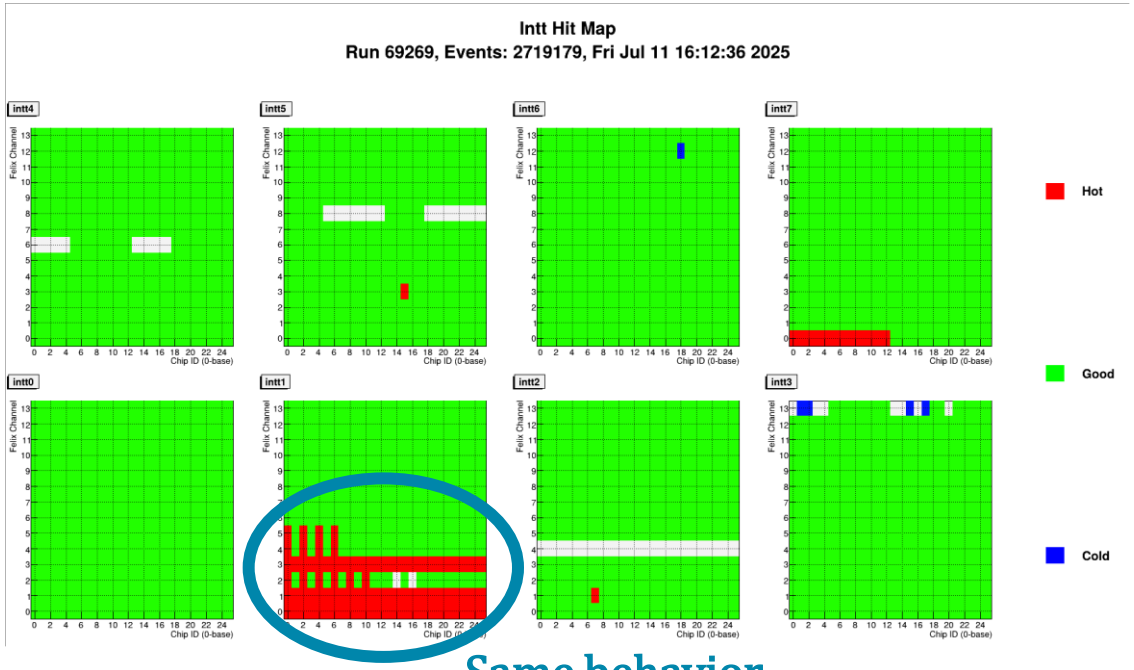
7/24　　Digital-Control-analysis

Rikkyo university M1　TOMOKI HARADA

Run number

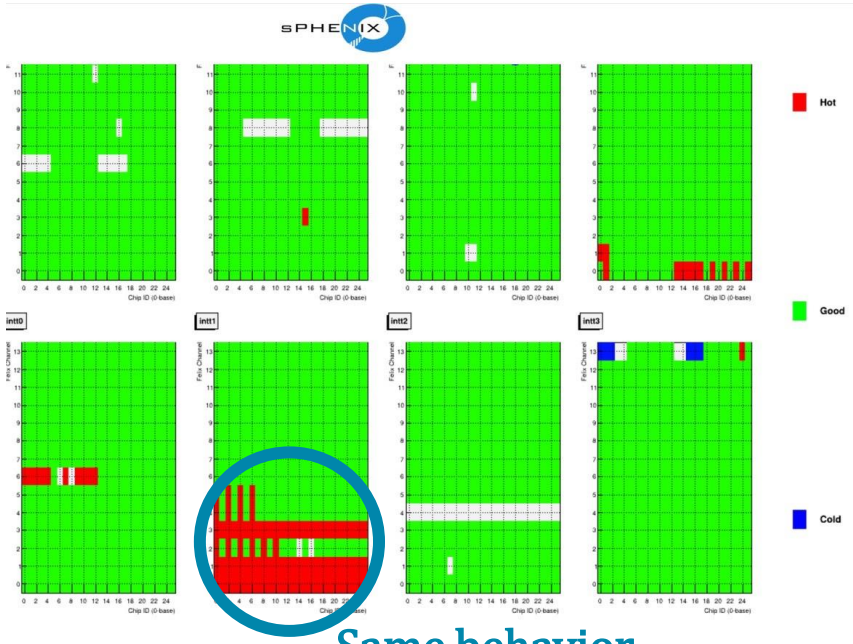
run#69268, 69269　　10min, physics×2



Same behavior

・We took the Digital-control test data twice as Physics.
・The settings for these two runs are exactly same.

・I changed digital-control parameter of some chips in intt1 as reference to see whether digital-control were reflected or not. These chips became to be HOT-CHIPS, sorry 🙇



Same behavior

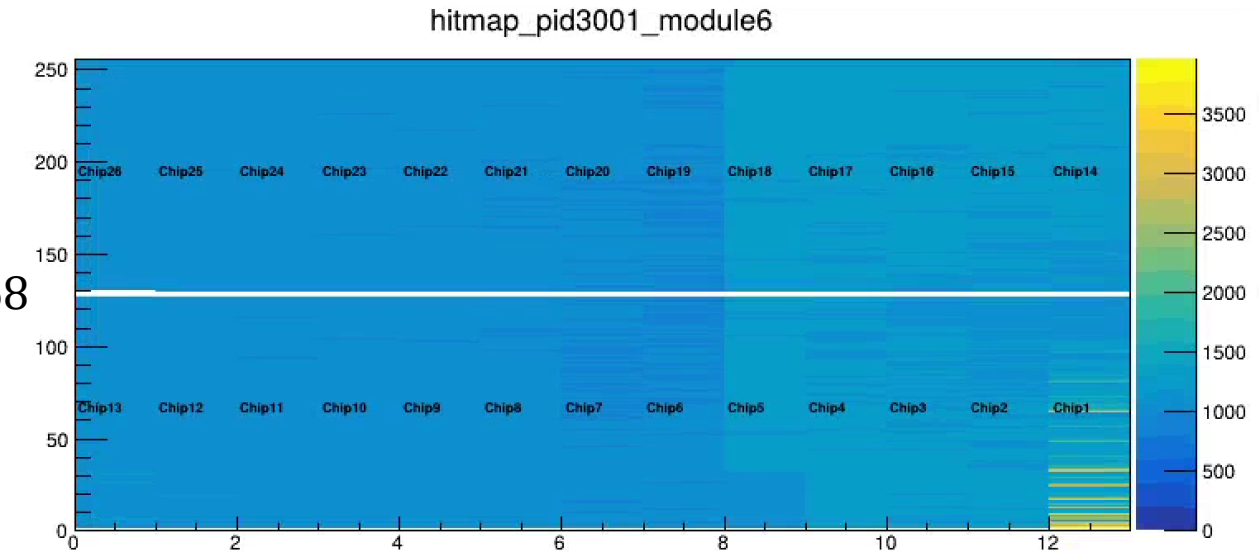
run#68016
(previous data of Digital-Control test on June 20)

```
#Just for reference

1  0  *  0
1  1  *  0
1  2  1  0
1  2  3  0
1  2  5  0
1  2  7  0
1  2  9  0
1  2  11 0

1  3  *  4
1  3  *  6

1  4  1  4
1  4  1  6
1  4  3  4
1  4  3  6
1  4  5  4
1  4  5  6
1  4  7  4
1  4  7  6

1  5  1  12
1  5  1  14
1  5  3  12
1  5  3  14
1  5  5  12
1  5  5  14
1  5  7  12
1  5  7  14
```

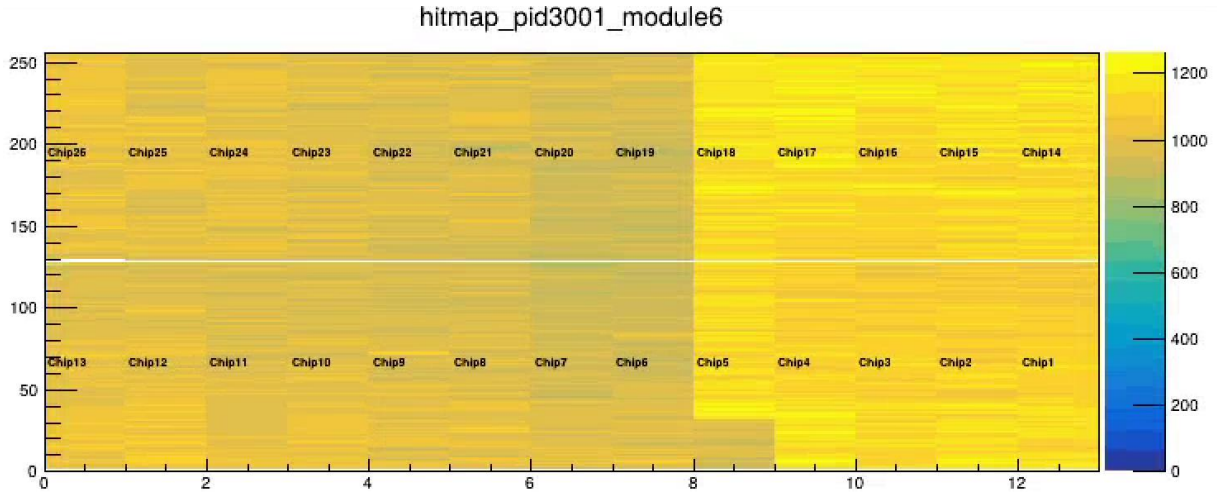
Viewing half-entry-chips Run69268, 69269

Felix Server	0
pid	3001
module	6
chip id	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13

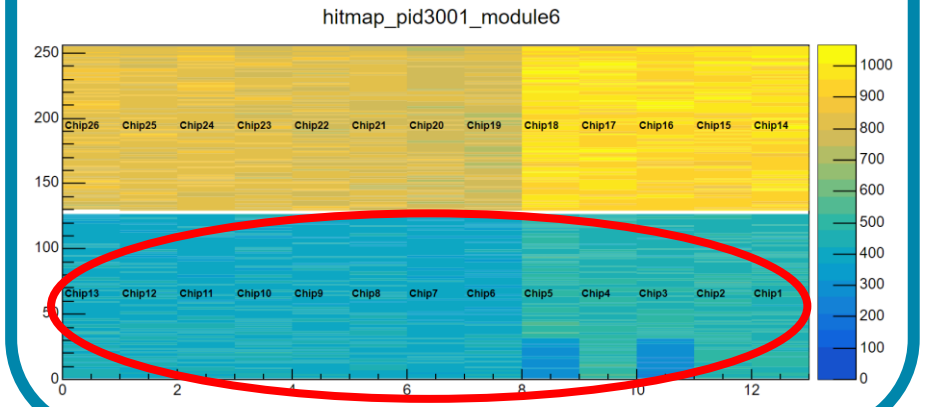
RUN69268



RUN69269

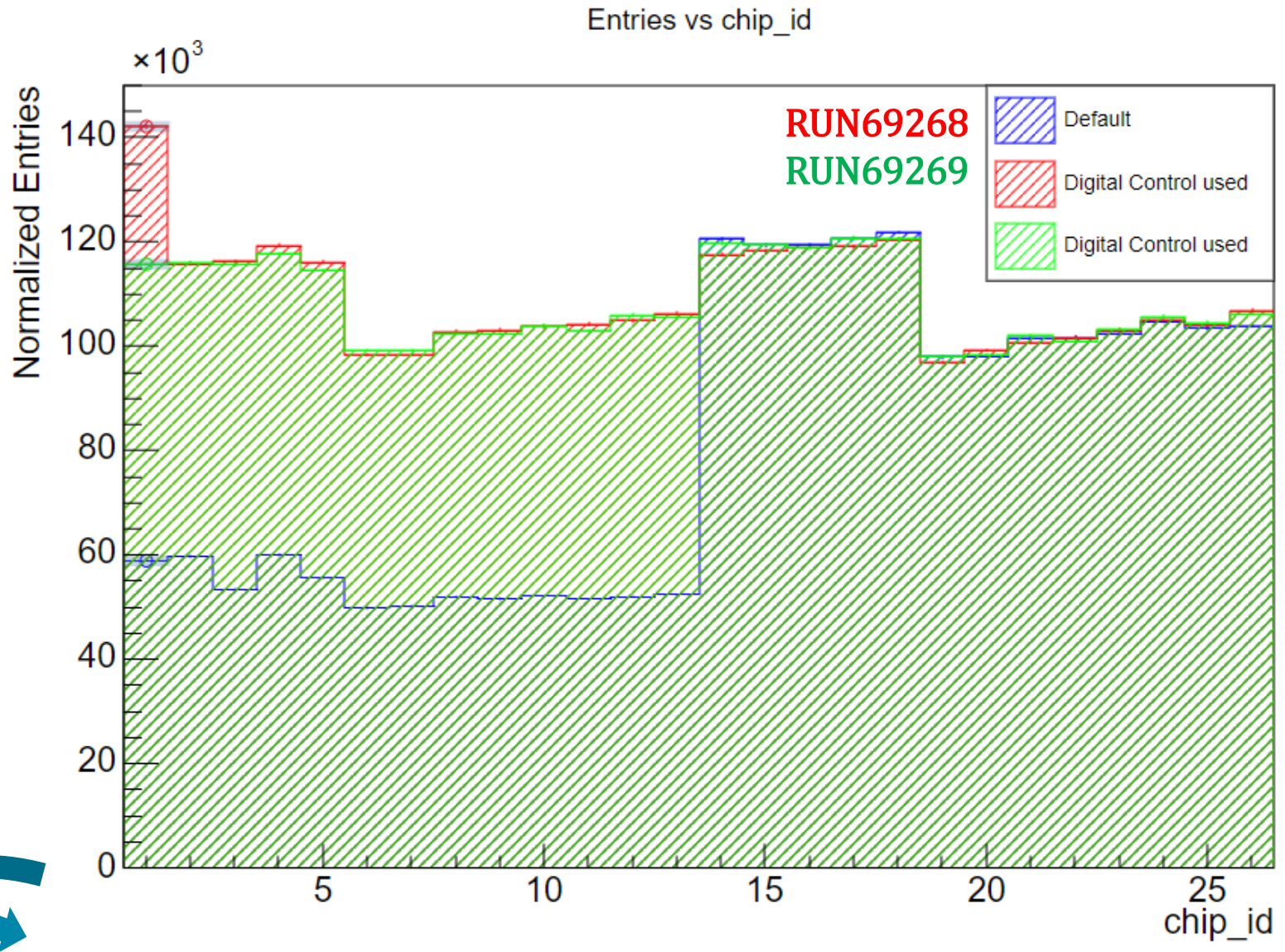


Half-entry-chips on HITMAP (default data)



Viewing half-entry-chips Run69268, 69269

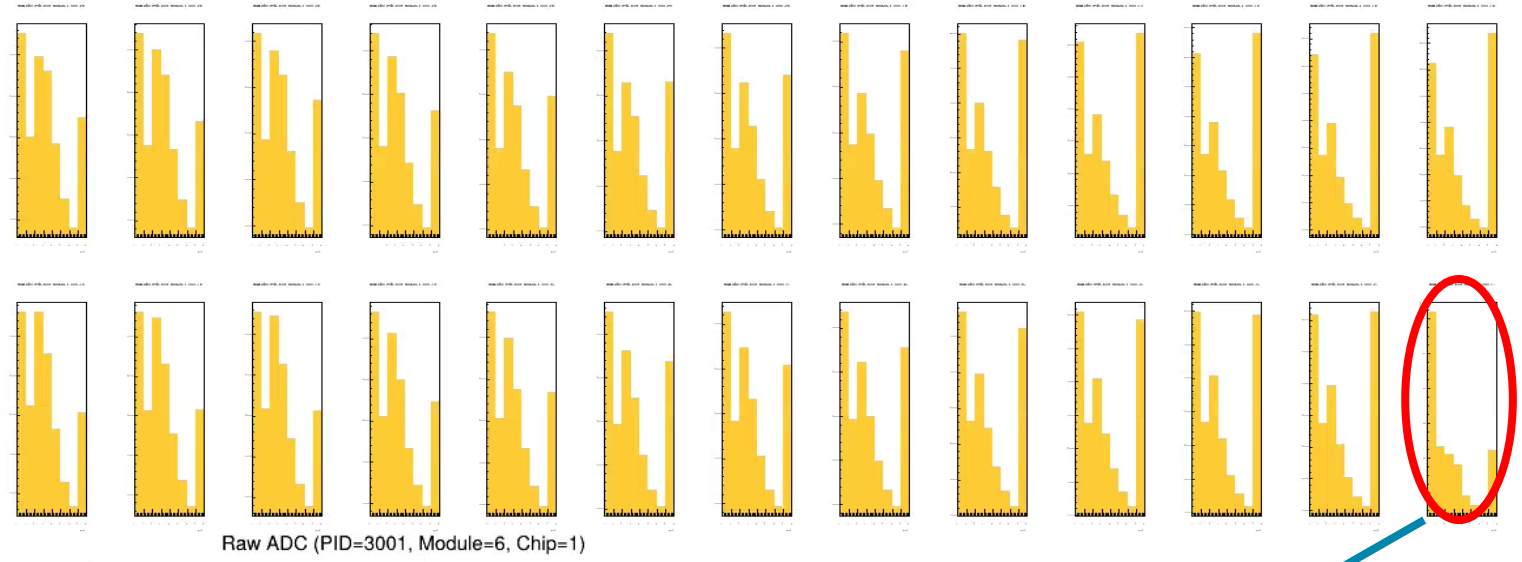
Felix Server	0
pid	3001
module	6
chip id	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13

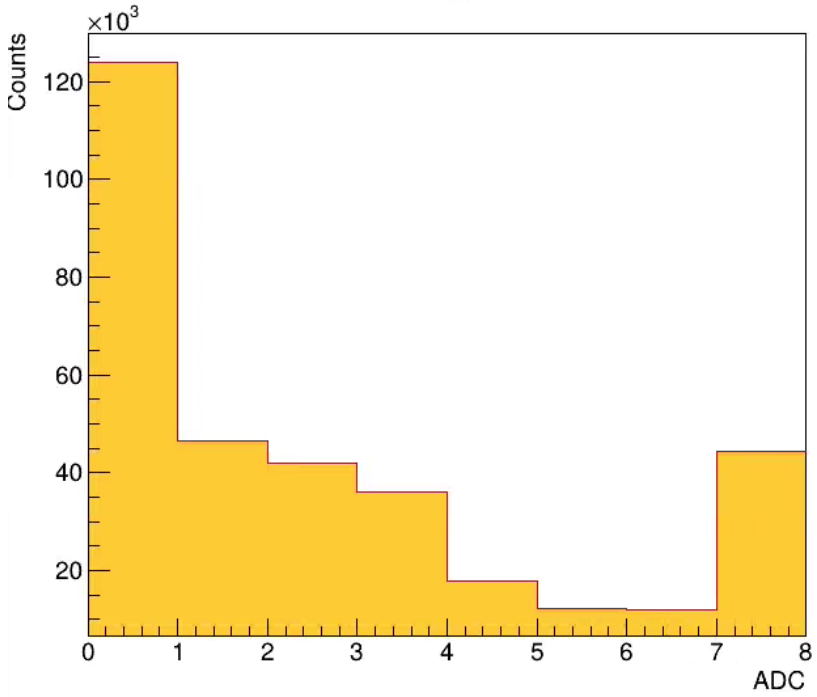


Check the adc distribution

Viewing half-entry-chips Run69268, 69269

Felix Server	0
pid	3001
module	6
chip id	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13

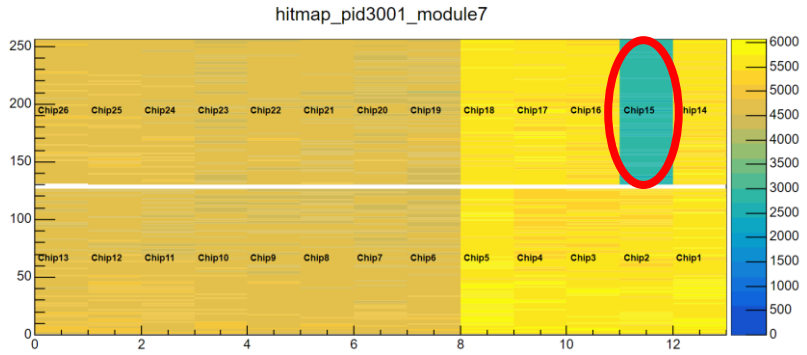




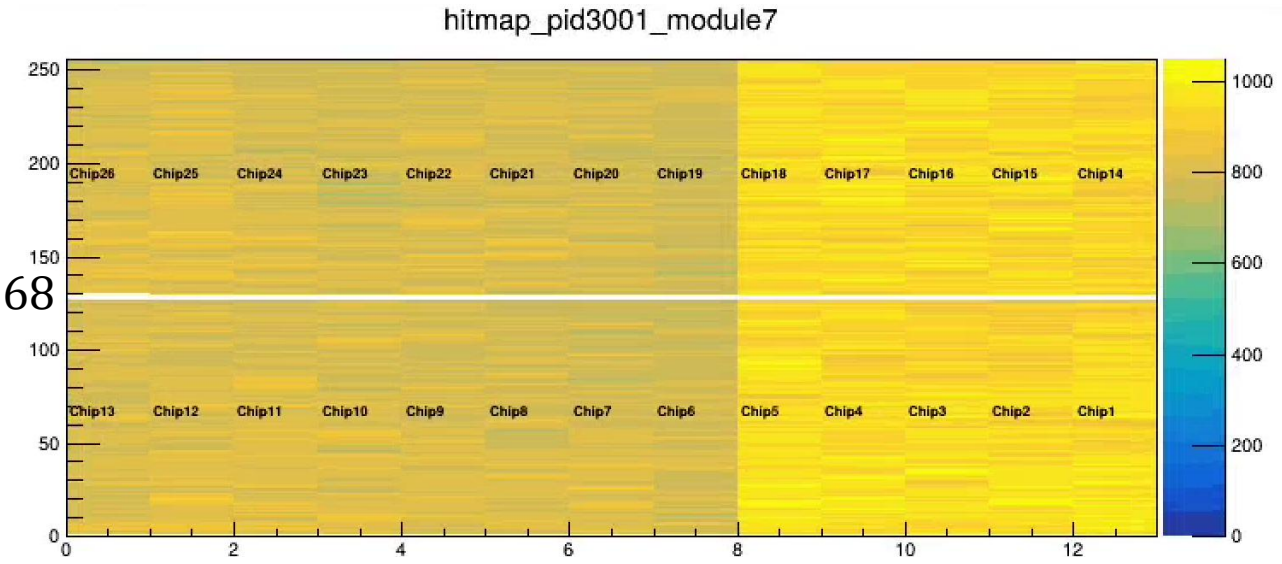
Viewing half-entry-chips Run69268, 69269

Felix Server	0
pid	3001
module	7
chip id	15

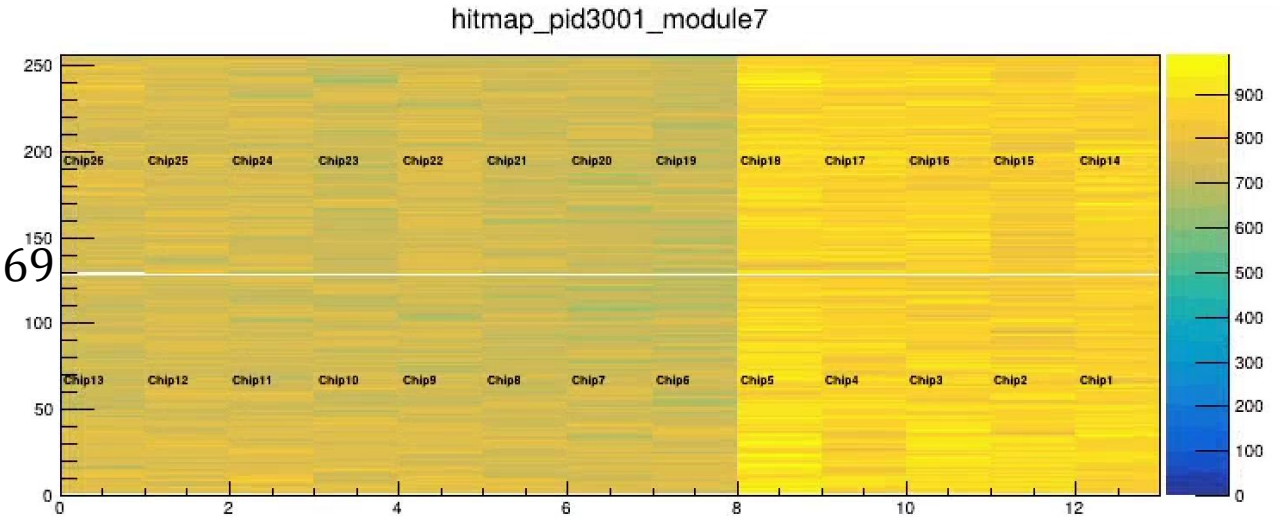
Half-entry-chips on HITMAP (default data)



RUN69268

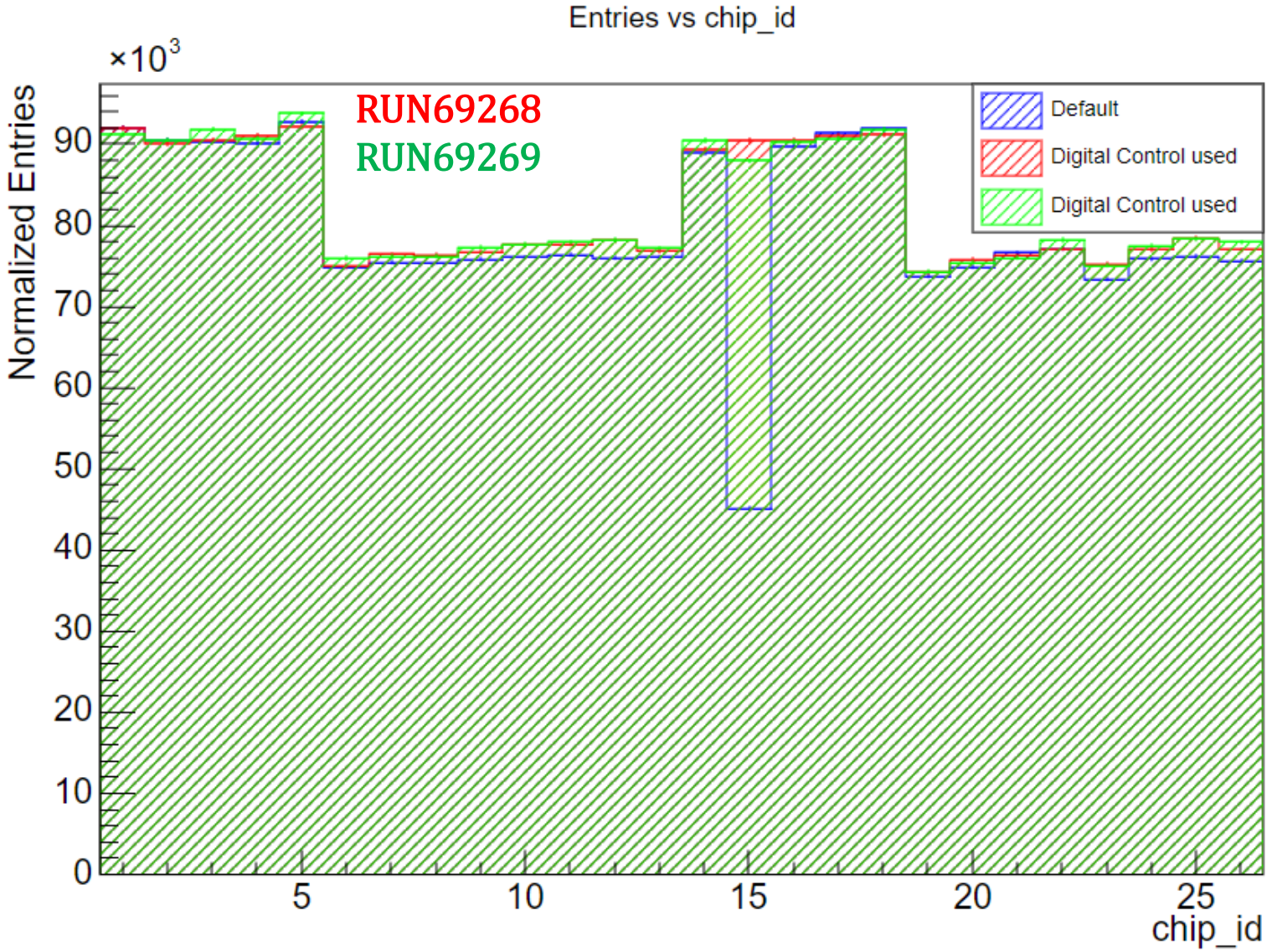


RUN69269



Viewing half-entry-chips Run69268, 69269

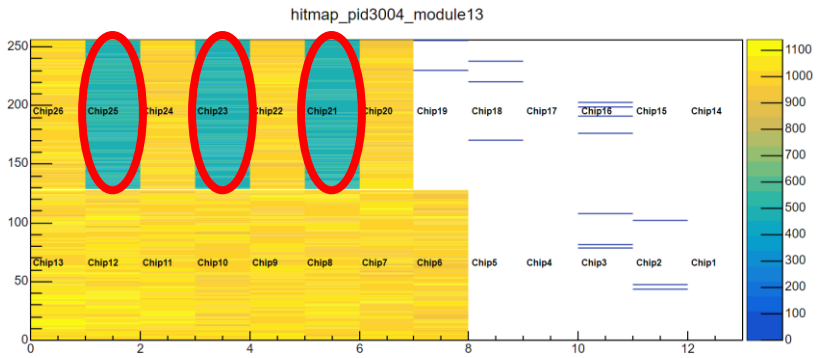
Felix Server	0
pid	3001
module	7
chip id	15



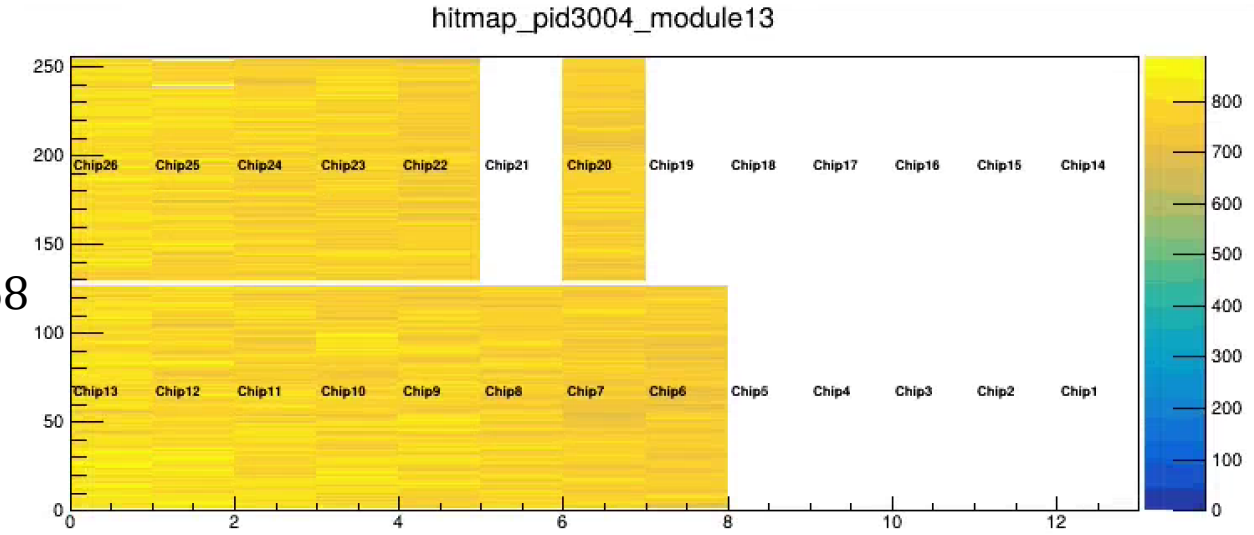
Viewing half-entry-chips Run69268, 69269

Felix Server	3
pid	3004
module	13
chip id	21, 23, 25

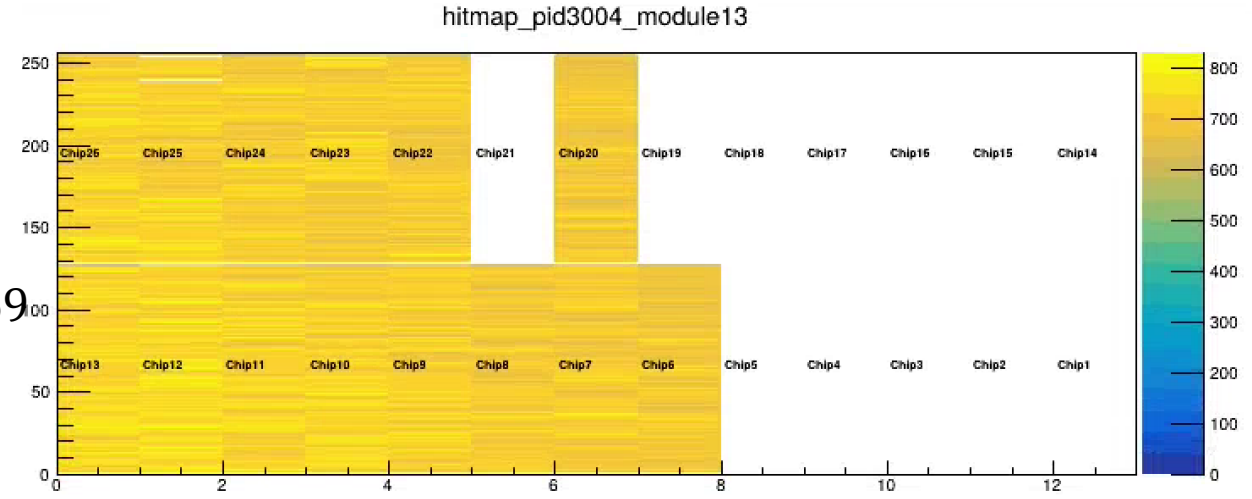
Half-entry-chips on HITMAP (default data)



RUN69268

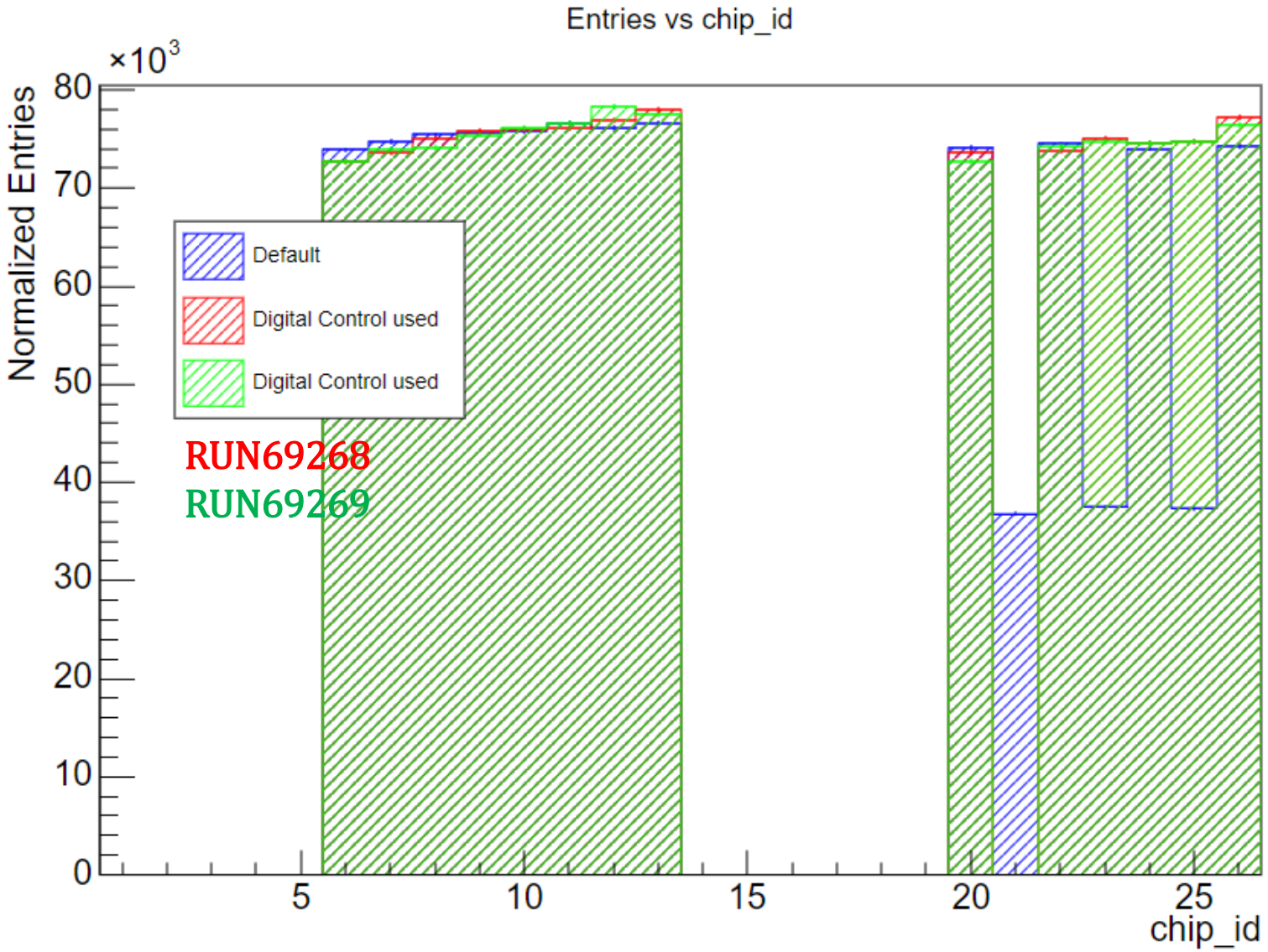


RUN69269

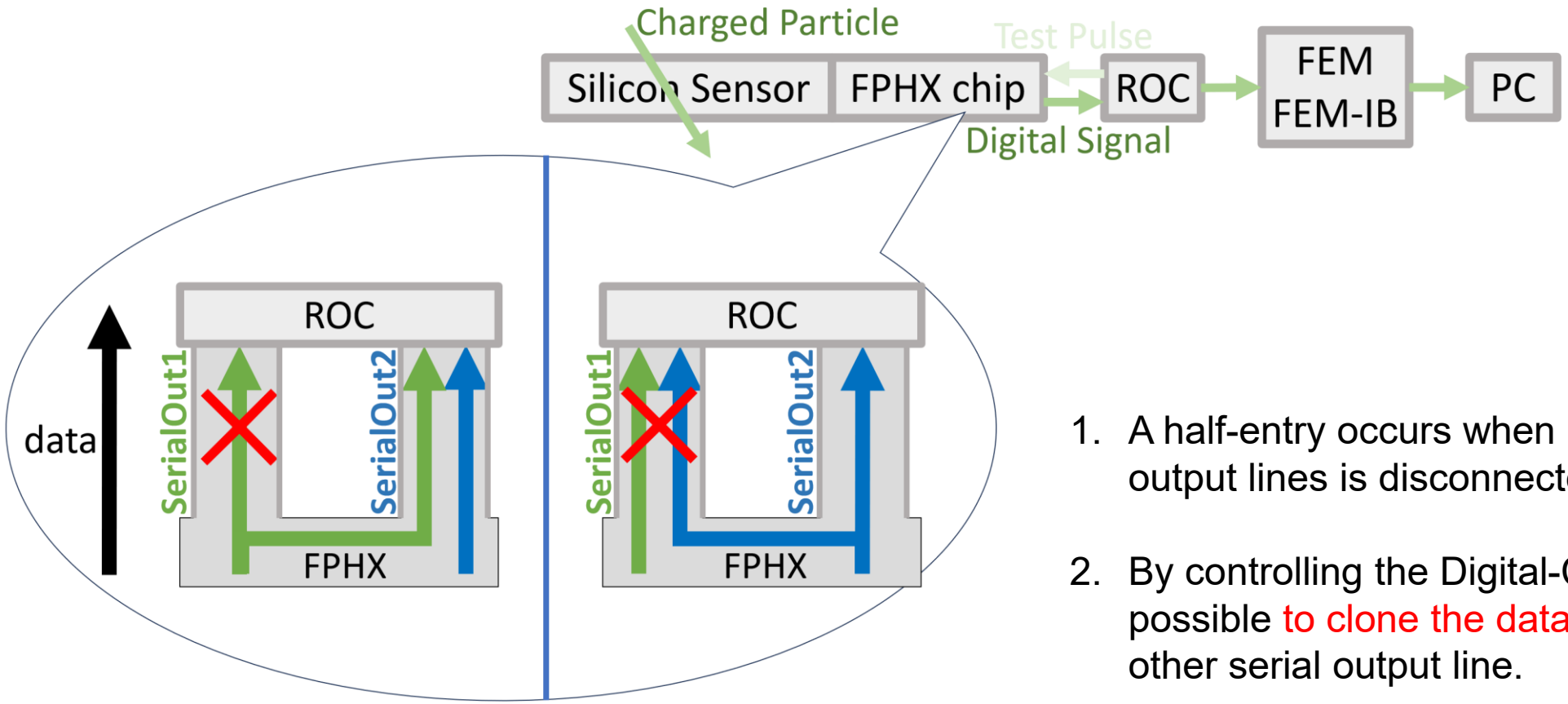


Viewing half-entry-chips Run69268, 69269

Felix Server	3
pid	3004
module	13
chip id	21, 23, 25



Viewing half-entry-chips Run69268, 69269

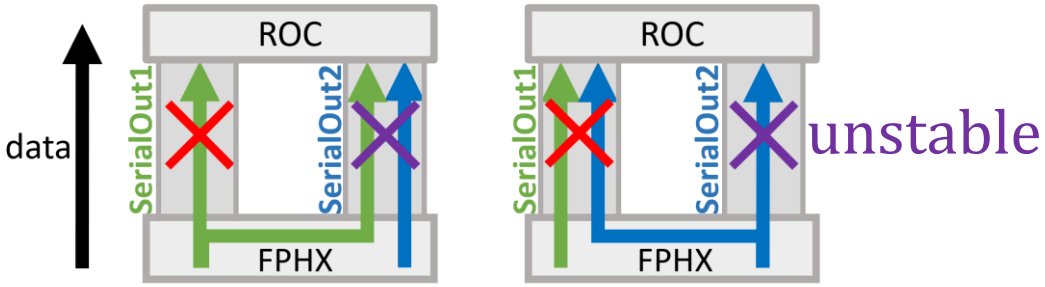


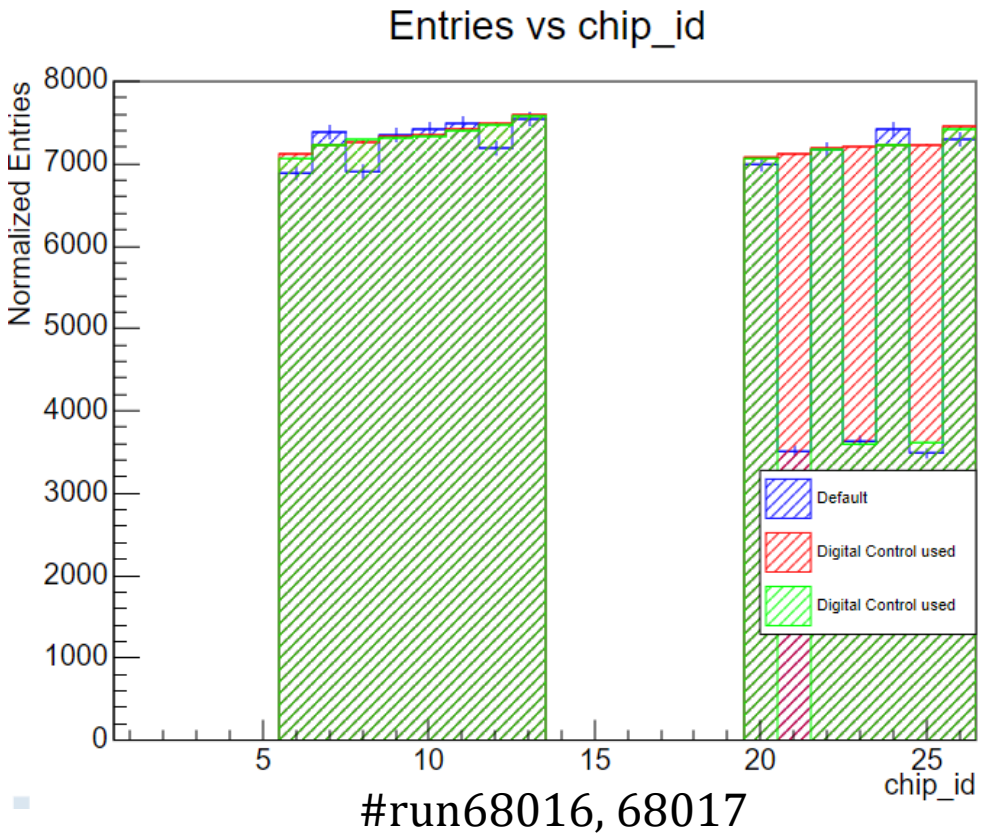
1. A half-entry occurs when one of the two serial output lines is disconnected from FPHX to ROC.

2. By controlling the Digital-Control parameters, it is possible to clone the data and send it through the other serial output line.

3. If the disconnected line and the cloned direction match, the number of entries is expected to recover to normal. If they do not match, the half-entry condition is expected to remain.

Viewing half-entry-chips Run69268, 69269





#run68016, 68017

Hypothesis

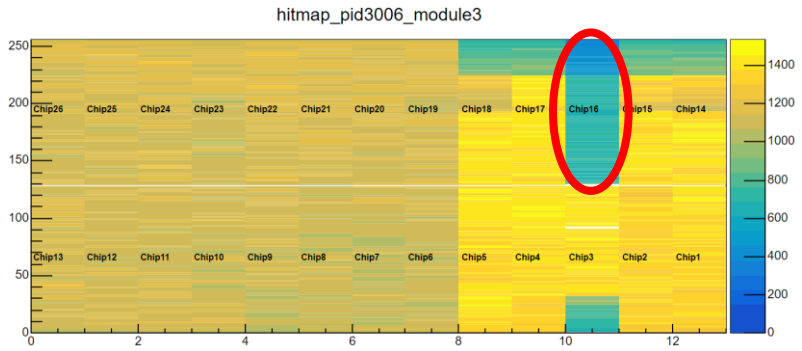
・In this chip, one of the output-line is disconnected, and also another output-line seems to be unstable.
→become to be no-entry.

Should we not touch this chip?
or
If it's going to be judged as a cold chip, should we try to use Digital-control?

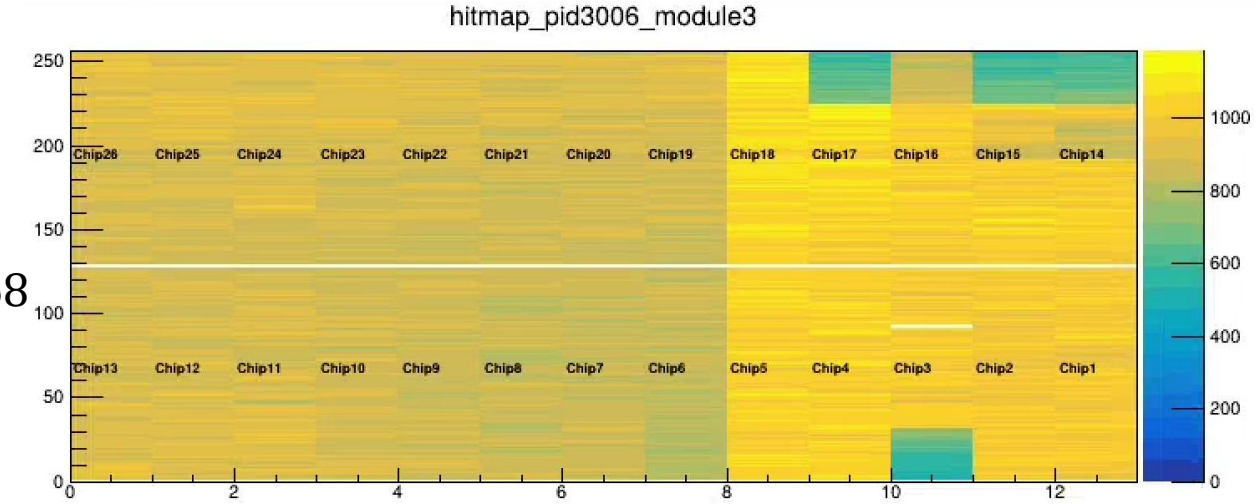
Viewing half-entry-chips Run69268, 69269

Felix Server	5
pid	3006
module	3
chip id	16

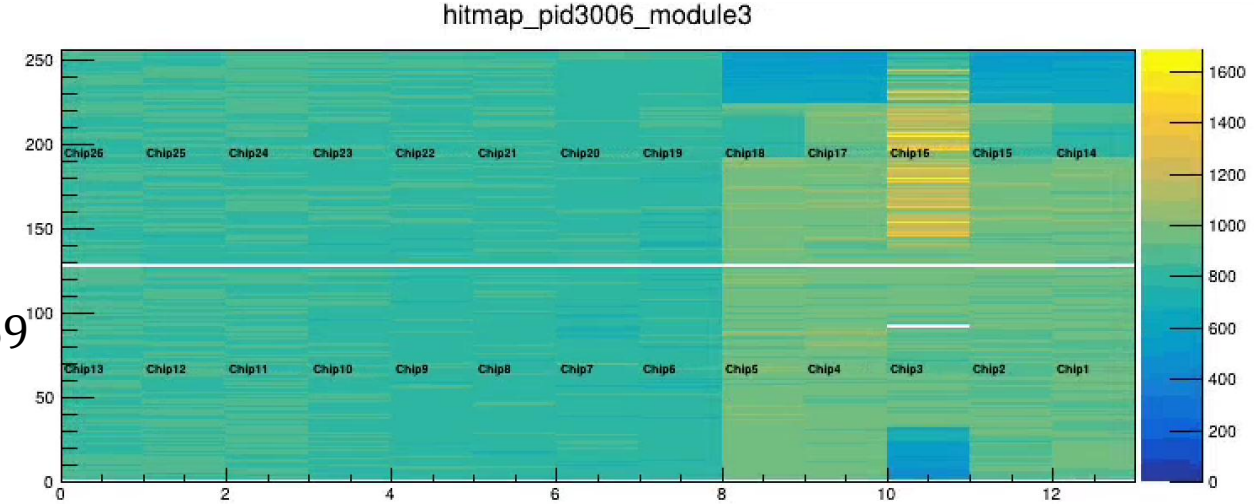
Half-entry-chips on HITMAP (default data)



RUN69268

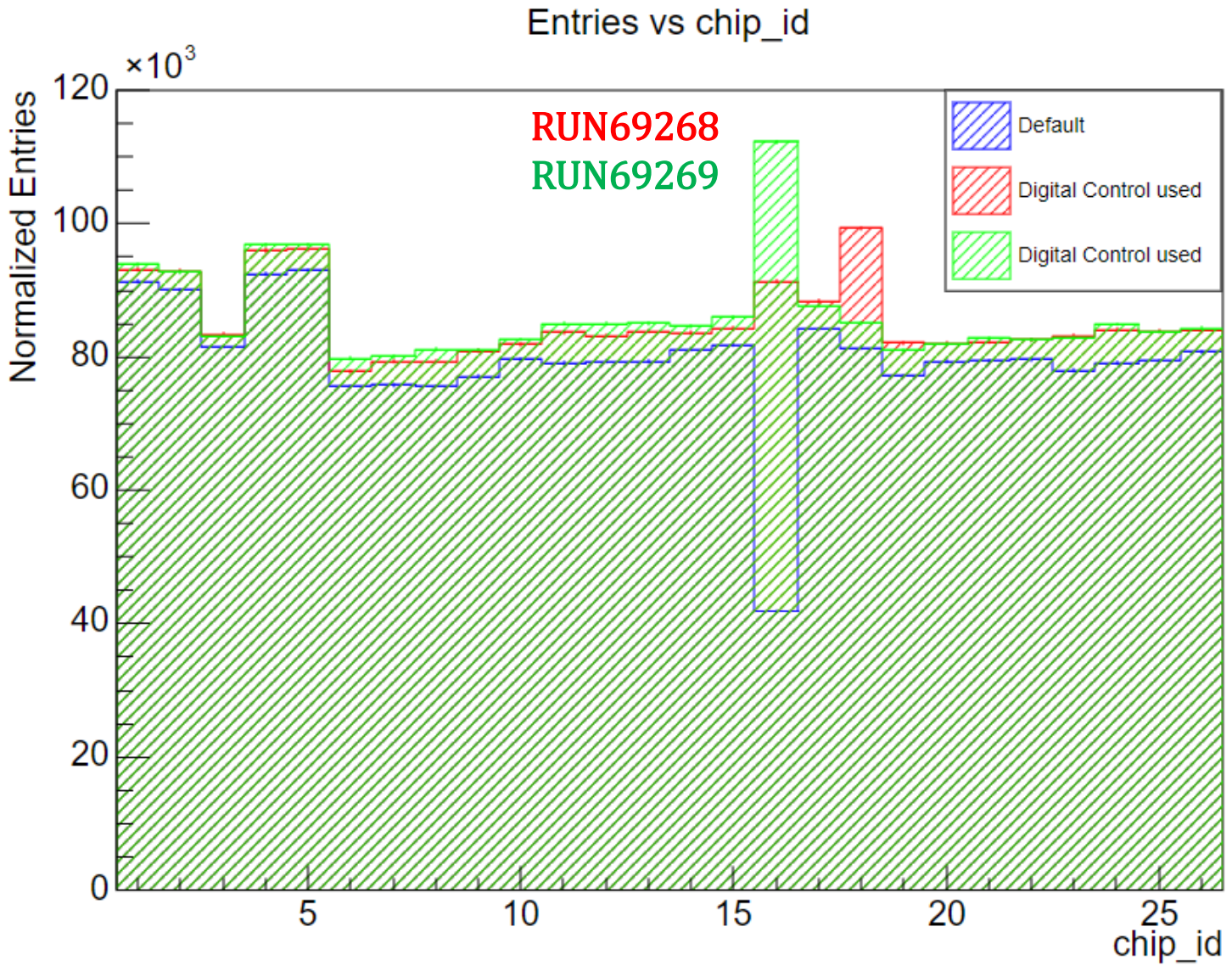


RUN69269



Viewing half-entry-chips Run69268, 69269

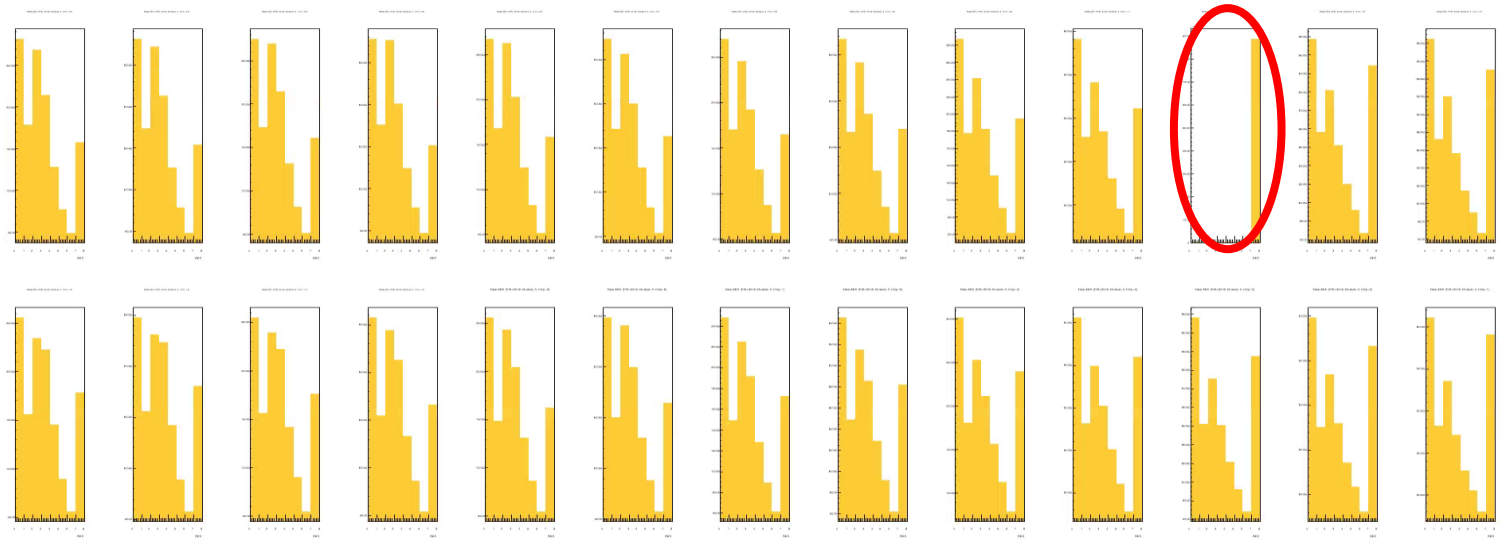
Felix Server	5
pid	3006
module	3
chip id	16

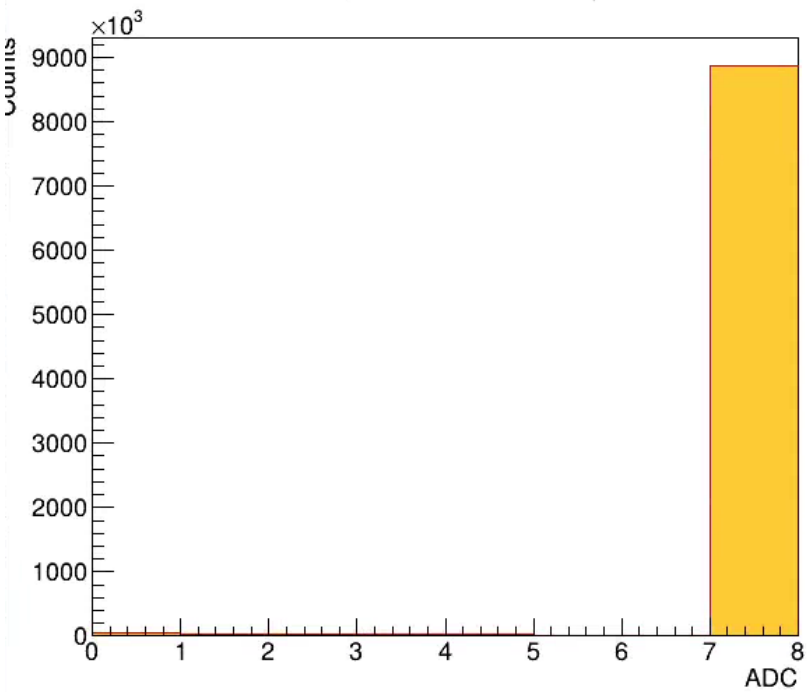


Check the adc distribution

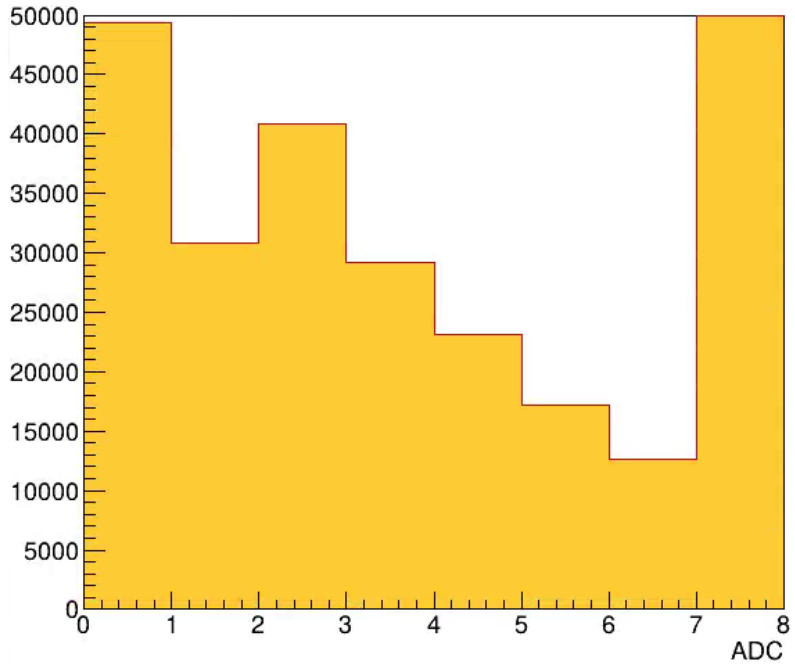
Viewing half-entry-chips Run69268, 69269

Felix Server	5
pid	3006
module	3
chip id	16





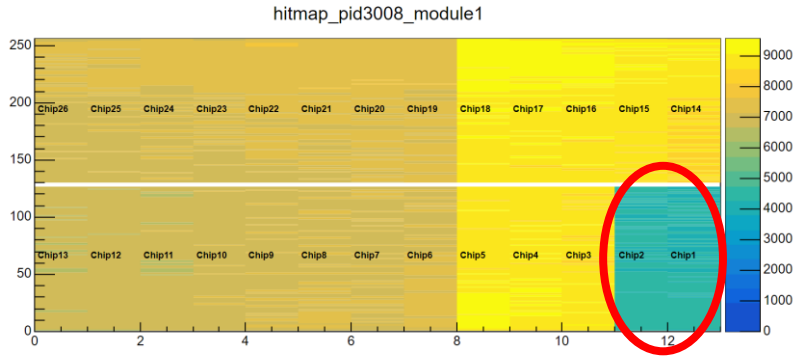
zoom



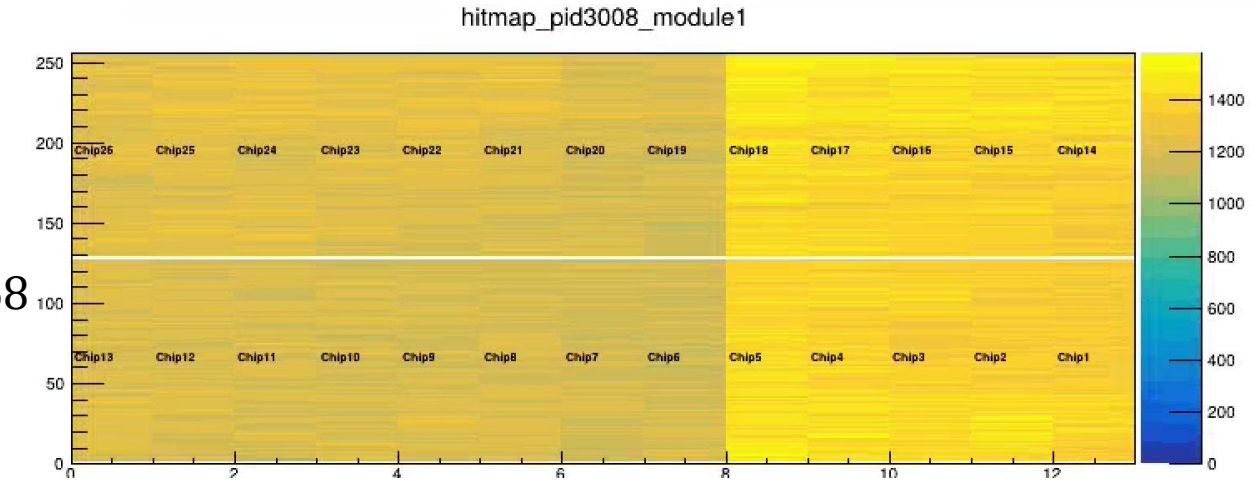
Viewing half-entry-chips Run69268, 69269

Felix Server	7
pid	3008
module	1
chip id	1, 2

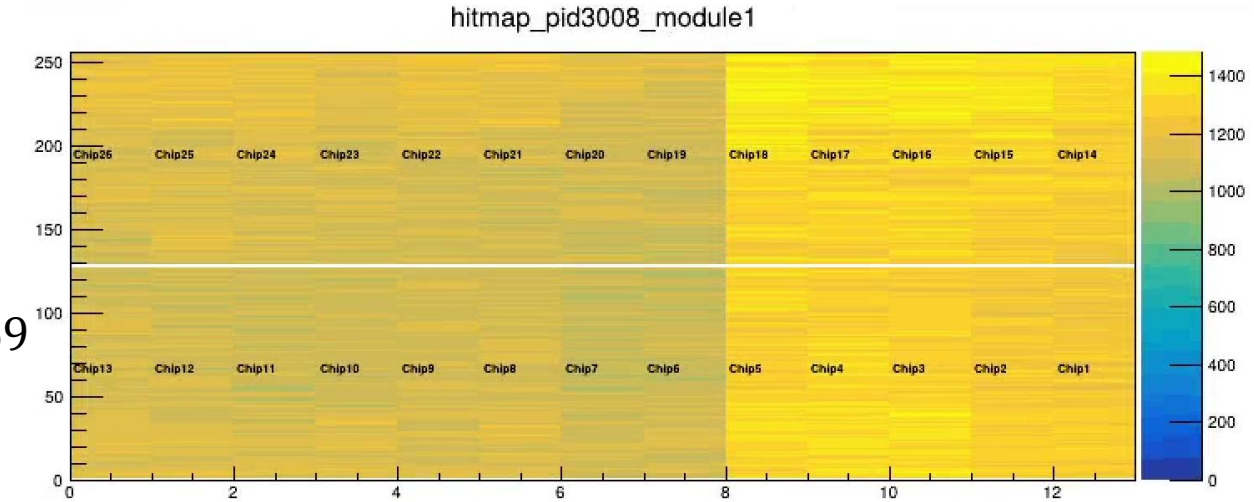
Half-entry-chips on HITMAP (default data)



RUN69268

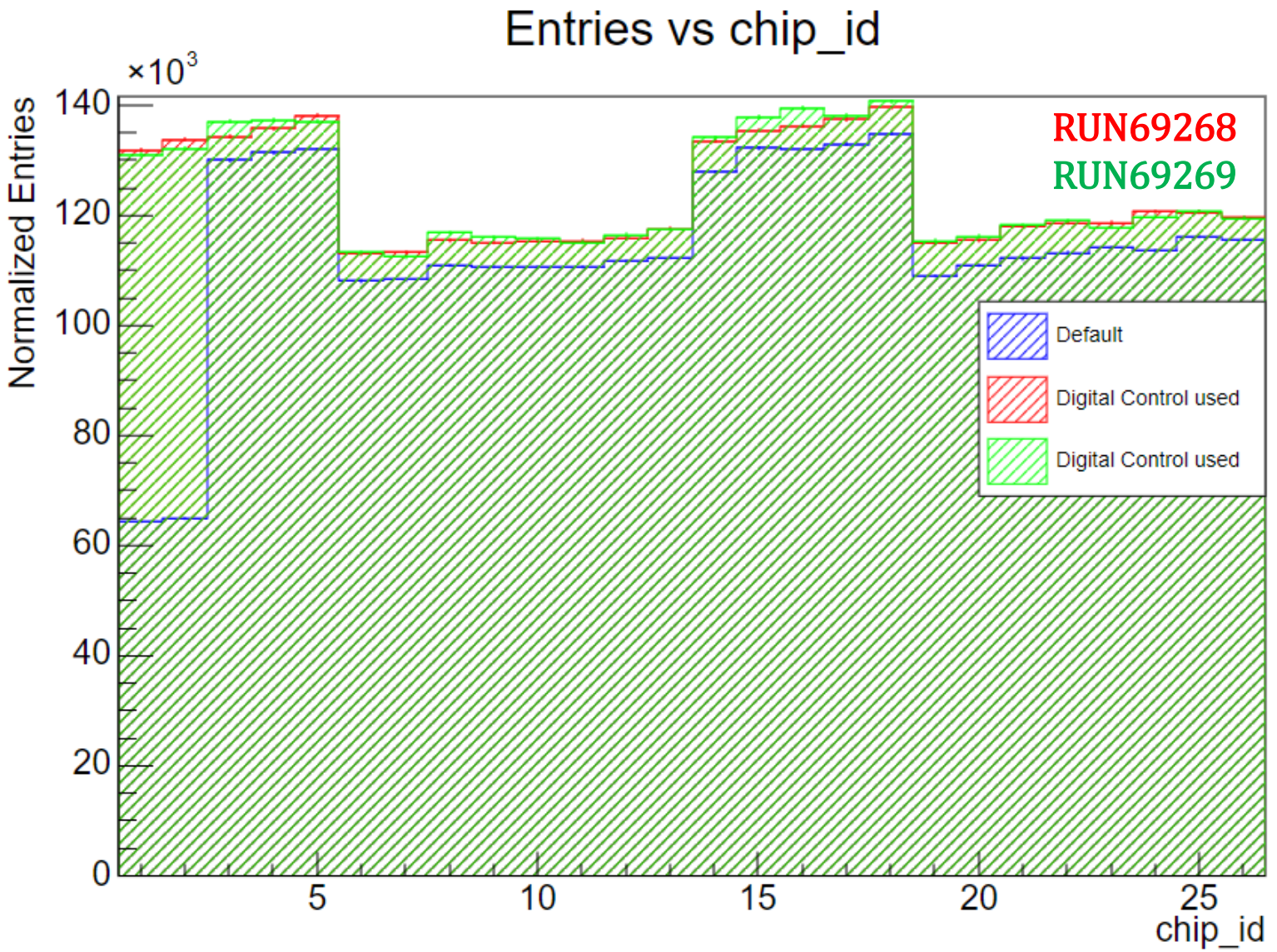


RUN69269



Viewing half-entry-chips Run69268, 69269

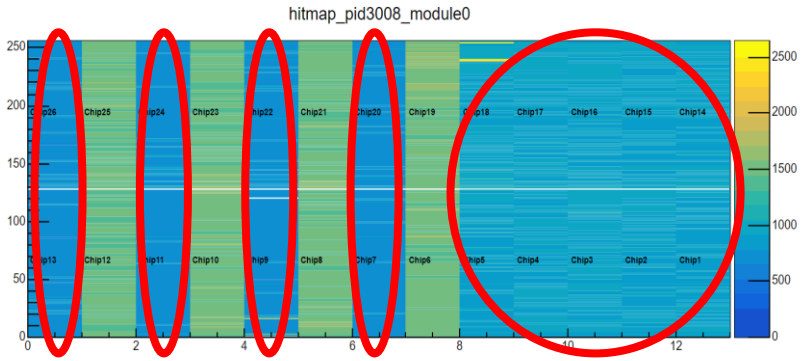
Felix Server	7
pid	3008
module	1
chip id	1, 2



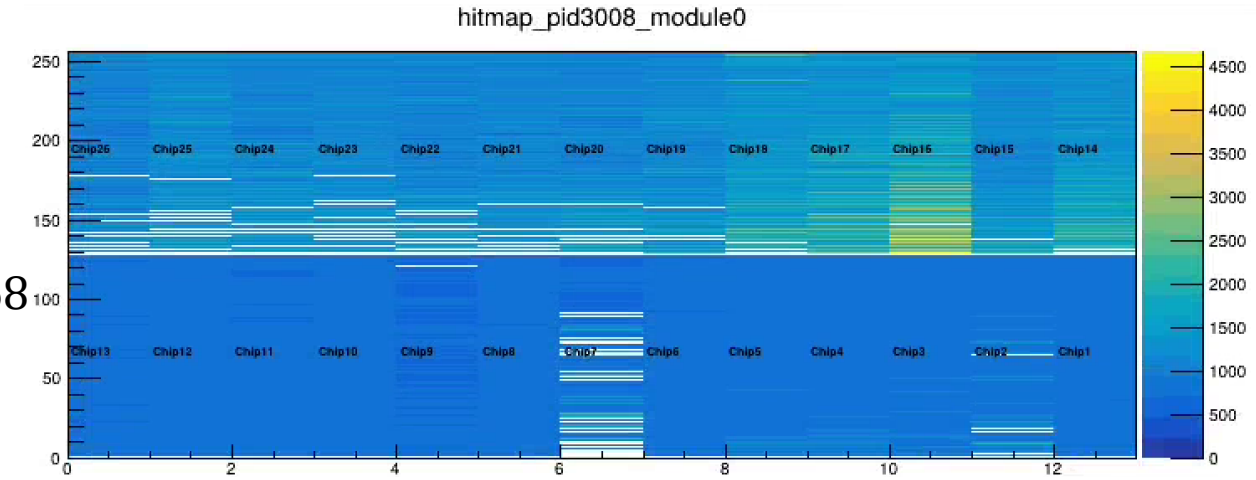
Viewing half-entry-chips Run69268, 69269

Felix Server	7
pid	3008
module	0
chip id	1, 2, 3, 4, 5, 7, 9, 11, 13, 14, 15, 16, 17, 18, 20, 22, 24, 26

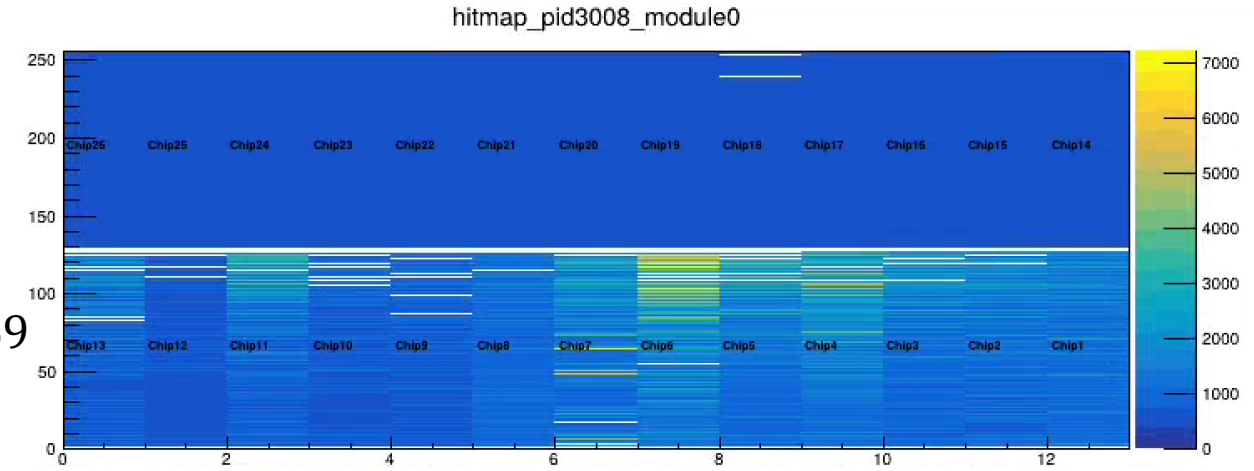
Half-entry-chips on HITMAP (default data)



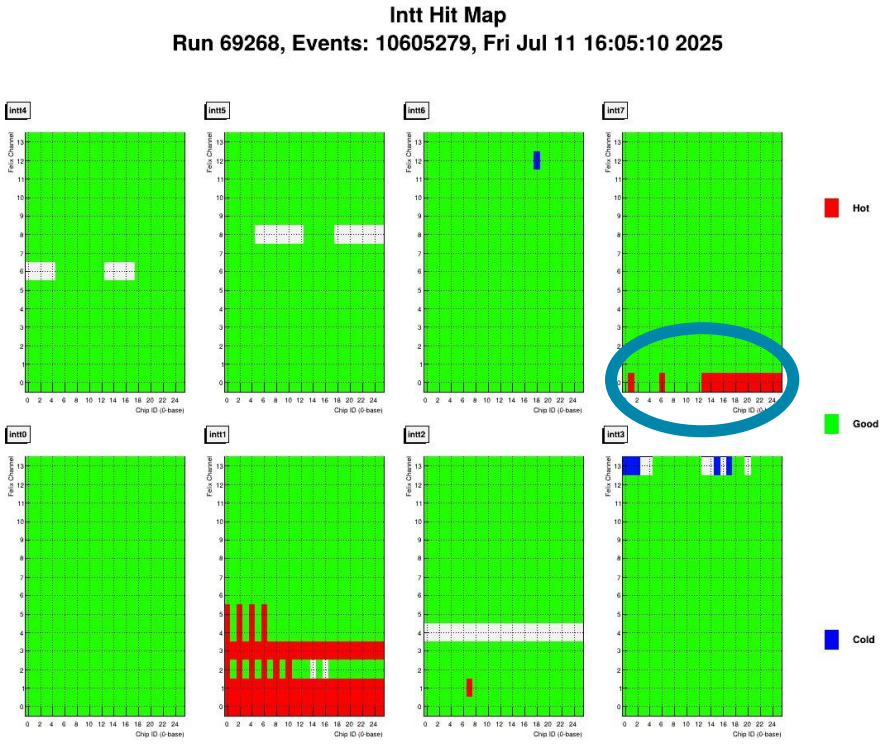
RUN69268

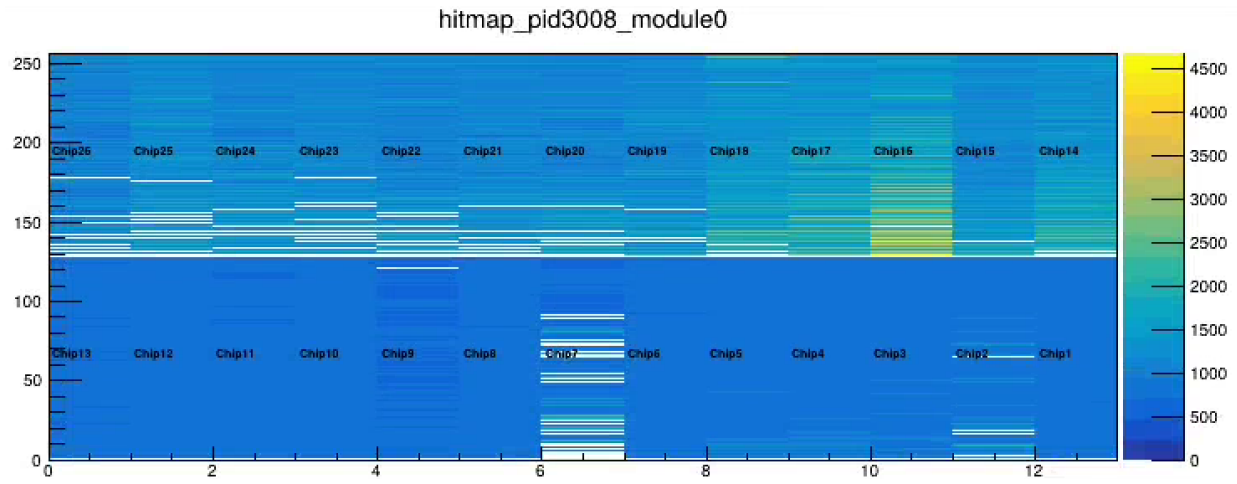


RUN69269



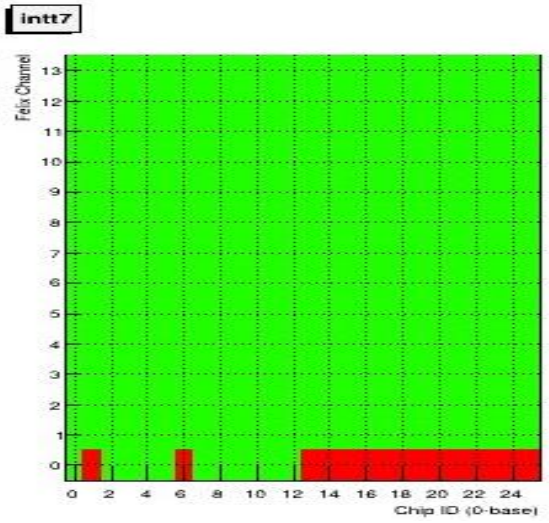
About hot-chips of INTT7



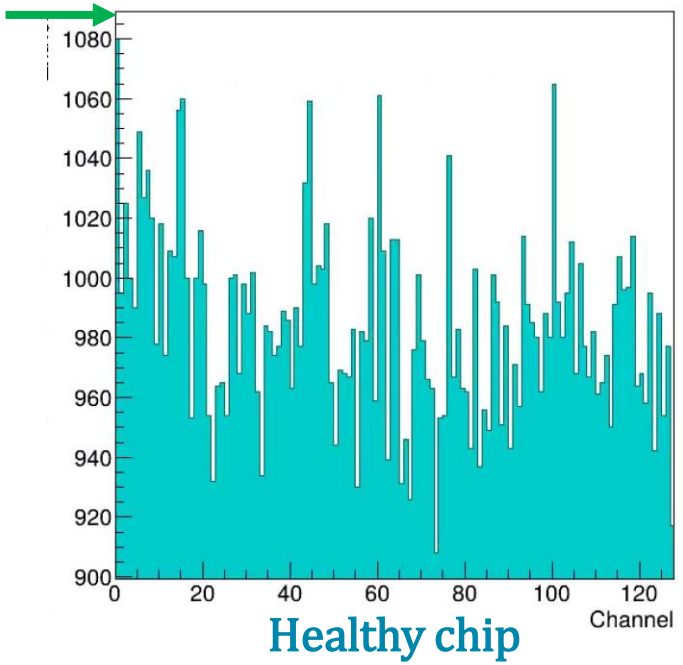


Felix Server	7
pid	3008
module	0
chip id	1, 2, 3, 4, 5, 7, 9, 11, 13, 14, 15, 16, 17, 18, 20, 22, 24, 26

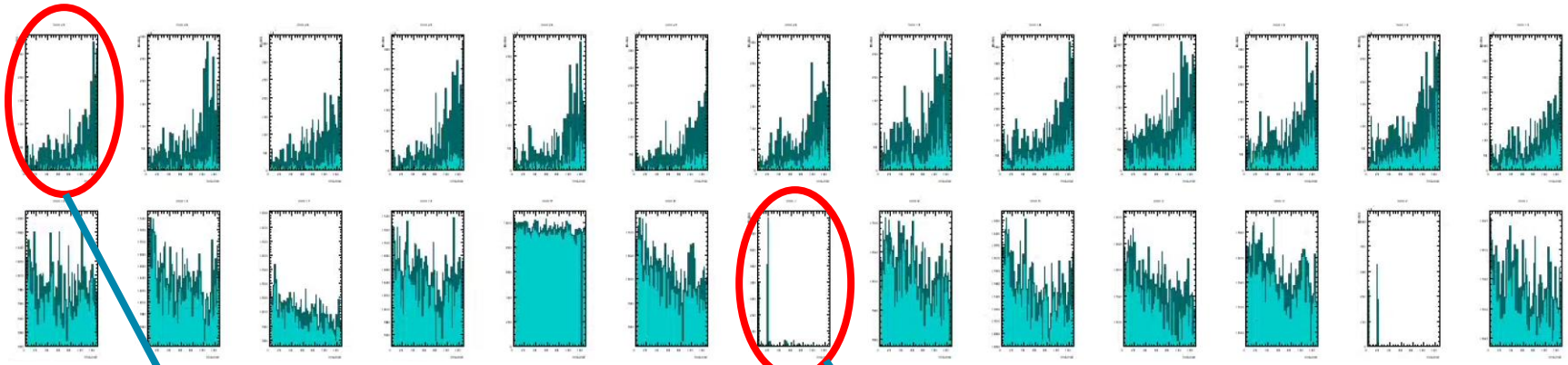
Viewing half-entry-chips Run69268, 69269



Chip 13

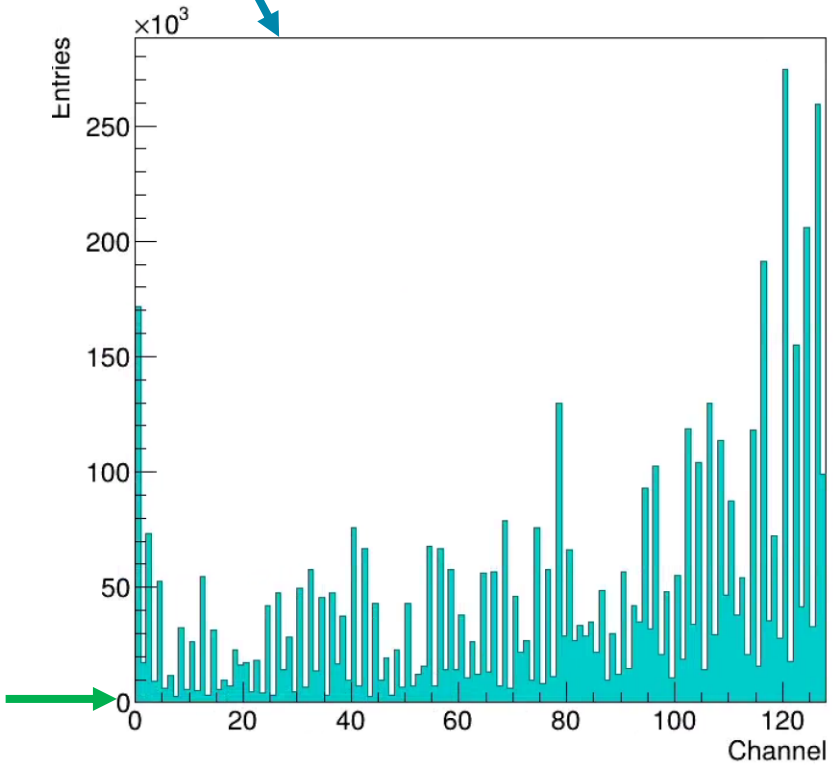


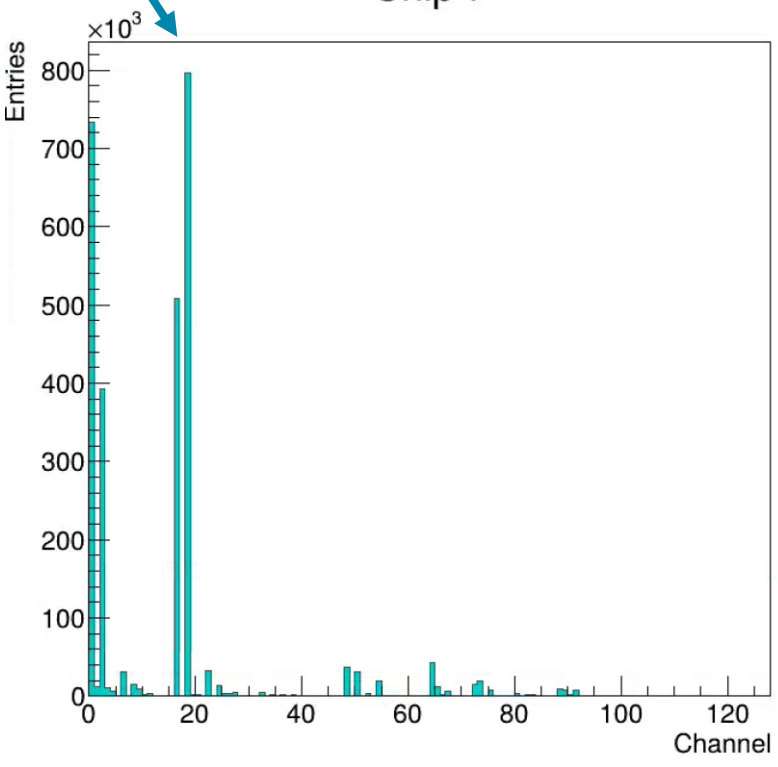
Healthy chip



Chip 26

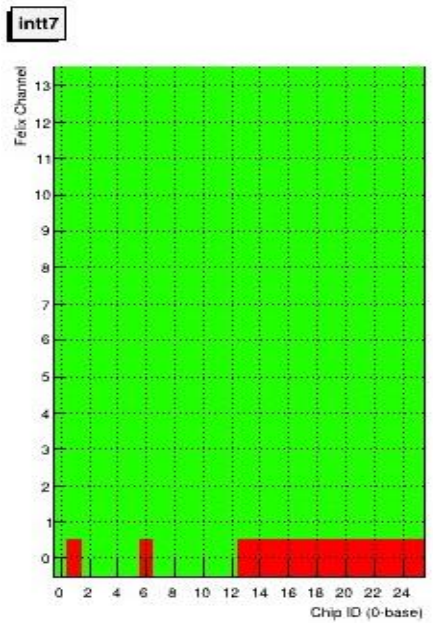
Chip 7



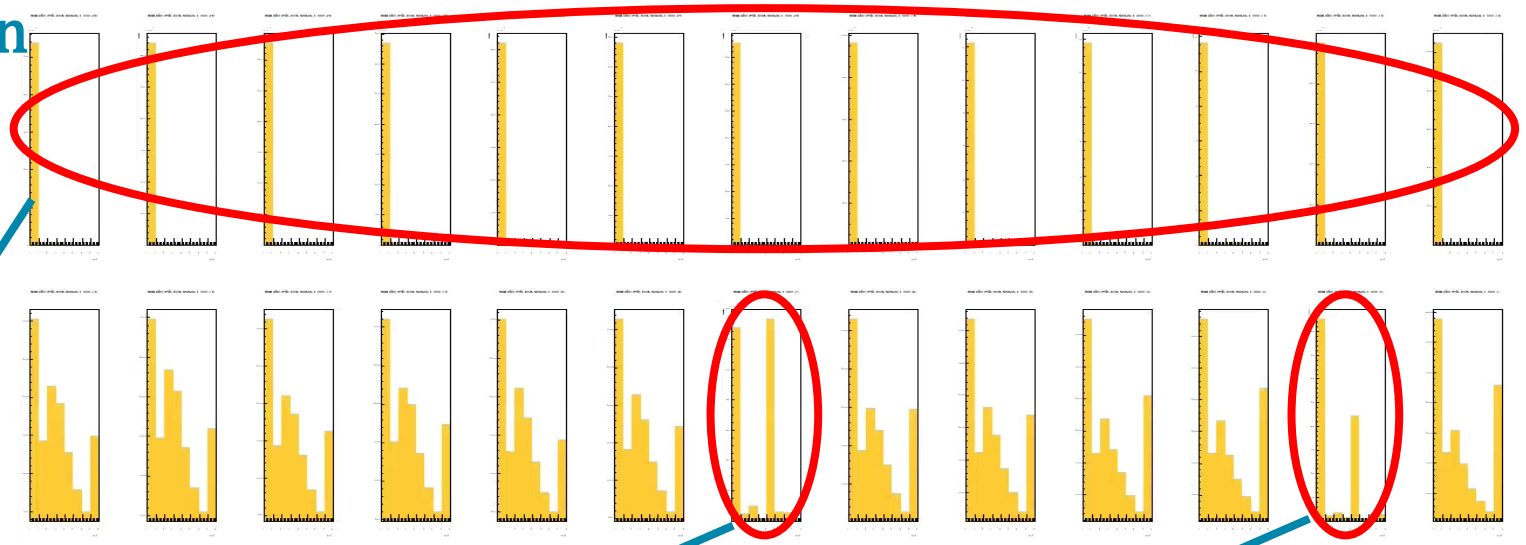


chan0 →Hot→ chan127

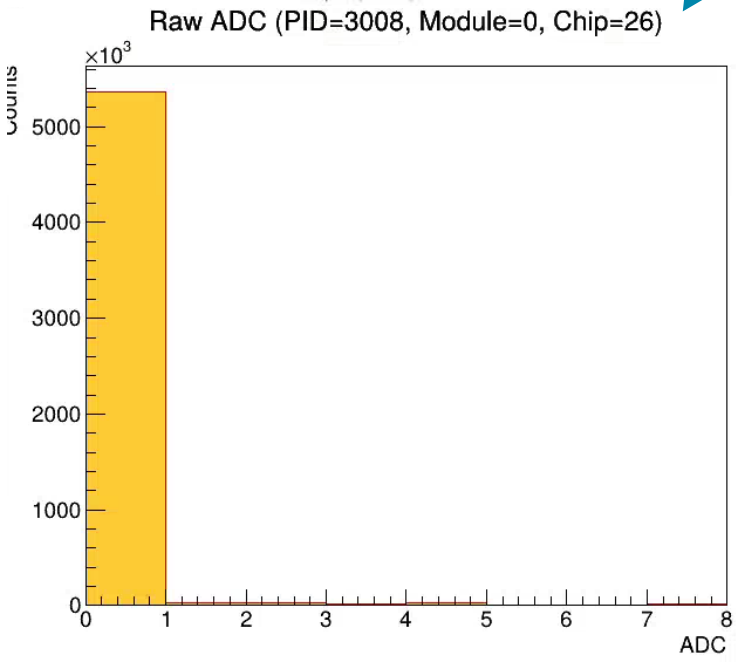
About hot-chips of INTT7

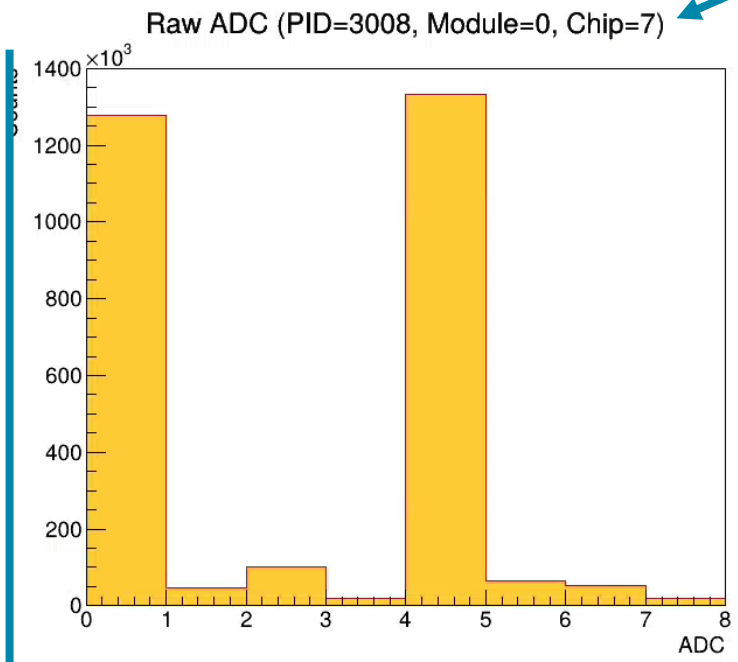


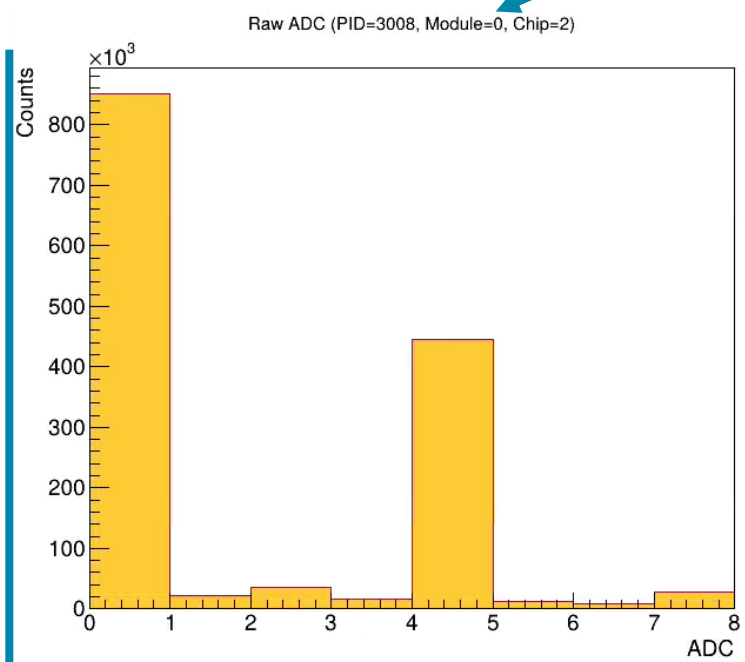
ADC distribution



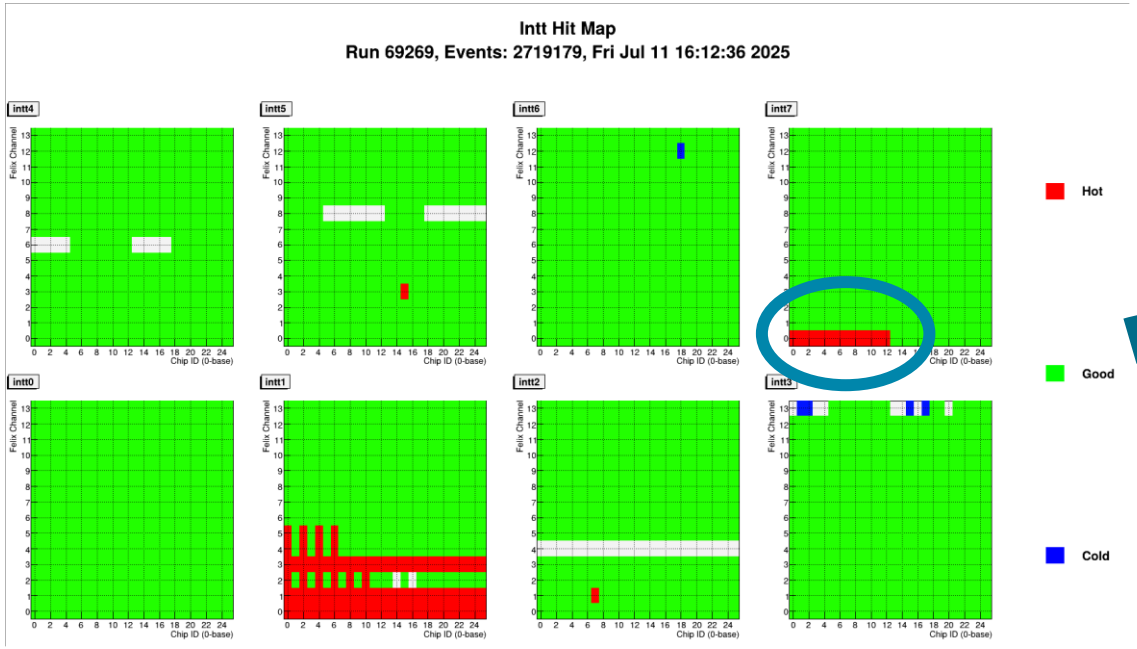
Hot chips

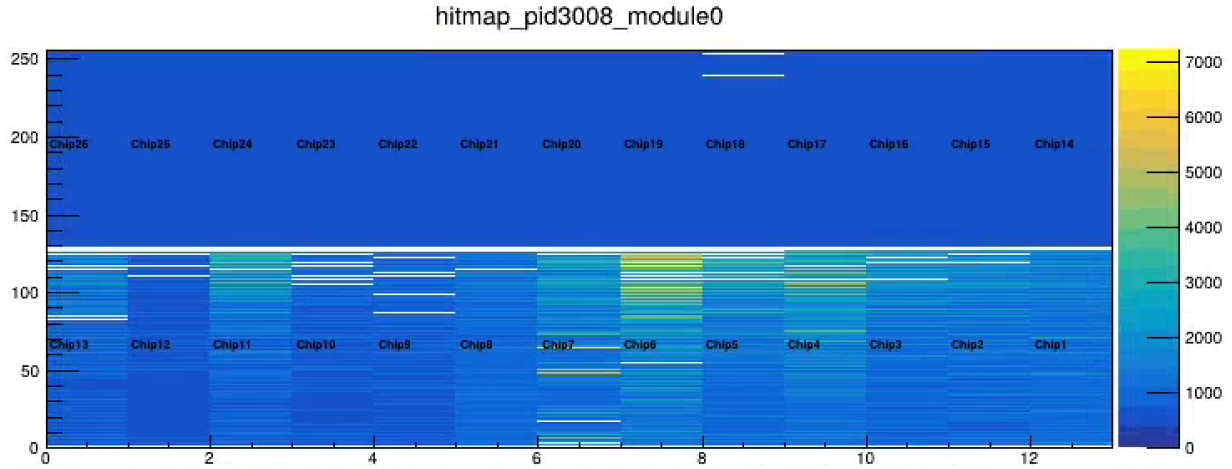






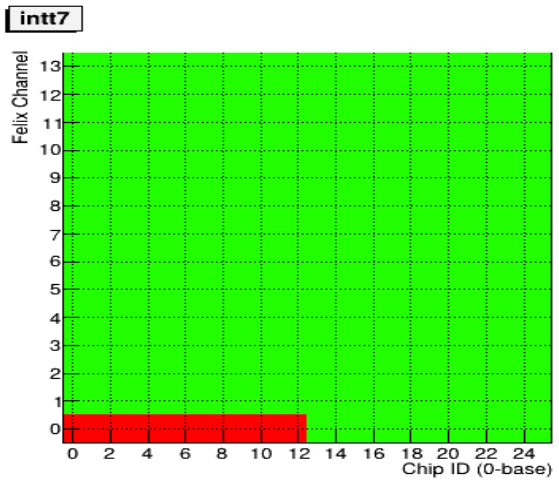
About hot-chips of INTT7



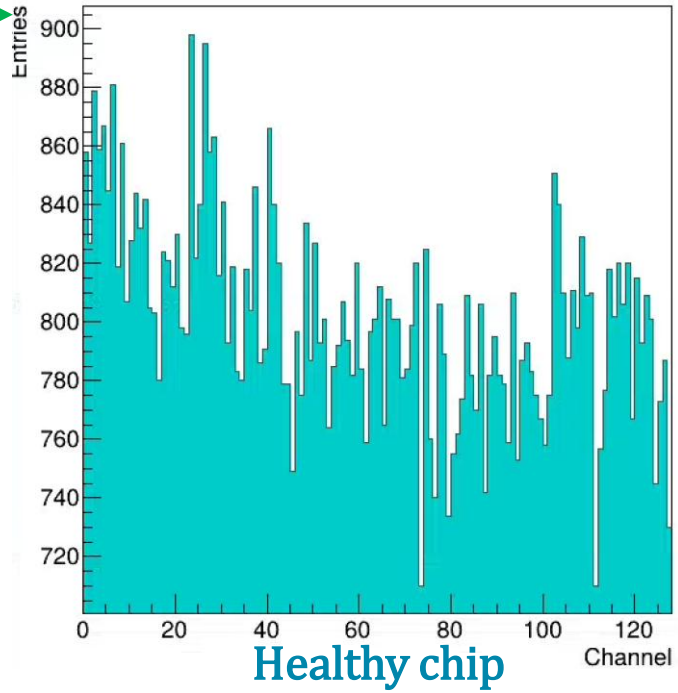


Felix Server	7
pid	3008
module	0
chip id	1, 2, 3, 4, 5, 7, 9, 11, 13, 14, 15, 16, 17, 18, 20, 22, 24, 26

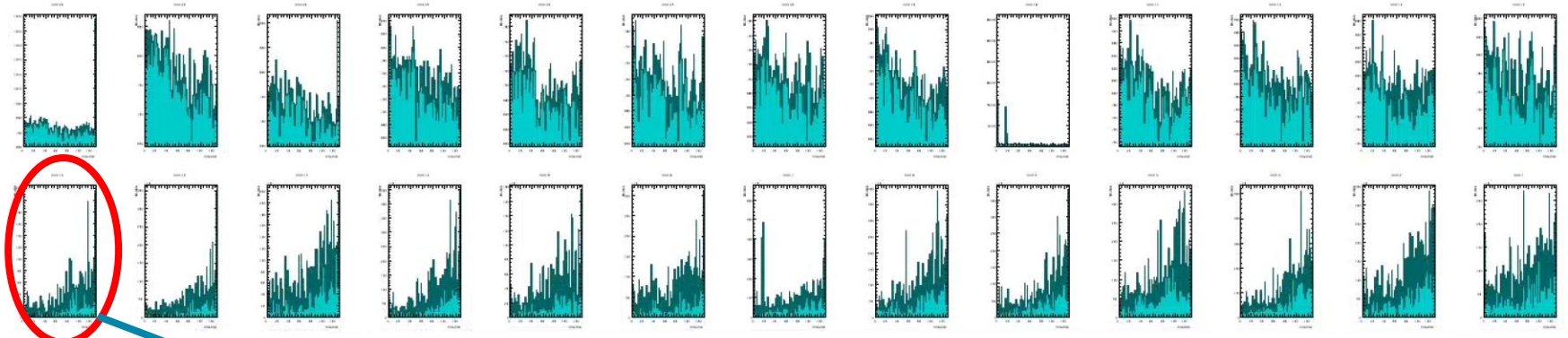
Viewing half-entry-chips Run69268, 69269

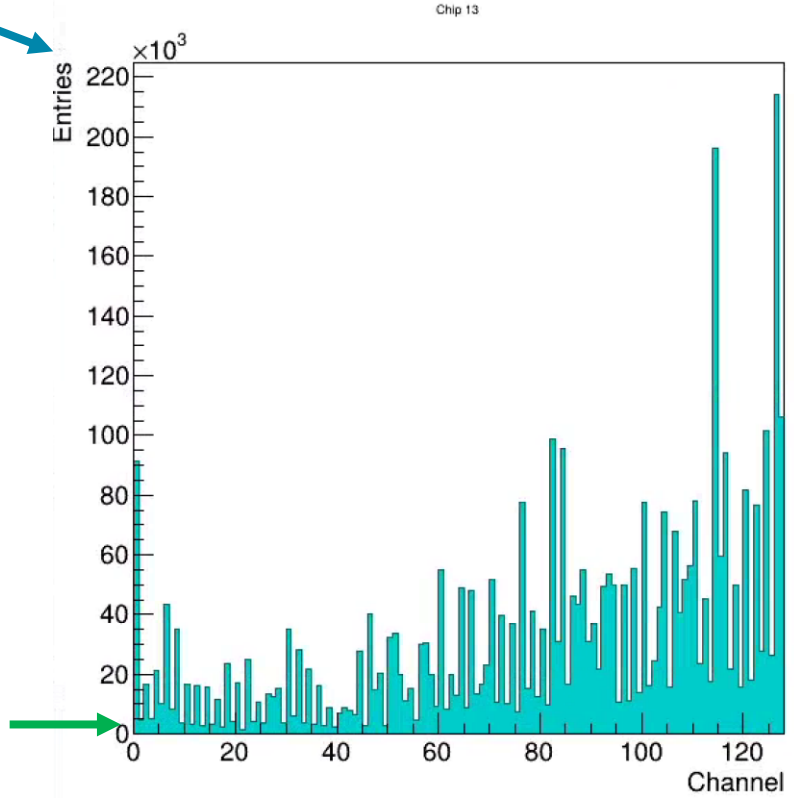


Chip 16



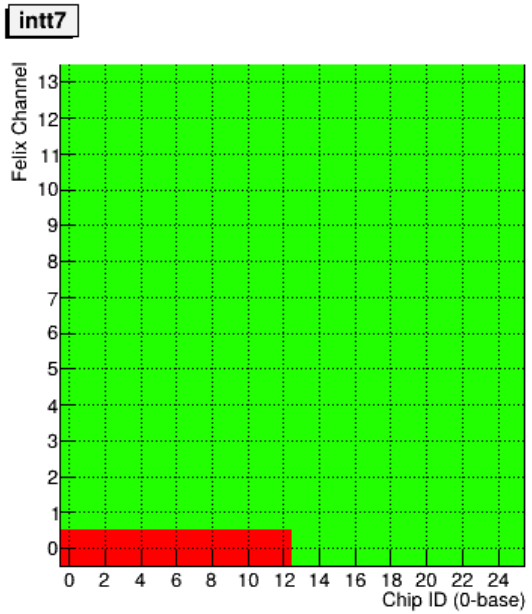
Healthy chip



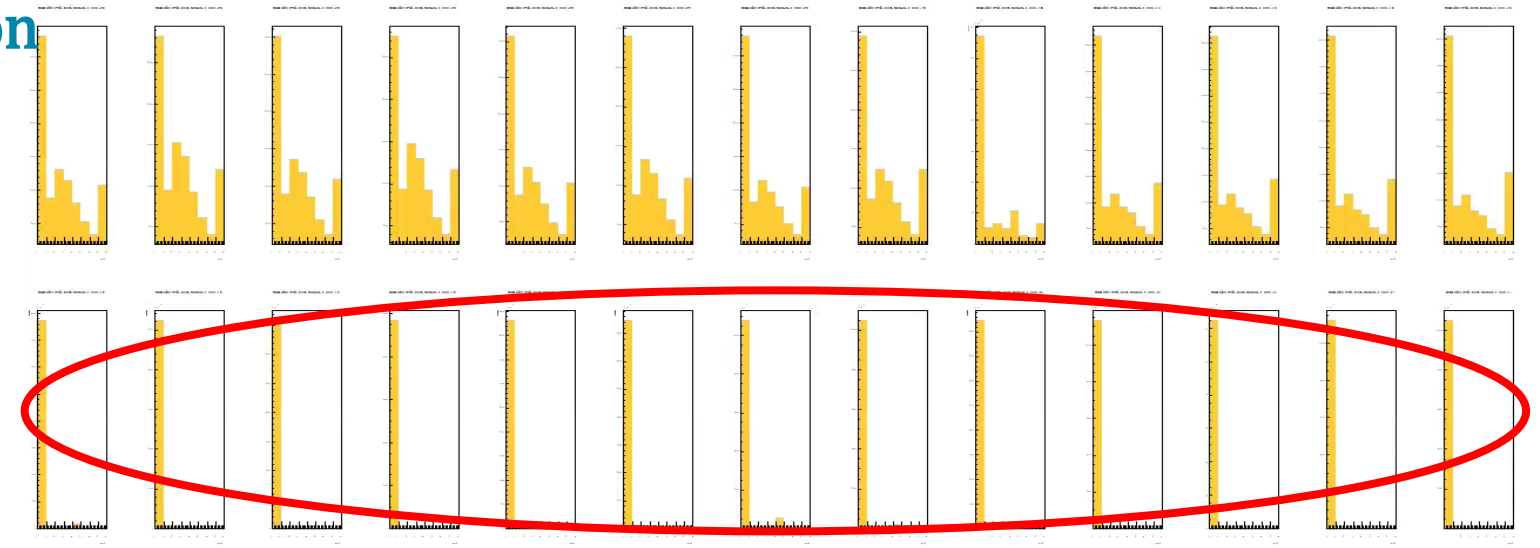


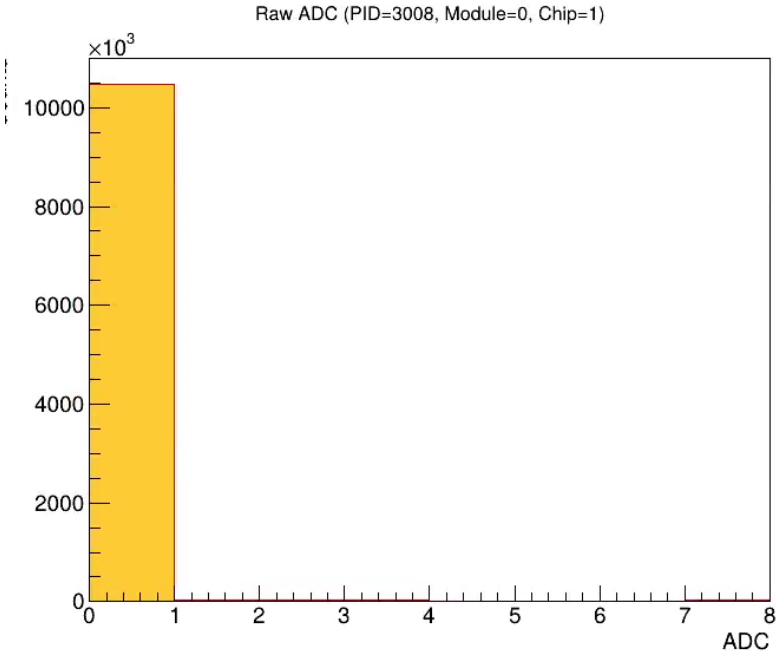
chan0 →Hot→ chan127

About hot-chips of INTT7

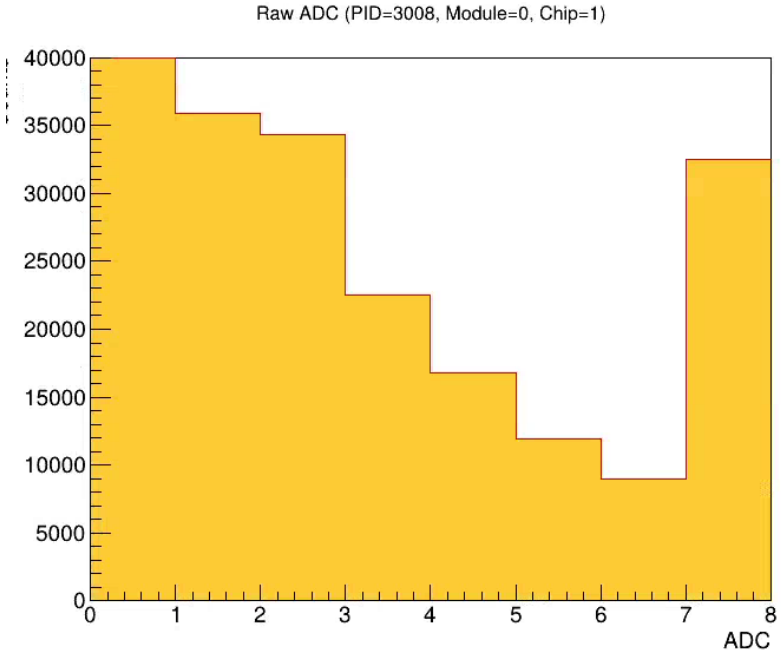


ADC distribution





zoom



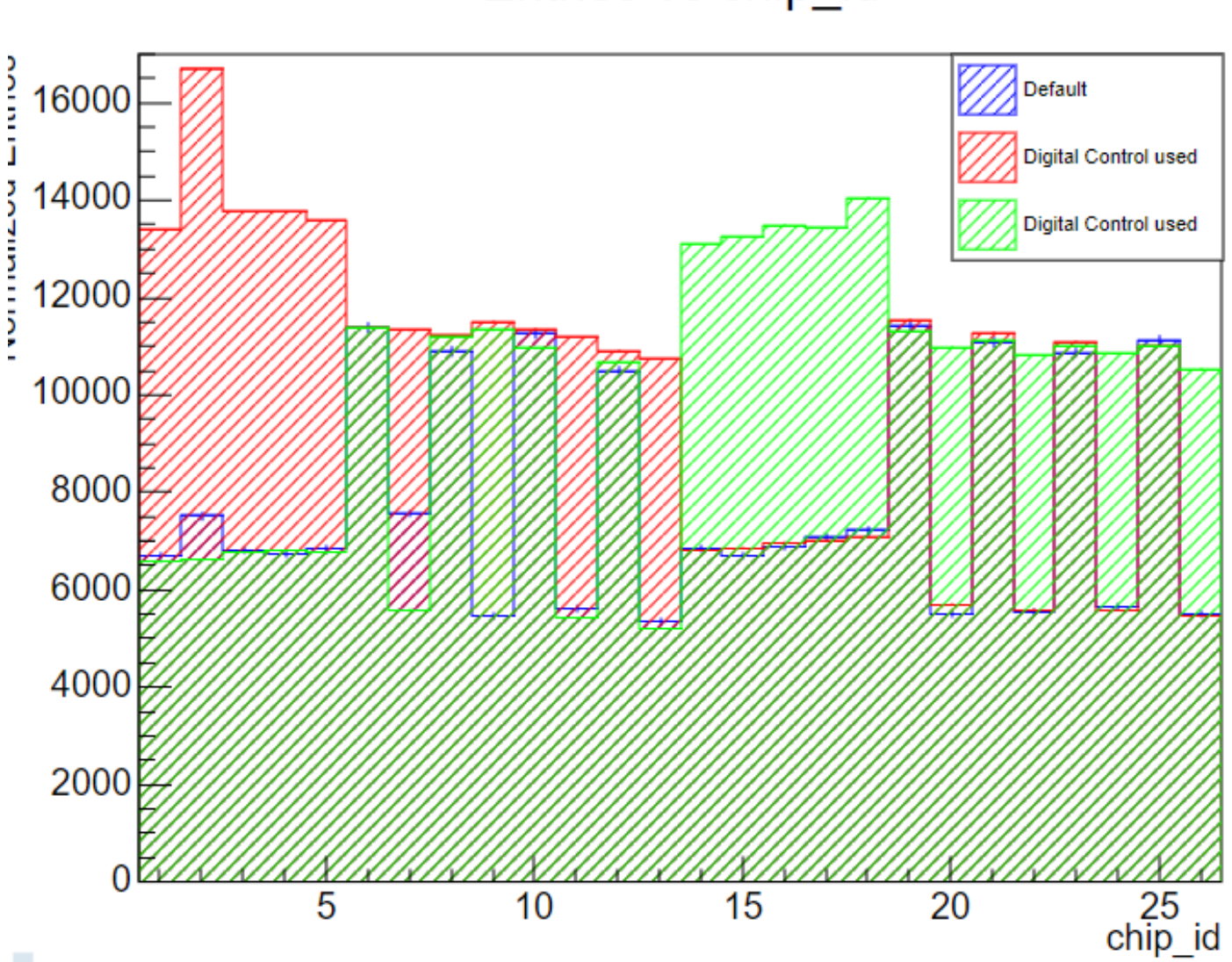
Viewing half-entry-chips Run69268, 69269

Felix Server	7
pid	3008
module	0
chip id	1, 2, 3, 4, 5, 7, 9, 11, 13, 14, 15, 16, 17, 18, 20, 22, 24, 26

- half-ladder here has a lot of half-entry-chips.
- When we cloned the data with digital-control in half, it's working. (you can see it right figure)

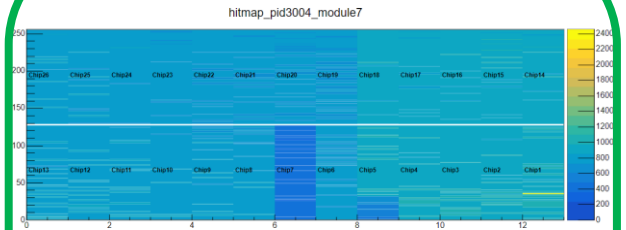
- I know that noise doesn't clone well, so it may be accidental. I need a few more runs.

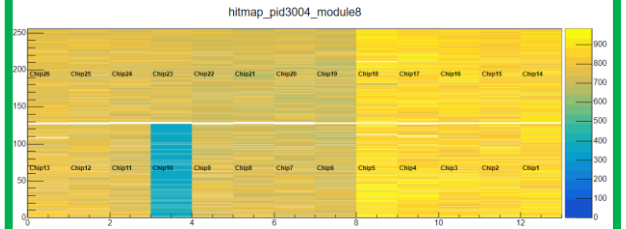
data took on June 20

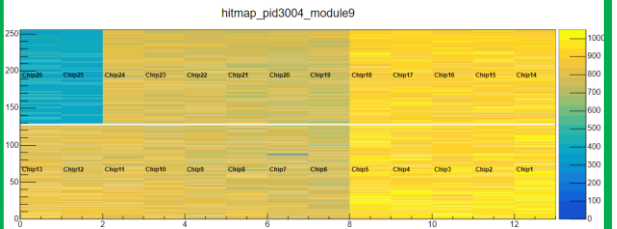


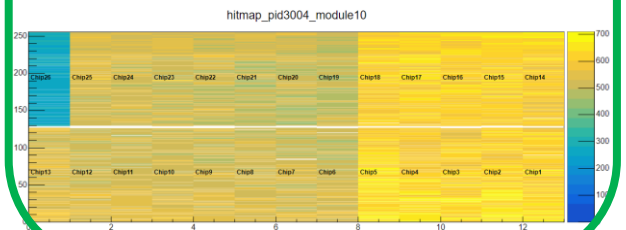
New half-entry-chips

RUN69260

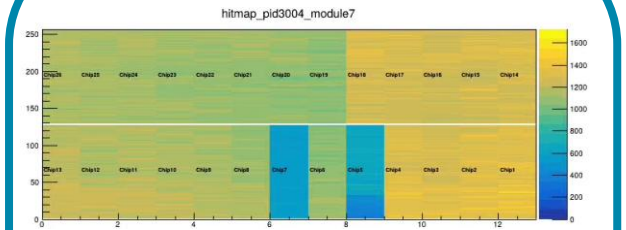


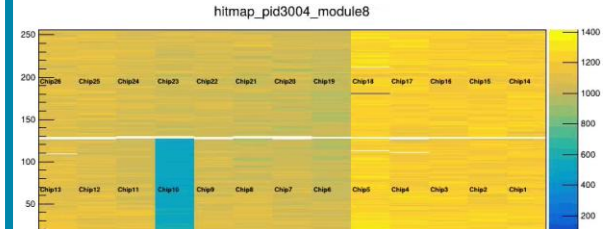


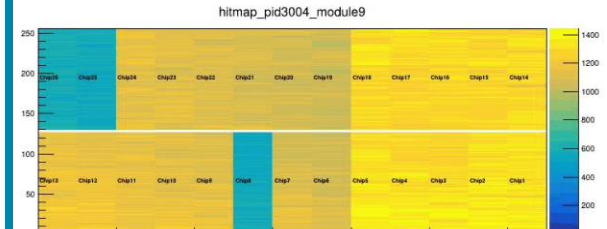


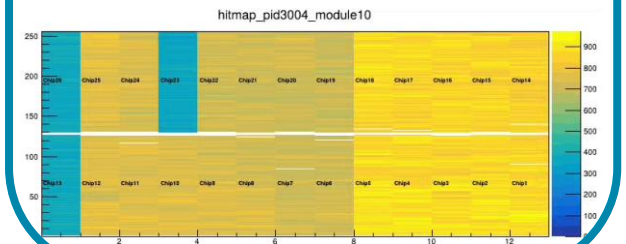


RUN69268

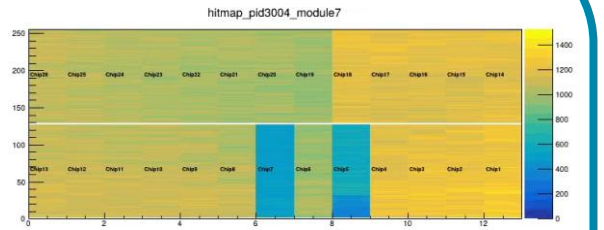


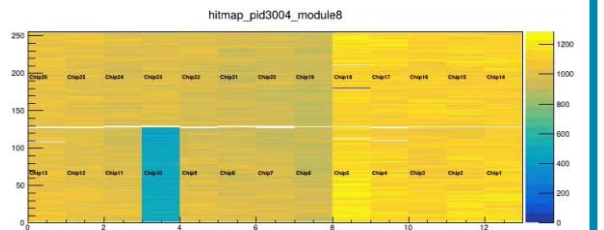


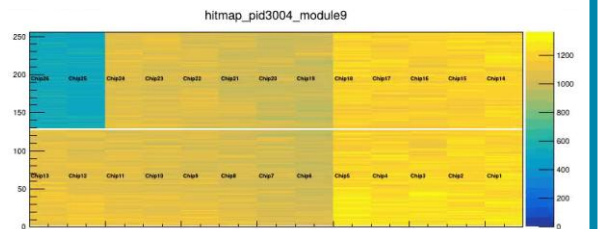


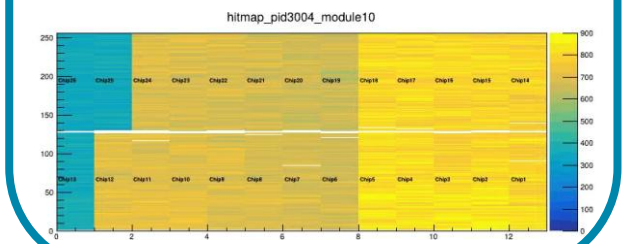


RUN69268

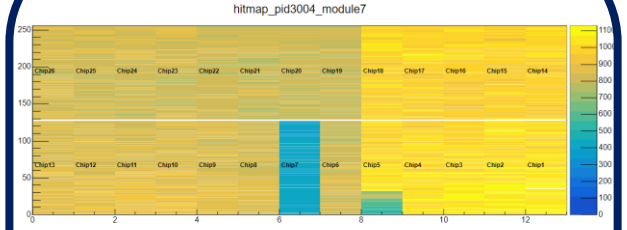


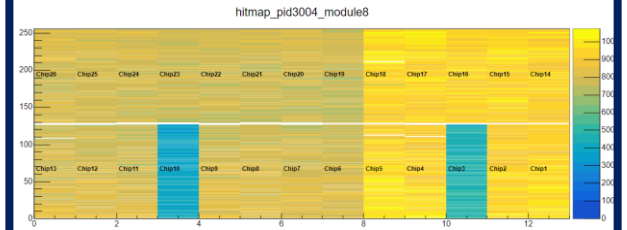


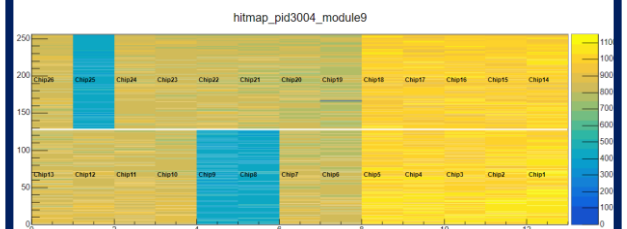


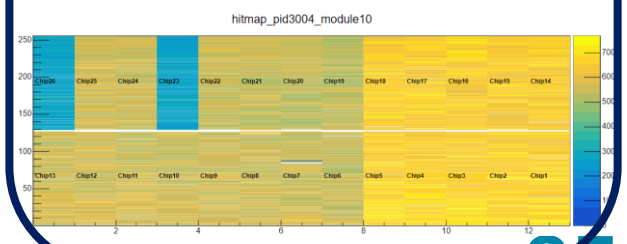


RUN69281









New half-entry-chips

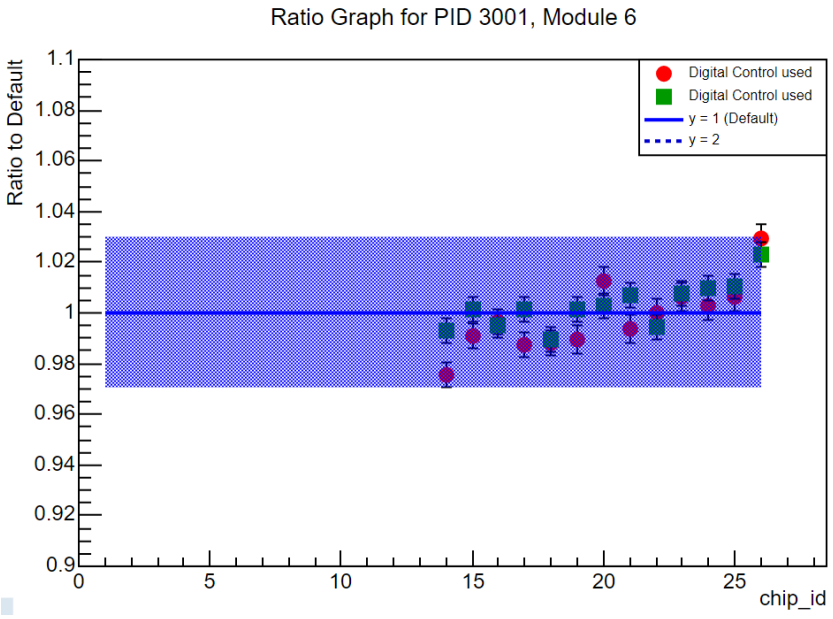
・New half-entry-chips were recently identified.

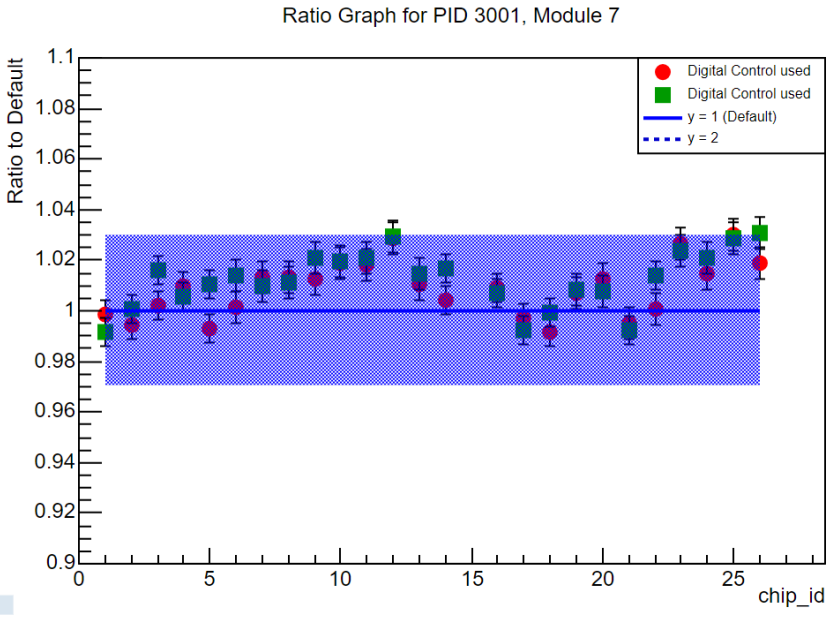
・Even data not using digital-control can be viewed. And, also it is unstable half-entry with no reproducibility.

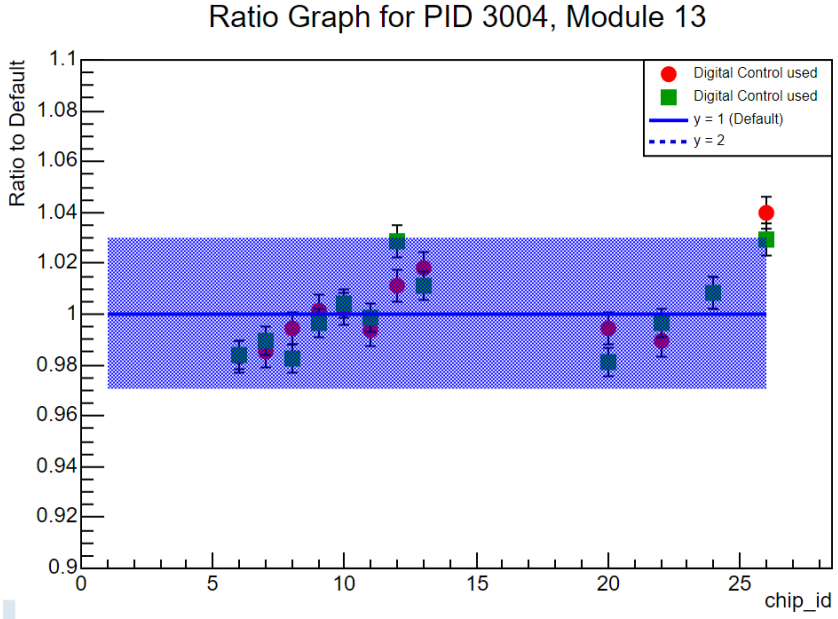
・It viewed in INTT4 && module 7～12.
→packet_id=3004(INTT3)

Effect to healthy chips

Effect to healthy chips

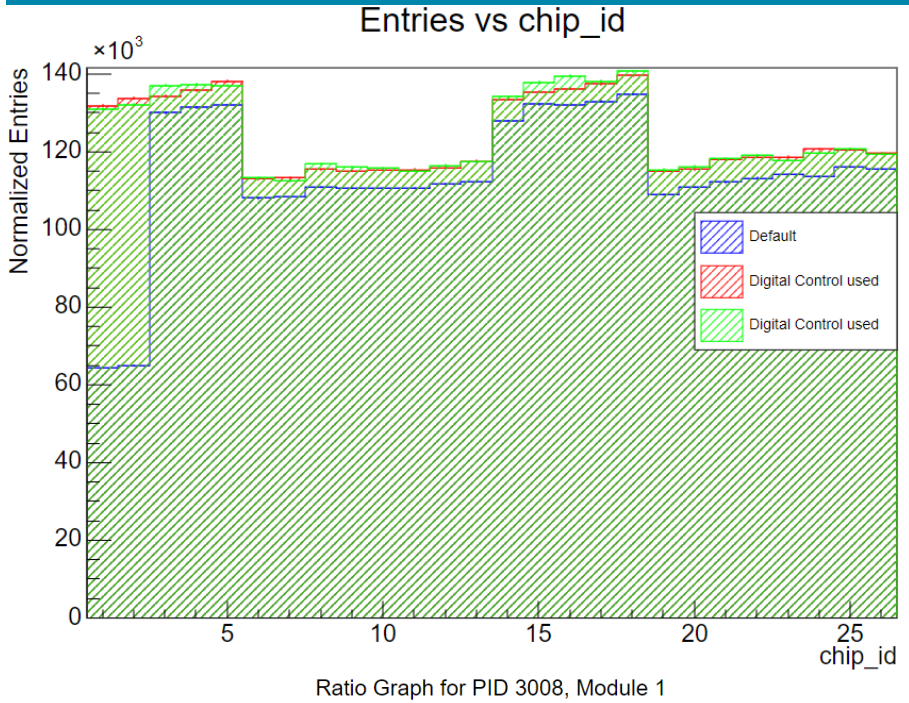




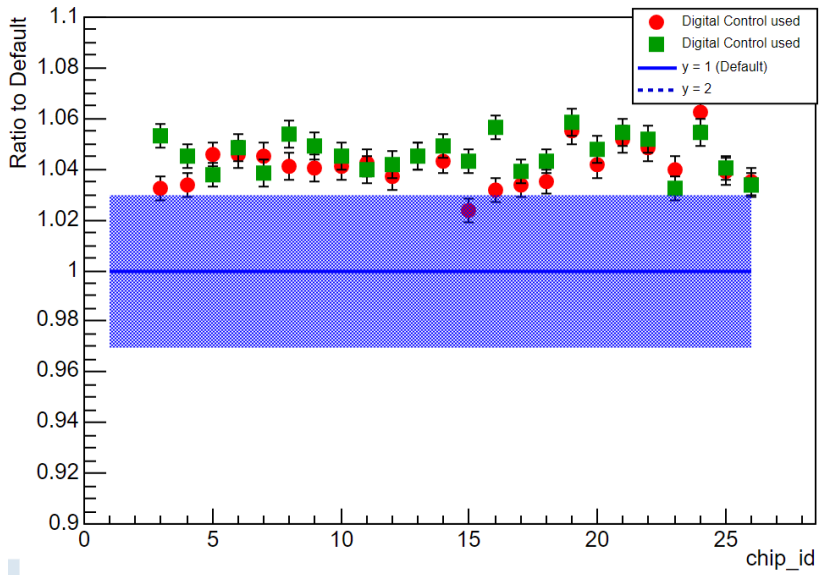


Most chips fall within the reproducibility range presented previously(3%),
and there are no effect to healthy chips with degital-control.

Effect to healthy chips



Felix Server	7
pid	3008
module	1
chip id	1, 2



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-
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Summary

Half-entry-chips chart(36 half-entry-chips)

Felix Server	0	0	3	5	7	7
pid	3001	3001	3004	3006	3008	3008
module	6	7	13	3	0	1
chip id	1, 2, 3, 4, 5, 6, 8, 10, 11, 12, 13	15	21, 23, 25	16	1, 2, 3, 4, 5, 7, 9, 11, 13, 14, 15, 16, 17, 18, 20, 22, 24, 26	1, 2

Hot

・19chips / 37chips are perfectly recovered with digital-control
(Seems to be less, but problematic only the half-ladder at intt7&module0)

・When we used digital-control, Hot chips are appeared in intt7.

・There are unstable half-entry-chips in intt3 these days from RUN68***.