Meeting CYGNO
News

LIME GAS System

The gas system has been all cleaned and re-assembled in Frascati last week;

Yesterday, a brand new booster was installed;

Tomorrow the system will be sent back to Gran Sasso Labs;

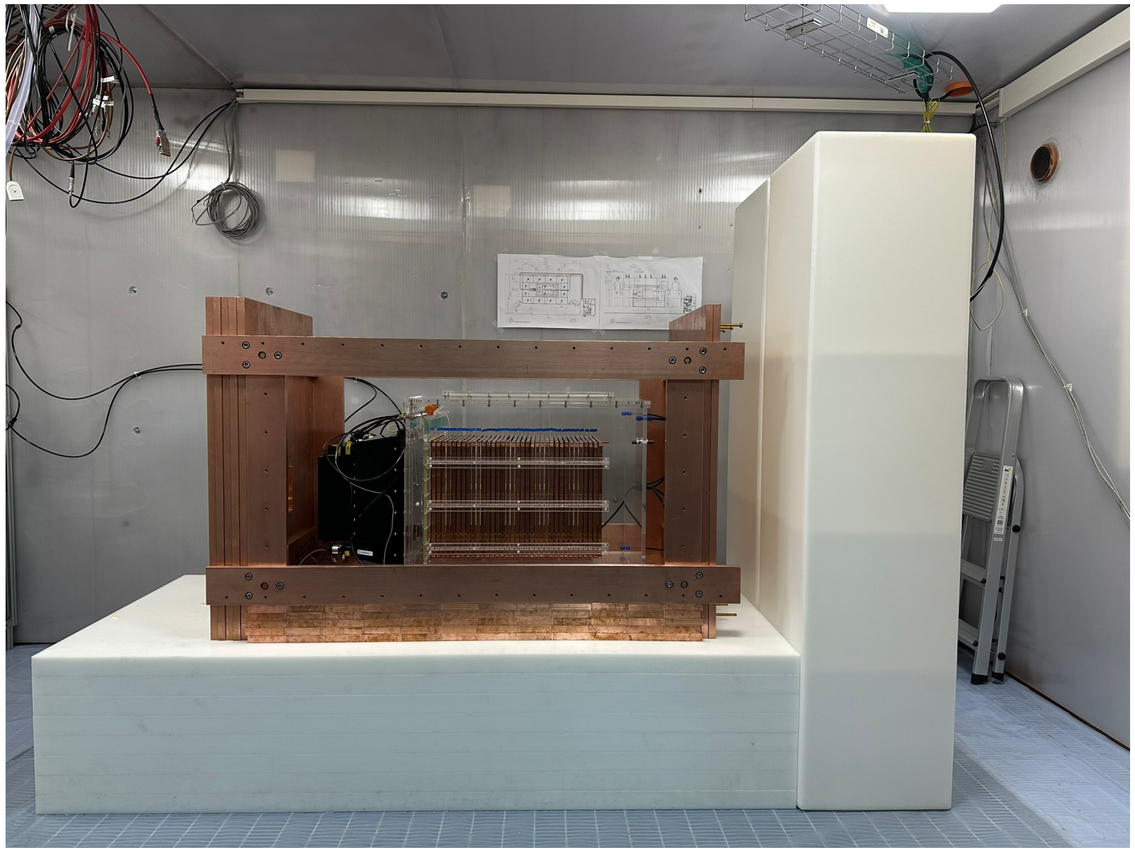
Next week we are going to:

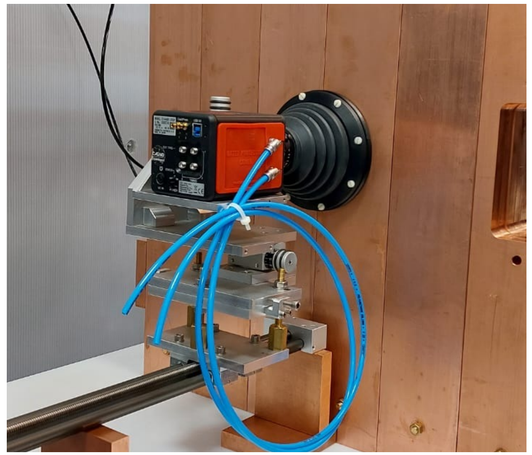
- test the gas tightness;
- check the humidity level;
- check the presence of dust in the outlet line;

If everything is fine, we will start the gas flux in LIME by the end of the next week

LIME Run 2: shield layer - 4 cm

In the meanwhile the first layer of copper shield, is almost complete.





Next week it will be closed;

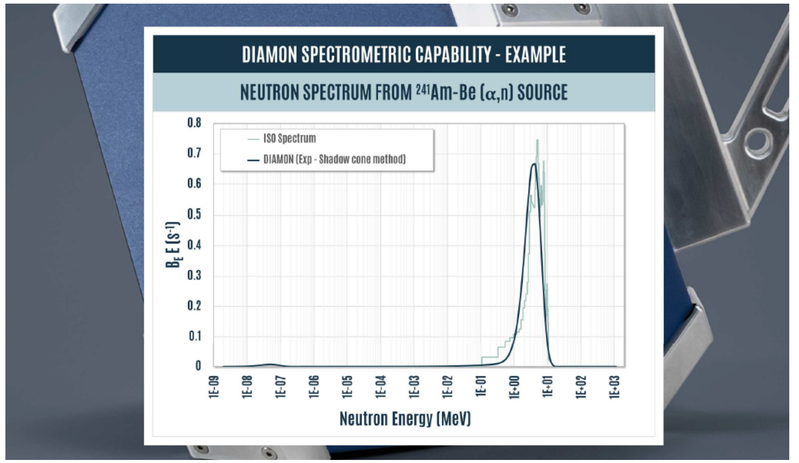
We’ll perform checks on:

- light tightness;
- optical alignement;

LIME Run 2: shield layer - 4 cm

If no major issues arise, the data taking for Run 2 can start on Monday 6 February;

Run 2 is expected to last for 4 weeks;



DIAMON

including 1 week of test with AmBe source;

DIAMON TECHNICAL DATA	
Overall weight	6.0 kg (Low Energy version) 8.5 kg (High Energy version)
H*(10) rate measuring range	10 nSv/h - 100 mSv/h
Neutron energy range	Thermal - 20 MeV (Low Energy version) hundreds of MeV or higher (High Energy version)
γ sensitivity	‹ 1*10^{-4} counts per nSv ^{137}Cs ‹ 1 µSv/h at 10 mSv/h ^{137}Cs
H*(10) calibration factor	3.5 µSv/h per cps (AmBe)
H*(10) response	1.03 counts per nSv (AmBe)
Connectivity	Ethernet, dedicated Wifi

DIAMON ANGULAR RESPONSE (over 4π)	
IRRADIATION FIELD	VARIABILITY
Thermal neutrons	5.95%
Neutrons from DT reaction	2.10%
Neutrons from DD reaction	1.90%
Neutrons from ^{241}Am-Be source	3.30%

This test is in preparation (neutron shield, source transportation) and we are planning to have a previous map of neutron background performing measurements with a neutron detector

LIME Run 2: shifts

There will be shifts from remote and shifts presence to ensure all the operations, we'll setup tools to book them:

- 4x6 hour shifts remotely to monitor detector operation, hv, gas, daq and data quality from middleware plots;

- 24-hour shifts from the LNGS surroundings of a person who enters to do the daily calibration with Fe and then leaves and remains available to enter in case of need (DAQ to be restarted or similar);

A run coordinator who organises the shifts, informs himself on a daily basis of what is going on, deals with problems that arise by assigning the solution to an expert and following their development and is in charge for the whole Run2;

Stefano Piacentini agreed to take on this role in the next run. Thanks!

LIME Run 2: shifts

The two shifters must be autonomous as far as possible and must be trained for this.

We are updating the instructions and the first two shifts must be done together with an expert.

In case of need they call the run coordinator.

Shifters can and should be everyone.

The contribution of the various institutions is taken into account so that everyone participates.

Run 1: data analysis

The different run intervals were “organised” in order to spot the main studies we can perform with them:

4366-4381	Test Trigger	Yes	55Fe	20 l/h	15 mV		Yes	
4145-4201	scan Z, scan VGEM1 with pmt Trg: LVL2, 15mV thr, veto 10 us	Yes	55Fe	20 l/h	15 mV		Yes	check efficiency
4257-4266	scan Z, scan VGEM1with pmt Trg: LVL2, 15mV thr, veto 10 us	Yes	55Fe	20 l/h	15 mV		Yes	
4271-4302	scan Z, scan VGEM1 with pmt Trg: LVL2, 15mV thr, veto 10 us	Yes	55Fe	20 l/h	15 mV		Yes	
3009-3116	stability while flushing gas (Z=5cm)	Yes	55Fe	20 l/h	15 mV		Yes	stability of the response while starting the gas flow
3125-3160	stability while flushing gas (Z=25cm)	Yes	55Fe	20 l/h	15 mV		Yes	
4202-4256	stability (Z=25cm), thr 15 mV	Yes	55Fe	20 l/h	15 mV		Yes	history of 55Fe response (light, n clusters, cluster size). Check T, P. Data taking conditins stable with 15 mV PMT threshold for trigger and flux = 20l/h
4314-4365	stability (Z=25cm), thr 15 mV	Yes	55Fe	20 l/h	15 mV		Yes	
4391-4468	stability (Z=25cm), thr 15 mV	Yes	55Fe	20 l/h	15 mV		Yes	
4469-4475	stability (Z=25cm), thr 5 mV	Yes	55Fe	20 l/h	5 mV		Yes	as above with PMT thr = 5 mV. Maybe same as above for images
4493-4512	stability (Z=25cm), thr 5 mV	Yes	55Fe	20 l/h	5 mV		Yes	
4513-4780	55Fe: stability (Z=25cm), thr 5 mV, flux 3l/h	Yes	55Fe	3 l/h	5 mV		Yes	Stability with different gas fluxes
5107-5162	55Fe: (Z = 25 cm) thr 5 mV, flux 20l/h, after operations on gas system	Yes	55Fe	20 l/h	5 mV		Yes	
5163-5174	55Fe: (Z = 25 cm) thr 5 mV, flux 1l/h, after operations on gas system	Yes	55Fe	1 l/h	5 mV		Yes	
5175-5178	WARNING: the sequencer was on while the cap was removed, the data of these runs could be thrash	Yes	55Fe	1 l/h	5 mV		Yes	
5179-5366	55Fe: (Z = 25 cm) thr 5 mV, flux 1l/h	Yes	55Fe	1 l/h	5 mV		Yes	
5377-5491	55Fe: (Z = 25 cm) thr 5 mV, flux 1l/h - new PMT HV (part 1)	Yes	55Fe	1 l/h	5 mV		Yes	
5507-5650	55Fe: (Z = 25 cm) thr 5 mV, flux 1l/h - new PMT HV (part 2)	Yes	55Fe	1 l/h	5 mV		Yes	
5652-5692	55Fe: (Z = 25 cm) thr 5 mV, flux 10 l/h - new PMT HV - to study the effect of new gas	Yes	55Fe	10 l/h	5 mV		Yes	
5694-5730	55Fe: (Z = 25 cm) thr 5 mV, flux 10 l/h - new PMT HV - stable	Yes	55Fe	10 l/h	5 mV		Yes	
4475-4492	BKG: 5 mV, flux 20l/h	Yes	None	20 l/h	5 mV		Yes	Golden runs with different gas fluxes.
4782-4935	BKG: 5 mV, flux 3l/h	Yes	None	3 l/h	5 mV		Yes	
5001-5106	BKG: 5 mV, thr 5 mV, flux 3l/h	Yes	None	3 l/h	5 mV		Yes	
5741-5908	BKG: thr 2 mV, flux 10 l/h - new PMT HV - (part 1)	Yes	None	10 l/h	2 mV		Yes	
5922-6287	BKG: thr 2 mV, flux 10 l/h - new PMT HV - (part 2)	Yes		10 l/h	2 mV		Yes	
6288 – 6744	BKG: thr 2 mV, flux 10 l/h - new PMT HV - (part 3) – no DGTZ	Yes	None	10 l/h	2 mV		Yes	
4936-4947	55Fe: 100 ms exposure, thr 5 mV, flux 3l/h	Yes	55Fe	3 l/h	5 mV		Yes	Test with 100 ms exposure
4949-4963	55Fe: (Z = 5 cm) thr 5 mV, flux 3l/h, test equalization	Yes	55Fe	3 l/h	5 mV		Yes	PMT studies (rate)
4964-4972	55Fe: (Z = 25 cm) thr 100 mV, flux 3l/h	Yes	55Fe	3 l/h	5 mV		Yes	
4973-4977	55Fe: (Z = 25 cm) thr 75 mV, flux 3l/h	Yes	55Fe	3 l/h	5 mV		Yes	
4978-4982	55Fe: (Z = 25 cm) thr 50 mV, flux 3l/h	Yes	55Fe	3 l/h	5 mV		Yes	
4983-4987	55Fe: (Z = 25 cm) thr 200 mV, flux 3l/h	Yes	55Fe	3 l/h	5 mV		Yes	
4988-4992	55Fe: (Z = 25 cm) thr 255 mV, flux 3l/h	Yes	55Fe	3 l/h	5 mV		Yes	
4993-5000	55Fe: (Z = 25 cm) thr 5 mV, flux 3l/h, scan drift field	Yes	55Fe	3 l/h	5 mV		Yes	Drift field scan
5732-5740	55Fe: (Z = 25 cm) thr 2 mV, flux 10 l/h - new PMT HV - Drift Field Scan	Yes	55Fe	10 l/h	2 mV		Yes	

Rita R.

Rita A.

Emanuele

Francesco, David et al.

Archive of radioactivity measurements

The LNF team, in particular Anna and Luigi, are gathering all the informations we collected in past years about the radioactivity of materials and instrumentation we are using in CYGNO

The idea is to have a common repository available for studies and simulation

Spot what is missing and need to be measured

Repository for pictures and plots

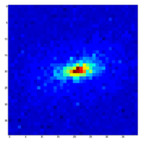
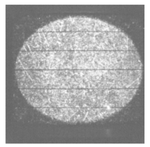
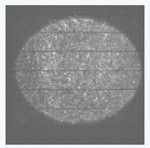
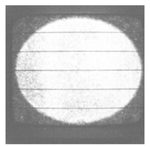
We investigated several options (Pandora, Alfresco, Google..). All of them have pros and cons, so for the moment we decided to use github;

Fabrizio set-up a test page with instructions on how to upload and comment the material;

We are going to set-up different pages for the different topics and use them;

- How to add images or plots

CYGNO

Figure	*caption and notes*
	example of a nuclear recoil in LEMON
	LEMON drawings
	LEMON exposed to neutrons at FNG
	LEMON exposed to neutrons at FNG
	LEMON exposed to neutrons at FNG
	example of a *jpeg* image (jpeg file stored on GitHub)