

Chip Saturation Study

Ryotaro Koike
Kyoto University

Scan of n_collision and open time

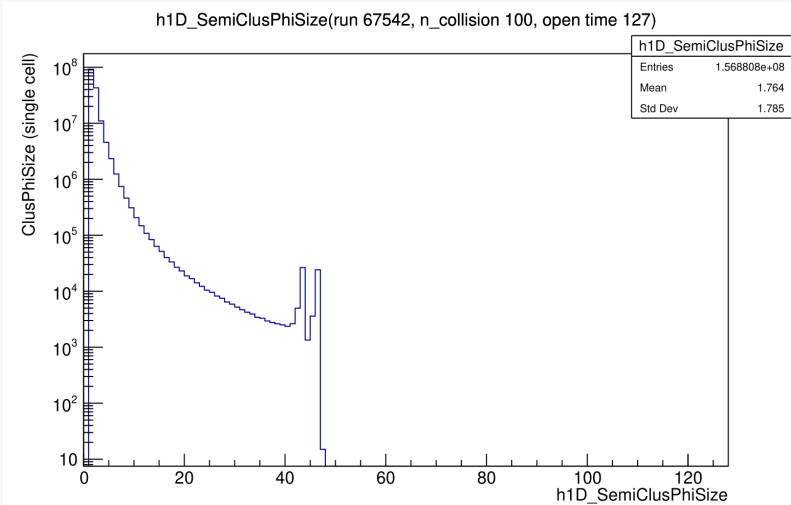
- We took a scan data for chip saturation study.

Date/Time	Run#	Run Type	Mag	Link	Duration (min)	DAC0	L1 Delay	n_coll	open time
2025/6/15 13:09	67542	beam	On	plot	5 min	35	108	100	127
2025/6/15 13:16	67544	beam	On	plot	5 min	35	108	100	110
2025/6/15 13:22	67545	beam	On	plot	5 min	35	108	100	90
2025/6/15 13:27	67546	beam	On	plot	5 min	35	108	100	80
2025/6/15 13:33	67547	beam	On	plot	5 min	35	108	100	60
2025/6/15 13:39	67548	beam	On	plot	5 min	35	108	100	40
2025/6/15 13:45	67549	beam	On	plot	5 min	35	108	100	25
2025/6/15 13:51	67550	beam	On	plot	5 min	35	108	2	127
2025/6/15 13:59	67552	beam	On	plot	5 min	35	108	2	110
2025/6/15 14:04	67553	beam	On	plot	5 min	35	108	2	90
2025/6/15 14:10	67554	beam	On	plot	5 min	35	108	2	80
2025/6/15 14:16	67555	beam	On	plot	5 min	35	108	2	60
2025/6/15 14:22	67556	beam	On	plot	5 min	35	108	2	40
2025/6/15 14:28	67557	beam	On	plot	5 min	35	108	2	25
2025/6/15 14:34	67558	beam	On	plot	5 min	35	108	50	127
2025/6/15 14:40	67559	beam	On	plot	5 min	35	108	50	110
2025/6/15 14:46	67560	beam	On	plot	5 min	35	108	50	90
2025/6/15 14:59	67563	beam	On	plot	5 min	35	108	50	60
2025/6/15 15:06	67564	beam	On	plot	5 min	35	108	50	40
2025/6/15 15:10	67565	beam	On	plot	5 min	35	108	50	25
2025/6/15 15:16	67566	beam	On	plot	5 min	35	108	50	80

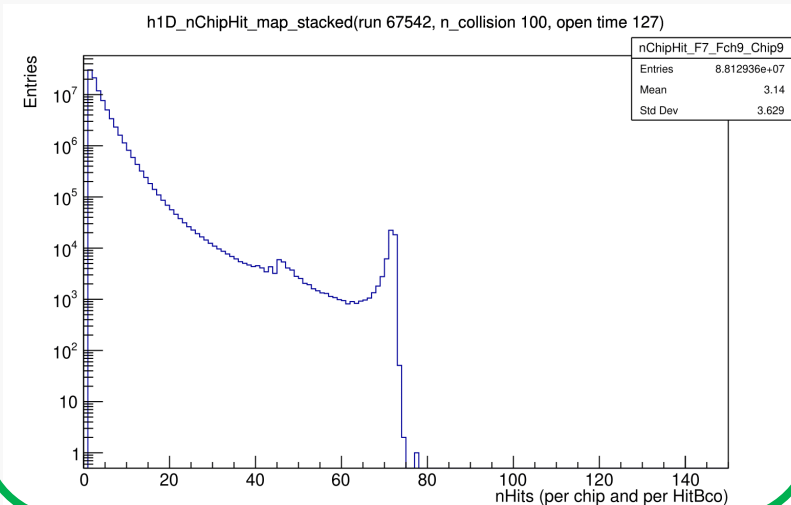
Plots produced by the Cheng-Wei's module

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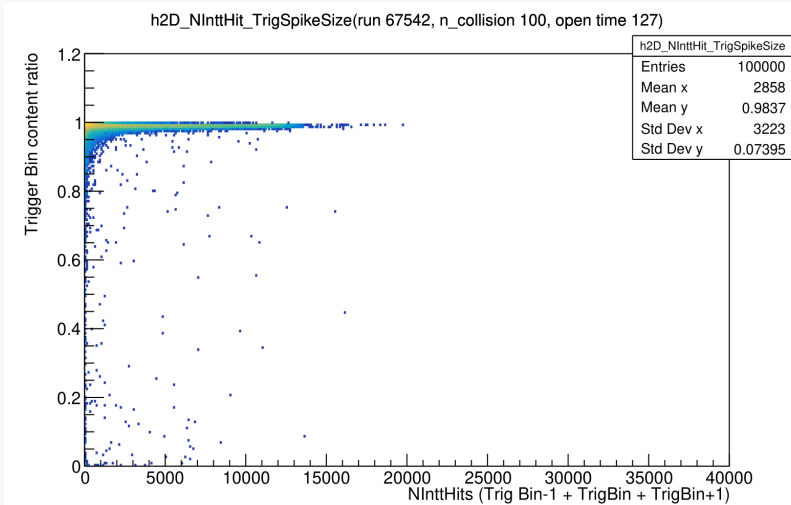
Cluster ϕ size For this study



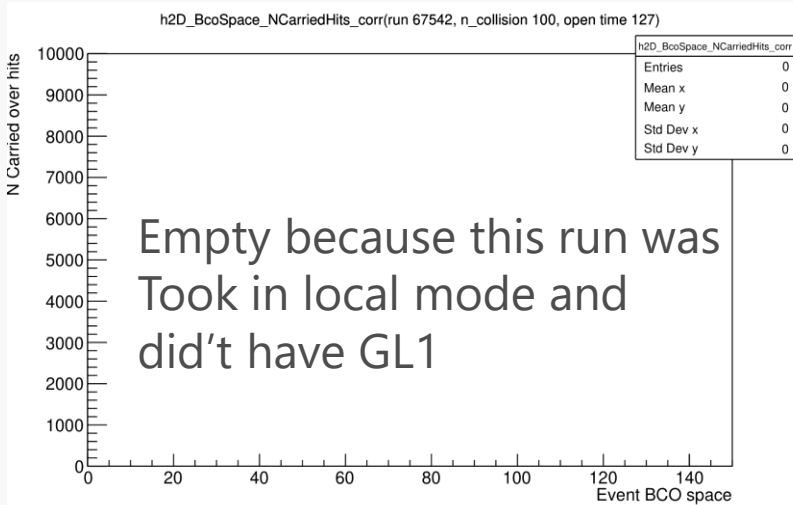
#hits per chip



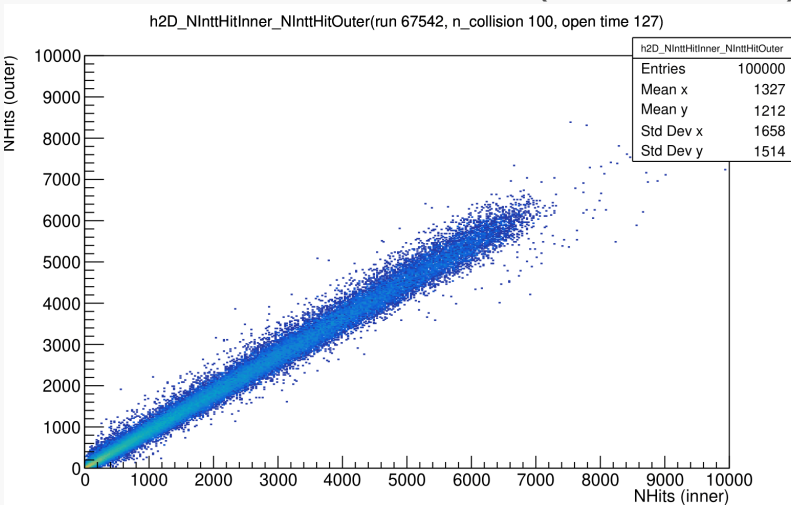
$N_{\text{trigger}} / (N_{\text{pre}} + N_{\text{trigger}} + N_{\text{next}})$



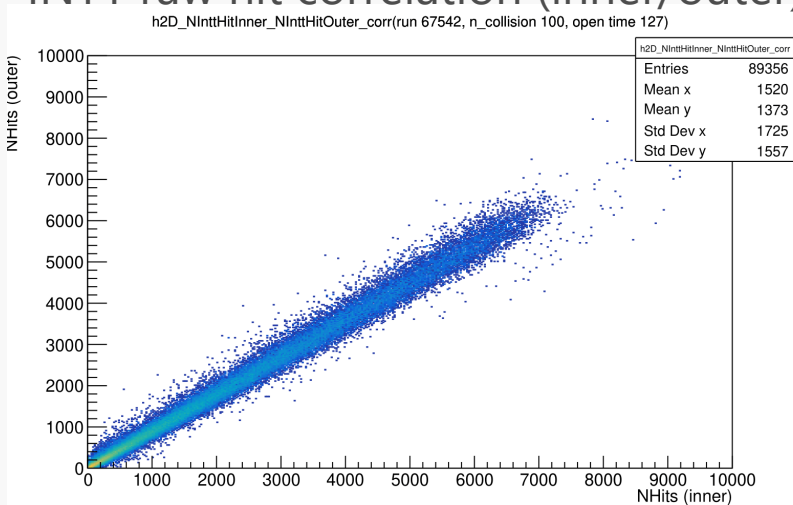
#Carried-over-hit



INTT raw hit correlation (inner/outer)



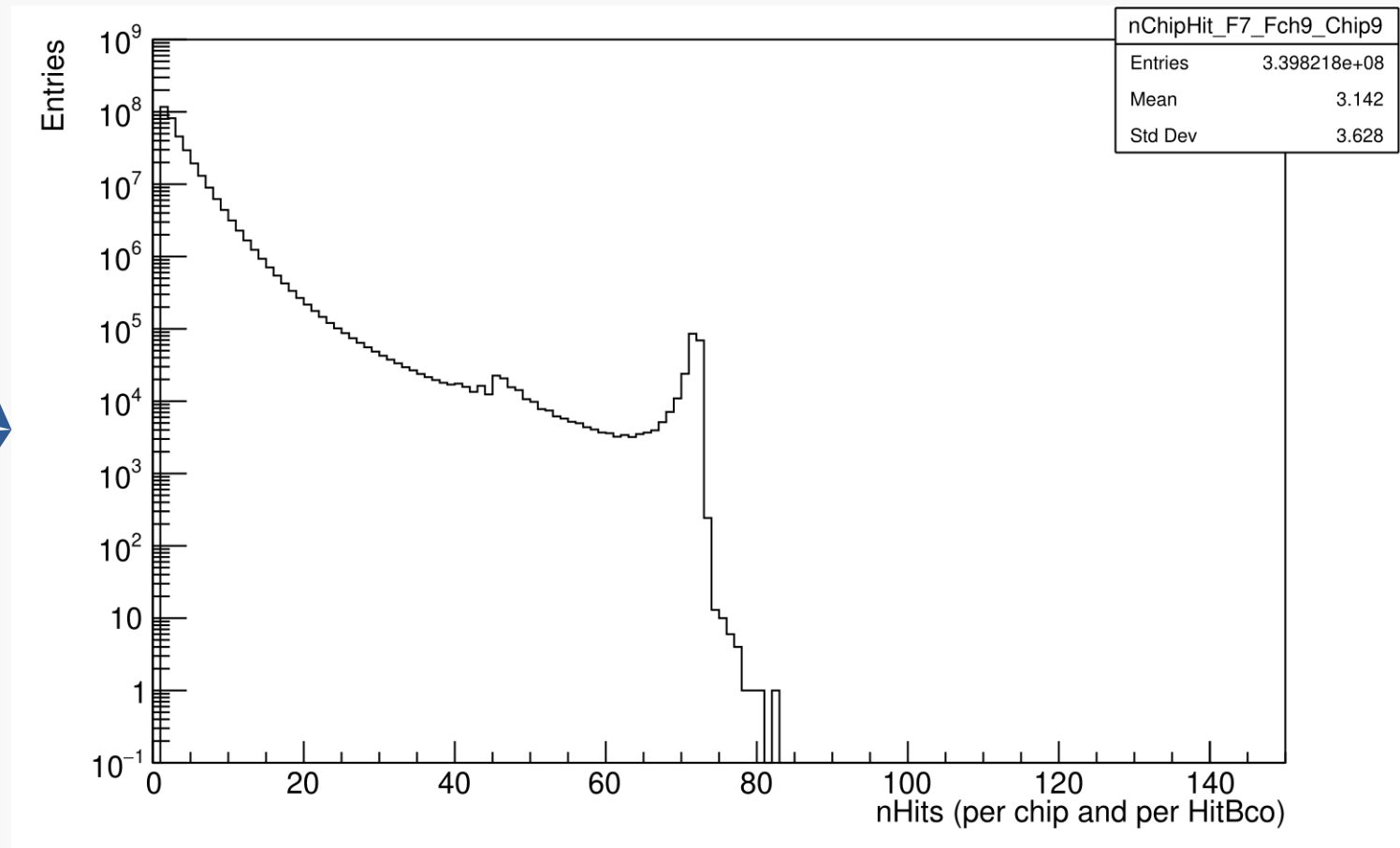
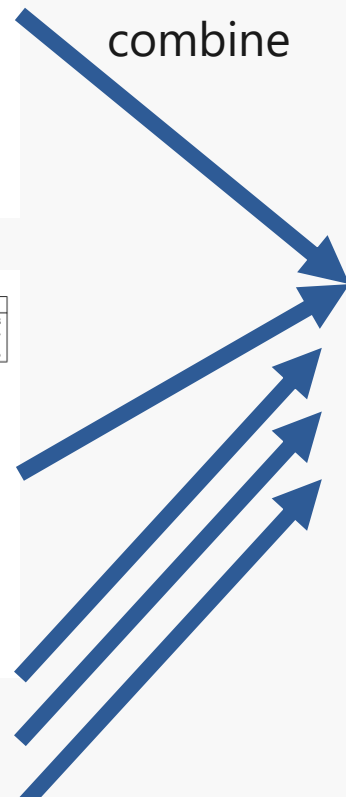
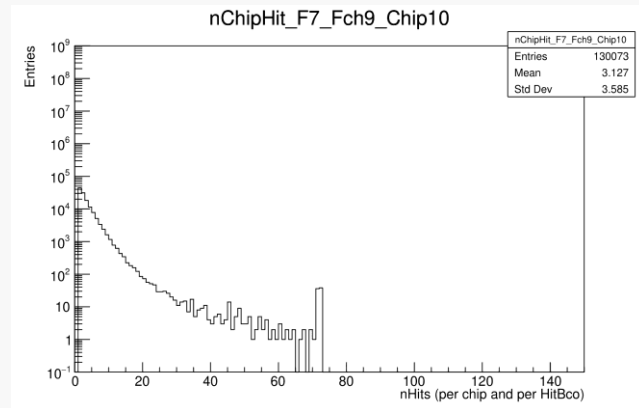
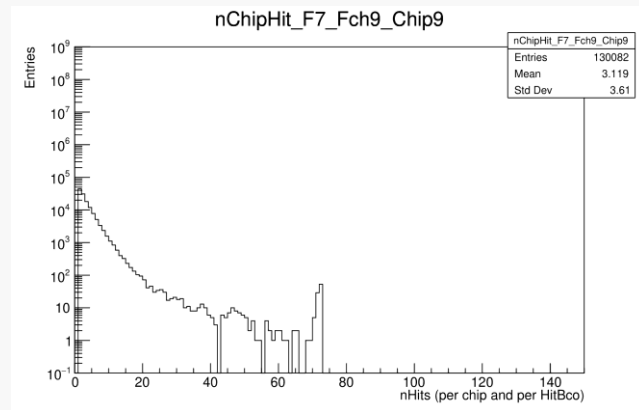
INTT raw hit correlation (inner/outer)



Answering questions in Japanese meeting ...

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- Does the calculation be done chip by chip?
→ Yes, but what I showed was after stacking chip-by-chip histograms.



~3000 histograms like these

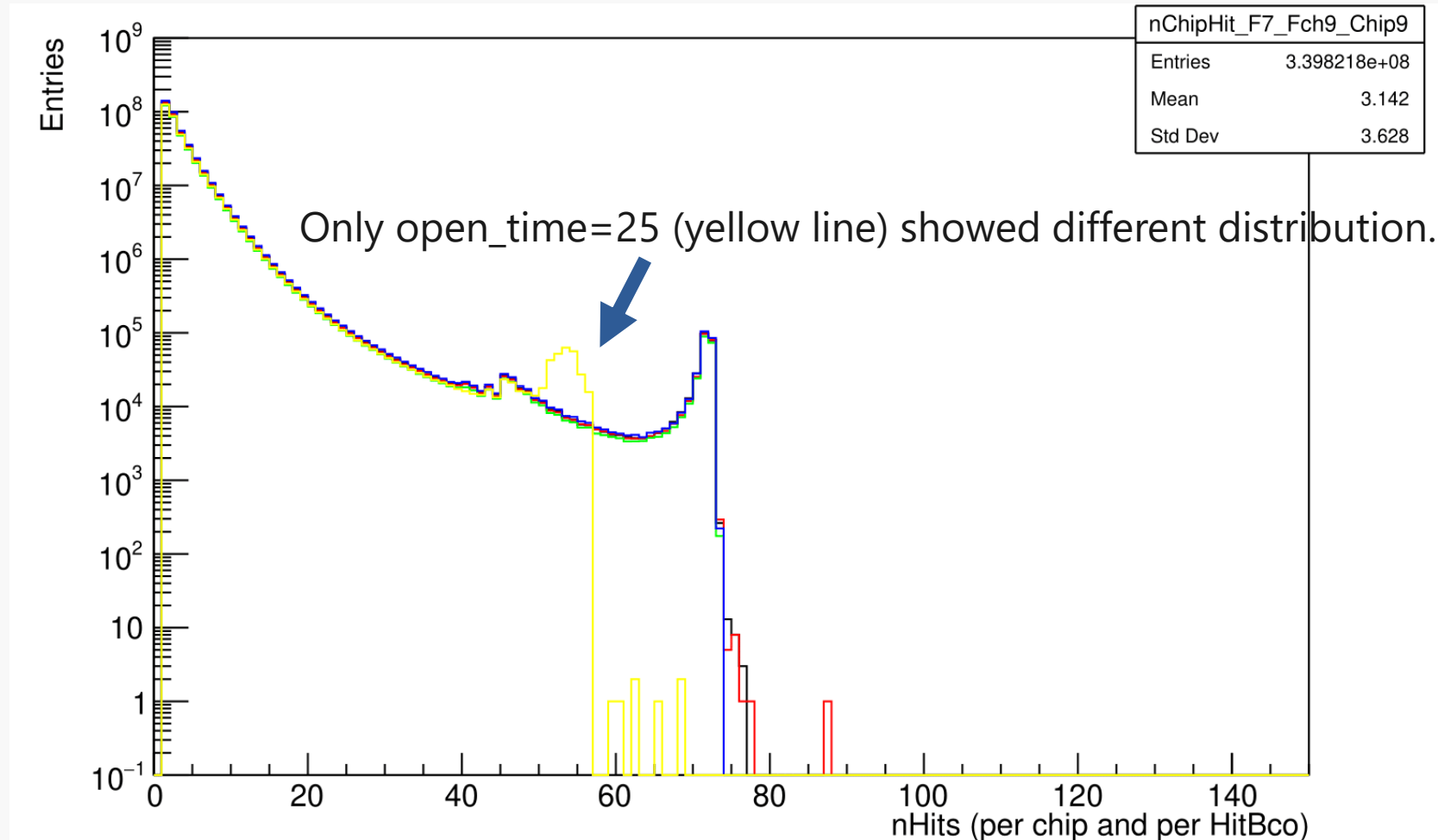
↑ What I showed (and will show in this slide.)

#hits when n_collision=100

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- open time=127,110,90,80,60,40,25
- Different colors for different open_time settings.

- Each histogram is not scaled yet.

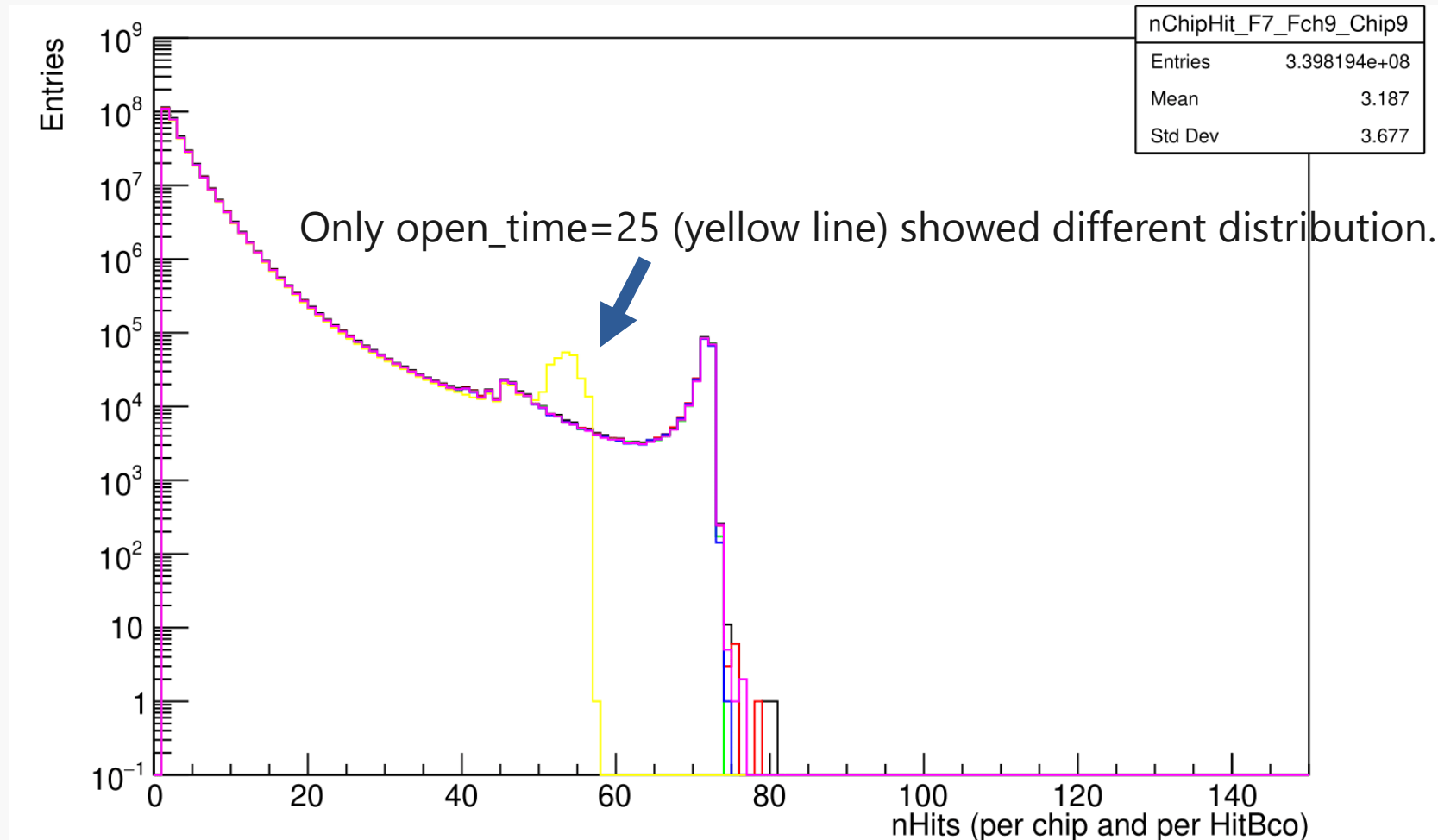


#hits when n_collision=50

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- open time=127,110,90,80,60,40,25
- Different colors for different open_time settings.

- Each histogram is not scaled yet.

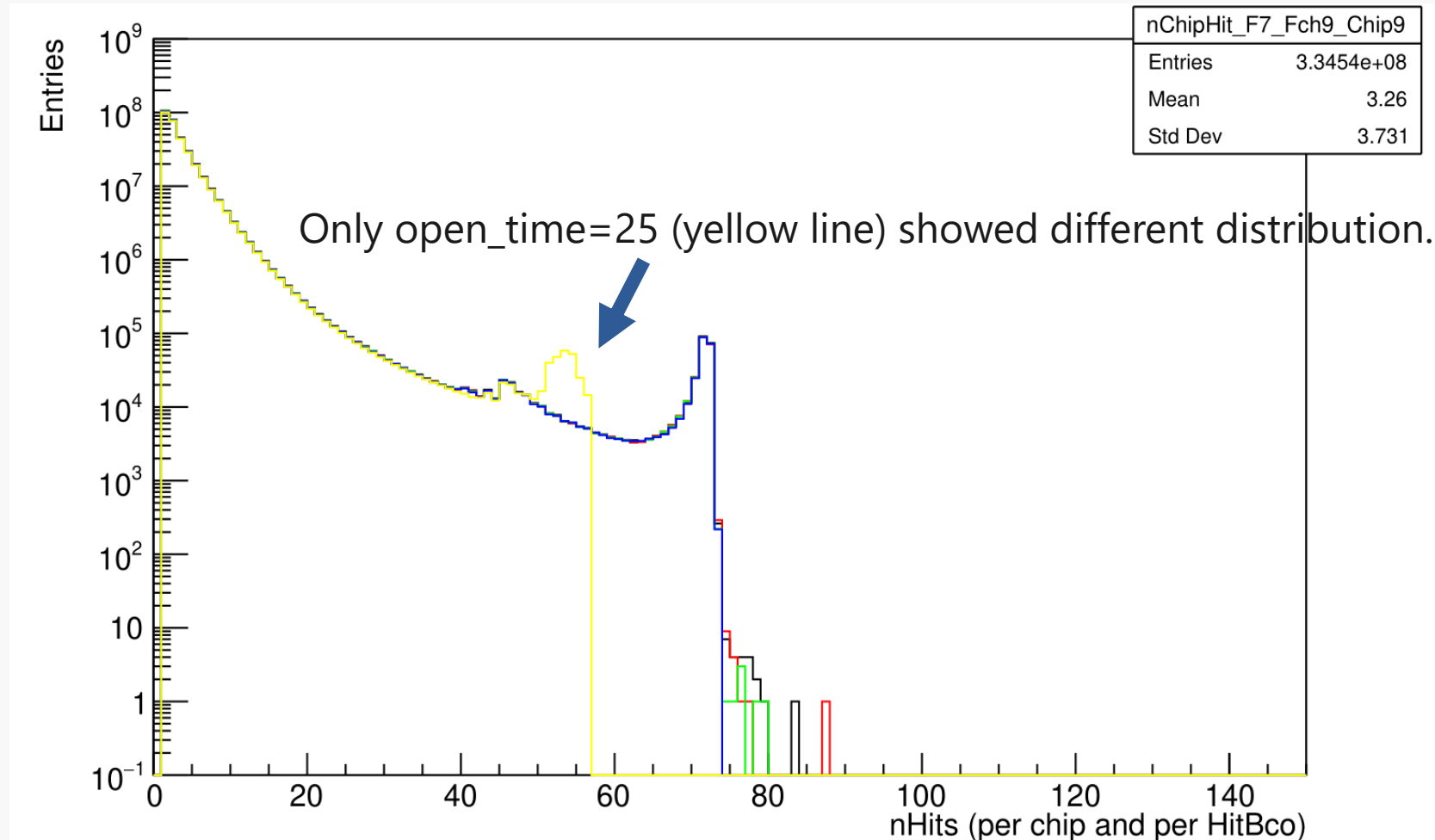


#hits when n_collision= 2

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- open time=127,110,90,80,60,40,25
- Different colors for different open_time settings.

- Each histogram is not scaled yet.



- **Visual check of plots was done.**
Things we found so far are;
 - Semi cluster ϕ size does not depend on either parameters.
 - #hits basically does not depend on open_time (an exception: open_time=25).
Setting open_time=25 leads to a stronger saturation.
- **More detailed/careful analysis is needed**
 - ~~Axis range should be fixed to see more in detail.~~
 - ,or a quantitative check is needed.