

Run 2 - status

S. Piacentini

09/03/2023

Run 2 - History

Legend:



Daily calibration

Specific measurements

LY stability studies



Relevant stops

Golden data

Week 1 and Week 2

Week 3 and Week 4

	Description	Fe source	Gas flow [l/h]	VGEM [V]	Run number
15-02 17:30 – to – 16-02 11:10	Start of Run 2	No	5	420	7792-7928
16-02 11:10 – to – 16-02 12:20	Calibration	Yes	5	420	7929-7935
16-02 12:45 – to – 16-02 15:40	Scan in VGEM ALL	Yes	5	///	7938-7954
16-02 16:15 – to – 17-02 10:10	LY vs time	Yes	5	440	7955-8169
17-02 10:10 – to – 17-02 11:05	Calibration	Yes	5	440	8170-8180
17-02 11:05 – to – 20-02 15:20	LY vs time	Yes	5	440	8181-9048
20-02 16:00 – to – 20-02 16:40	Calibration	Yes	5	440	9049-9055
20-02 19:10 – to – 21-02 09:35	LY vs time	Yes	20	420	9083-9134
21-02 09:35 – to – 21-02 10:25	Calibration	Yes	20	420	9134-9141
21-02 12:25 – to – 22-02 08:45	LY vs time	Yes	20	420	9171-9250
22-02 08:45 – to – 22-02 12:50	Technical operations	///	///	///	///
22-02 12:50 – to – 22-02 14:48	LY vs time	Yes	20	420	9251-9341
22-02 16:02 – to – 22-02 23:25	Scan VGEM 1	Yes	20	///	9352-9446
22-02 23:23 – to – 23-02 09:40	LY vs time	Yes	20	420	9447-9710
22-02 09:40 – to – 23-02 13:00	Scan VGEM 1	Yes	20	///	9711-9753
23-02 15:59 – to – 23-02 16:51	Calibration	Yes	20	420	9755-9762
23-02 16:51 – to – 23-02 18:10	LY vs time	Yes	20	420	9763-9773
23-02 18:10 – to – 23-02 19:20	Scan in pressure	Yes	20	420	9774-9783
23-02 19:25 – to – 24-02 08:33	LY vs time	Yes	20	420	9784-9850
24-02 08:35 – to – 24-02 09:10	Calibration	Yes	20	420	9851-9857
24-02 09:10 – to – 24-02 11:00	LY vs time	Yes	20	420	9858-9867
24-02 12:13 – to – 24-02 13:58	LY vs time	Yes	20	440	9872-9887
24-02 14:01 – to – 25-02 13:51	Golden	No	20	440	9888-10131
25-02 14:00 – to – 27-02 16:15	STOP	///	///	///	///

	Description	Fe source	Gas flow [l/h]	VGEM [V]	Run number
25-02 14:00 – to – 27-02 16:15	STOP	///	///	///	///
27-02 16:16 – to – 28-02 13:10	LY vs time	Yes	20	420	10345-10435
28-02 13:10 – to – 28-02 13:56	Calibration	Yes	20	420	10436-10443
28-02 13:56 – to – 01-03 09:58	LY vs time	Yes	20	420	10444-10518
01-03 10:00 – to – 01-03 21:09	Technical operations	///	///	///	///
01-03 21:09 – to – 04-03 09:52	STOP	///	///	///	///
04-03 09:52 – to – 06-03 11:25	LY vs time	Yes	20	420	11031-11279
06-03 11:25 – to – 06-03 12:17	Calibration	Yes	20	440	11281-11287
06-03 12:21 – to – 07-03 11:29	Golden	No	20	440	11288-11582
07-03 11:36 – to – 07-03 12:10	Calibration	Yes	20	440	11583-11589
07-03 12:18 – to – 08-03 16:48	Golden	No	20	440	11590-11951
08-03 16:48 – to – 08-03 17:36	Calibration	Yes	20	440	11951-11958
08-03 17:36 – to – 09-03 09:55	Golden	No	20	440	11959-12165
09-03 09:55 – to – 09-03 10:30	Calibration	Yes	20	440	12168-12174
09-03 10:30 – to – 09-03 11:30	Golden	Yes	20	440	12175-xxxxx

To do list before closing:

1. Scan in VGEM 1 and z
2. LY vs gas flow

Trigger configuration

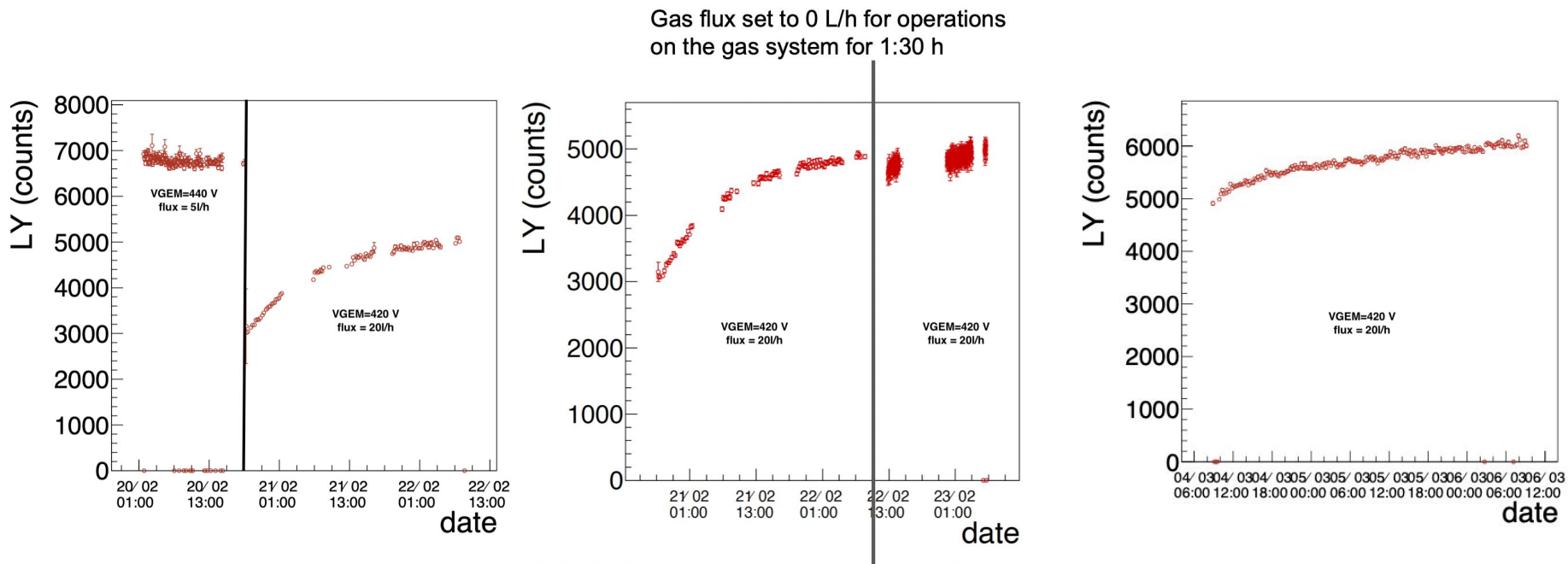
- PMT coincidence logic:
 - Coincidence of at least 2 PMTs
 - Discrimination threshold of 2 mV
 - Veto of 100 us between subsequent signals
- Trigger logic: the AND of the following 3 signals
 - Camera sensor exposed (CAM_EXP)
 - PMT coincidence
 - DAQ not busy

Observed trigger rate without Fe source [RUN 2]: ~ 3-4 Hz - From simulation expected 1.1 Hz

Observed trigger rate without Fe source [RUN 1]: ~ 34-35 Hz - From simulation expected 37 Hz

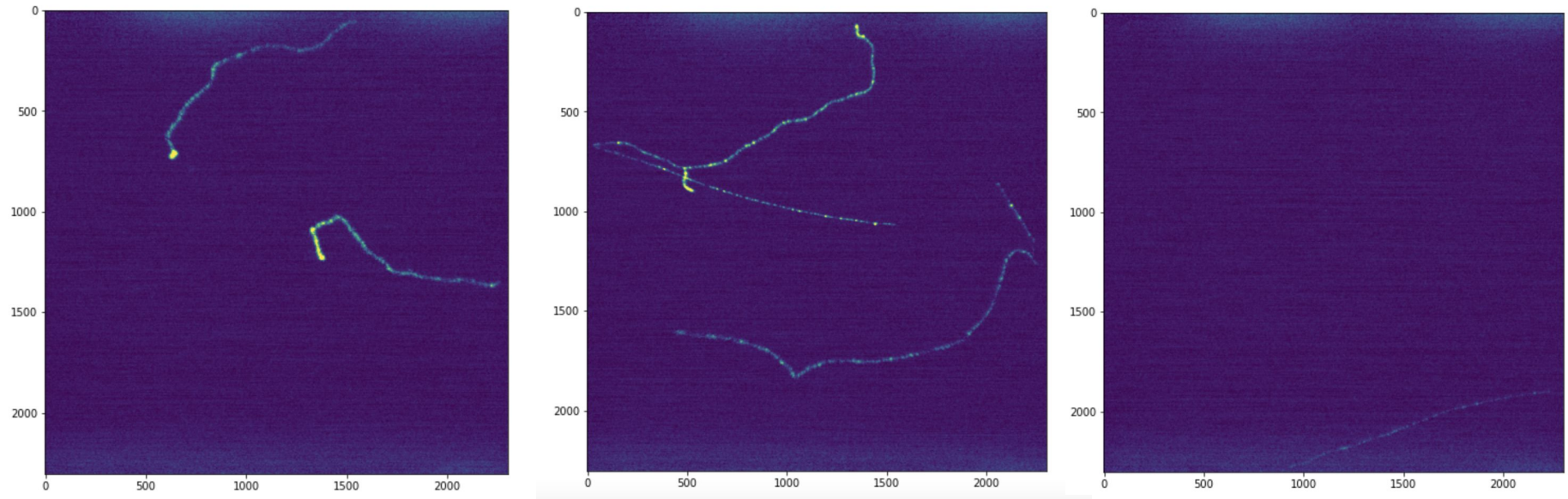
Observed light yield

With equal conditions (gas flow, VGEM, drift field, etc) RUN 2 showed a **smaller light yield** with respect to RUN 1.



The golden dataset

- ~ 1104 runs equivalent to ~ 400k pictures with an exposure of 300 ms
- We acquired just in the last 3 days ~350k of events (~ 5.4 k events/h)



Improvements with respect to RUN 1

- We now have the possibility to acquire the fast digitizer (V1742) with an **offset different from 0**.
- Midas **logger is no more failing**, and the acquisition is way more stable (no interruptions since the fix).
- Replicable optical alignment with a **LED**
- **Fixed channels** of the **slow DGTZ**
- Very **low humidity** in the gas mixture
- **Alarms** on the **Discord** channels
- Meaningful readout of the **GEM currents**
- New system to **precisely move the Fe source**, in principle automatable
- Great **light tightness**
- A new **super-fast** release of the **reconstruction** code

Conclusions

- RUN 2 will finish next Sunday (12/03/2023)
- We collected a lot of events and pictures of the environmental and internal background, ~4x more than the original plan.
- The run will last 4 weeks, as scheduled.
- The next weeks will be used to fix all the remaining issues, such that the data taking of RUN 3, which is scheduled to last ~ 6 months, will be as smooth as possible
- Thanks to all in-person and remote shifters! Their help was very important to promptly react to all the issues that we had.

Many thanks to all the shifters!!!

R. Antonietti

F. Borra

G. Cavoto

G. D'Imperio

F. Di Giambattista

E. Di Marco

M. Folcarelli

H. Lima

G. Maccarone

D. Mano

D. Marques

A. Messina

C. Monteiro

I. Pains

D. Pinci

A. Prajapati

R. Roque

S. Torelli