Status report

Tokyo University of Science

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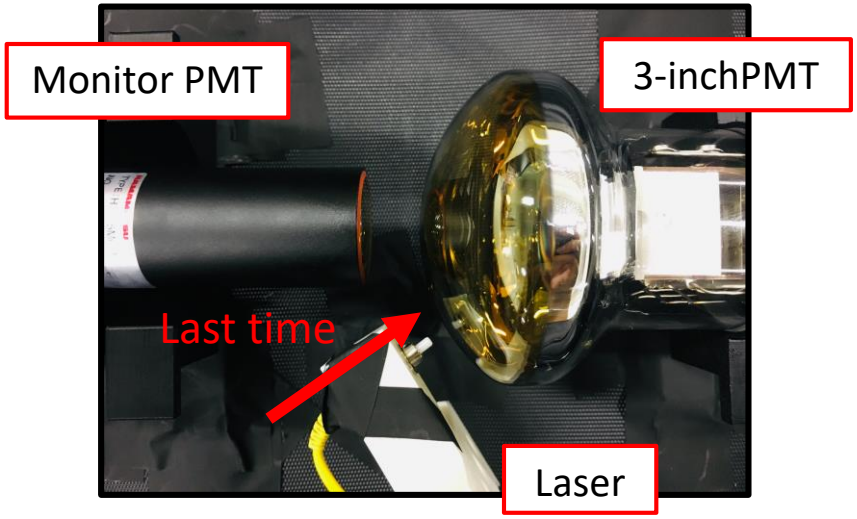
20th March, 2020

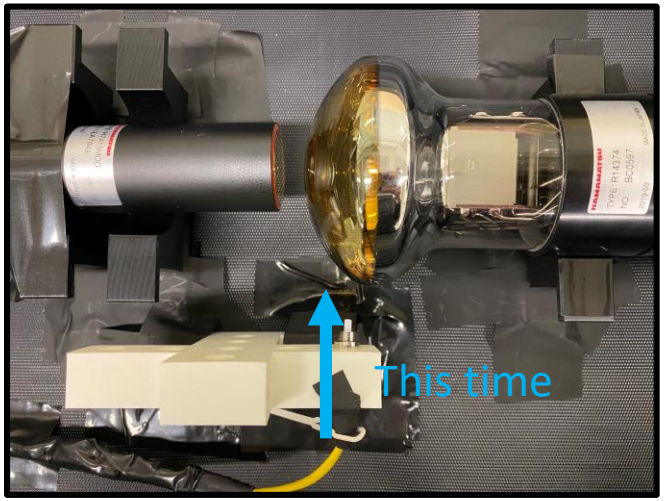
mPMT meeting

This week : PMT emission

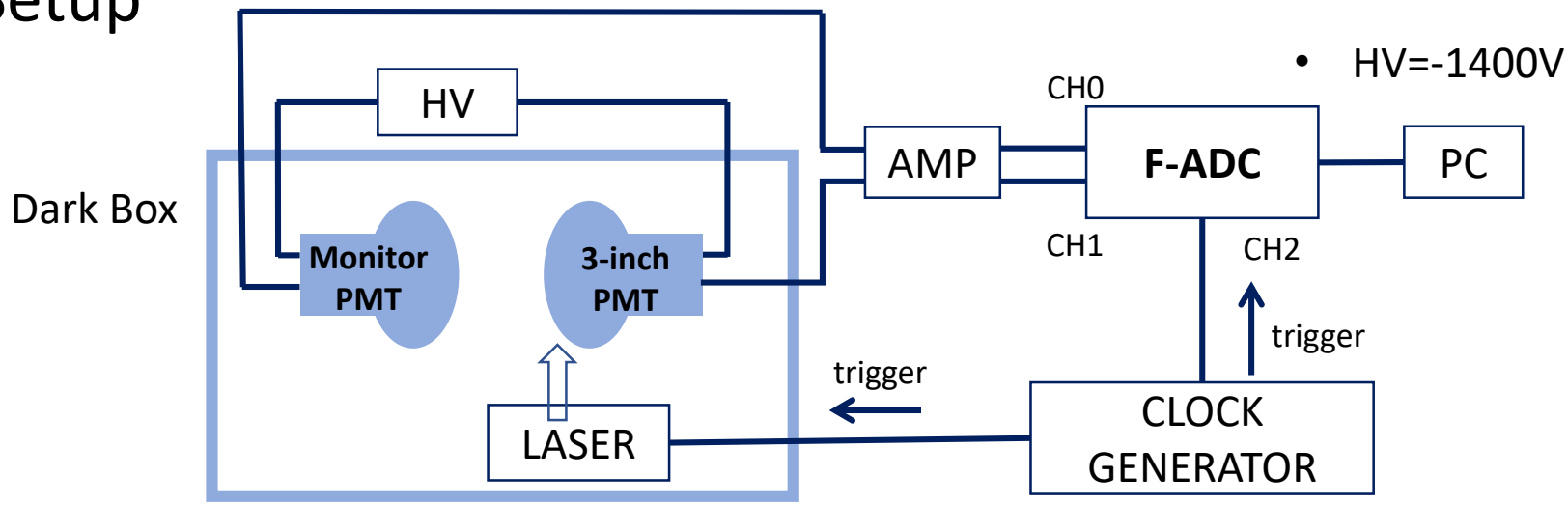
- I changed the direction of laser to illuminate photocathode.
  - check the signals of monitor PMT when the HV for 3-inch PMT was on and off.

→ We checked if monitor PMT signals were still seen or not.

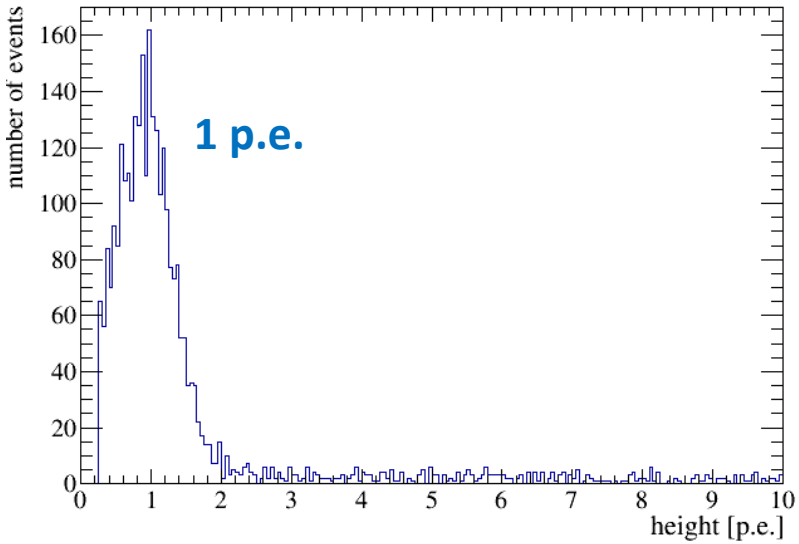


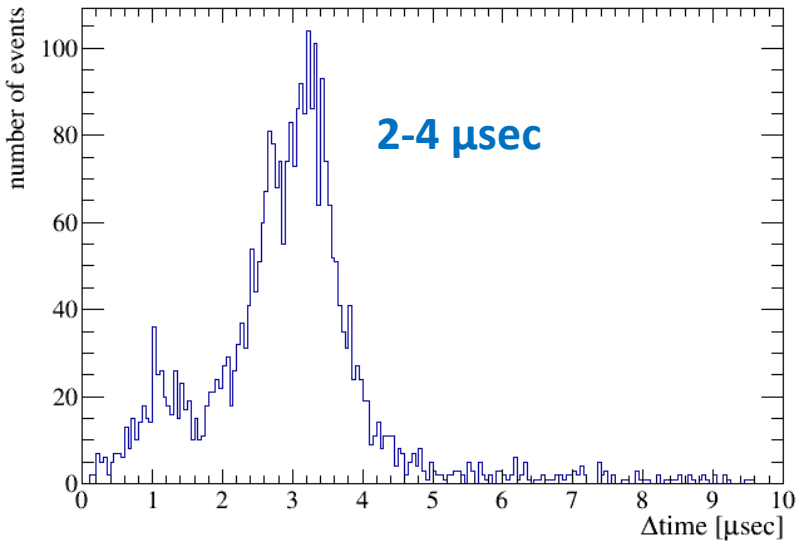


Setup



3-inch PMT (when the HV for 3" PMT was on)

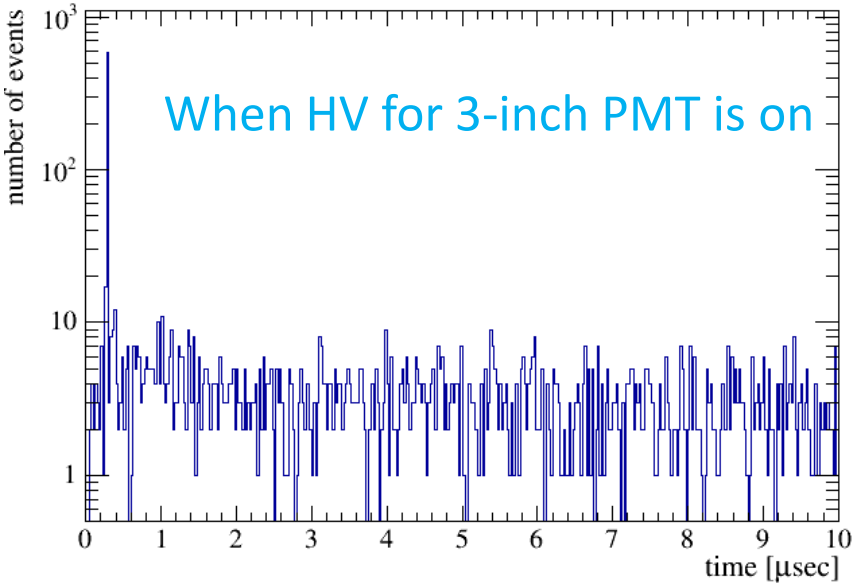


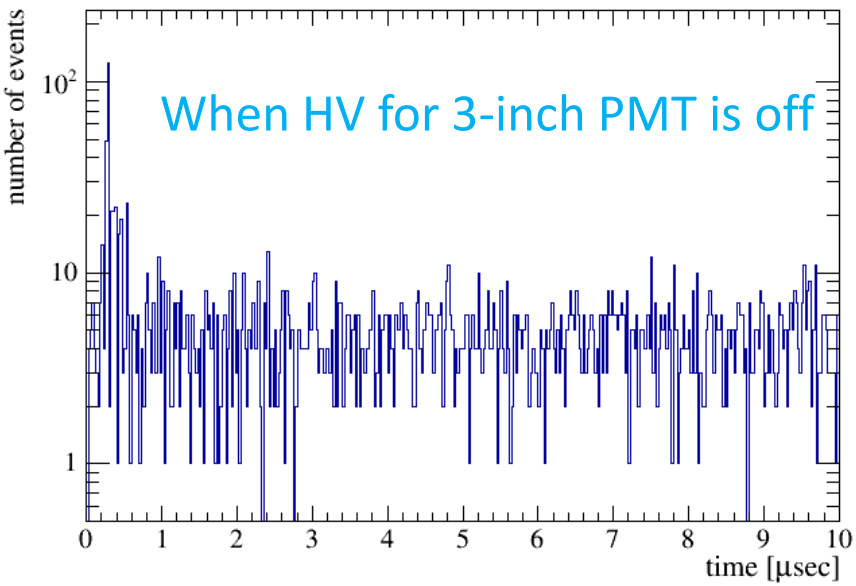


- The same characteristics of previous measurement were seen.

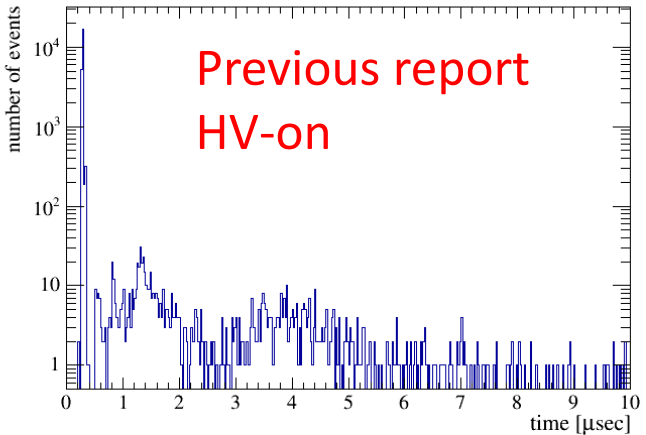
Monitor PMT

Time distribution of pulses observed by monitor-PMT (> 0.1p.e.)

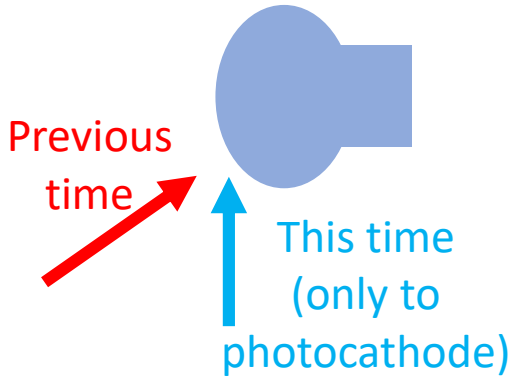




- We couldn't see signals at around 2-4 μs for both when HV is on and off.
  → the angle or spot of illuminating the laser may cause?



- We can see pulses at around 1.5 μs and 3-5 μs for previous measurement in case the HV is on.



The direction of laser

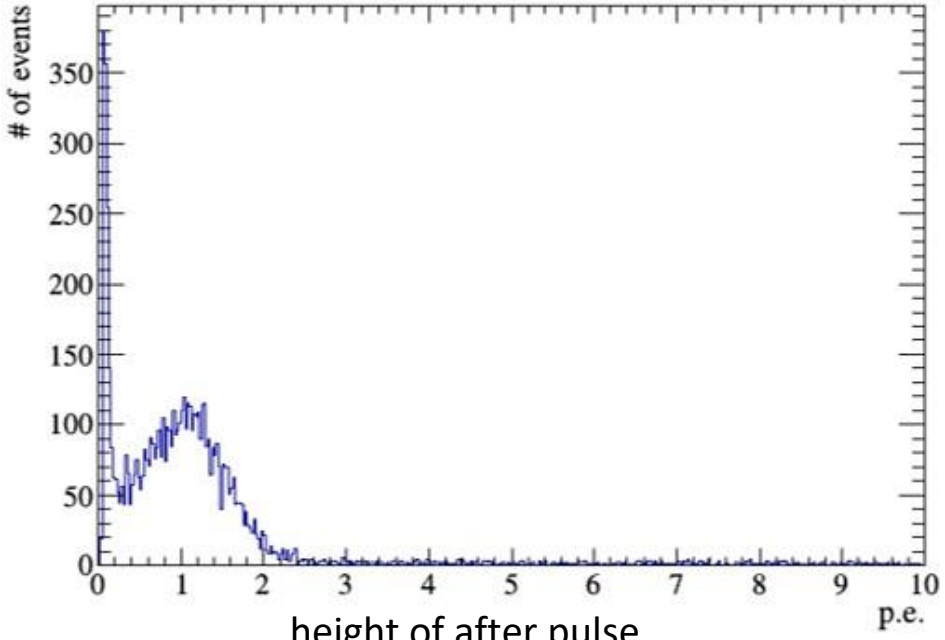
Future plan for next few weeks

- I plan to
  - increase the intensity of laser
  - check the fraction of after pulse for this laser direction

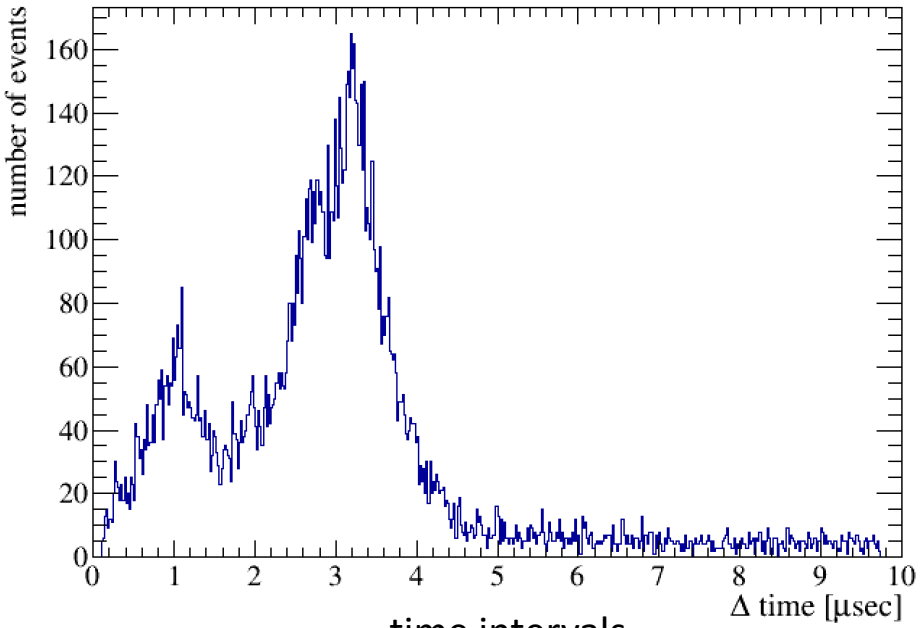
  - send this 3”PMT to Hamamatsu

after pulse - R14374

- Threshold ≈ 0.03 p.e.
- HV = -1400 V



height of after pulse

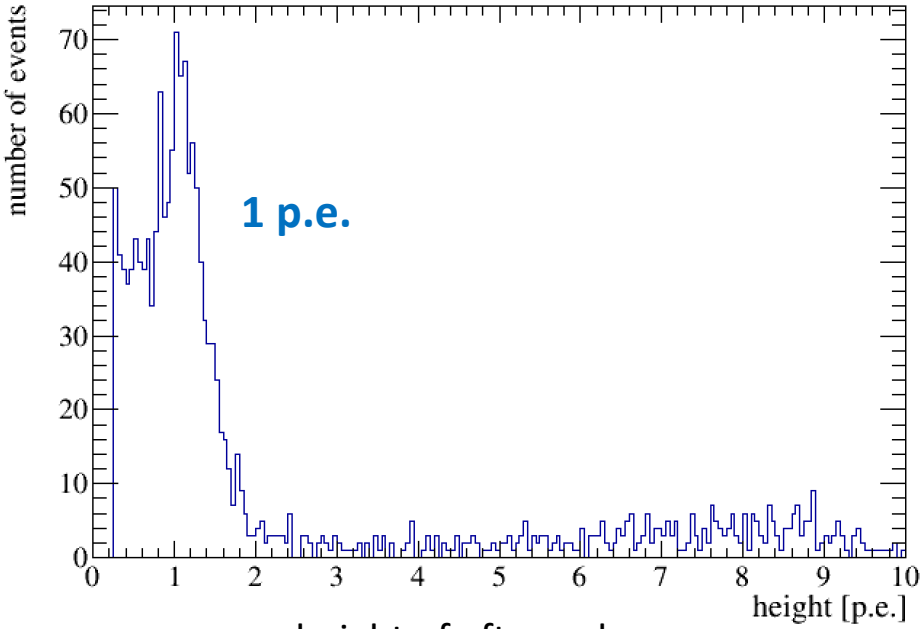


time intervals

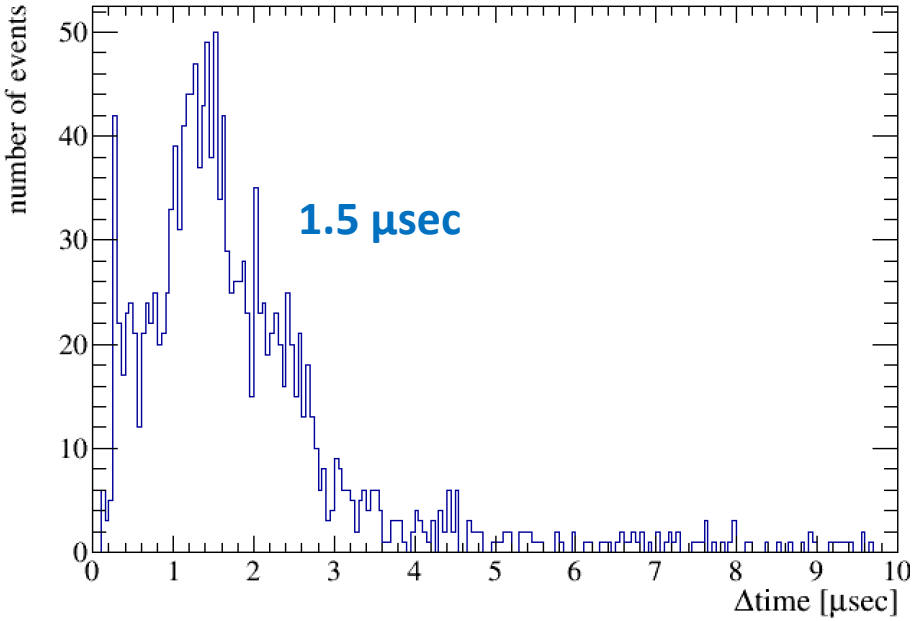
- We can see the peak at the 1 and 3 μsec in right histogram.

after pulse - H7415

- Threshold = 0.25 p.e. (analyzed same way)
- HV = -1400 V

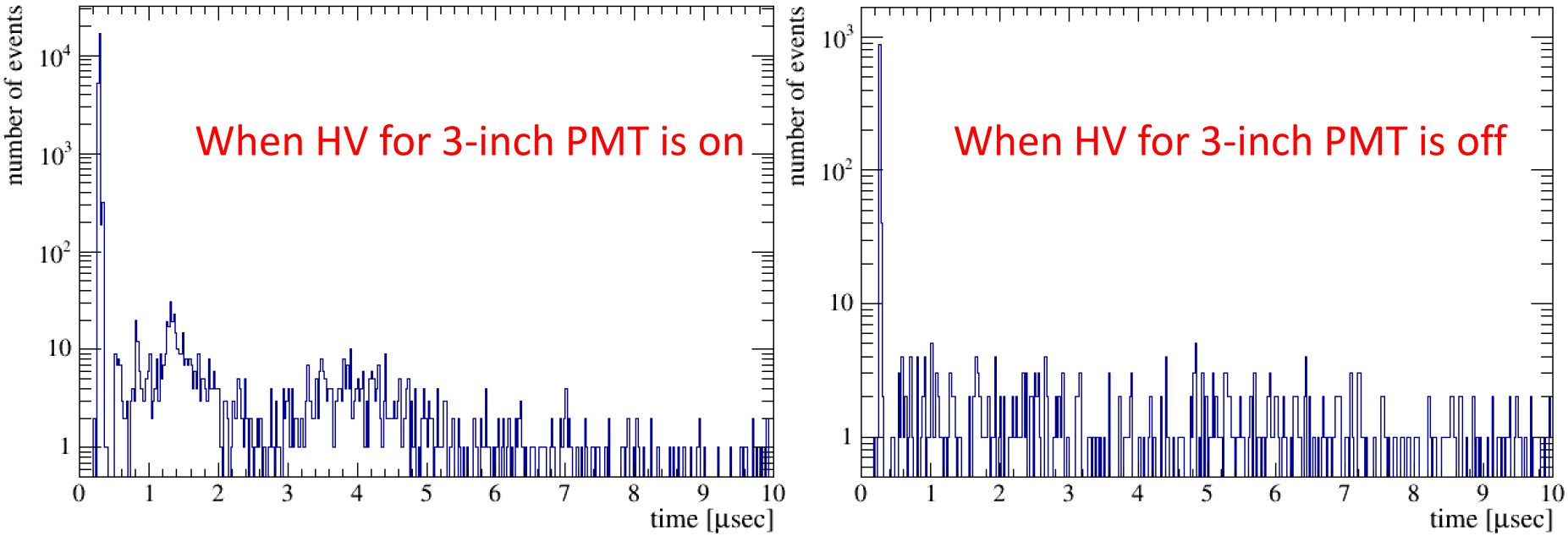


height of after pulse



time intervals

- We found after pulse (1 p.e.) at 1.5 µsec.
- The histogram of the time intervals doesn't show same tendency of 3-inch PMT.
  → The after pulses of 3-inch PMT was not caused by laser.



Time distribution of pulses observed by monitor-PMT (> 0.1p.e.)

- We can see after pulse at around 1.5 μs and 3-5 μs in case the HV for 3-inch PMT is on. No such signals were observed when HV for 3-inch PMT is off.

→ This tells the 3-inch PMT emitted the lights.