INTT status
Genki Nukazuka (RIKEN)

General status

TPC tests are the highest priority.

sPHENIX is taking p-p data with rare triggers. Calorimeters have priority.

RHIC is very unstable these days.

INTT is more or less stably operated in the last 14 days. It might be related with the type of trigger.

We cannot count Jaein and Cheng-Wei as INTT manpower.

Biggest change

I masked a half-ladder , which has the very noisy channel. If the half-ladder is included, 13 half-ladders of the FELIX get less hits than nominal value.

Run 43410 before masking

Run 43410 after masking
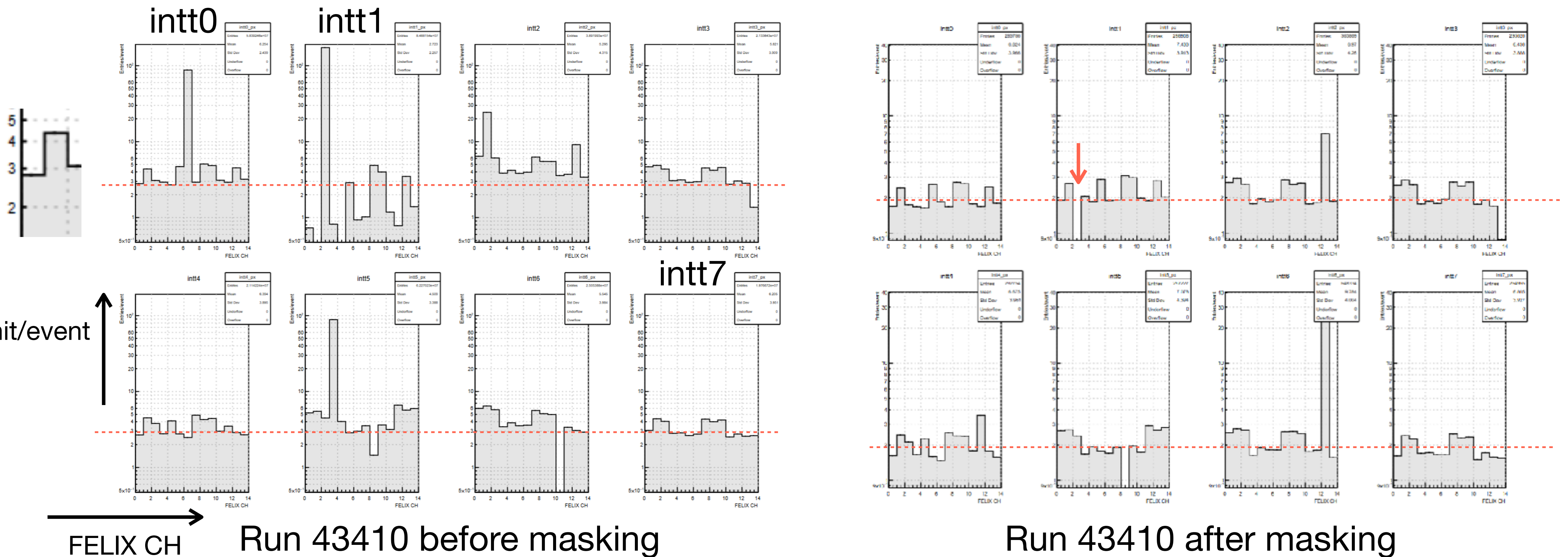
Biggest change

I masked a half-ladder , which has the very noisy channel. If the half-ladder is included, 13 half-ladders of the FELIX get less hits than nominal value.
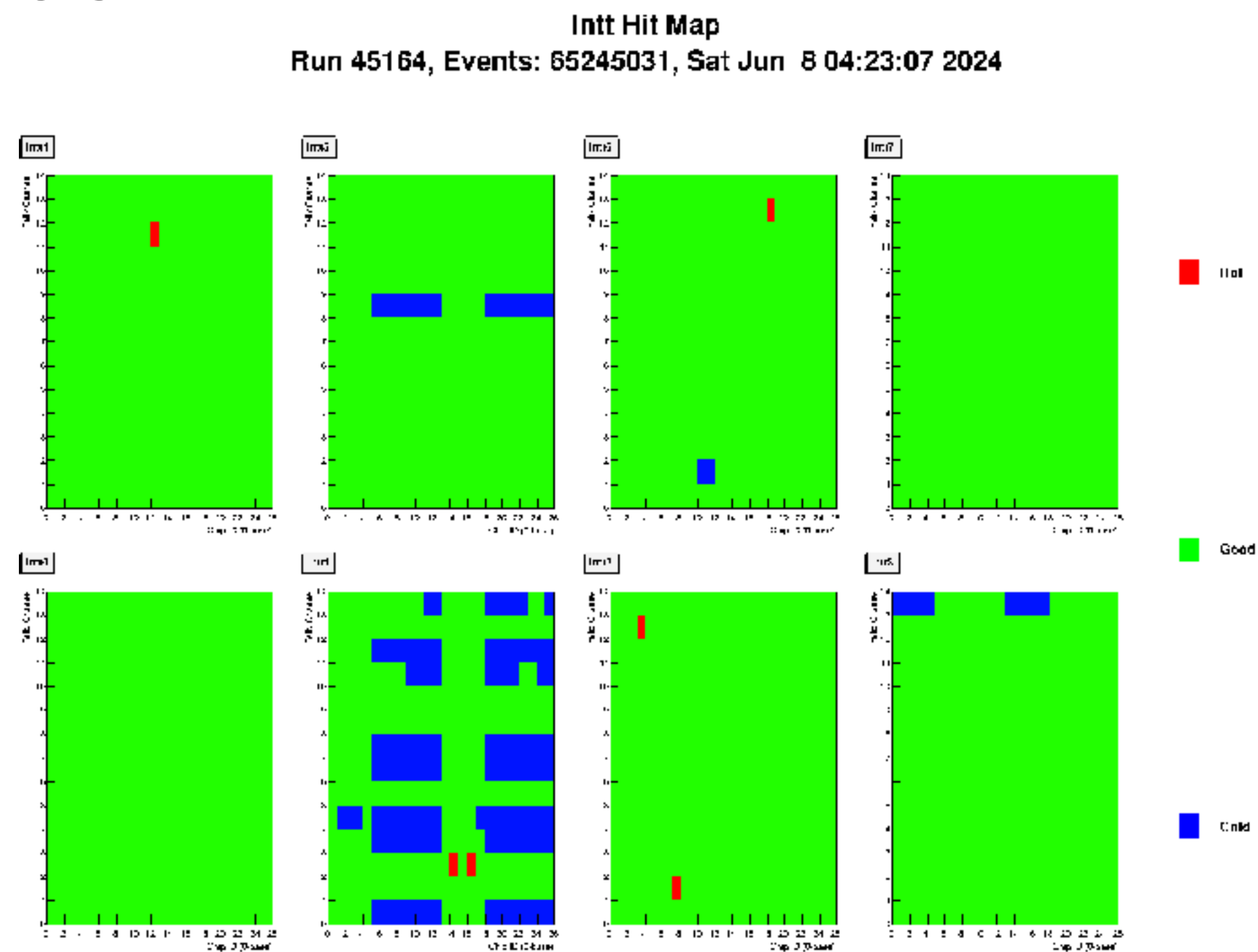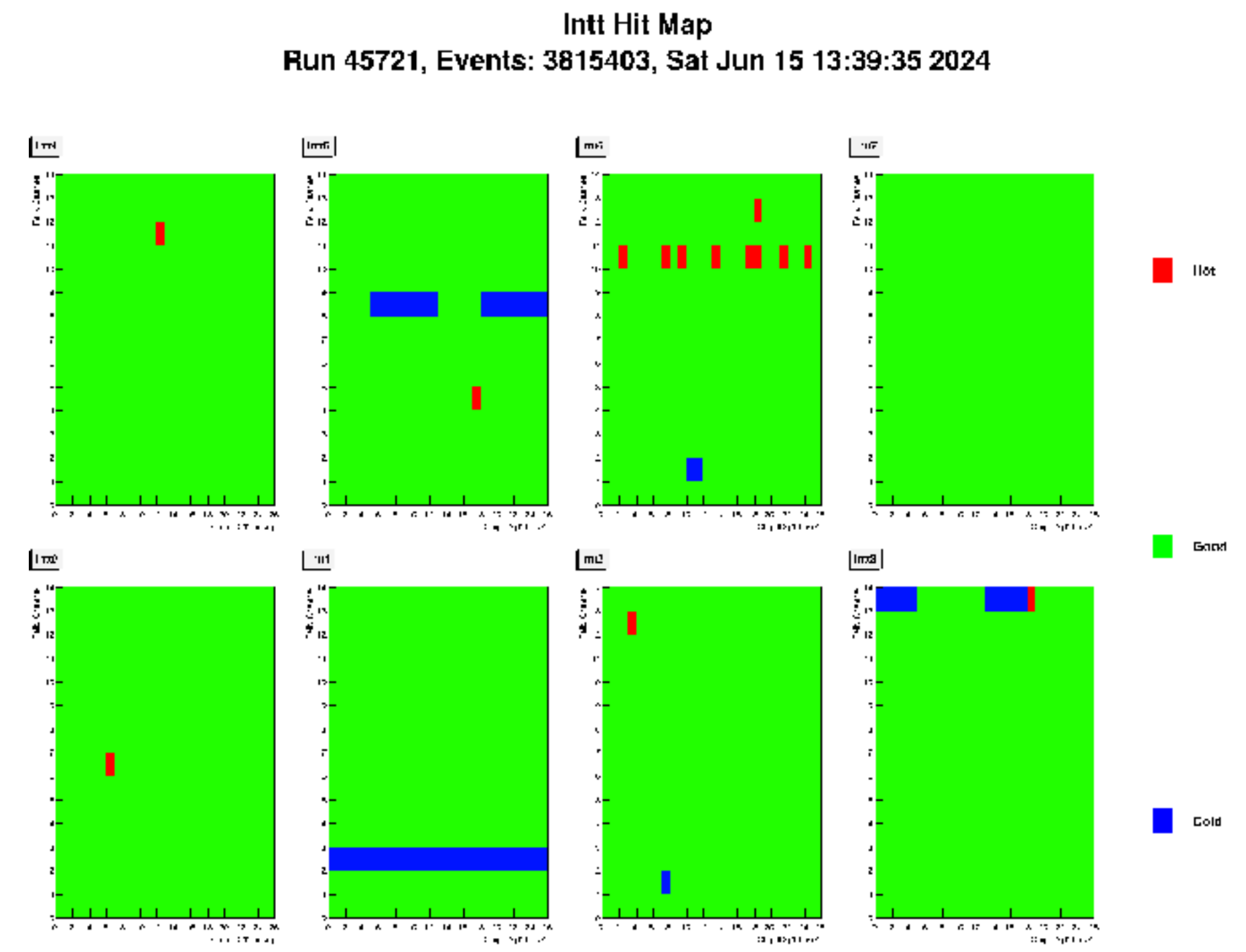

Run 45164 before masking

Run 45721 after masking

Joseph's online monitor also confirmed it.

Biggest change

As requested by Kin, I reported the very noisy channel issue in the sPHENIX Operations Board Meeting but without showing too much details.

INTT *(Genki Nukazuka)*
- Noisy channel issue
  - [Situation] There are few very noisy channels which cannot be masked by the standard procedures: slow control command for FPHX chips. Very noisy conditions make the operation unstable and affect the FELIX less efficiently.
  - [Current solution]: Disabling the half-ladder containing the noisy channel. It's **successful** but ~3000 channels are lost. #ch of a half-ladder corresponds to 1/56 ~ 1.8% of all channels.
  - [Next step]: Implementation of a new function to disable particular chip or channel at the level of FELIX so the impact of disabling gets to be less. Raul is working on it.

FW: sPHENIX Operations Board Meeting on June 14

Yip, Kin <kinyip@bnl.gov>
宛先: Genki Nukazuka; Nouicer, Rachid <nouicer@bnl.gov>; 他 +27 件   2024/06/14 (金) 11:51

FW: sPHENIX Operations Board Meeting on June 14
2024/06/14 (金) 14:30 - 15:30   予定の重複なし
https://bnl.zoomgov.com/j/1610204861?pwd=ckdTWVNGcEMwSlJ1bXVtMHY3aEVKQT09

このイベントの出欠確認
☑ 開催者にメールを送信する
メッセージの追加 (省略可能)

✓ はい   ? 仮承諾   ✕ いいえ   ⏱ 新しい時刻を提案 ⌄

As we discussed, can you please give some brief "current problem and possible solutions" for INTT in this 2:30 pm ?

Kin

-----Original Appointment-----
From: Yip, Kin
Sent: Thursday, May 30, 2024 5:19 PM
To: Yip, Kin; Haggerty, John; Nagle, James; Nouicer, Rachid; itaru@riken.jp; Thomas Hemmick; Bathe, Stefan; Chiu, Mickey; Rosi Reed; Purschke, Martin; Perepelitsa, Dennis; Pinkenburg, Christopher; Christof E Roland; Osborn, Joseph; Frawley, Anthony; Mills, James A; Vasquez, Joel; Morrison, David; rolandg@mit.edu; criedl@illinois.edu; O'Brien, Edward; Sakaguchi, Takao; Huang, Jin; Liu, Ming Xiong; Stoll, Sean; Ross Corliss; Hugo Pereira Da Costa; Dean, Cameron; Schambach, Jo
Subject: sPHENIX Operations Board Meeting on June 14
When: Friday, June 14, 2024 2:30 PM-3:30 PM (UTC-05:00) Eastern Time (US & Canada).
Where: https://bnl.zoomgov.com/j/1610204861?pwd=ckdTWVNGcEMwSlJ1bXVtMHY3aEVKQT09

Just a reminder for today's meeting at 2:30 pm (https://docs.google.com/document/d/17HjjgJCnBX7xBYNT86xNY6-dCxiVP8sXXMWyAtkkEr0/edit) 😊

Kin

HV issue

A strange HV failure was reported on June/11.

HV issue

Joseph solved the issue. The same problem was found by TPC.

INTT (Joseph, Mahiro)
- HV (Joseph)
  - High voltage issue was fixed last night–it was exactly as Tom suspected
  - Shift crew can continue running as normal as of last night (communicated this to shifters before I left)
  - Some new buttons on the INTT HV GUI to help run/troubleshoot this or similar issues should they happen again, but they aren't needed for standard use

The ramp speed was 5 V/s though it should be 2 V/s (Joseph)

Individual operation in the future just in case, Joseph modified the shifters' HV GUI. We have to review it.

Note: gl1p (v66) became available from run 44680

Timing changed by other subsystem?

Run 46022
L1 delay 114
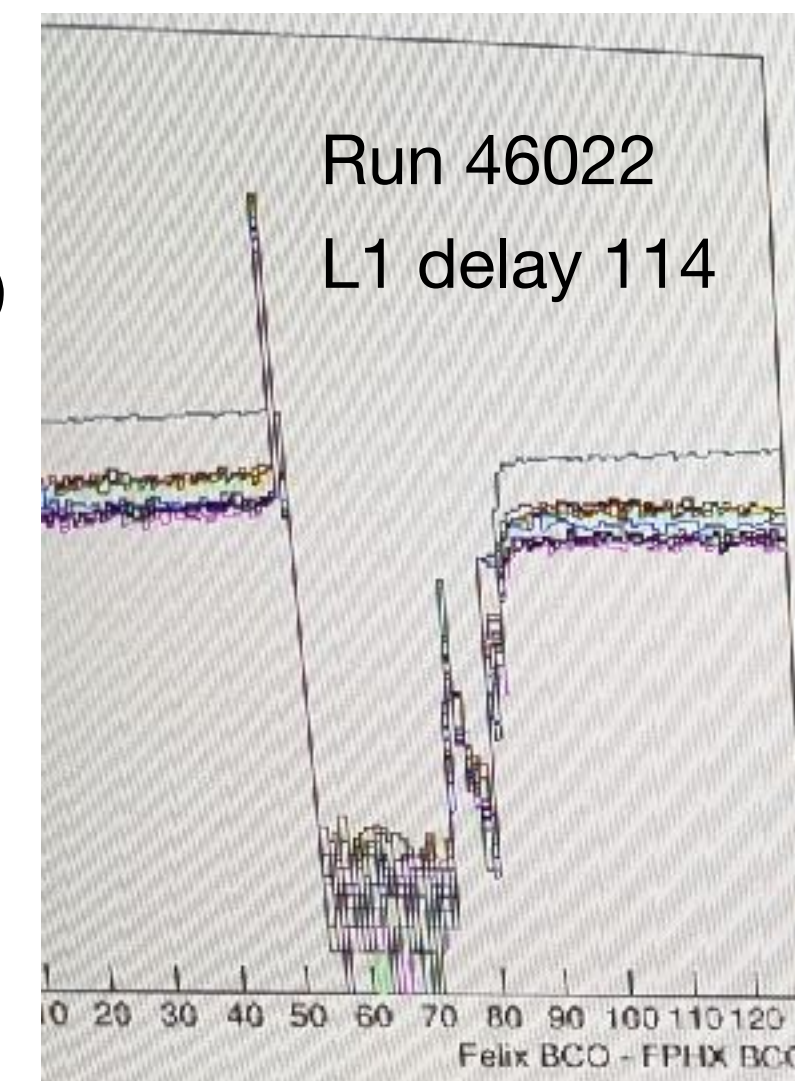
Run 43276
L1 delay 120
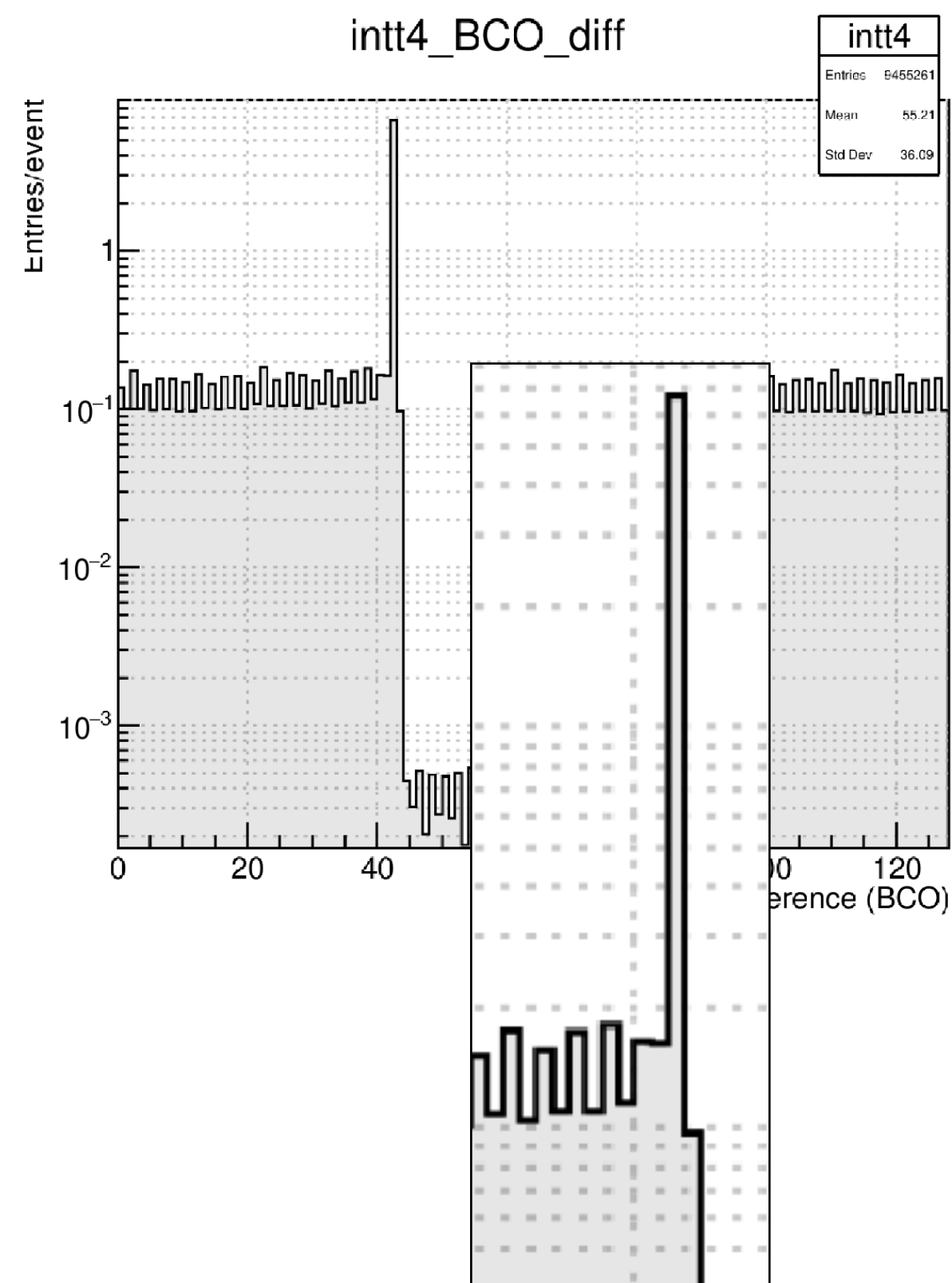
Run 45751
L1 delay 120

At some point, the peak position was moved to right by 1 bin. It's dangerous.

The run after the timing scan.
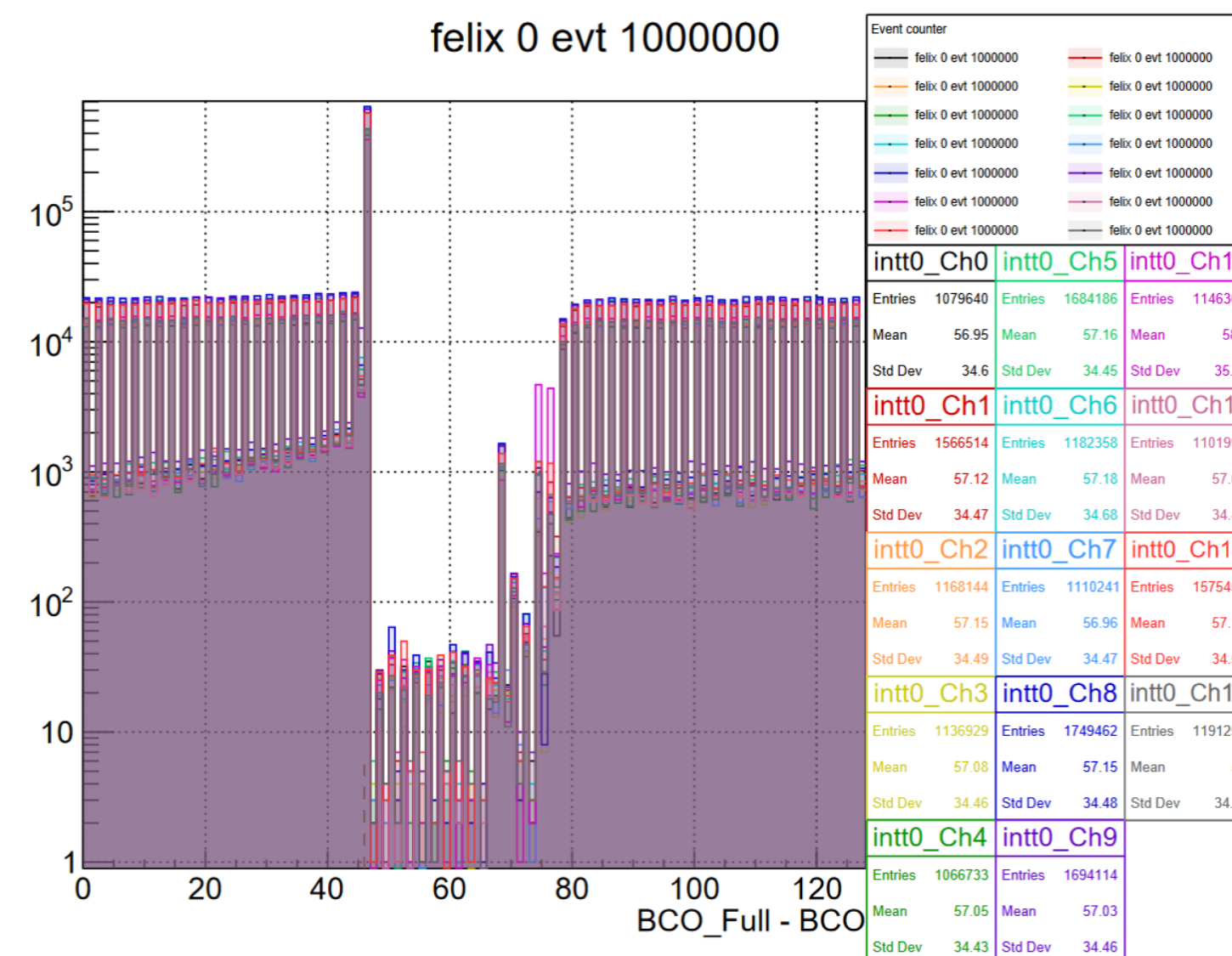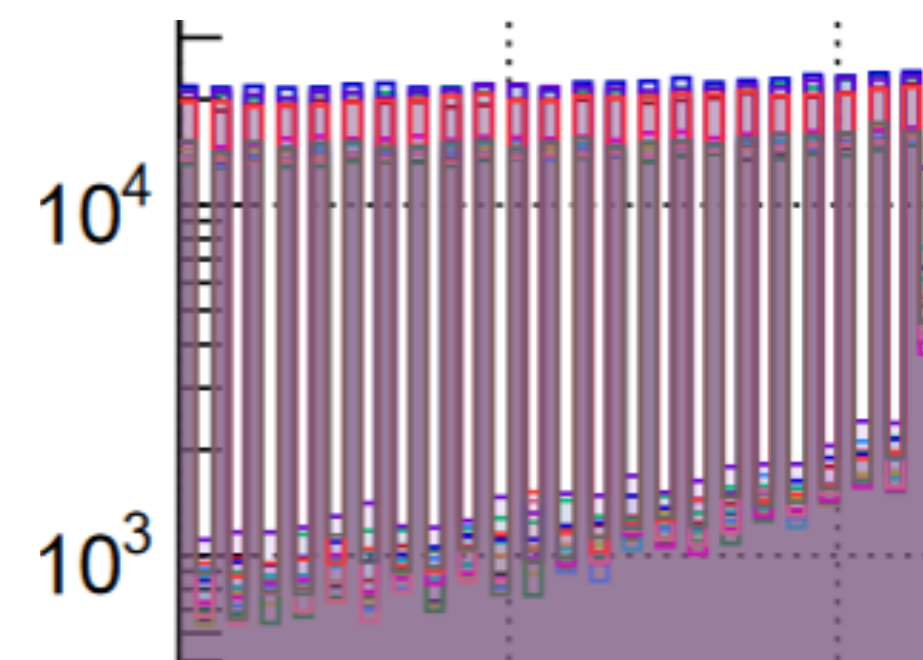
Run 45164 with fill 56x56.
Even phase may be changed.

Data drop finding campaign

Jamie requested all tracking detector groups to check whether we have taken data which corresponds to GL1. Joseph and Martin are working on it.

Martin is implementing a new decoder to get information directly from the raw files. Joseph will use it.

Joseph's independent analysis shows very high rate.

Joe Osborn is also working for this task but focusing all tracking detectors.

Joseph's independent analysis from Martin's decoder.

GL1 Triggers (BCOs) with INTT hits by Felix server (Run 00044581)
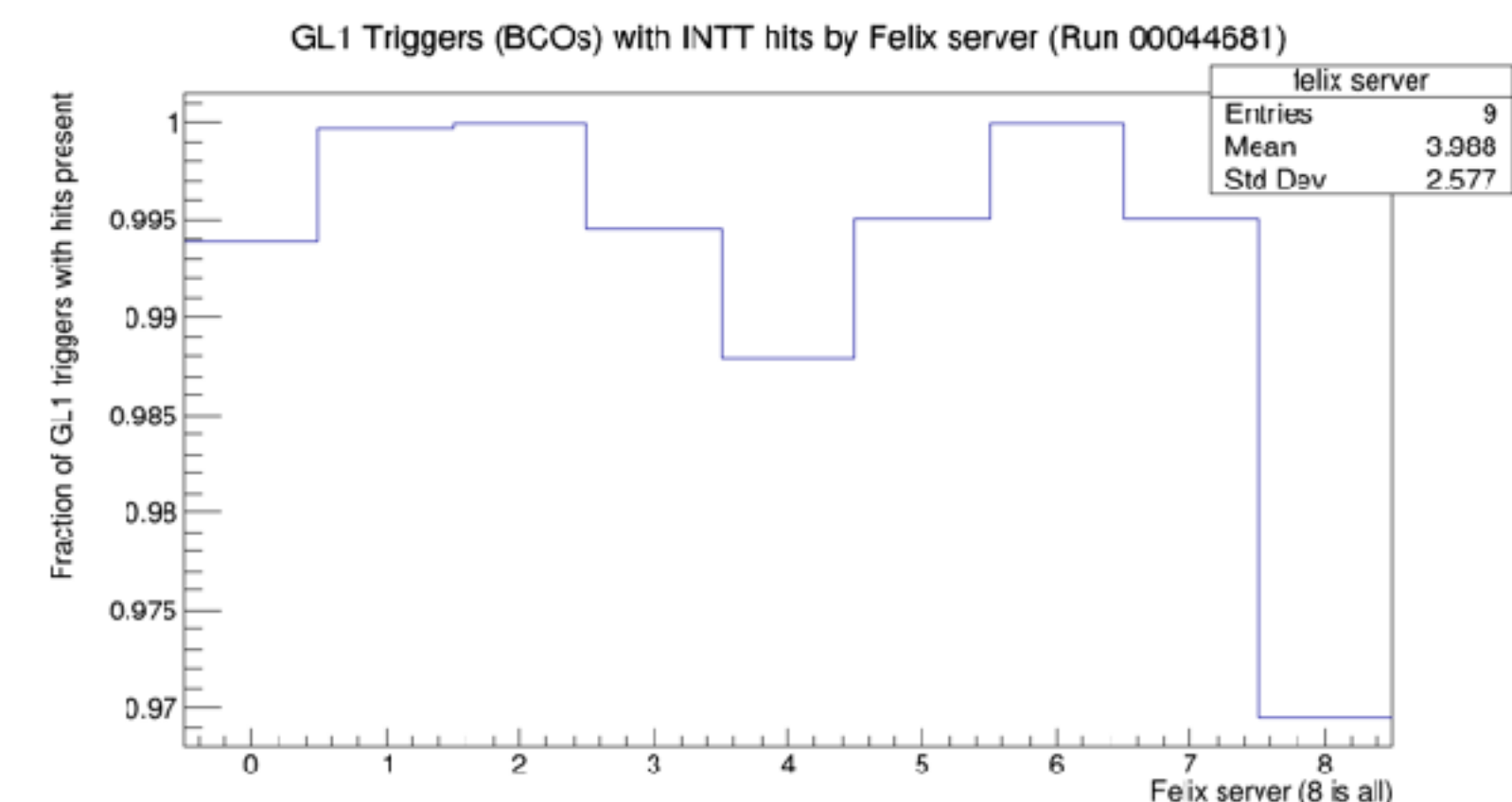
Requests for vertexing

Jamie requested us to check z_{vtx} distribution for 2 types of runs: crossing angle 2 mrad and 1.2 mrad.

Mahiro quickly checked it, and no major difference was found.
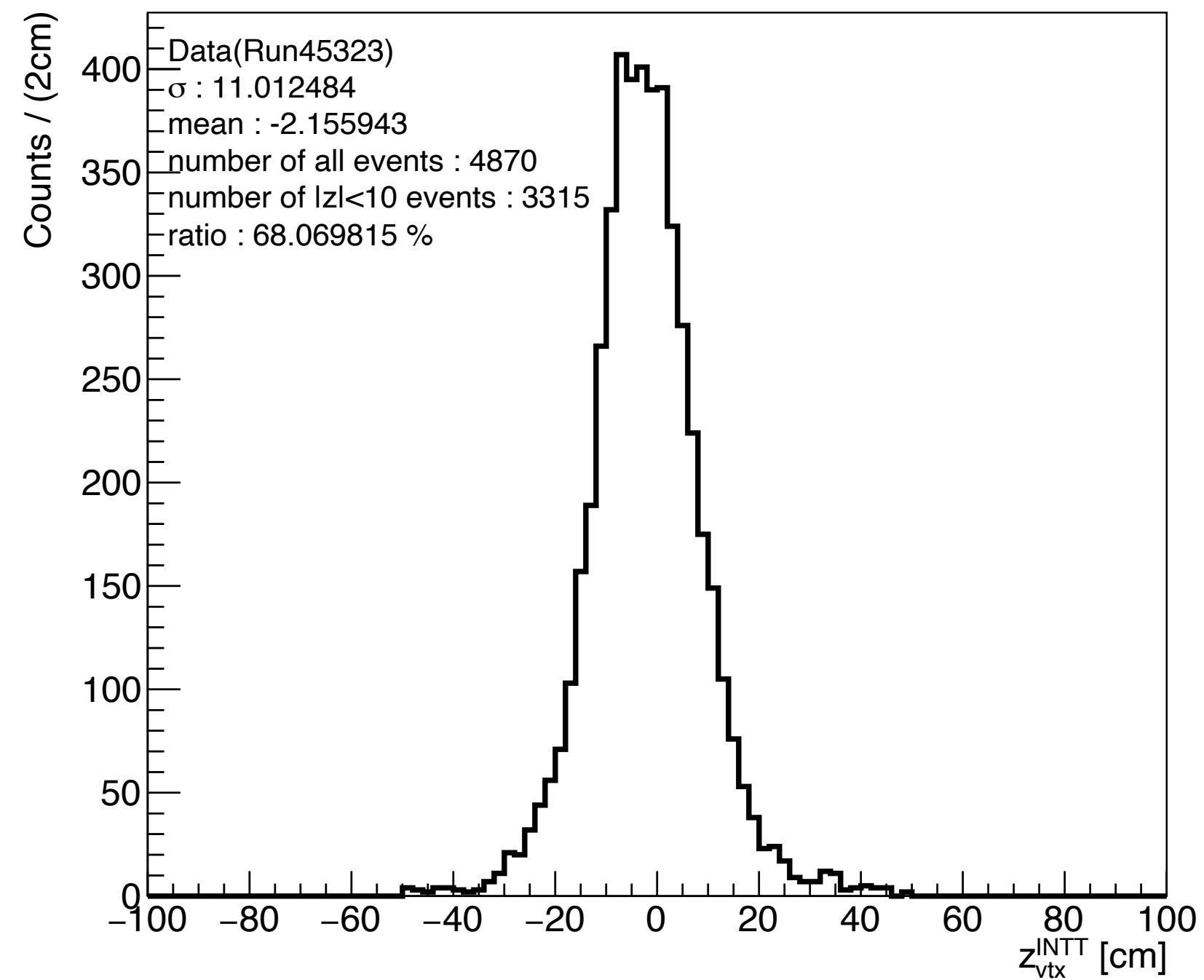
z_{vtx} distribution of Run 45323 (2 mrad)
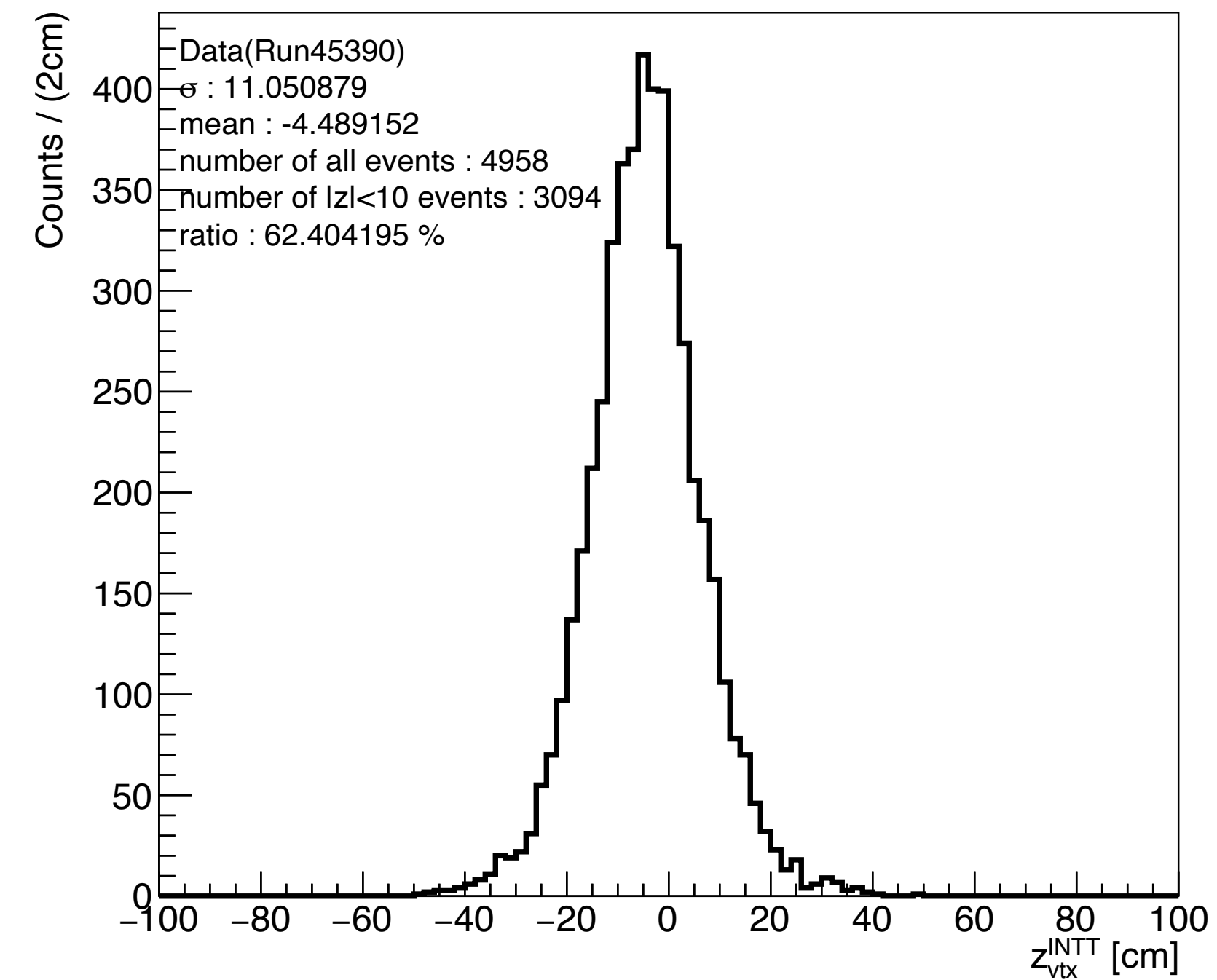
z_{vtx} distribution of Run 45390 (1.2 mrad)

QA coordination by the software (tracking?) group

差出人: Joe Osborn <osbornjd91@gmail.com>
送信日時: 2024年6月4日 14:11
宛先: Cameron Thomas Dean <cameron.dean@cern.ch>; Genki Nukazuka <genki.nukazuka@riken.jp>; Huang, Jin <jhuang@bnl.gov>; Pereira Da Costa, Hugo Denis Antonio <hugo.pereira-da-costa@lanl.gov>
CC: THOMAS MARSHALL <rosstom@g.ucla.edu>
件名: Tracking Offline QA

Dear all,

Thomas presented some nice work today that shows that the offline QA infrastructure is almost in place. This email is being sent to you as I know you are detector experts for your particular subsystem. Thomas and Aditya have very kindly offered to add additional plots to the QA modules and write the code to display them. However, they need guidance as to what kind of plots the subsystem experts (i.e. you) want monitored. Can you either:

1. Provide them/us with a list of plots that you would find useful to be continuously monitored as a function of run number. These could be hit or cluster (or something else) related.
2. Implement these plots yourself, which should be as easy as just creating a plot and filling it in one module, and then writing the code to create a canvas and draw in another module. If you are interested in doing this yourself, any one of us can show you the places to add code.
3. If there is someone better to ask, point us to another subsystem expert who could provide this.

Thanks for your help in getting some offline tracking subsystem QA integrated into the sPHENIX framework!

Joe Osborn

_____

Joe Osborn, Ph.D
Physics Department
Brookhaven National Laboratory
josborn1@bnl.gov

Re: Tracking Offline QA

Genki Nukazuka
宛先: Joe Osborn <osbornjd91@gmail.com>; THOMAS MARSHALL <rosstom@g.ucla.edu>
Cc: Hachiya Takashi <hachiya@cc.nara-wu.ac.jp>
2024/06/08 (土) 18:22

Dear Joe and Thomas,

I'm really sorry for the late reply. Working on the detector operation, scan data analysis, RHIC&AGS meeting (for myself and supervising 3 students) are obviously too much for me 😇

1.
What I can imagine for the moment is

- InttRawHit level
  - Mean +/- std dev of the number of InttRawHit per event (almost same as occupancy, occupancy is also fine.)
  - Mean +/- std dev of the number of InttRawHit per pid per fee per event
  - Mean +/- std dev of the number of InttRawHit per pid per fee per event after rejection of clone hits (not ready)
  - Mean +/- std dev of the number of clone InttRawHit per pid per fee per event (not ready)
  - Peak position of time timing plot (GTM BCO%0x7f - FPHX BCO) per pid per fee (or something to confirm timing synchronization over all ladders) for data taken in the trigger mode (not ready)
  - The number of hot channels
  - The number of hot channels per pid (not ready)
- Trkr_hit level
  - Mean +/- std dev of the number of Trkr_hit of INTT per event after hot channel rejection
  - Mean +/- std dev of the number of Trkr_hit of INTT per pid per fee per event after hot channel rejection
  - Mean +/- std dev of ADC of Trkr_hit of INTT per event per fee per pid per event after hot channel rejection (not ready)
  - Ratio of the number of Trkr_hit on the inner and the outer layer for each barrel per event after hot channel rejection (not ready)
  - Ratio of the number of Trkr_hit on the inner and the outer barrels per event after hot channel rejection (not ready)
  - Ratio of the number of Trkr_hit on the south and the north sides of INTT (intt[0-3] vs [4-7]) per event after hot channel rejection (monitoring external noise condition) (not ready)
- Trkr_cluster level
  - Mean +/- std dev of the number of Trkr_cluster of INTT per event per pid per fee after hot channel rejection (not ready)
  - Mean +/- std dev of cluster size after hot channel rejection (not ready)

Those are clearly too much to ask Thomas or somebody to work on. Maybe, I'm dreaming. I'm looking for someone work on it in the INTT group. Probably, a student in 2nd grade of master course from Japan will be assigned.
I guess the interest of the INTT group and that of you (the tracking group?) are different. Do we just make all plots the INTT group wants?

2.
Some analysis module are put here: https://github.com/sPHENIX-Collaboration/INTT/tree/main/QA_codes/InttQA

- InttRawHit analysis: InttRawHitQA
- Hot channel analysis: https://github.com/sPHENIX-Collaboration/coresoftware/tree/master/calibrations/intt/InttHitMap
- Trkr_hit analysis: InttTrkrHitQA
- Trkr_cluster analysis: We don't make it yet.

The codes implementation of us (i.e. me) is getting chaotic. Since lots of parameters to be monitored are similar, the codes can be more elegant...
I had to skip contributing to coresoftware repo to go on. Now, the situation is getting calm, so we can start migrating there.

3.
In principle, Takashi is a responsible person for general software stuff as he is the INTT software coordinator. For the moment, you can contact me since I have worked on INTT QA. Once a student is assigned to this task, you can contact the student and his/her supervisor.

Best regards,
Genki

Genki Nukazuka
Special Postdoctoral Researcher
RIKEN/RBRC

Towards the streaming readout

Currently, INTT is operated with the trigger mode + extended readout

- n_collisions 100 (BCO)

- open_time 60 (BCO/2)

- 100 BCO = 100 × 106 ns = 10 μs while sPHENIX requested 7 μs.

Preparation of the 100% streaming readout (75 kHz readout frequency) is ongoing. We need data with a dedicated configuration to check its validation. For example:

- 100% streaming readout: INTT should take corresponding events to 100% of gl1 events (triggered event) even if INTT doesn't use gl1 information because 100% streaming readout should be 100% alive in time.

- N% streaming readout: INTT should take corresponding events to N% of gl1 (triggered event) even if INTT doesn't use gl1 information because N% streaming readout should be N% alive in time.

Jamie's plan for the moment is to move to the streaming readout mode this Friday.

Towards the streaming readout

Raul Cecato 11:32

As a reminder for the test we're doing today/this week:

Configuration conditions

open_time = 59

n_collision = 127

GTM = local mode

scheduler = /home/phnxrc/operations/INTT/intt_raul.scheduler (after validating we'll save a new file)

accept L1 = False

intt servers included = {all servers}

DAQ thresholds: "high"

force accept rate = start with 1kHz

rcdaq runtype: junk

Semi-online figure of merit

FPHX BCO plot. We need to see the abort gap at the same position (FPHX_BCO from 0 to 8 or 1 to 9). Check data corruption and FELIX overflows.

Procedure

Start with 1kHz and increase FA rate to 75kHz in triggered+extended mode, then switch to full streaming. If successful, switch DAQ thresholds to regular operation and validate. Hand data sets to Takashi so he can try to correlate with other systems.

Run 45108 (June/07 2024)
Trigger mode + ext. readout

abort gap
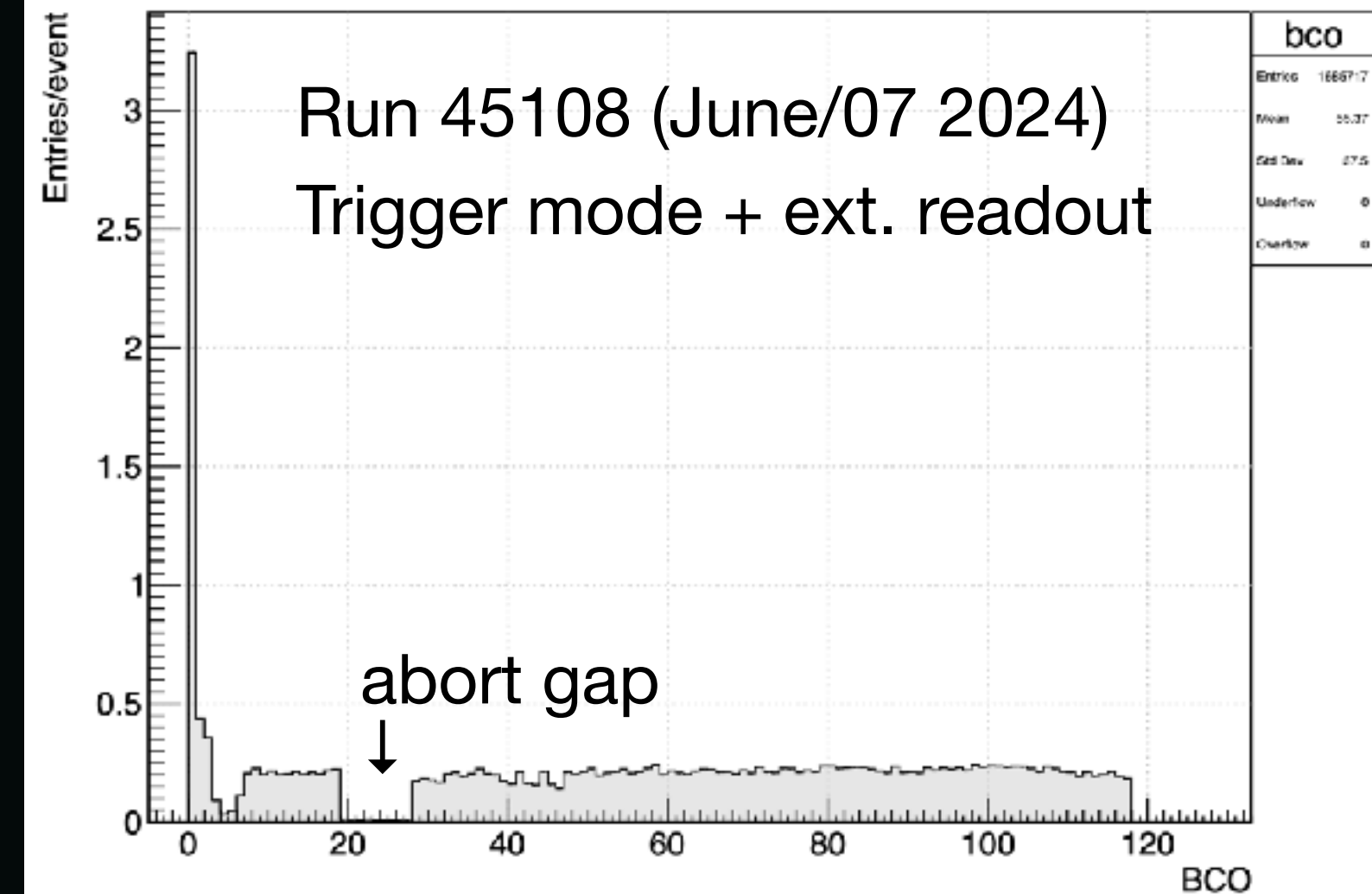
Schedule

Akitomo: June/16 — July/12

Takashi: June/18 — Aug/7

Genki: will leave BNL in mid July — end July
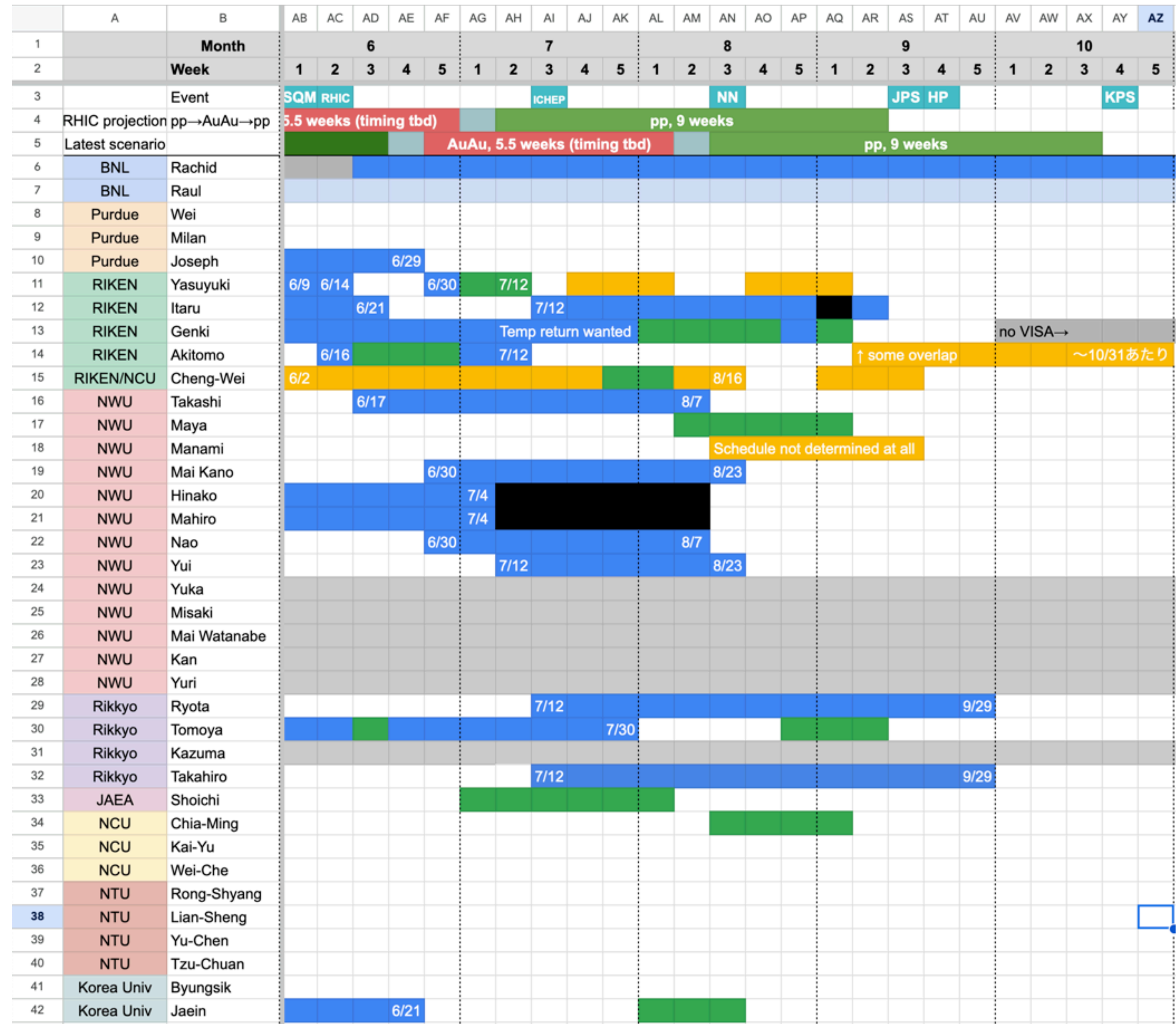
Genki: will leave BNL from early Sep

Jaein: — June/21

Itaru: — June/20

Itaru, Ryota, Takahiro, and Yui: July/12—

Joseph: —June/29

Joseph: mid Aug — mid Sep

Mai and Nao: June/30—

Genki is 😫 now

I'm happy to give the role of INTT representative to Rachid for at least the coming 2 weeks. Don't call me.