

# sPHENIX Status

## RHIC Coordination Meeting

### May 14, 2024

Jamie Nagle  
University of Colorado Boulder  
sPHENIX Run Coordinator

5/14/24

sPHENIX 2024



# Progress in the Last Week

Delivered collision rate improving:  
sPHENIX ZDCNS rate: 700 → 2000 Hz  
at the start of physics in store

sPHENIX magnet turned on  
Friday, May 10, 2024. Everything stable.

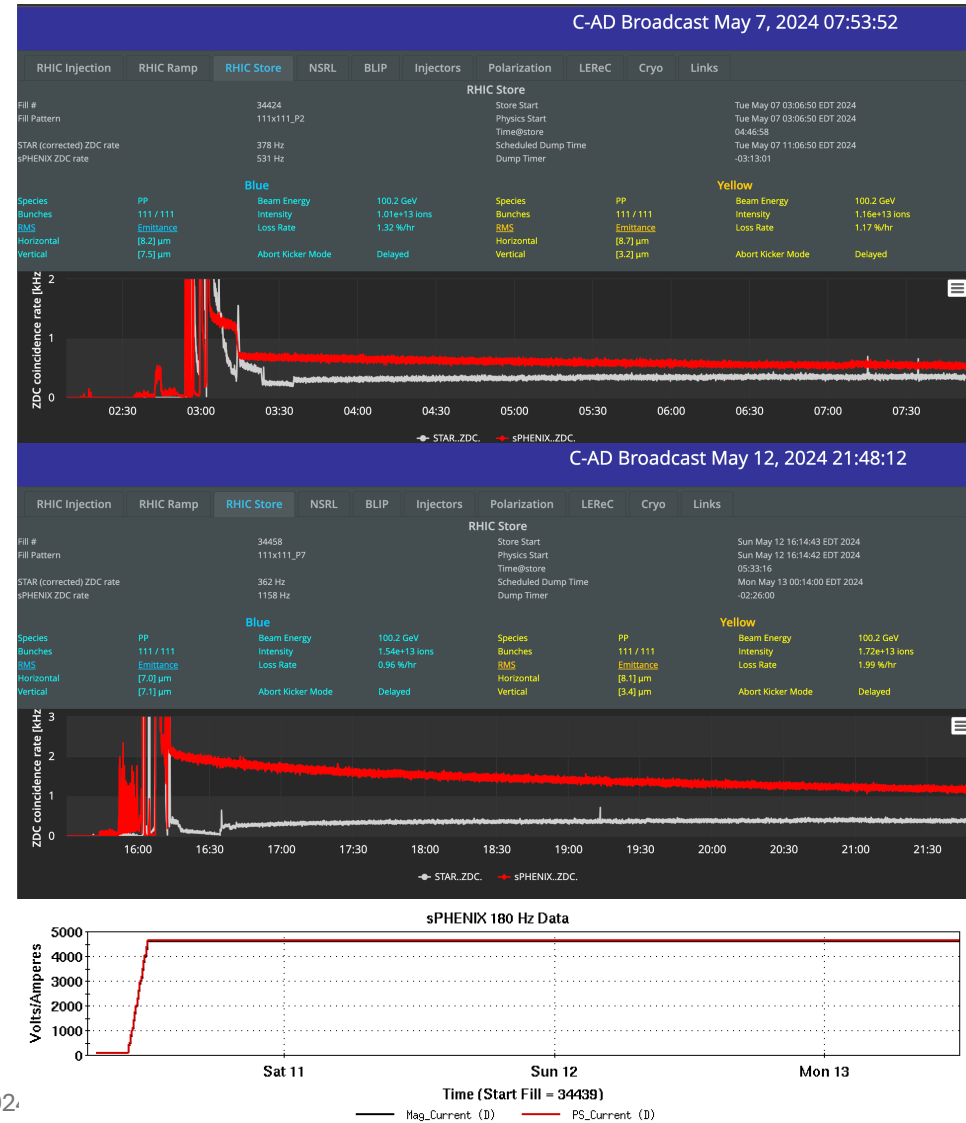
Continued running of min. bias trigger  
w/ (GL1, MBD, EMCAL, HCal, sEPD,  
SMD/ZDC) at 11-12 kHz by Shift Crew.

**Up to 2.1 billion recorded.**

In parallel, continued commissioning  
work on Time Projection Chamber.

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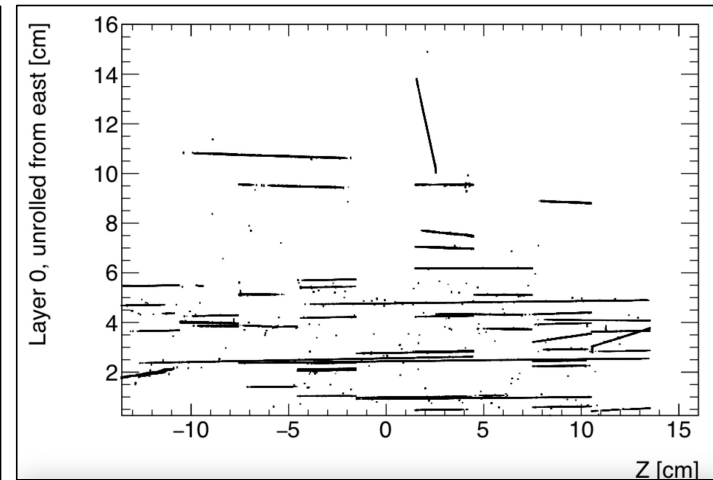
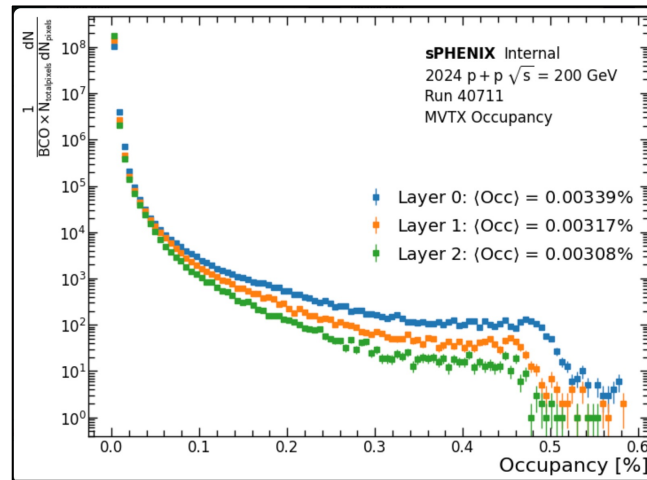
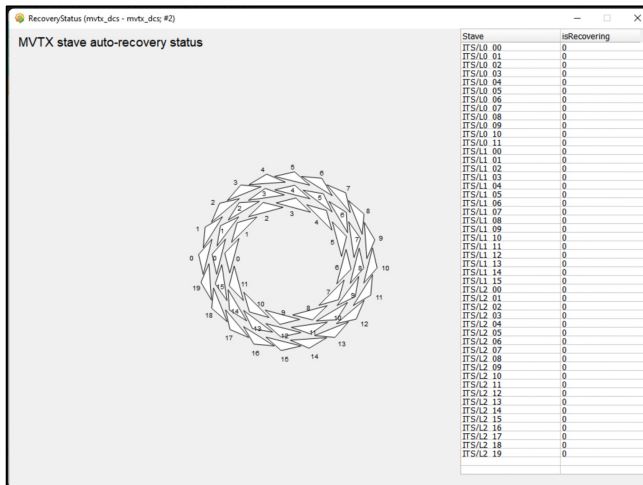
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# Issues still being worked on ....

## MVTX

- Currently running with 89  $\mu\text{s}$  strobe and debugging required 5  $\mu\text{s}$  strobe.
- Periodic issue with single-staves lockup and readout unit (RU) failure.
- Continued examination of high occupancy events (x2 away from auto-rec.)

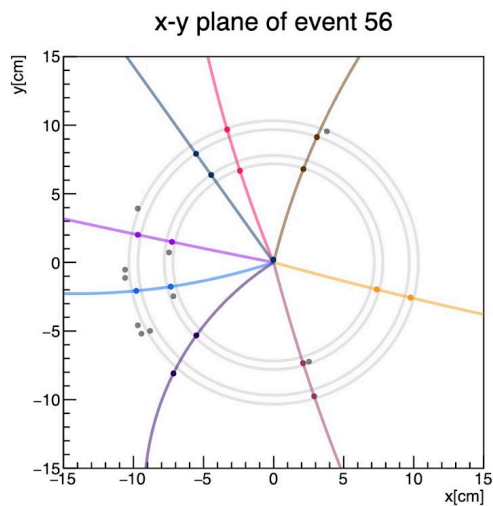




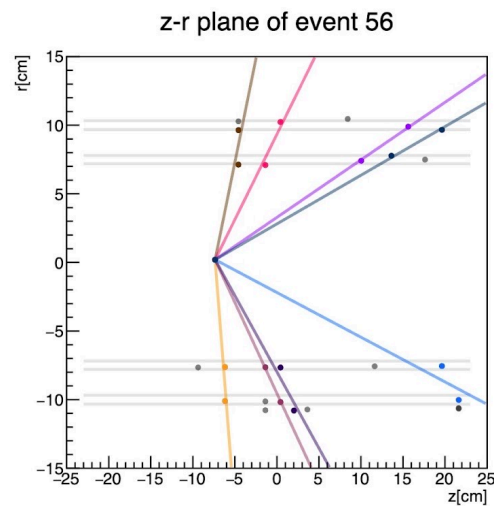
# Issues still being worked on ....

## INTT

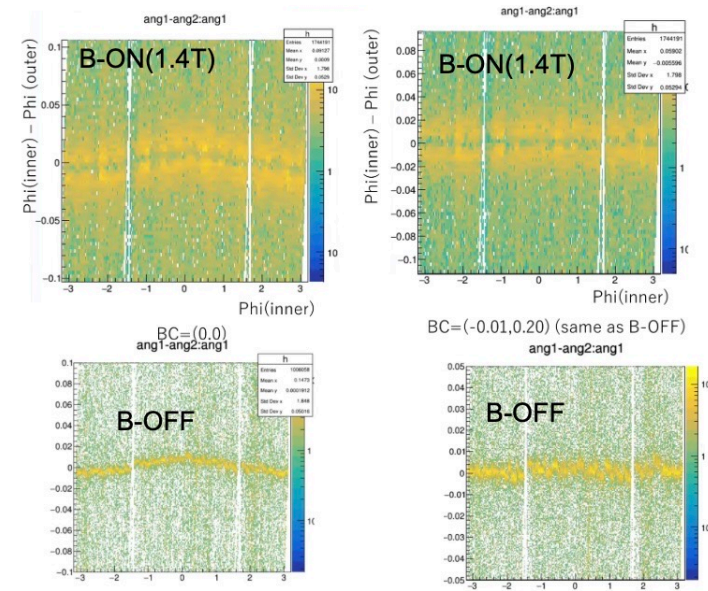
- 28x28 store for fine delay scan → initial look is good; more data needed
- Reliable running; however, GL1/GTM port issue remains (intermittent).
- Fast offline analysis progressing including alignment.



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## Issues still being worked on ....

### EMCal

- Initial pass on energy calibration
- Numerous issues with LV controller boards (unclear why), current draws
- Using extended access to investigate

### HCal, sEPD

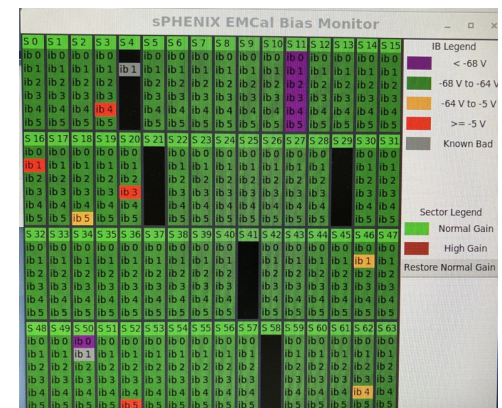
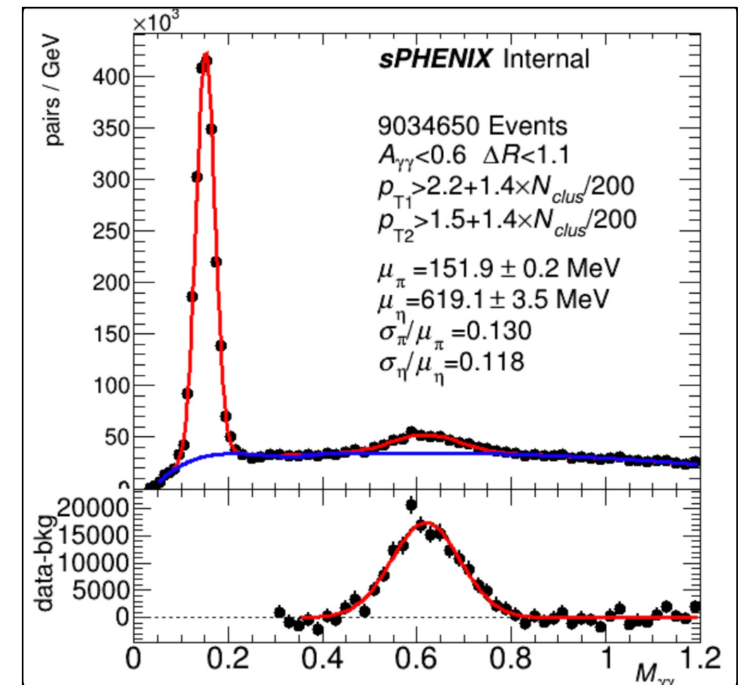
- Stable operations

### SMD/ZDC

- Had tunnel access for cable swap
- Commissioning local polarimeter

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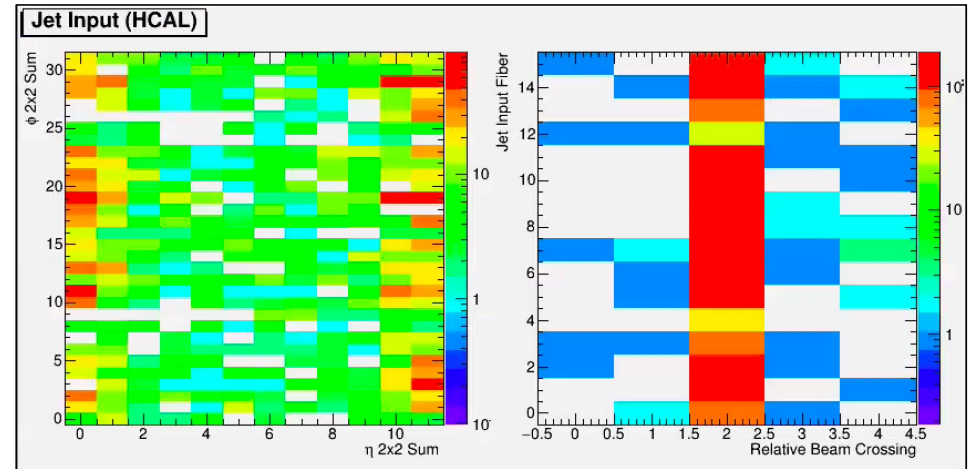
## Issues still being worked on ....

### Trigger

- Commissioning jet / photon triggers
- Ran with 4 thresholds on each this past weekend
- Now using latest Calo

### Calibrations

- Checking rejections and efficiencies

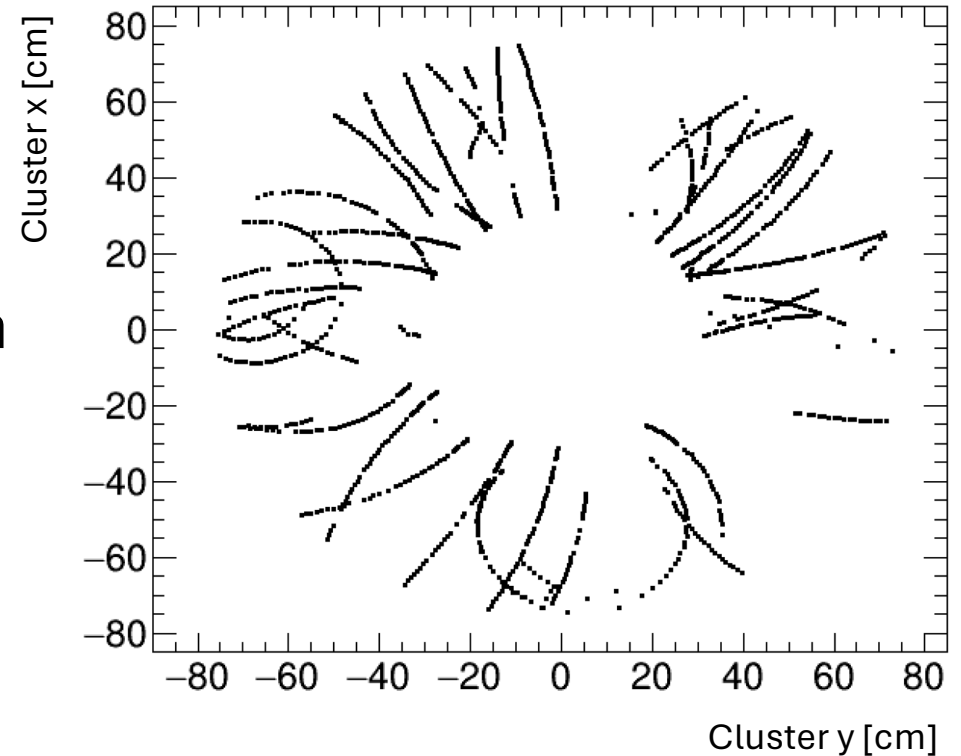


24	Photon 1 + MBD NS >= 1	yes	off	292959	187636	0
25	Photon 2 + MBD NS >= 1	yes	off	66199	41478	0
26	Photon 3 + MBD NS >= 1	yes	off	6407	3566	0
27	Photon 4 + MBD NS >= 1	yes	off	238	91	0
28	Photon 1	yes	0	1991956	561937	561937
29	Photon 2	yes	off	635164	128065	0
30	Photon 3	yes	off	167890	13247	0
31	Photon 4	yes	off	15190	1373	0

## Issues still being worked on ....

### TPC

- Running with B=1.4 T
- Took collision and cosmic data
- Significant improvement in HV operating point, but gains are still x2-3 too low
- Plan another round of resistor swaps on Wednesday (reduce HV on GEM4)



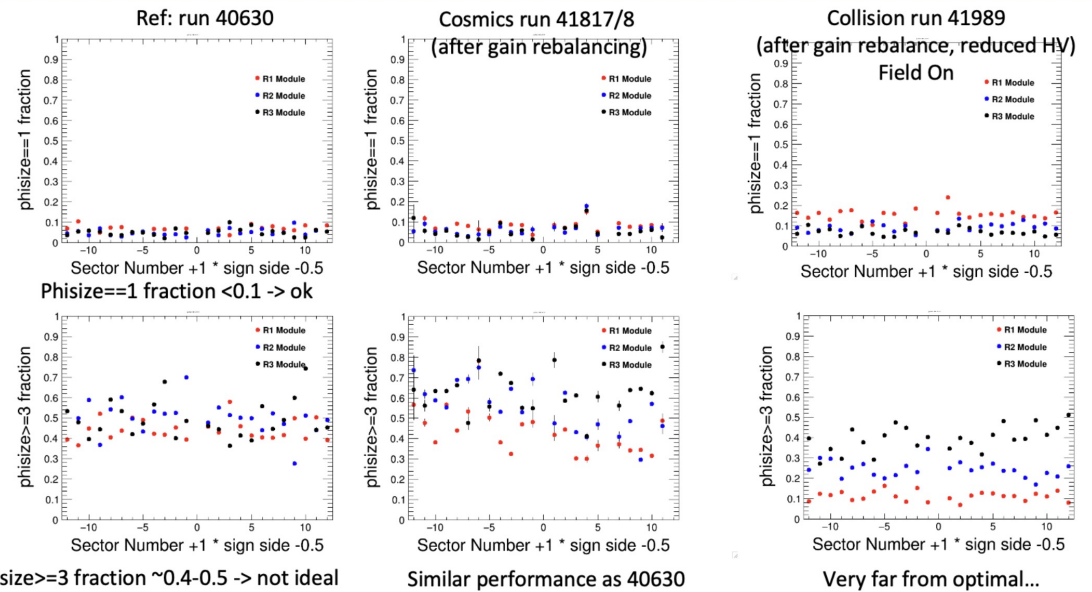
GEM 1 (S)	—————	$E_{\text{drift}}$
GEM 2 (LP)	—————	$E_{T1}$
GEM 3 (LP)	—————	$E_{T2}$
GEM 4 (S)	—————	$E_{T3}$
Readout pads	-----	$E_{\text{ind}}$

$$\vec{F} = \underbrace{q\vec{E}}_{\text{Electric force}} + \underbrace{q\vec{v} \times \vec{B}}_{\text{Magnetic force}}$$

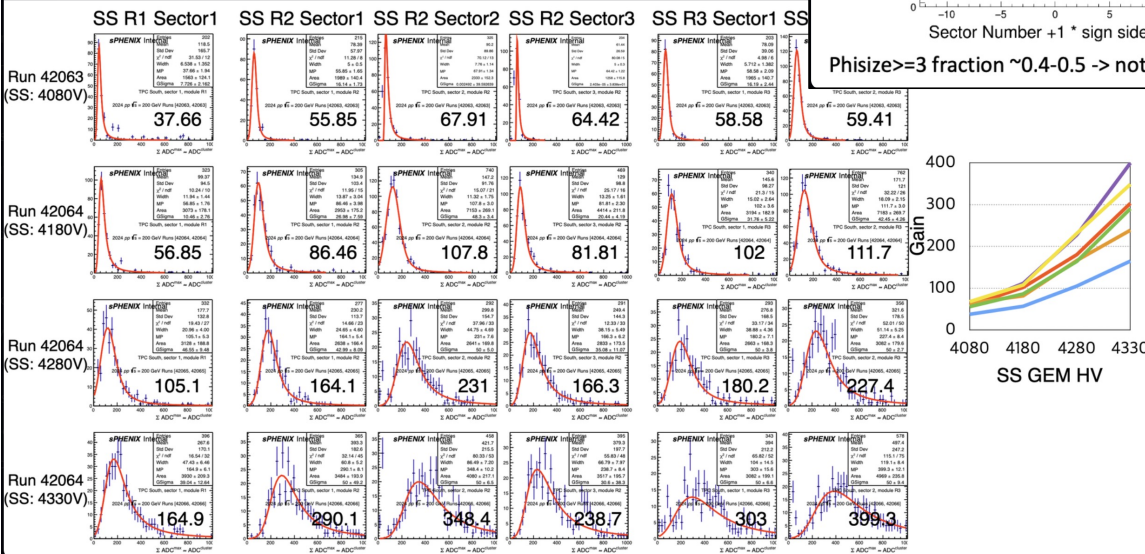
Very fast turn around feedback to optimize performance...

Everyone is working hard and in a coordinated fashion

# TPC Cluster size on min ionizing tracks



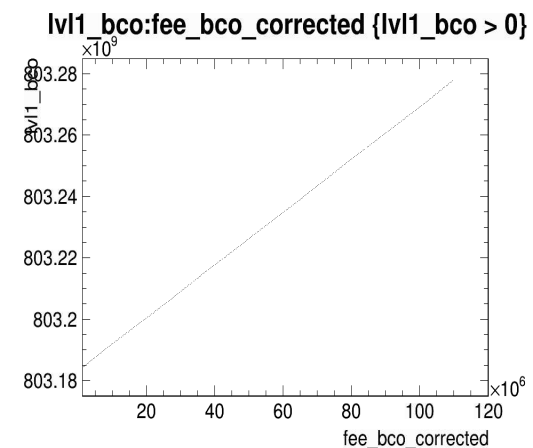
## Gain: HV Scan, Cosmics, 1.4



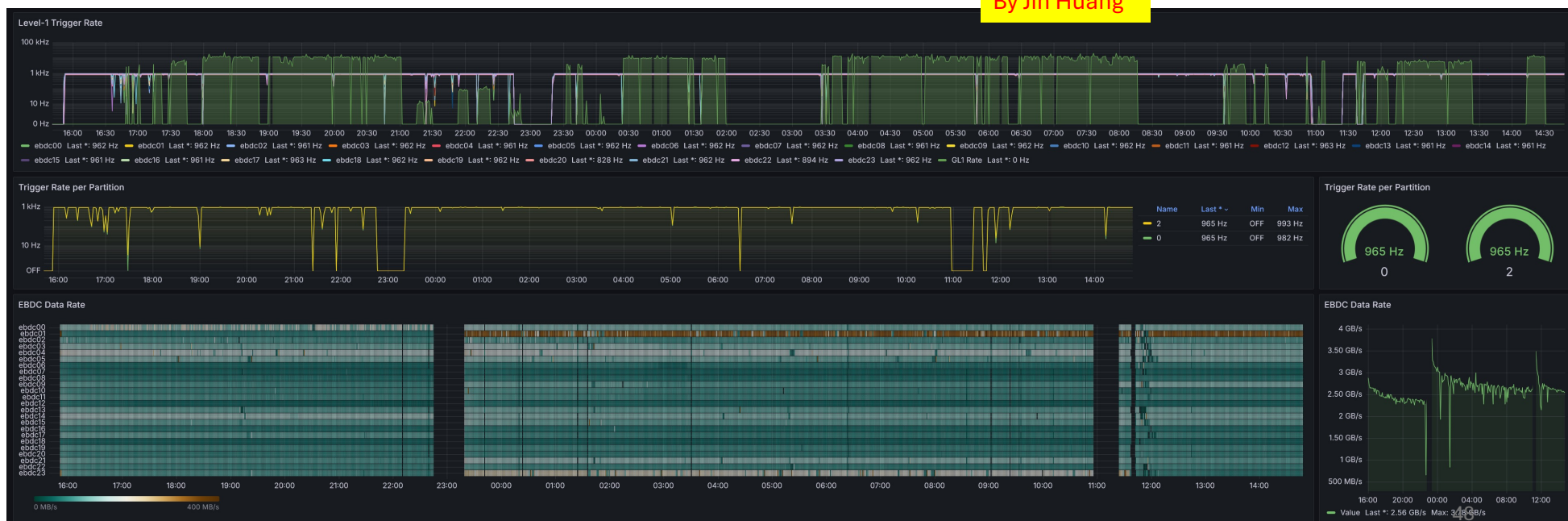


# TPC firmware/zero-suppression status

- Clock synchronization was successful
  - FEE and FELIX communicate at the frequency of 56MHz, instead of 60MHz.
- DAQ was stably operated at 1KHz at a threshold of 75 ADU
  - pedestal is 60 ADU. Typically, RMS is ~2-3 ADU.
- Turned on so-called baseline correction which forces the baseline of a fixed value

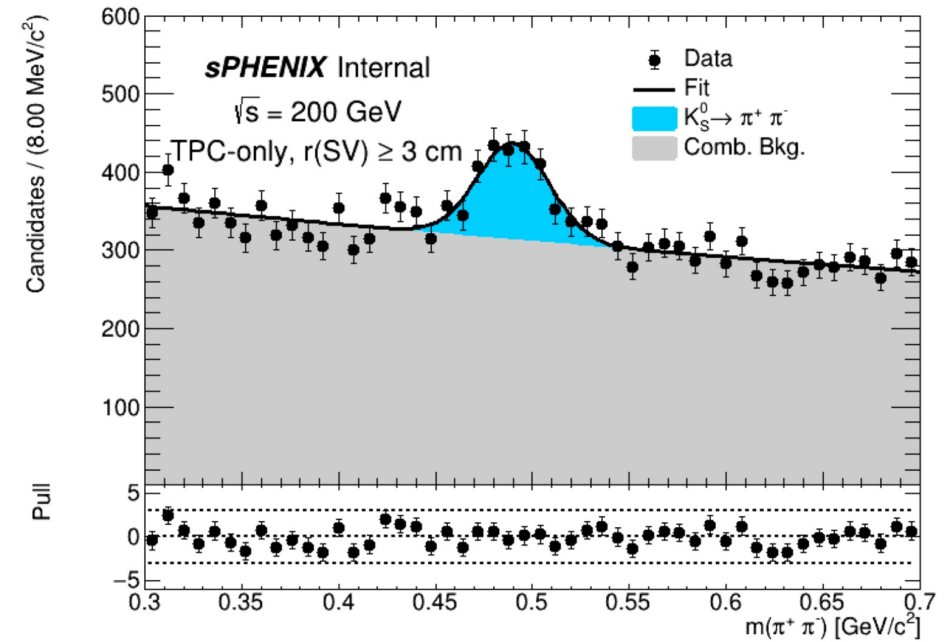
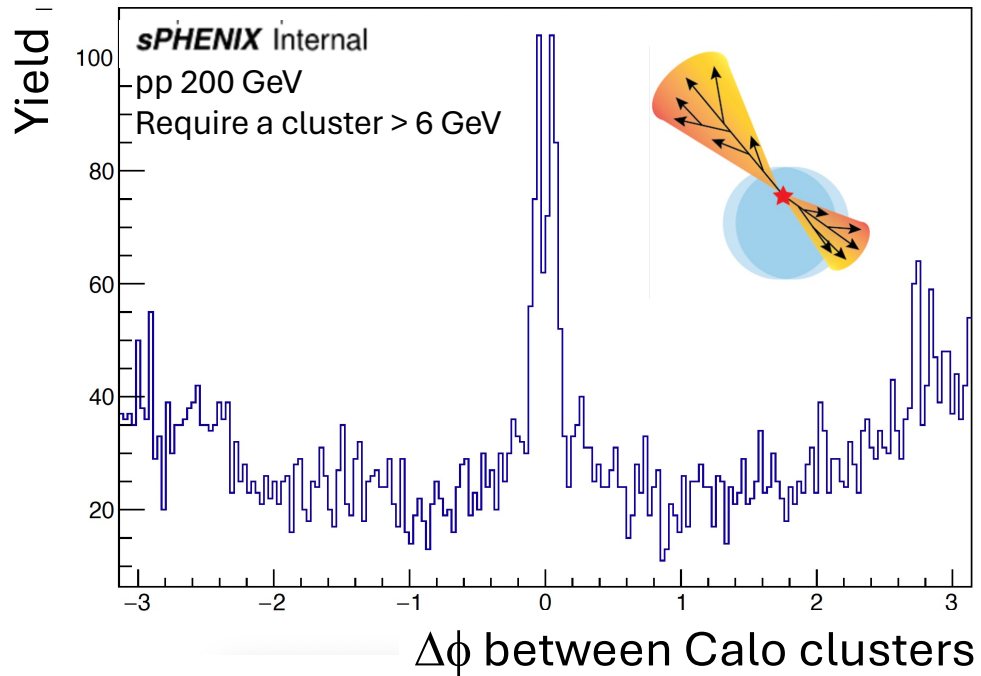


By Jin Huang



# Fun plots...

Elena Adams



## Not fun plot...



“If you have not already heard, we will have a more difficult food situation in the coming weeks. The quoting for the “new cafeteria” is still in process and no date for it has been issued. Furthermore, the vending machines are being emptied since the vendor has been noncompliant with filling them so the Coalition for the Blind is seeking a new vendor. **As a result, those machines will definitely be empty till the new vendor comes on board and there is no time frame for that as well.**”

As a result, on campus food supply at Berkner will remain that same and mini-marts will be the only other option. Building 400 is not locked so the mini-mart there can be accessed. Building 911 is locked so access to that mini-mart would be limited during working hours. 911 unlocks just after 6:30am in the morning and locks at 7:30 at night M-F. On Friday after 7:30pm, it stays locked until Monday morning at 6:30am.”

**Continued lack of BNL support impacts RHIC/sPHENIX efficiency and takes time away from scientific work.**