Chip saturation issue for half-entry

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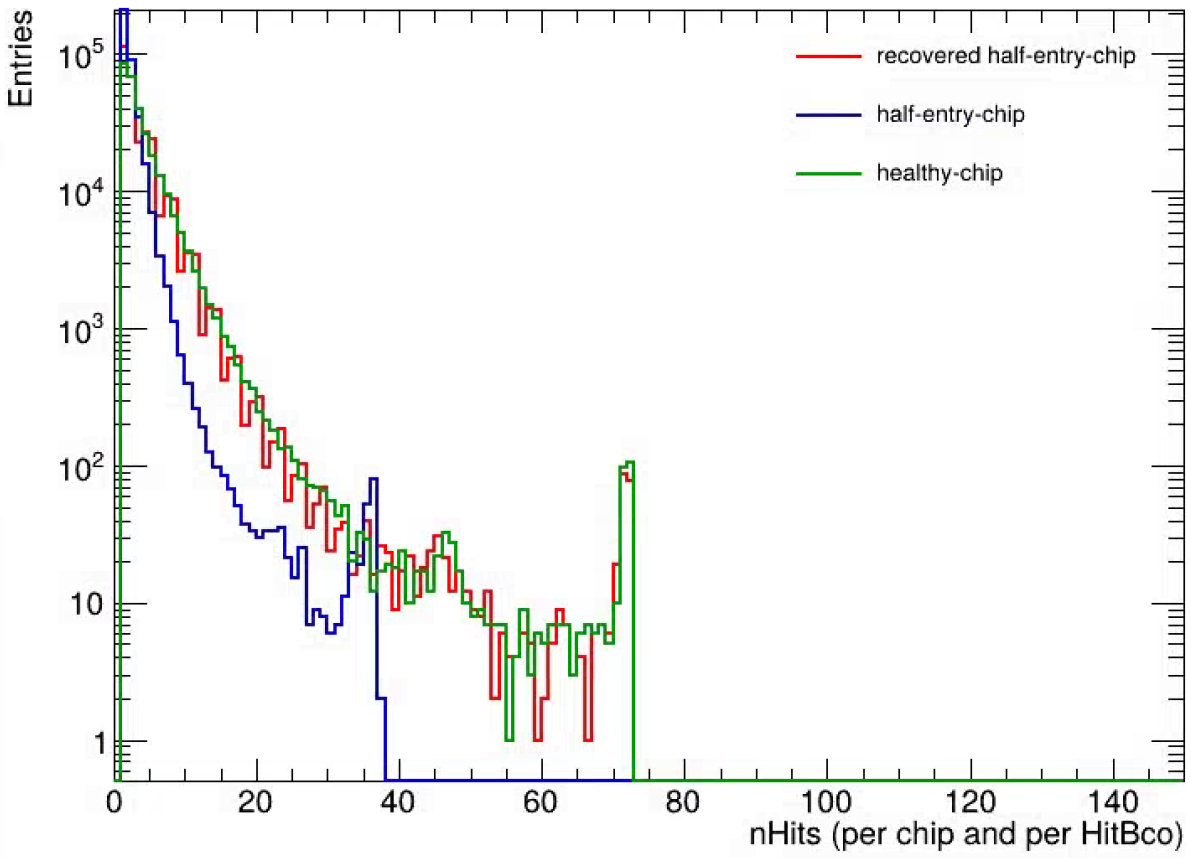
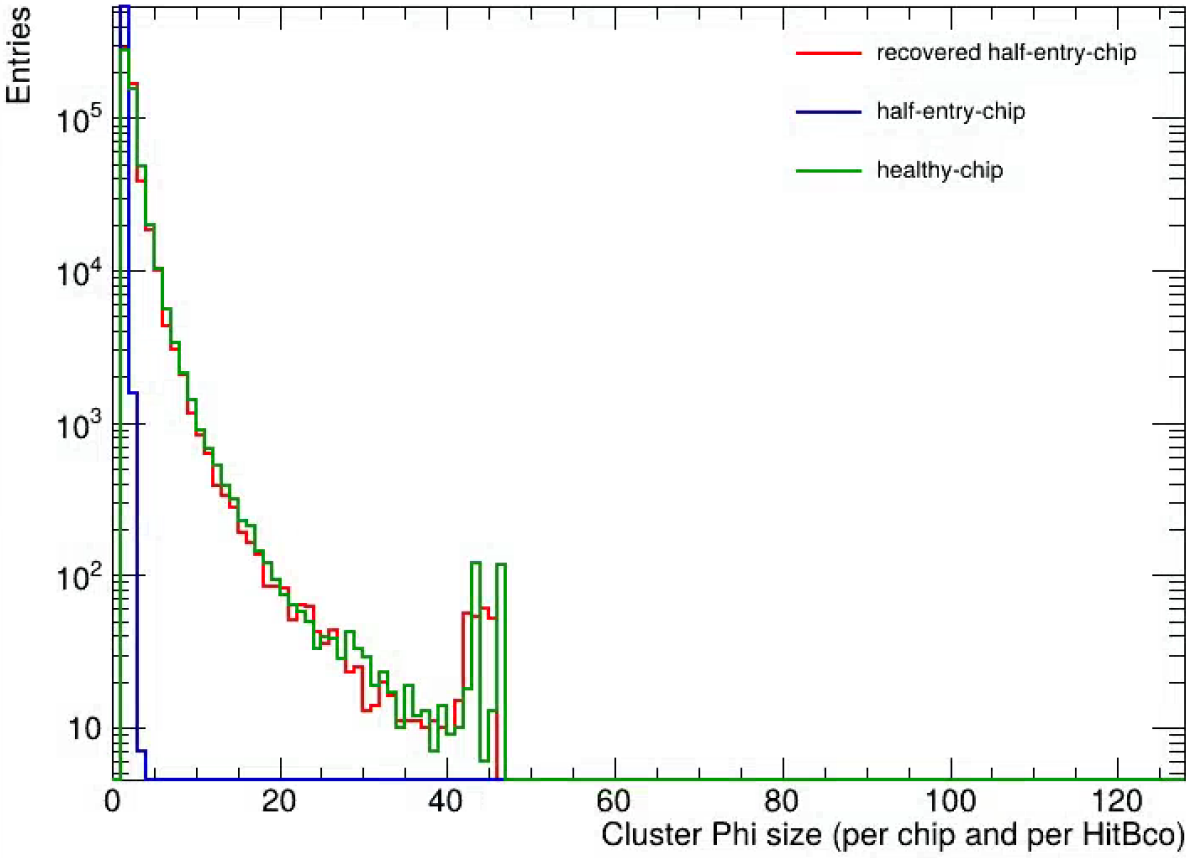
Chip saturation of half-entry chips

Before normalization



It shows half-entry in blue histogram.



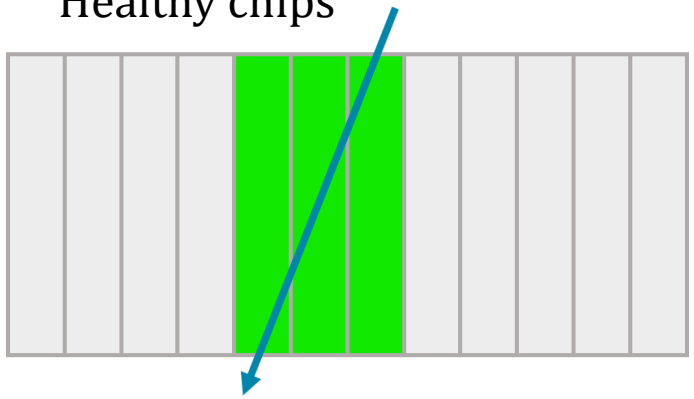
It seems that the shapes of the red and green histograms look similar.

About blue histogram

Chip saturation of half-entry chips

About clustering for half-entry chips (Blue histogram in previous page)

Healthy chips



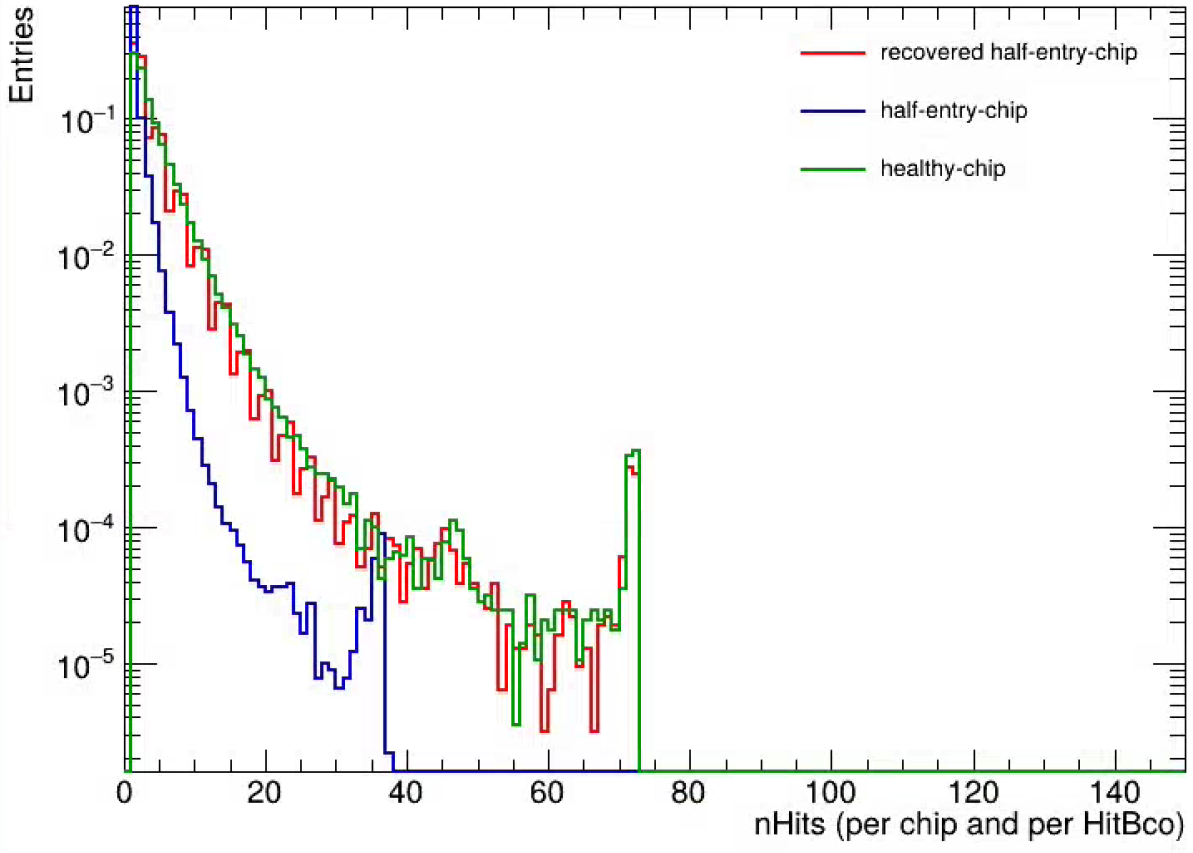
Cluster Φsize : 3

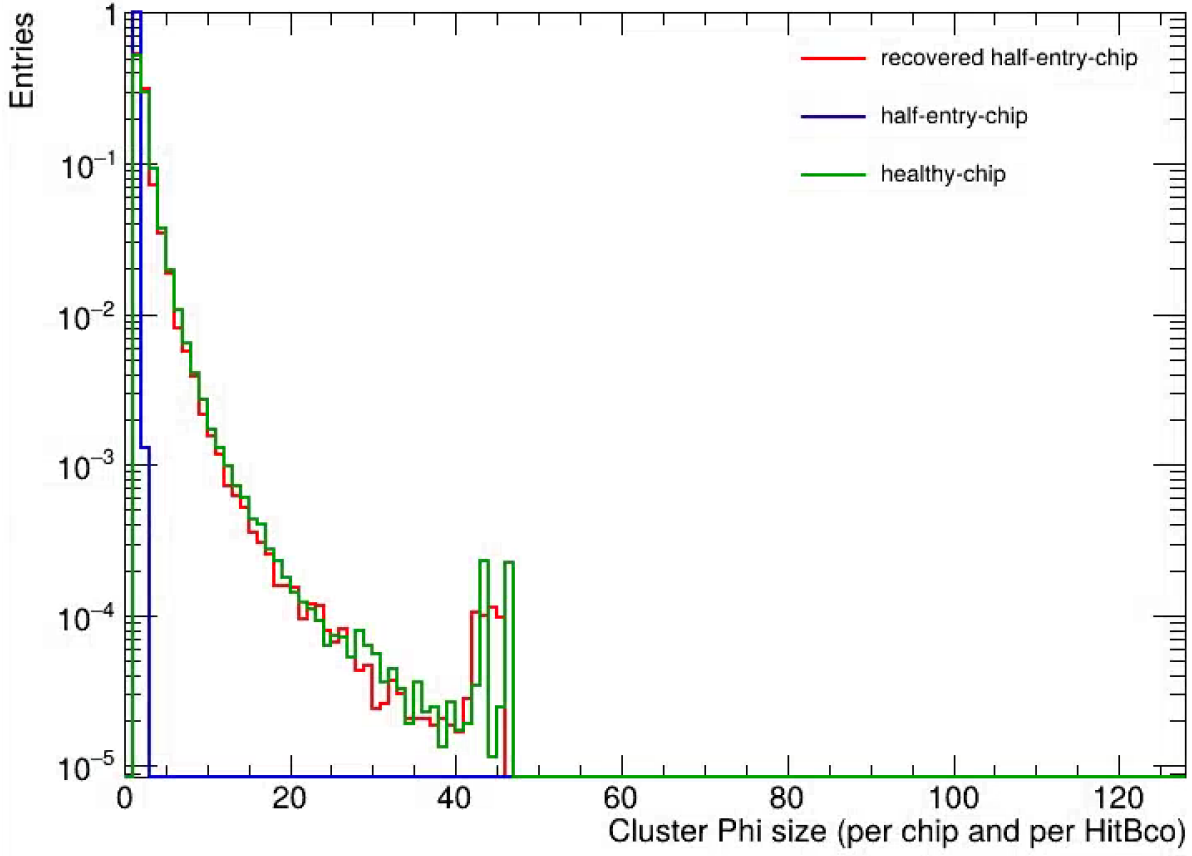
Half-entry chips

Cluster Φsize : 1
→ For half-entry chips, clustering does not work properly

Chip saturation of half-entry chips

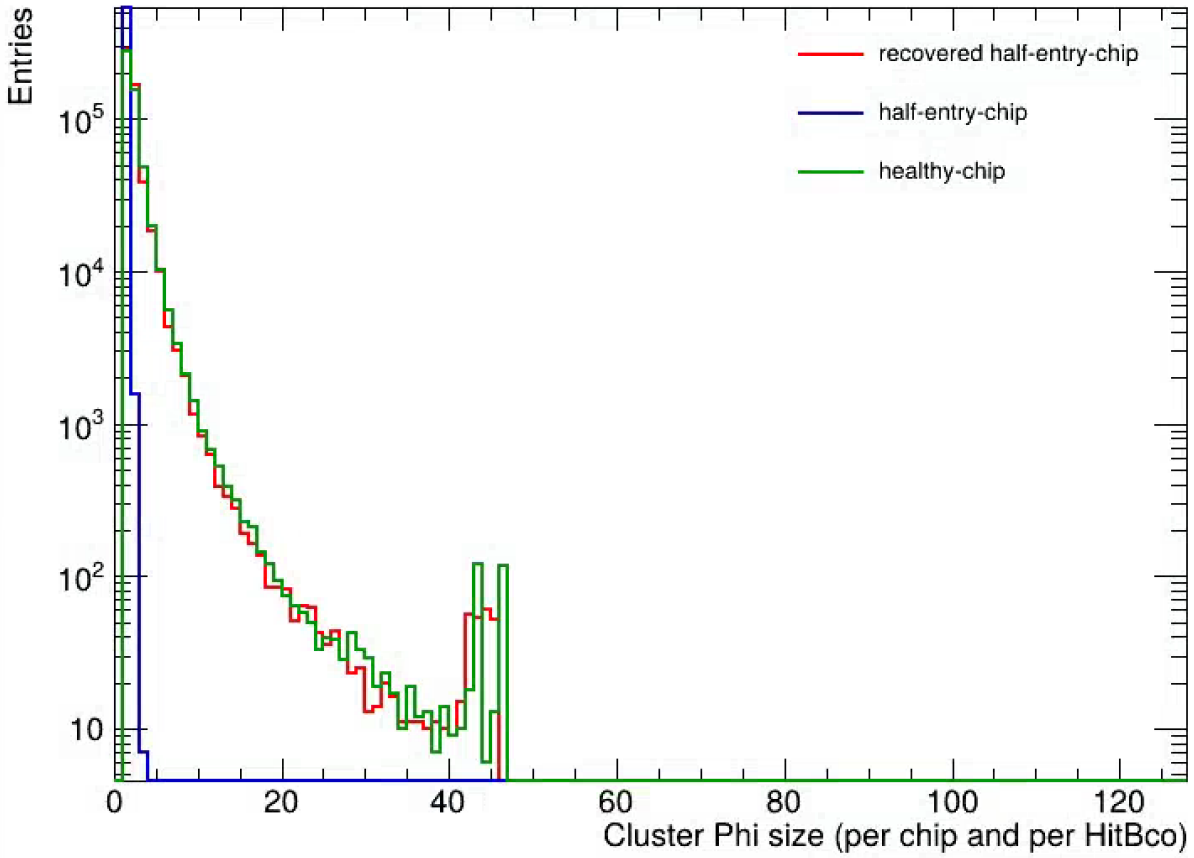
After normalization

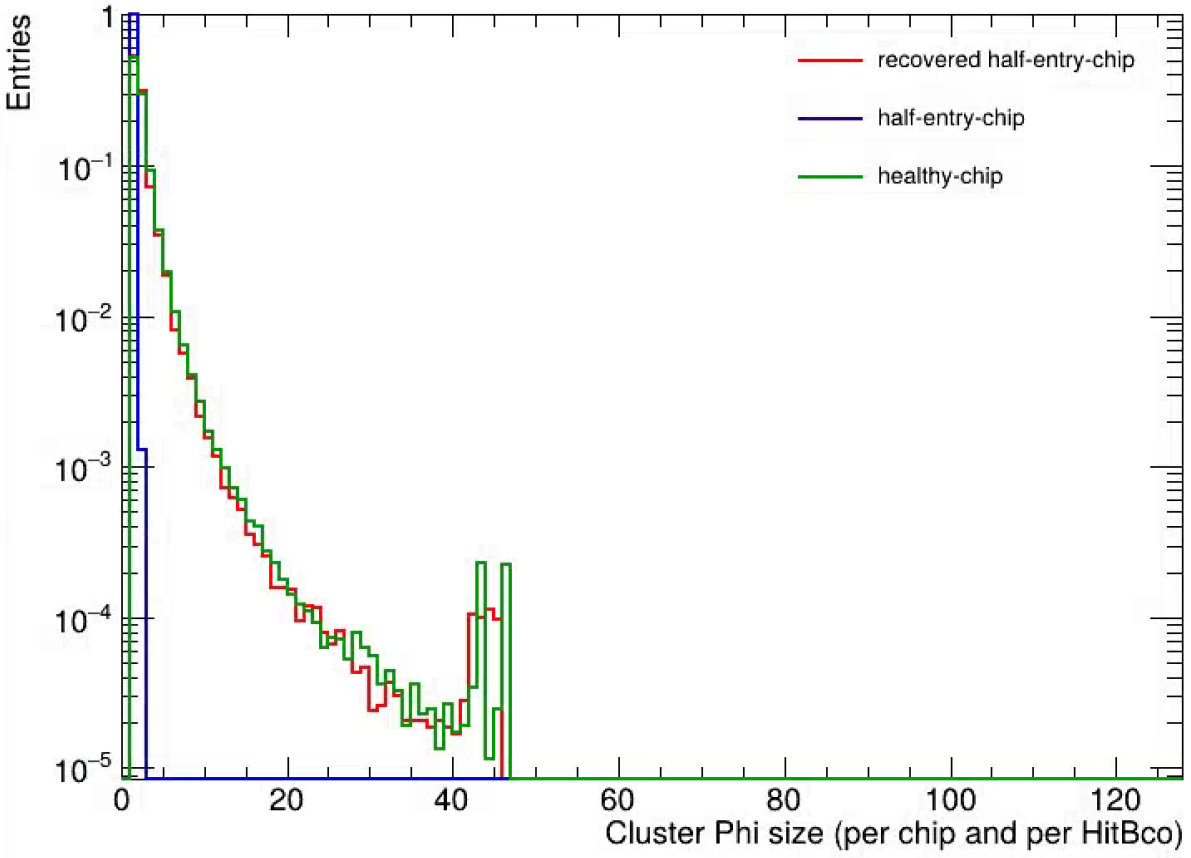




Chip saturation of half-entry chips

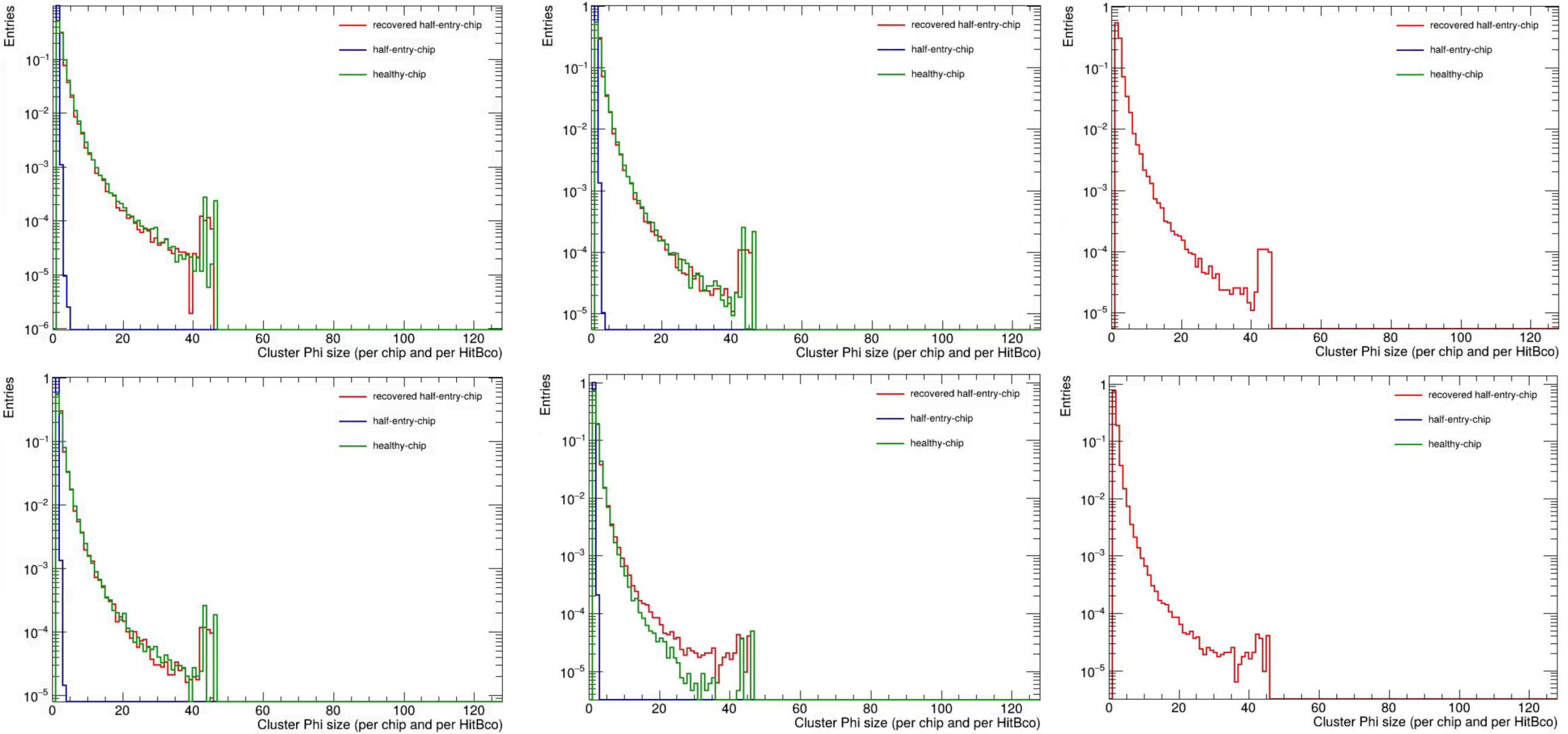
Comparation Cluster Phi size plot between before(left) and after(right) normalization





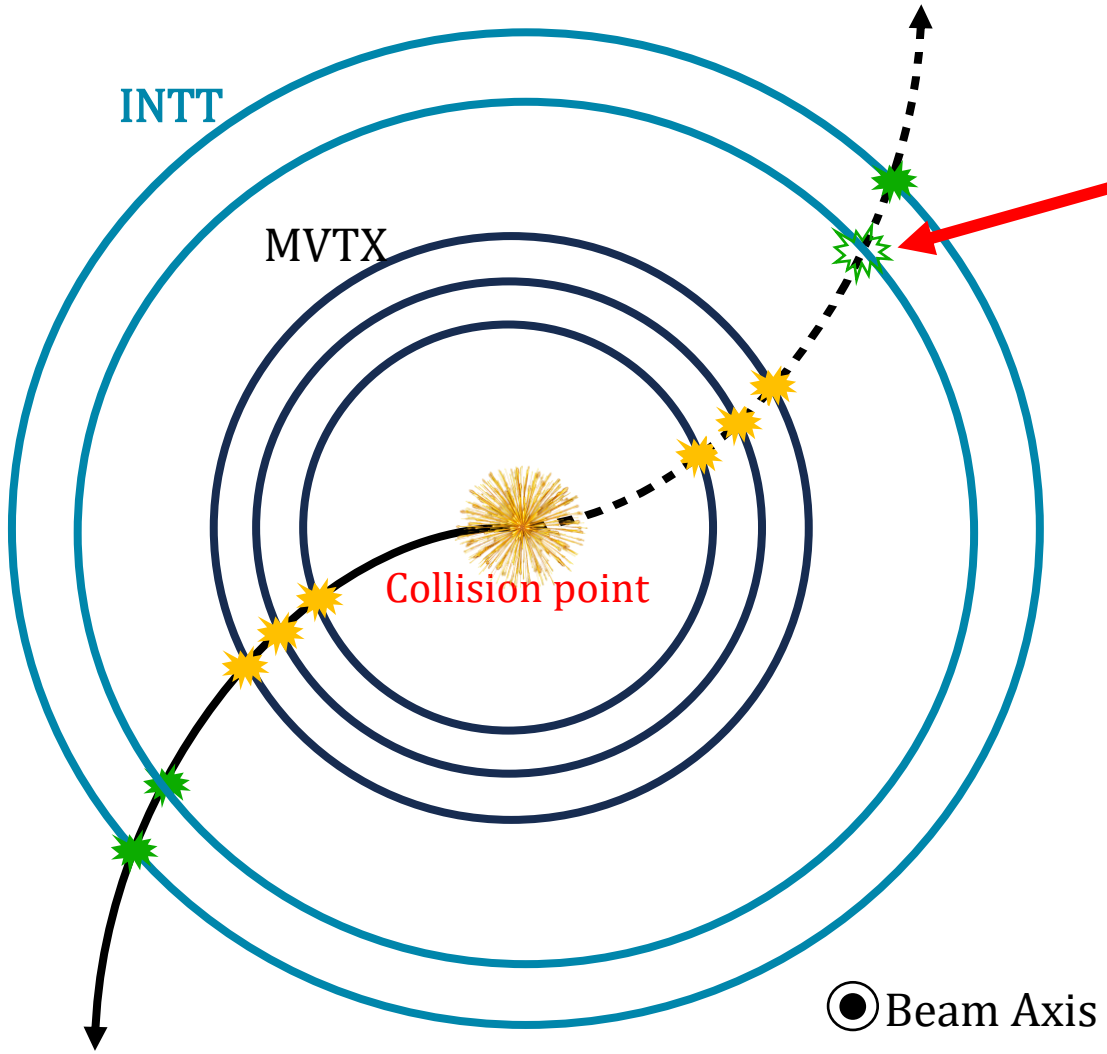
Chip saturation of half-entry chips

Plots of other half-entry chips



Current and Future Work

Tracking



In case of half-entry chip

- When a charged particle passes through **half-entry chips,** the corresponding tracking hit is lost with a probability of 1/2.

- By applying the solution to this problem, the tracking count is expected to increase.

My next study topic

My interest

TSSA (Transverse Single-Spin Asymmetry)
・**Collins effect**: an asymmetry arising from the correlation between the transverse spin of a quark and the direction of hadronization (fragmentation).
・**Sivers effect**: an asymmetry due to the correlation between the transverse spin of the proton and the intrinsic transverse momentum distribution of its quarks (or gluons).

flow-physics analysis
→This is the topic measuring the bulk properties of QGP, which may not be that sensitive to some calibrations (which could take years).
Ex) to reproduce the neutral-pion flow results with much larger statistics and sEPD data.

the silicon track - calo matching
to reconstruct some mass resonance. And use the silicon-calo-matched tracking doing some flow analyses.

Topics that still need to understand
・chip timing instability
・INTT MC fine tuning

Back up

How to check tracking count of half-entry chips

There are 2 ways how to check tracking count

A) From the chip_id information, create 128 TrkrHits to determine the x, y, and z ranges.
Since the cluster size corresponds to the number of channels, conversion into hits is possible.

B) track -> clusters in the track -> hits in the cluster
-> convert those hits to the raw-level convention to have the chip information

In sPHENIX default, half-entry chips are already masked as cold(bad) chips. So, for seeing the improvement, I need to re-process the cluster DST files (with a customized map).