# Event Mixup (preliminary plots)

20240911

INTTMT
Mai Kano

Run41502 (Mixup) BCO BCO_FULL intt0
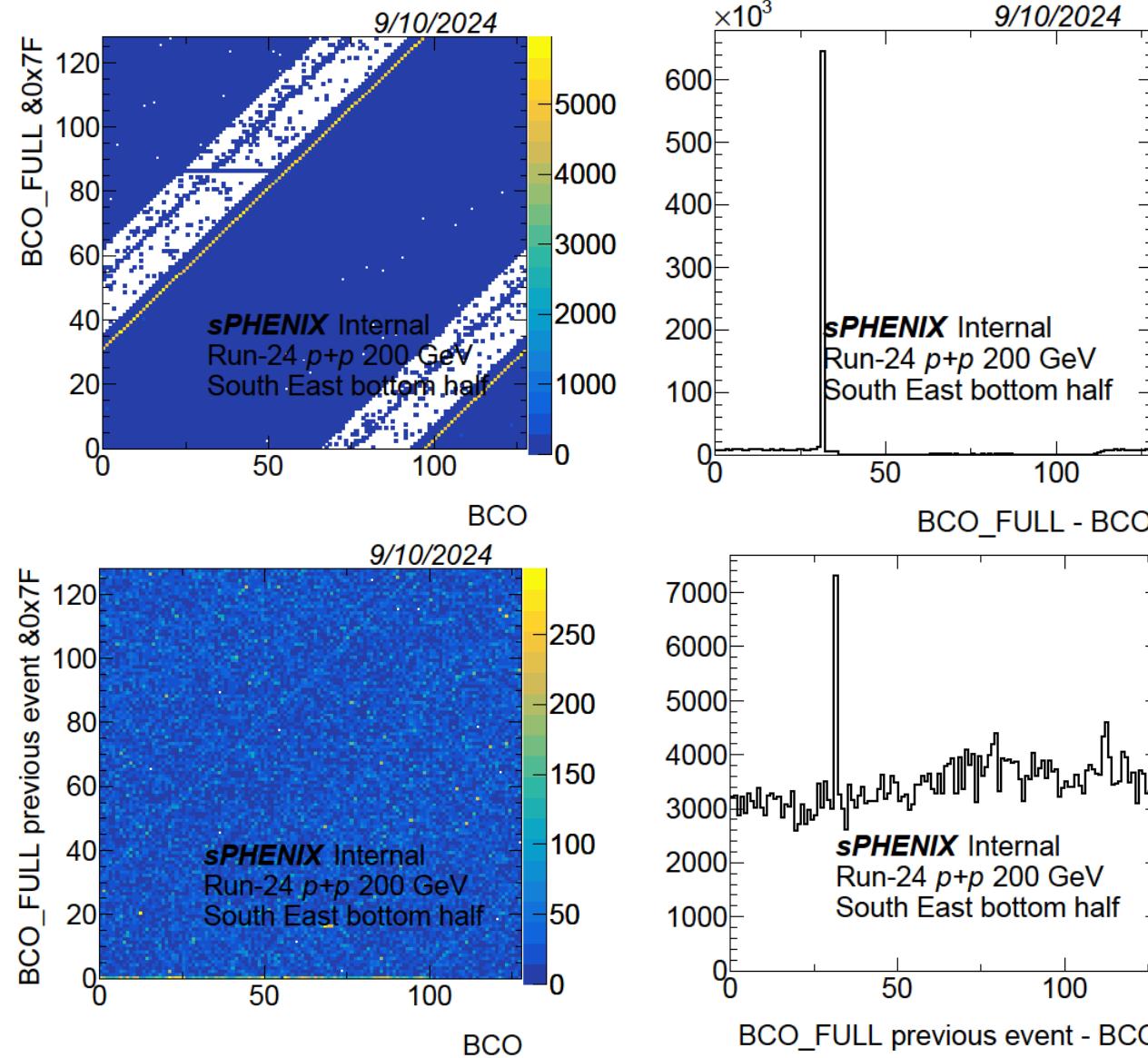
- Top figure shows INTT hits are well tagged by correct BCO time stamp in the data.

- Bottom figure shows Event Mixup.
- There should be no correlation between the BCO_Full of the previous event and the BCO of this event, but the correlation as shown on the figure.
- And pre_BCO_FULL-BCO have peak at same position top figure.

- This suggests that the previous and current collision data are mixed.

Run50379 (No Mixup) BCO BCO_FULL intt0
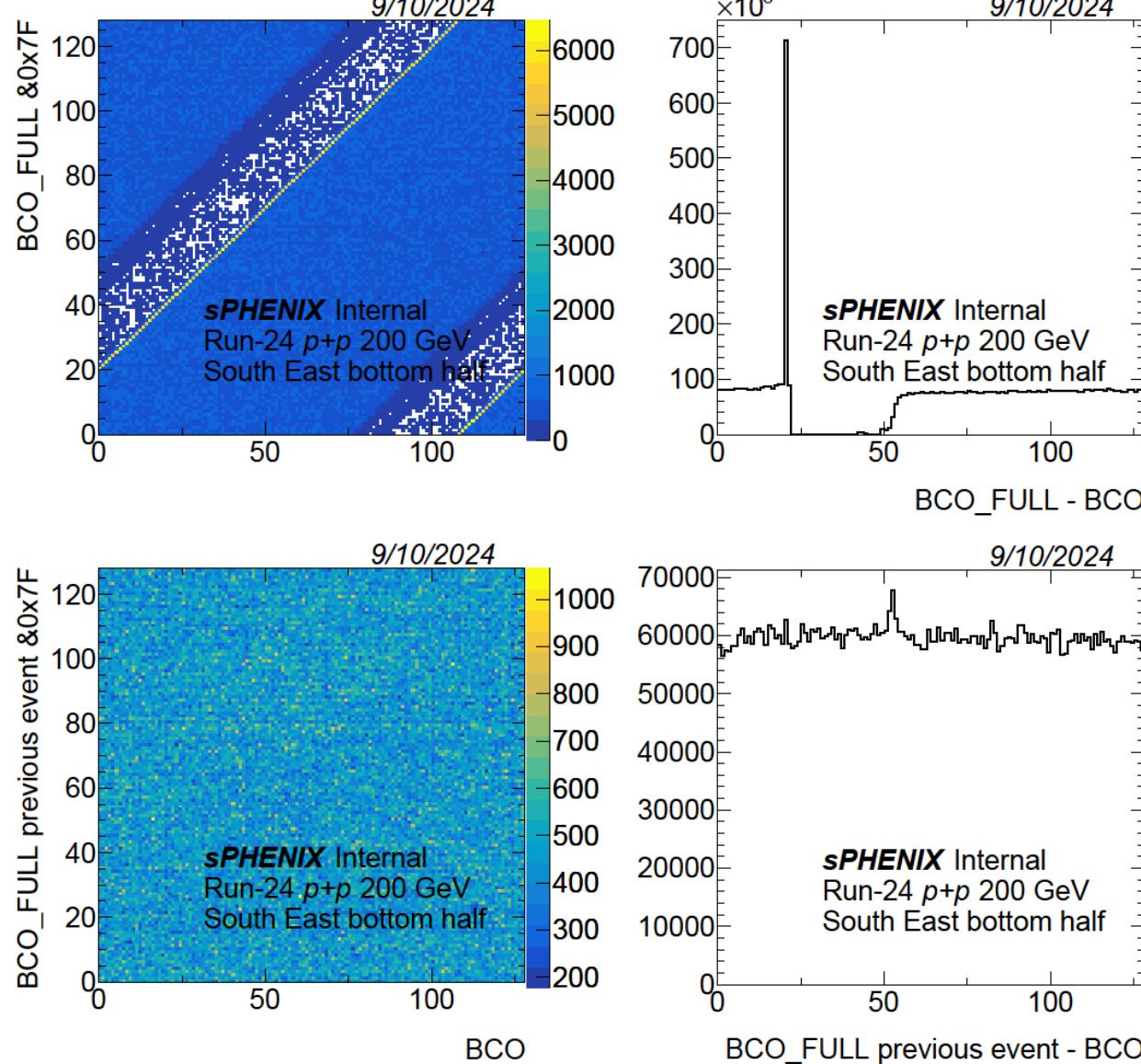
- Top figure shows INTT hits are well tagged by correct BCO time stamp in the data.

- Bottom figure shows No Event Mixup.
- There don't have same position correlation and peak.
- The peak seen in another position is currently under investigation, but we do not believe it is related to Mixup.

Run50379 (No Mixup) BCO BCO_FULL intt0
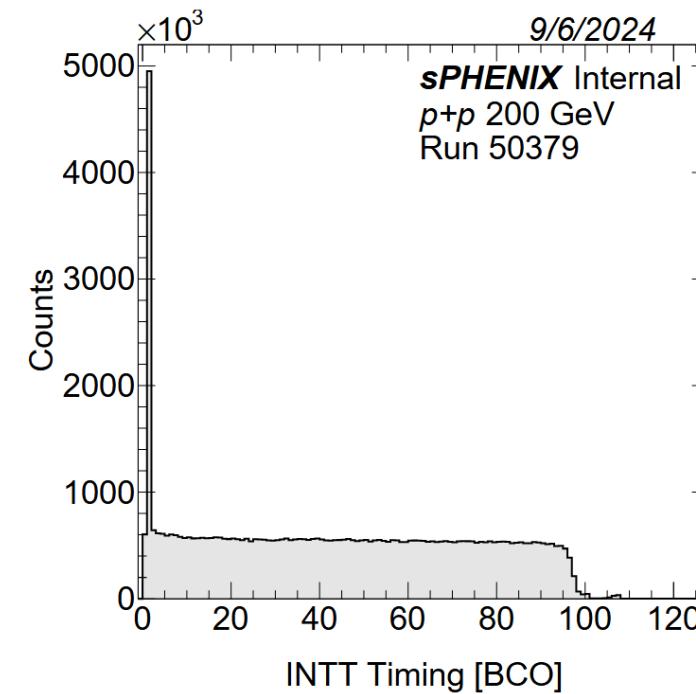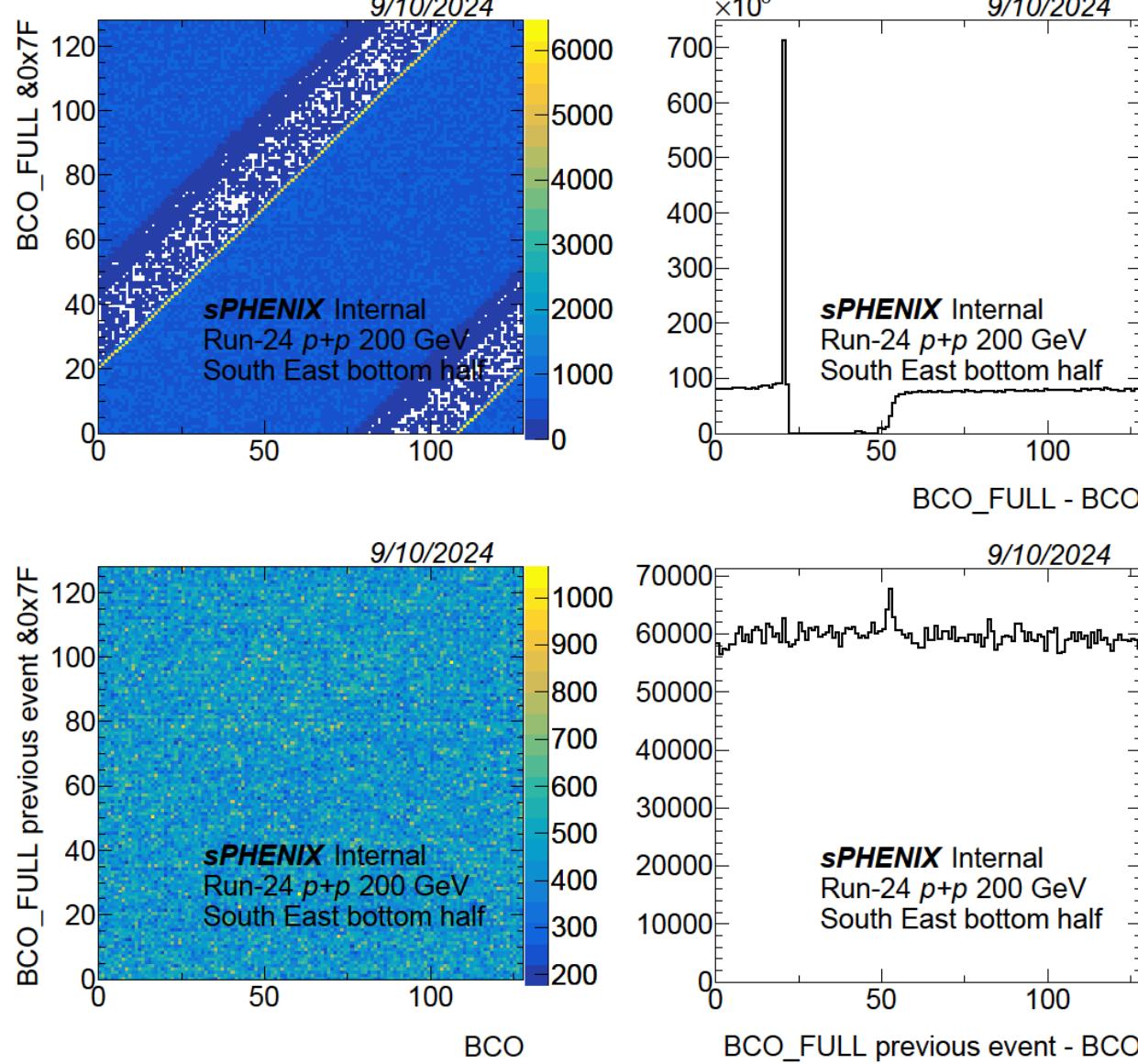
- However, I plan to change the BCO_FULL-BCO and pre_BCO_FULL - BCO plots to one with shifted peak positions similar to genki's preliminary plot (sorry, not done yet).

BCO_FULL-BCO
Run41502(Mixup)　All Felix
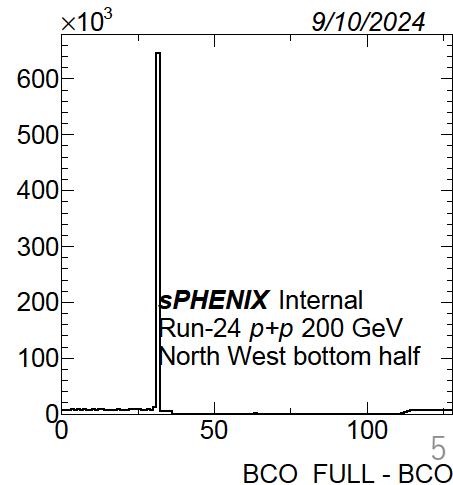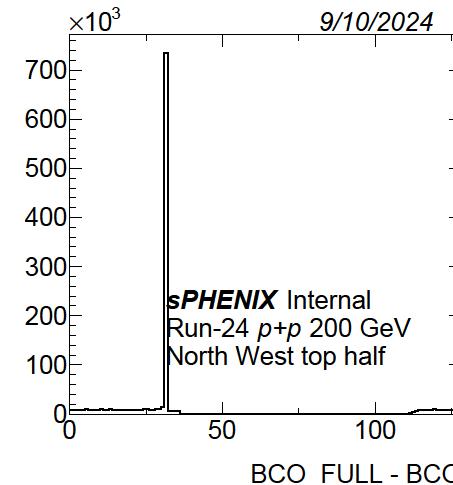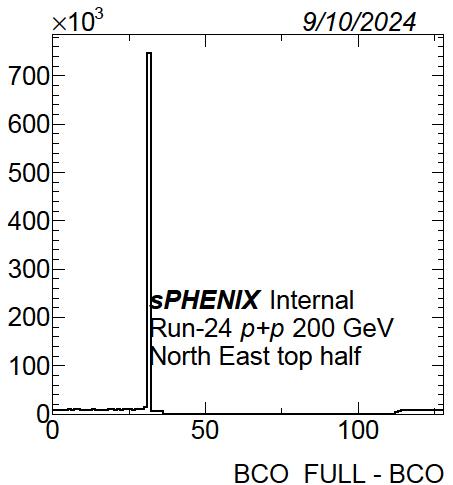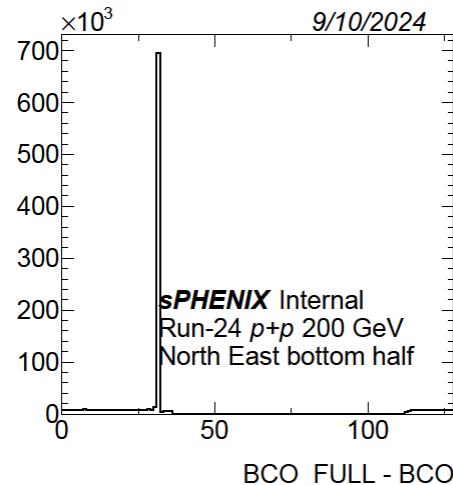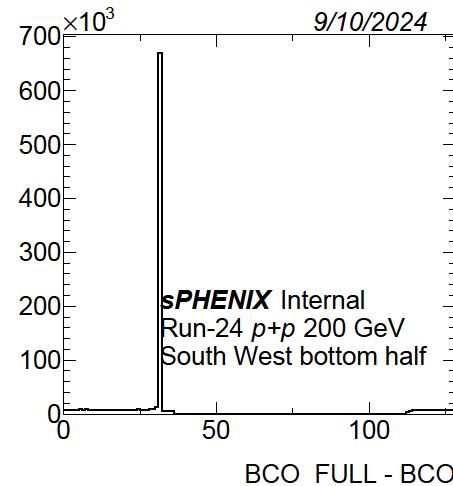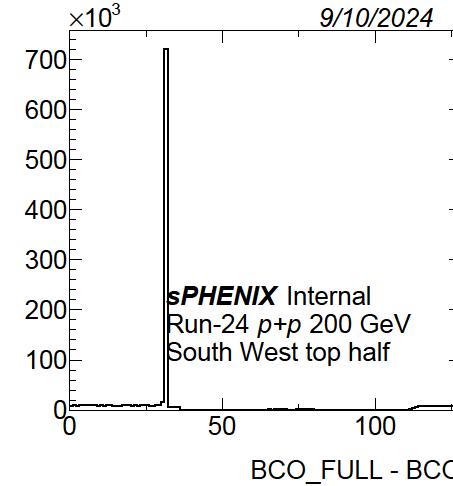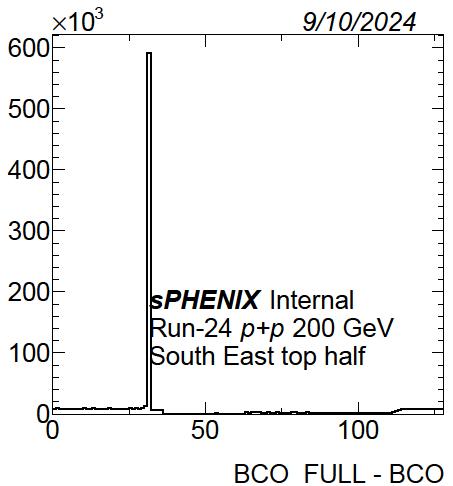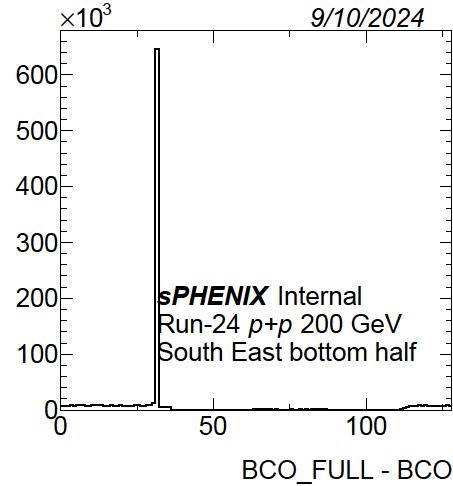
# previous event BCO_FULL – BCO Run41502(Mixup) All Felix
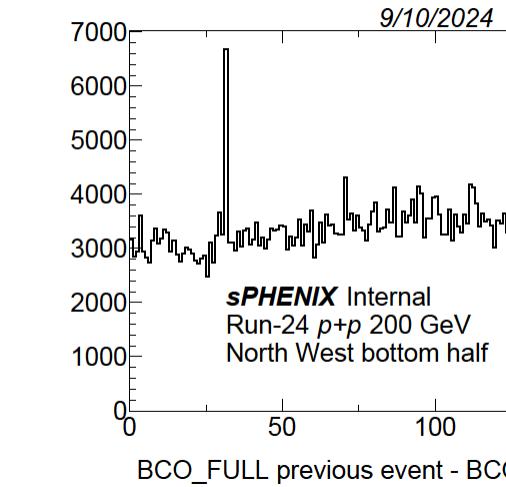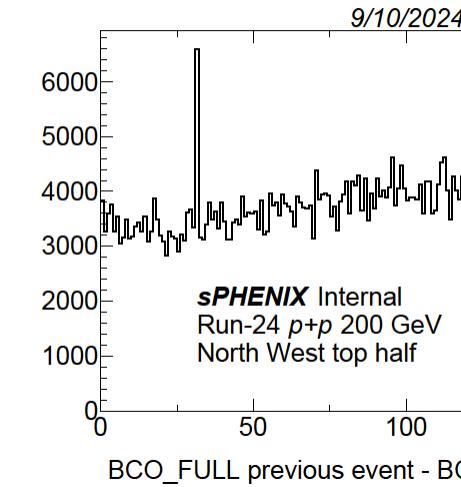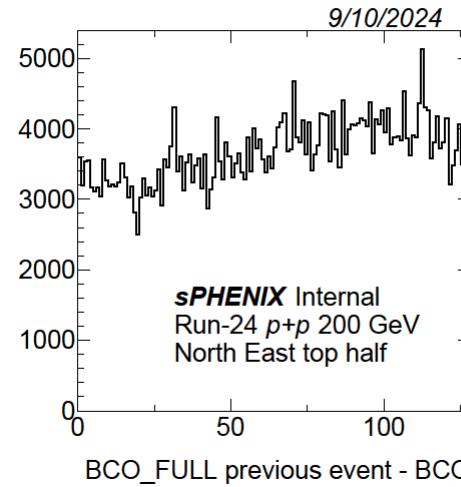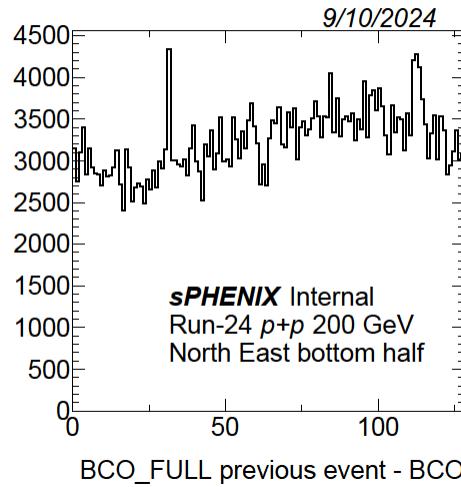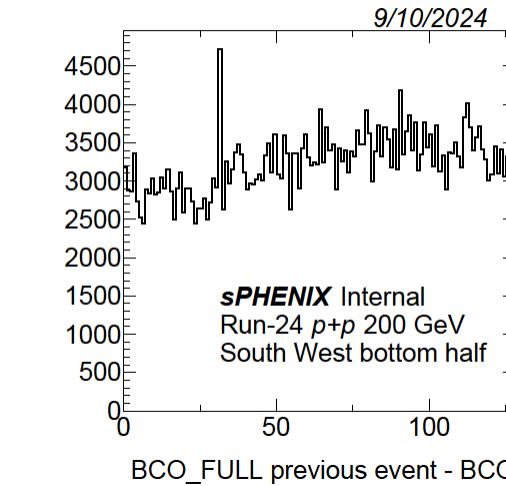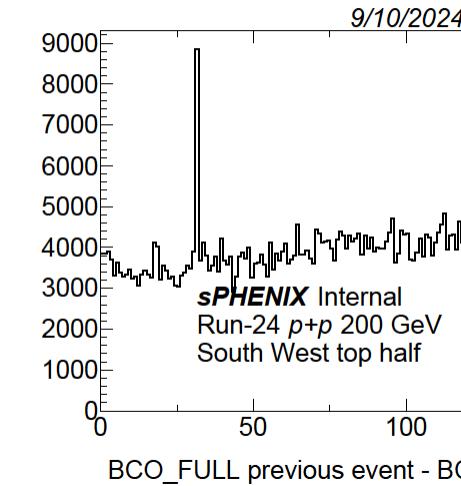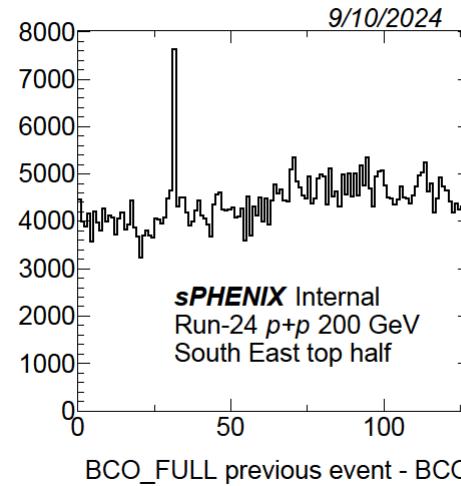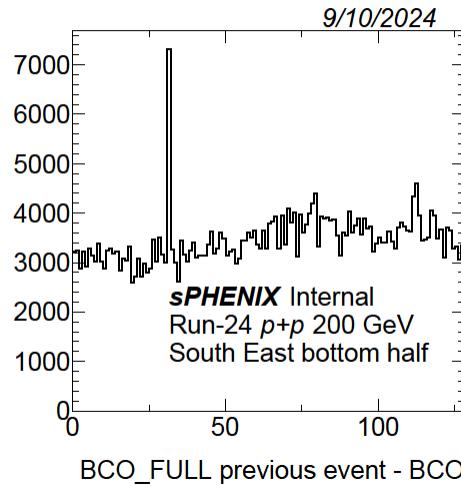
BCO vs BCO_FULL
Run41502(Mixup)　All Felix
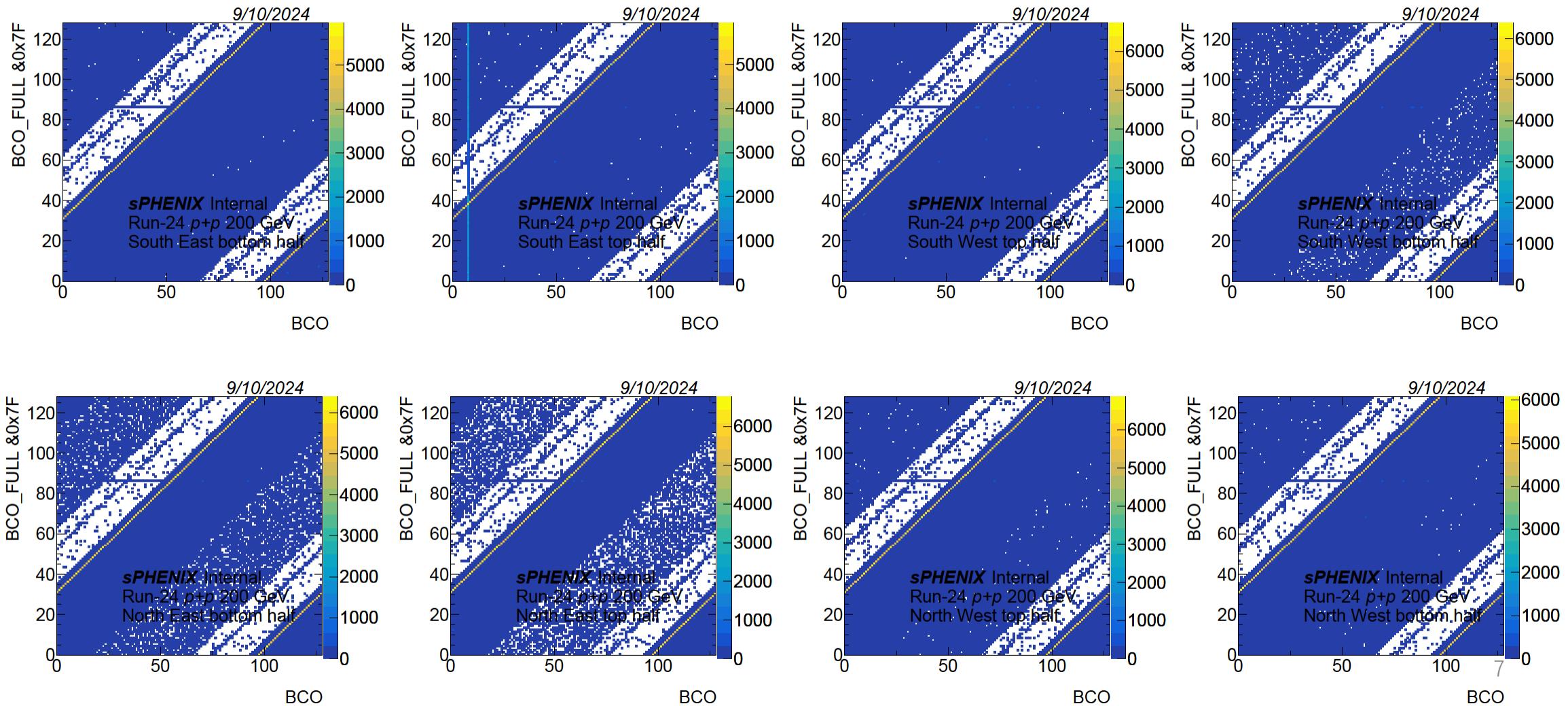
BCO vs previous event BCO_FULL
Run41502 (Mixup)   All Felix
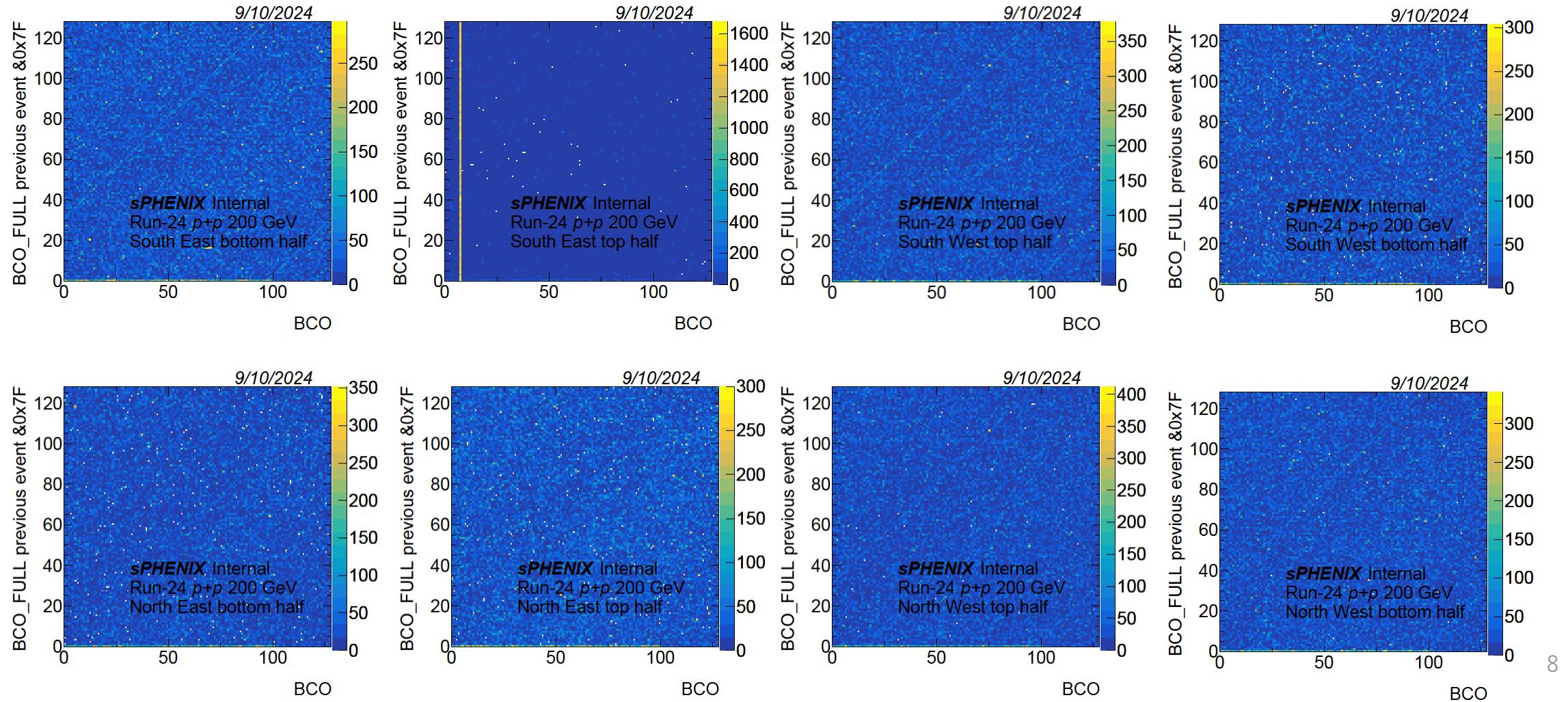
BCO_FULL-BCO
Run50379(NoMixup)　All Felix
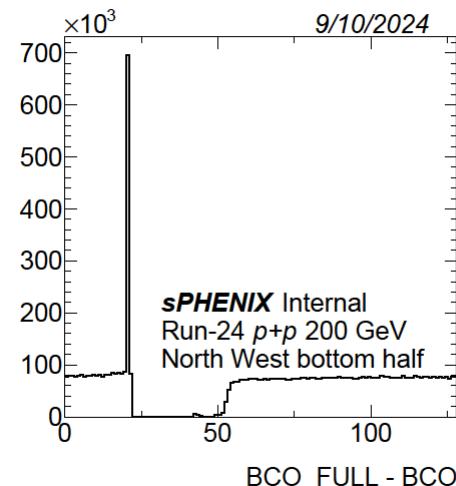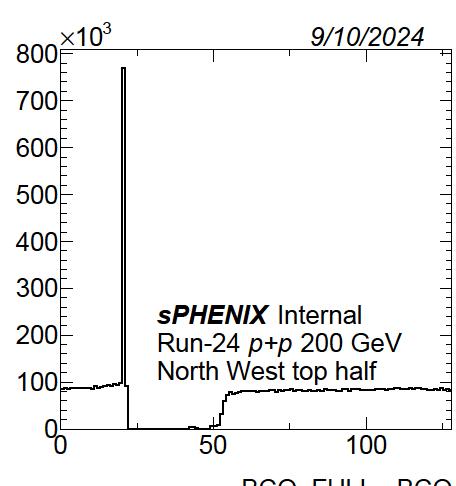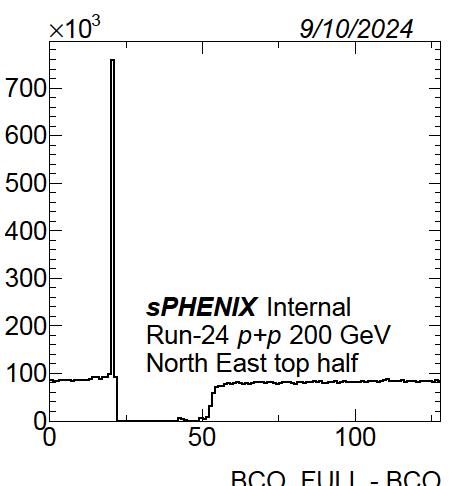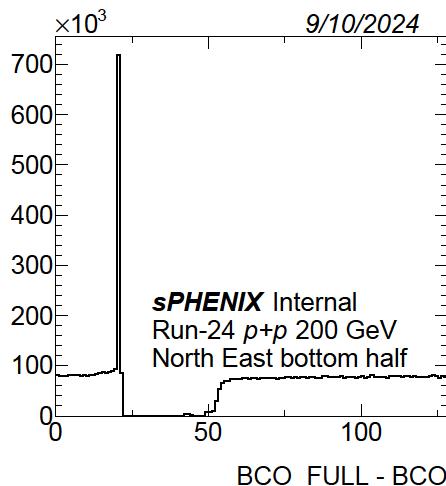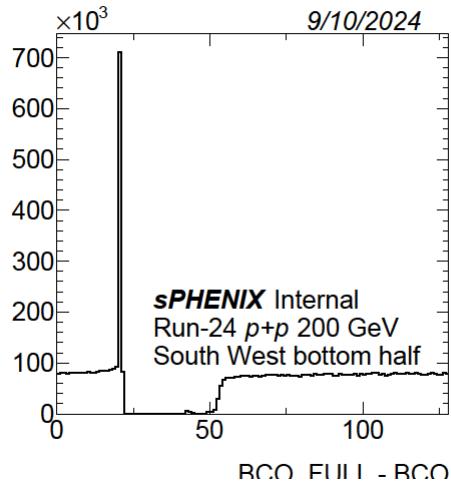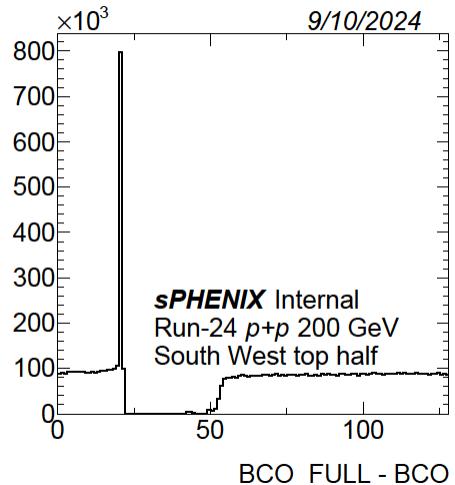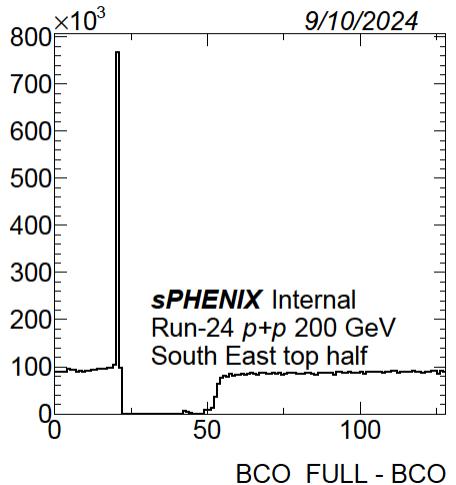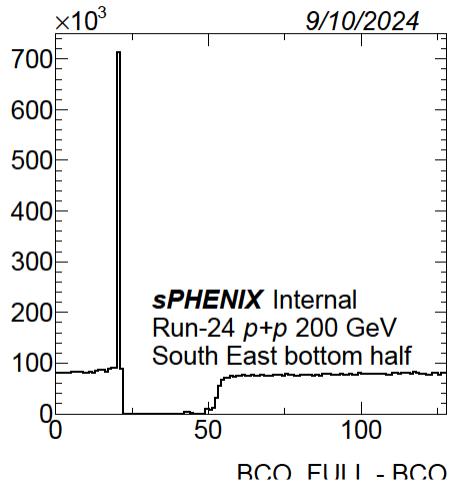
previous event BCO_FULL – BCO Run50379(No Mixup)　All Felix
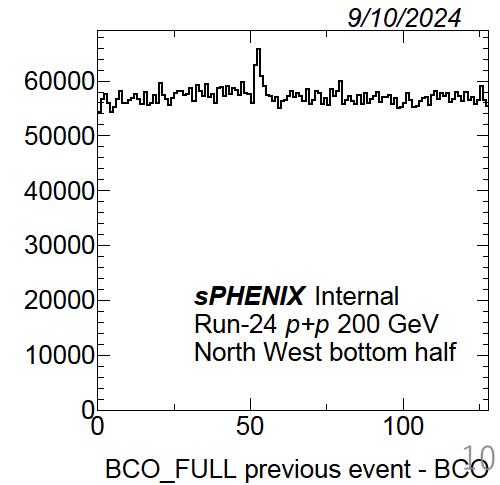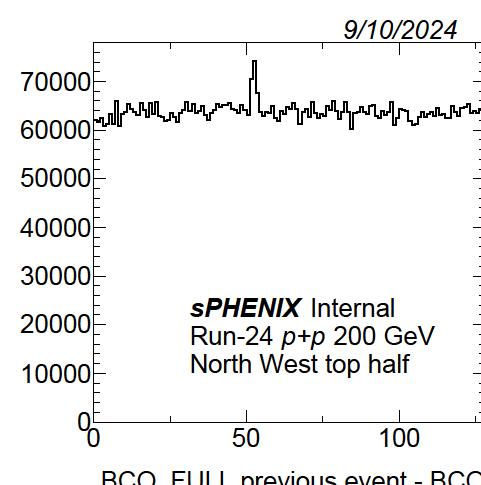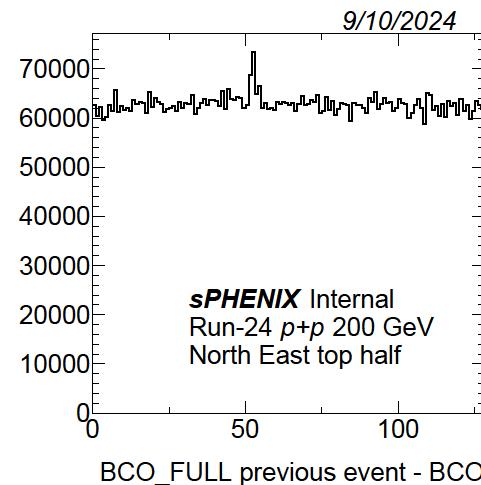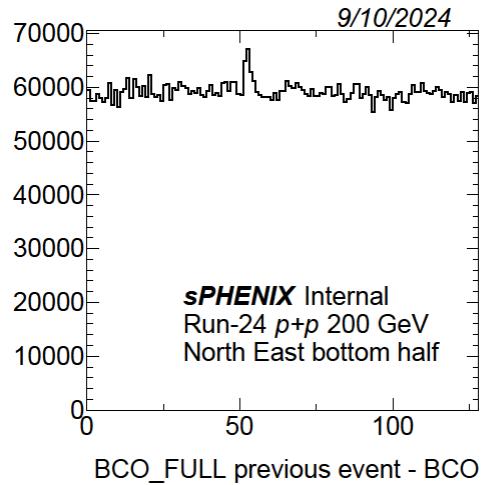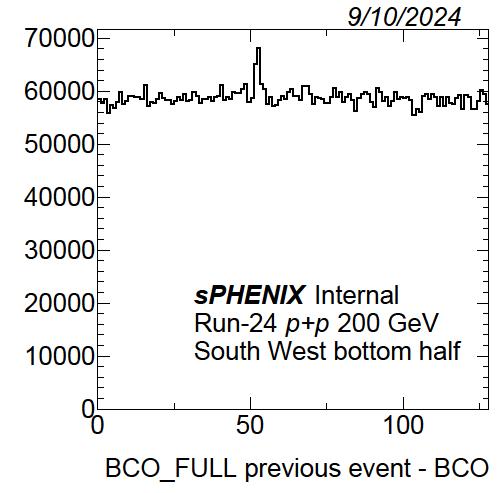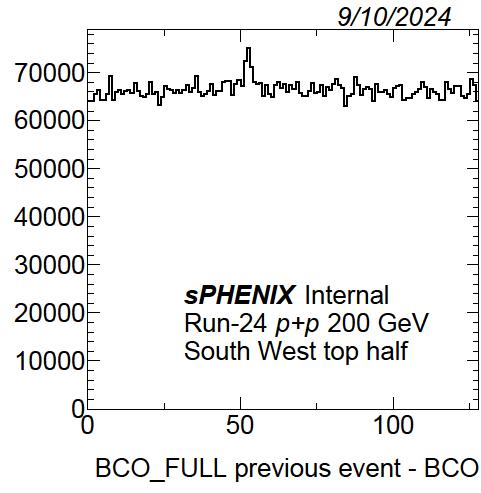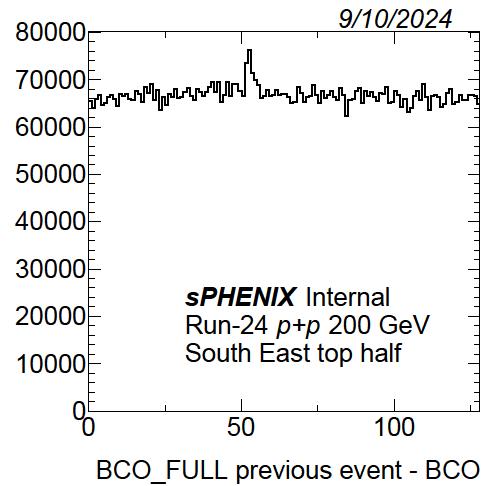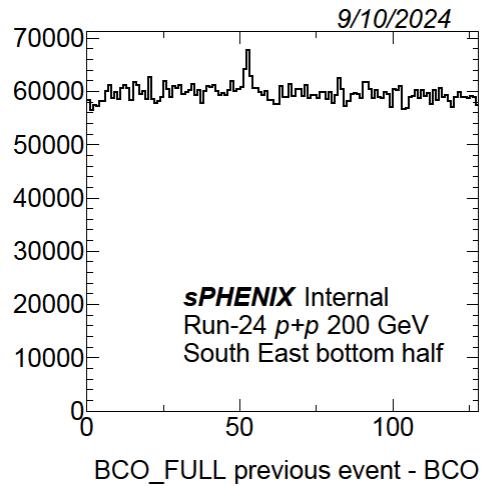
BCO vs BCO_FULL
## Run50379(No Mixup)   All Felix
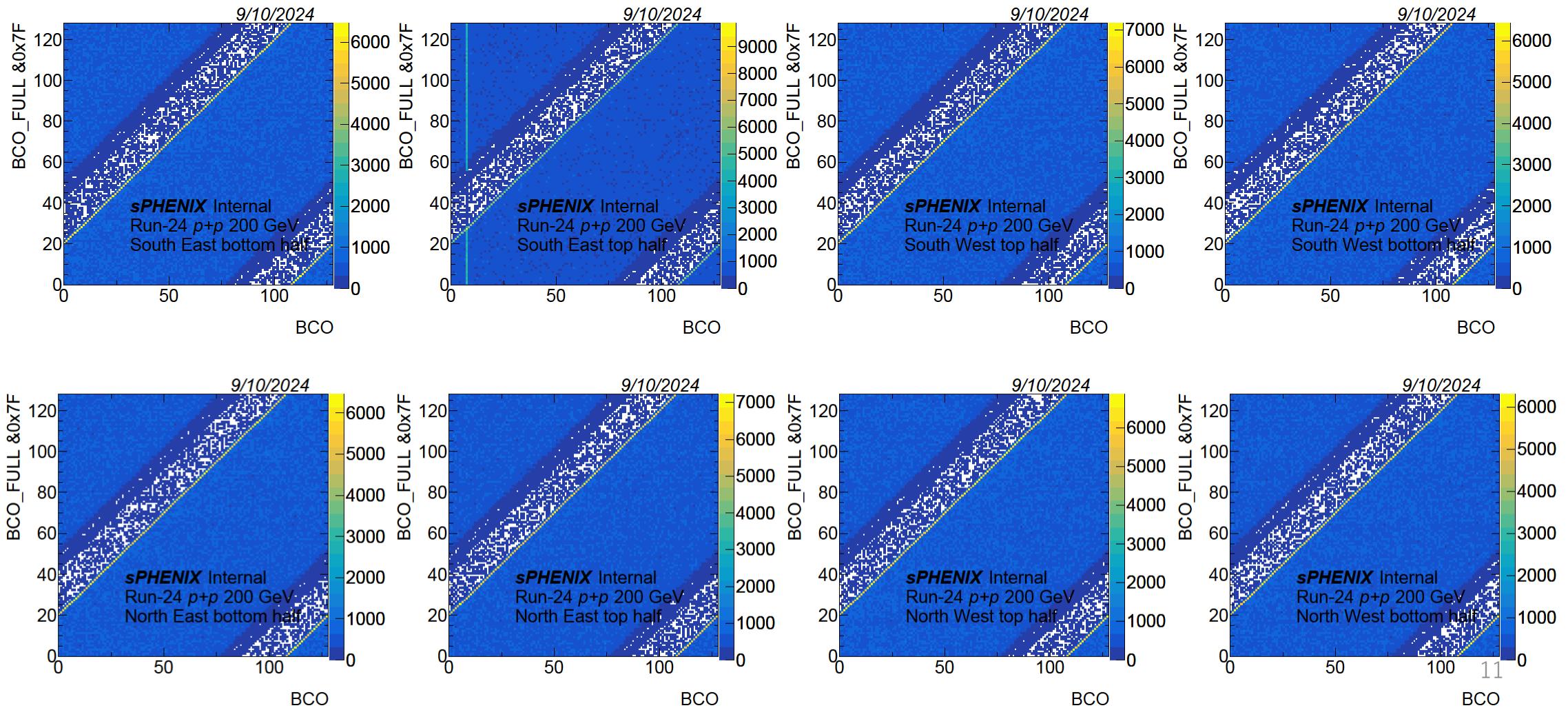
BCO vs previous event BCO_FULL Run50379 (NoMixup)   All Felix
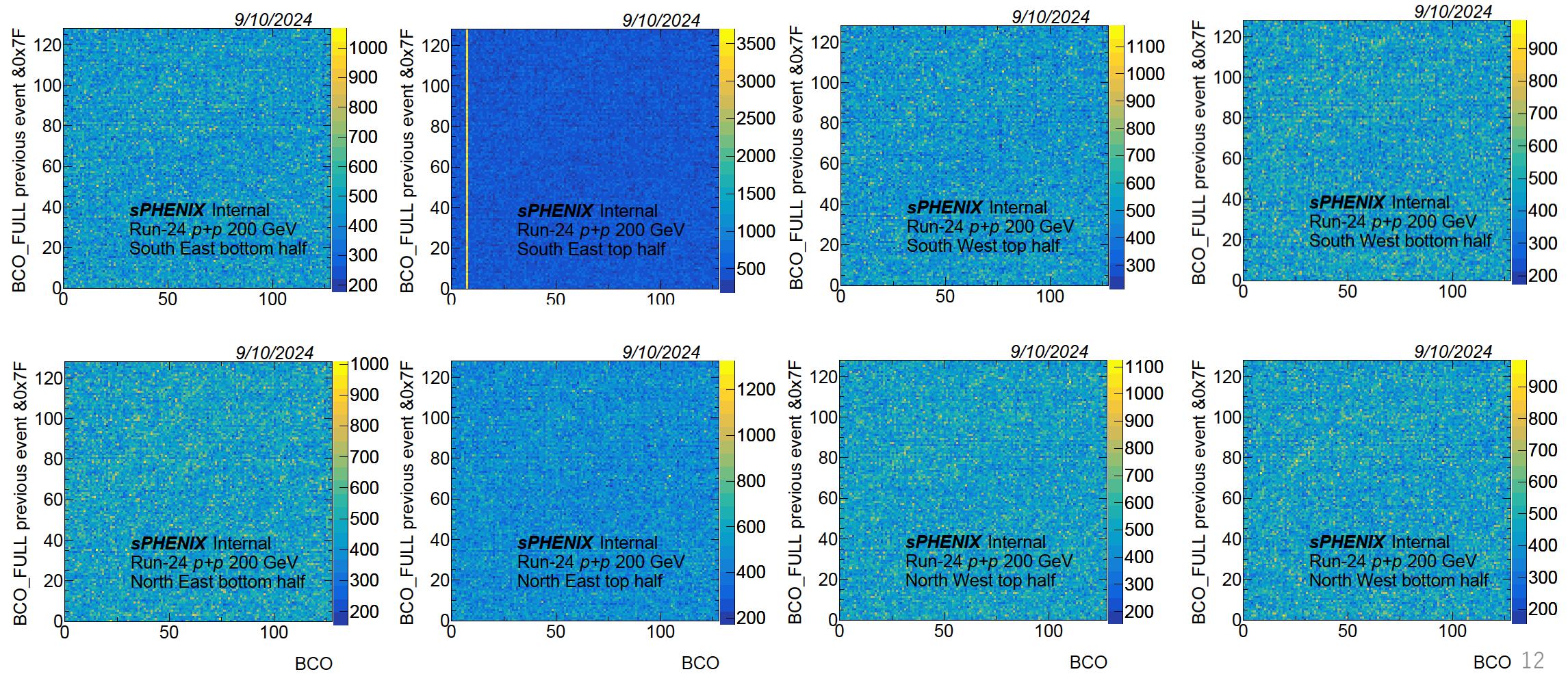
Mixup event・hit fraction

$$Mixup\ Event\ fraction = \frac{Mixup\ Event}{All\ Event}$$

$$Mixup\ Hit\ fraction = Mixup\ Bin\ Hit\ fraction(Average) - Random\ Hit\ fraction(Average)$$

$$Mixup\ Bin\ Hit\ fraction = \frac{Mixup\ Hit}{Previous\ Event\ Hit + Mixup\ Hit}$$

$$Average = \frac{Mixup\ Hit\ fraction}{Mixup\ Event}$$

$$Random\ Hit\ fraction = \frac{\pm2bin\ from\ Mixup\ peak\ Hit}{Previous\ Event\ Hit + \pm2bin\ Hit}$$

$$Average = \frac{Random\ Hit\ fraction}{\pm2bin\ Event}$$

previous event hit
+
Mixup hit

Previous event

Previous Event Hit

This event

Mixup hit

This Event Hit

9/10/2024

sPHENIX Internal
Run-24 $p+p$ 200 GeV
South East bottom half

BCO_FULL previous event - BCO

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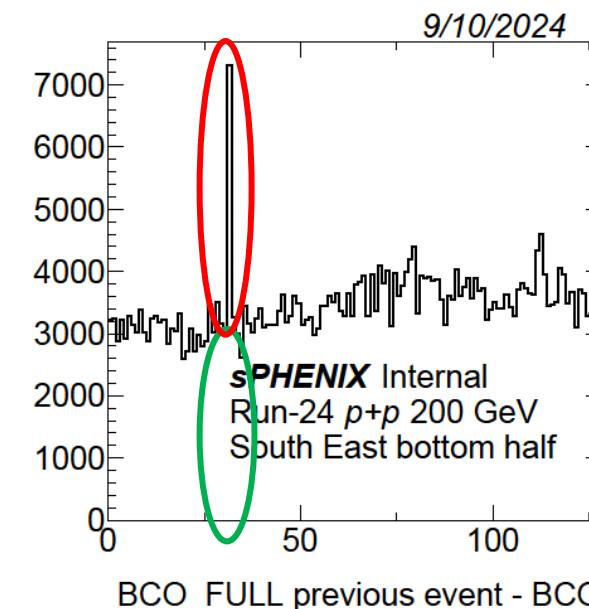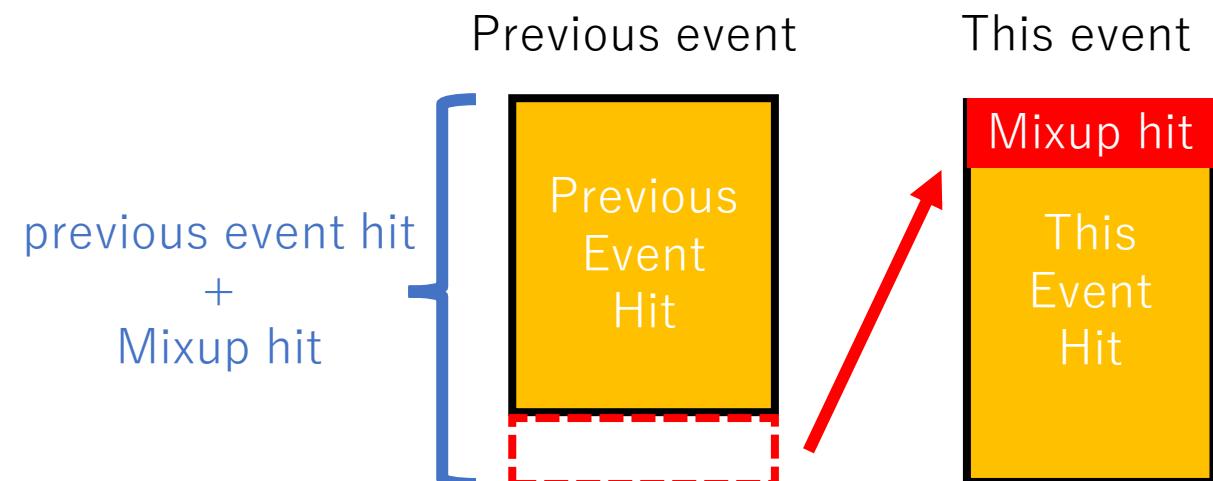
Mixup Event fraction vs Run number intt0
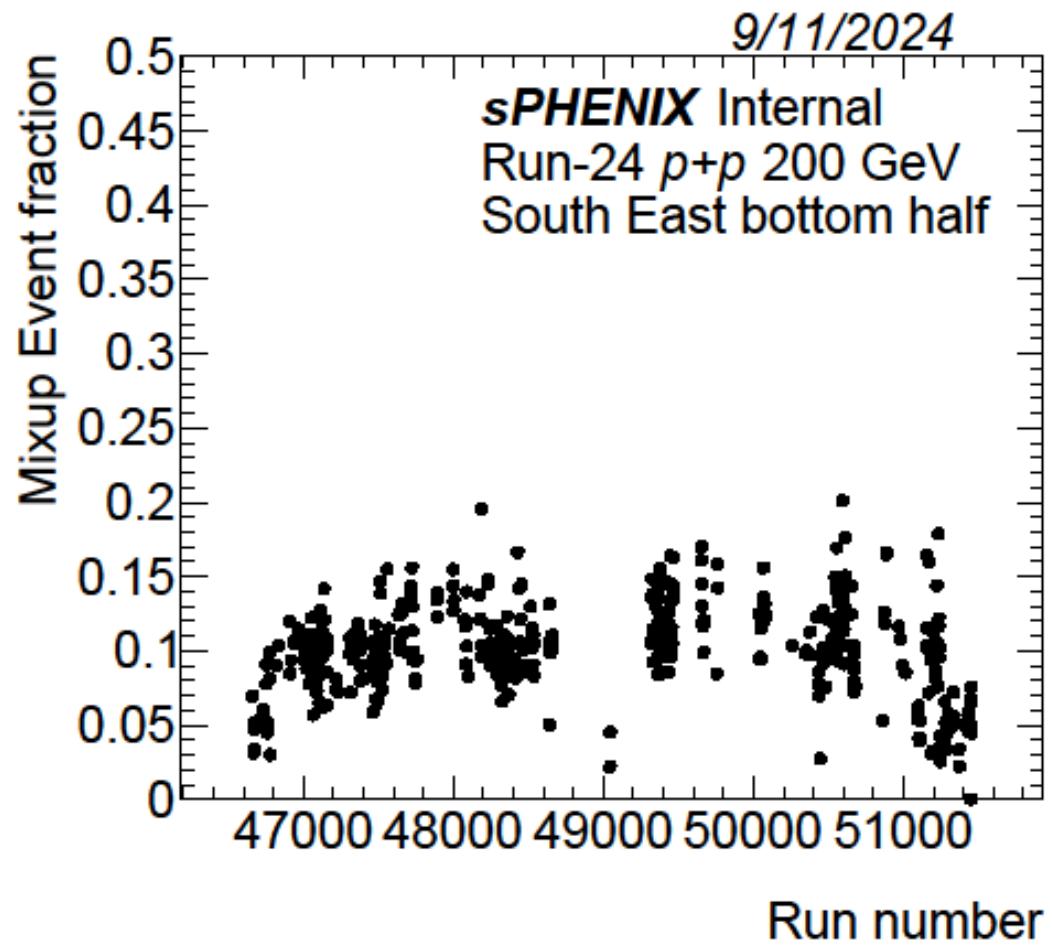
- Run type: physics
- Date : 2024/06/25(change to 0mrad) ~
- Mode : Trigger
- Duration : >10min

Mixup Event fraction vs Run number All Felix

Mixup hit fraction vs Run number intt0

9/11/2024

sPHENIX Internal
Run-24 *p+p* 200 GeV
South East bottom half
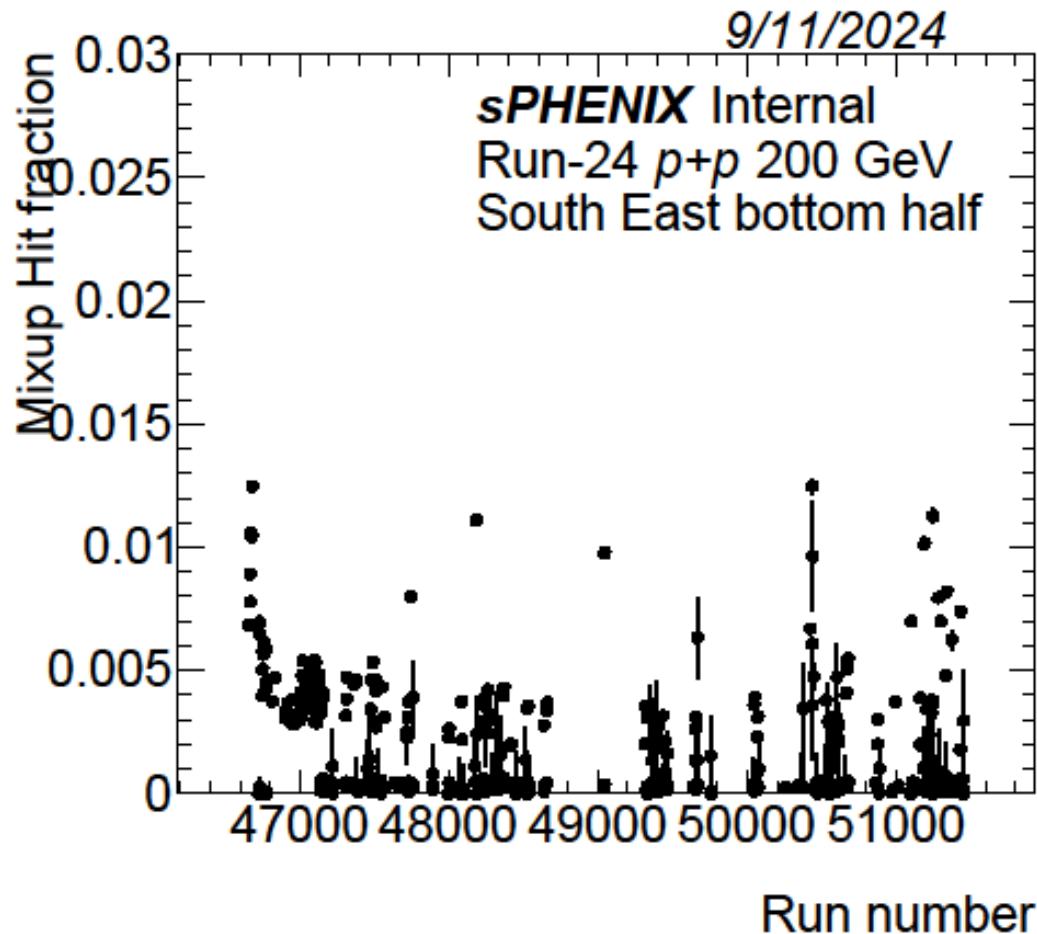
- Run type: physics
- Date : 2024/06/25（change to 0mrad）~
- Mode : Trigger
- Duration : >10min

Mixup hit fraction vs Run number All Felix
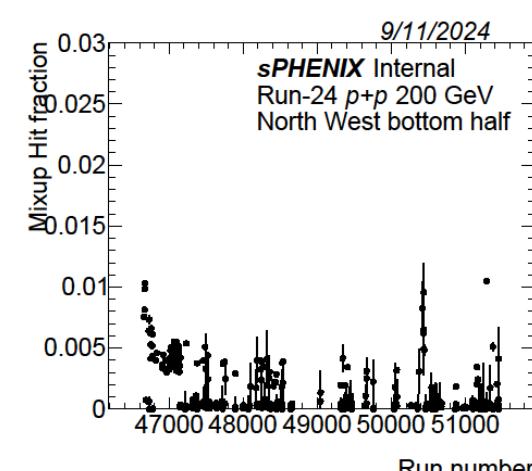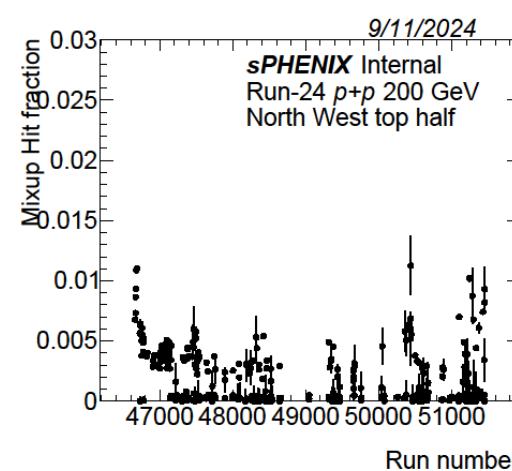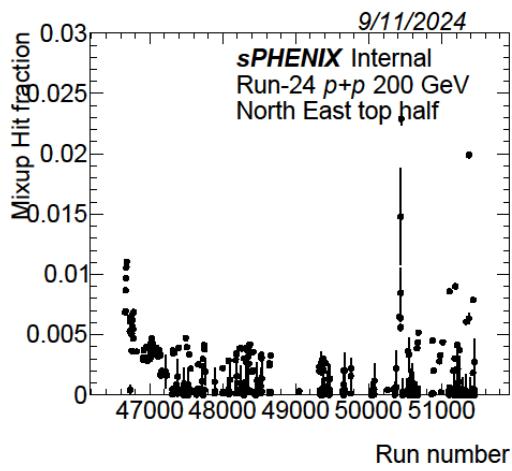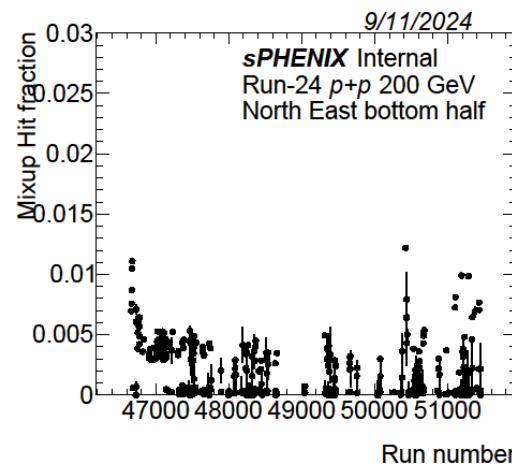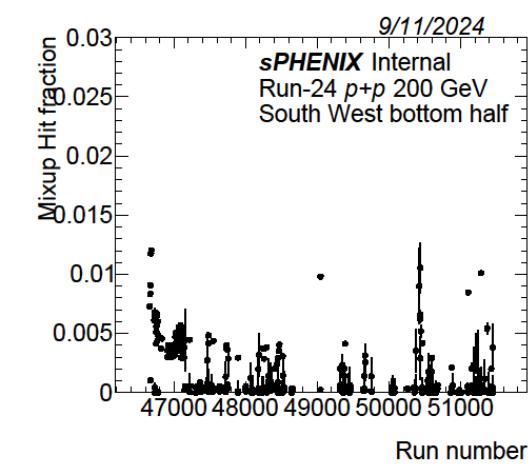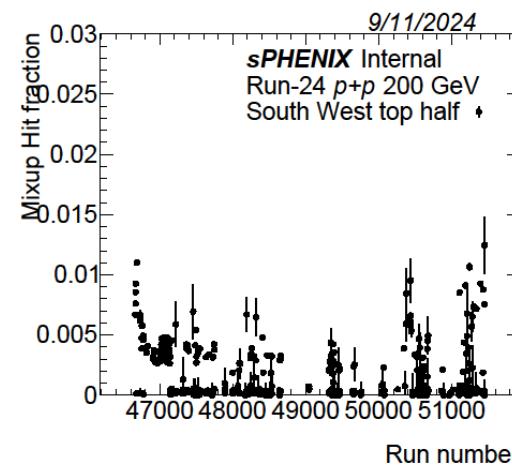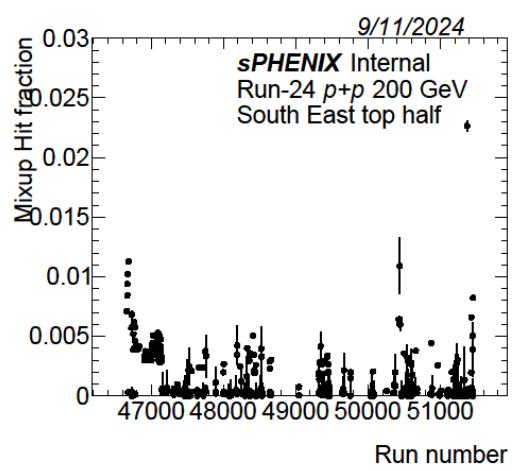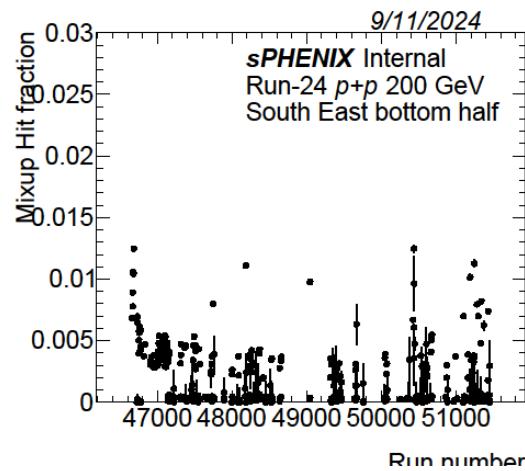
Mixup Event fraction vs Trigger Rate intt0
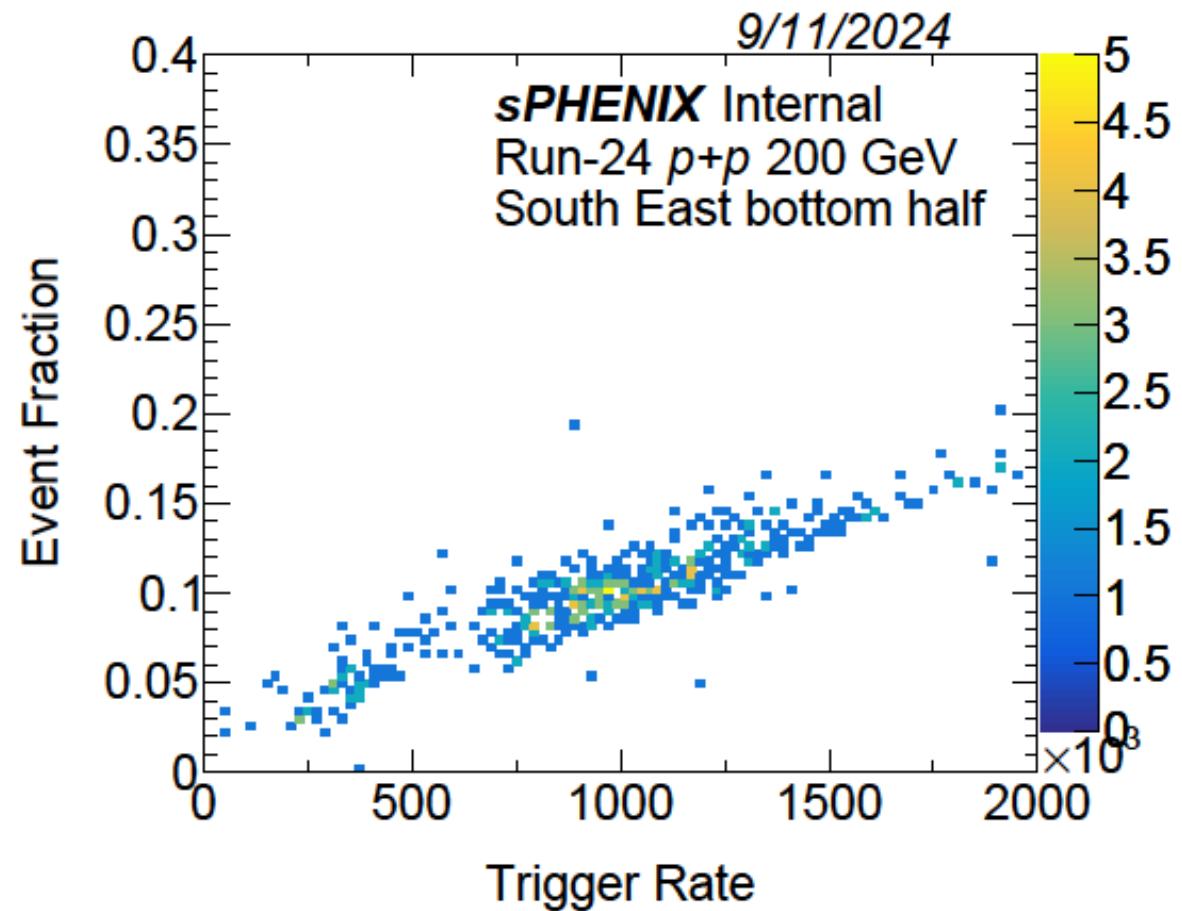
- Run type: physics
- Date : 2024/07/01 ~
- Mode : Trigger
- Duration : >10min
- Trigger Rate : Raw value of
   MBD N&S >= 1 in the database

Mixup Event fraction All Felix

Mixup hit fraction vs Trigger rate intt0

- Run type: physics
- Date : 2024/07/01 ~
- Mode : Trigger
- Duration : >10min
- Trigger Rate : Raw value of
  MBD N&S >= 1 in the database
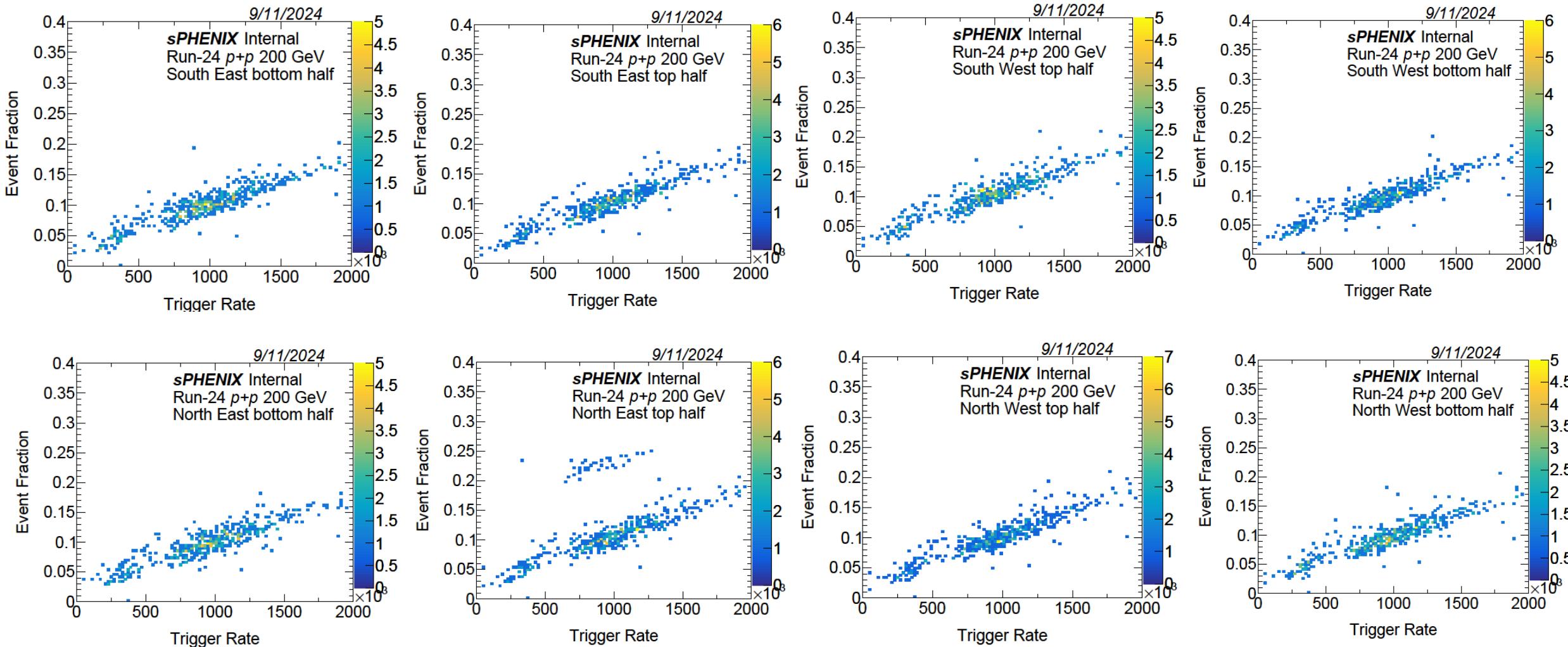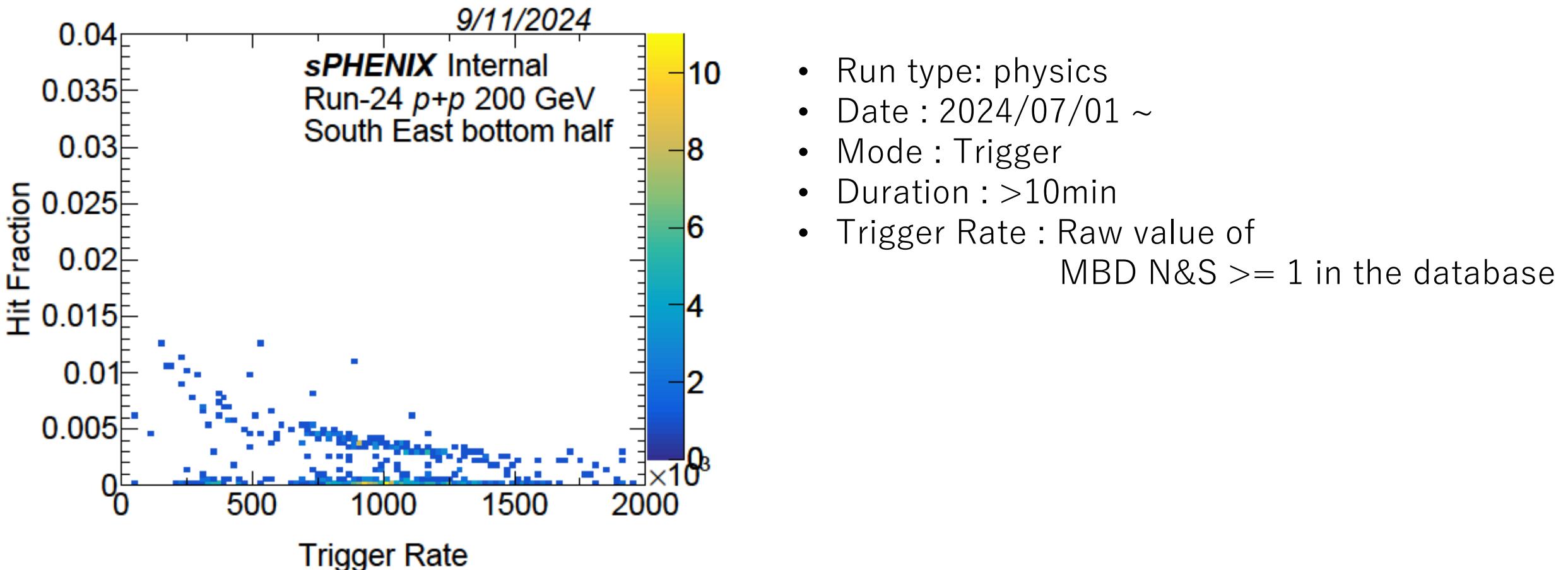
Mixup hit fraction vs Trigger rate All Felix