

MAGiC progress report

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Abstract

This report highlights the progress and changes made on the MAGiC instrument since the last STAP meeting in April 2025.

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I. PROJECT MANAGEMENT

A. Personnel

- Iurii Kibalin, an Instrument Data Scientist, started on September 1st at DMSC.
- We are hiring an Instrument Operation Engineer, the application period closed on October 15th, interviews will follow soon.

B. Design activities

- After the failed spring help attempt MAGiC gets a new* designer to help with the analyzer/detector B support structure from the NSS designer team.

II. PROGRESS ON INSTRUMENT COMPONENTS

A. Bridge Beam Guide (BBG)

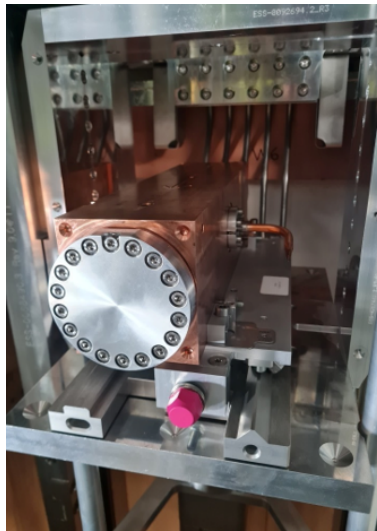


FIG. 1. The installed BBG.

The BBG was successfully installed in May.



FIG. 2. The assembled in-Bunker Vacuum Housing at the Mirrotron facility.

B. In-Bunker Vacuum Housing

The manufacturing is over. The factory acceptance testing were finished on week 42. We found issues with a remnant magnetization of the steel plates of the magnetic assembly and a position reproducibility of the remotely handled section. Mirrotron is working to fix them. The installation is planned in January, before the Beam-on-Target date.

C. Bunker Wall Insert (BWI)

The Bunker Wall Insert design is finished. The tender was closed on October 15th.

D. Heavy Shutter

The Heavy Shutter was successfully installed in May.



FIG. 3. The installed Heavy Shutter.

E. Out-of-Bunker Vacuum Housing

The design of the 130m-long Out-of-Bunker Vacuum Housing is practically completed. The tender will be opened in 1-2 weeks after the STAP meeting. The manufacturing contract will define the first critical path and the TG5 date of the instrument.

F. Analyzer

We carried out an experiment with a 10-stack analyzer prototype at BOA instrument, SINQ, PSI in August. Overall the prototype demonstrated a good performance, we were able to achieve a 98% polarization efficiency across the entire spectrum of the cold moderator at SINQ. We also identified an issue with deformation of the Si wafers glued to the stacks resulting in a certain waviness of the individual channels. This leads to appearance of extinctions, i.e. affects the transmission function, for certain wavelengths. For a better characterization of the stack transmission function we applied for a beamtime at the IMAT instrument, ISIS.

G. Radial Collimator and oscillation system

The manufacturing of the radial collimator has started and it is expected to be delivered in April 2026. We received a good offer for the oscillation system satisfying the MCA control integration requirements.

H. Detector A

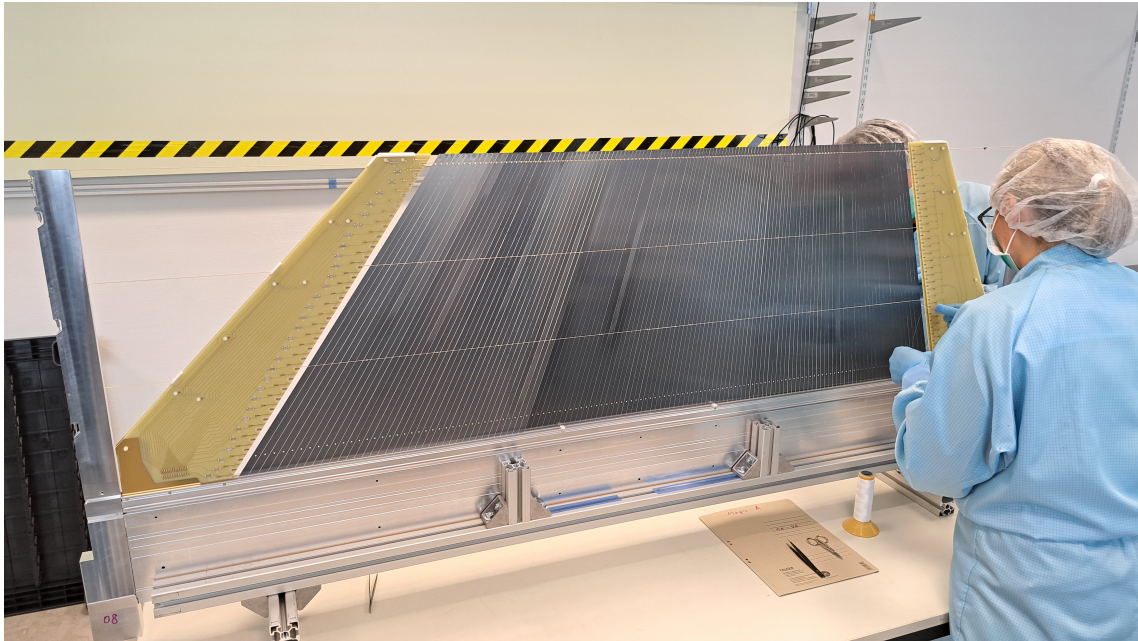


FIG. 4. Manufacturing of the Detector A section.

The manufacturing of the Detector A has started and is expected to be finished in the first quarter of 2026.

I. Integration progress

The budget offers were finalized for all common projects, we are in the middle of the design stage. The design freeze for the common electrical project is expected to happen in December.

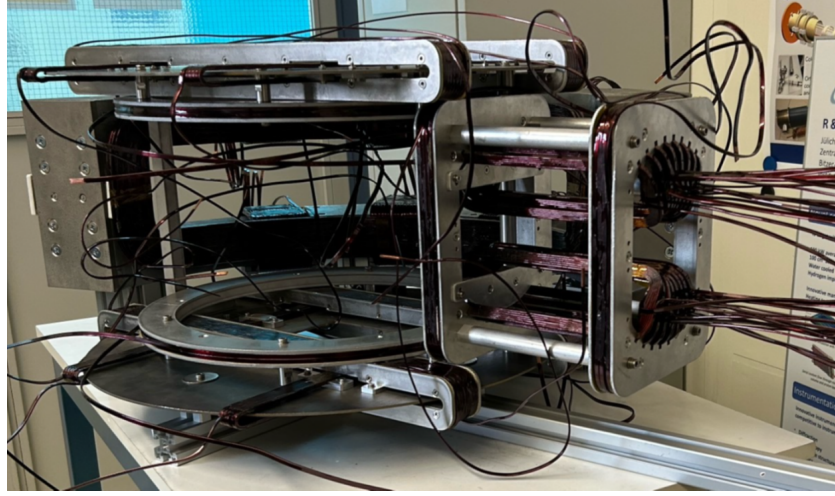


FIG. 5. The XYZ magnetic field system.

J. XYZ magnetic field system

The XYZ magnetic field system was assembled at FZJ and functional tests has started.

K. Neutron beam termination system

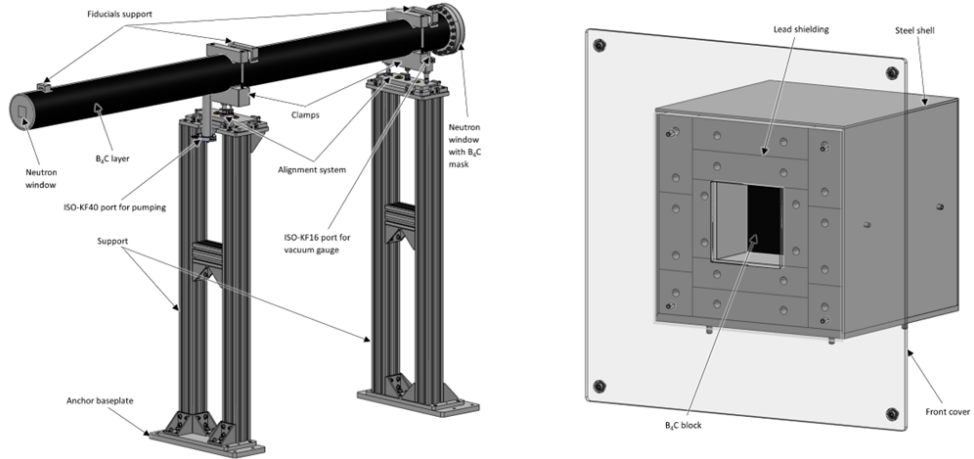


FIG. 6. The evacuated flight path and the beam stop.

The design of the evacuated flight path and the beam stop has successfully passed the sub-TG3. We begin to order the components.

L. Elevated platform

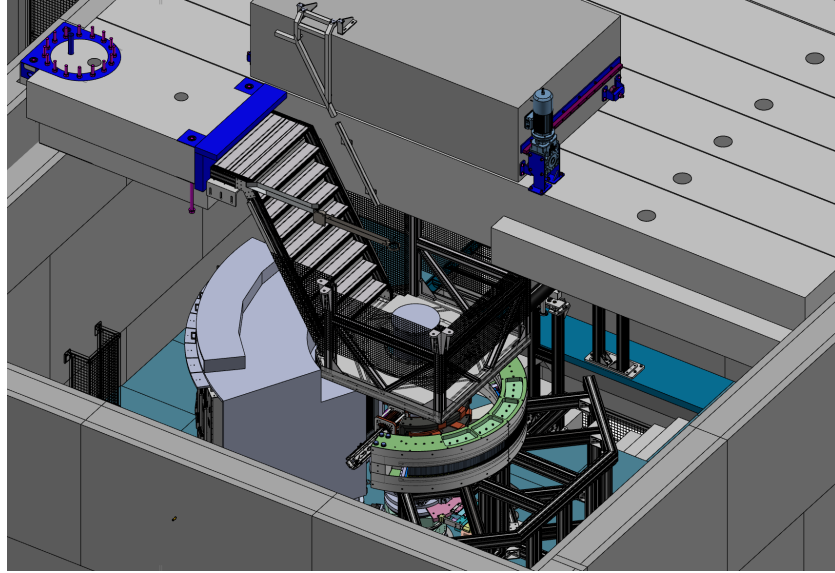


FIG. 7. The elevated platform for the sample environment access.

The principal design of the elevated platform is finished. A vendor was contacted for the finalization of design, manufacturing and documentation preparation.