

MAGiC progress report

April 2023 STAP meeting

This report highlights the progress and changes made on the MAGiC instrument since the last meeting in April 2023.

1. Project management

Personnel

- 1) The hired MAGiC Engineer on site bailed out at the last minute in August. Starting the process again will delay the hire to end of Q1-24 which is not in line with the instrument need. We are reassessing the profile required to carry on with (mostly) installation activities. The on-site engineer will now focus on:
 - a. the TG3/TG4 documentation
 - b. installation activities on-site
 - c. interaction with ESS technical groups
- 2) A job position has been written with ESS for the Instrument Scientist position. As of January 2024, X. Fabrèges will gradually step down from his Instrument Scientist responsibilities. The position will be advertised “soon”.

Documentation

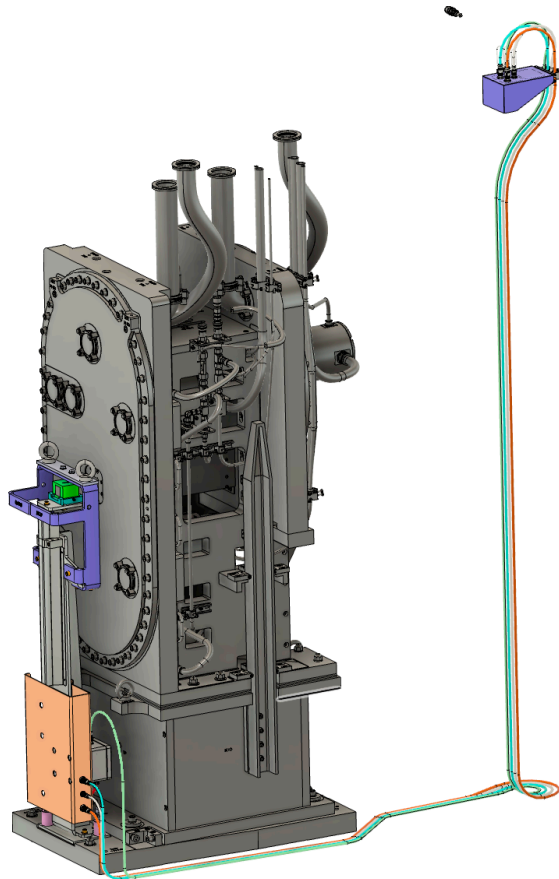
A request has been made by NSS to provide the complete Safety, Hazard and Radiological report to go through licensing. The deadline is set to end of October. Failure to meet the deadline will postpone the first neutrons on the instrument to October 2026. We have no resources available to speed up the process in the instrument team, and it is unlikely that MAGiC will be ready for the end of October.

The first neutrons were scheduled on MAGiC for Q2-26. A delay of 3 months is now expected.

2. Progress on individual components

Solid State Bender

The S-like Solid State Bender has been ordered in September 2023. Interfaces are in discussion to ensure proper alignment. A dedicated support and motorization has been developed in-house at LLB to achieve 0.025° accuracy in alignment.



Choppers

- All axes have been tested at nominal speed and are in the last stage of commissioning. All frequencies are tested from 14 Hz to 154 Hz for the PSC (pulse shaping chopper) in combination with the 14 Hz SC (selection chopper) to ensure that no resonant mode is excited.
- The installation is scheduled in early 2024. Preparation work in-Bunker (drilling, metrology) will start at the end of 2023.



Monitor

The IB-Monitor will be tested in November 2023 for integration with the FE choppers assembly in early 2024.

Neutron Guide system

In-Bunker: all elements have been delivered to ESS and passed Quality check.

Bunker Wall Insert: all elements have been delivered to ESS and passed Quality check.

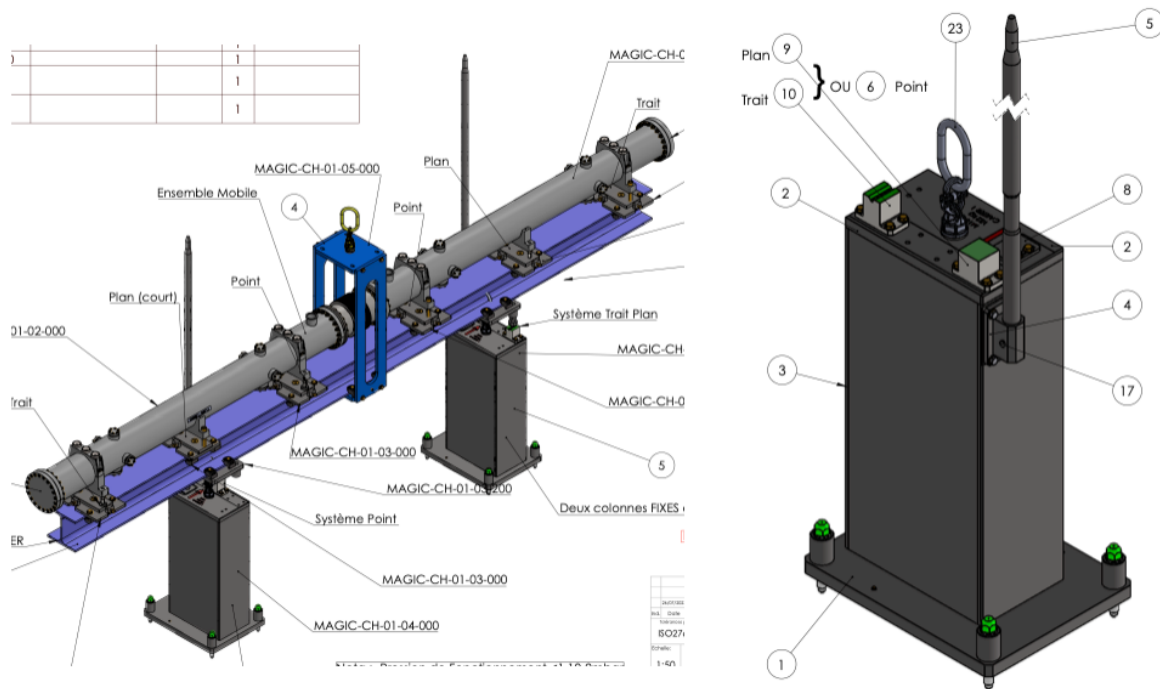
Polarizer: FAT has been performed and minor discrepancies have been found in the metrology. This has now been solved and the elements will be delivered to ESS.

Out of Bunker: the first 29 elements have been delivered to ESS. Mirrotron is working on the remaining elements quickly, and delivery is expected in Q1-24 at the latest.



Vacuum Housing

The tendering process is in progress for the in-Bunker VH elements with CNRS since completion of the manufacturing drawing by the LLB CAD team. Tender release is expected in end of November 2023 for a delivery in June 2024. The schedule for installation is tight since the bunker will be closed in October 2024.



Heavy Shutter

The Heavy Shutter is now stored at ESS. Installation binder has been created and activities on site are scheduled for January 24.

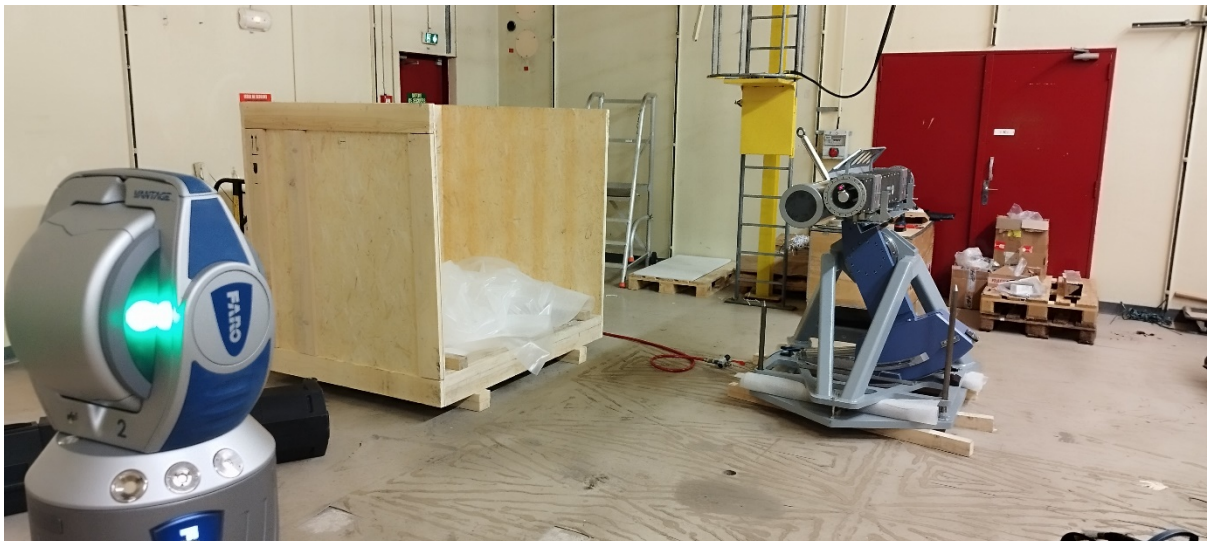
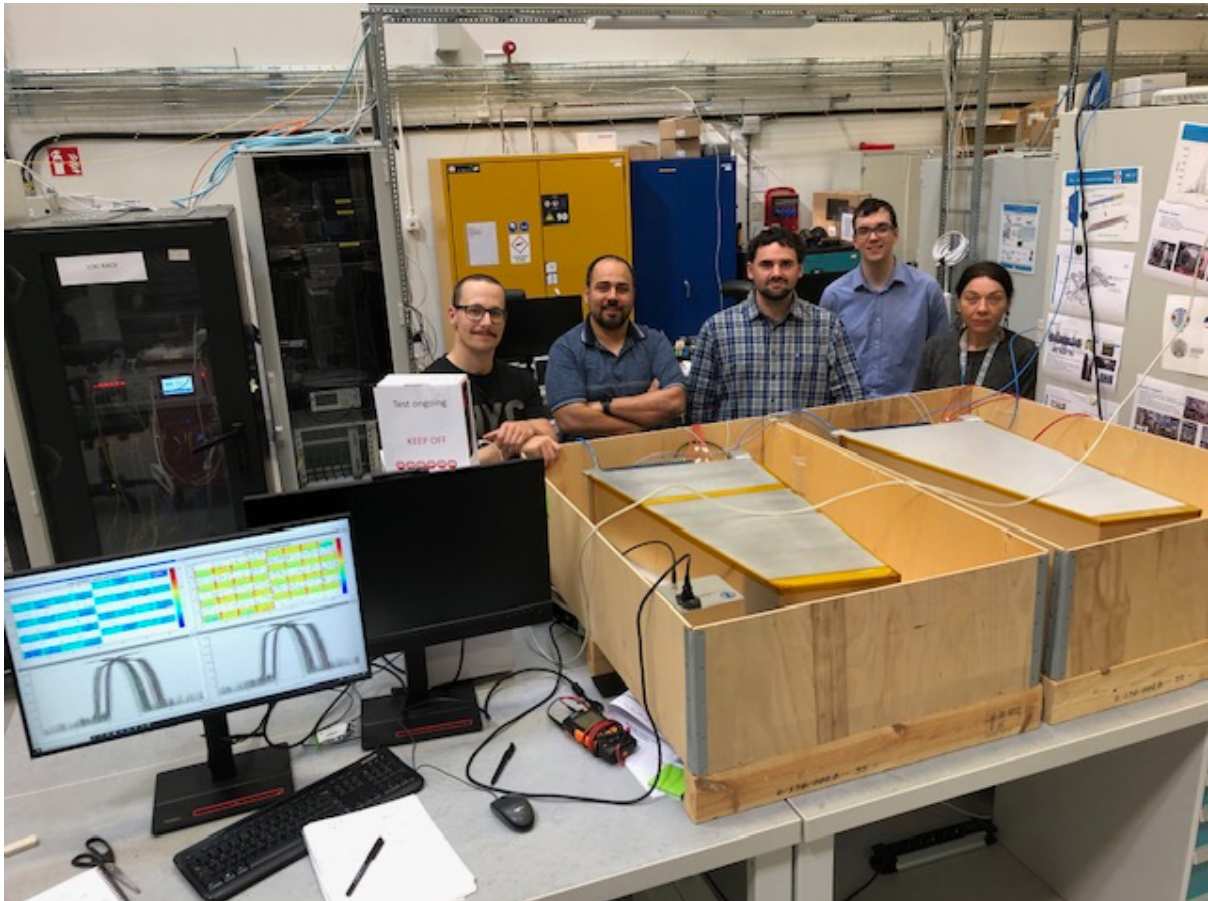


Figure 2.1: Metrology using Faro laser tracker of the HS positioning during FAT

Detectors

Detector B modules have been sent to ESS for testing and integration with the acquisition system. The whole process is a success.



Analyzer

- Offers have been received by PSI for the coated wafers.
- All offers are above CBV and discussions are in progress with NSS to define the best way forward.
 - o Within budget, only 75% of the total angular aperture can be procured.
 - o The instrument efficiency is reduced by a factor 2 in PA mode (2 positions required to cover the whole Q-space).
 - o 2 detector B modules (on 8) must be uninstalled to accommodate for the lack of analyzer coverage.

The instrument team strongly encourages NSS to find contingency funding to procure the missing 25% and ensure proper scientific production of MAGiC.

Experimental Cave

The sub-TG3 has been validated in July 23, 10 weeks above scheduled. Mshield managed to bring it down to 6/8 weeks by pre-ordering elements. Manufacturing of precast element is in progress and start of installation on site is scheduled for November 13th.

The installation binder has been created and is populated by Mshield. The Quality check will be performed prior to the IRR in early November (6th November at the latest).

A request will be made to SAM (metrology) to place the experimental cave in E01.

The end of construction is scheduled for March 19th 2024.

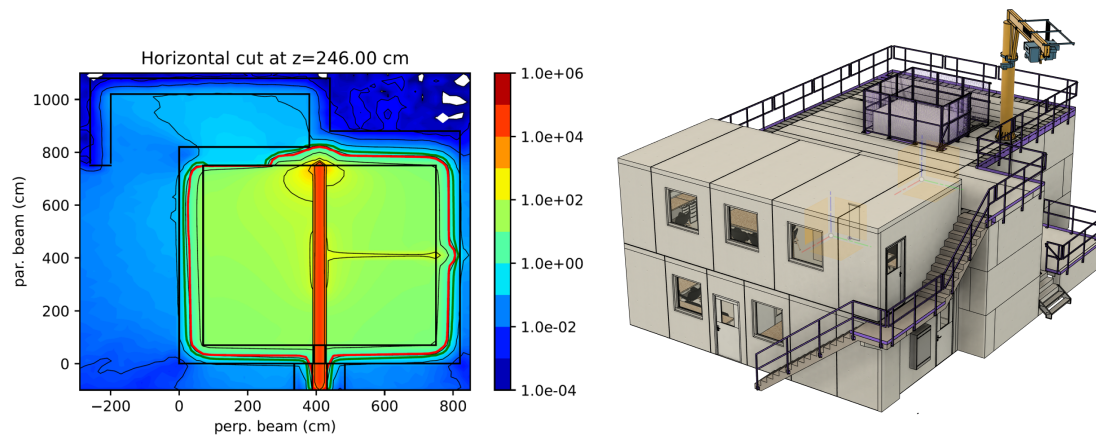


Figure 2.2: (left) dose rate at sample height in the case of a Bragg reflection hitting the closest wall. (right) Detailed designed experimental cave render

Elevator

A contract has been signed with a french company for the delivery and installation of an elevator. Installation will start after the completion of the cave project in April 2024.