

SKADI

Current Status

STAP Oct 2024

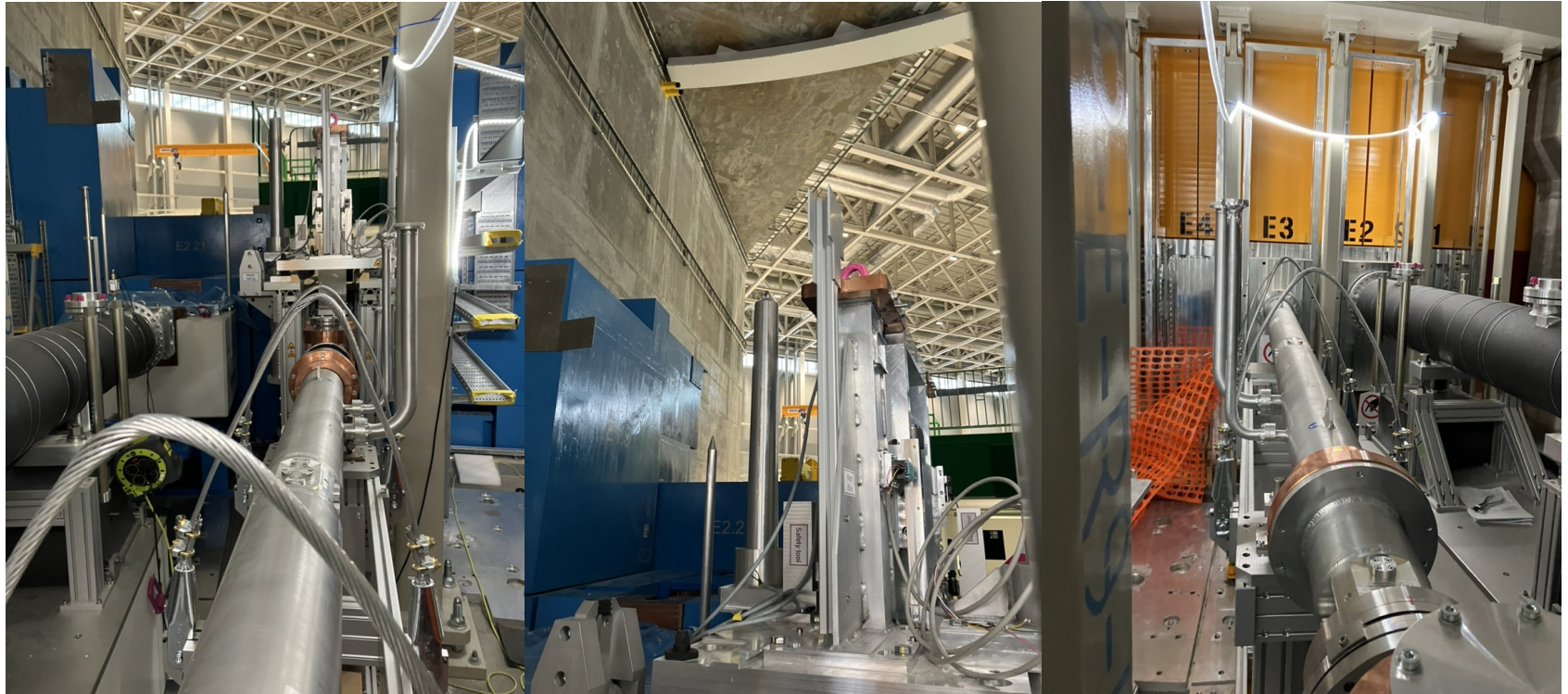
Sebastian Jaksch, Romuald Hanslik, Tadeusz Kozielowski, Annika Stellhorn, Henrich Frielinghaus, Alexis Chennevière, Sylvain Désert, Pascal Lavie et al.

Major Steps since last STAP

- Installation of collimation shielding (MShield)
- Installation of detector shielding (MShield)
- Sample Cave completed (MShield)
- Manufacturing of detector tube (SDMS)
- Manufacturing of collimation stretch (AVS)
- Out of bunker guides being manufactured (Mirrotron)
- Hutch designed and ordered (Nuvia)
- Polarizer optics manufactured (SNAG)
- Polarizer/Fast Shutter/Spin Flipper CDR happening now (in-House)
- Currently finalizing licensing documentation
- Detector housing interior manufactured

- Detector has been tested at ORNL → extra slides

Overview Photos

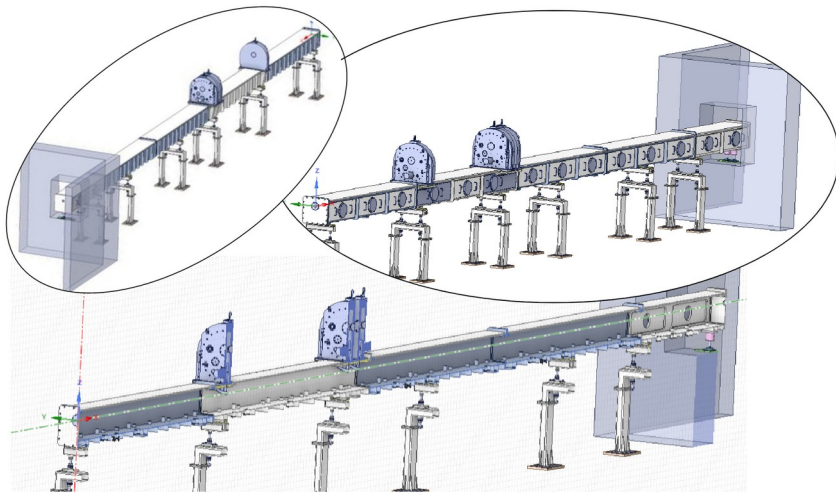


Overview



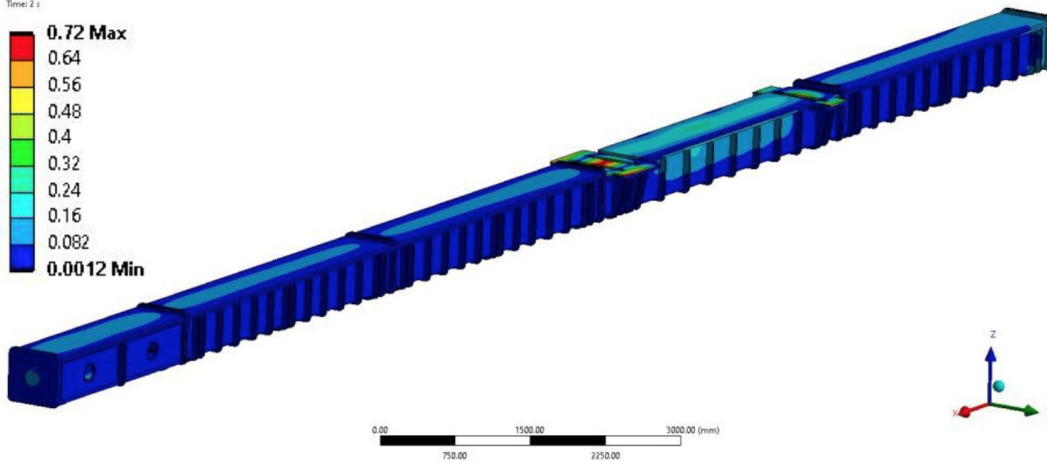
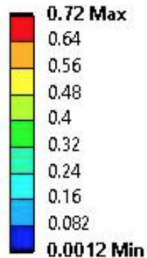
Collimator

Overview



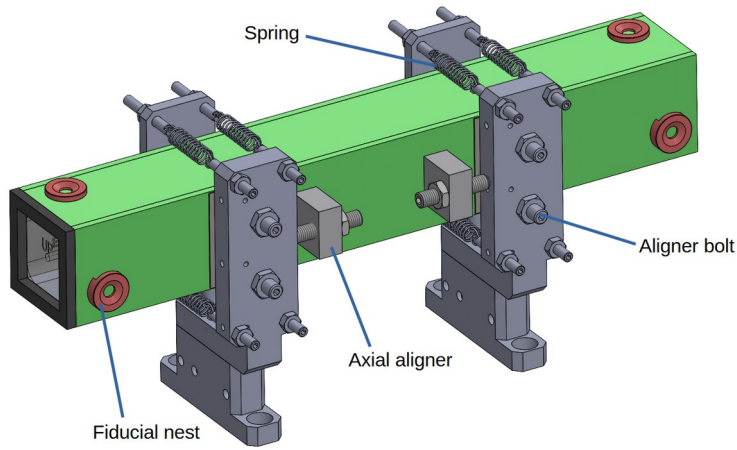
Deformation testing of housing

IB: 1.2xG+Vacuum+200kg+3x350kg
Total Deformation
Type: Total Deformation
Unit: mm
Time: 2 s



- Currently preparing for final FAT
- Some issues with motors had to be addressed, but are solved now (vibrations when using ESS MCA controls → use different motors)
- Installation Nov 2024

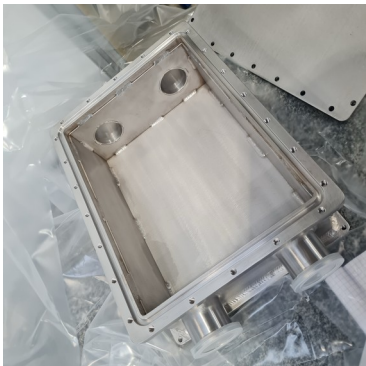
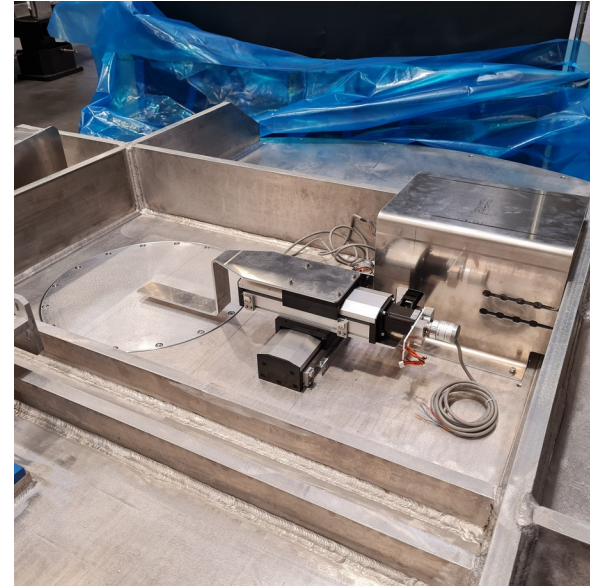
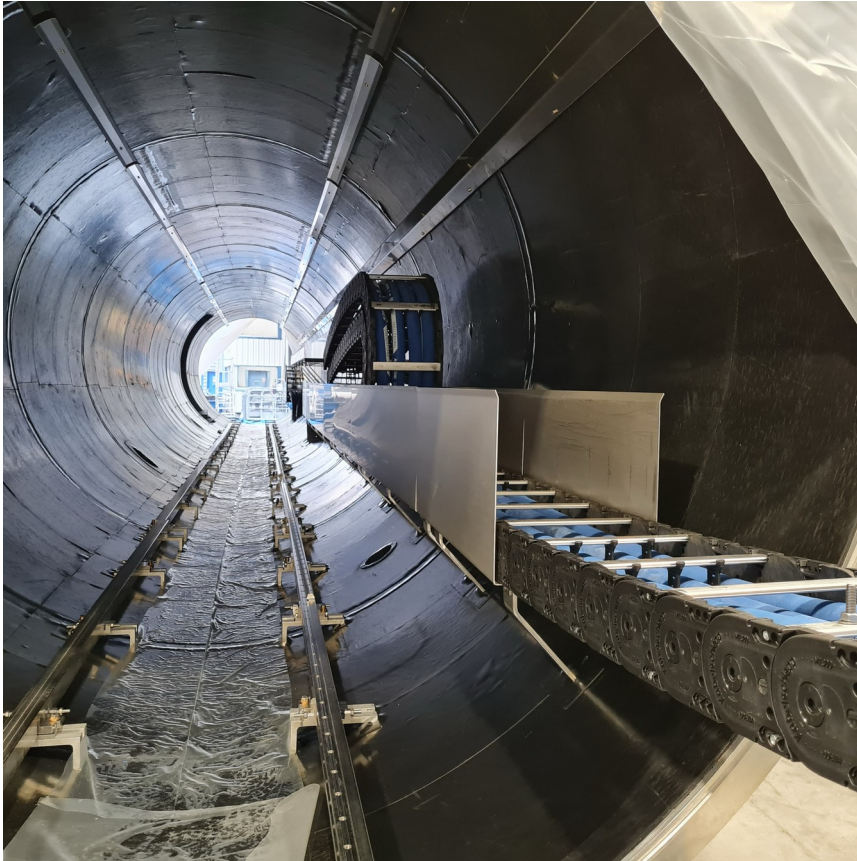
Collimator guides



Cross section (W x H):	30.00 x 30.00 mm ²
Cross section tolerance:	±0.05 mm in each direction
Substrate:	Borofloat glass
Substrate thickness:	5.5 mm
Thickness tolerance:	±0.2 mm
Supermirror coating type:	nonmagnetic
Supermirror coating m value:	m = 1.0 on all surfaces
Reflectivity:	R ≥ 99% on all surfaces
Guide length tolerance:	0/-1 mm

- Currently preparing for final FAT
- Installation after collimator tank early 2025

Detector tube



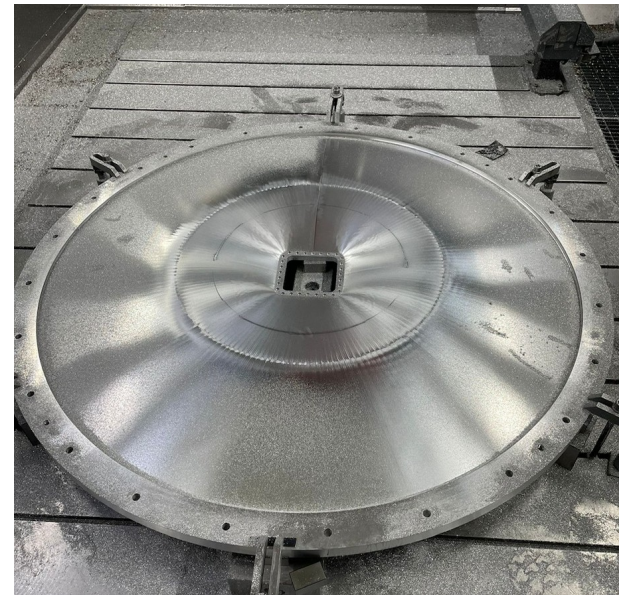
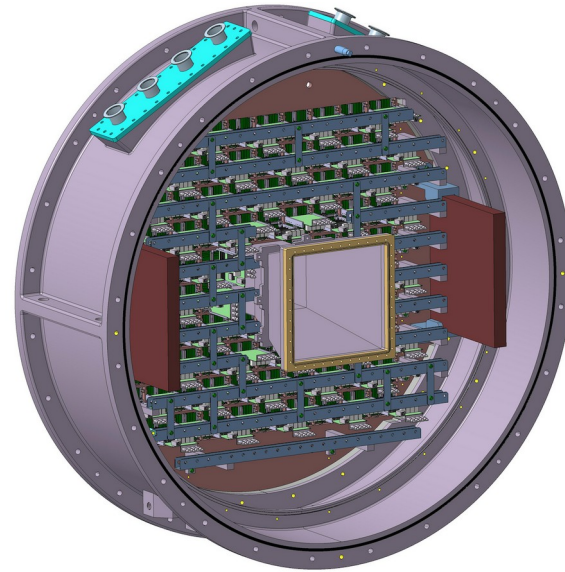
- FAT currently under way
- Installation early 2025
- Includes MCA for detector positioning

Detector housing

Details in separate presentation

- Manufacturing started
- Barrel being manufactured until Q2-2025
- Assembly until mid 2025

- Assembly is not affected by firmware/software integration, since modules can be updated via network



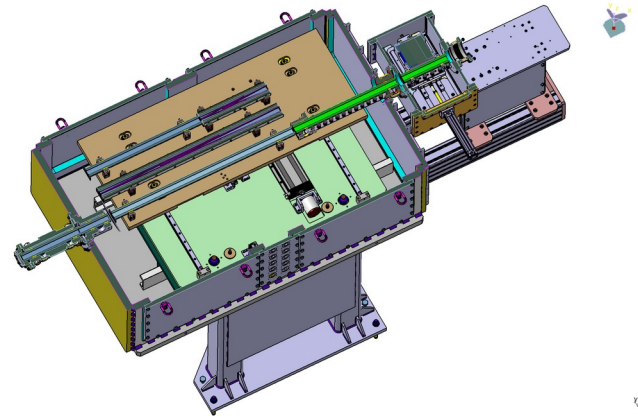
Shielding installation

- Done during summer this year
- Now ready to take installation by CEP/CUP
- Installation of collimation, tube and hutches will follow now the structure is in place

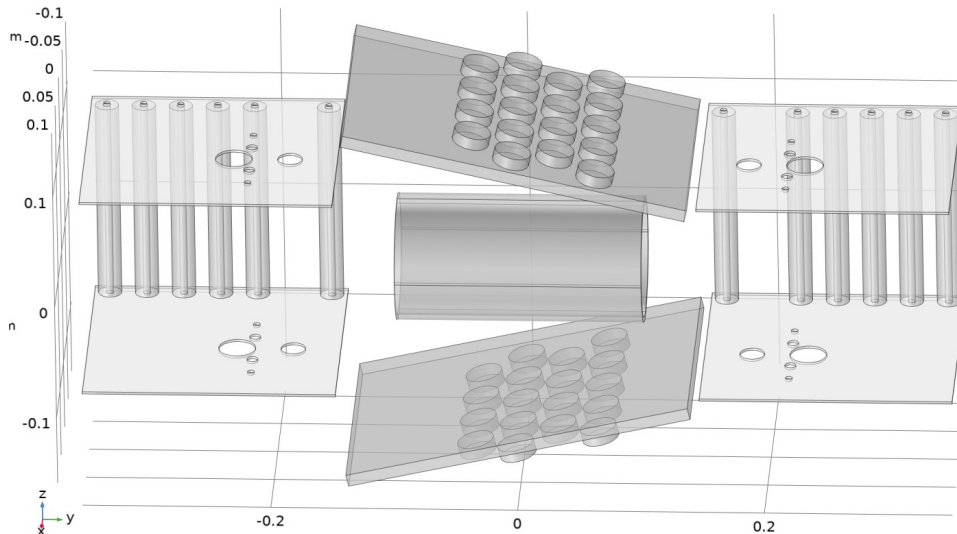


Polarizer/Spin Flipper

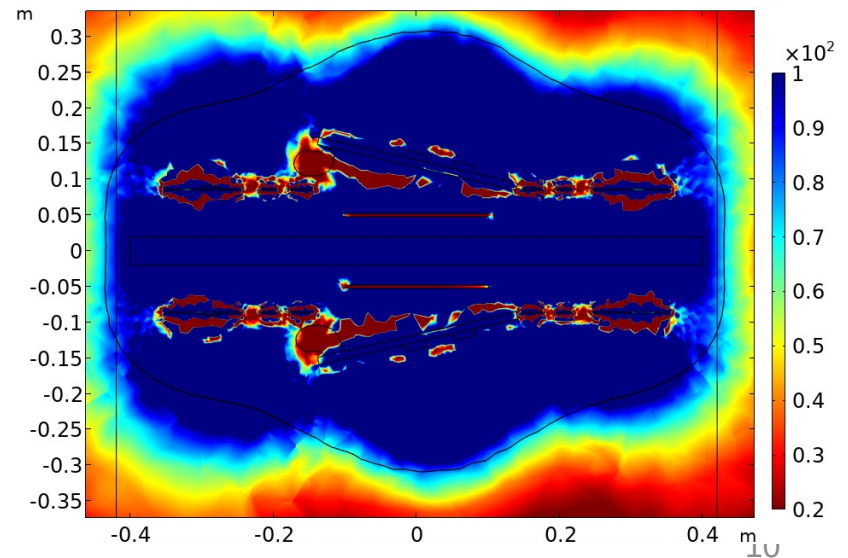
- Polarizers optics are manufactured at SNAG, FAT in November
- Simulations for magnetic field conditions have been performed
- Housing is currently undergoing CDR



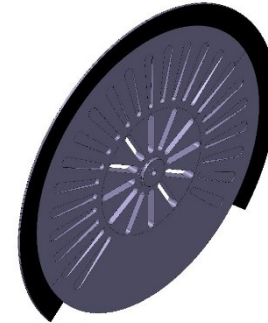
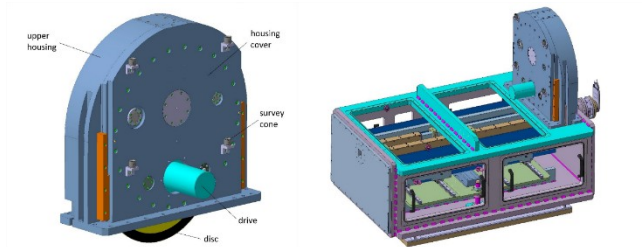
SKADI Gradient field flipper:



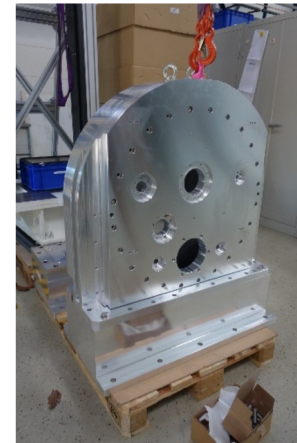
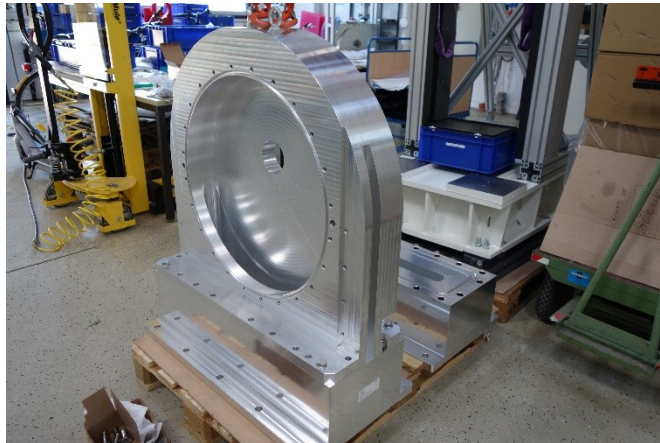
Spin-transport:
$$A = \frac{\omega_L}{\omega_B} = \frac{\gamma |\vec{B}|}{\frac{\Delta\theta}{\Delta d} v_n}$$



Chopper

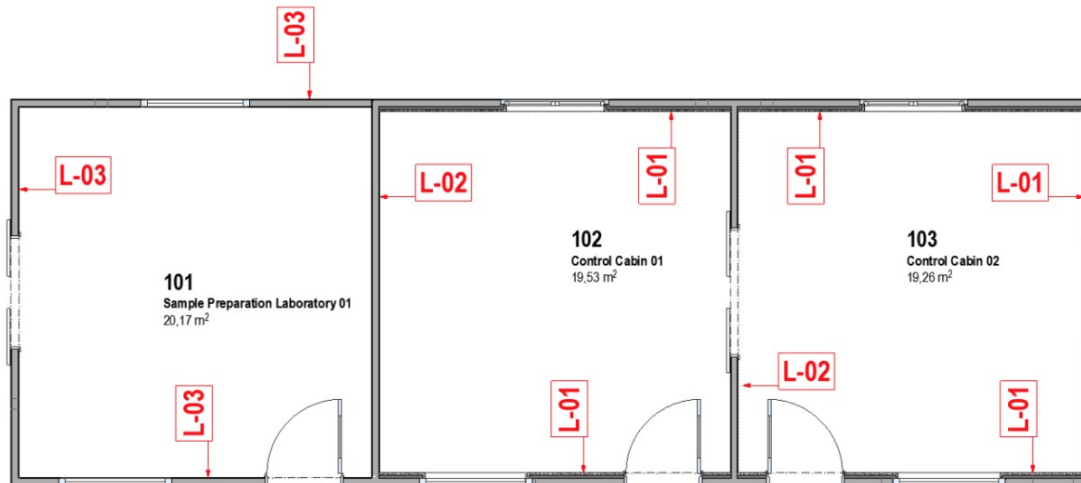
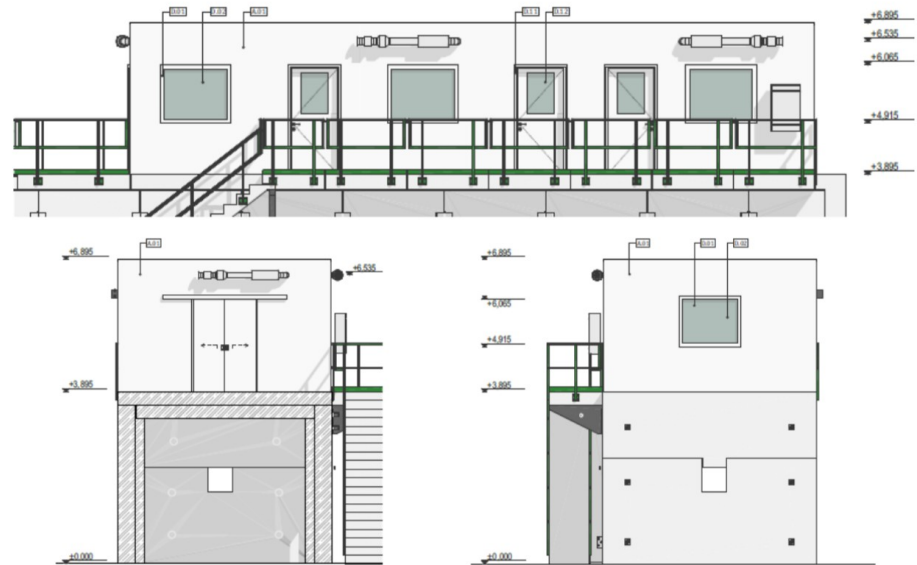


- Manufacturing of choppers complete
- Sitting in Jülich awaiting final assembly before shipping
- Chopper racks have been ordered and will be available soon
- Agreement for testing of assembly done with chopper group (preliminary electronics for FAT in Jülich in order to avoid to have to ship the complete chopper racks)
- FAT currently being finalized (carbon copy of DREAM chopper FAT)



Hutch and sample preparation lab location

- Currently being manufactured
- Installation early 2025
- Three rooms
- 2 offices, one lab/workshop
- Access to the instrument roof
- Incoming and outgoing groups can be separated



Detectors

- Test at HFIR and SNS
- Lab testing done on a Cf-source
- Contract with IDEAS:
 - Currently doing CDR before firmware implementation
- Monitors: part of common monitor project

More: Separate detector presentation

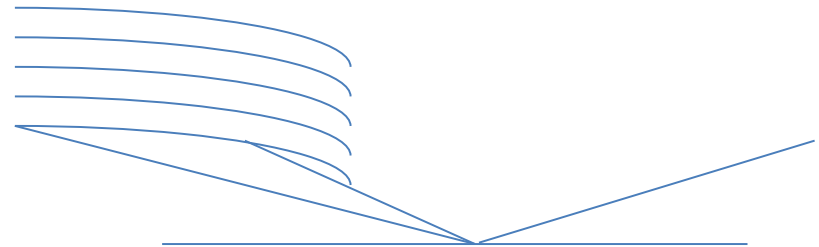
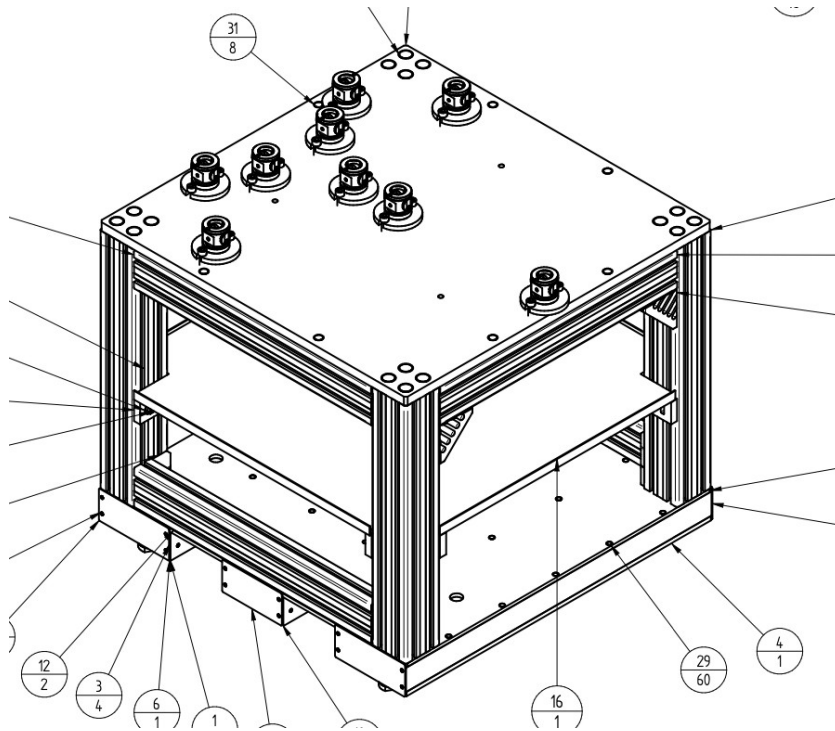
CEP/CUP/MCA

- Regular integration meetings
- Ongoing discussion between SKADI team and CEP/CUP teams
- Quotation and acceptance expected in end 2024
- Start of design and integration expected in 2025

- Currently aiming for level 3 integration (everything done by CEP/CUP/MCA teams, only dedicated instrument systems installed by instrument installation team)

Polarization and RAC

- RAC grant together with ESS (Hal Lee), Uppsala U (Max Wolff), LMU Munich (Bert Nickel):
 - Focusing GISANS setup in manufacturing
 - Will deliver a sample table on top



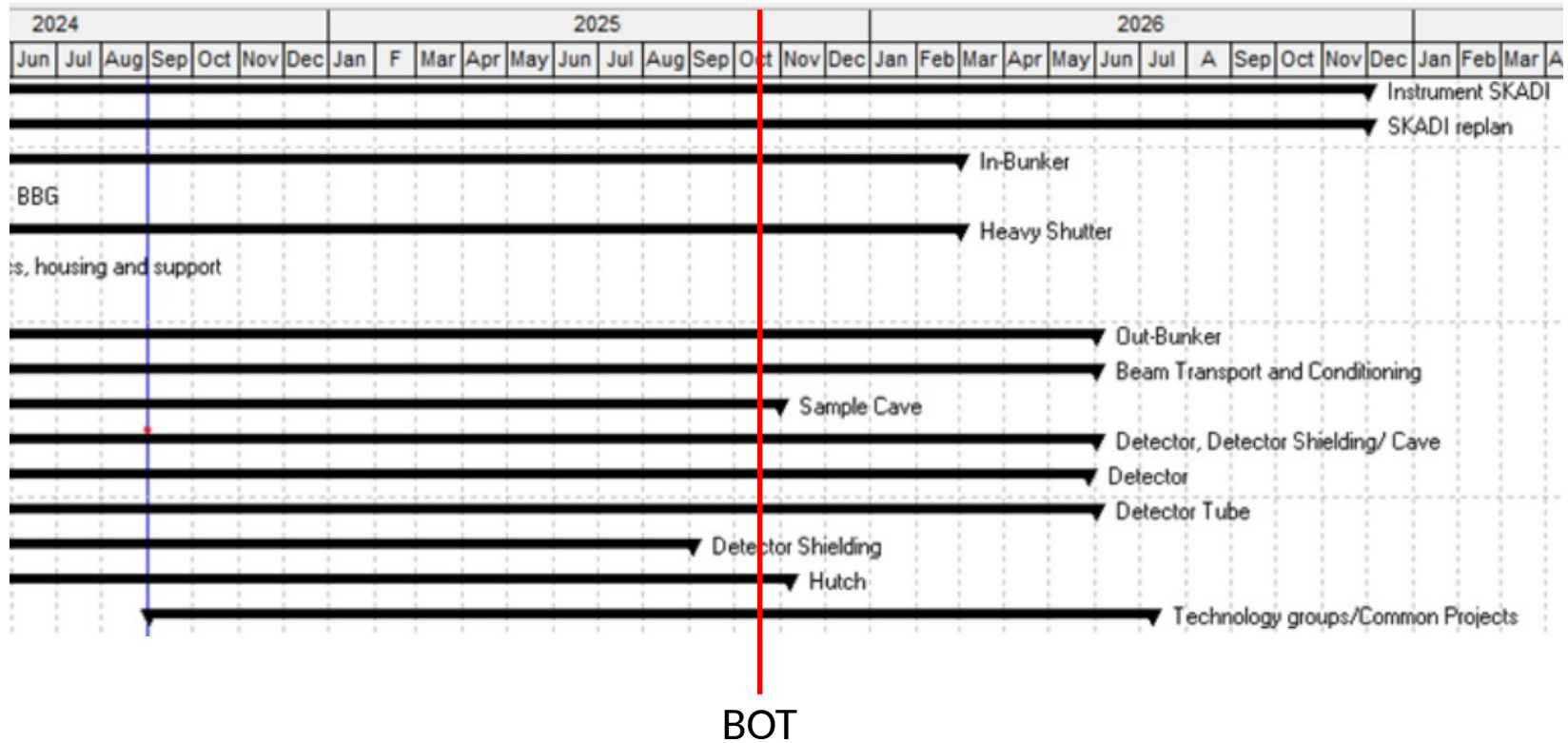
Schedule Overview

Schedule risks:

- Manufacturer overload
- Material shortages

Component	Delivery and Installation current
NBOA	Delivered
In-Bunker	Delivered
Collimator+Detector vessel+shield.	Delivered
Polarizer, Fast Shutter	Q1-25
Choppers	Q2-25 (are manufactured, awaiting installation)
SCS	Q4-25
Monitors	Part of ESS common monitors project
Sample Area	Delivered
Hutch Area	Q1-2025
TG3-Full	2025
TG5-Full	Q2-26

Project Overview for installation



NB: This is all activities, also non-instrument team (like technical groups etc.) activities

Hence the shift for the end of the timeline

This is for operational readiness

Summary

- All external components have been subcontracted
- Both guides and shielding in preparation for procurement
- CEP / CUP: waiting for quote
- Manufacturing of most components is in progress or done
- Major parts delivered or ready for delivery/installation
- Control software crucial for installation and cold commissioning
- **The project is on track and complete installation in 2025**