First glimpse on Run4

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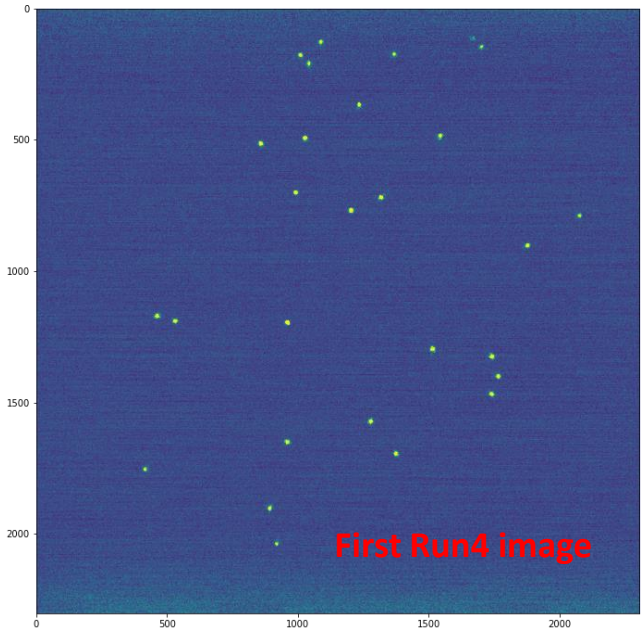
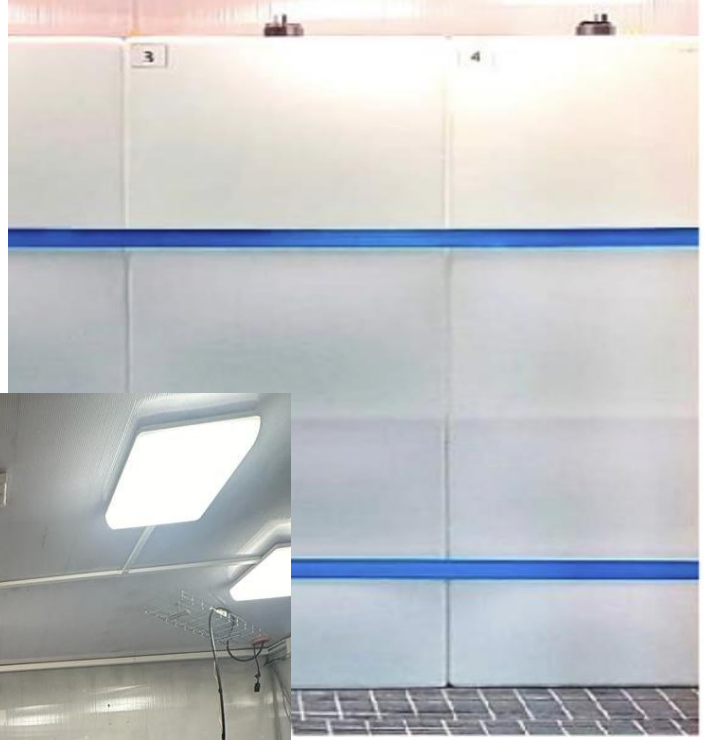
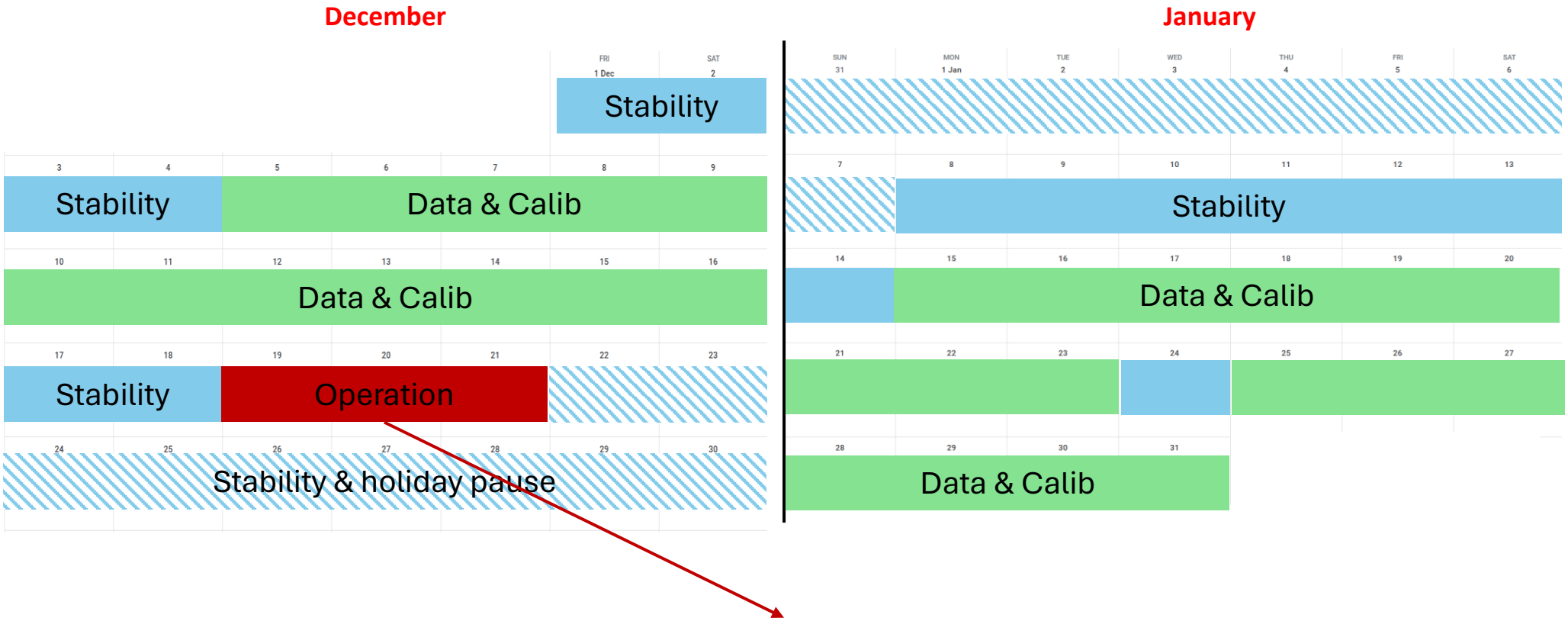
RUN4 TIMELINE

- Run3 ended on 16th Nov and the water shielding installation started immediately
- First data taken for Run4 on 1st December
- Decommissioning of the water shielding is happening now





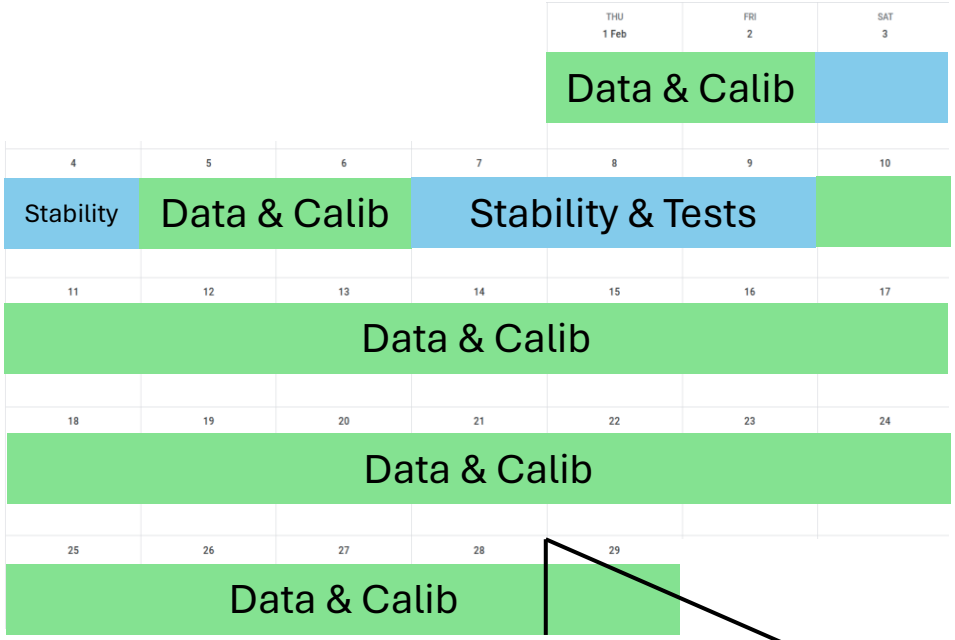
RUN4 DATA TAKING



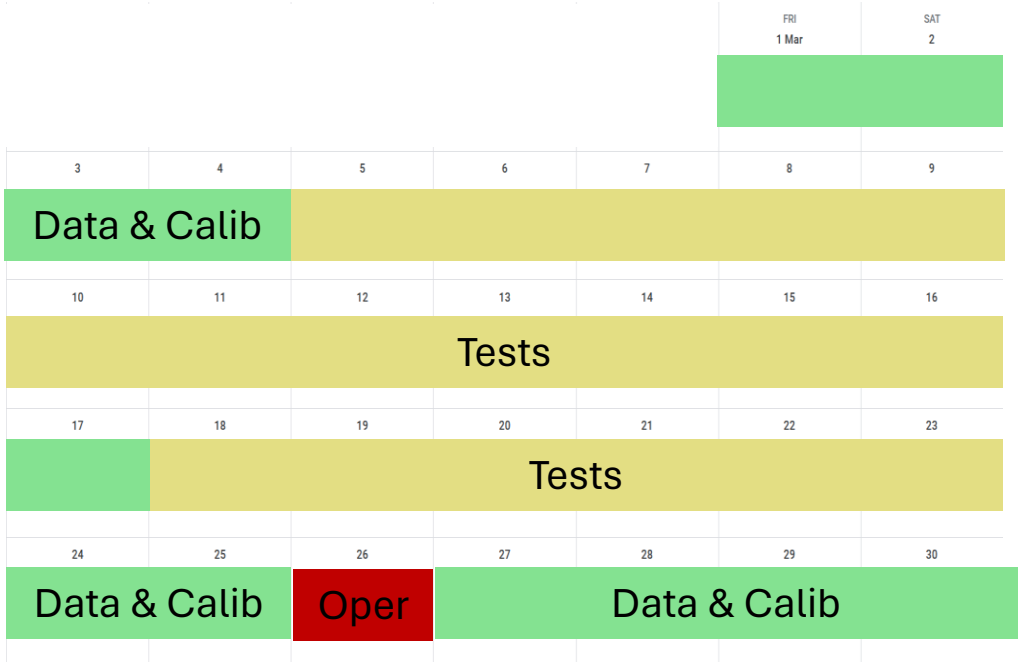
Key moment: Both humidity and oxygen filters employed in series

RUN4 DATA TAKING

February

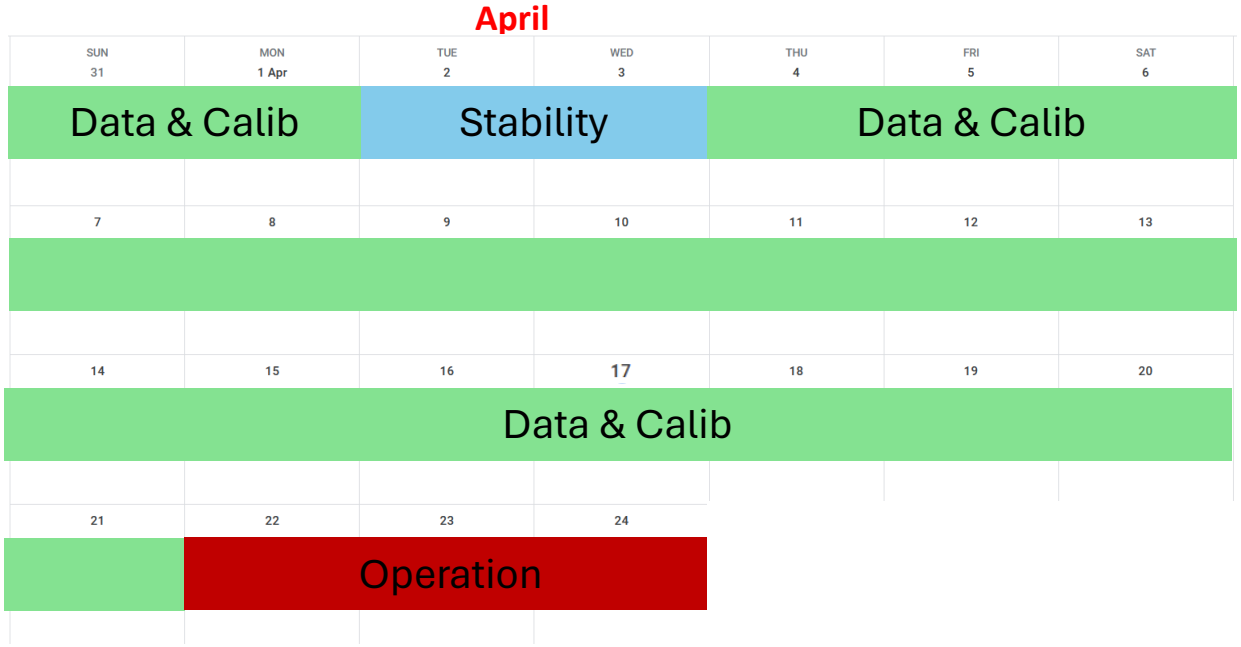


March



Key moment: PMT analysis integrated in the automatic reconstruction of the data

RUN4 DATA TAKING



- Long stretches of data collected in these 5 months
- Duty cycle around 95%
- High reliability of all components

2.8 * 10^6 pictures collected at a 0.9 Hz

Run3 had 2.7 * 10^6 pictures with 1.3 Hz rate and in one more month

REMOTE SHIFTS AND MONITOR

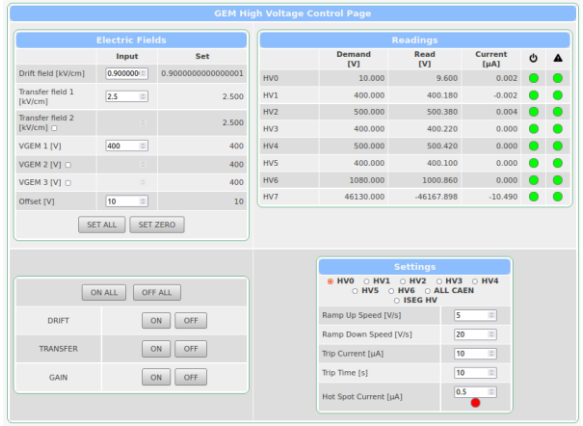
- The remote control system was improved and extended. Allows to check:

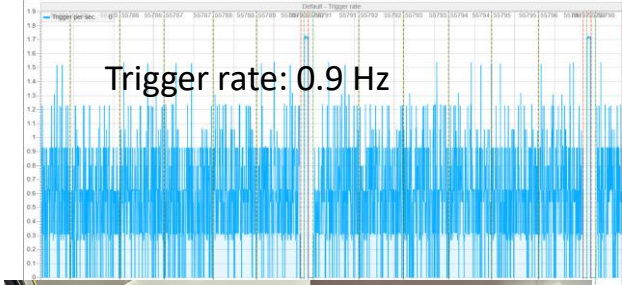
  Environmental variables

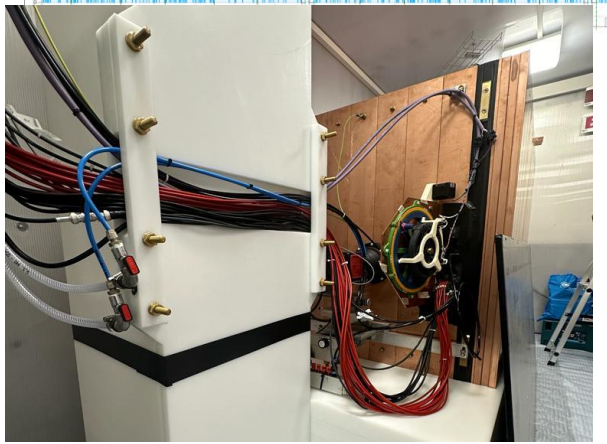
  HV currents and stability

  Step motor for dail scan calibration

  Trigger rate







- A complementary online monitor based on Grafana server was extended to grant monitoring without direct access to DAQ machines

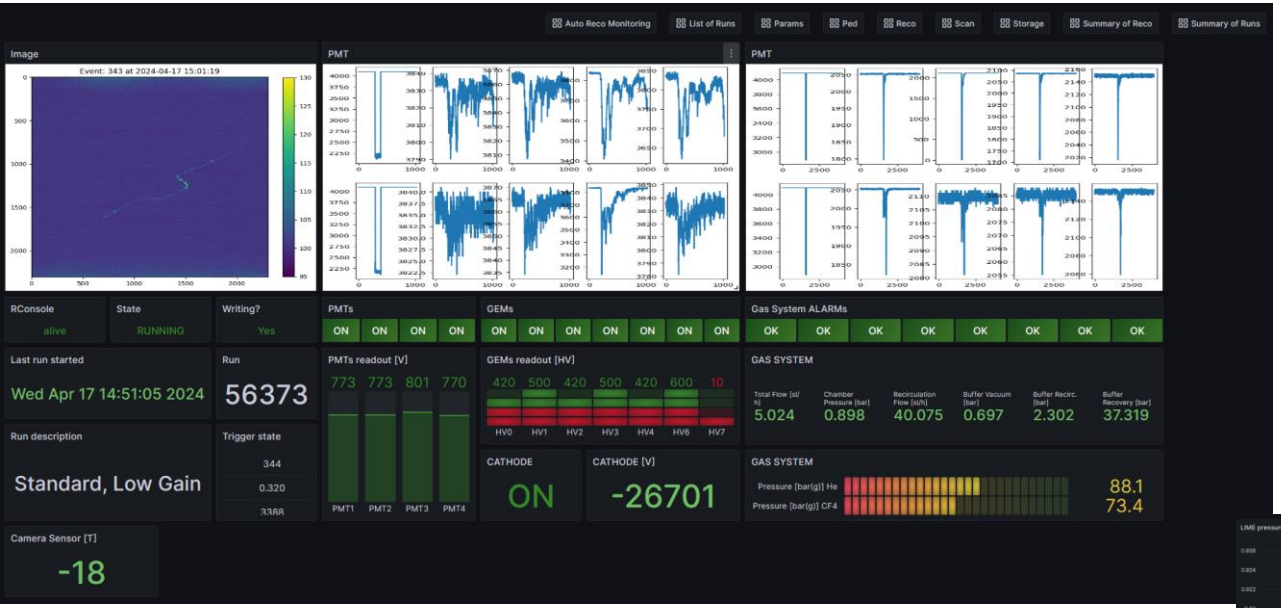
No in person shifter was required anymore

(except for gas bottle changes)

GRAFANA IMPROVEMENTS

- The Grafana-based monitor was extended and serves multiple purposes

Check on-line status



Current Run

HV status

Gas system

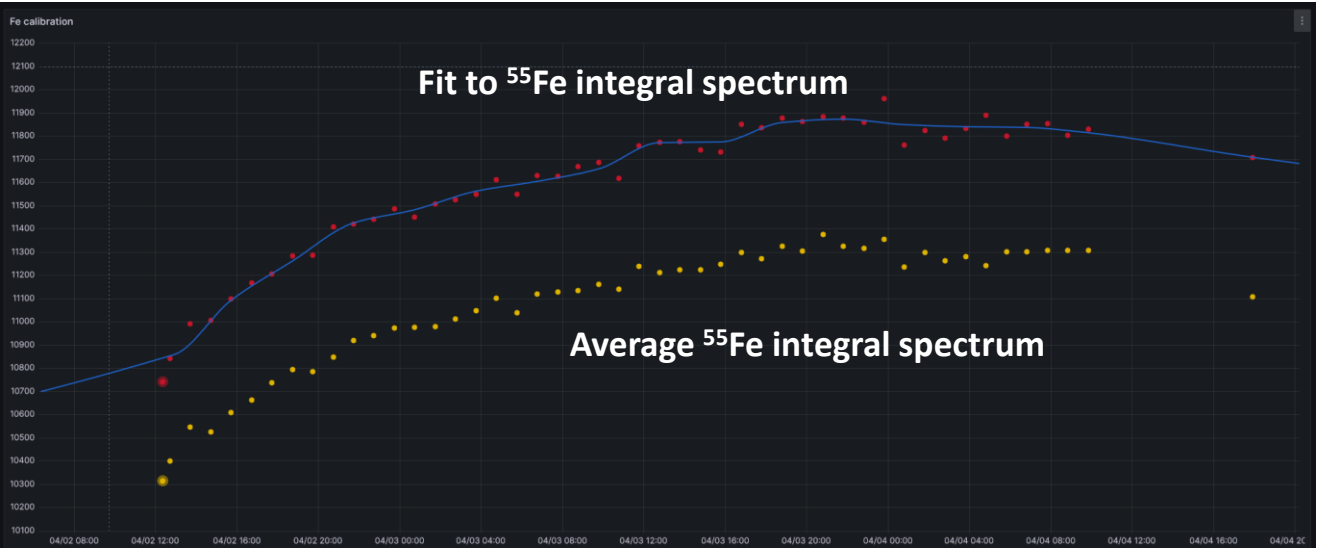
LIME pressure

GRAFANA IMPROVEMENTS

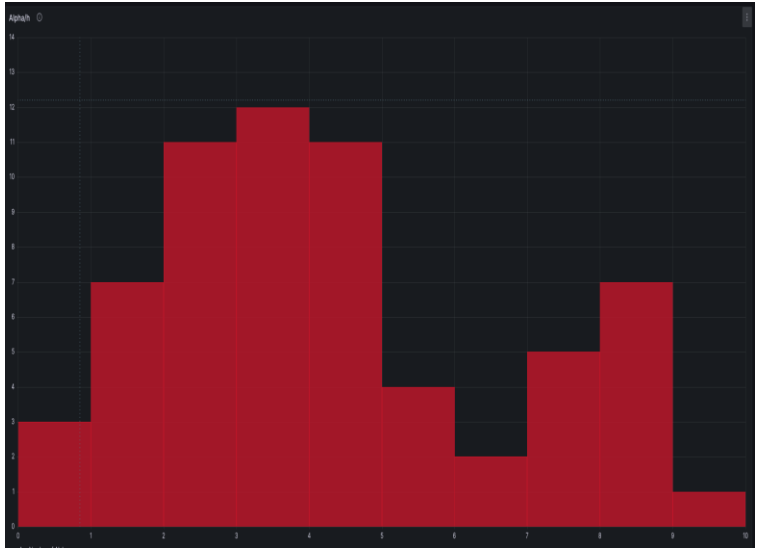
- The Grafana-based monitor was extended and serves multiple purposes

Exploit reconstructed files for small analysis

^{55}Fe calibration vs Time



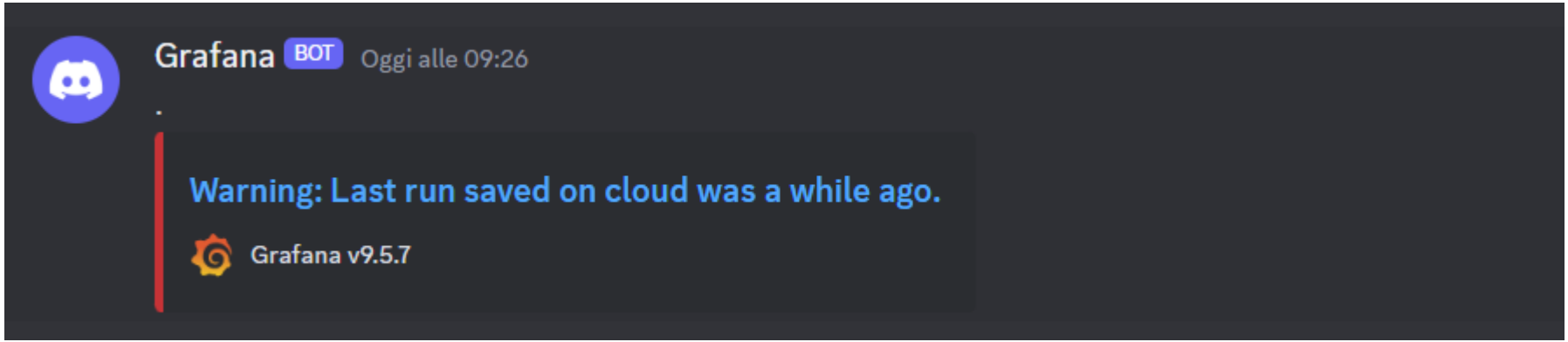
Alpha rate vs Time



GRAFANA IMPROVEMENTS

- The Grafana-based monitor was extended and serves multiple purposes

Send alarm to our Discord server

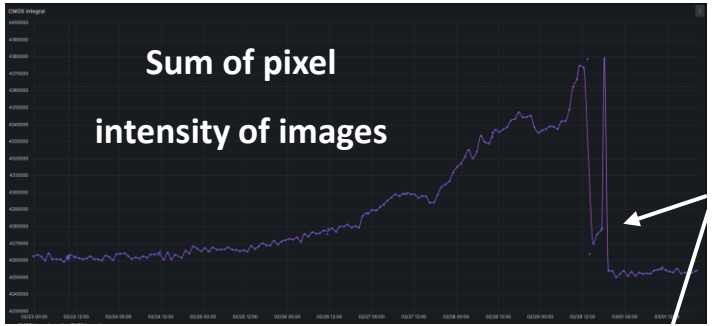


Example: the DAQ crashes and no new files are taken and uploaded to the cloud -> Alarm triggered

EXAMPLE: CAMERA TEMPERATURE

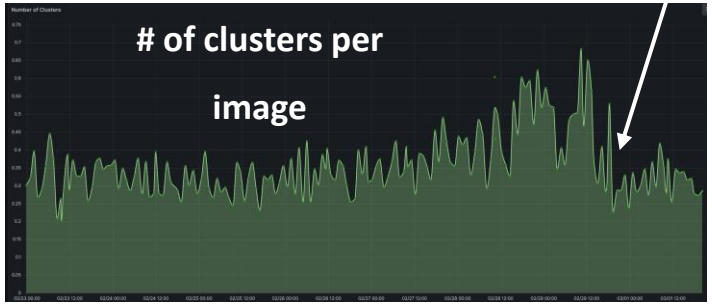
- This tool helped us to improve our response to detector issues:

We noticed the total counts of the camera pixels was increasing



Intervention

The average clusters found by the reconstruction algorithm increased too



More noise in the camera

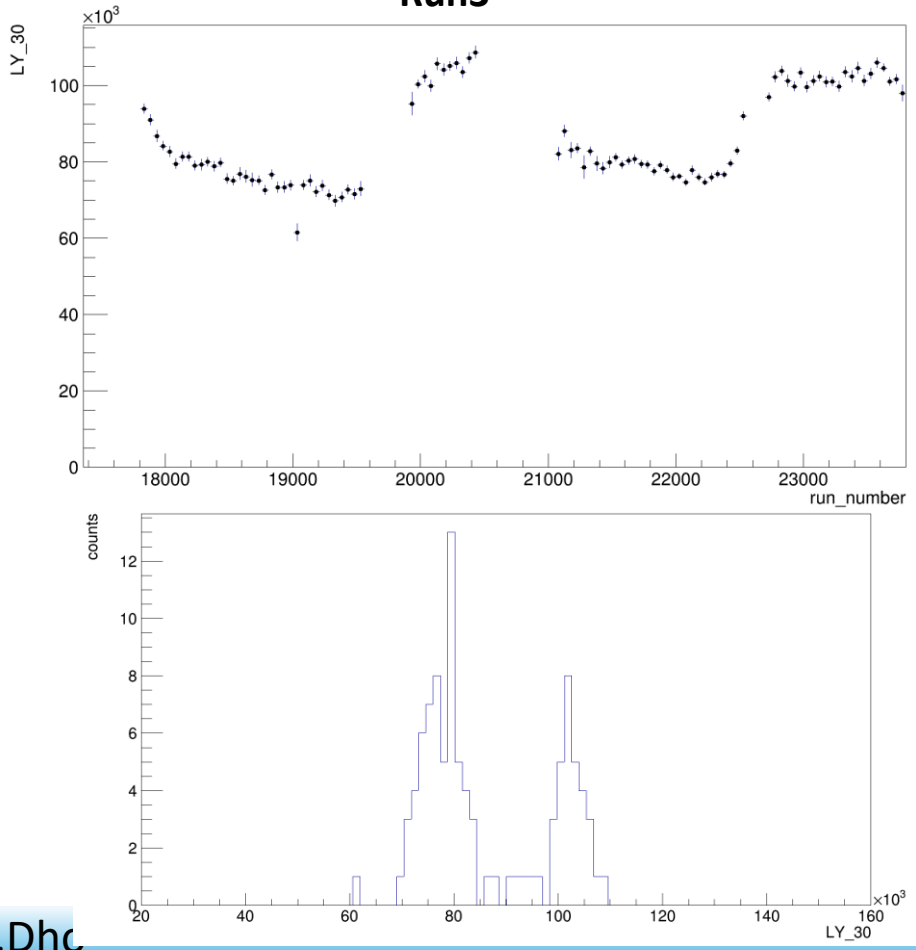
Thus, we found the water cooling of the sCMOS was not properly working and repaired it before it could affect the data

Light yield vs time

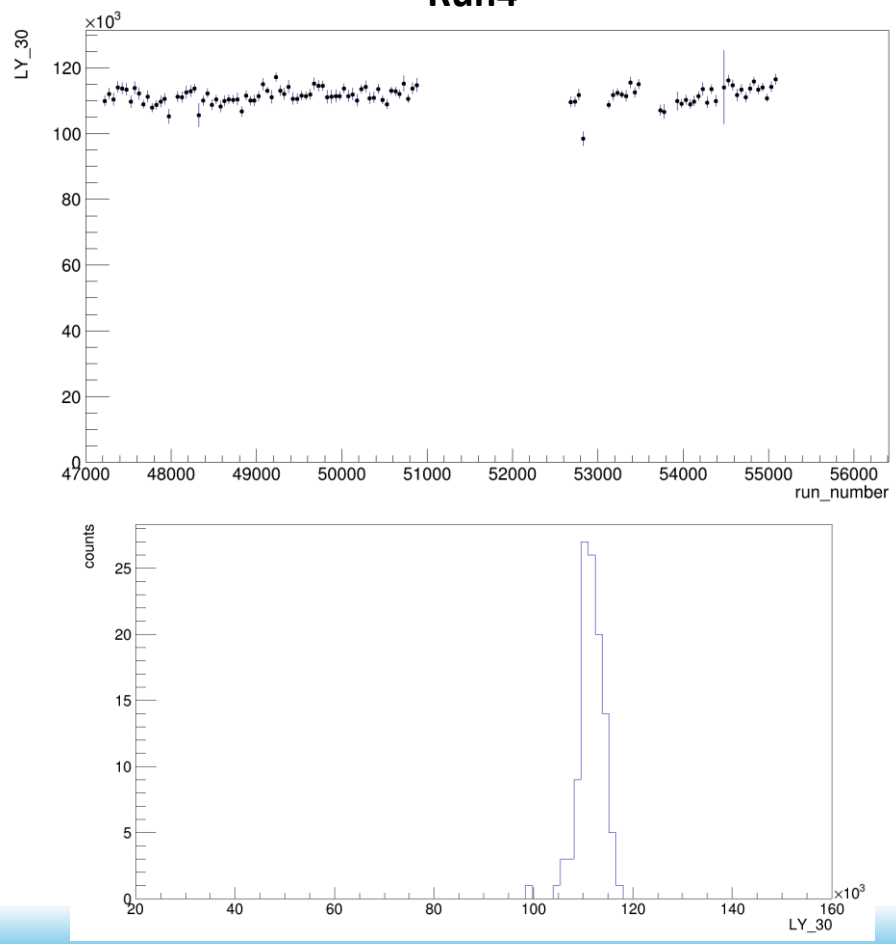
COSTANT LIGHT YIELD

- Given what was learnt from past Runs, Run4 was operated with rather constant light yield.

Run3

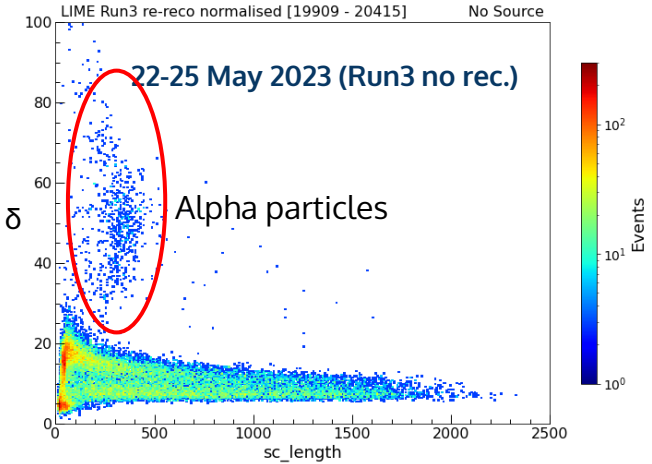


Run4

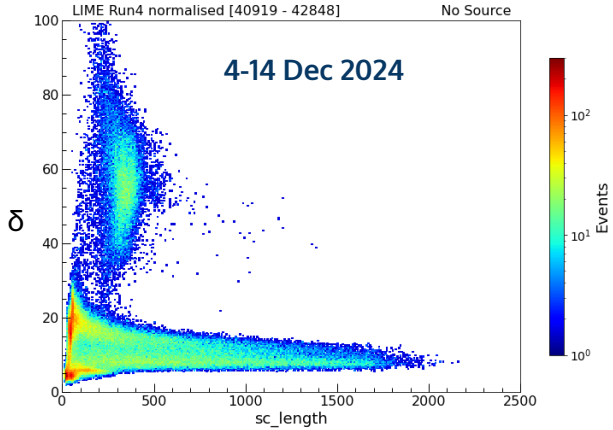


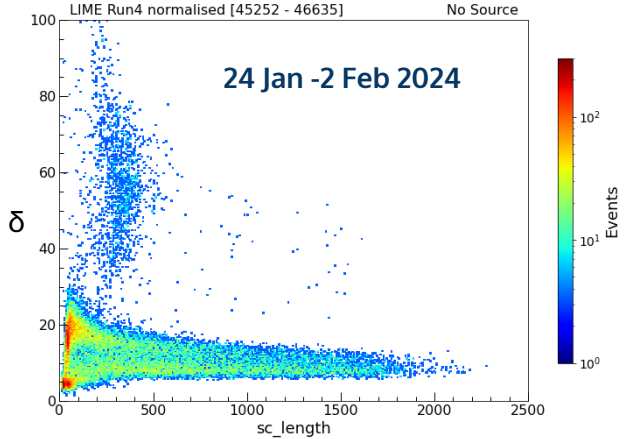
Alpha Rate Decrease

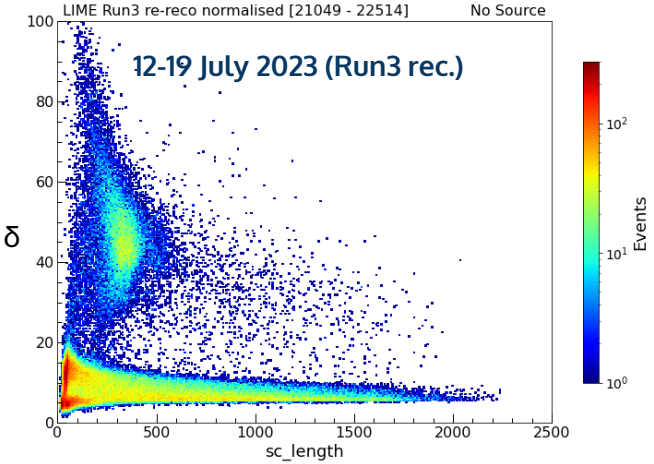
- We had a preliminary look at the reconstructed data. **Density vs length**

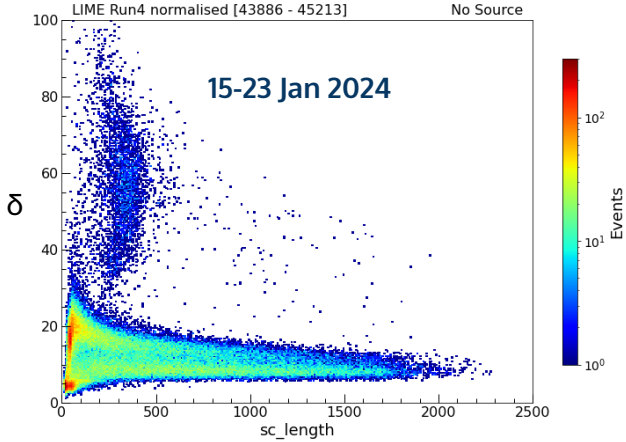


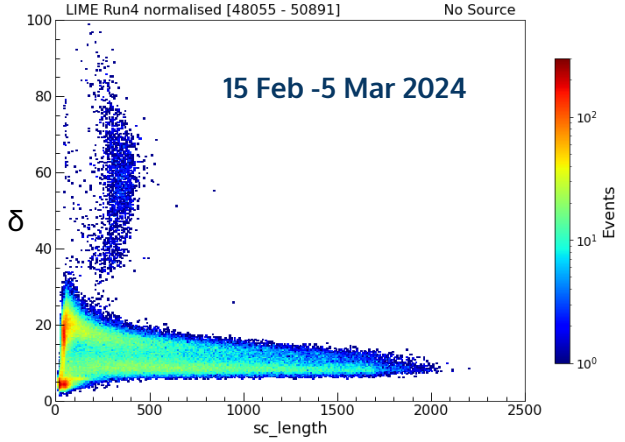
Run4 periods











ROUGH LOOK AT THE SPECTRA

- Only the quality cuts applied to the data (no extremely thin tracks, no borders)
- We can compare the light equivalent spectra (Run3 data set corrected for light yield difference and rate difference)