

News

INFN review

- Annual INFN review last week;
- We were asked to present a schedule for LIME underground:
 - Underground LIME tests will represent the last step of the PHASE_0;
 - The idea is to take data (with periodic calibration runs) with different and increasing shield schemes: no shields, 6 cm Cu, 10 cm Cu, 10 cm Cu + 40 cm H₂O;
 - This program will allow:
 - to evaluate performance in low radioactivity and low pile-up configuration;
 - to characterise the real radioactive background present in the site and then to validate the GEANT4 simulation;
 - Moreover, without the H₂O, we can also study the neutron flux in the site as a part of the PRIN “Zero radioactivity in future experiments”;
 - Installation and data taking with complete (copper+water) shield will be performed in 2023;

INFN review

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- We were asked to present a schedule for LIME underground:

- **LIME** is expected to start installation underground at the beginning of November 2021;
- Installation of detectors and ancillary systems should finish by the end of 2021;
- Commissioning and data taking program is expected to start at the beginning of 2022:
 - Unshielded:
 - detector characterisation with ^{55}Fe (we are buying a 7 MBq source) and AmBe;
 - bkg study (10^8 event/months), with periodic calibration with ^{55}Fe ;**2~3 Months**
 - 6 cm Cu shield:
 - bkg study (10^6 event/months), with periodic calibration with ^{55}Fe ;**1 Month**
 - 10 cm Cu shield:
 - bkg study (10^5 event/months), with periodic calibration with ^{55}Fe ;
 - In this configuration we plan to study the lab neutron flux. About 100 NR are expected in the range 20-100 keV in 4 months.**4 Months**

INFN review

- Referees report here:
- https://agenda.infn.it/event/27538/contributions/142507/attachments/84514/111854/Relazione_Referee_Cygno_2021.pdf
- Main message is summarised in this slide:

RICHIESTE per il 2022

- installazione di LIME ai LNGS, commissioning & operation - **finanziato** (limando su alcune richieste)
- **R&D**
 - fotocamera a bassa radioattività - **sj a risultati LIME**
 - DAQ per il dimostratore - **sj a risultati LIME**
 - studio miscele di gas alternative - **rimandate**

Installation and Operation of LIME underground fully supported and financed;

Fundings for R&D and other activities “sub judice” (lower priority) to results from LIME

- They proposed to fund about 75% of our requests (140/180 ke);
- After the last day cuts, 94k survived;

LIME operation

- Next months and years will be crucial for CYGNO project;
- We are organising meeting with LNGS management to discuss about space for the demonstrator;
- Success in LIME underground operation will demonstrate we are able to run an underground apparatus;
- This is now an essential requirement both for INFN and LNGS committees;
- We should then focus on:
 - conclude LIME overground tests (^{137}Cs , stability);
 - analyse of all over ground data taken so far;
 - finalise the LIME simulation software and compare with above data;

The Analysis and Simulation groups are organising in this direction.

People are really welcome to join!

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LIME under test

Next plans:

- Francesco, Rita, Roberto setup the automatised monitoring and started the stability test for 10/15 days;
- tests with ^{137}Cs not done for a “mechanical issue” (now solved). To be done in October.
- INFN milestone **30/09/22: Sottomissione articolo su performance overground di LIME**