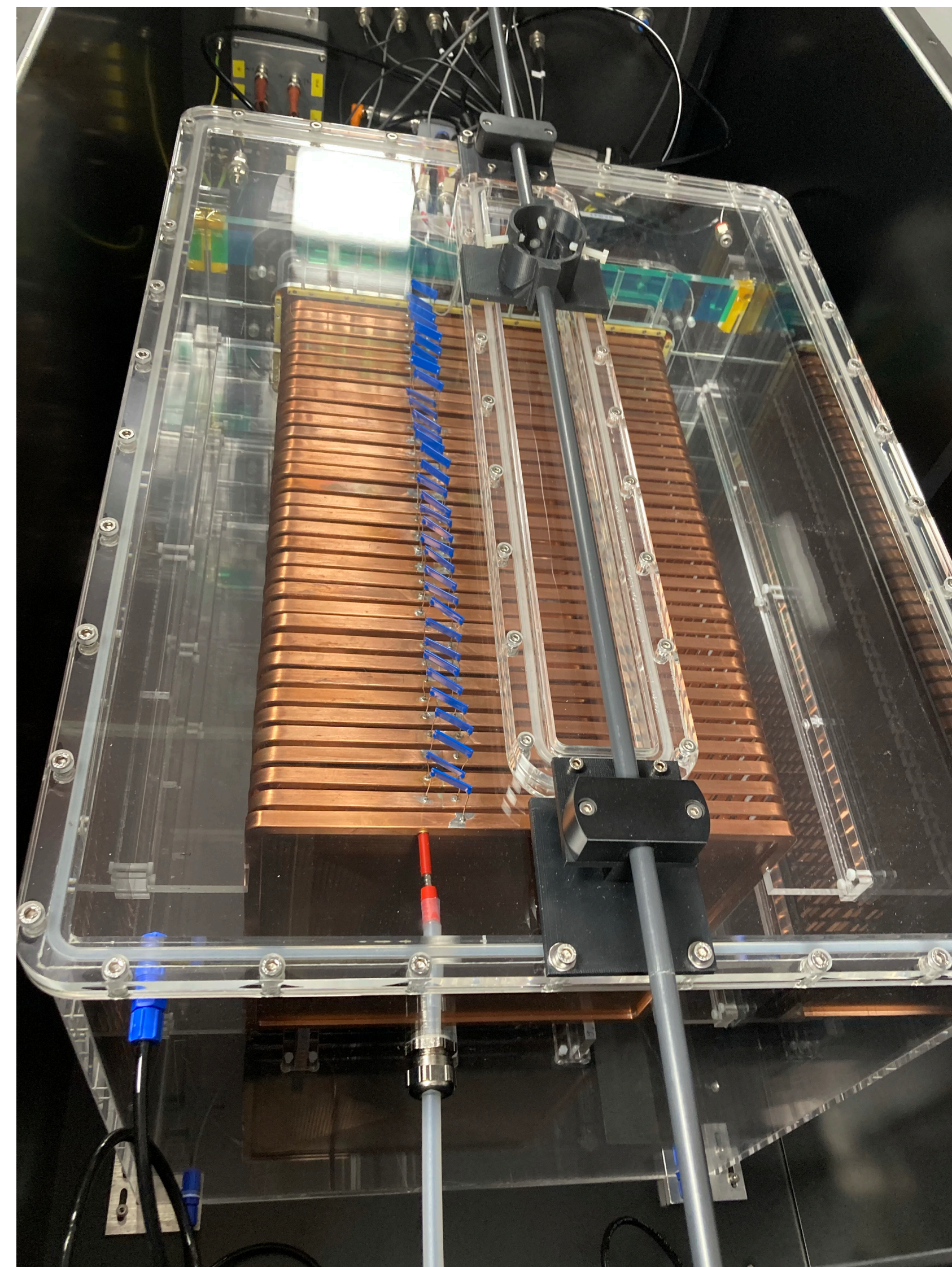


RUN 3 - summary

Stefano Piacentini

General Meeting

14/09/2023



RUN 3 - Summary

- **Run 3** officially **began on May 5th, 2023**, and it is still ongoing
- It went through **different phases**, that were interrupted mostly by issues with the gas system (leakages at the booster level, and the defective vacuum pump)
- Even with these issues, **we collected a big amount of data**, in different conditions of the detector (humidity, pressure, and, therefore, light yield)



RUN 3 - Summary [May]

* stability = ⁵⁵Fe source at step 3 [25 cm]
* * exposure of the camera = 300 ms

[Link to the sheet](#) [then look for the tab “LIME Underground Run 3 Summary”]

- A total of 1931 **bkg data** runs [equivalent to 7.77×10^5 pictures* *]
- A total of 608 ⁵⁵**Fe data** runs* [equivalent to 2.45×10^5 pictures* *]

Start	Stop	Numbers			Description	Data runs	Data runs
2023-05-05 16:27	2023-05-09 10:07	17362	-	17816	Stability *	362	146148
2023-05-09 10:18	2023-05-10 14:08	17817	-	18091	Bkg	243	97825
2023-05-10 14:11	2023-05-10 14:44	18092	-	18098	Daily Calibration	-	-
2023-05-10 14:47	2023-05-11 16:07:17	18099	-	18363	Bkg	234	94252
2023-05-11 16:13:02	2023-05-11 16:41:25	18364	-	18370	Daily Calibration	-	-
2023-05-11 16:47:28	2023-05-12 12:01:49	18371	-	18594	Bkg	198	79734
2023-05-12 12:07:31	2023-05-12 13:03:43	18595	-	18605	Daily Calibration	-	-
2023-05-12 13:04	2023-05-15 16:28:23	18606	-	19542	Bkg	831	334685
2023-05-15 16:29:41	2023-05-15 17:17:51	19543	-	19551	Daily Calibration	-	-
2023-05-15 17:21:24	2023-05-16 17:32:35	19552	-	19674	Stability *	97	39100
2023-05-16 17:34:57	2023-05-16 18:11:26	19675	-	19691	Daily Calibration	-	-
Issue with the booster: sudden increase of humidity and too many hotspot to continue the data taking							
2023-05-20 11:16:18	2023-05-21 0:18:49	19704	-	19891	Stability *	149	60005
2023-05-21 16:30:45	2023-05-22 16:17:07	19902	-	19908	Daily Calibration	-	-
2023-05-22 16:20:26	2023-05-23 12:31:49	19909	-	20067	Bkg	133	53455
2023-05-23 12:36:17	2023-05-23 13:26:35	20068	-	20074	Daily Calibration	-	-
2023-05-23 13:29:43	2023-05-24 14:59:51	20075	-	20277	Bkg	177	71138
2023-05-24 15:05:03	2023-05-24 15:46:29	20278	-	20284	Daily Calibration	-	-
2023-05-24 15:49:09	2023-05-25 9:06:39	20285	-	20415	Bkg	115	46184
Issue with the pump: it didn't restarted after technical intervention to fix the booster leakage							

This sample is characterized by a **low** (and **not constant**) **LY** due to humidity issues

RUN 3 - Summary [May]

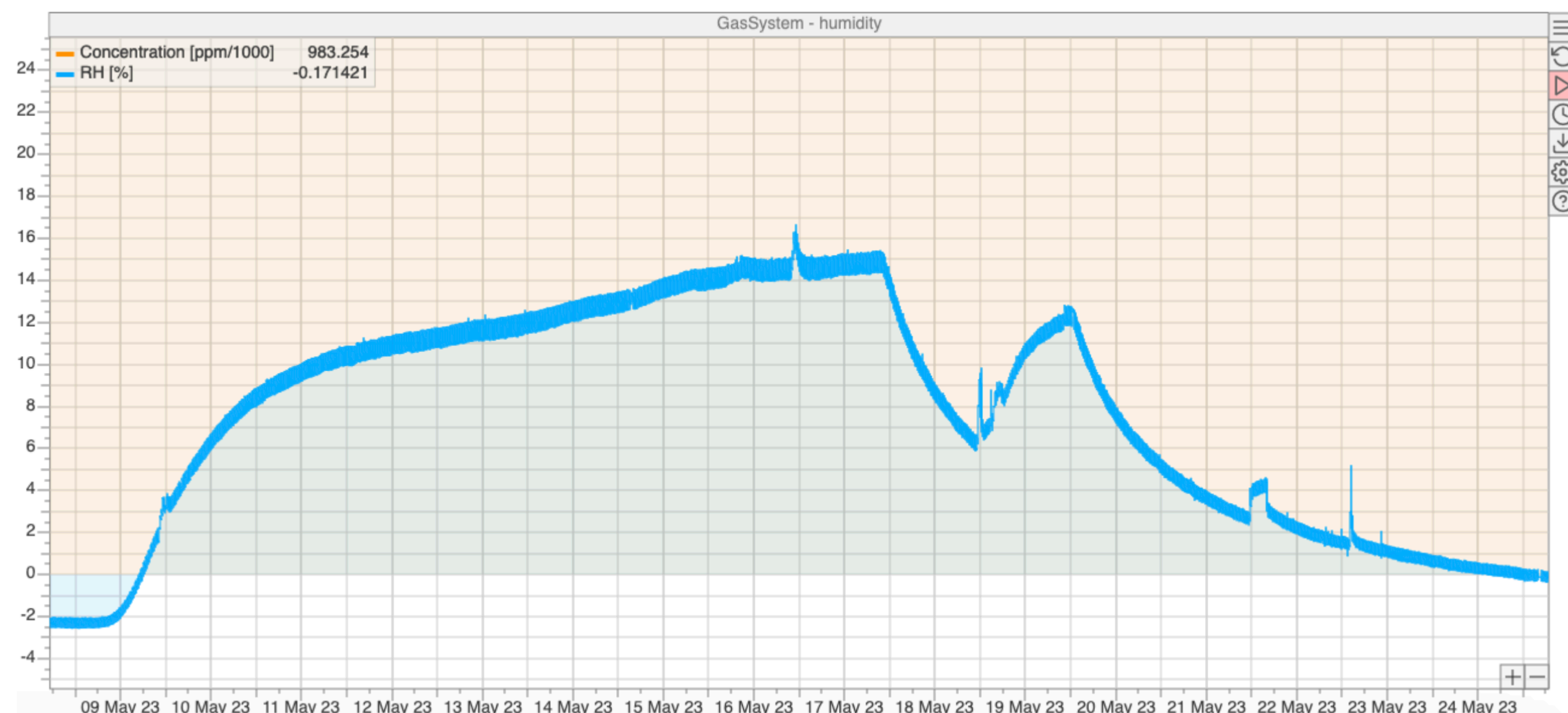
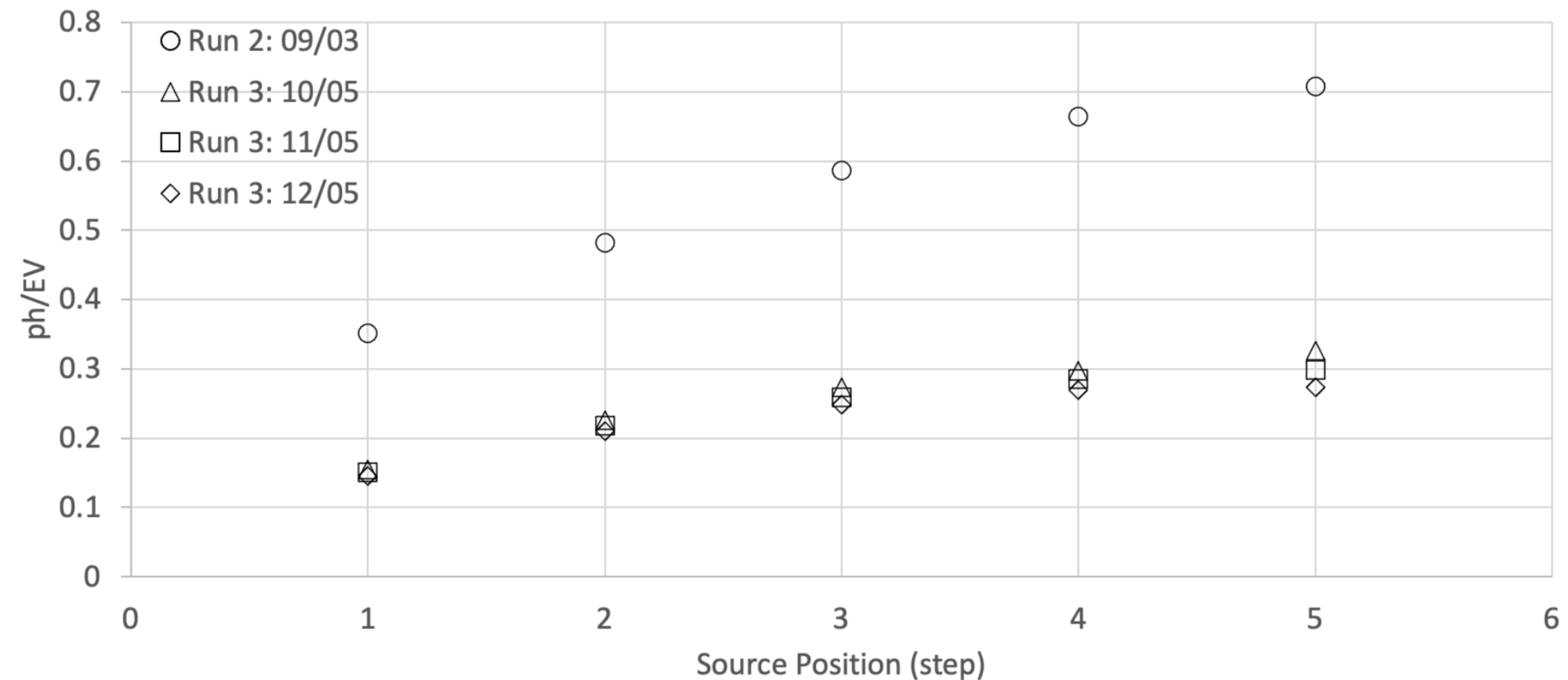
[Link to the sheet](#) [then look for the tab “LIME Underground Run 3 Summary”]

* stability = ^{55}Fe source at step 3 [25 cm]

** exposure of the camera = 300 ms

- A total of 1931 **bkg data** runs [equivalent to 7.77×10^5 pictures**]
- A total of 608 ^{55}Fe **data** runs* [equivalent to 2.45×10^5 pictures**]

This sample is characterized by a **low** (and **not constant**) **LY** due to humidity issues



RUN 3 - Summary [mid July]

[Link to the sheet](#) [then look for the tab “LIME Underground Run 3 Summary”]

* stability = ^{55}Fe source at step 3 [25 cm]
* * exposure of the camera = 300 ms

- A total of 1228 **bkg data** runs [equivalent to 4.93×10^5 pictures* *]
- A total of 138 ^{55}Fe **data** runs* [equivalent to 0.55×10^5 pictures* *]

Start	Stop	Numbers			Description	Data runs	Data runs
Issue with the pump: it didn't restarted after technical intervention to fix the booster leakage							
2023-07-06 15:16:24	2023-07-07 18:52:12	20426	-	20816	Pedestal Study [GEMs OFF]	340	136940
2023-07-07 18:54:41	2023-07-12 10:10:41	20817	-	21041	Stability *	112	45072
2023-07-12 14:47:29	2023-07-12 15:32:40	21049	-	21055	Daily Calibration		
2023-07-12 15:37:53	2023-07-17 11:10:11	21056	-	22074	Bkg	862	346008
2023-07-17 11:14:10	2023-07-17 12:09:49	22075	-	22083	Daily Calibration		
2023-07-17 12:29:04	2023-07-18 11:13:28	22084	-	22291	Bkg	184	74014
2023-07-18 11:16:48	2023-07-18 11:55:00	22292	-	22298	Daily Calibration		
2023-07-18 12:00:51	2023-07-19 11:46:29	22299	-	22505	Bkg	182	73048
2023-07-19 11:48:55	2023-07-19 12:46:22	22506	-	22514	Daily Calibration		
2023-07-19 12:51:52	2023-07-20 13:44:11	22515	-	22568	Stability *	26	10493
Issue with the pump: it abruptly stopped working							

This sample is characterized by a **low** (and **slightly decreasing**) **LY** due to a very low gas flow (1 L/h)

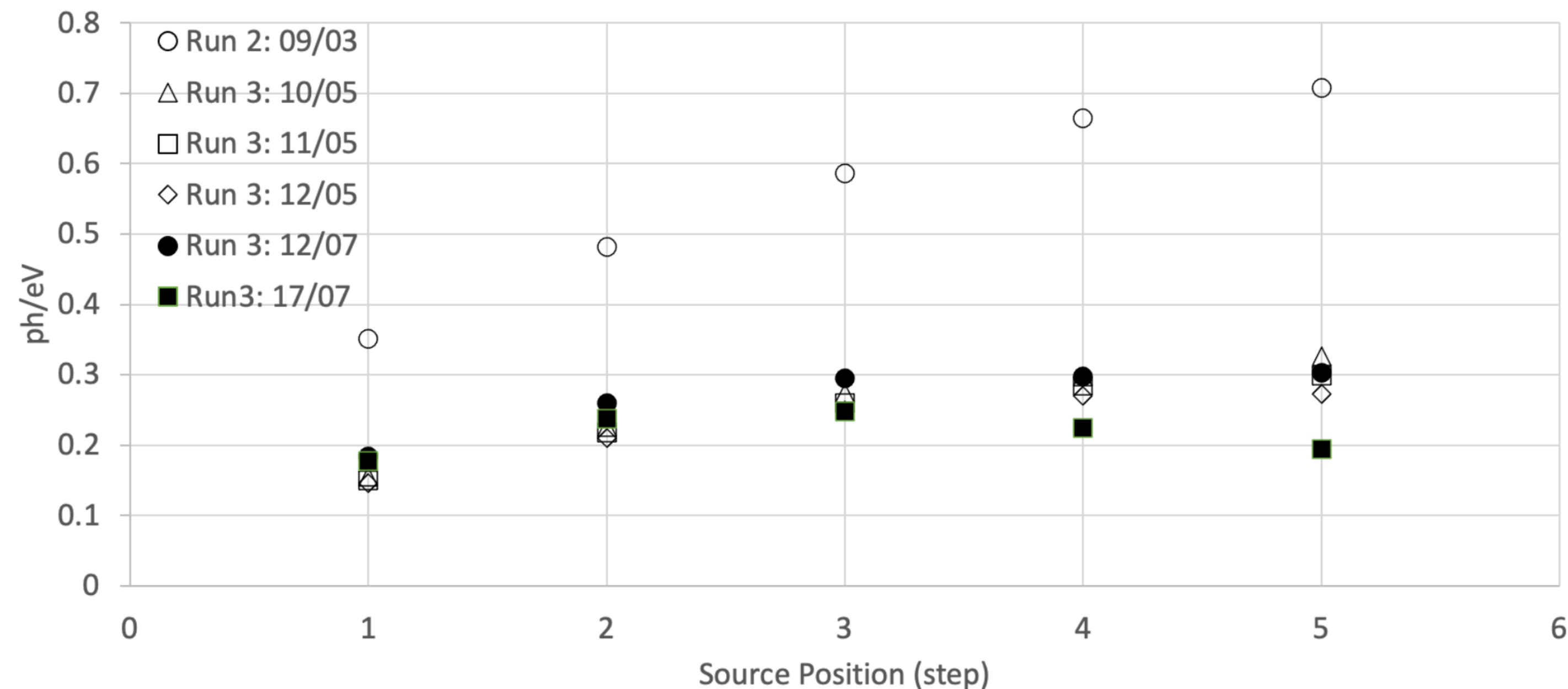
RUN 3 - Summary [mid July]

[Link to the sheet](#) [then look for the tab “LIME Underground Run 3 Summary”]

* stability = ^{55}Fe source at step 3 [25 cm]

** exposure of the camera = 300 ms

- A total of 1228 **bkg data** runs [equivalent to 4.93×10^5 pictures**]
- A total of 138 ^{55}Fe **data** runs* [equivalent to 0.55×10^5 pictures**]



This sample is characterized by a **low** (and **slightly decreasing**) **LY** due to a very low gas flow (1 L/h)

RUN 3 - Summary [Golden]

* stability = ^{55}Fe source at step 3 [25 cm]
* * exposure of the camera = 300 ms

[Link to the sheet](#) [then look for the tab “LIME Underground Run 3 Summary”]

- A total of 924 **bkg data** runs [equivalent to 3.71×10^5 pictures* *]
- A total of 102 ^{55}Fe **data** runs* [equivalent to 0.41×10^5 pictures* *]
- A total of 427 **AmBe data** runs [equivalent to 1.72×10^5 pictures* *]
- A small sample of 31 **AmBe + ^{55}Fe data** runs

Start	Stop	Numbers			Description	Data runs	Data runs
Issue with the pump: it abruptly stopped working							
2023-07-25 12:15:46	2023-07-28 10:33:13	22570	-	22717	Stability	73	29432
2023-07-28 11:13:45	2023-07-28 11:51:10	22718	-	22724	Daily Calibration		
2023-07-28 11:55:49	2023-07-31 12:11:05	22725	-	23350	Bkg	567	227938
2023-07-31 12:13:08	2023-07-31 12:50:11	23351	-	23357	Daily Calibration		
2023-07-31 12:52:29	2023-08-01 14:42:19	23358	-	23579	Bkg	200	80382
2023-08-01 14:44:07	2023-08-01 15:27:10	23580	-	23586	Daily Calibration		
2023-08-01 15:33:15	2023-08-02 11:54:39	23587	-	23760	Bkg	157	63111
2023-08-02 11:56:49	2023-08-02 12:41:09	23761	-	23767	Daily Calibration		
2023-08-02 12:43:32	2023-08-02 14:50:34	23768	-	23800	Stability	29	11690
Installation of the AmBe source							
2023-08-02 15:56:54	2023-08-03 9:57:41	23819	-	23984	AmBe Campaign	150	60339
2023-08-03 10:07:42	2023-08-03 12:28:56	23987	-	24022	AmBe + Fe	31	12511
2023-08-03 12:31:49	2023-08-04 21:35:21	24023	-	24328	AmBe Campaign	277	111389
2023-08-04 21:39:20	2023-08-07 20:00:35	24329	-	25427	Pedestal Study [AmBe - GEMs OFF]	1013	411196
Issue with the pump: it died after run 24328							

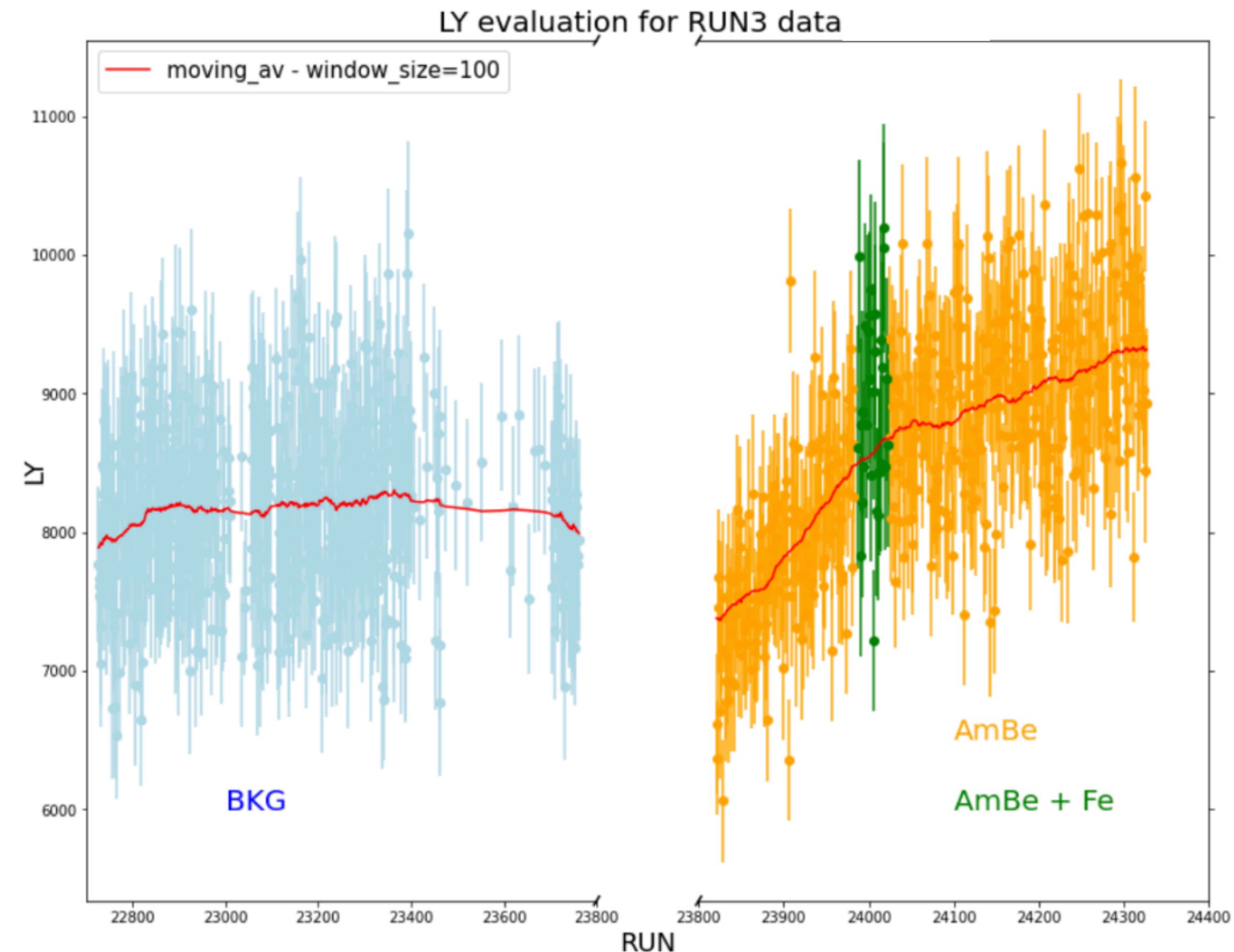
This sample is characterized by the **best LY** conditions we ever achieved during RUN 3

RUN 3 - Summary [Golden]

* stability = ^{55}Fe source at step 3 [25 cm]
* * exposure of the camera = 300 ms

[Link to the sheet](#) [then look for the tab “LIME Underground Run 3 Summary”]

- A total of 924 **bkg data** runs [equivalent to 3.71×10^5 pictures* *]
- A total of 102 ^{55}Fe **data** runs* [equivalent to 0.41×10^5 pictures* *]
- A total of 427 **AmBe** **data** runs [equivalent to 1.72×10^5 pictures* *]
- A small sample of 31 **AmBe + ^{55}Fe data** runs



This sample is characterized by the **best LY** conditions we ever achieved during RUN 3

RUN 3 - Summary

- Putting together all the data collected so far during RUN3:
 - ➡ 4083 **bkg data** runs [equivalent to 1.64×10^6 pictures]
 - ➡ 848 ^{55}Fe **data** runs [equivalent to 3.42×10^5 pictures]
 - ➡ 427 **AmBe data** runs [equivalent to 1.72×10^5 pictures]
 - ➡ 31 **AmBe + ^{55}Fe data** runs [equivalent to 1.25×10^4 pictures]
 - ➡ 340 “**pedestal**” **data** runs [equivalent to 1.37×10^5 pictures]
 - ➡ 1013 **AmBe “pedestal” data** runs [equivalent to 4.11×10^5 pictures]
- **Observed event rate** (from PMT coincidence) varying **between 1.5 Hz and 2.0 Hz** throughout RUN 3.