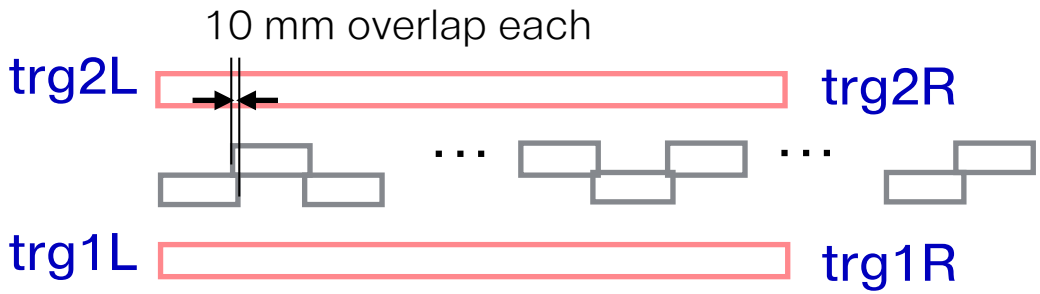
Status of TOF analysis

6 Oct. 2014

Shinhyung Kim

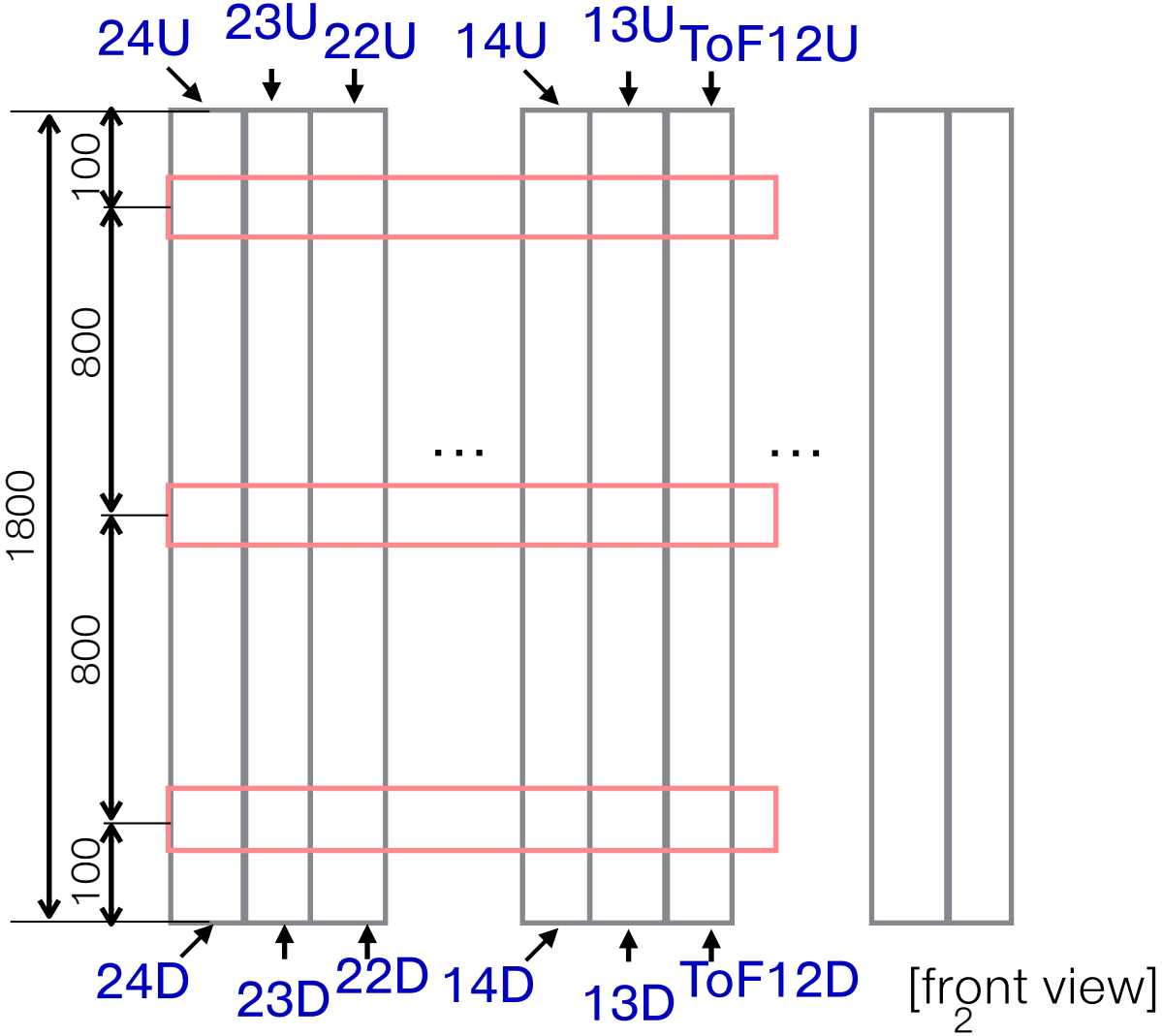
Setup



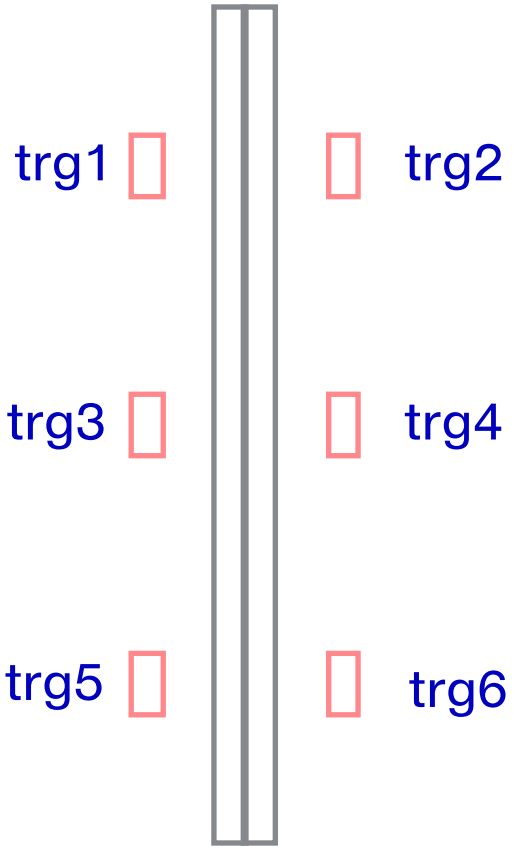
[top view]

24 ToF counters
30 x 80 x 1800 mm^3

6 trigger counters
30 x 80 x 1200 mm^3



[front view]

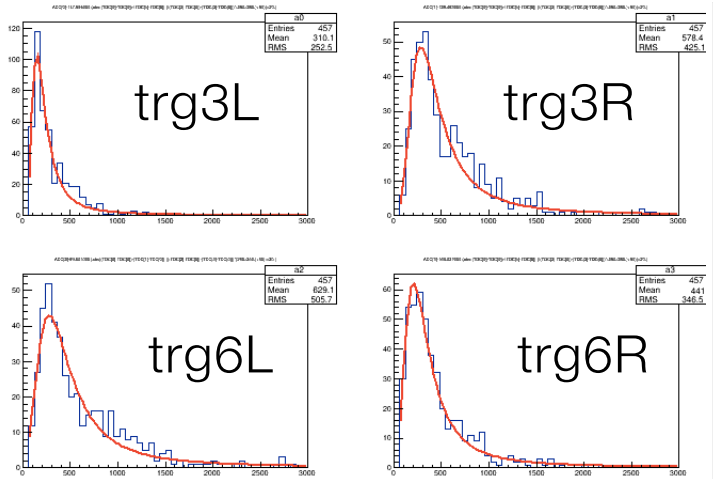


[side view]

trg3&6

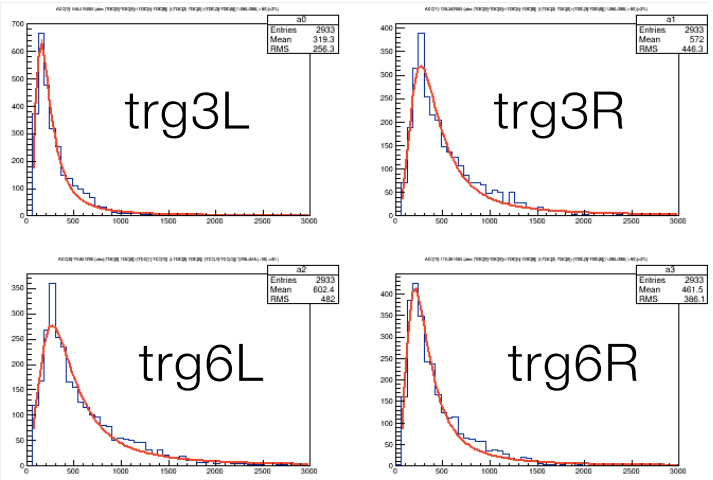
ADC distribution (ch)

run#51 HV 1800 V



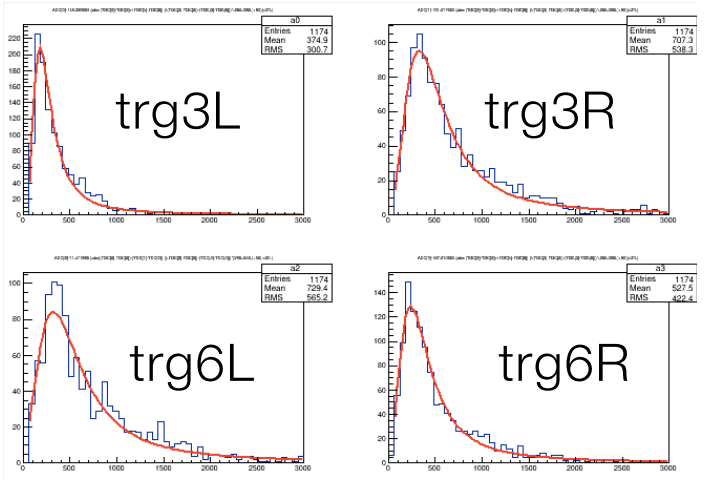
157.33, 306.599,
301.996, 224.645,

run#15 HV 1800 V



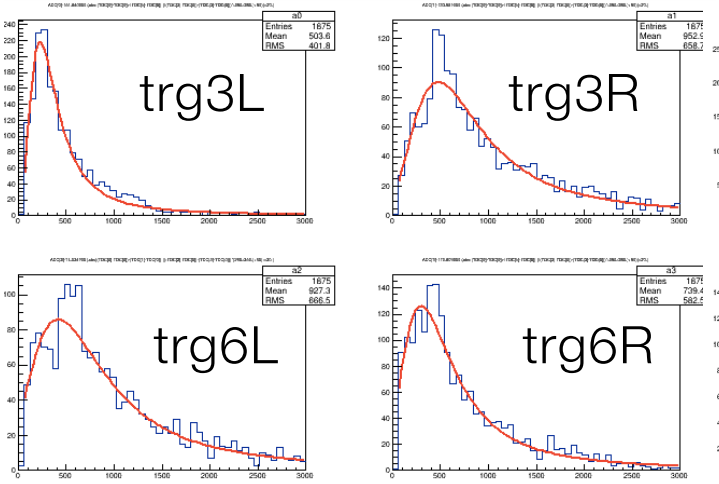
162.551, 288.805,
295.045, 221.088,

run#52+53 HV 1850 V



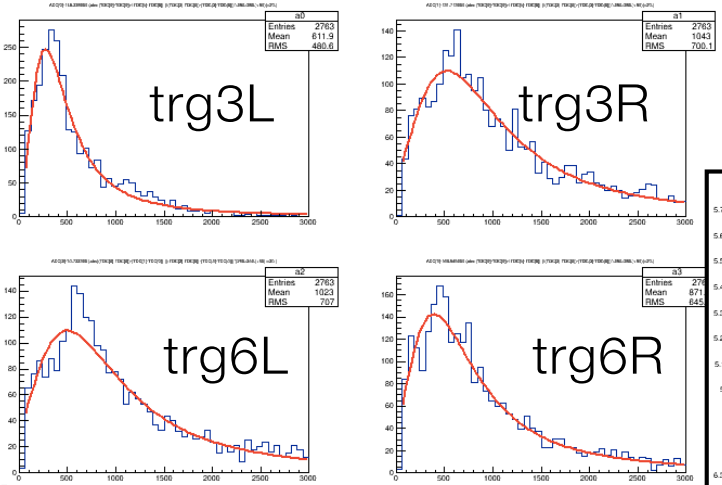
190.87, 357.82,
353.628, 258.415,

run#54+55 HV1950 V



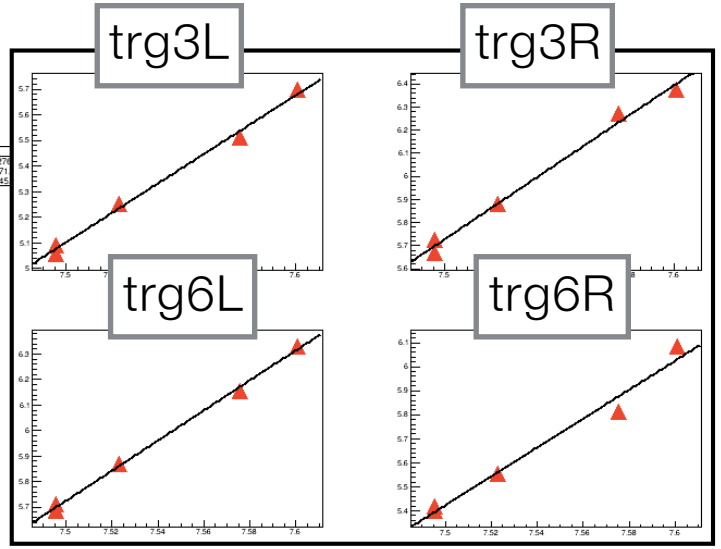
246.995, 527.591,
471.265, 333.977,

run#11 HV2000 V



298.537, 587.605,
561.368, 438.519,

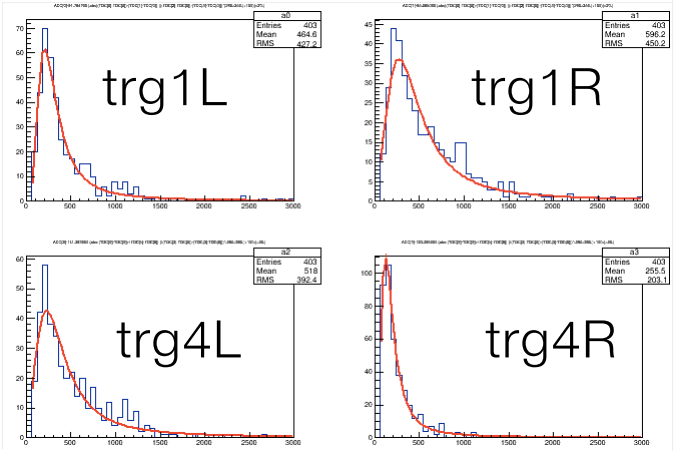
log(ADC) vs. log(HV)



trg1&4

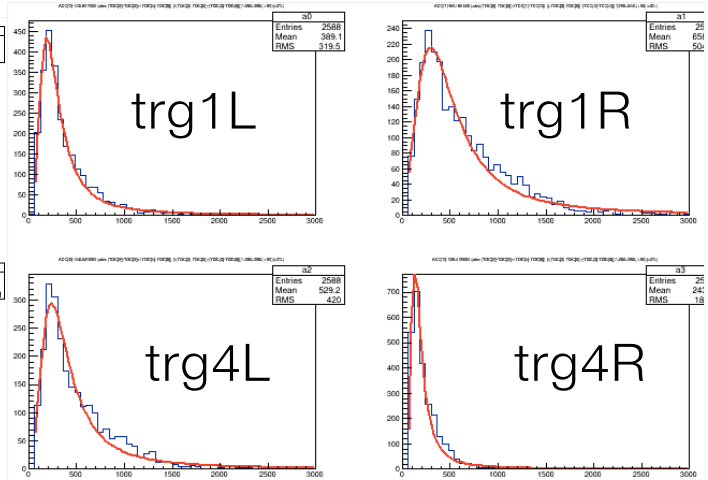
ADC distribution (ch)

run#51 HV 1800 V



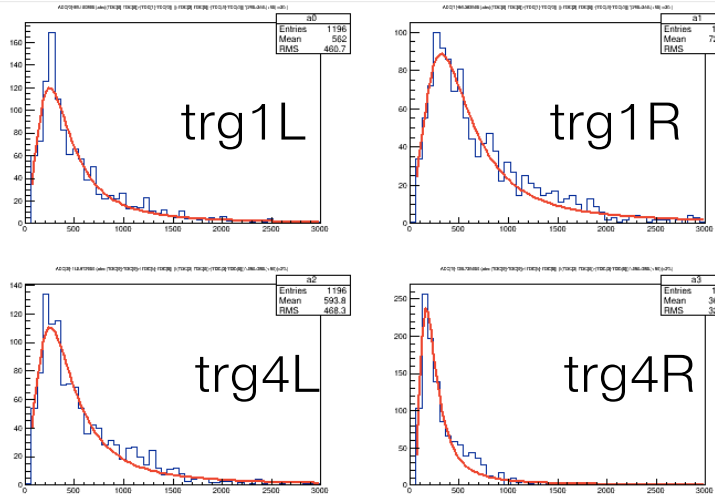
220.153, 297.036,
247.894, 129.64,

run#15 HV 1800 V



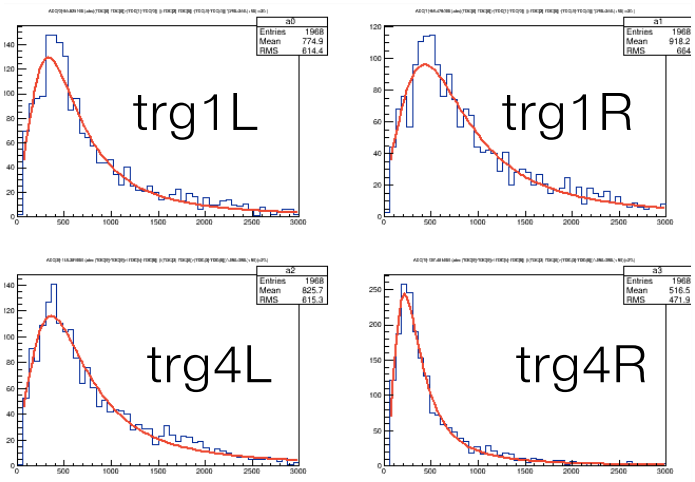
200.58, 324.694,
257.331, 135.219,

run#52+53 HV 1850 V



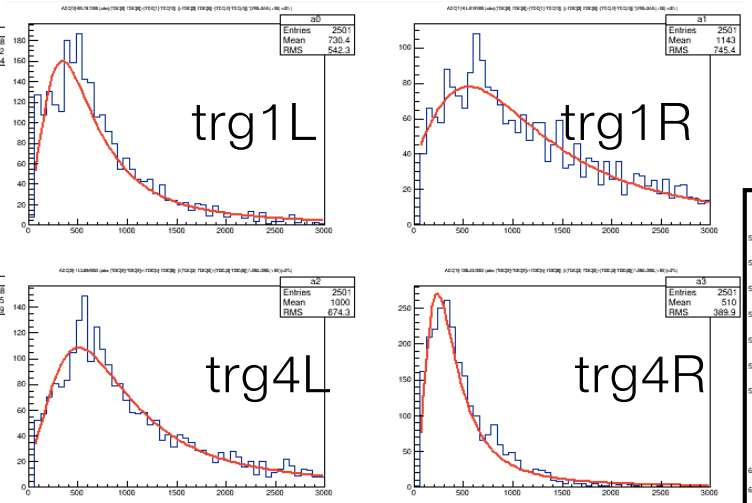
272.787, 351.771,
280.667, 175.801,

run#54+55 HV1950 V



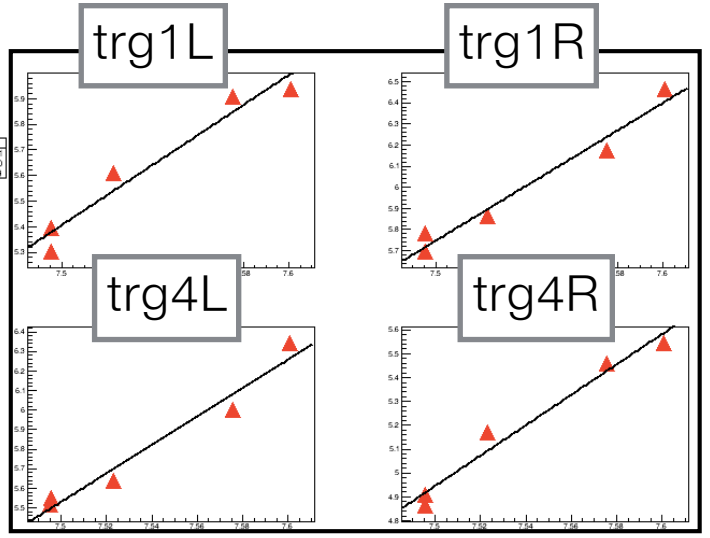
368.162, 480.438,
403.885, 234.704,

run#11 HV2000 V



378.514, 640.965,
568.571, 256.05,

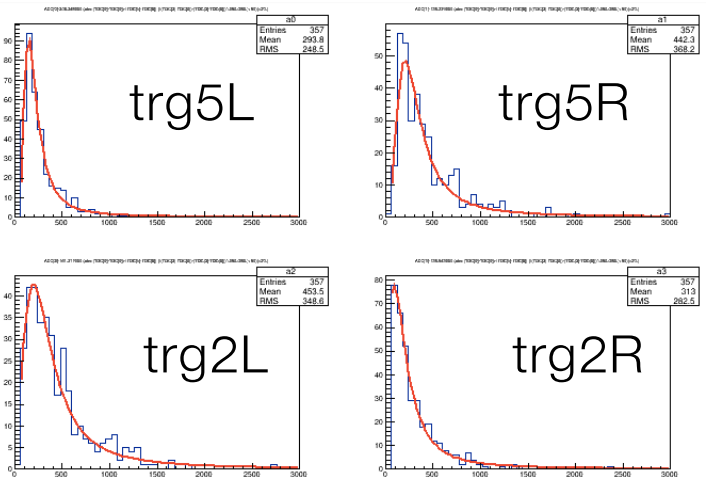
log(ADC) vs. log(HV)



trg5&2

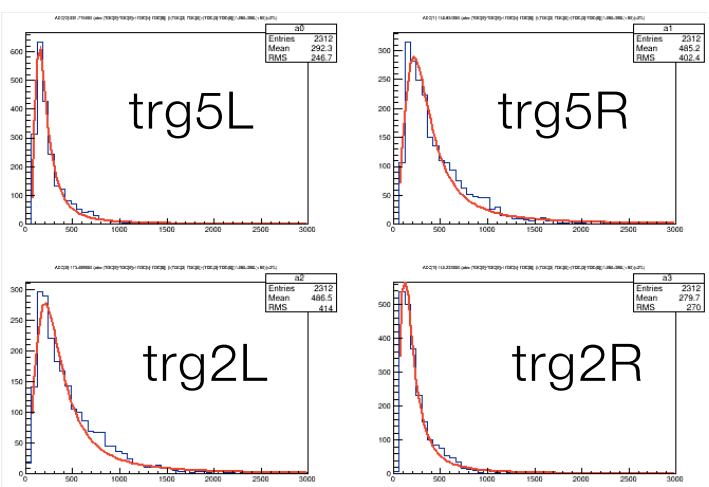
ADC distribution (ch)

run#51 HV 1800 V



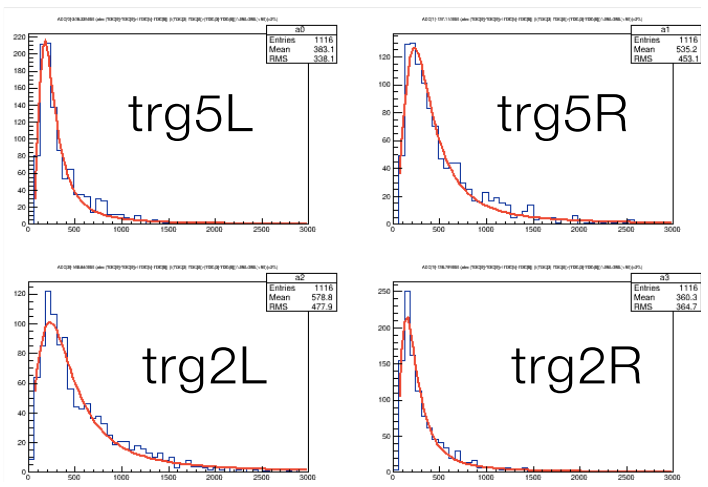
155.601, 223.115,
217.731, 101.7,

run#15 HV 1800 V



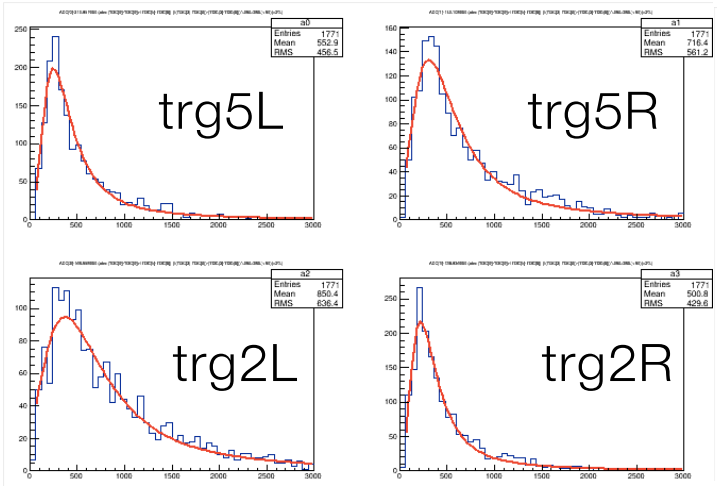
153.2, 236.862,
225.72, 128.475,

run#52+53 HV 1850 V



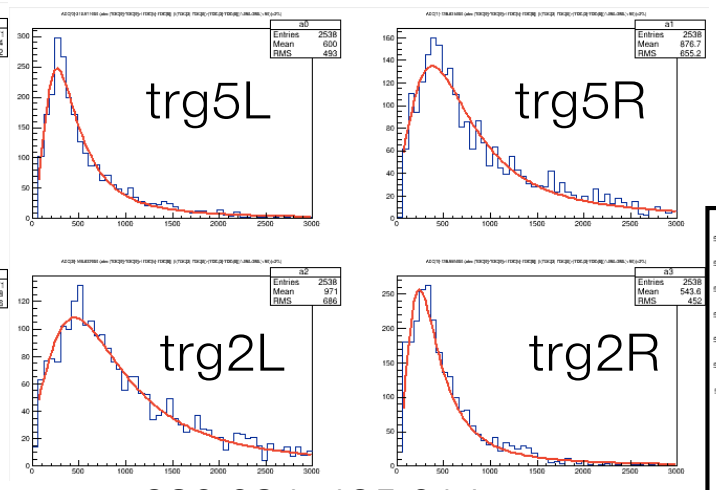
185.824, 249.12,
257.797, 156.489,

run#54+55 HV1950 V



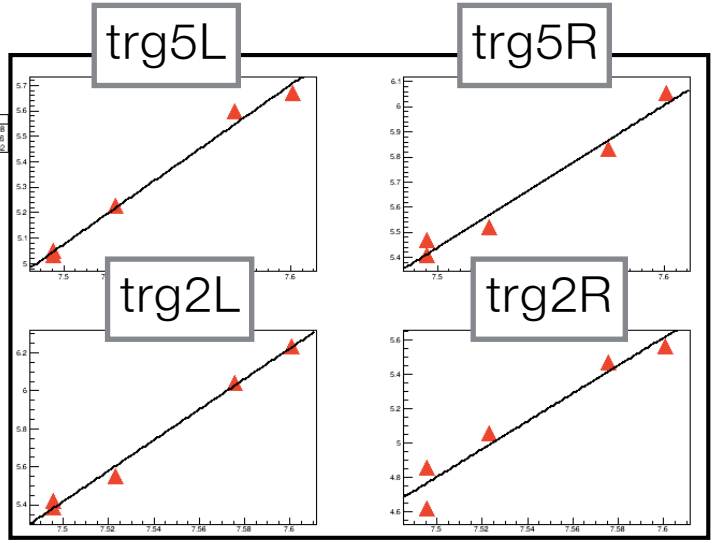
270.044, 340.555,
420.285, 237.893,

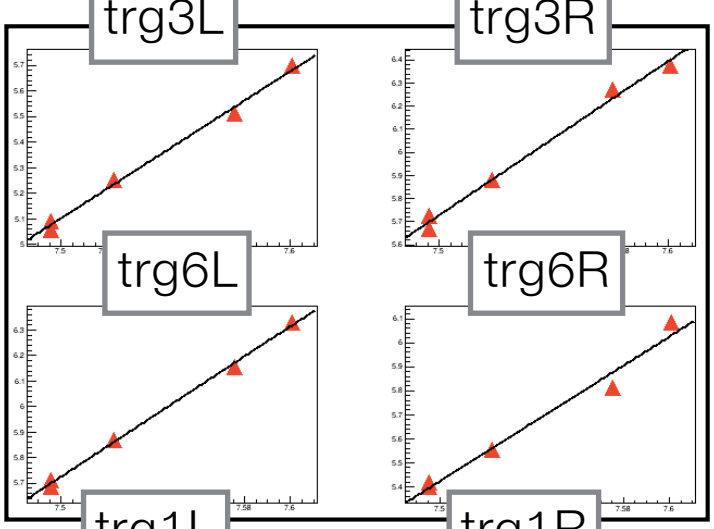
run#11 HV2000 V

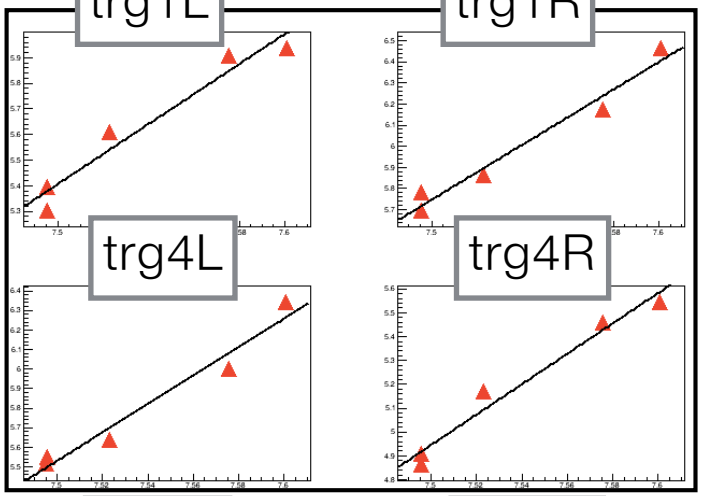


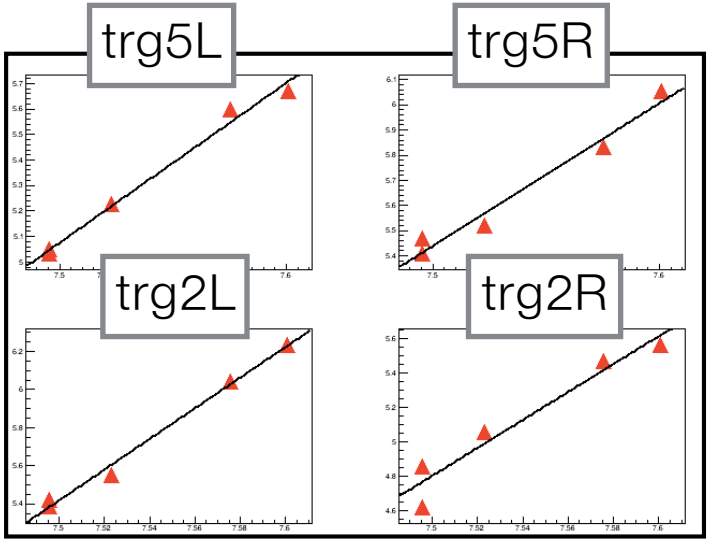
289.684, 425.614,
510.328, 261.062,

log(ADC) vs. log(HV)









log(ADC) vs. log(HV)

$$ADC = \alpha(HV)^{\beta}$$

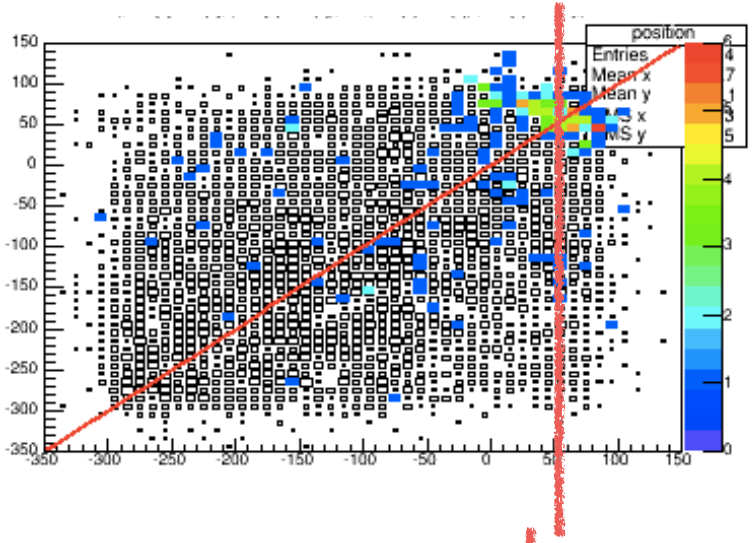
	α	β	HV
trg3L	3.32E-17	5.74	2008
trg3R	5.67E-20	6.67	1801
trg6L	1.98E-17	5.89	1801
trg6R	5.43E-18	6.02	1894

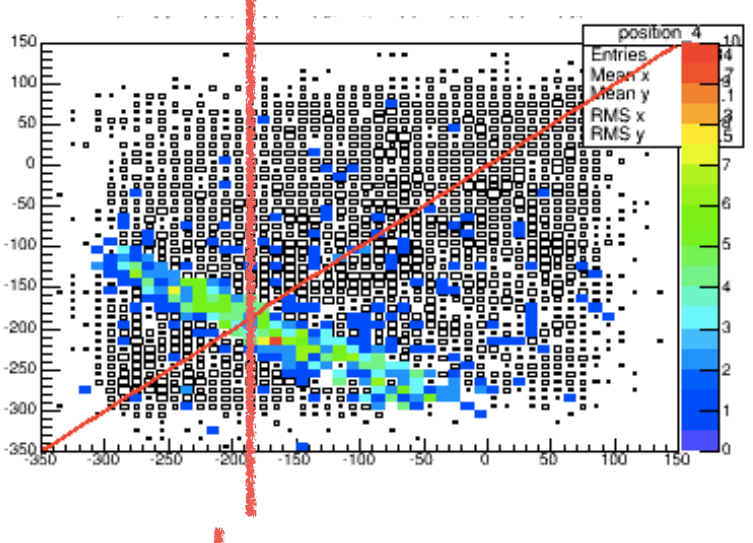
	α	β	HV
trg1L	1.68E-17	5.87	1902
trg1R	1.85E-19	6.52	1796
trg4L	5.02E-22	7.28	1851
trg4R	2.58E-19	6.37	2036

	α	β	HV
trg5L	6.19E-19	6.27	1999
trg5R	7.69E-17	5.67	1894
trg2L	1.38E-24	8.05	1873
trg2R	4.87E-25	8.10	2020

run#51,
trg3&6

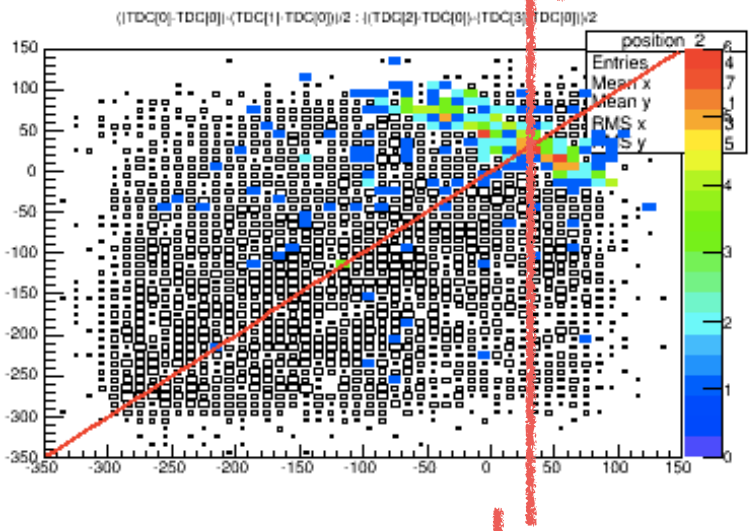
tof12

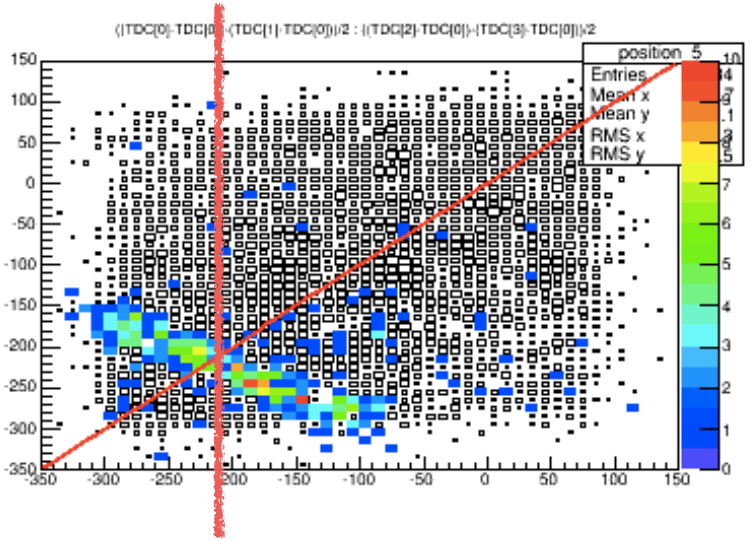




tof22

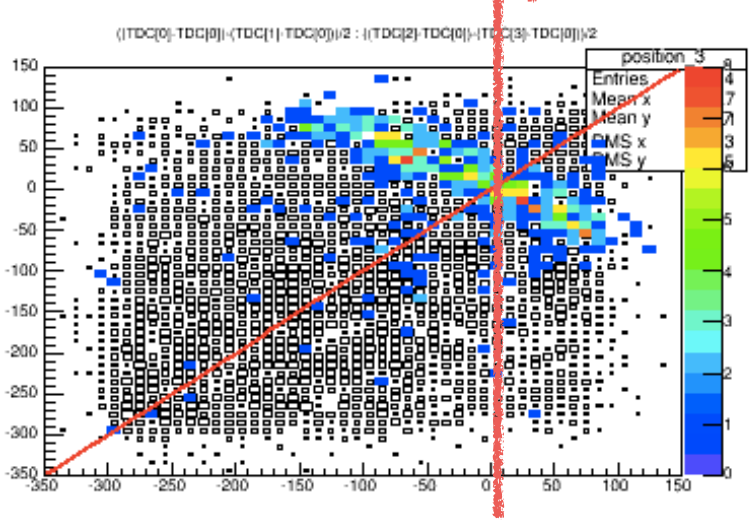
tof13

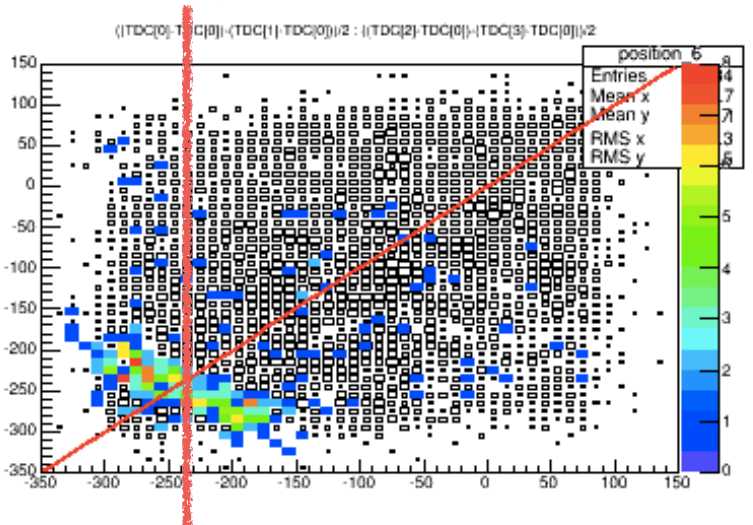




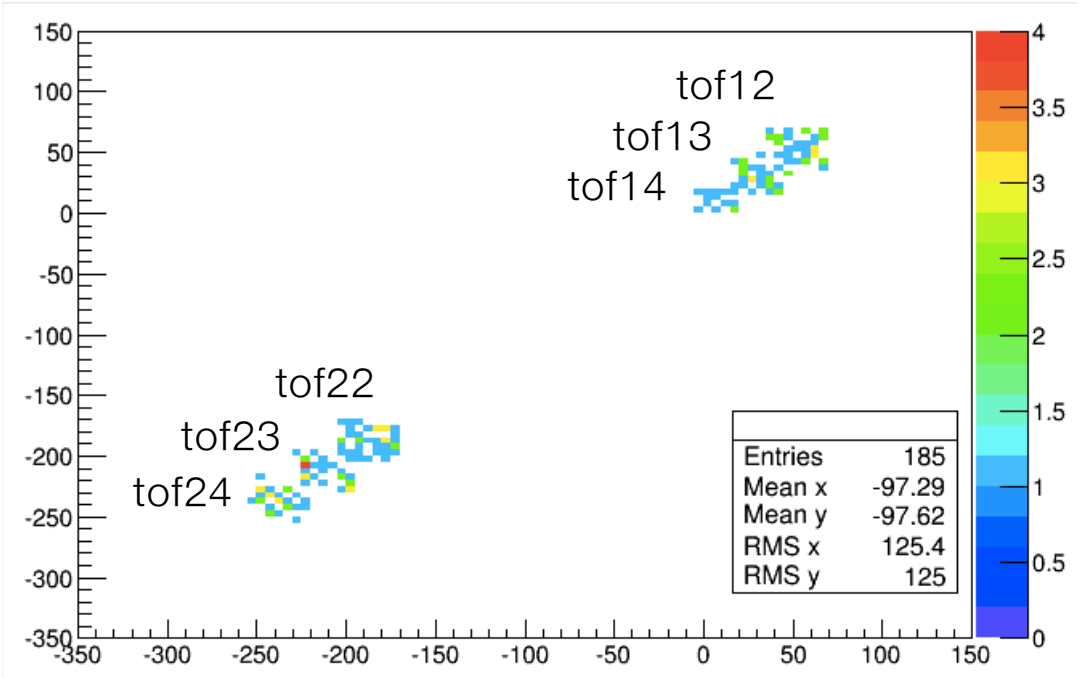
tof23

tof14



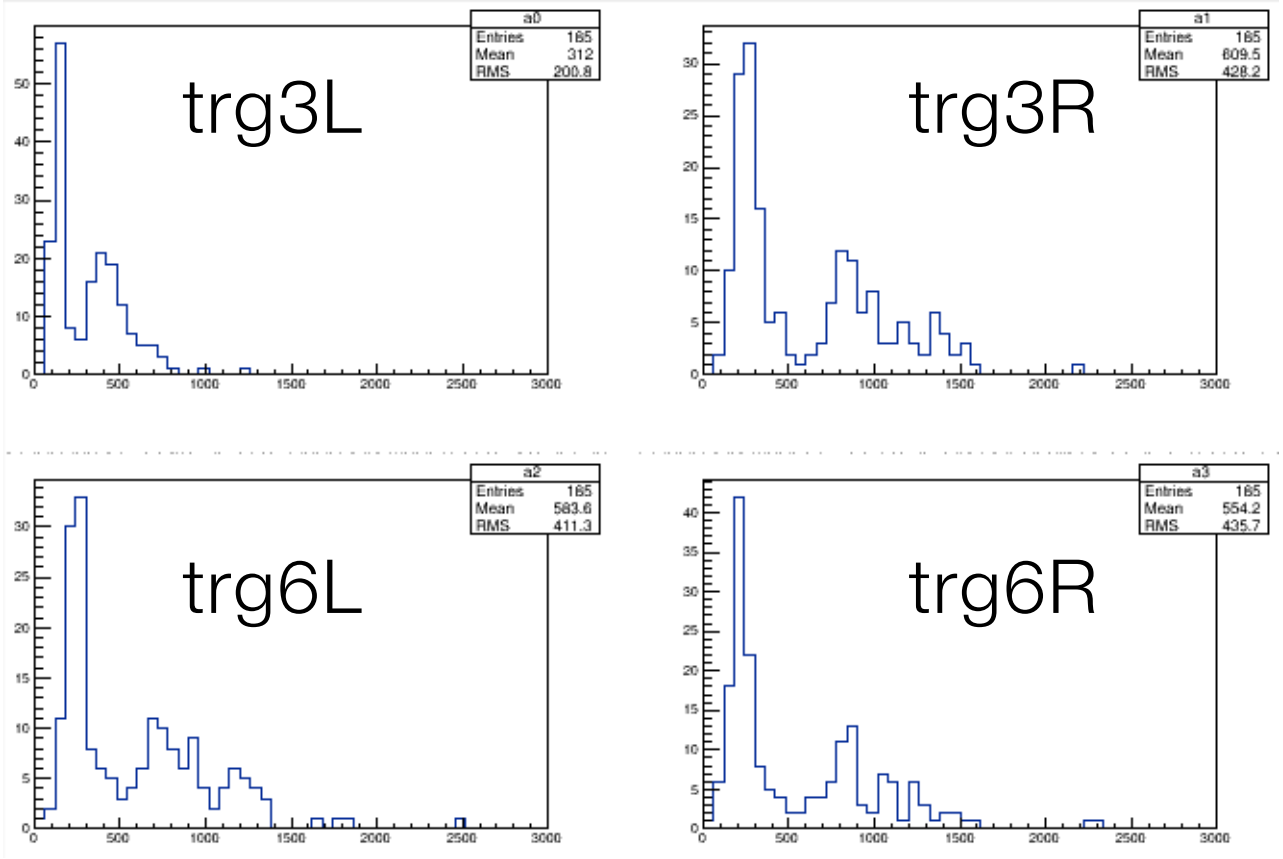


tof24



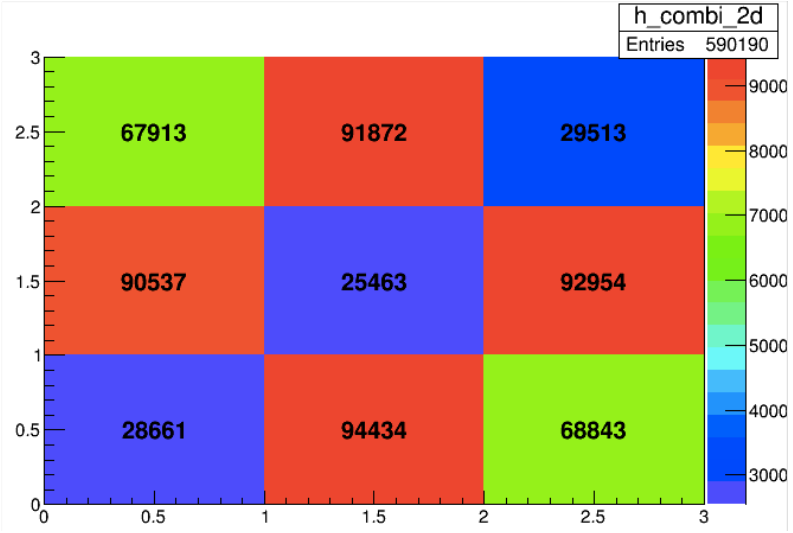
cut

* ADC distribution (ch)



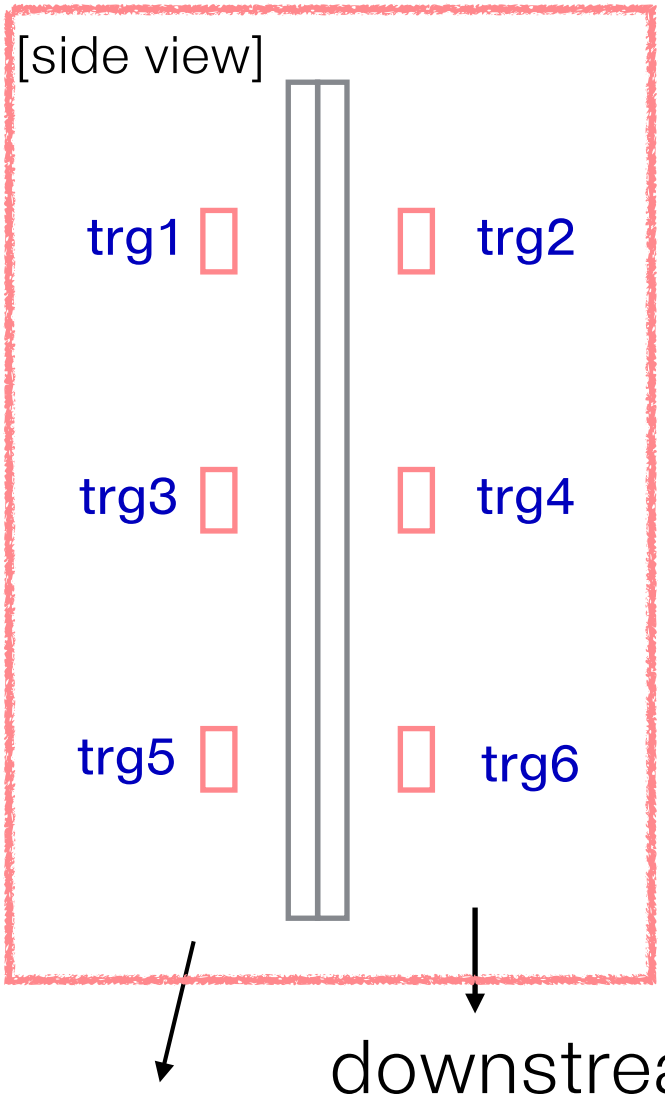
Plan

- will get data taken with counters laid on the ground before installing the system and analyze them
- got data w/ 600,000 events (crude gain calibration) and will analyze them
- horizontal / diagonal?



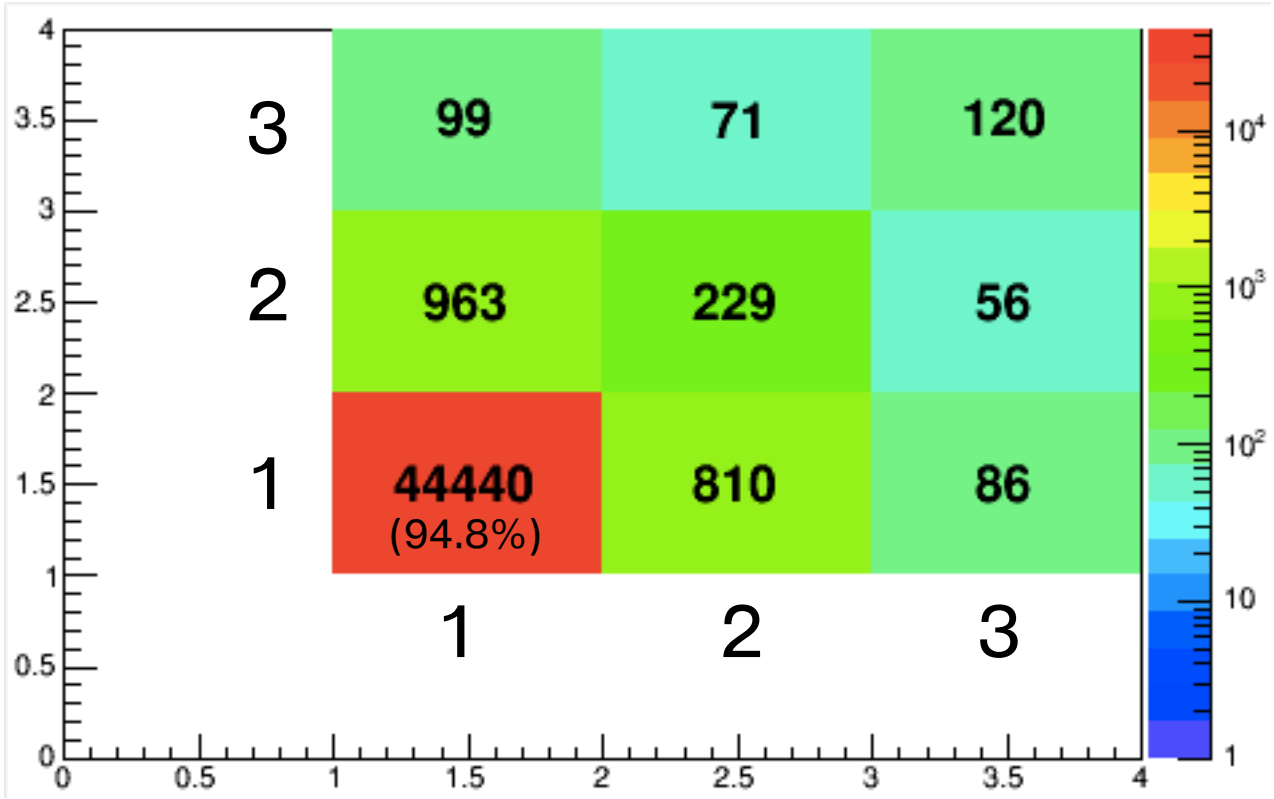
24 hrs -> 100,000 events -> 4,000 horizontal events
-> choose diagonal events -> but after cuts, ~30 events for each TOF

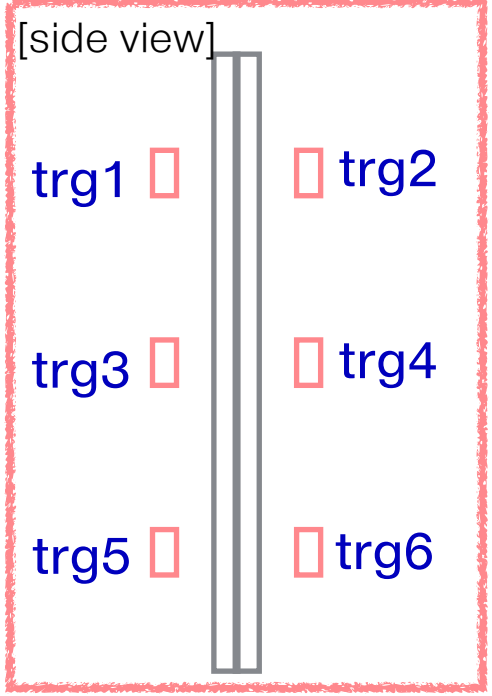
Back-up

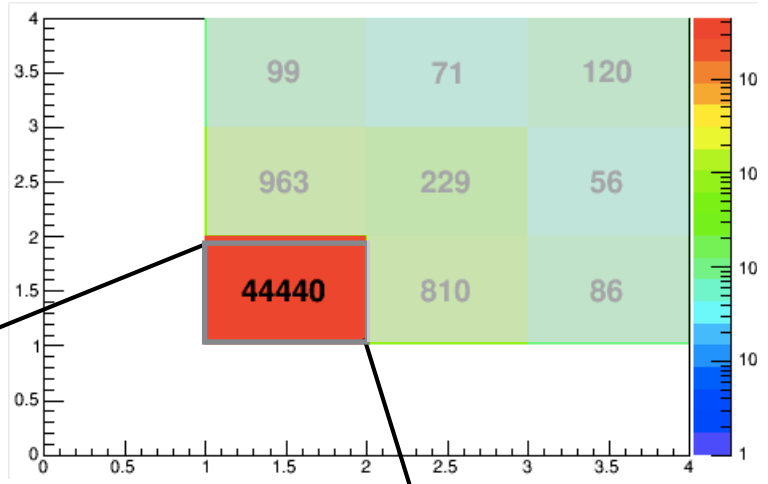


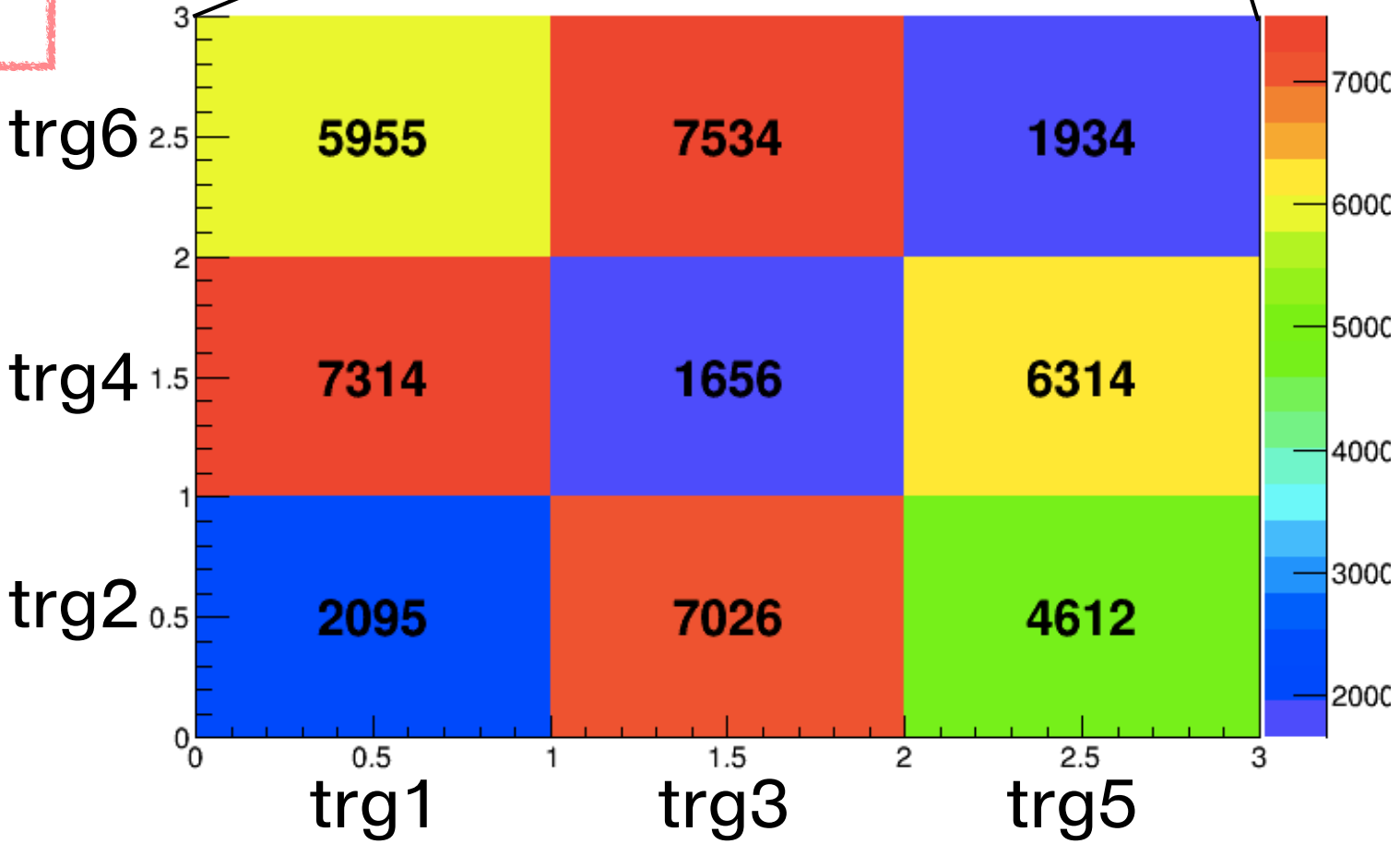
- trigger condition:
(trg1+trg3+trg5) • (trg2+trg4+trg6)
- total event number = 46874

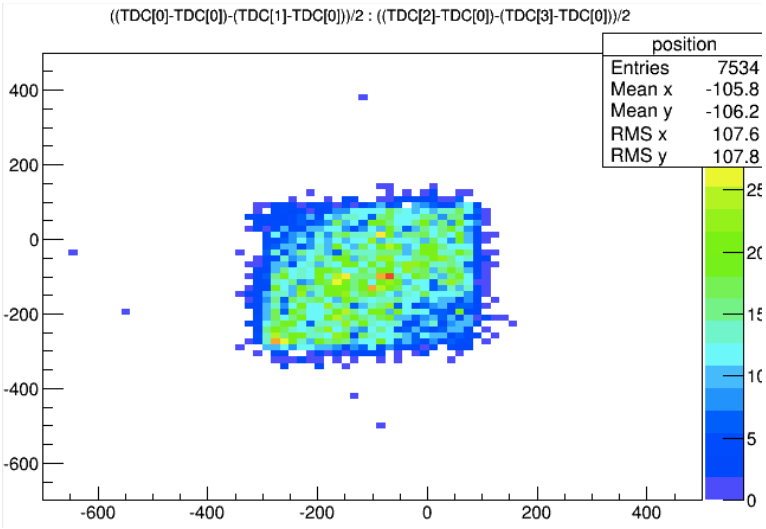
downstream

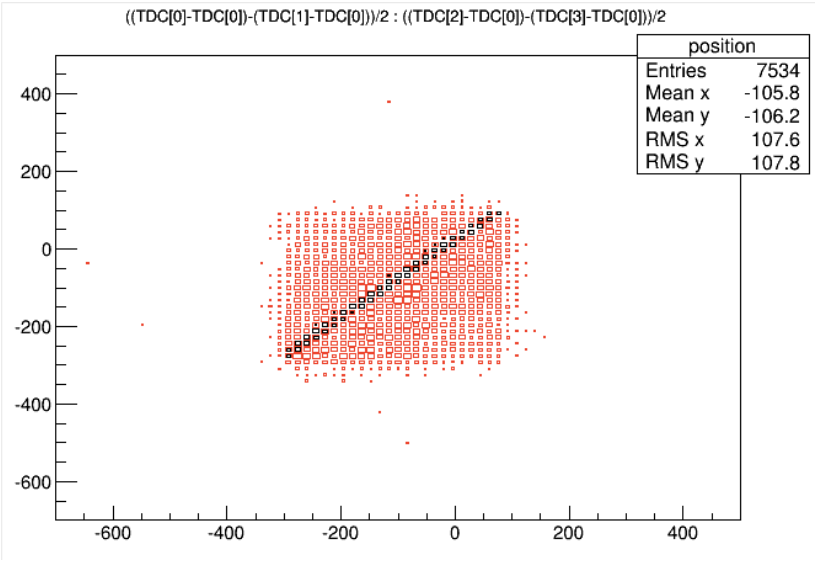


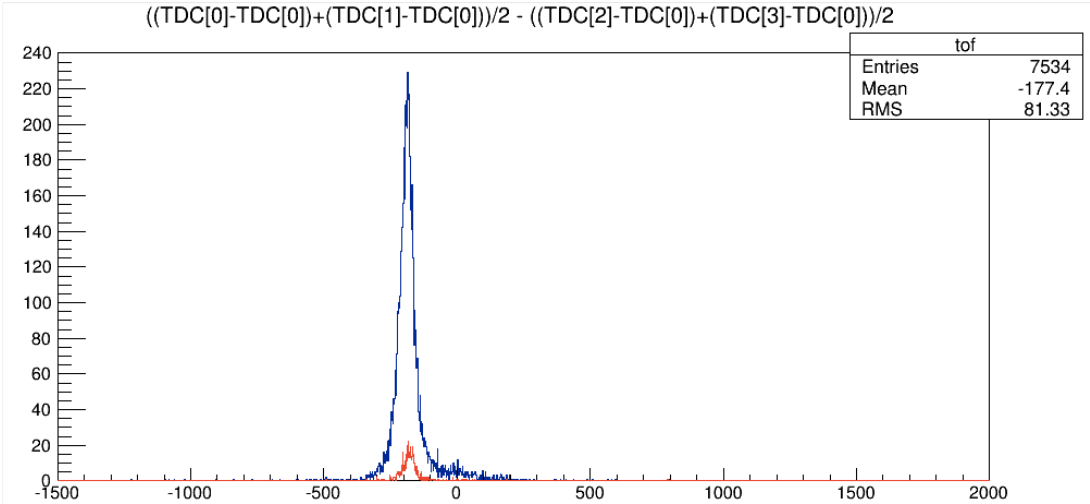

[side view]
trg1
trg2
trg3
trg4
trg5
trg6


99
71
120
963
229
56
44440
810
86


trg6
trg4
trg2
5955
7534
1934
7314
1656
6314
2095
7026
4612
trg1
trg3
trg5


((TDC[0]-TDC[0])-(TDC[1]-TDC[0]))/2 : ((TDC[2]-TDC[0])-(TDC[3]-TDC[0]))/2
position
Entries 7534
Mean x -105.8
Mean y -106.2
RMS x 107.6
RMS y 107.8


((TDC[0]-TDC[0])-(TDC[1]-TDC[0]))/2 : ((TDC[2]-TDC[0])-(TDC[3]-TDC[0]))/2
position
Entries 7534
Mean x -105.8
Mean y -106.2
RMS x 107.6
RMS y 107.8


((TDC[0]-TDC[0])+(TDC[1]-TDC[0]))/2 - ((TDC[2]-TDC[0])+(TDC[3]-TDC[0]))/2
tof
Entries 7534
Mean -177.4
RMS 81.33