

# Run 2 - status

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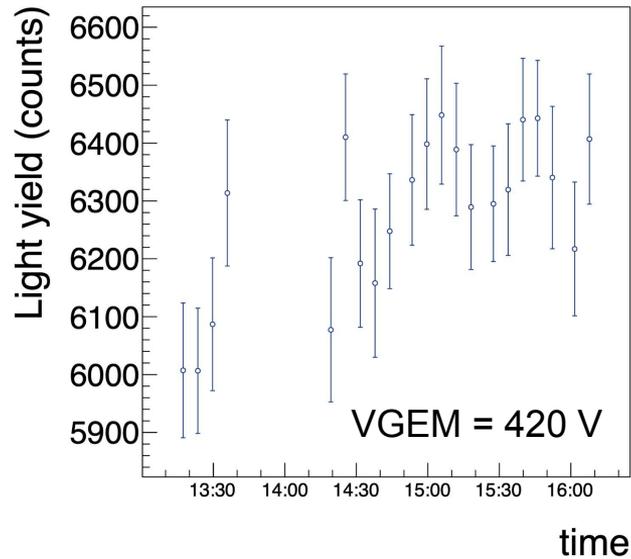
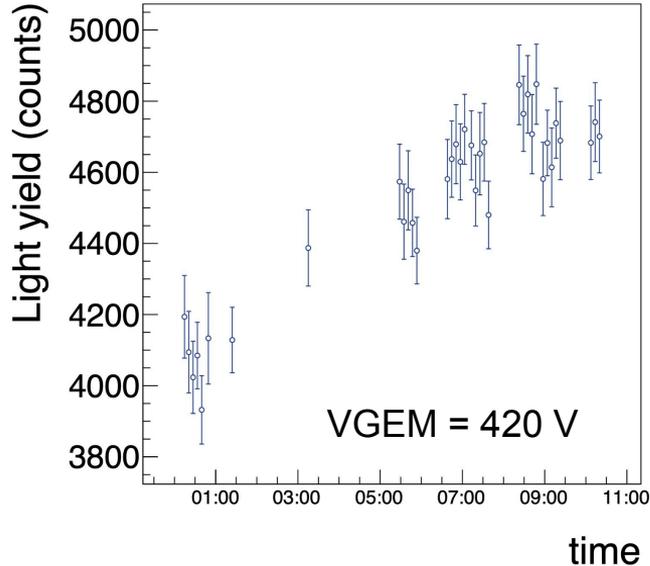
# Run 2 - History

## Start: Wed 15-02-2023

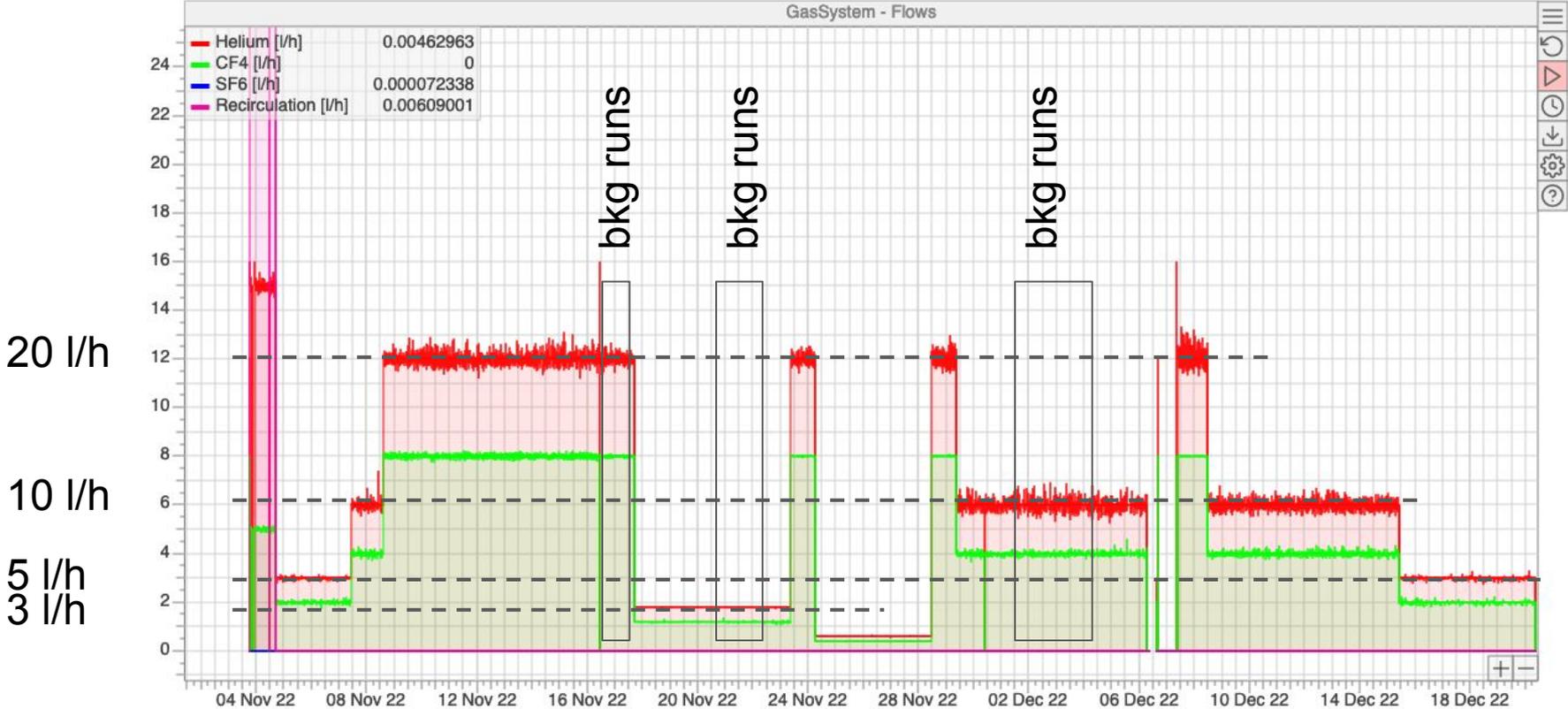
- Initial data-taking : flux @ 5 L/h VGEM = 420 V
  - Observed gain: 2.3 smaller than Run 1!!!
- We kept collecting data in different configurations of gas flow and VGEM up to  
**Mon 20-02-2023:**
  - with and without the  $^{55}\text{Fe}$  source
  - data collected with DTGZ offset 0 and -0.3
- Daily calibrations (scan in z with the source):
  - Fri 17-02-2023
  - Mon 20-02-2023
  - Tue 21-02-2023 with scan in VGEM for all z values
  - Wed 22-02-2023 [in progress!]

# Run 1 - History

In run 1, after the gas flux was set 20 l/h, we observed an increase of gain that lasted few days



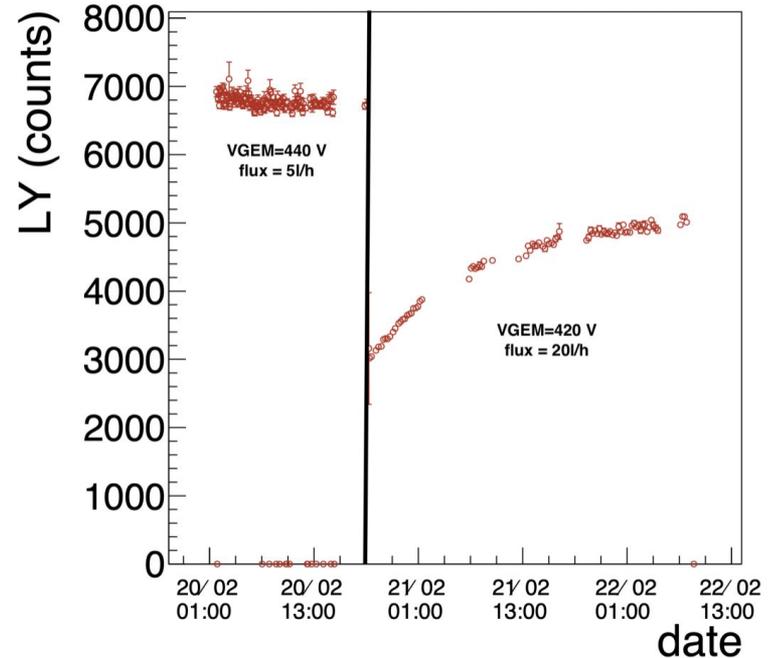
# Run 1 - Gas flux history



# The lower gain

We are investigating the reason for the lower gain, in particular:

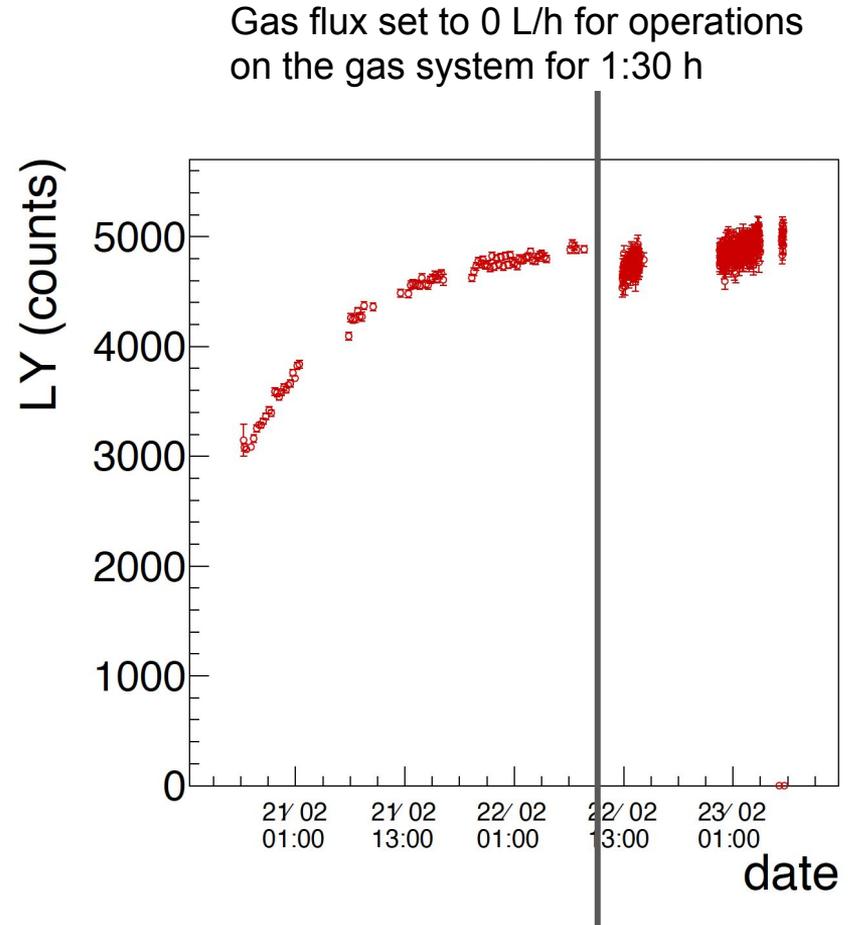
- @ 5 l/h we obtain a comparable gain wrt Run 1 only with VGEM = 440 V
- @ 20 l/h and VGEM = 420 V, we observe an increase in the gain with time



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- @ 5 l/h we obtain a comparable gain wrt Run 1 only with VGEM = 440 V
- @ 20 l/h and VGEM = 420 V, we observe an increase in the gain with time



# The lower gain: possible explanations

## 1. Overpressure between LIME and the copper shield:

- we are flushing air on the PMTs, to prevent possible He leakages to permeate the PMTs
- if the system responsible to avoid overpressure is not working, we can have air contamination inside LIME
- However **this is not the case! We measured it and everything is ok!**

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## 2. Humidity in the gas mixture. We measured the humidity with a sensor:

- @ 20 L/h:
  - i. LIME inlet = 0.0%\* - LIME outlet = 0.0%\*
  - ii. "Trolley" inlet = 15%\*
- @ 5 L/h:
  - i. LIME inlet = 4.0%\*

\* 4.0 % ~ 1000 ppm

# The lower gain: conclusions

- It is not correlated with overpressure in the space between the shield and LIME
- Is it correlated with humidity?

We will perform additional tests in the next days @ 5 L/h and 3 L/h to monitor humidity and gain.

- It seems that we are observing what we already experienced during Run 1. At that time, we reached a stable gain after ~ 1 week of gas flow @ 20L/h.

# Run 2 - Next steps

All runs reconstructed! (**winter23** branch of the reconstruction code)

## Physics:

- Finalization of VGEM and z scan
- Study the gain VS internal pressure
- As soon as the gain is stable: **golden (signal) run! [>48 h]**
- **Breaking news: AmBe during Run 3**

## R&D:

- Additional tests on the stability of the DAQ system
- Study the LIME gas tightness at very low gas flow