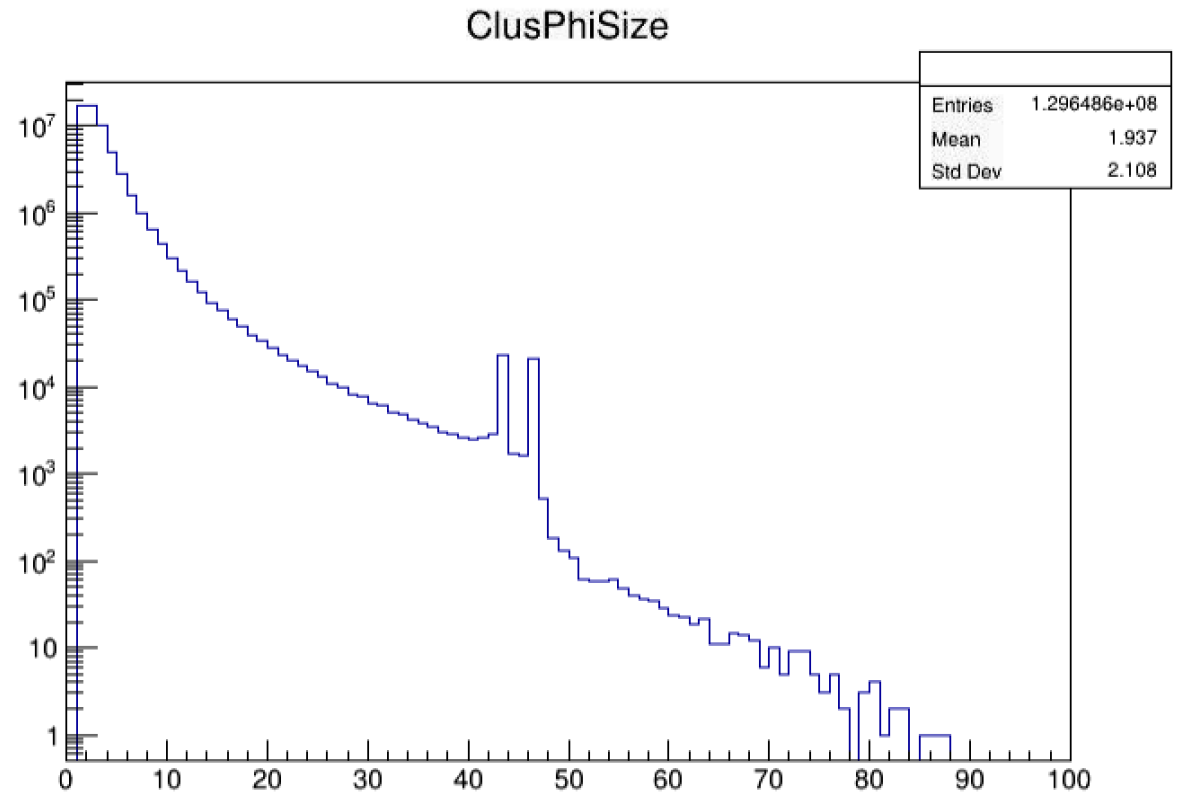# Cluster Phi Size Issue

2024/12/06 INTT MT

NWU M2  Manami Fujiwara
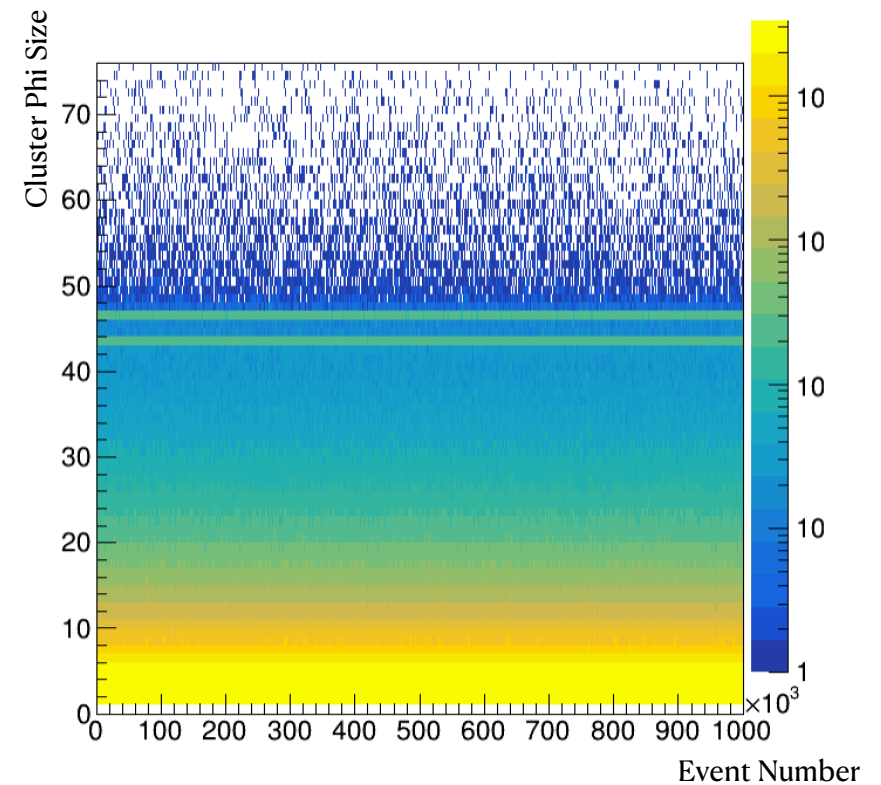
# Cluster phi size issue

- Cluster phi size distribution has 2 spike in cluster phi size = 43 and 46



ClusPhiSize

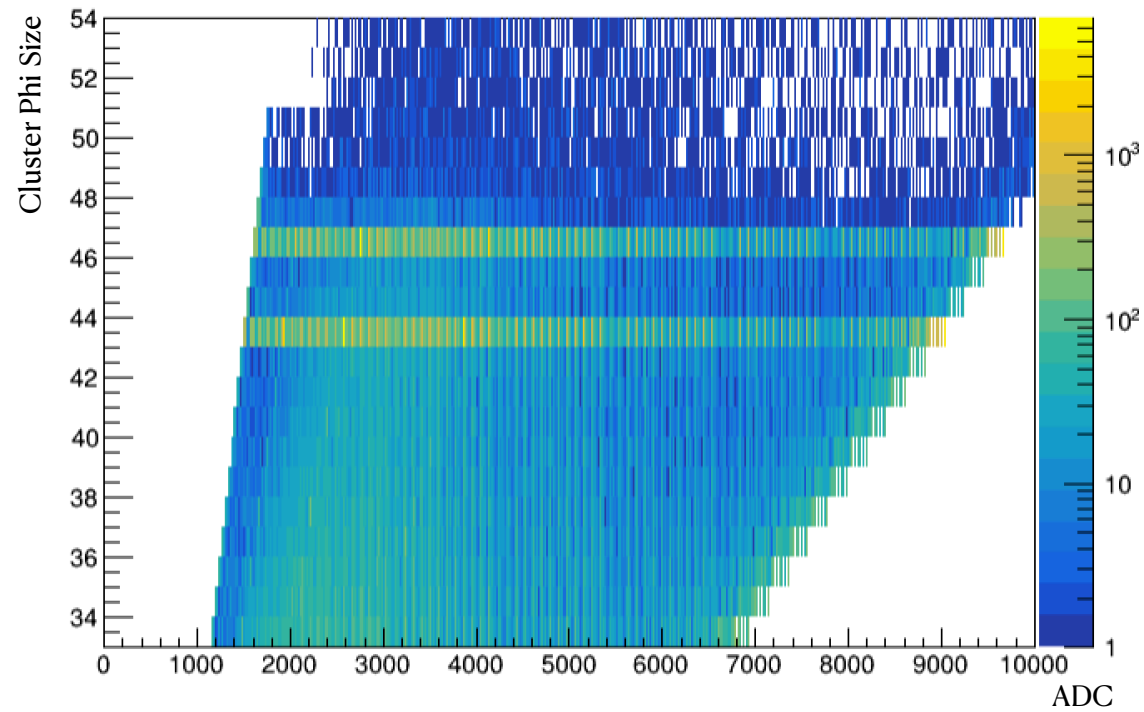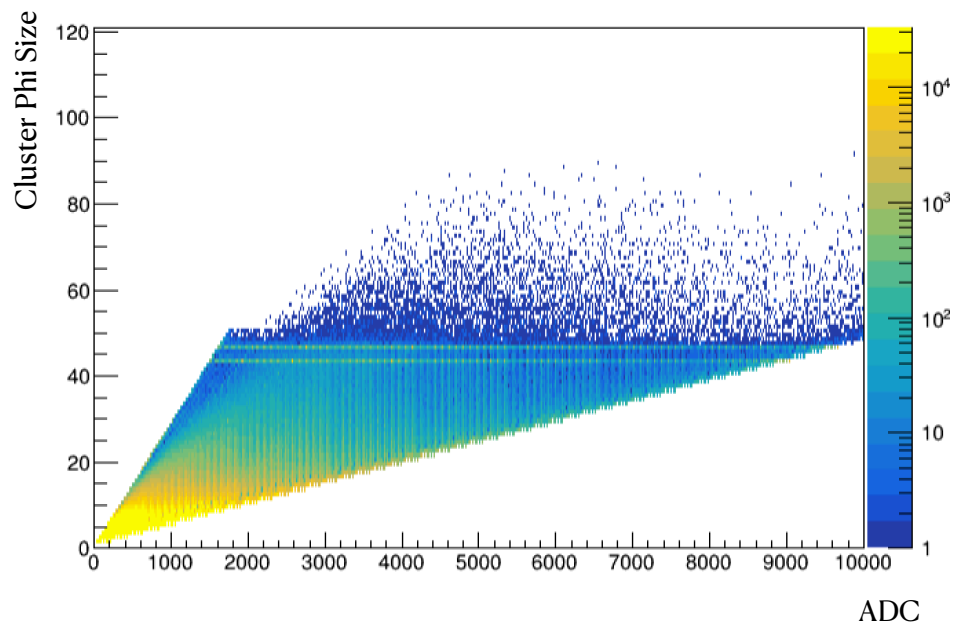| Entries | 1.296486e+08 |
|---------|--------------|
| Mean    | 1.937        |
| Std Dev | 2.108        |

# Event number dependence

- X axis: Event number (10000 events fill in each bin)

- Y axis: Cluster Phi Size

- Cluster phi size distribution doesn't depend on event number
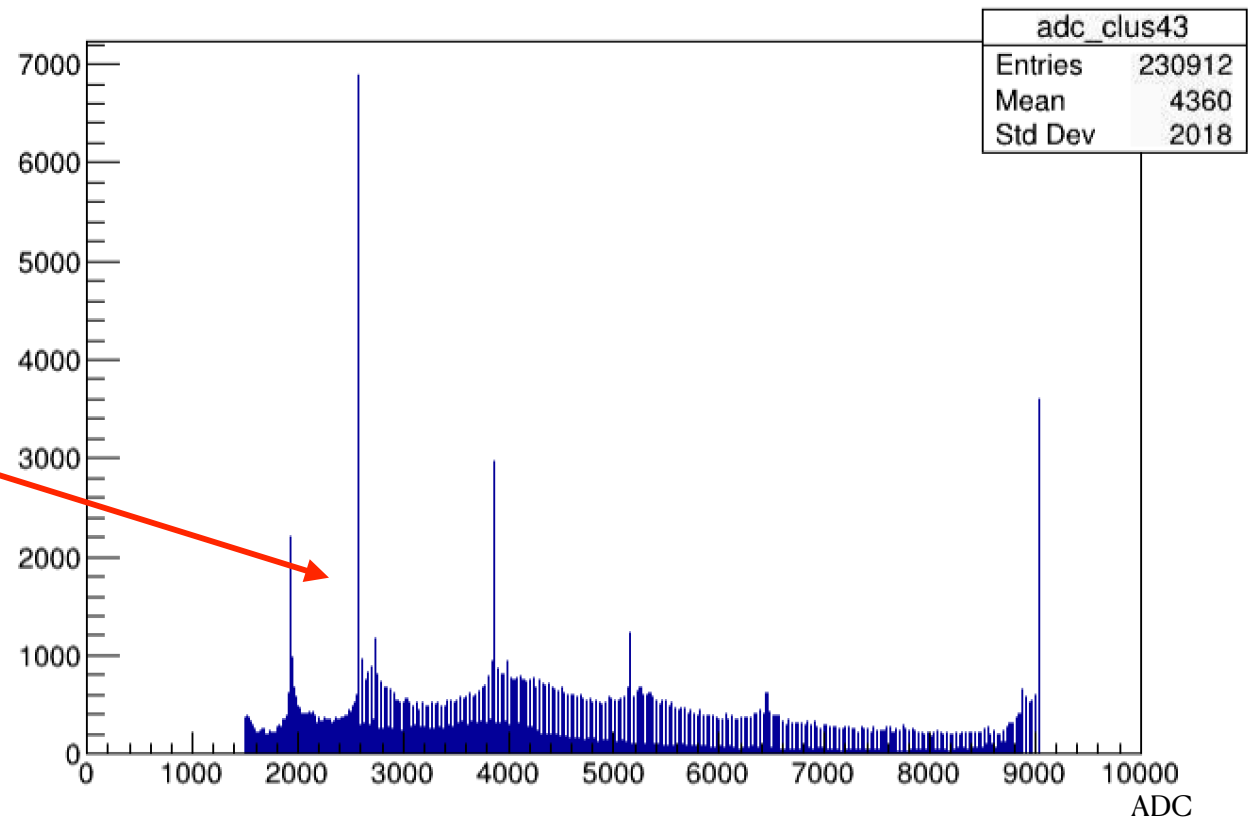
# Adc dependence

- X axis: adc, Y axis: cluster phi size

# Adc distribution
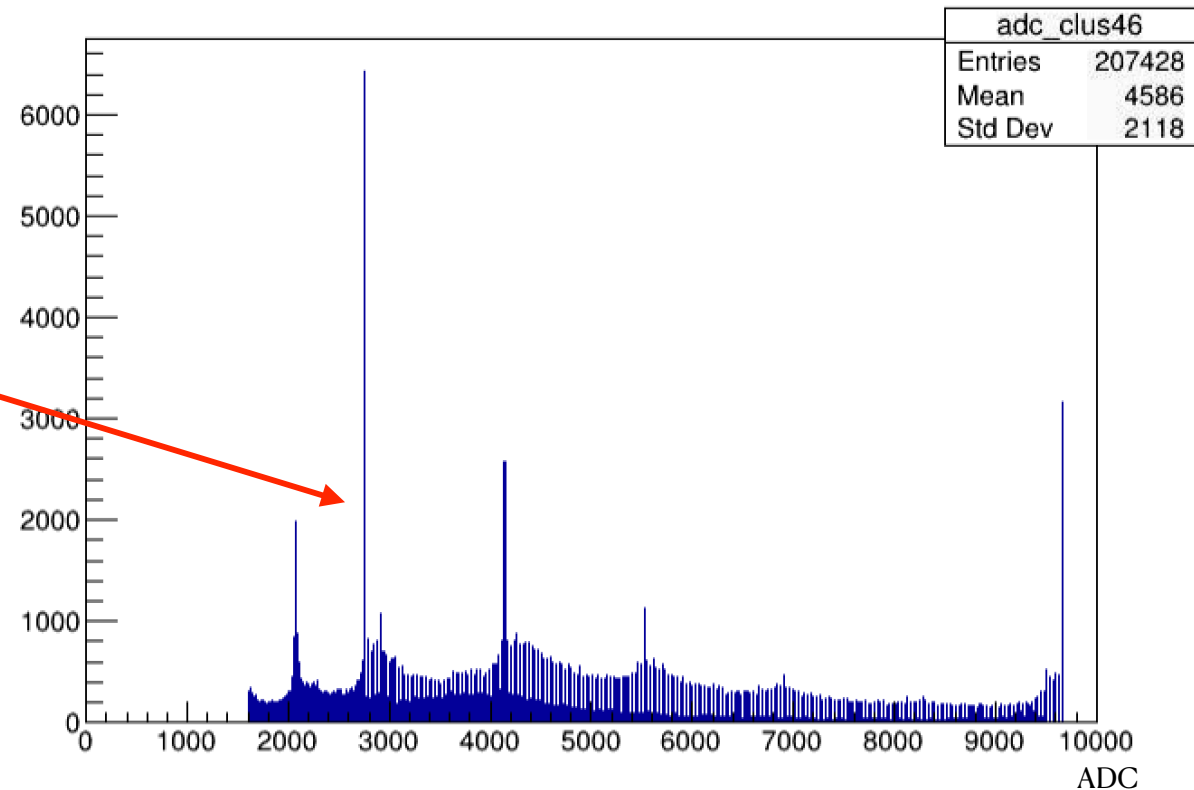
## Problematic cluster phi size

- Clusphisize =43

- Entries of peak / total entry =0.03

- Adc = 2580

- 2580/43 =60
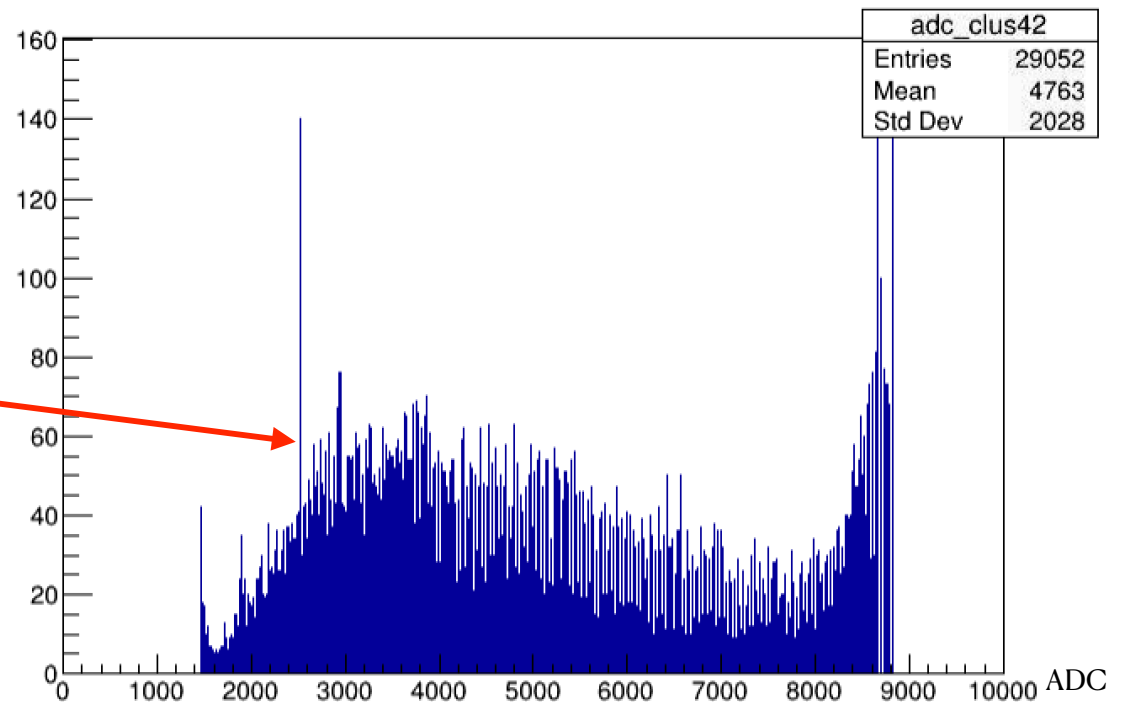
# Adc distribution

## Problematic cluster phi size

- Clusphisize =46

- Entries of peak / total entry = 0.029

- Adc = 2760

- 2760/46 = 60

- Entries of peak / total entry is higher than other cluster phi size

- Peak position is corresponds with dac value x cluster phi size

- My guess is that hits, which have same adc value and difference channel, make the problematic clusters

| adc_clus46 | |
|---|---|
| Entries | 207428 |
| Mean | 4586 |
| Std Dev | 2118 |

ADC

6

# Adc distribution

## Non-problematic cluster phi size

- Clusphisize =42

- Entries of peak / total entry = 0.0048

- Adc = 2520

- 2520/42 =60



| adc_clus42 | |
|---|---|
| Entries | 29052 |
| Mean | 4763 |
| Std Dev | 2028 |

# Summery and next to do

**Summery**

- There are no dependence between cluster phi size and event number

- Position of Adc peak corresponds with cluster phi size x dac value

- If cluster phi size = 43 or 46, the ratio of the clusters is higher than other cluster phi size

**Next to do**
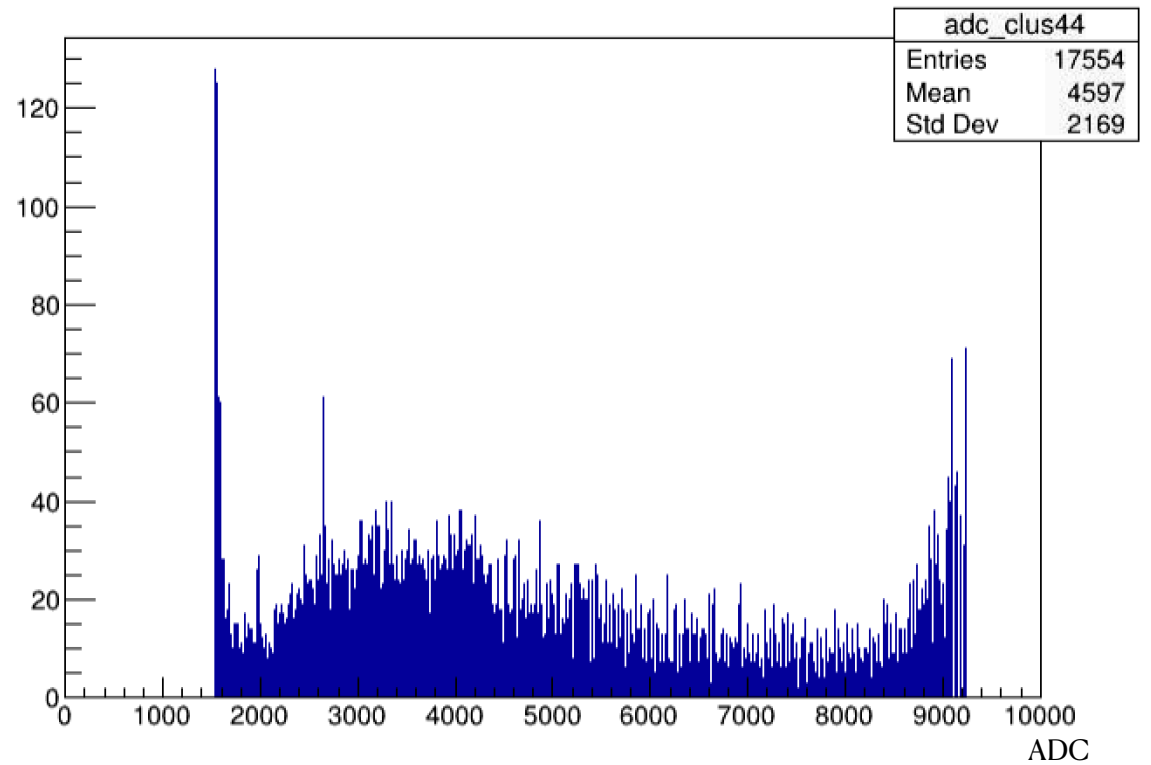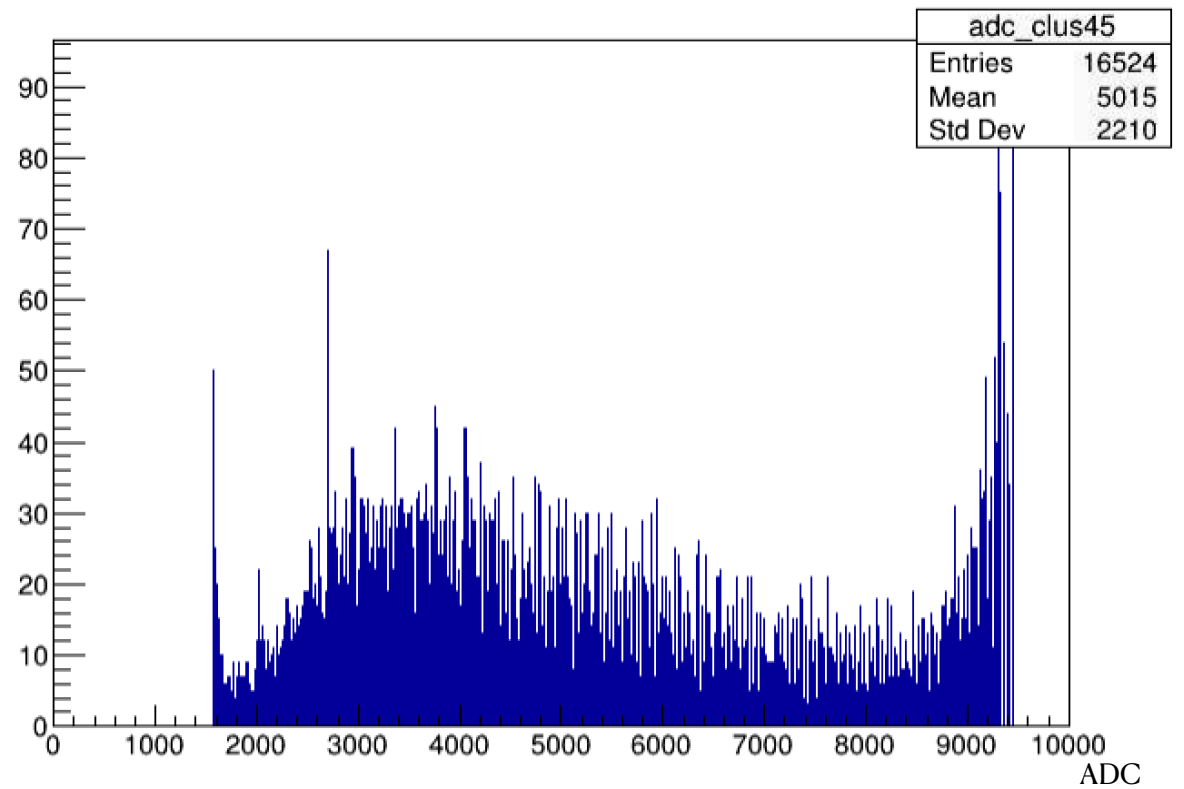
- Check the hits adc

# Back Up

# DAC Setting

```
daq=> select * from intt_setting where runnumber = 54280;
 runnumber | n_collisions | open_time | readout_mode | dac0 | dac1 | dac2 | dac3 | dac4 | dac5 | dac6 | dac7
-----------+--------------+-----------+--------------+------+------+------+------+------+------+------+-----
     54280 |          100 |        60 | triggered    |   35 |   45 |   60 |   90 |  120 |  150 |  180 |  210
(1 row)
```
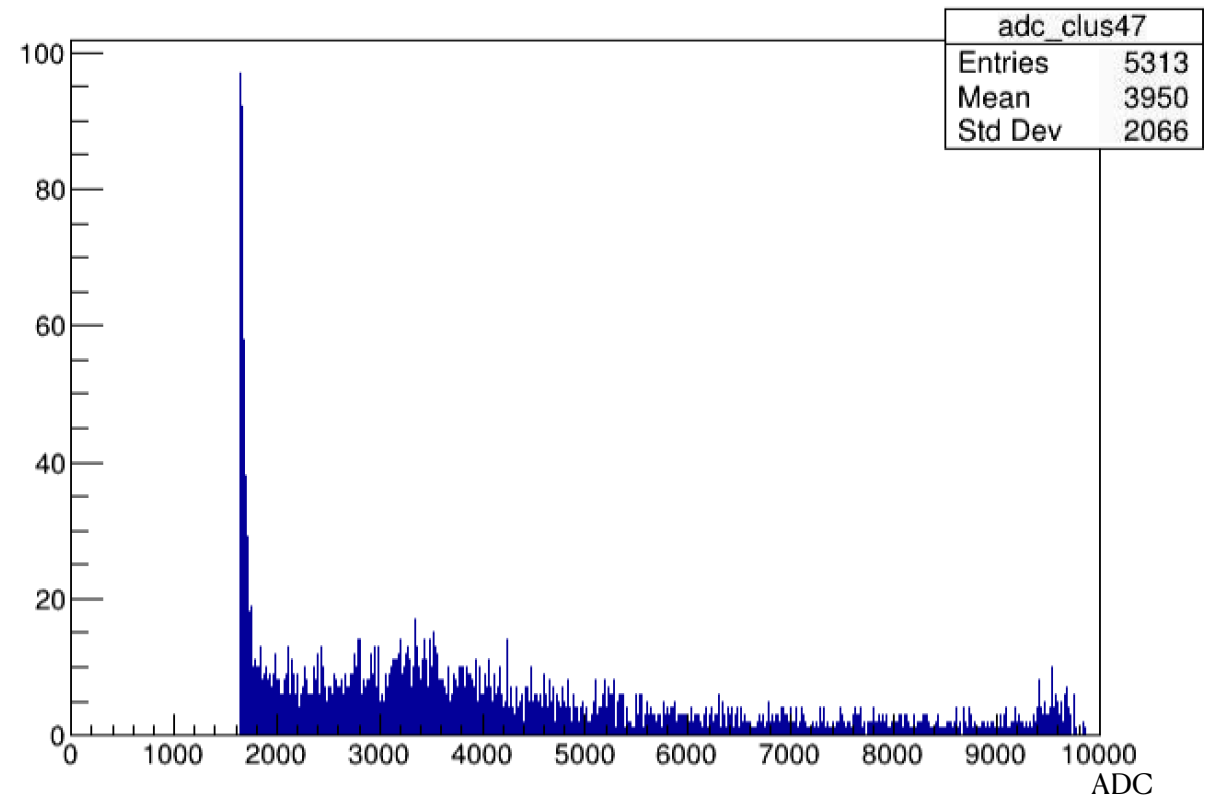
- Clusphisize =44

- 120/17554=0.0068

- Clusphisize =45



ADC

- Clusphisize =47



adc_clus47
| | |
|---|---|
| Entries | 5313 |
| Mean | 3950 |
| Std Dev | 2066 |

ADC

- Clusphisize =20



| adc_clus20 | |
| --- | --- |
| Entries | 276556 |
| Mean | 2344 |
| Std Dev | 948.8 |

ADC