

The HEIMDAL Instrument at ESS Diffraction STAP Meeting Oct 2025 Update Summary

Summary: Heimdal is currently well into the manufacture phase, with many components constructed. We are now about to start installation phase from end 2025-2026, with the following initial installation plan: Cave installation Q4 2025, in-bunker components installation, light shutter Heavy shutter, choppers installation Q1 2026. The construction of the A0 CDT 2D detector prototype is fabricated and tested with cosmic neutrons. The Cave concrete blocks manufacture is started. In addition, contracts for sample stage and control hutch projects are initiated.

Choppers: Thermal choppers manufactured. Ready for testing and installation (January 2026), T0 manufacture in progress. T0 support manufactured and to be installed Q4 2025.



TPSC 1&2.

TWSC 3

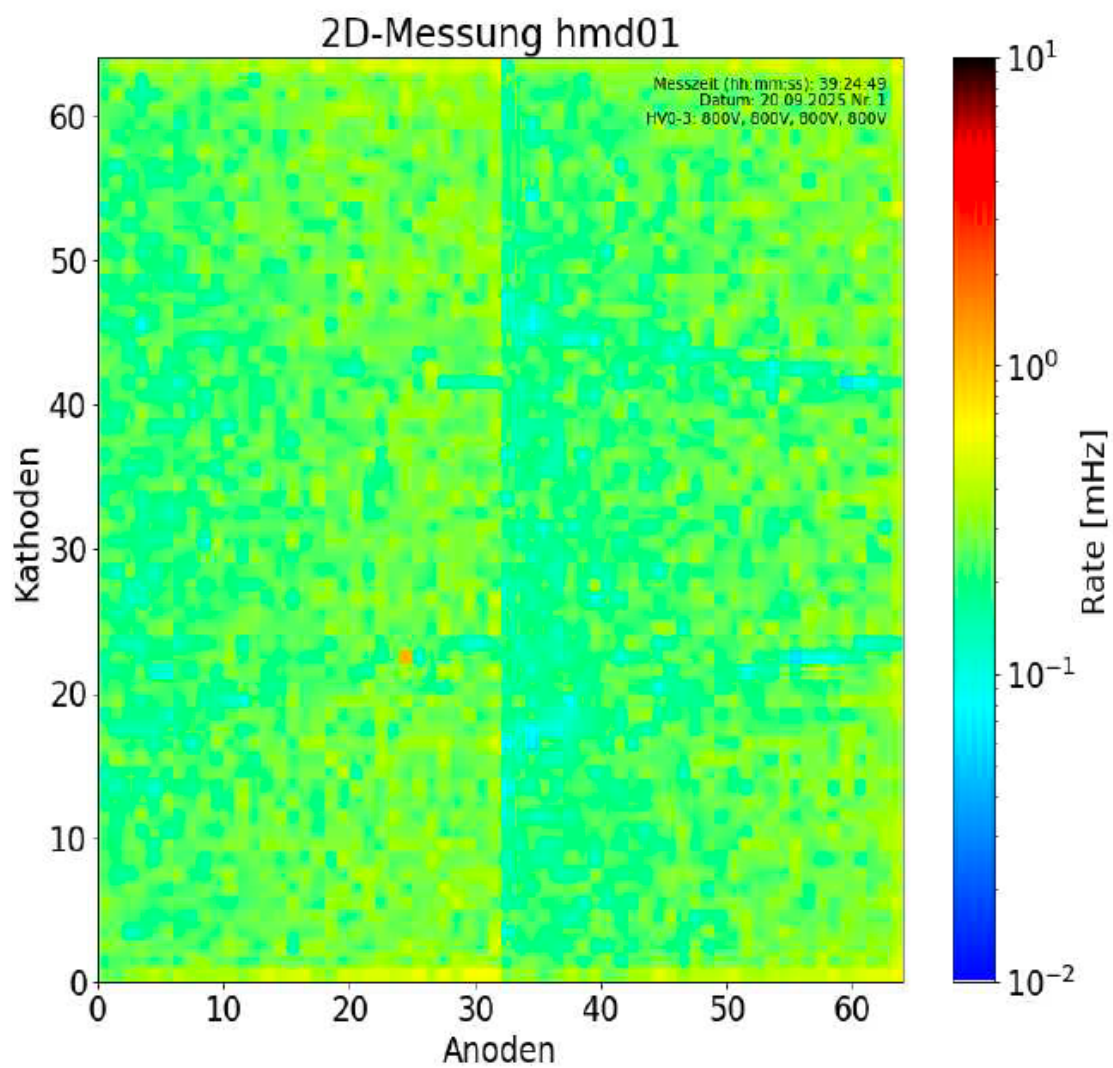


TFOC 3



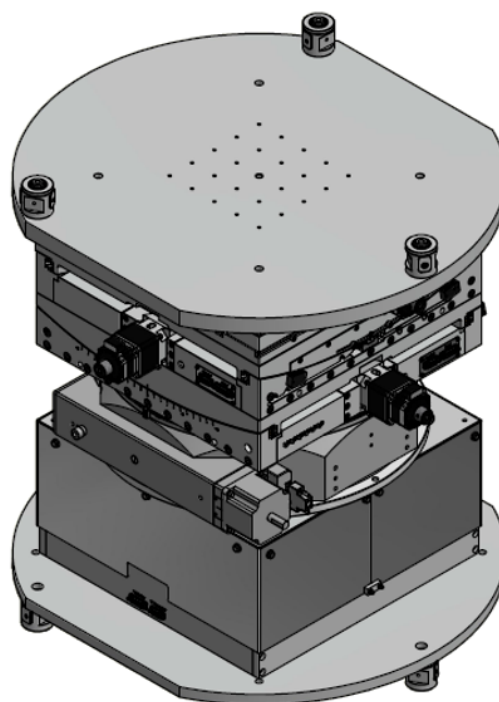
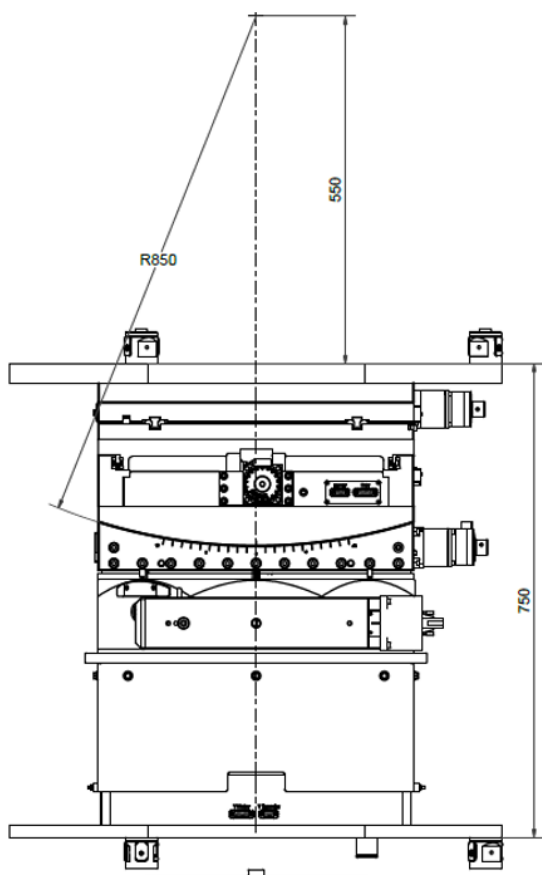
Pictures of Heimdal Choppers awaiting testing and installation at ESS.

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.

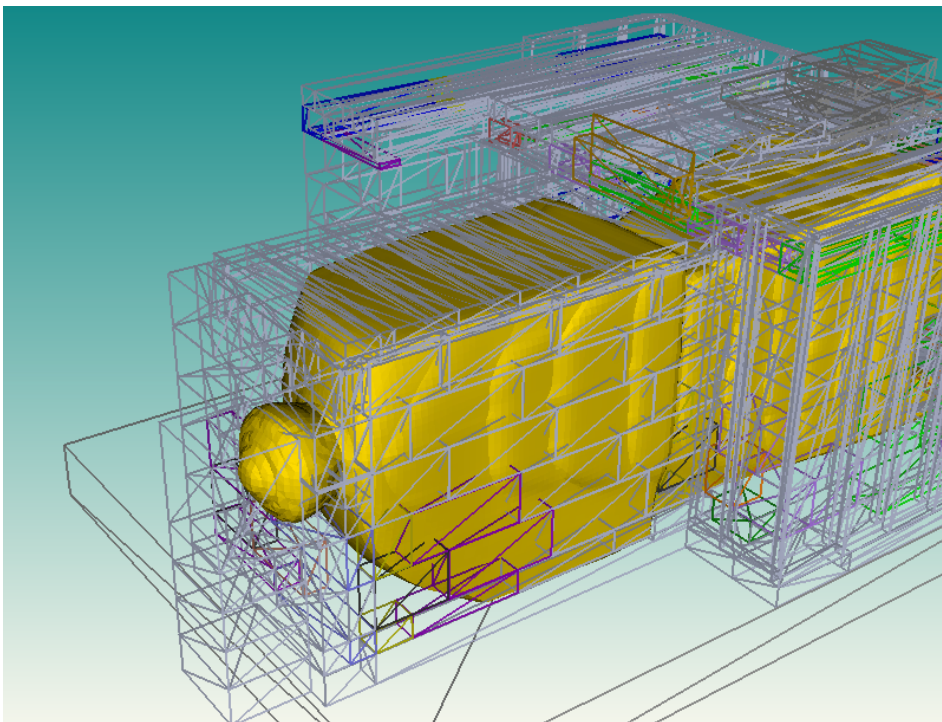


Above: Drawing of the Heimdal motorised sample stage, with x,y,z, omega and tilt stages

Cave: Manufacture of concrete blocks started with contractor Mirrotron. Start of installation expected Q4 2025 / Q1 2026. Base foundation installation to start in December 2025.

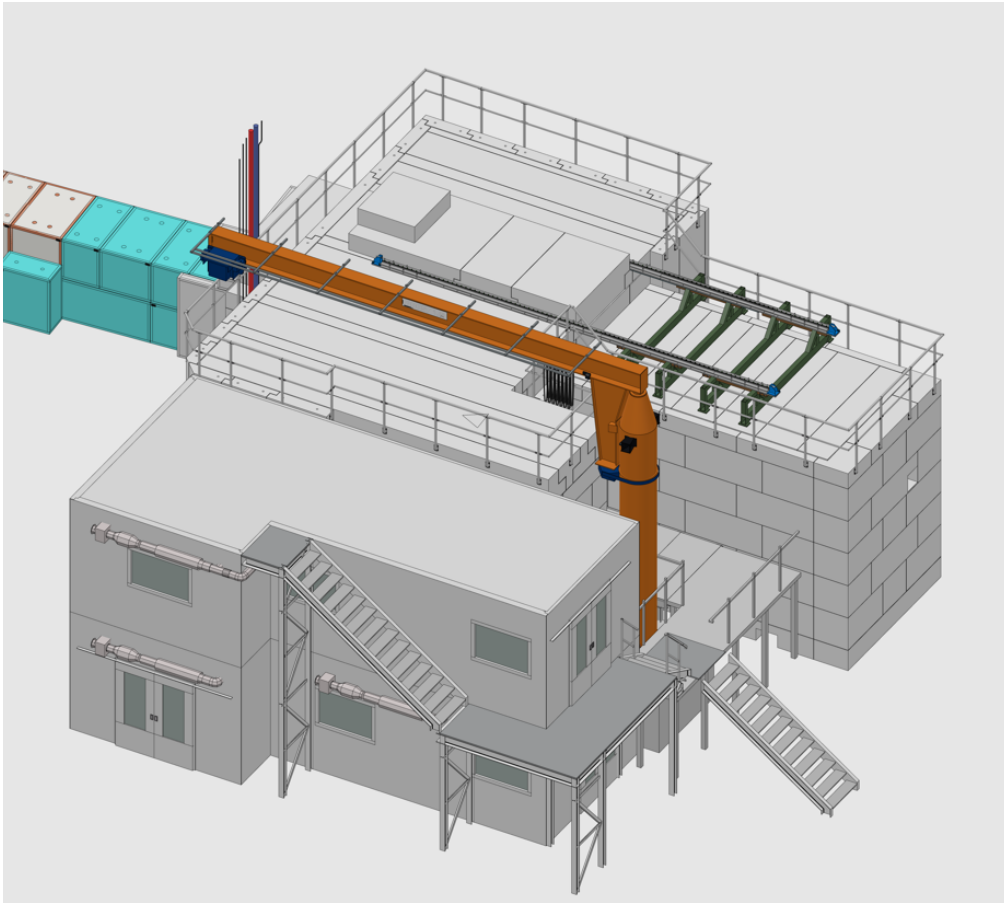


Manufacture of "Lego" concept Heimdal cave concrete blocks contractor Mirrotron.



Neutronics calculations for Heimdal cave structure for H1&H2 scenarios.

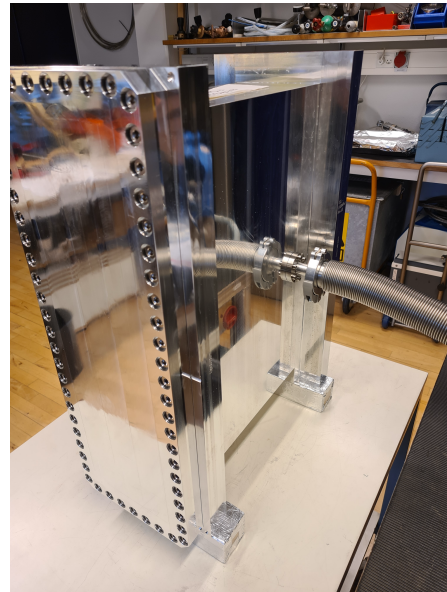
Experimental cabin: Experimental cabin contracted to mshield, along with crane, platforms, internal cave floors and railings.



The Heimdal experiment cabin and cave design to date. The cave is being supplied by Mirrotron and the cabin supplied by mshield.

Heavy Shutter and Light Shutter:

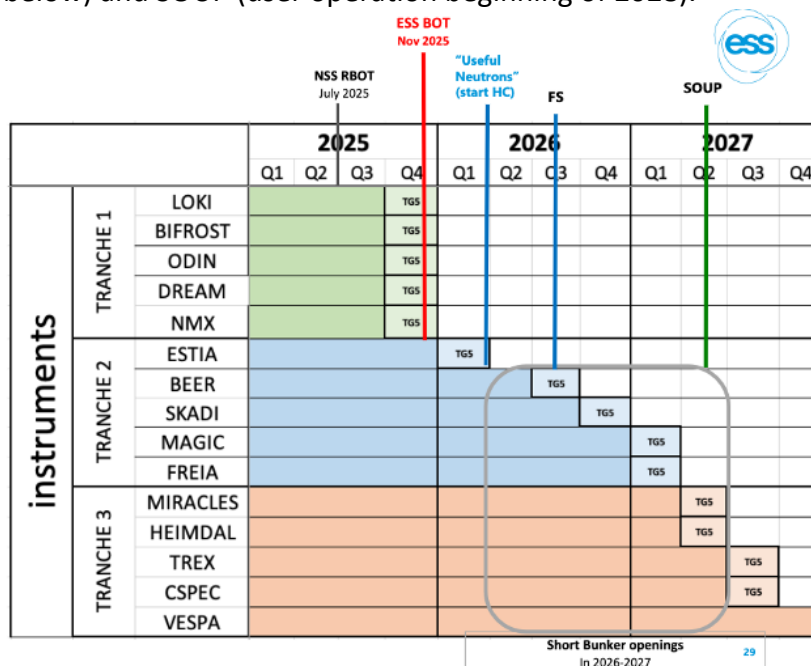
The heavy shutter design is based on the ESS test beamline design constructed by Kinetic. The light shutter is manufactured and under vacuum tests at Aarhus University. The bi-spectral switch fits inside the light shutter has been designed and is be fabricated by swissneutronics and is now at ESS.



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

Instrument Schedule

Heimdal has this year undergone a new rescheduling review along with other T2&T3 instruments. The current TG5 milestone (start of hot commissioning) is Q2 2027 (see chart below) and SOUP (user operation beginning of 2028).



The TG5 milestones for Heimdal compared to other ESS instruments.

