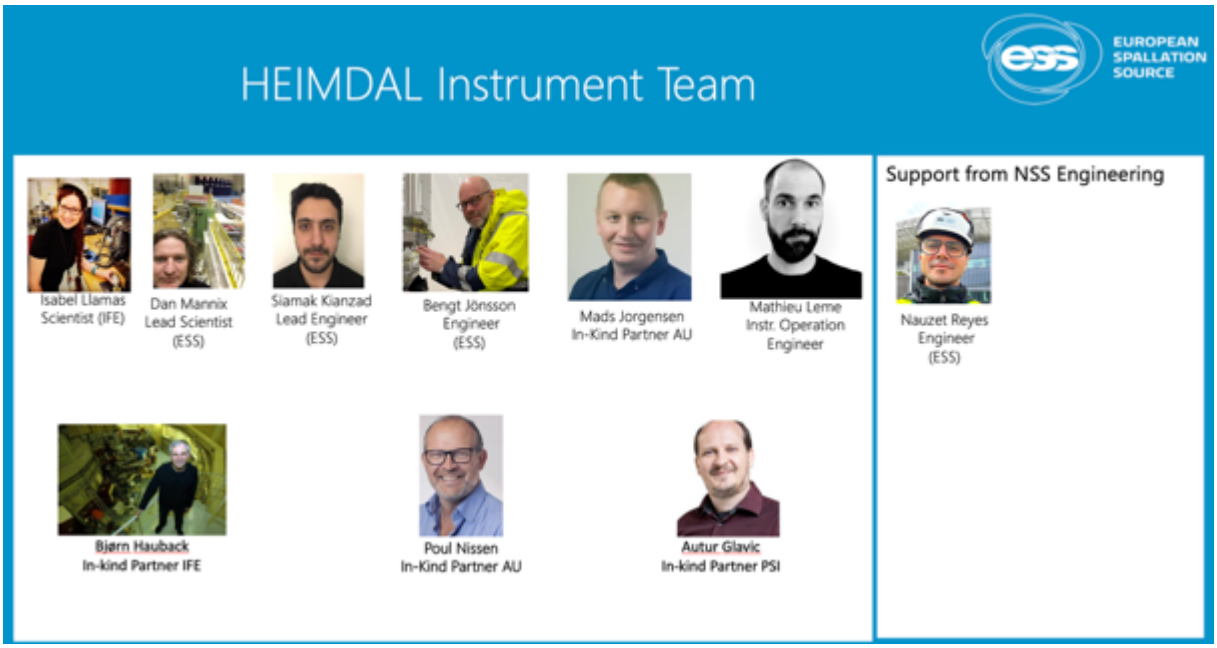
The HEIMDAL Instrument at ESS
Diffraction STAP Meeting April 2026
Update Summary

Summary: Heimdal is currently starting the installation phase over 2026, with many components constructed and delivered to ESS. The Cave installation has started with the foundation structure and delivery of concrete blocks. The cave installation will restart over April-May 2026. The in-bunker components installations have started and light shutter Heavy shutter, choppers manufactured and ready for installation. The construction of the A0 CDT 2D detector prototype is fabricated and tested with cosmic neutrons and 50% of the detector is constructed and ready to be shipped to ESS.

Personnel: Heimdal has just recruited a new instrument operation engineer (IOE) Mathieu Leme, who start 13th April 2026. He has experience of working at ILL, ESRF and MAX-IV and will help with the integration, installation phase as well as sample environment integration. Heimdal has opened a position for a data scientist at DMSC which should start by before the end of 2026. The opening of a second scientist position should also start by the end of 2026 or beginning of 2027.



Choppers: Thermal choppers manufactured and testing has started. T0 manufacture in progress and the bearing has been tested manually. T0 support block has been installed in the bunker.

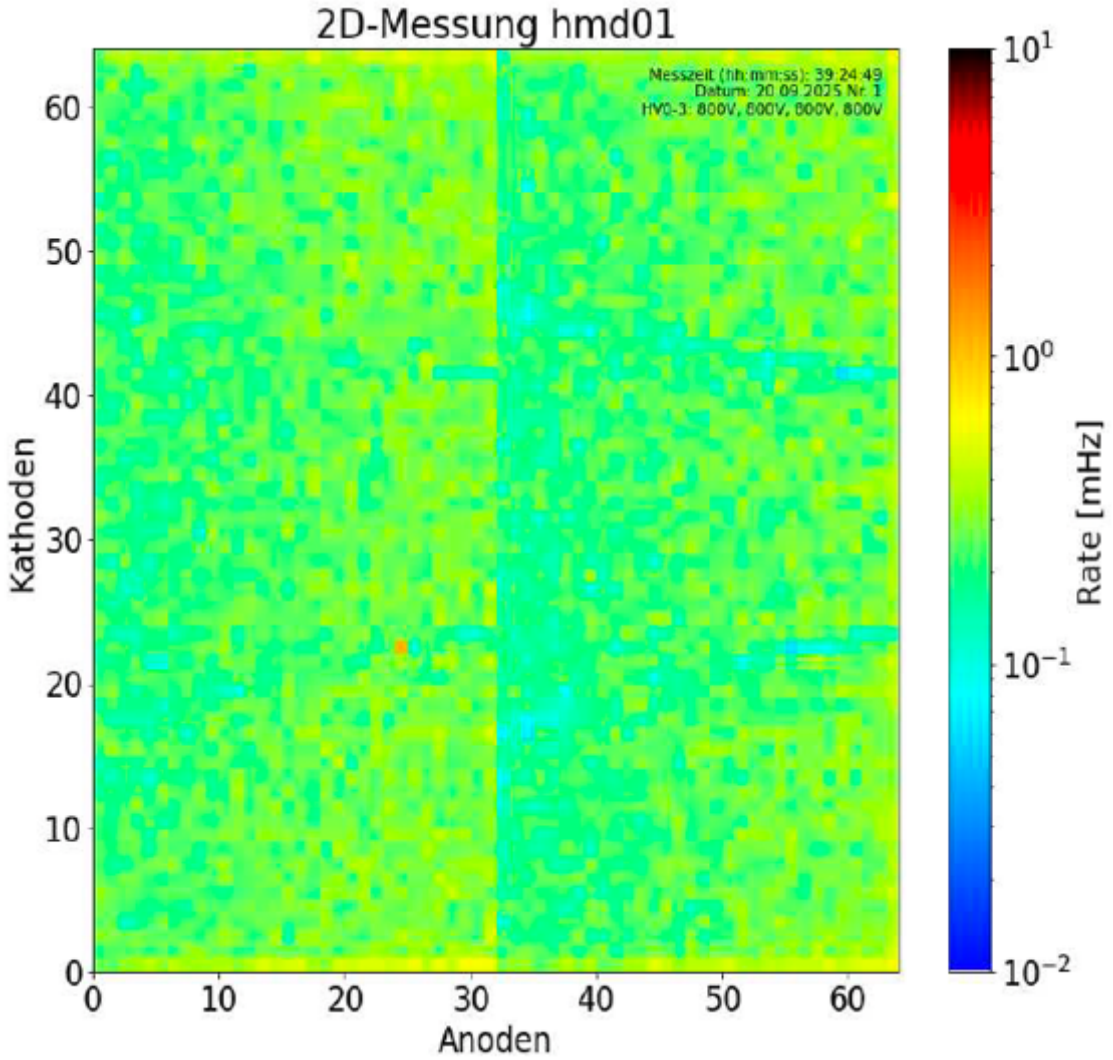
TPSC 1&2.

TFOC 3

TWSC 3

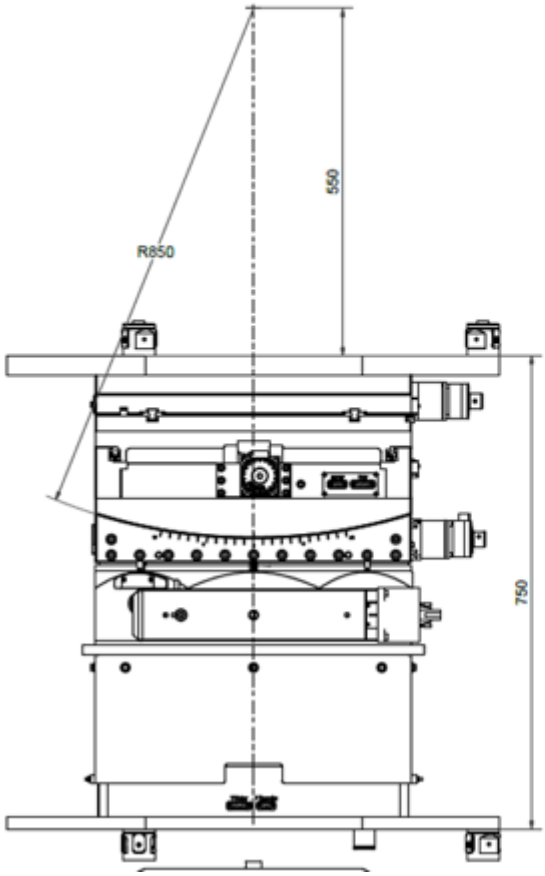
Pictures of Heimdal Choppers being tested and waiting for installation at ESS.

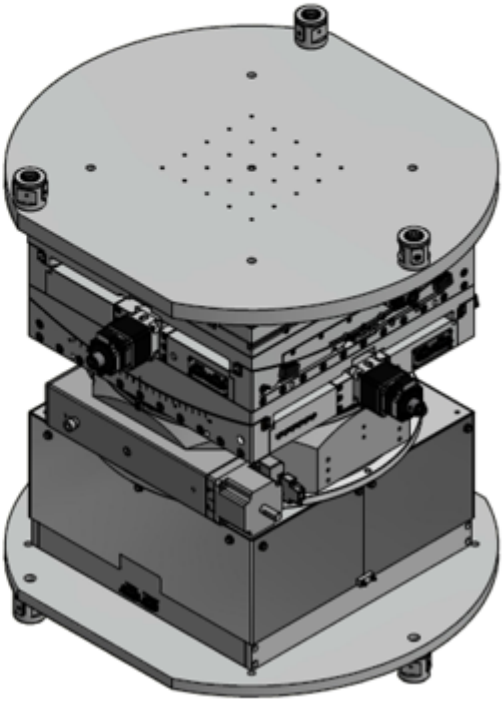
2D Detector: A0 prototype manufactured and tested with cosmic neutrons at CDT and FAT undertaken. Manufacture started 1.0 (80 degrees) of detector.



Picture above: Results of tests with cosmic neutrons. Very low intrinsic background 0.3mHz/Voxel. No missing anode wide or cathode strips missing.

Sample table: Contract awarded to JJ-X-ray solution for x,y,z and omega rotations, + tilt stages within the technical specification of the instrument and compatible with magnetic field. This will enable both neutron powder and single crystal diffraction on Helmdal from small mm sized samples.



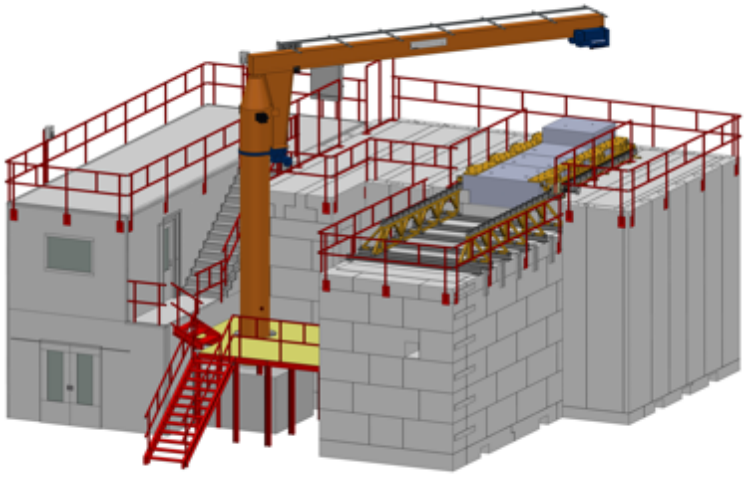


Above: Drawing of the Heimdal motorised sample stage, with x,y,z, omega and tilt stages

Cave: Manufacture of concrete blocks being delivered with contractor Mirrotron. A small delay due to delay of painting at manufacturer caused by winter cold weather. Blocks are now painted and delivered to ESS. Installation will restart in April/May 2026.. Base foundation installation has been completed.

Heimdal Cave foundation installed at ESS and wall blocks delivered to be installed in April/May 2026..

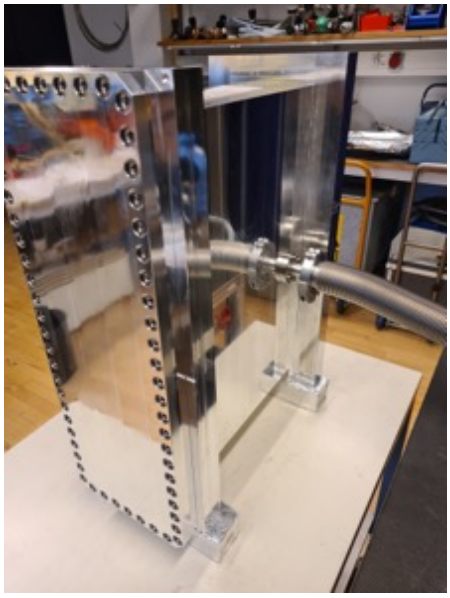
Experimental cabin: Experimental cabin contracted to mshield, along with crane, platforms, internal cave floors and railings. There is a new optimized design for the cabin with slightly moore internal space and less external walkways and simplified crane.



The H ve is being supplied by Mirrotron and the cabin supplied by mshield.

Heavy Shutter and Light Shutter:

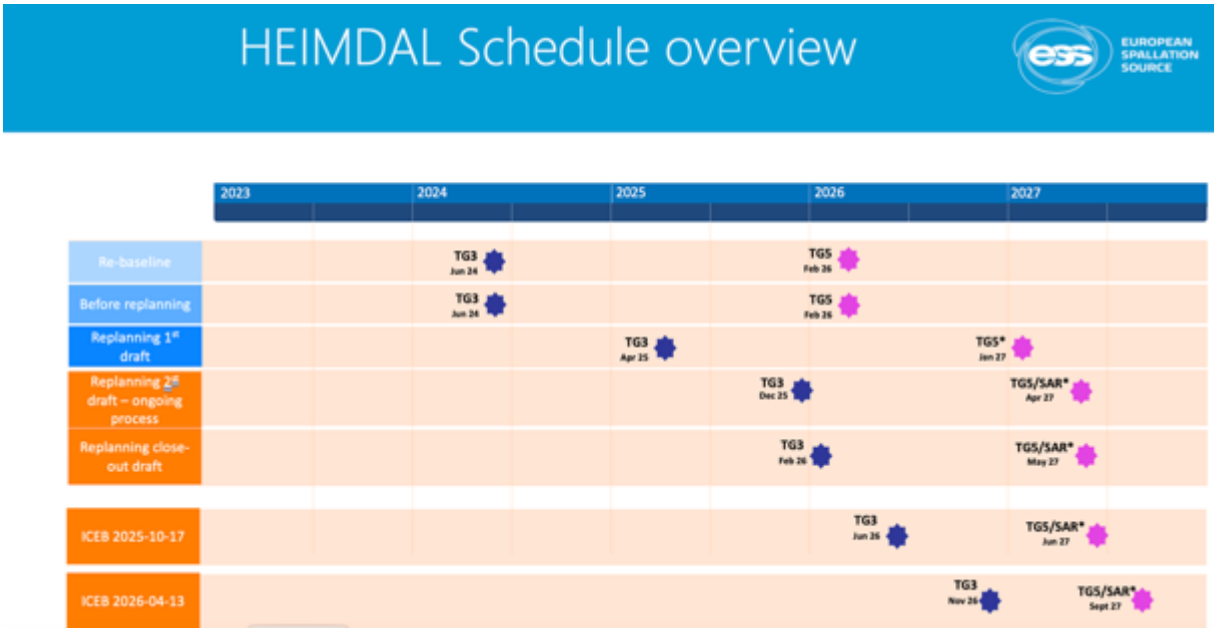
The heavy shutter design is based on the ESS test beamline design constructed by Kinetic. The light shutter and bispectral switch is manufactured and delivered to ESS and going vacuum tests. The heavy shutter is manufactured and delivered to ESS and a going though testing before installation.



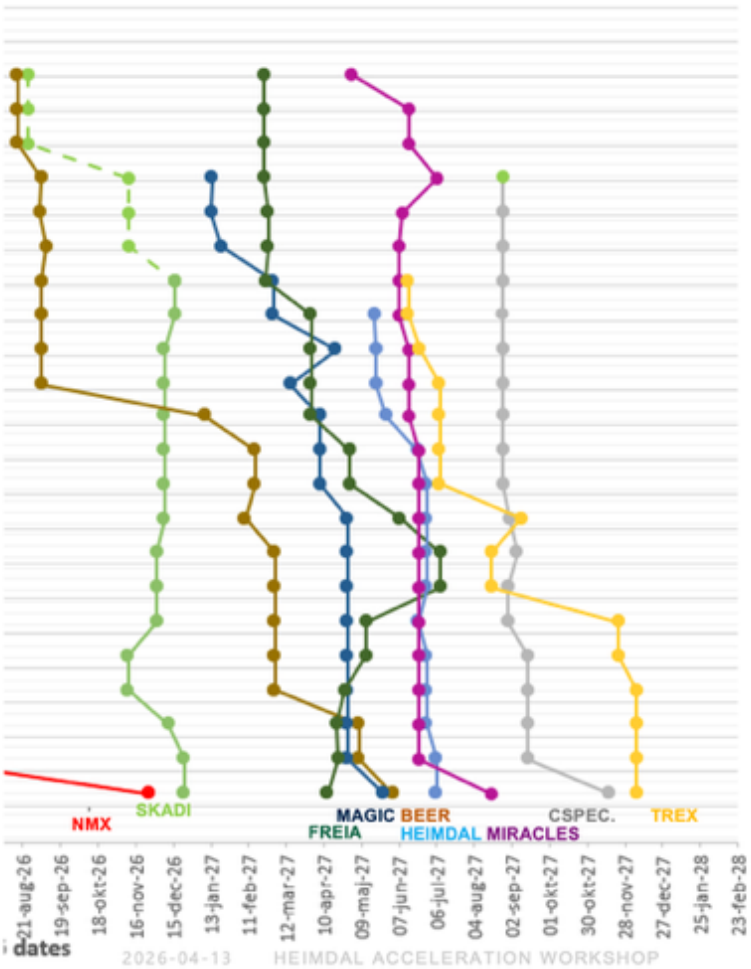
Picture (above left) Heavy shutter manufactured. (above right) Light shutter manufactured and under vacuum testing at Aarhus University.

Instrument Schedule

The current TG5 milestone (start of hot commissioning) is sept 2027 (see chart below). There has been some slip in the schedule but this is so far much less than other instruments.



The TG3 and TG5 milestones some small schedule slips.



Heimdal progress slip- chart compared to other ESS instruments.