



# Update on PXD Offline Calibration

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# Outline

- New features
- Status of pixel masking
- Studies on gain calibration
- Summary & outlook

# New features

- Airflow support for automated calibration (**release04-01**)
    - Dedicated python module for PXD calibration
    - Script for Airflow framework, handling run chunks and configurations
  - Issues/limits:
    - All data are grouped into run chunks
      - ▶ Cosmic, beam & physics runs require **different treatment**.
      - ▶ **Annealing** in gain calibration
    - *No enough data* or broken files in a run chunk will generate FAILURES
      - ▶ Will **prevent the processing** of calibration algorithms
      - ▶ Could be removed manually, but current Airflow framework will get stuck
  - Workaround:
    - Always sending good runs for calibration
    - Different calibration strategies for sorted chunks
      - ▶ Physics/beam: Sequential run-by-run strategy, several runs/IOV, the last IOV of each chunk is open
      - ▶ Cosmic data: Simple run-by-run strategy, only one run/IOV
- No gaps , but with overlaps**

# Status of pixel masking

- Local calibrations for Bucket8 (all runs in experiment 10) have been finished.
  - We also keep our **pxd\_calibration** GT up to date.
- However, the recent background study still showed strong noise component (-> Sally's talk).
  - Changing threshold ( $7 \rightarrow 3$ ) doesn't help
  - Gain study also showed the hint that the noise peak around 8 ADU may be coming from a few pixels near the masked gates.

# Gain calibration studies

- Track cluster study with  $\theta$  correction
  - Cluster charge will be normalised → More landau-like
  - Low statistics for bins in high V
  - Some bugs for regions with no enough data.
- Pixel level study
  - New figure of merit for gain comparison in a local region:
    - ▶ Seed probability for clusters with a certain size

# Summary & outlook

## ■ Summary

- In the past three months, Airflow related development is of the highest priority.
  - ▶ The test is still ongoing and PXD scripts work well so far
- The current hot pixel masking algorithm works fine (efficiency and noise tradeoff), but a dedicated algorithm aiming at cleanness is better for background studies.
- Full validation of gain calibration code has been resumed and more detailed studies are also in progress.

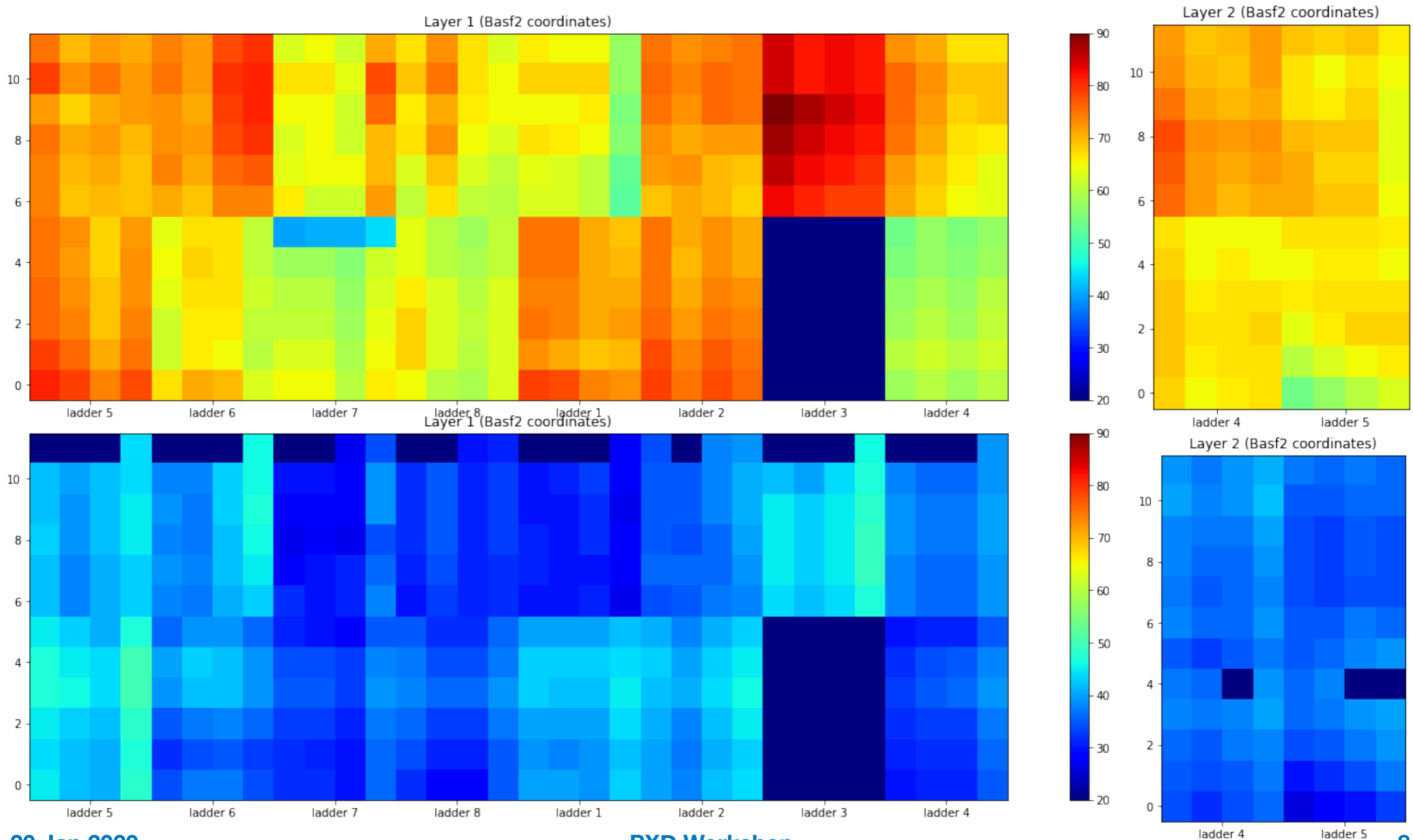
## ■ Outlook

- Track cluster charge distribution from MC
- Bug fixing in gain calibration code
- Request PXD clusters in CDST for post-tracking calibration

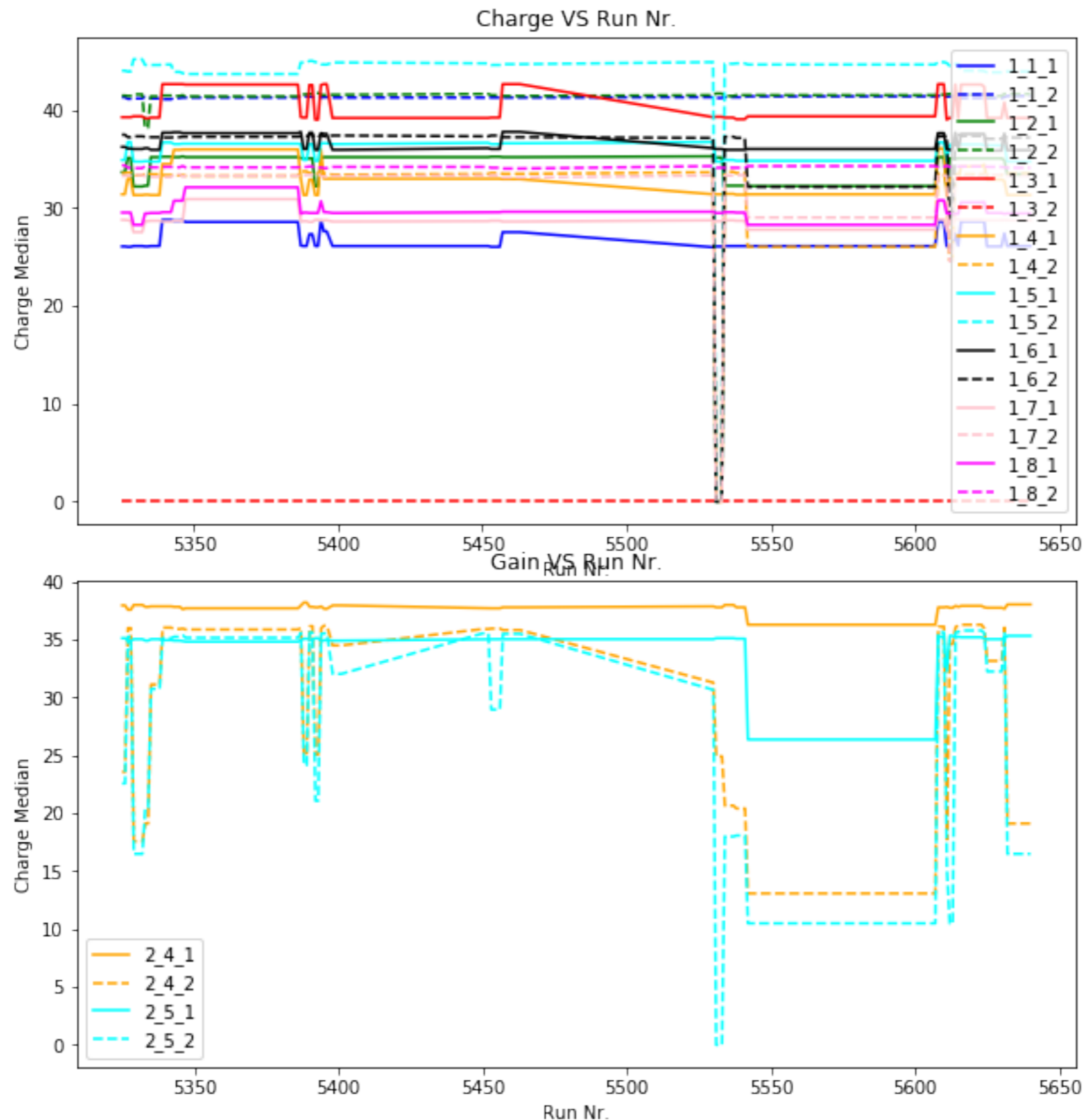
**Thank you!**

# Backups

- Cluster charge MPV before and after  $\theta$  correction (run 5401, e 10)

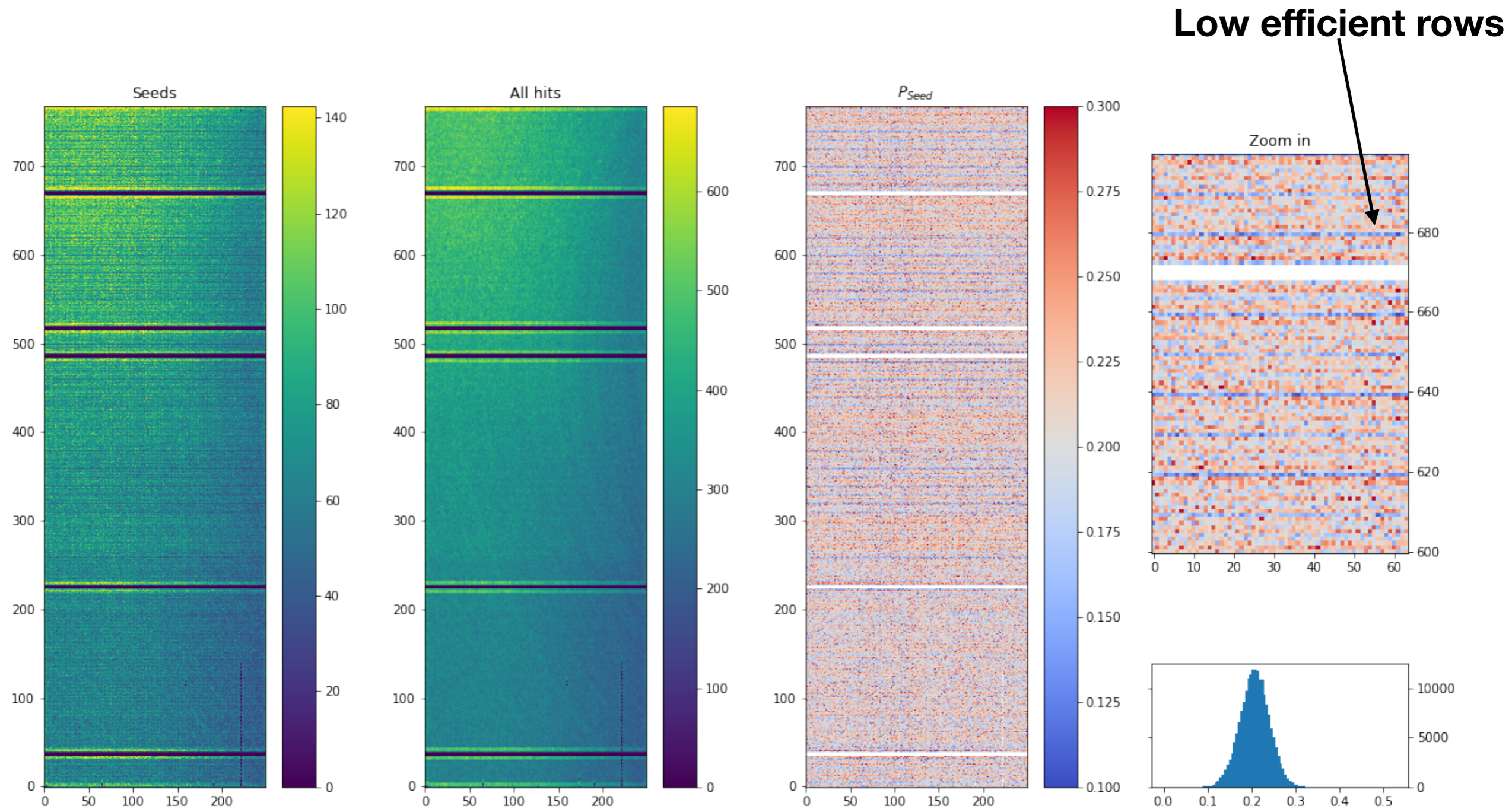


# Mean charge vs run No.



# Seed probability of clusters(size = 5)

No only track clusters (run 4700 - 4930)



# Seed charge distribution of single pixels

