

Summer summary and plans

GAS System

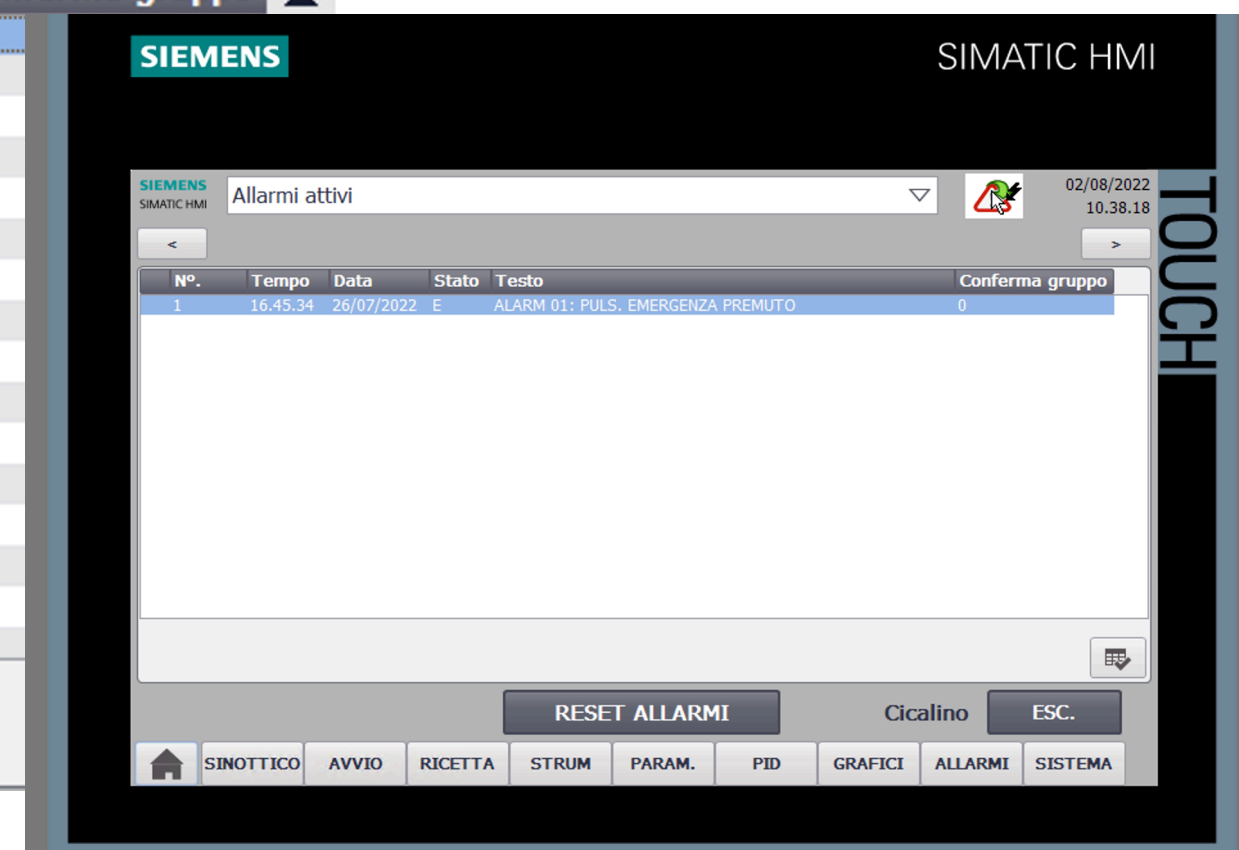
We discovered and fixed an important leakage on the detector gas piping;

- now it's possible to flush the gas with a rate of few litres/hour (reduction in consumption and recovery volume);
- PMT should be in more safe conditions;

Still present a malfunction on the booster compressor: i.e. not efficient behavior of the recovery circuit;

Moreover, in last weeks, we had several (fake?) alarms (6/06, 19/06, 19/07);

N°.	Tempo	Data	Stato	Testo	Conferma gruppo
1	16.45.34	26/07/2022	E	ALARM 01: PULS. EMERGENZA PREMUTO	0
1	12.01.52	26/07/2022	EU	ALARM 01: PULS. EMERGENZA PREMUTO	0
1	12.01.02	26/07/2022	E	ALARM 01: PULS. EMERGENZA PREMUTO	0
1	12.00.30	26/07/2022	EU	ALARM 01: PULS. EMERGENZA PREMUTO	0
1	12.00.08	26/07/2022	E	ALARM 01: PULS. EMERGENZA PREMUTO	0
1	12.00.03	26/07/2022	EU	ALARM 01: PULS. EMERGENZA PREMUTO	0
1	11.59.09	26/07/2022	E	ALARM 01: PULS. EMERGENZA PREMUTO	0
1	11.58.40	26/07/2022	EU	ALARM 01: PULS. EMERGENZA PREMUTO	0
1	11.58.17	26/07/2022	E	ALARM 01: PULS. EMERGENZA PREMUTO	0
1	11.57.53	26/07/2022	EU	ALARM 01: PULS. EMERGENZA PREMUTO	0
1	11.57.15	26/07/2022	E	ALARM 01: PULS. EMERGENZA PREMUTO	0
1	11.57.01	26/07/2022	EU	ALARM 01: PULS. EMERGENZA PREMUTO	0
6	11.54.40	26/07/2022	EU	ALARM 06: PT101L - Bassa pressione bombola (He)	0
5	11.54.40	26/07/2022	EU	ALARM 05: PT101LL - Bassissima pressione bombola (He)	0
5	11.19.08	26/07/2022	E	ALARM 05: PT101LL - Bassissima pressione bombola (He)	0
6	11.19.04	26/07/2022	F	ALARM 06: PT101L - Bassa pressione bombola (He)	0



This morning the system was sent back to Air Liquide for repair

LIME

LIME has taken data for almost 1 month in different conditions;

So far it was not possible to calibrate CMOS and PMT with the ^{55}Fe source;

We are working to solve last technical missing parts and we hope to be have it in September;

We are also starting the procedure to have the AmBe source for underground tests in LNGS;

In the meanwhile, we'll calibrate new 4 PMTs to substitute the "helium-damaged" set after the summer;

LIME is now OFF and it will stay like this in the next 3 or 4 weeks at least;

More news in September;

Data Analysis

A complete list of acquired runs is available here:

http://Inf.infn.it/~mazzitel/php/cygno_sql_query.php?table=on

The most “significant” ones are the one with the tag:

S000:DATA:BKG,trigger with at least 2 pmt

With PMT gain equalised. HV: 730, 895, 785, 895

We are now reconstructing all runs in the interval 1700 - 2280 (22/06 - 6/07);

DAQ

We are currently running a simple TDAQ version;

We should upgrade it to:

- mitigate the effect of “images” cut by the CMOS working mode;
- integrate the Herman trigger module (HTM);
- operate the HTM via Midas;

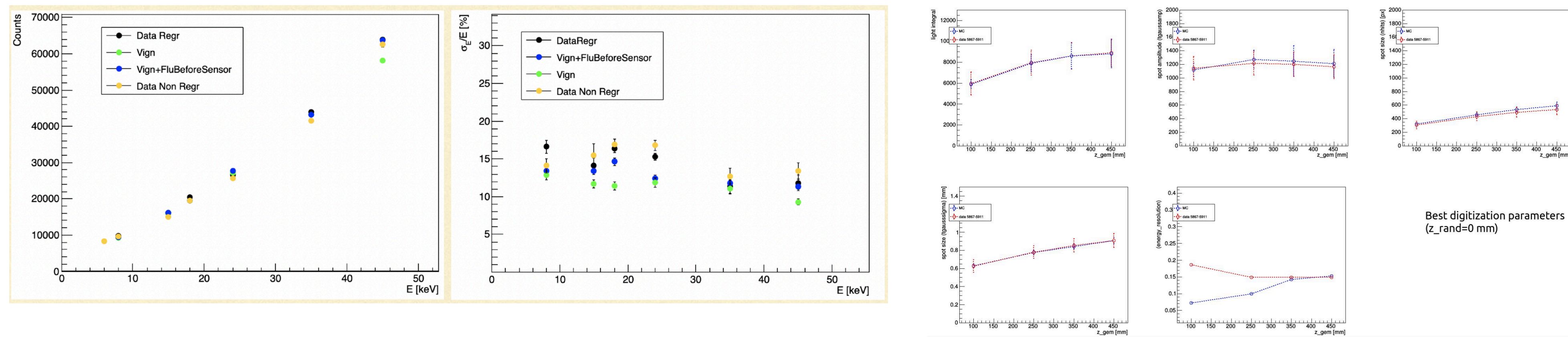
Development and tests to be performed in LNF and then moved to LNGS;

We have to start developing the CYGNO-04 TDAQ system;

Herman and Rafael will be in Italy at the beginning of October;

LIME response simulation

There was a lot of work by the Simulation team in last months;



Linearity very well reproduced. Energy resolution, better than exp data, probably some issue on data analysis, we are accepting it;

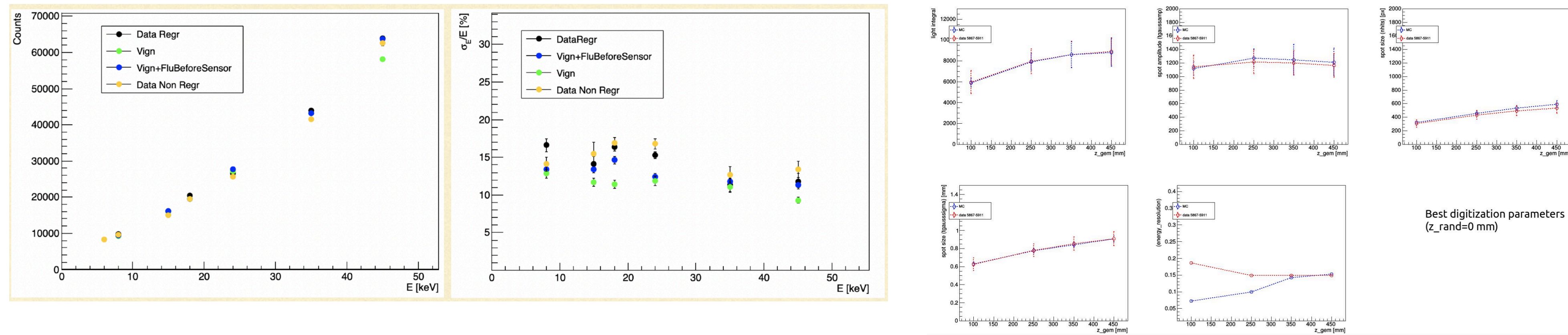
Flaminia simulated the background spectrum in LIME;

Mariana is simulating the PMT response;

ToDo: integrate all of them to simulate LIME response (CMOS+PMT) underground, taking into account the particle rate and pile-up;

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Pending papers

<https://airtable.com/shrzOTHNqWQ6tARSi/tbl3ESqx7hsxsv9EQ/viwxnTfCi1tZR5xRa?blocks=hide>

Usual table seems quite out of date;

- LIME: overground performance, c.a. Luca, expected by September;
- Electro-luminescence: latest results with ITO, c.a. Giorgio, expected by September;
- CMOS-Noise: study of pedestal stability of different CMOS, c.a. Rafael, expected by September (?);
- Hydrocarbons: study of GEM light yield with Isobutane (and Methane?), c.a. Cristina, expected by September (?);
- CMOS-Performance: study of light yield of different CMOS, c.a. Rafael, expected by December (?);
- Optical signal simulation: method developed to simulate signals and comparison with ^{55}Fe , c.a. Fabrizio, expected by December (?);
- Underground background simulation: background expected in CYGNO-04, with different shields, c.a. Giulia, expected by beg. 2023 (?);