Onsite Report

RIKEN/RBRC

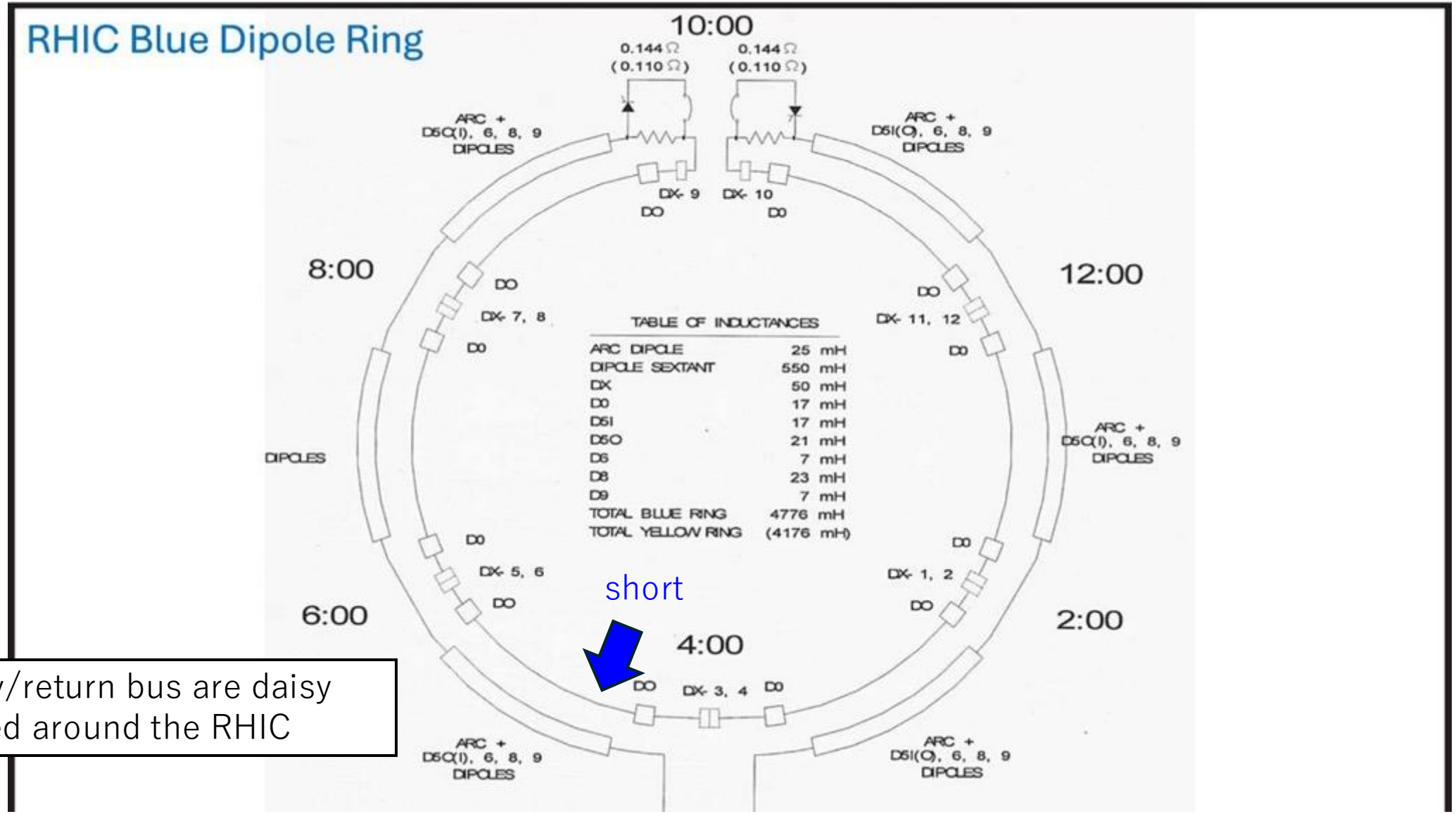
Itaru Nakagawa

Table of Contents

Short in Return Bus Issue

at 4 o’clock area in RHIC

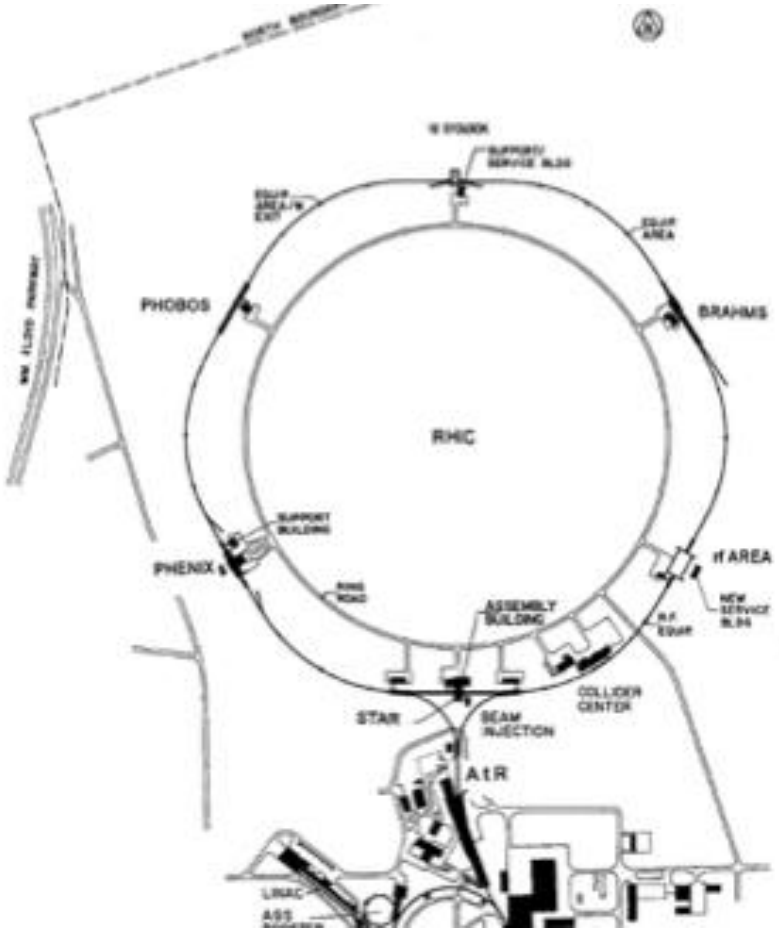
Super Conducting Dipole Magnets in Series

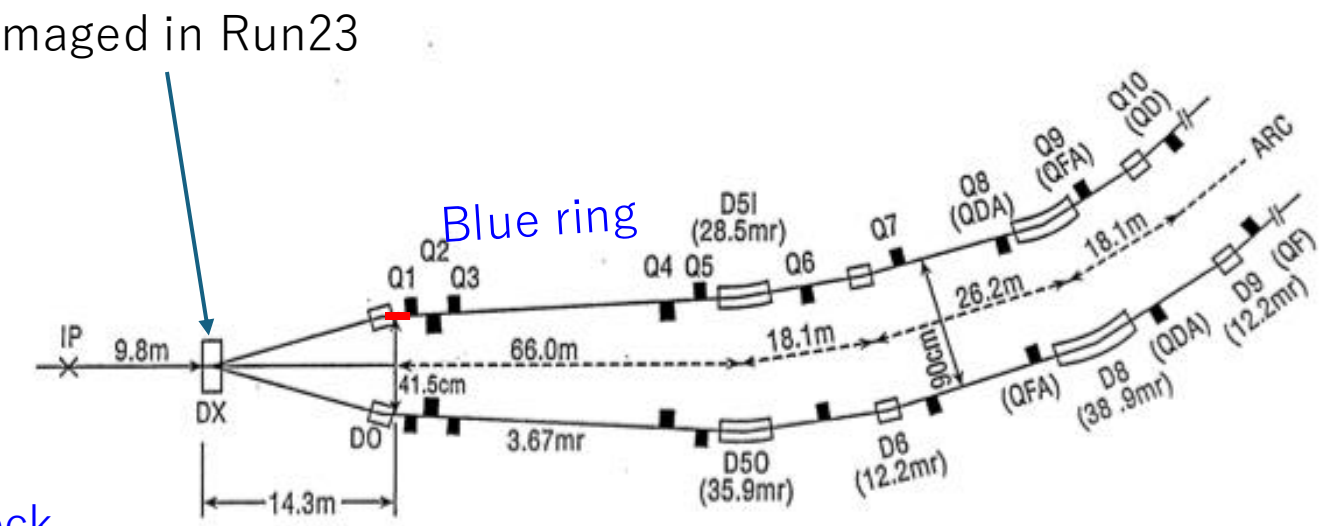


Supply/return bus are daisy chained around the RHIC

Prep work for opening has started. Absent new information from power supply once we are warm we will open the ~~Q3~~ to Vacuum Jacketed Return area to inspect the splice can.

Region of the short



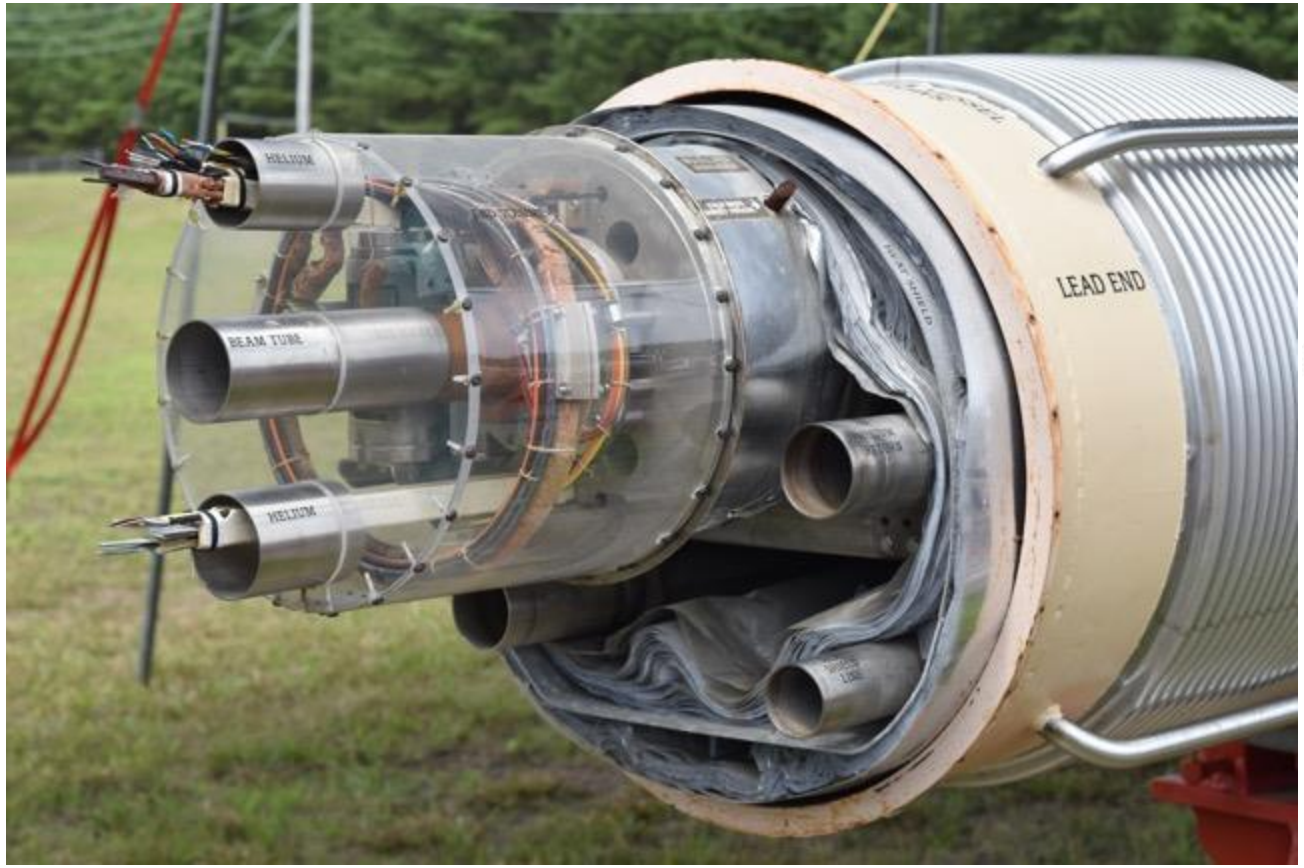


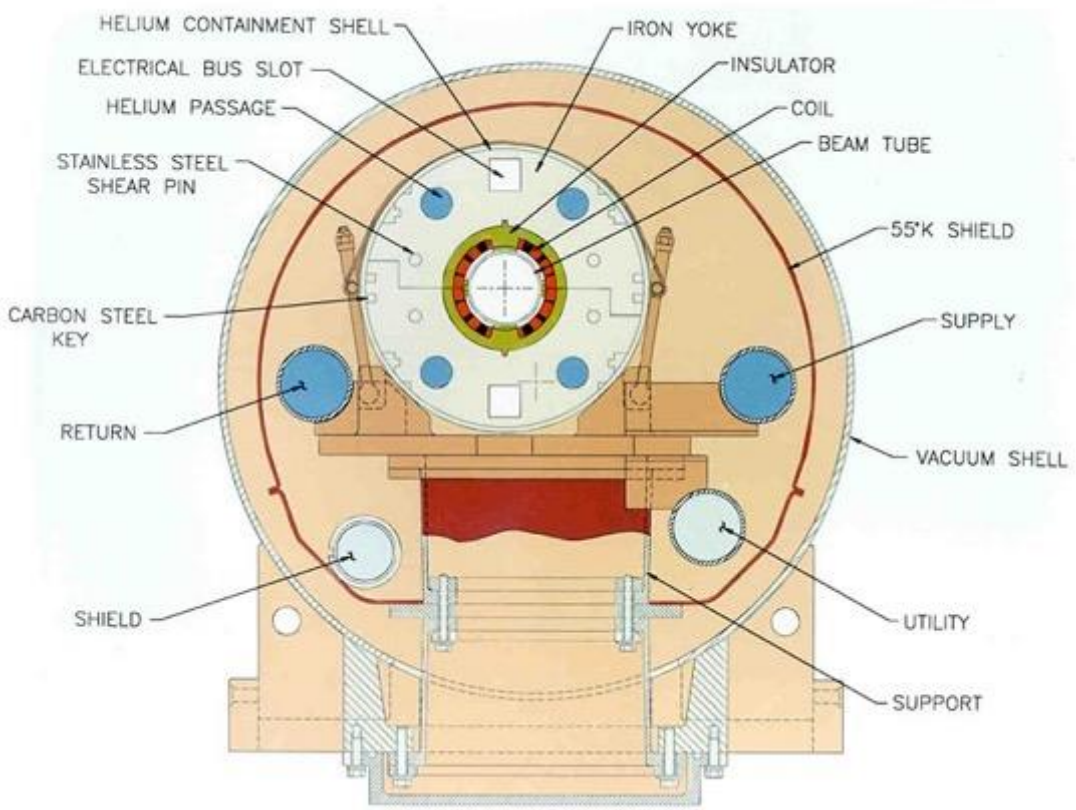
Nuclear Instruments and Methods in Physics Research A499(2003)245–263

Building 912 (AGS Building)

Some photographs of the spare magnets kept in the AGS building

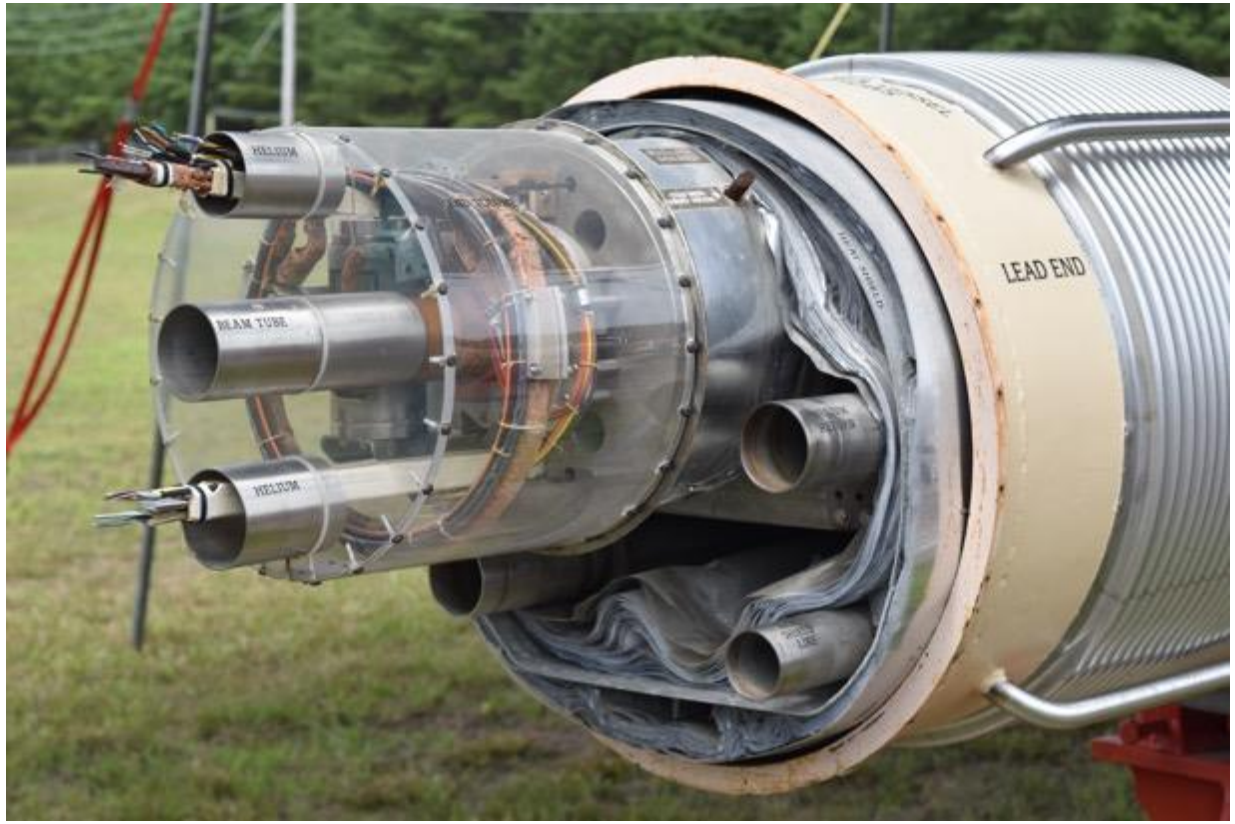
End Section of the magnet





https://www.bnl.gov/magnets/rhic-project.php

End Section of the magnet

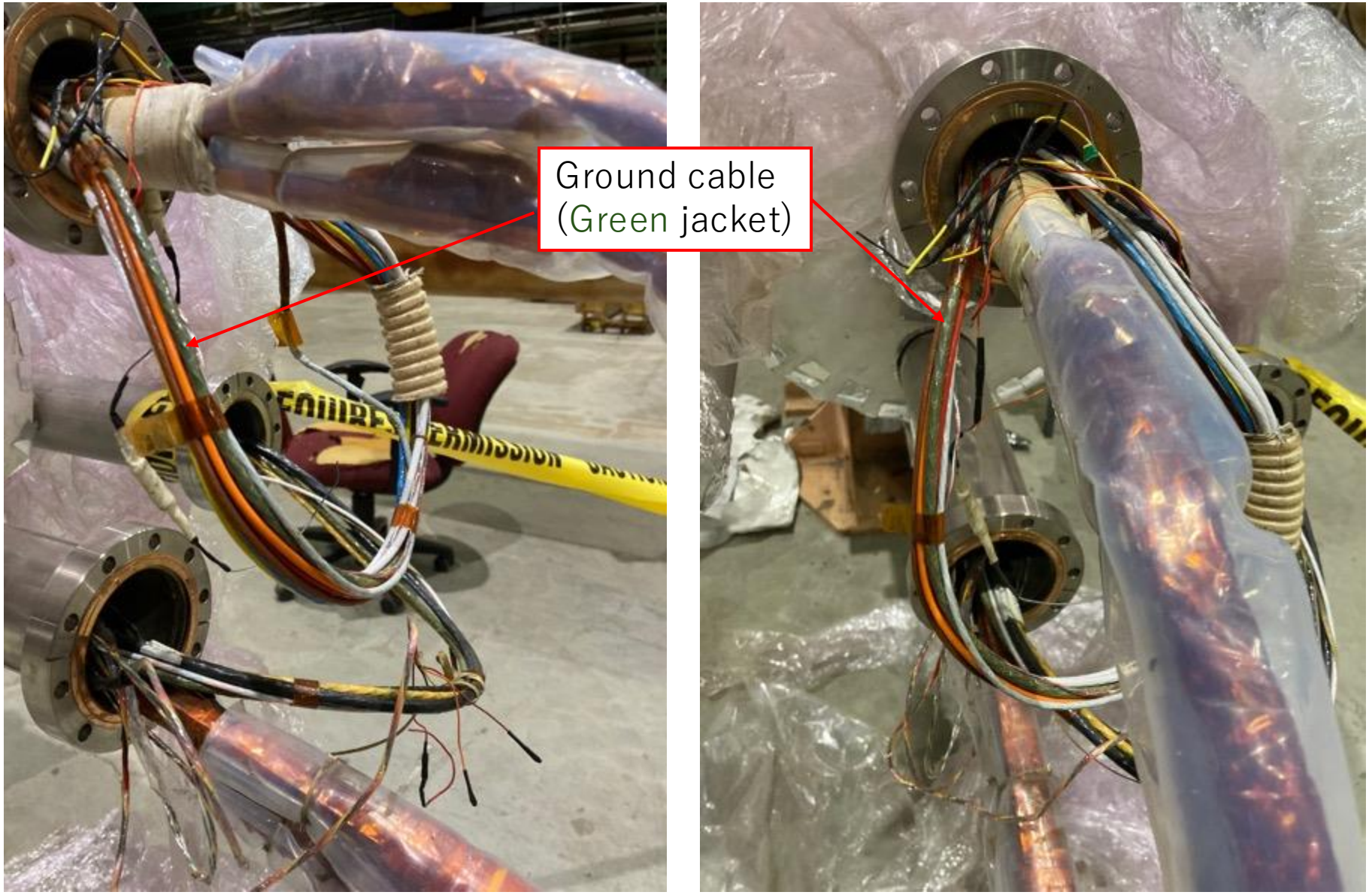


The bus is wrapped by Kapton tape and plastic cover.

“Blade” at Splice can part

This blade is spliced with another return bus from the adjacent magnet. This joint is the suspect of the short since the rest of the return bus is well insulated by the Kapton tape and plastic wrapper.

Ground Cable

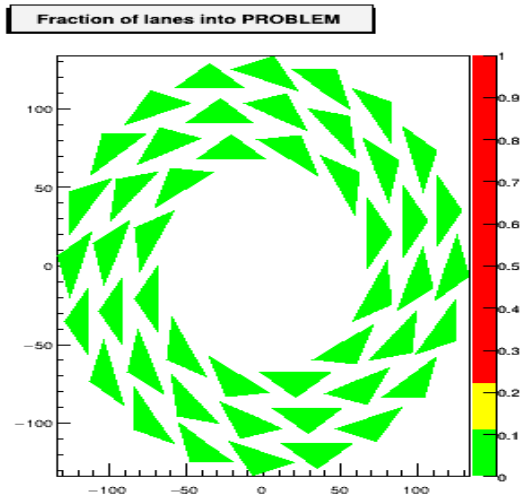


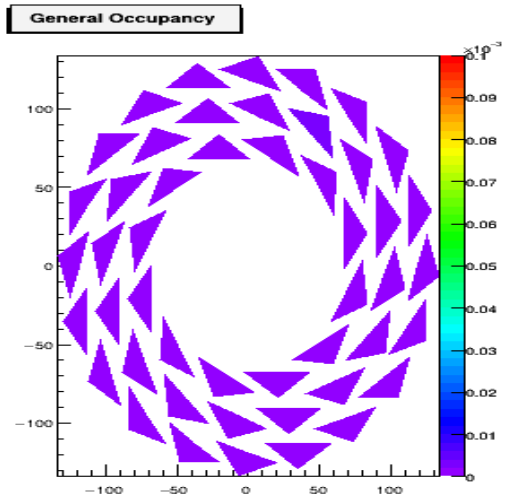
The hypothesis as of now is the short between the return bus and ground wire at the splice section.

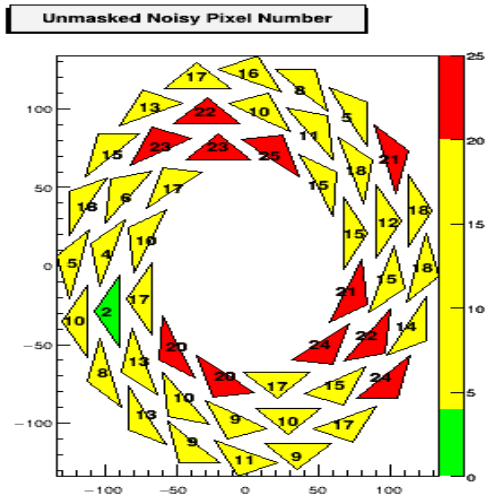
Subsystem Status

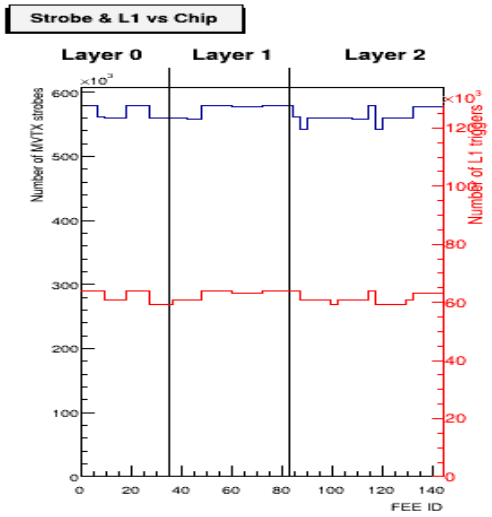
MVTX Acceptance

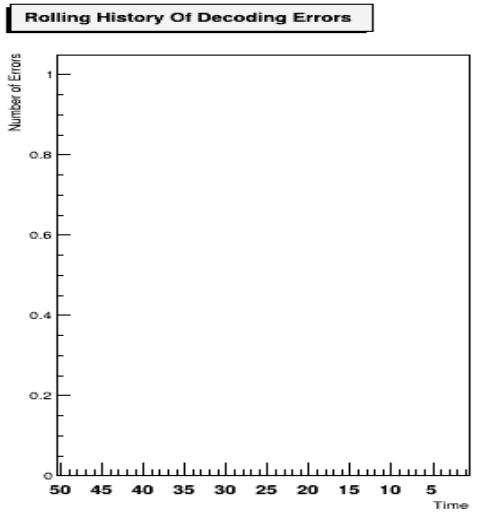
MVTXMONDRAW_1 Run 61498, Time: Sat Apr 12 08:51:26 2025

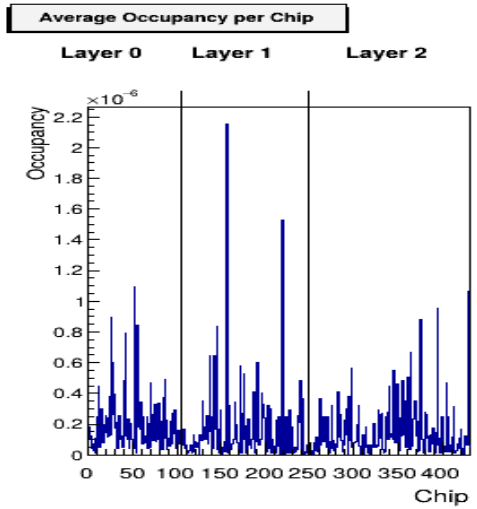


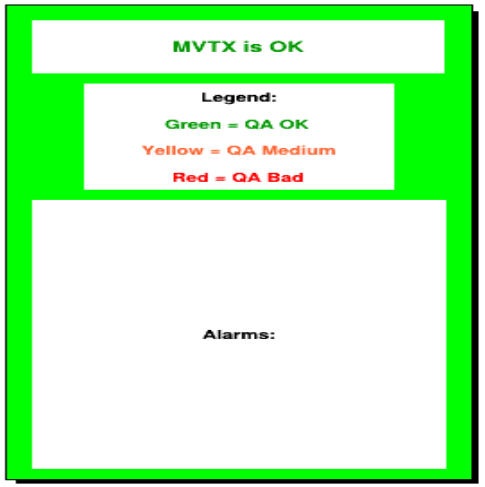








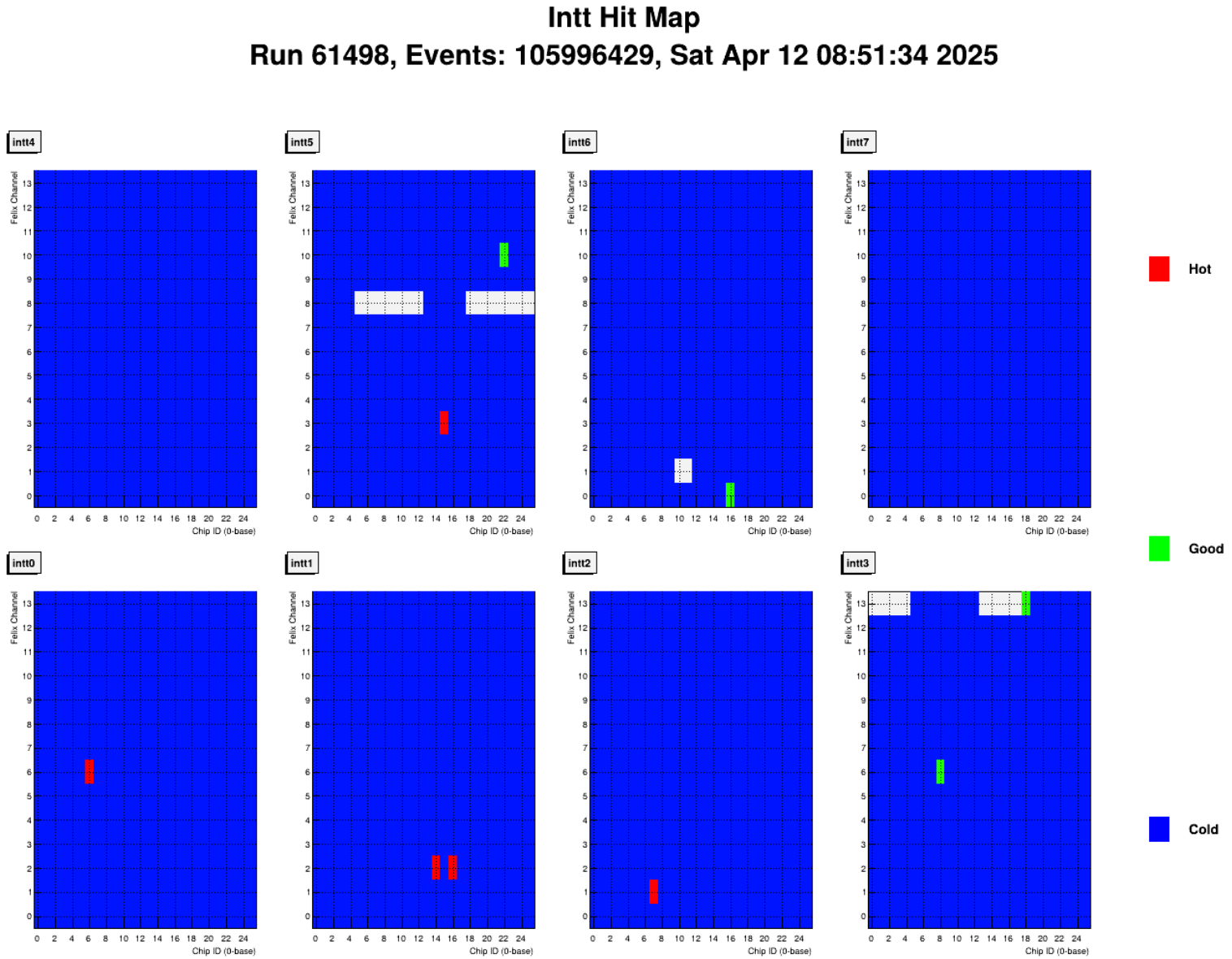




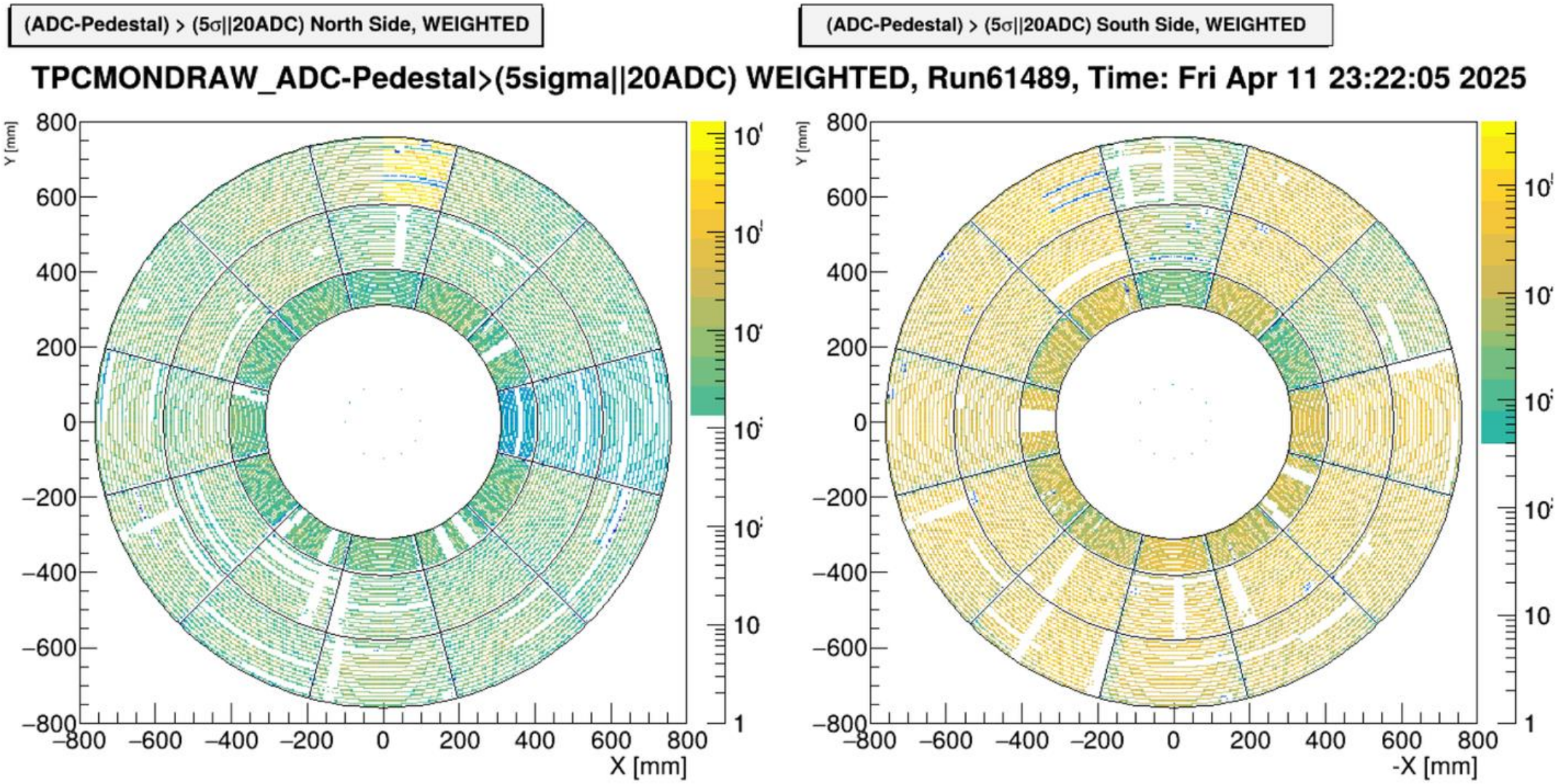
Online Monitoring Server Status

Felix 0	ONLINE	542106	560214
Felix 1	ONLINE	559296	559107
Felix 2	ONLINE	579285	561523
Felix 3	ONLINE	542301	559980
Felix 4	ONLINE	561855	579348
Felix 5	ONLINE	578448	577953

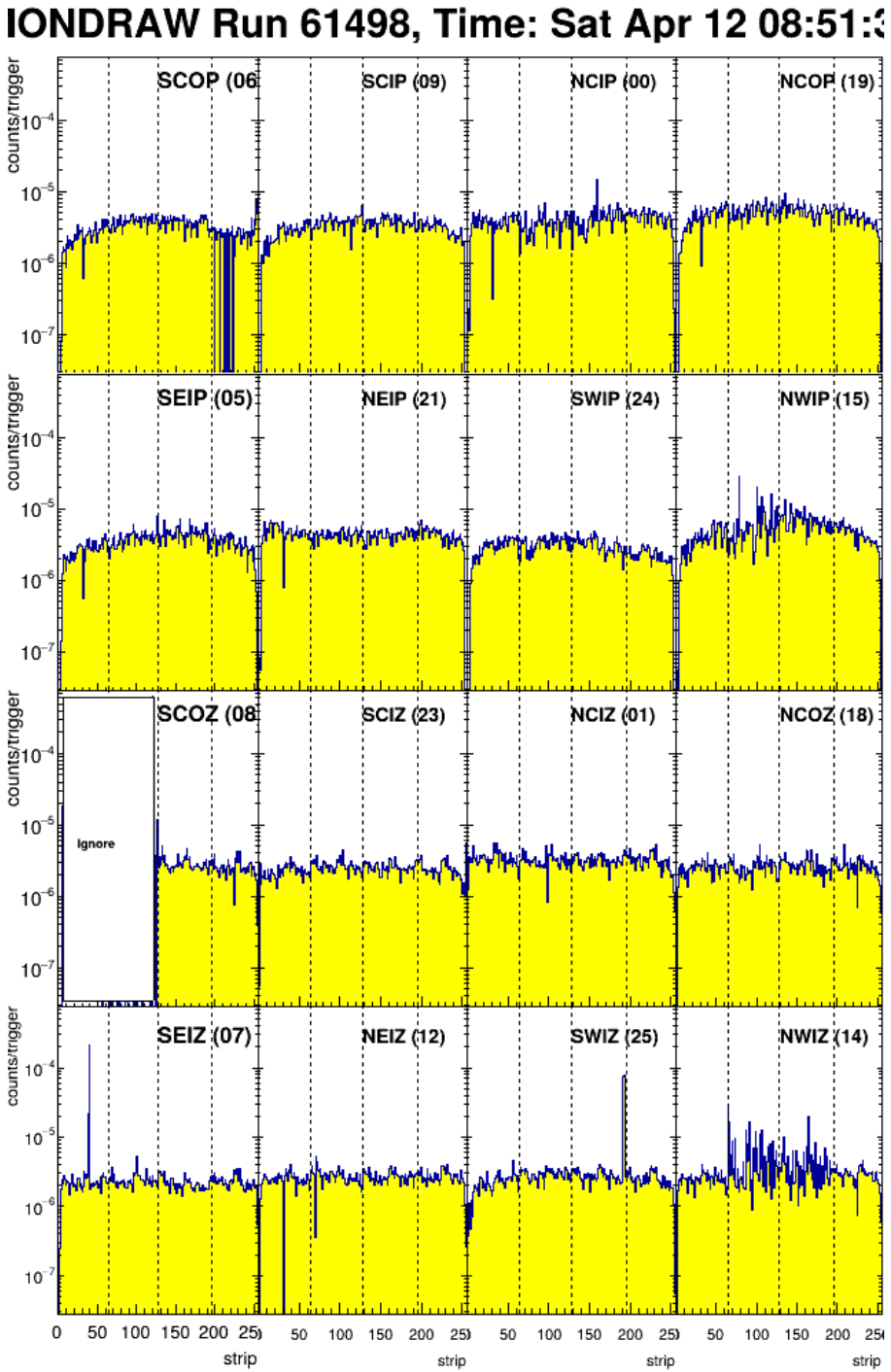
INTT Acceptance



TPC Acceptance



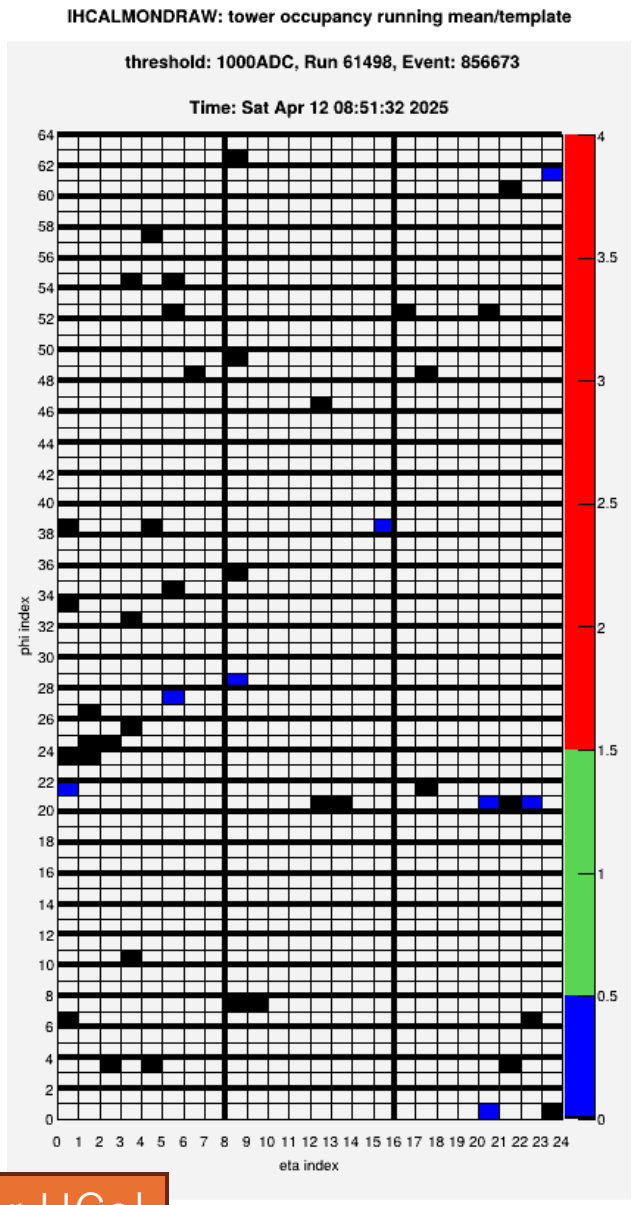
TPOT Acceptance



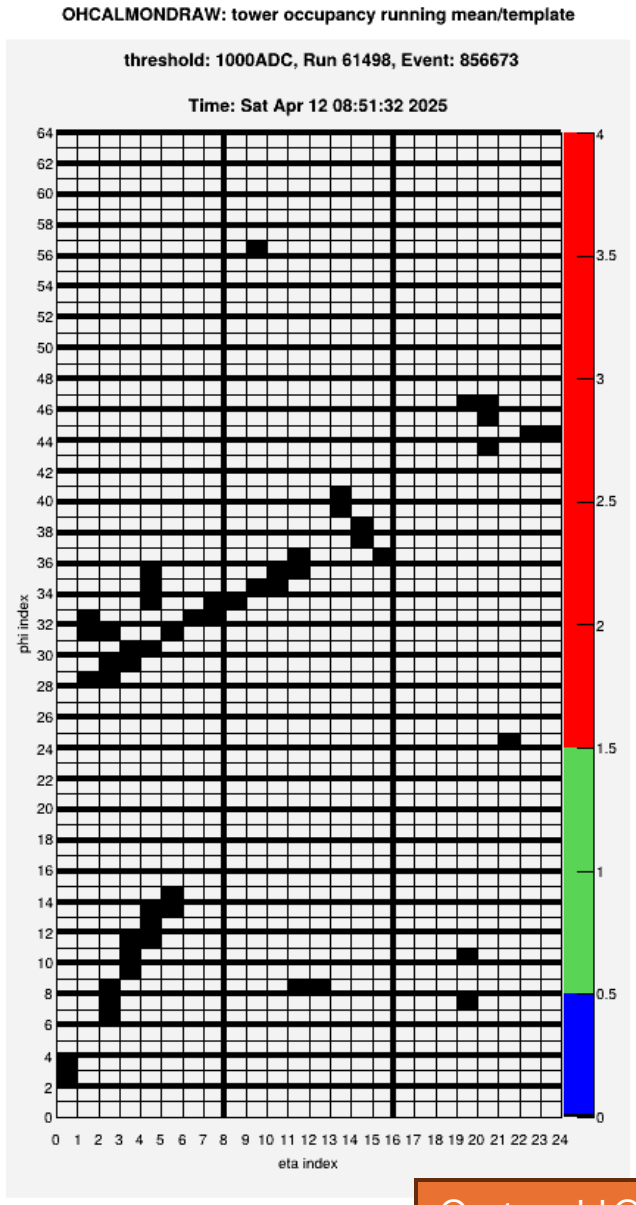
EMCal & MBD & sEPD

- Not in the big partition yet. DAQ is under debugging after their SEB machines OS (CentOS --> Alma 9, Debian 10--> Debian12) upgrade.

HCal Acceptance



Inner HCal

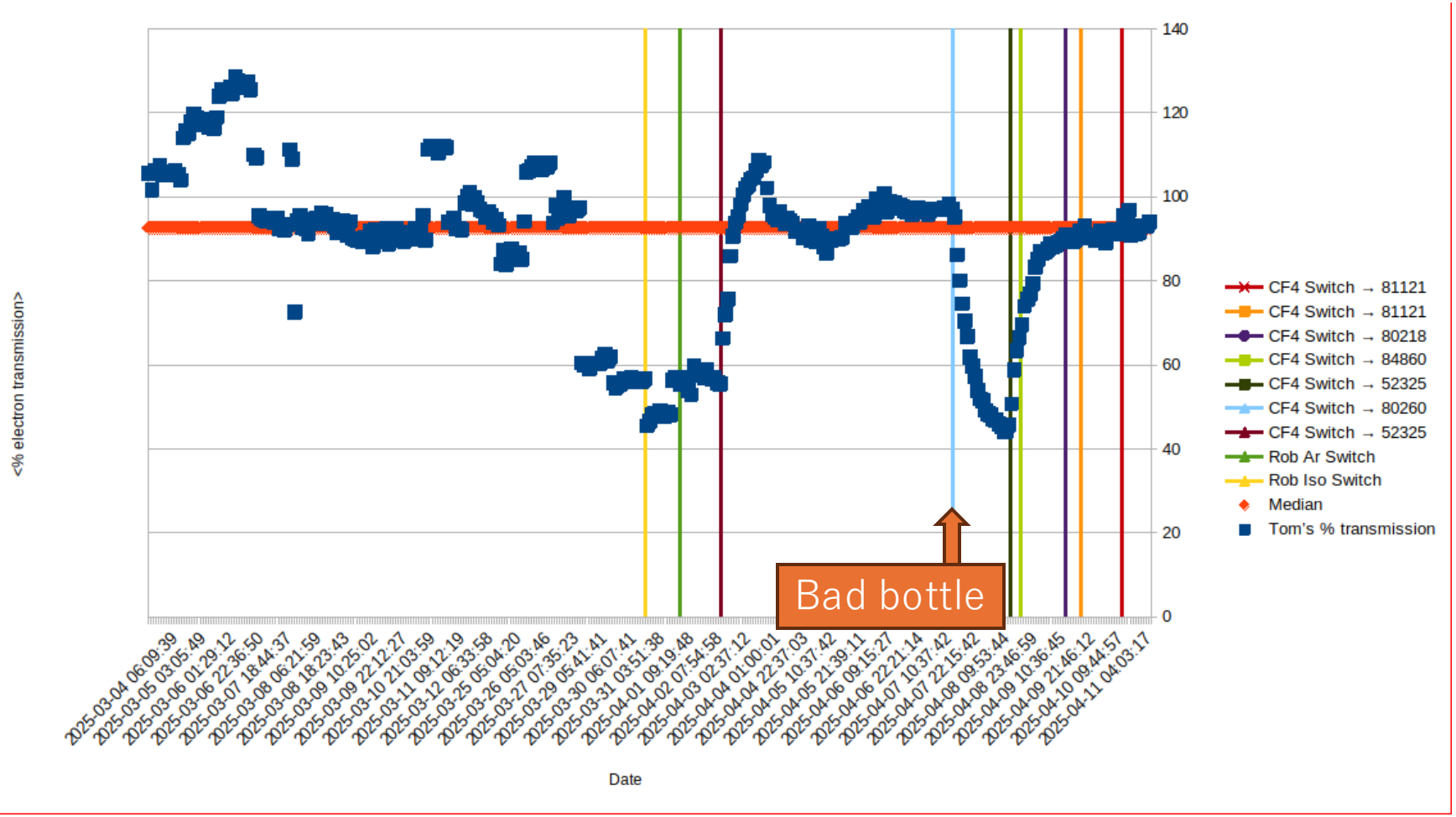


Outer HCal

TPC Gas Issue

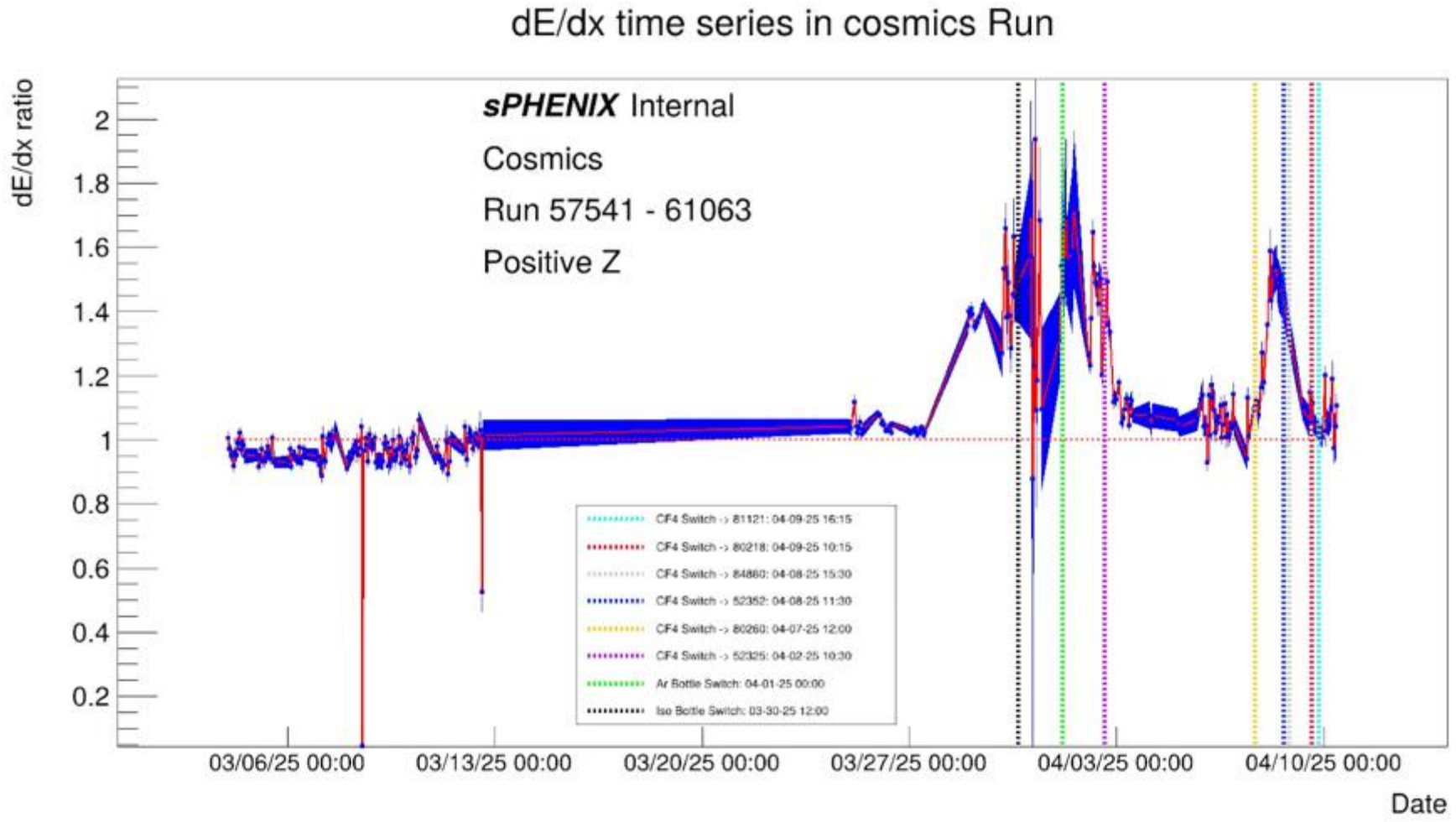
Suffered gain by bad CF4 gas

Electron Transmission (Relative)



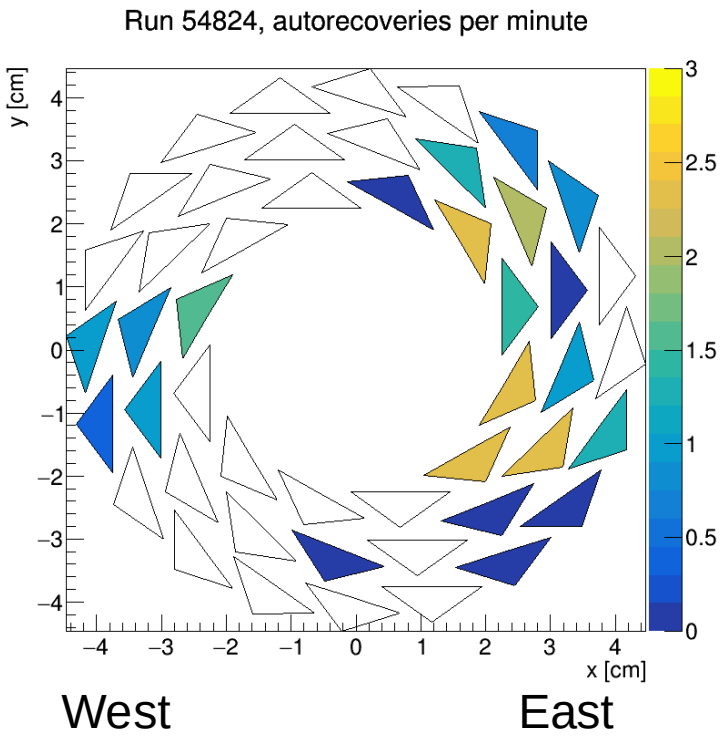
The transmission was degraded due to contamination of the CF4 gas bottle. After bottle scan test, they identified one of 4 LOTs is bad. Other 3 LOTs are confirmed to be OK. # of Known Good Bottles (KGB) is sufficient to keep TPC running until the next delivery in early May.

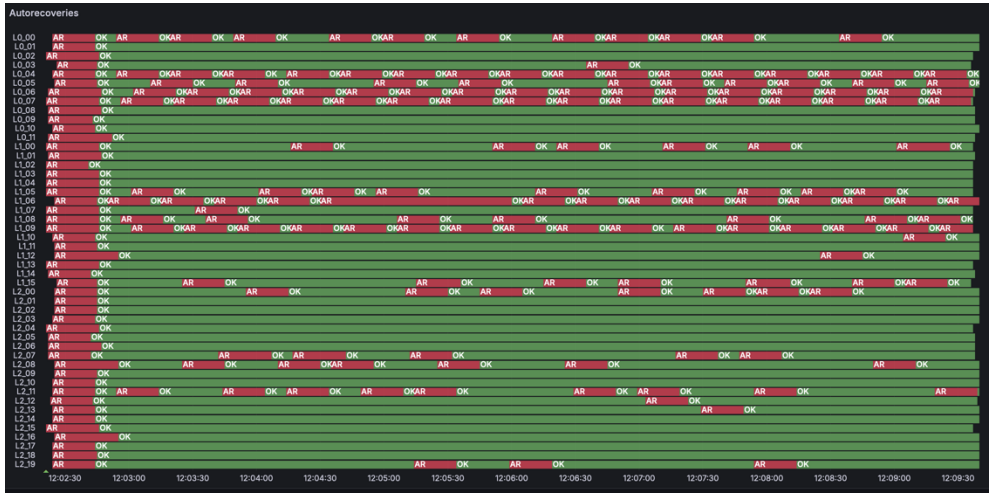
Effect in the dE/dx



Preparation Status of Beam Background Test for MVTX

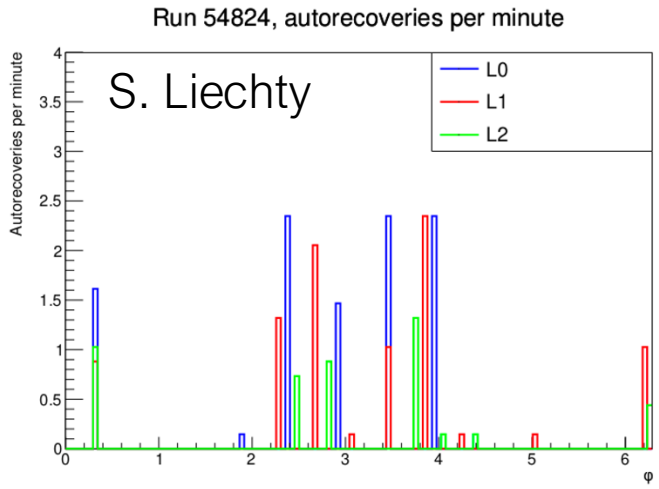
Streamed 12 yellow, before optimization





Notes: 600 Mb/s
Normal beta* in IP8
IP10 beta squeeze from 5m to 2m

All staves go into autorecovery at the start of run due to readout setup (not real autorecoveries)



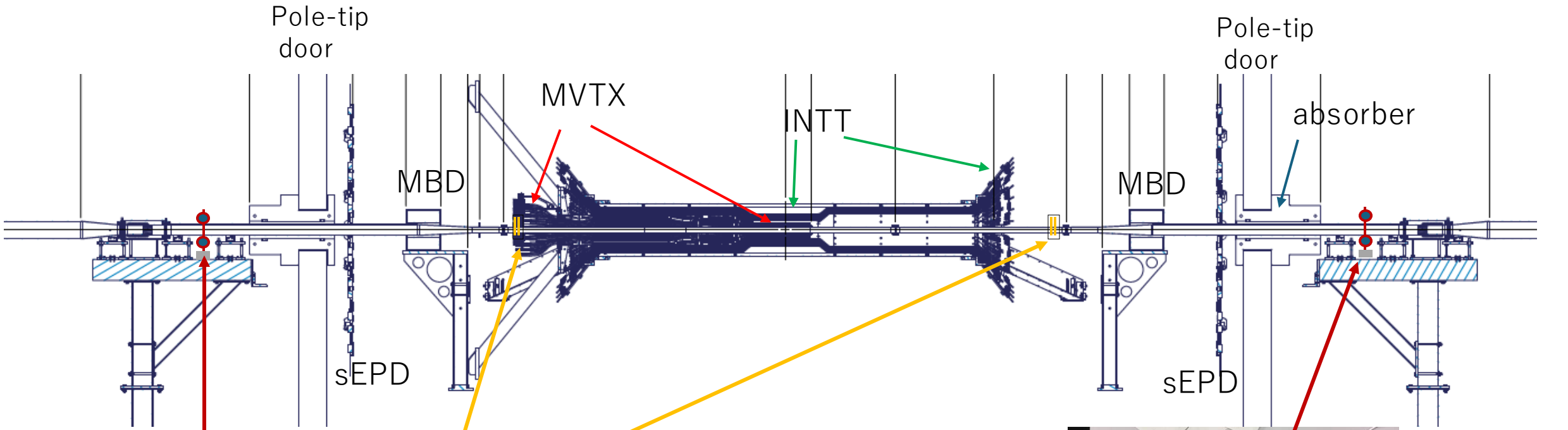
Bunch setup	12, yellow
Global orbit radial change [mm]	0
Crossing angle [mrad]	1
Orbit bump	0

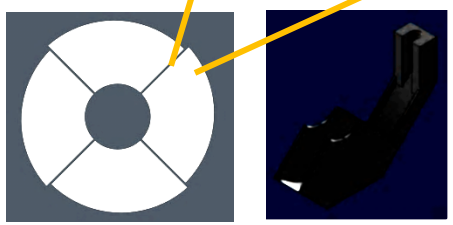
φ = 0, 2π is west
φ = π is east

From Dan Cacace and Sean Stoll

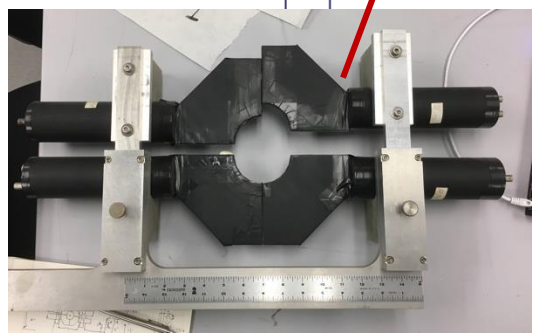
Inner and Outer “Donut” Counters

- To be positioned along the beampipe.
- Better understand the backgrounds seen in the MVTX
- Provide MCR with a feedback signal to steer and tune the beams
- Discriminated output signals -> scalers, electronics in Rack 3C6





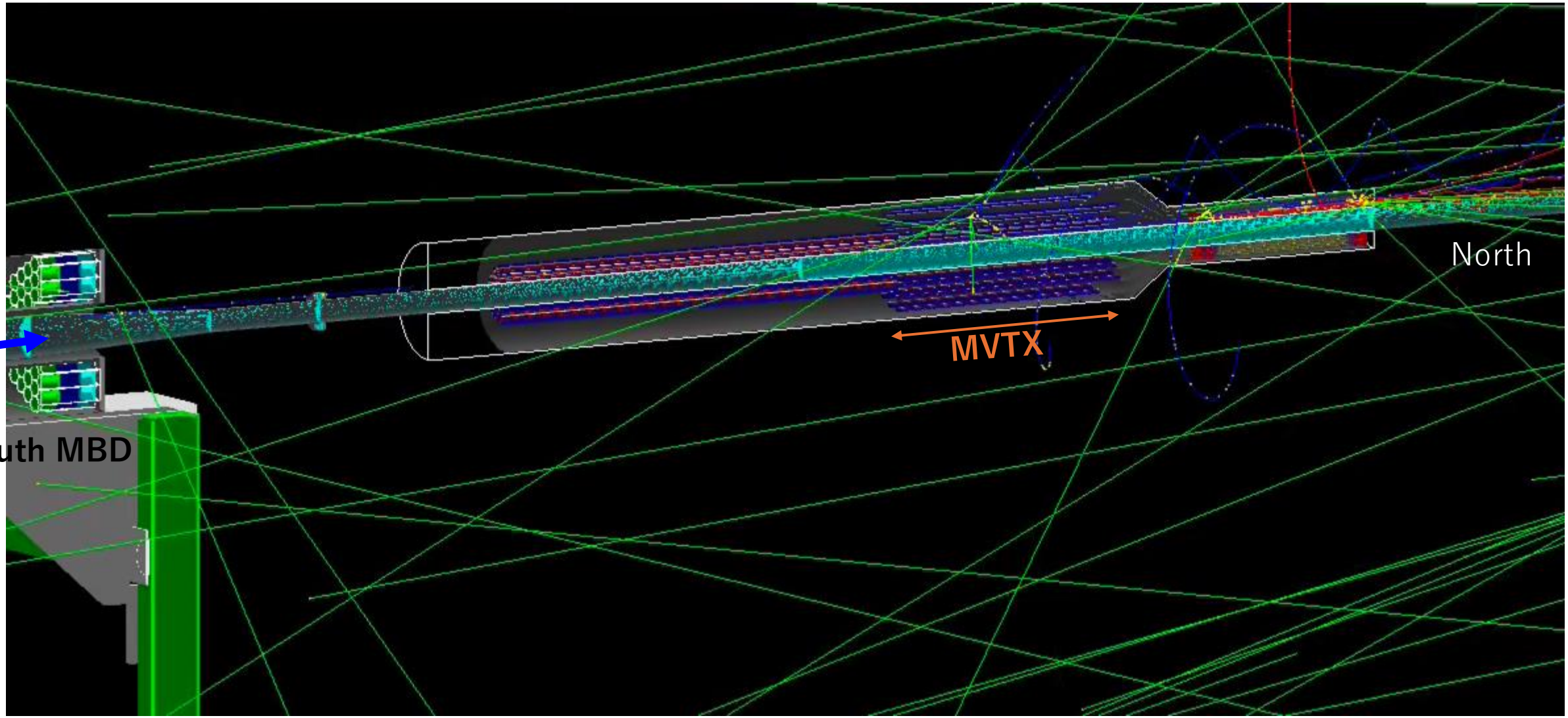
“Inner Donut” : each is 2 - 5” OD x 1.75” ID 0.7mm thick scintillator



“Outer Donut” : re-purposed pp2pp detector modules : pmts and scintillator

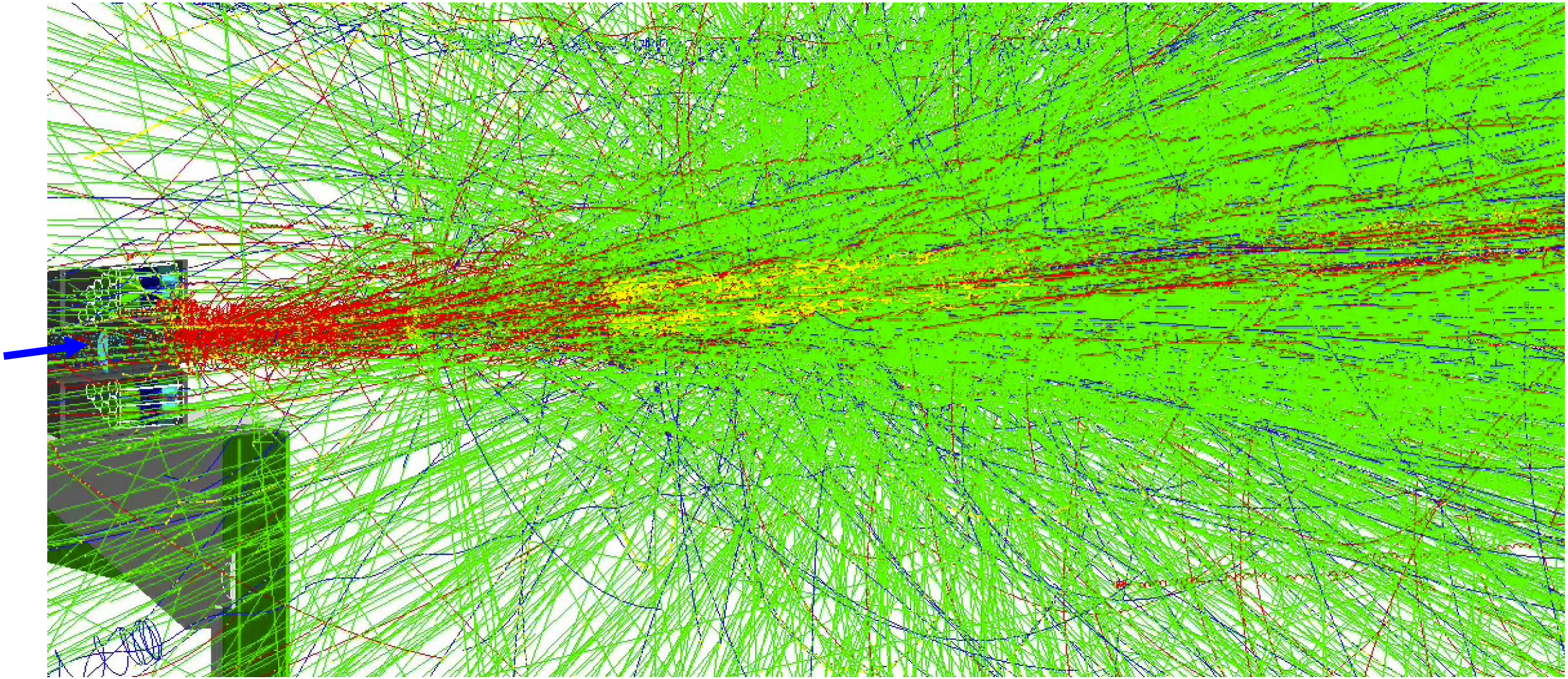
Courtesy of John H. presented in 17th sPHENIX collaboration Meeting (Dec.12, 2024)

100 GeV proton on south taper

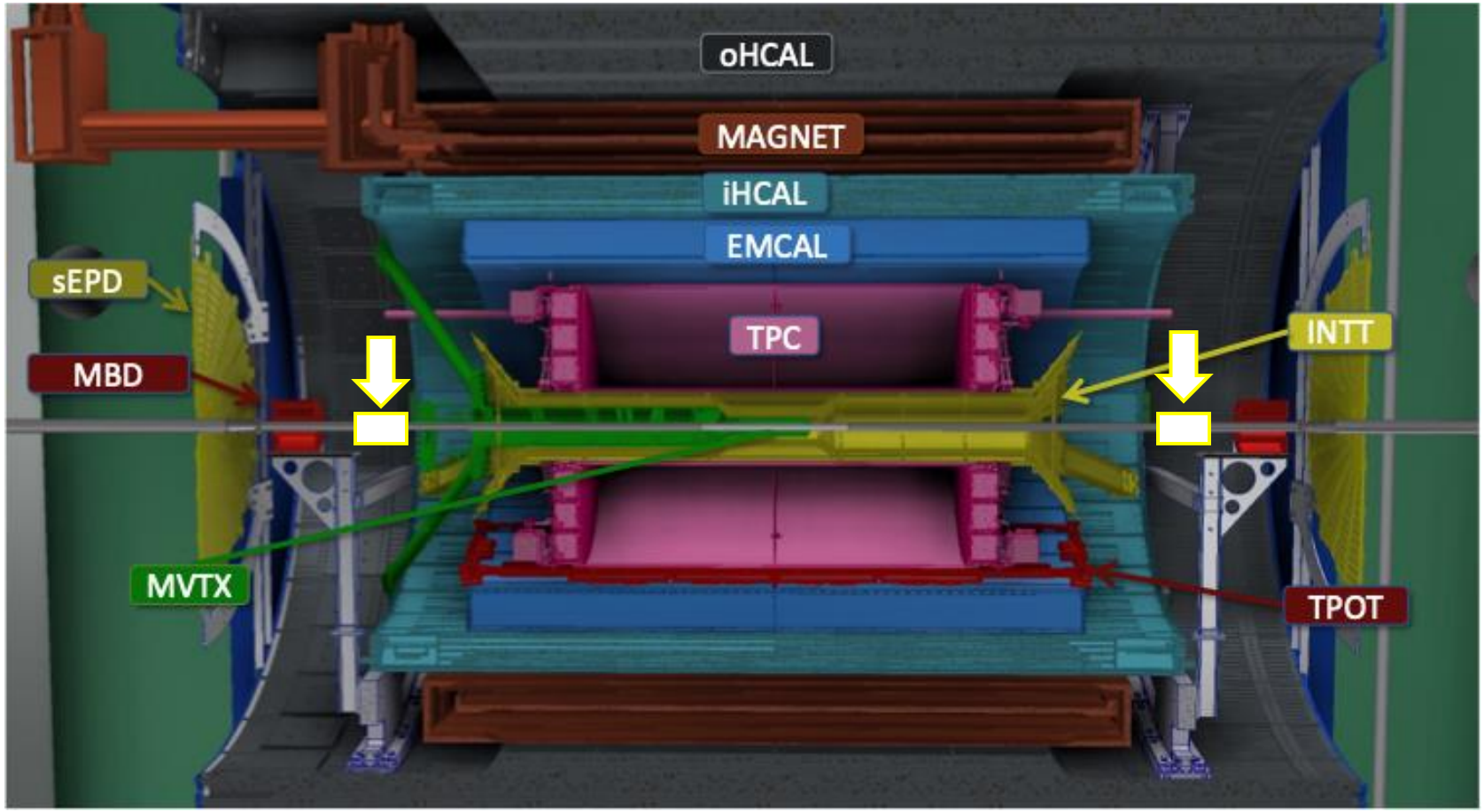


Blue single beam simulation

100 GeV/n gold on south taper

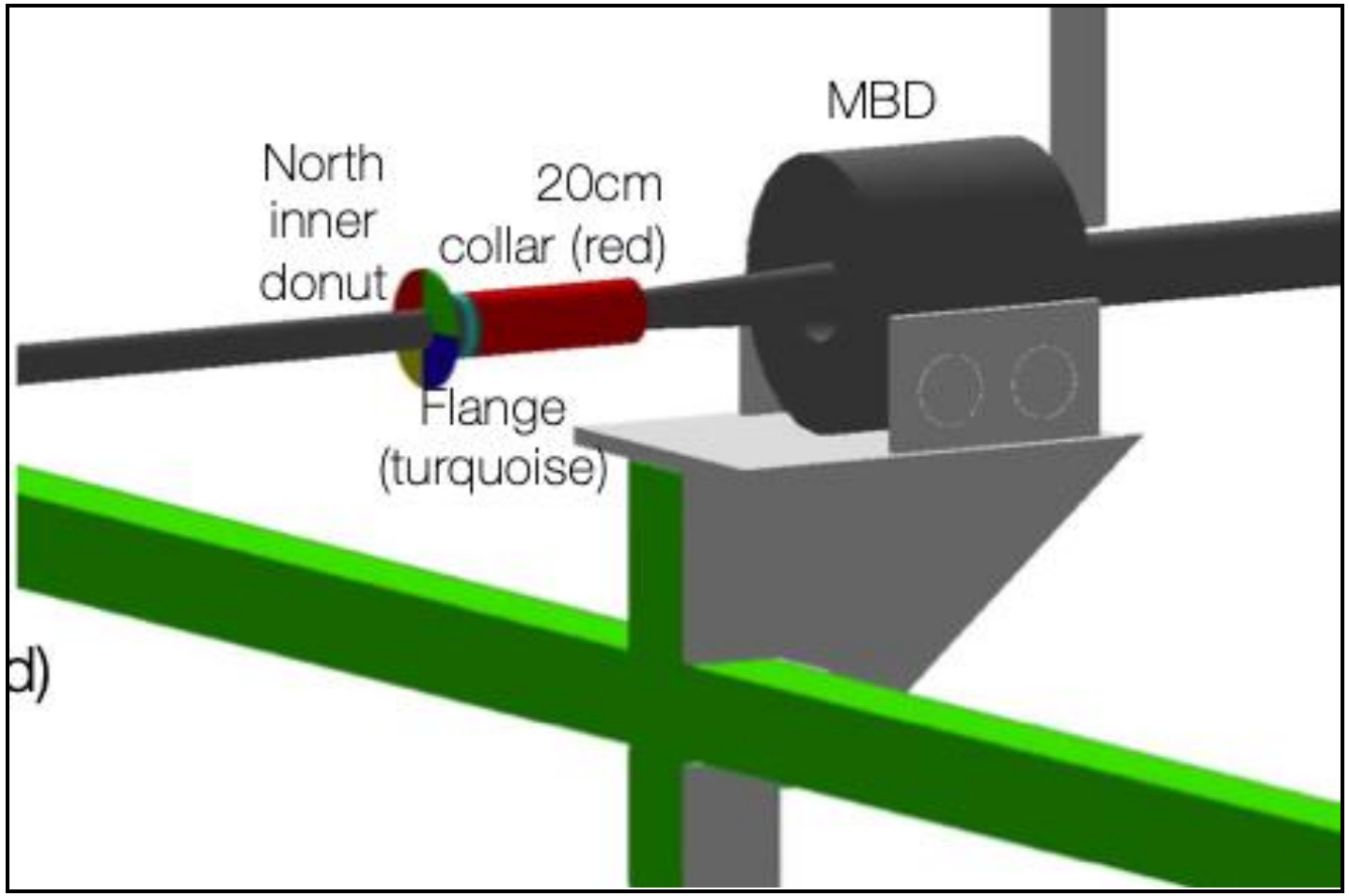


New Beamline Equipments (1)

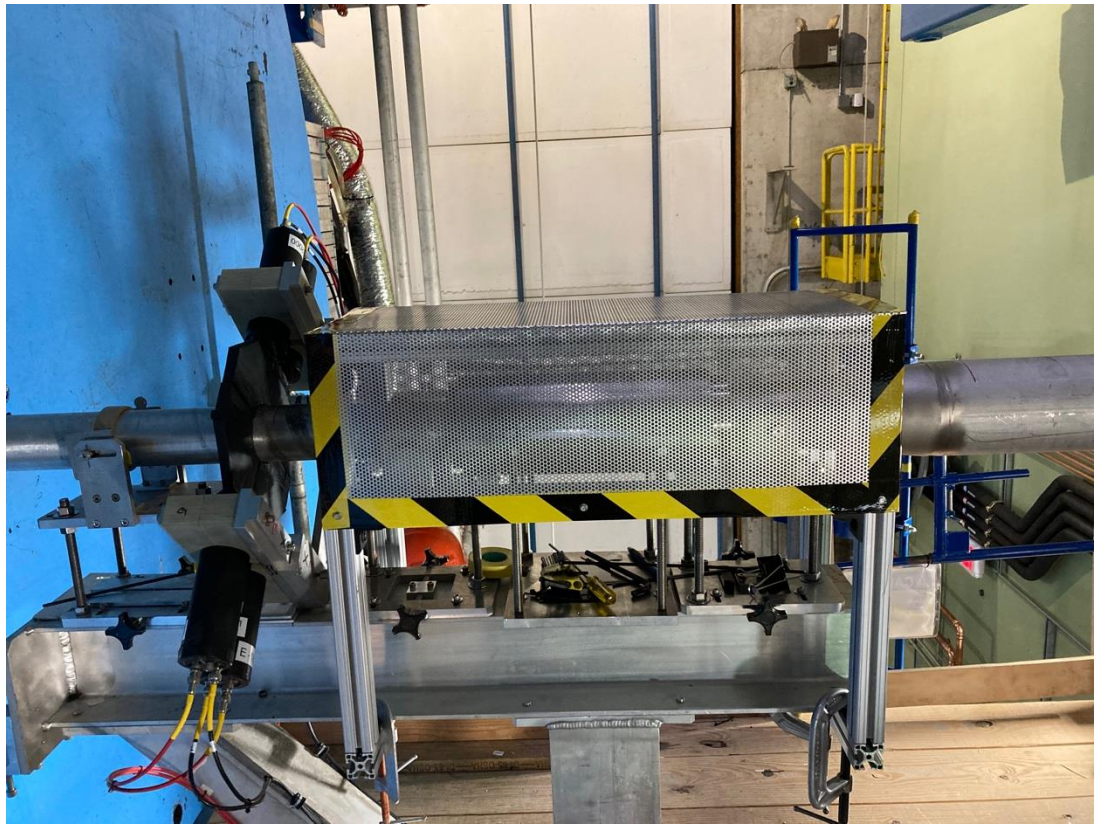


New Beamline Equipments (2)

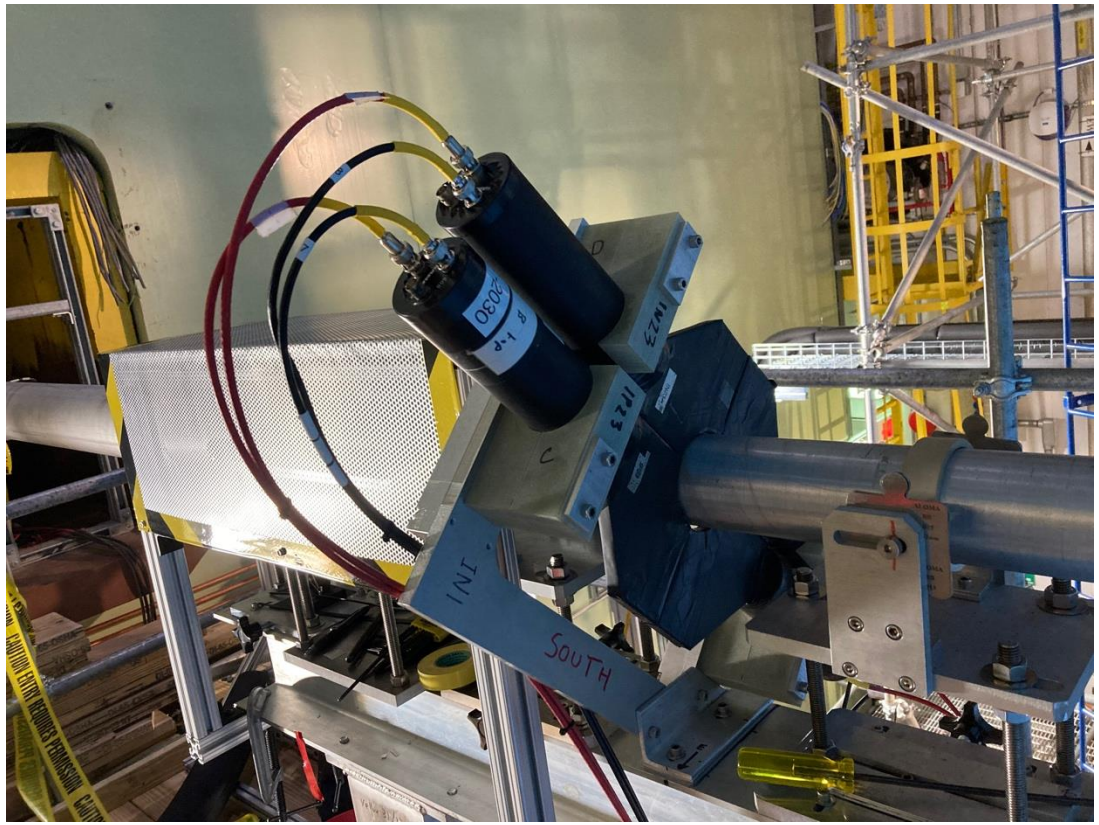
1. **Stainless Steel Collar**
   Beam background absorber
2. **Donut counter readout**
   Each quadrant has independent readout for the immediate feedback to MCR



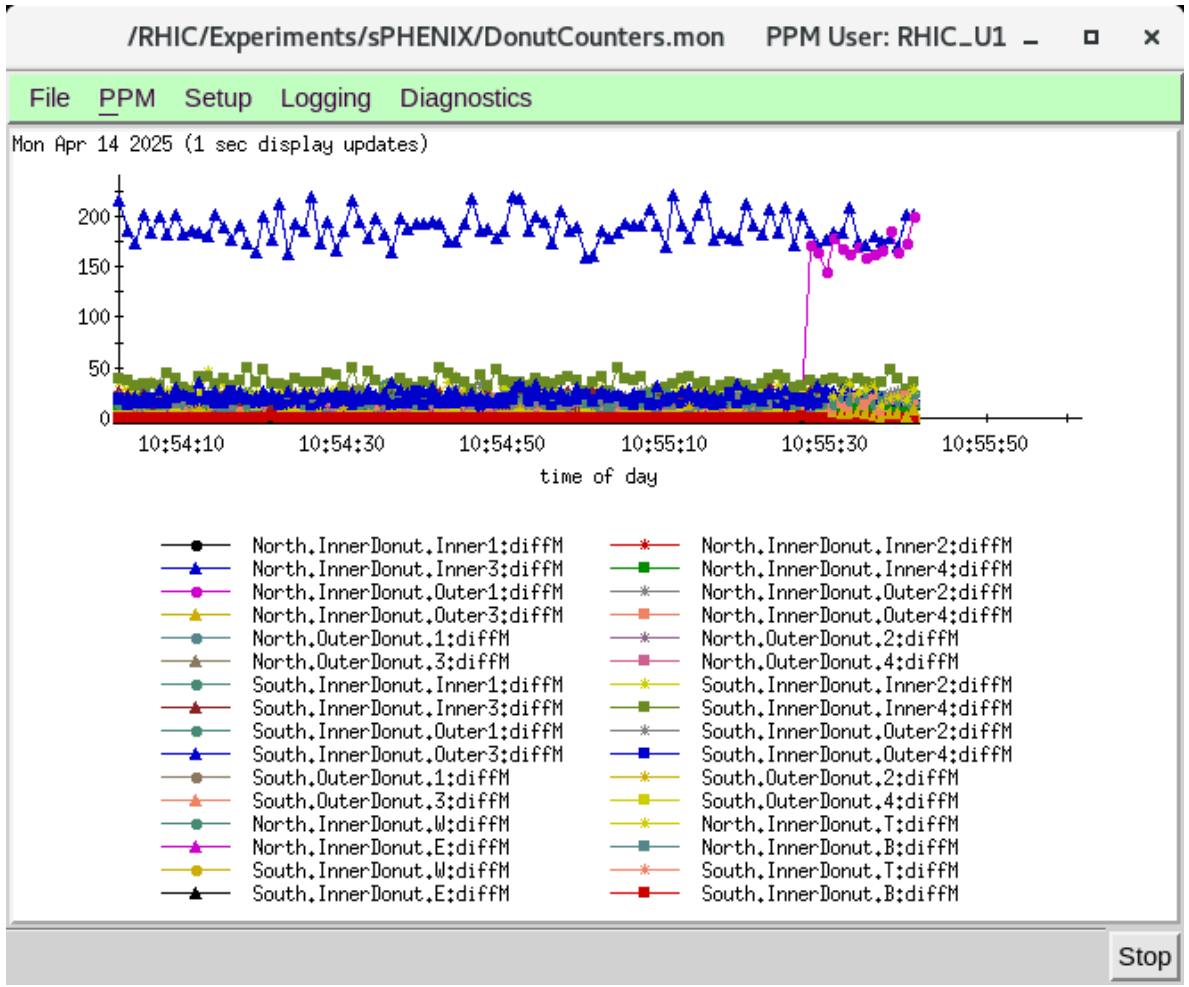
New Beamline Equipments (3)

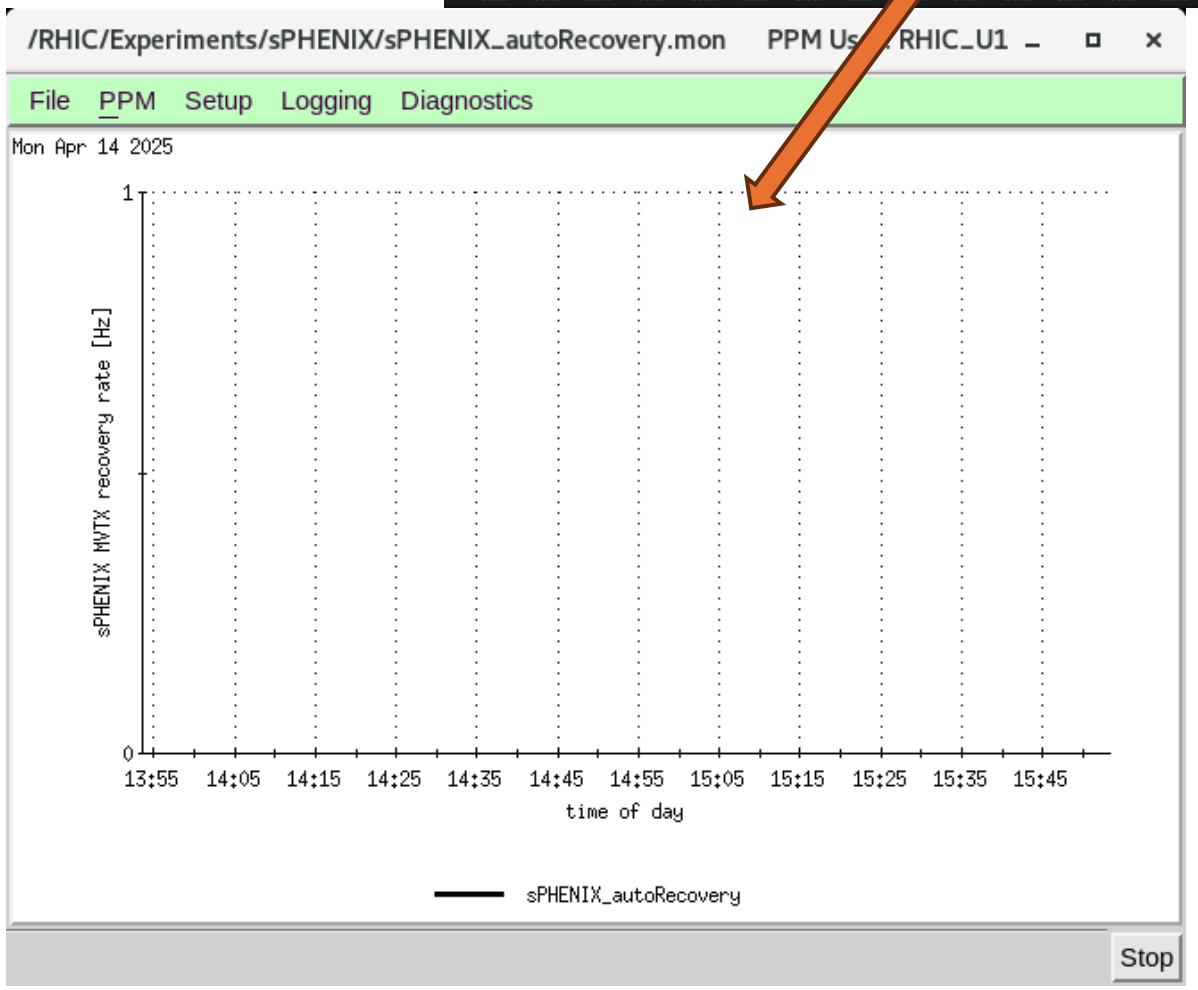


New Beamline Equipments (4)



New Beamline Equipments (5)





MCR can monitor the MVTX's auto-recovery status in real time while they are tuning the beam.

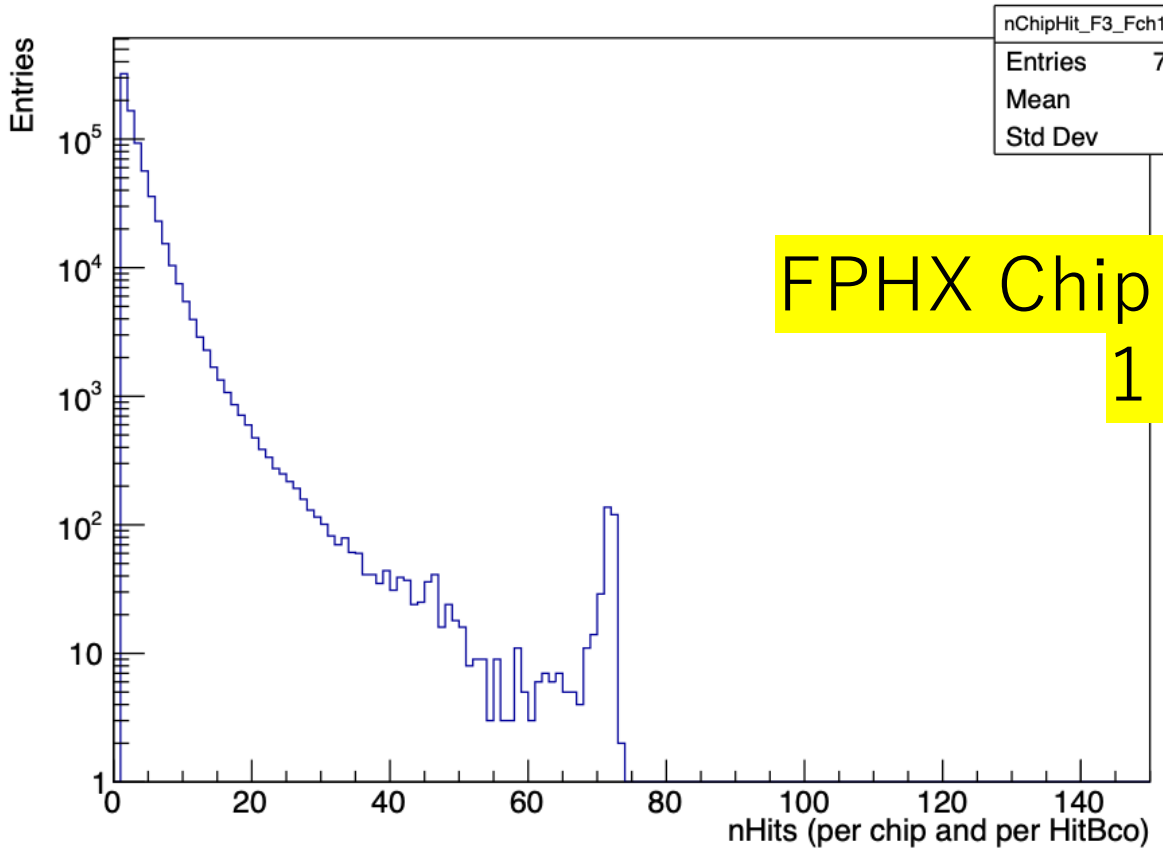
Run25 INTT Operation Plan

INTT Run Coordinator : Akitomo Enokizono

Assistant : Yuko Sekiguchi

Chip saturation issue

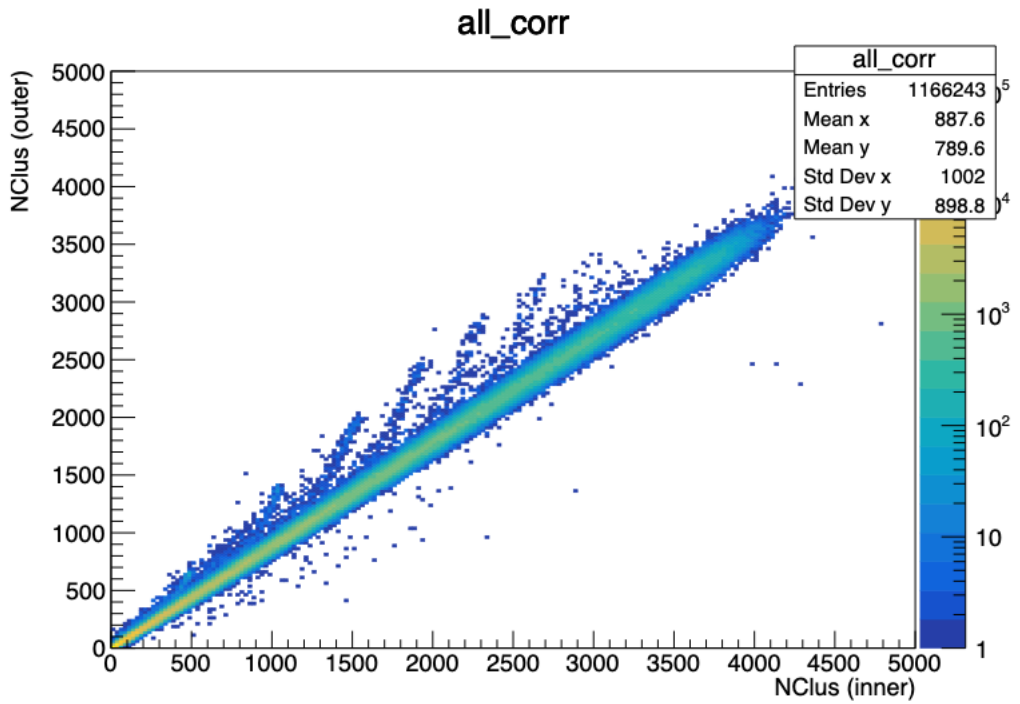
Count the number of hits of each chip in each bunch crossing

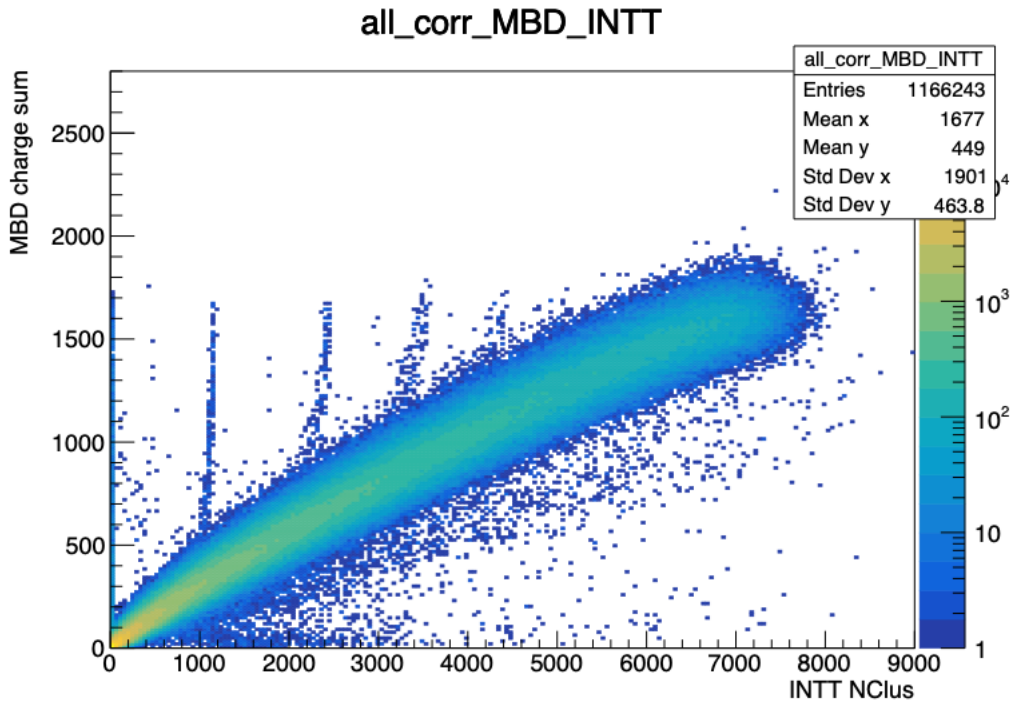


FPHX Chip Data Transmission
1 hit/1BCO

- The distinct cutoff in the right edge of the distribution indicates that INTT has chip saturation issue
- The issue could happen in all the INTT chips

Hit carried over issue

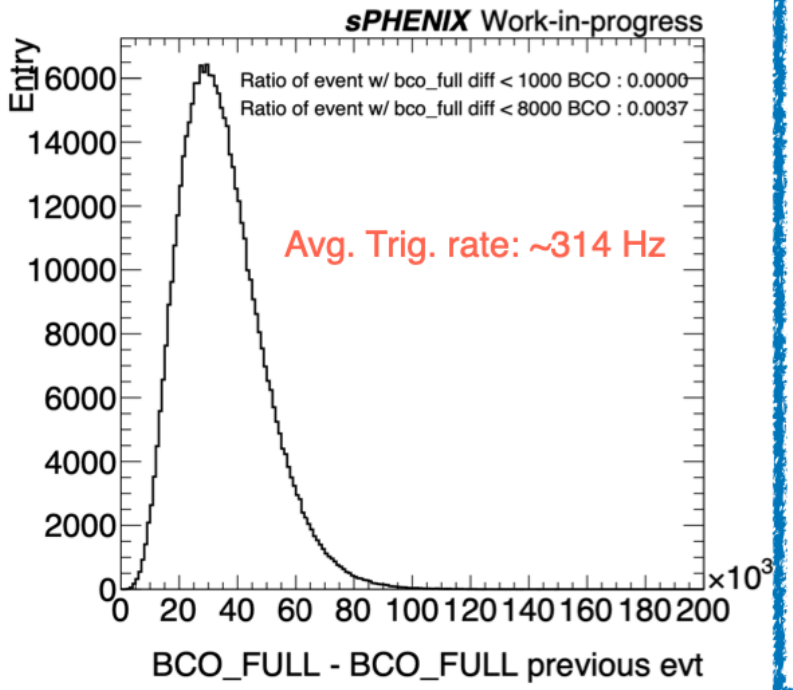




- Off-diagonal entries observed in the correlations of number of inner clusters vs. number of outer clusters and number of INTT clusters vs. MBD charge sum
- Those entries were identified as being due to hits carried over to the next F4A event (INTT hits from one collision are split into two F4A events. Some hits are missing, hence off-diagonal correlations observed)

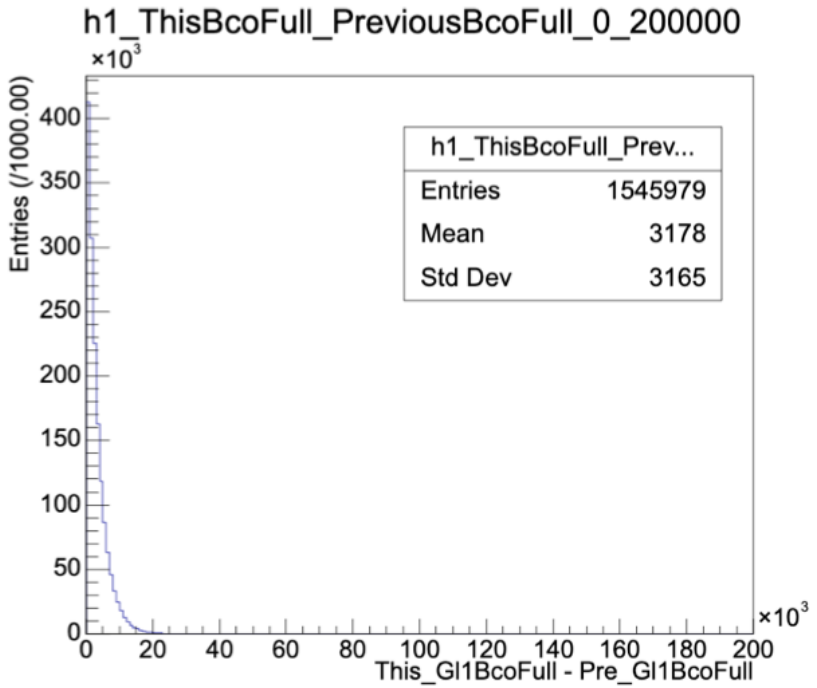
Trigger interval (unit: BCO)

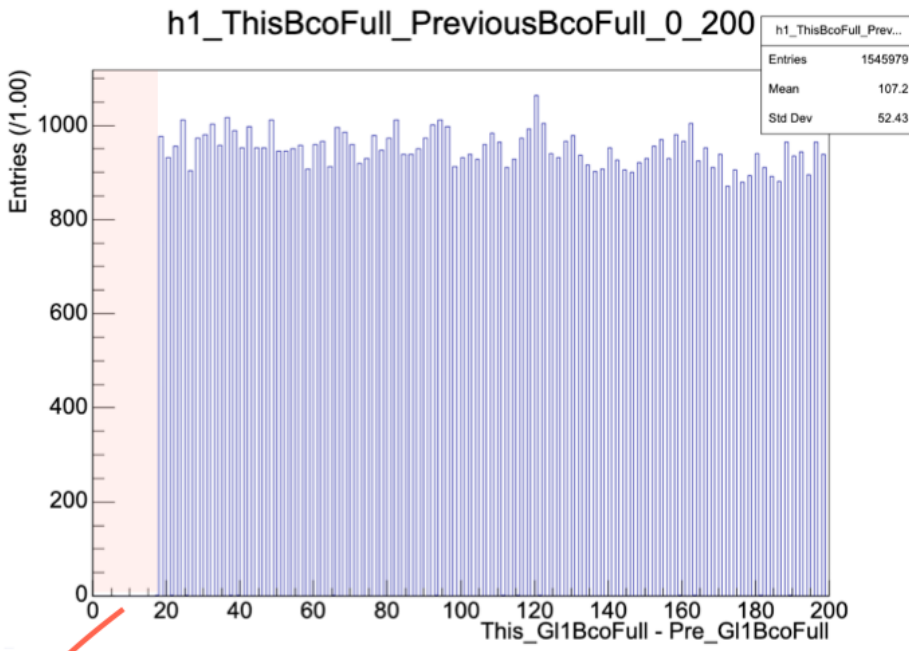
Run23, run 20869



Run24, run 54280

Avg. Trig. rate: ~3000 Hz

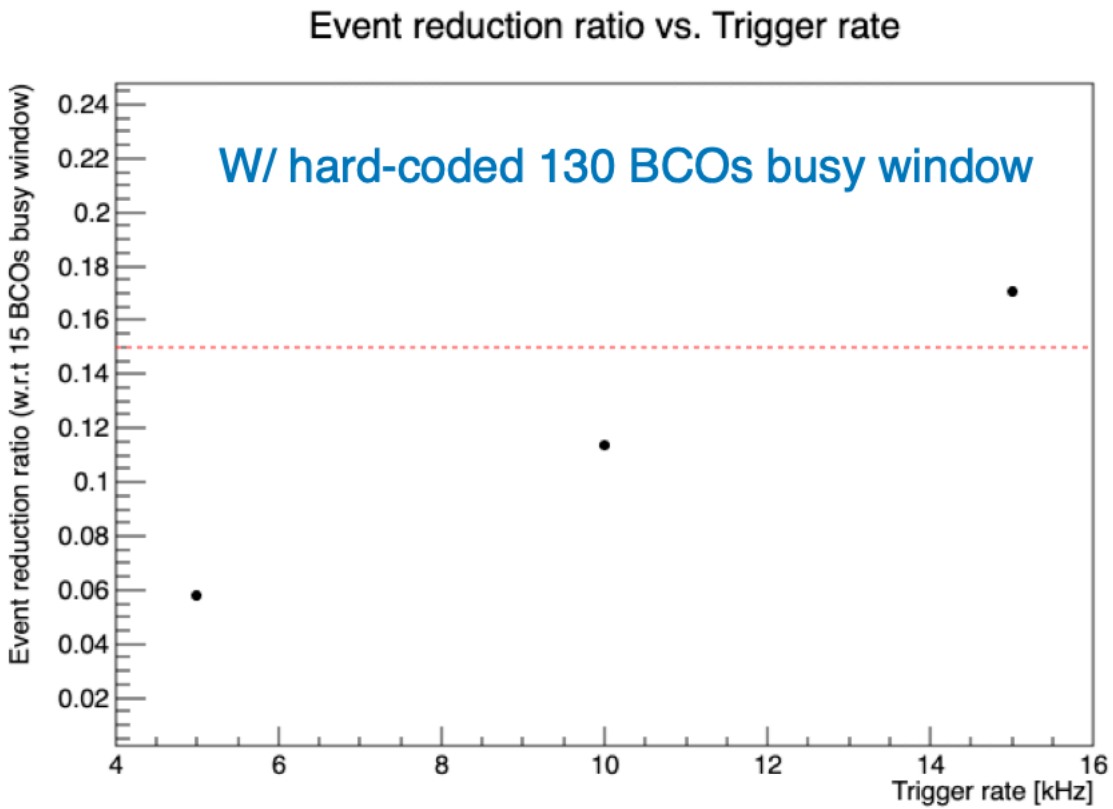




Default busy window(15 BCOs)

Estimation of event reduction with longer busy window

Busy window: DEAD4N

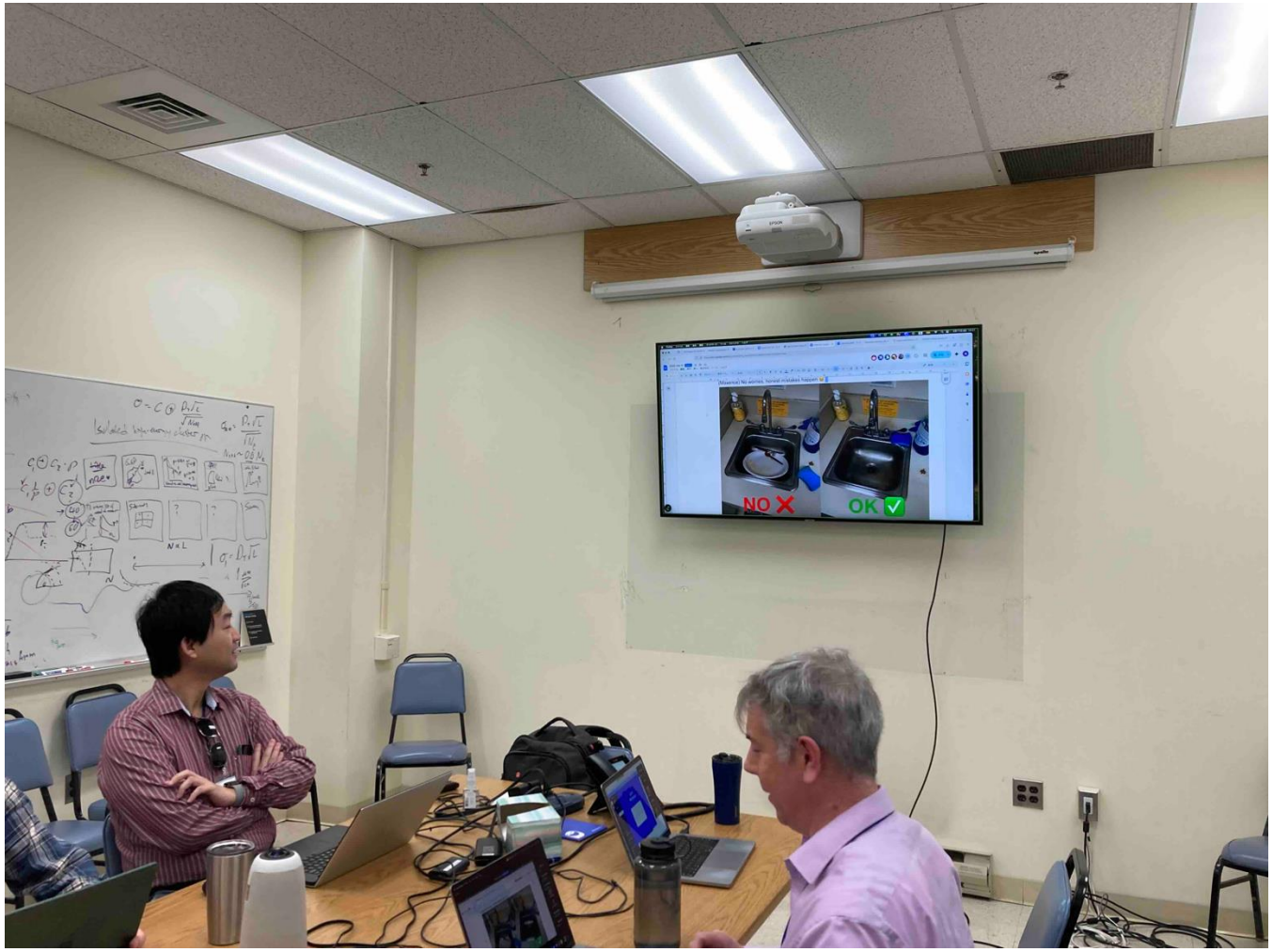


- With the trigger rate of 10k Hz, ~11.4% of the triggered events (w.r.t to the current 15 BCOs busy window) will be rejected if 130 BCOs busy window is set
- In the other words, if we keep the same configuration for Run25, up to ~11.4% of INTT events would have the hit-carried-over issue

Summary

- Continue cosmic running
- Detectors are in good shape in general
- Debugging is in progress for OS upgrades by DAQ group
- INTT will optimize time window parameters at the beginning of Run25
- No prospect about the schedule
  - Repair work of the short issue in the return bus of blue ring (Start investigation from Tuesday morning).
  - RHIC Cooldown
  - Summer Break
  - End date of Run25

Appendix



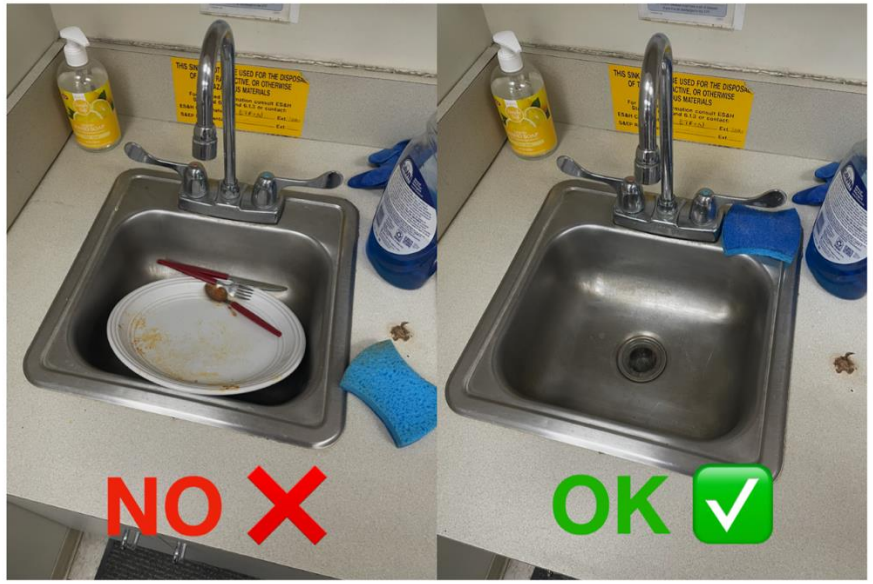
sPHENIX Run-2025 Shift Change Meeting Page

Date: Friday, April 11, 2025

Zoom coordinates
https://bnl.zoomgov.com/j/1614645041?pwd=bmE4STBRZk5tVVVUUC8zRnQxSlFyQT09

General (Rosi/Ron/Kin/John)

- (Ron) Friendly reminder: keep the sink clear.+> Sorry, I got distracted while washing it (Maxence) No worries, honest mistakes happen 🙂



Joint Section Between Magnet