Status Report

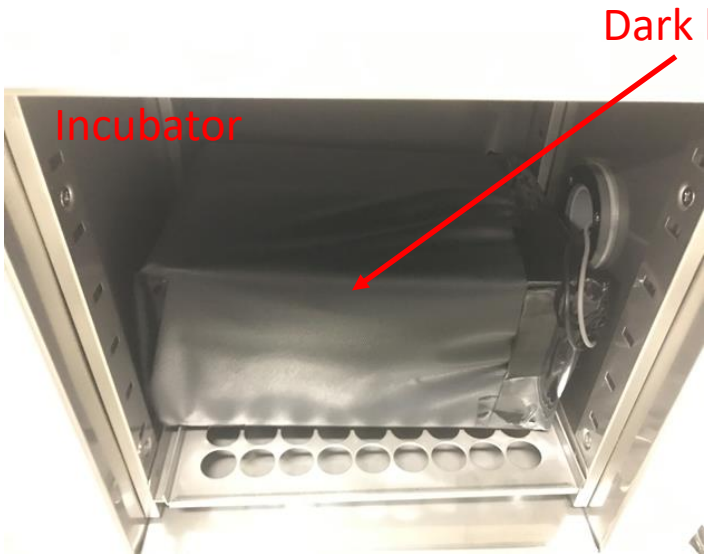
06/21/2019

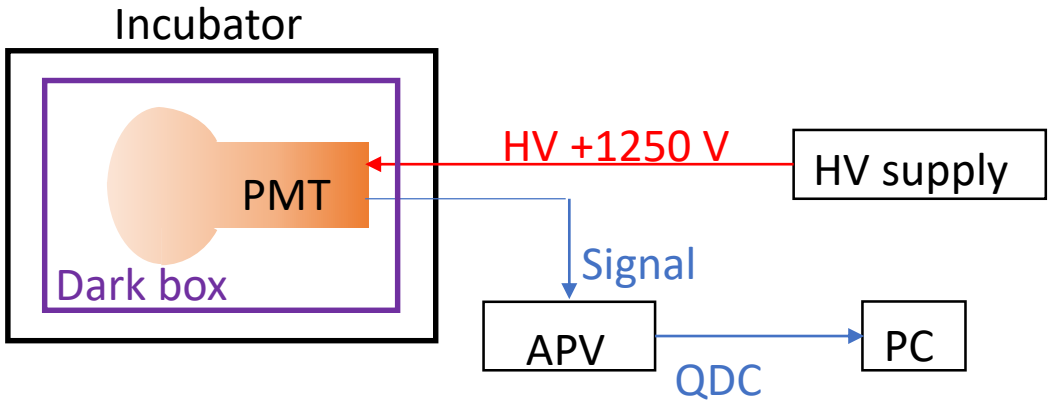
Tokyo University of Science

Michitaka Inomoto

Dark Box

- Kinoshita-san, who is another student in TUS, made a dark box.
- We put HA coated PMT into the Box with fixtures made by 3D printer.





Time dependence

- We measured the time dependence of dark rate with the dark box to know how long it takes to stabilize the dark rate.
- We checked the dark rate in 13 ℃.

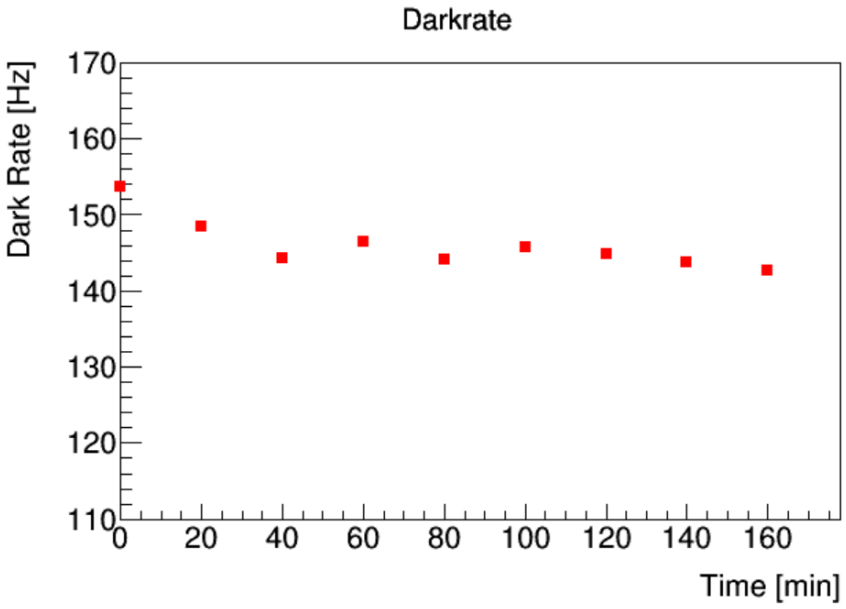
"Dark Current Rate" is defined as follows:

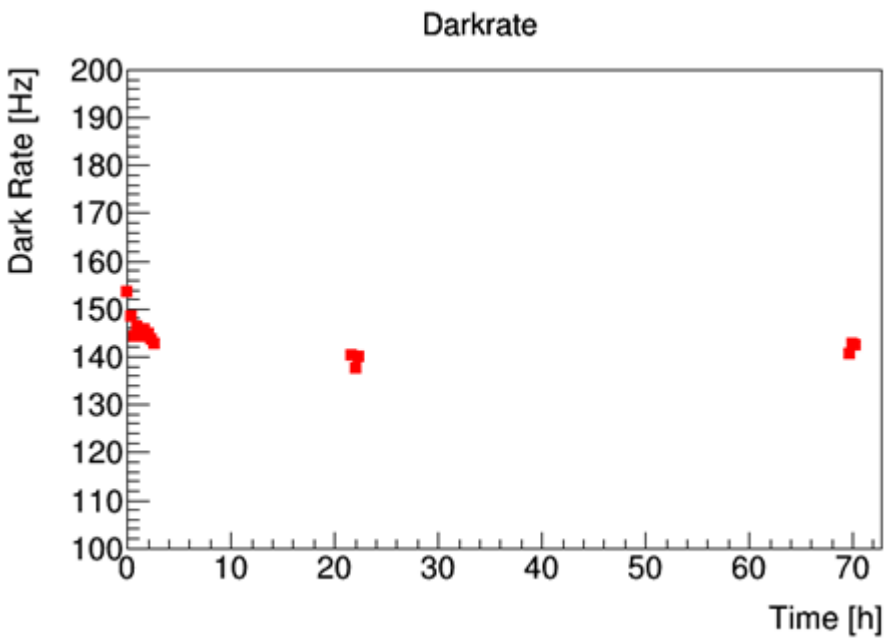
$$\text{Dark Current Rate} = \frac{\text{the number of PMT's signals}}{\text{Real Time (600 s)}}$$

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

Time dependence

- We measured the time dependence for about 3 days.

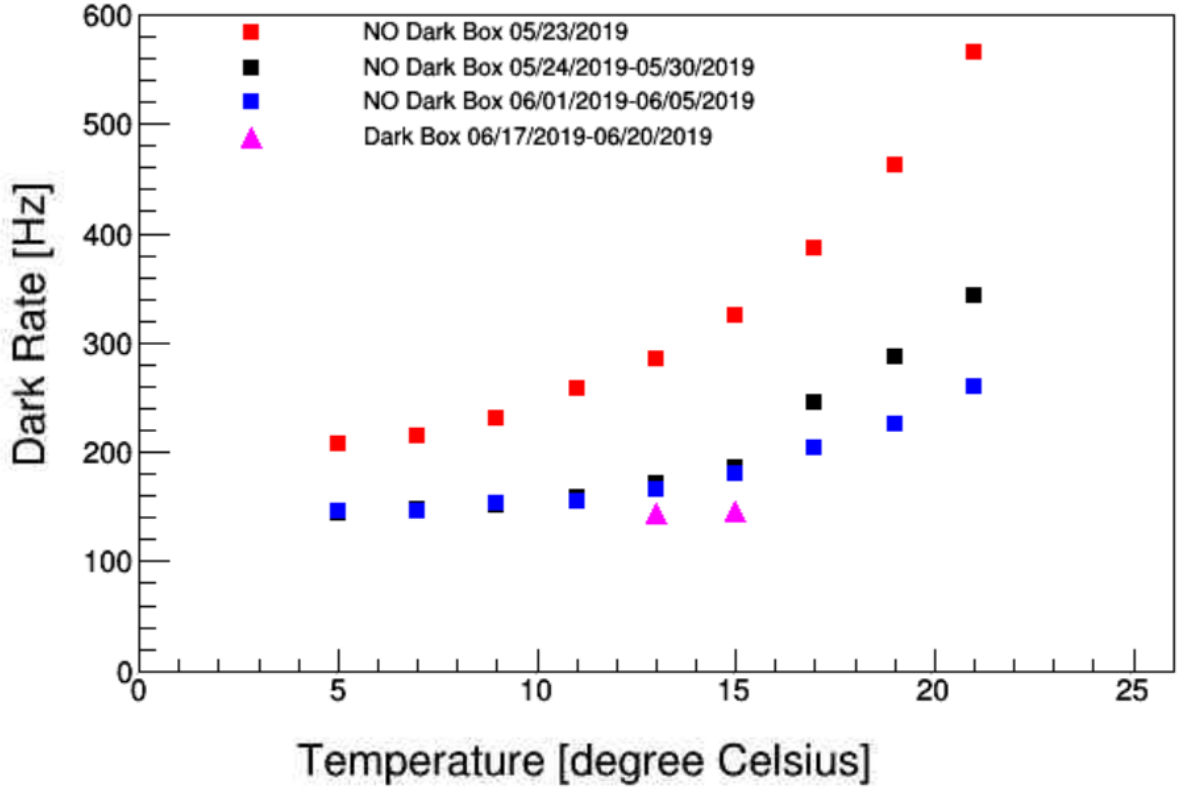




- These results show that the dark rate is stable after 40 mins or more.
- From now on, we will wait for 40 mins after the temperature is stable.

Temperature dependence

- We compared the dark rate with the dark box with that without it.
- We used HA coated PMT for those measurements.

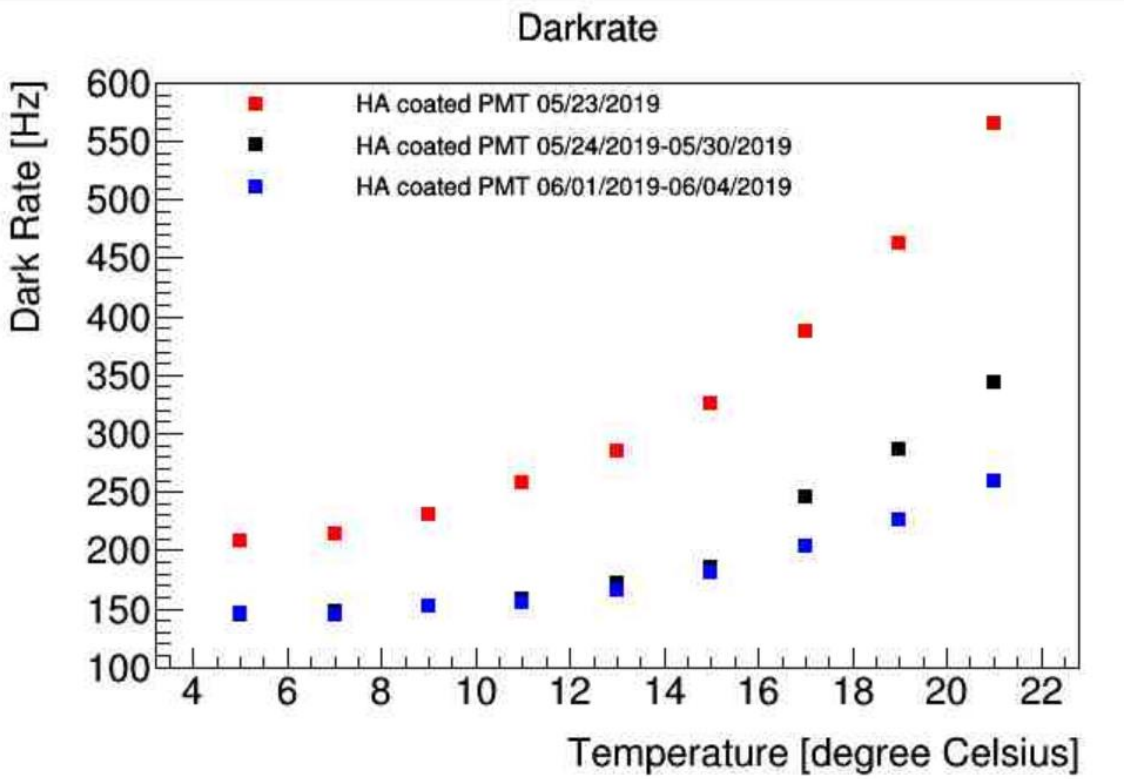


- In this figure, the dark rate with the dark box is lower than that without it.
- These results tend to show that the dark rate with the dark box is less temperature dependence than that without it.

Future plan

- We will check the dark rate with the dark box in the higher temperature.

Backup



Measurement order

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

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

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