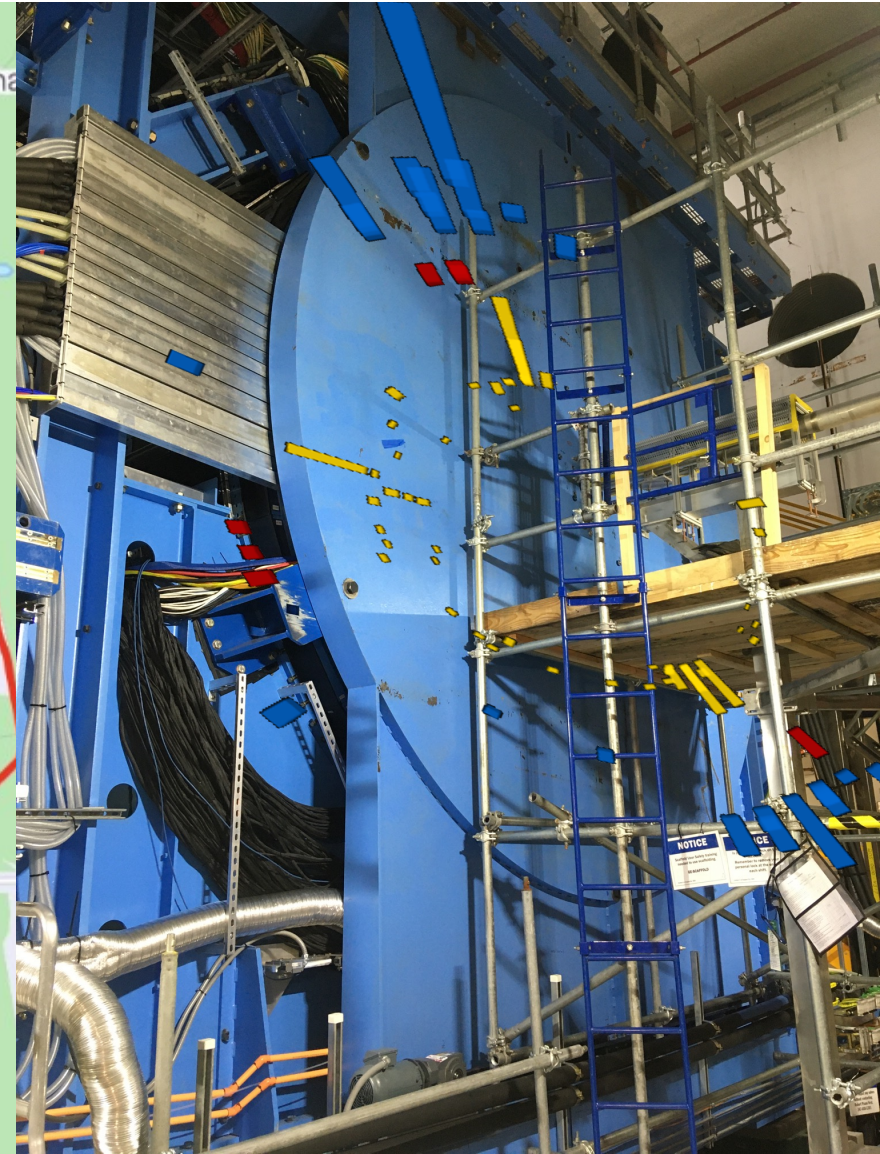


# sPHENIX Status RHIC Coordination Meeting August 06, 2024

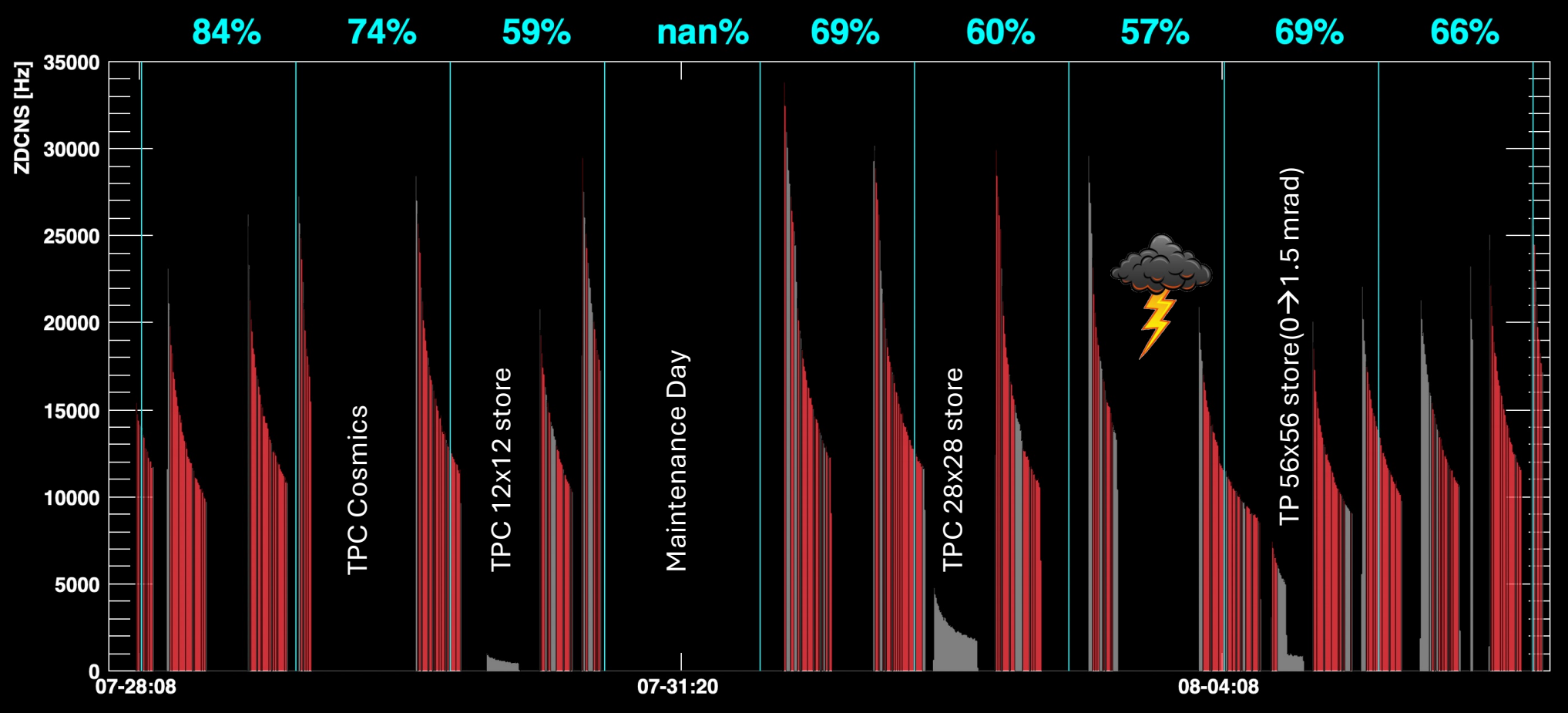
Jamie Nagle  
University of Colorado Boulder  
sPHENIX Run Coordinator

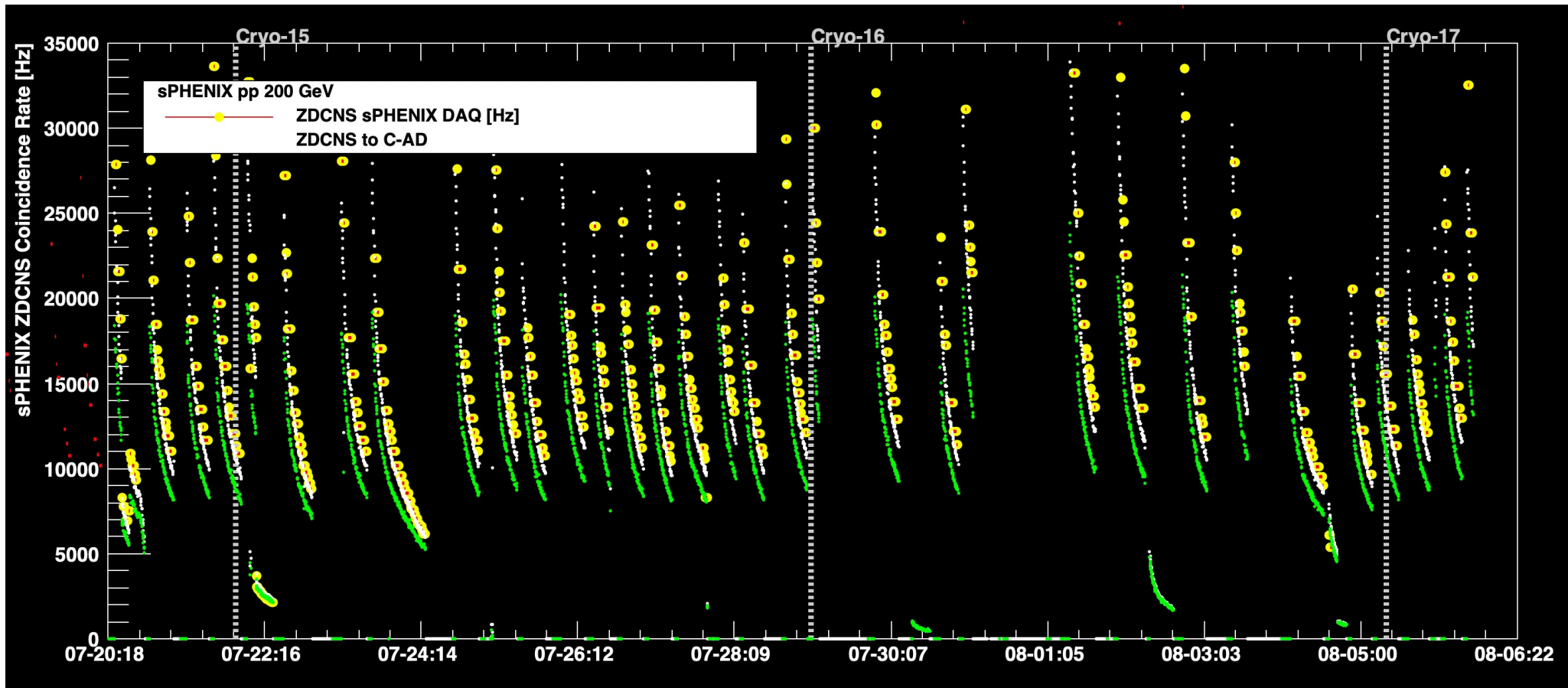
8/6/24

sPHENIX 2024

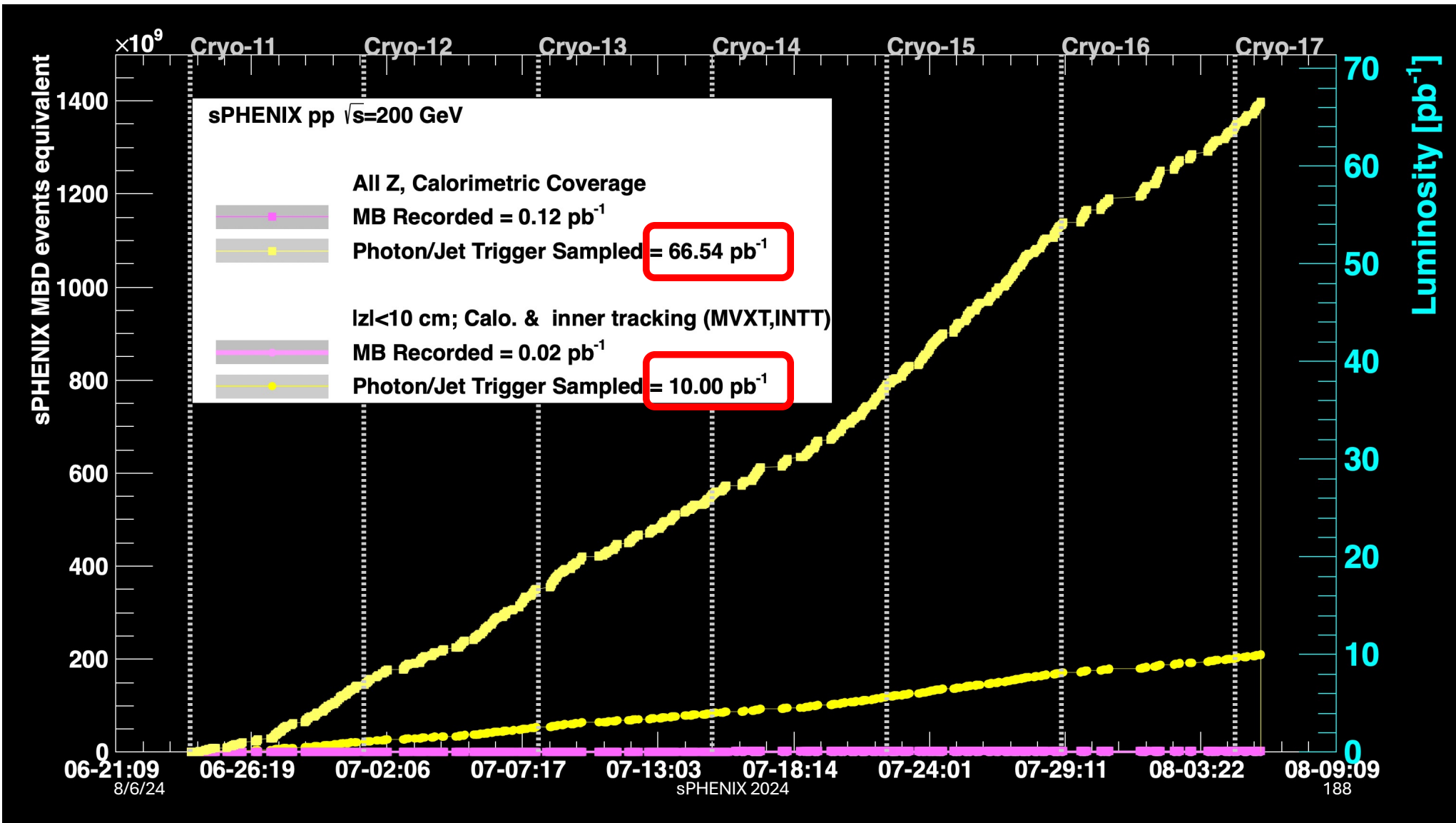


Now alternating between TPC commissioning time and continued jet/photon triggered data taking



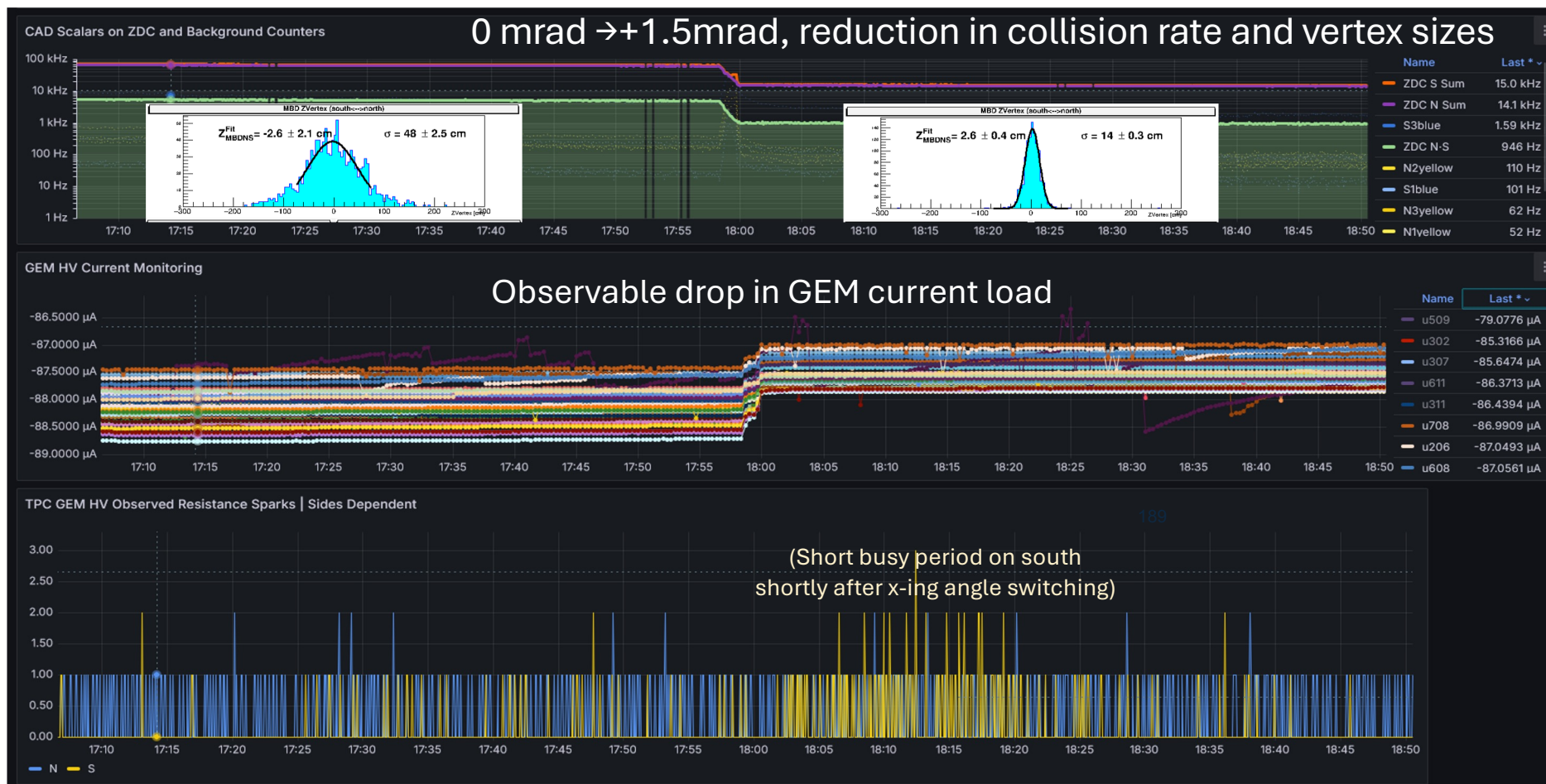






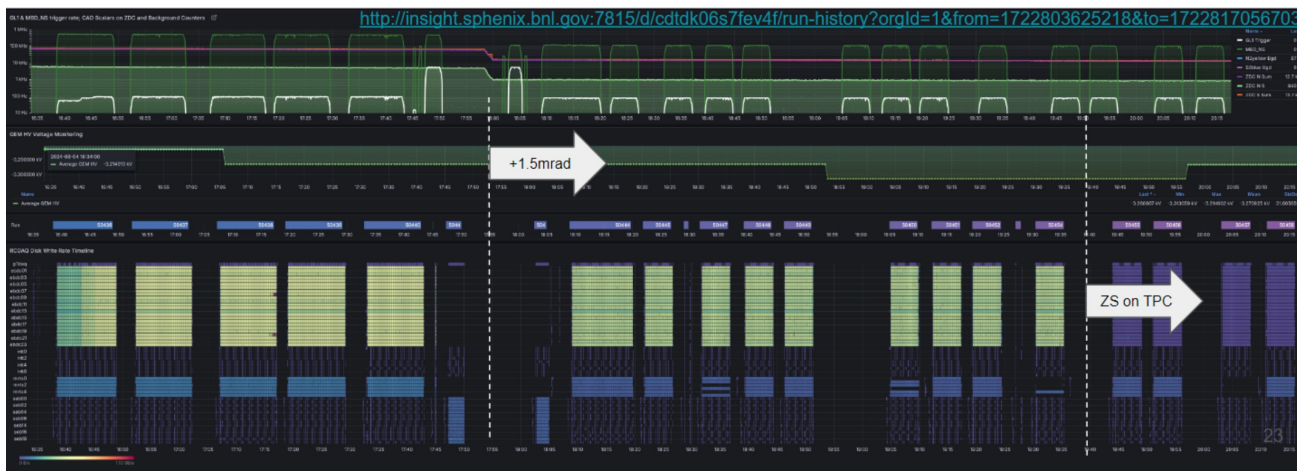
# TPC Status Report

Special Store:  $56 \times 56$ ,  $1.5 \times 10^{11}$ , (x-ing:  $0 \rightarrow 1.5$  mrad)



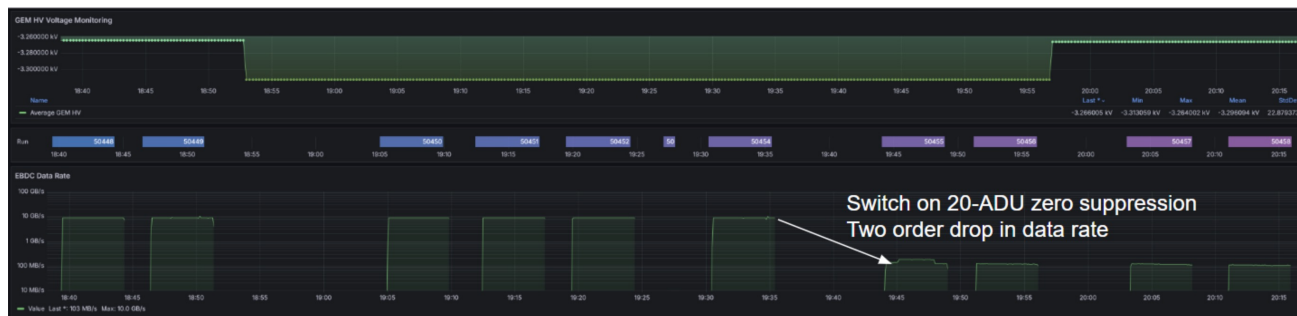
# TPC Status Report

Special Store:  $56 \times 56$ ,  $1.5 \times 10^{11}$ , (x-ing:  $0 \rightarrow 1.5$  mrad)



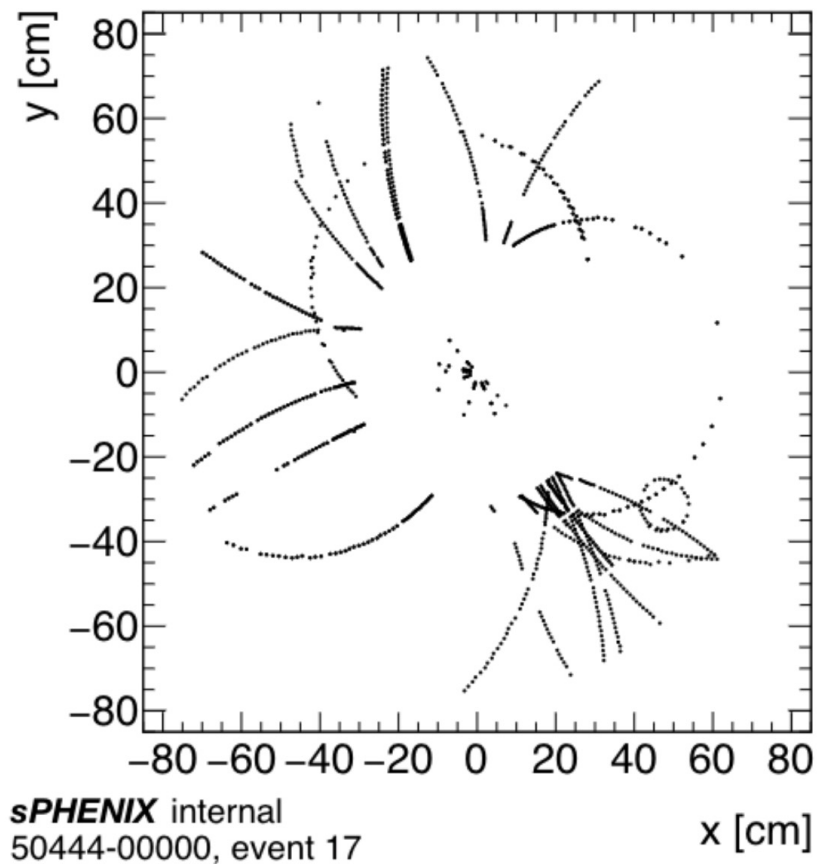
TPC GEMs were stable

Test with zero suppression  
but e-links were  
dropping out.

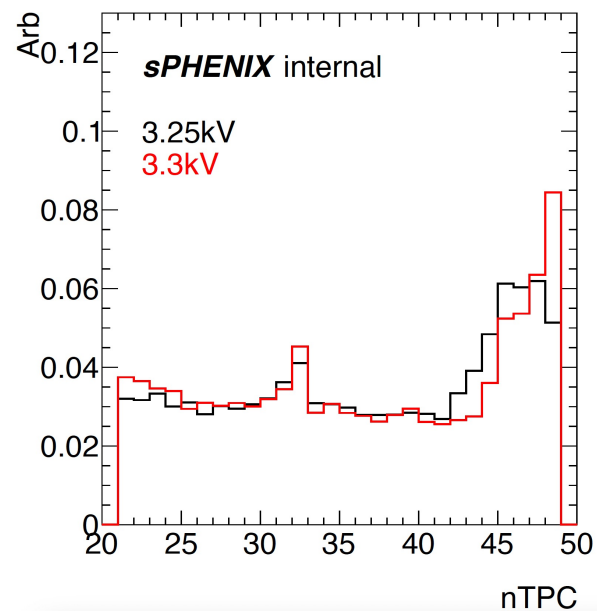
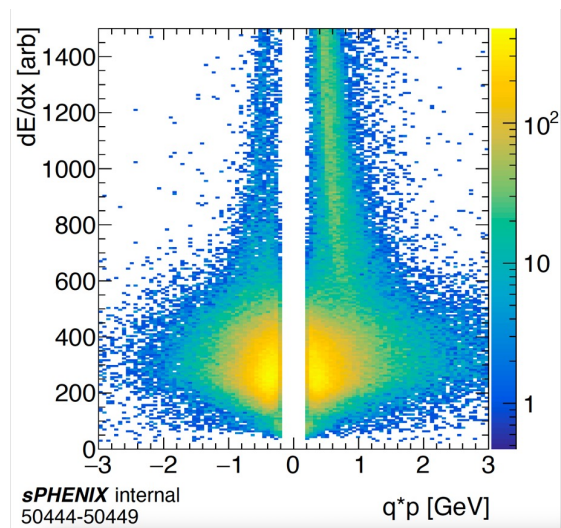


Initial data volumes  
looked reasonable.

# Fast Offline Analysis



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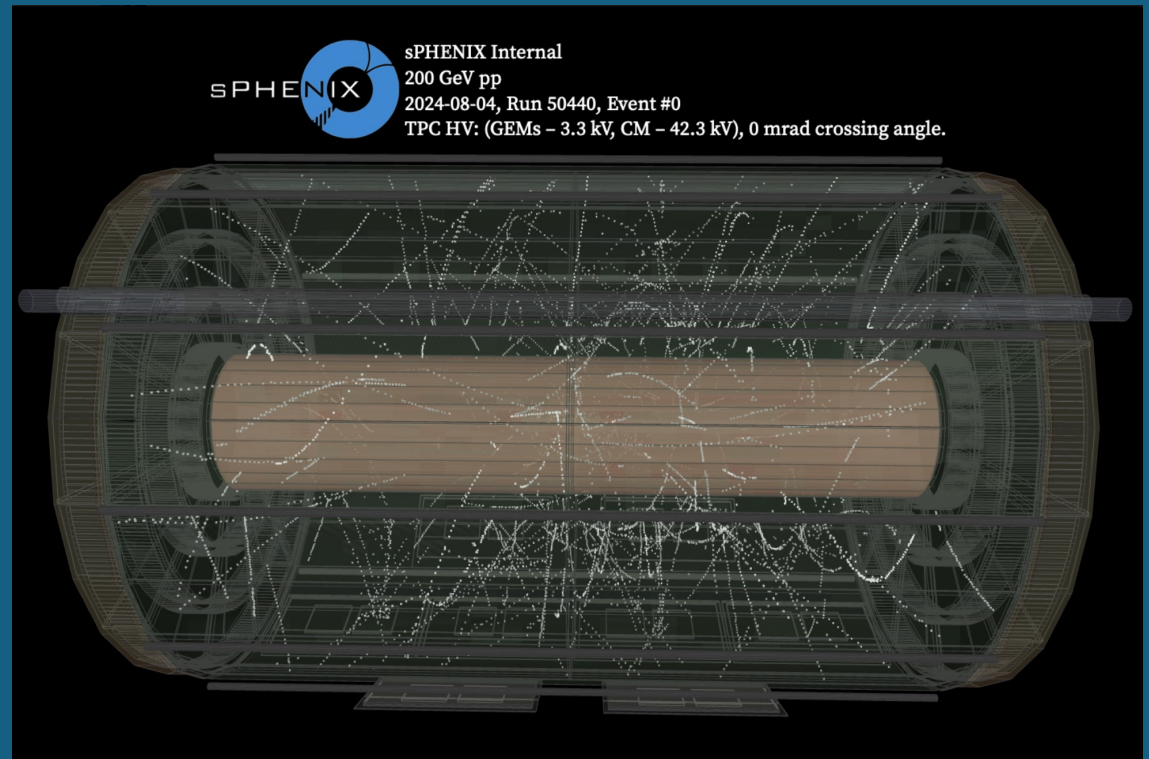
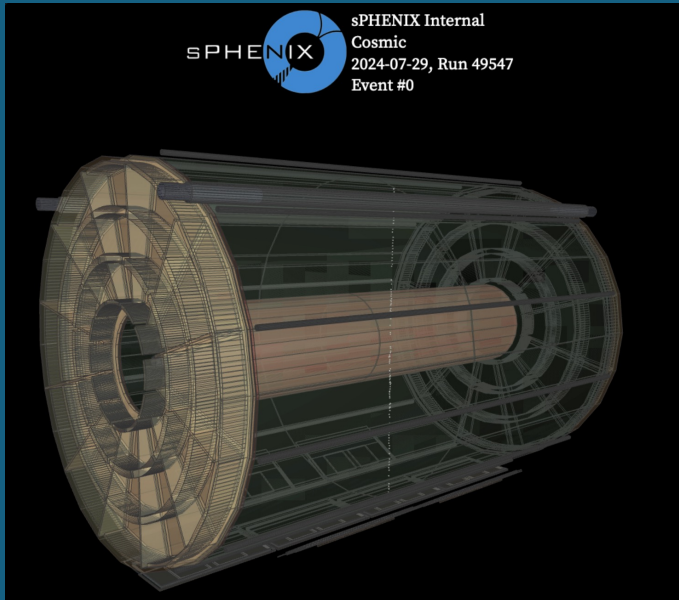


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# Got Isobutane? Yes!



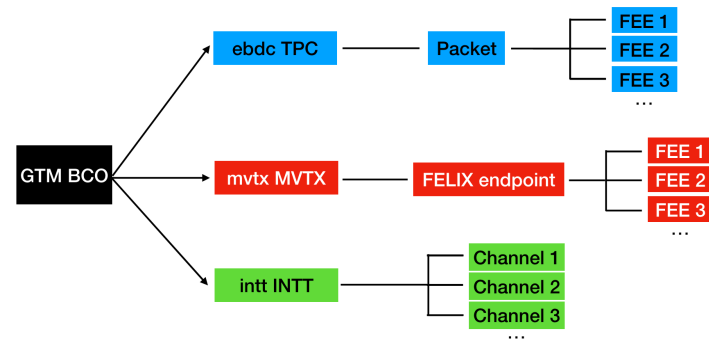
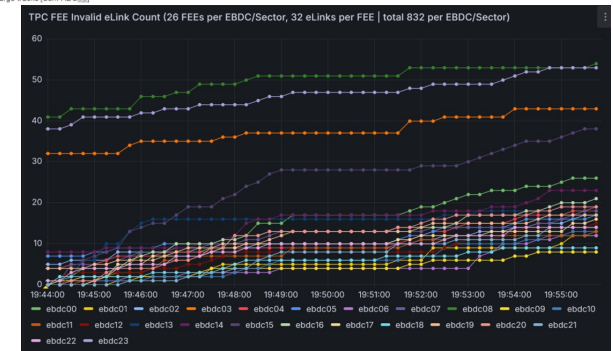
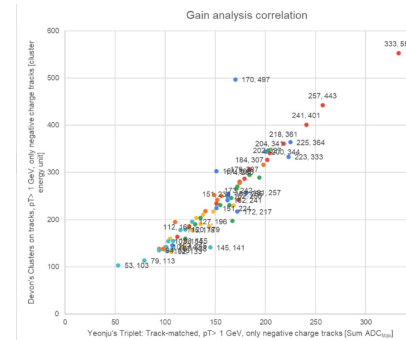


# Challenges...

TPC gain balancing resistor swaps underway (today 2-3 hours and Thursday 8 hours).

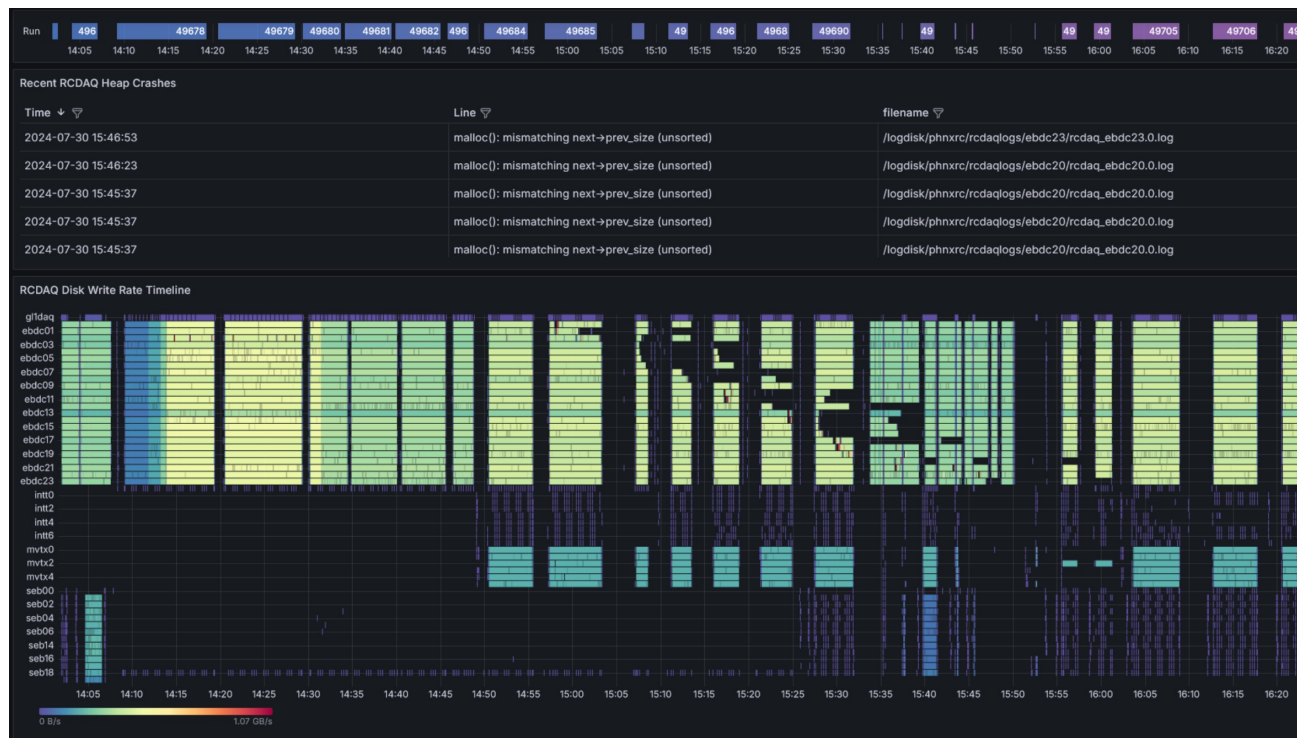
Zero suppression necessary to run about 100 Hz. Firmware issue, not necessarily ZS which is in the Sampa chip, and rather high data rate aggregation problem. Results in dropping e-links on short time scale. All hands on deck.

BCO alignment issue to confirm data alignment. Issue with INTT streaming. Issue with TPC checks.



TPC	24 ebdc servers	2 packets / ebdc	13 FEE / packet	Total 624 BCOs
MVTX	6 mvtx servers	2 endpoints / mvtx	12 FEEID / endpoint	Total 144 BCOs
INTT	8 intt servers	14 channels / intt		Total 112 BCOs

# Both natural and unnatural challenges



Turns out to be an ITD network scan.  
Nature is fighting back.

During last Tue July 30 TPC first beam time with Isobutane gas, there has been an hour-long period when we deal with many RCDAQ crashes, as in the first attached plot:

- Such crash shows up in the RCDAQ log file as heap corruption: ``malloc(): mismatching next->prev_size (unsorted)``
  - Such crash goes through all TPC EBDCs, one by one, from EBDC00 -> EBDC23, showing continuous crashing RCDAQ for a few minutes
  - They have been there since Run23 of TPC operation
  - They can not be resolved by rebooting the EBDC server
- The best solution so far is simply wait it through, which took 1hr of beam time that day.

# Summary

This week (i) resistor swaps Tuesday, Thursday and then (ii) 111x111, 1.5e11 ions/bunch, steering into 1.5 mrad x-ing. Plans for the weekend TBD.

Working to address challenges wrt TPC firmware, data throughput, BCO matching.

