

Updates for DREAM instrument (April 2024)

The following report describes the major activities of the instrument project since the last STAP meeting in October 2024.

Recruitment

Mikhail Feygenson has started as the Diffraction & Imaging Division Head as of February 2024. He is still attached to the DREAM project, but the recruiting for his replacement will start soon. The negotiations with Uppsala University to bring a commissioning scientist to the DREAM team have started. The position will be permanent with employment at Uppsala University. Hiring is expected to begin after the summer break.

Schedule update

The current planning still assumes a complete installation of DREAM (Final TG5) by December 2024, which is still before the current beam-on-target (BOT) date estimates (2025).

In-bunker optics: NBOA, BBG and Bi-spectral switch

The neutron beam optical assembly (NBOA) and bridge beam guide (BBG) were manufactured by SwissNeutronics (SNAG). The NBOA was delivered to ESS and integrated into the neutron beam port insert (NBPI). The installation of NBPI inside the bunker was completed. The bi-spectral switch was manufactured at FZJ and tested with neutrons at ISIS in July 2022. The final report was completed and the switch was installed.

Neutron guides

The in-bunker and out-of-bunker guide installations are completed.

Neutron guide shielding

The DREAM instrument is a part of the ESS Common Shielding project. The shielding blocks were manufactured and all blocks were delivered to ESS. The upper blocks were installed to cover the outside bunker neutron guides.

Chopper system

The factory acceptance tests are completed at FZJ. The tests include over 500 hours of running time at various speeds, including ones that will be used during high, medium and low-resolution diffraction measurements at DREAM. The choppers are being disassembled for the shipping to ESS. The expected arrival of the choppers is in May 2024. The remote-handling frame for the pulse shaping chopper and base for the band control chopper were installed inside the bunker (Fig.1).



Figure 1: Pulse shaping chopper remote handling frame installed inside the bunker.

Detectors

The manufacturing of the endcap detectors is complete. They were delivered and tested with the cosmic neutrons at ESS detector testing facility in Utgard. After passing the tests, the endcap detectors were installed inside the DREAM cave (Figure 2).

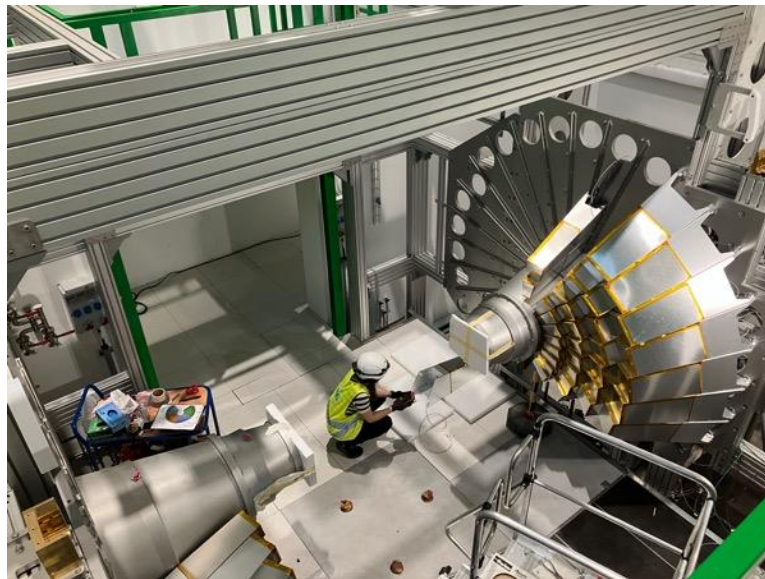


Figure 2: Installation of the endcap detectors inside the DREAM cave.

The high-resolution detectors will be delivered for the installation to ESS in May 2024, while mantle detectors will arrive in June, 2024. The technical solution for the detection gas support system is ongoing. The detector racks will be delivered and installed by June 2024.

Beam monitors

The in-bunker and cave beam monitors for DREAM were tested at ISIS. The collected data is being analyzed.

Common projects

The DREAM instrument is part of a common utility project (CUP) and a common electrical project (CEP). Both projects are led by ESS with input from the instrument team. As names imply, both projects will deliver necessary gas, water and electrical supplies to experimental caves and control hutches. CEP and CUP teams have completed the installation. After the control cabinets are delivered to DREAM, they will be connected and energized by CEP team. The instrument control system (ICS) group will start the installation soon.

Sample environment

The scope and budget of the DREAM-specific sample changer cryofurnace were moved to the ESS sample environment group, with the DREAM team taking a lead role in procurement and contract negotiations. We have failed to receive a commercial offer from the CryoVac. We will start the new European procurement soon. As a backup option, the capillary sample changer with cryostream was developed by ESS sample environment team. The manufacturing will begin after summer break. In parallel, Florence Porcher is working on delivery of the used furnaces from LLB.