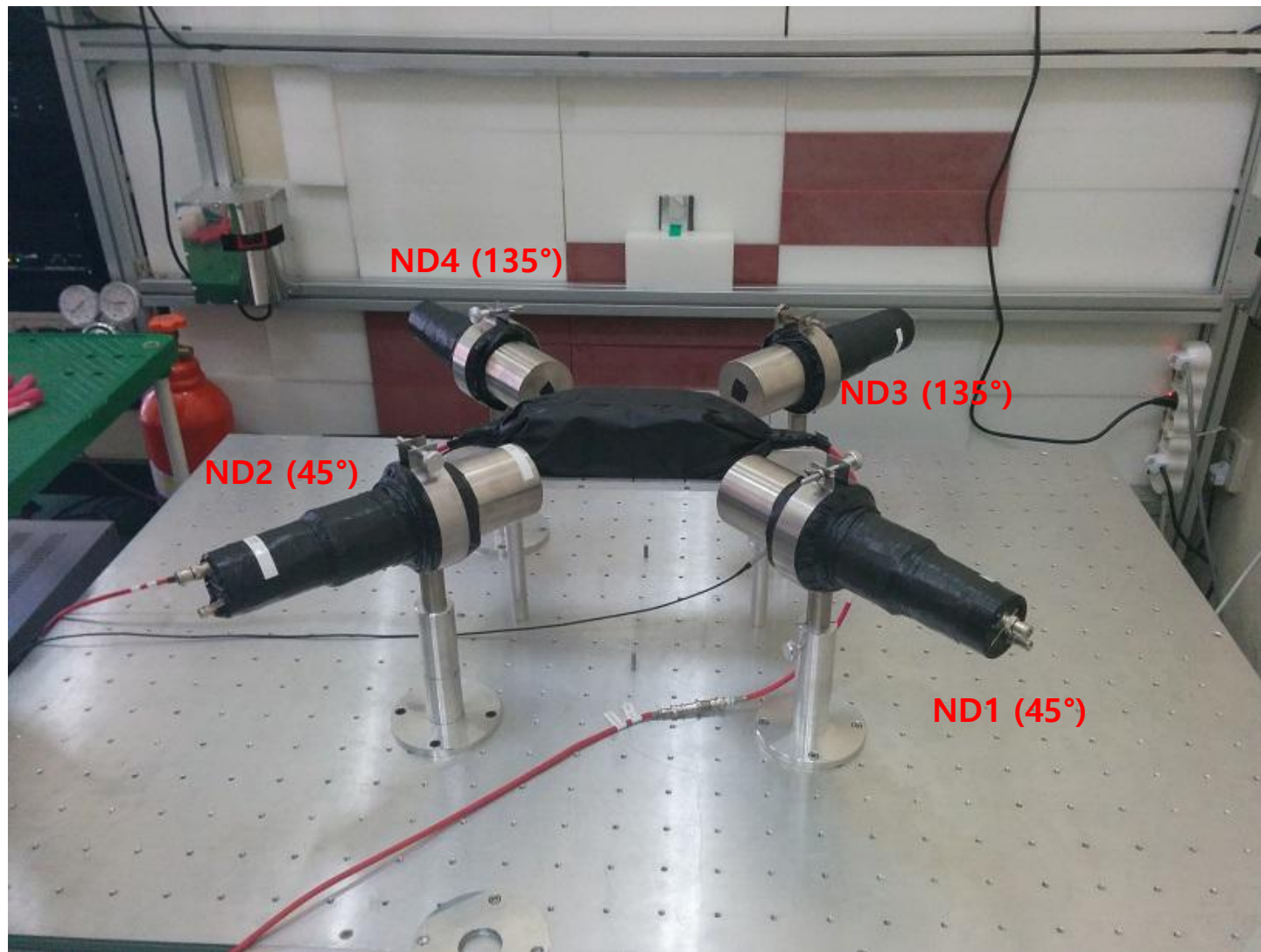
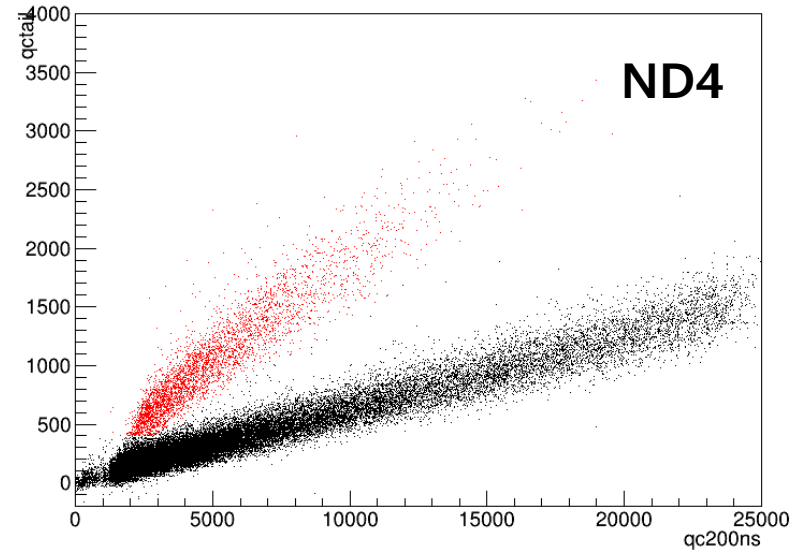
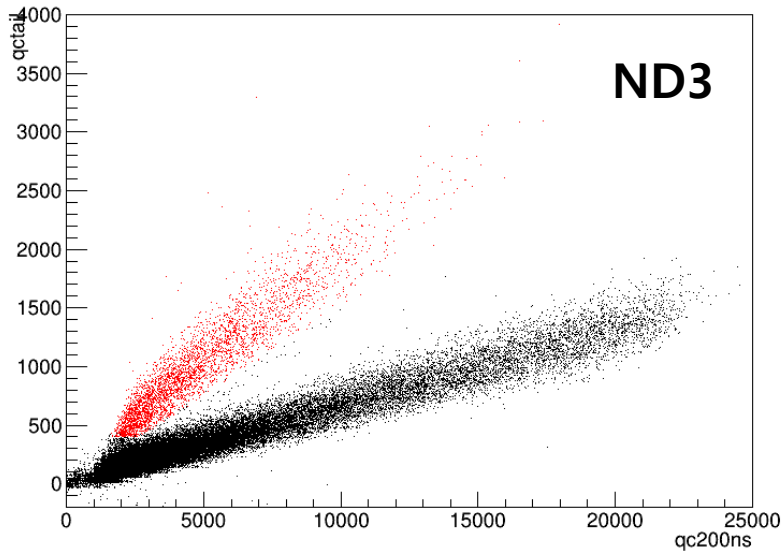
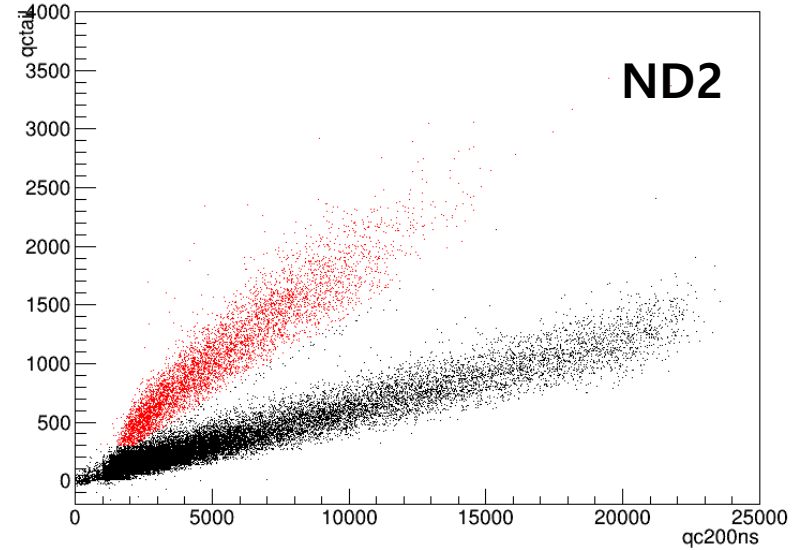
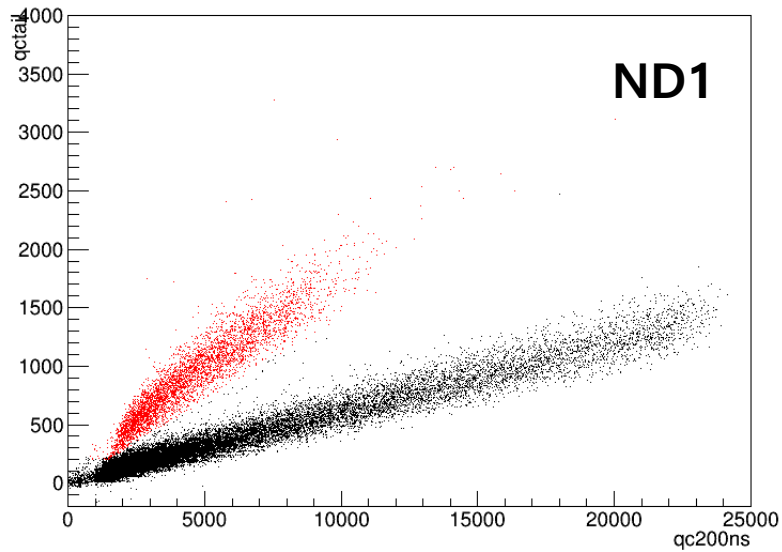
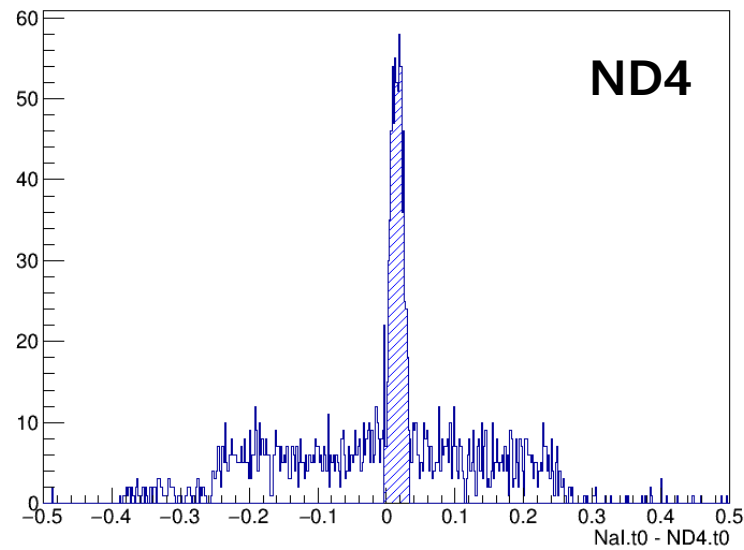
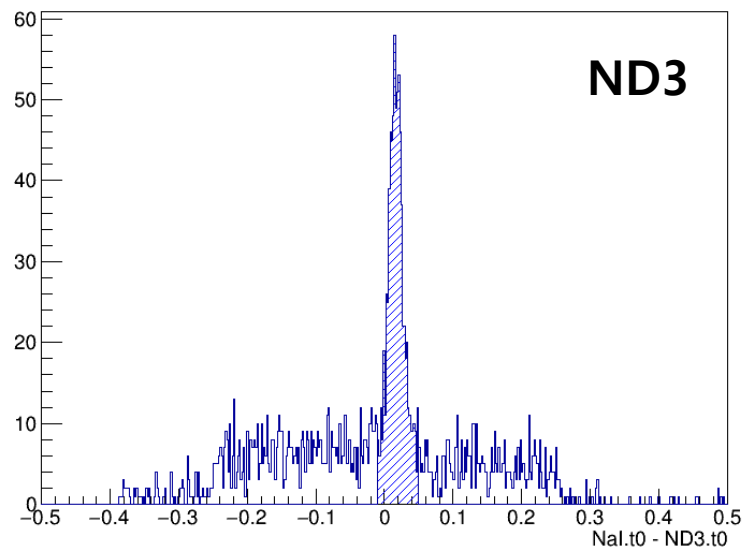
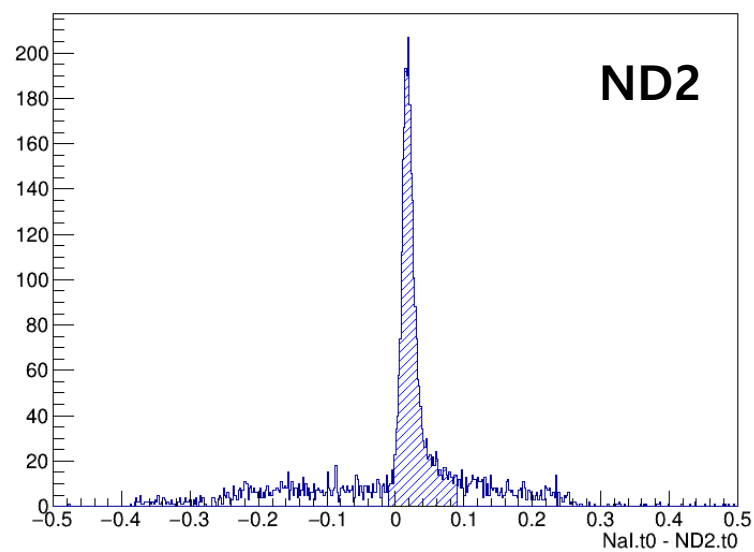
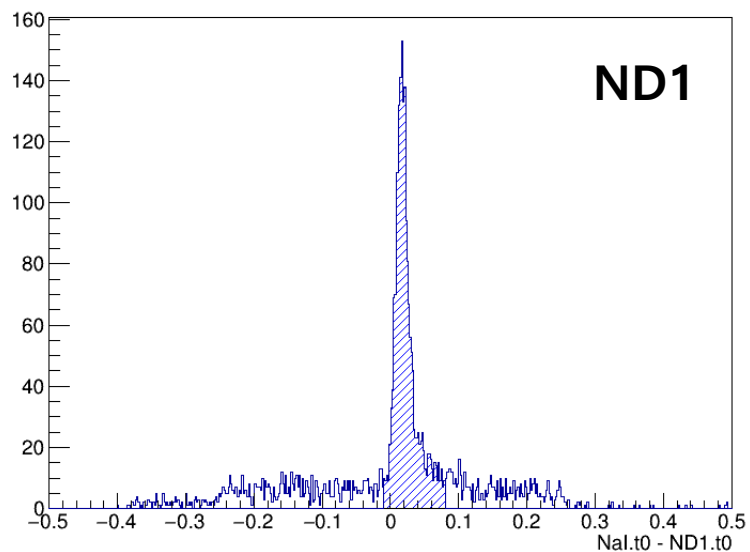


Event rate test



Neutron Detector PSD

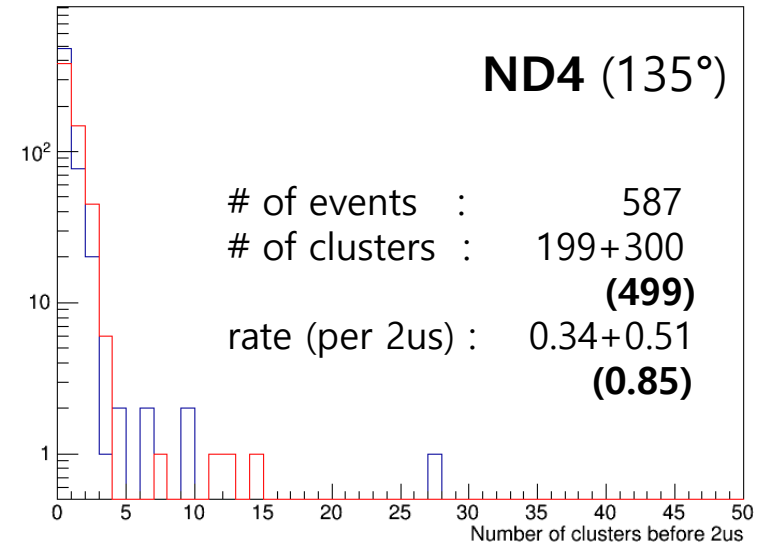
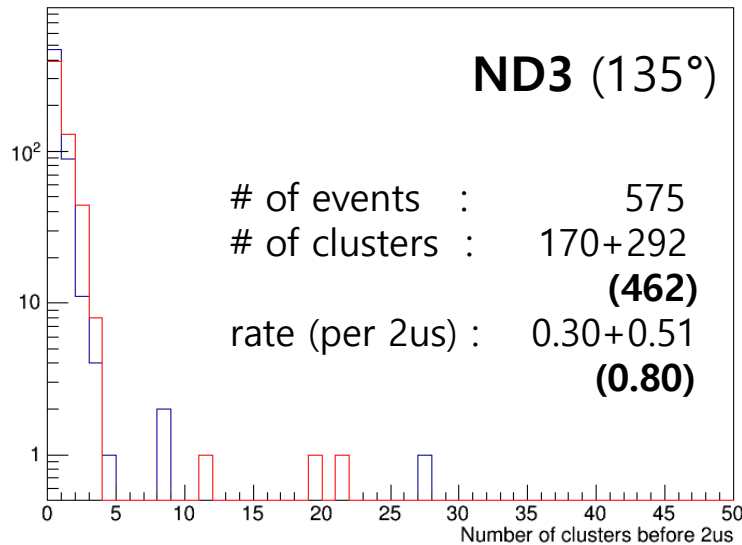
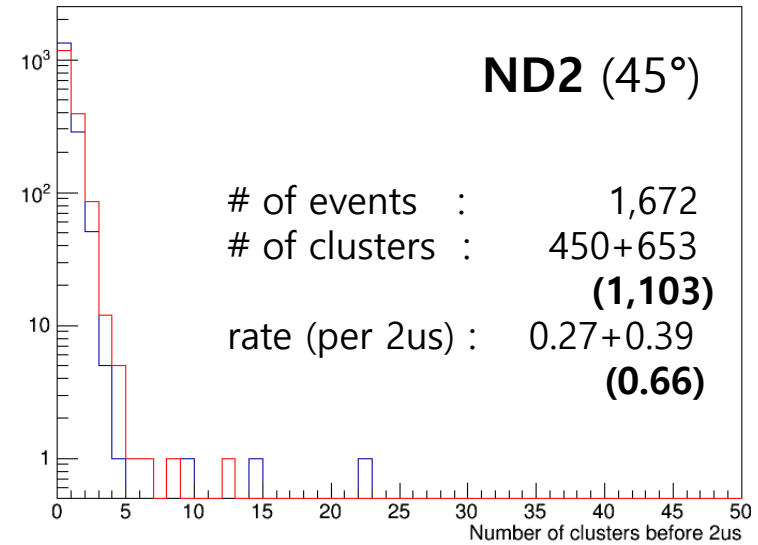
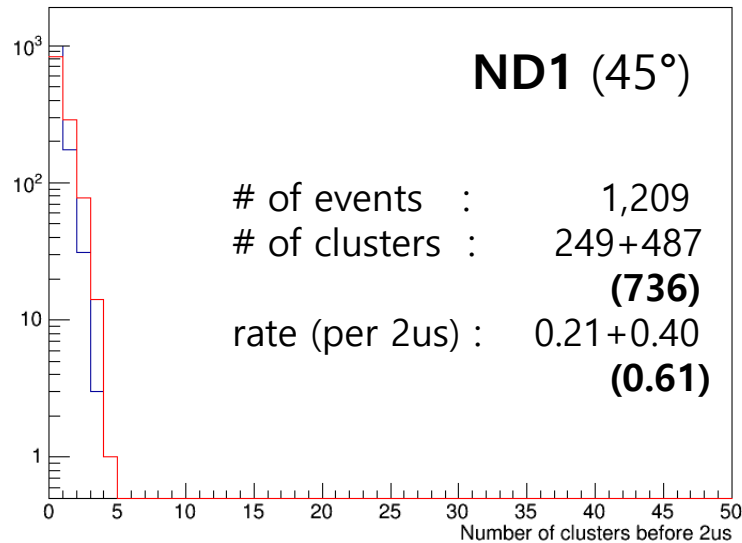




Number of clusters before 2 us (PSD, TOF, >1 keV)

(current setup)

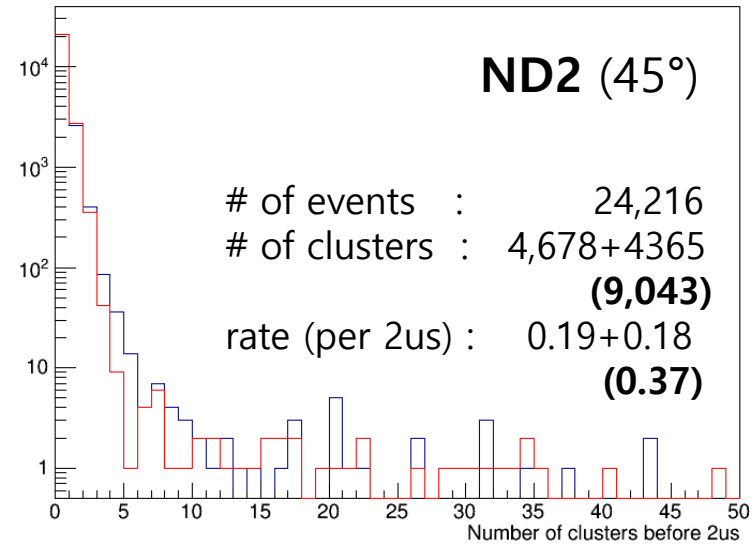
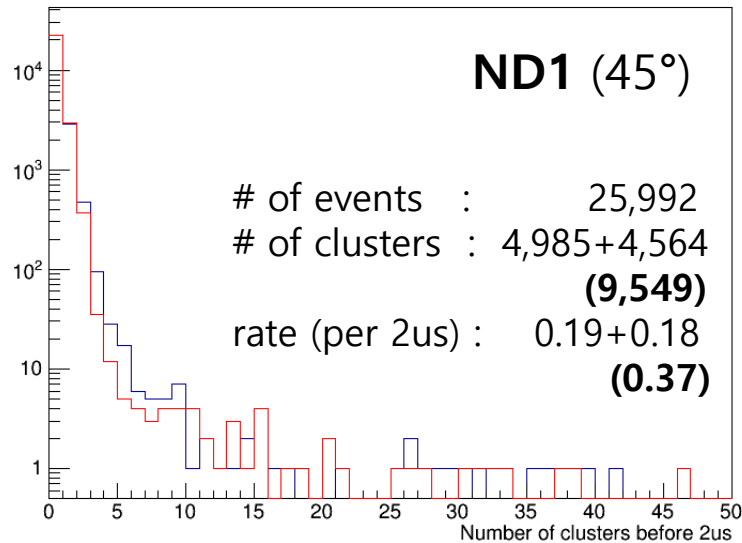
Blue : PMT1
Red : PMT2



Number of clusters before 2 us (PSD, TOF, >1 keV)

(PSD measurement with low NG power)

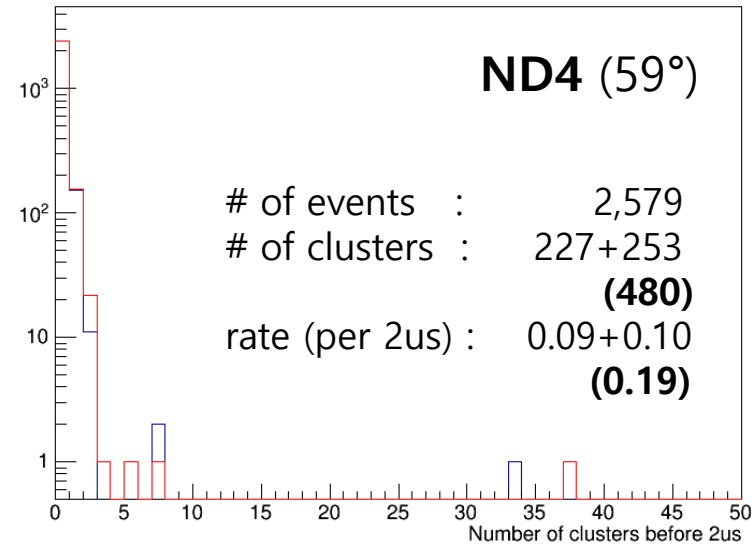
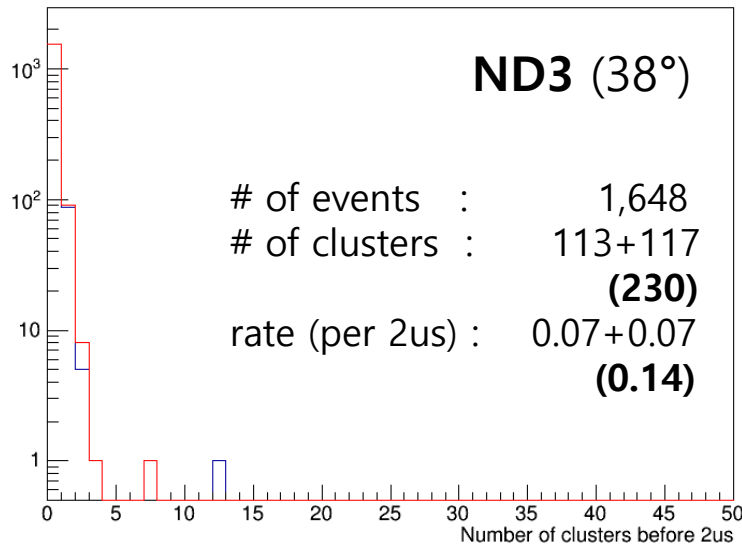
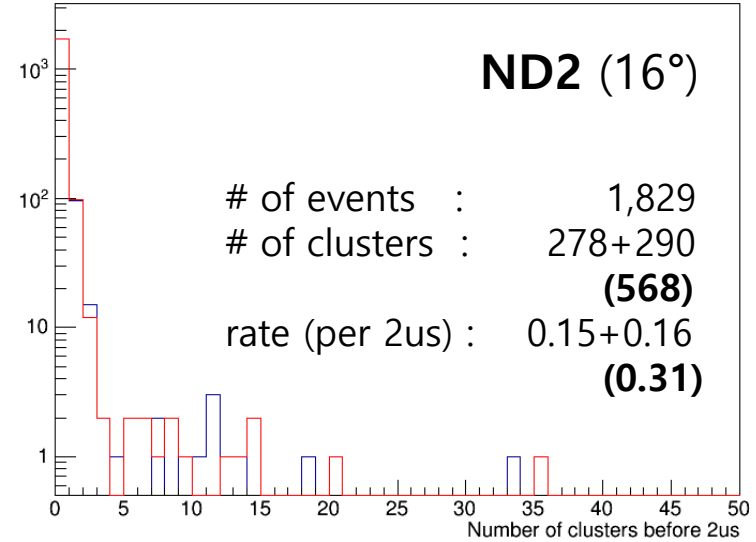
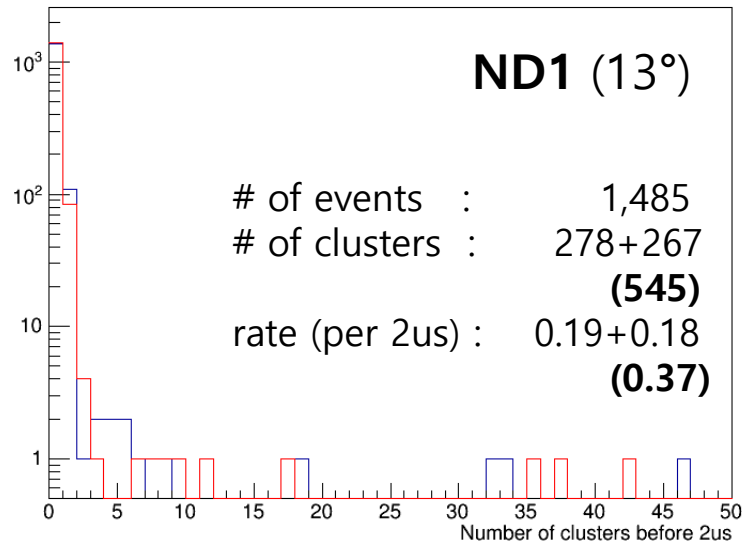
Blue : PMT1
Red : PMT2



Number of clusters before 2 us (PSD, TOF, >1 keV)

(Quenching factor measurement with low NG power)

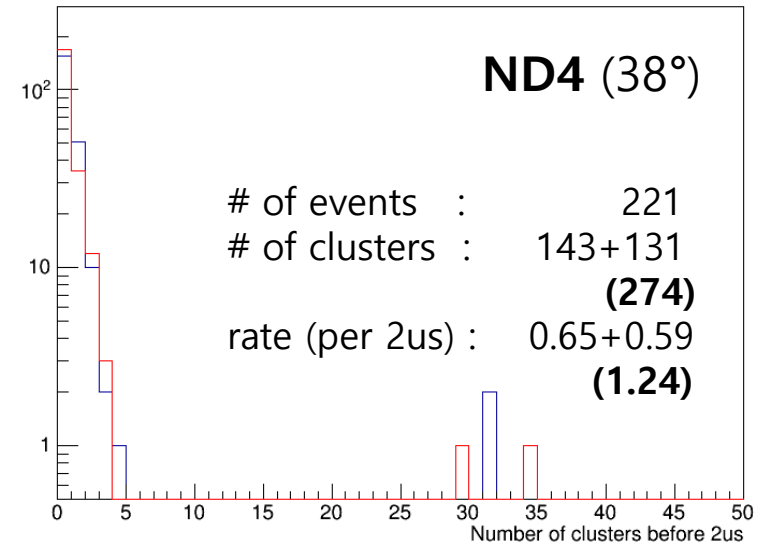
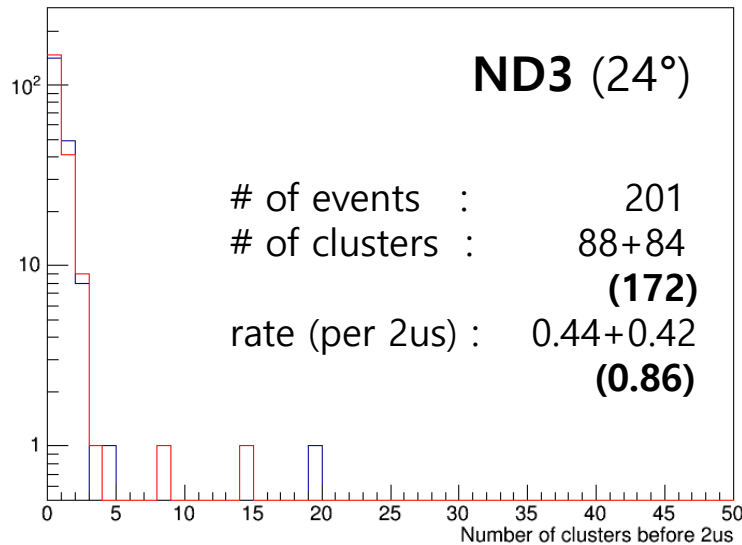
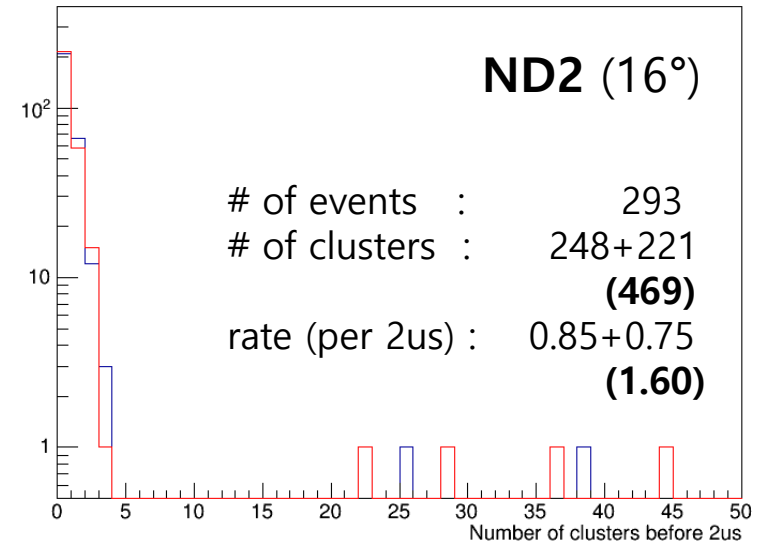
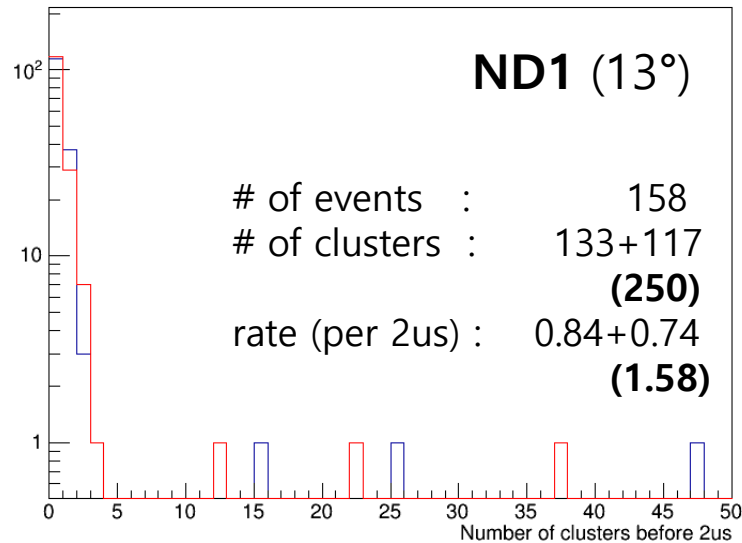
Blue : PMT1
Red : PMT2



Number of clusters before 2 us (PSD, TOF, >1 keV)

(Quenching factor measurement with high NG power)

Blue : PMT1
Red : PMT2



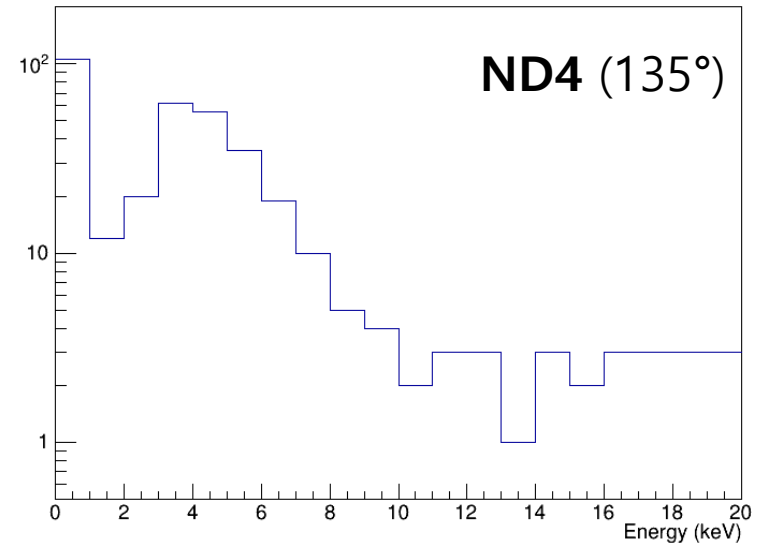
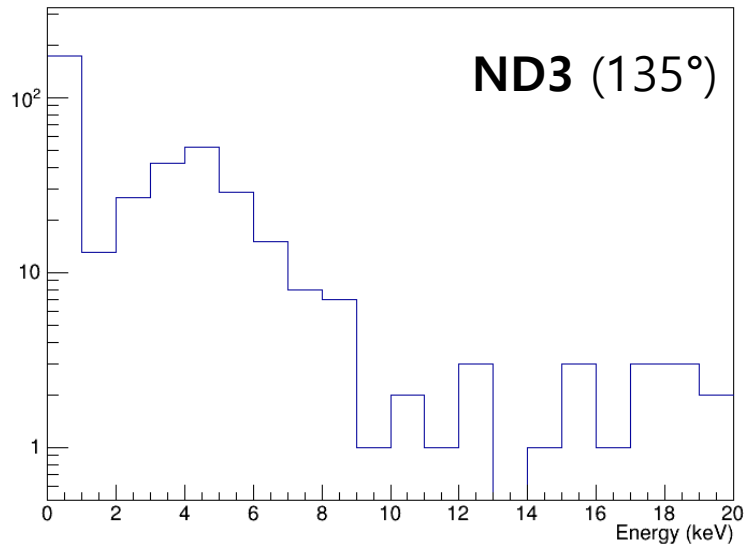
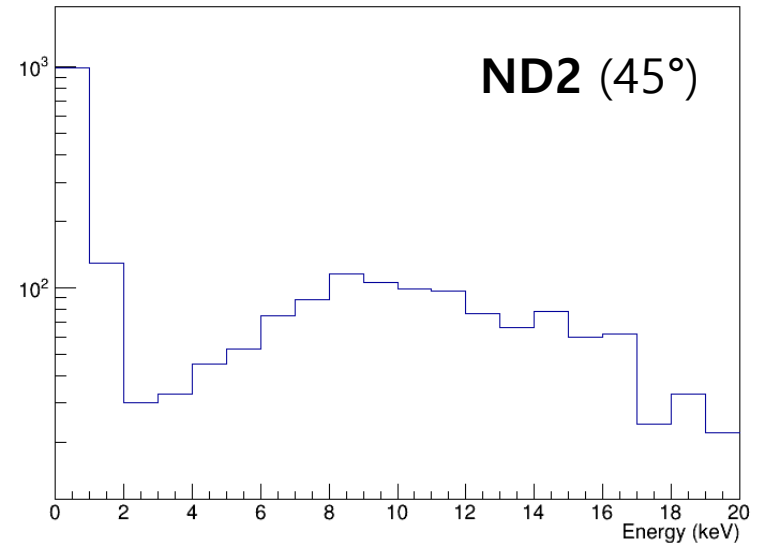
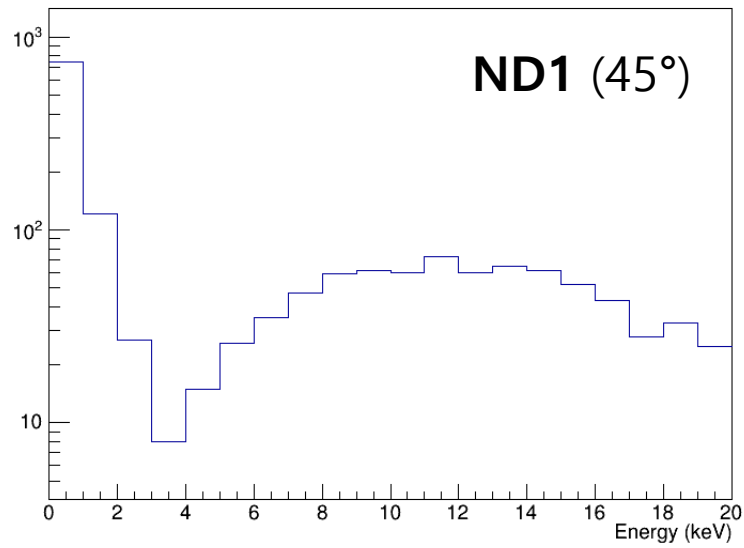
Number of clusters before 2 us (PSD, TOF, >1 keV)

	PMT1	PMT2	SUM
Low NG power (PSD measurement)	0.10	0.09	0.19
Low NG power (QF measurement)	0.06	0.06	0.12
High NG power (QF measurement)	0.35	0.32	0.67
High NG power (current)	0.13	0.21	0.35

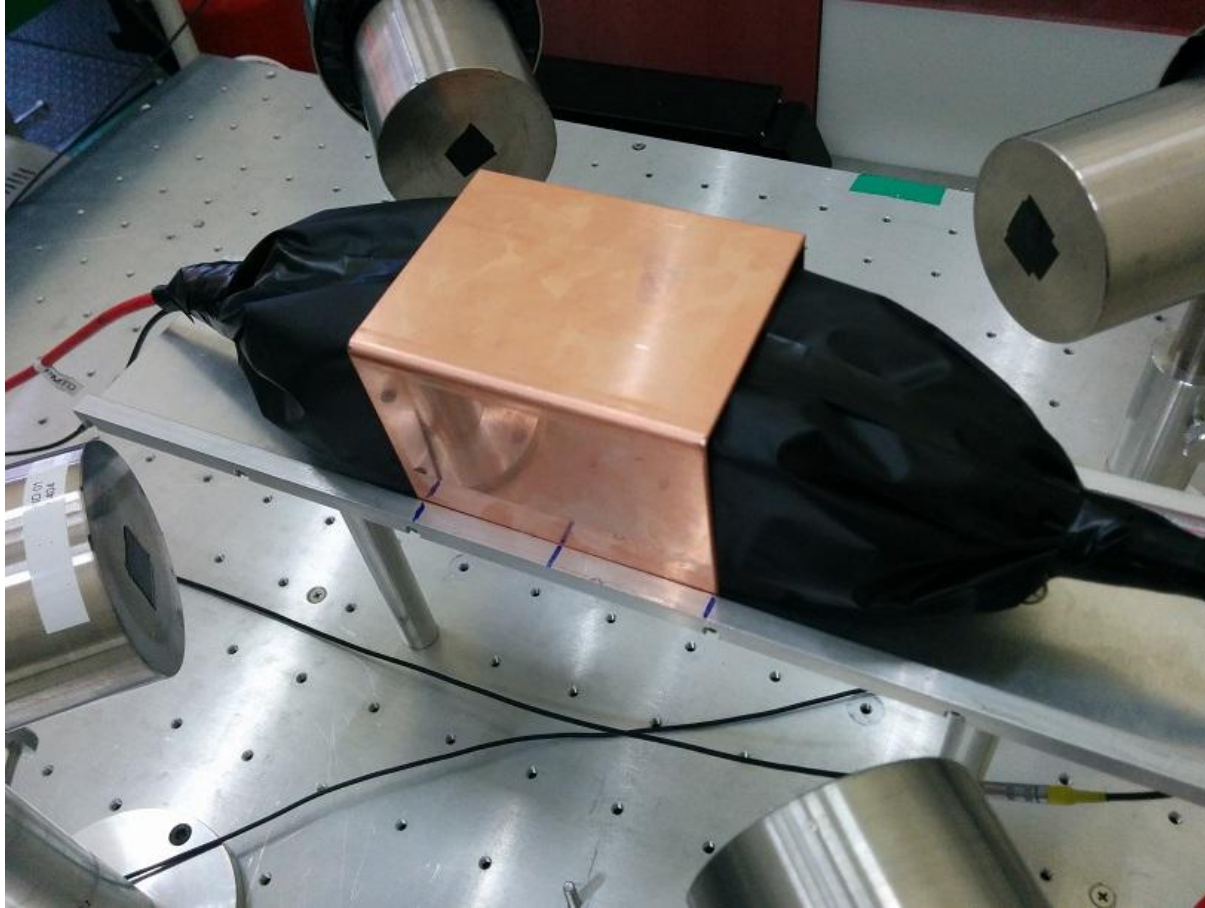
(unit : Clusters / event / 1 us)

- * **PSD measurement** : ~0.9 m from generator
- * **QF measurement, current setup** : ~1.5 m from generator
- * **Low NG power** : ~ 10^7 neutrons / sec
- * **High NG power** : ~ $2 \cdot 10^8$ neutrons / sec

Deposit energy (PSD, TOF, 1 hour data)

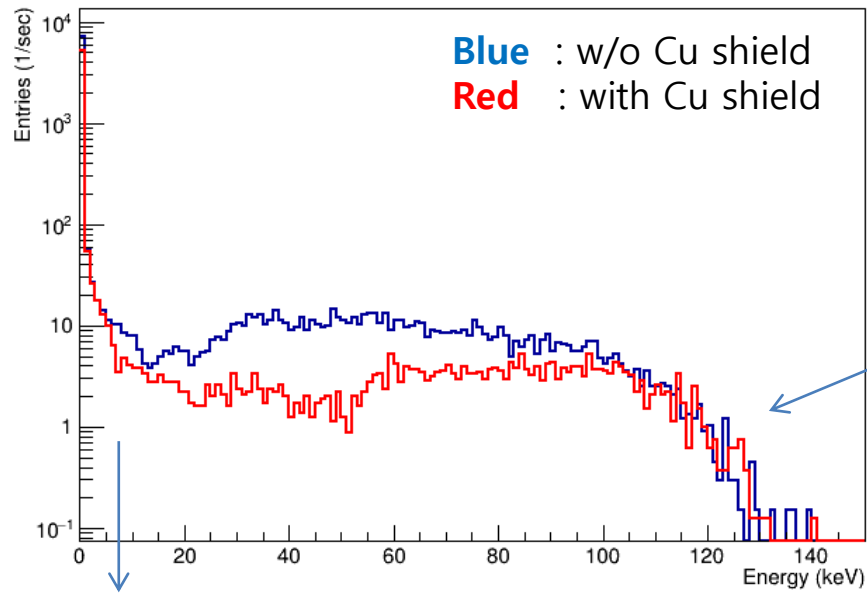


Shield with 2mm Cu

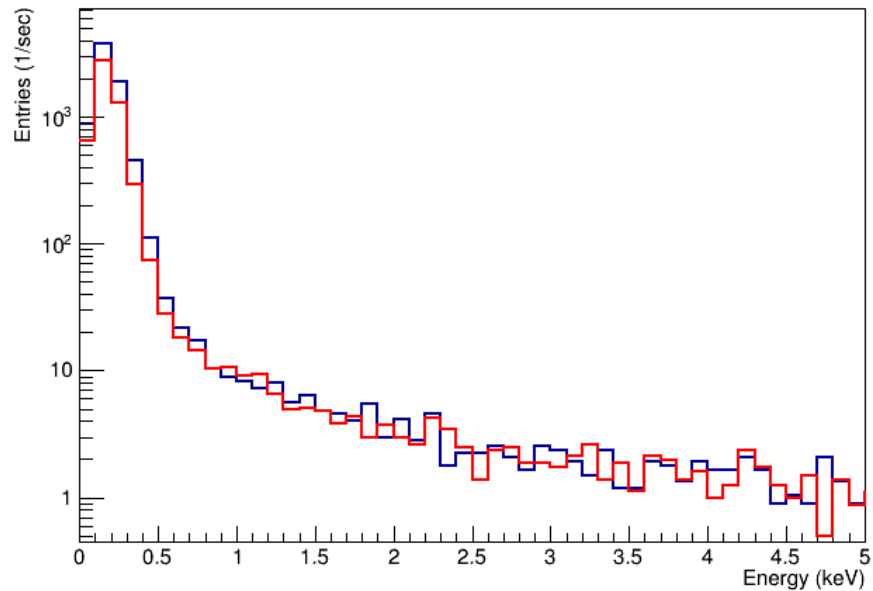


	BKG	NG on
w/o Cu	65.0	8,239.1 Hz
with Cu	49.4	5,643.9 Hz

Shield with 2mm Cu



Pulse height saturated events are removed



Plans

- **Reduce NaI single rate more**

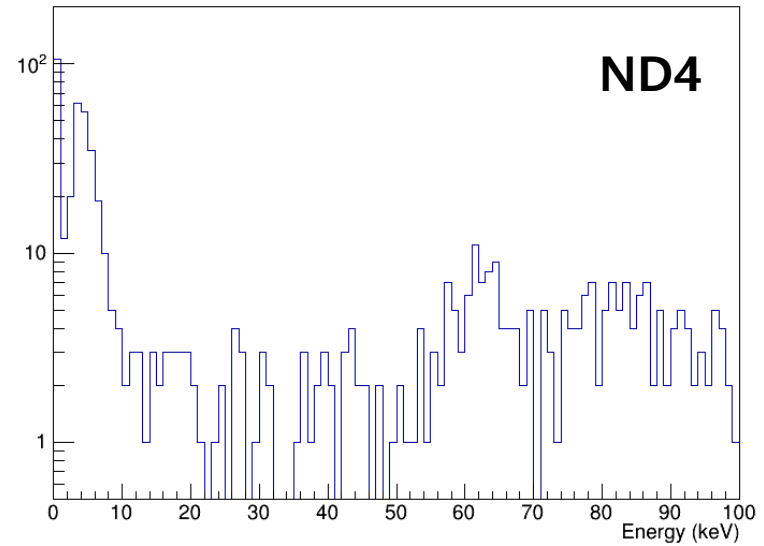
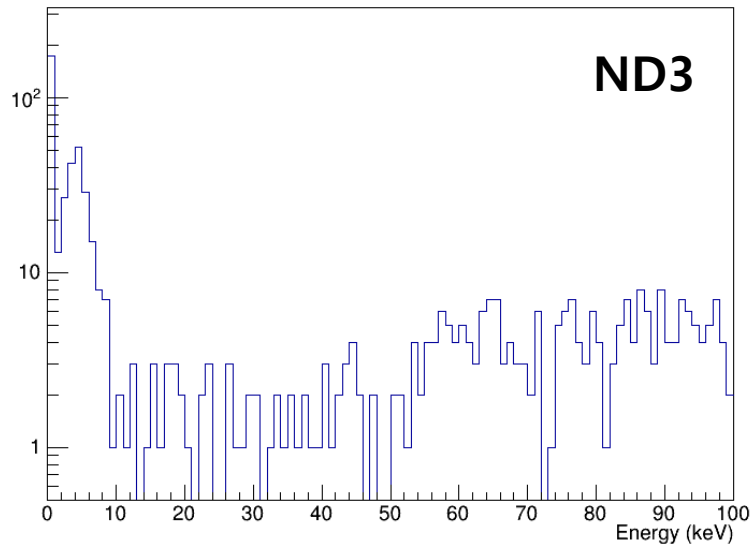
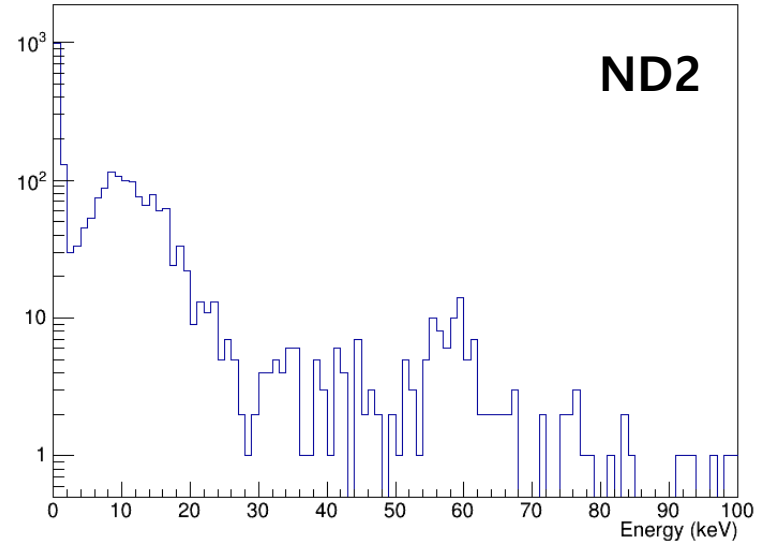
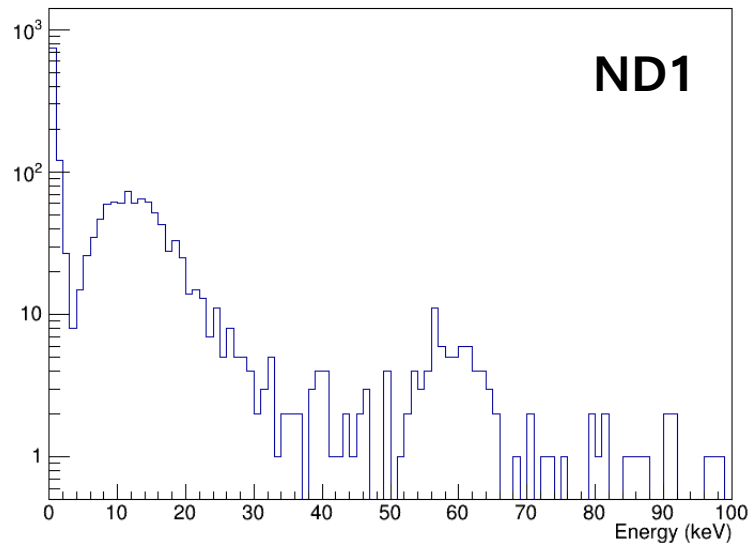
- Set Lead block to reduce neutron

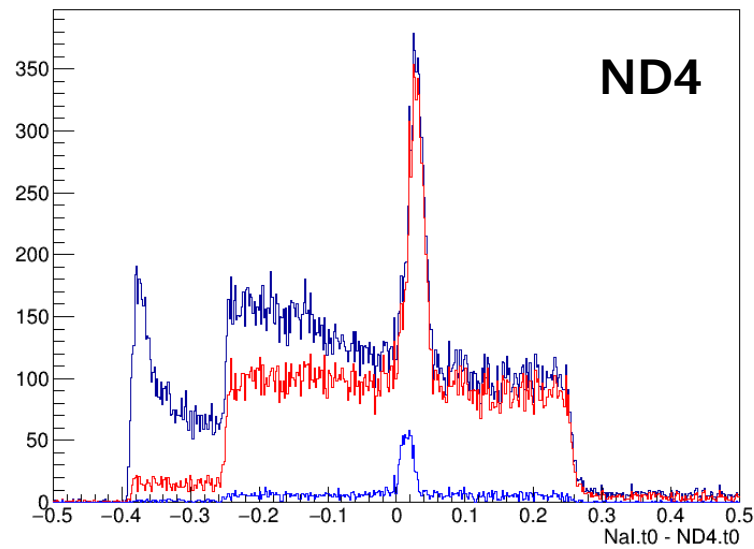
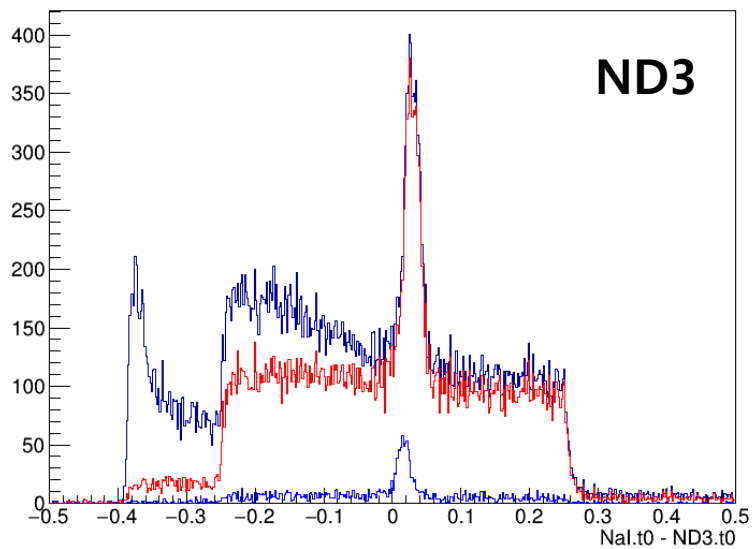
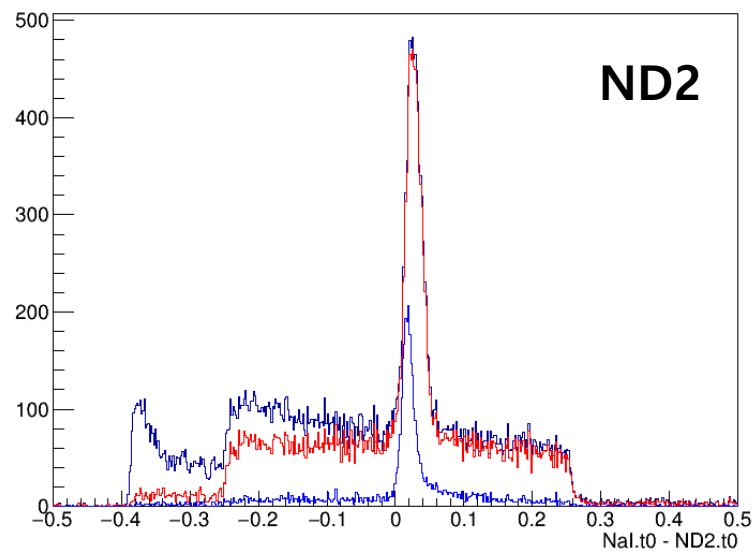
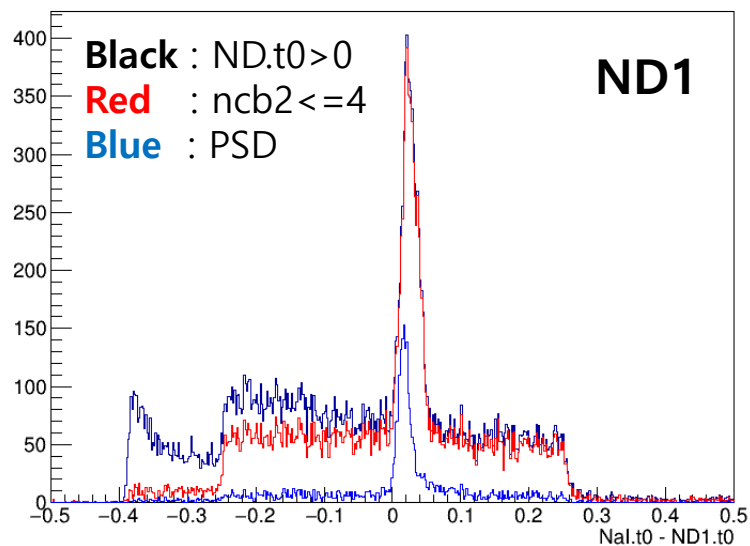
- Set longer dead time for DAQ (8 μ s $\rightarrow$ 1 ms)

- **Move neutron detectors to forward**

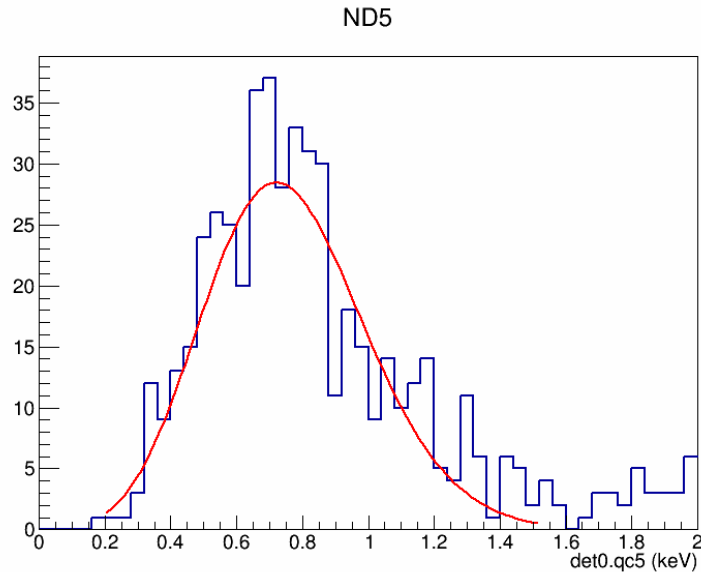
- (Expected peak energy : 2~6 keV)

Deposit energy (PSD, TOF)



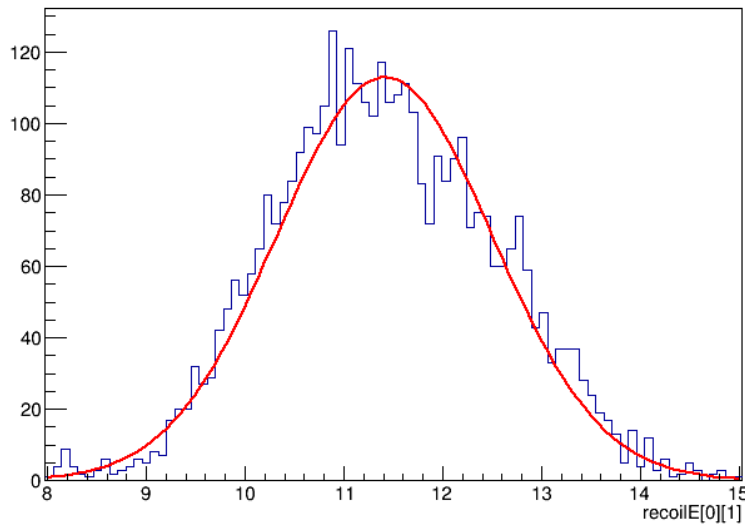


ND3 (45°, 1 recoil)



Poisson fit
0.2 ~ 1.5 keV (488 event)

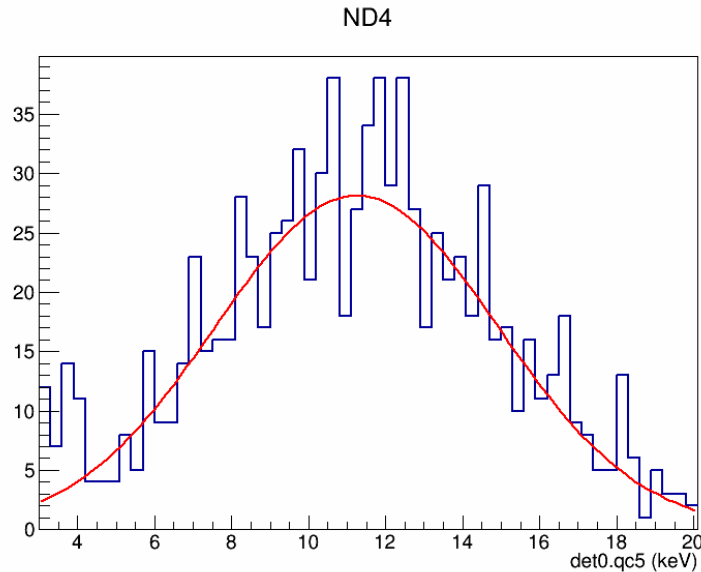
Mean = 0.761
Sigma = 0.872



Gaussian fit
8 ~ 15 keV (3,894 event)

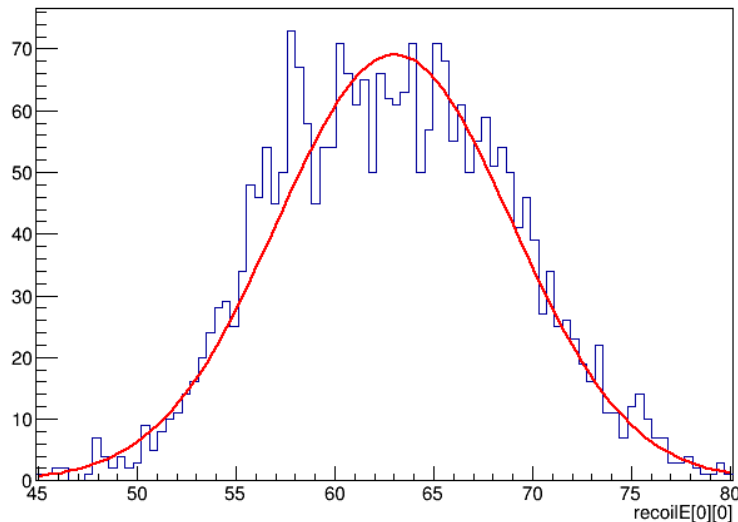
Mean = 11.418
Sigma = 1.091

ND3 (45°, Na recoil)



Gaussian fit
3 ~ 20 keV (946 event)

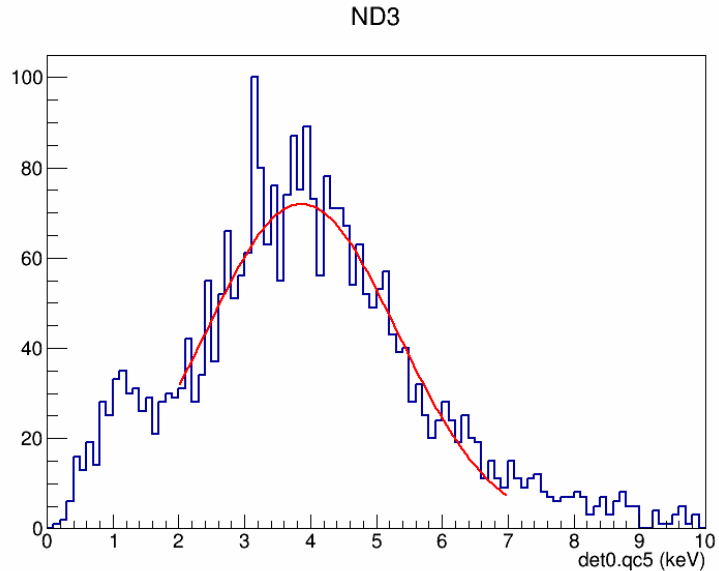
Mean = 11.257
Sigma = 3.673



Gaussian fit
45 ~ 80 keV (2,588 event)

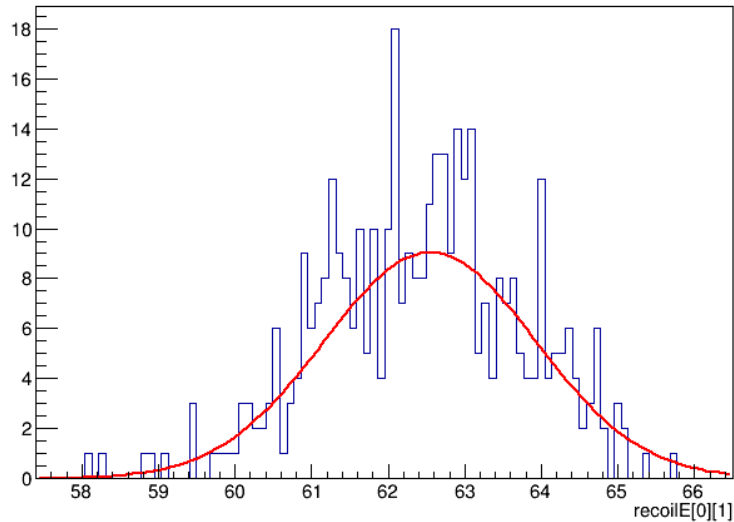
Mean = 63.045
Sigma = 5.934

ND7,8 (126.9°, 1 recoil)



Gaussian fit
2 ~ 7 keV (2,417 event)

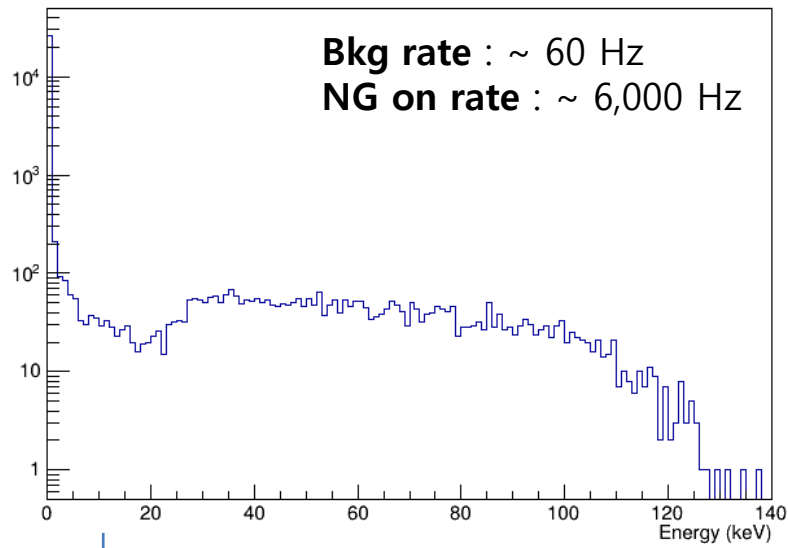
Mean = 3.872
Sigma = 1.452



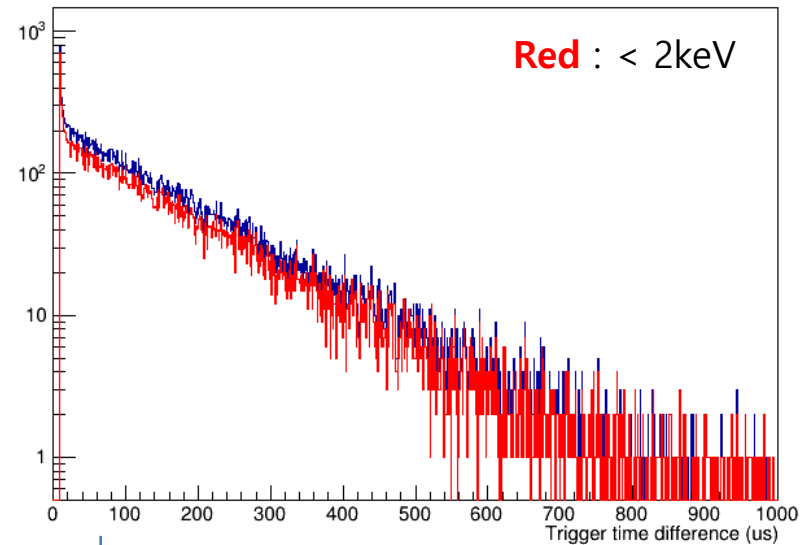
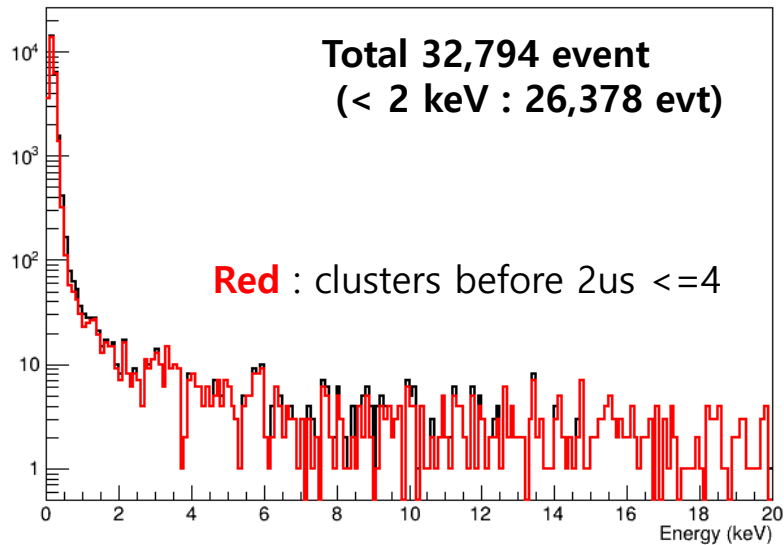
Gaussian fit
58 ~ 66 keV (387 event)

Mean = 62.553
Sigma = 1.382

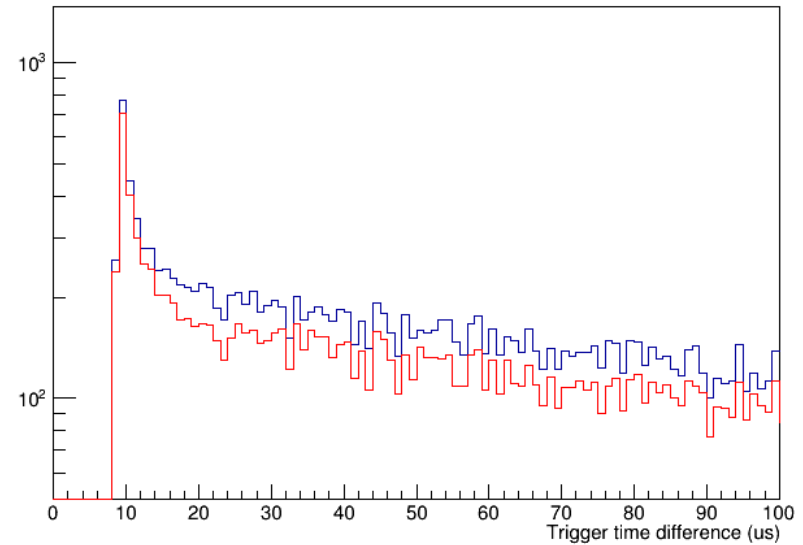
Neutron generator on (~5 sec)



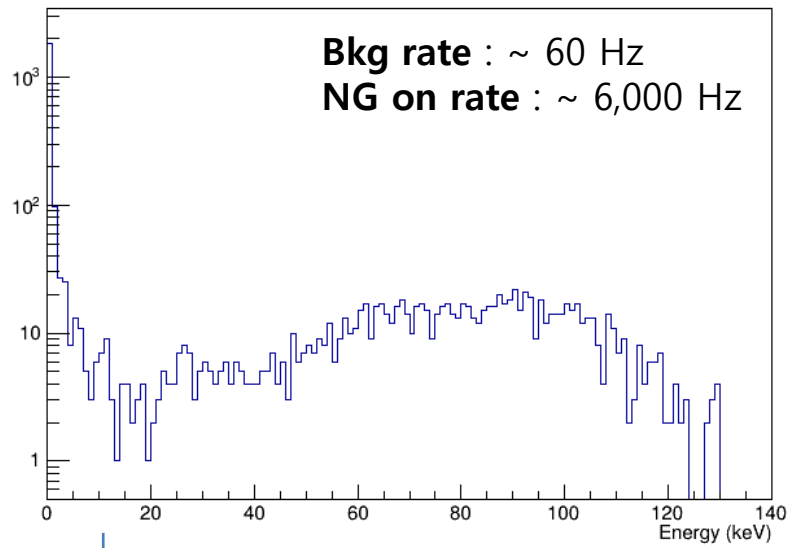
Zoomed



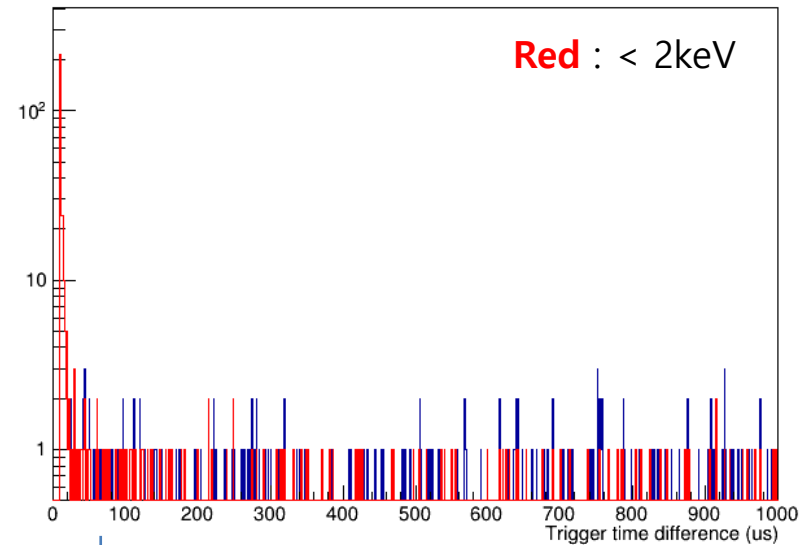
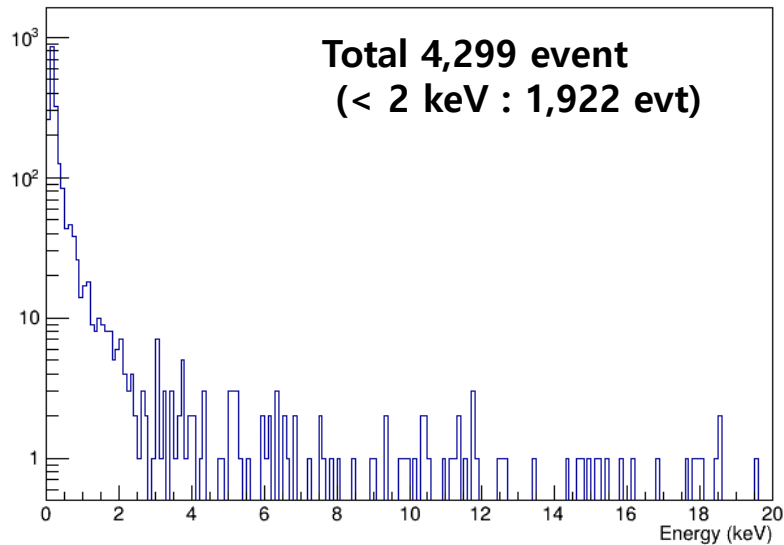
Zoomed



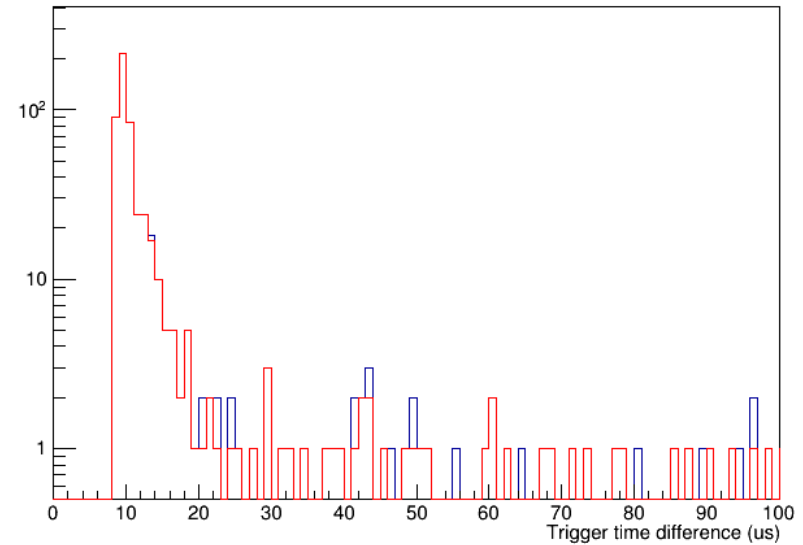
Neutron generator off (~ 60 sec)



Zoomed



Zoomed



Event rate test

