



sPHENIX Status RHIC Coordination

June 24th, 2025

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sPHENIX Run Coordinator

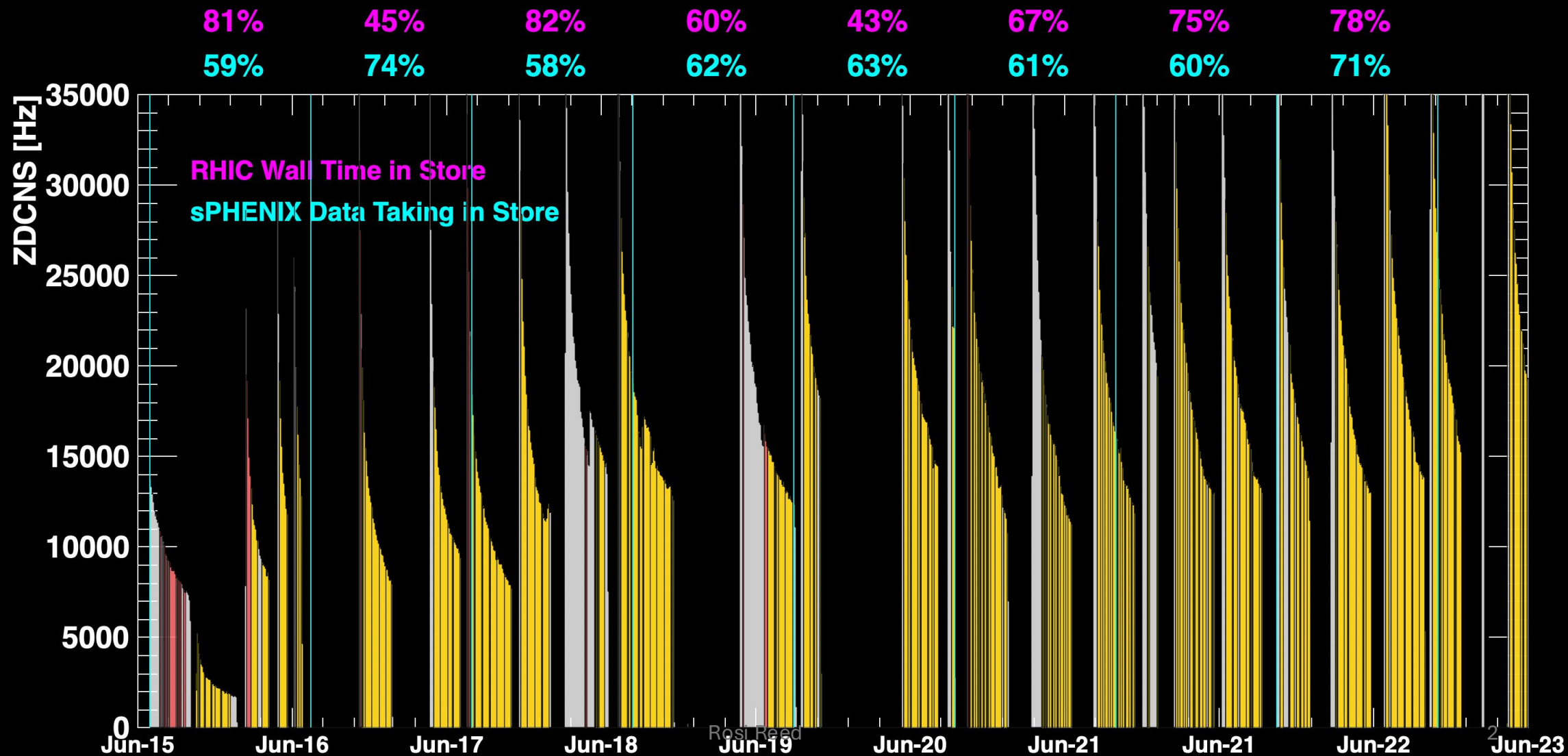


Ron Belmont
UNC Greensboro
sPHENIX Deputy Run Coordinator



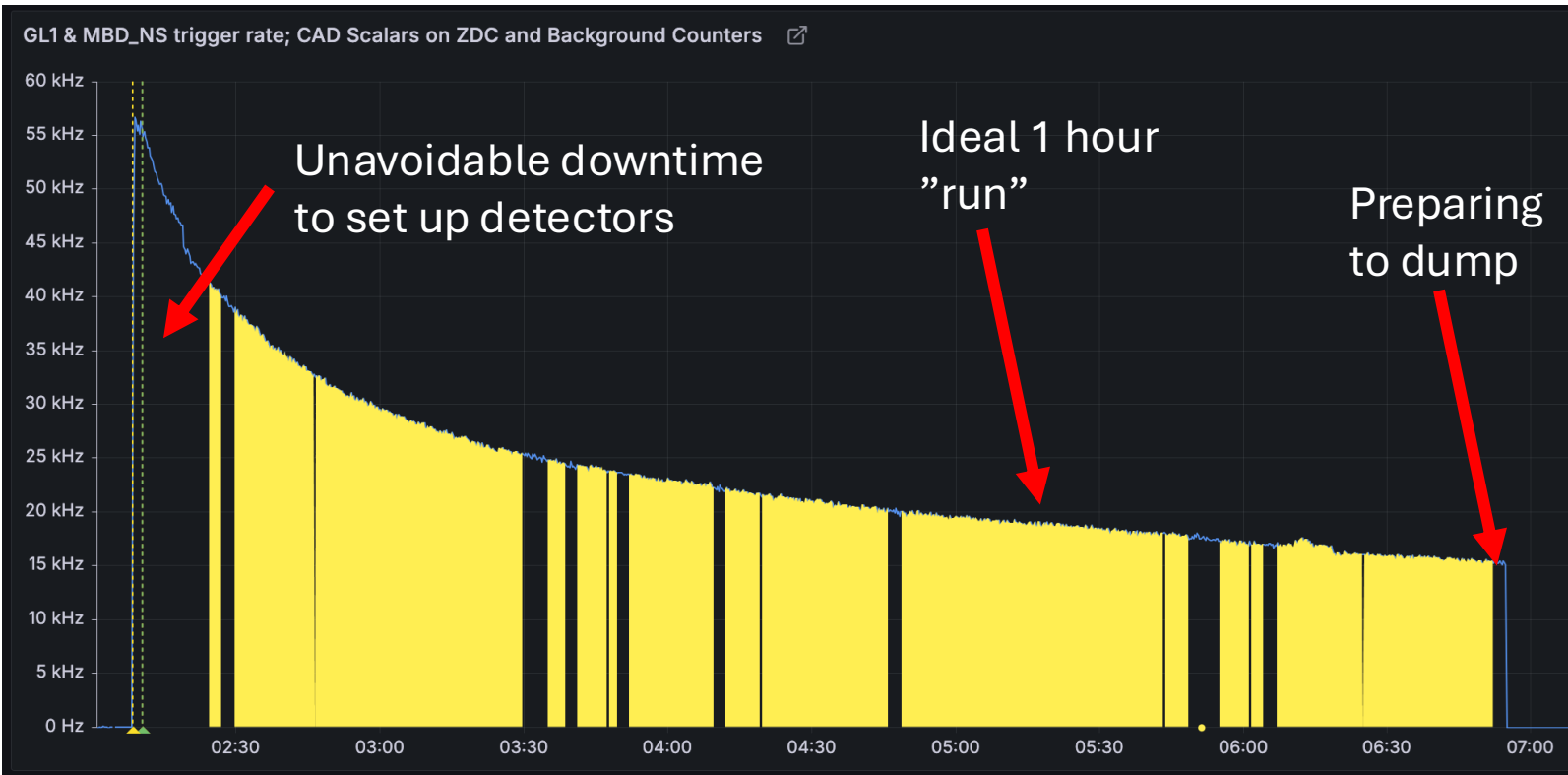
sPHENIX and RHIC uptime

DAQ growing pains



sPHENIX Uptime

June 23rd example



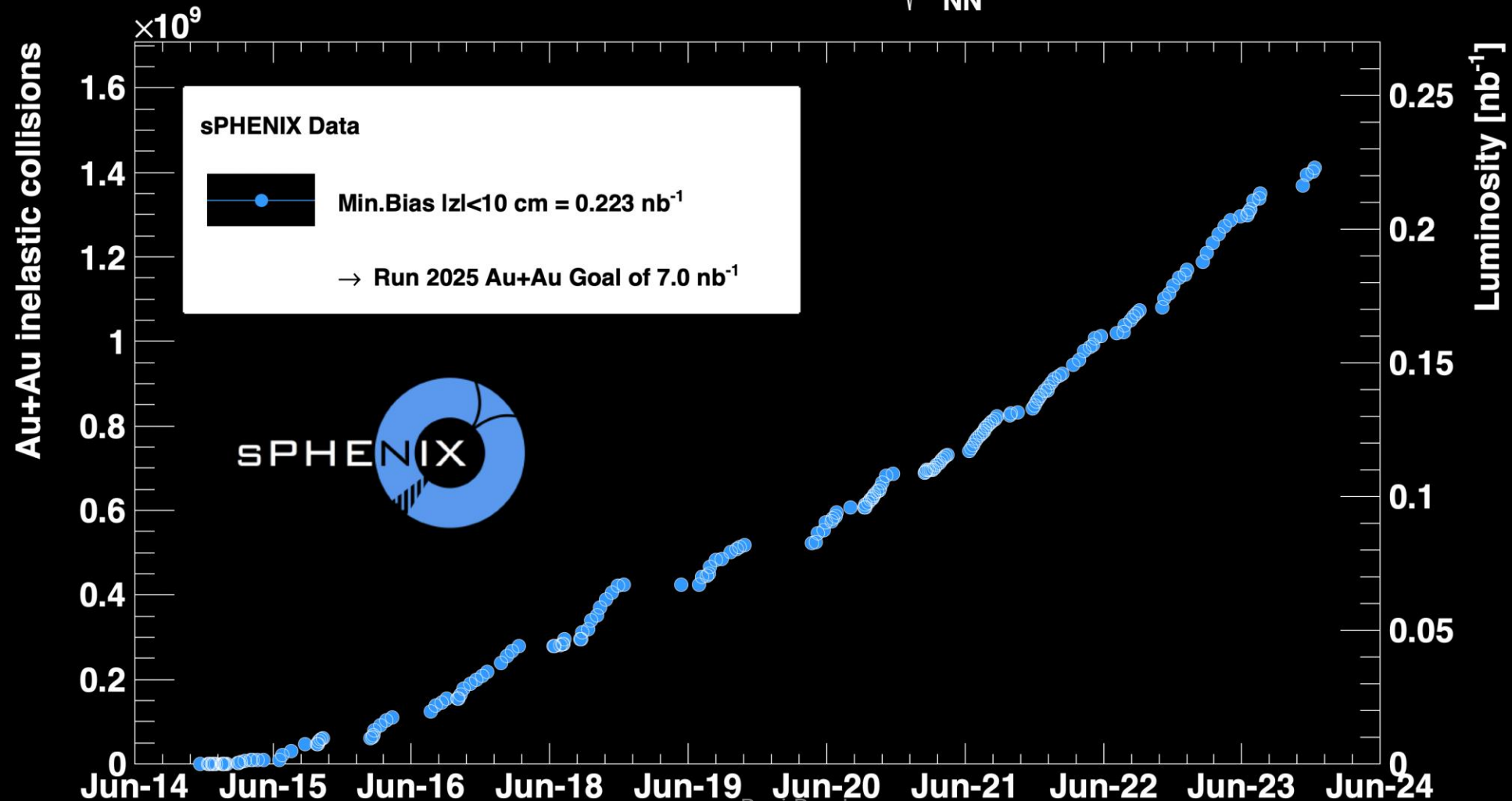
Most “longer” stops are due to power cycling (or otherwise resetting) a subsystem. Little room for improvement.

- Start-of-store will always require some downtime
 - Ongoing work to improve, but we do not want to risk detectors or data corruption (~20 min)
 - Longer fills → Increased sPHENIX uptime
 - 6 hours → Max 87%
 - 8 hours → Max 90%
- Average time between “runs” is about 2 – 3 minutes (even if stopped due to DAQ)

sPHENIX Integrated Luminosity

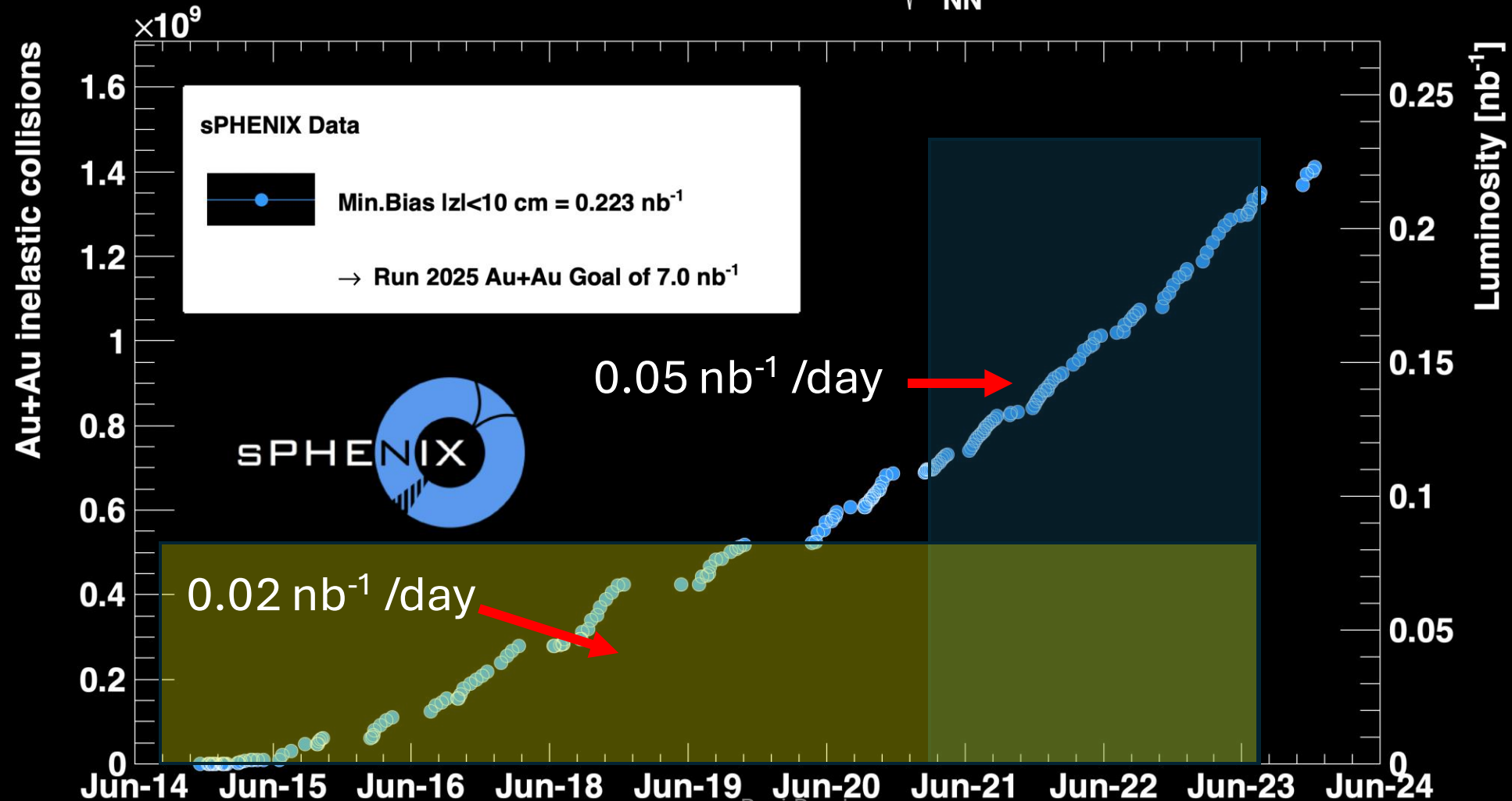
3% of Goal

sPHENIX Run 2025 Au+Au $\sqrt{s_{NN}} = 200$ GeV



sPHENIX Integrated Luminosity

sPHENIX Run 2025 Au+Au $\sqrt{s_{NN}} = 200$ GeV



sPHENIX Integrated Luminosity

- Taking running since June 14th (when all our subsystems were ready for beam), we averaged $0.02 \text{ nb}^{-1}/\text{day}$ → 48 weeks, May 5, 2026 (then add APEX, maintenance days)
- Taking our “best” 2 days so far, we averaged $0.05 \text{ nb}^{-1}/\text{day}$ → 20 weeks, Nov 11, 2025 (then add APEX, maintenance days)
- Reality will be between these two values, in-line with our earlier predictions using the BUP calculations
 - After a few more weeks, the uncertainty will decrease for normal running

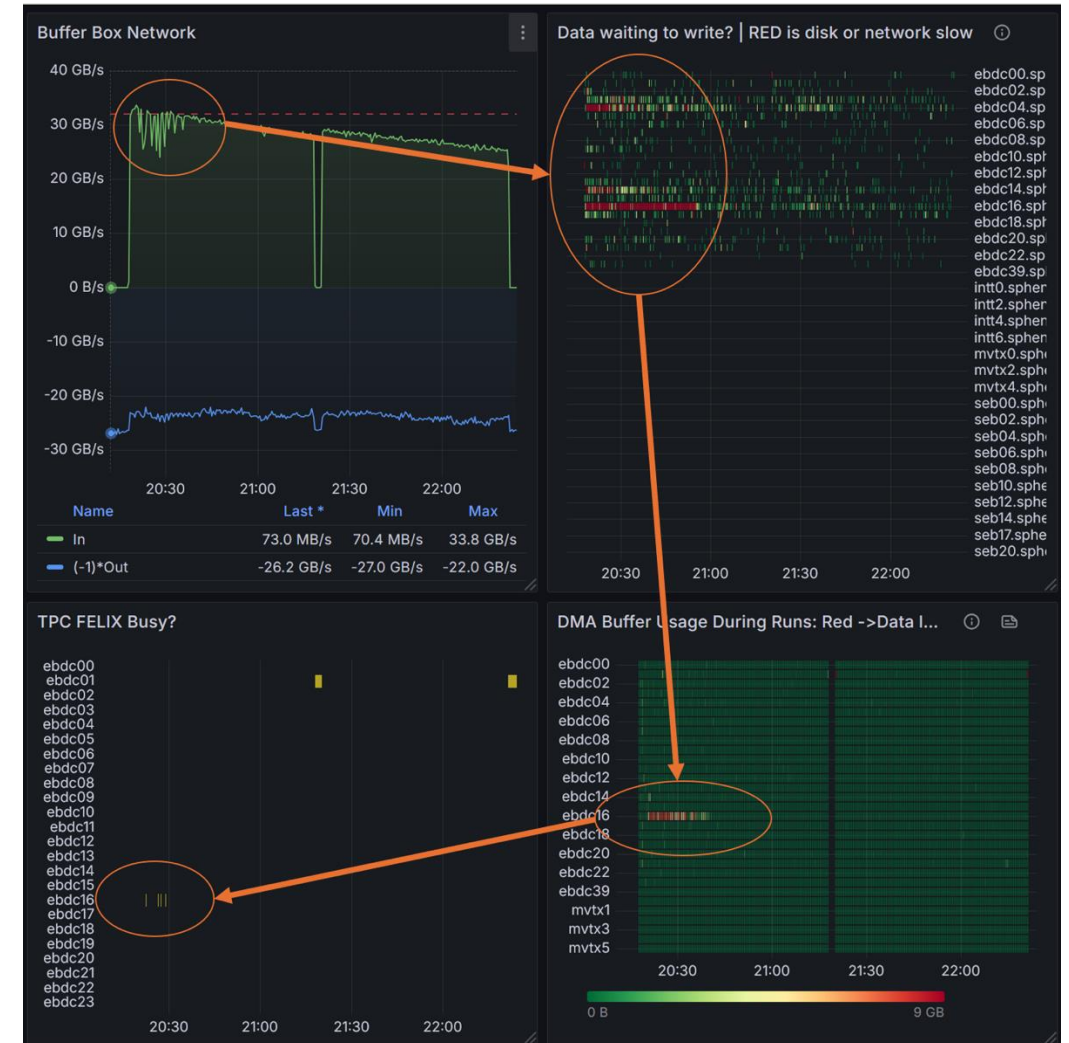
sPHENIX Data Taking Rates Upgrades for '25 are Key



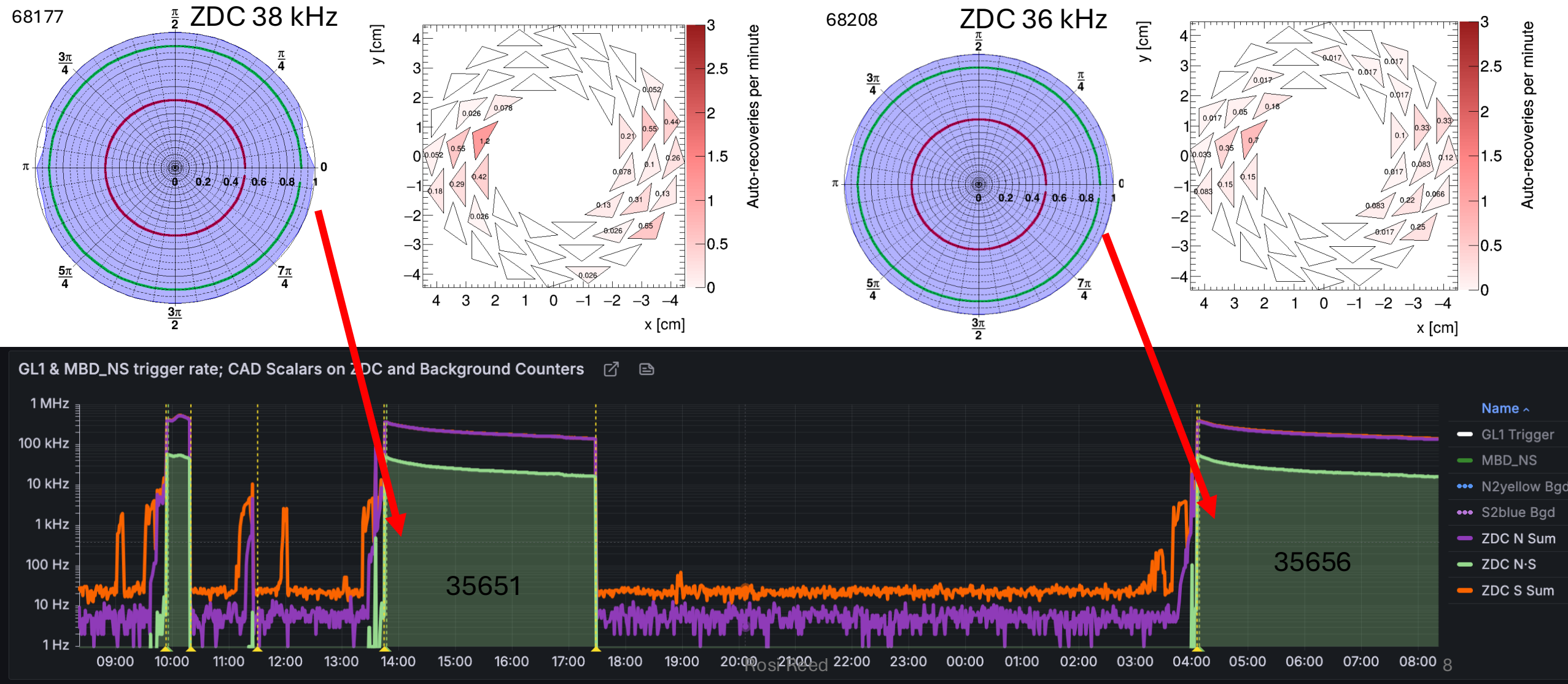
At the beginning of the store, hitting our max safe rate of 32GB/s

- Stop writing to SDCC for the first hour, increases stability limit to 35 GB/s
- Run only $|V_z| < 10$ cm and rare triggers to decrease rate

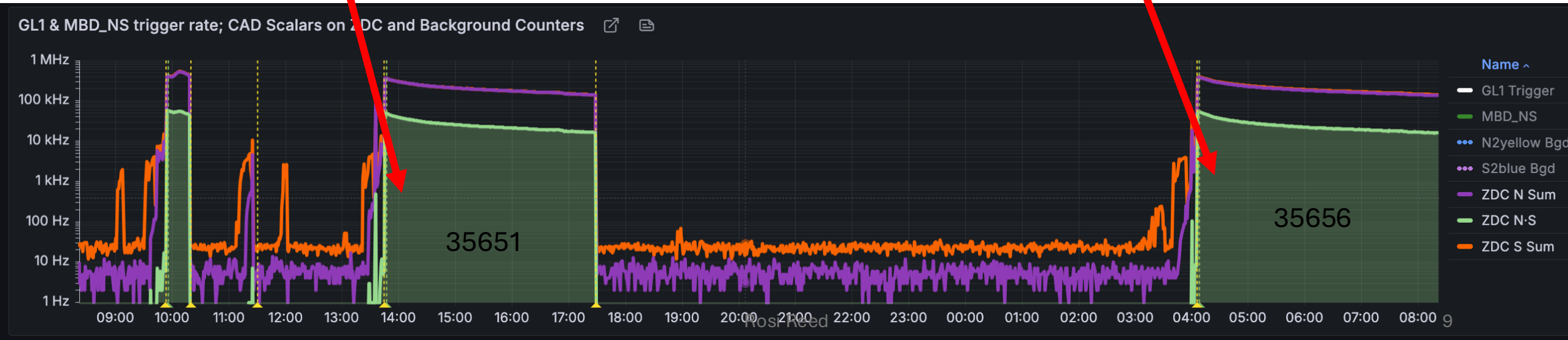
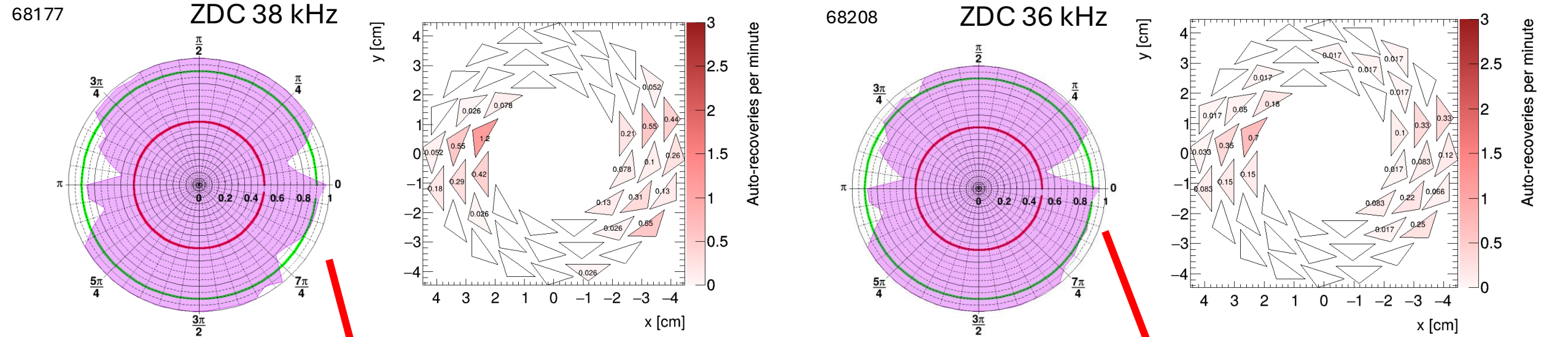
Rosi Reed



sPHENIX Last 24 Hours Background – Only 2 MVTX Hits



sPHENIX Last 24 Hours Background – Require 3 MVTX Hits



Backgrounds

- The continued improvement in the backgrounds is visible in the MVTX and will improve our physics program!
- Thanks to Travis and others for their continued hard work in improving the capabilities
- Any further improvements will be helpful 😊

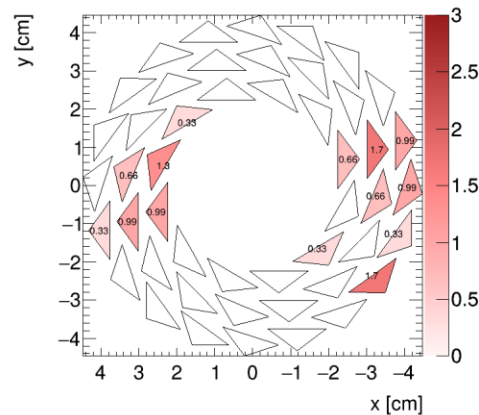
Conclusions

- We benefit by steady running where we can give shift crews a specific set of instructions that they follow
 - Running methodology has evolved to improve uptime, decrease subsystem/DAQ issues
 - We can take (and use) any increase in luminosity
- Test yesterday for 15 kHz UPP for DOE (beam abort during test)
- TPC trip threshold is complete and now detector is in the hands of the shift crew
 - Has been included since the beginning, but required 24 hours in-person expert coverage
- Analyzing and understand backgrounds and their impact on the physics in the ongoing collaboration meeting/workfest

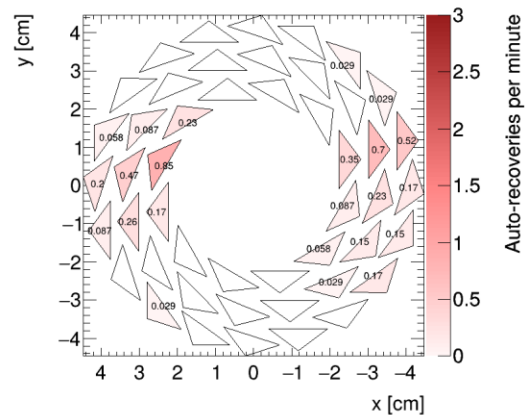
Back Up

MVTX Performance Yesterday

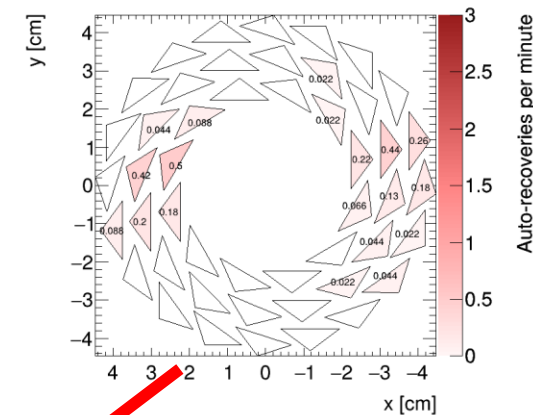
Run 68151



Run 68156 → ZDC 20 kHz



Run 68160 → 16 kHz



ZDC 40.7 kHz!

