sPHENIX INTT
- Weekly Report

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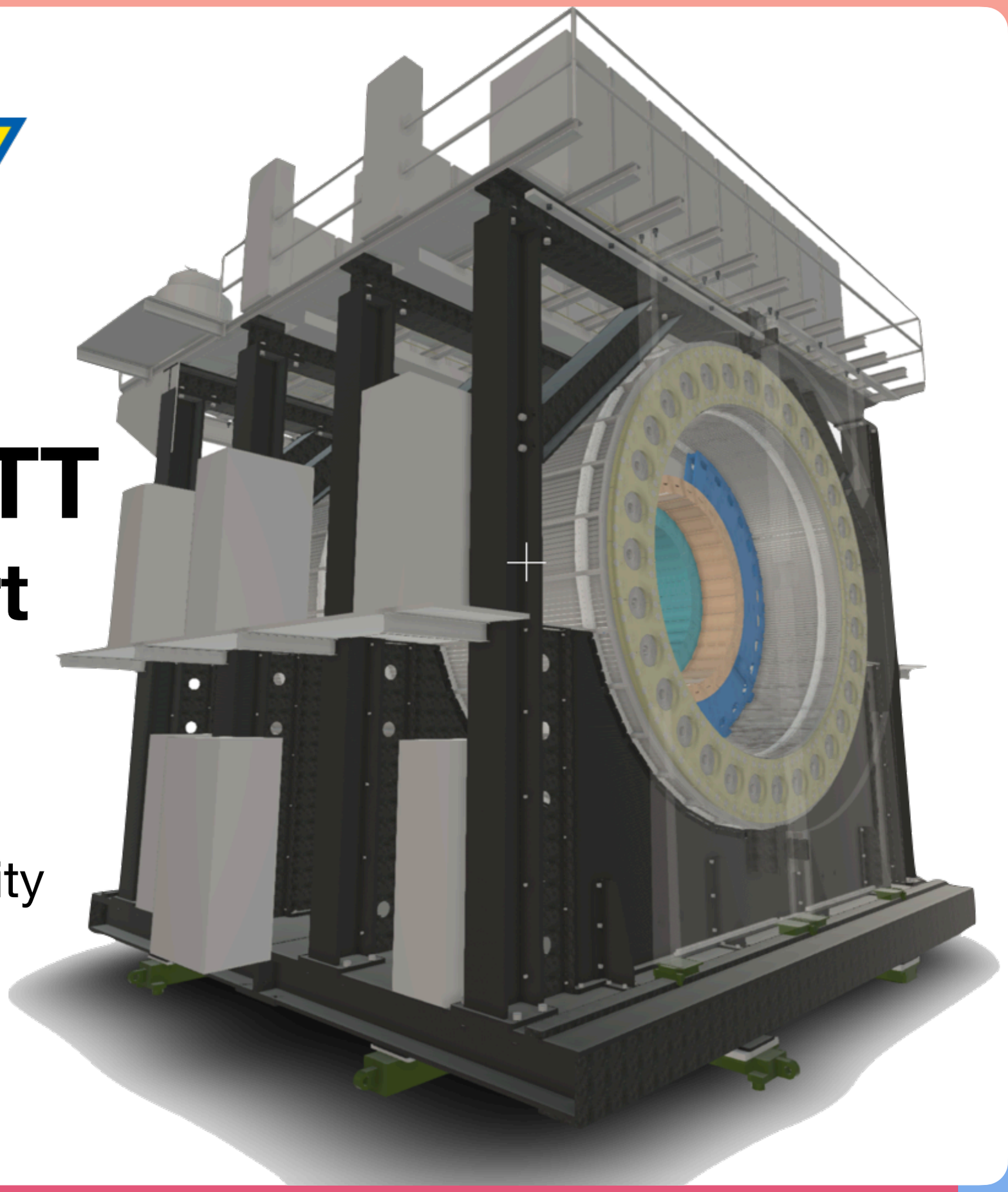
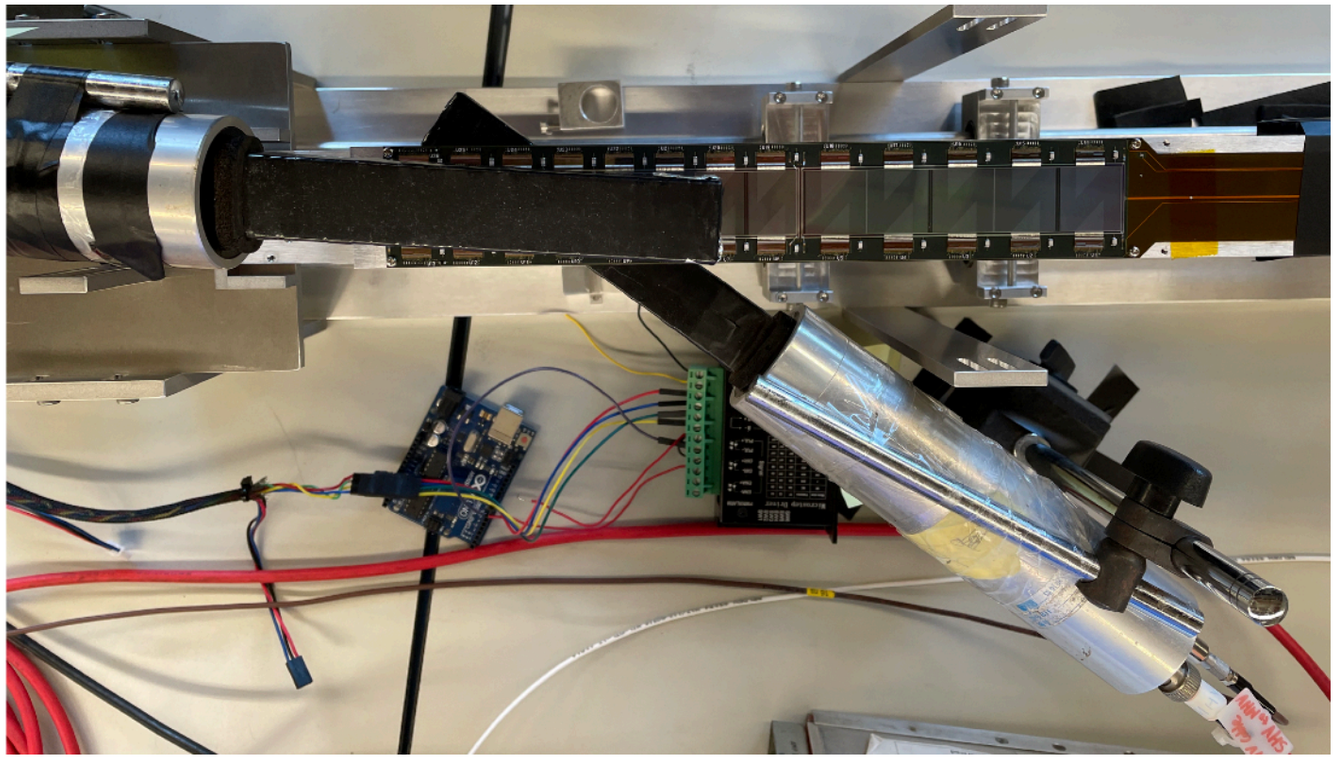
National Central University

2021/8/4

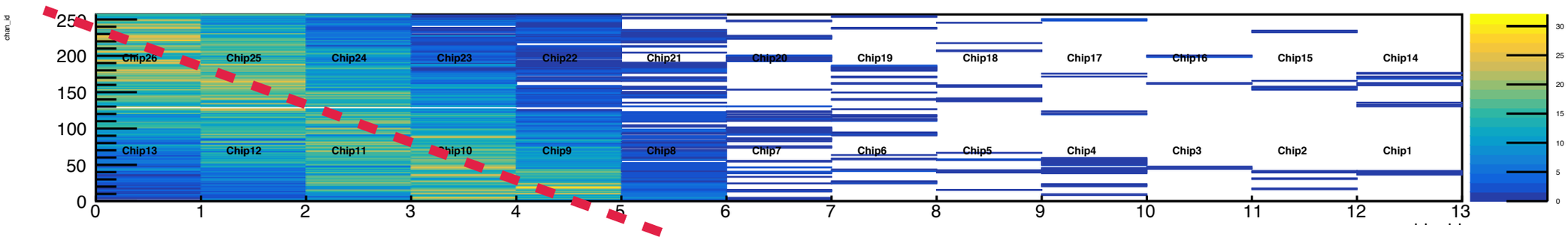


Cosmic test : 2 scintillators

- NI coincidence module was used in the test.

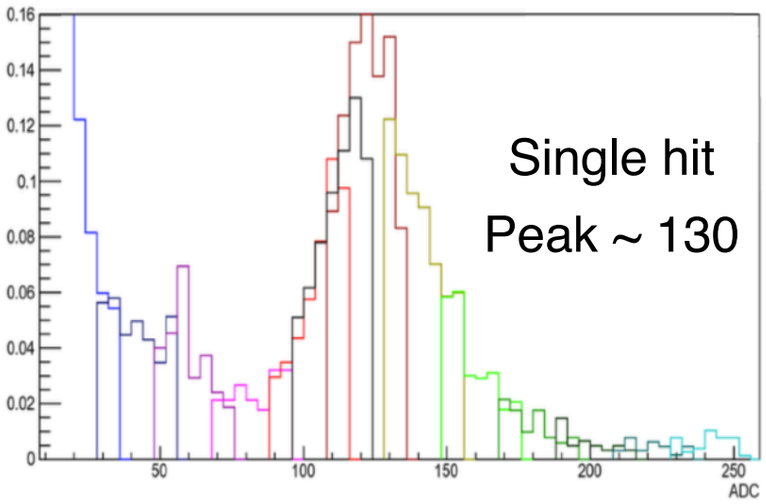


Hit map



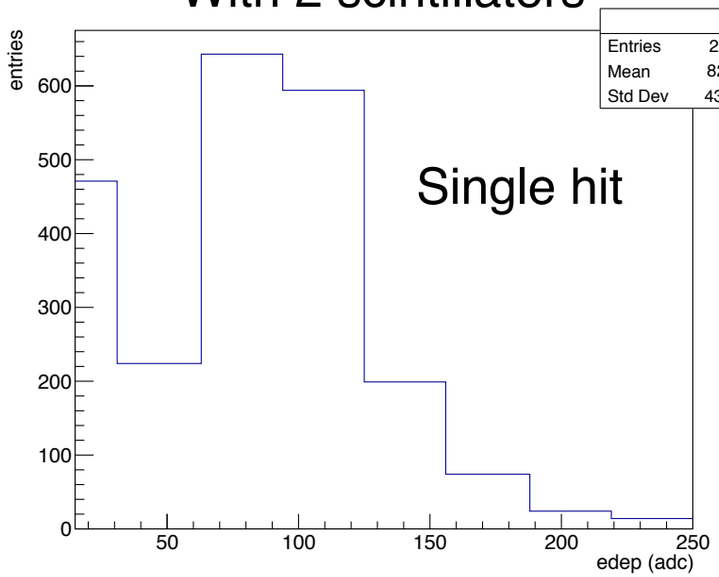
Cosmic test : 2 scintillators

DAC Scan result from last TestBeam

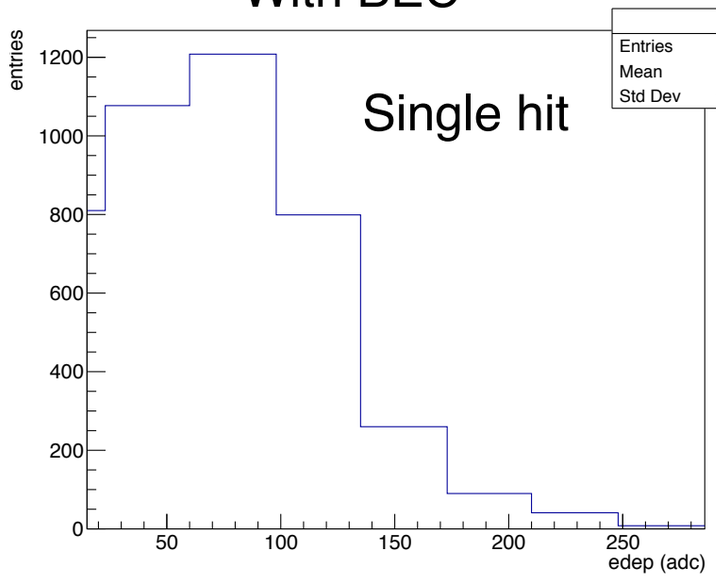


Result from cosmic test

With 2 scintillators



With BEC



Second TestBench preparation

- FEM :
  - 3 FEM boards have been tested, all are functional.

- ROC :
  - 2 ROC boards have been tested, one is functional.
  - The condition of bad ROC :
    1. Column A and C have been tested, both are bad.
    2. The chip current is consistent before & after clicking “init”.
    3. No test pulse is generated.

- Clock Distribution board
  - 2 boards in Taiwan, both are good.

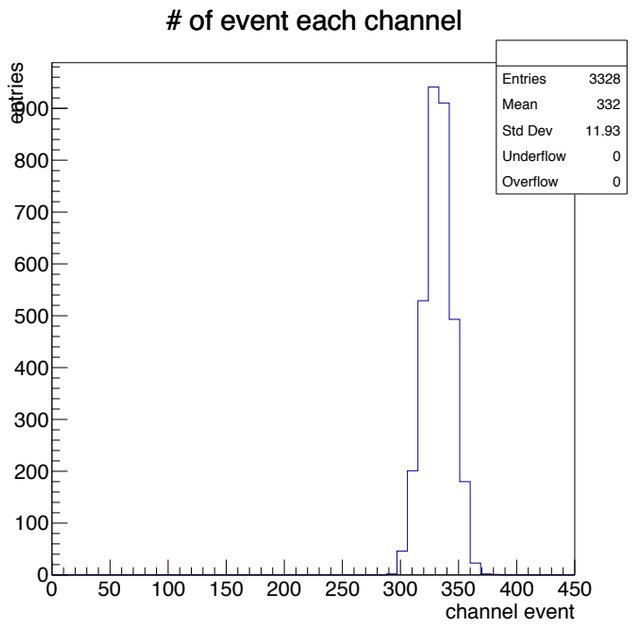
Second TestBench preparation

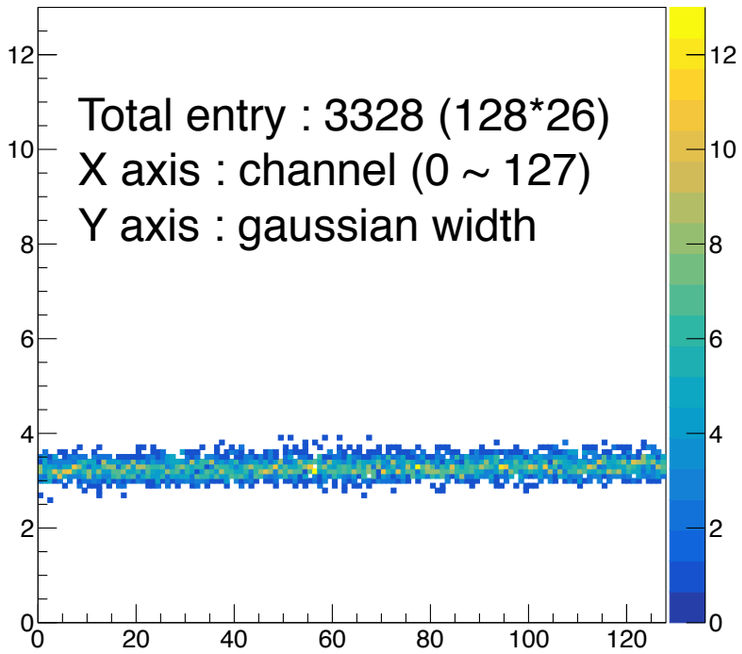
Item	required amount	status	where	note
ROC	1	0		Tested to be bad
FEM board	1	2	in NTU	Tested to be good
FEM-IB	1	0		Only one FEM-IB in TW
clock distribution board	1	1	in NTU	Tested to be good
VME crate	1	2	in NCU	
PCIE board	1	0		PCIe-6536B Board
cooling fan	4	4	in NCU	
win 7 PC	1	0		
Wifi module	1	0		
monitor, keyboard & mouse	1	1	in NCU	
NIM crate	1	1	in NCU	
cable				
ROC power cable	1	0		
chip power cable	1	1	in NCU	
2 pins optical fibers	3	3	in NTU	
10 m data cable	1	2	in NTU	
BCLK cable (clock)	1	2	in NTU	
PCIE cable	1	0		SHC68-C68-D4 cable.
PCIE adapter	1	0		NI653x cable adapter
USB cable (FEM-IB to PC)	1	1	in NCU	
clock distribution board power cable	1	0		
100V bias power cable	1	1	in NTU	

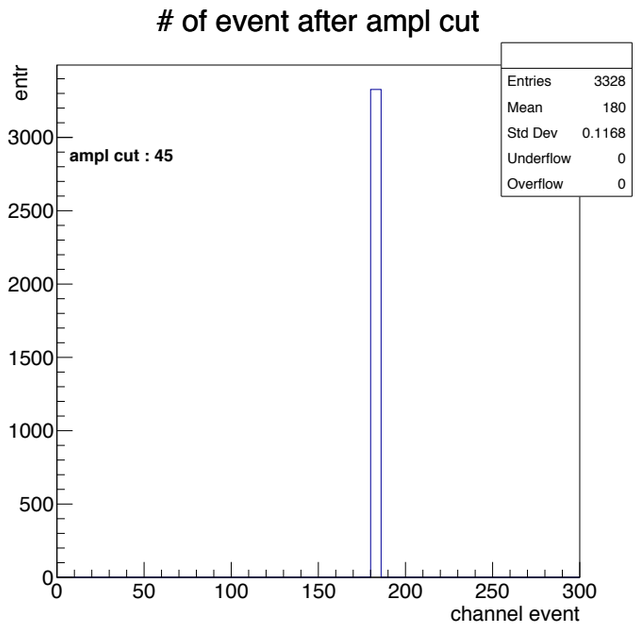
Macro demonstration

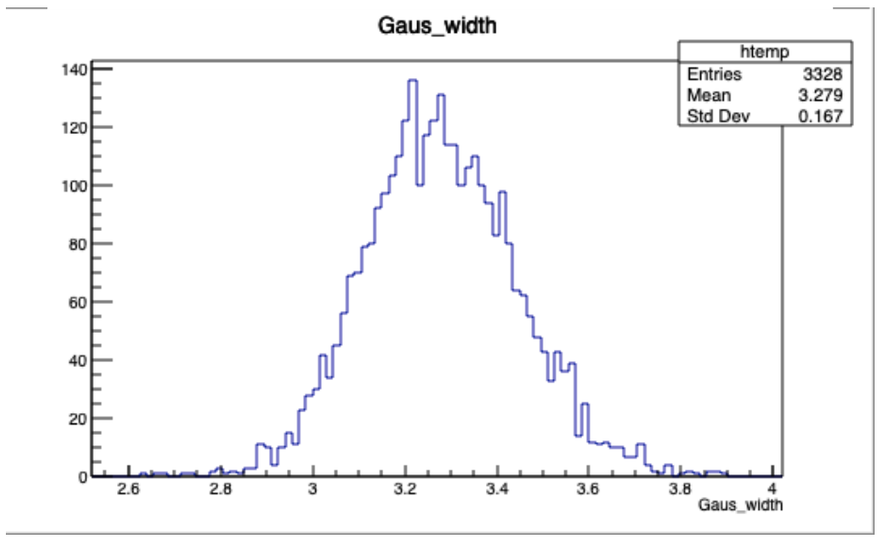
- File : riken_fphx_raw_20210721-2259_ 0.root

ROC	NE2
ROC port	A2
CC	I3
BEC	N/A
LVDS	3 mA









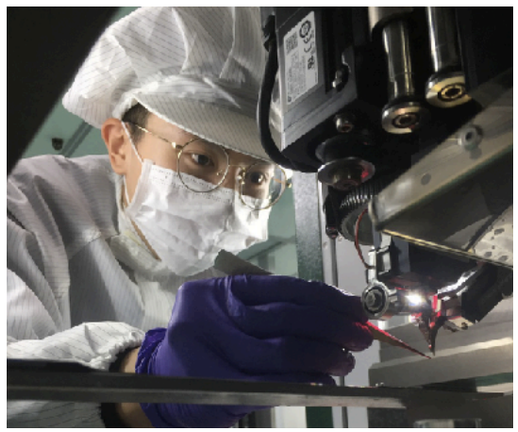
Summary of this file : all channels are good

Summary

- The Testbench in Taiwan can do cosmic test with 2 PMTs.
- The column A & C of bad ROC board have been tested to be bad. we will keep working the preparation the rest components.
- In my algorithm of channel classification, so far there are 4 approaches : width, entry, un-bonded & ampl cut.
  - Criteria “width” & “entry” are used now. I plan to integrate “un-bonded” into the marco.
  - The ampl cut is not used now.

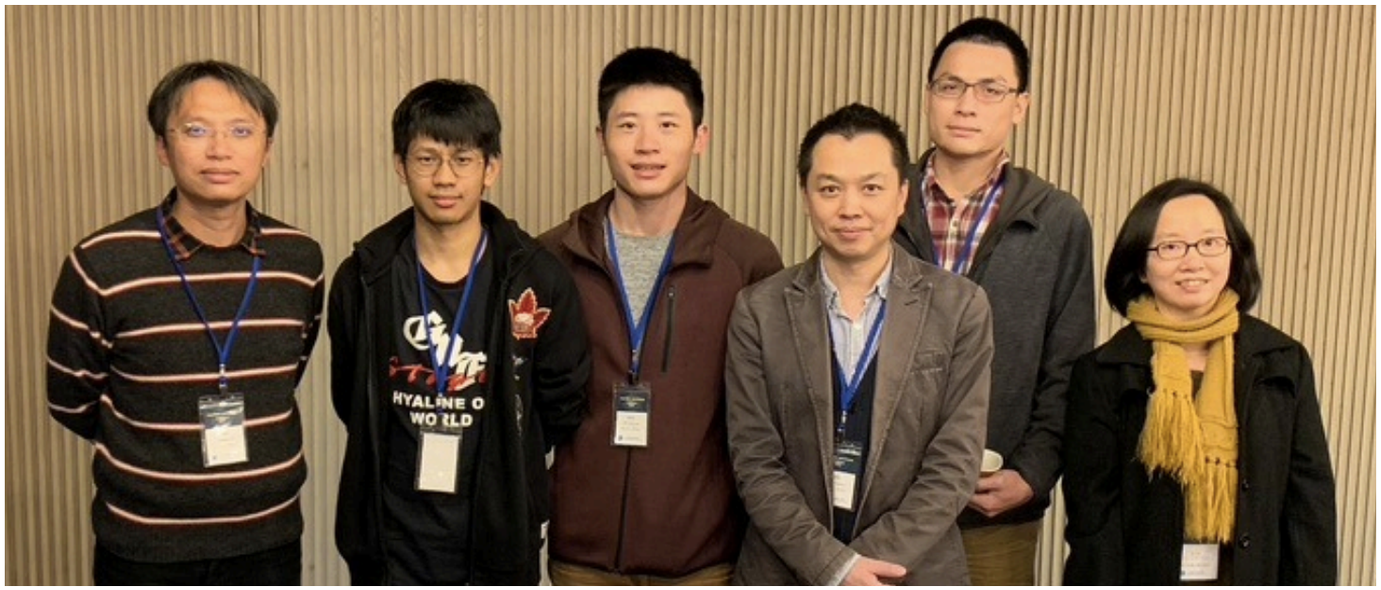
Back up

Taiwan INTT team



Ou-Wei Cheng

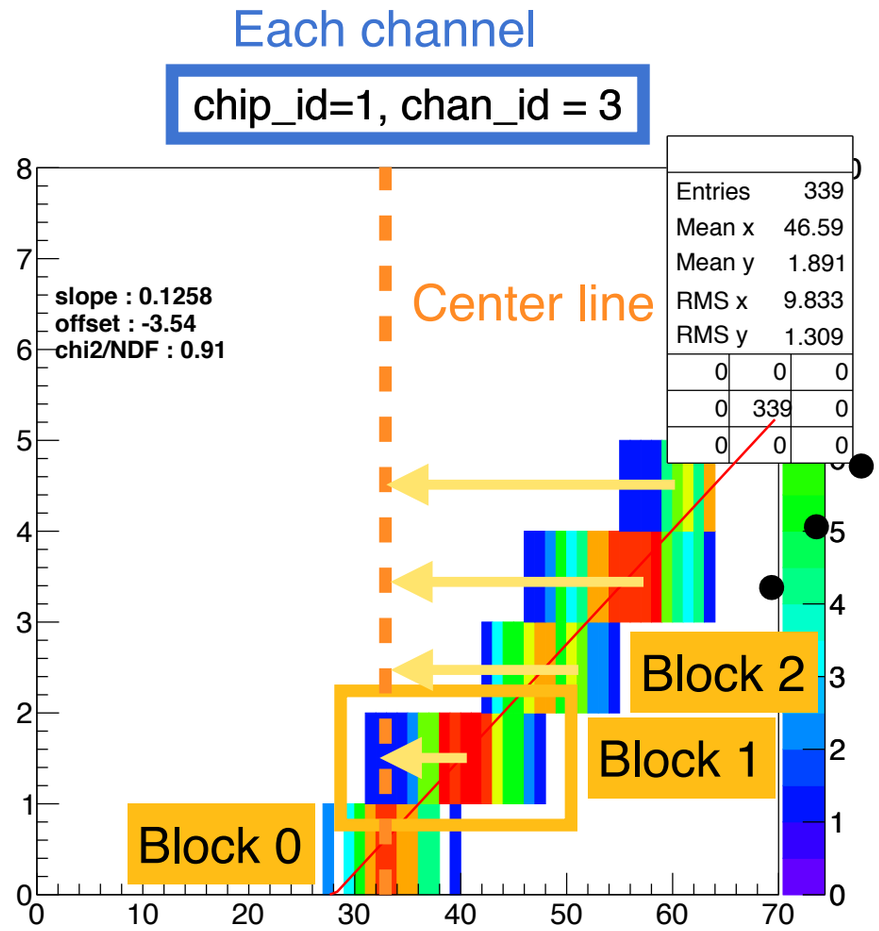
Kai-Yu Cheng



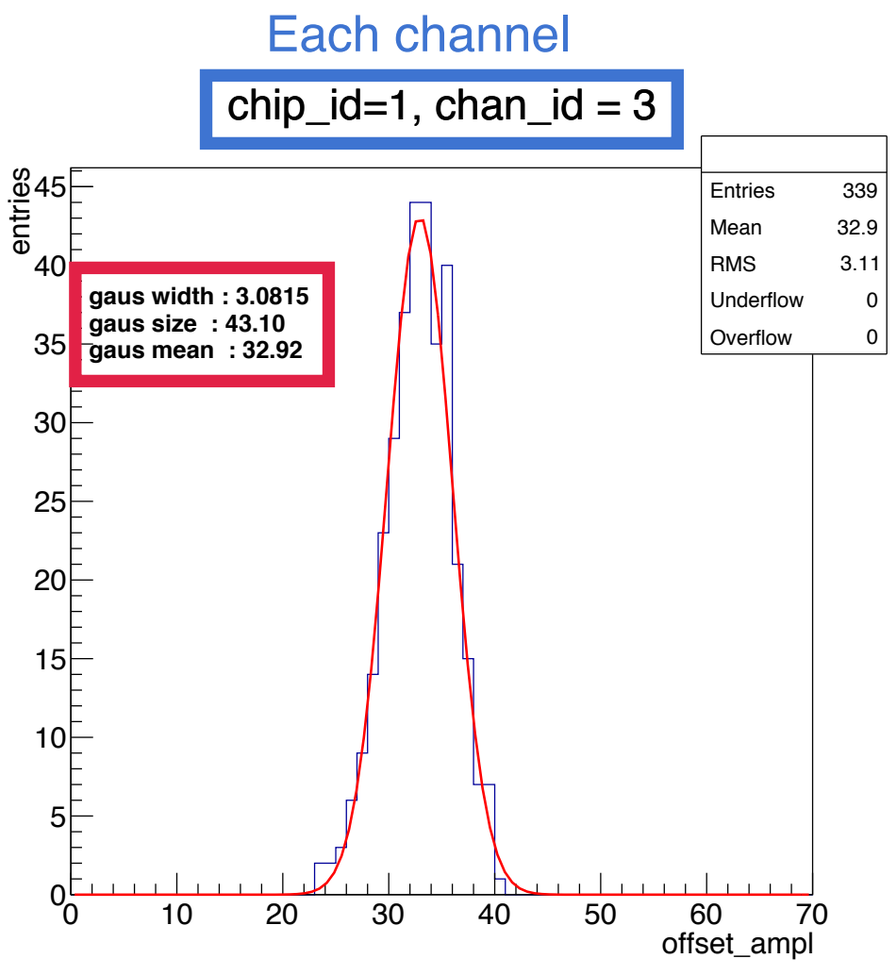
Chia-Ming Kuo Cheng-Wei Shih Lian-Sheng Tsai
Wei-Che Tang Rong-Shyang Lu Jenny Huang

Algorithm introduction : width

- For each channel of each chip :
  - Center line : average of events in “Block 0” (ADC==0)
  - Centers of the rest blocks are aligned to center line.
    - Amount of movement : Mean of each block - center line
  - Each event is filled in TH1F, and fit with gaussian.

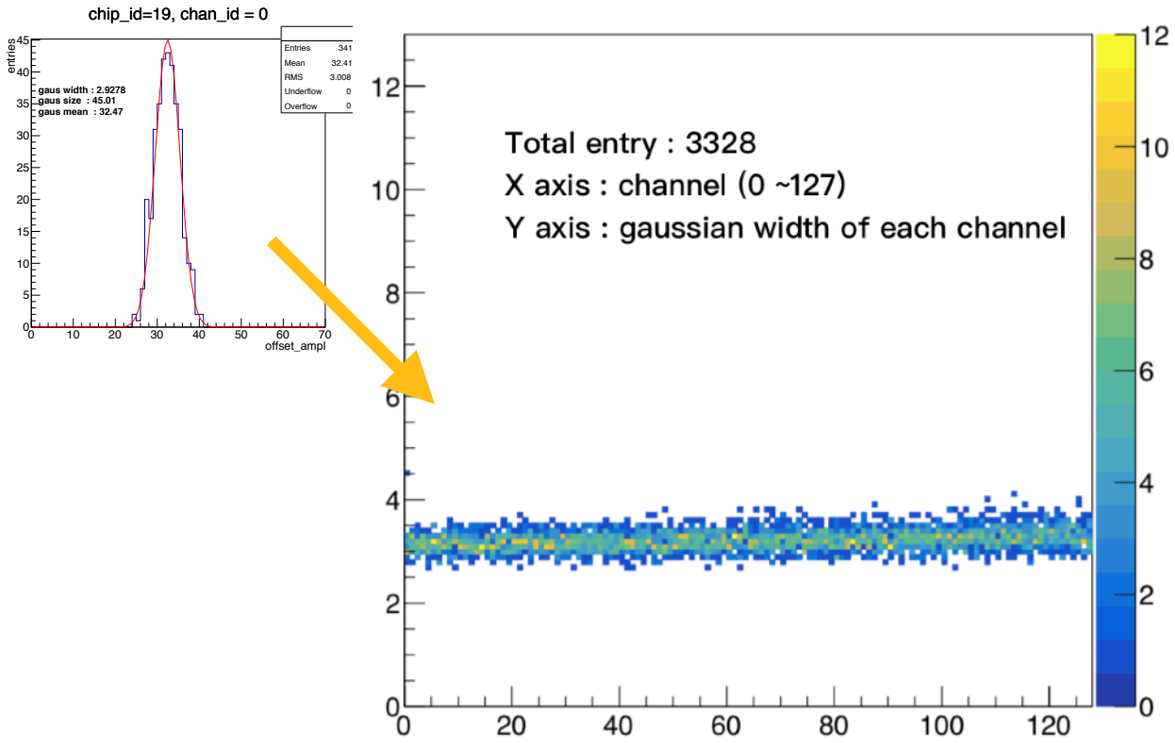


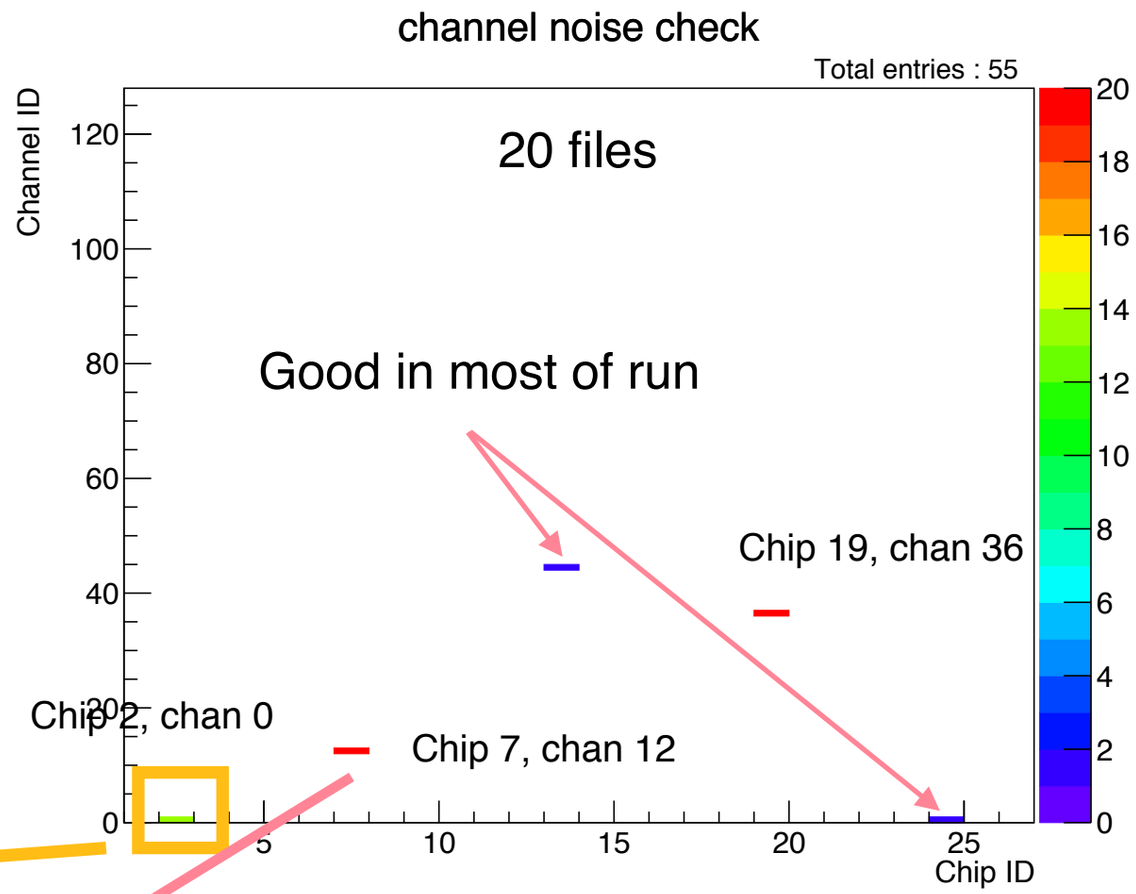
X axis : amp,
Y axis : ADC

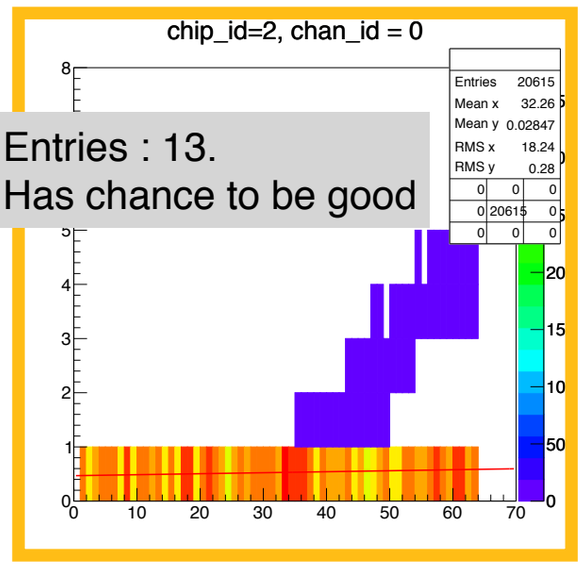


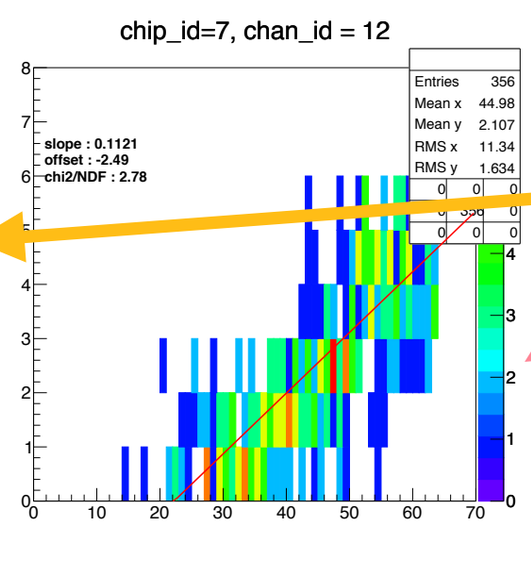
Algorithm introduction : width

The Gaus width of most channels are less than 4
Gaus width > 4 will be shown in right plot





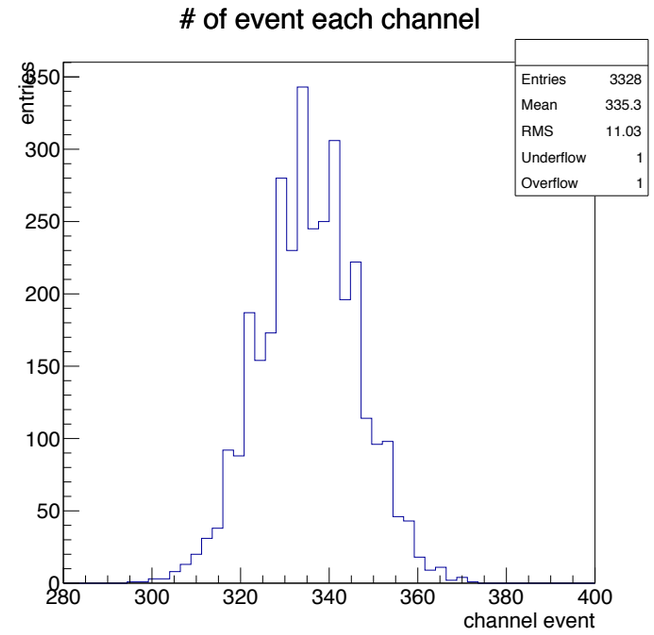




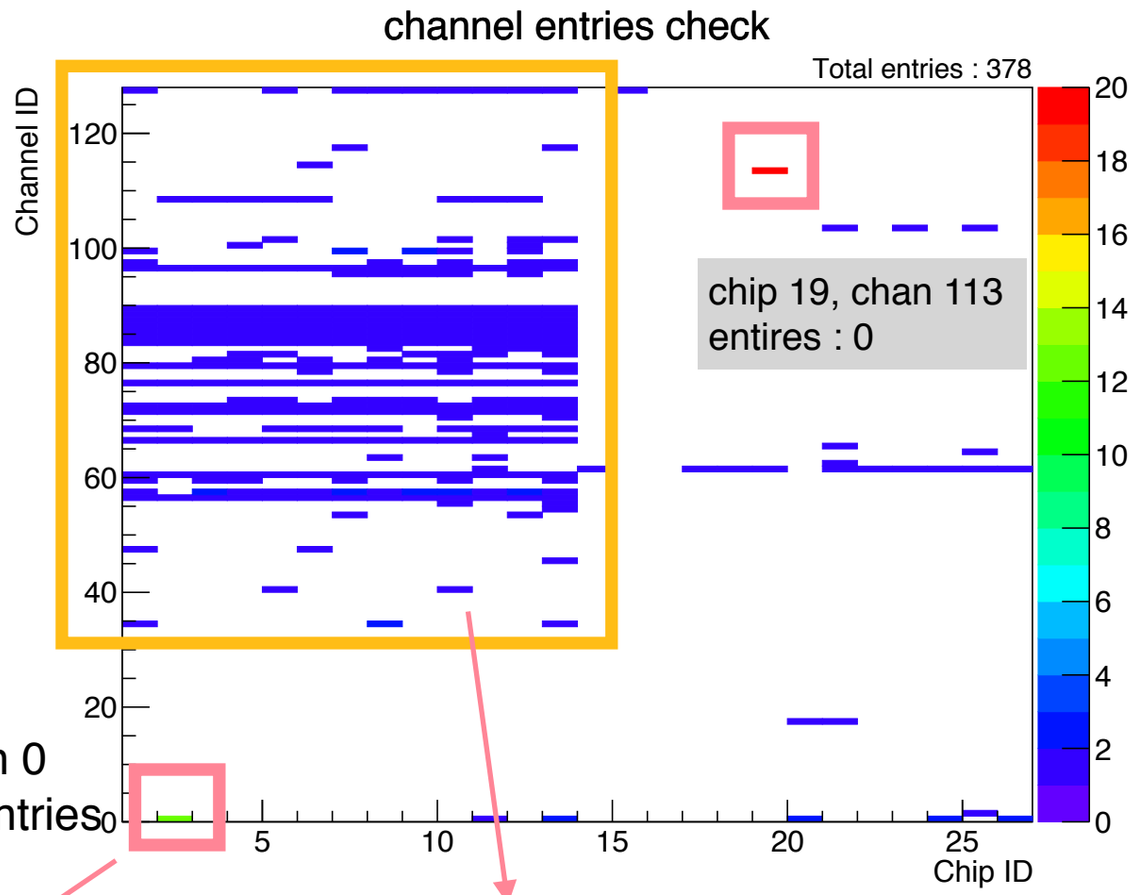
The less entries in plot, better performance it is.

Algorithm introduction : entry

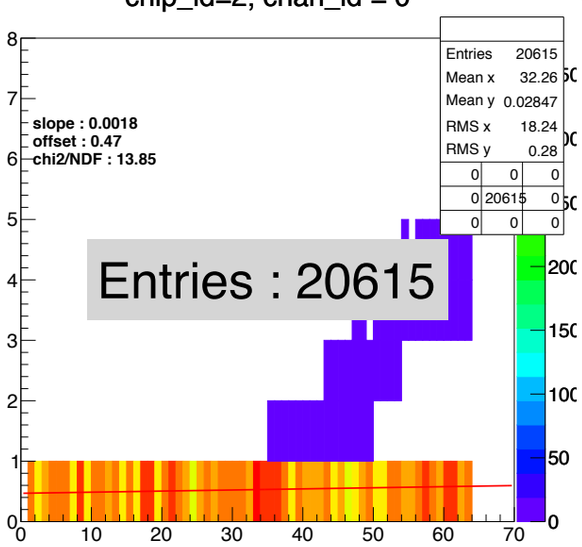
of event of each channel ~ 330

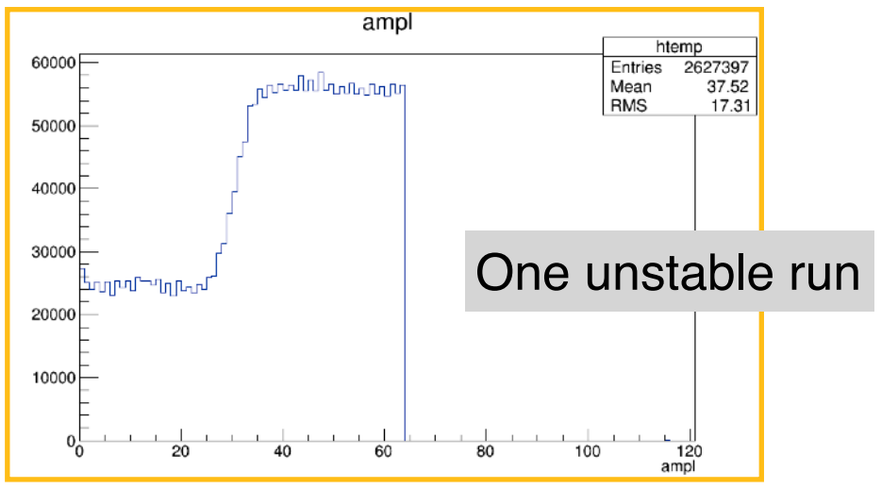


# of event > 400 or < 280 will be filled in the plot



chip 2, chan 0
Very high entries



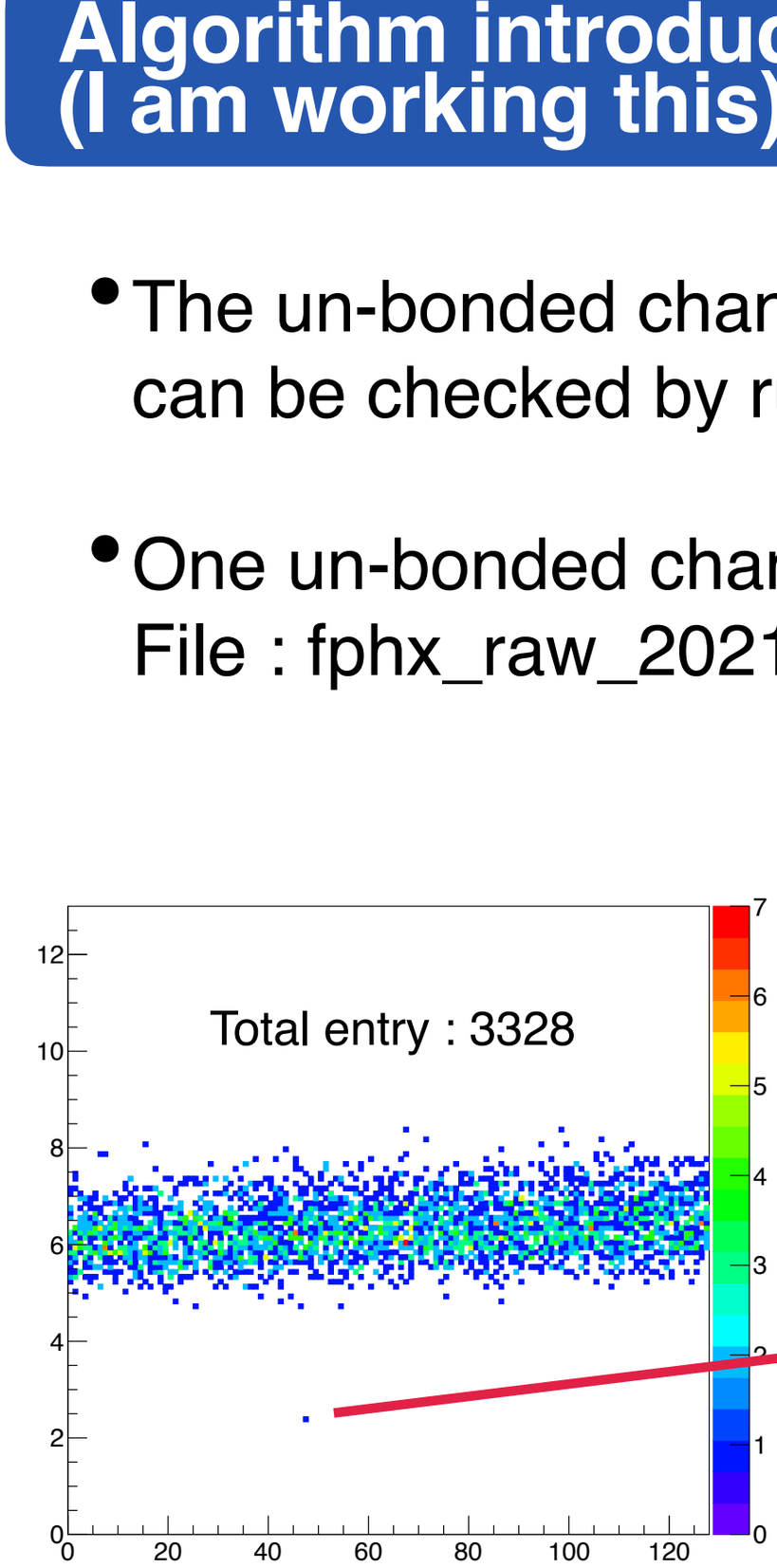


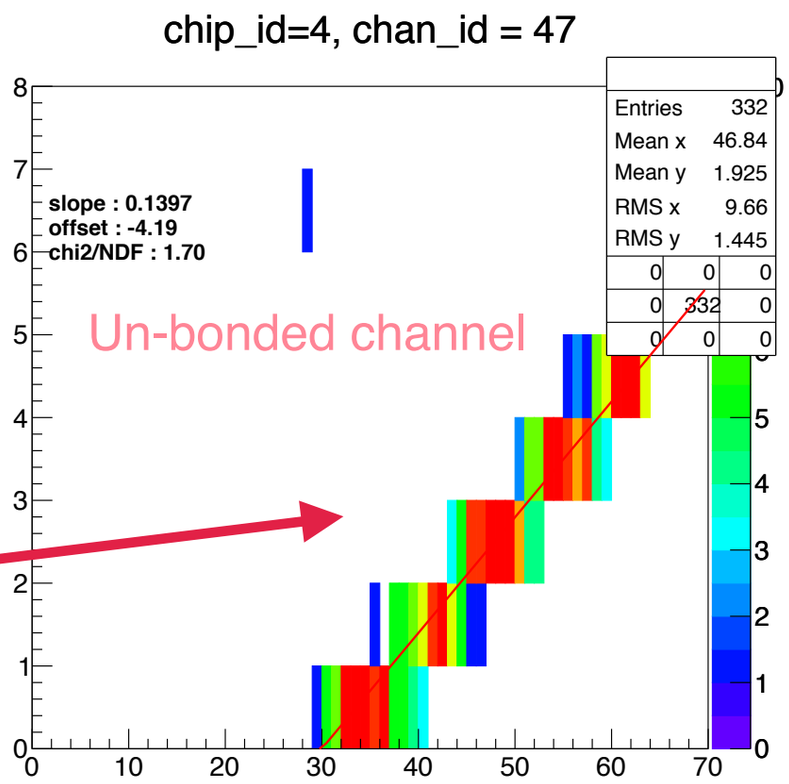
Algorithm introduction : un-bonded channel (I am working this)

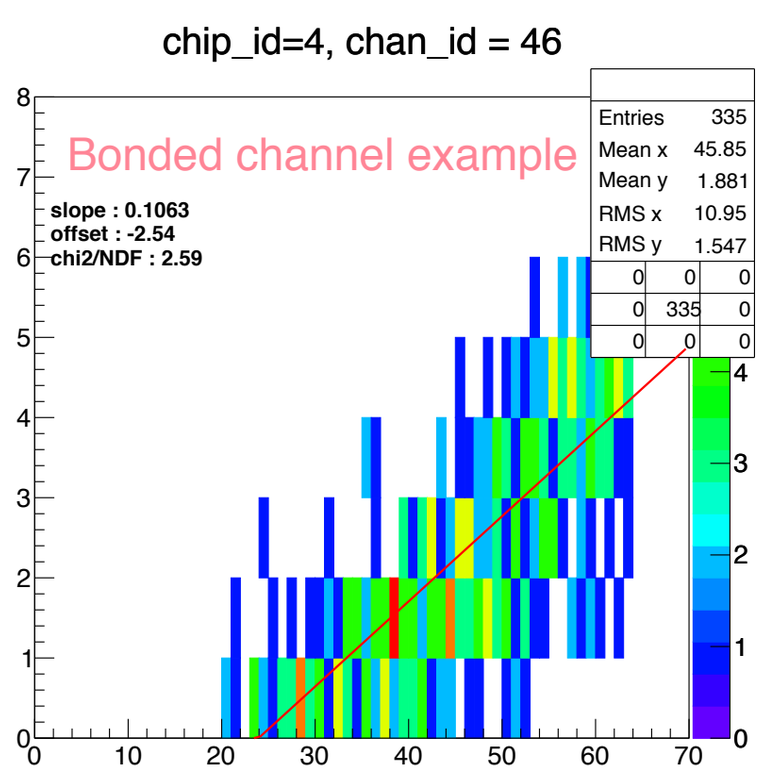
- The un-bonded channel should be considered as bad channel, it can be checked by running calibration test without bias voltage.

- One un-bonded channel was found in BNL ladder (PPB2-L2N)
  File : fphx_raw_20210212-0942_0.dat

Calibration file without bias voltage



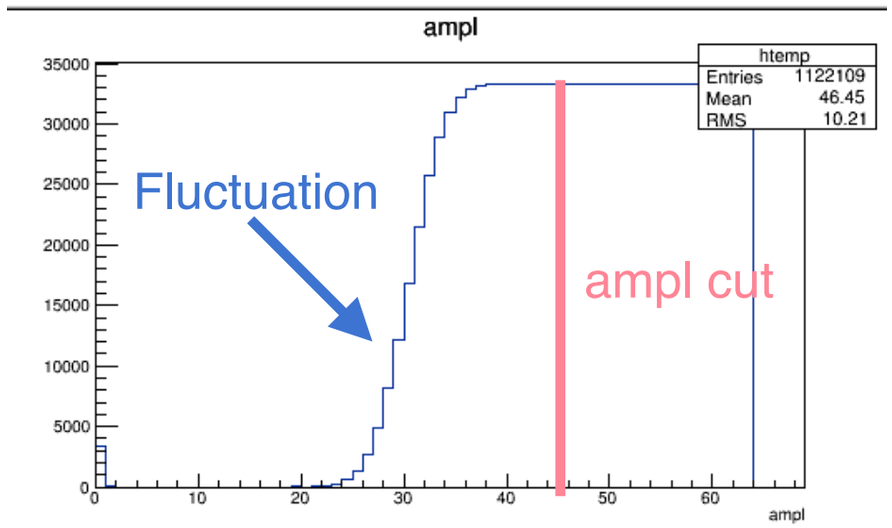




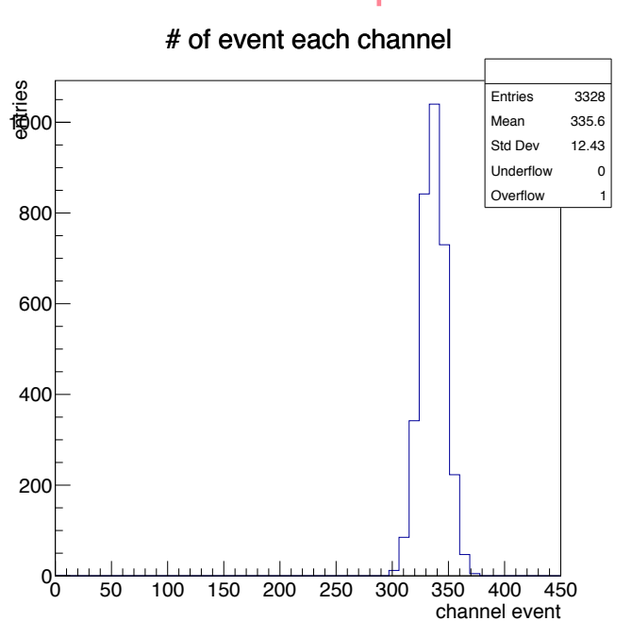
Algorithm introduction : ampl cut (not use so far)

- New entry criteria candidate : applying a ampl cut.

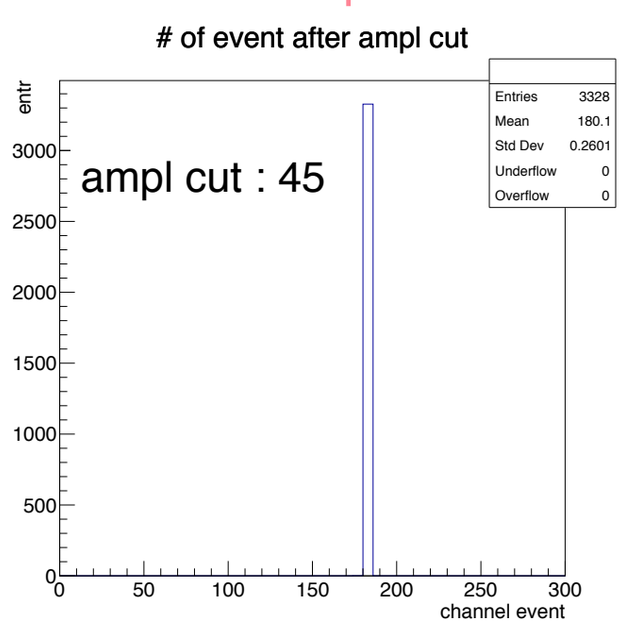
The width of gaussian is mainly contributed by the fluctuation around DAC0.

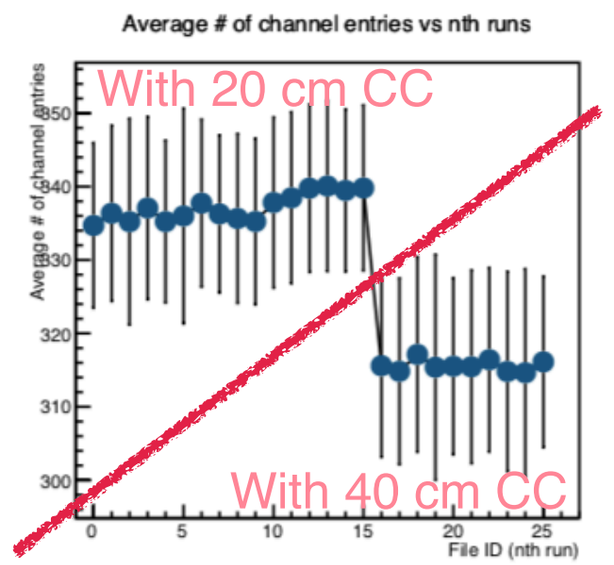


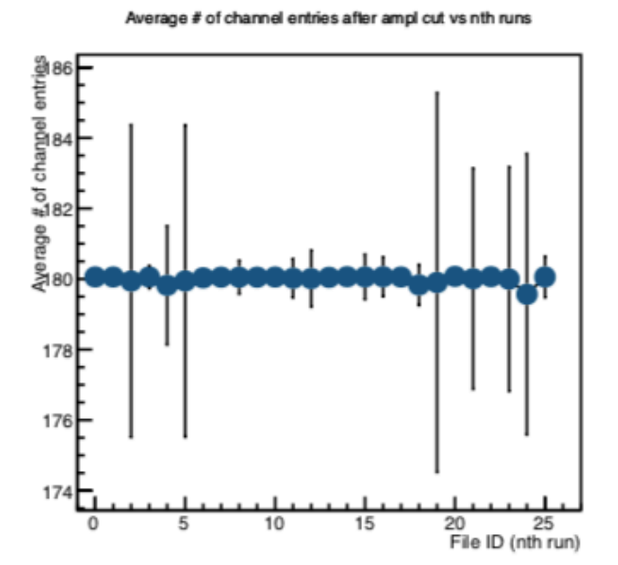
Without ampl cut



With ampl cut





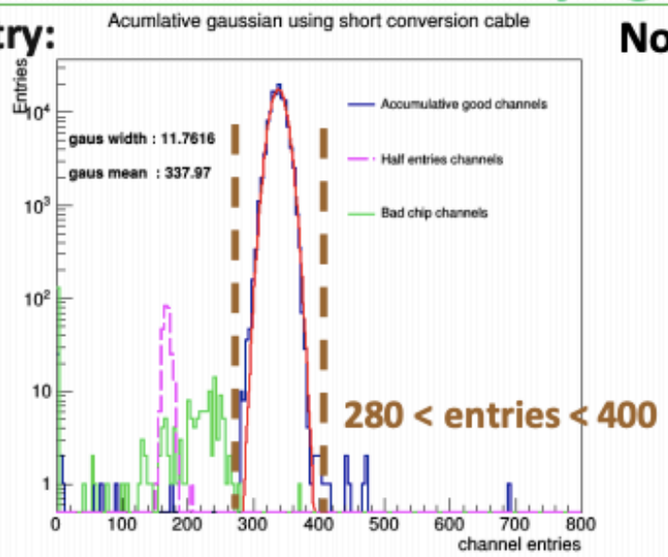


Slide from Han-Sheng

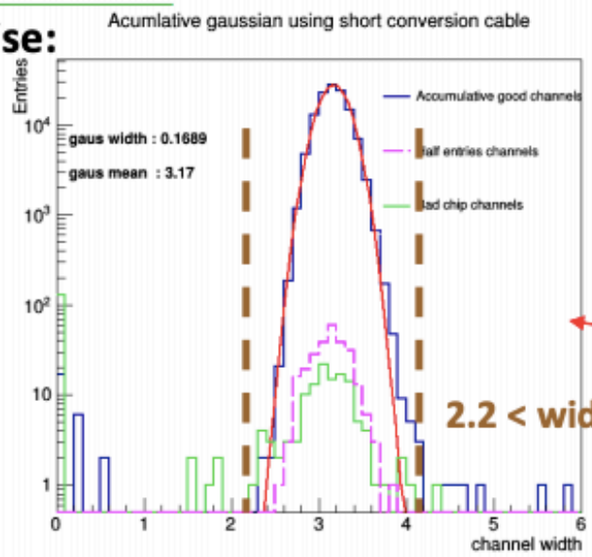
Classification for ladders

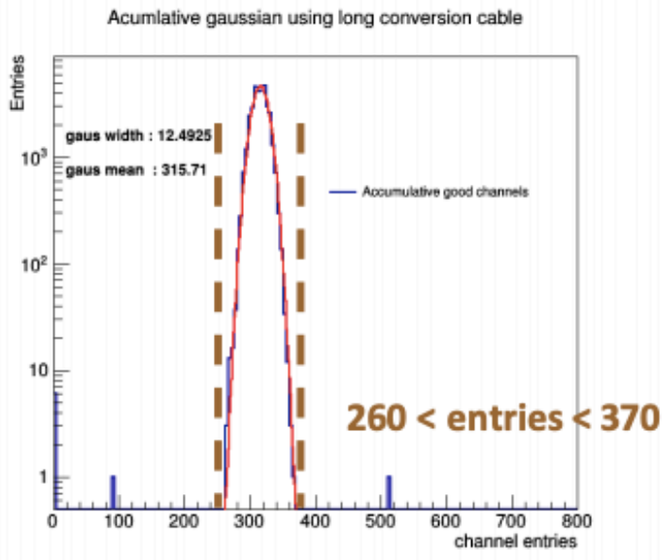
STEP 1. Criteria for classifying ladders

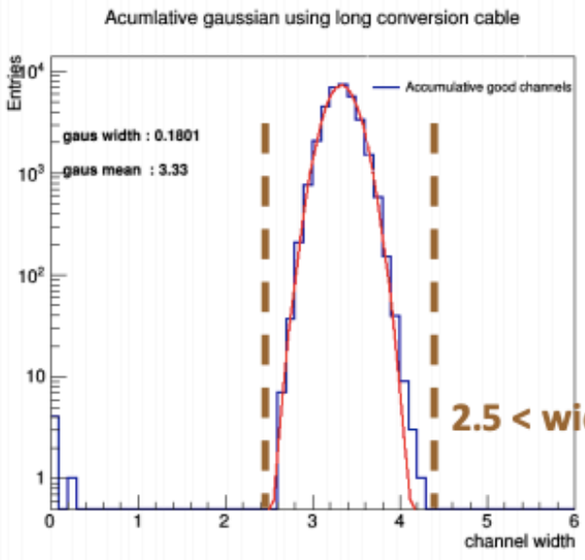
Entry:



Noise:

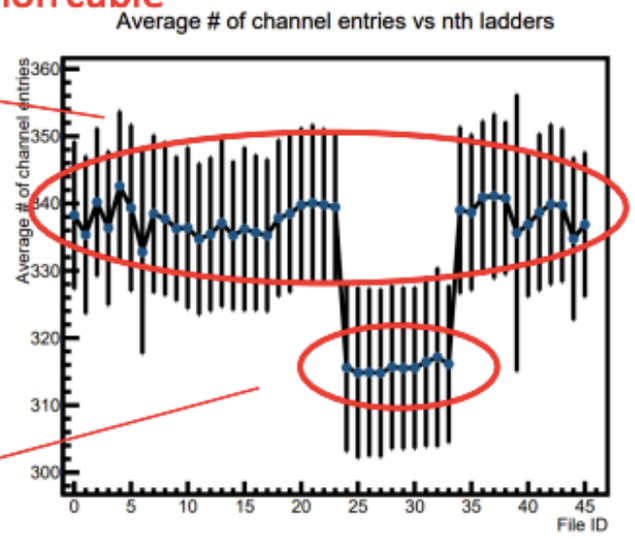






The framework of classification done by Cheng-Wei

Short conversion cable



Long conversion cable

The channel width distribution comes from amplitude gaussian fit using all the channels.

eng Li 20210720@Weekly Meeting 2