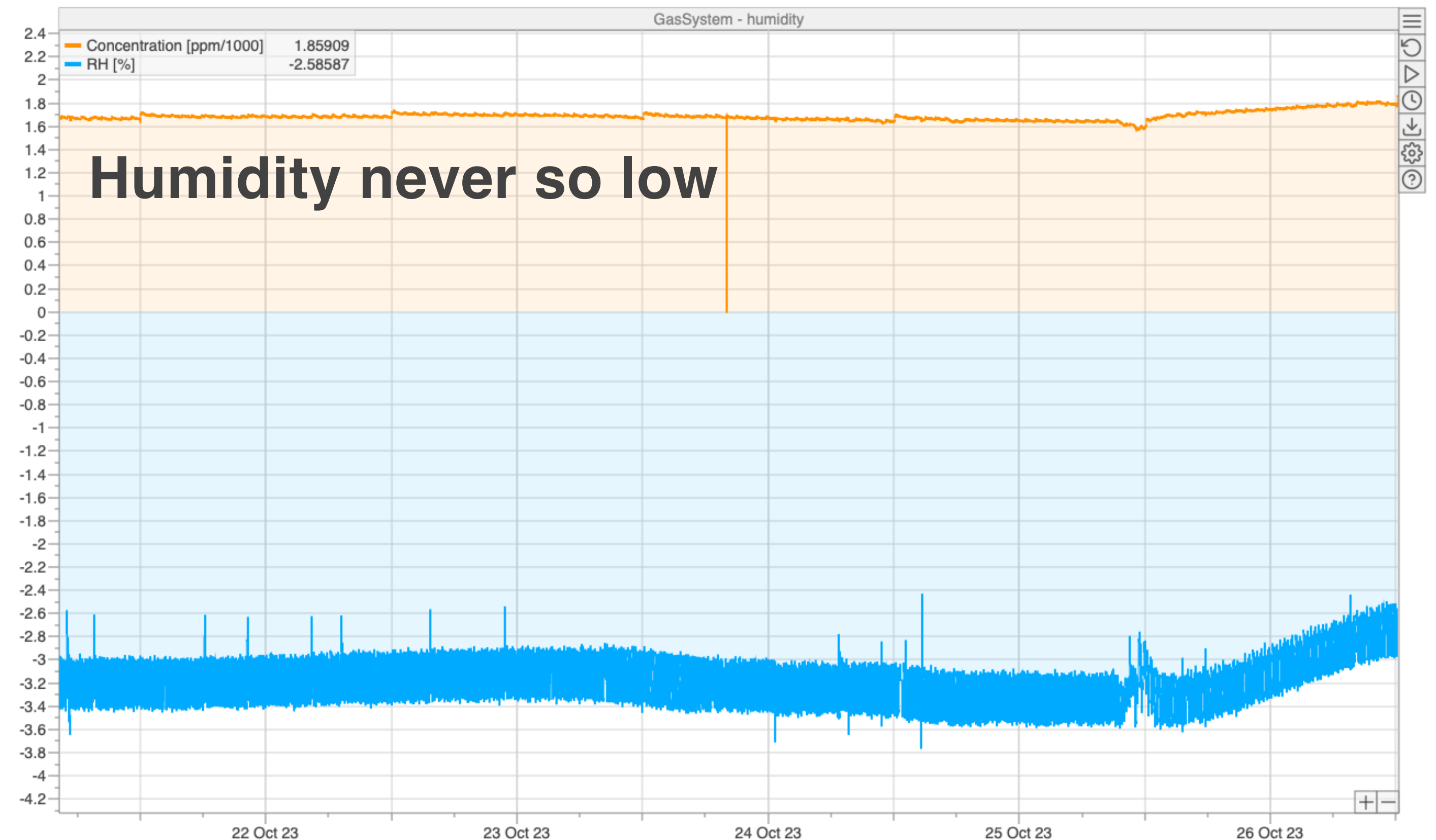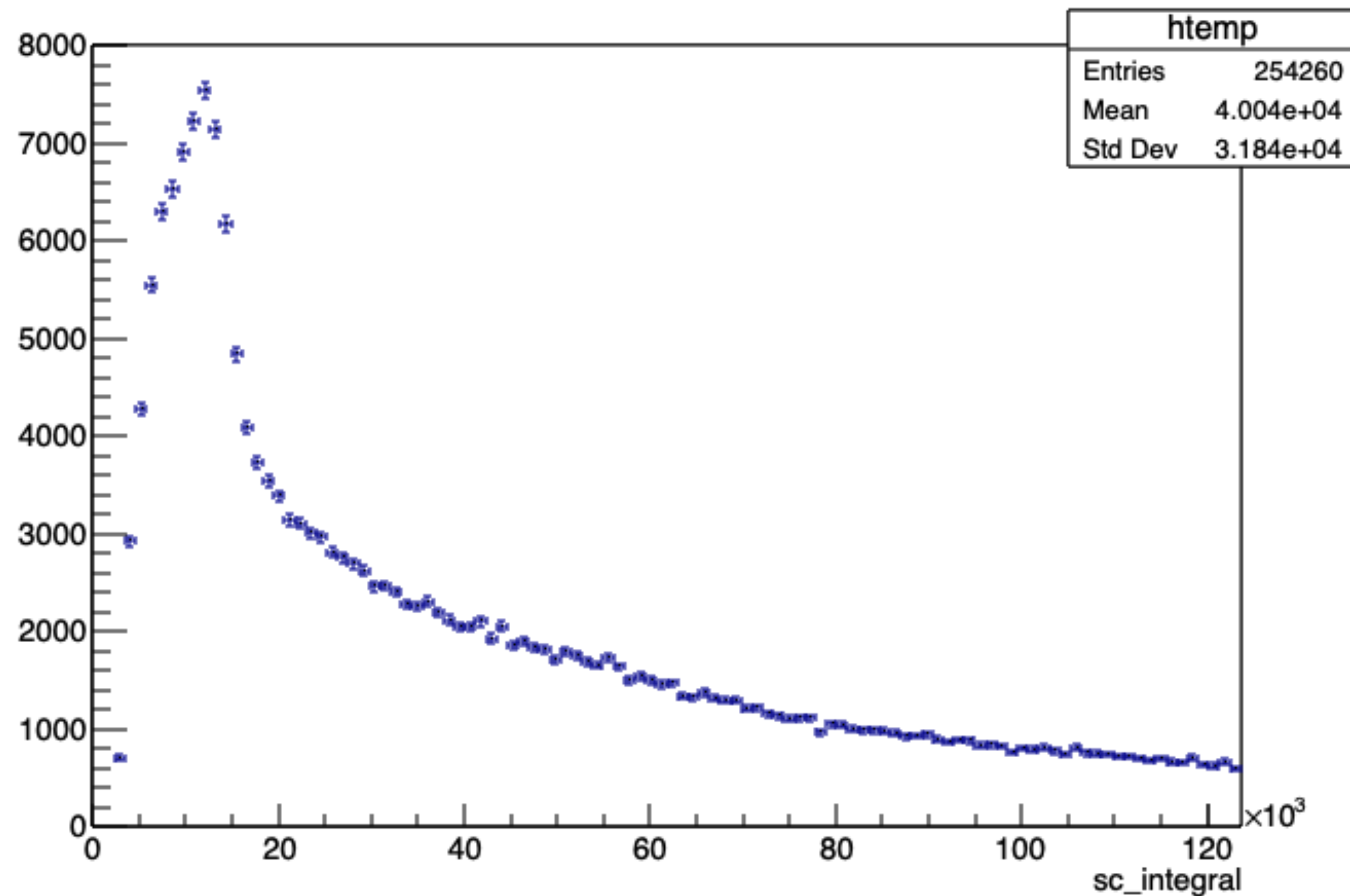# CYGNO status, 12 Oct 2023

LIME: Run3

- After main intervention on the gas system it is working since 6 weeks;

- The filter on line2 was substituted and is now working fine

- Small increase in humidity since yesterday:

  - filter starts to be full;

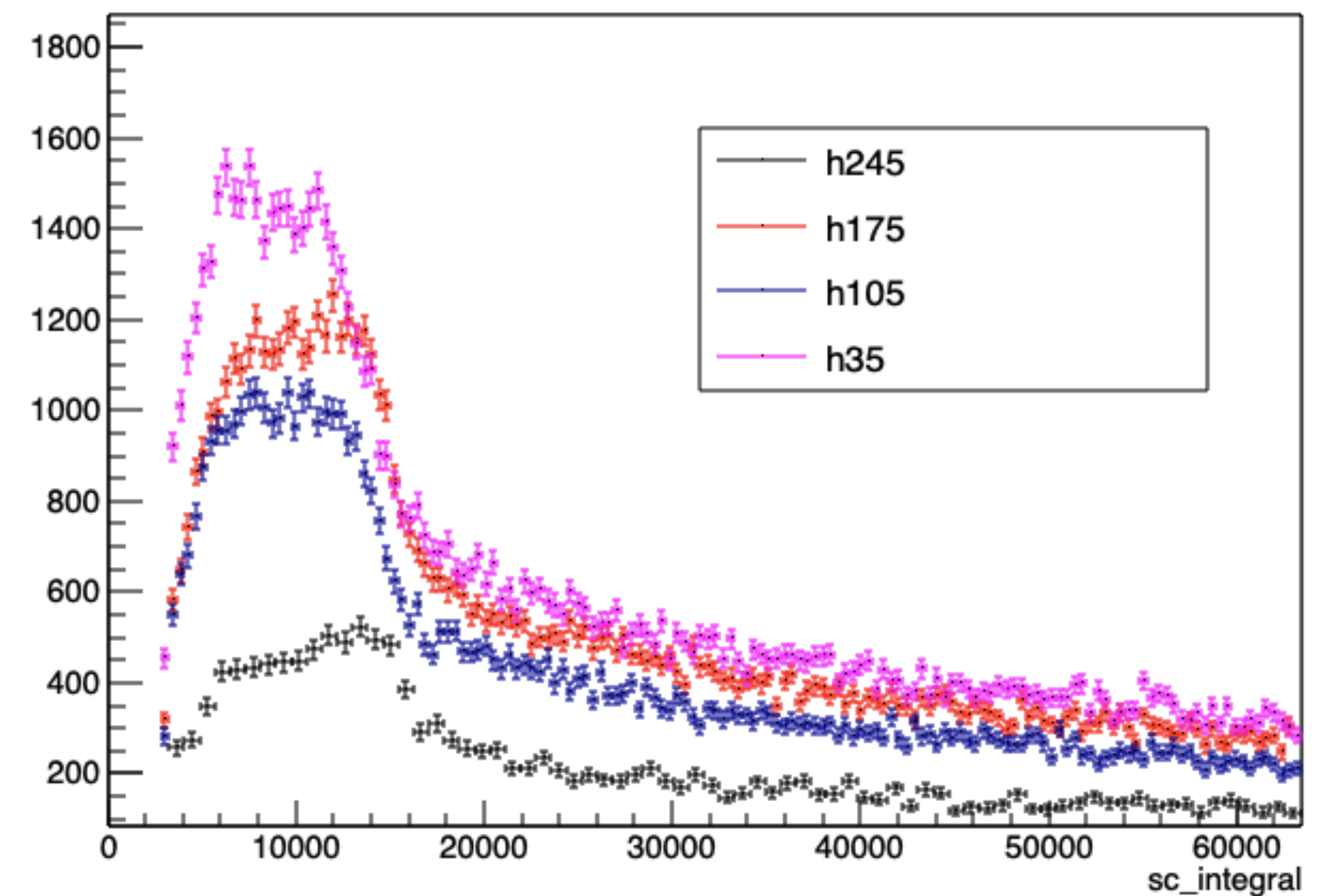 - effect of the copper shielding open

Program

- ☑ Tuesday, 26th Turn on HV and start stability tests
- ☑ Friday, October 29 start with bkg + daily scan
- ☑ Tuesday, October 10 Ba source
- ☑ Tuesday, October 17 Eu source
- ☑ Tuesday, October 24 ^{55}Fe without collimator
- ☐ October 26 start with bkg + daily scan
- ☐ November 6 end of Run 3
- ☐ Water shielding installed in November
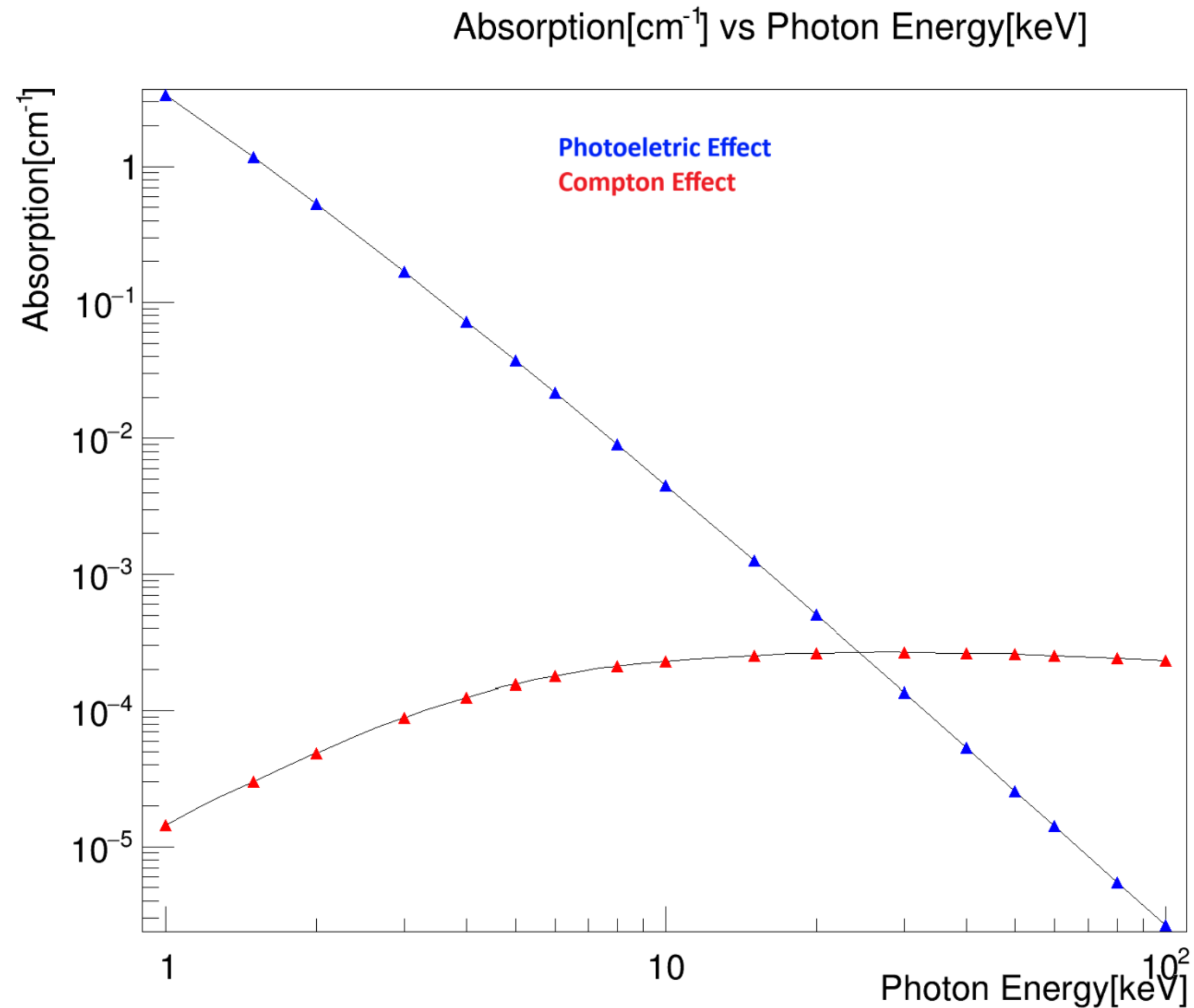- ☐ Start of Run4 in December

First results

Analysis and plots by Samuele

- We probably see the 8 keV peak in the data (good candle);

- But we do not see peaks at higher energies

First results

Absorption[cm⁻¹] vs Photon Energy[keV]

Plot by Davide based on NISR

- This is because in LIME very light gas the probability of Compton interaction becomes larger w.r.t. the photoelectric one already at very low energies;

- Compton is creating an huge background that hides the p.e. signal and makes reco life complicated;

- To try to overcome this issue, we are going to test two possibilities:

  - use a lower activity Eu source;

  - use a low energy gamma emitter (Am);

New Program

- [x] Tuesday, 26th Turn on HV and start stability tests

- [x] Friday, October 29 start with bkg + daily scan

- [x] Tuesday, October 10 Ba source

- [x] Tuesday, October 17 Eu source

- [x] Tuesday, October 24 ^{55}Fe without collimator

- [ ] October 26 start with low act Eu source

- [ ] October 31 start with Am source

- [ ] November 6 start with bkg + daily scan

- [ ] November 13 end of Run 3

- [ ] Water shielding installed in November

- [ ] Start of Run4 in December

- So, we are planning to shift the end of Run 3 by 1 week that should not affect the plan of installing water shield by the end of November

General comment

- The successful data taking of Run3 and AmBe has been well received;

- They anyway pointed out that there is now a lot of work to do to completely analyse and understand the data and to compare them with the Monte Carlo;

- Among others, they made the request of organising a meeting for the next April to show them the final results for Runs 1, 2 and 3 and the preliminary of Run 4;

- A complete and well understood data taking with LIME is one of the crucial aspects of the CYGNO activities;

- Moreover, as stated in the TDR, all the work we are now doing on LIME systems (Gas, DAQ, HV, Slow Control…) and to develop Analysis and Simulation will be very useful also for CYGNO-04.