



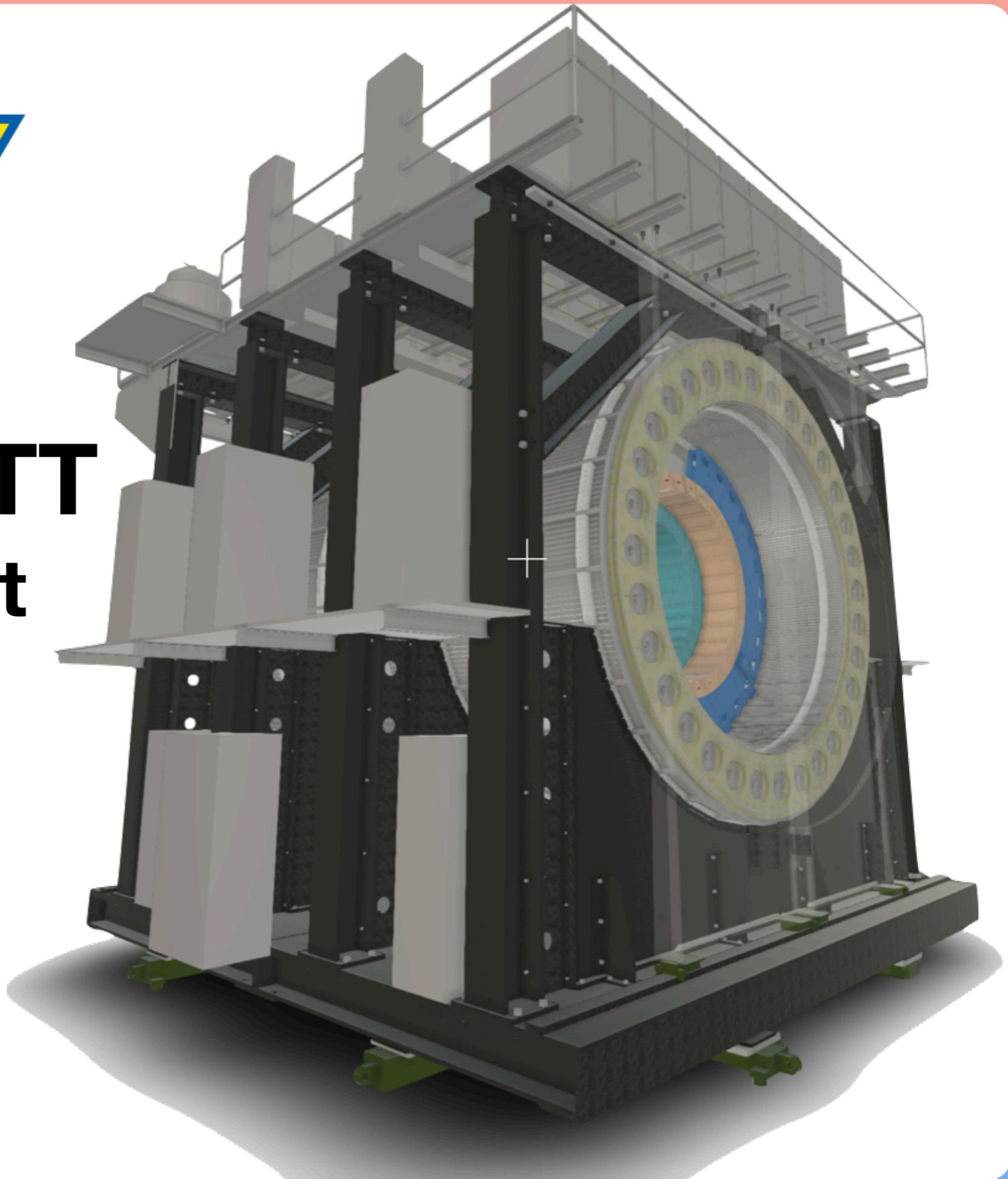
SPHENIX INTT

- Weekly Report

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NCUHEP

2021/5/27

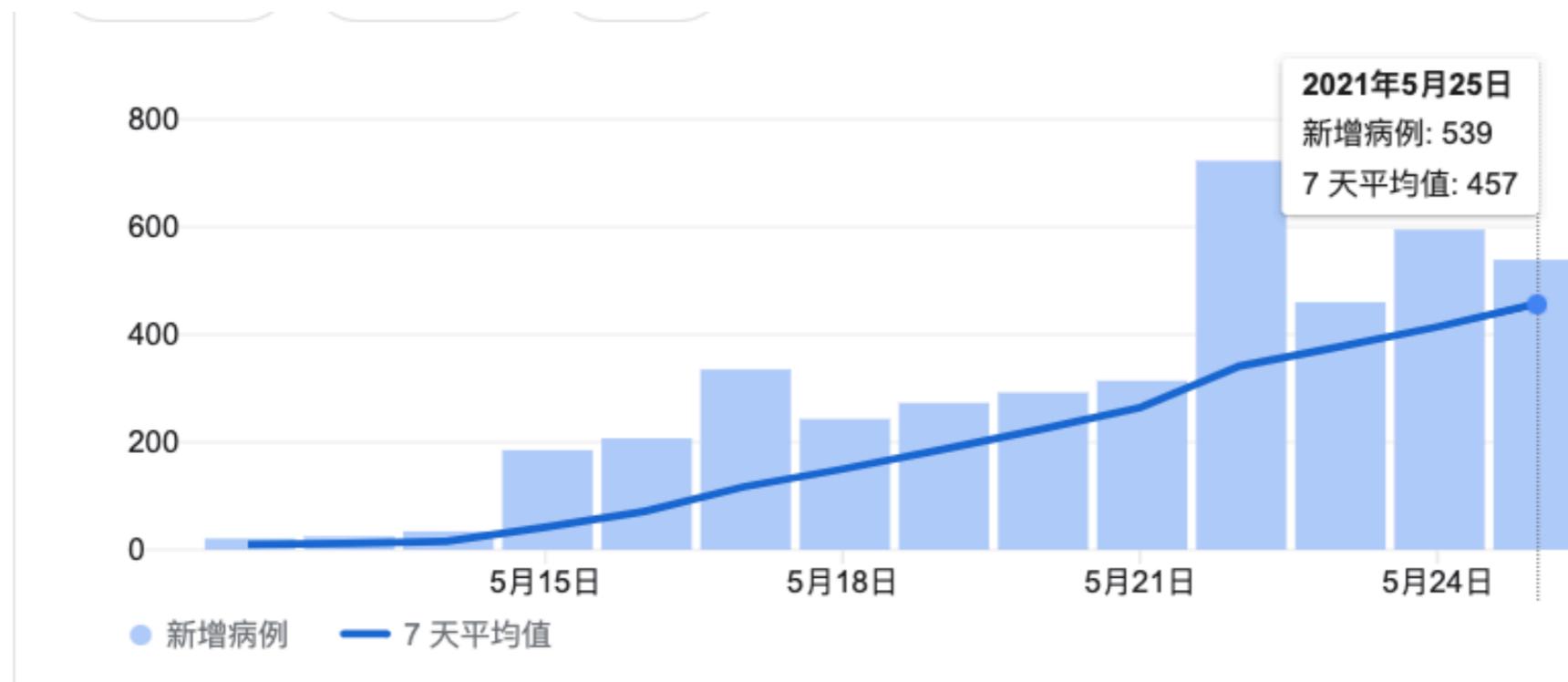


COVID-19 status in Taiwan



- ~ 300 new COVID-19 cases each day.
 - Most of the cases are from Taipei and new Taipei City.
- National level 3 epidemic warning is extended to 6/14.
 - Indoor gathering < 5 people.
 - We stop to go to NTU for 1 more week so far.

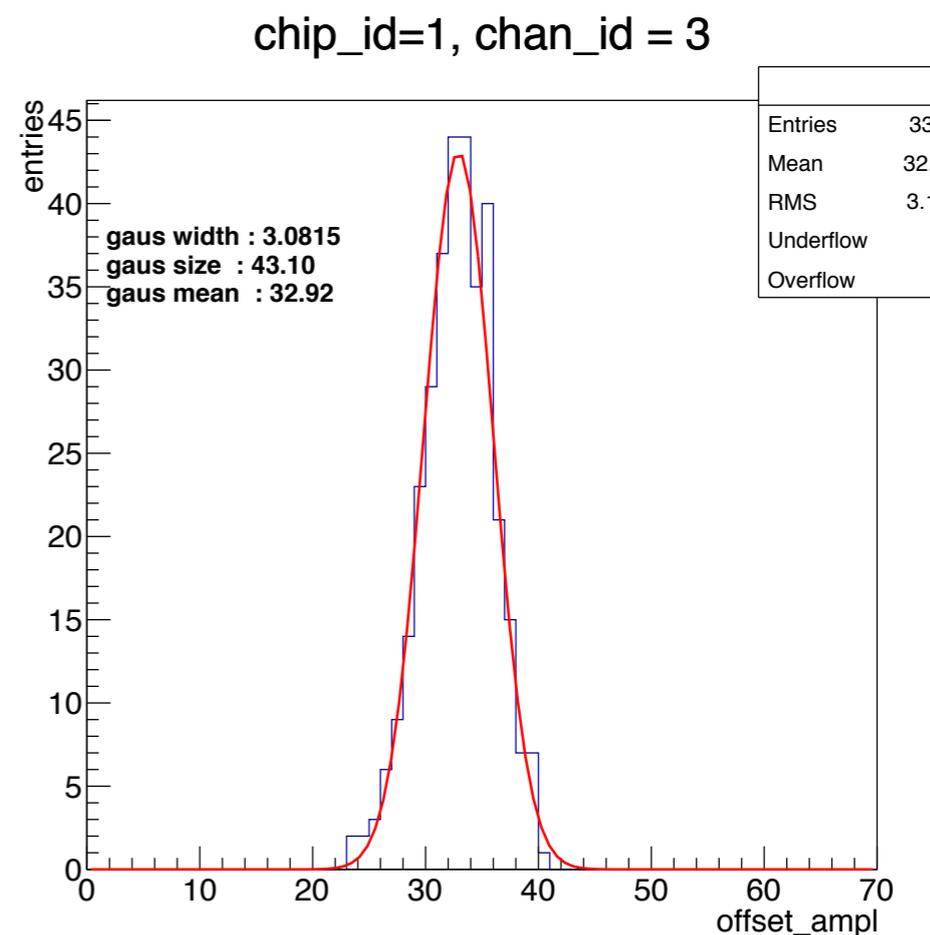
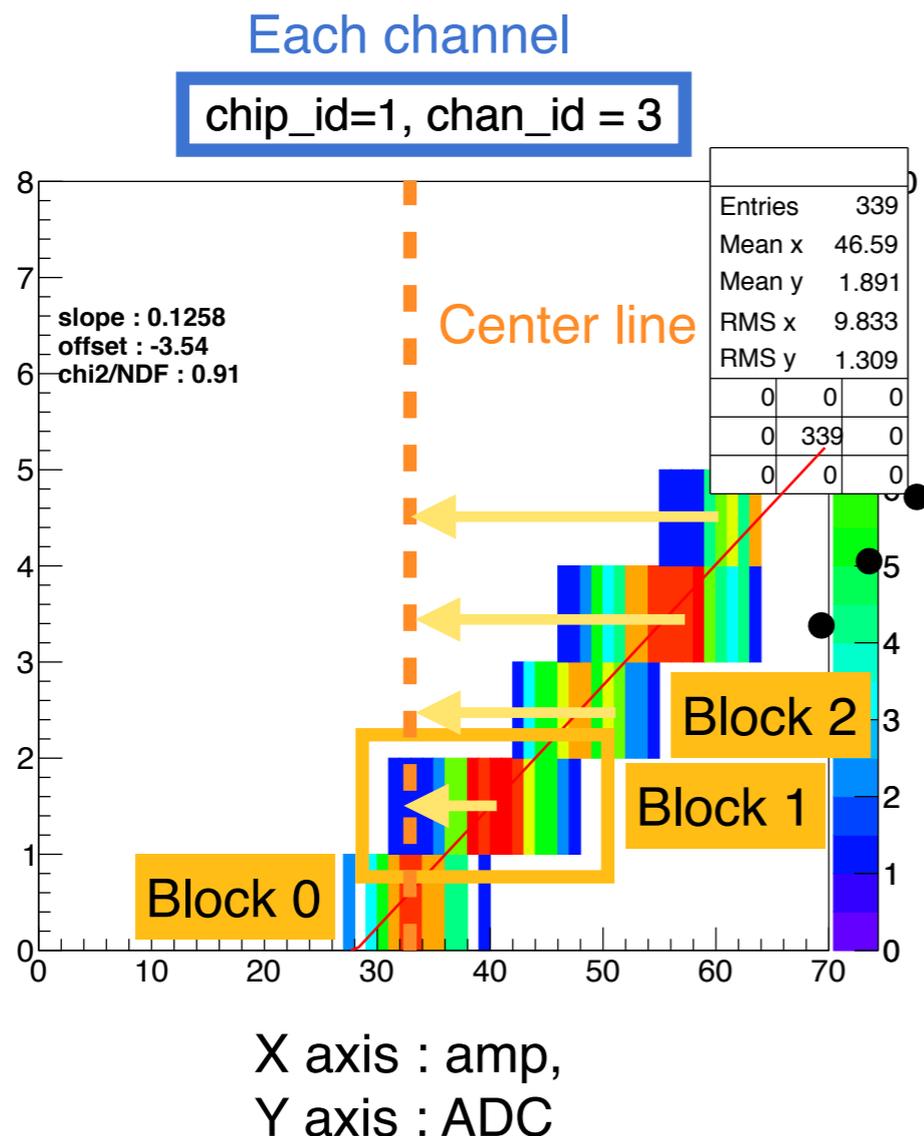
Increase cases



Channel classification



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



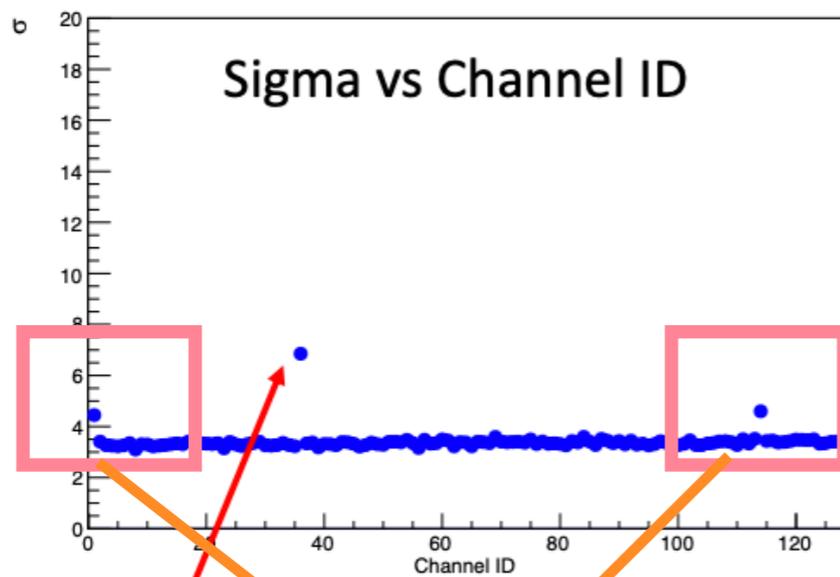
Channel classification



- Why my algorithm doesn't see 3 noisy channels but only 1 ?

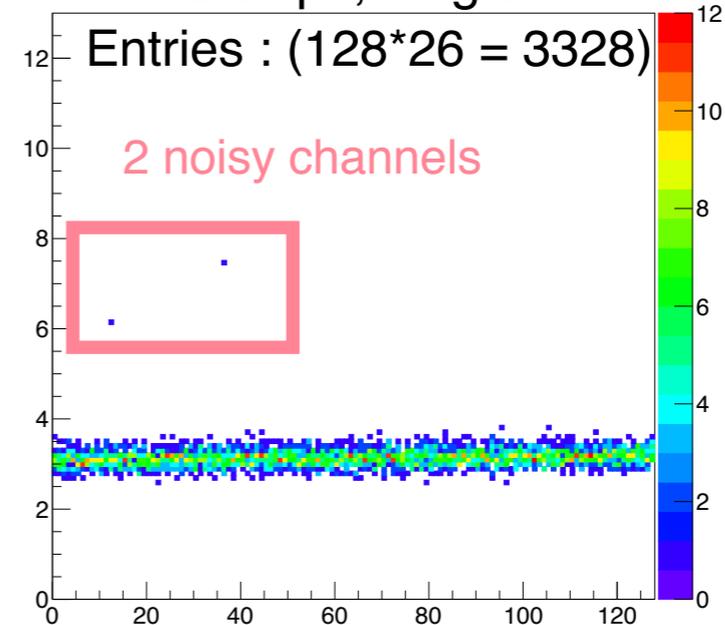
Summation of 20 files

chip id = 19



Noisy channel

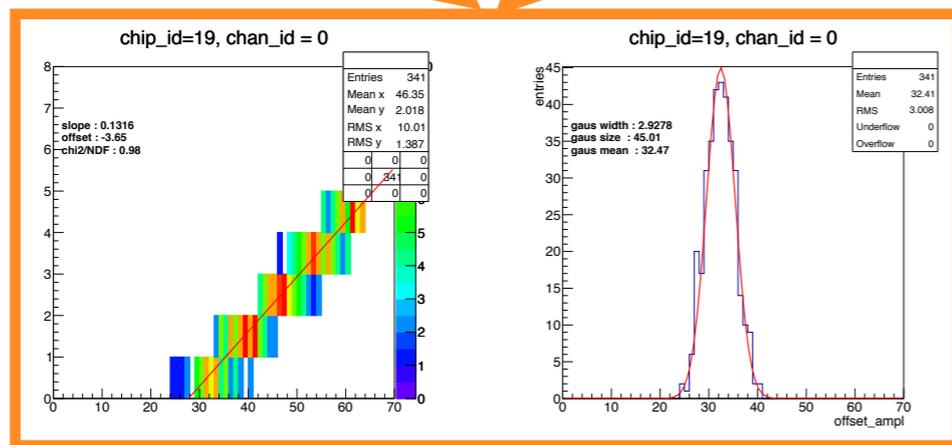
All chips, single run



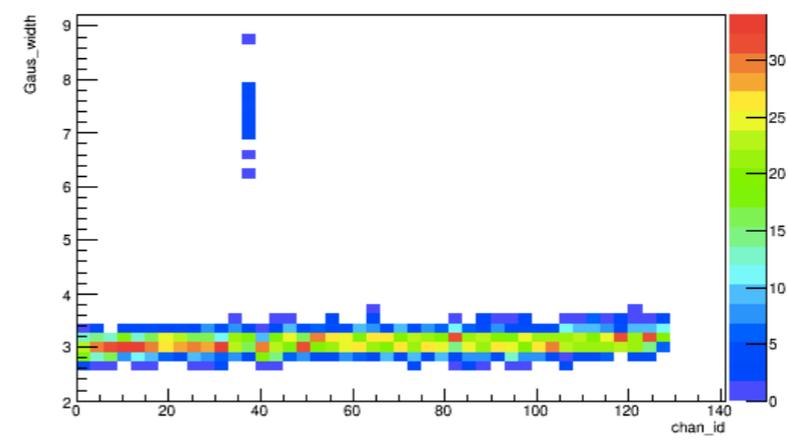
2 noisy channels

X axis : Channel,
Y axis : Gaussian width

The plot I showed in the meeting last week



Chip 19 only, 20 runs



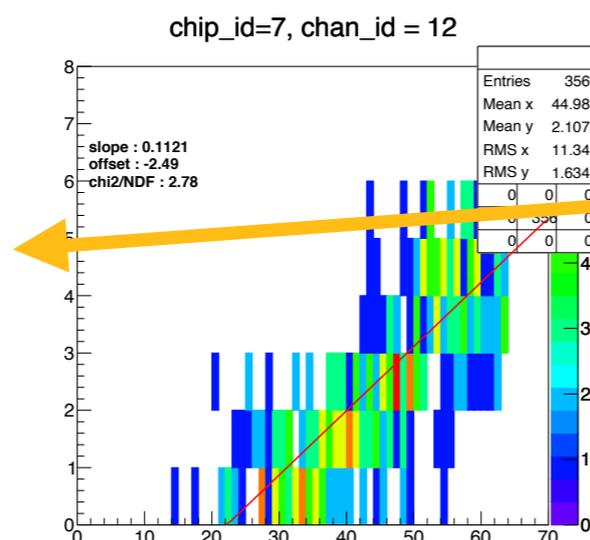
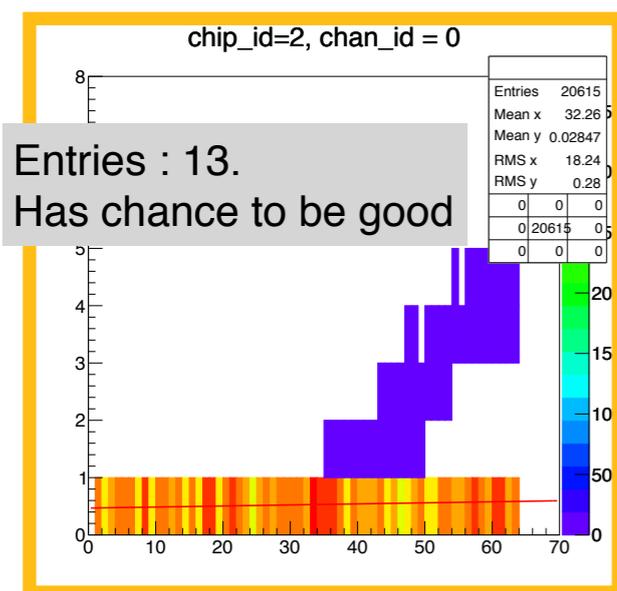
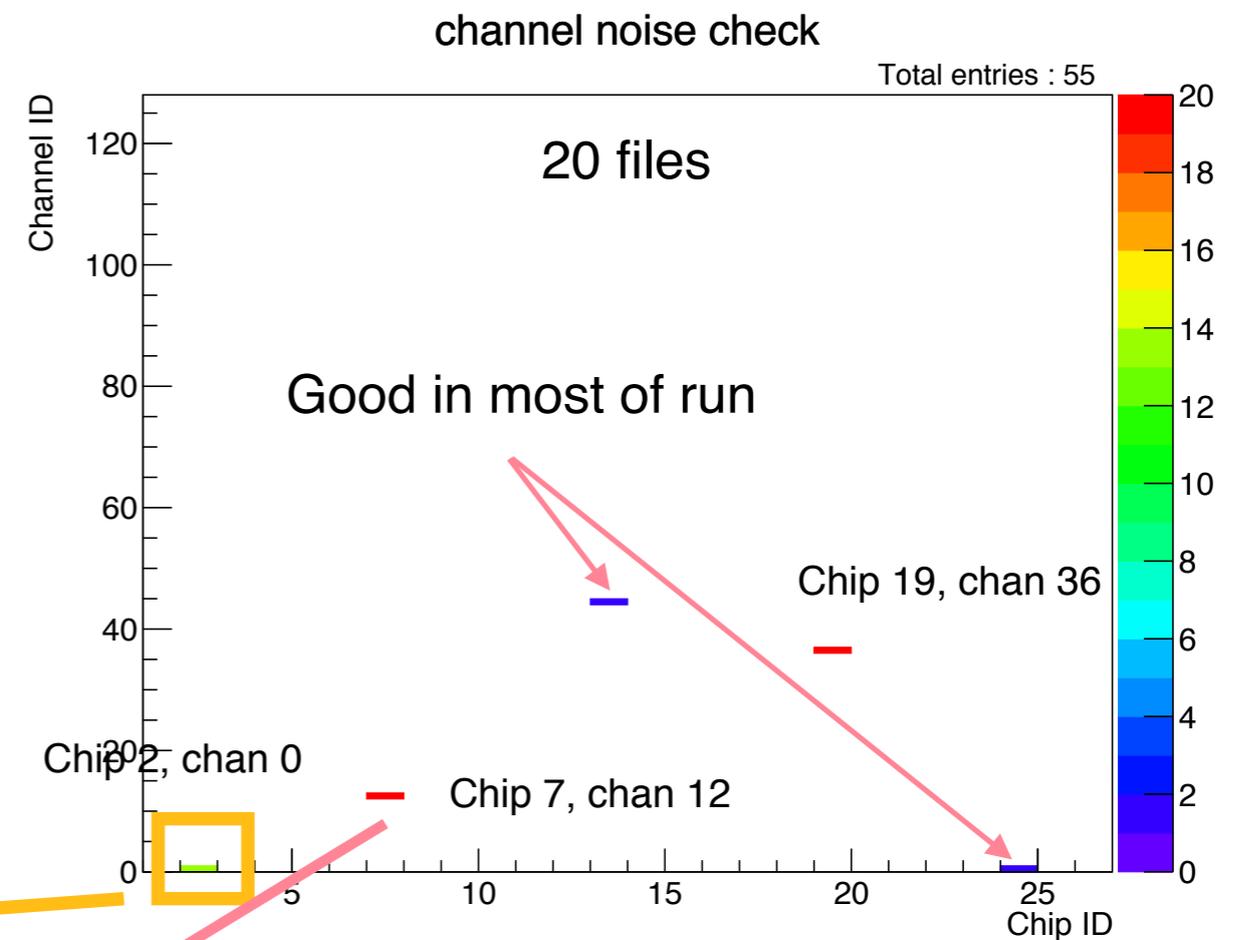
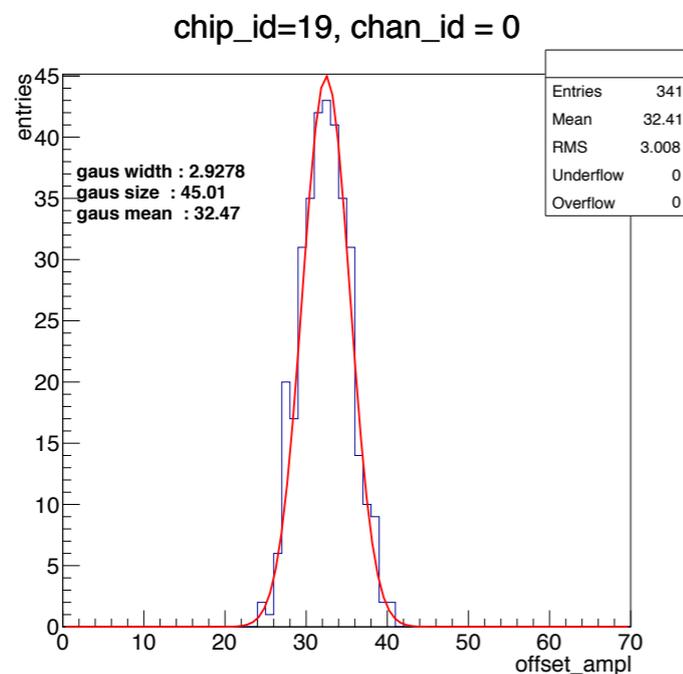
I ran 20 root files this week, only 1 noise channel in chip 19 for all files

Channel classification : noise



- Update of my algorithm, 2 criteria : noise and entries

Gaus width > 4 will be shown in right plot

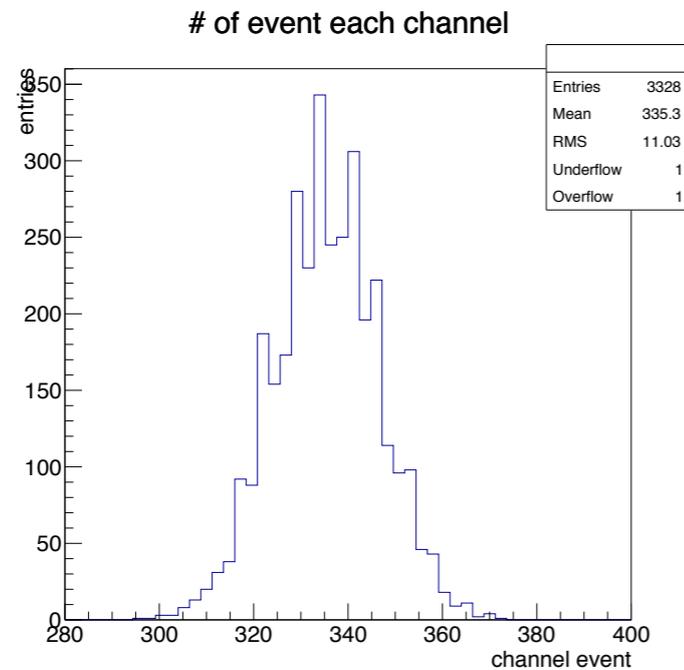


The less entries in plot, better performance it is.

Channel classification : entires

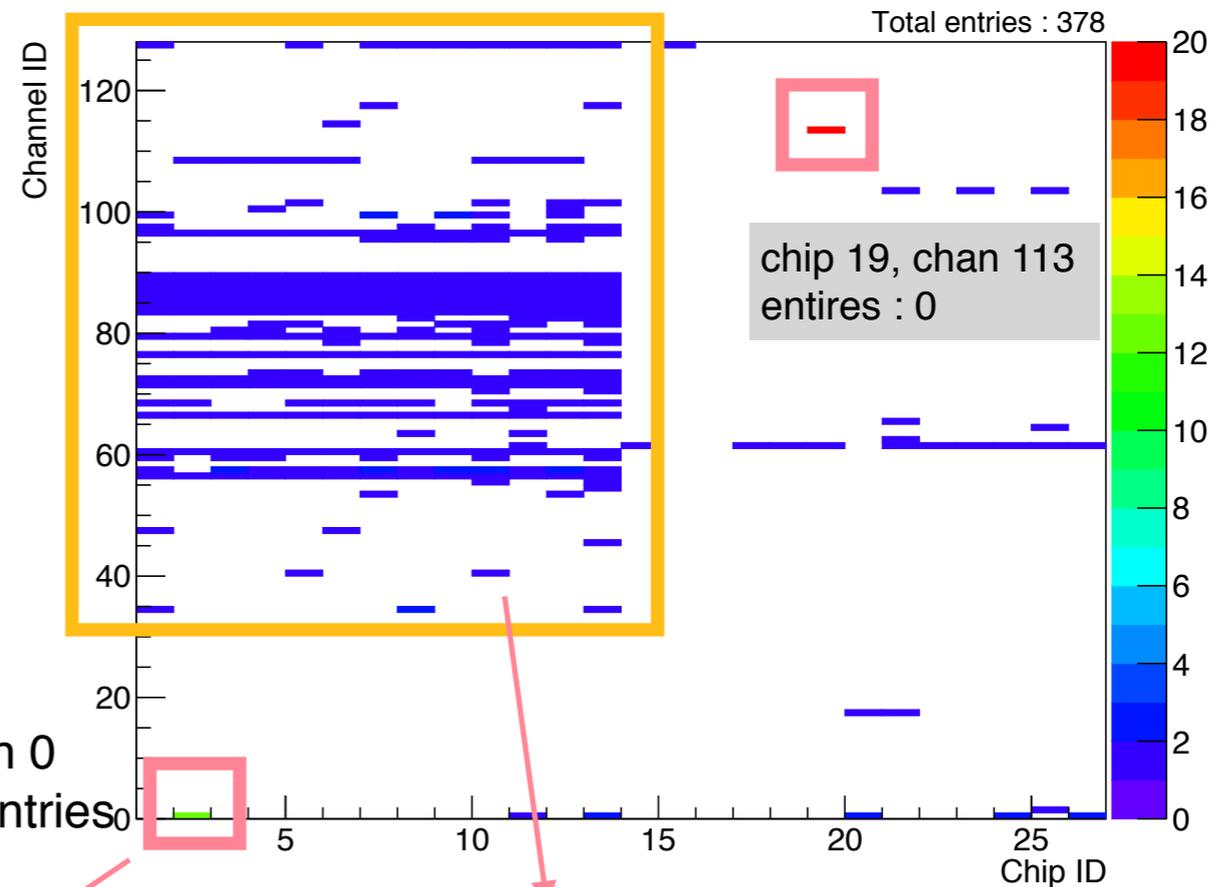


of event of each channel ~ 330

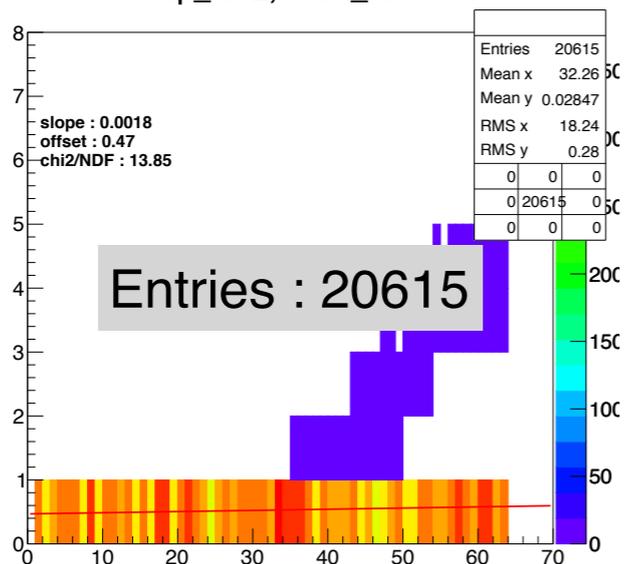


of event > 400 or < 280 will be filled in the plot

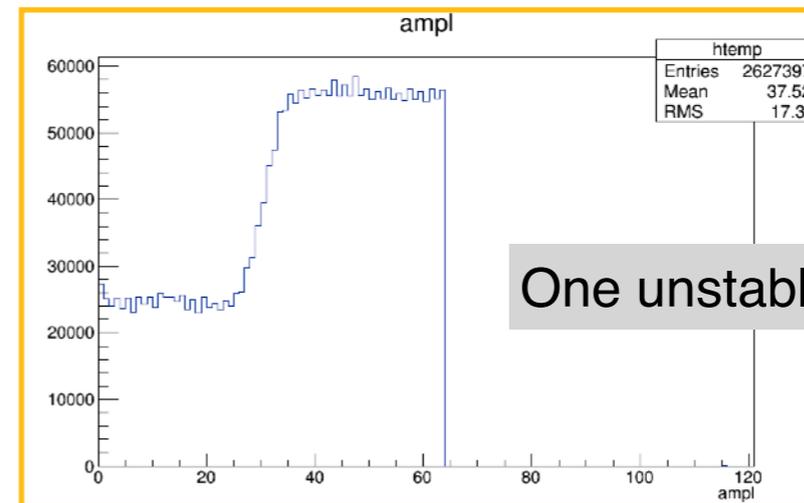
channel entries check



chip_id=2, chan_id = 0



chip 2, chan 0
Very high entries



One unstable run

The output

```
10:00 → 10:10 Yu-Hsuan's report
Noise channel found, chip : 2 channel : 0, failed time : 13/ 20, ratio : 0.65
Noise channel found, chip : 7 channel : 12, failed time : 20/ 20, ratio : 1
Noise channel found, chip : 19 channel : 36, failed time : 20/ 20, ratio : 1
WeeklyReprot_052...
Weird entries found, chip : 2 channel : 0, failed time : 12/ 20, ratio : 0.6
Weird entries found, chip : 19 channel : 113, failed time : 20/ 20, ratio : 1
```

Summary



- The assembly is stop due to epidemic.
- Channel classification :
 - Update of my algorithm, 2 criteria : entries & noise.
 - 4 Un-functional channels are found :
 - Chip 2, channel 0 (failed times : 13 / 20)
 - Chip 7, channel 12 (failed times : 20 / 20)
 - Chip 19 channel 36 (failed times : 20 / 20)
 - Chip 19, channel 113 (failed times : 20 / 20)
 - Multi-run is necessary as this means multi-chip reset
 - Check chip stability
 - We should look into the performance of each run, not just overall performance.
- Can Rachid send us the 2D drawing of stave glue mask ?

Back up



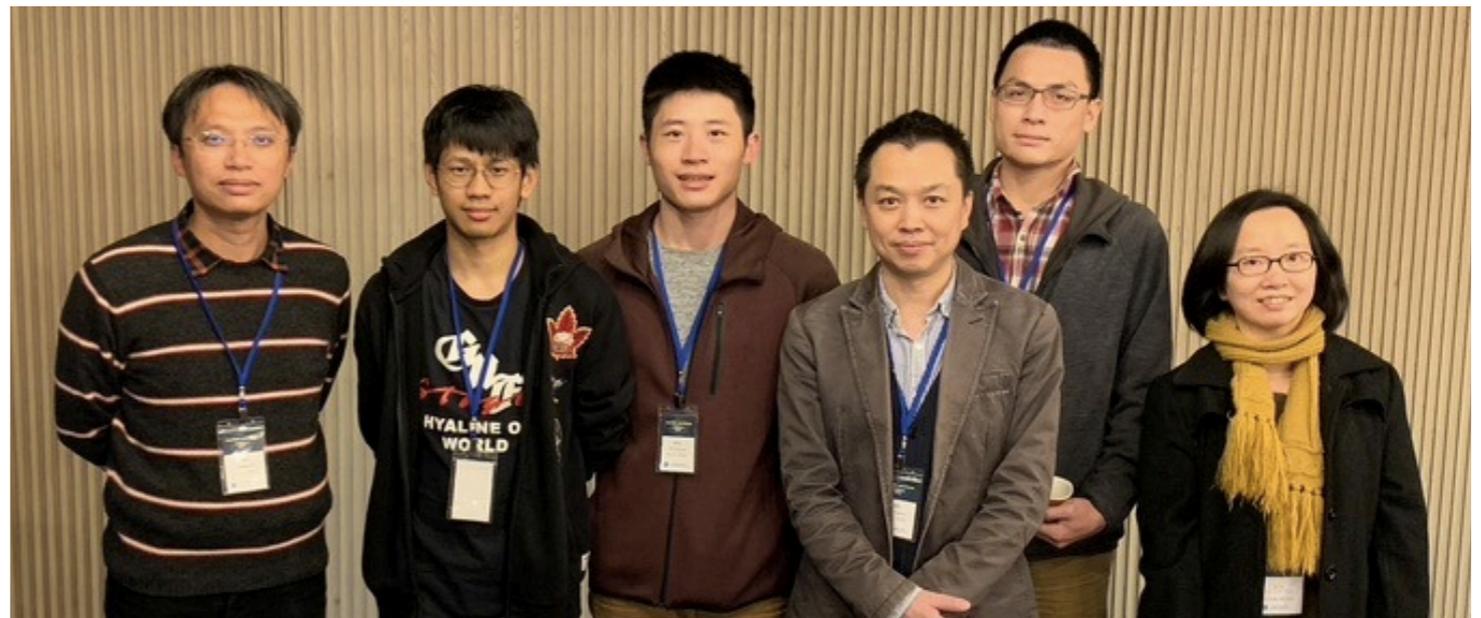
Taiwan INTT team



Ou-Wei Cheng



Kai-Yu Cheng

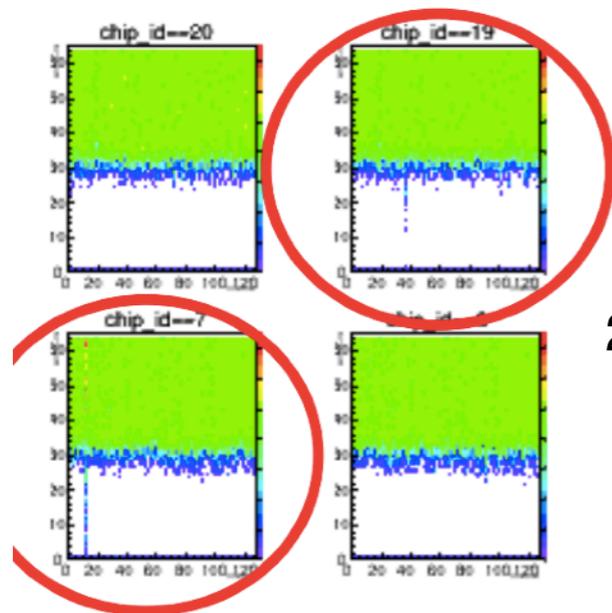


Chia-Ming Kuo Cheng-Wei Shih Lian-Sheng Tsai
Wei-Che Tang Rong-Shyang Lu Janny Huang

Channel classification : BNL

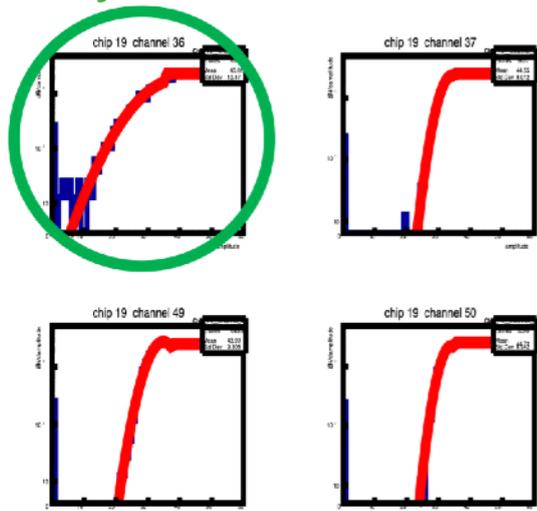


- Goal : try to classify good channel & bad channel.
- 2 algorithms so far, from BNL and me.



2 noisy channel in this case

Noisy channel



Every channel is fitted with gaussian

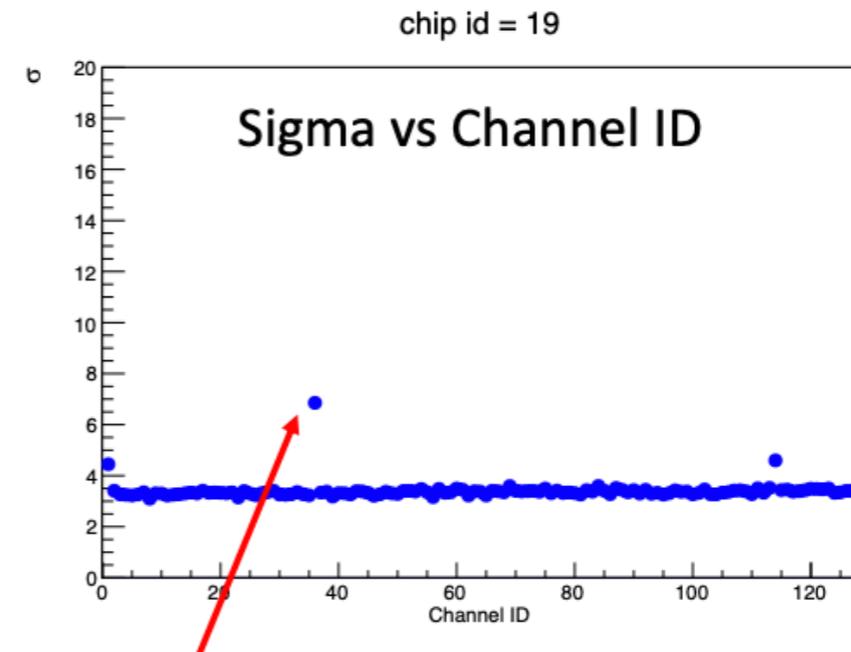
X axis : ampl

Y axis : entries

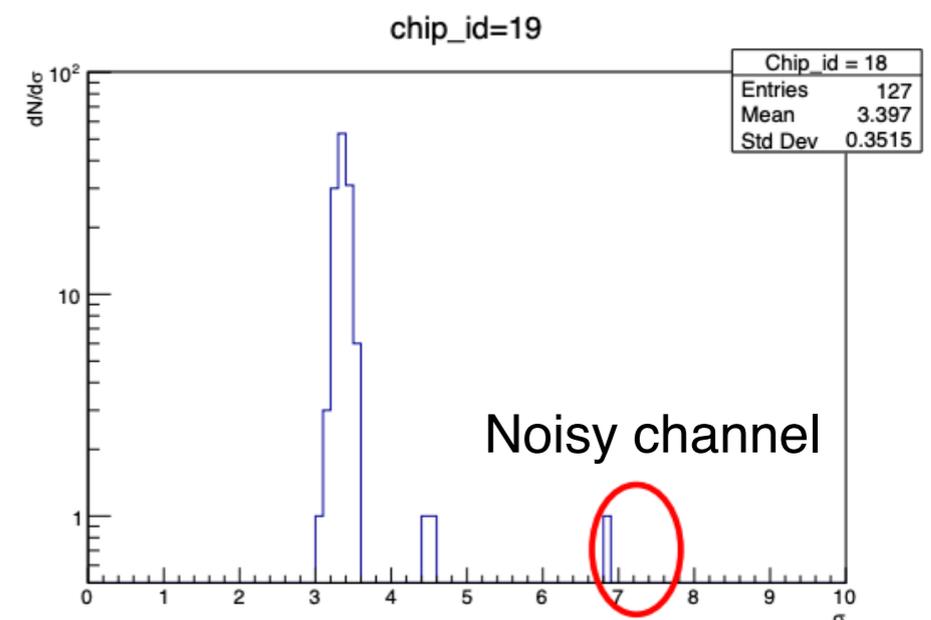
Fit function:

$$f(x) = \begin{cases} \text{Gaus}(x, \text{mean}, \text{sigma}), & x < a \\ \text{const}, & x \geq a \end{cases}$$

Require 20 runs of calibration test



Noisy channel

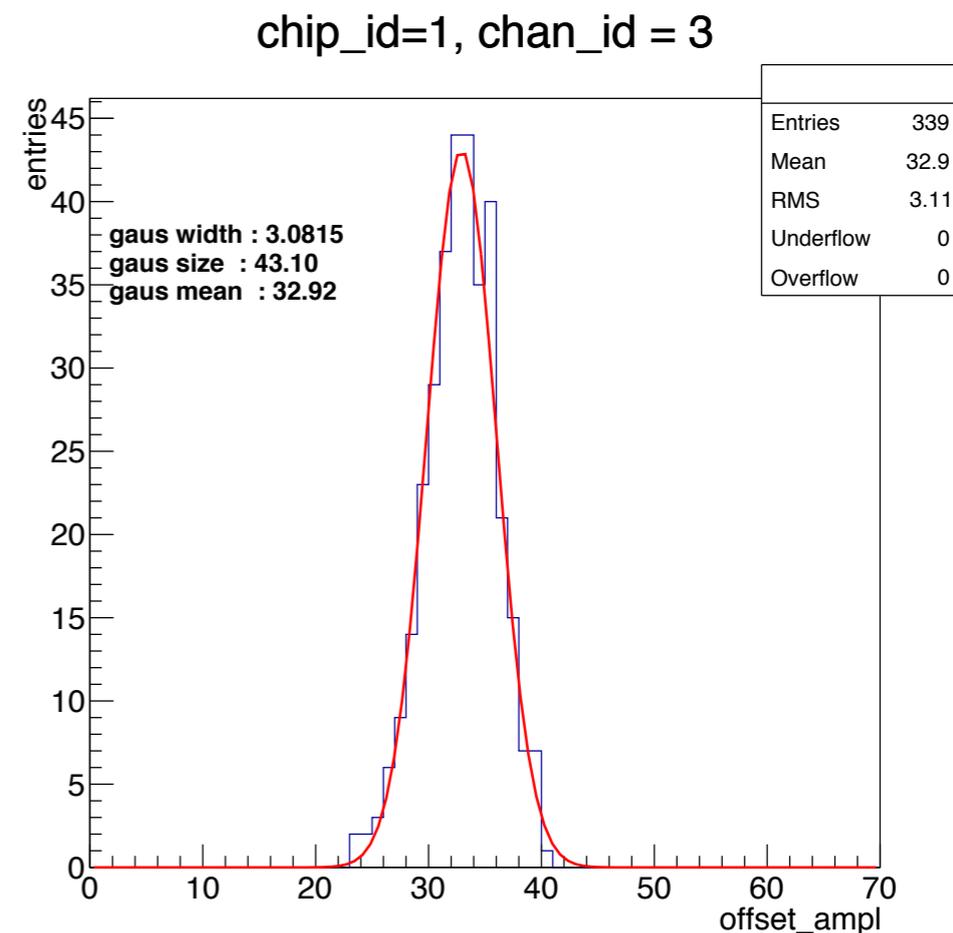
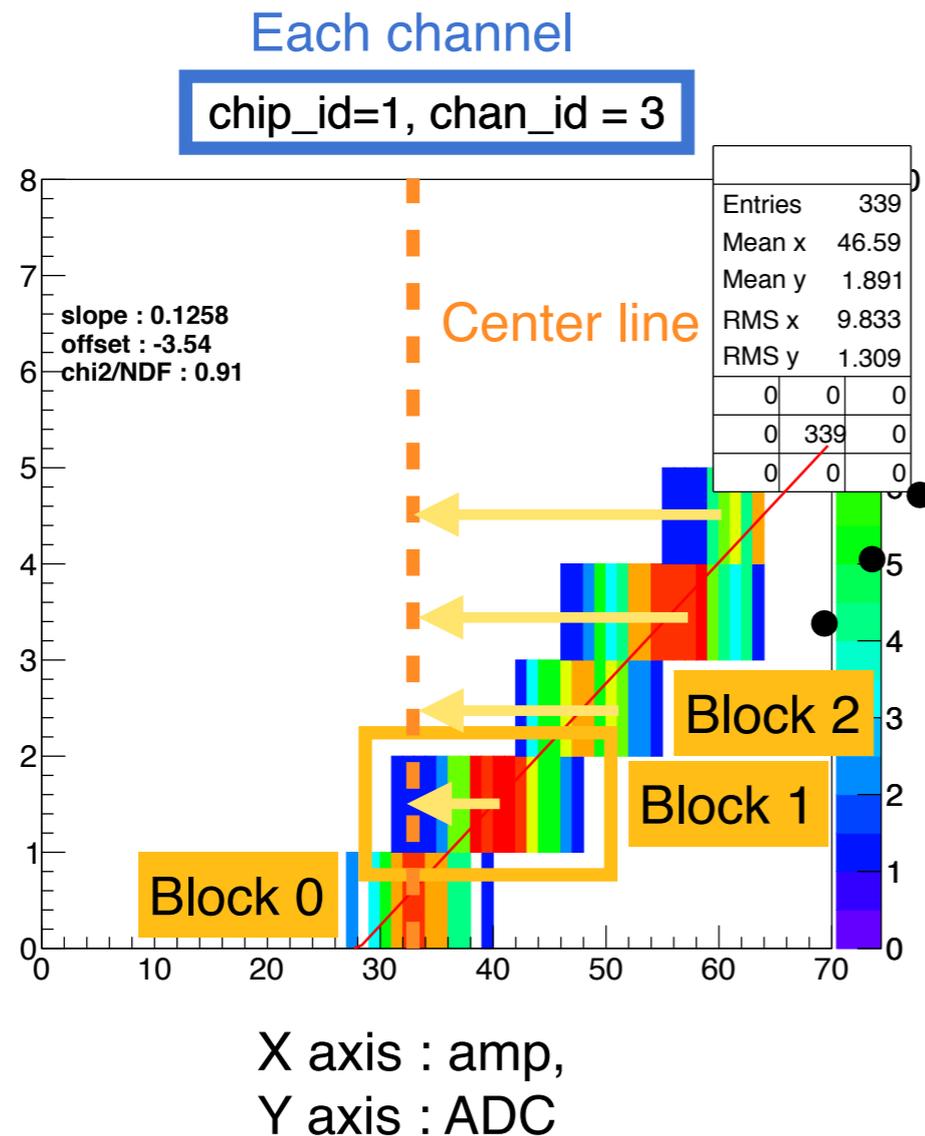


Noisy channel

Channel classification : Taiwan



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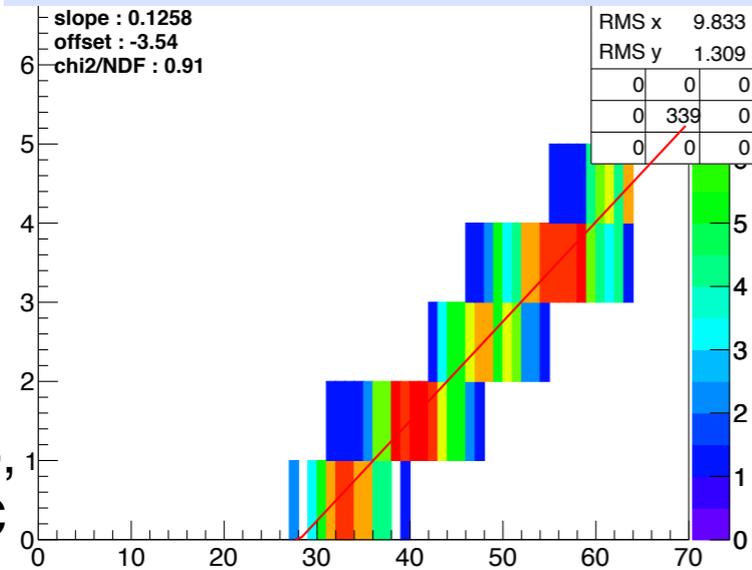


Channel classification : Taiwan



chip_id=1, chan_id = 3

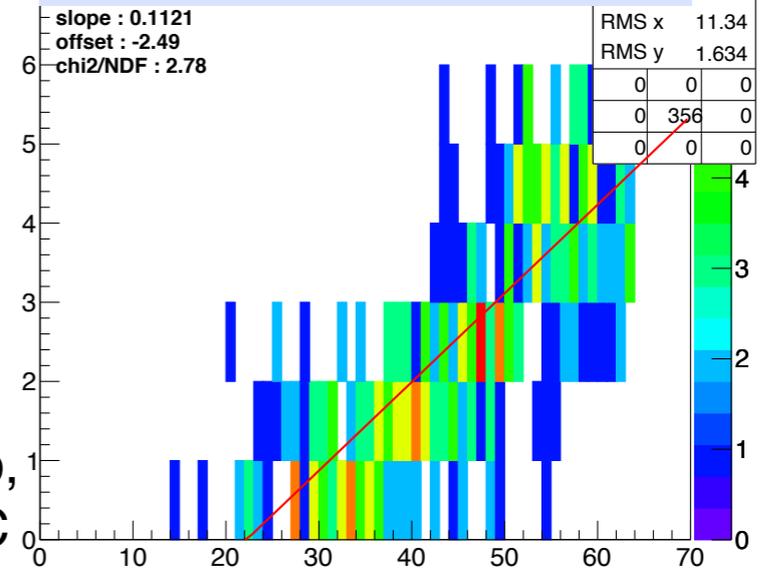
Example for functional channel



X axis : amp,
Y axis : ADC

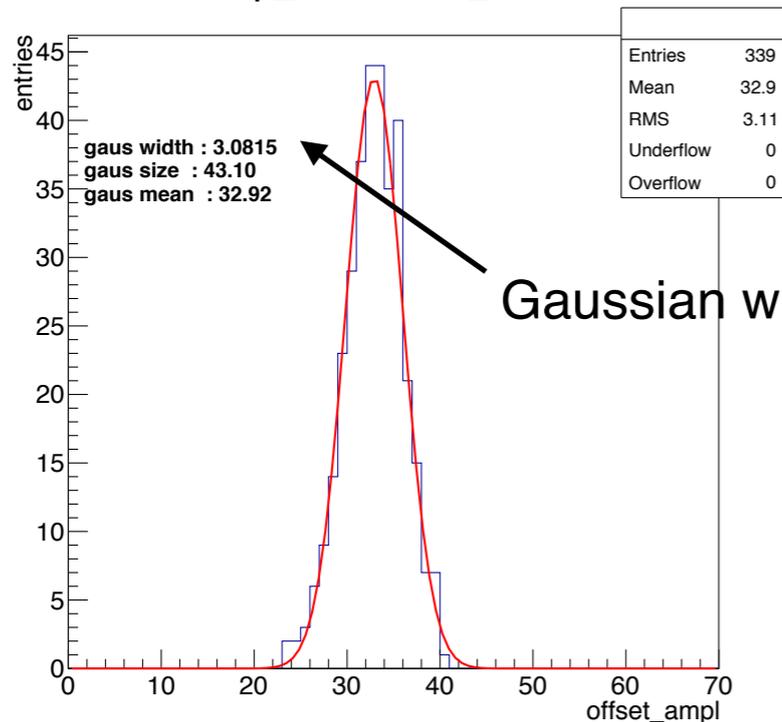
chip_id=7, chan_id = 12

Example for noisy channel



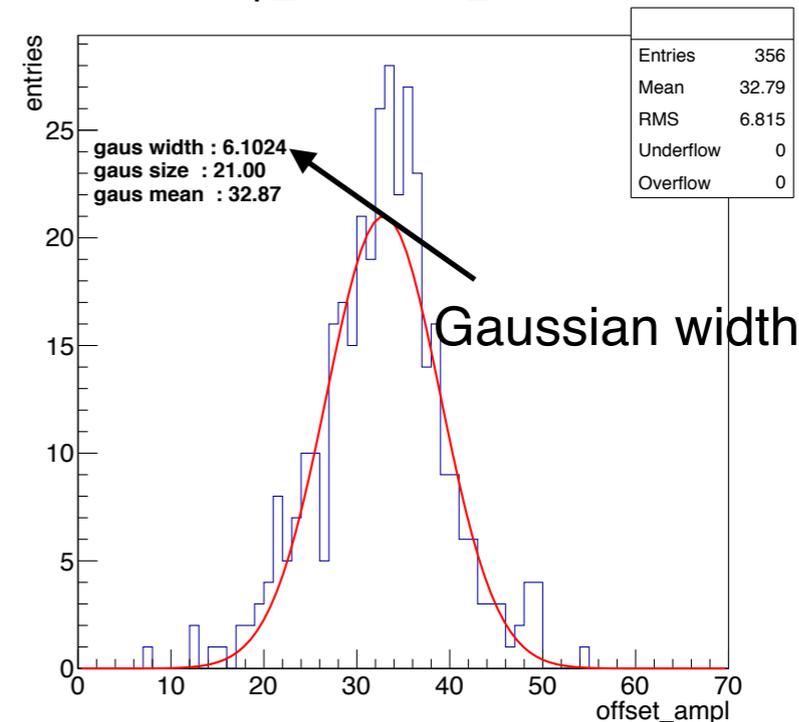
X axis : amp,
Y axis : ADC

chip_id=1, chan_id = 3



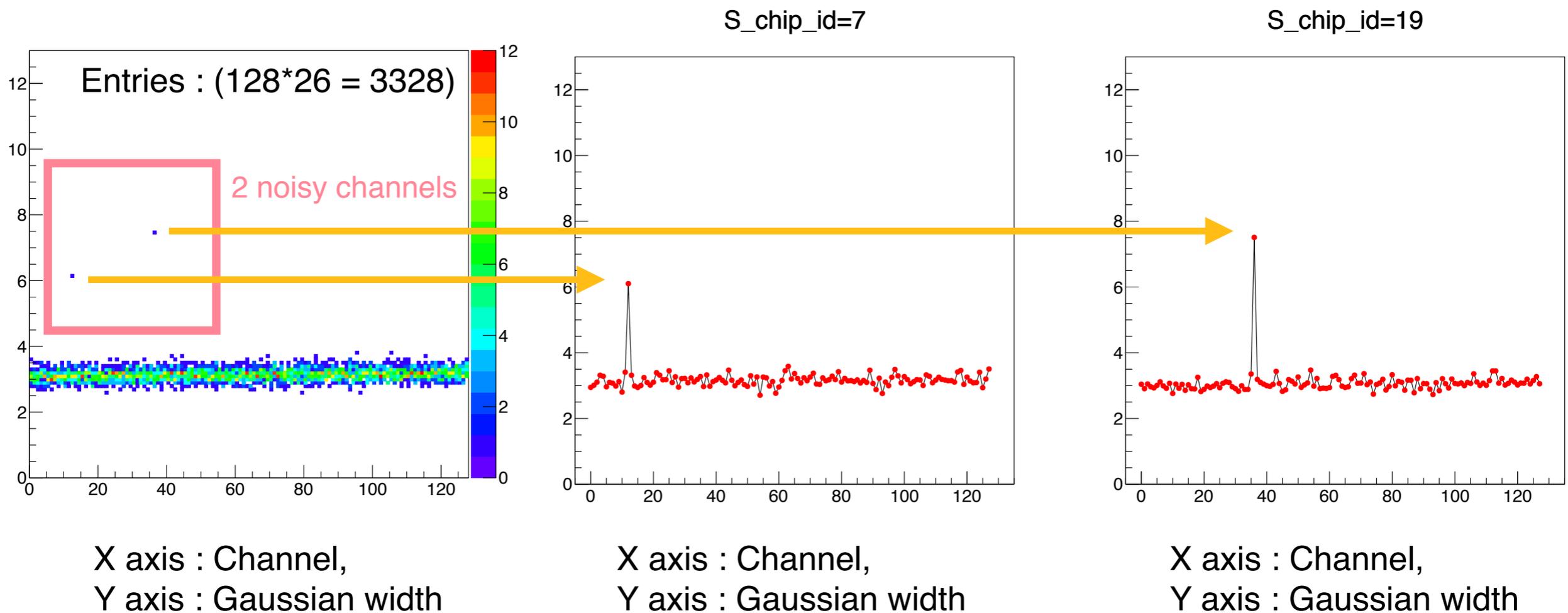
Gaussian width mostly < 4

chip_id=7, chan_id = 12



Gaussian width mostly > 4

Channel classification : Taiwan

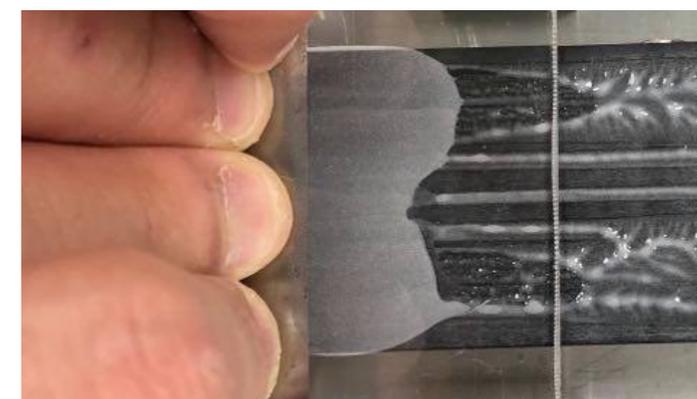


Faster and with better separation power

Ladder assembly



- Ladder glue issue
 - According to previous test, glue spreads well.
- To do
 - Test glue spread with full size acrylic plate.
 - Tune the gantry glue deposit parameters (more rings).
 - Optional : glue mask for applying glue (the same as BNL).



60 um SS plate in between



Thickness : 50um
Glue mask from BNL