

Status report

Tokyo University of Science

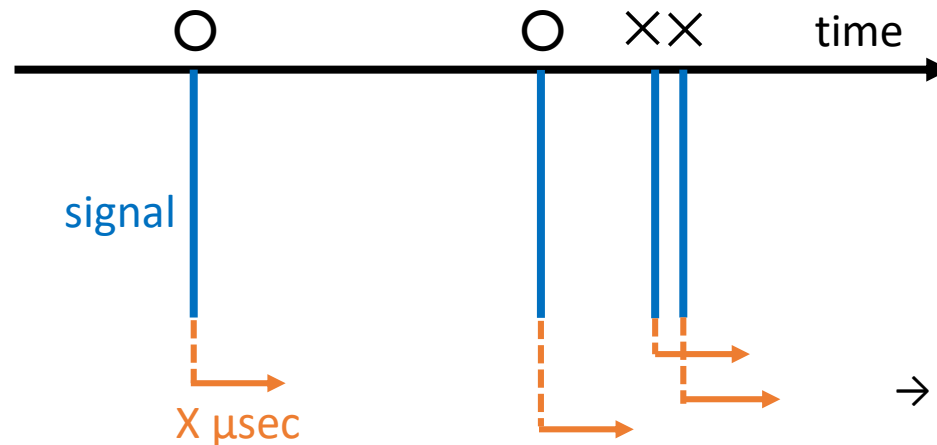
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24th January, 2020

mPMT meeting

< Dark rate time structure >

- Changing the value of time frame, I reduced the signal count within that frame and check the dark rate.



→ The rate may decrease?
(reported at last meeting)

Until this week...

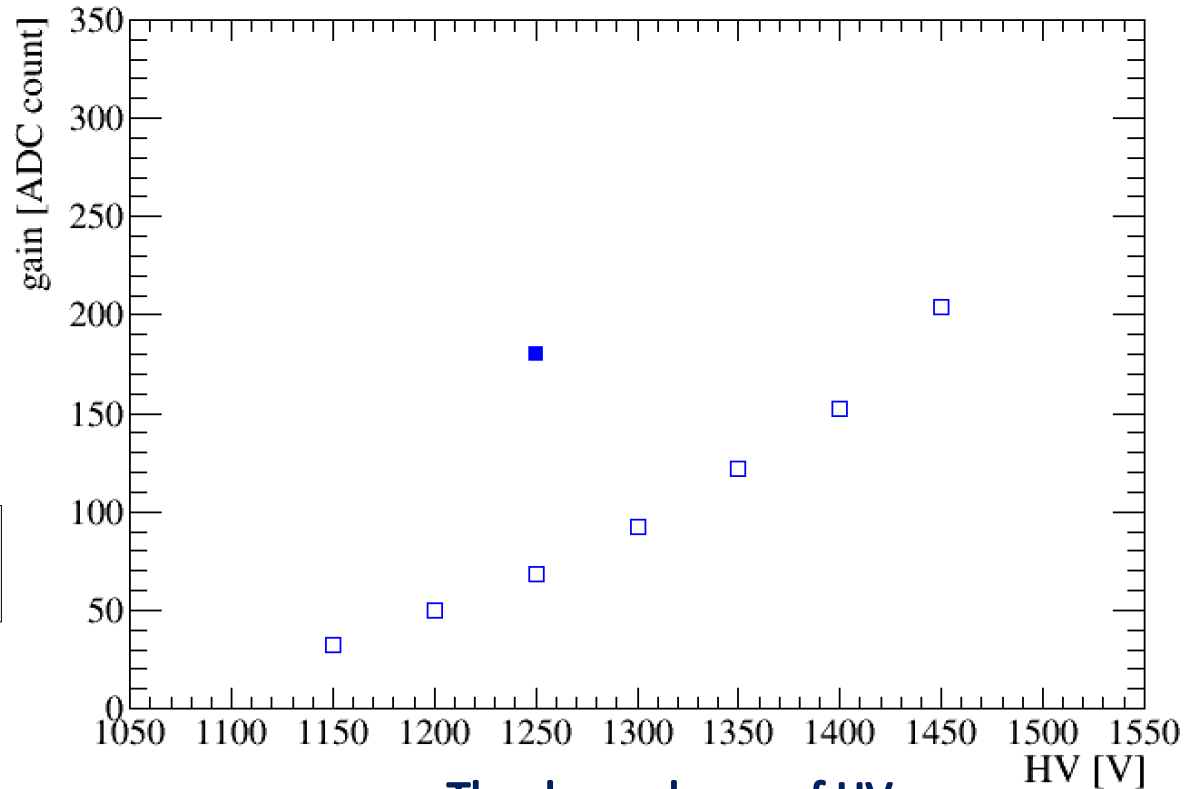
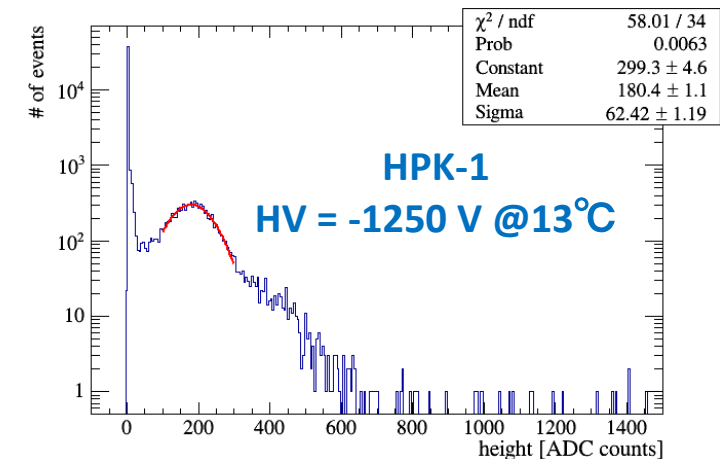
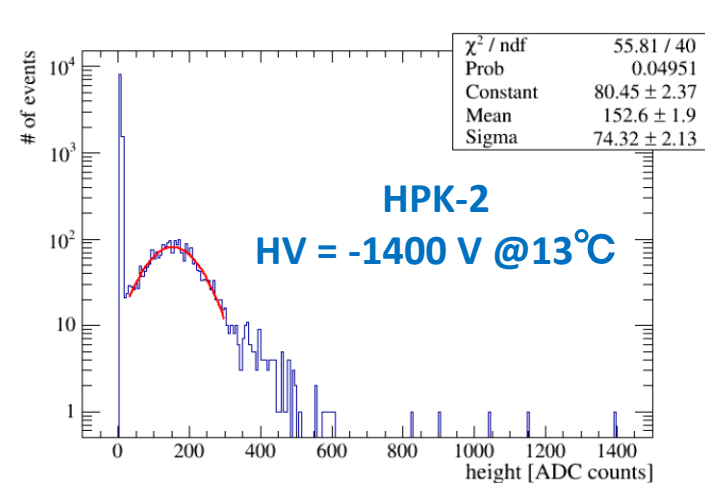
→ I tuned the HV value of another 3-inch Hamamatsu's PMT to give almost same gain, then I calculated with same way.

	ID	Type	HV
Hamamatsu	HPK-1	H14374	-1250V
	HPK-2	H14374	Tuned

← previous
measurement

HV dependence of gain

- Changing HV supplied to HPK-2, I measured 1 p.e. pulse height by illuminating low intensity laser.

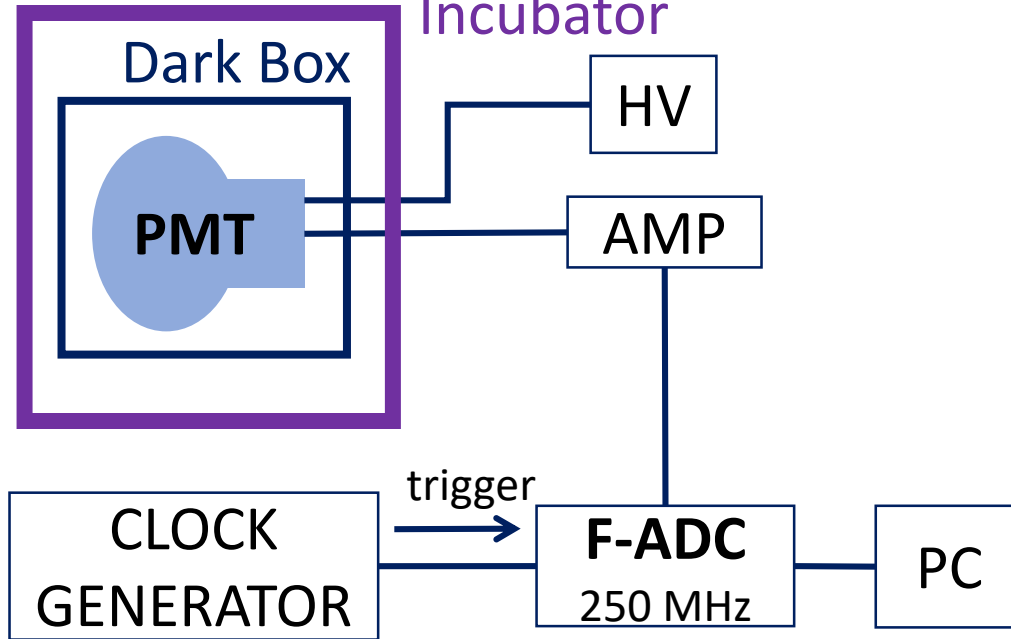


- HV = -1400V for almost same gain

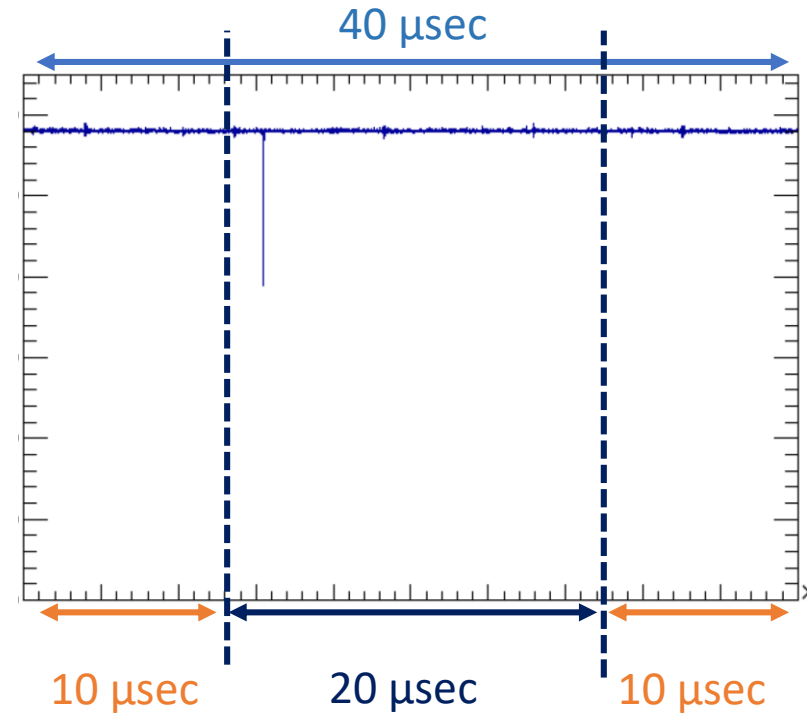
< setup >

- 13°C
- Threshold = 0.4 p.e.

Incubator



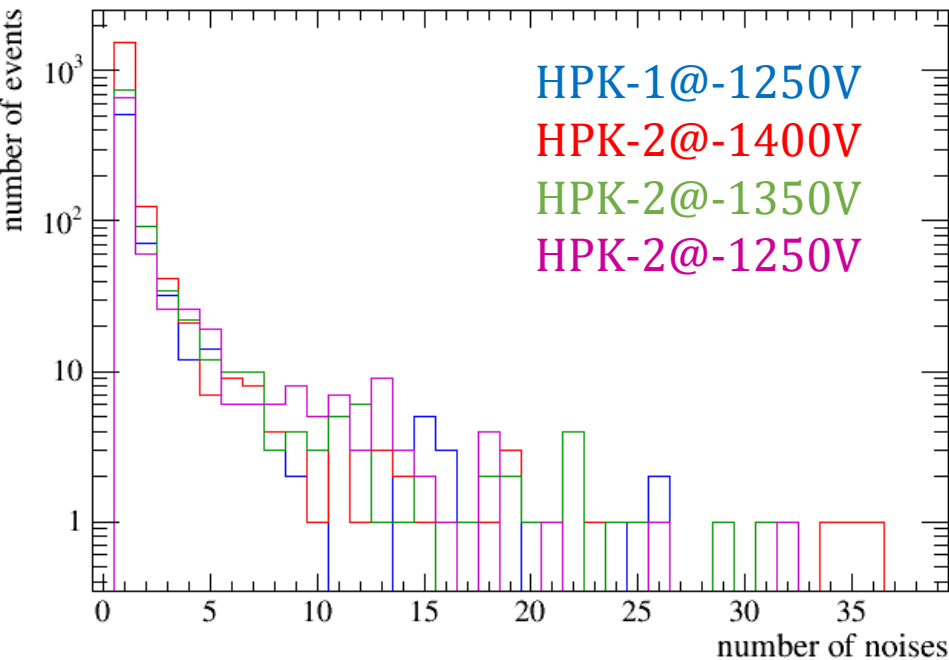
< event example >



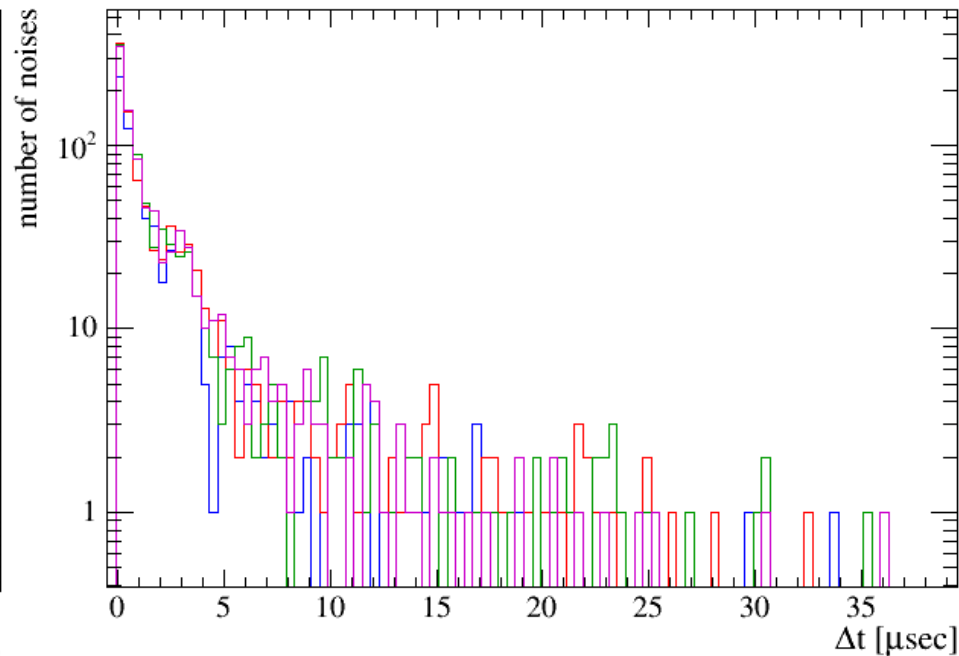
	ID	Type	HV
Hamamatsu	HPK-1	H14374	-1250V
	HPK-2	H14374	-1400V(gain tuned)
			-1350V
			-1250V

- I measured each event for 40 μsec , but calculated the rate in 20 μsec to check if there is signal at just before or after the both end of time window.

Dark rate time structure

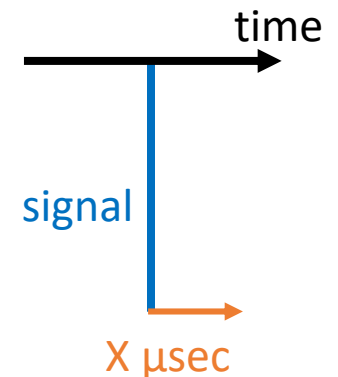


the number of dark noises in each event

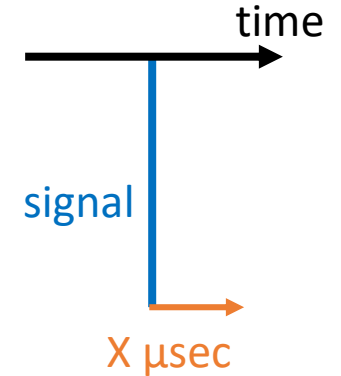
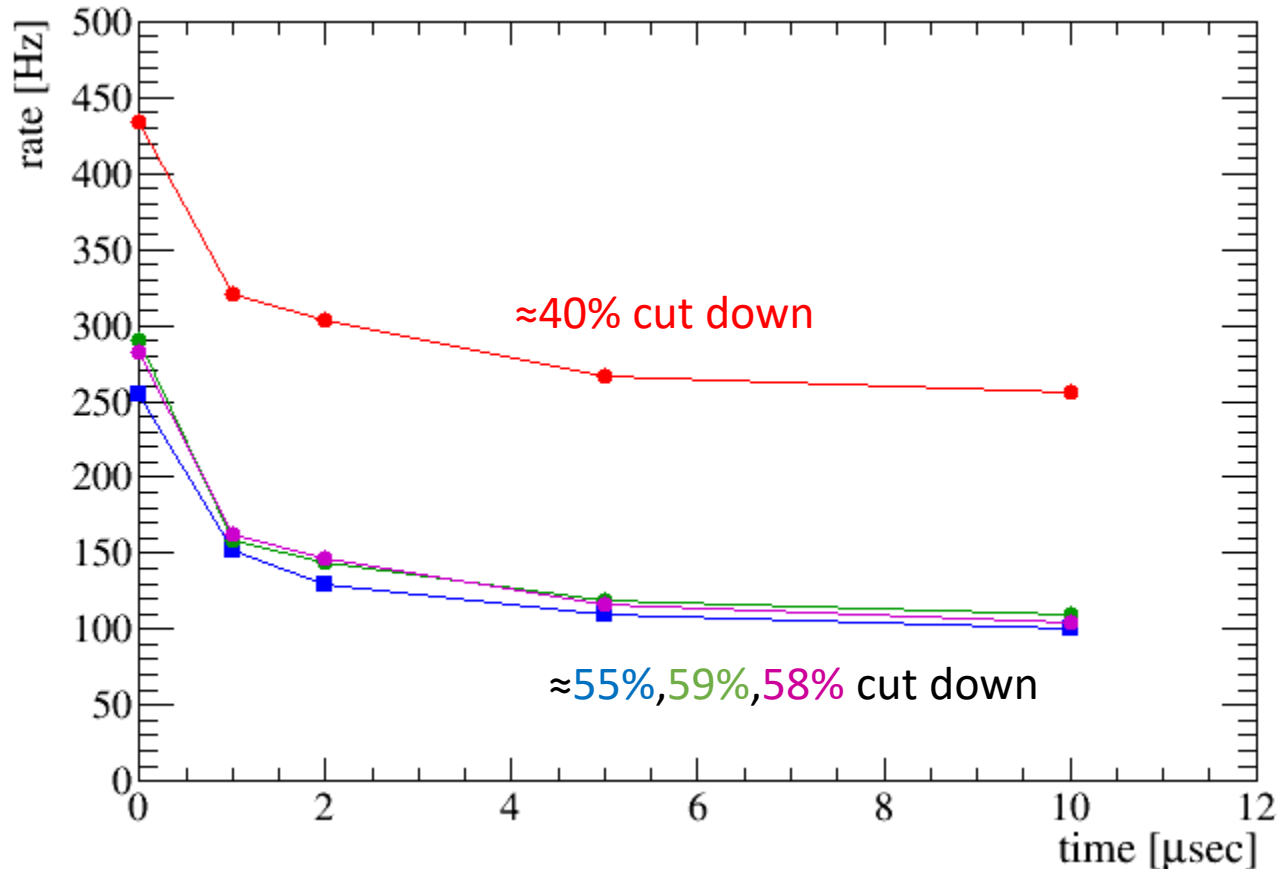


the time intervals of multi signals

- The distribution similar to HPK-1 was seen for both number and time intervals.
→ set the cutting time frame for 1, 2, 5 and 10 μsec.



Cutting time frame dependence



- HPK-1@-1250V
- HPK-2@-1400V
- HPK-2@-1350V
- HPK-2@-1250V

- The graph shows the dark rates at each value of cutting time frame. The plot at $X=0$ corresponds to no cutting.
- The rates were cut down for almost 40-60% at $5\mu\text{sec}$.

Future plan

-

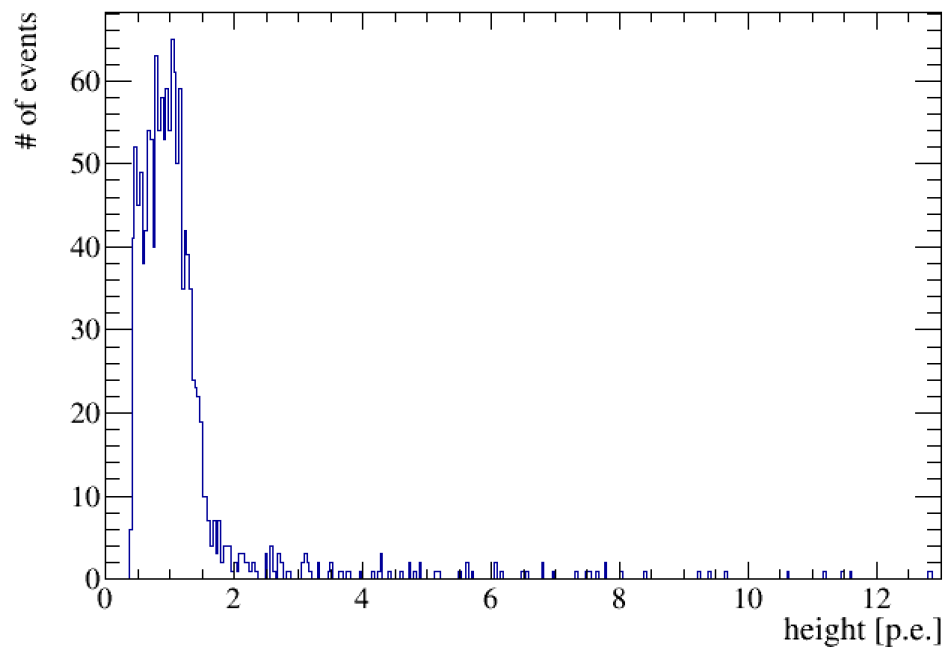
X = 0 μ sec

HPK-1@-1250V
254.44Hz (2.78sec 708hits)

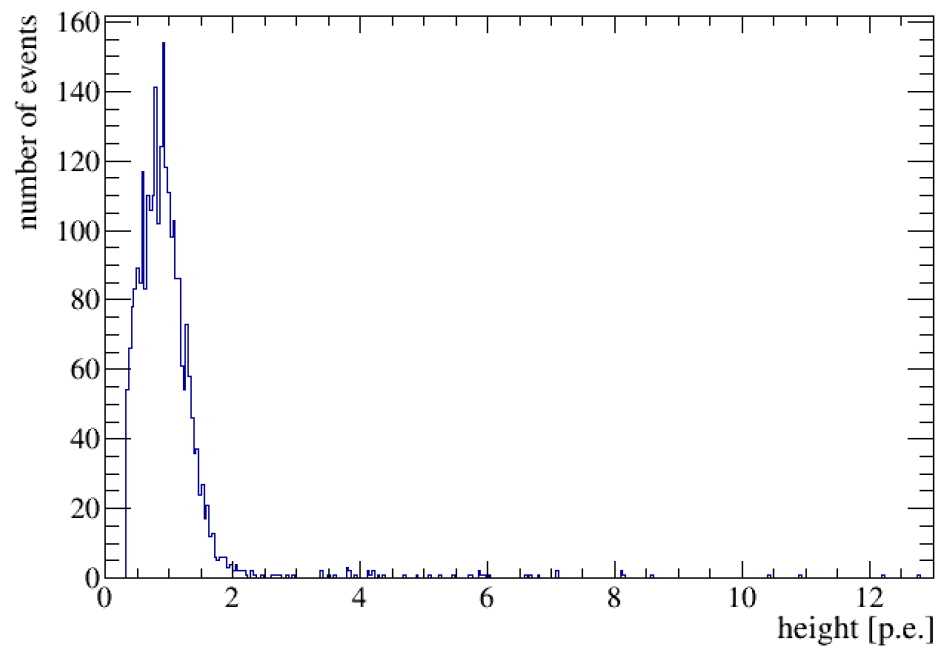
HPK-2@-1400V(gain tuned)
433.898Hz (3.01sec 1305hits)

HPK-2@-1250V
281.81Hz (3.23sec 911hits)

HPK-2@-1350V
289.657Hz (3.33sec 966hits)



Height of dark noises(HPK-1)



Height of dark noises(HPK-2)