78k issue

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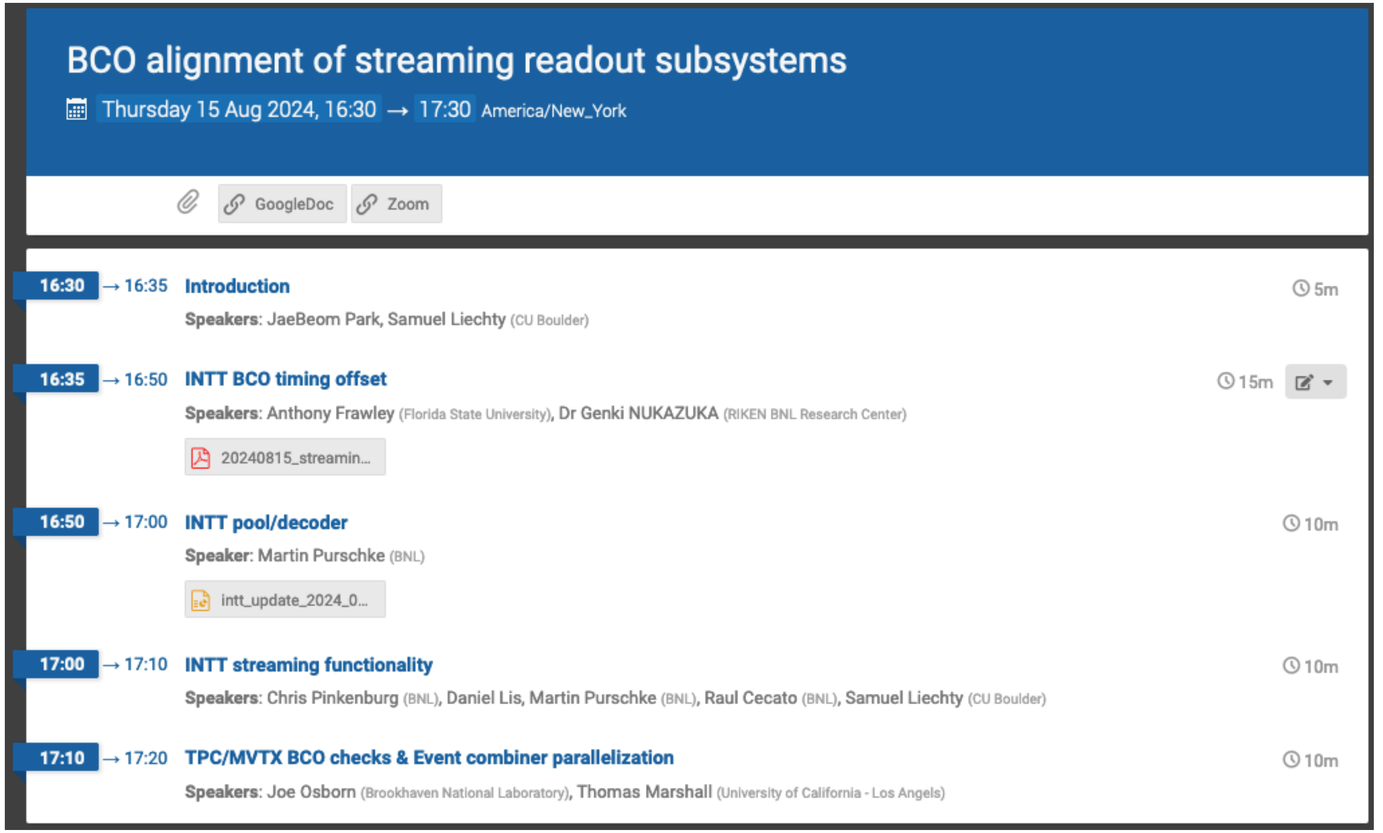
Takashi Hachiya (NWU)

Meeting for BCO alignment of streaming readout subsystems

A new meeting was organized by JaeBeom and held every day last week. We discussed

- Streaming data of INTT
  - Fun4All decoder doesn't decode events later than 78k.
- Extended data and streaming data
  - Tony from the tracking group finally realized the importance: multiple collisions is in a single event of INTT. Software implementation is needed.
- Discussion of INTT operation
  - Everybody didn't understand how INTT is operated. They learned it in the meetings.
- MVTX and TPC stuff
- Software stuff



3 phases in INTT streaming data

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Fun4AllServer::run - processing event 78250 from run 51486
Fun4AllServer::run - processing event 78251 from run 51486
Fun4AllServer::run - processing event 78252 from run 51486
Fun4AllServer::run - processing event 78253 from run 51486
Fun4AllServer::run - processing event 78254 from run 51486
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Sam's summary about the 3 phases in INTT streaming data reported on Aug 14

There seem to be three distinct "phases."

First phase

- Lasts from RCDAQ event 1 through ~1300.
- RCDAQ events all contain 16396 words.
- BCOs are properly separated by 120.

GL1 Prestart?

Second Phase

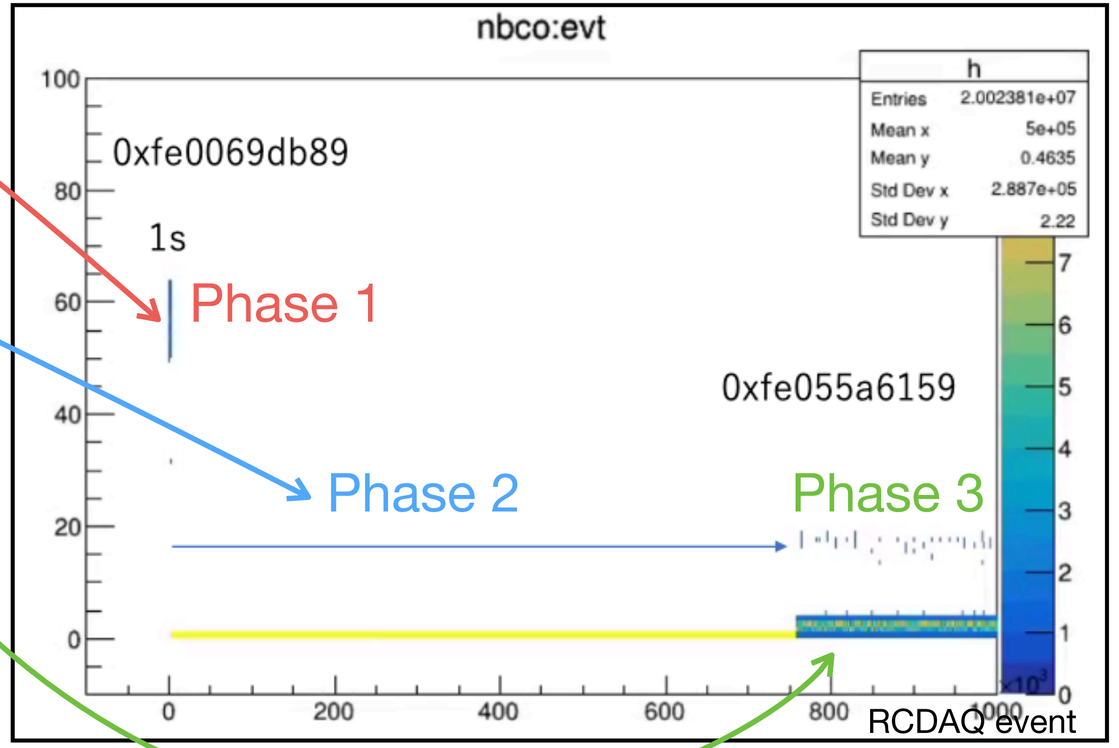
- Lasts from RCDAQ event ~1300 through ~700000.
- There are no headers or footers, this means we get no BCOs, and no complete hits
- but we do see the correct structure for a given hit
- RCDAQ events rarely get more than 300 words

Time between Prestart and the real start

Third phase

- For the two runs I've been able to go all the way to the end, this phase persists until the end of the run.
- The first BCO for every fee of the third phase is about a few million greater than the last BCO of the first phase
- RCDAQ events get a few hundred words.
- BCOs are separated by 120.
- Perhaps the most important: the first BCO of this phase lines up with the first BCO in the GL1 packet.

The real start and on

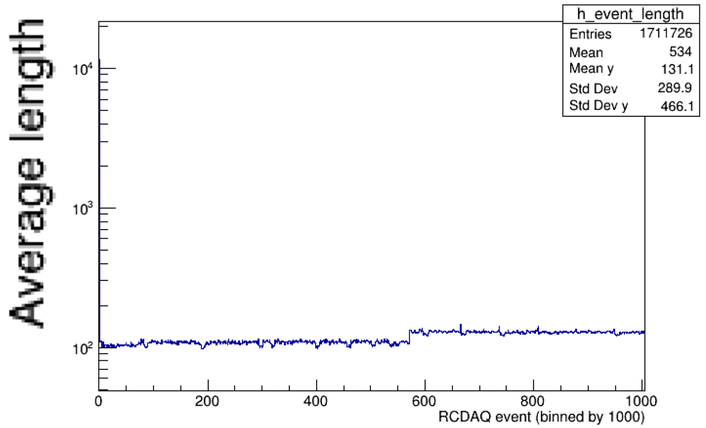


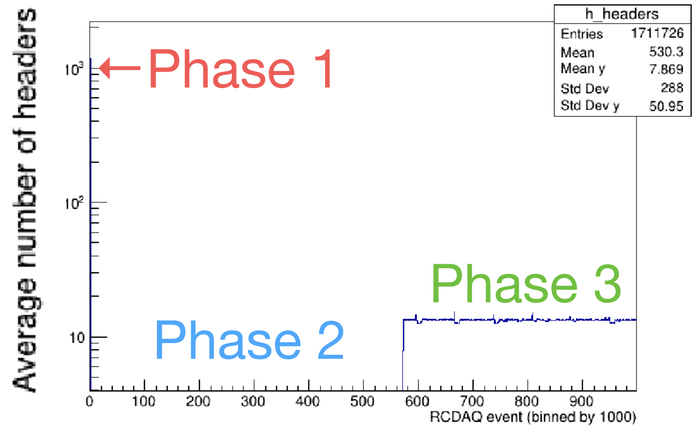
Takashi's work reported on Aug 5

Existence of phase 2 is not so comfortable but not critical issue.
We just have to confirm existence of phase 3 and its validity.

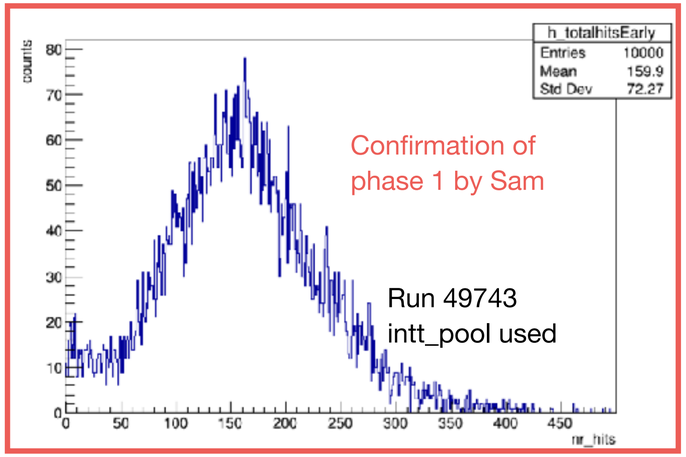
Sam's work: intt_pool

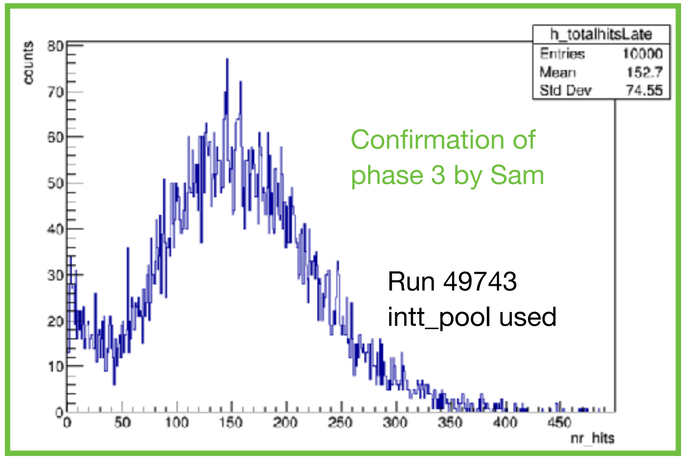
Sam used intt_pool directly to check the data.





→The same results as Takashi's were obtained.





Total hits rate(?) of data at the beginning of file and after skipping 700k RCDAQ events.
Data of phase 3 looks consistent with that of phase 1.

Genki's work: SingleInttPoolInput

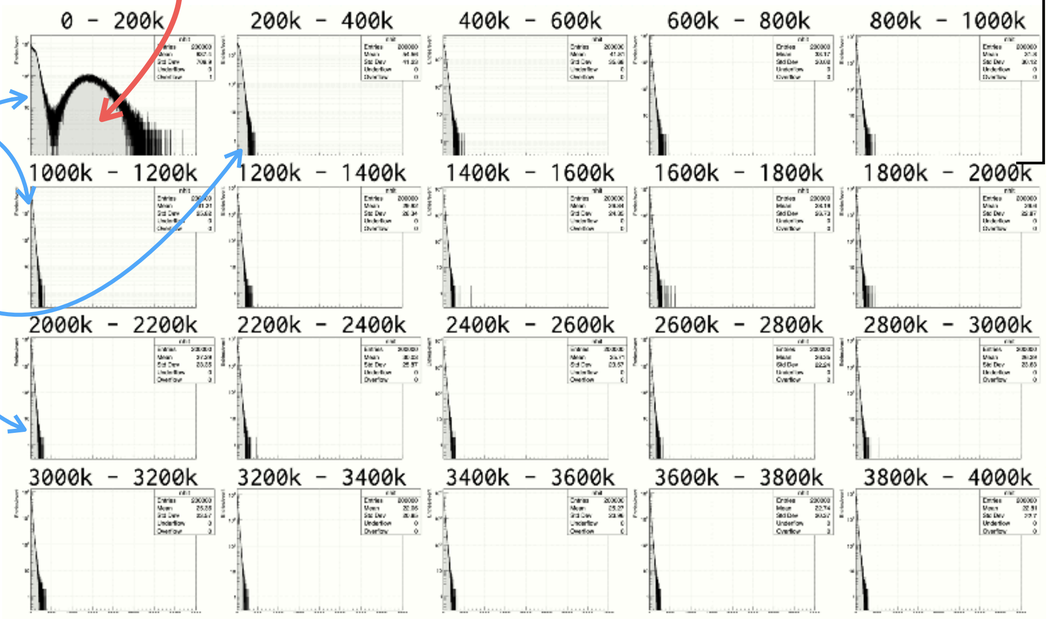
Genki used SingleInttPoolInput to check the data.
Analysis steps:

1. Decode raw data using SingleInttPoolInput. GL1 is not used.
   → DST containing InttRawHit
2. Feed the DST to our QA module
   - After skipping first 200k × n events, only 200k events are analyzed

Phase 1 (0-78k events)

Phase 2
(later than
78k events)

1M INTT strobes
= 1M × 100 ns
= 10 s



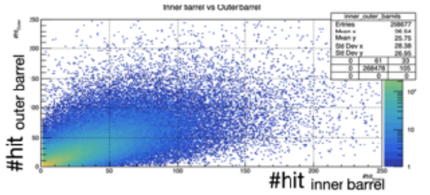
Run 49743
(4.0M events)

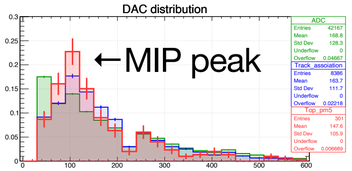
The number of hits per event (=INTT strobe)

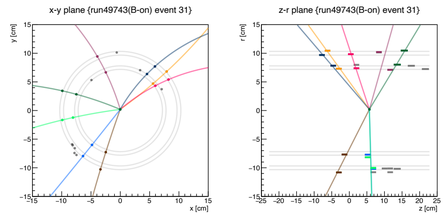
If I take only the first 78k events, I confirmed

- good correlation b/w the inner/outer barrels
- successful tracklet reconstruction
- observation of a clear MIP peak

Data in phase 1 is reliable.





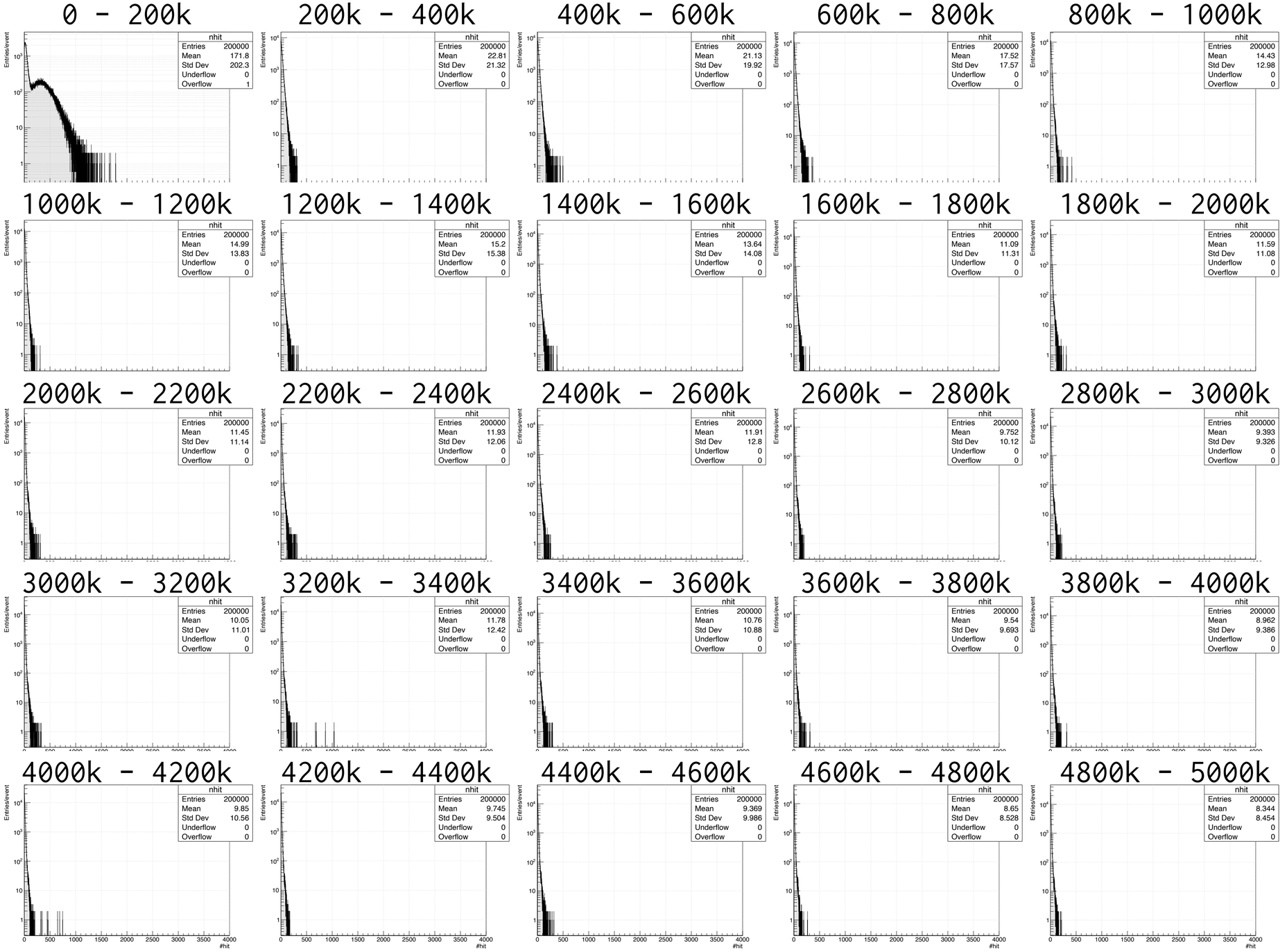


Run 49743

Phase 1 and 2 are found by using SingleInttPoolInput.
I confirmed that phase 1 data is good to use physics study.
Phase 3 has not been confirmed though we expect skipping 1M INTT strobes are enough.

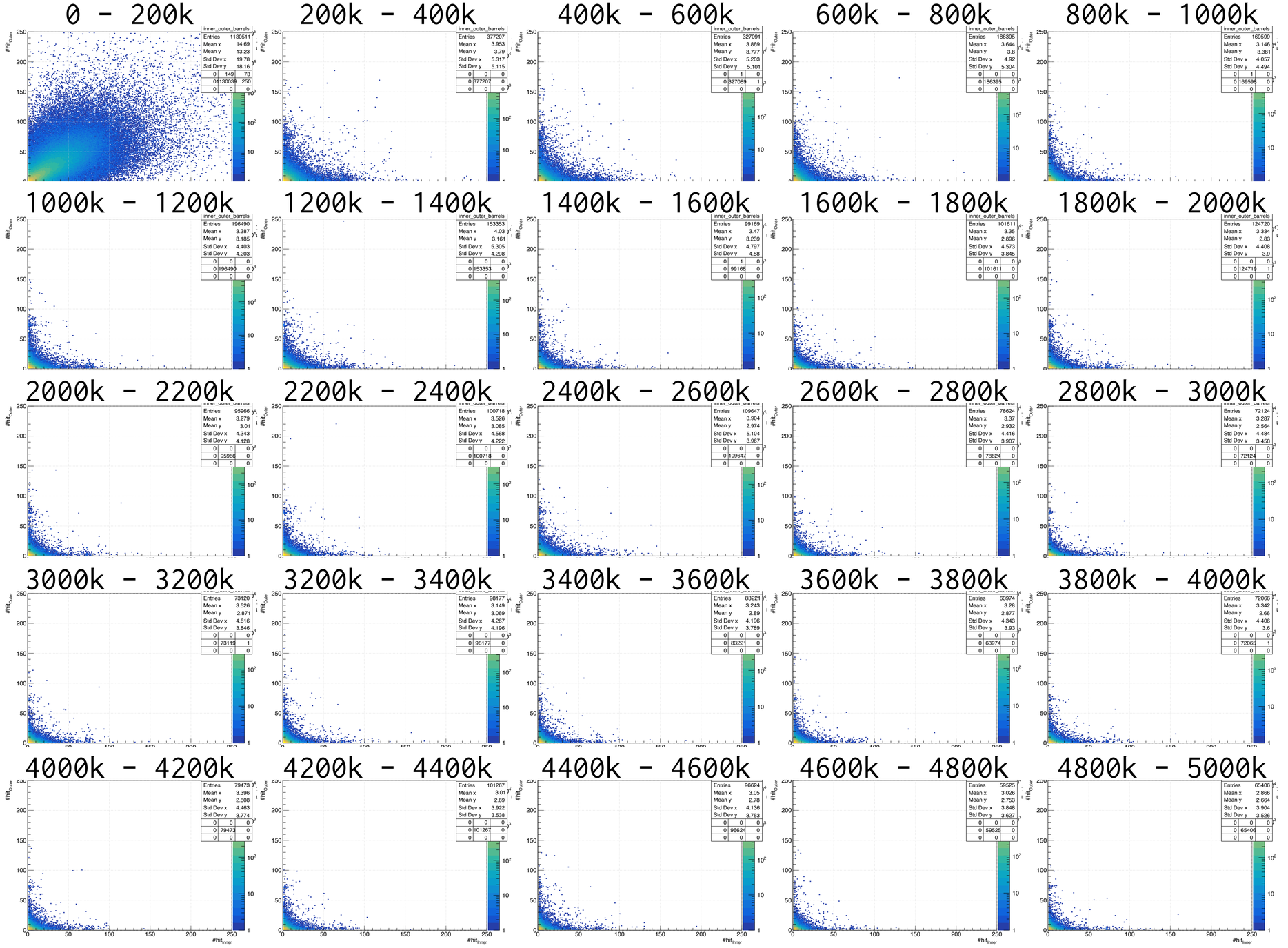
Run 51493 (5.0M events)

#hit / strobe

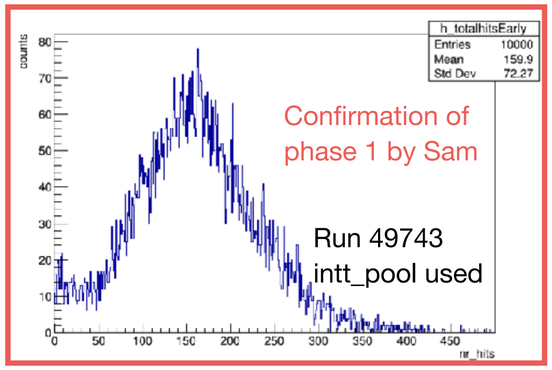


Run 51493 (5.0M events)

#hit / strobe correlations Inner vs Outer

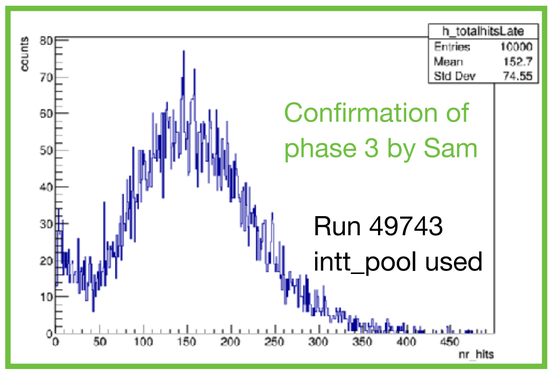


Takashi's work reported on Aug 5



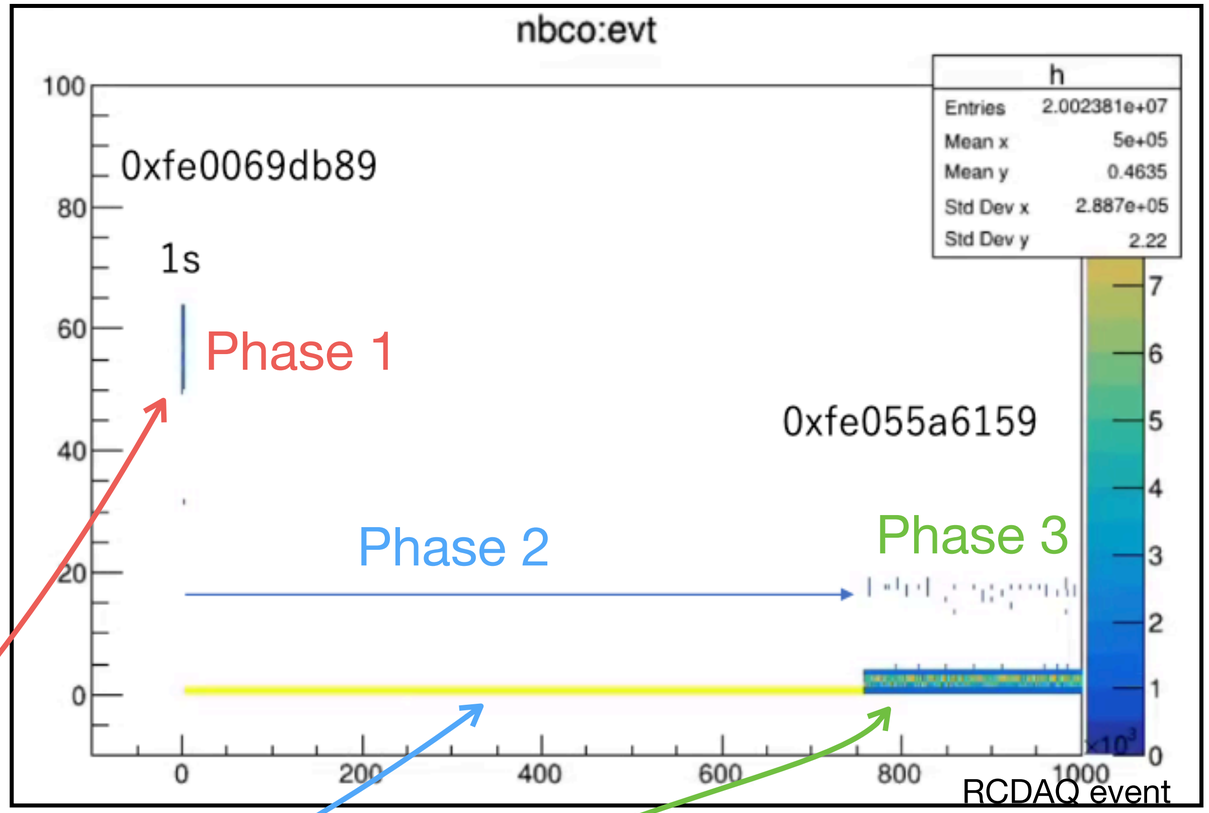
Confirmation of phase 1 by Sam

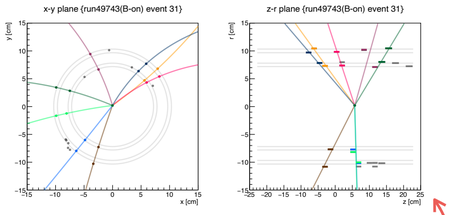
Run 49743
intt_pool used



Confirmation of phase 3 by Sam

Run 49743
intt_pool used

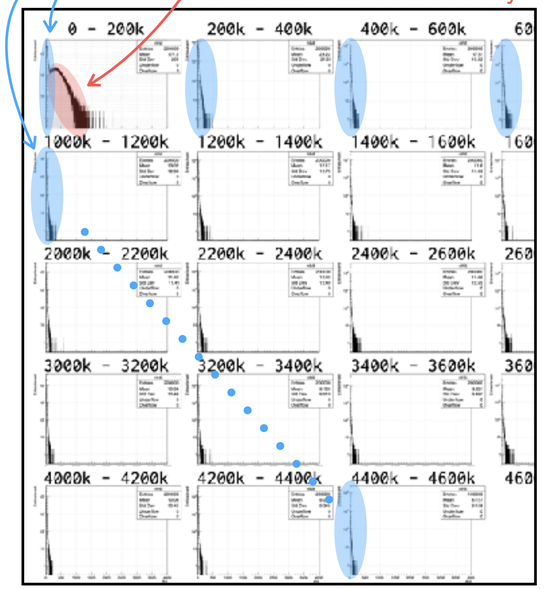




Genki has not confirmed phase 3 yet

Confirmation of phase 2 by Genki

Confirmation of phase 1 by Genki and tracklets successfully made



Genki's #hit/strobe dists. for each 200k strobes of run 51492. using SingleInttPoolInput

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The real start and on

Sam's summary about the 3 phases in INTT streaming data reported on Aug 14

Confirmation of 3 phases

- intt_pool (Sam)
  All confirmed
- SingleInttPoolInput (Genki)
  Phase 1 and 2 are found.
  Phase 3 has not been found yet though skipping the first 1M INTT strobes should be enough to reach phase 3.

→ What is the difference b/w intt_pool and SingleInttPoolInput? It must be the key to understand why SingleInttPoolInput does not find phase 3.