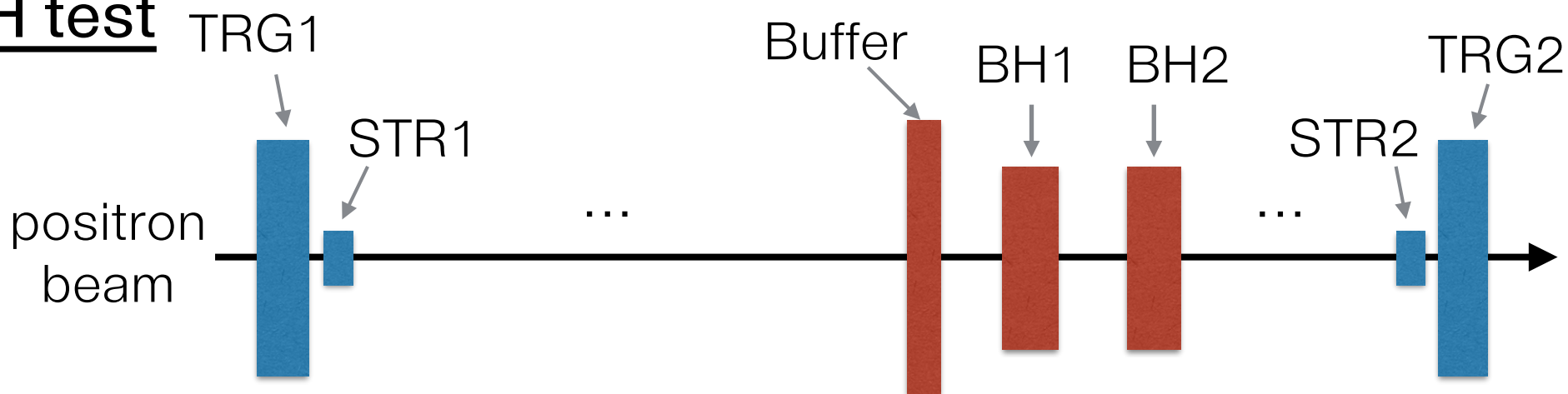


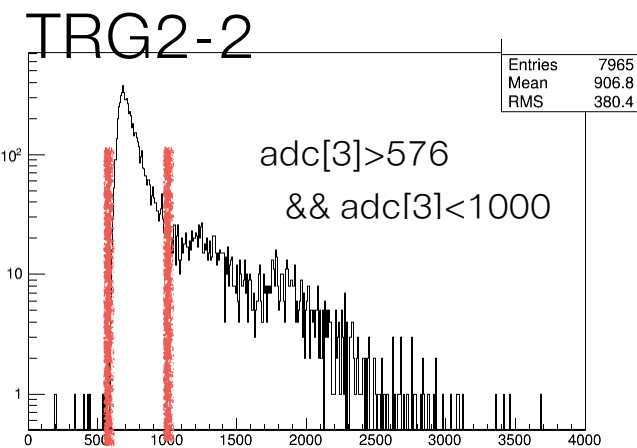
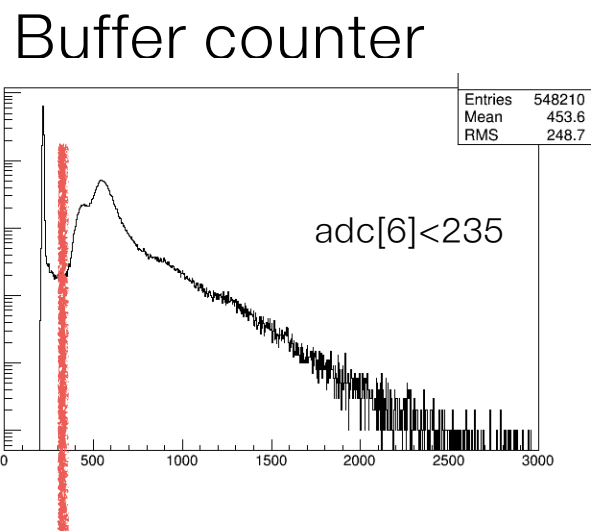
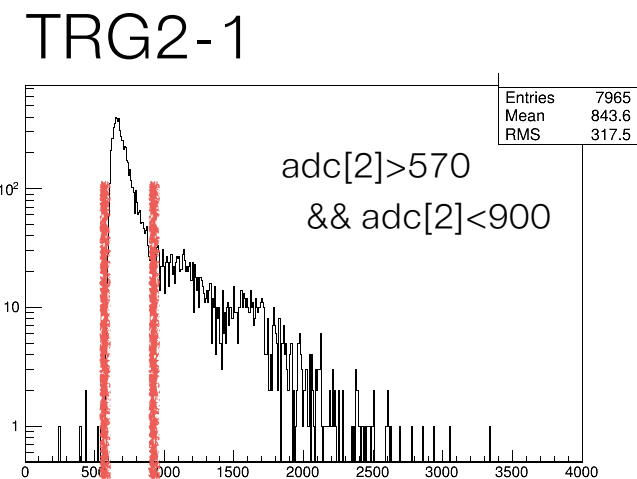
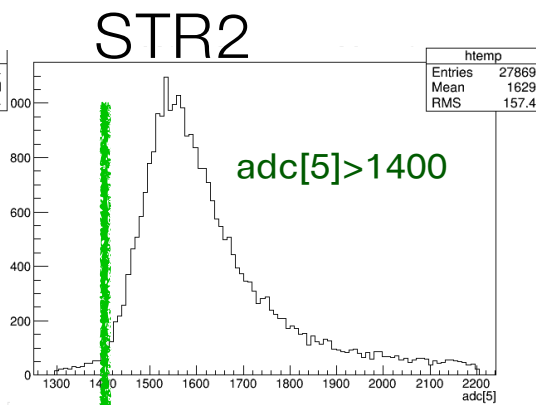
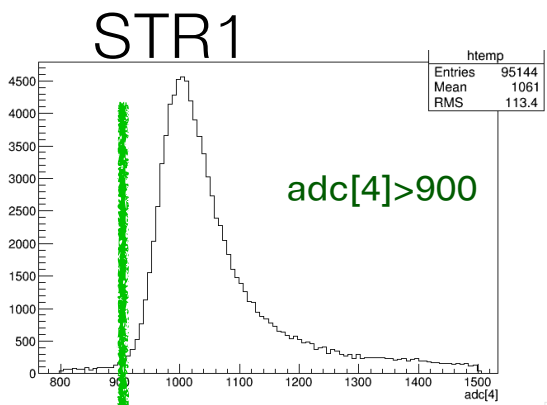
# ELPH beam test

29 August 2014  
Shinhyung Kim

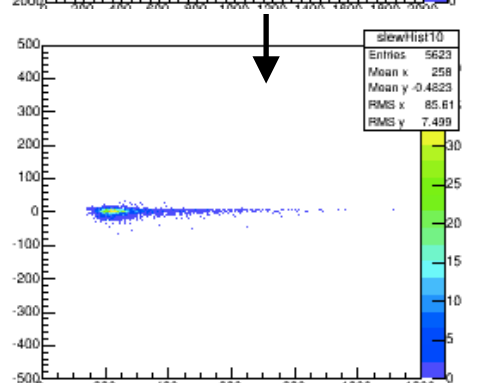
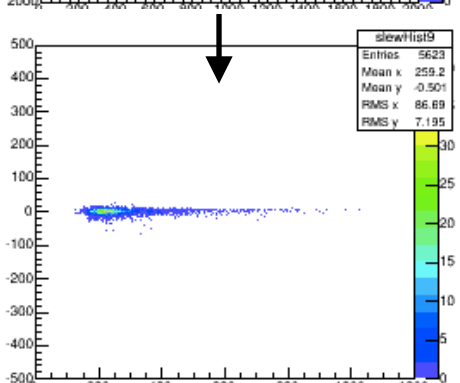
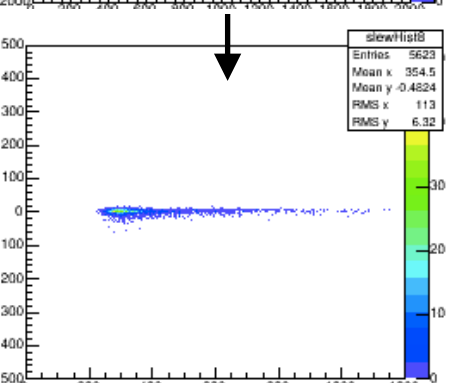
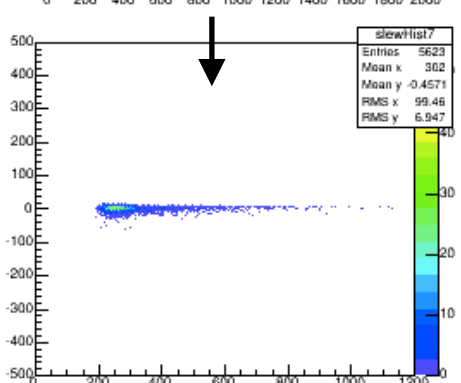
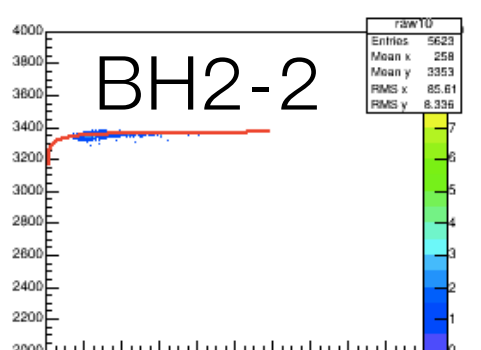
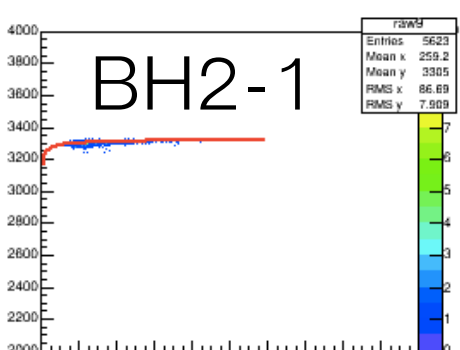
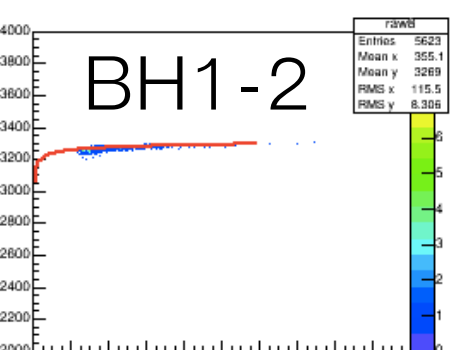
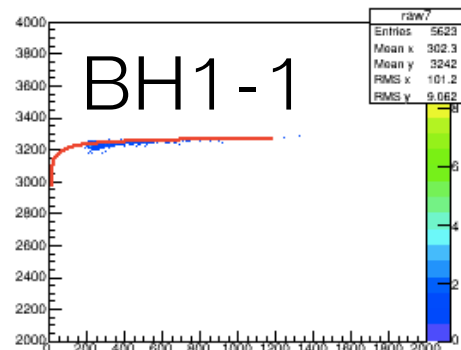
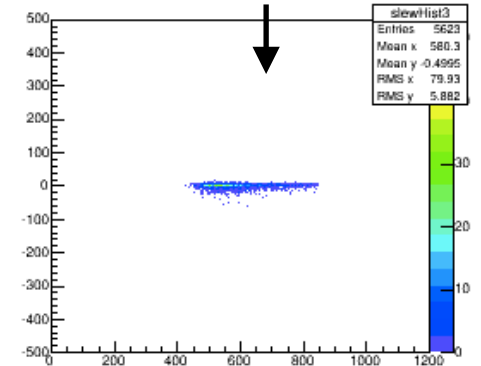
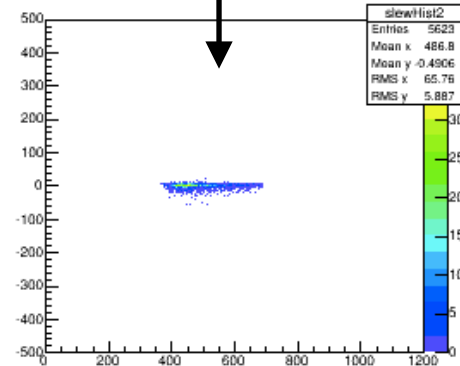
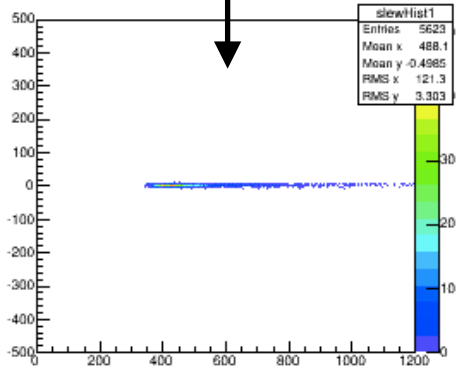
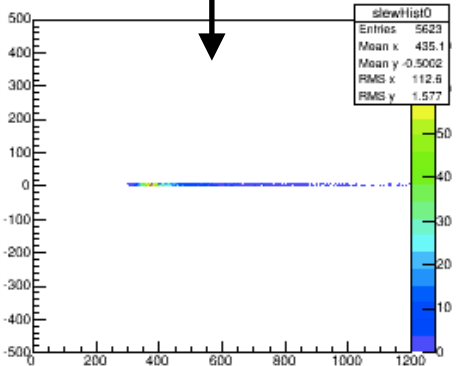
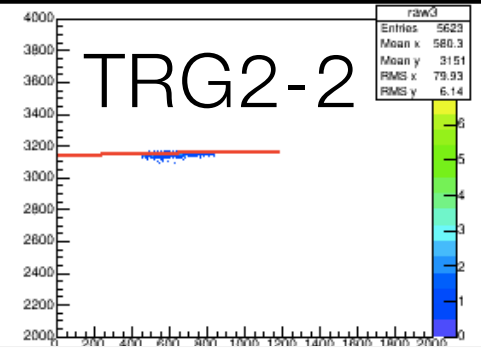
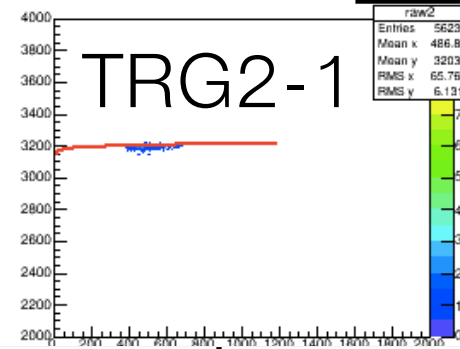
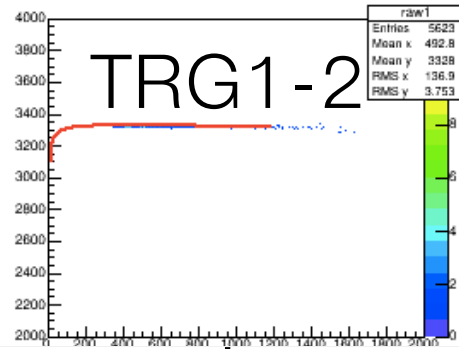
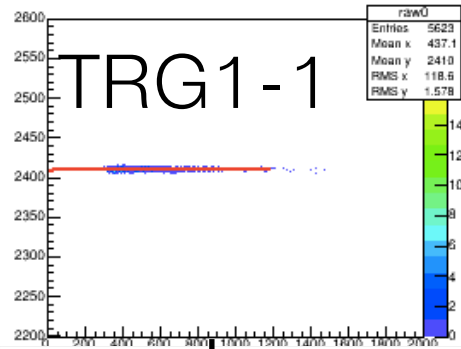
# ELPH test



cut:



# time walk correction



# BH - Intrinsic Time Resolution

	run#84	run#85	run#86	run#84+run#85+run#86
BH1 (w/ new PMT)	96.7 ps	92.4 ps	94.4 ps	94.0 ps
BH2 (w/ old PMT)	115.8 ps	108.2 ps	111.0 ps	111.3 ps

# Back-up



TRG

144 x 44 x ? mm<sup>3</sup>

H1949-50



STR

10 x 10 x 4 mm<sup>3</sup>

H3167B

Buffer

200 x 200 x 5 mm<sup>3</sup>

w/ 25mm hole



BH1

120 x 40 x 6 mm<sup>3</sup>

H10570

BH2

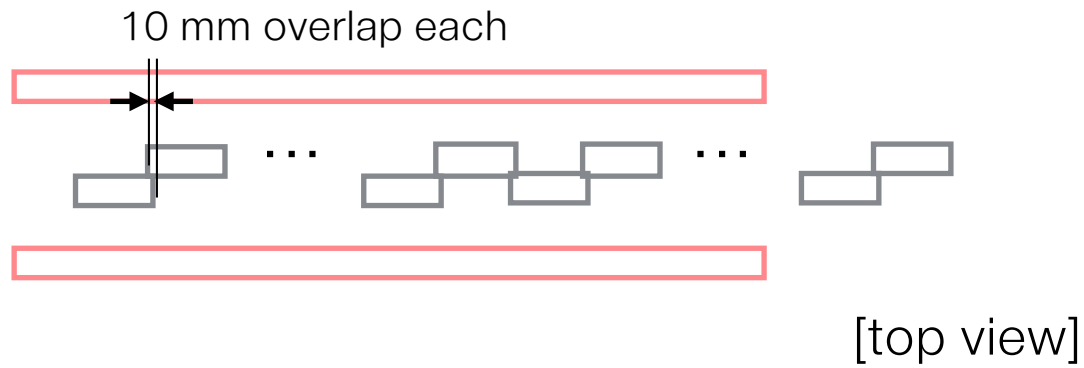
120 x 40 x 6 mm<sup>3</sup>

H2431-50



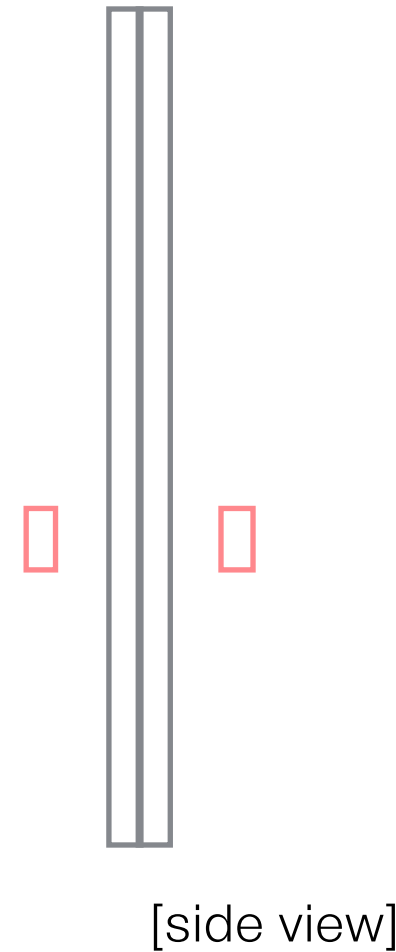
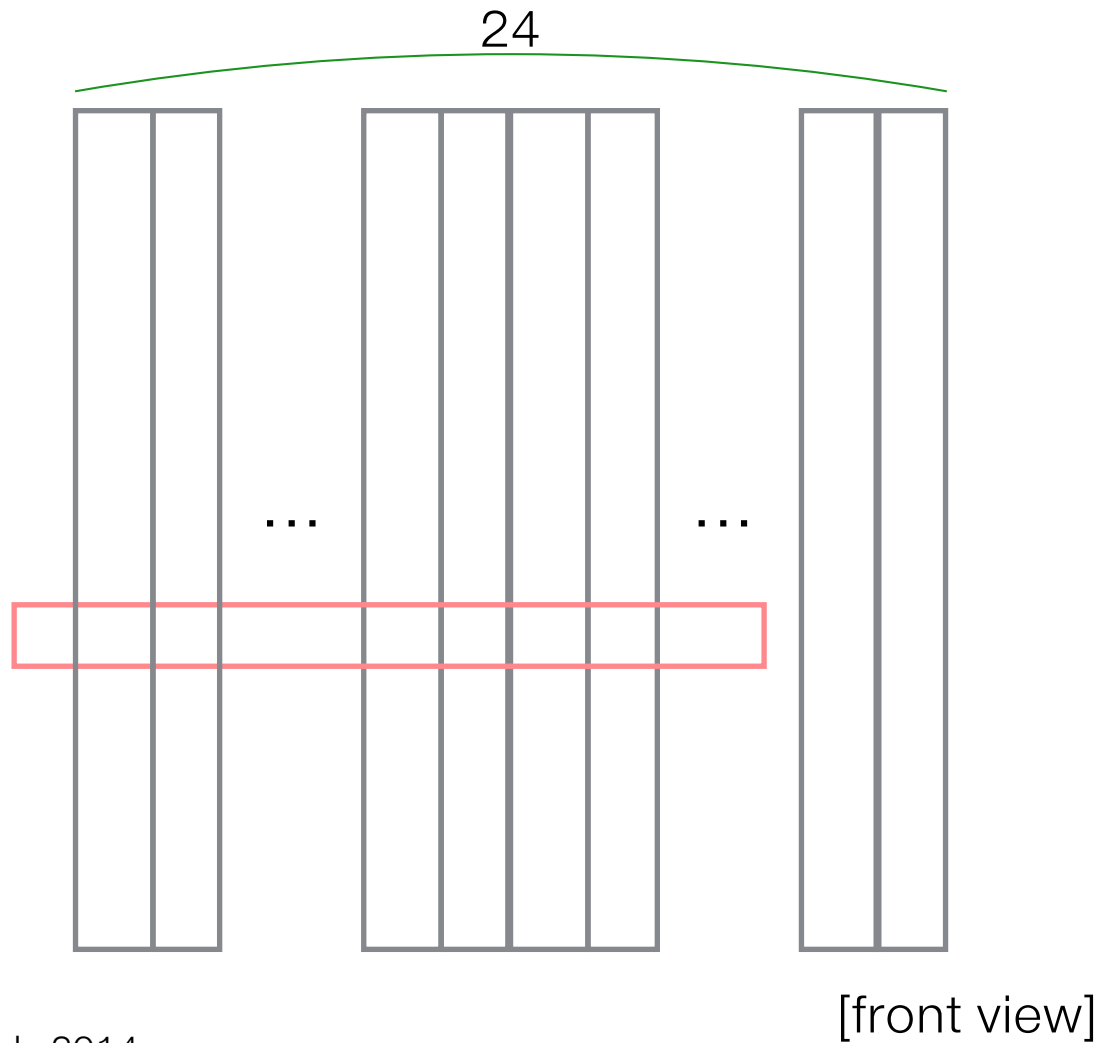
E07/E42  
ToF  
J-PARC

# Setup



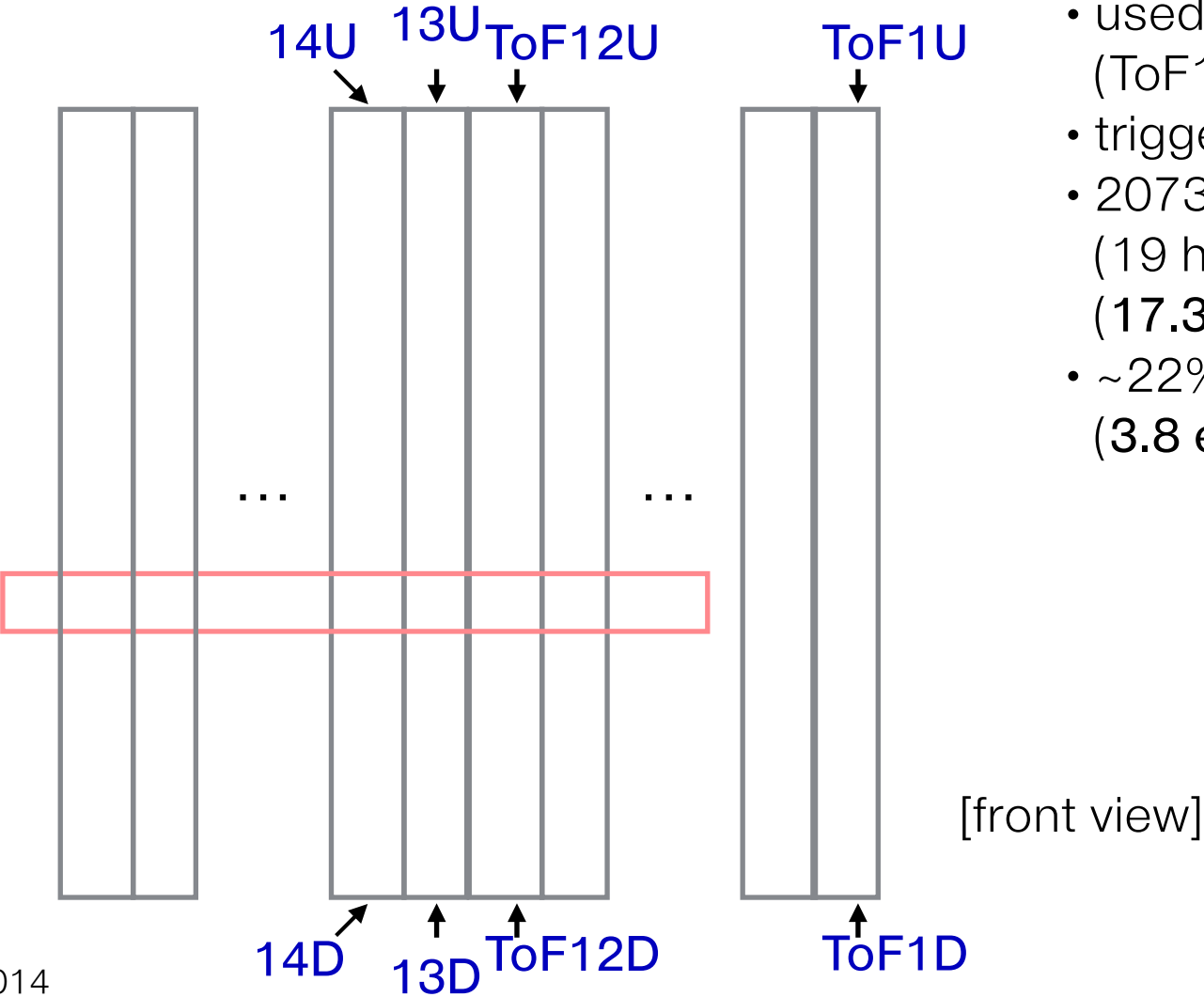
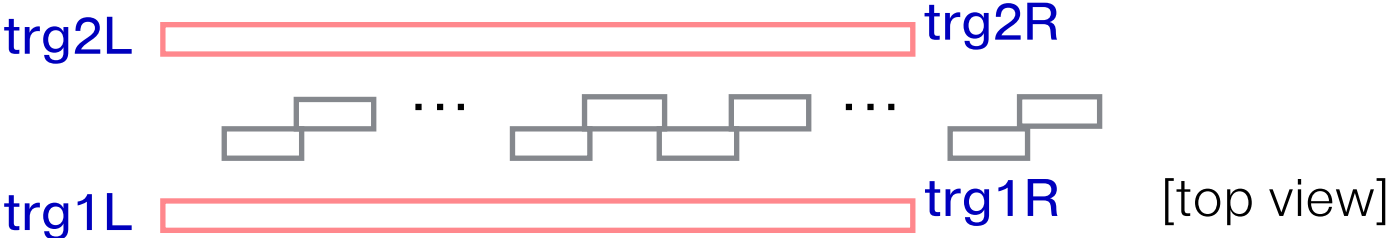
24 ToF scintillators  
30 x 80 x 1800 mm<sup>3</sup>

2 trigger scintillators  
30 x 80 x 1200 mm<sup>3</sup>

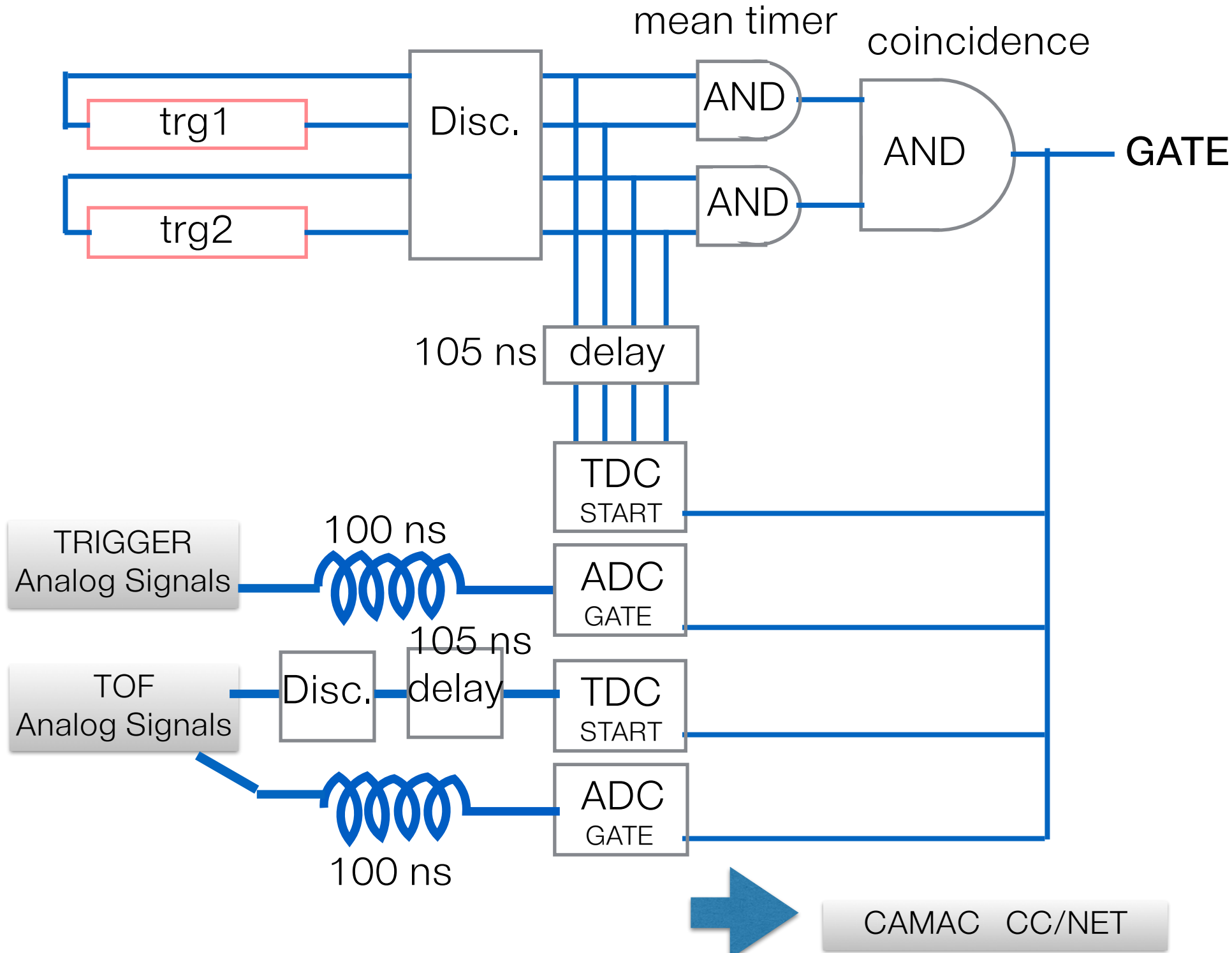


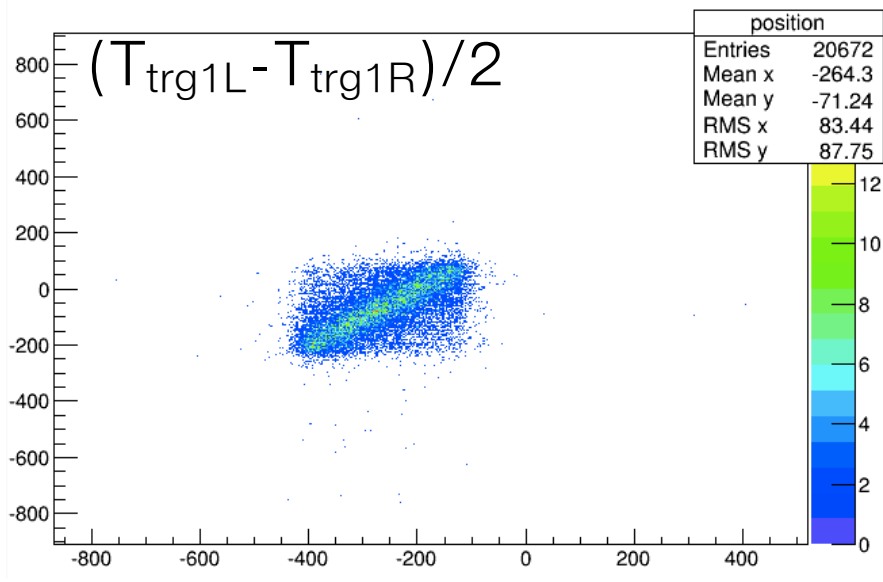


# cosmic ray test

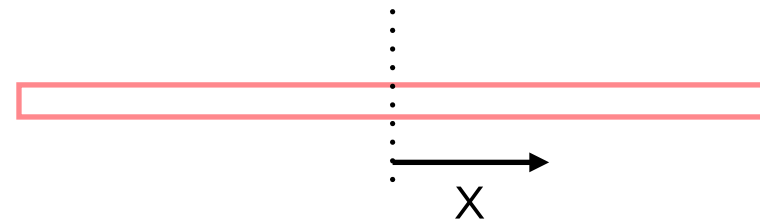


- used only 3 ToF (ToF12,13,14)
- trigger : trg1 AND trg2
- 20731 events (19 hr 57 min 26 sec) (17.31 event/ min)
- ~22% of events for each TOF (3.8 event/min)

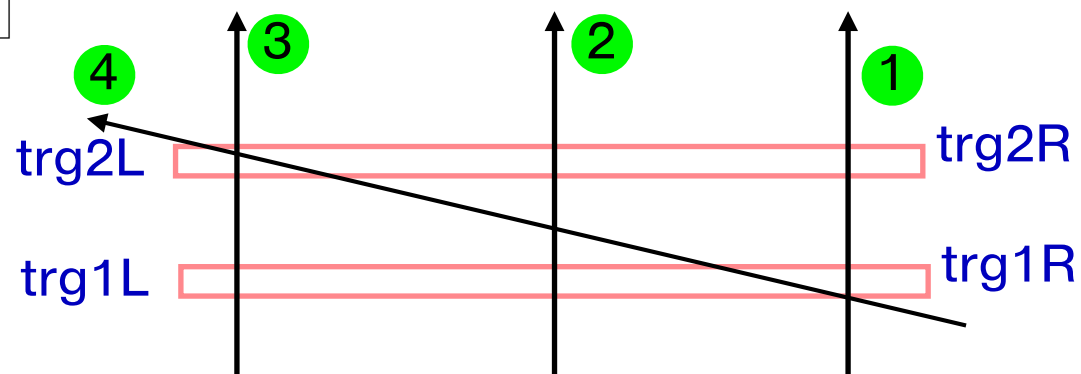
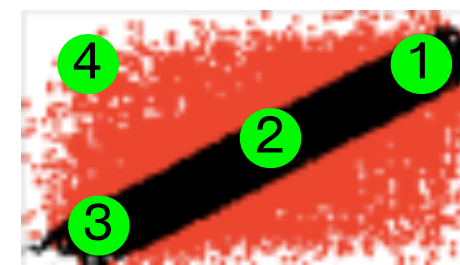
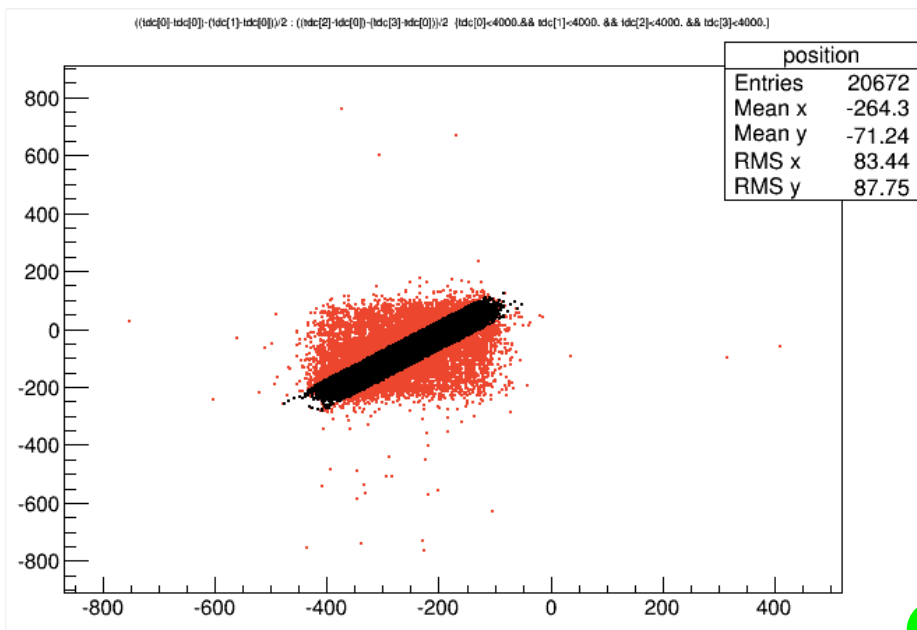




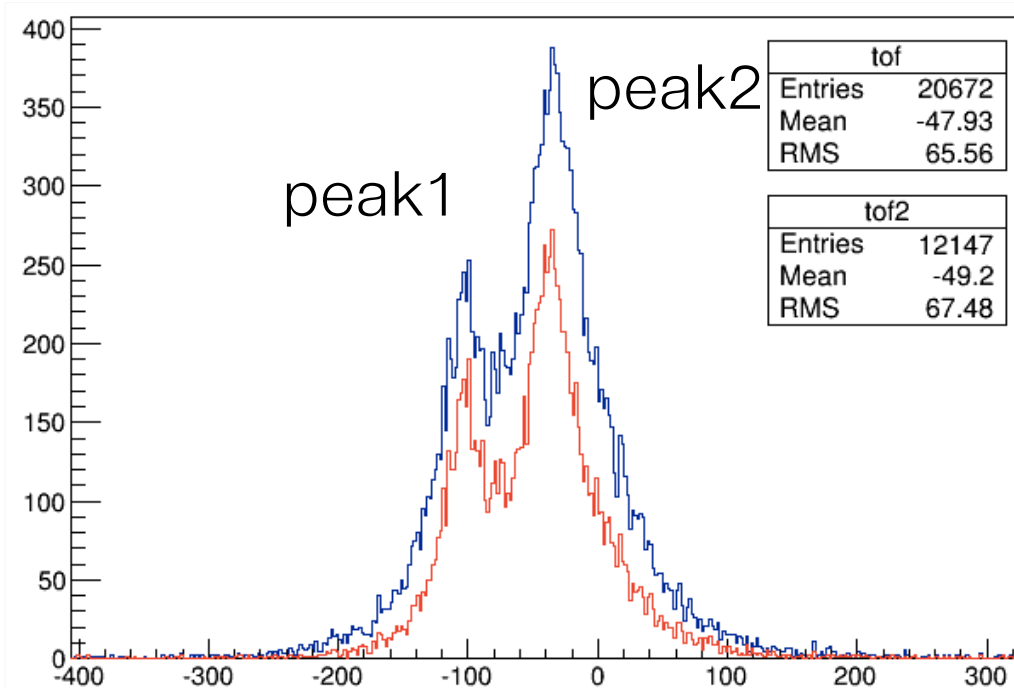
Cut



$(T_{trg2L} - T_{trg2R})/2 \sim X/v$

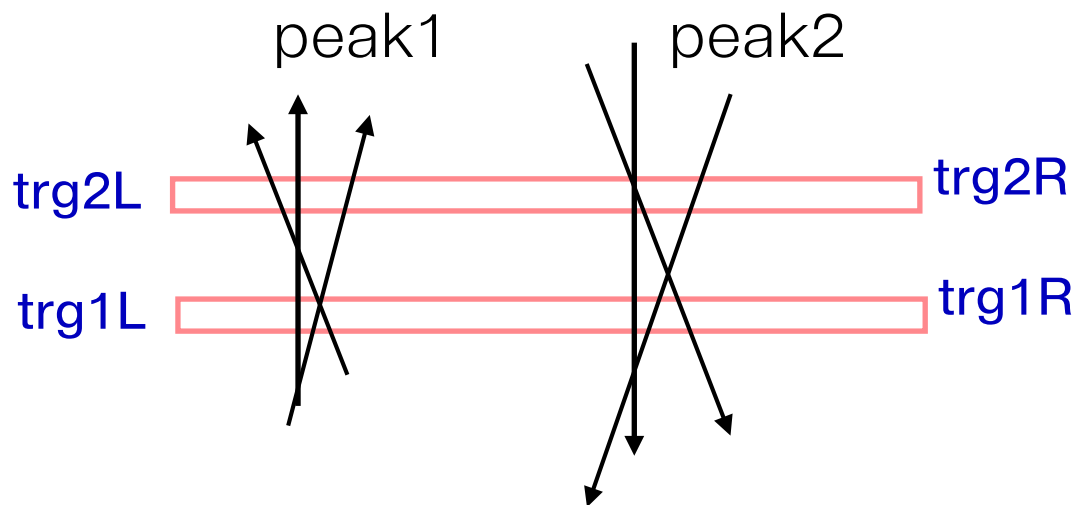


# Cut



blue : all event  
red : perpendicular to trg.

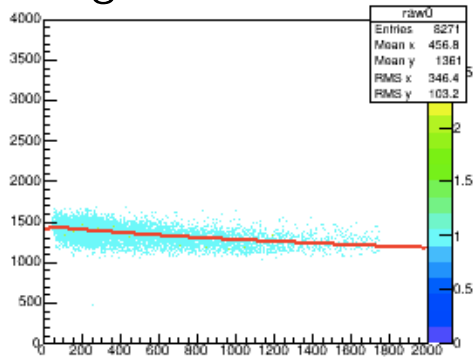
$$T_{\text{mean,trg1}} - T_{\text{mean,trg2}}$$



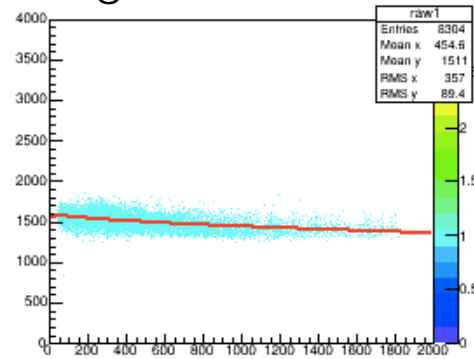
[top view]

# time walk correction

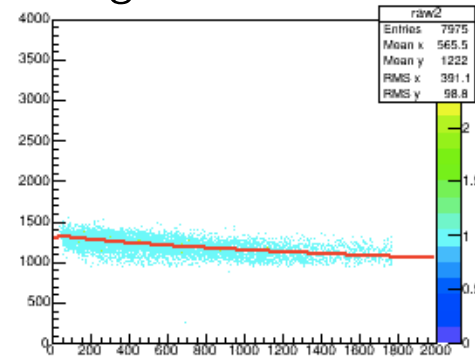
trg1L



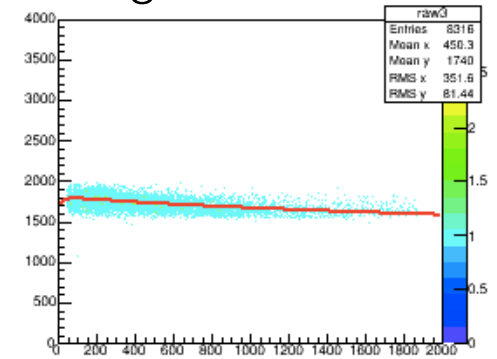
trg1R



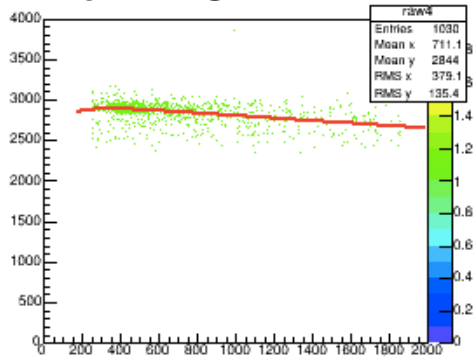
trg2L



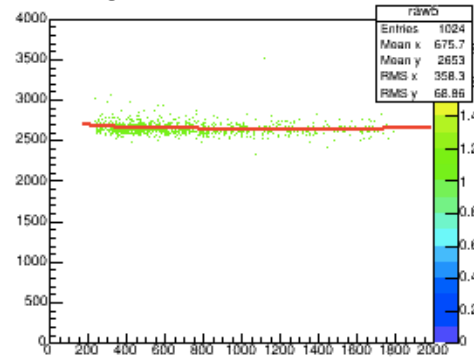
trg2R



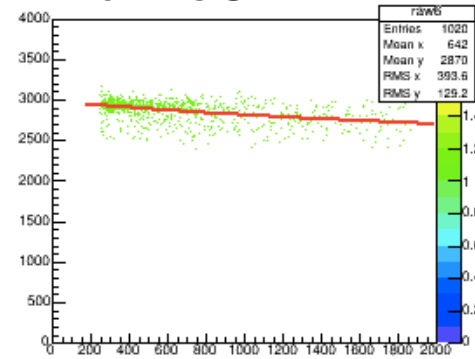
ToF12U



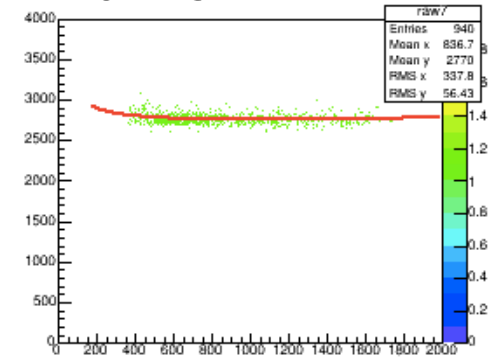
ToF12D



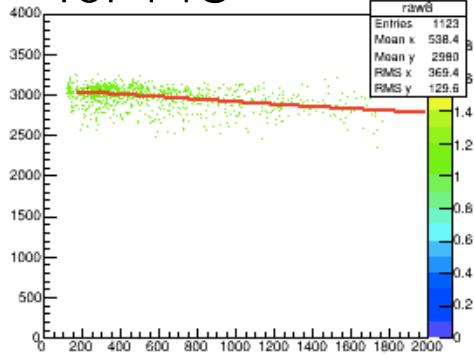
ToF13U



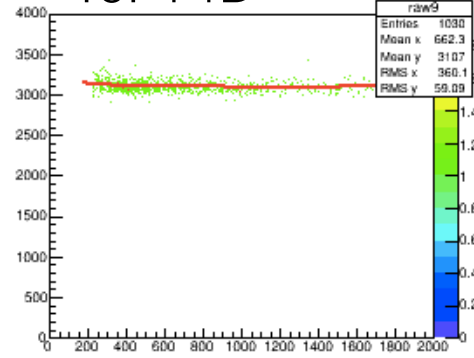
ToF13D

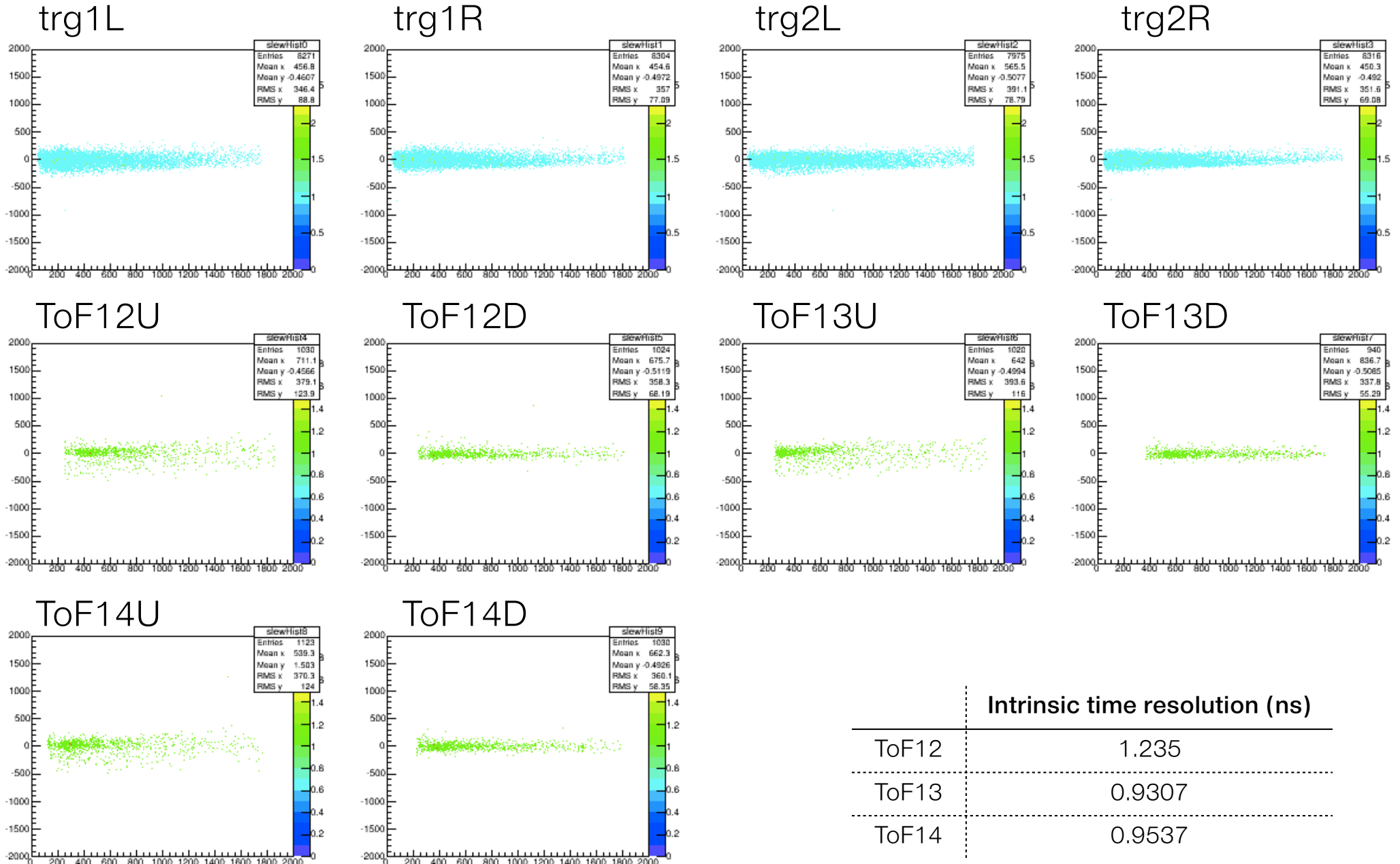


ToF14U

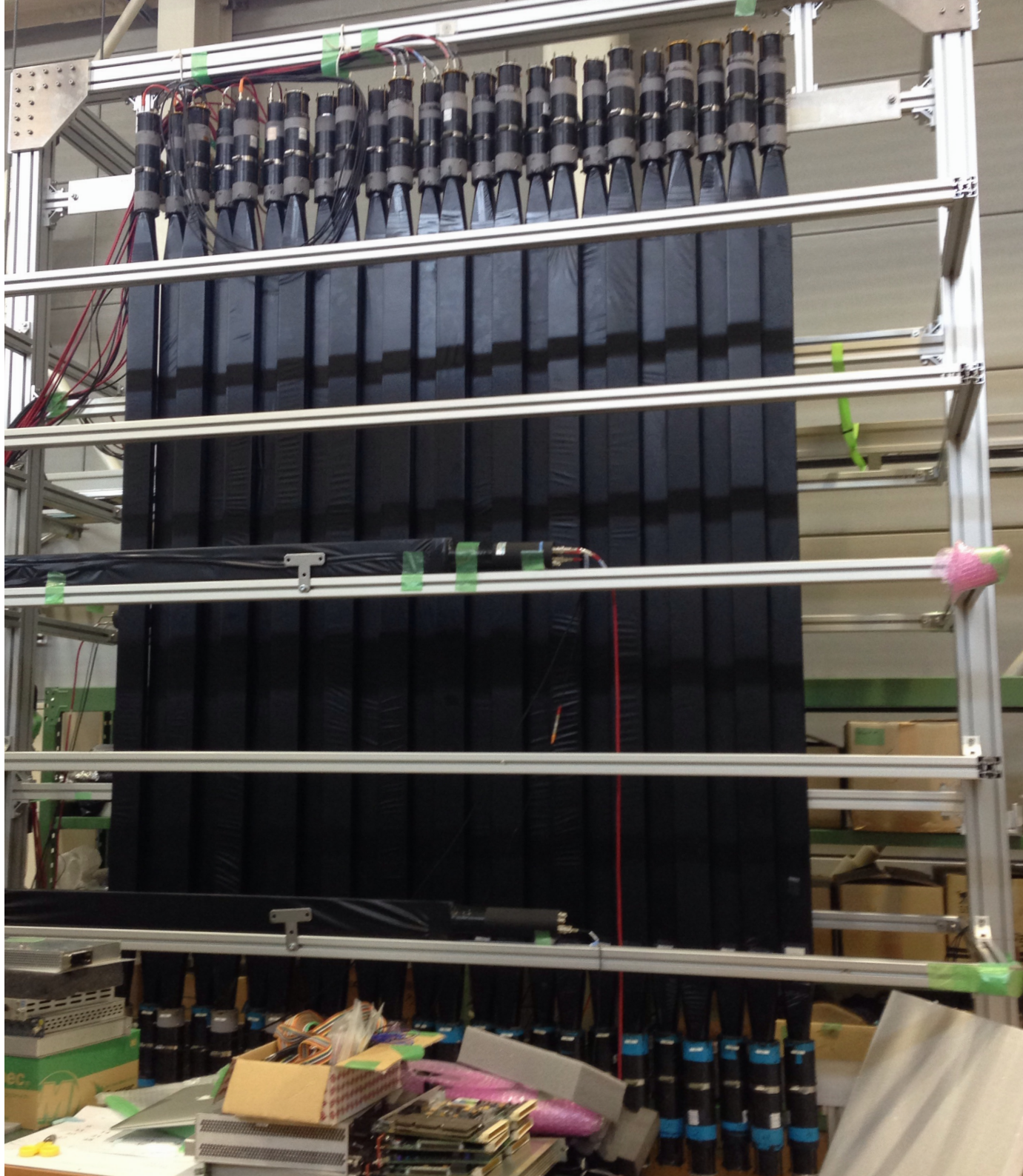


ToF14D



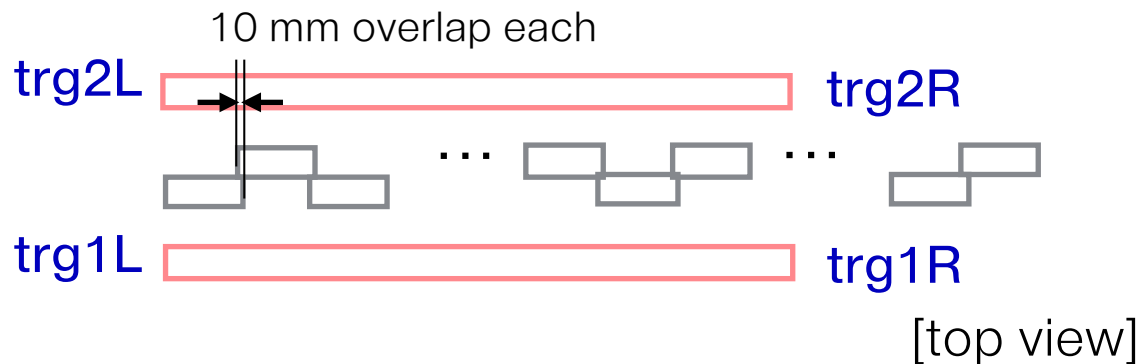


	Intrinsic time resolution (ns)
ToF12	1.235
ToF13	0.9307
ToF14	0.9537



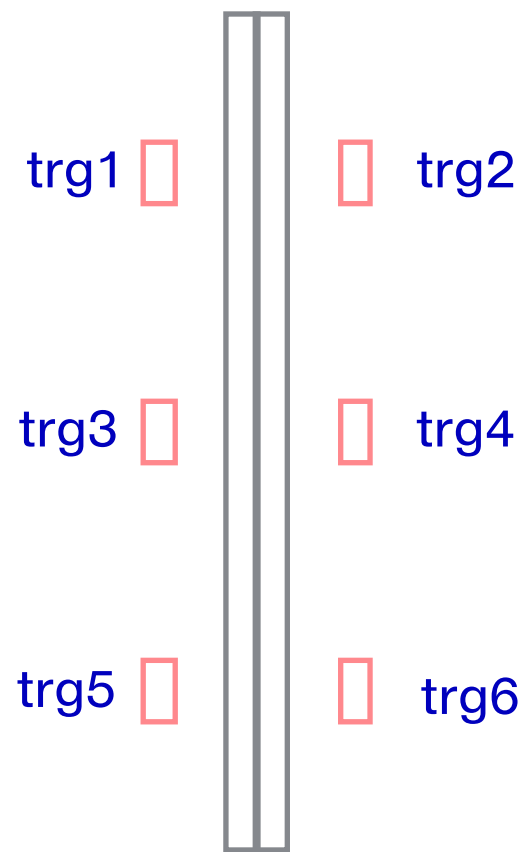
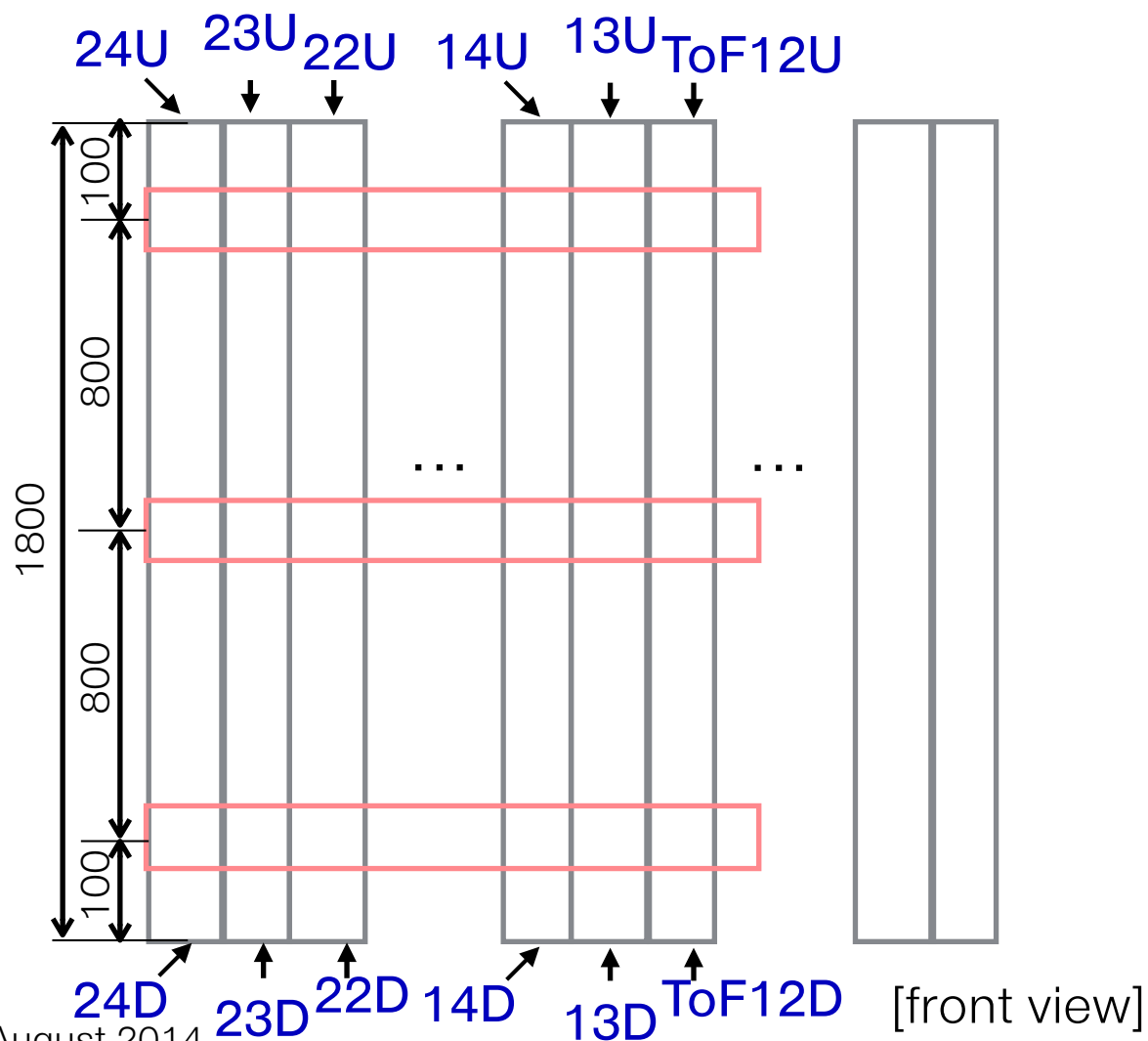
E07/E42  
ToF

# Setup



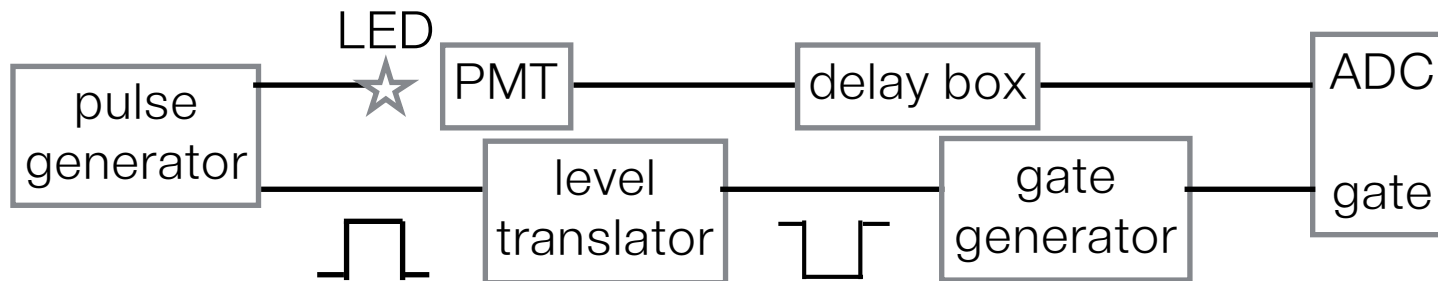
24 ToF scintillators  
30 x 80 x 1800 mm<sup>3</sup>

6 trigger scintillators  
30 x 80 x 1200 mm<sup>3</sup>

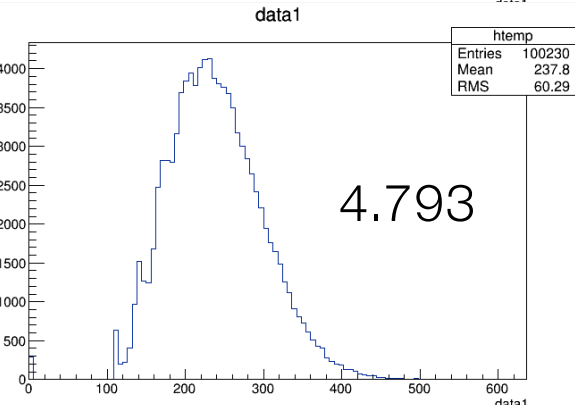
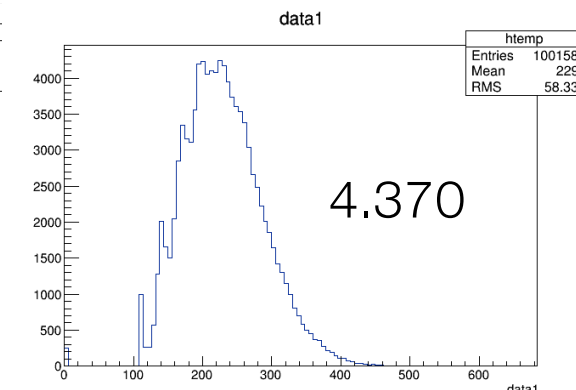
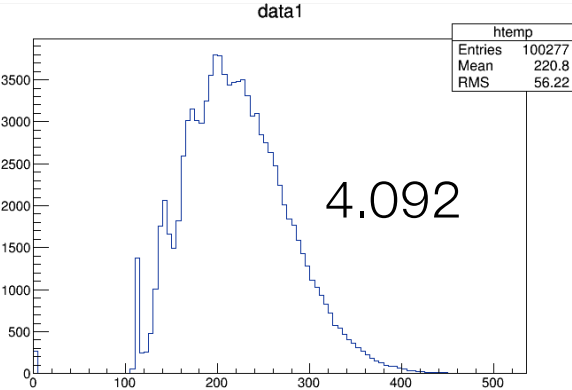
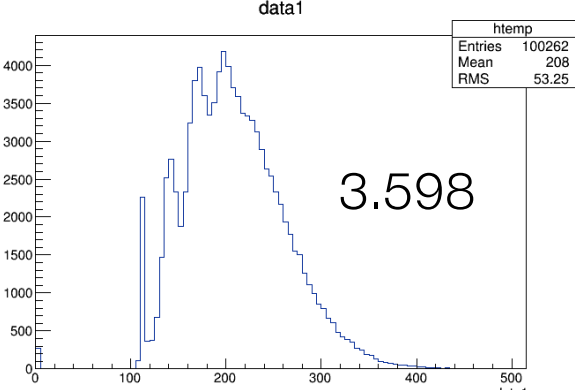
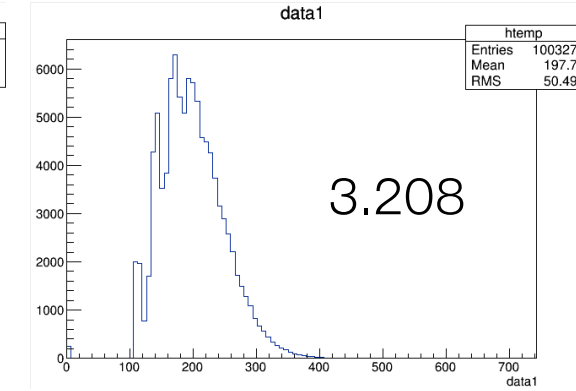
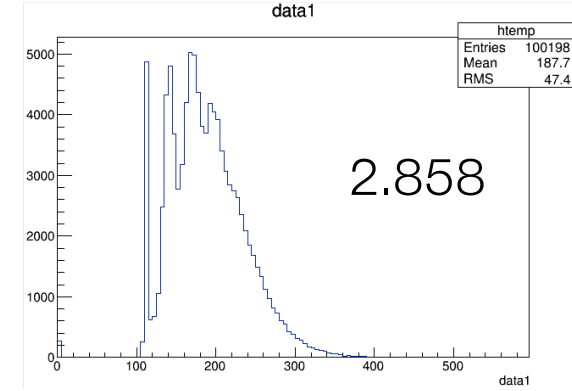
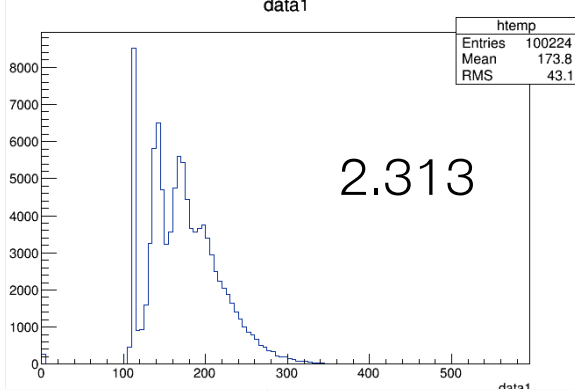
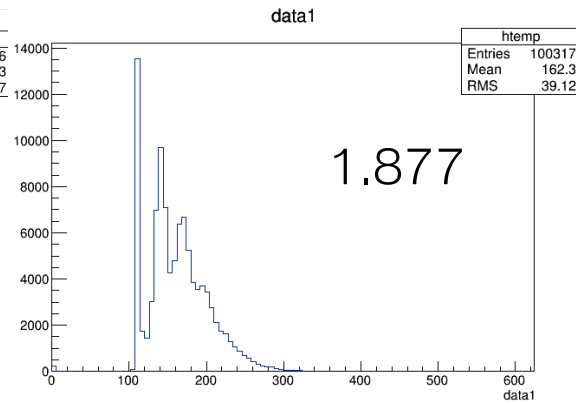
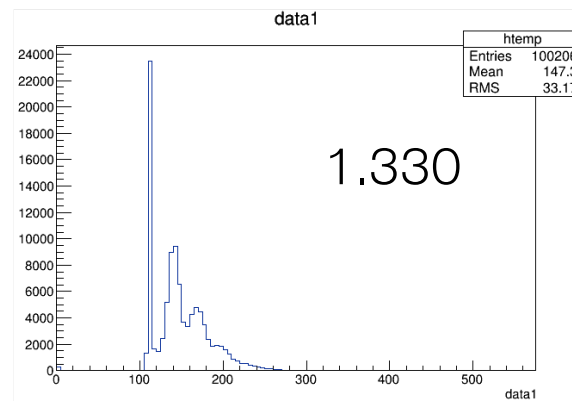
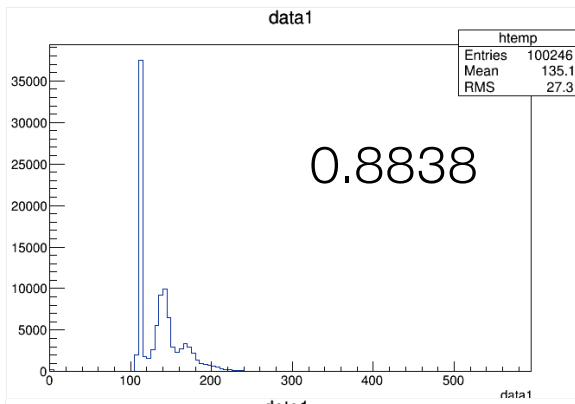




# Single Photoelectron Measurement Exp.



29 August 2014  
Shinhyung Kim



x axis : ADC (ch)  
y axis : count

Poisson Distribution

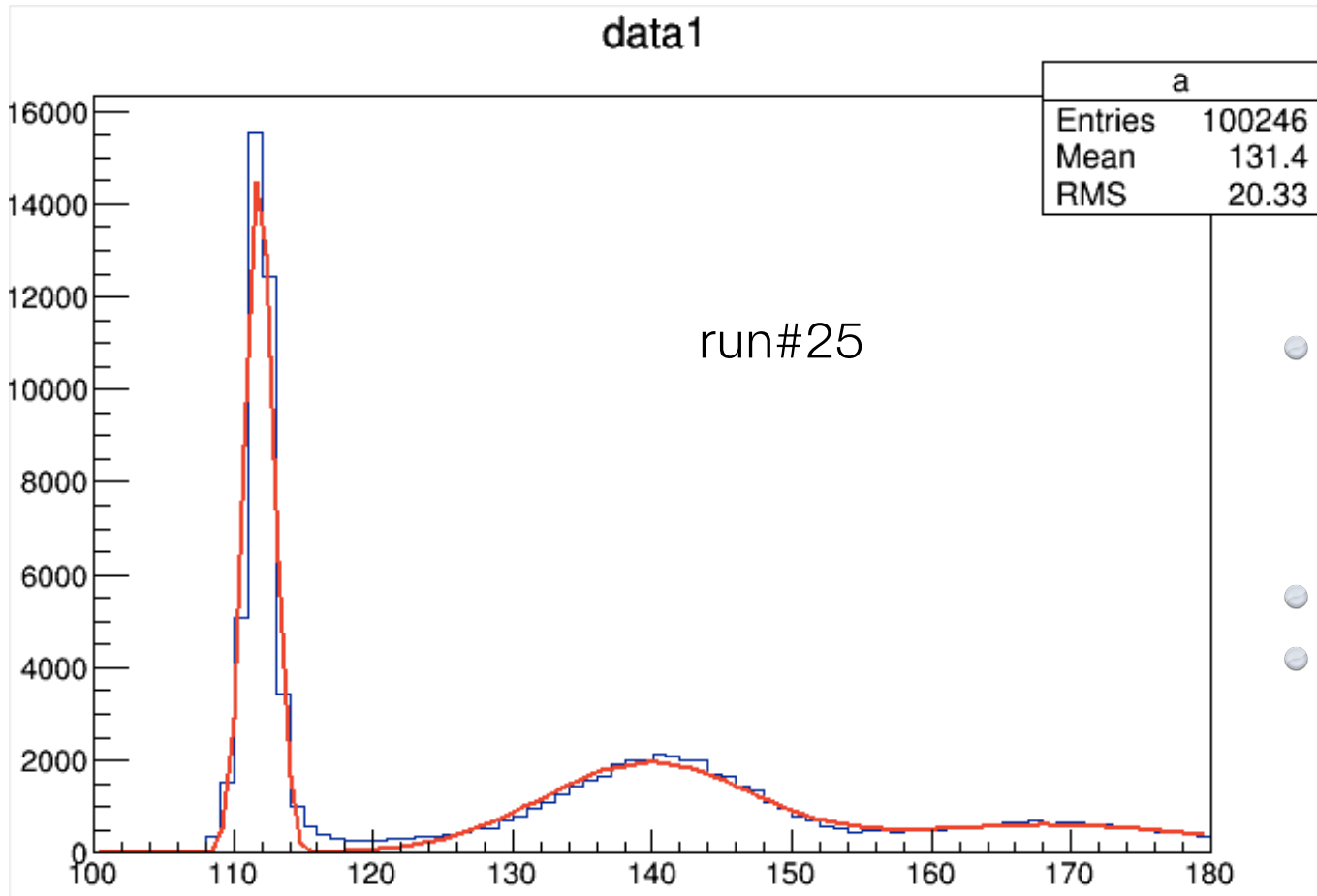
$$f(k; \lambda) = \Pr(X = k) = \frac{\lambda^k e^{-\lambda}}{k!}$$

# Back-up

Poisson Distribution

$$f(k; \lambda) = \Pr(X = k) = \frac{\lambda^k e^{-\lambda}}{k!}$$

LED (V)	N_all	N_0	NPE_avg
1.618	100246	41423	0.8838
1.628	100206	26505	1.330
1.636	100317	15360	1.877
1.641	100224	9920	2.313
1.646	100198	5749	2.858
1.649	100327	4057	3.208
1.652	100262	2746	3.598
1.655	100277	1676	4.092
1.657	100158	1267	4.370
1.659	100230	831	4.793



- 1st peak(0 event)  
 $p0 = 14898.6$   
 $p2 = 1.02567$   
 # of 0 event : 38304
- mean : 0.962
- peak interval : 7.65273 ch