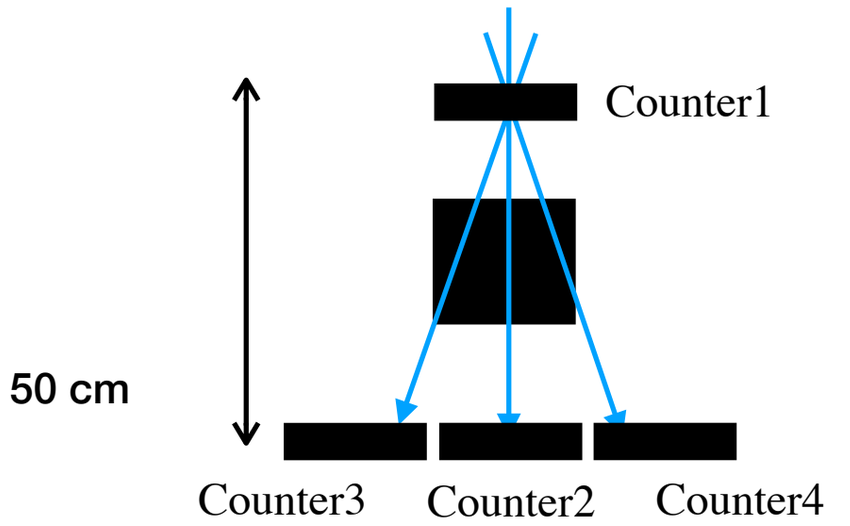
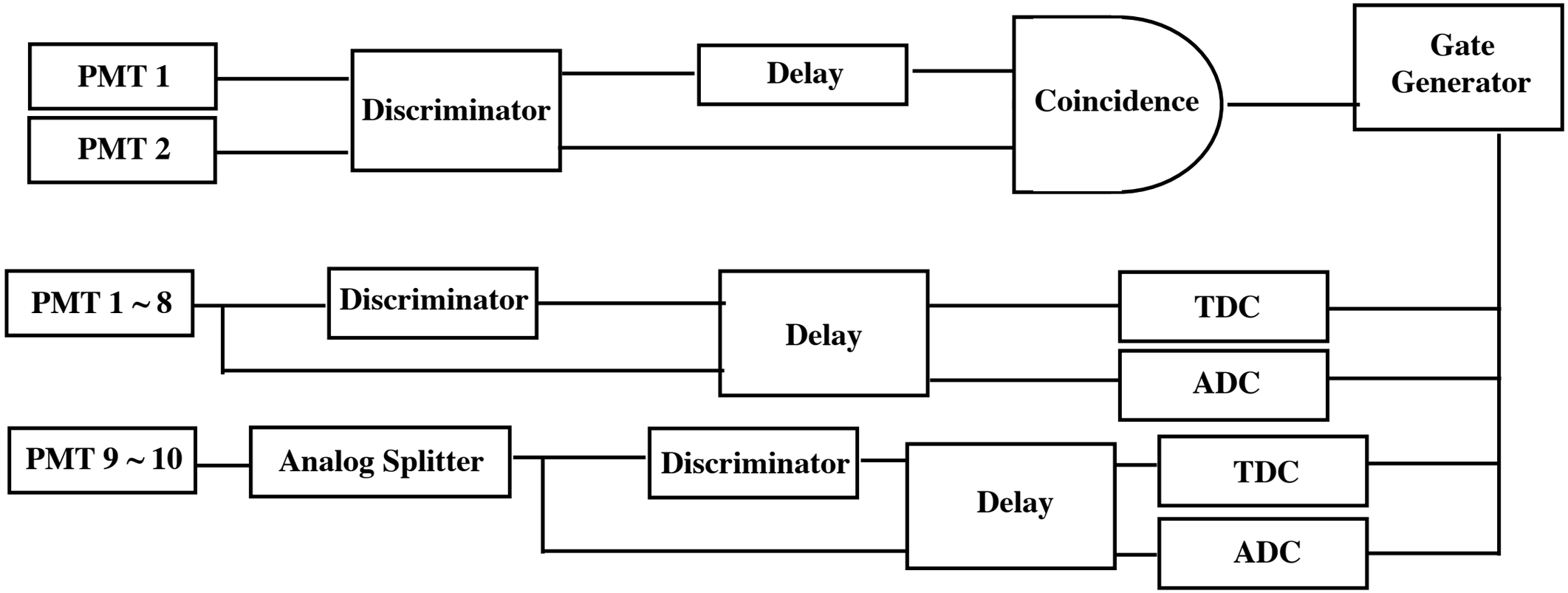
WC Test Progress
-2nd Week

Sungwook Choi

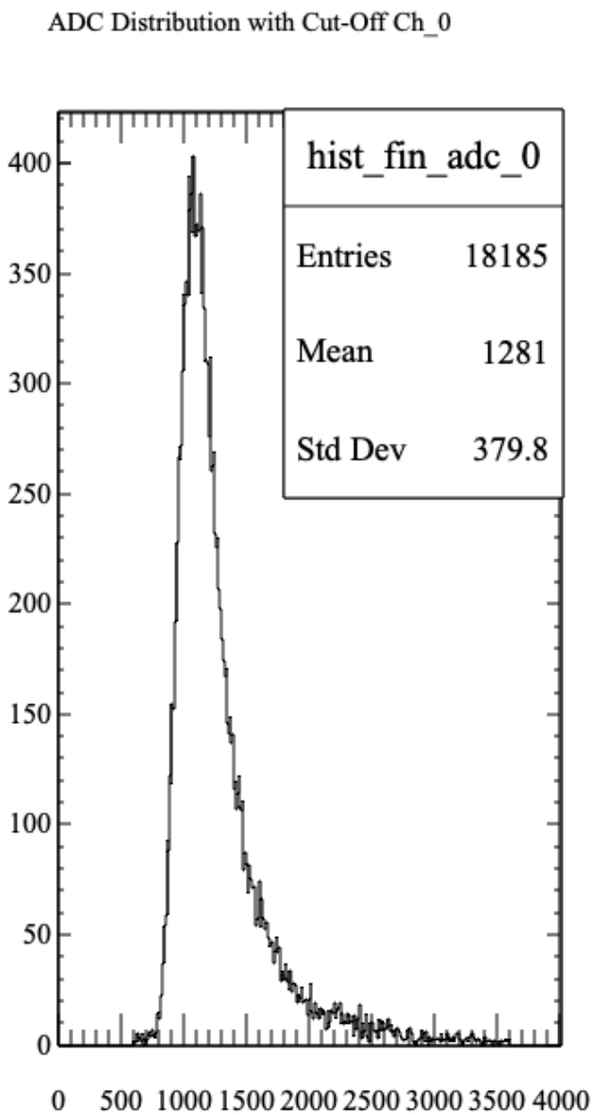
Test Setup

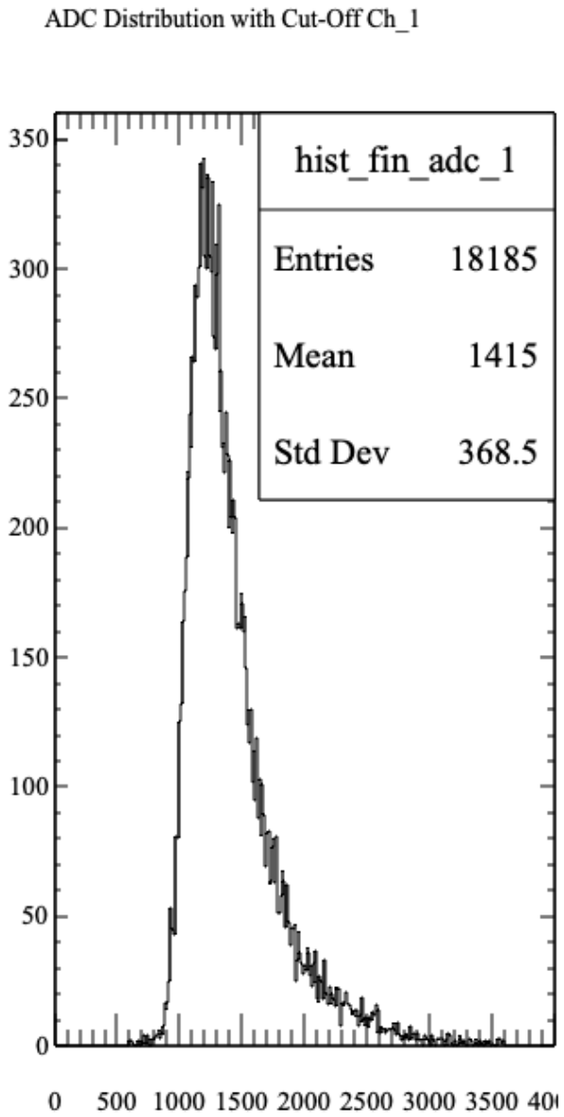


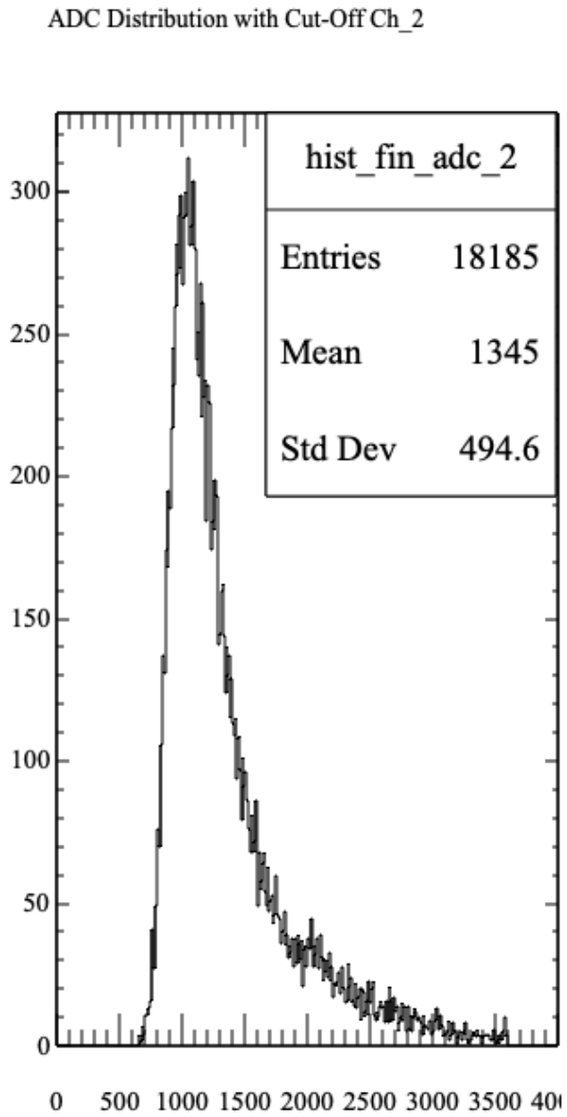
Spacing : 10 cm

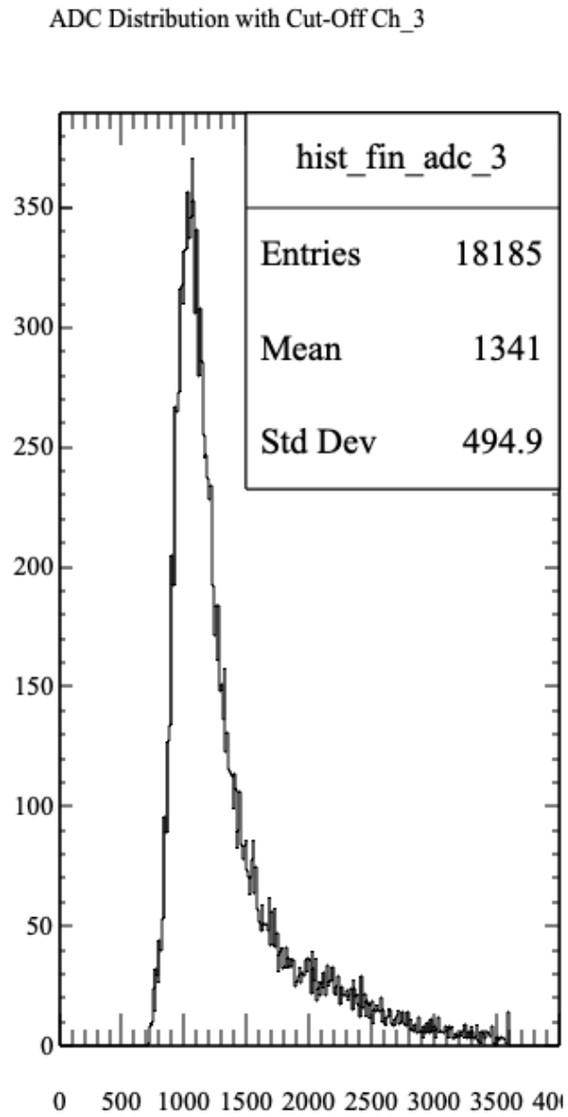


Center Position Trigger





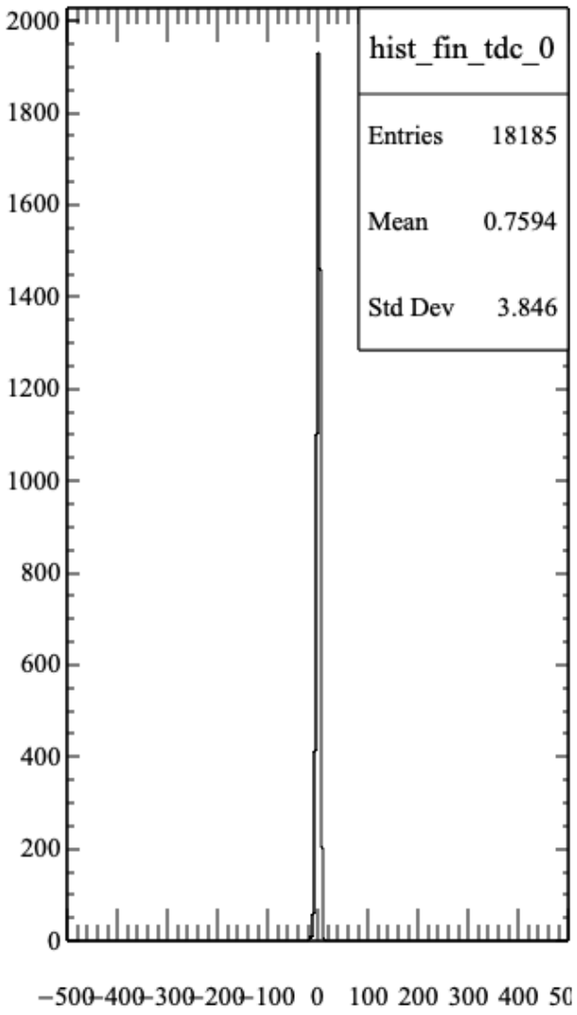




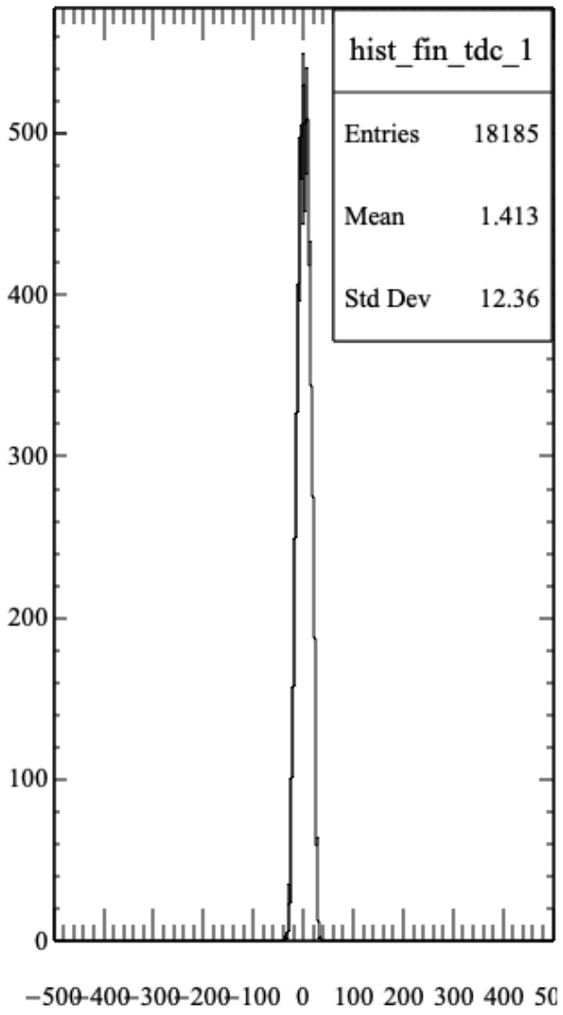
- Data taken for 14 days (from Jan.25)
- Final ADC distribution of trigger counters (Trigger : Channel 1 & Channel 2)
- After neglecting overshoot and applying coincidence cut and position cut

Center Position Trigger

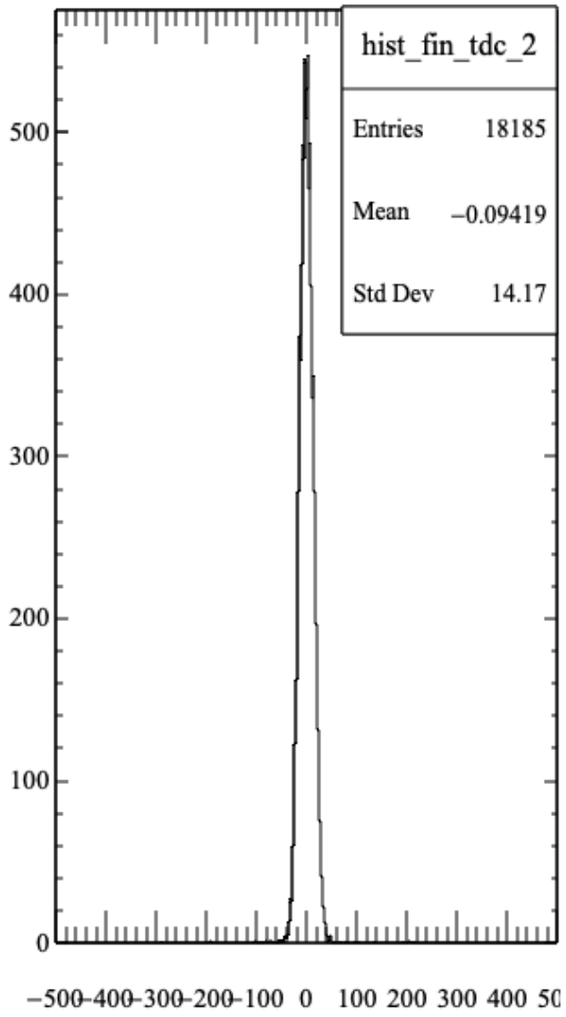
TDC Distribution with Cut-Off Ch_0



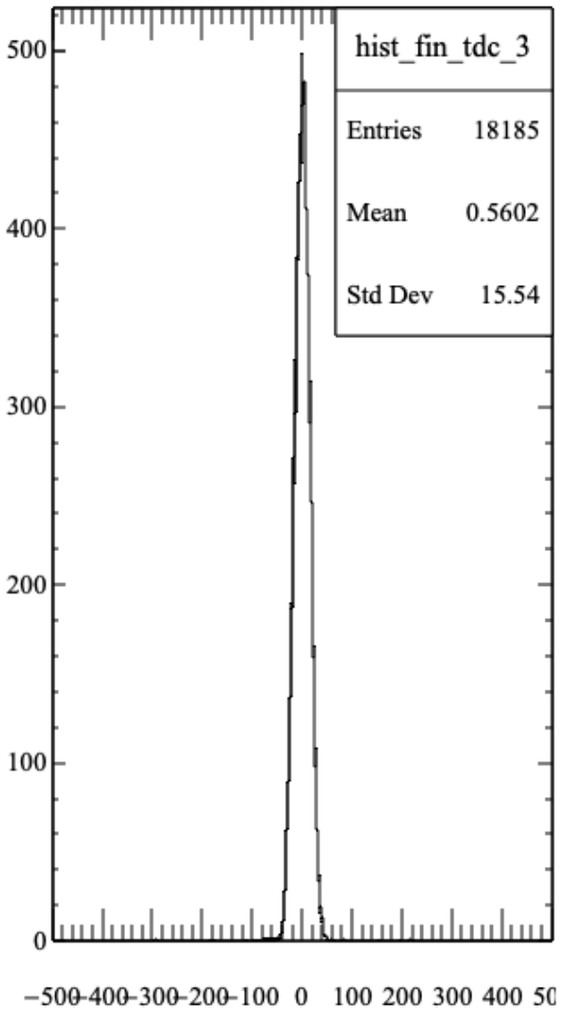
TDC Distribution with Cut-Off Ch_1



TDC Distribution with Cut-Off Ch_2

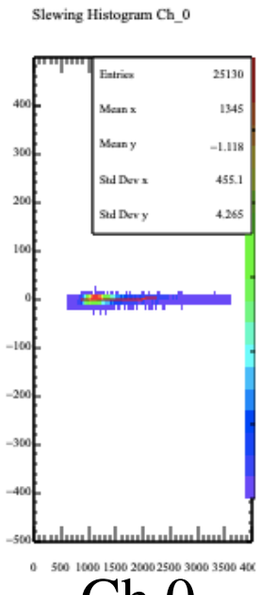


TDC Distribution with Cut-Off Ch_3

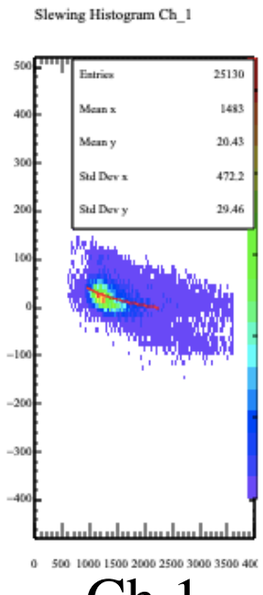


- Data taken for 14 days (from Jan.25)
- Final TDC distribution of trigger counters (Trigger : Channel 1 & Channel 2)
- After neglecting overshoot and applying coincidence cut and position cut

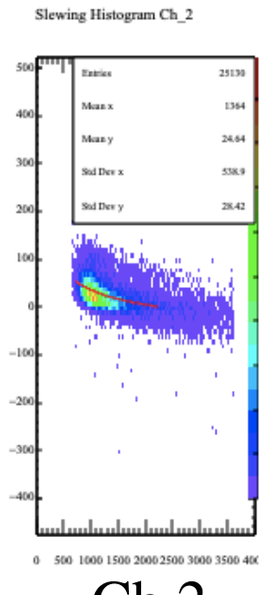
Center Position Trigger



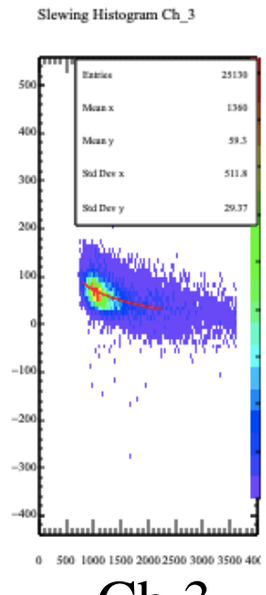
Ch 0



Ch 1

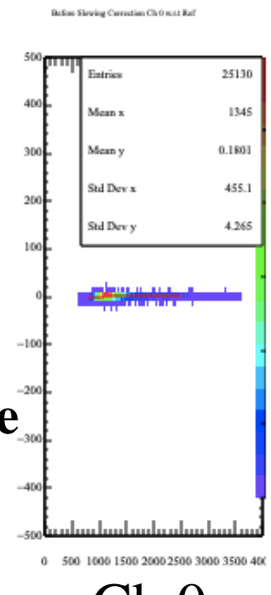


Ch 2

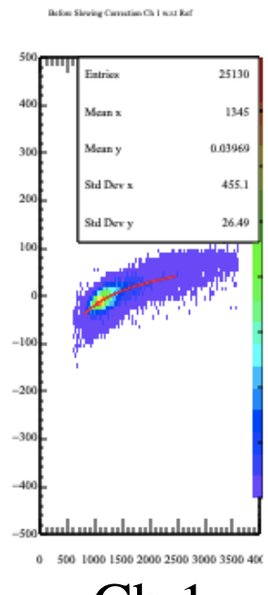


Ch 3

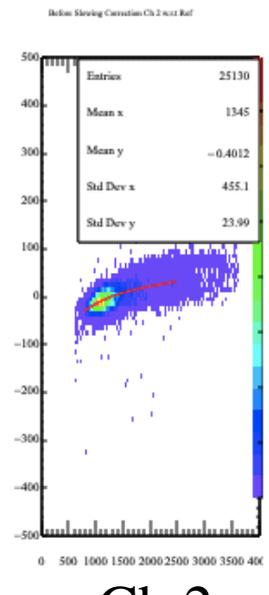
Before



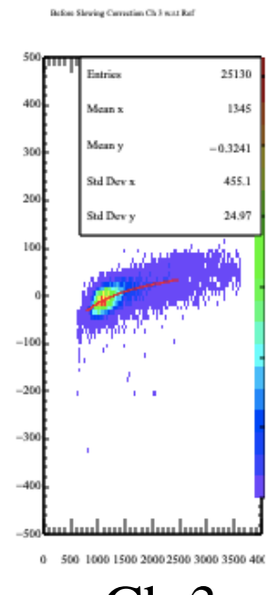
Ch 0



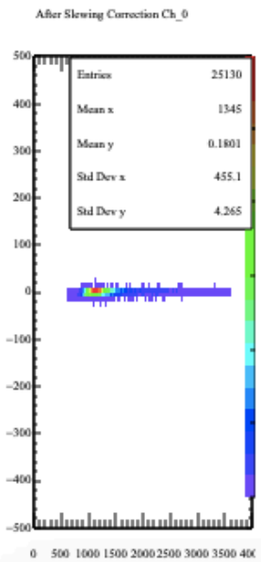
Ch 1



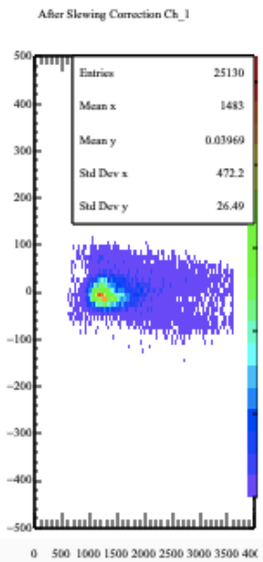
Ch 2



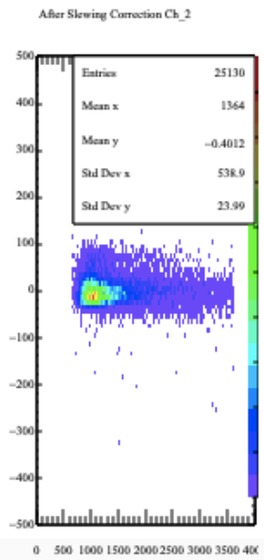
Ch 3



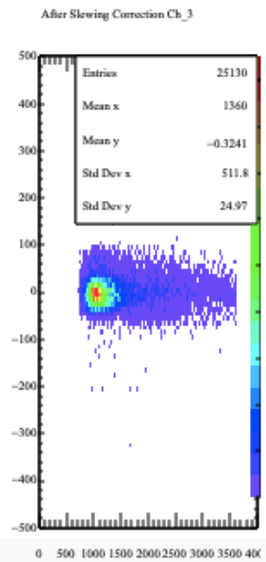
Ch 0



Ch 1

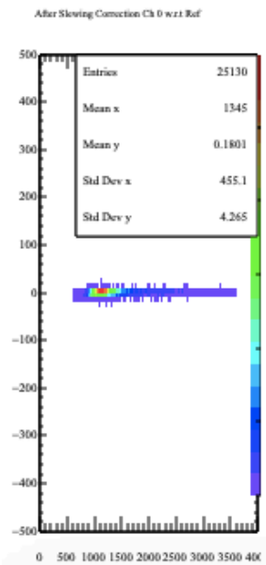


Ch 2

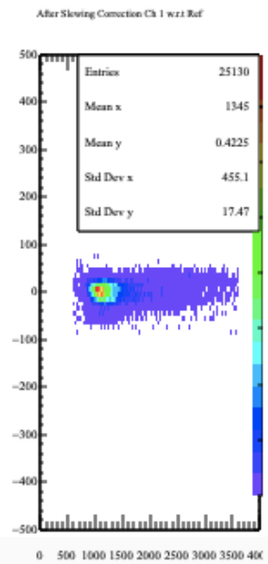


Ch 3

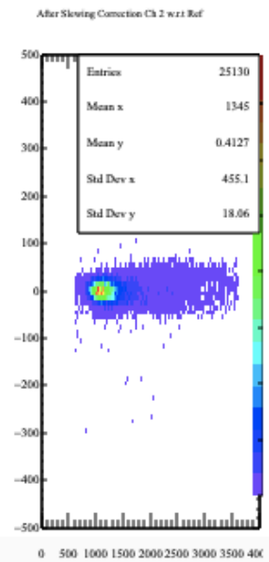
After



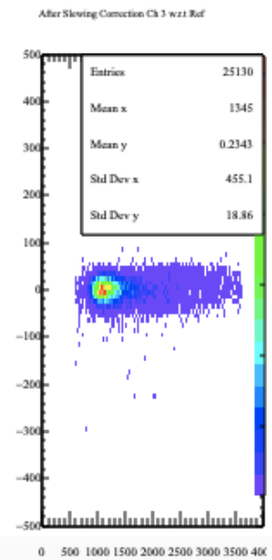
Ch 0



Ch 1



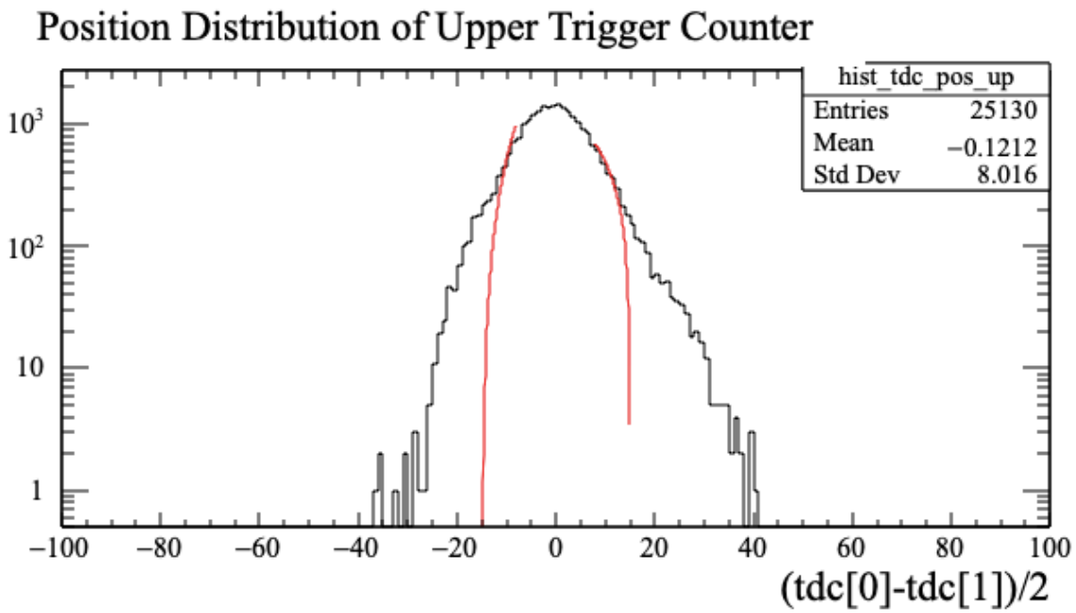
Ch 2

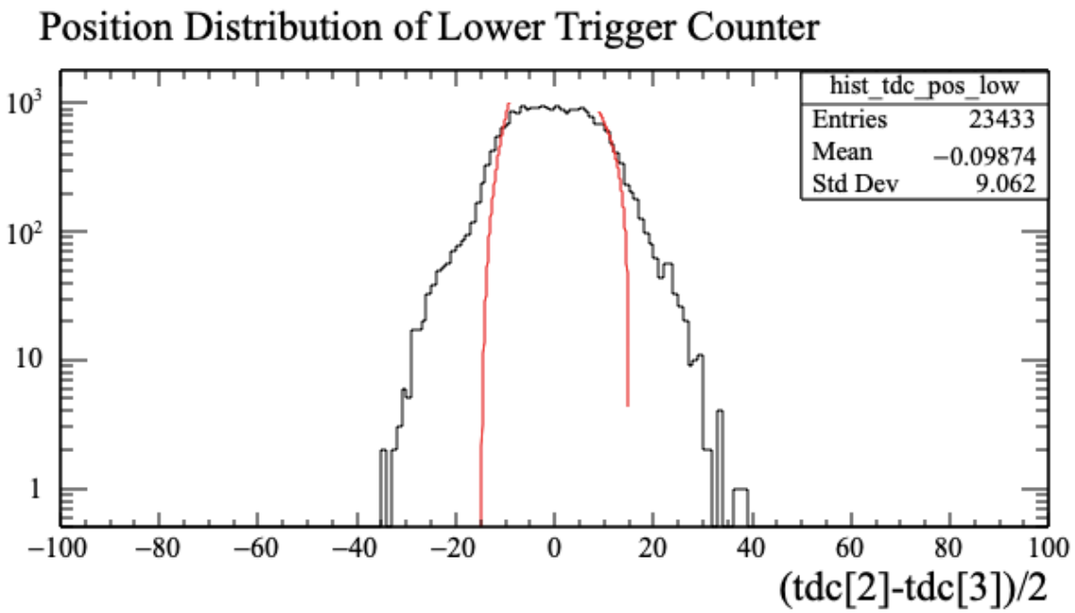


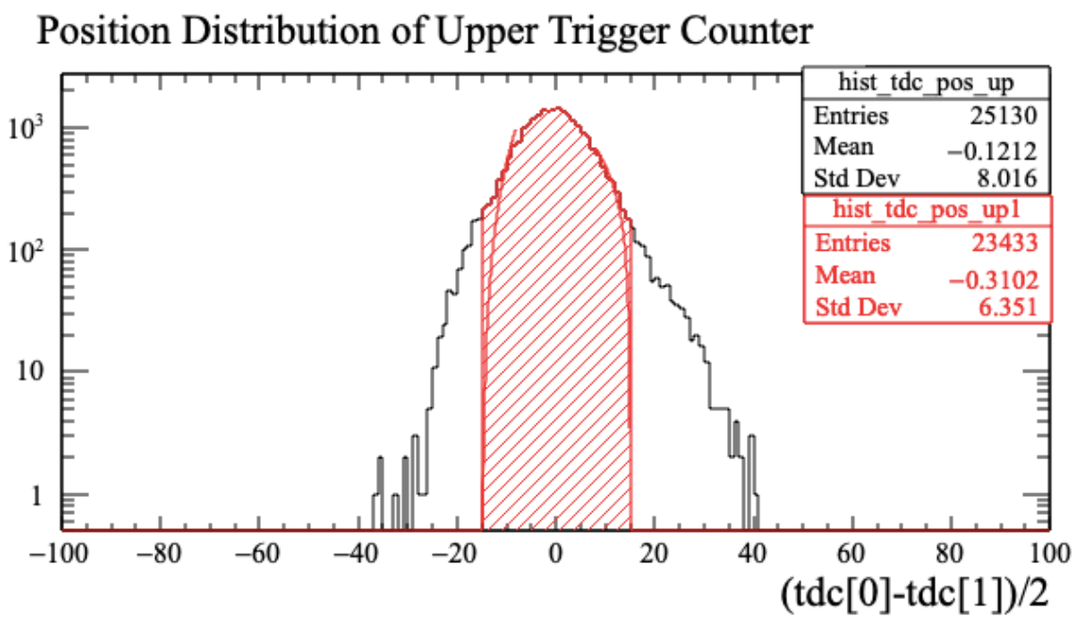
Ch 3

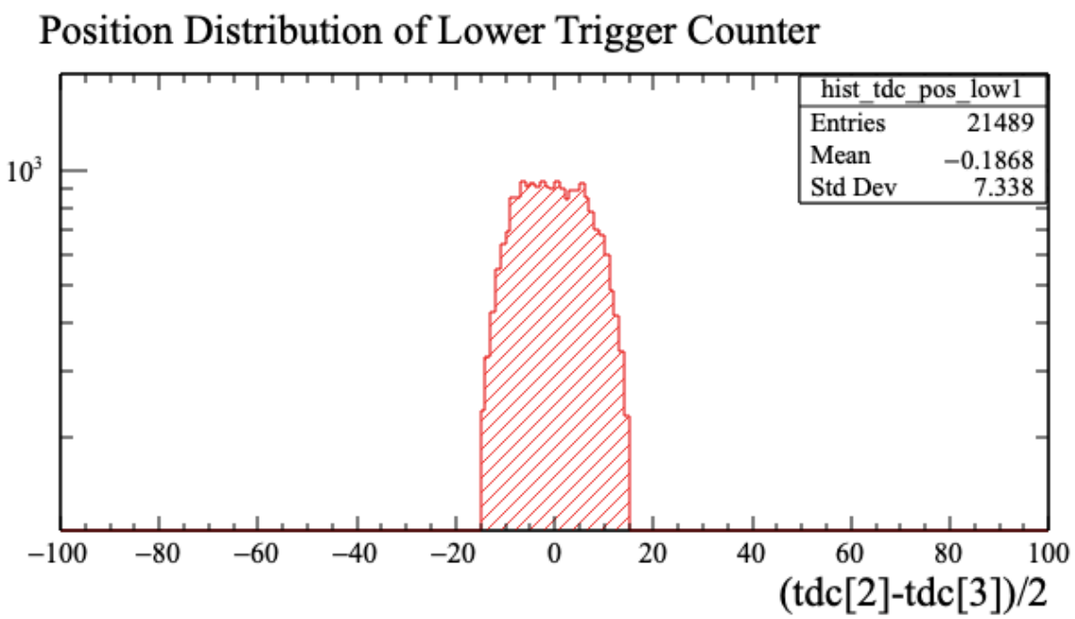
- Timewalk correction of raw TDC w.r.t each channel and reference

Center Position Trigger





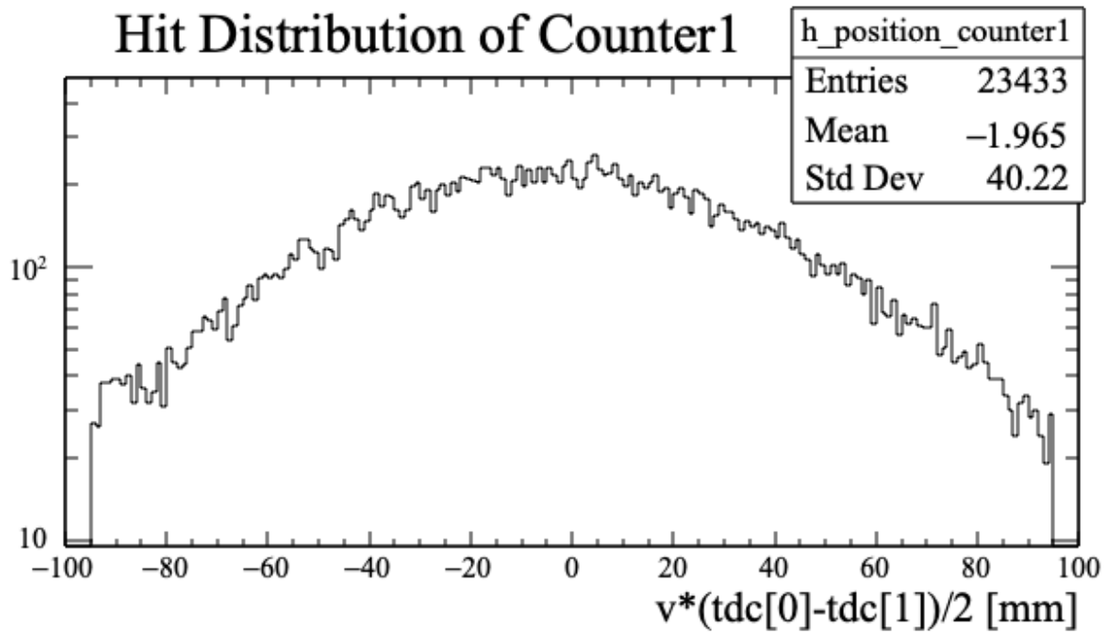


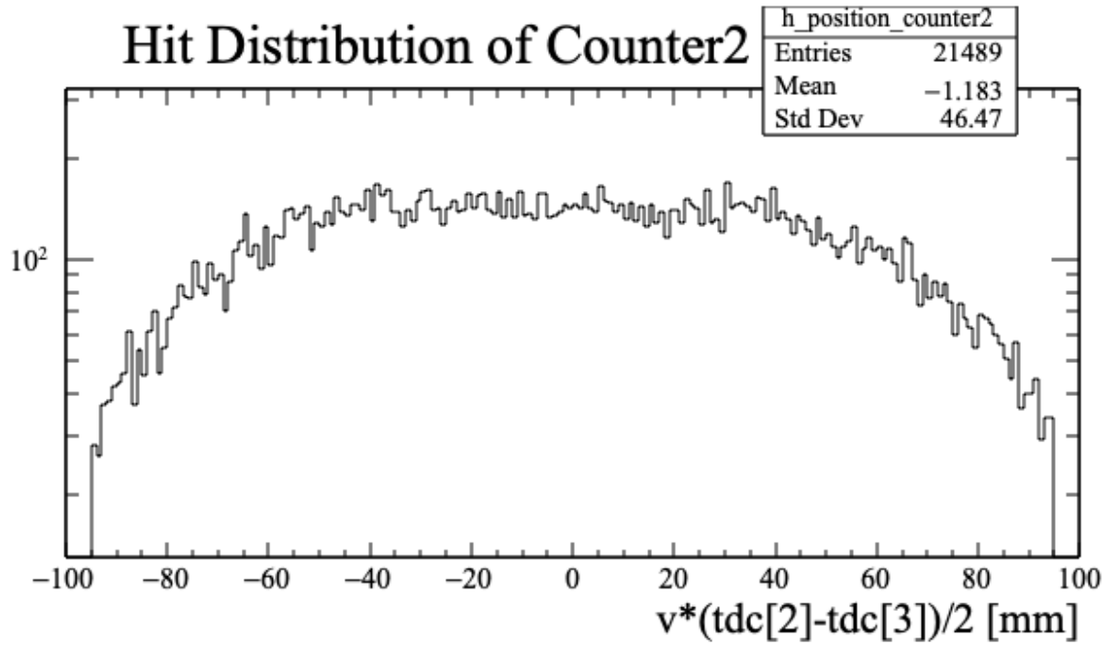


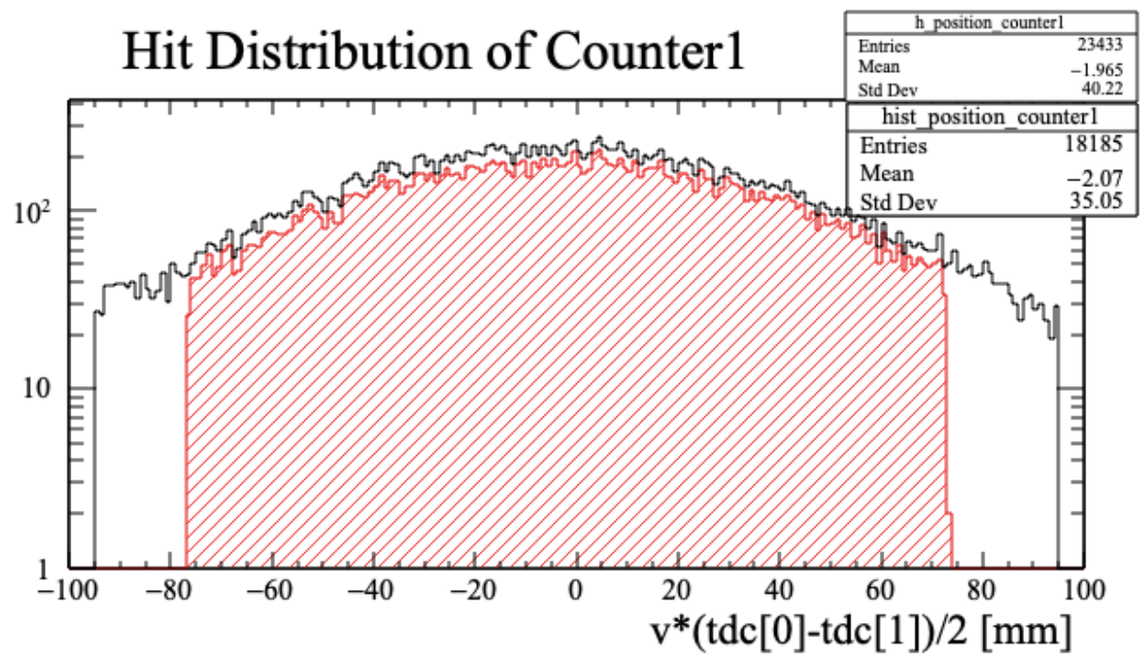
- Applying position cuts

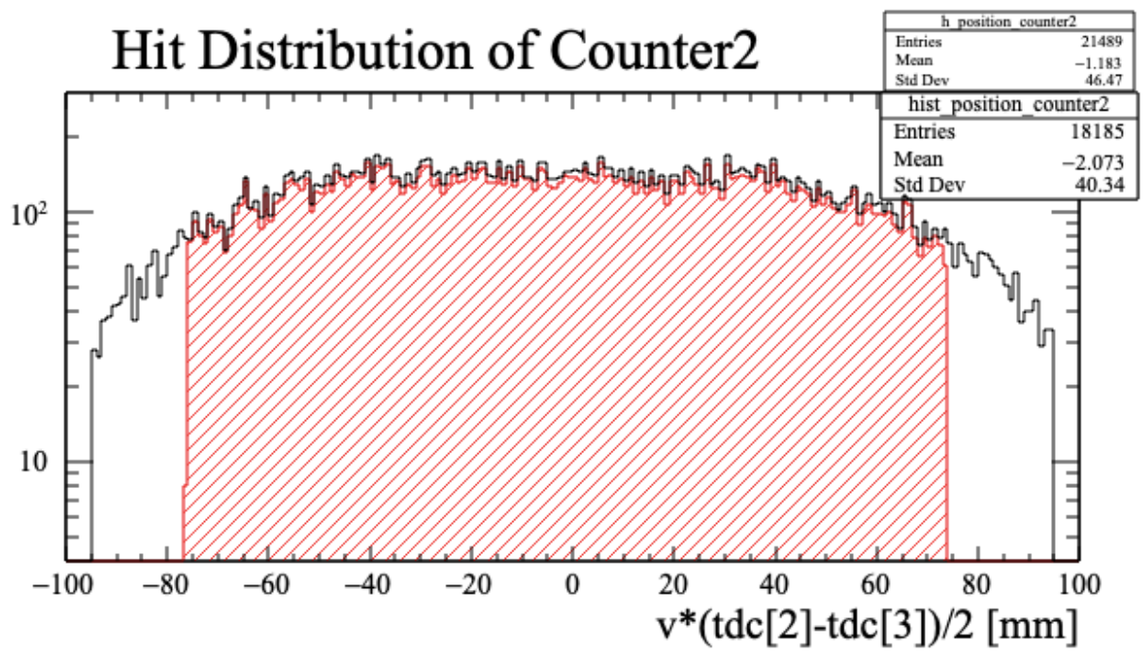
Center Position Trigger

- Selecting hits between -75 mm and 75 mm (15 cm = radiator length)

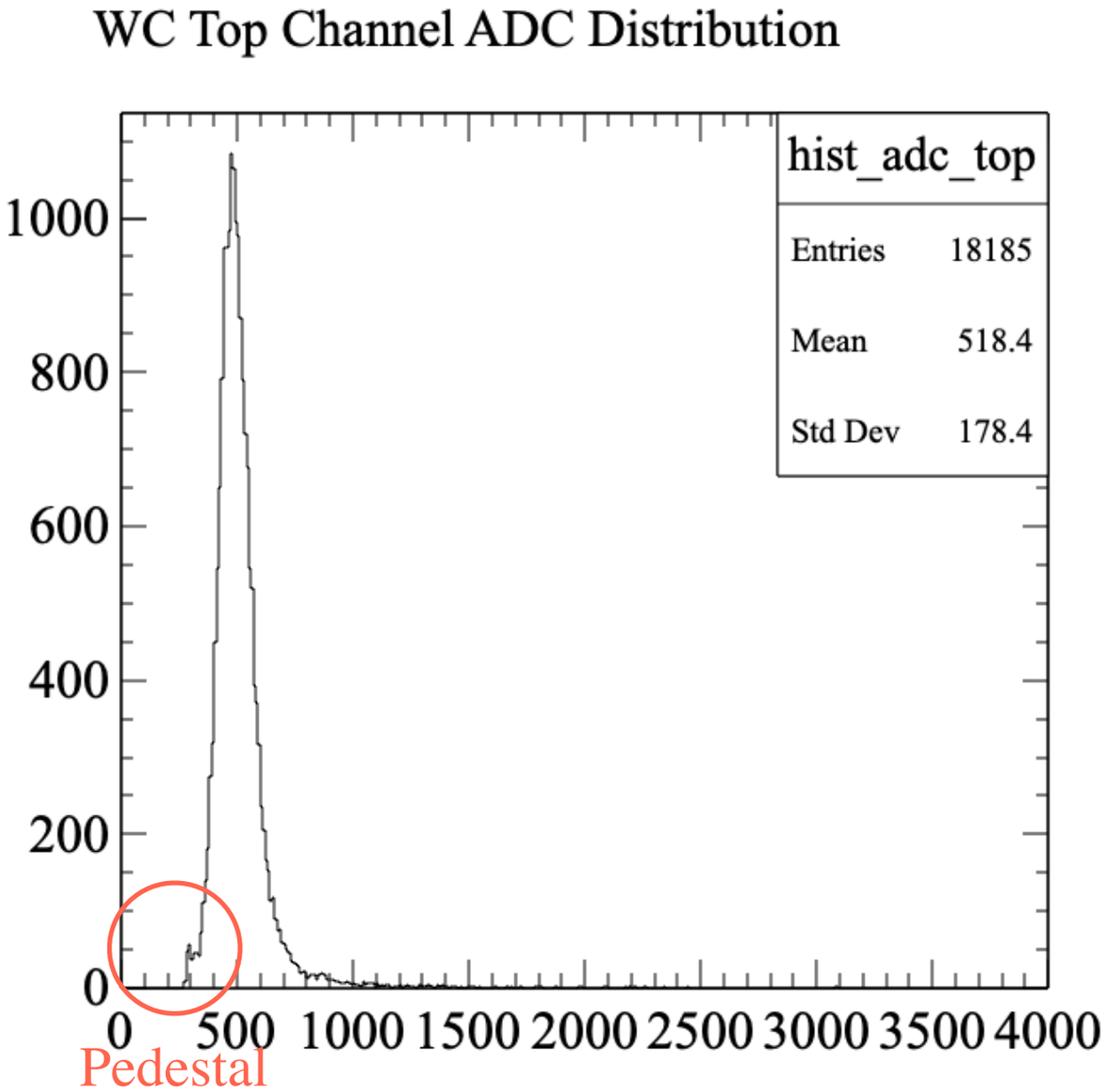


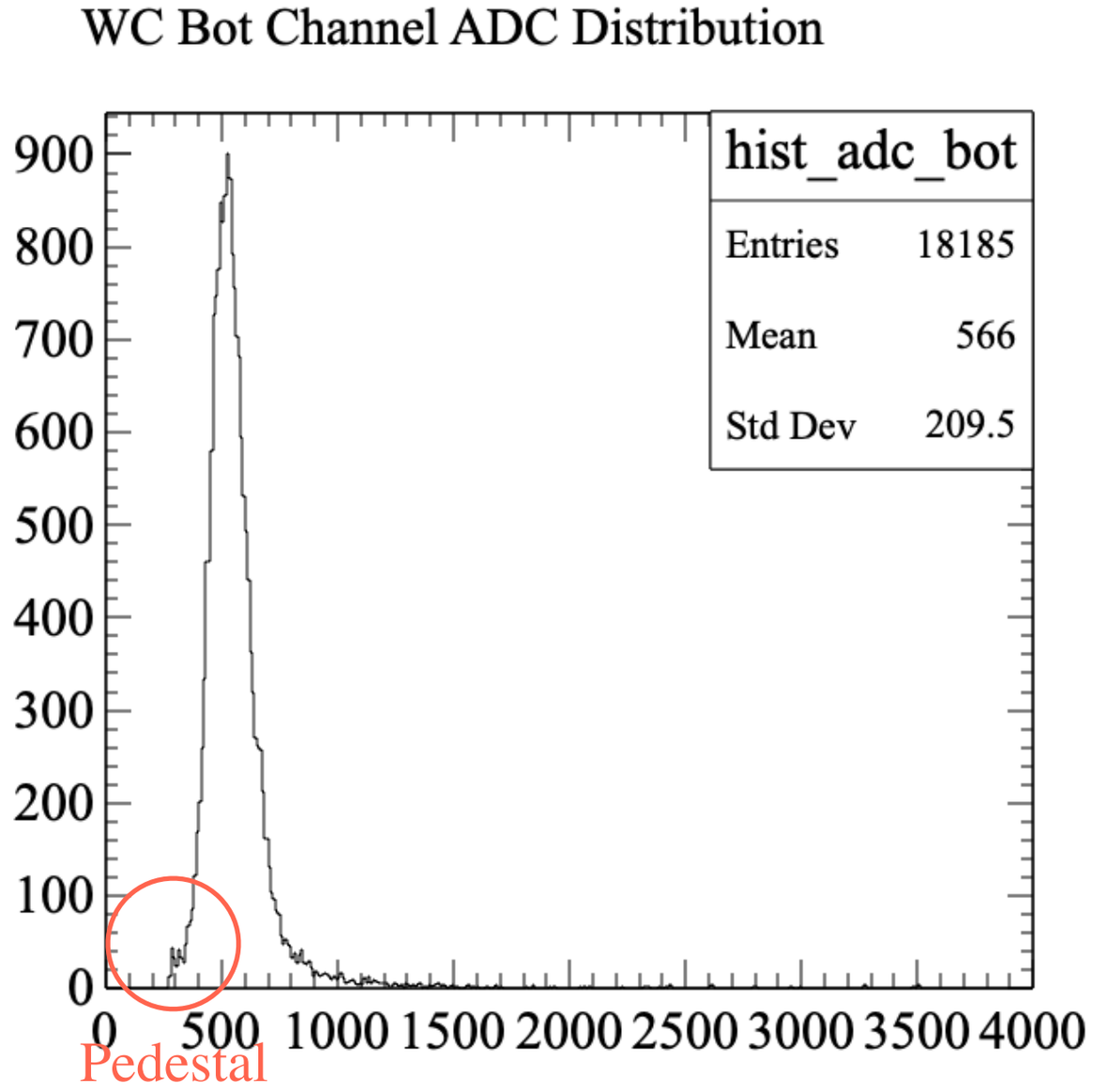






Center Position Trigger



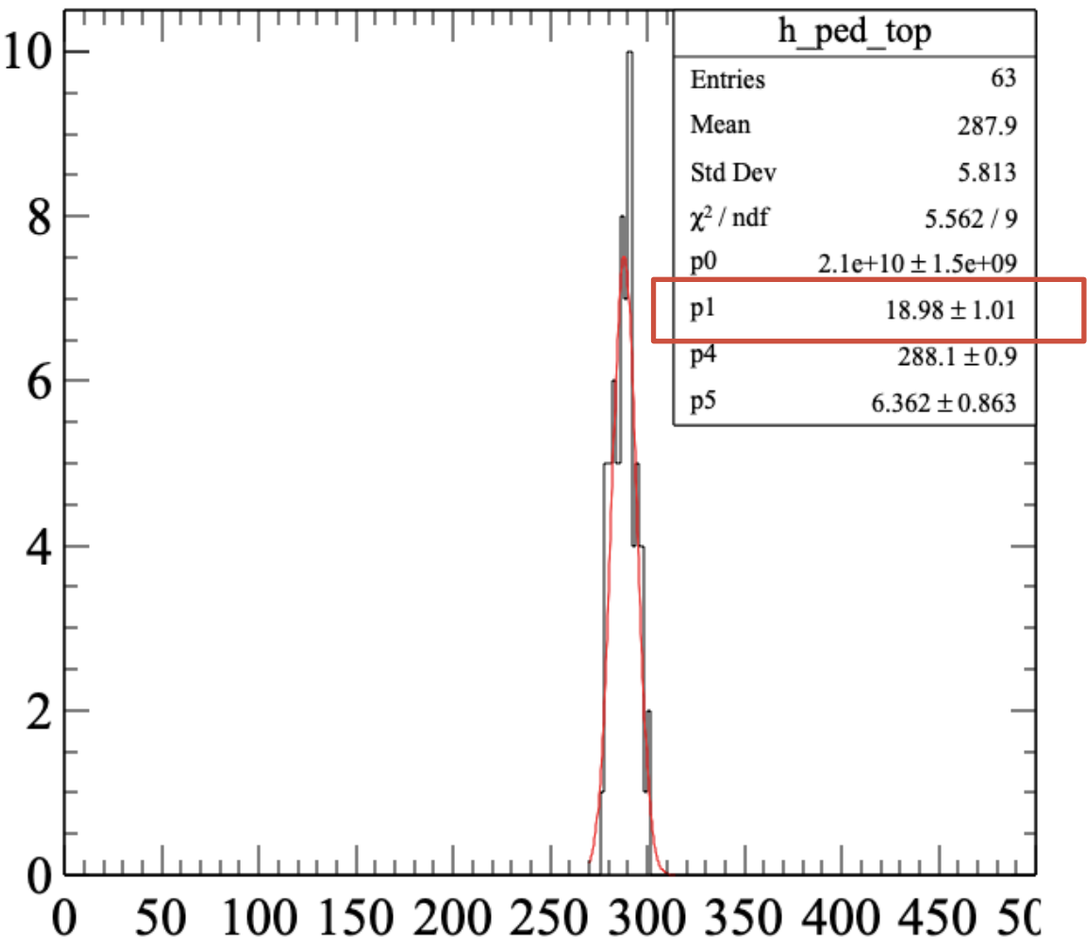


- After the data sorting, raw ADC distribution of WC top and bottom

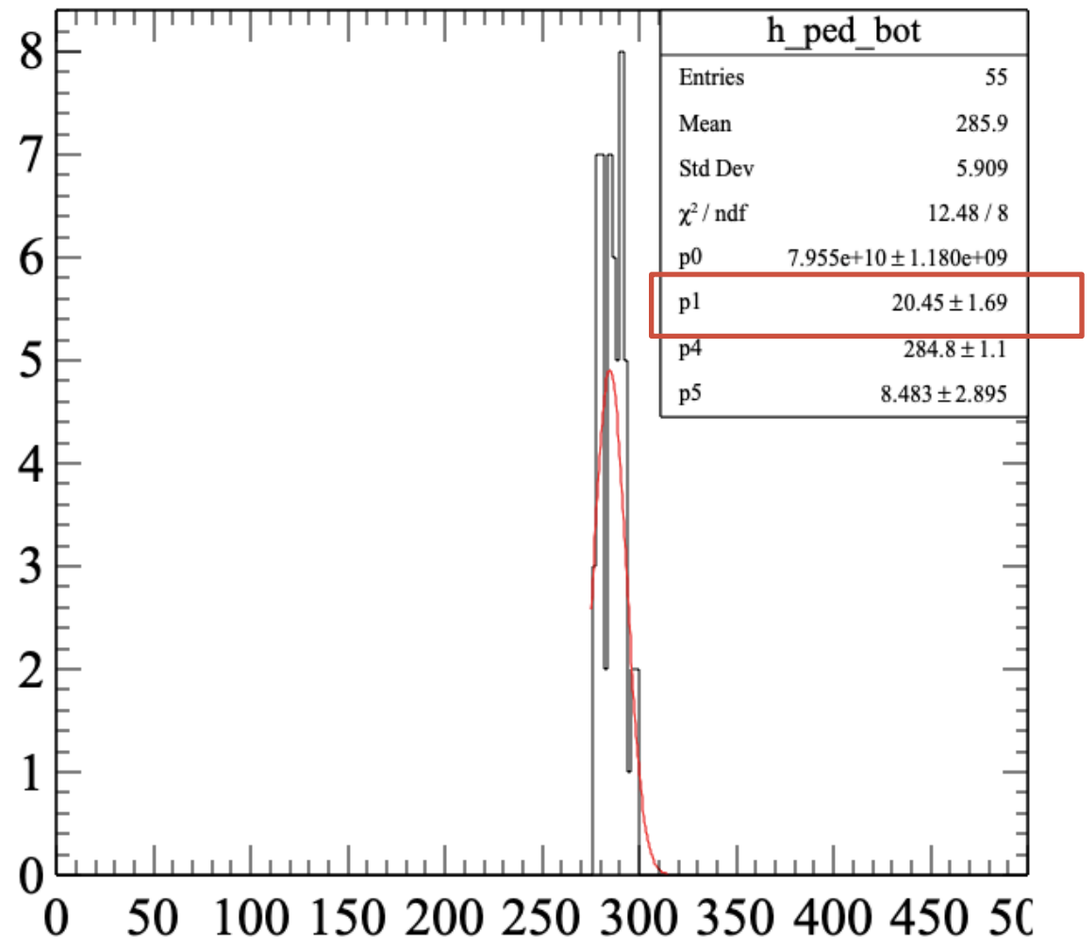
Center Position Trigger

- Pedestal is fitted with the convolution of gaussian and poisson distribution.
- Fitted mean of poisson distribution is **18.98 ± 1.01 [top], 20.45 ± 1.69 [bottom]**

WC Top Pedestal Distribution

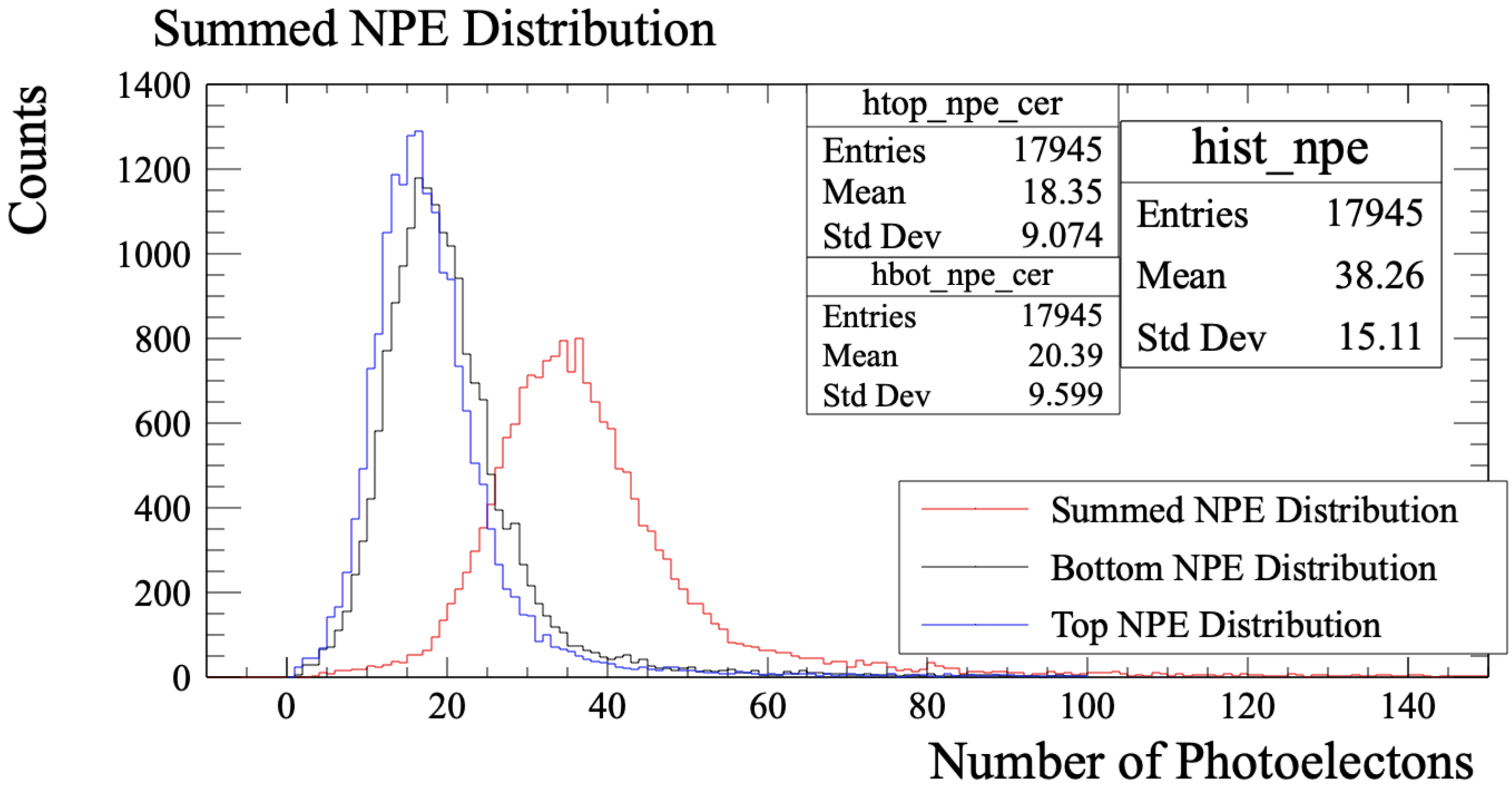


WC Bot Pedestal Distribution

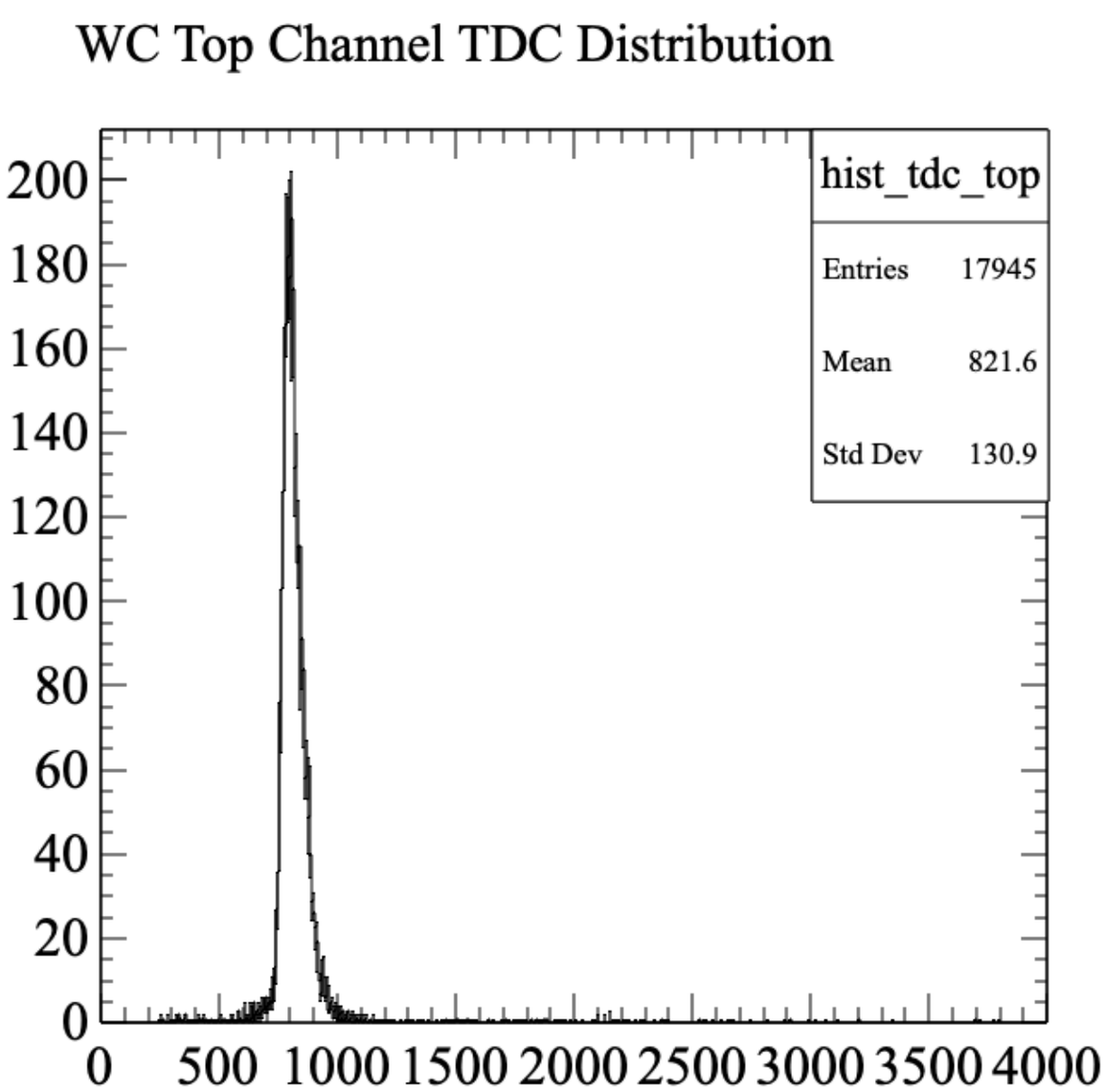


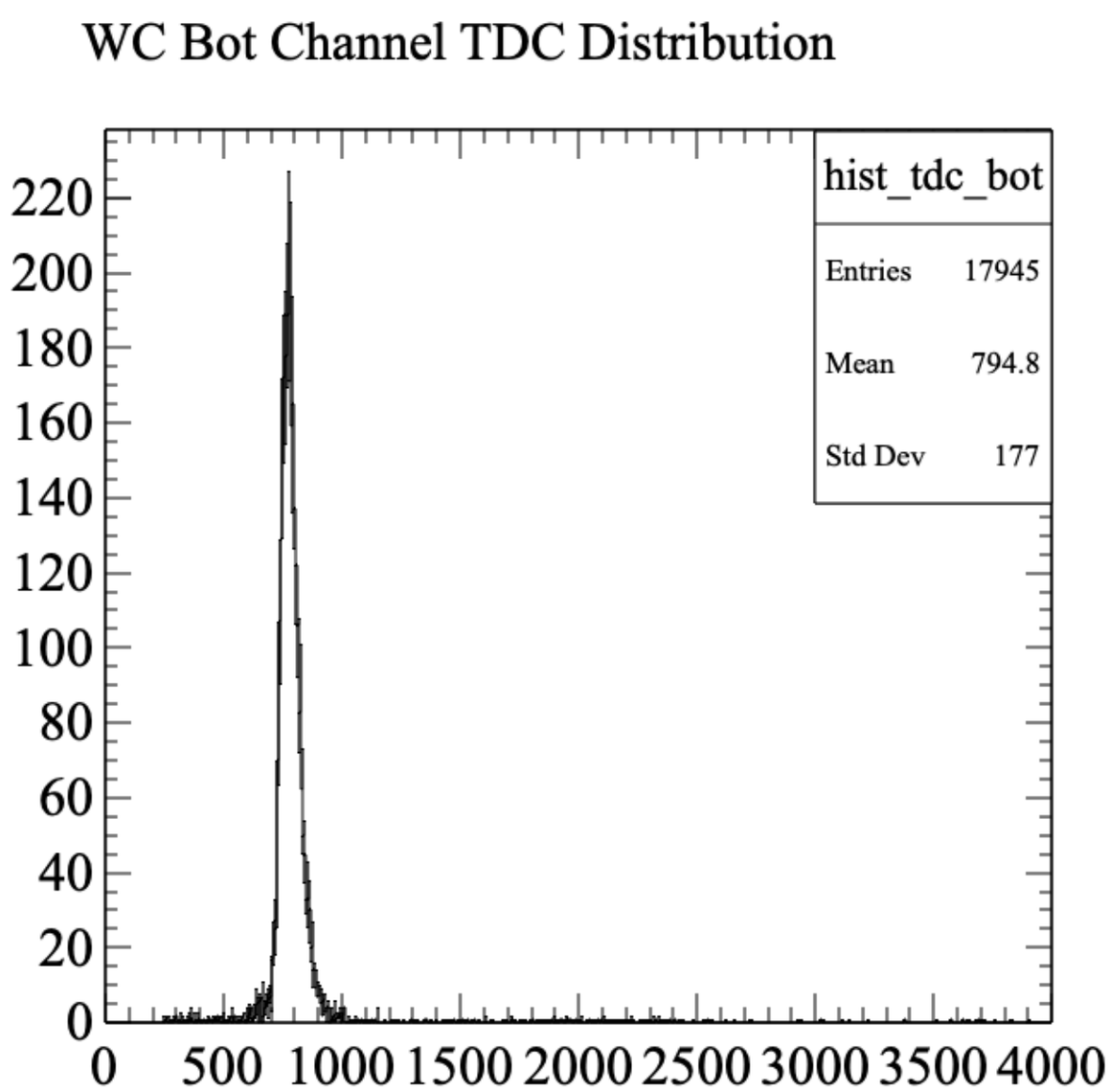
Center Position Trigger

- Summation of top and bottom NPe distribution has a mean value of 38.26



Center Position Trigger

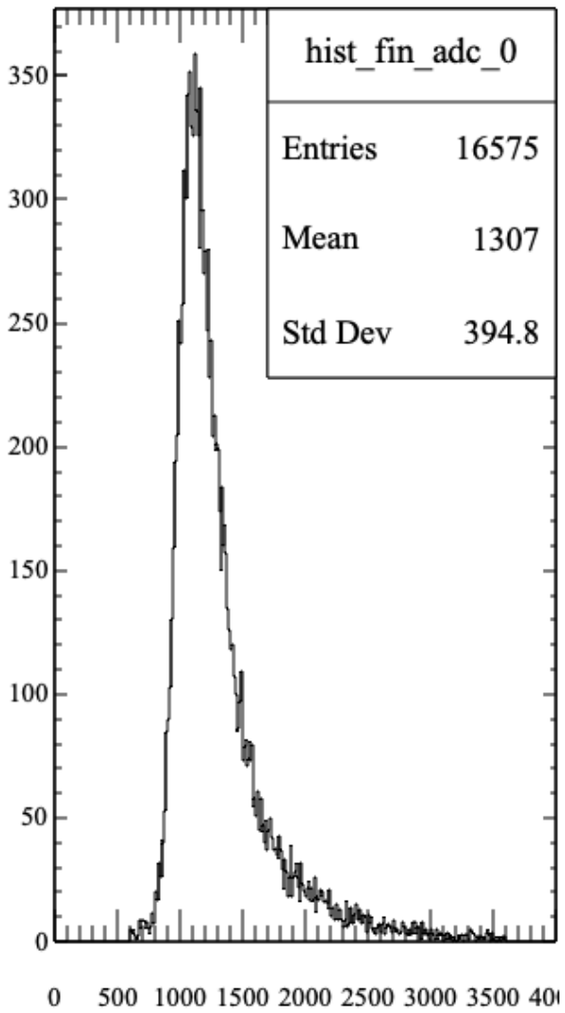




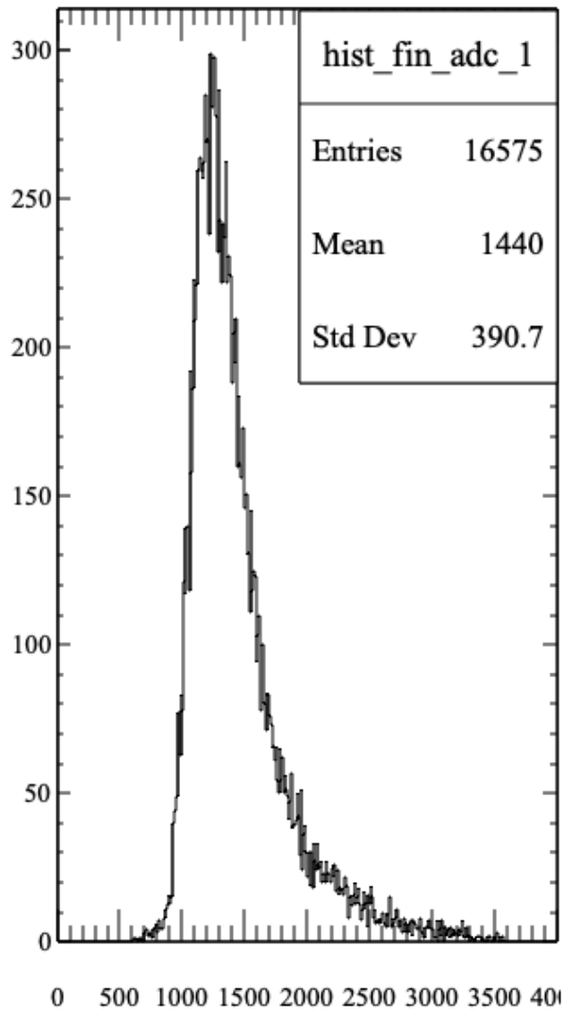
- Corresponding TDC distribution

Lower Position Trigger

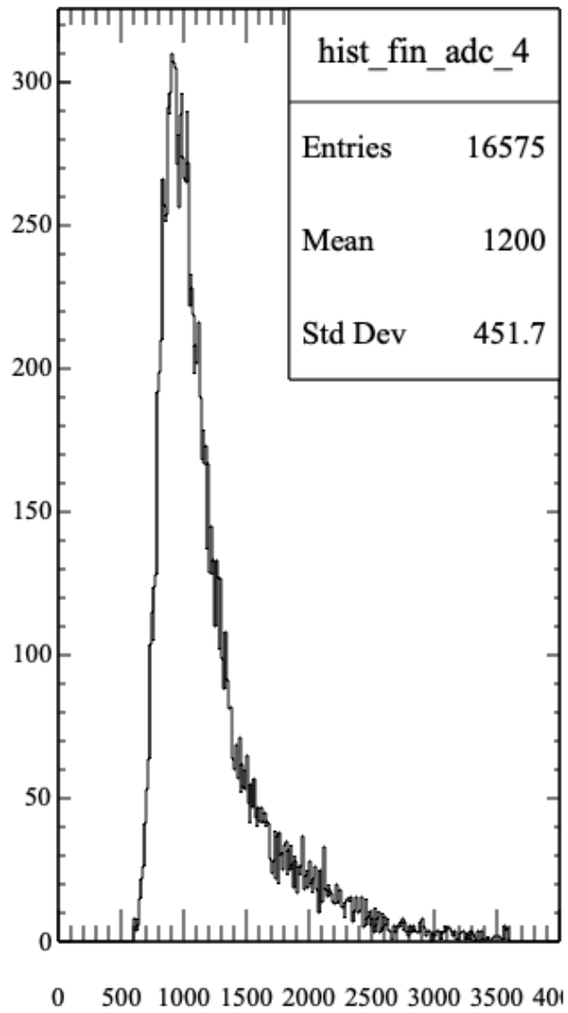
ADC Distribution with Cut-Off Ch_0



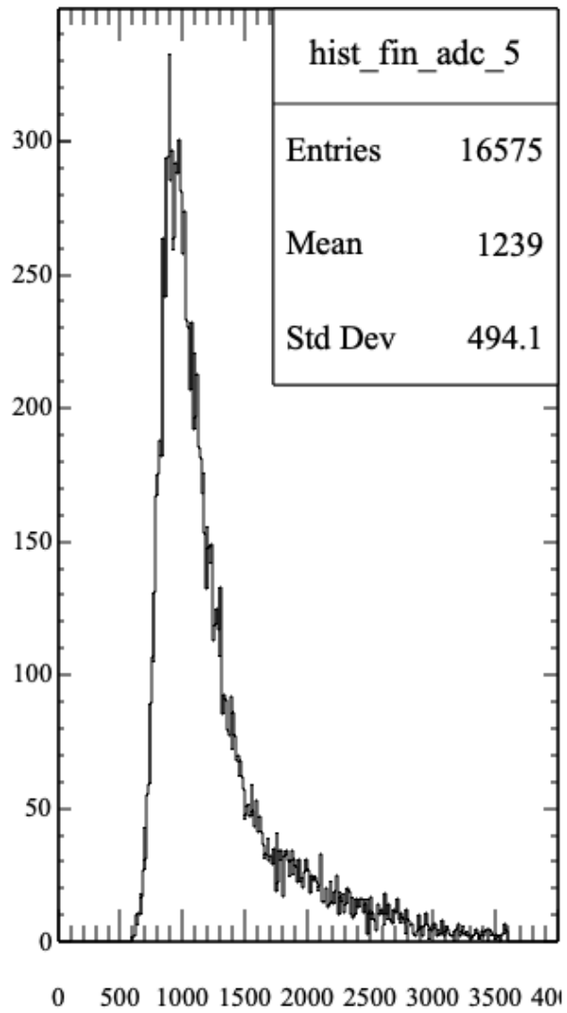
ADC Distribution with Cut-Off Ch_1



ADC Distribution with Cut-Off Ch_4

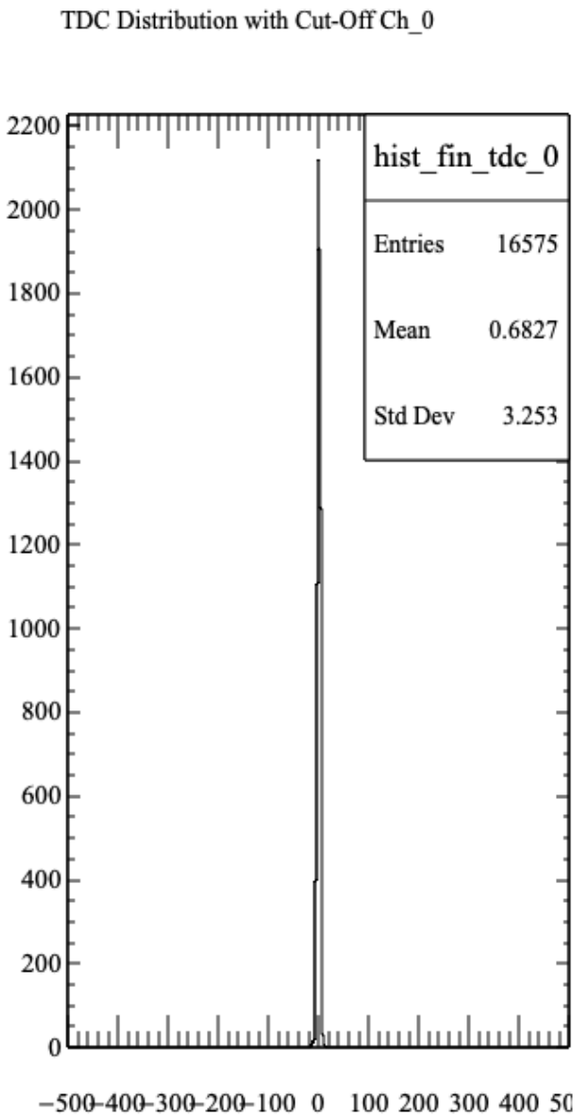


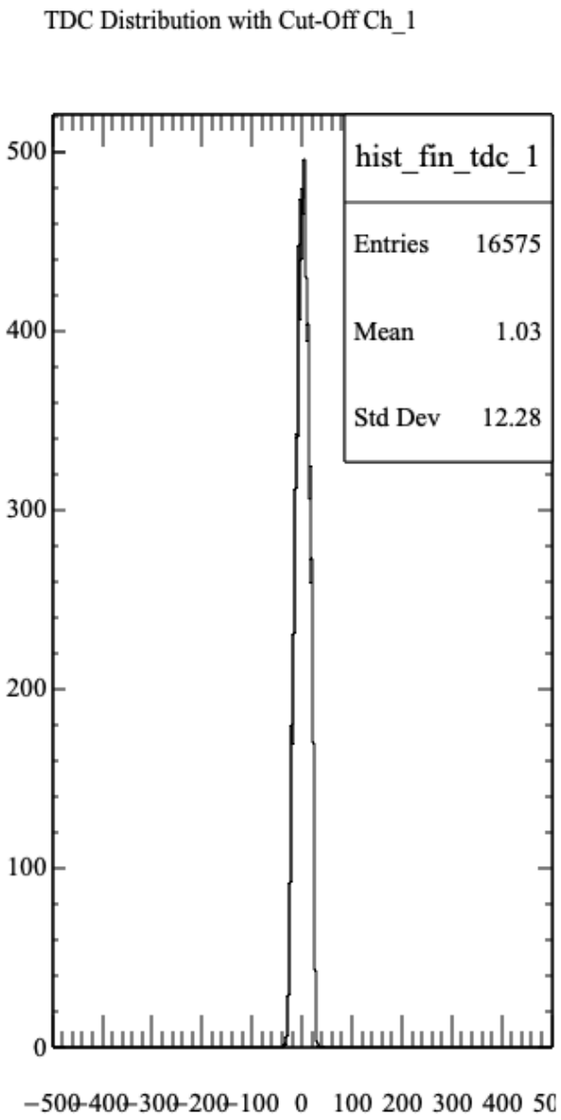
ADC Distribution with Cut-Off Ch_5

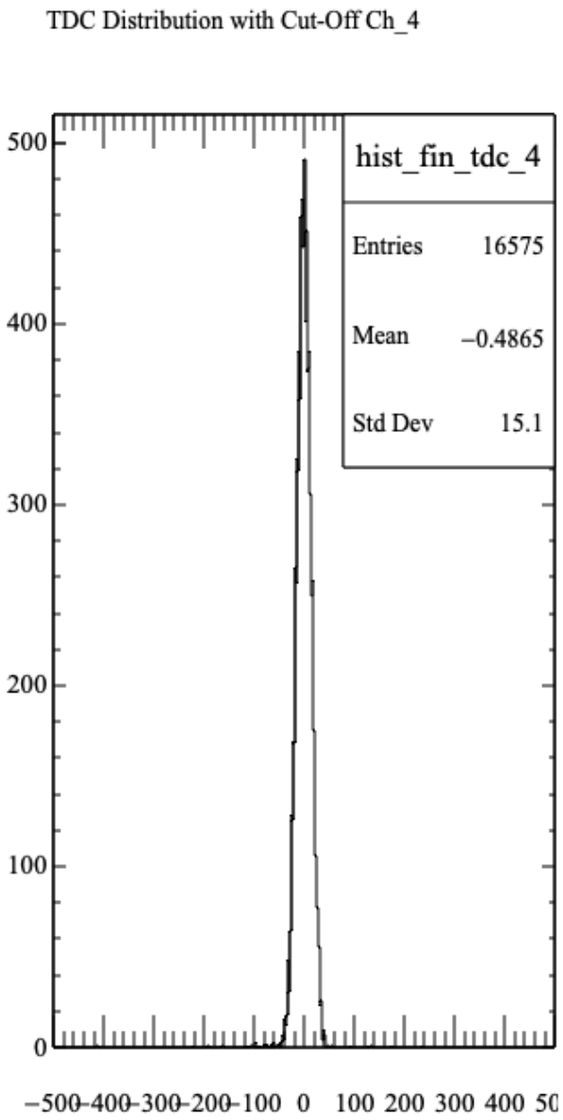


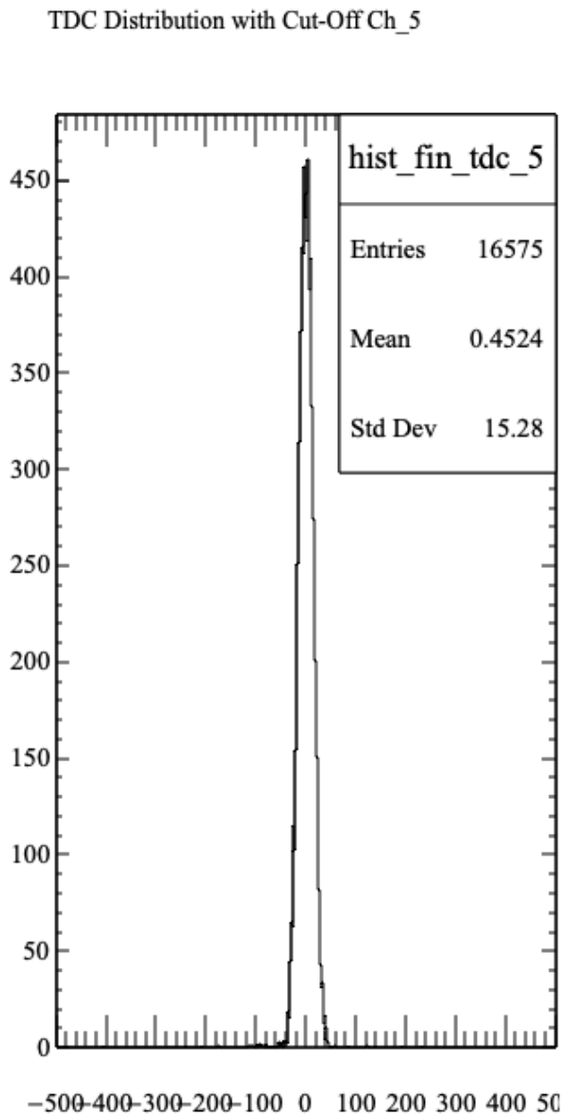
- Data taken for 14 days (from Jan.25)
- ADC distribution of trigger counters (Trigger : Channel 1 & Channel 2)
- After neglecting overshoot and applying coincidence cut and position cut

Lower Position Trigger



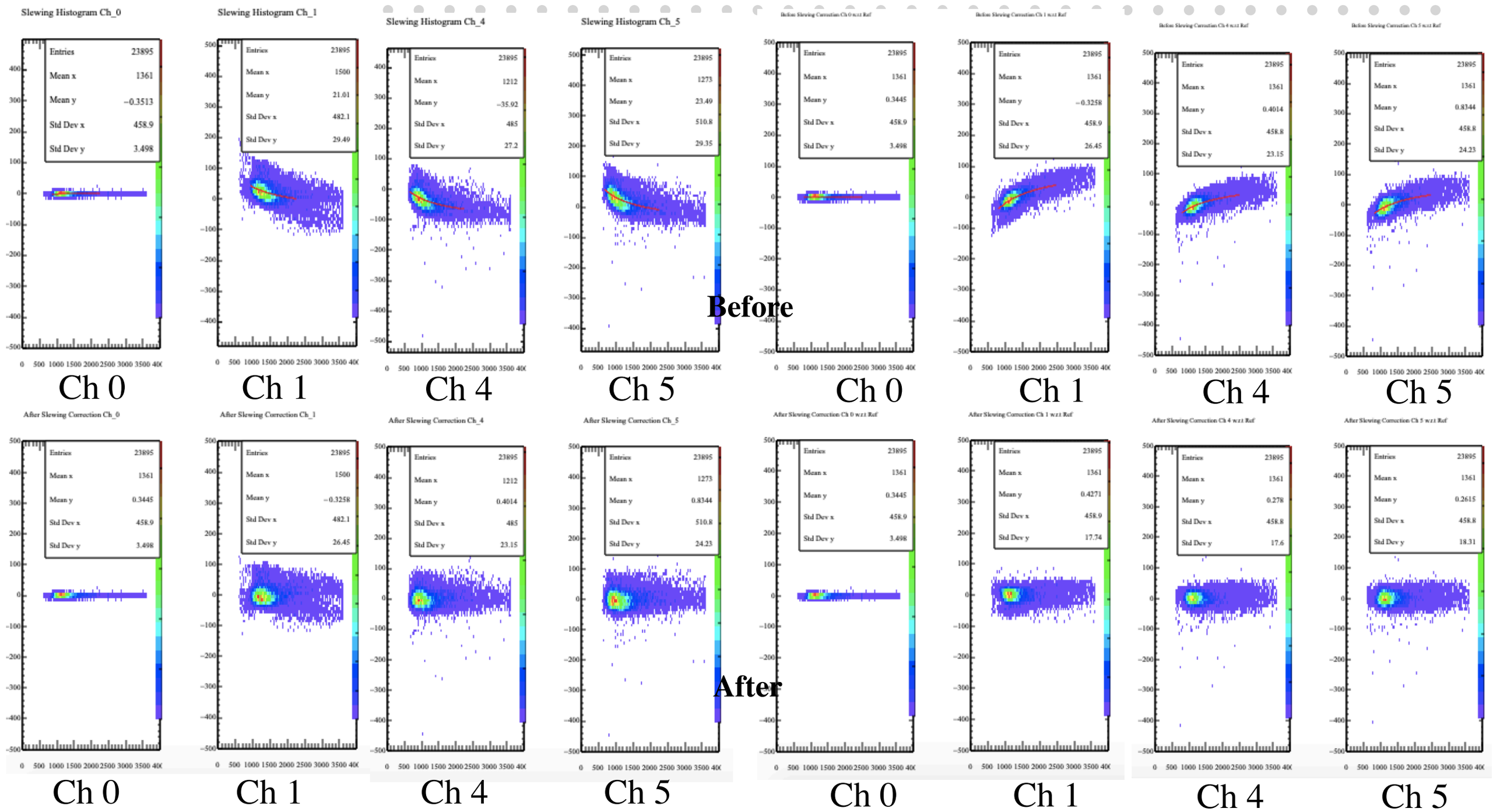






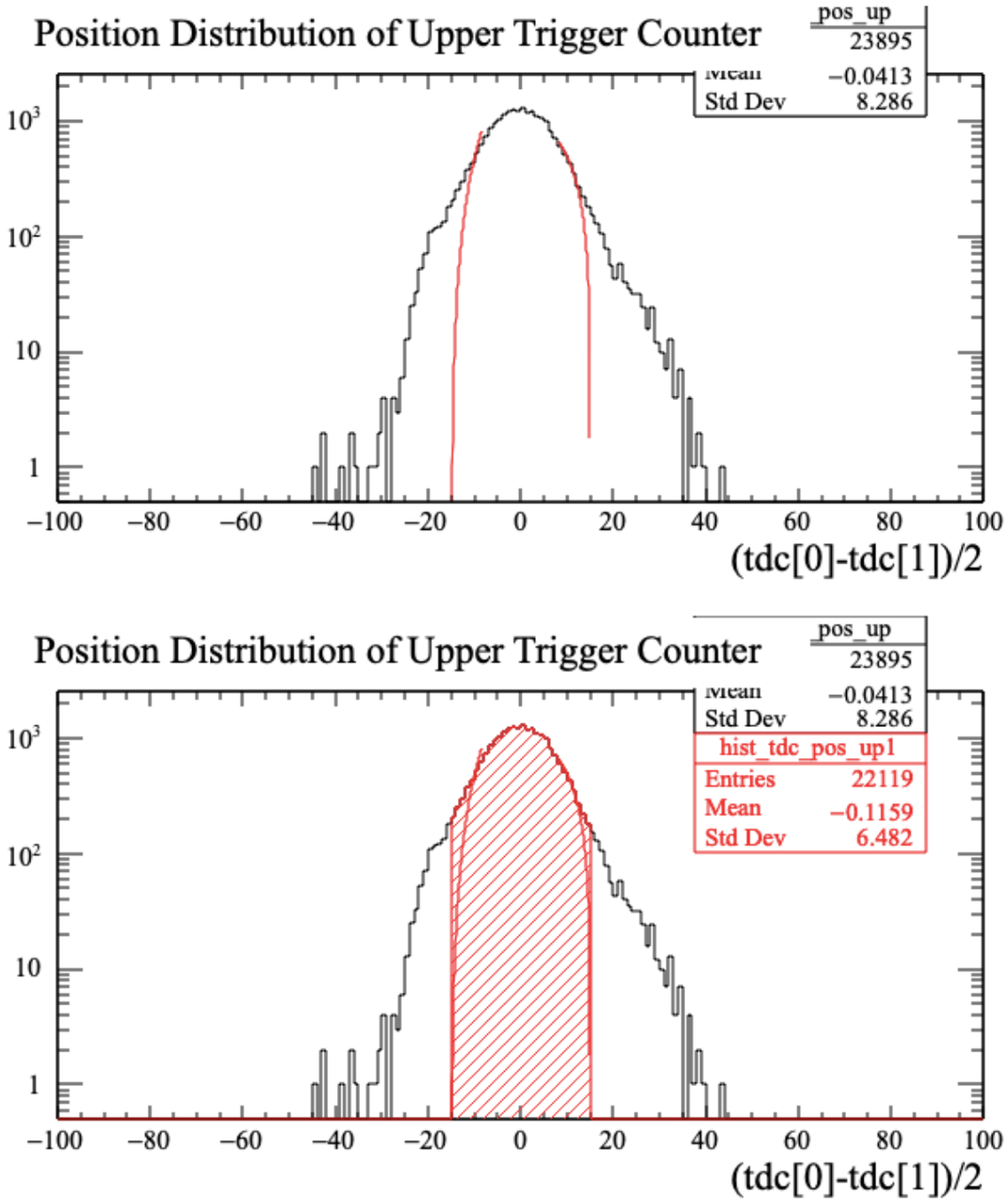
- Corresponding TDC distribution of trigger counters

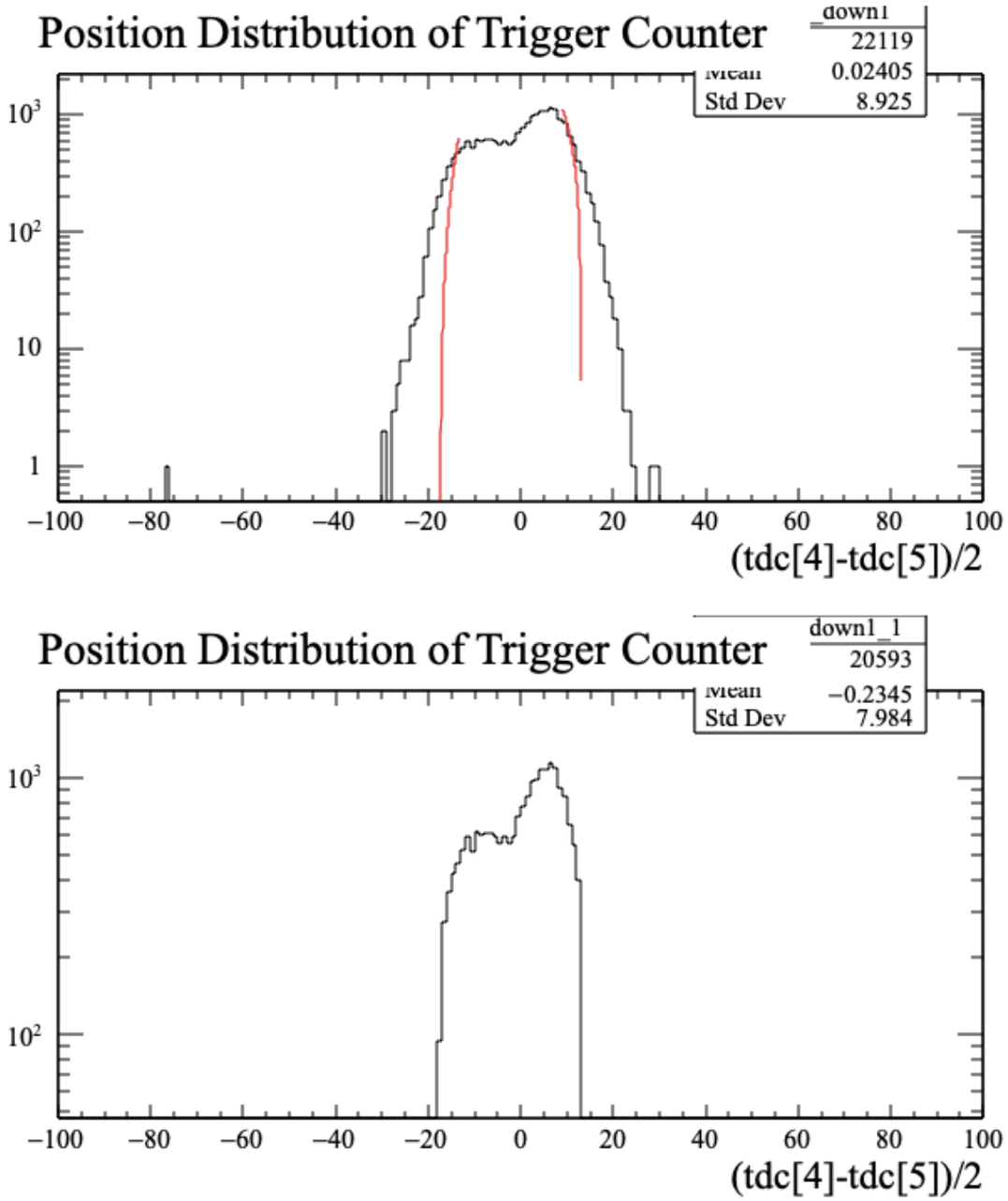
Lower Position Trigger



- Timewalk correction of raw TDC w.r.t each channel and reference

Lower Position Trigger

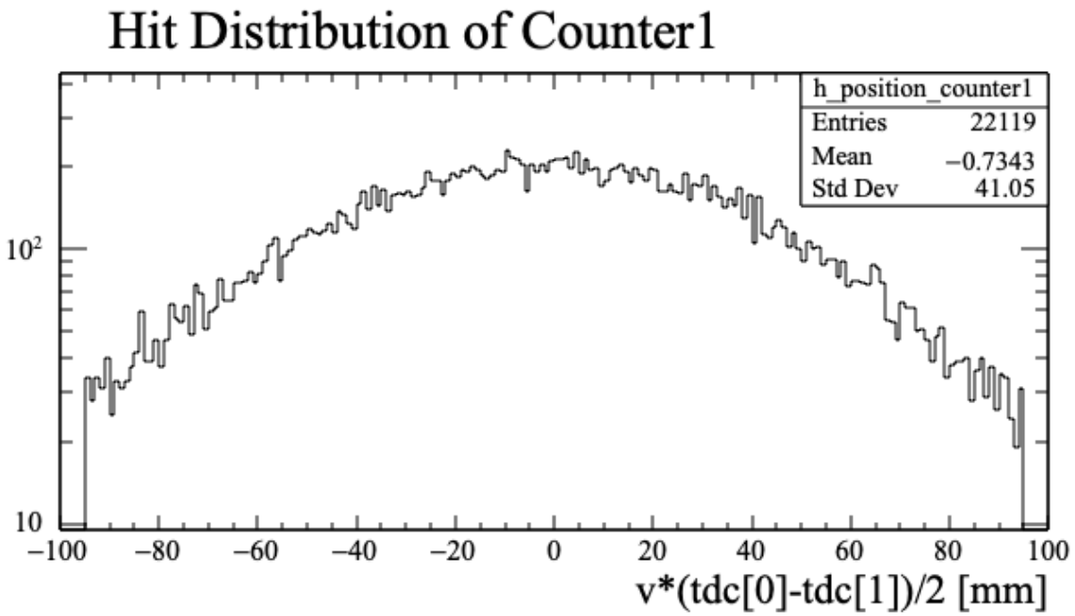


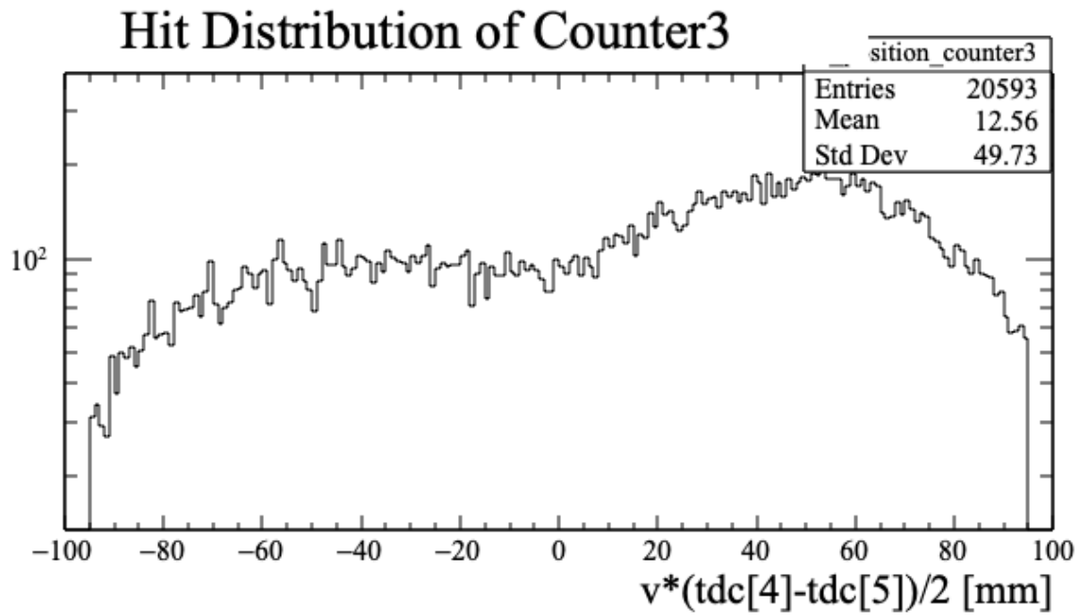


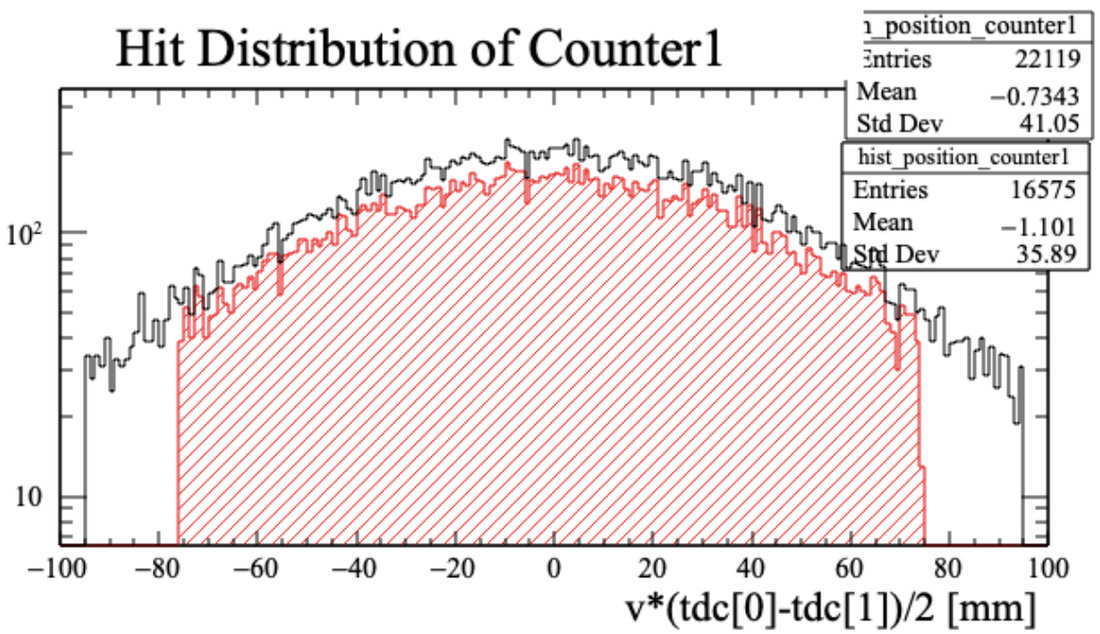
- Applying position cuts

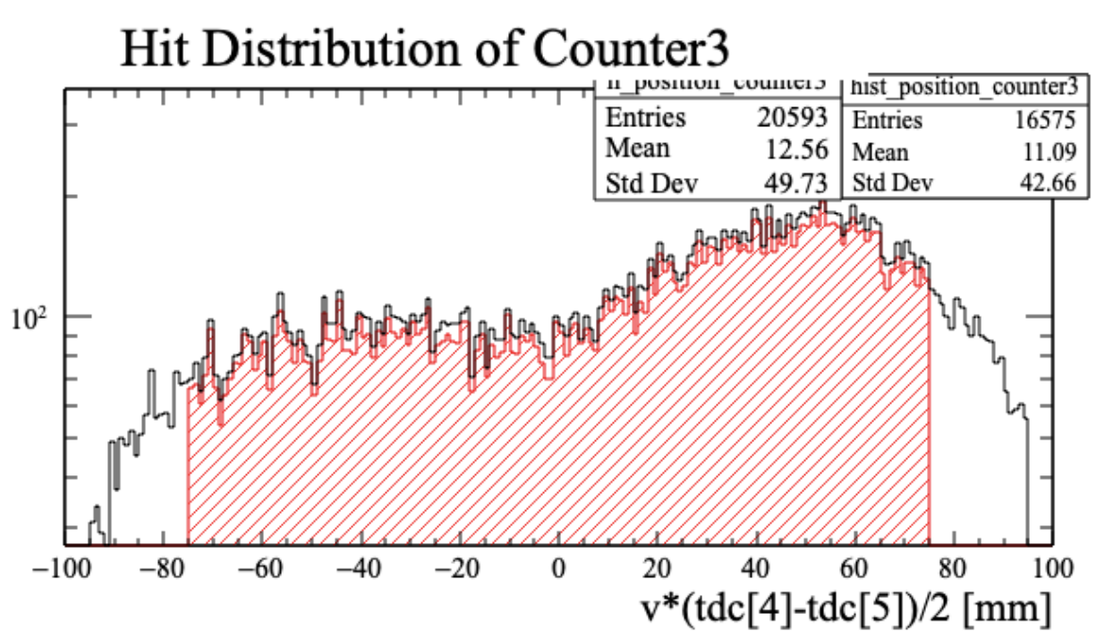
Lower Position Trigger

- Selecting hits between -75 mm and 75 mm (15 cm = radiator length)

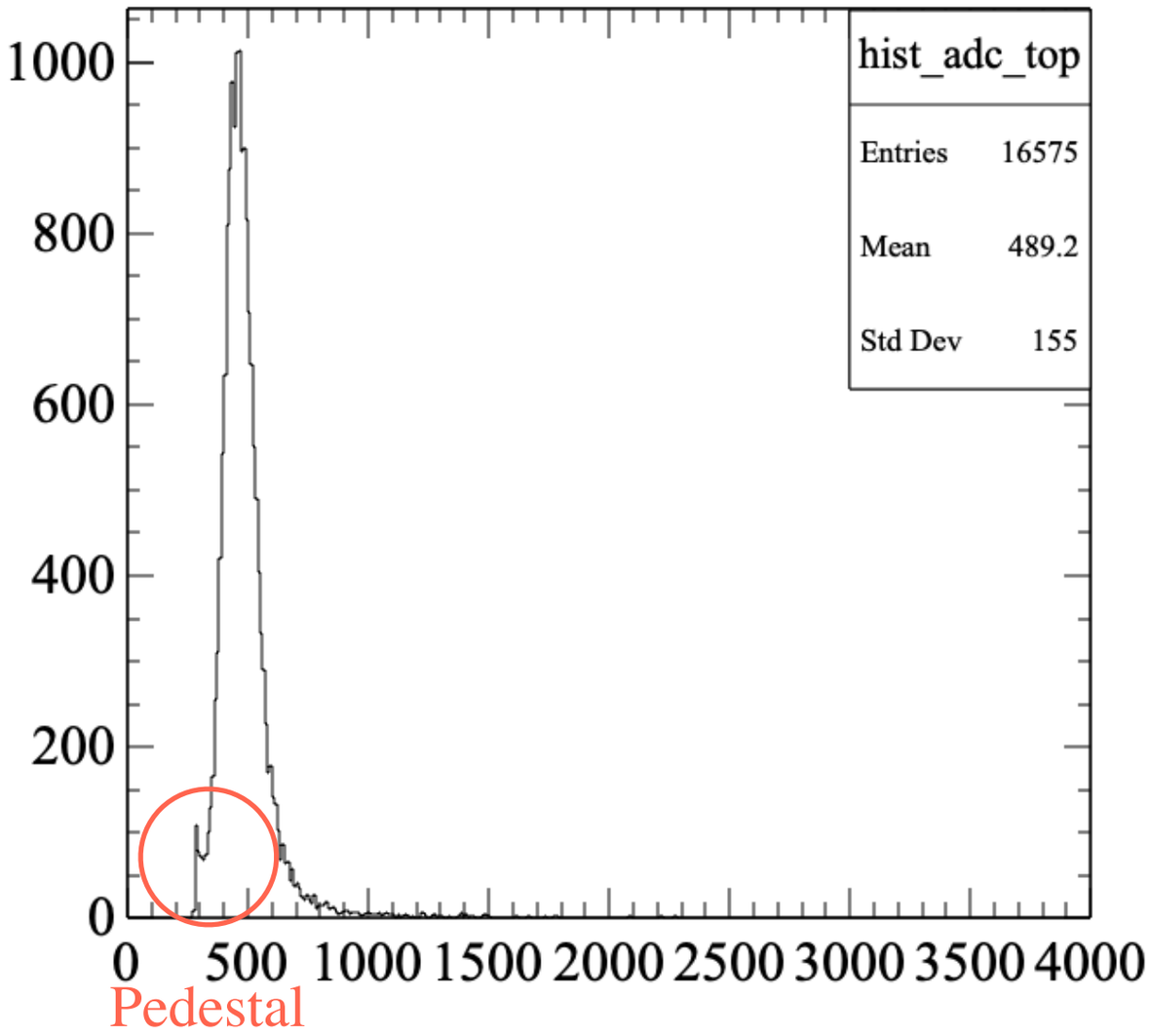


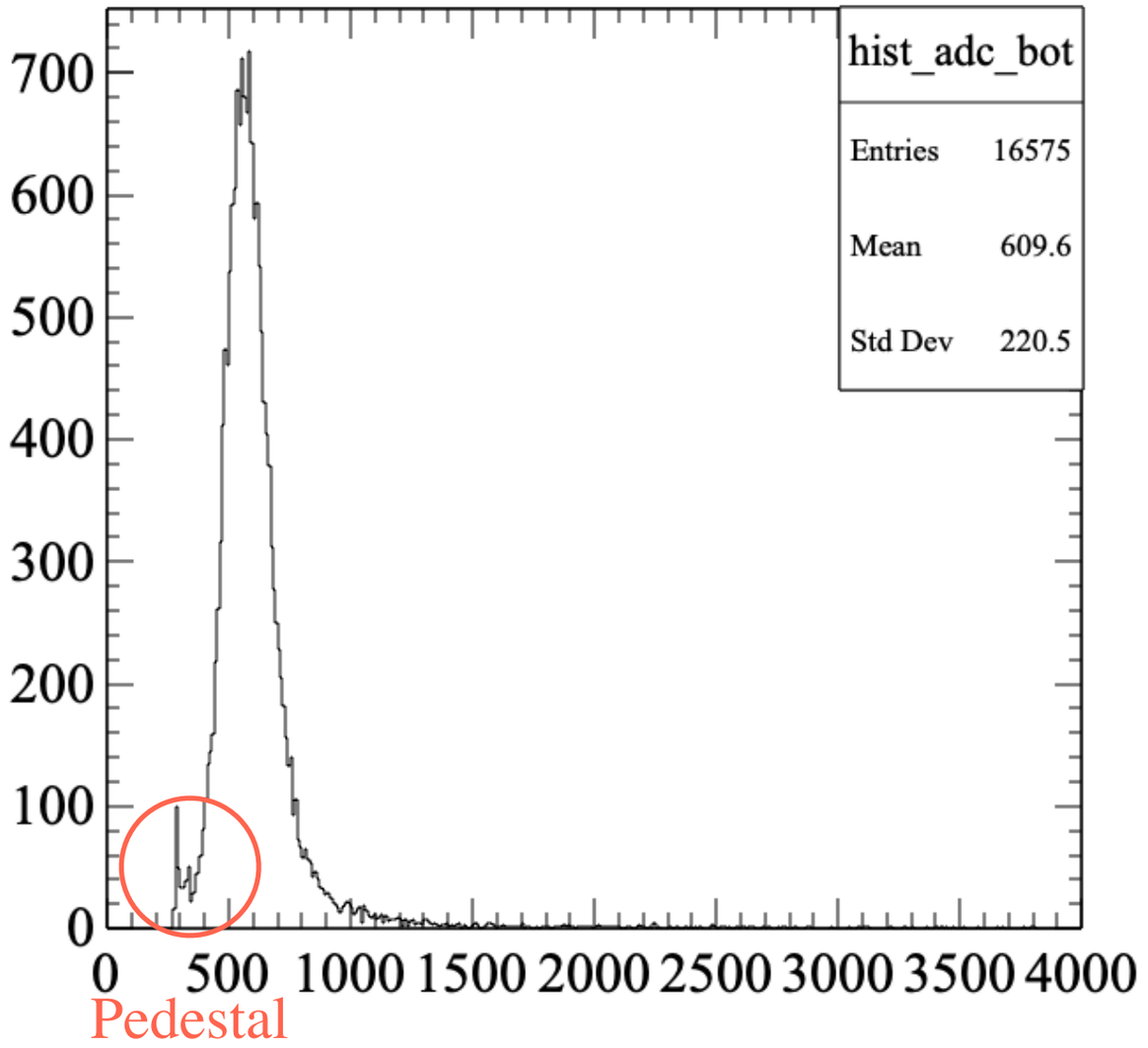






Lower Position Trigger



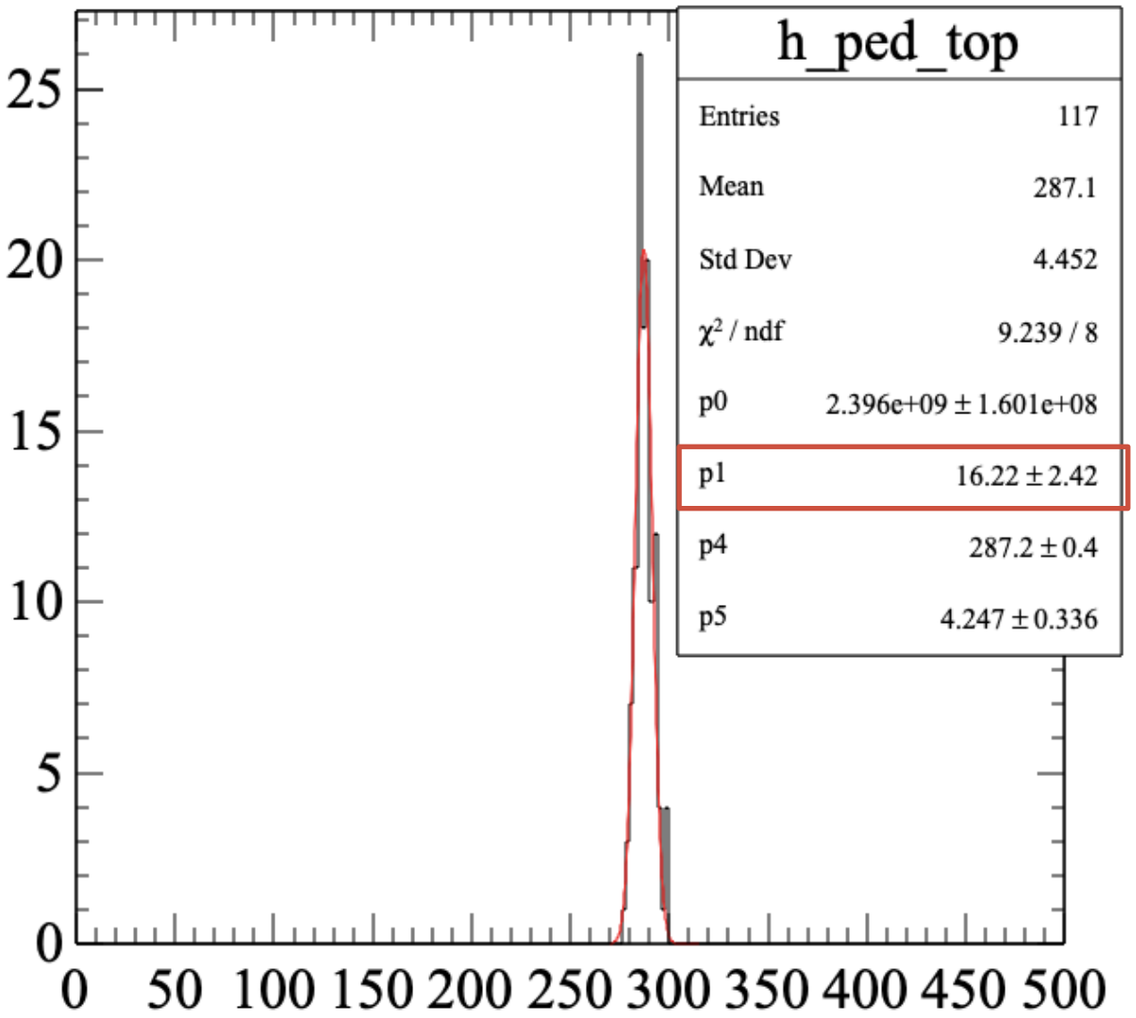


- After the data sorting, raw ADC distribution of WC top and bottom

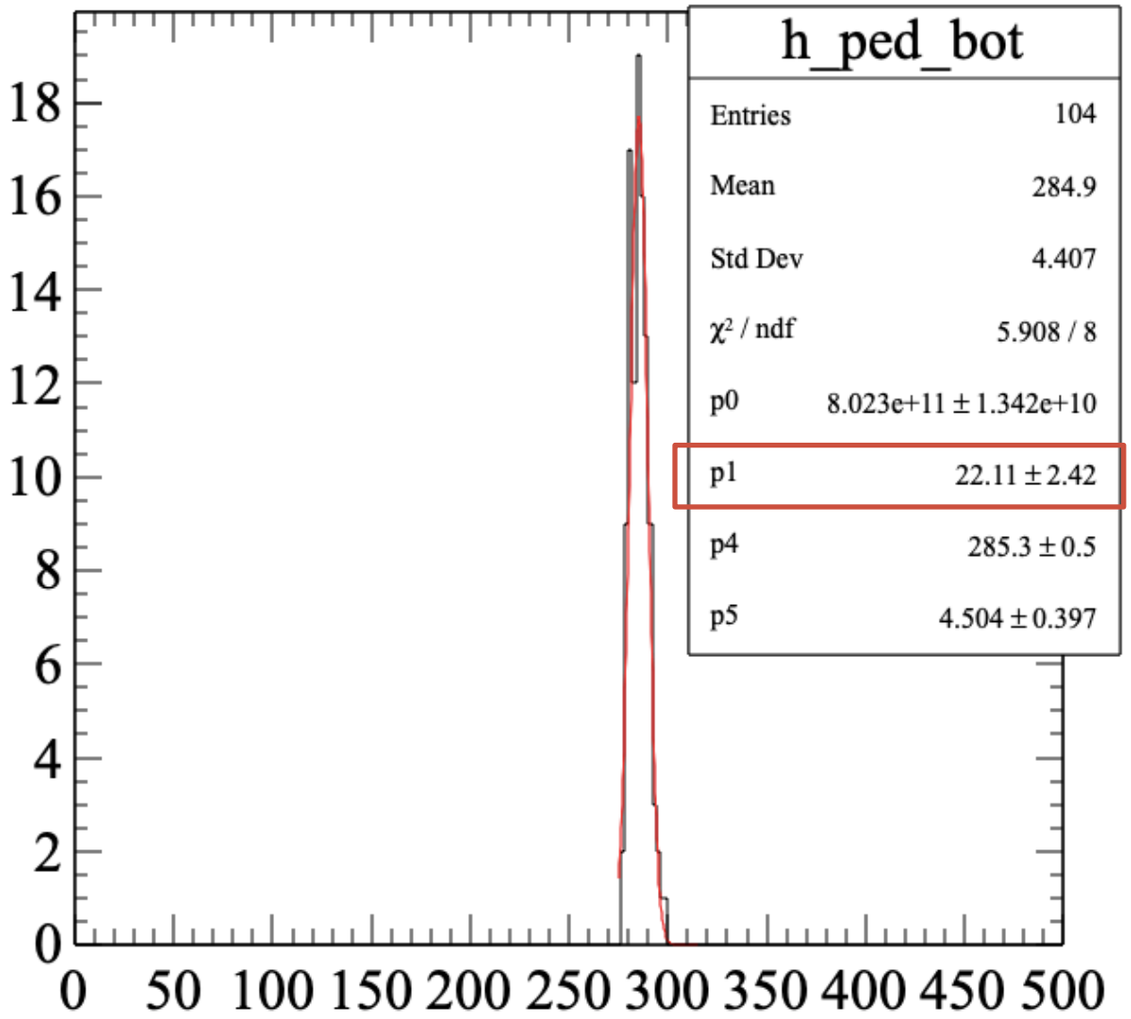
Lower Position Trigger

- Pedestal is fitted with the convolution of gaussian and poisson distribution.
- Fitted mean of poisson distribution is **16.22 ± 2.42 [top], 22.11 ± 2.42 [bottom]**

WC Top Pedestal Distribution

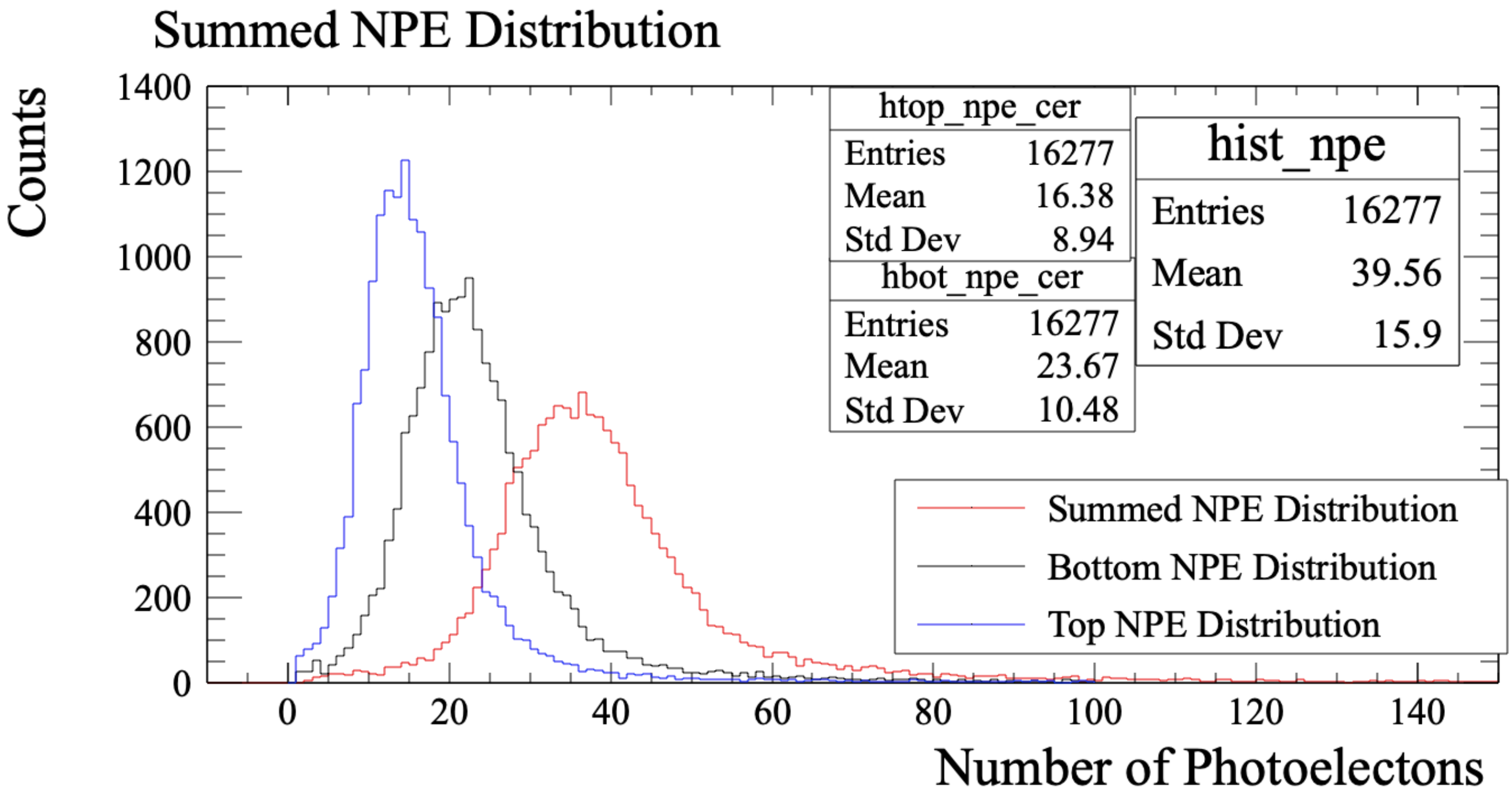


WC Bot Pedestal Distribution

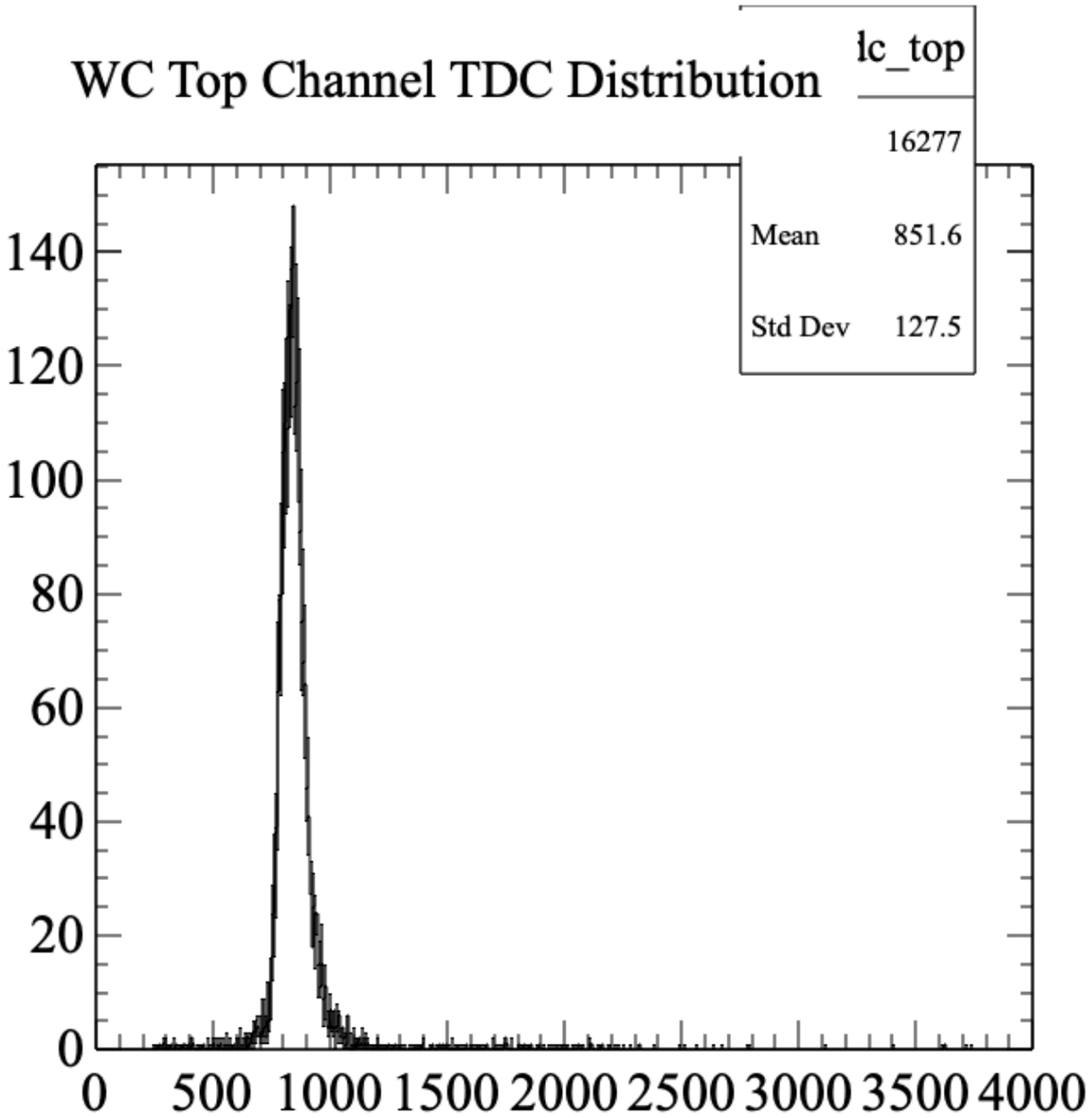


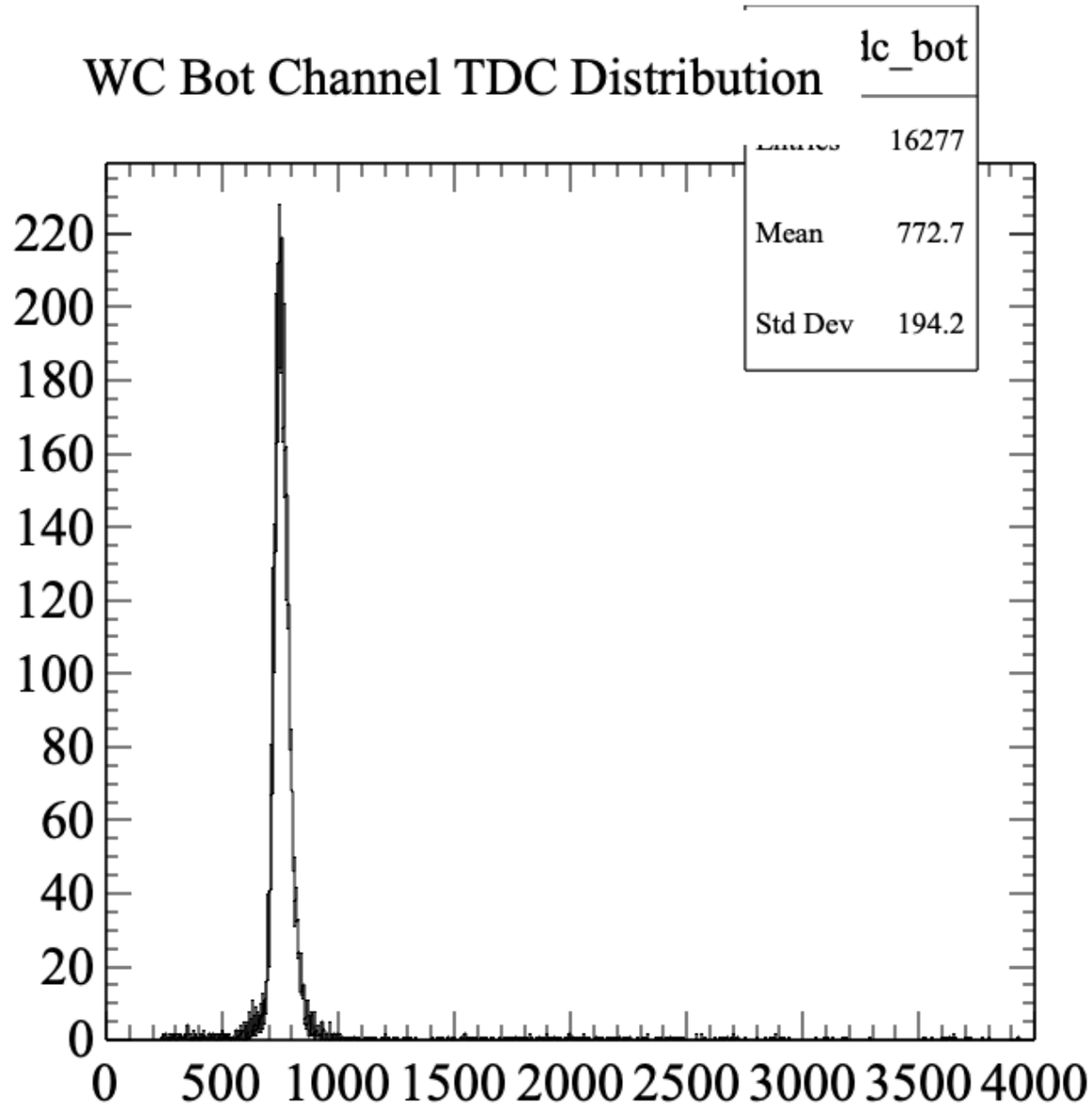
Lower Position Trigger

- Summation of top and bottom NPe distribution has a mean value of 39.56



Lower Position Trigger

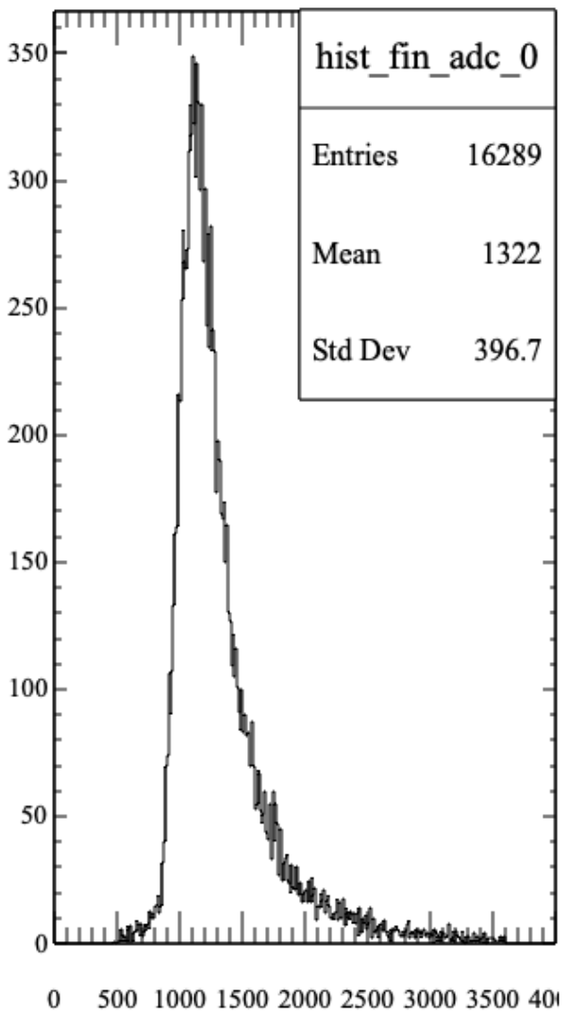




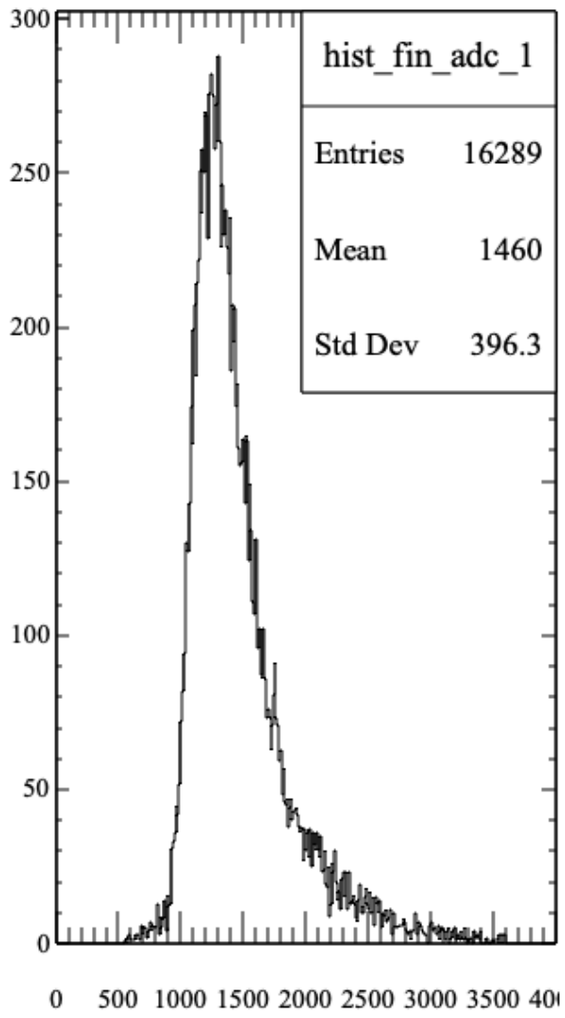
- Corresponding TDC distribution

Upper Position Trigger

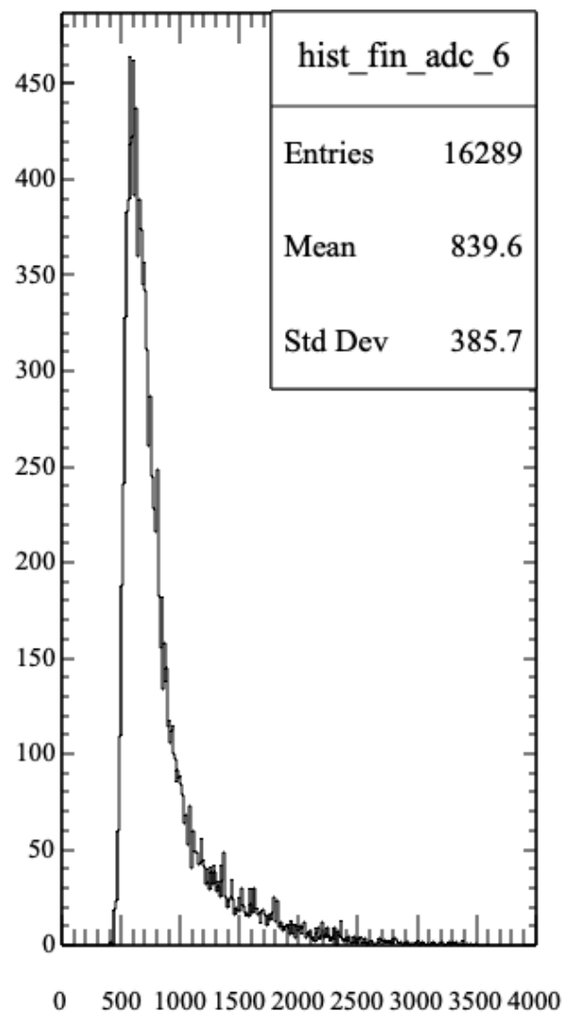
ADC Distribution with Cut-Off Ch_0



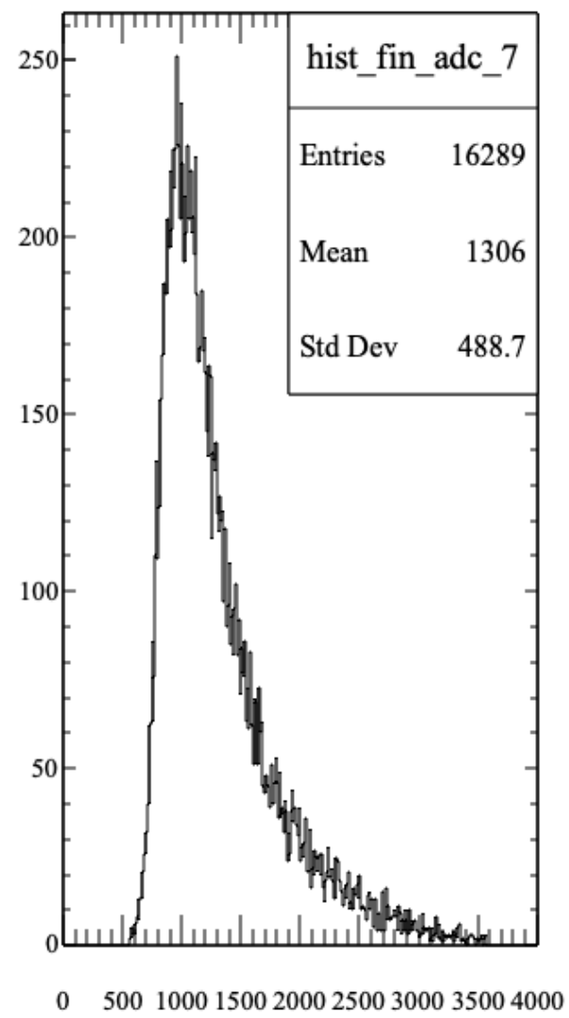
ADC Distribution with Cut-Off Ch_1



ADC Distribution with Cut-Off Ch_6

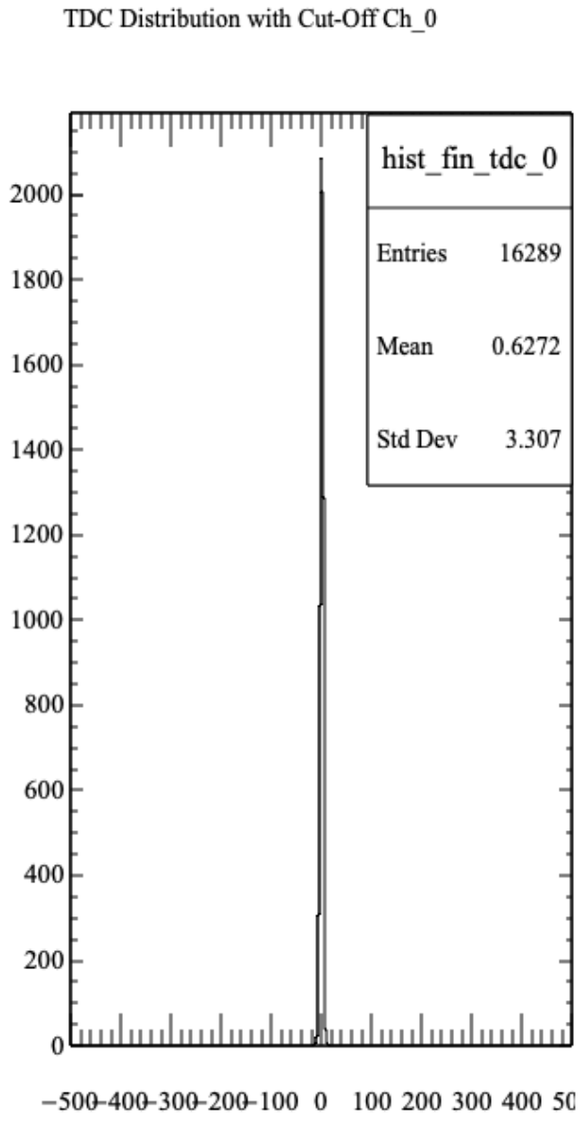


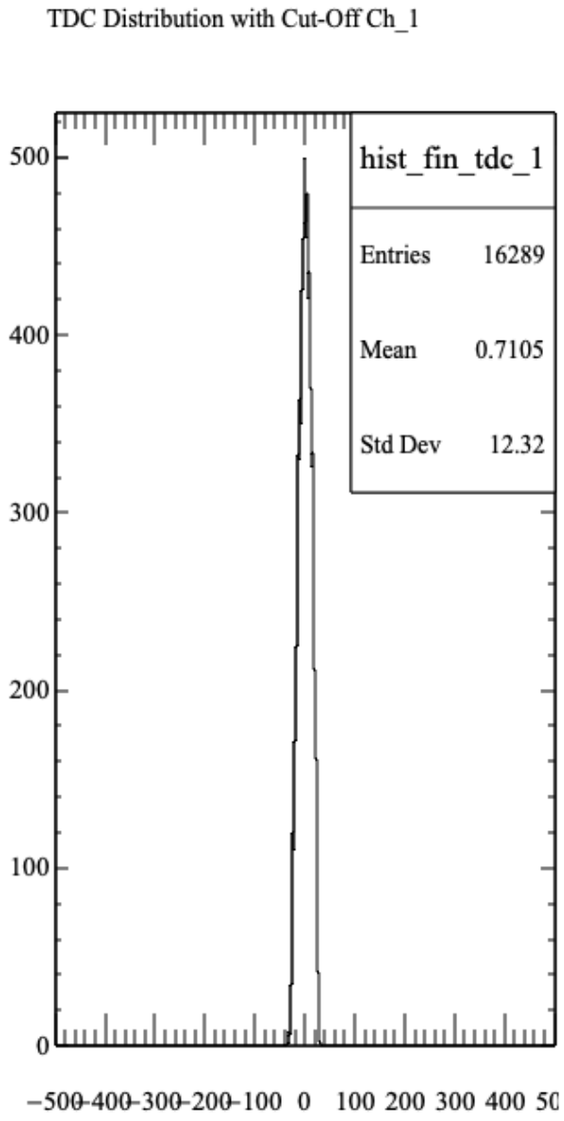
ADC Distribution with Cut-Off Ch_7

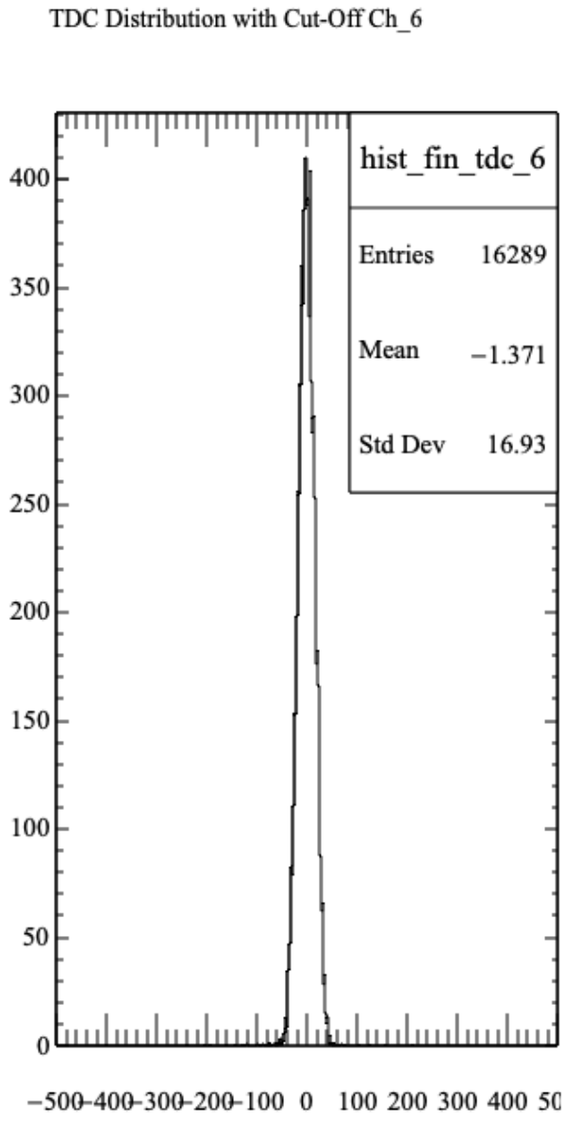


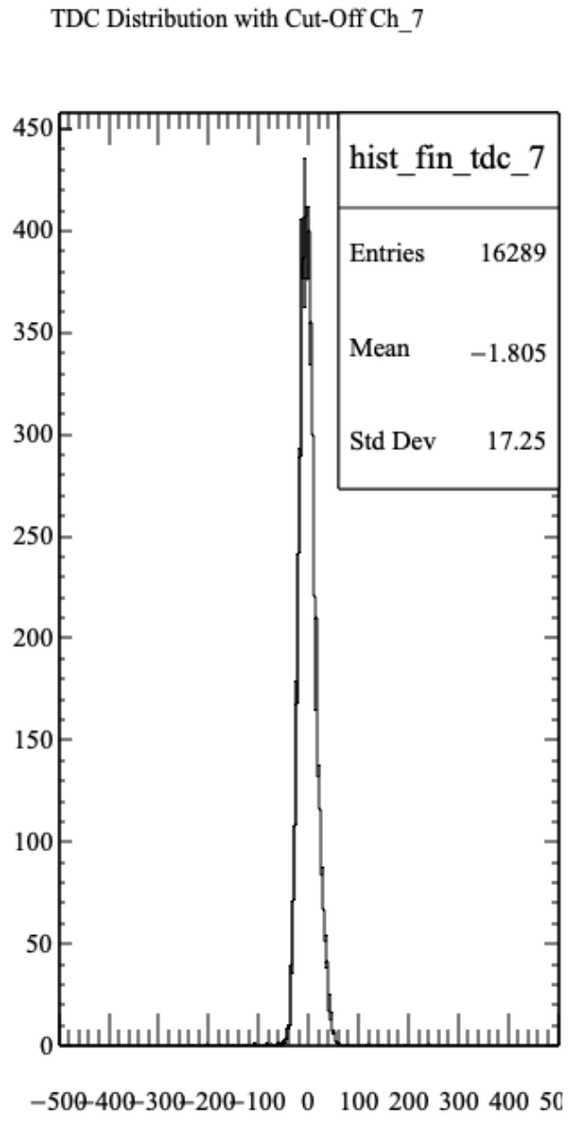
- Data taken for 14 days (from Jan.25)
- ADC distribution of trigger counters (Trigger : Channel 1 & Channel 2)
- After neglecting overshoot and applying coincidence cut and position cut

Upper Position Trigger



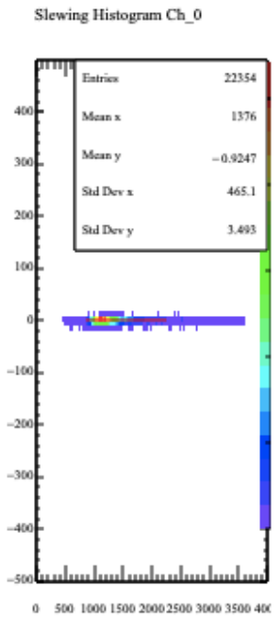


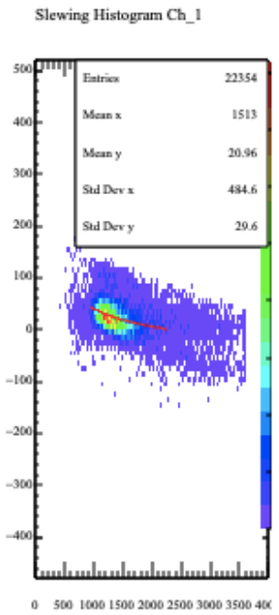


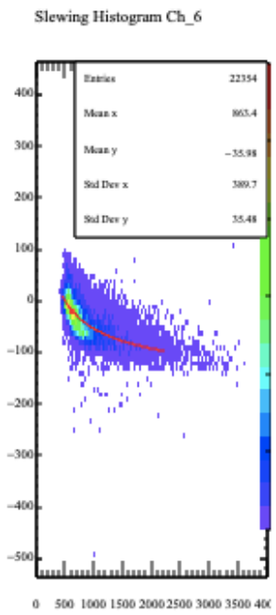


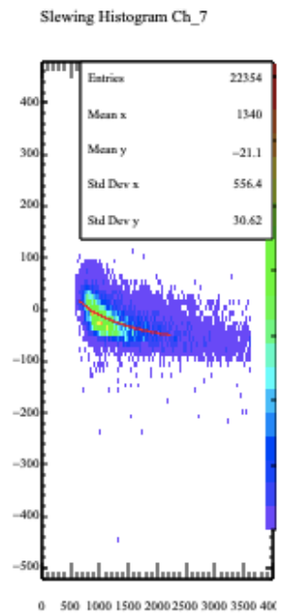
- Corresponding TDC distribution of trigger counters

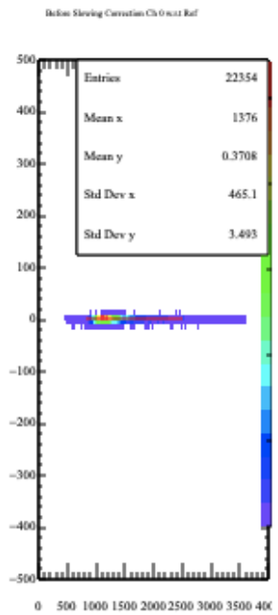
Upper Position Trigger

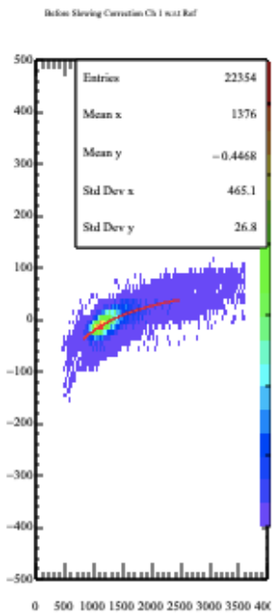


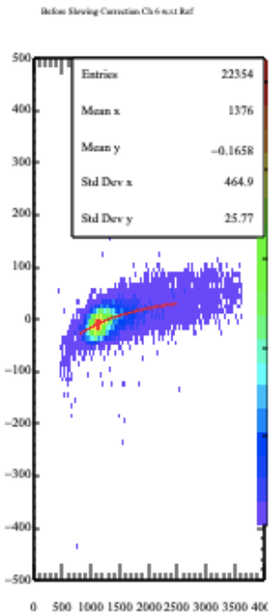


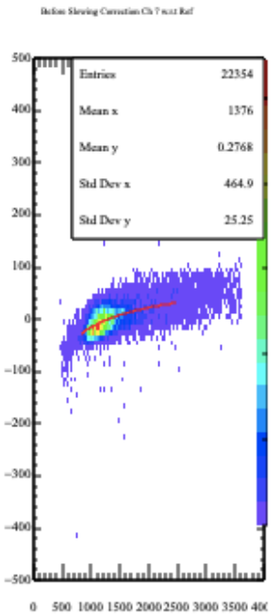




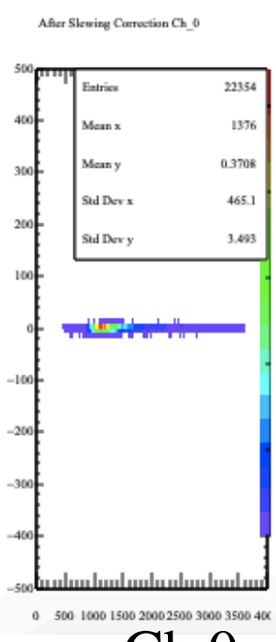


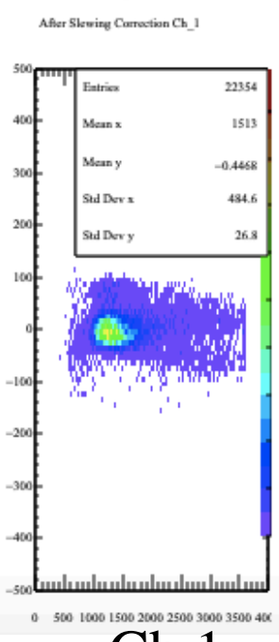


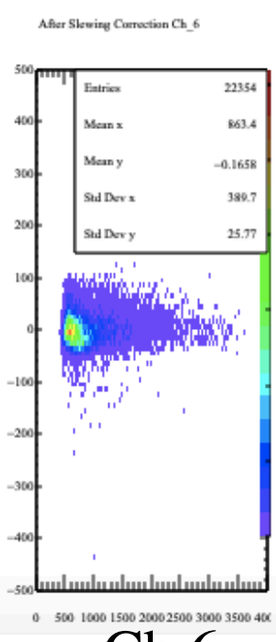


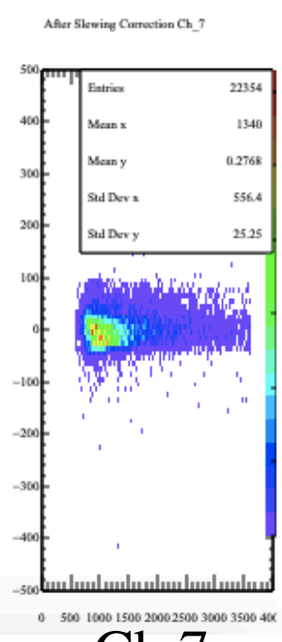


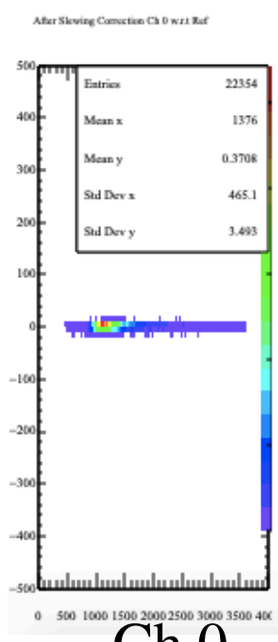
Ch 0 Ch 1 Ch 6 Ch 7 Ch 0 Ch 1 Ch 6 Ch 7

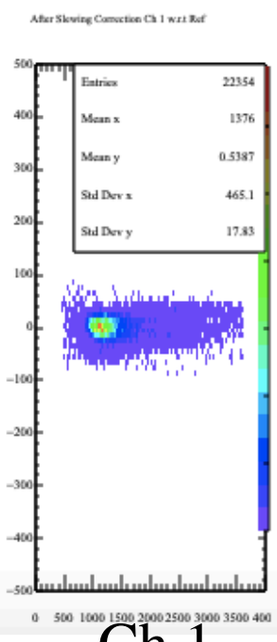


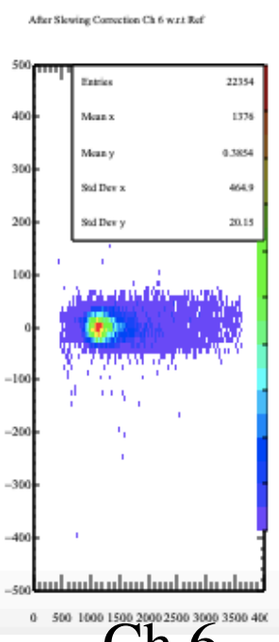


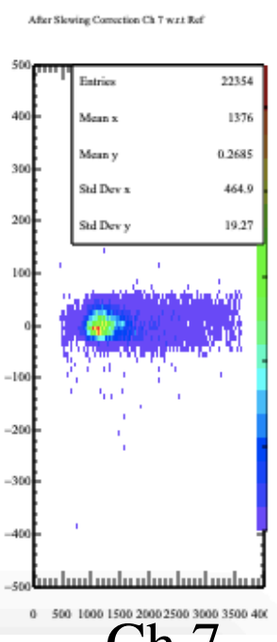








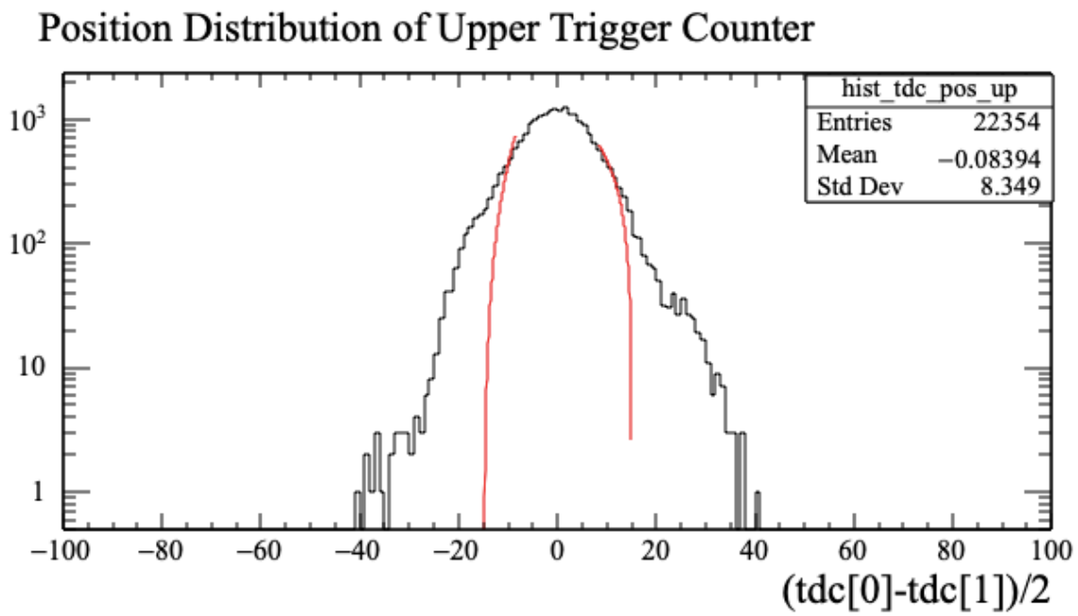


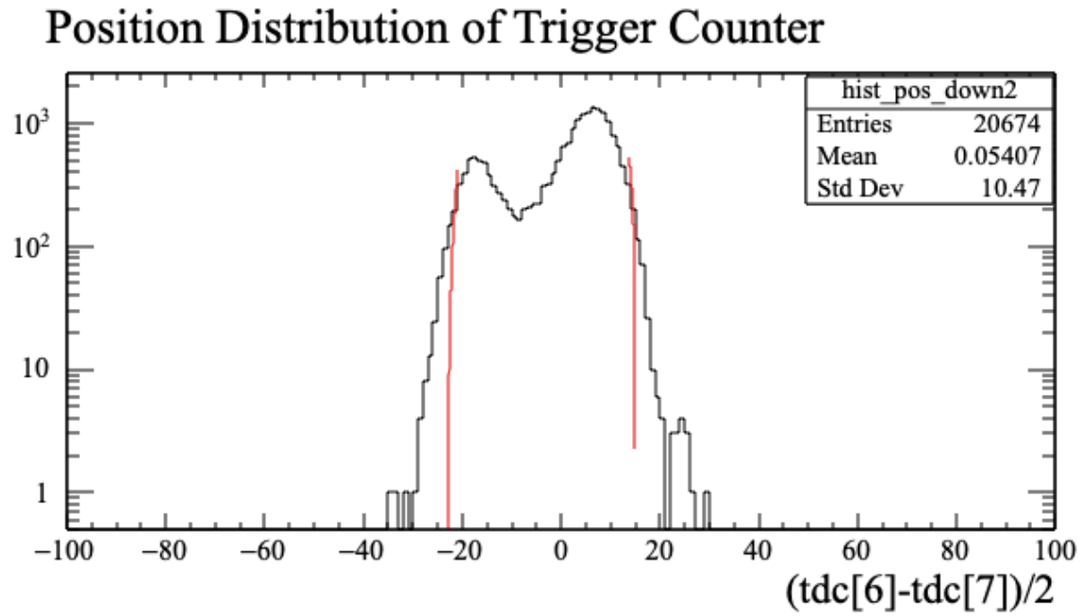


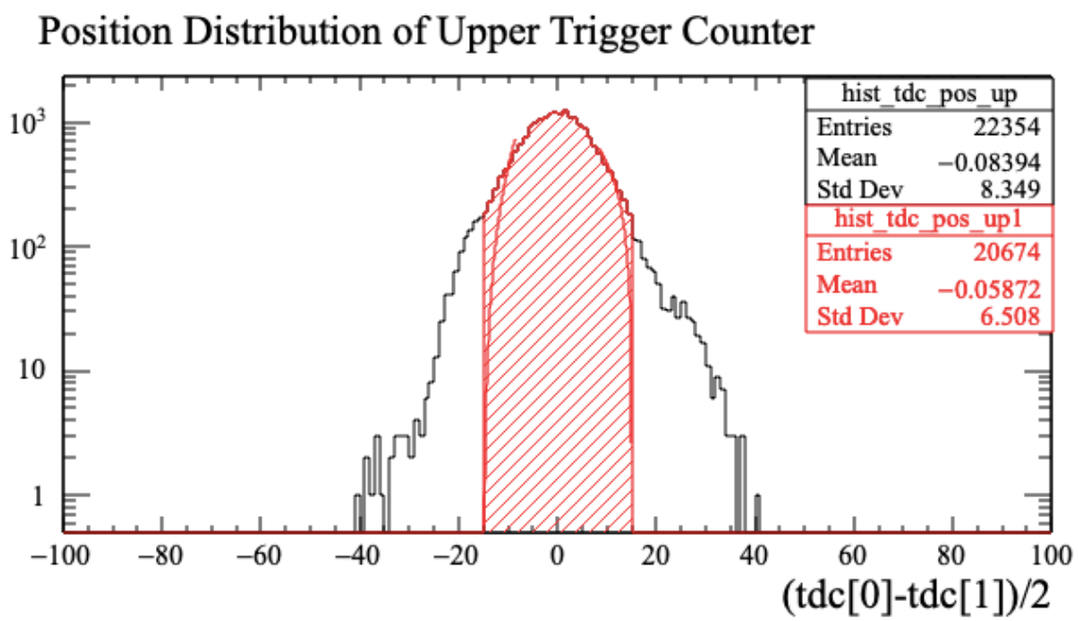
Ch 0 Ch 1 Ch 6 Ch 7 Ch 0 Ch 1 Ch 6 Ch 7

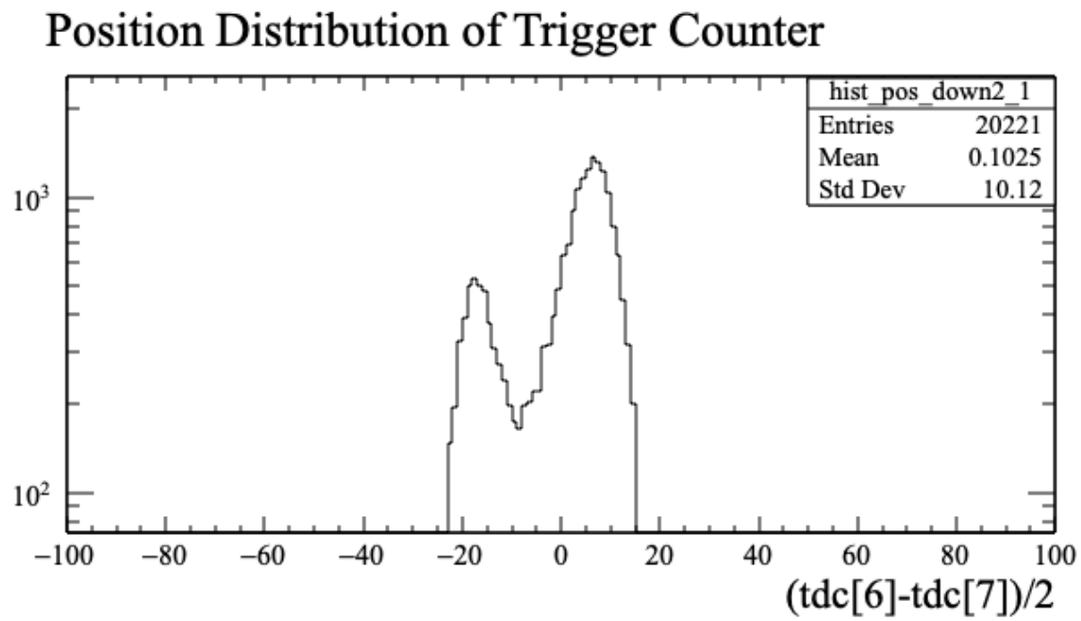
- Timewalk correction of raw TDC w.r.t each channel and reference

Upper Position Trigger



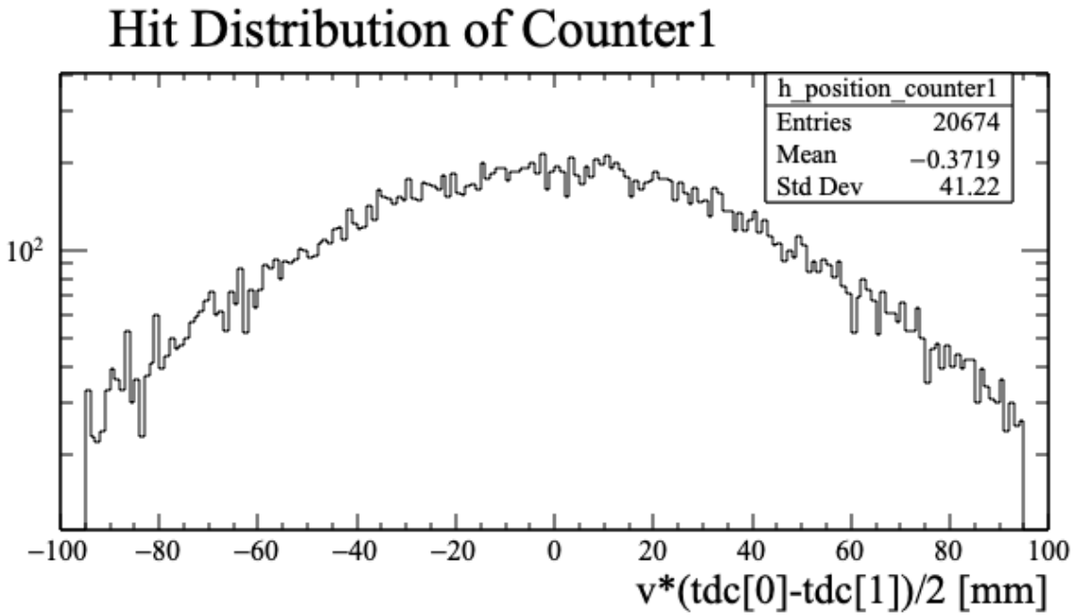


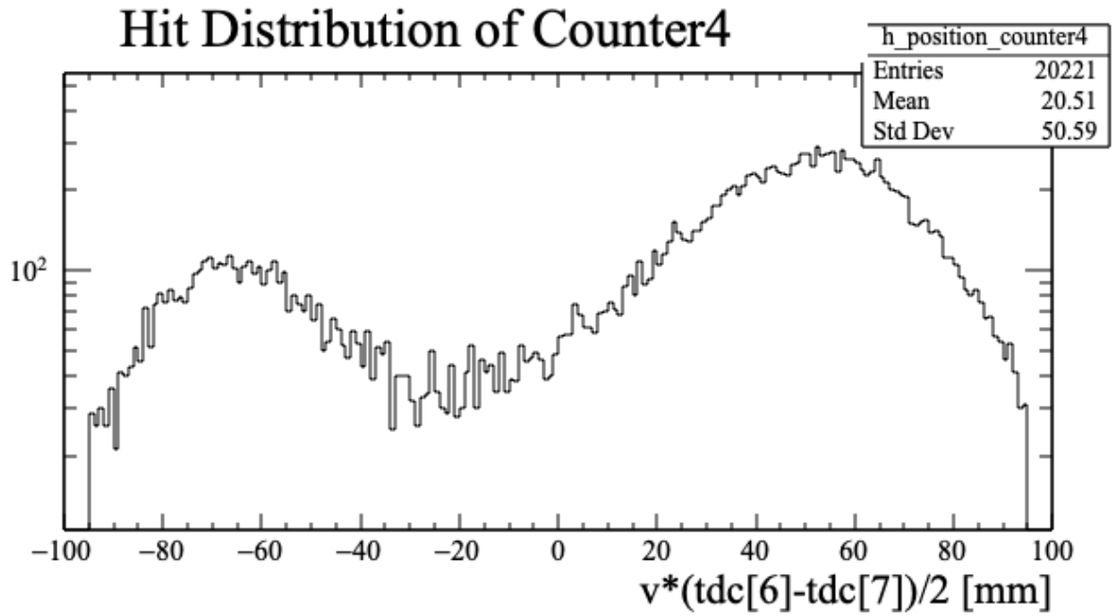


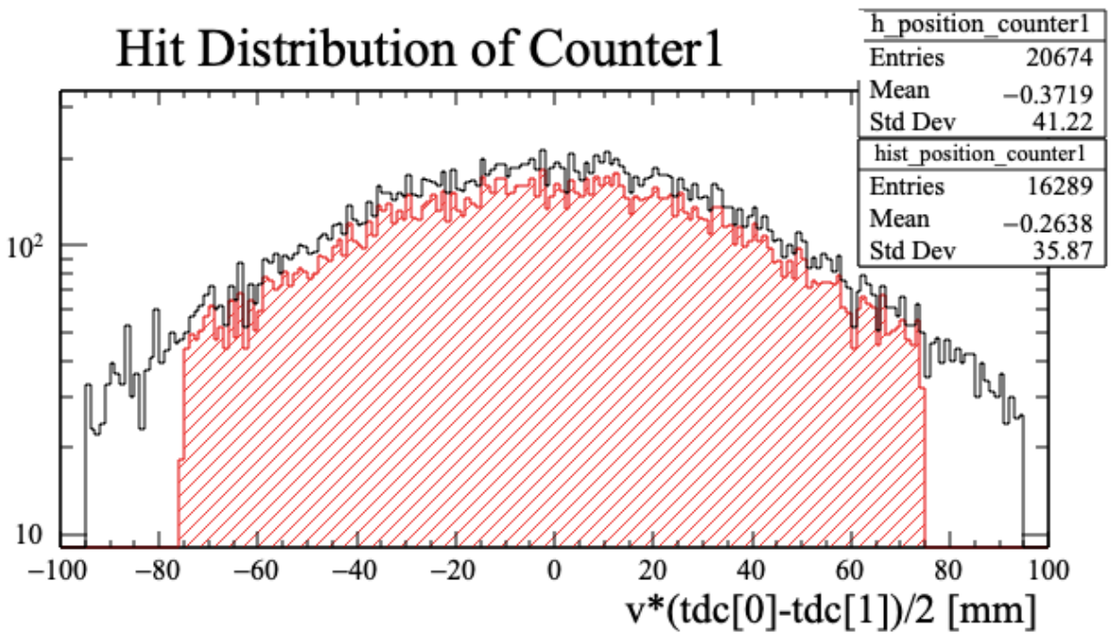


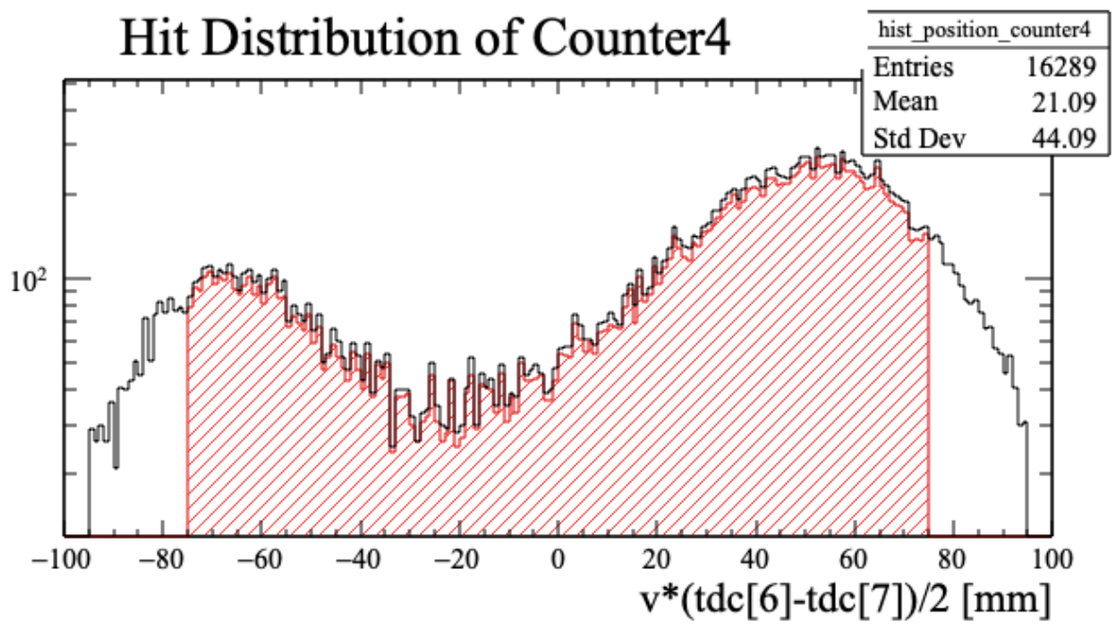
- Applying position cuts

Upper Position Trigger

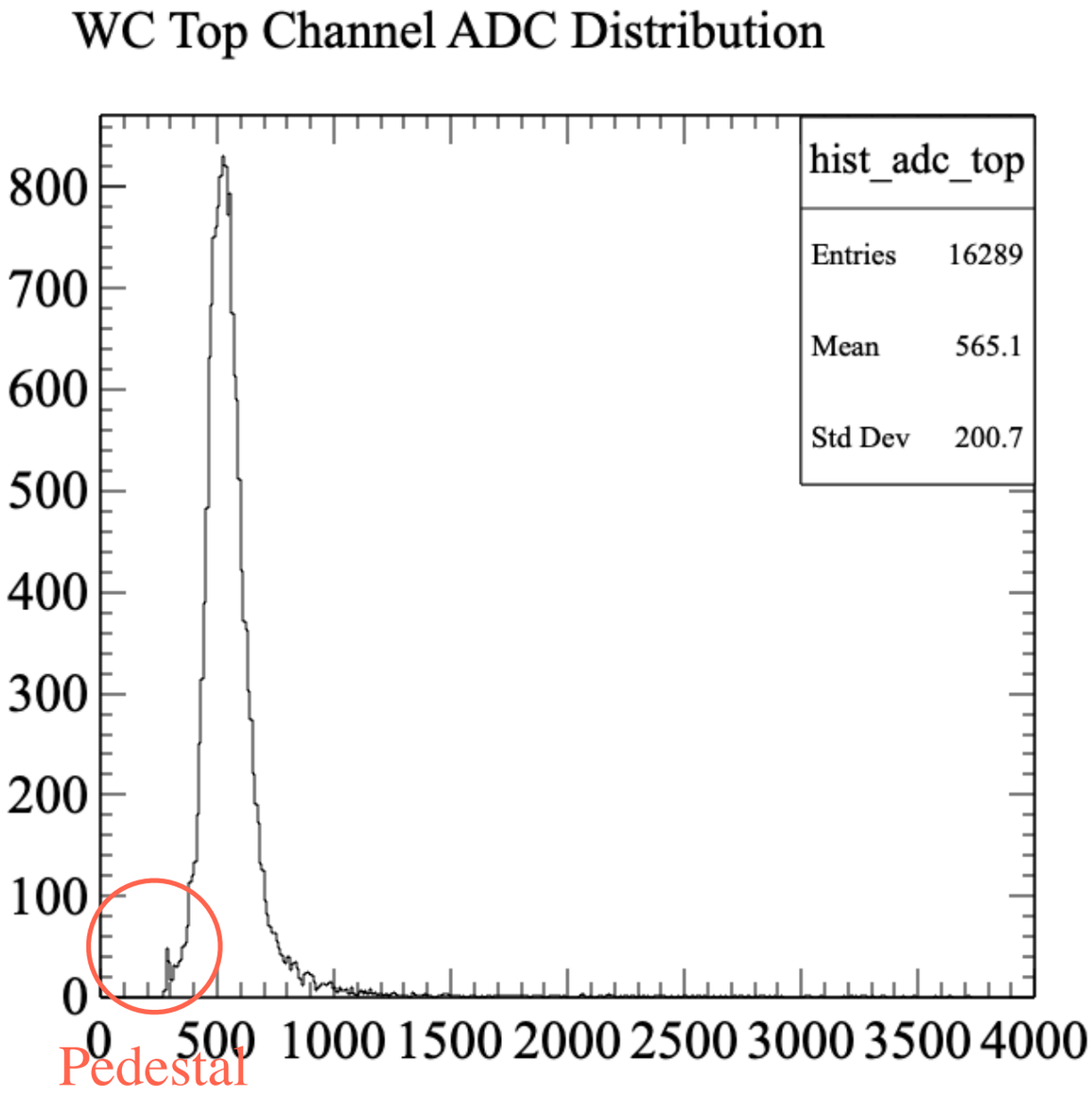


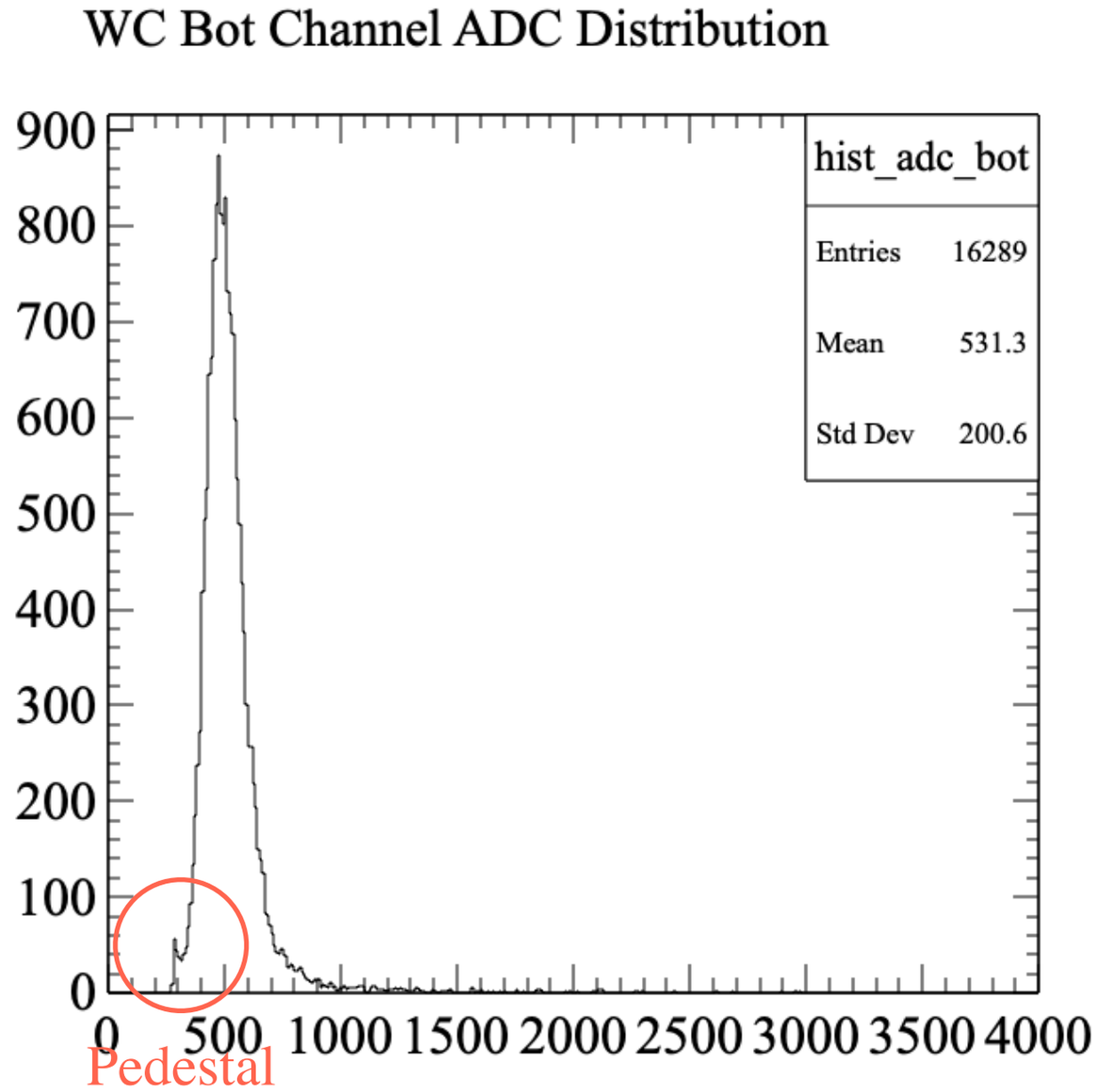






Upper Position Trigger



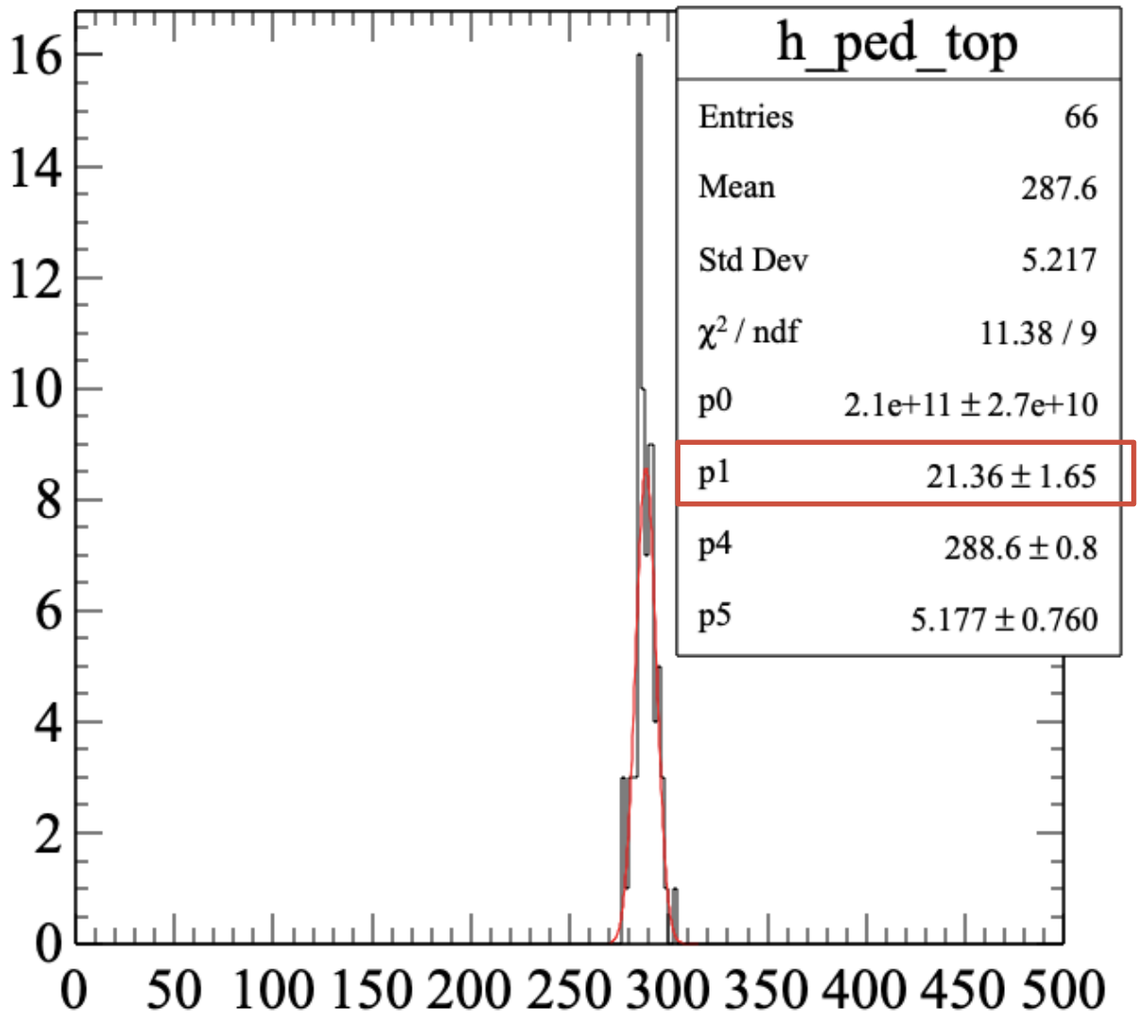


- After the data sorting, raw ADC distribution of WC top and bottom

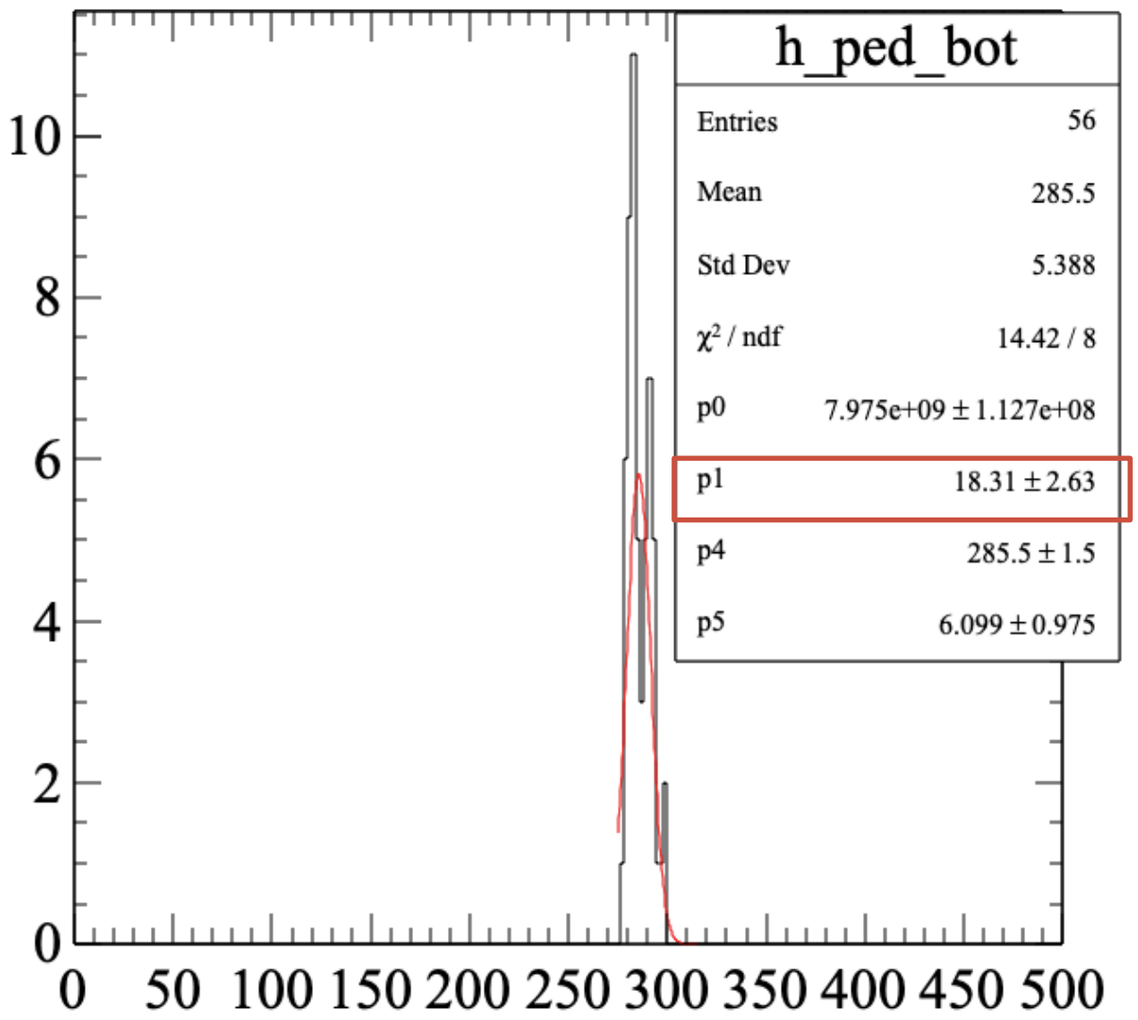
Upper Position Trigger

- Pedestal is fitted with the convolution of gaussian and poisson distribution.
- Fitted mean of poisson distribution is **21.36 ± 1.65 [top], 18.31 ± 2.63 [bottom]**

WC Top Pedestal Distribution

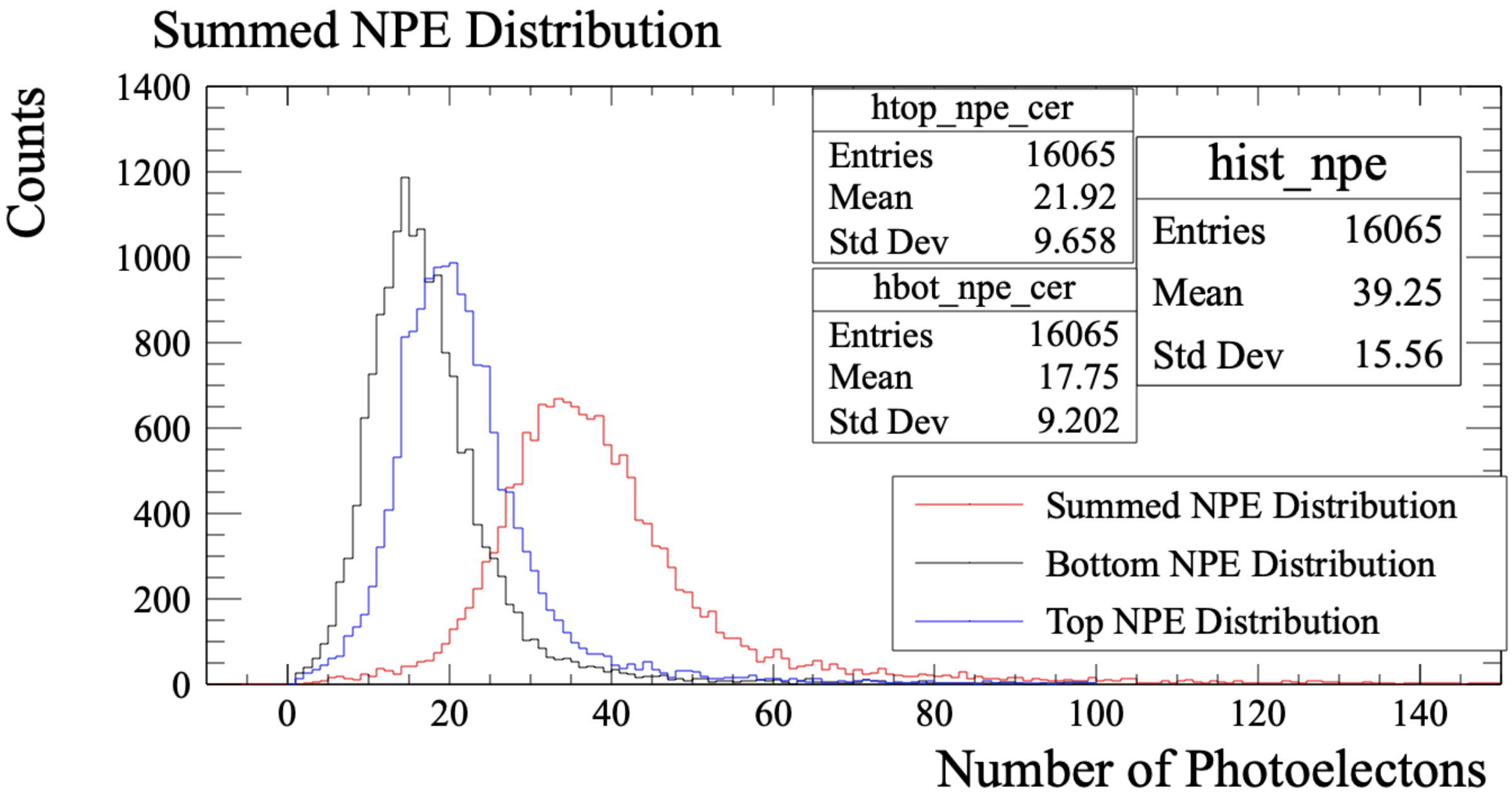


WC Bot Pedestal Distribution

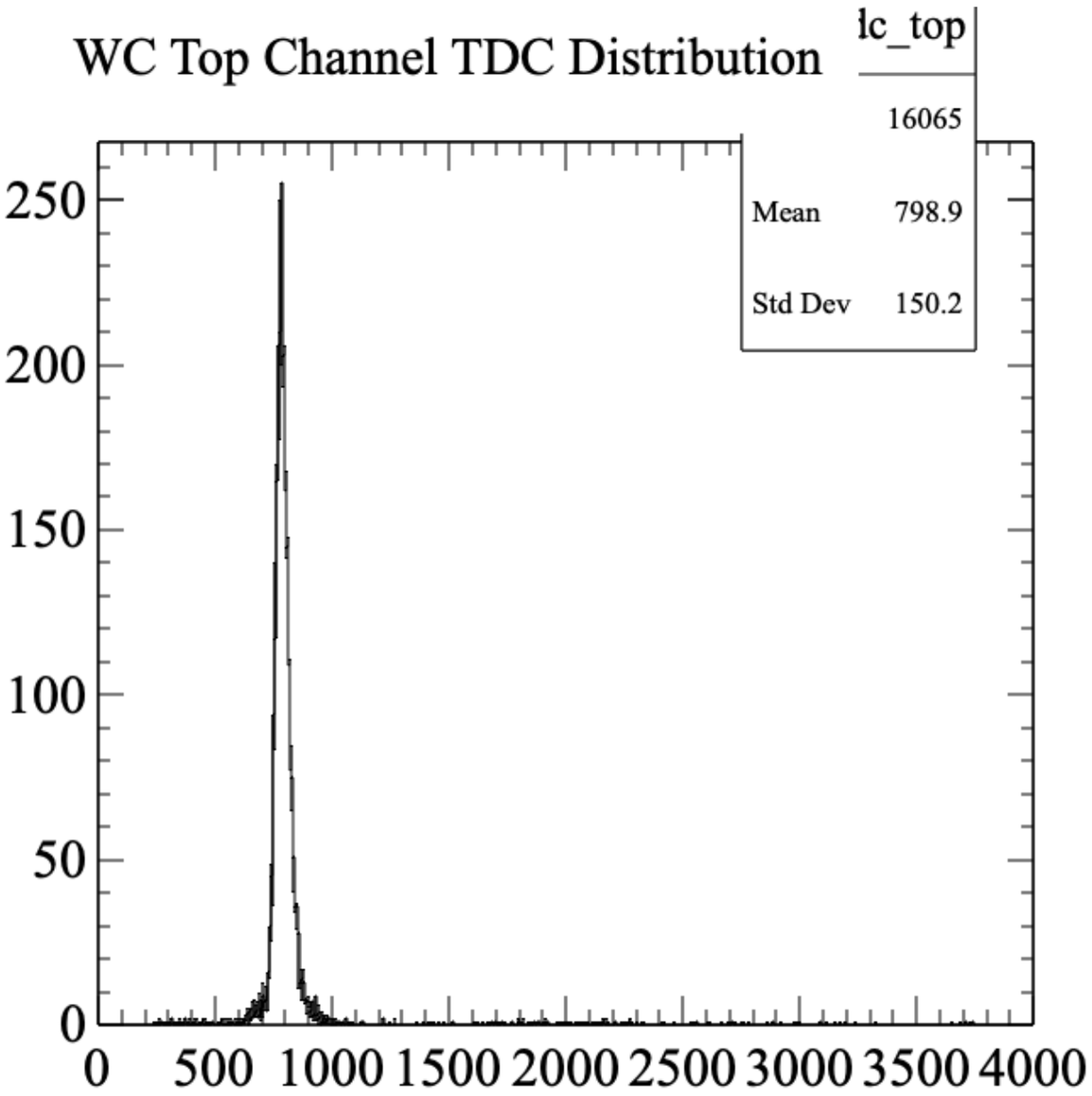


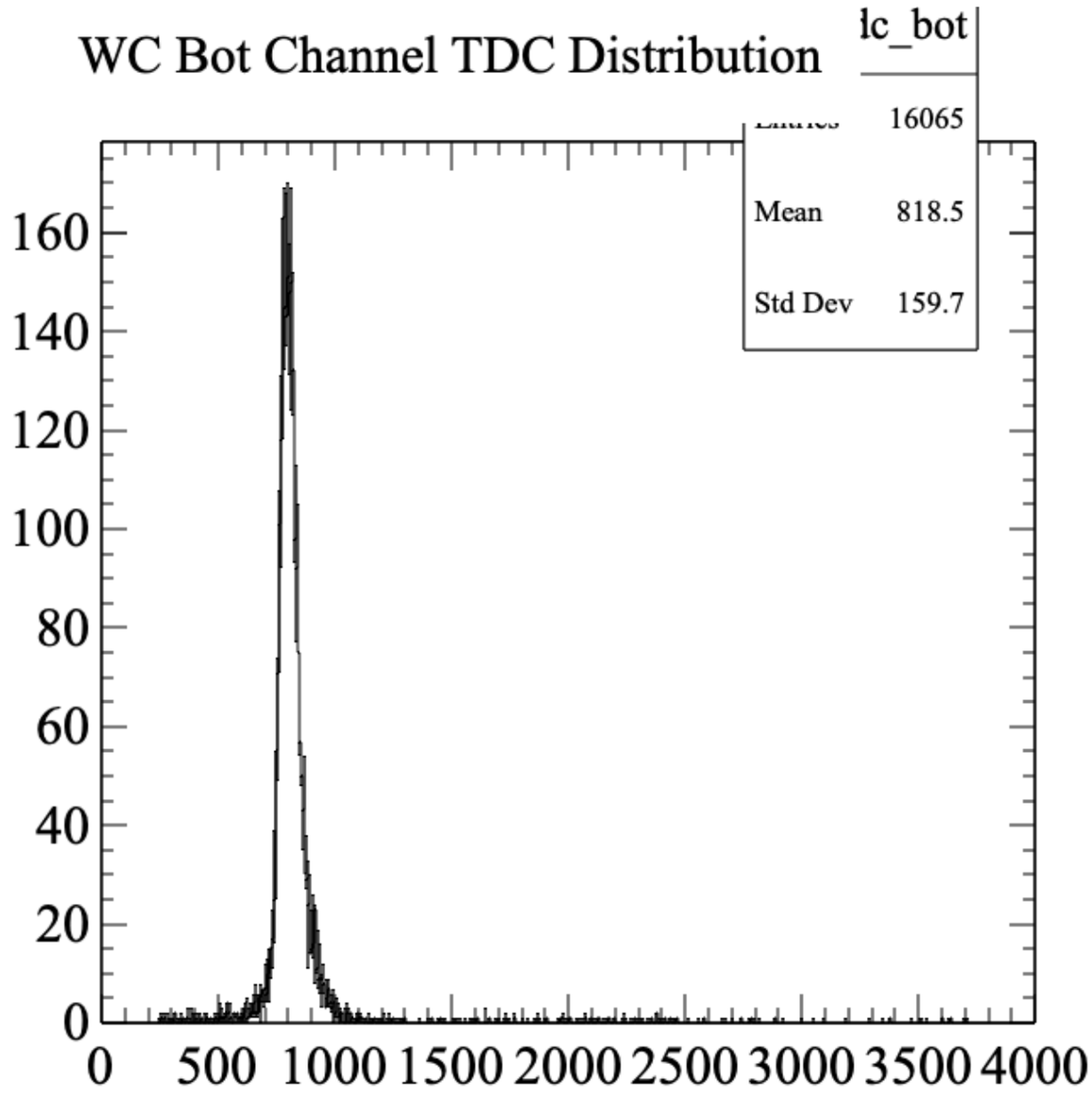
Upper Position Trigger

- Summation of top and bottom NPe distribution has a mean value of 39.25



Upper Position Trigger

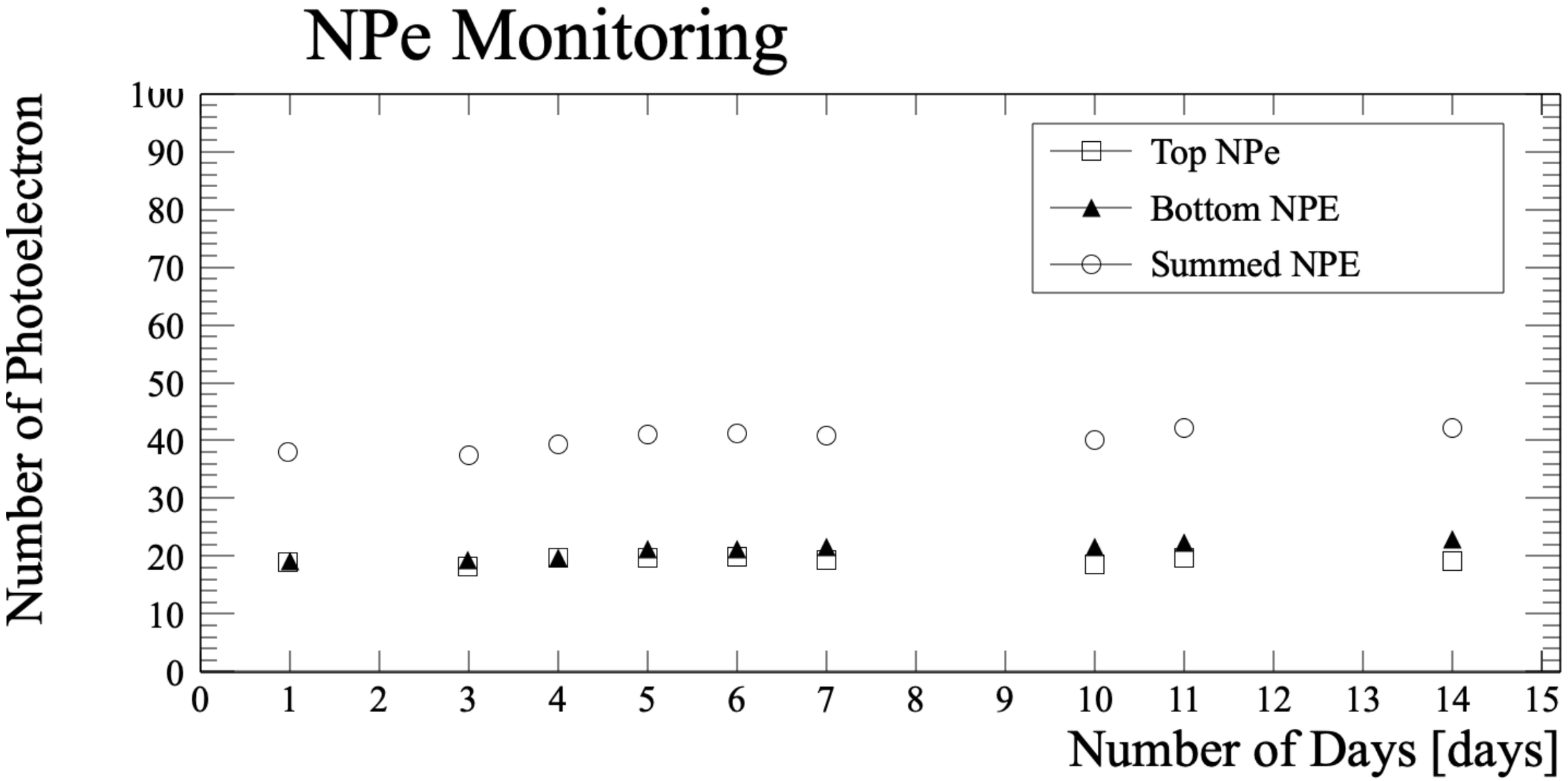




- Corresponding TDC distribution

Monitoring - Center

- NPe and ADC mean of WC are monitored
- Also, MPV, ADC Mean, RMS of 4 channels of trigger counter are also monitored



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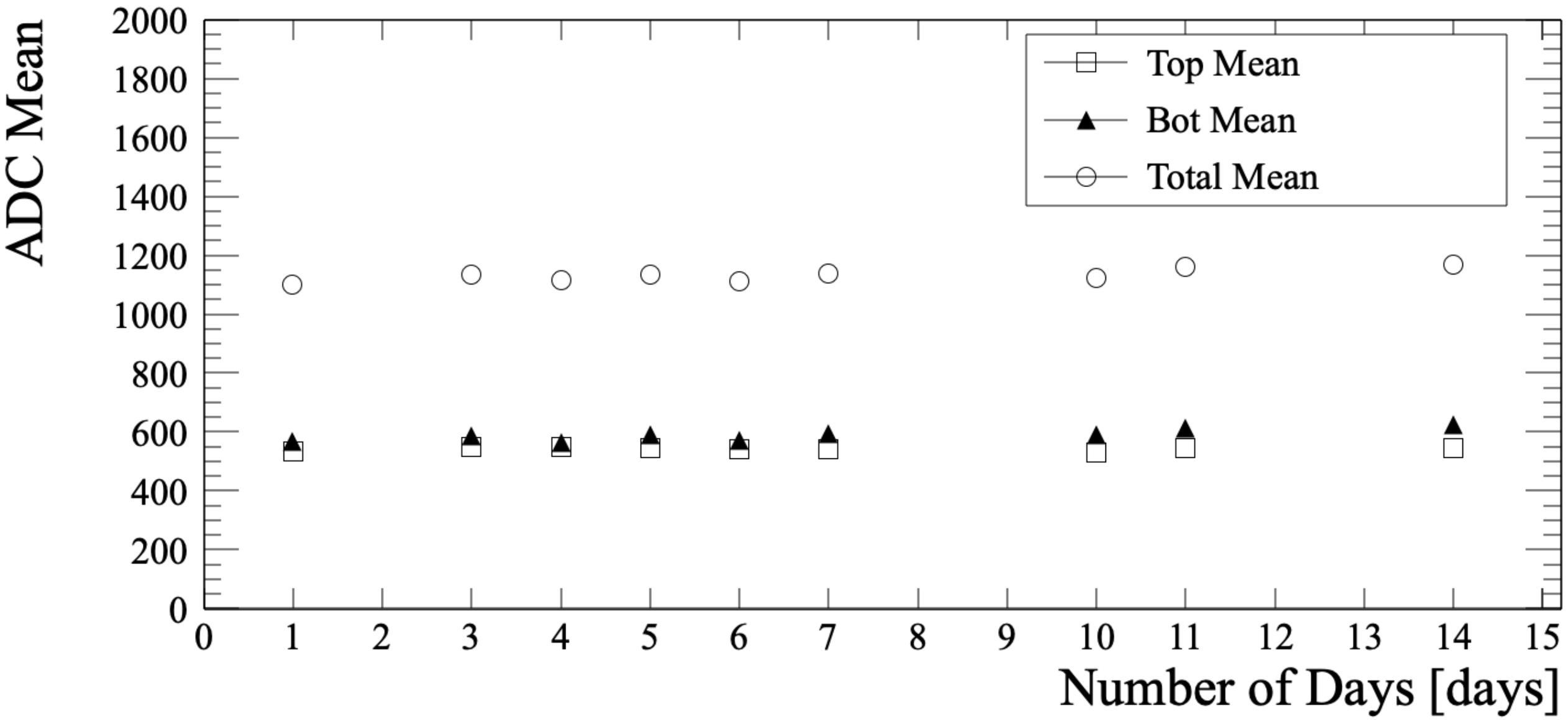
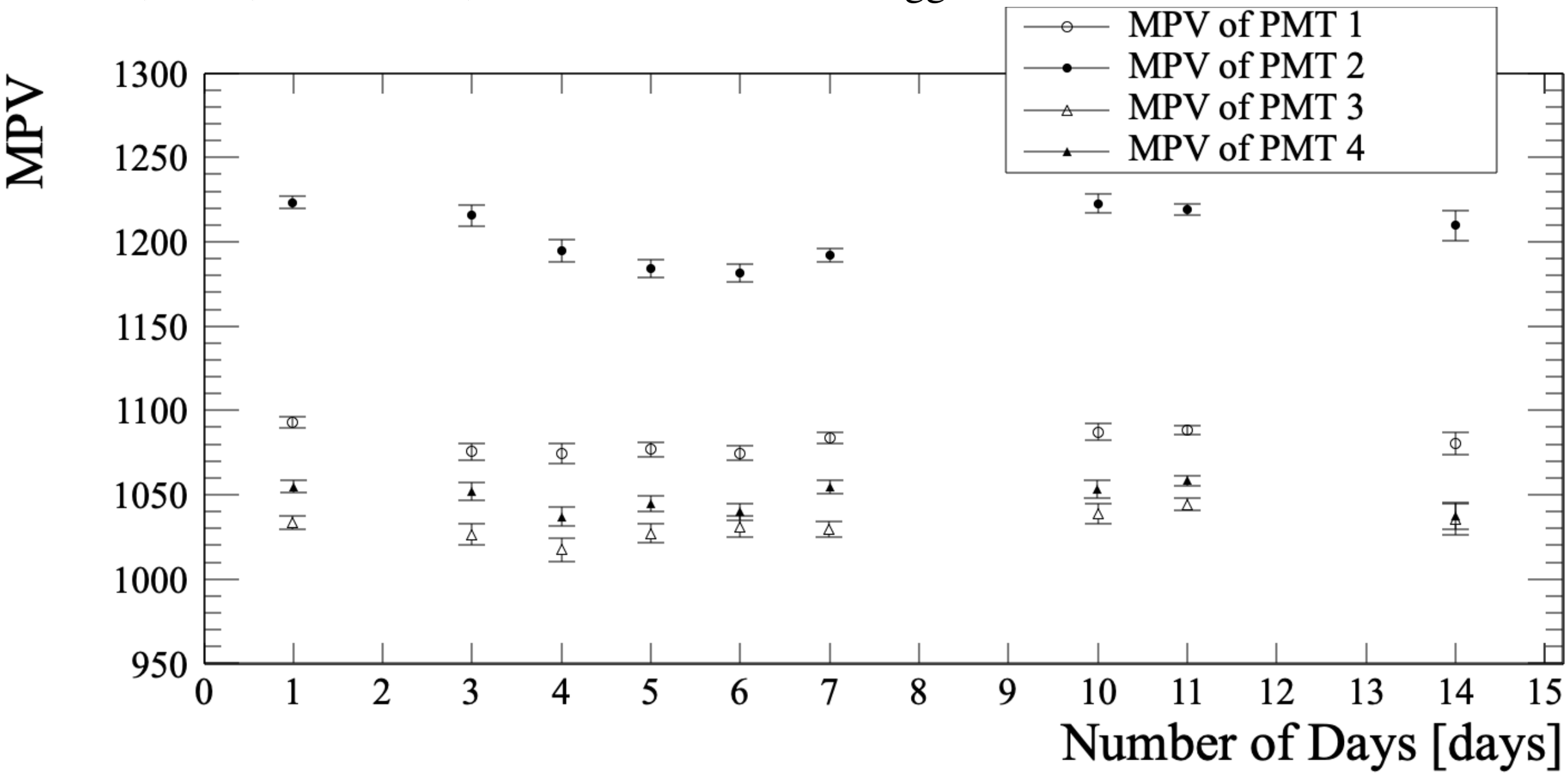


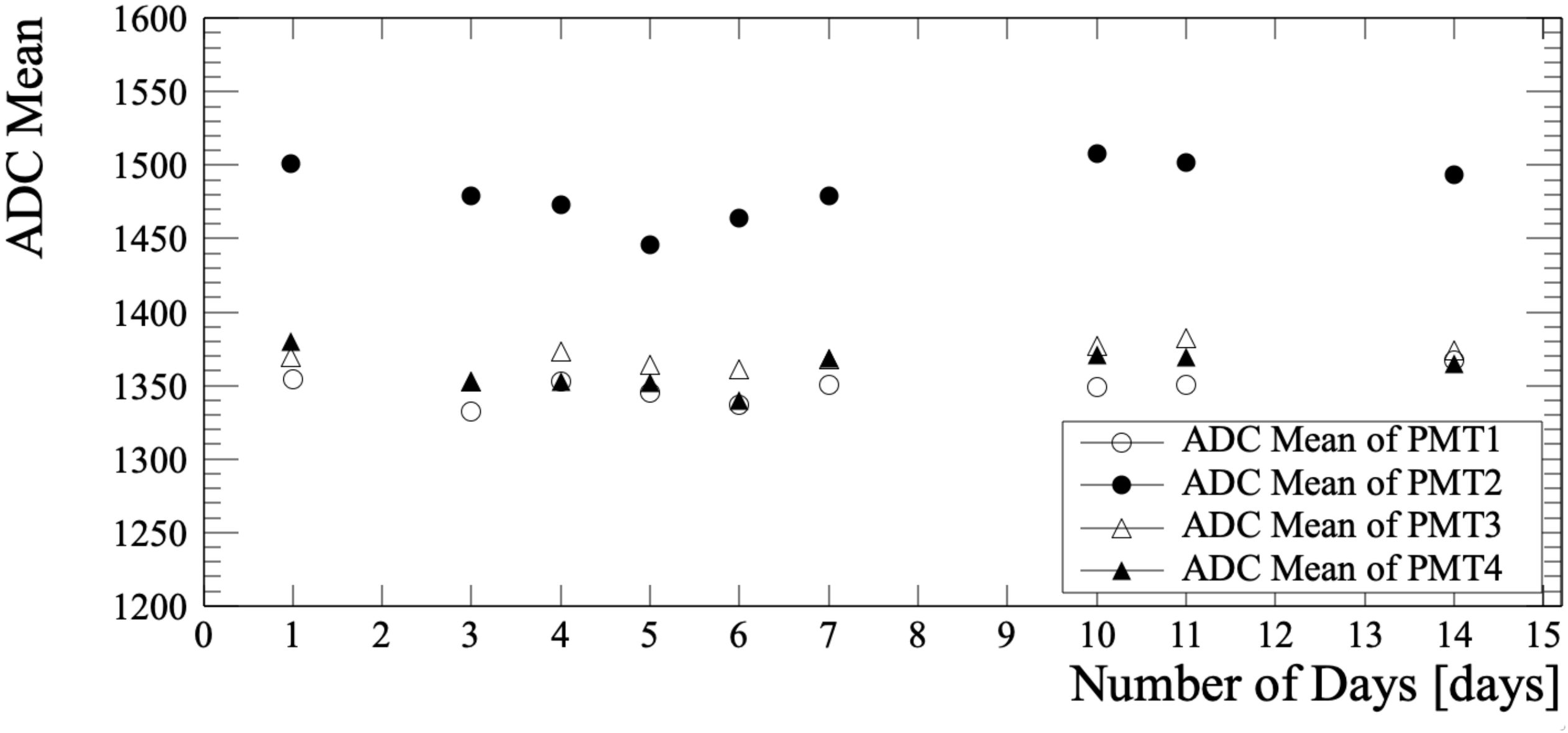
Monitoring - Center

- NPe and ADC mean of WC are monitored
- Also, MPV, ADC Mean, RMS of 4 channels of trigger counter are also monitored



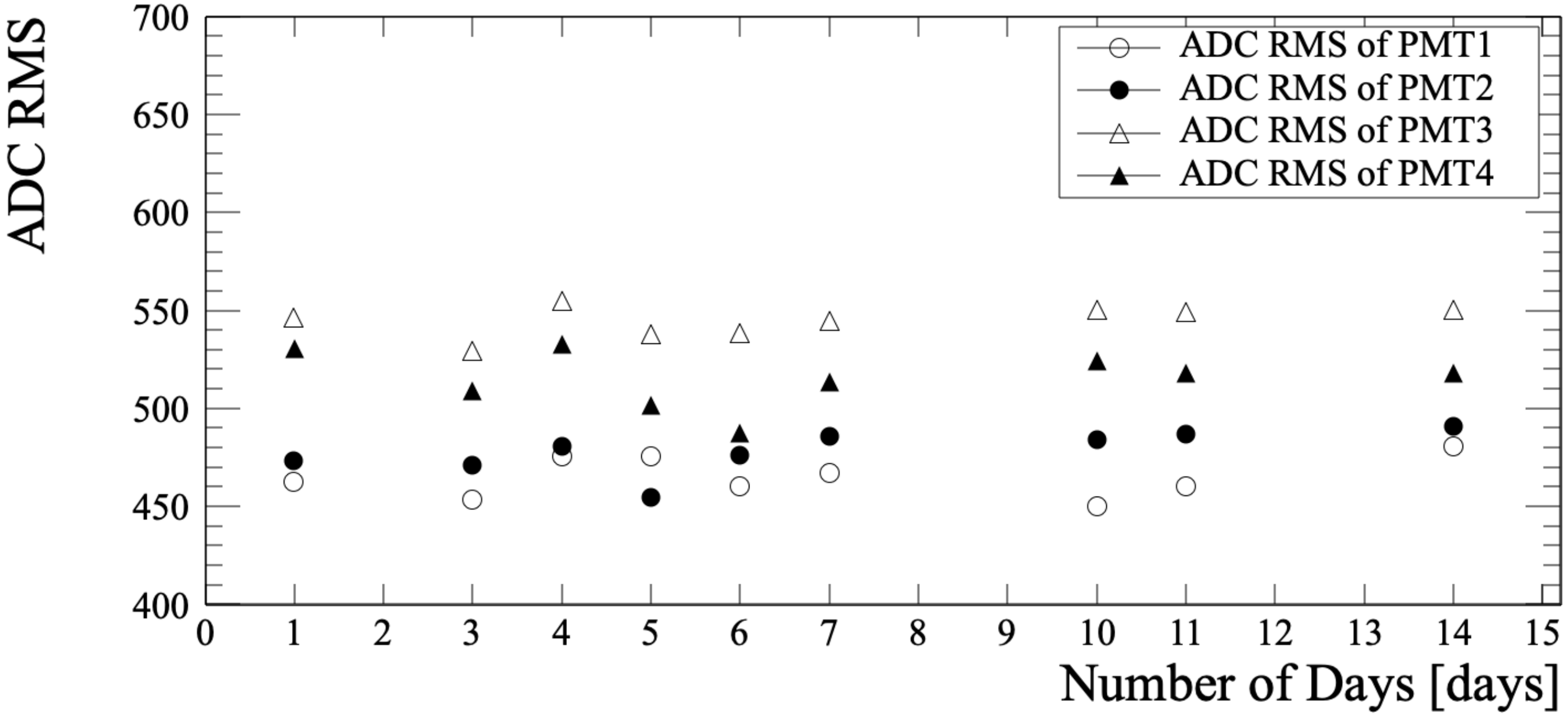
Monitoring - Center

- NPe and ADC mean of WC are monitored
- Also, MPV, ADC Mean, RMS of 4 channels of trigger counter are also monitored



Monitoring - Center

- NPe and ADC mean of WC are monitored
- Also, MPV, ADC Mean, RMS of 4 channels of trigger counter are also monitored

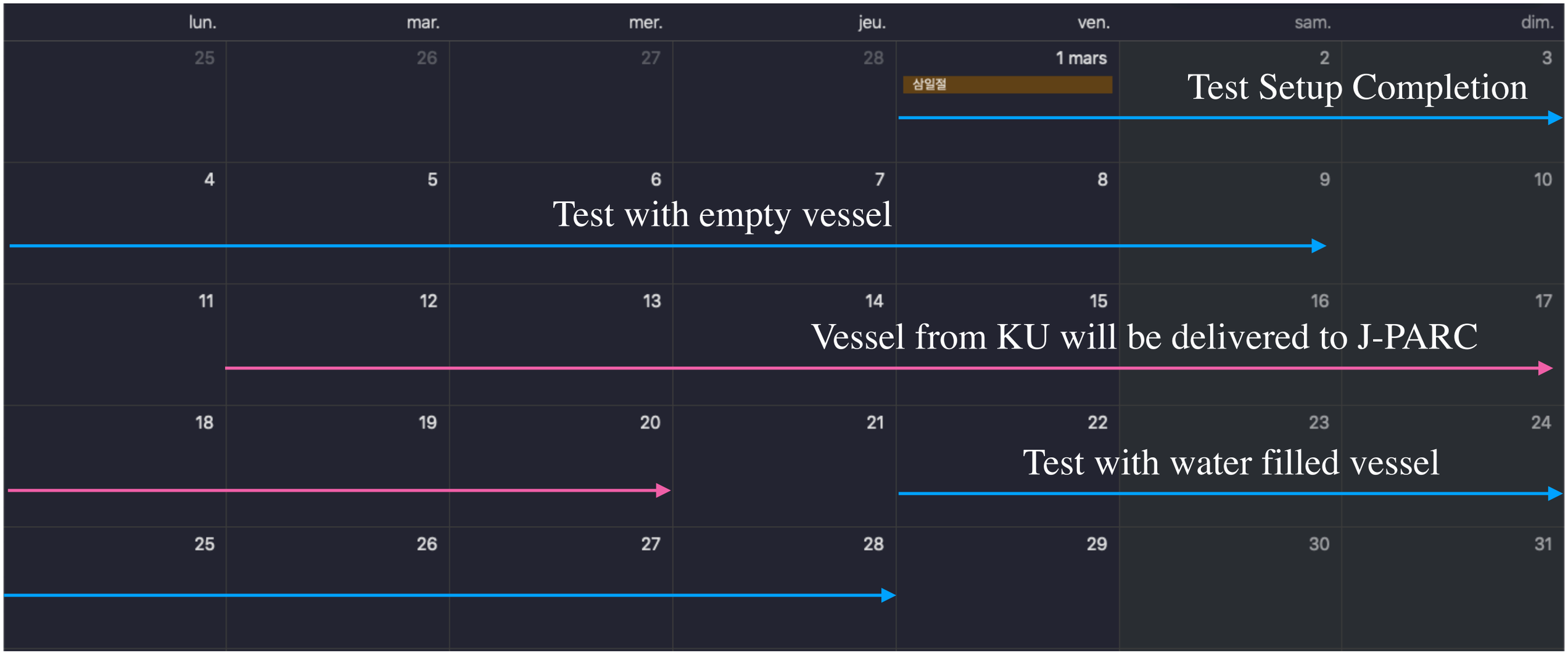


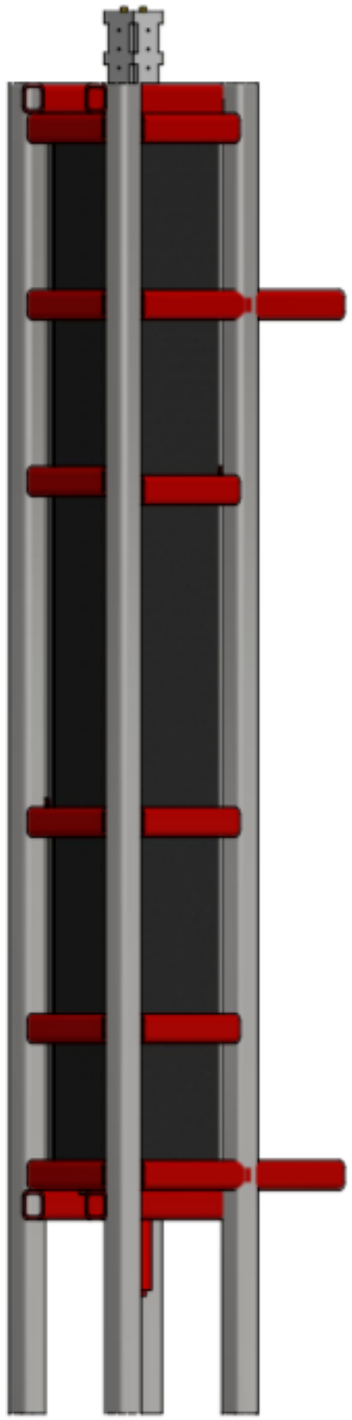
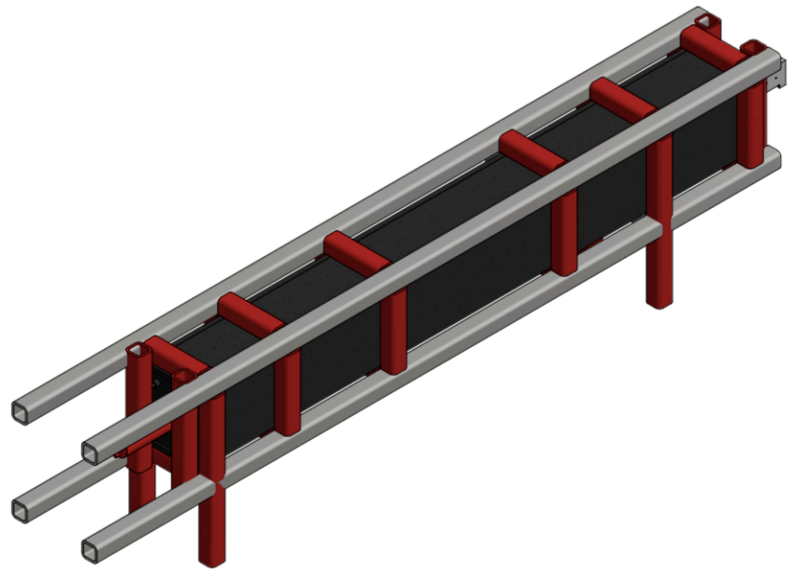
Summary

	Lower Trigger	Center Trigger	Upper Trigger
Top NPE	16.38	18.35	21.92
Top Poisson Mean	16.22 ± 2.42	18.98 ± 1.01	21.36 ± 1.65
Bottom NPE	23.67	20.39	17.75
Bot Poisson Mean	22.11 ± 2.42	20.45 ± 1.69	18.31 ± 2.63
Summed NPE	39.56	38.26	39.25
Entries Ratio (After Coinc. / Sorted)	0.98 (= 16277/16575)	0.99 (= 17945/18185)	0.99 (= 16065/16289)

- Vertical distance between top and bottom trigger counters : 50cm
- Upper, lower, centre trigger counters have spacings of 10 cm each other -> ~11 deg

Plan for Test at J-PARC



- E05 Water Cherenkov Detector
- Water Cherenkov Prototype from Japan (Op.Window : UV00)
- Water Cherenkov Prototype from Korea (Op.Window : ACRYLITE #000)

Profile Structure