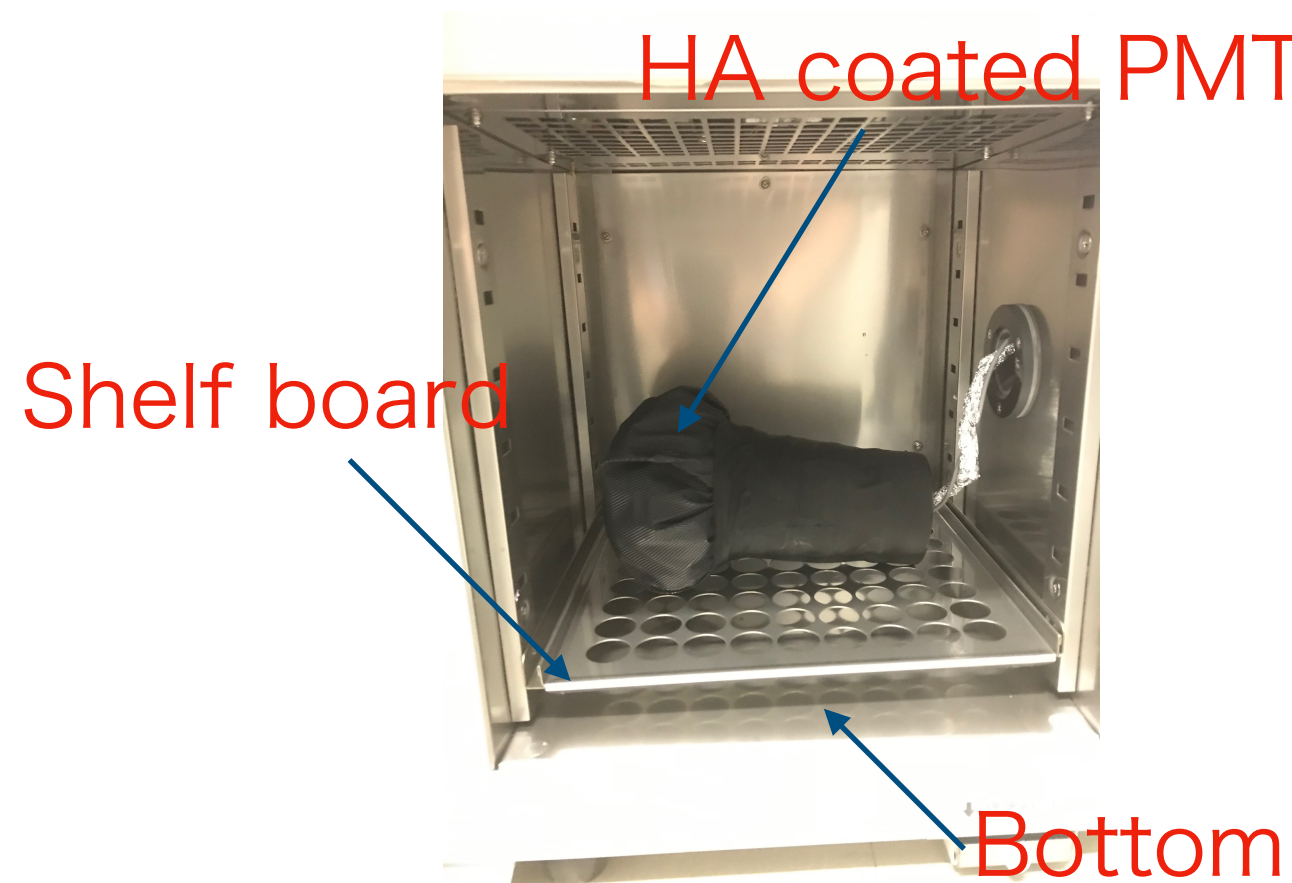
Measurement order:

5, 7, 9, 11, 13, 15, 17, 19, 21

- There is different in the rate between 1st measurement and 2nd measurement. ➡ I investigated the causes.
- In over 10 °C, temperature dependence of HA coated PMT is larger than that of normal PMT.

Space to put PMT

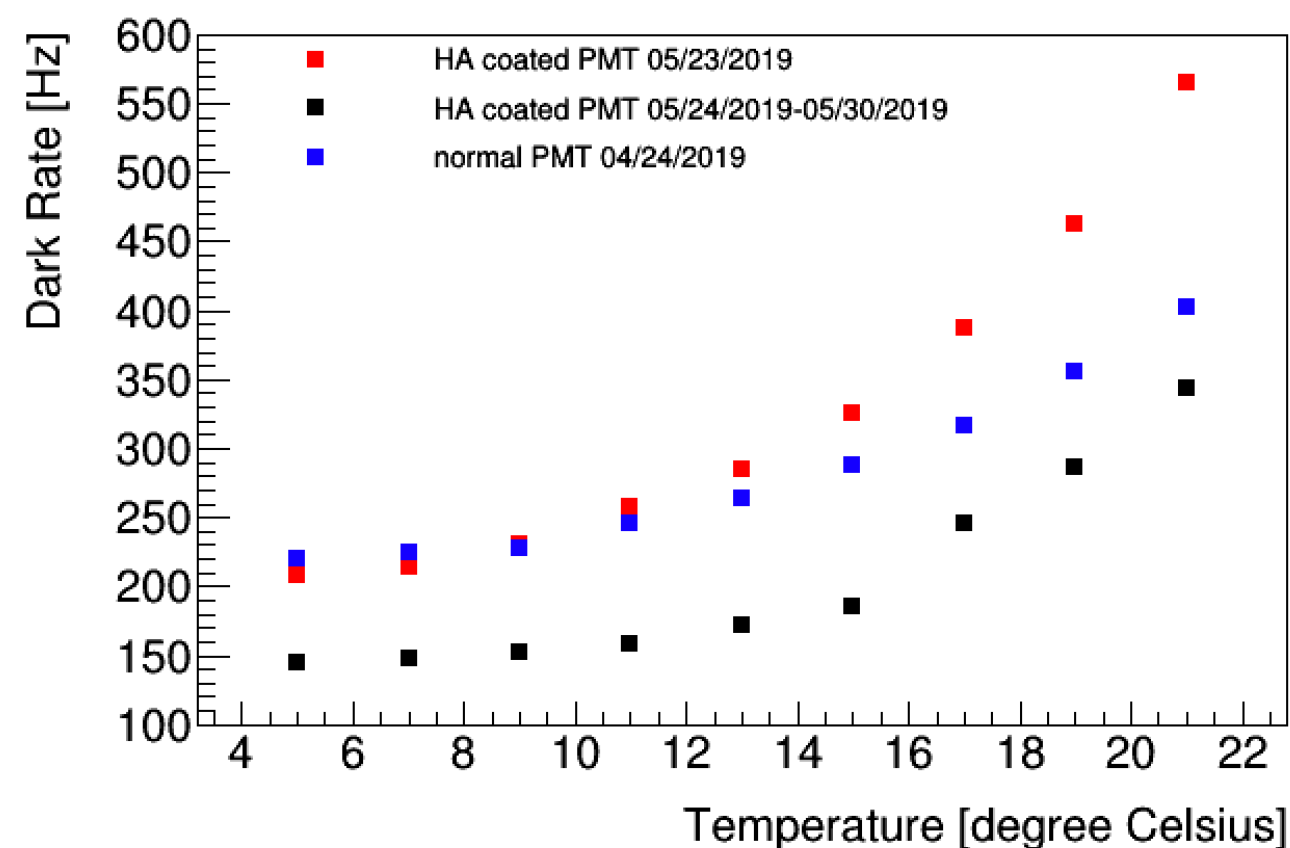
- I was directly putting PMTs on the bottom of the incubator until this 1st measurement. But, I put the HA coated PMT on the shelf board in this 2nd measurement.
- According to a manual for the incubator, it becomes harder that the incubator controls temperature when something is put on the bottom.
- I checked the difference in the rate between HA coated PMT on the bottom and that on the shelf board.



Space to put PMT

- I measured the dark rates in 13 °C with the incubator.

	Bottom	Shelf board
1st time	167.27	164.29
2nd time	167.09	171.2



- This table shows no significant difference in the rate between the PMT on the bottom and that on the shelf board.

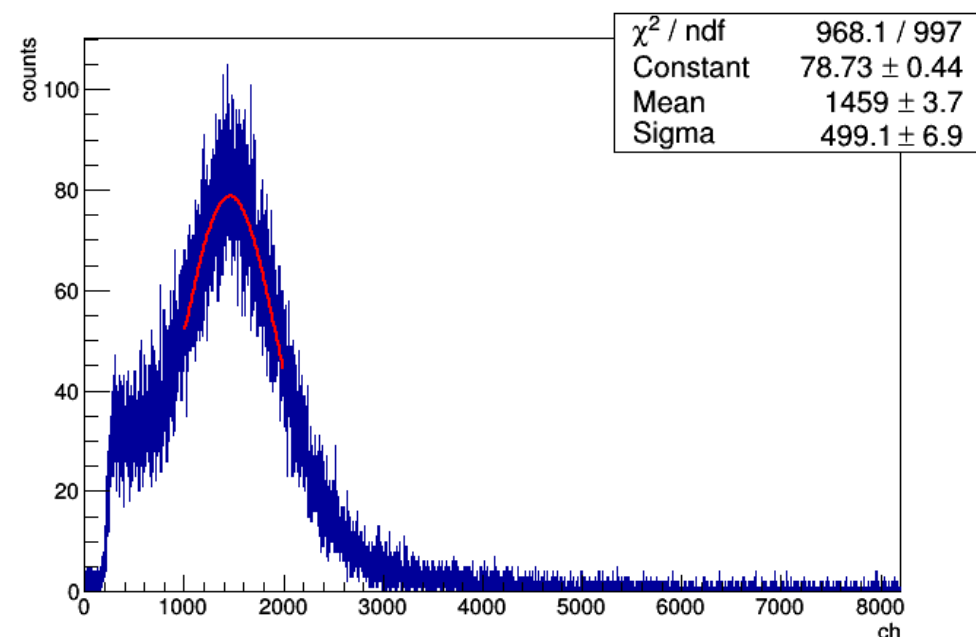
➡ The difference in the space is not one of the causes.

Next

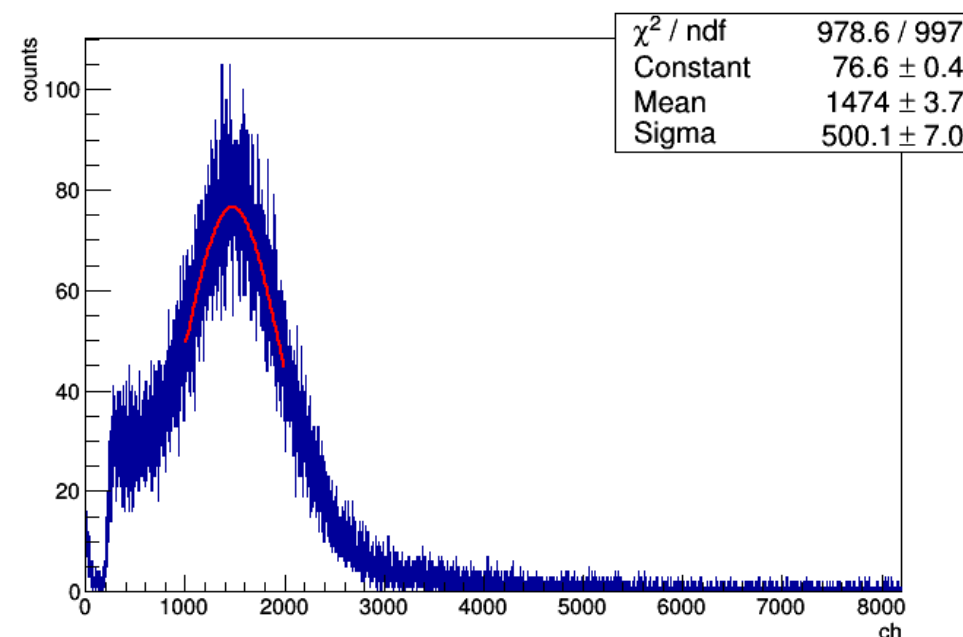
- Will measure the rate of HA coated PMT in the same setup as this 2nd measurement again.
- Will checked the temperature dependence of the rate with a dark box.

Backup

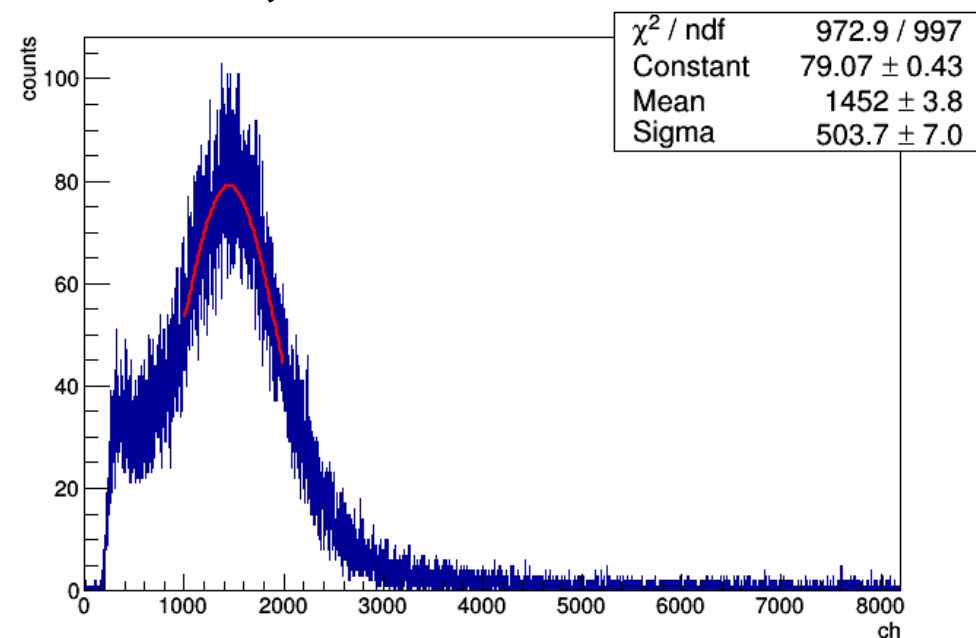
Bottom, 1st time



Shelf board, 1st time



Bottom, 2nd time



Shelf board, 2nd time

