

**University of Cincinnati**

**NP04 Shorted Channels - Summary**

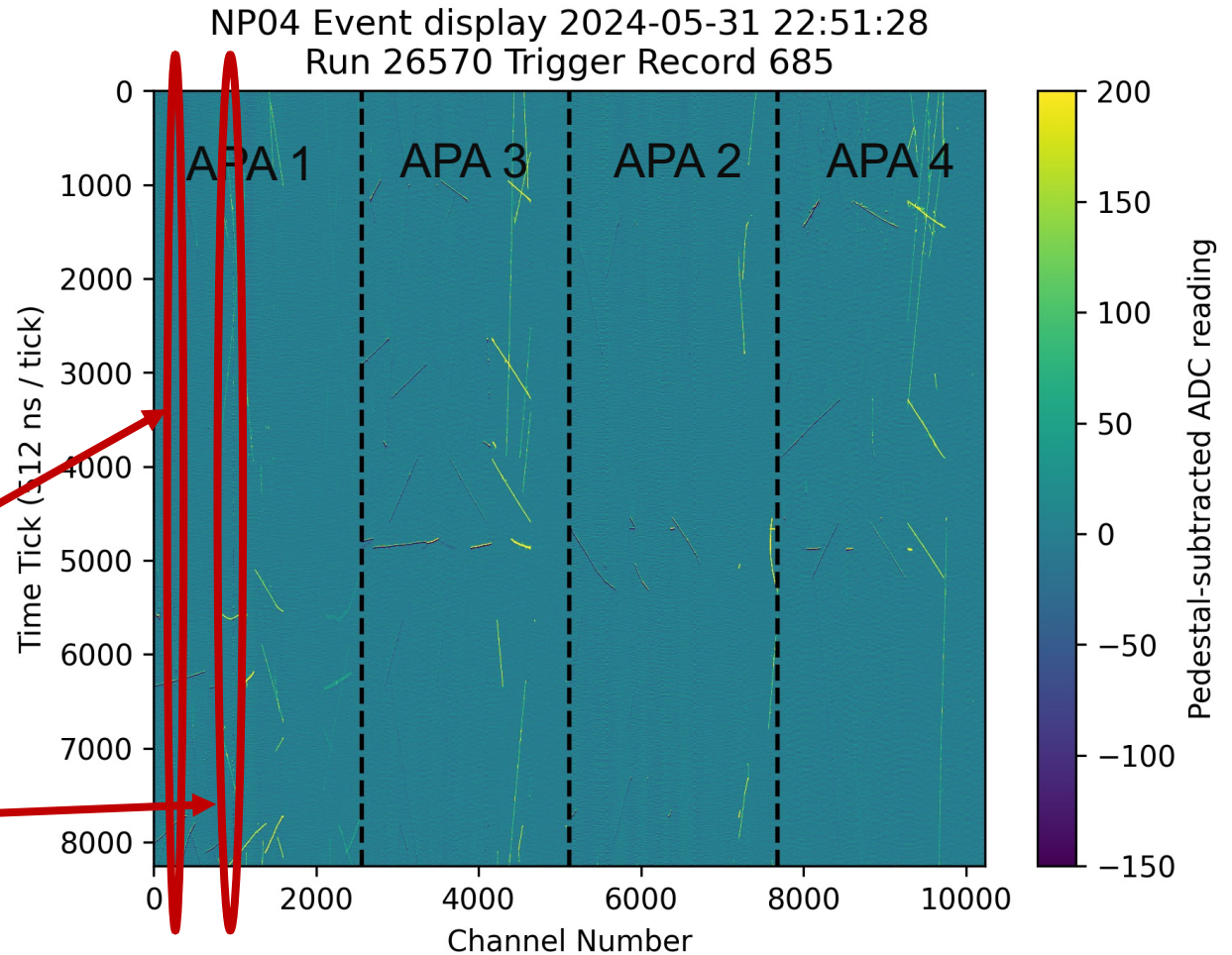
**Miriama Rajaoalisoa**

**BDE Consortium Meeting - June 11, 2024**

# Shorted Channels – May 31<sup>st</sup>

## NP04 - All APAs Event Display

- ▶ Several instances of shorted channels were seen on the APAs, especially APA1.
- ▶ Monitored APA shorts starting from May 31<sup>st</sup>.
- ▶ Event **26570** – Partial 5 – record Number 0 (Time 22:51:28)
- ▶ **Shorted Channels**
  - **APA 1**
    - **Channel 255**
    - **Channel 984**

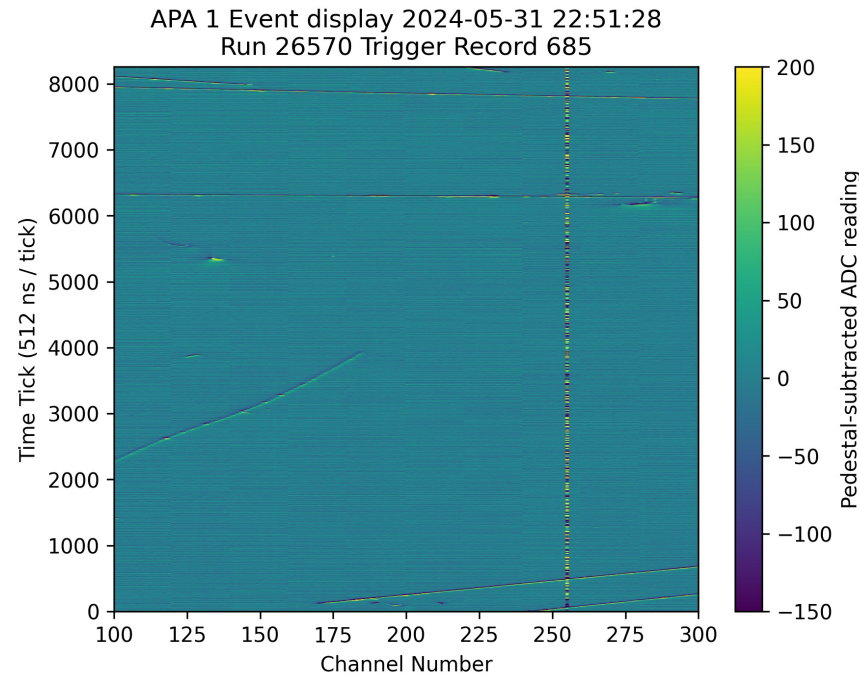


# Shorted Channels – May 31<sup>st</sup>

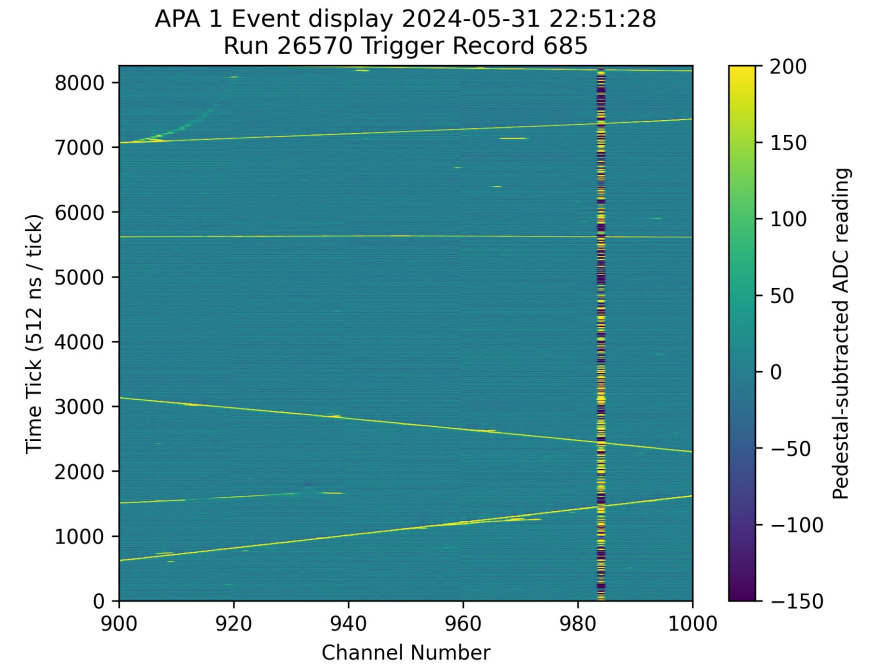
## APA 1

- ▶ Event **26570** – Partial 5 – record Number 0 (Time 22:51:28)

### APA 1 Channel 255



### APA 1 Channel 984



- ▶ The shorted channels persisted until Night of June 03<sup>rd</sup> to June 04<sup>th</sup>

# Shorted Channels – June 04<sup>th</sup> ~ 02:15 AM

## APA 1 New Shorted Channels

- ▶ At ~ 02:15 AM, there was a spike in the APA1 Trigger Primitives.

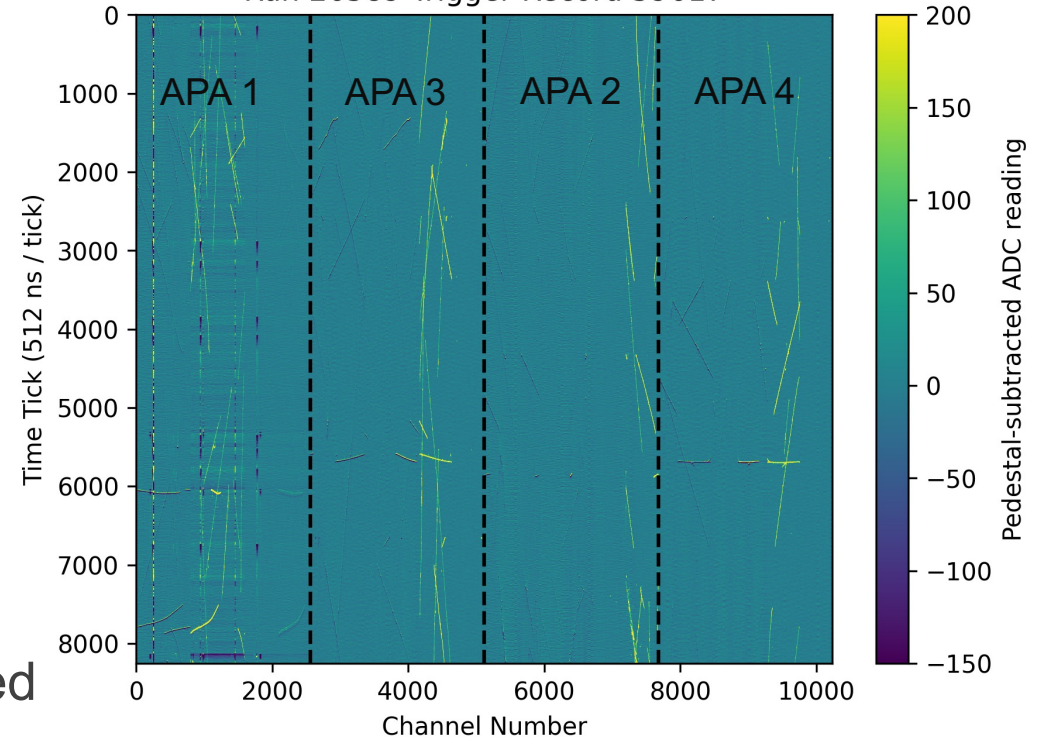
**Trigger Primitive Rates**



- ▶ Corresponded to the apparition of several other shorted channels on APA1, APA1 readout died afterwards.

- ▶ Event **26589** – Partial 400 – record Number 17 (Time **02:14:24**)

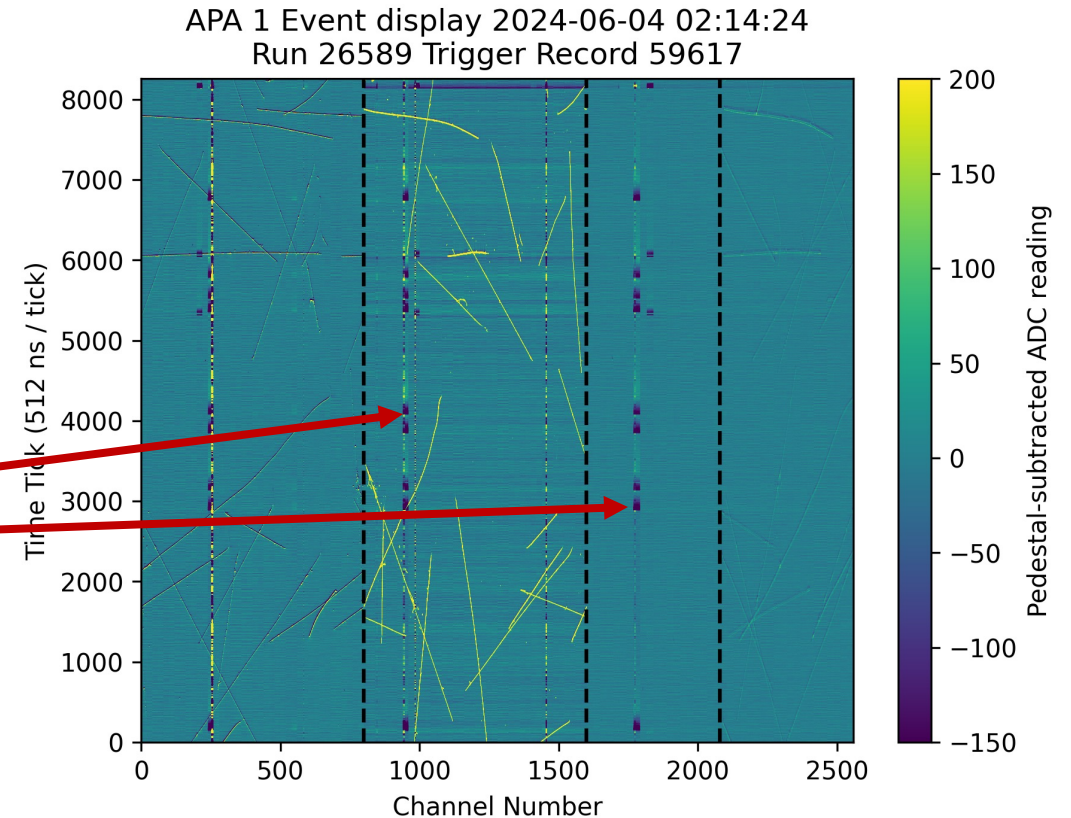
NP04 Event display 2024-06-04 02:14:24  
Run 26589 Trigger Record 59617



# Shorted Channels – June 04<sup>th</sup> ~ 02:15 AM

## APA 1 New Shorted Channels

- ▶ At ~ 02:15 AM, there was a spike in the APA1 Trigger Primitives.
- ▶ Event **26589** – Partial 400 – record Number 17 (Time **02:14:24**)
- ▶ Corresponded to the apparition of several shorted channels on APA1.
- ▶ Also corresponds to several instances of FEMBs getting negative pulses.

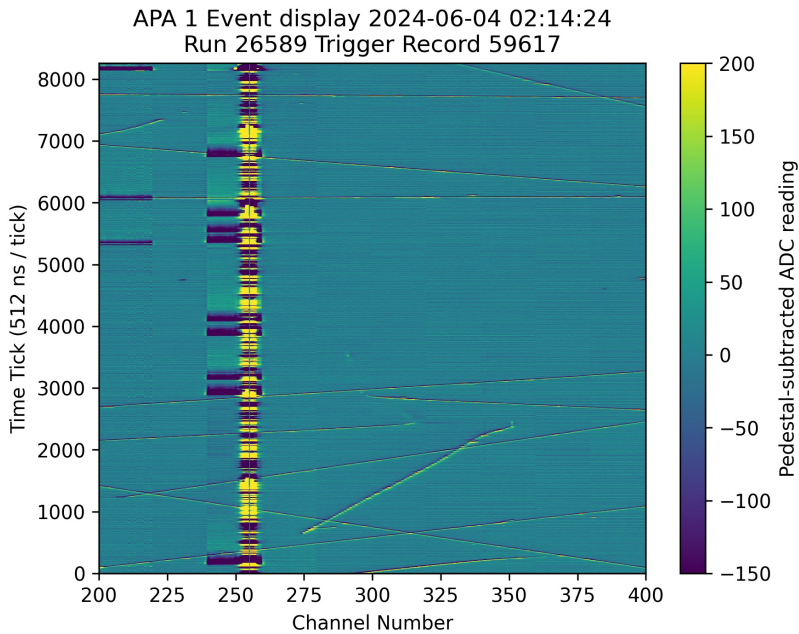


# Shorted Channels – June 04<sup>th</sup> ~ 02:15 AM

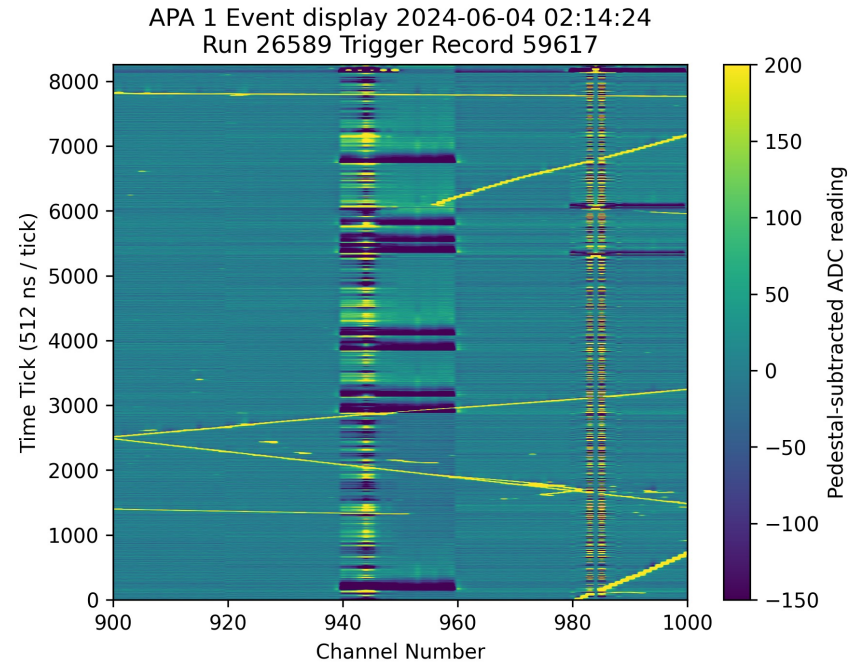
## APA 1 New Shorted Channels

- ▶ Event **26589** – Partial 400 – record Number 17 (Time **02:14:24**)

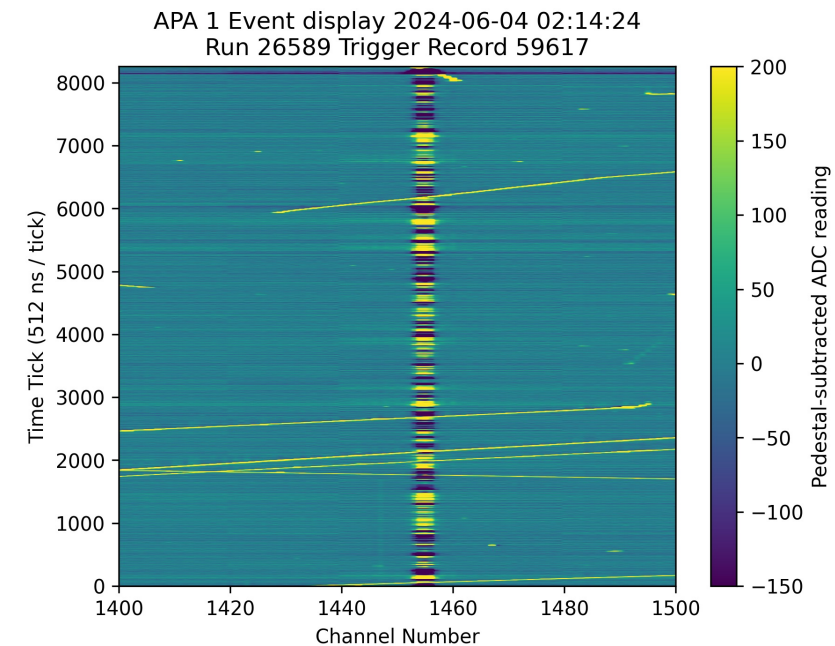
### APA 1 Channel 253,254,255



### APA 1 Channel 944, 981, 984



### APA 1 Channel 1454, 1456

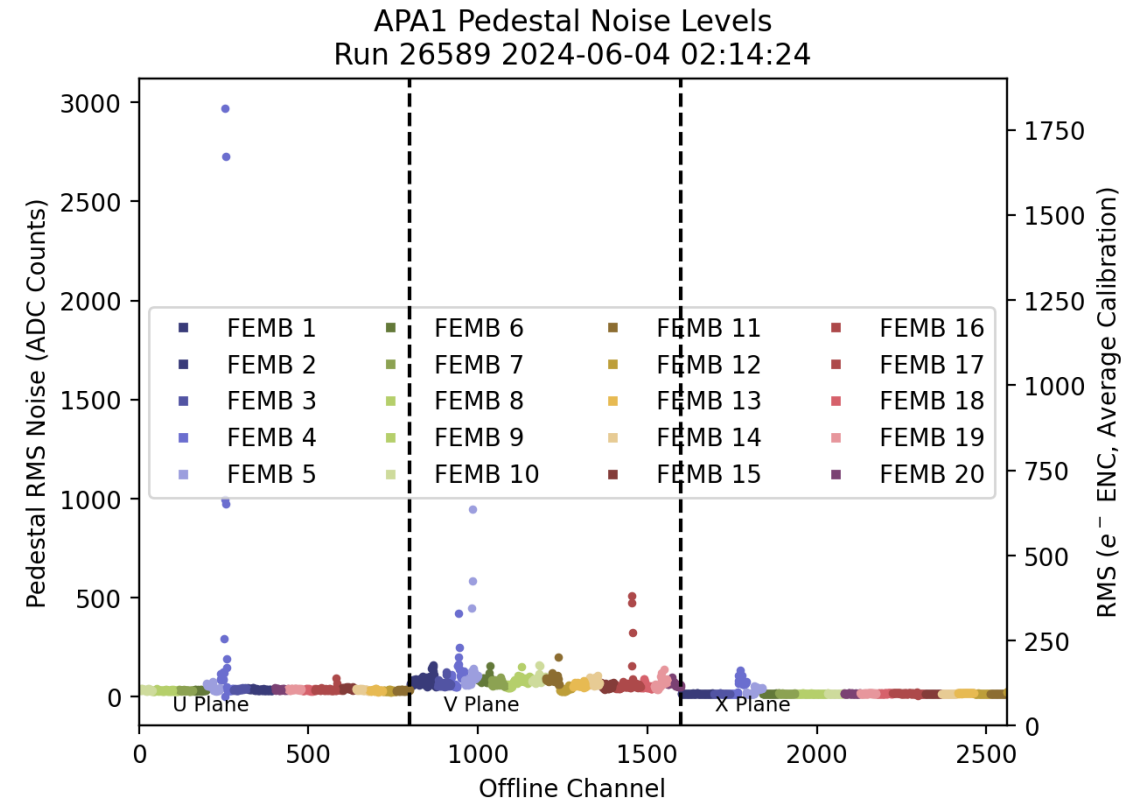


# Shorted Channels – June 04<sup>th</sup> ~ 02:15 AM

## APA 1 New Shorted Channels

- ▶ Event **26589** – Partial 400 – record Number 17 (Time **02:14:24**)
- ▶ APA 1 readout died at around 02:20 until around 09:00 AM.
- ▶ After it has been restarted, the shorted channels were no longer present (at around 10:00 AM).

## APA 1 Noise levels



# Shorted Channels – June 04<sup>th</sup> ~ 11:20 AM

## APA 1 New Shorted Channels

- ▶ At ~ 11:20, there was a spike in the APA1 trigger Primitives.

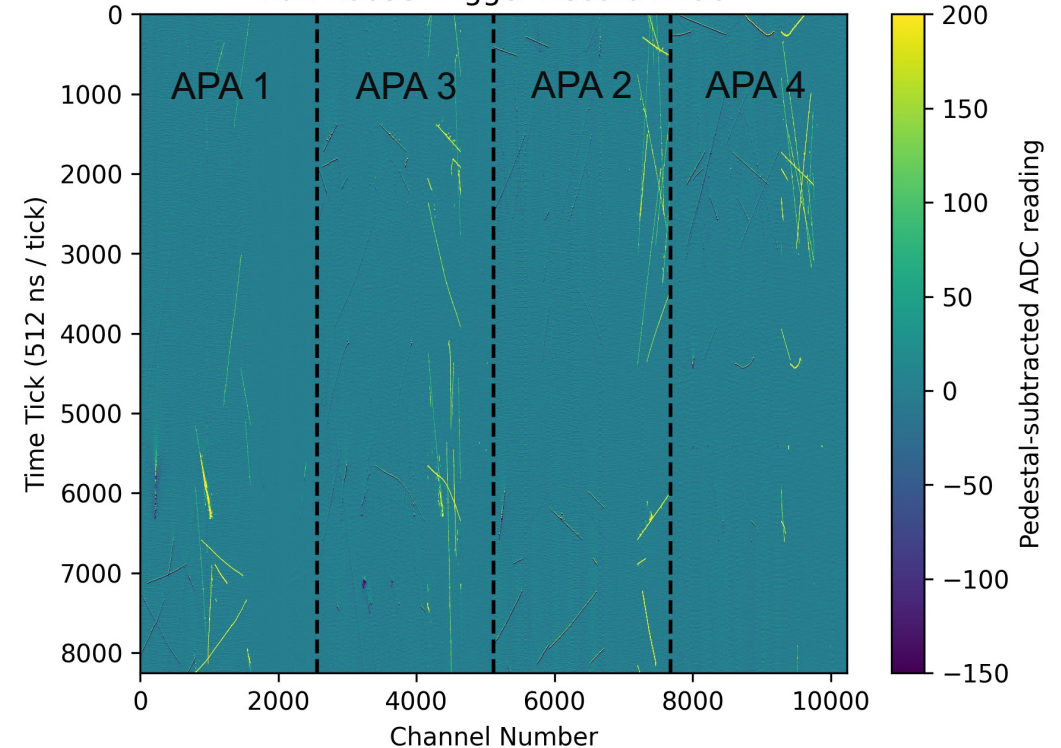


**Trigger Primitive Rates**

- ▶ Corresponded to the apparition of 2 shorted channels on APA 1, APA1 readout died afterwards.

- ▶ Event **26633** – Partial 8 – record Number 102 (Time **11:19:58**)

NP04 Event display 2024-06-04 11:19:48  
Run 26633 Trigger Record 1190





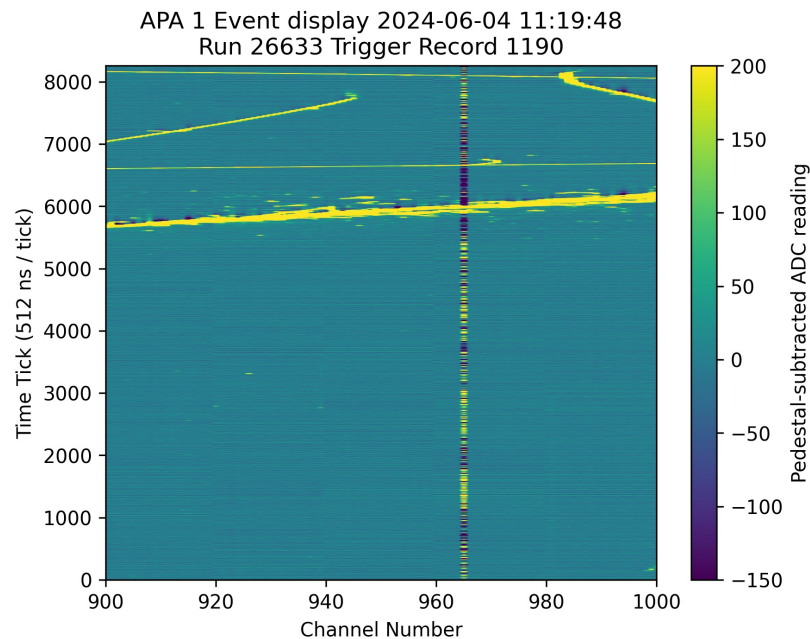
# Shorted Channels – June 04<sup>th</sup> ~ 11:20 AM

## APA 1 New Shorted Channels

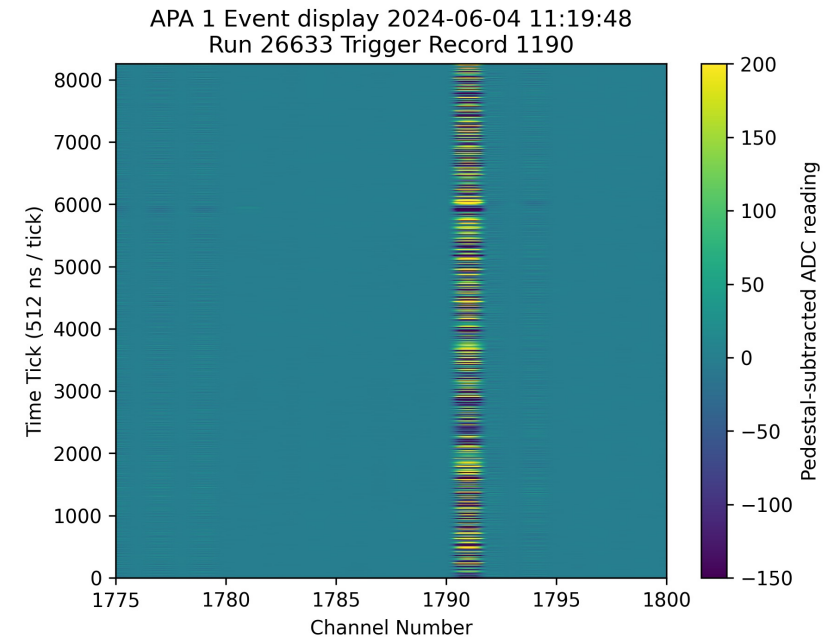
- ▶ Event **26633** – Partial 8 – record Number 102 (Time **11:19:58**)

**APA1 – Shorted Channels (Shorts appeared at 11:19 and disappeared at ~11:21)**

### APA 1 Channel 965



### APA 1 Channel 1791

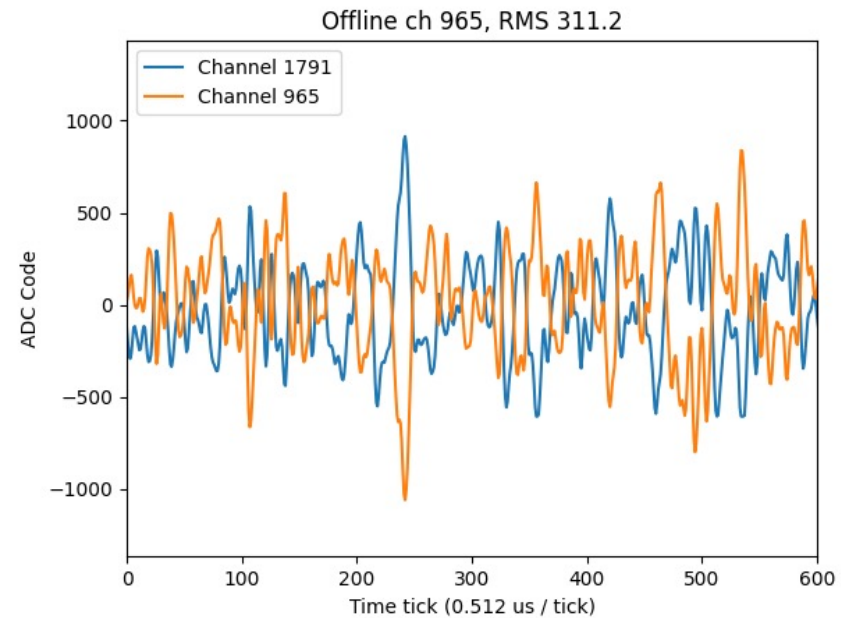
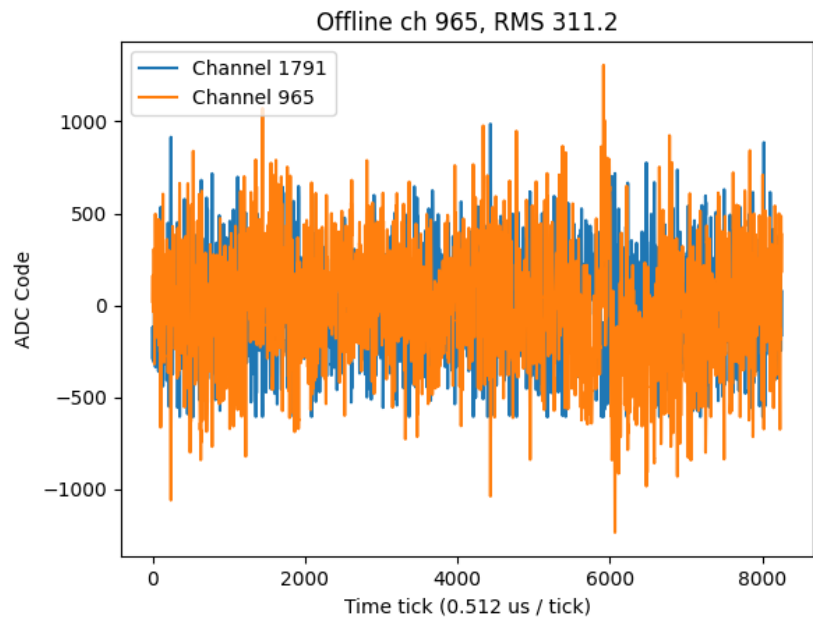


# Shorted Channels – June 04<sup>th</sup> ~ 11:20 AM

## APA 1 New Shorted Channels

- ▶ Event 26633 – Partial 8 – record Number 102 (Time 11:19:58)

**APA1 – Shorted Channels (Shorts appeared at 11:19 and disappeared at ~11:21)**



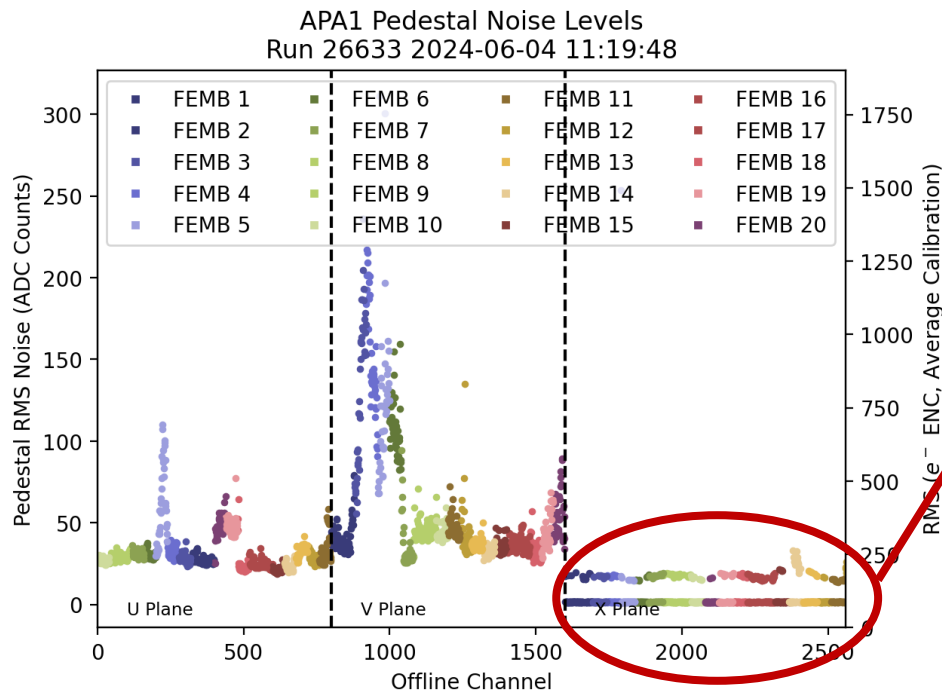
**Anti-correlated channels**

# Shorted Channels – June 04<sup>th</sup> ~ 11:20 AM

## APA 1 New Shorted Channels

- ▶ Event **26633** – Partial 8 – record Number 102 (Time **11:19:58**)

### APA1 – Noise level

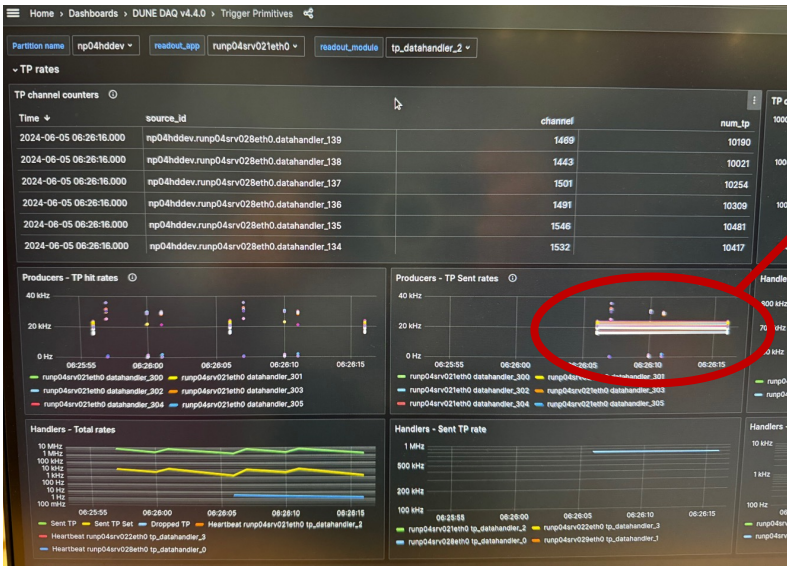


- ▶ Odd banded features on the APA 1 Collection plane.
- ▶ Channels with  $15 < rms < 22$  : **215 channels.**
- ▶ Channels with  $rms < 2$  : **745 channels.**
- ▶ The bands also disappeared when the shorted channels returned to normal.

# Shorted Channels – June 05<sup>th</sup> ~ 06:25 AM

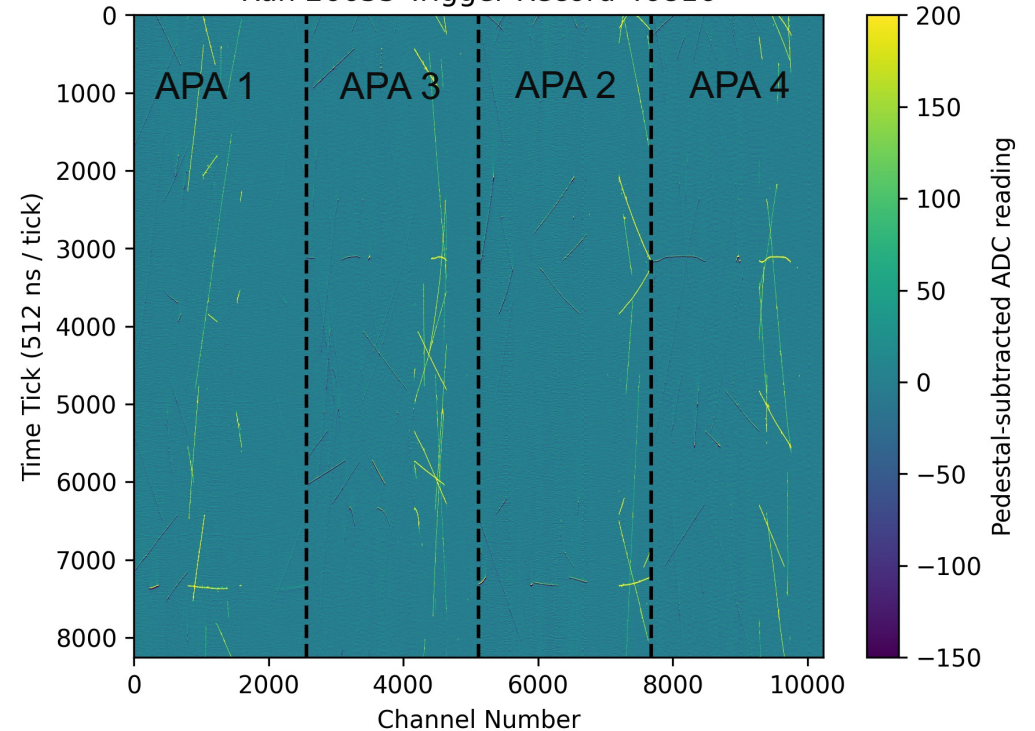
## APA 1 New Shorted Channel

- At ~ 06:25 for June 05<sup>th</sup>, there was some other spikes in the trigger rates.



- Event **26655** – Partial 352 – record Number 0 (Time **06:26:46**)

NP04 Event display 2024-06-05 06:26:56  
Run 26655 Trigger Record 46816



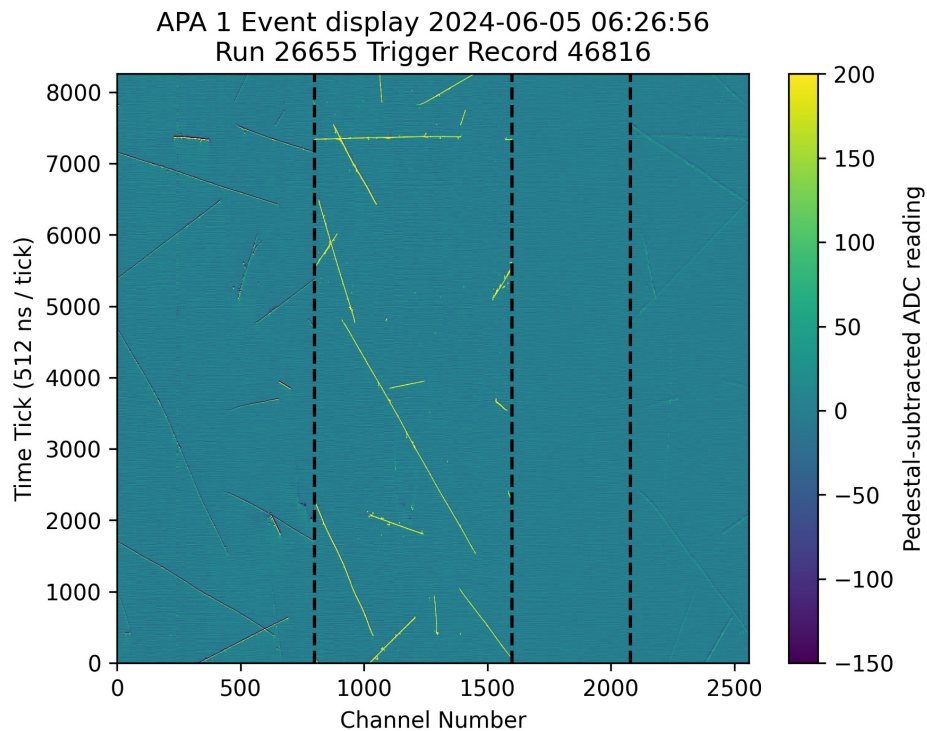
- Corresponded to the apparition of 1 shorted channel on APA 1.

# Shorted Channels – June 05<sup>th</sup>

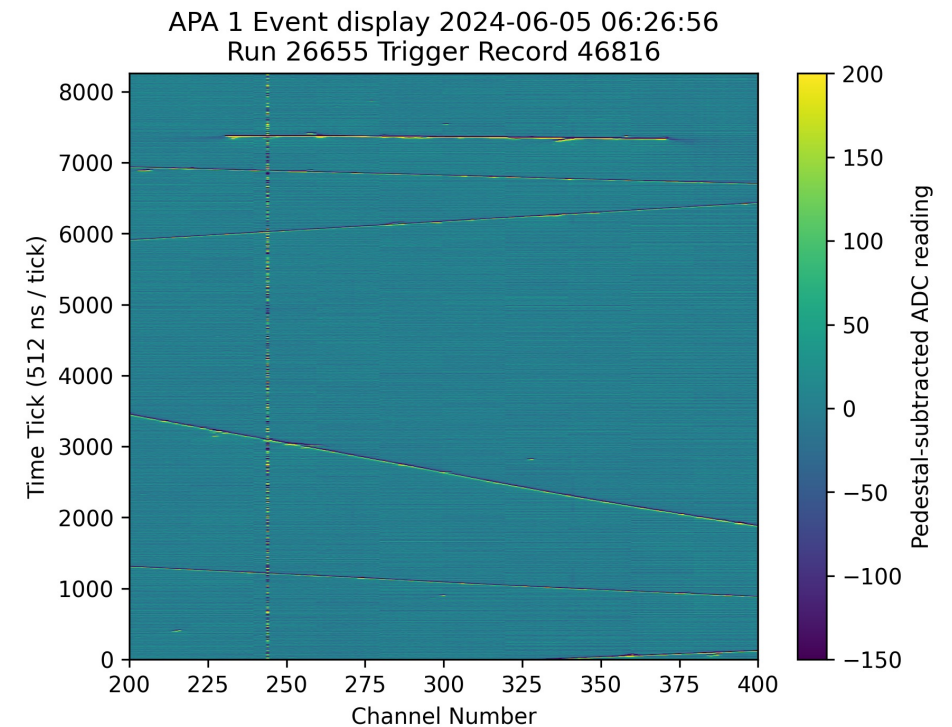
## APA 1 New Shorted Channel

- ▶ Event **26655** – Partial 352 – record Number 0 (Time **06:26:46**)

### APA 1 Event Display



### APA 1 Channel 244 (Still present until now)

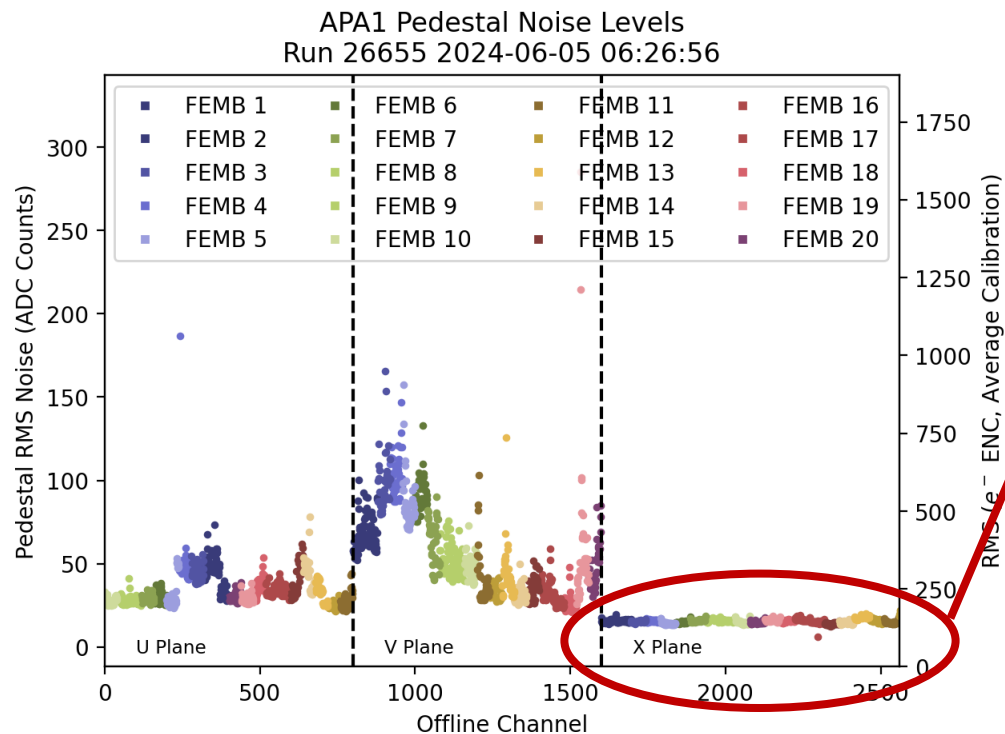


# Shorted Channels – June 05<sup>th</sup>

## APA 1 New Shorted Channel

- ▶ Event **26655** – Partial 352 – record Number 0 (Time **06:26:46**)

### APA 1 Noise Level



- ▶ APA 1 Collection channel has the usual distribution.
- ▶ **APA 1 Channel 244 is shorted (up until now).**

# Shorted Channels – Summary Table

| Date                     | APA Number | Channel Number | Time/Run issue is discovered                     | Time first appeared   | Time short disappeared        |
|--------------------------|------------|----------------|--------------------------------------------------|-----------------------|-------------------------------|
| 05/31/2024               | APA 1      | 255            | Run 26570 / Partial 5 / Record 0<br>(22:51:28)   |                       | ~Night of 06/03 - 06/04       |
|                          |            | 984            | Run 26570 / Partial 5 / Record 0<br>(22:51:28)   |                       | ~Night of 06/03 - 06/04       |
| 06/04/2024<br>~ 2:15 AM  | APA 1      | 253,254,255    | Run 26633 / Partial 8 / Record 102<br>(11:20:11) | 06/04 at around 11:19 |                               |
|                          |            | 944, 981, 984  | Run 26633 / Partial 8 / Record 102<br>(11:20:11) | 06/04 at around 11:19 | APA 1 readout died afterwards |
|                          |            | 1454, 1456     |                                                  |                       |                               |
| 06/04/2024<br>~ 11:20 AM | APA 1      | 965            | Run 26633 / Partial 8 / Record 102<br>(11:20:11) | 06/04 at around 11:19 | 06/04 at around 11:21         |
|                          |            | 1791           | Run 26633 / Partial 8 / Record 102<br>(11:20:11) | 06/04 at around 11:19 | 06/04 at around 11:21         |
| 06/05/2024               | APA 1      | 244            | Run 26655 / Partial 352 / Record 0<br>(06:26:46) | 06/05 at around 06:25 | Still Present                 |