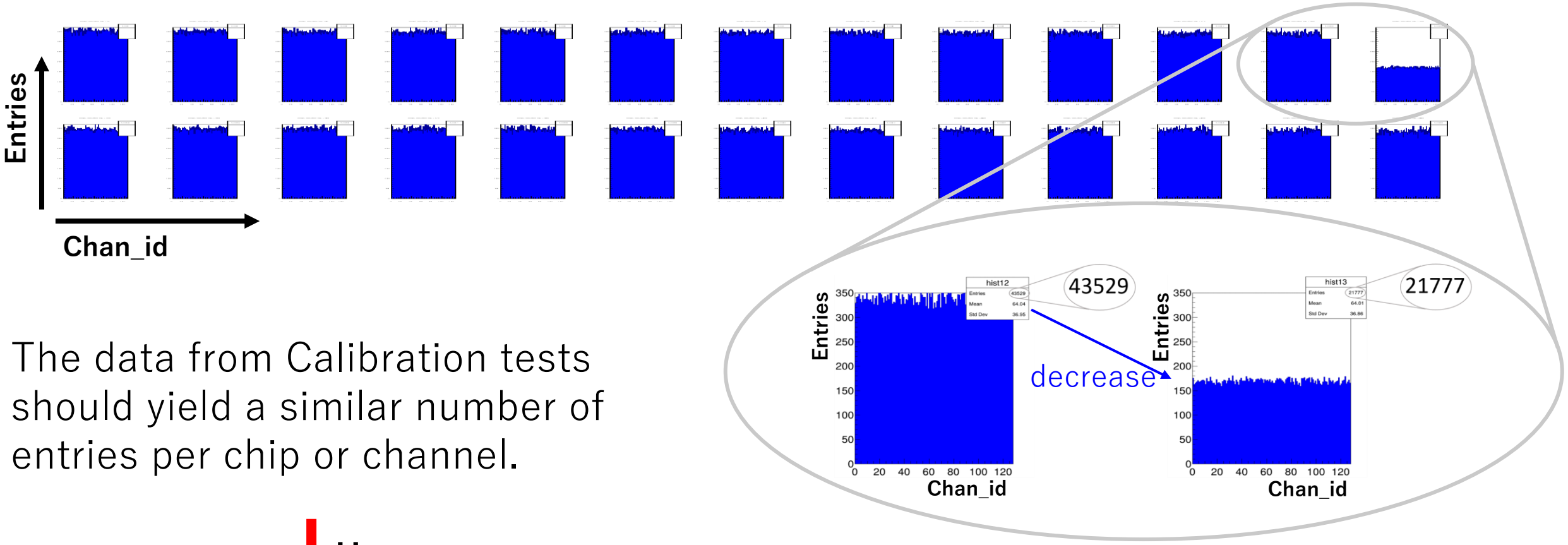
11/29　Final Report

原田

In my graduation study



The data from Calibration tests should yield a similar number of entries per chip or channel.

However

Several chips were observed with only half the number of entries detected.
We call this the half-entry issue.

In my graduation study

Focus on transfer method

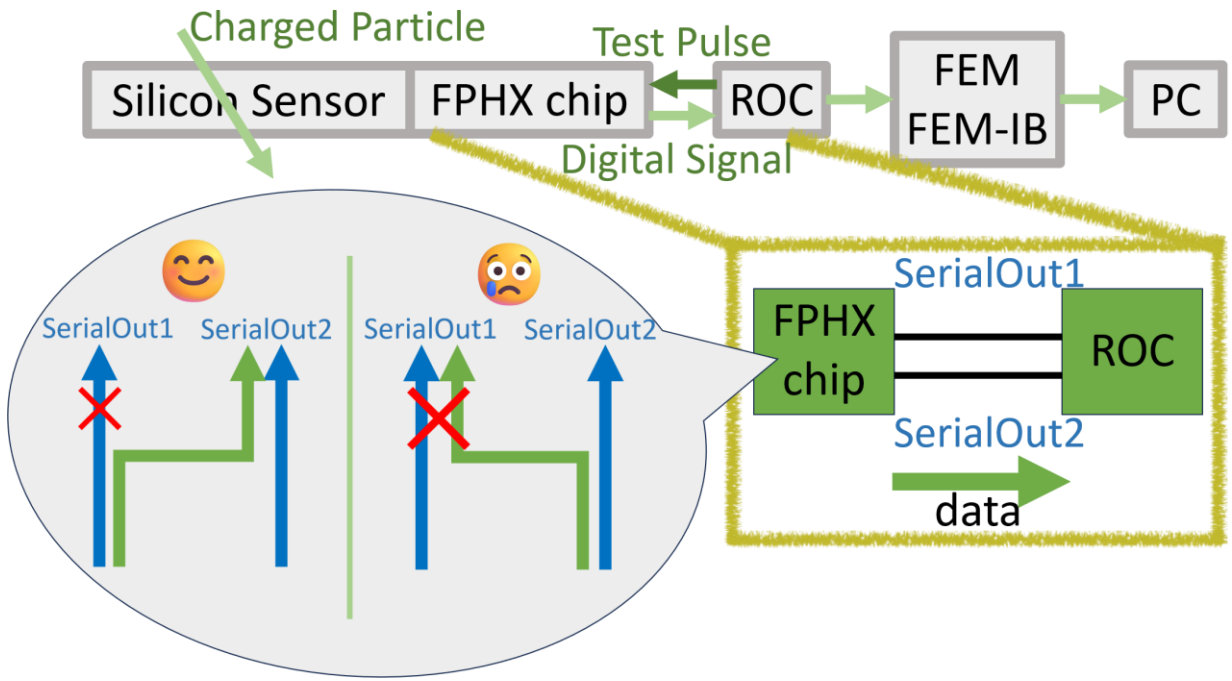
- There are two data output lines from a FPHX-chip to the ROC

Hypothesis

- The FPHX-chip is equipped with a feature called Digital-Control, one of which is a mode that clones data and sends them to both output lines.

Result

- The number of data on all chips with half-entry at the Riken could be restored to normal.

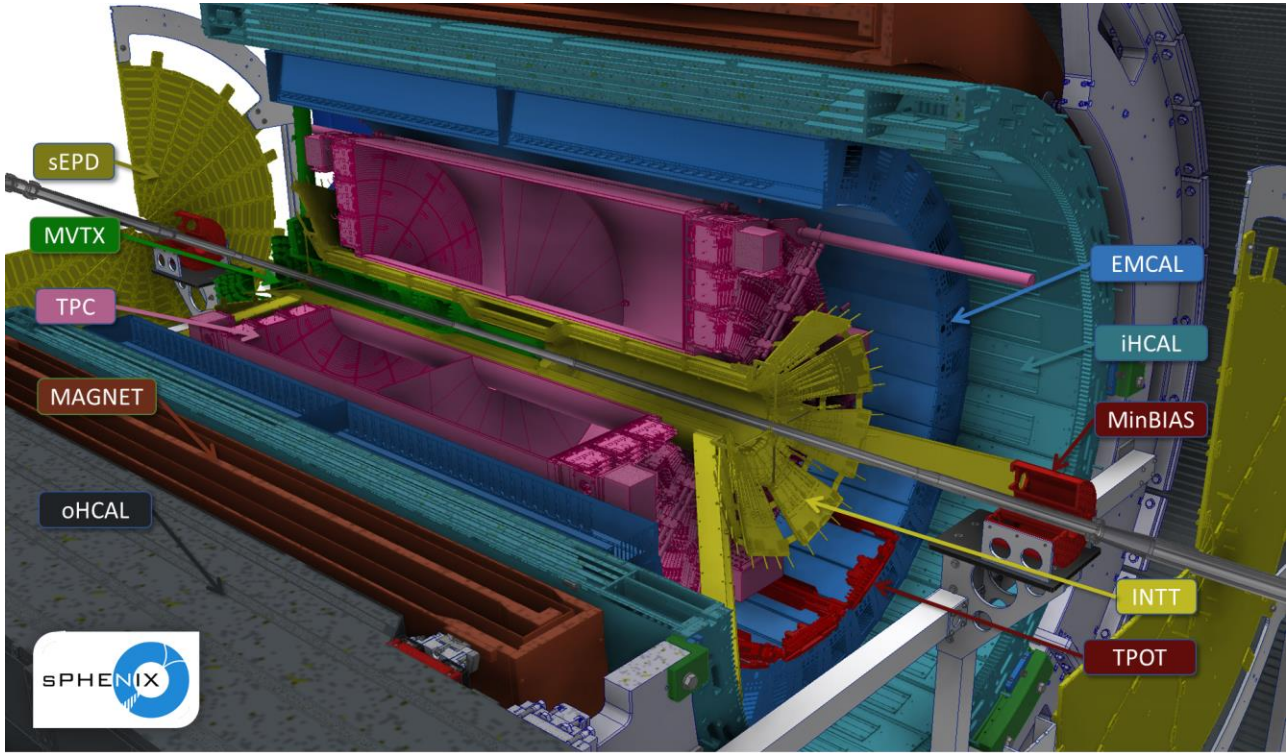


Contents

1. Estimate the number of chips with half-entries

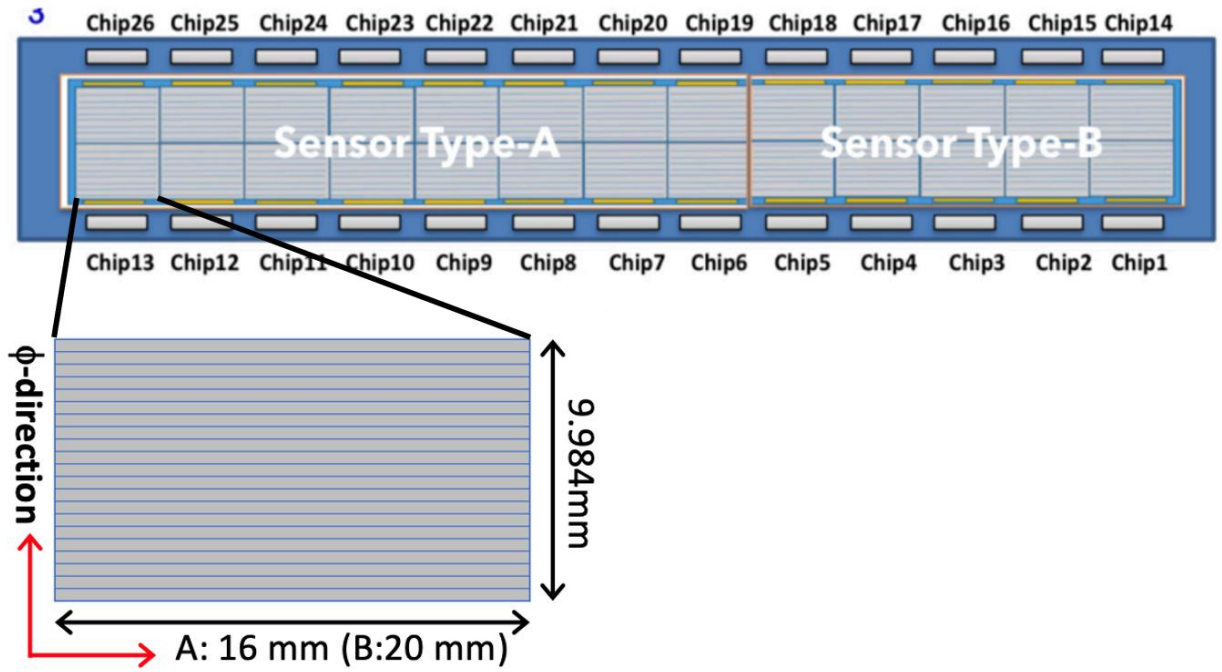
2. Confirm that the half-entries were restored by analyzing the data with different Digital-Control

3. Identify the parameters to restore each chips



1. Estimate the number of chips with half-entries

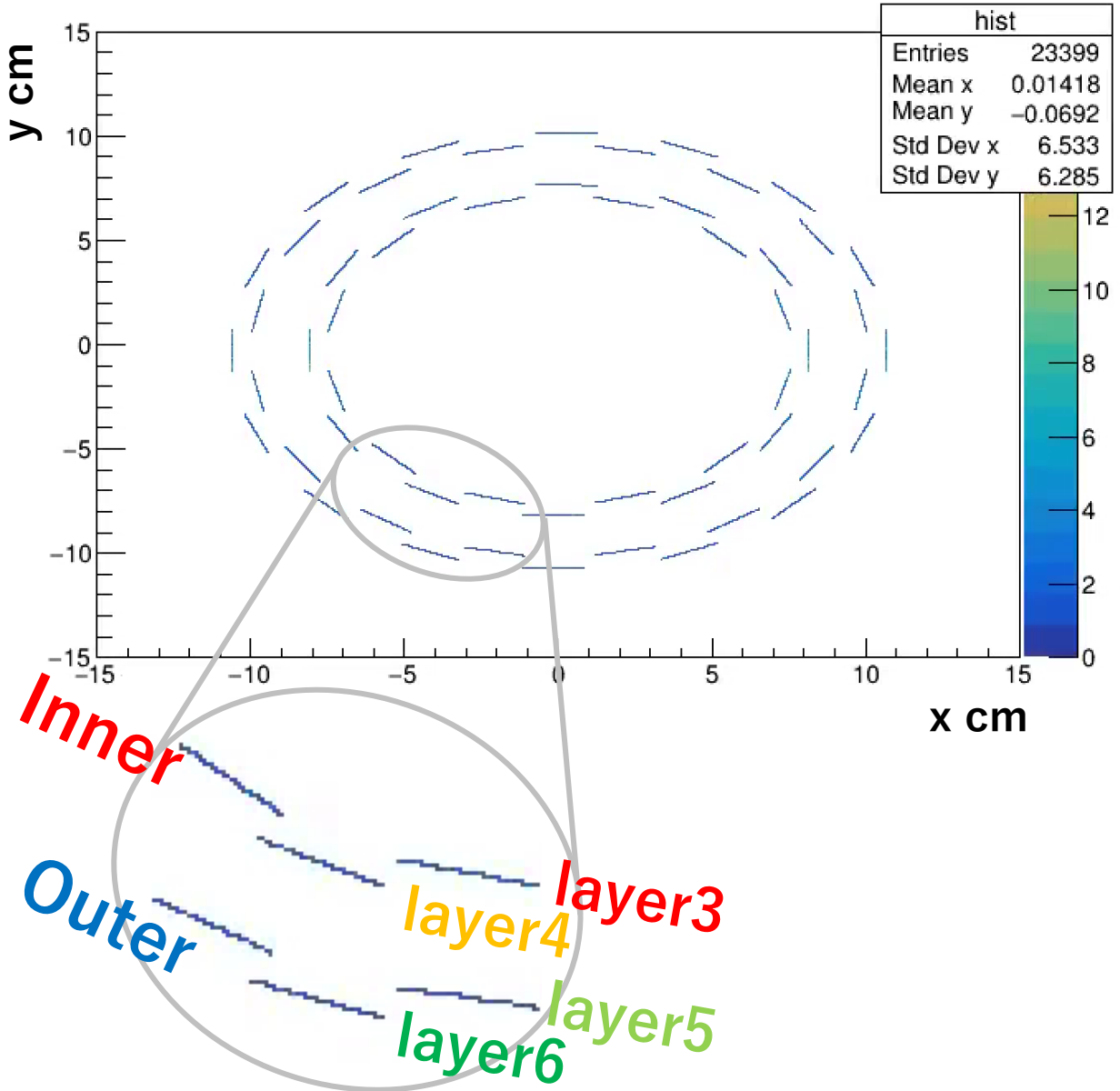
Chip type dependence



Chip type-B > Chip type-A

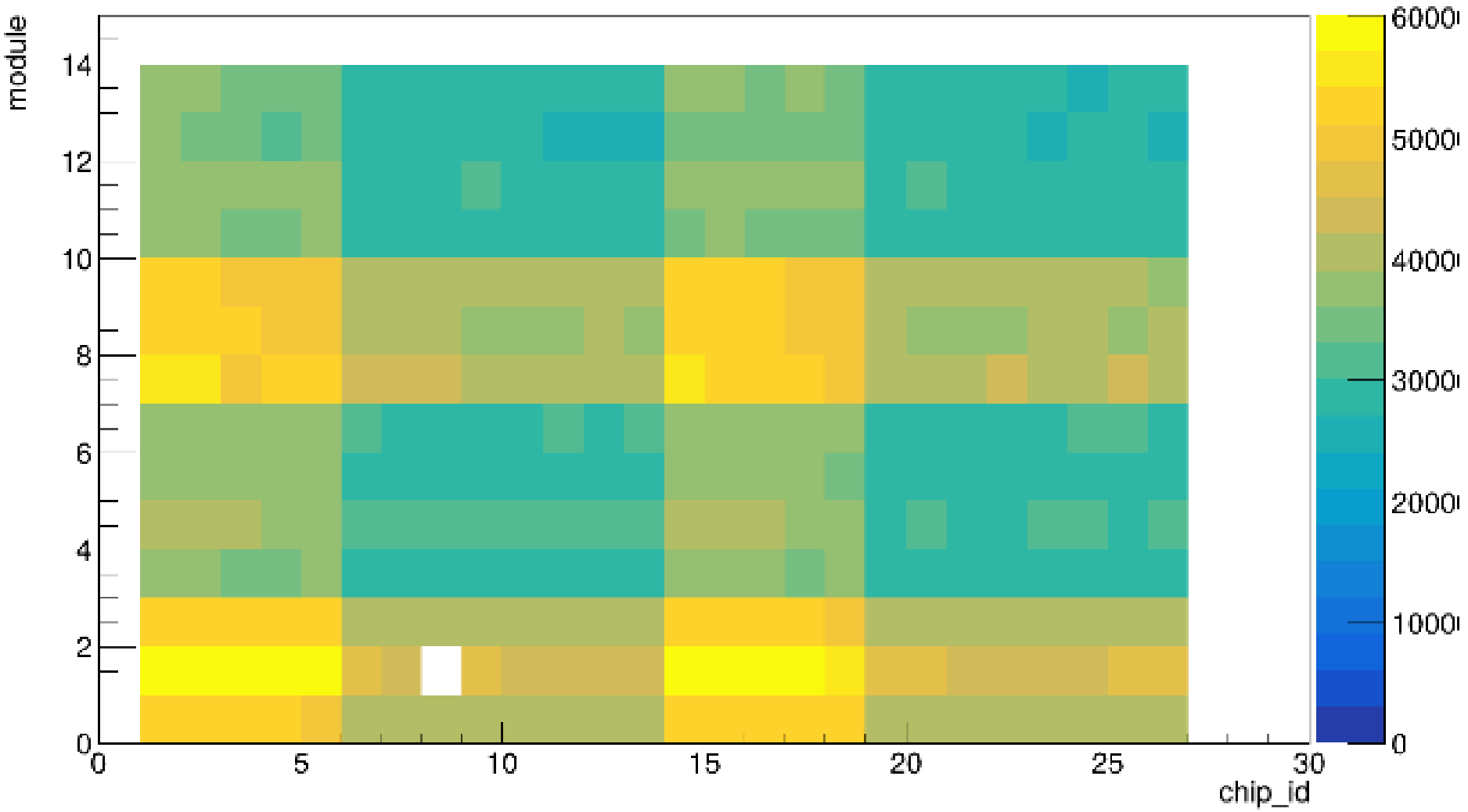
Inner layer > Outer layer

Layer dependence



1. Estimate the number of chips with half-entries

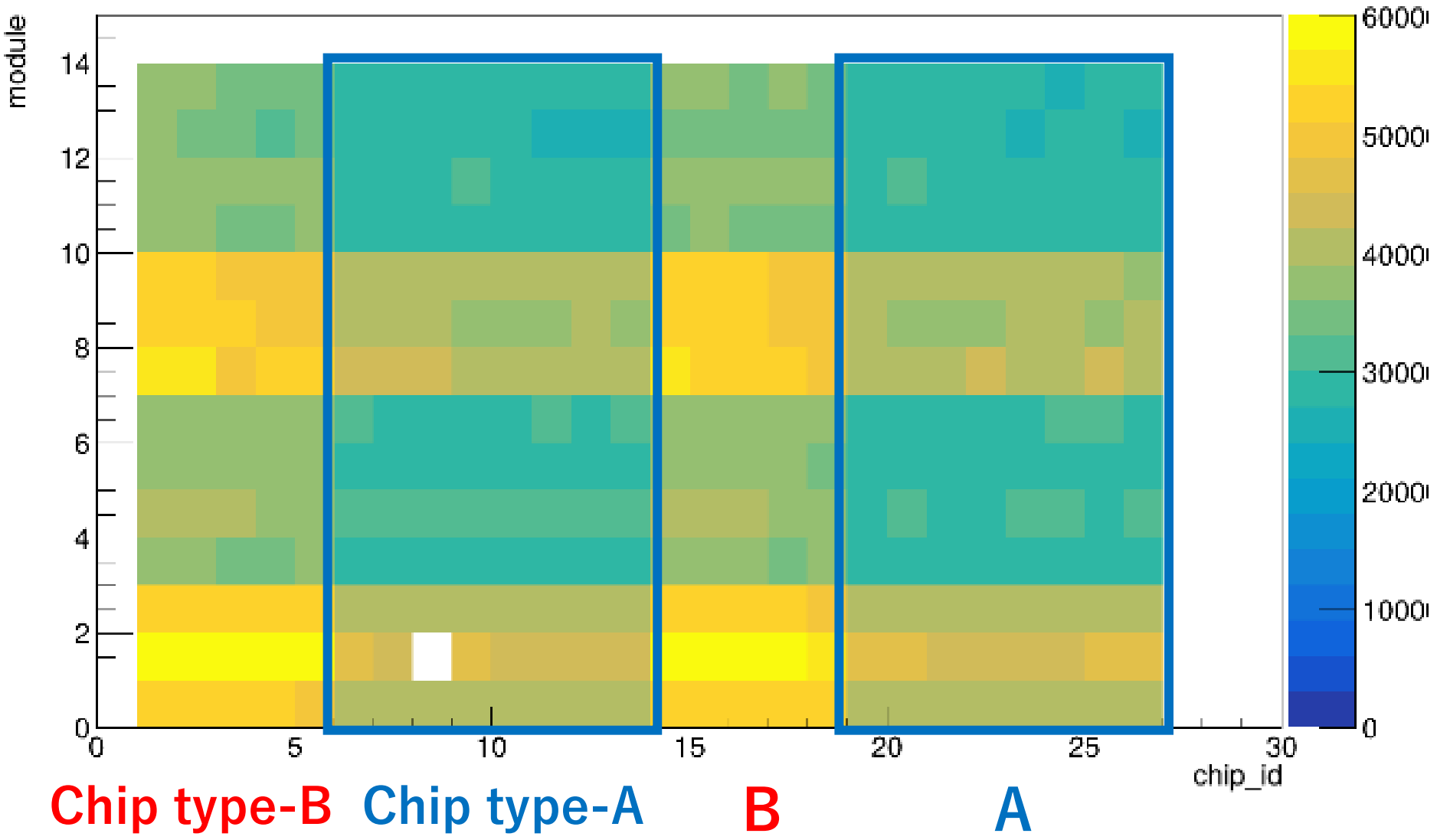
RUN#49314(P+P beam data)



chip_id vs module (pid==3003)

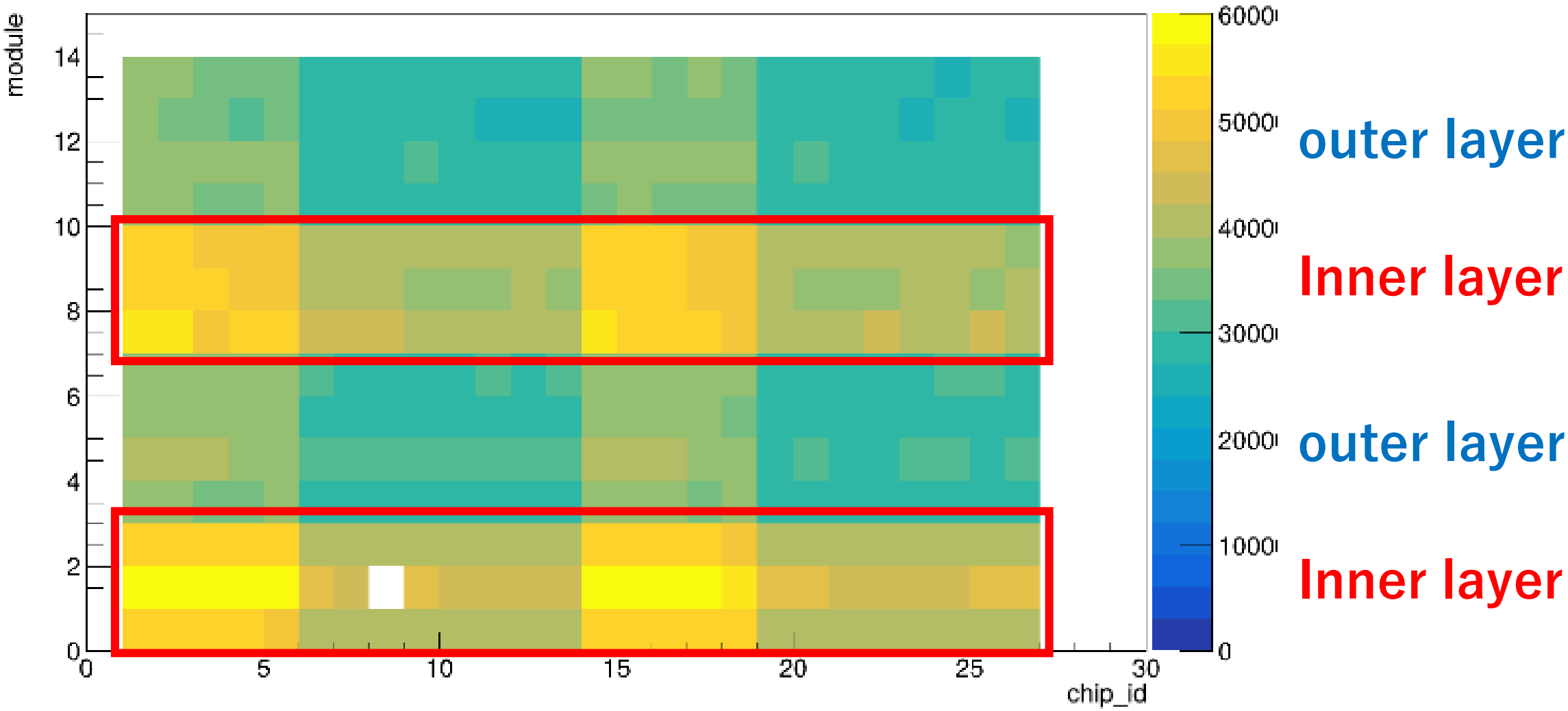
1. Estimate the number of chips with half-entries

RUN#49314(P+P beam data)



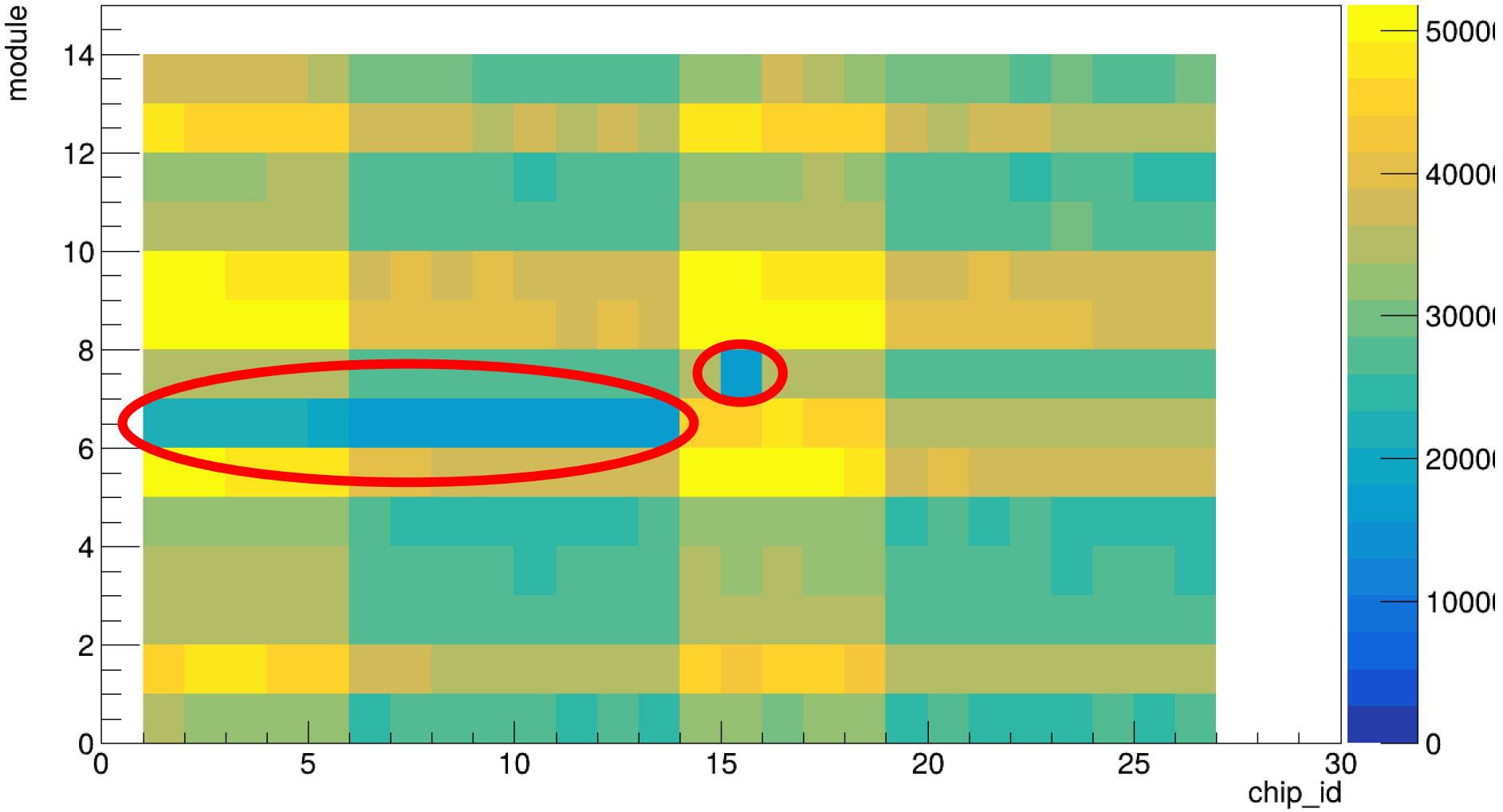
1. Estimate the number of chips with half-entries

RUN#49314(P+P beam data)



1. Estimate the number of chips with half-entries

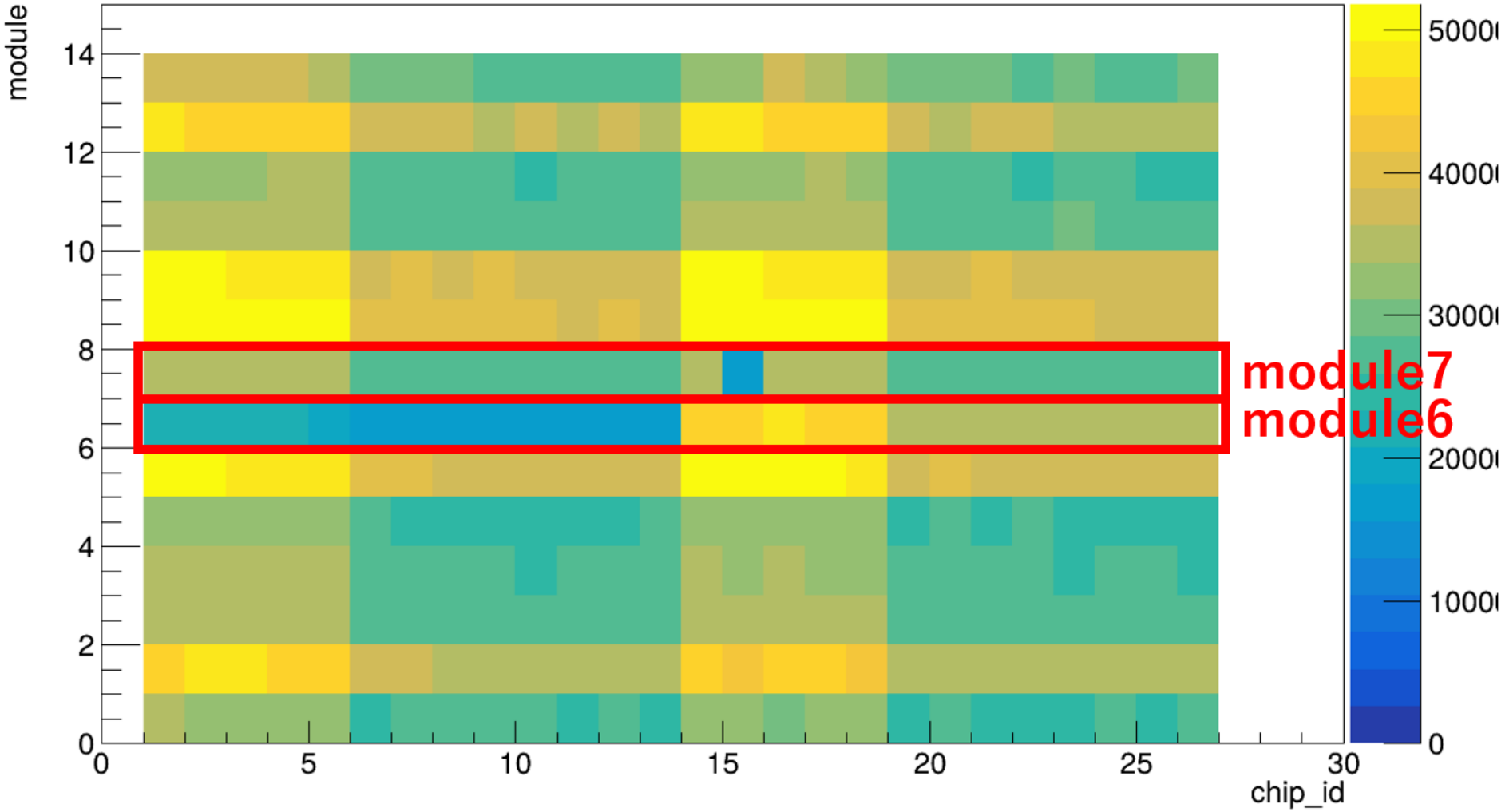
RUN#49314(P+P beam data)



chip_id vs module (pid==3001)

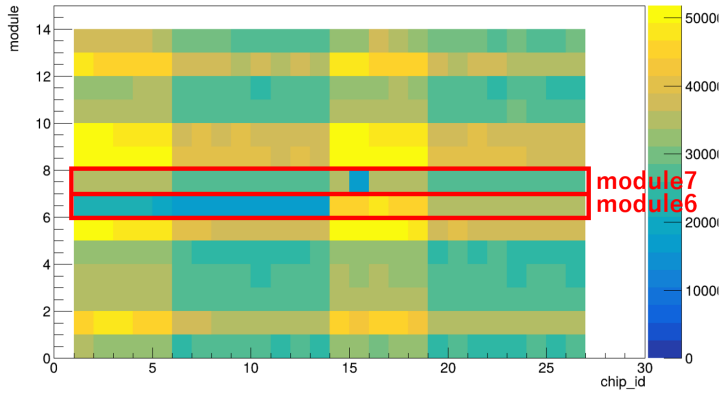
1. Estimate the number of chips with half-entries

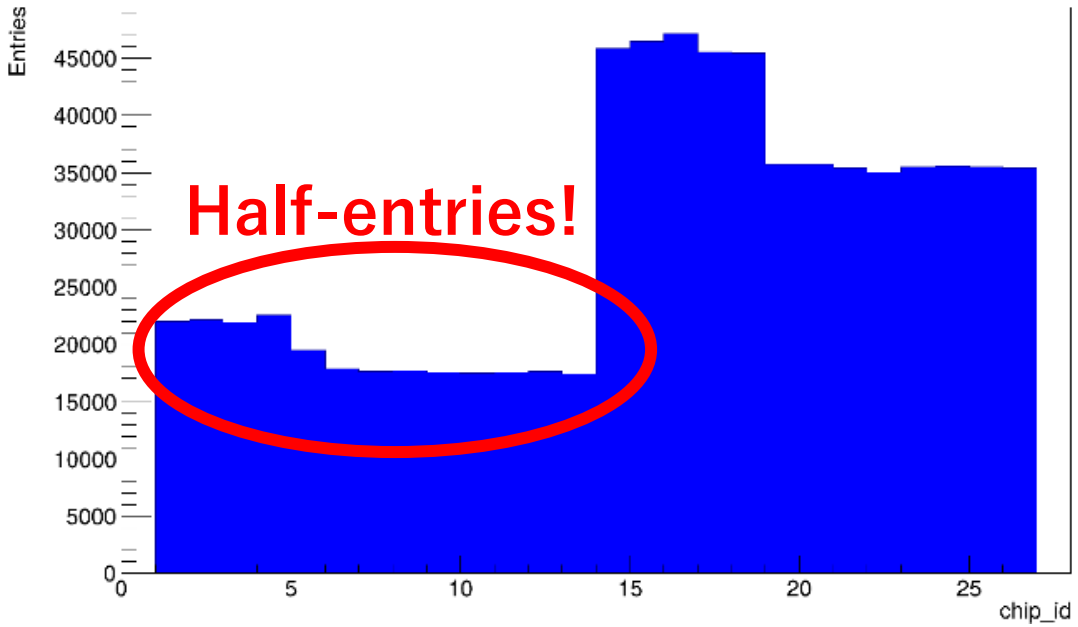
RUN#49314(P+P beam data)



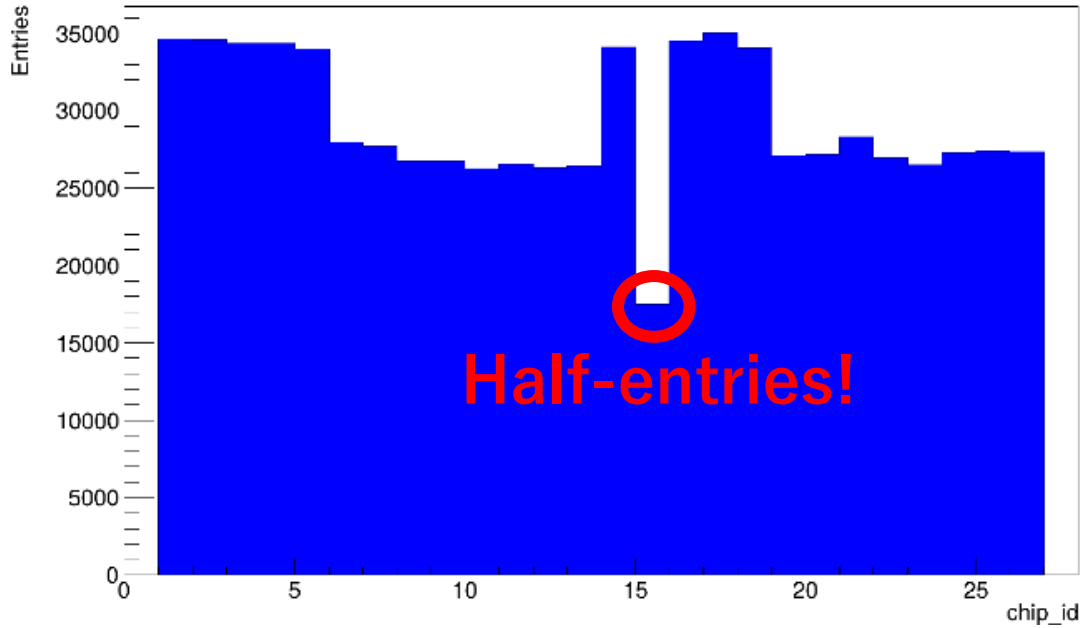
chip_id vs module (pid==3001)

1. Estimate the number of chips with half-entries





chip_id vs Entries
(pid=3001 & module=6)



chip_id vs Entries
(pid=3001 & module=7)

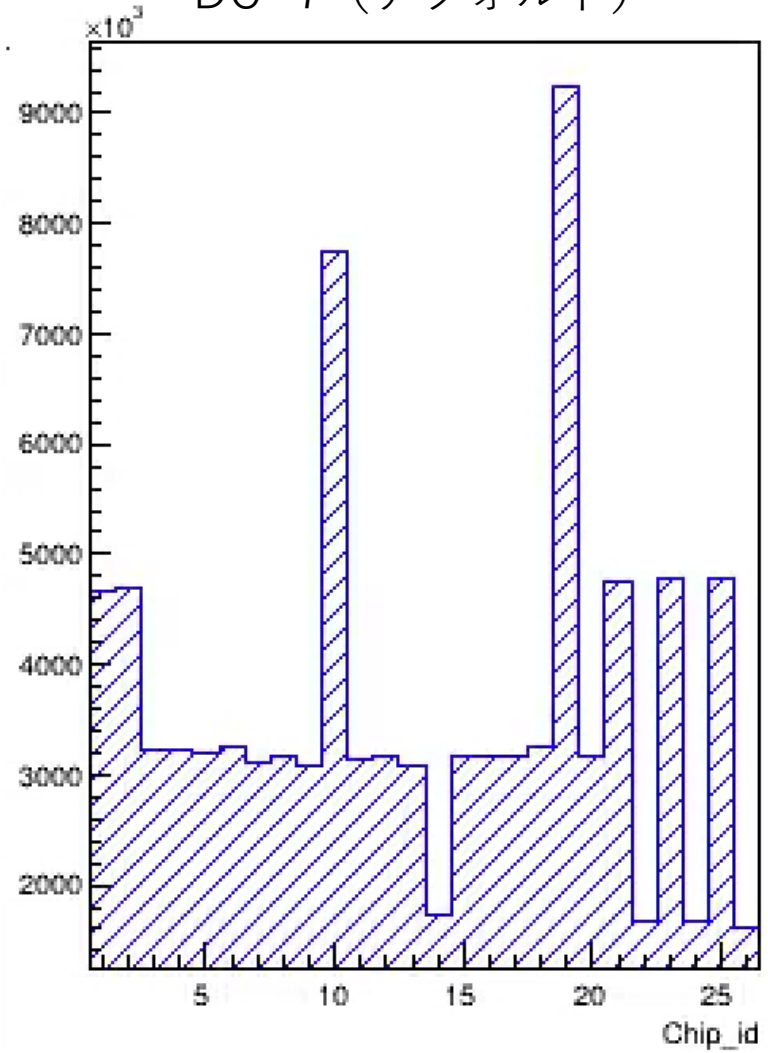
1. Estimate the number of chips with half-entries

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

$38\ \text{chips}/2912\ \text{chips} = \mathbf{1.3}\%$

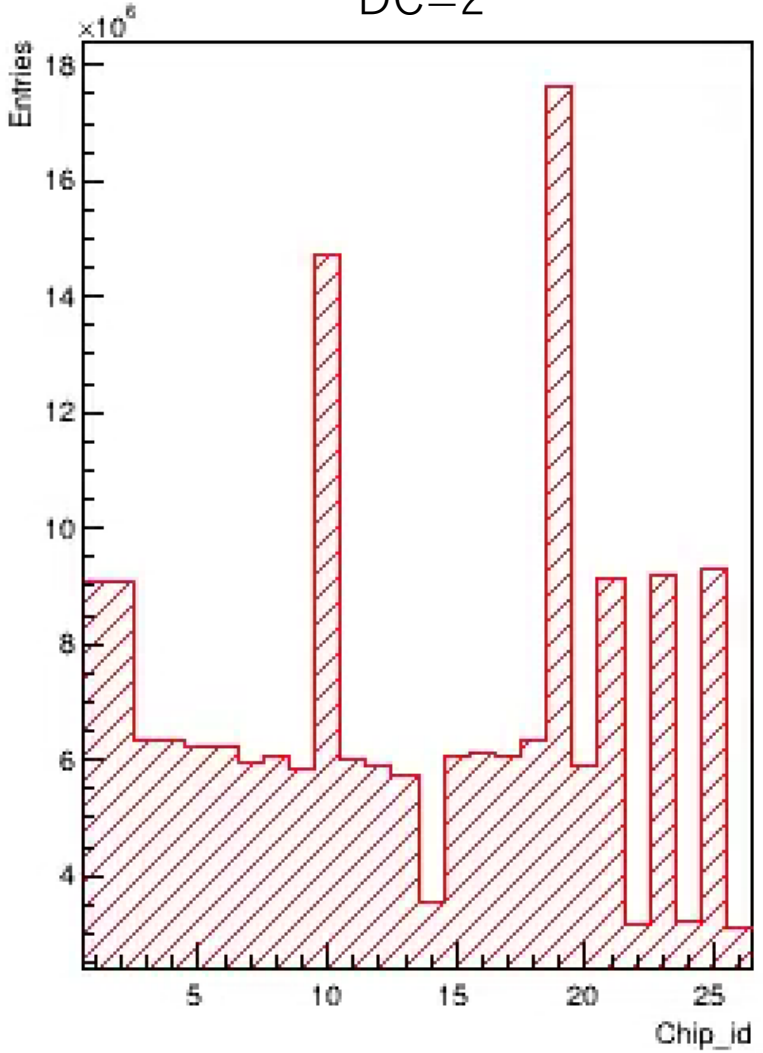
2. Confirm that the half-entries were restored by analyzing the data

DC=7（デフォルト）



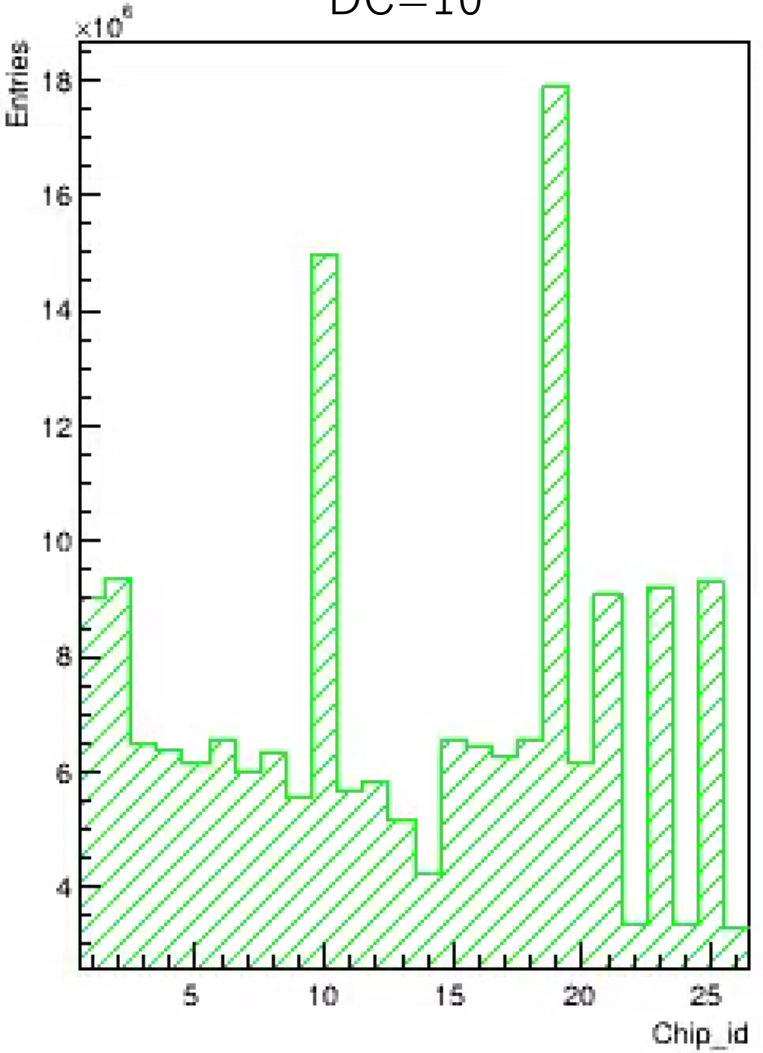
pedestal_intt7-00055060-0018.root

DC=2



pedestal_intt7-00055062-0013.root

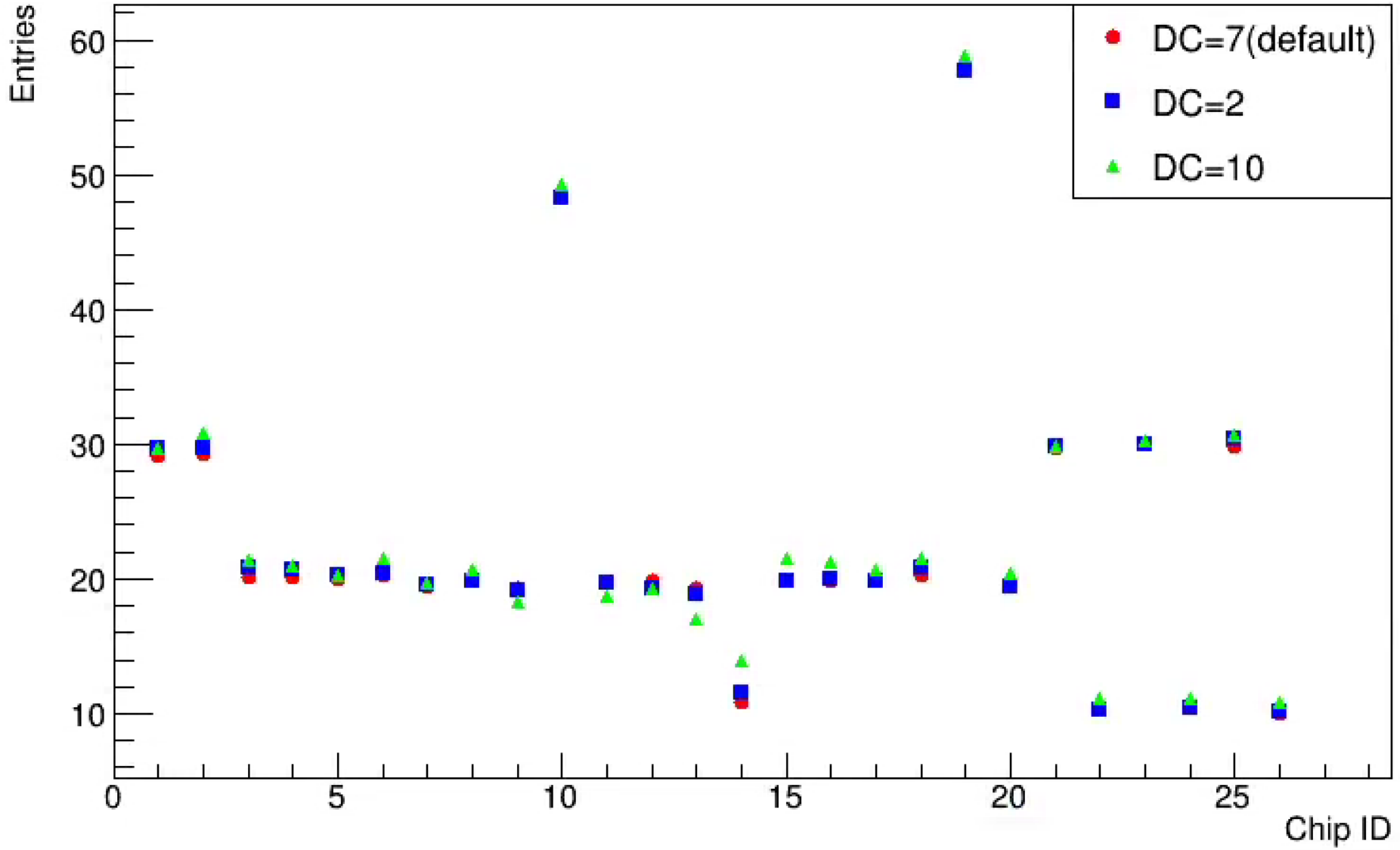
DC=10



pedestal_intt7-00055064-0013.root

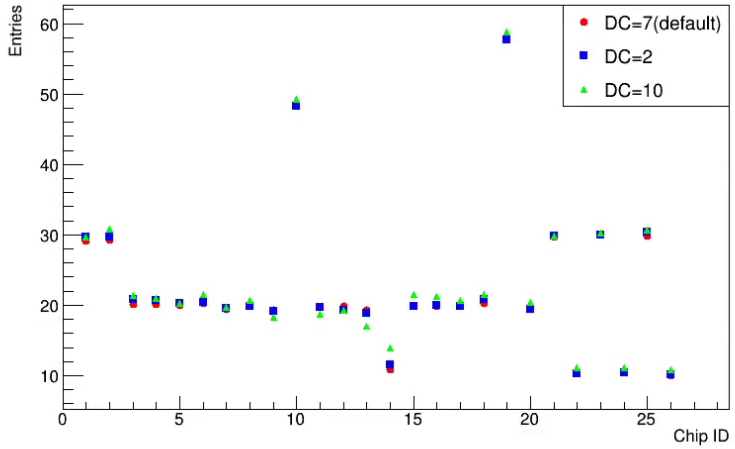
module=0

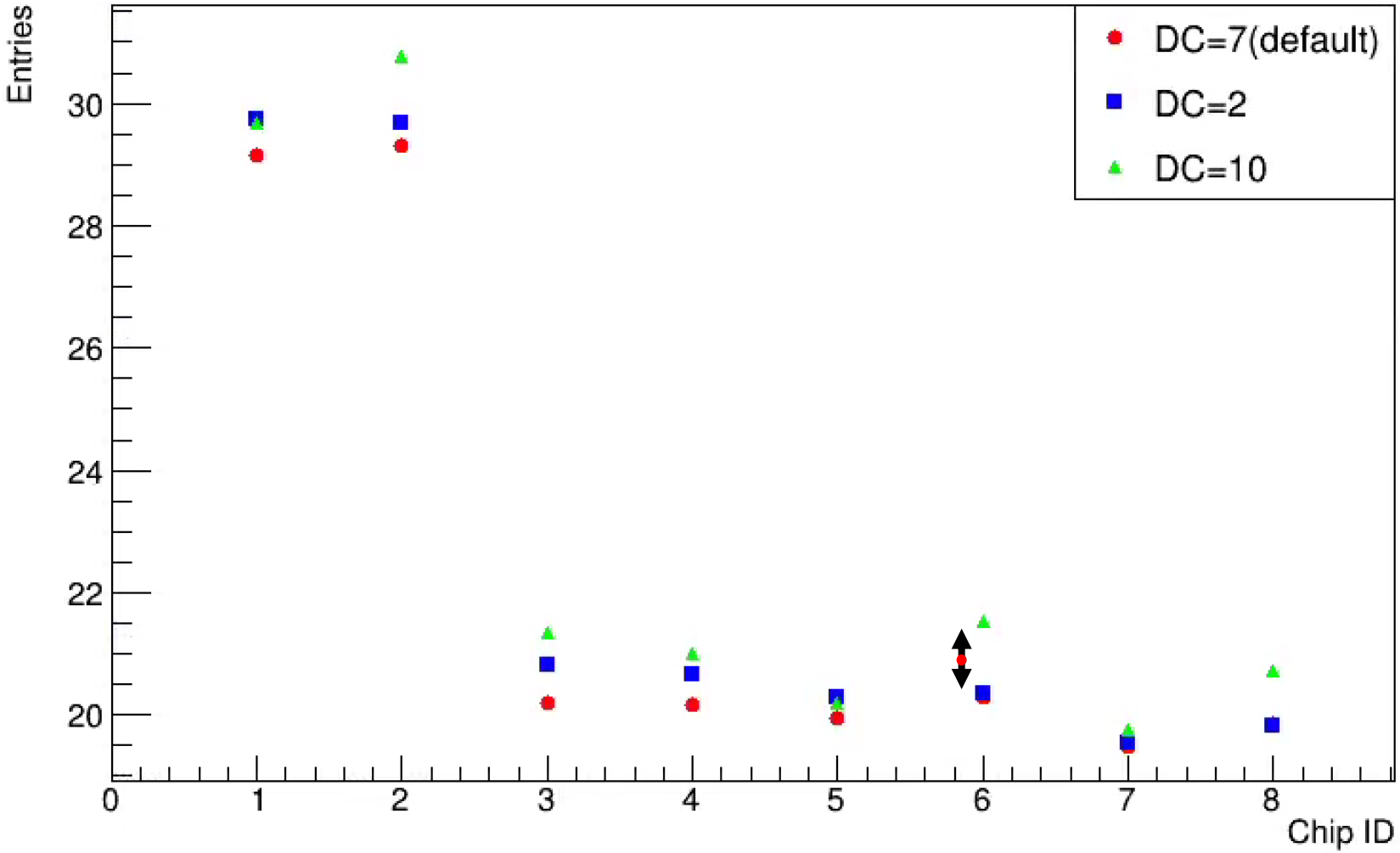
2. Confirm that the half-entries were restored by analyzing the data



Pid=3008 & module=0

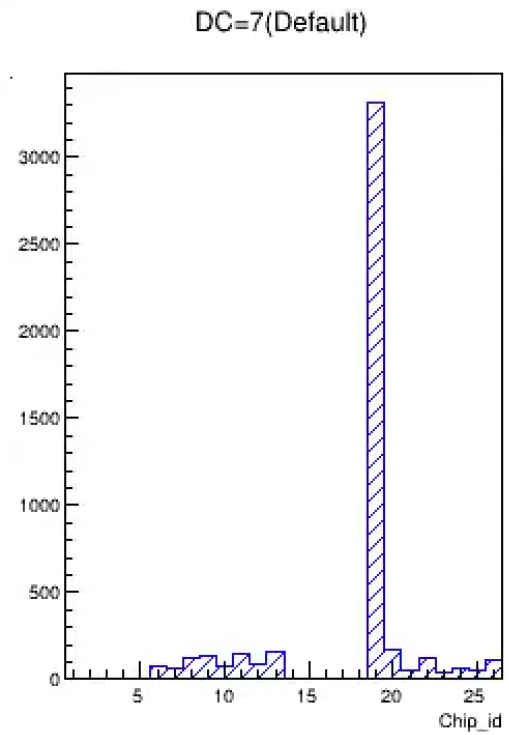
2. Confirm that the half-entries were restored by analyzing the data

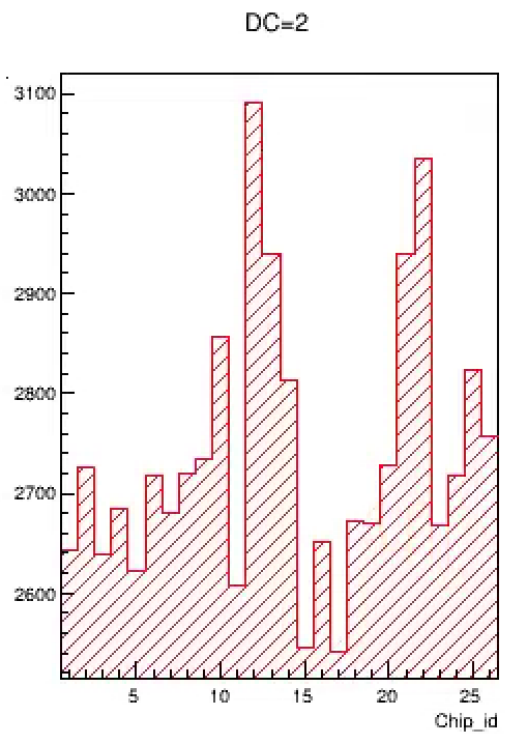


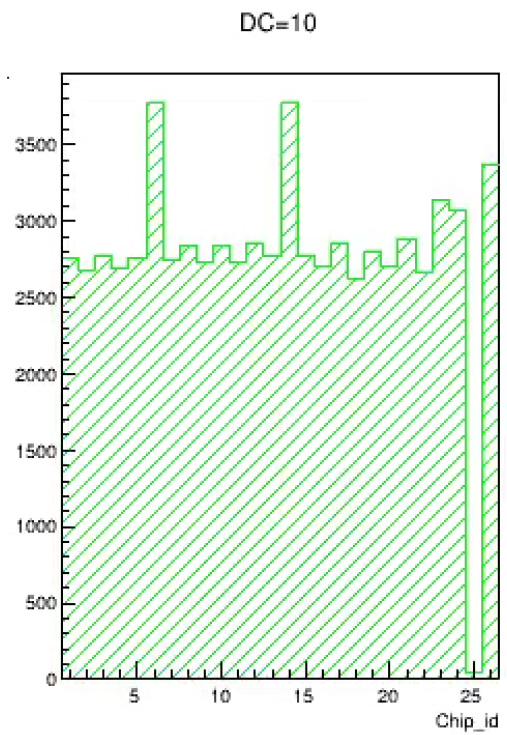


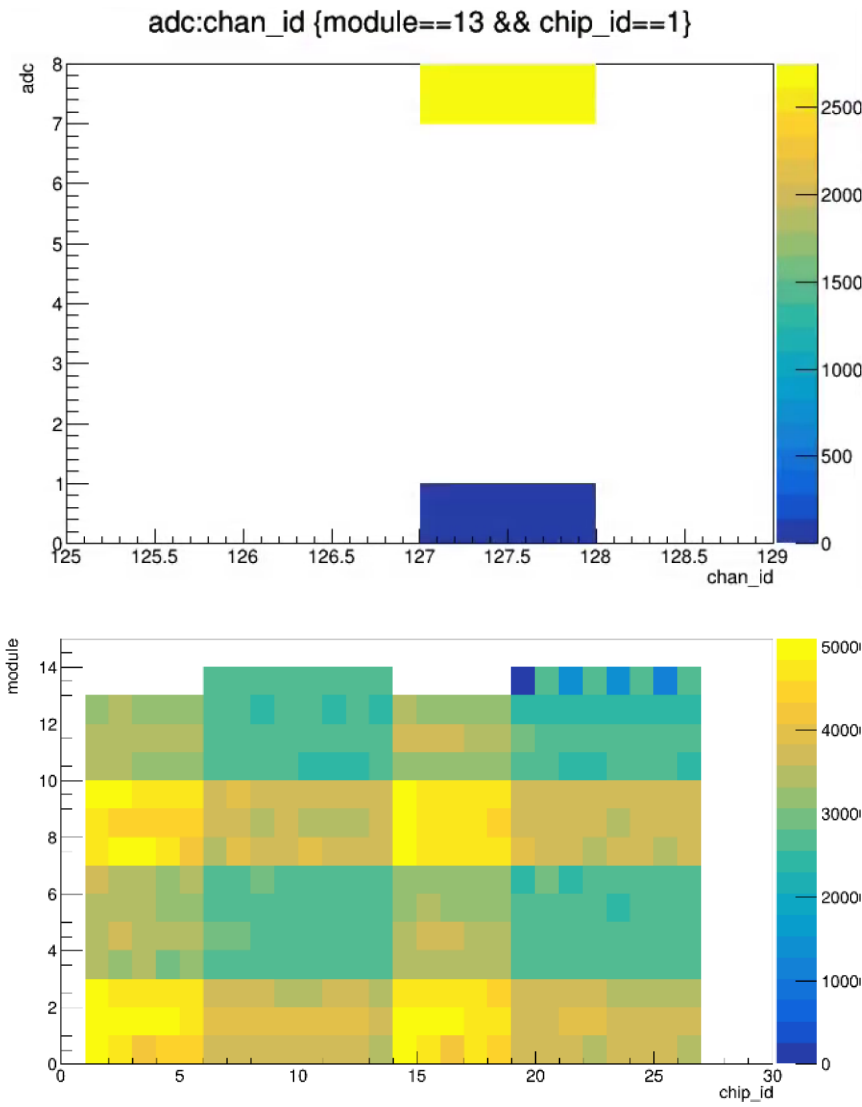
Pid=3008 & module=0

2. Confirm that the half-entries were restored by analyzing the data





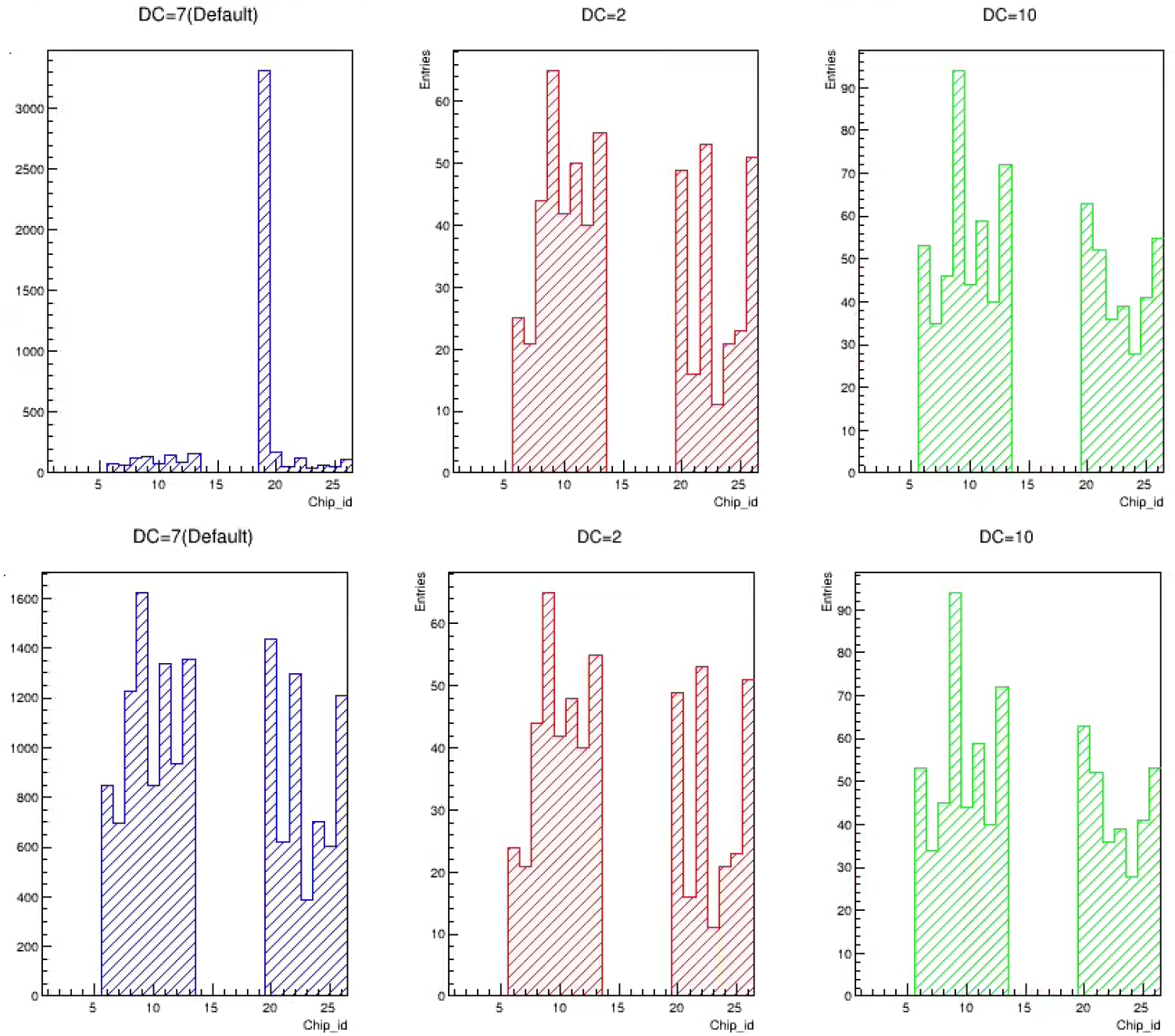




Pid=3004 & module=13

2. Confirm that the half-entries were restored by analyzing the data

Cut chan_id=0



Pid=3004 & module=13

SUMMARY

1. Estimate the number of chips with half-entries
→1.3% of chips have half-entries.

2. Confirm that the half-entries were restored by analyzing the data with different Digital-Control
→Couldn’t Confirm that the half-entries were restored by using Digital-Control. Noise data may not show half entries.

Focus on hit rate, I’m going to study that half entries can be seen in noise data.