Ad3 Dry Run Study

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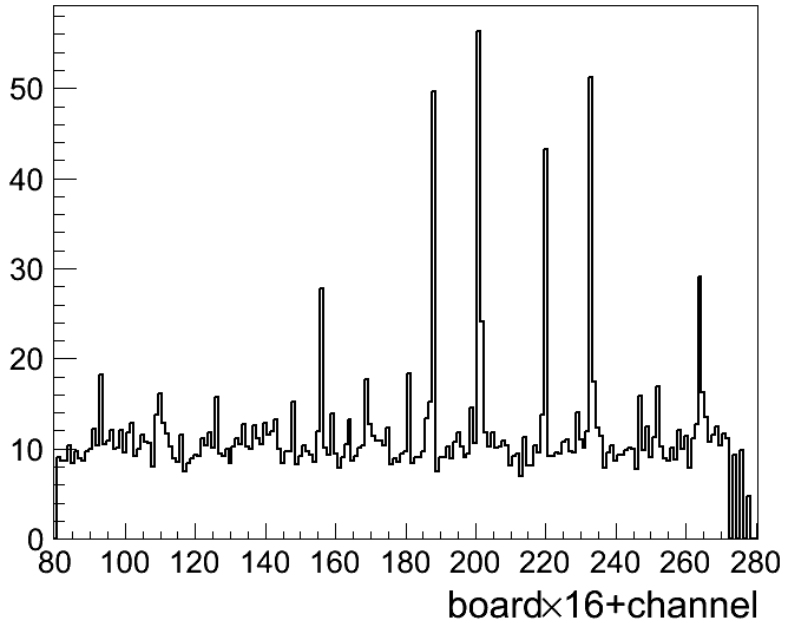
Princeton University

Dayabay Collaboration

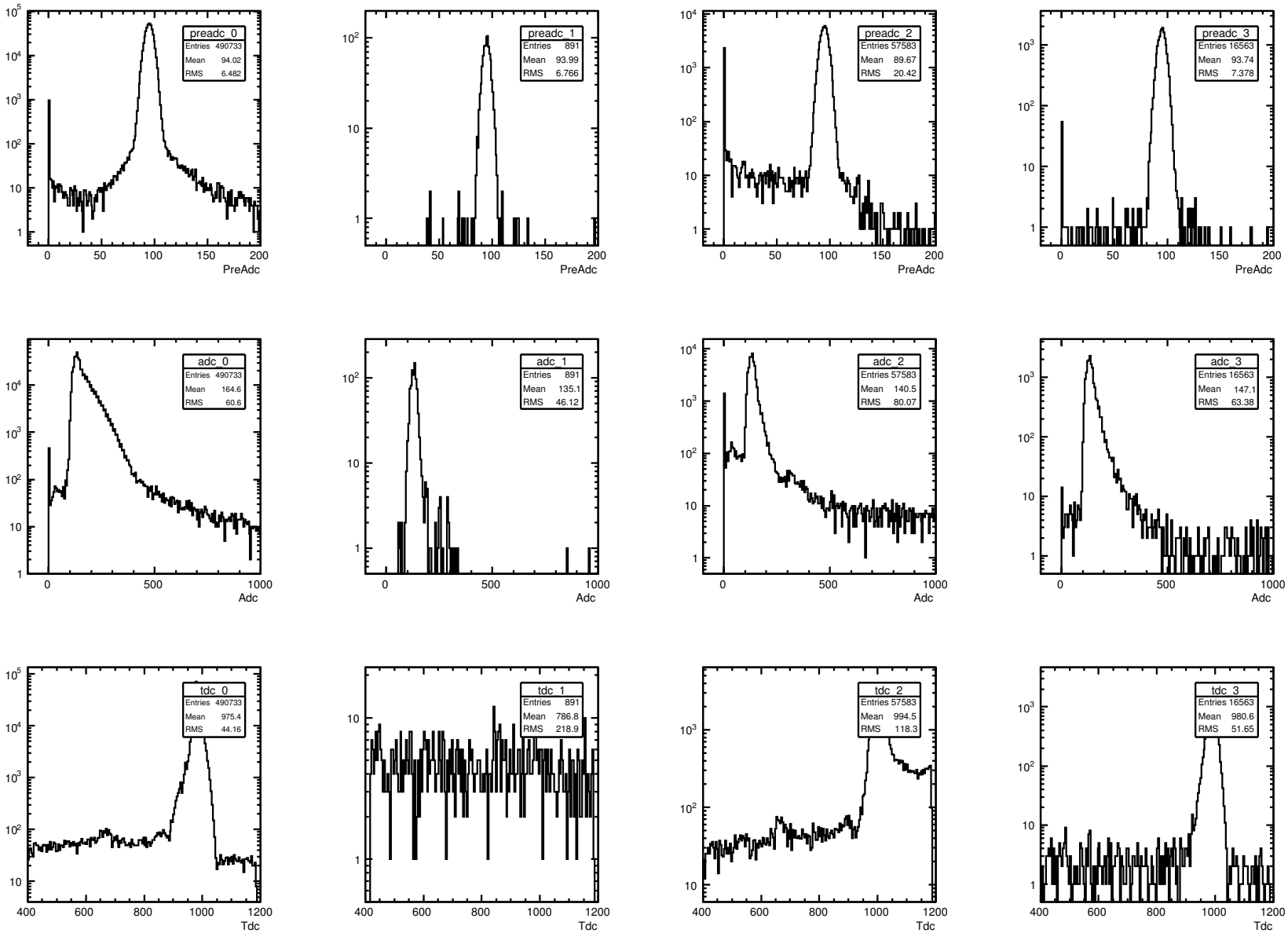
Run 7005

- Ad3 Dry Run 7005
- PQM preAdcRMS plot:



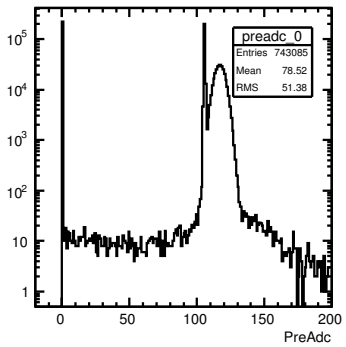
- A few channels have very large RMS value.
- Checked two channels:Normal:(Board=12, Channel=1) Abnormal: (Board=12, Channel=9)

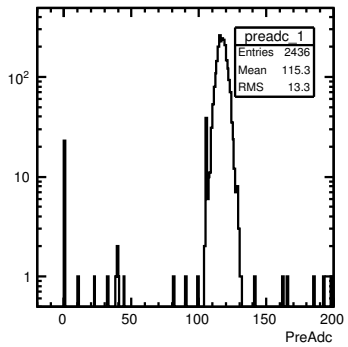
(Board=12, Channel=1)

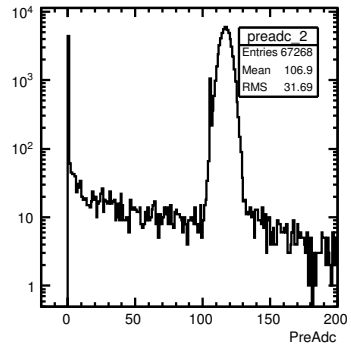


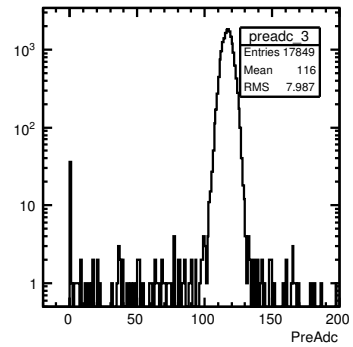
Trig type:NChannel Periodic ESum External

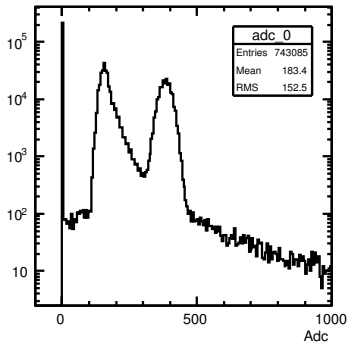
(Board=12, Channel=9)

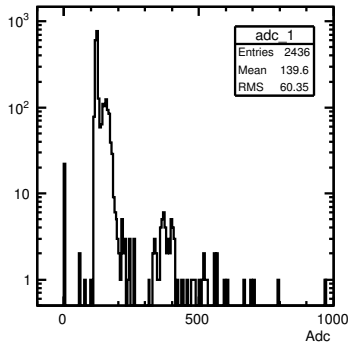


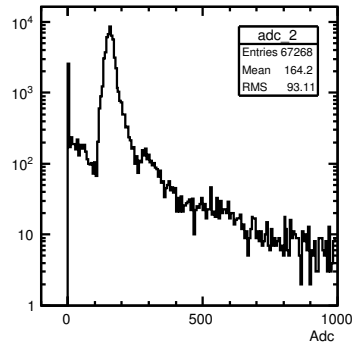


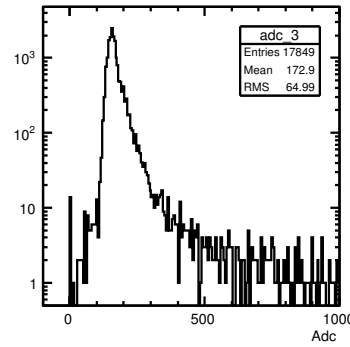


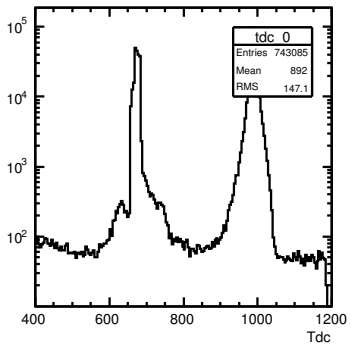


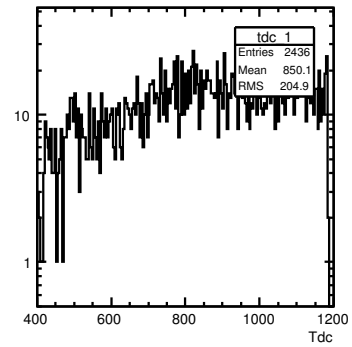


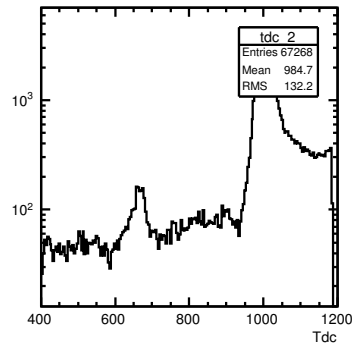


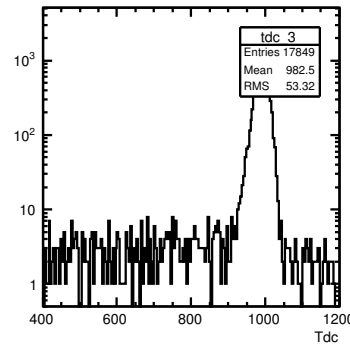








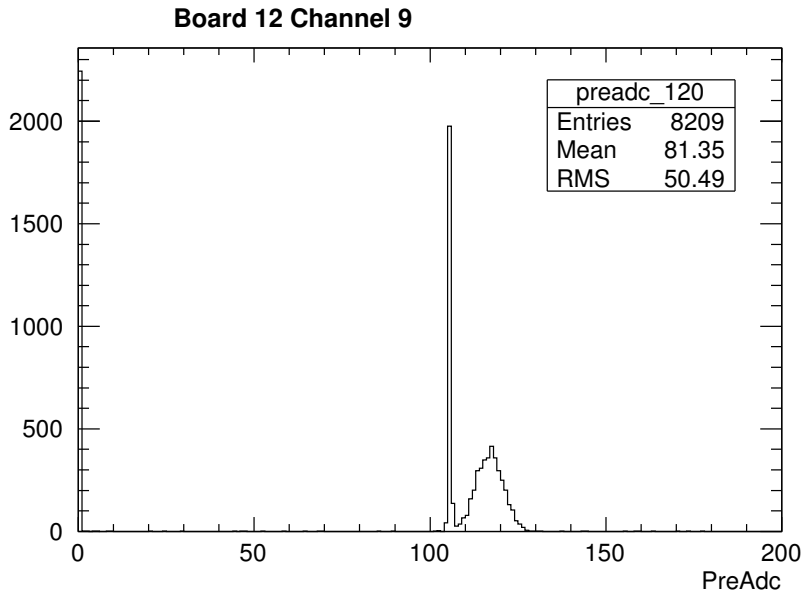




Trig type:NChannel Periodic ESum External

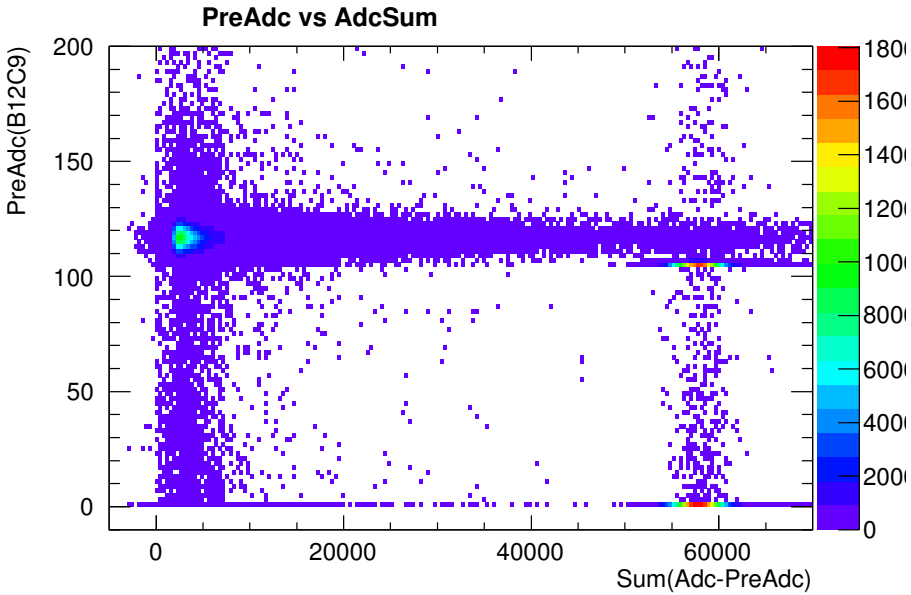
Observations

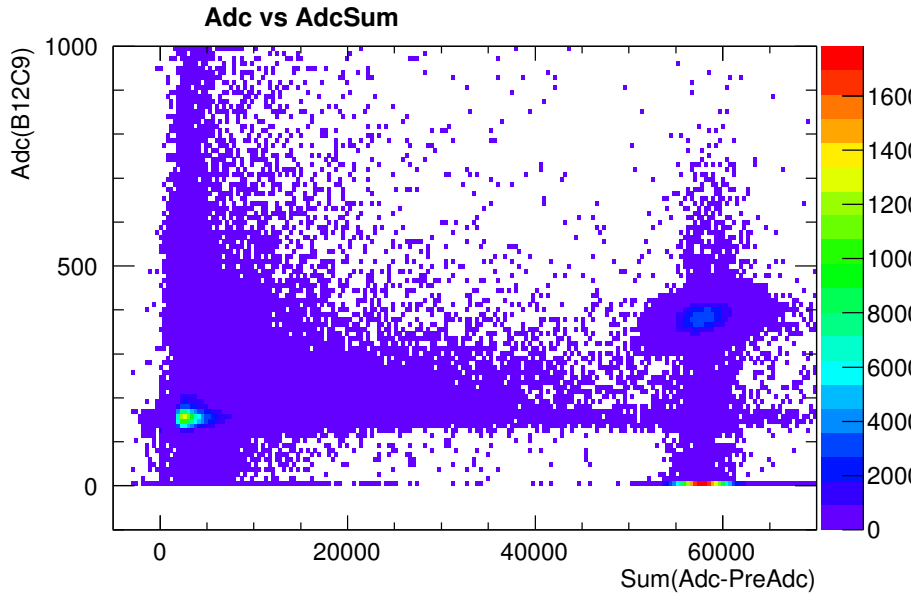
- Adc, PreAdc have 0 values due to PMT overshoot (see Doc 5967 for more information)
- Esum trigger Tdc has some abnormal noise (Doc 5963)
- (Board=12,channel=9) has an abnormal peak at PreAdc=105:



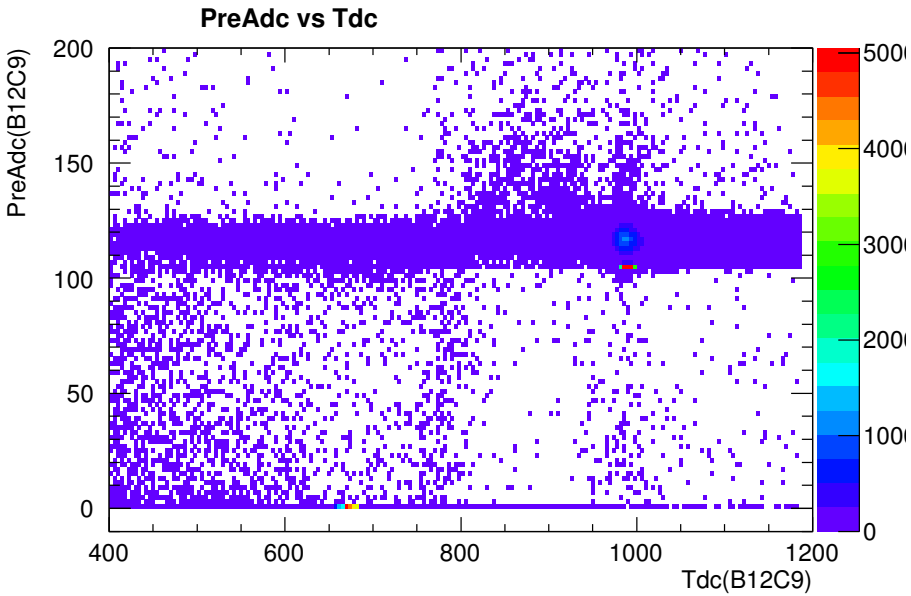
- (Board=12,channel=9) has an abnormal peak in Tdc distribution

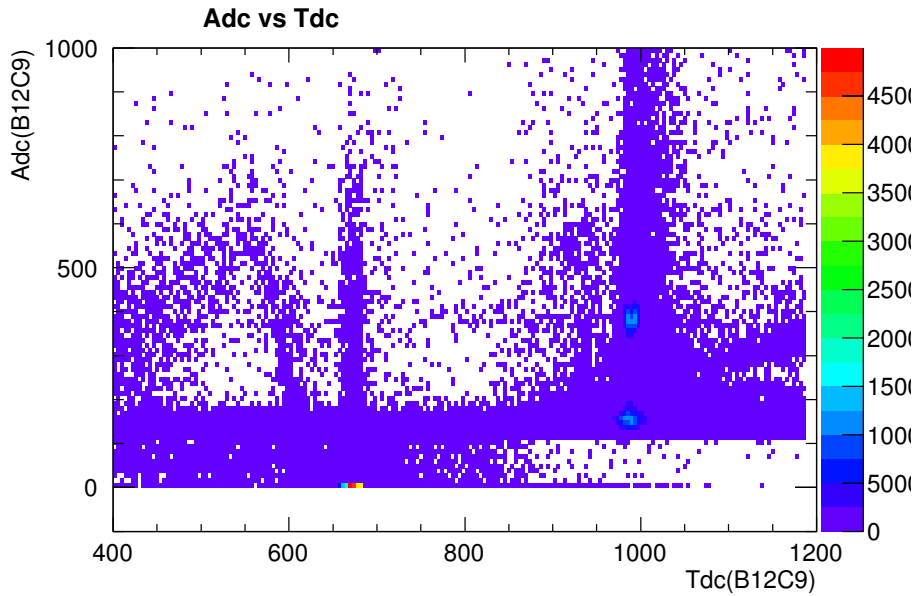
Investigation



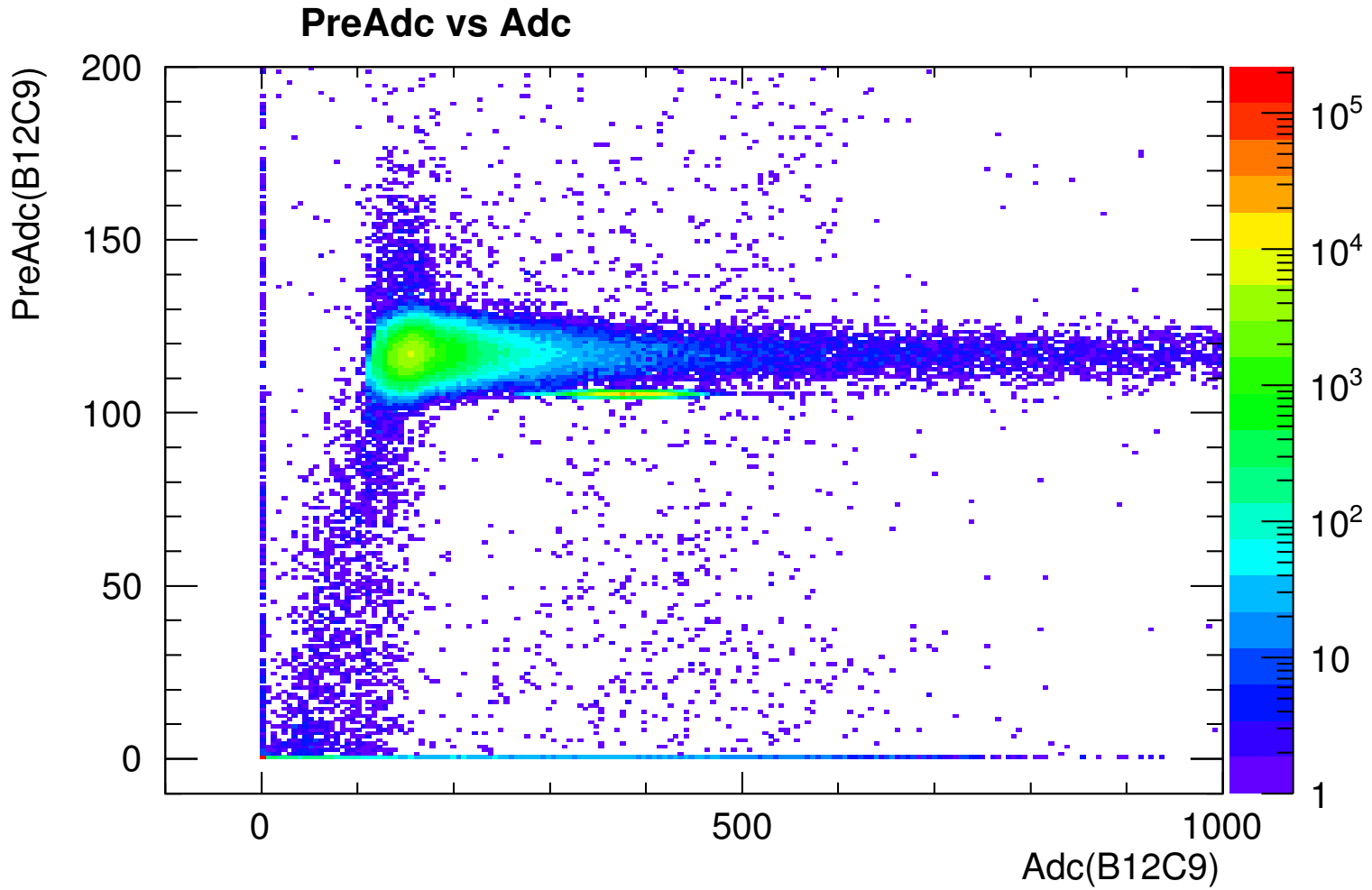


- LED events is responsible for the PreAdc=0, PreAdc=105, and Adc=0.



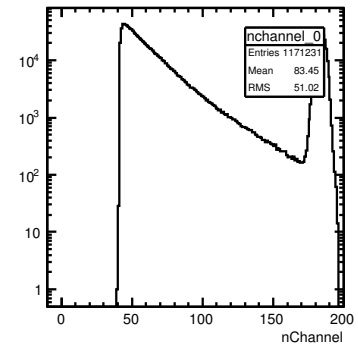


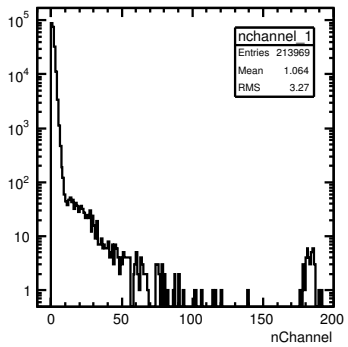
- The abnormal peak in Tdc distribution has PreAdc=0 and Adc=0.

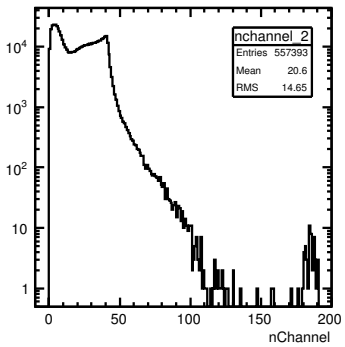


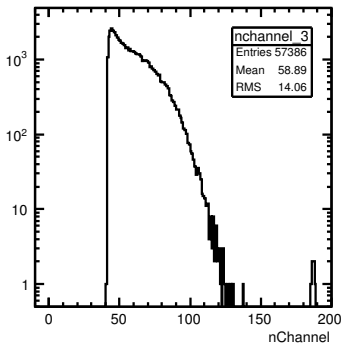
- Adc=0 and PreAdc=0 are highly correlated.
- The second peak of Adc distribution has PreAdc=105.

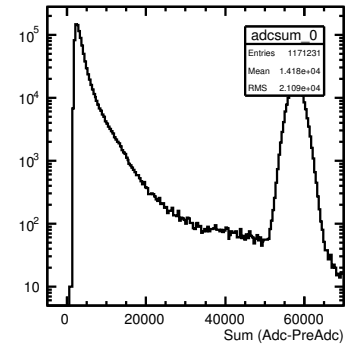
Event information

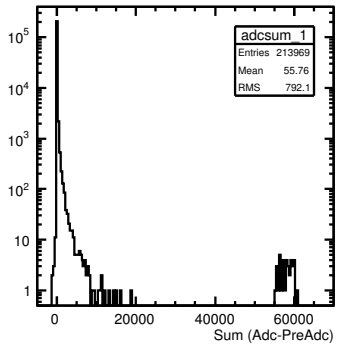


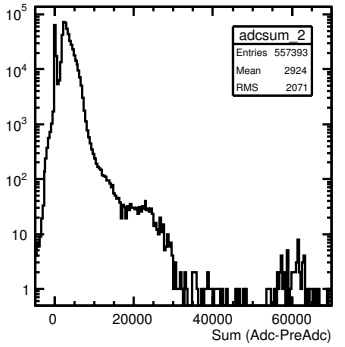


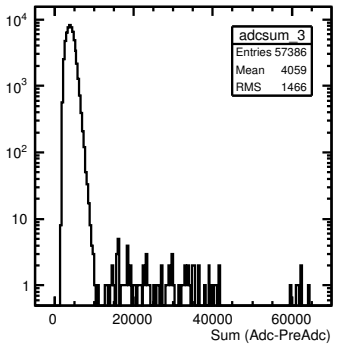


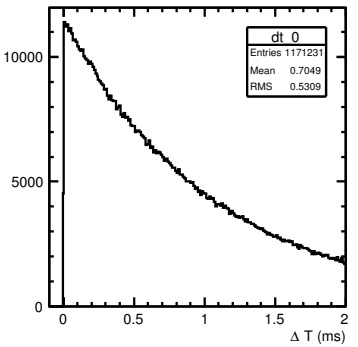


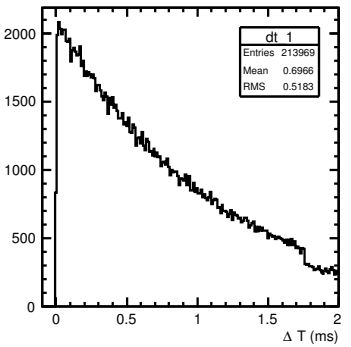


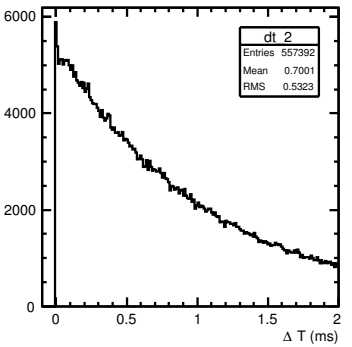


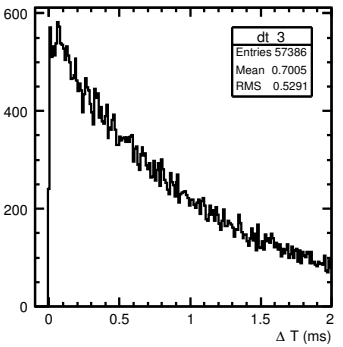








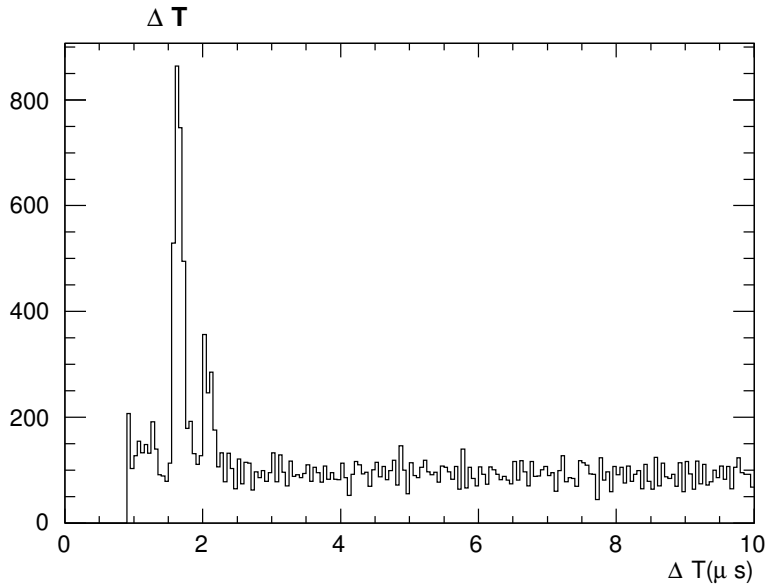




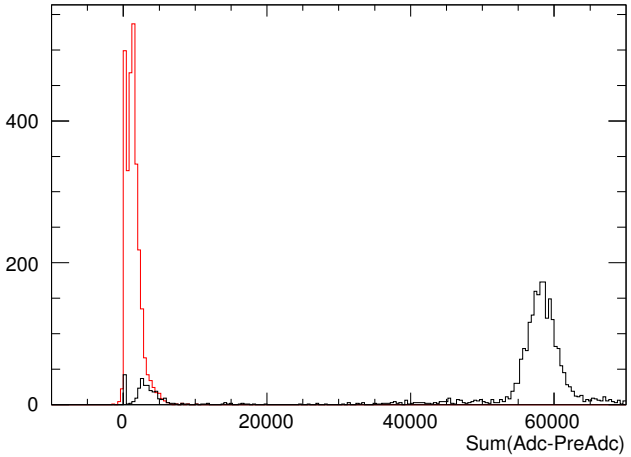
Trig type:NChannel Periodic ESum External

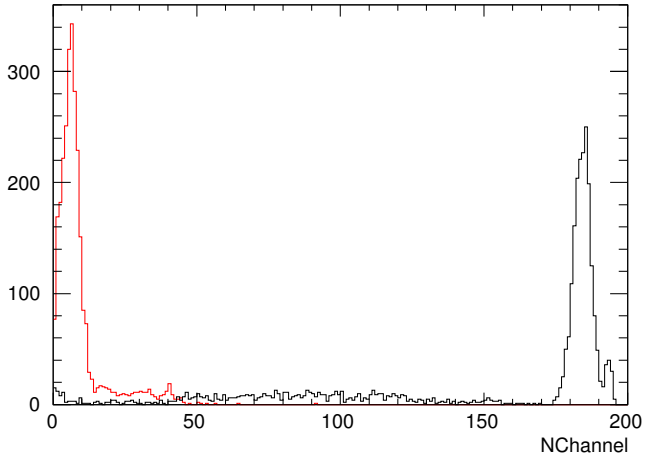
Observations

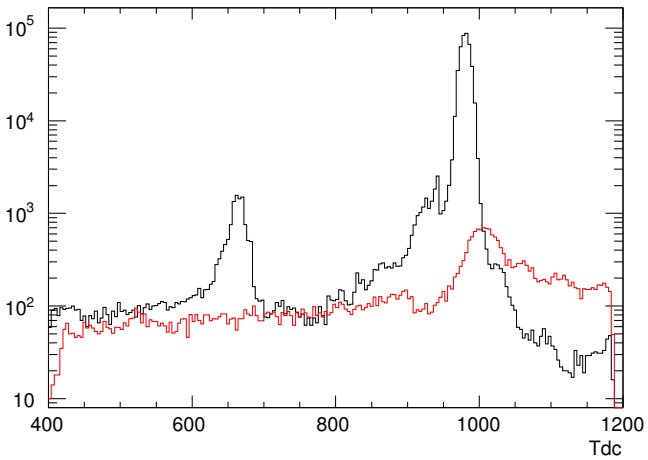
- Esum trigger ΔT has a peak at $1.6\mu s$, what are those events?



Check the pre-Trigger info

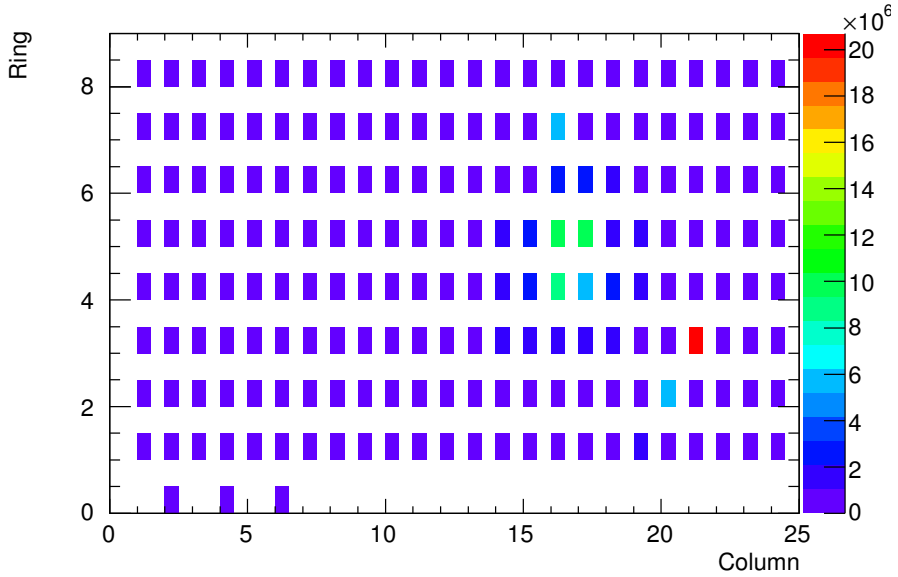




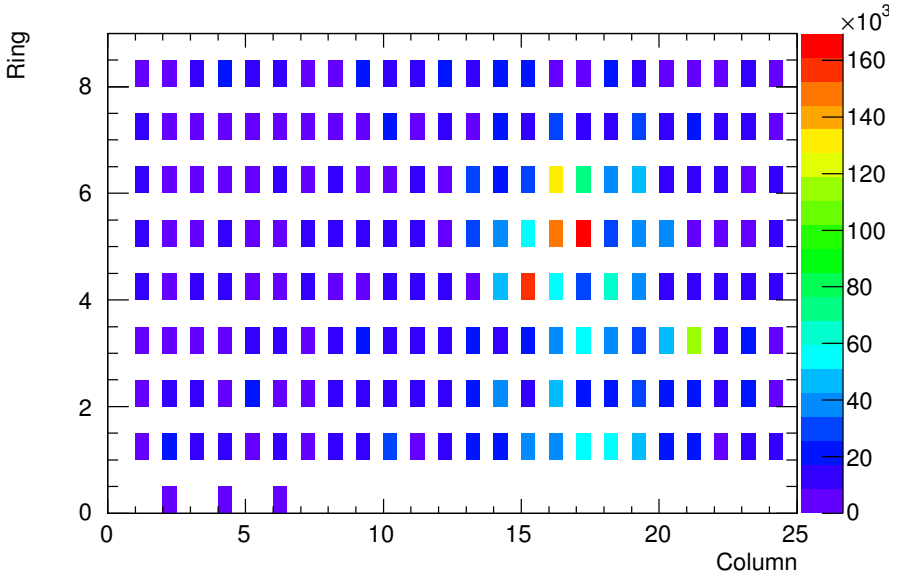


- $1.5 < \Delta T < 2\mu s$
- Black histogram: pre-trigger; Red histogram: current trigger
- Semms like these events are related to LED, and they contribute some noise in $Tdc > 1050$ region.

Charge distribution



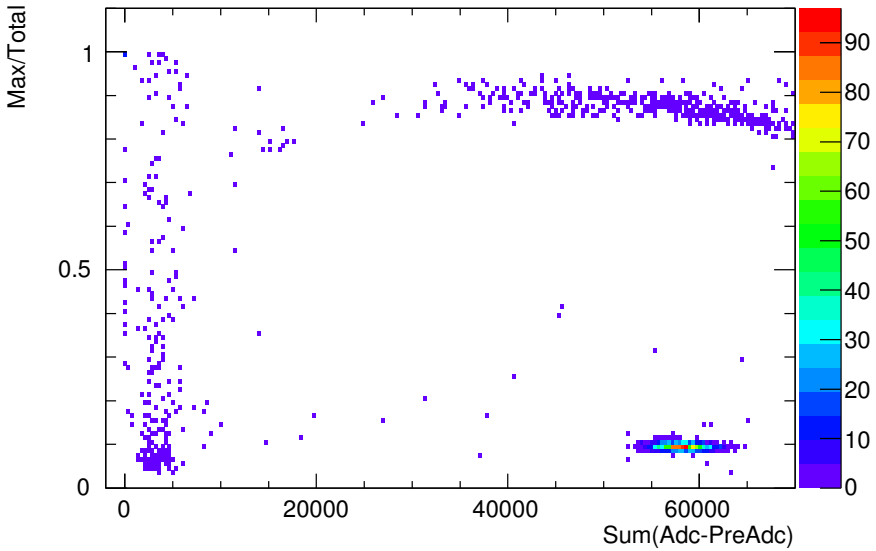
pre-Trigger



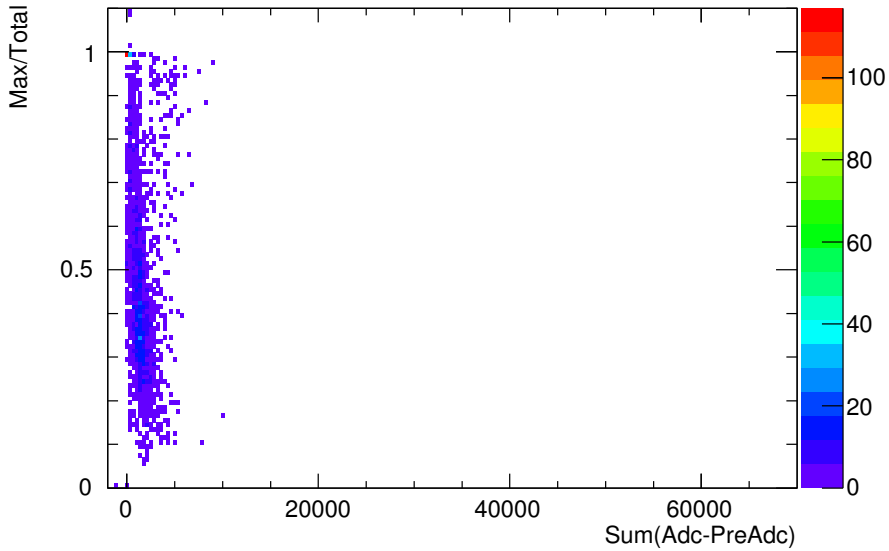
current trigger

- There is a very hot channel in pre-Trigger

Charge distribution: Max/Total



pre-Trigger



current trigger

- Besides the very hot channel, most pre-Trigger events are normal LED events.

Summary

- LED events cause some channels have strange peaks.
- LED events sometimes cause a ESum trigger at around 1.6μs later.