



SPHENIX Collaboration

<https://www.sphenix.bnl.gov/node/1751378401>

Highlighting early career collaborators

sPHENIX Hero: Joey Clement

How long have you been working in sPHENIX and at what institution?

I've been working on sPHENIX for a little over three years at CU Boulder.

What is the focus of your work on the sPHENIX experiment?

Right now, my focus is on making the DAQ system work, as well as calorimeter QA.

Where were you born and what is your educational background before your current position?

I was born in Fairfax, VA, and I went to college at the University of Virginia in Charlottesville, VA.

What is the title of your Ph.D. or tentative title? Awards or biggest talk highlight?

Potential thesis title: something like "Measurement of Medium Induced Energy Loss by Means of Photon-Correlated Calorimeter Jets."

How did you decide to go into heavy ion or spin research?

I shopped around a bit during my first semester in grad school and ultimately landed on HI physics because it sounded interesting (and difficult).

What do you like to do in your spare time?

I play a lot of D&D, play some videogames, and go to the gym.

Fun fact?

I am the fourth person in my paternal line to be named "Joseph," but we all have different middle names.



sPHENIX Hero: Jaein Hwang

How long have you been working in sPHENIX and at what institution?

I've been working with sPHENIX since February 2023 as a graduate student at Korea University.

What is the focus of your work on the sPHENIX experiment?

Most of my work has focused on INTT. I started with the ladder response test after the INTT installation in the IR, worked on the migration of the standalone DAQ system to rcdqa, and have been involved in several calibration tasks since then. This year, I had a great opportunity to work with the Cold-QCD group, which allowed me to participate in the first phase of local polarimetry development. I presented the results at the 2024 RHIC/AGS meeting.

Where were you born and what is your educational background before your current position?

I was born in Seoul, South Korea, and spent most of my childhood in Goyang City, near Seoul. Before joining sPHENIX for my PhD, I was involved in a brand-new rare isotope accelerator experiment in South Korea. I developed a drift chamber to diagnose beam trajectories. I moved from one brand-new experiment to another, sPHENIX! You can easily guess I like brand-new!

What is the title of your Ph.D. or tentative title? Awards or biggest talk highlight?

The title isn't fixed yet, but I'm interested in measuring transverse single spin asymmetry with either di-jet or heavy flavor.

How did you decide to go into heavy ion or spin research?



sPHENIX Hero: Joseph Bertaux

How long have you been working in sPHENIX and at what institution?

My primary institution is Purdue University, and I have been working with sPHENIX with support from Purdue and RIKEN since 2022.

What is the focus of your work on the sPHENIX experiment?

Currently, I've been focused on INTT related software tasks. In particular, the High Voltage GUI (both the version used by shifters and other experts) and the Online Monitoring plots for the INTT. I also compiled the INTT survey geometry into CDB files and wrote the original draft of the class used for hit unpacking to DSTs, but many others have contributed to that class since. As we move more toward data analysis, I will focus on Λ_c reconstruction through the $\Lambda_c \rightarrow pK^0$ decay chain.

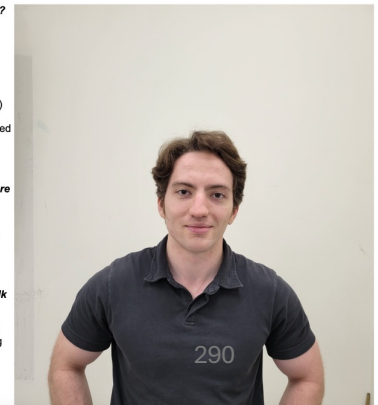
Where were you born and what is your educational background before your current position?

I was born in Illinois, but I have spent most of my life in Indiana. Before coming to Purdue, I graduated Summa Cum Laude from Wabash College with a double major in math and physics.

What is the title of your Ph.D. or tentative title? Awards or biggest talk highlight?

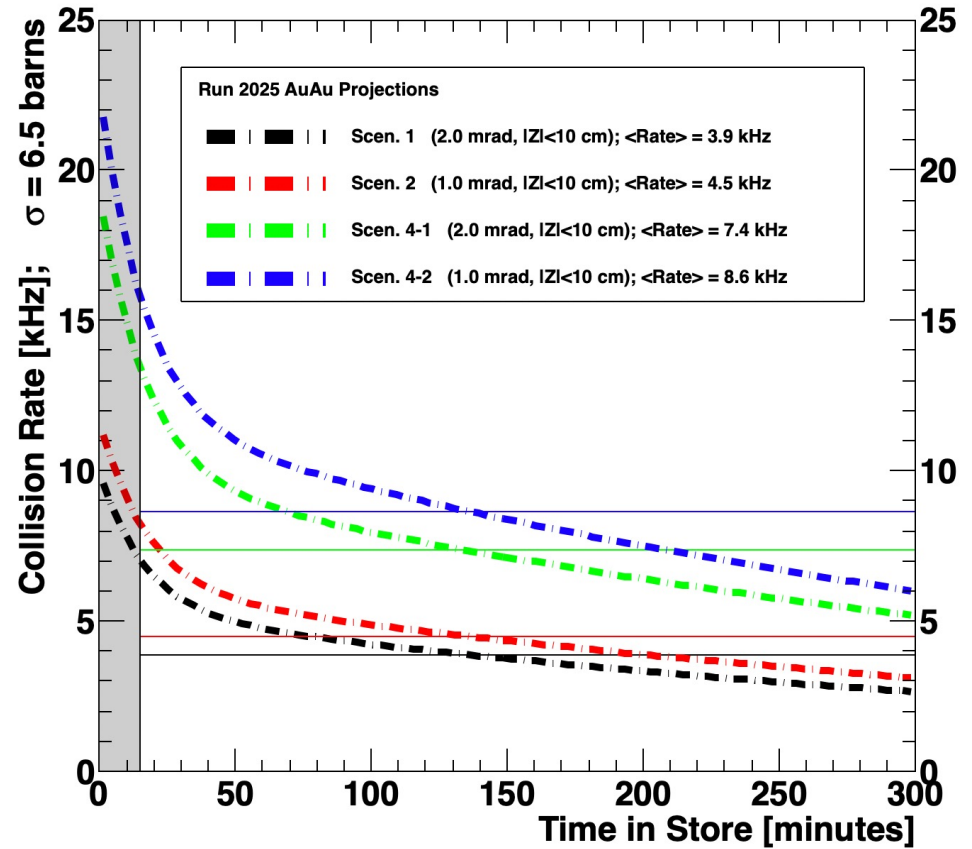
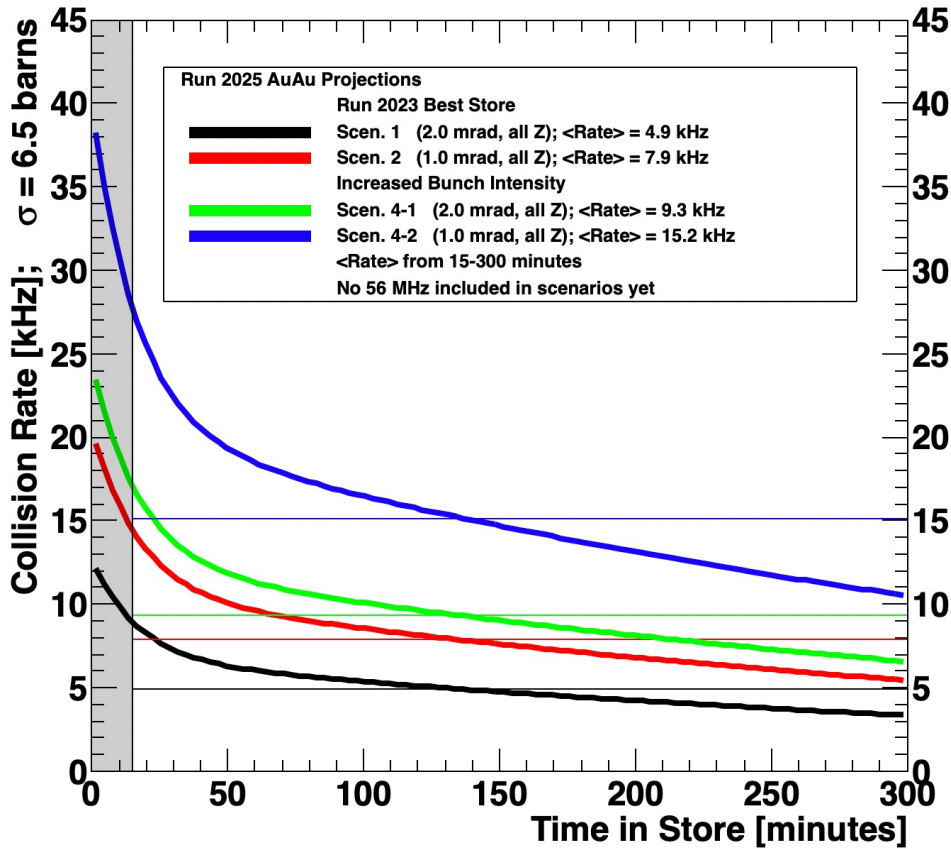
The tentative title for my thesis is "Prompt Λ_c reconstruction in sPHENIX $\sqrt{s_{NN}}$ ", and my biggest talk was "Overview of sPHENIX Tracking Detectors," which I presented at the RHIC AGS Users' Meeting in August 2023.

How did you decide to go into heavy ion or spin research?

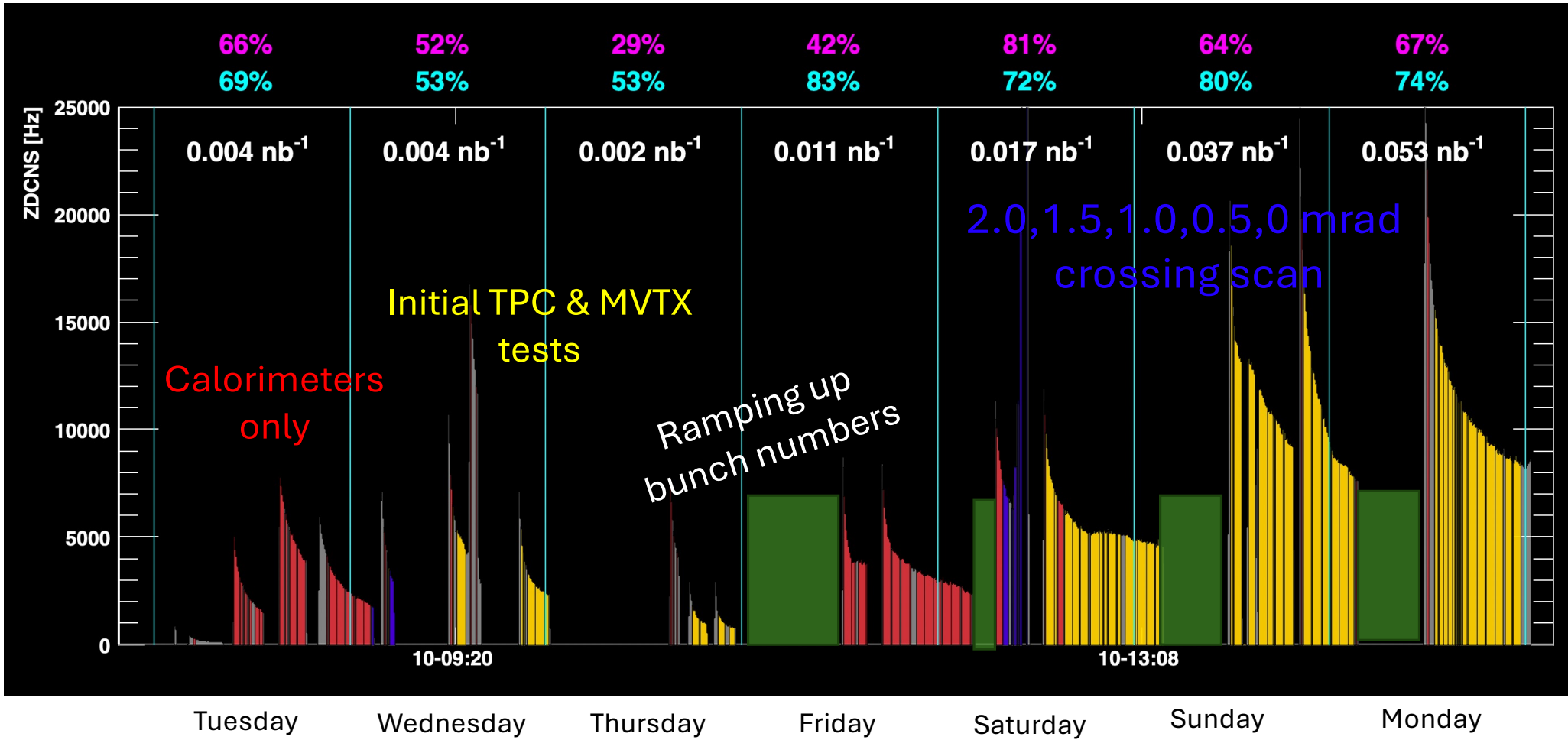


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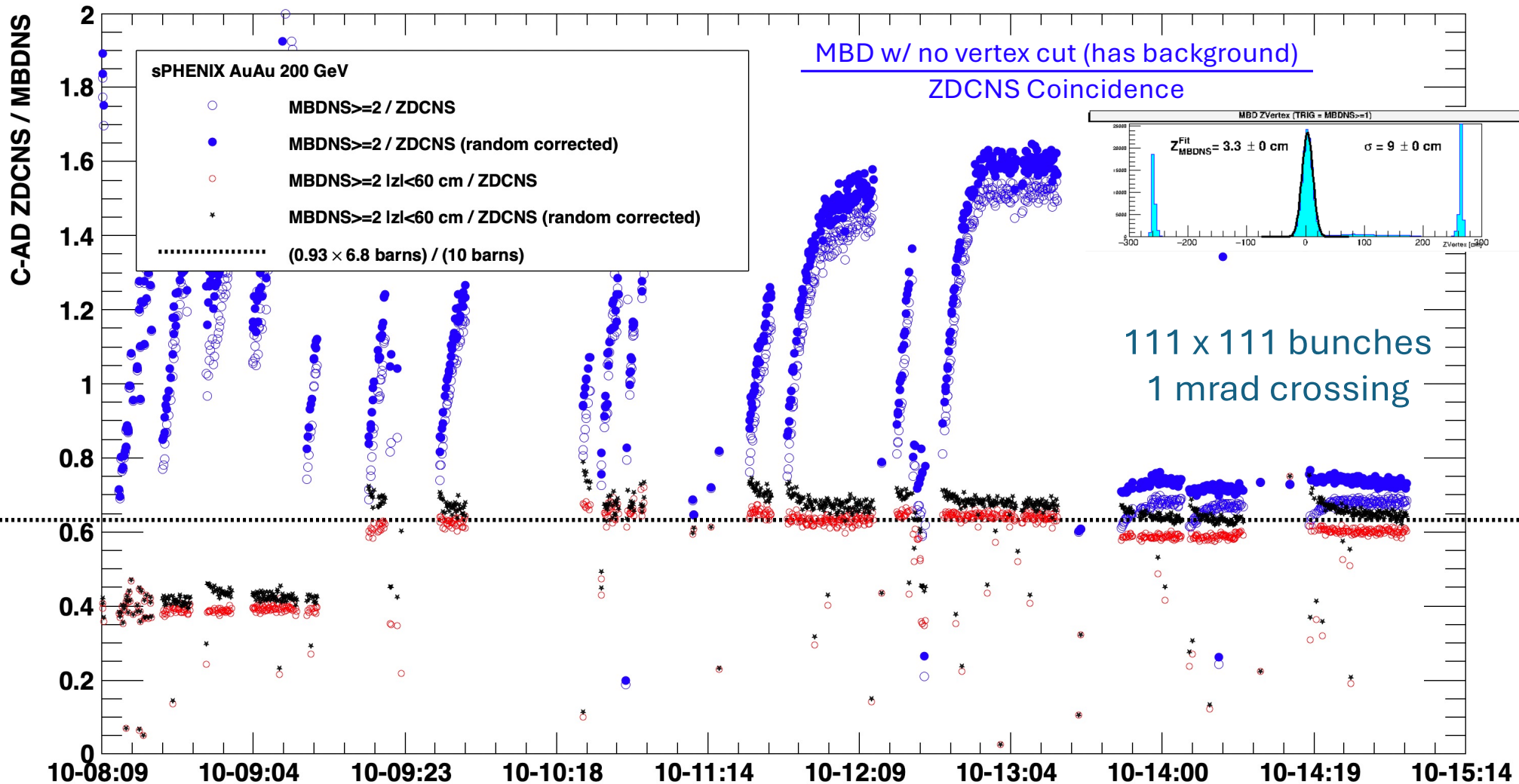
Run 2024 AuAu Goal → Be Ready for Run 2025 Physics



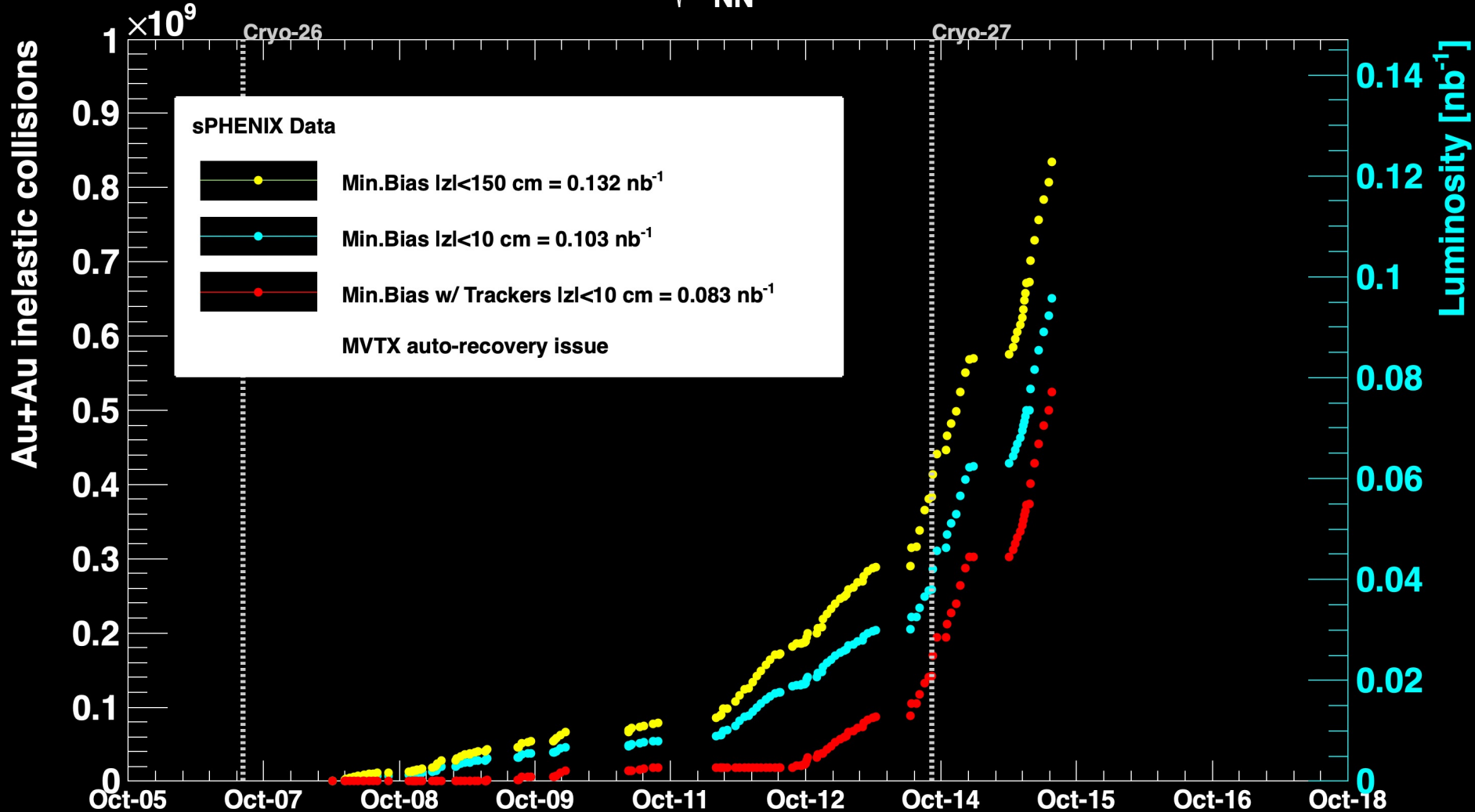
Working with Kiel / C-AD on projections for Run 2025

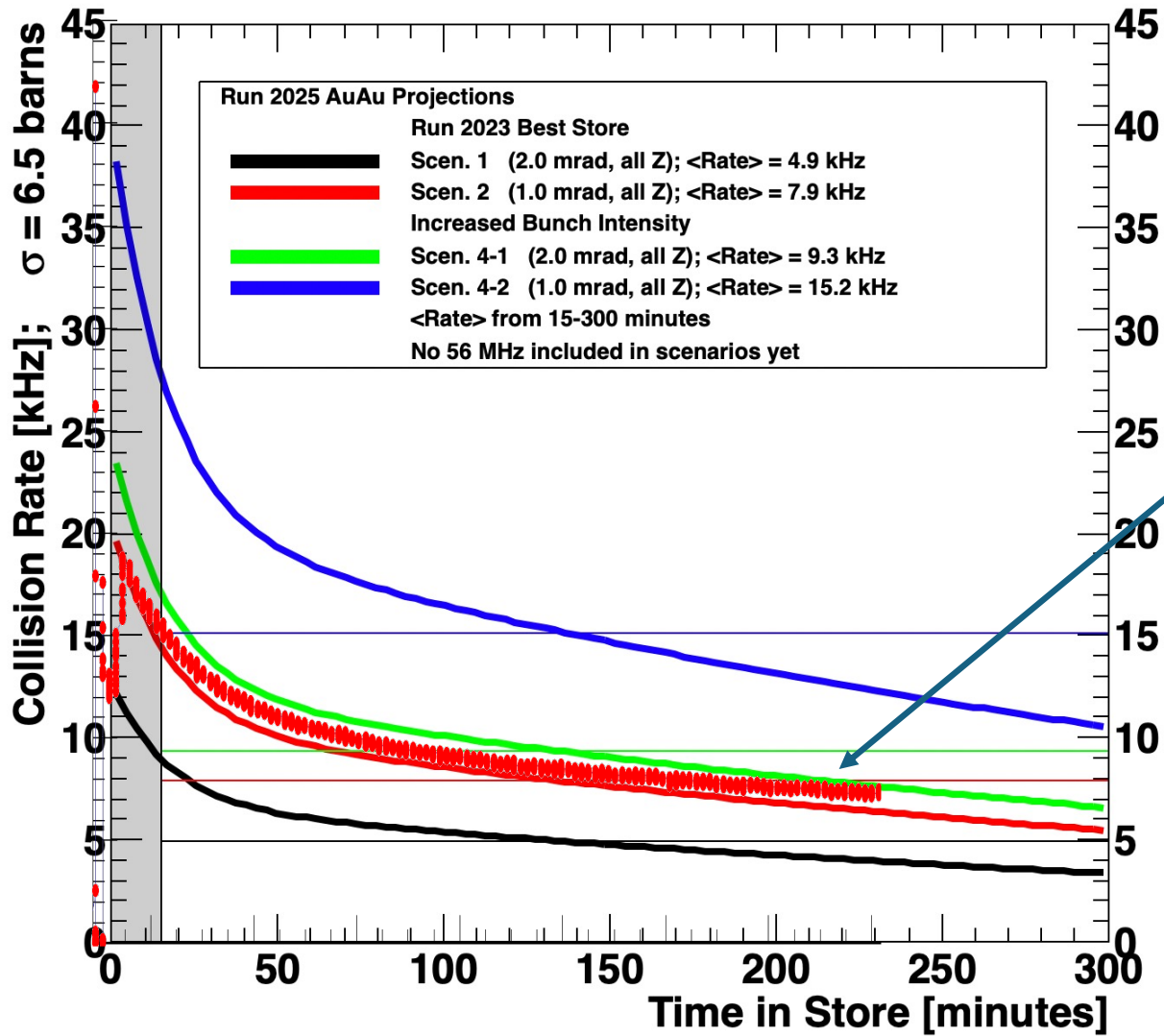


Dedicated MVTX background studies

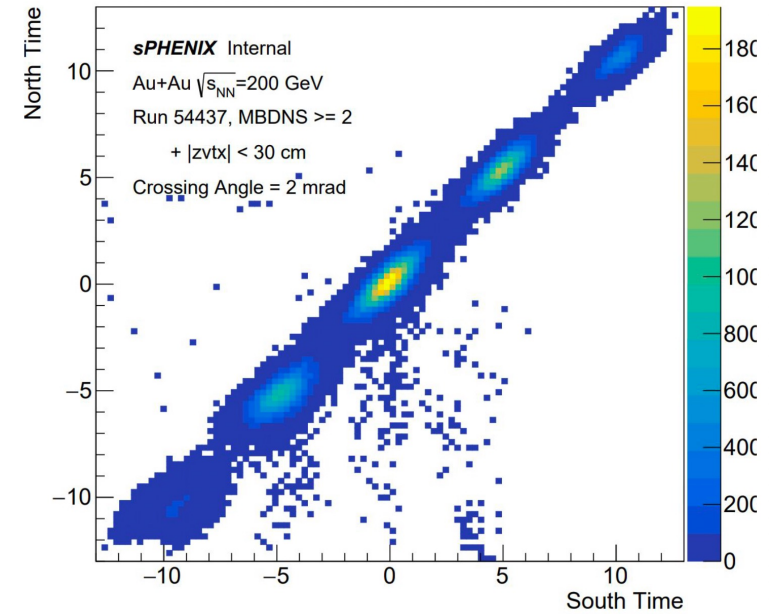
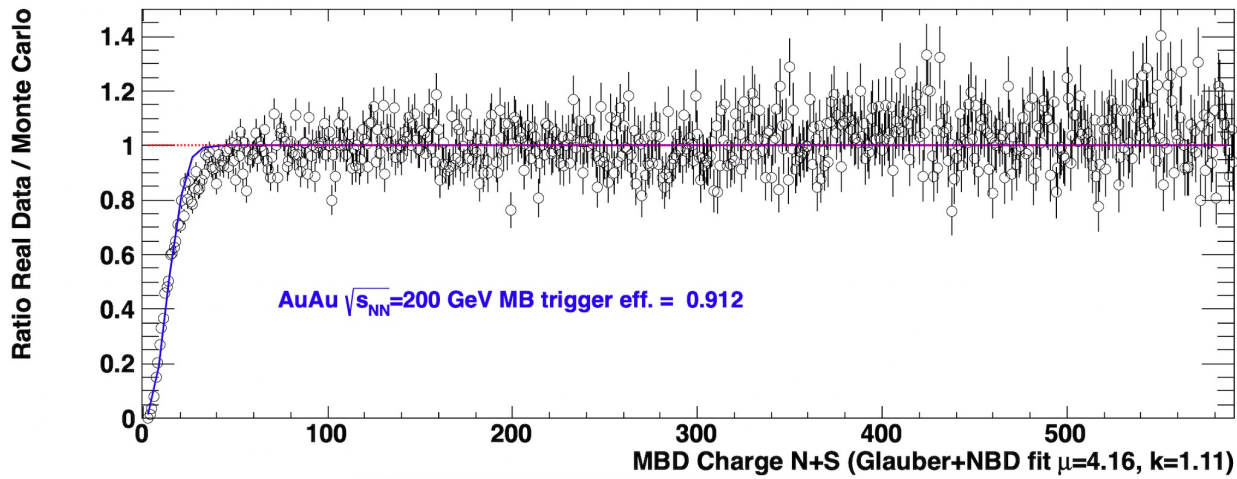
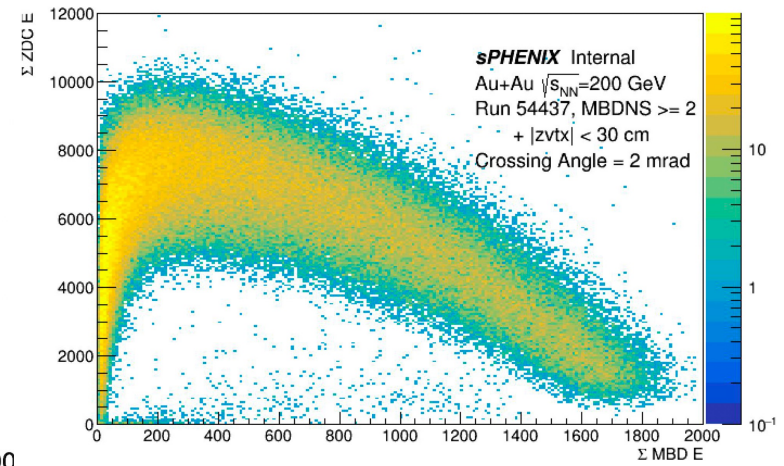
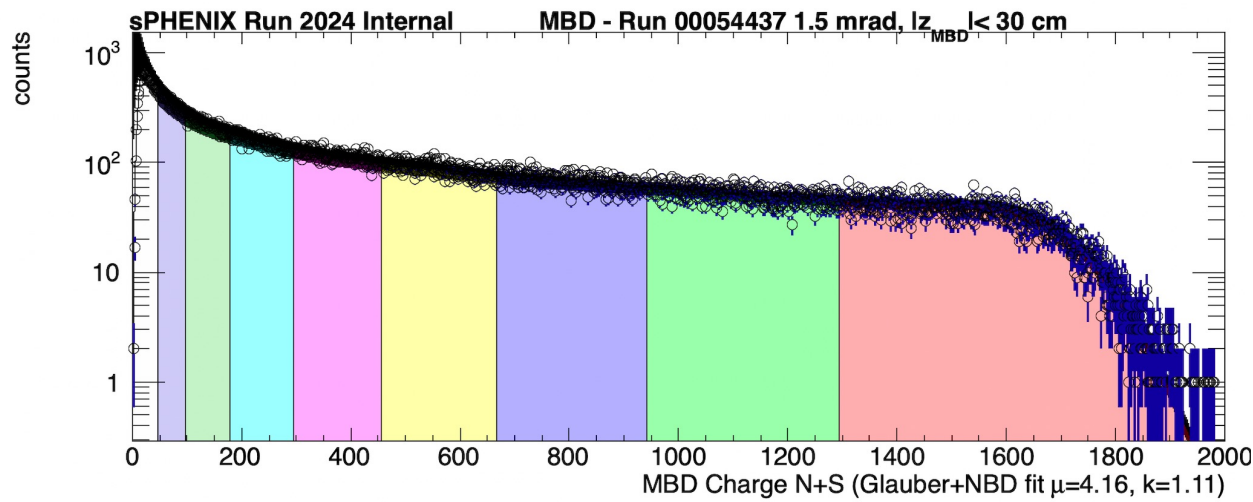


sPHENIX Run 2024 Au+Au $\sqrt{s_{NN}}=200$ GeV





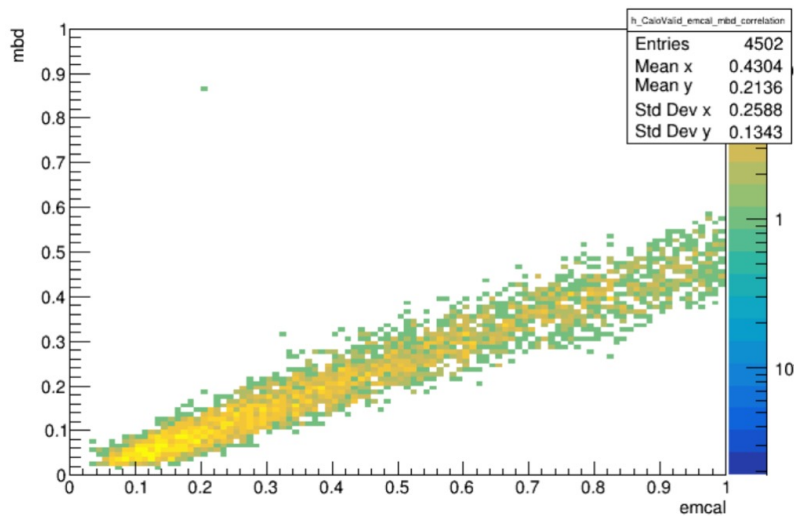
Store last night at 1 mrad crossing is well matched to Scenario 2 in the Projections



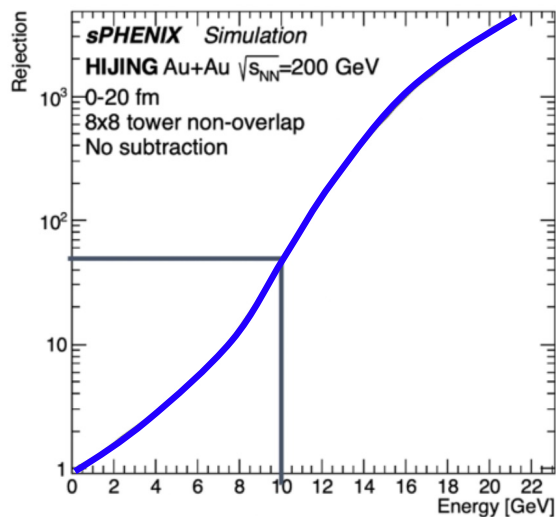
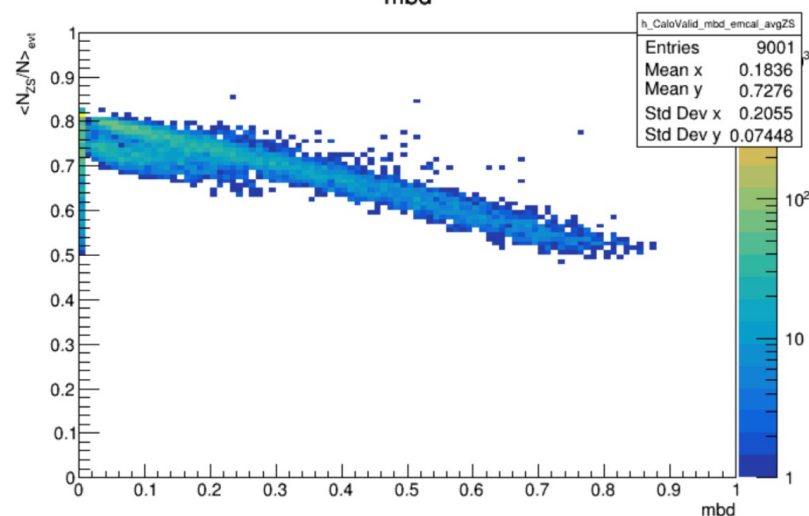
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sPHENIX 2024

MBD vs EMCal

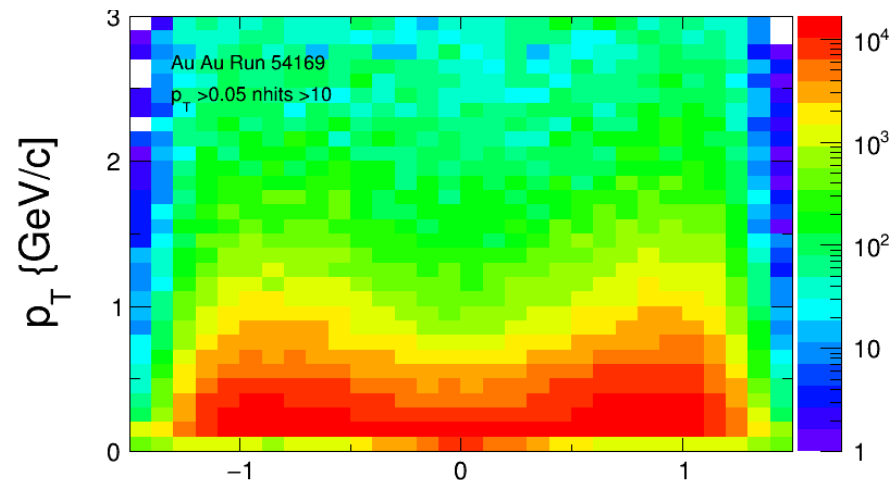
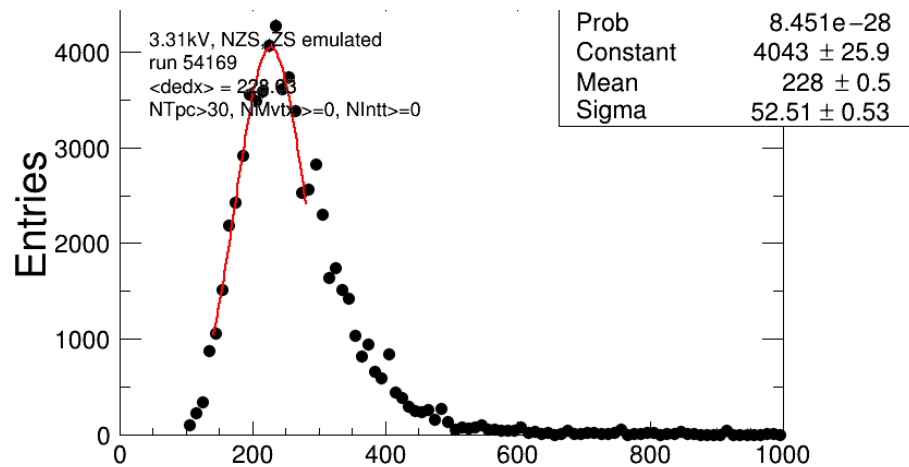
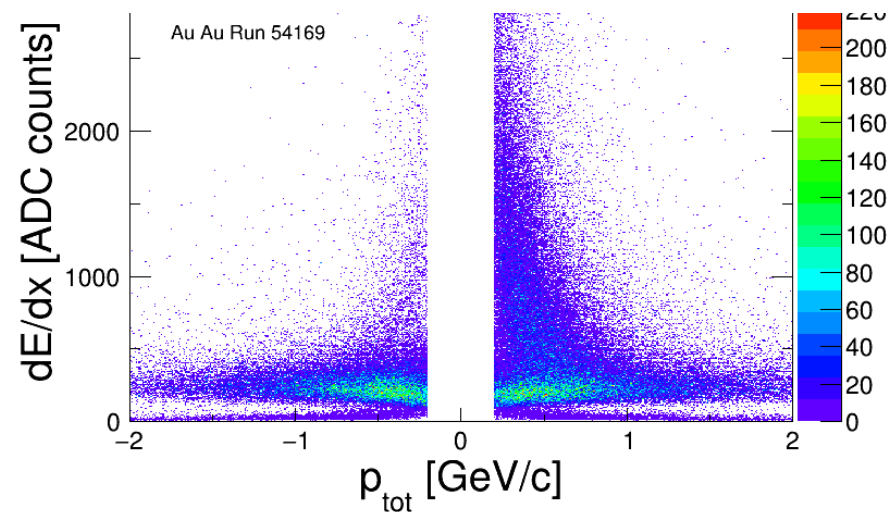
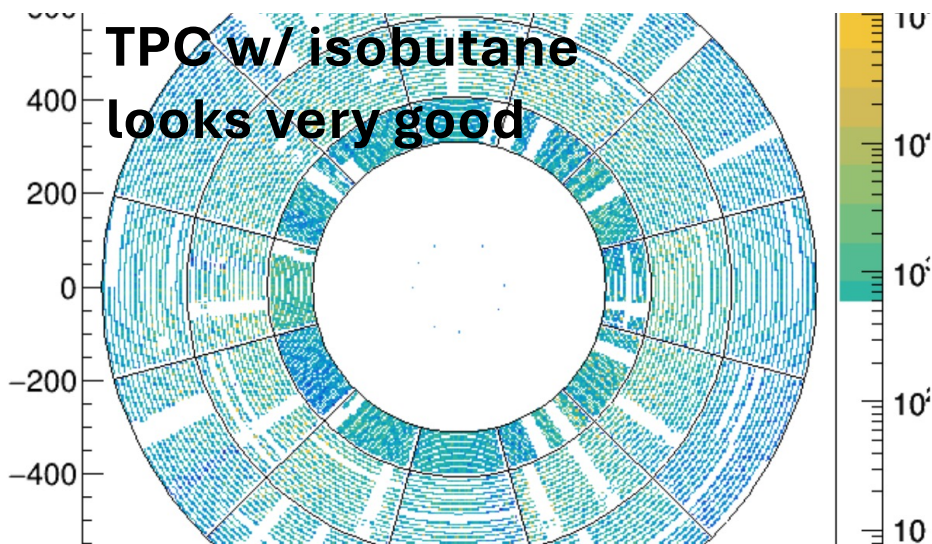


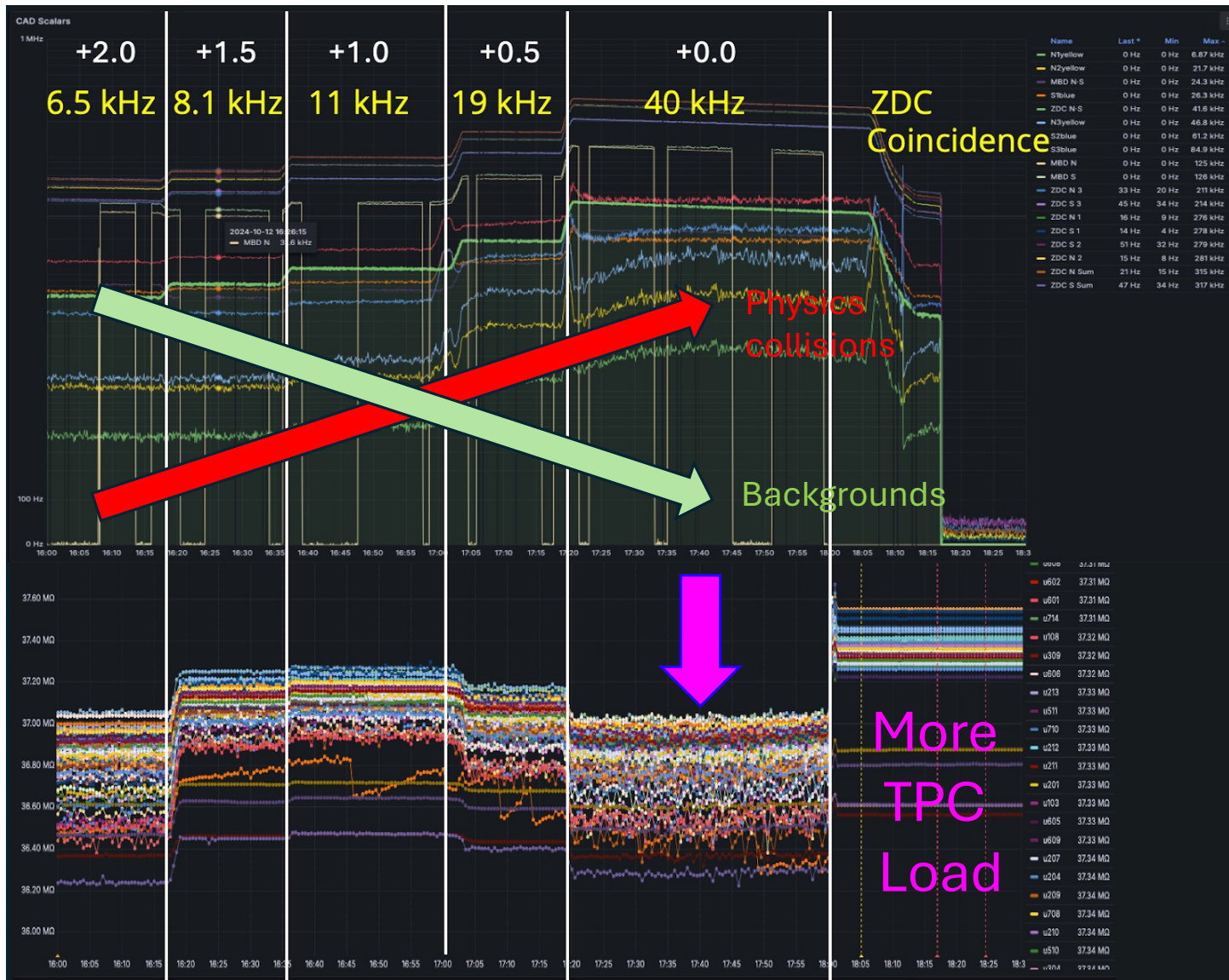
EMCal Zero Suppression vs MBD



Minimum Bias Triggers working
 MBD/ZDC ratio as expected.
 Vernier scan would be beneficial.

Testing photon trigger rejections
 10, 14, 18, 20 GeV thresholds





The TPC charge load appears to be dominated by beam background (not collisions)

Charge load is directly related to the distortions in the TPC that must be corrected to achieve momentum resolution.

Implications for Run2025 optimal running.

Trays of Resistor Chains → CAEN HV Control



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sPHENIX 2024

300

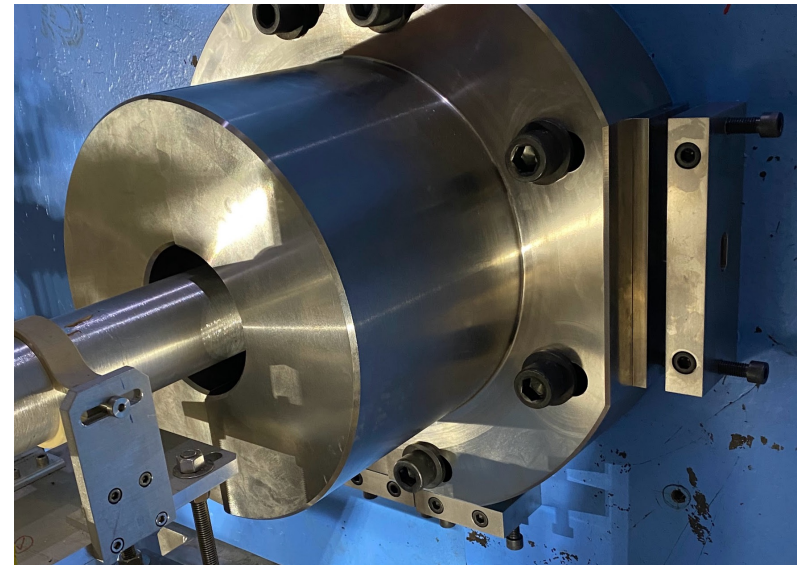


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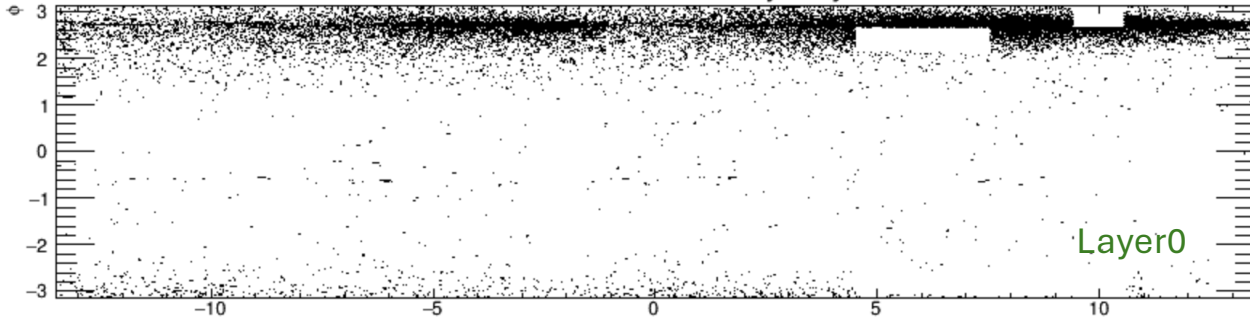


sPHENIX 2024

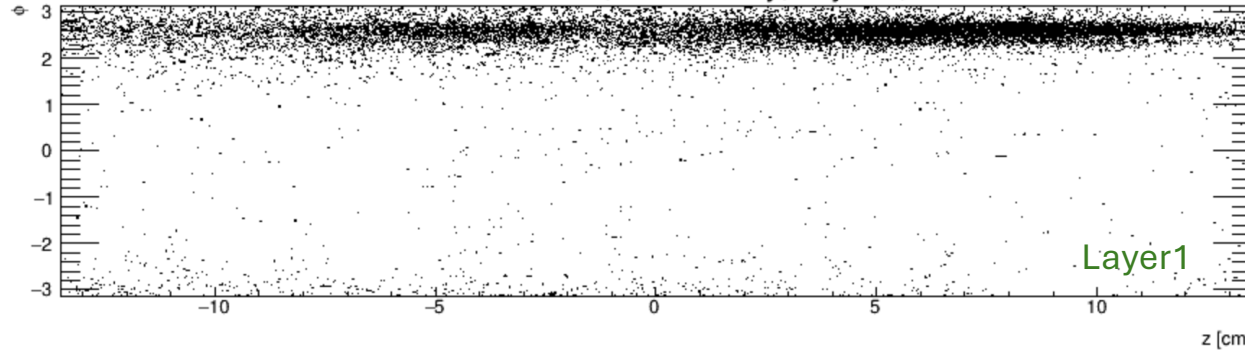
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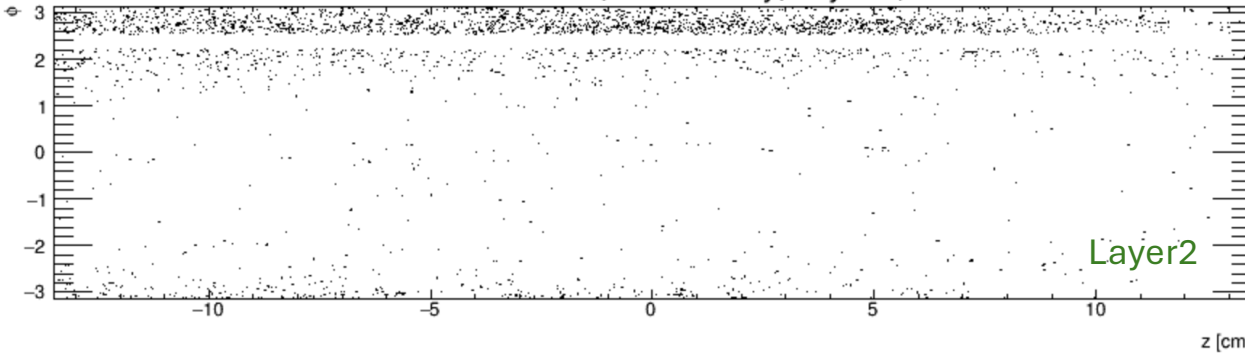
sPHENIX Internal, Yellow Only, Layer 0, t = 64.90 ms



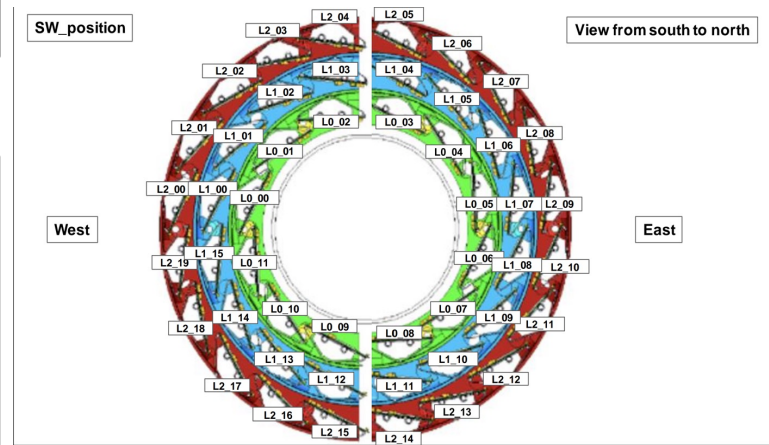
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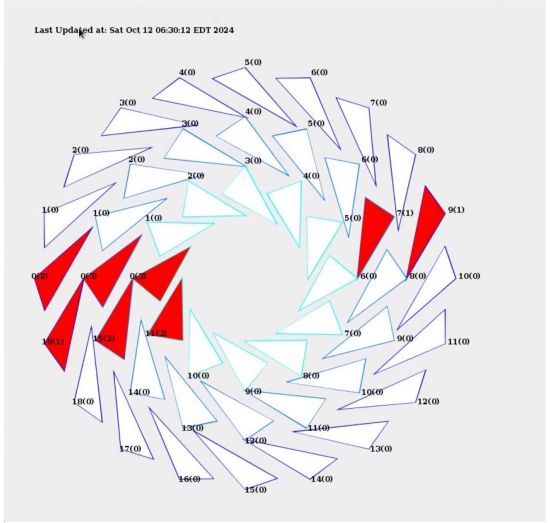
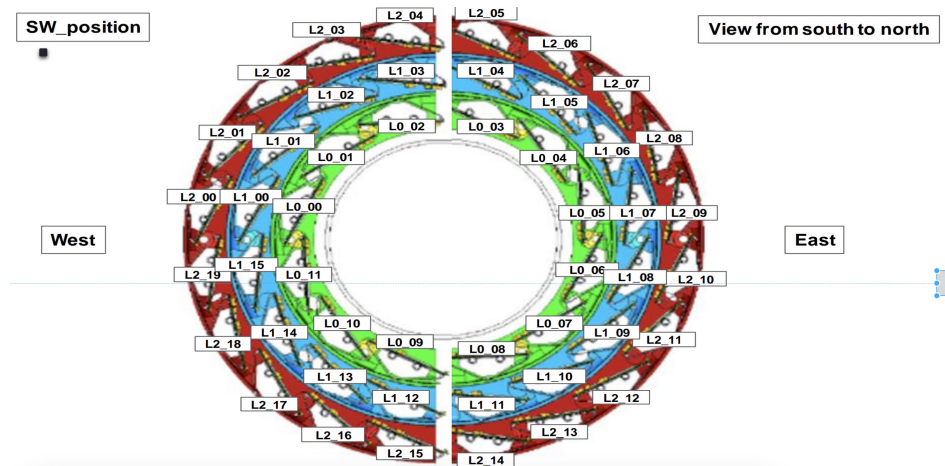
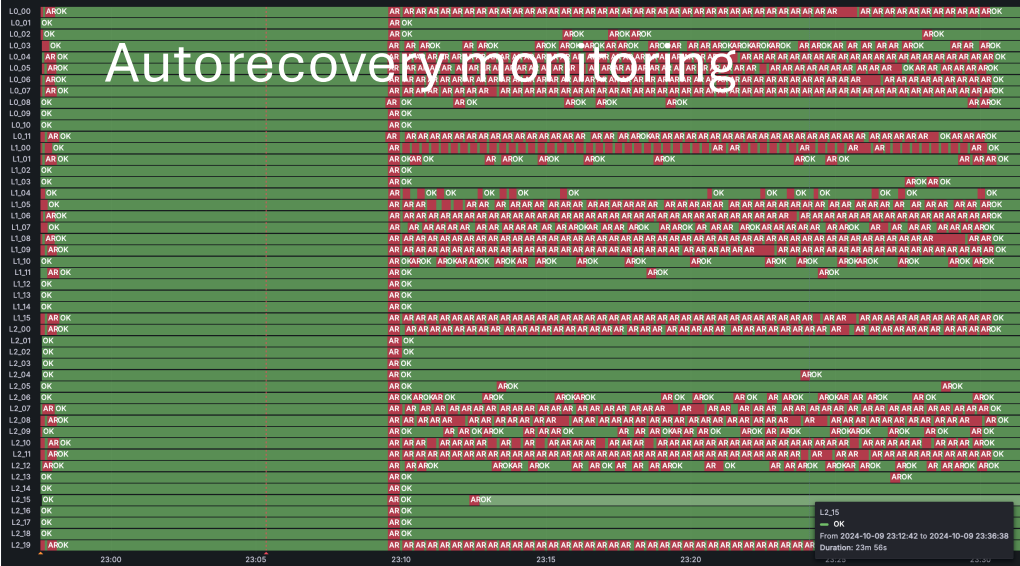


sPHENIX Internal, Yellow Only, Layer 2, t = 64.90 ms

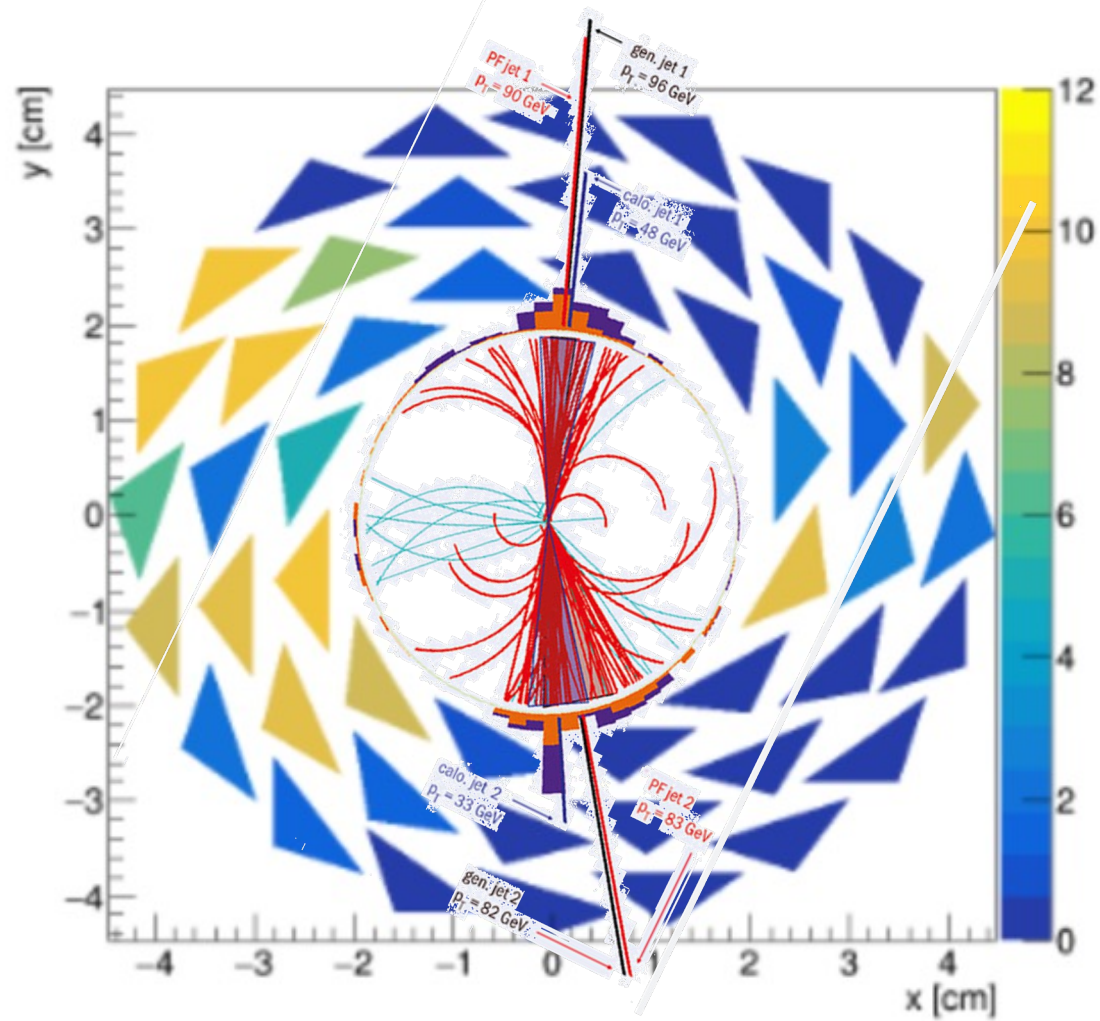


Beam backgrounds...
induces auto-recoveries
in MVTX

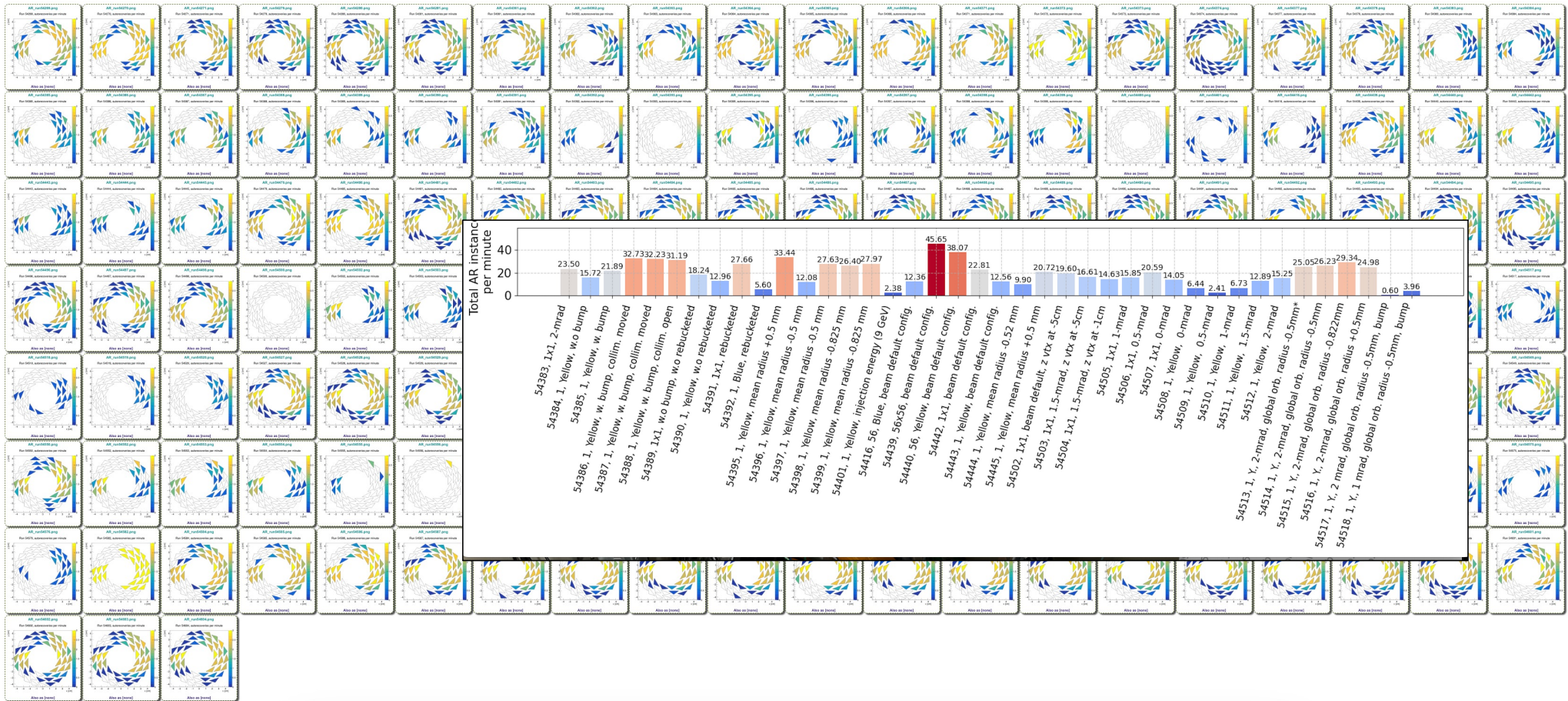




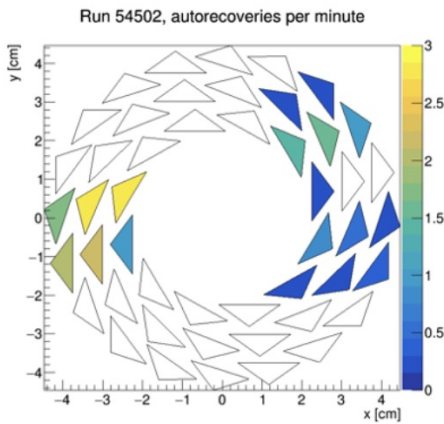
Proposal: Modify the laws of physics so all dijets are oriented along gravitational field.



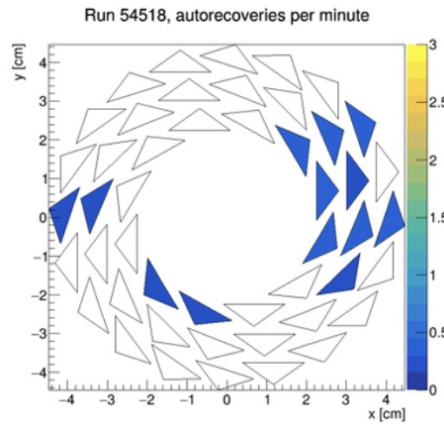
Many detailed studies over the past four days...
 with quantification of the backgrounds...
 many with 1 x 1 bunch to not saturate auto-recoveries...



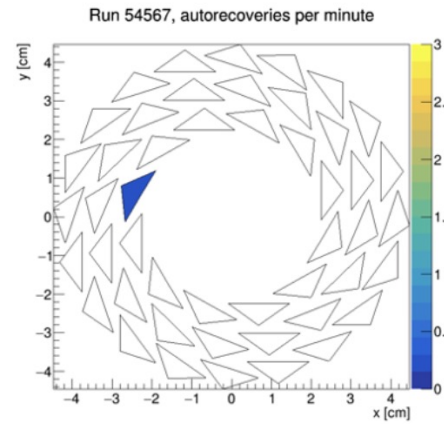
October 14, 2024, MVTX Background Study Results



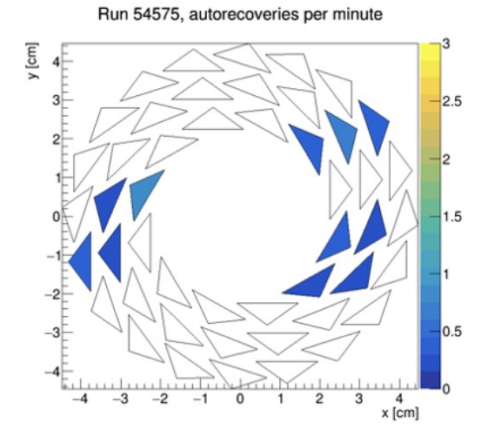
Baseline configuration
 1x1 bunches
 2 mrad crossing
 0mm global radial change
 No bump



Yellow optimization
 1 bunch
 1 mrad crossing
 -0.5mm global radial
 change
 -8mm bump in 8 o'clock
 arc



Blue optimization
 1 bunch
 1 mrad crossing
 -0.41mm global radial
 change
 No bump



Final optimization
 1x1 bunches
 1 mrad crossing
 -0.39mm global radial
 change
 Yellow -8mm bump in 8
 o'clock arc

Open triangle represent no auto-recoveries during 5-minute test (as requested)

Summary

Five (5) more days (120 hours) of beam after today!

Good progress on all goals for Run 2024 AuAu

All subsystems (modulo MVTX) look good.

Test of new TPC HV CAEN underway. Other triggers/detectors in physics mode.

MVTX background mitigation is the highest priority and has our people focused.

12x12 test with orbit/bump corrections ongoing...

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sPHENIX 2024

MVTX current auto-recoveries during 111x111 running

