

MAGiC progress update

STAP meeting – 25th October 2022

Tendering/review/delivery progress

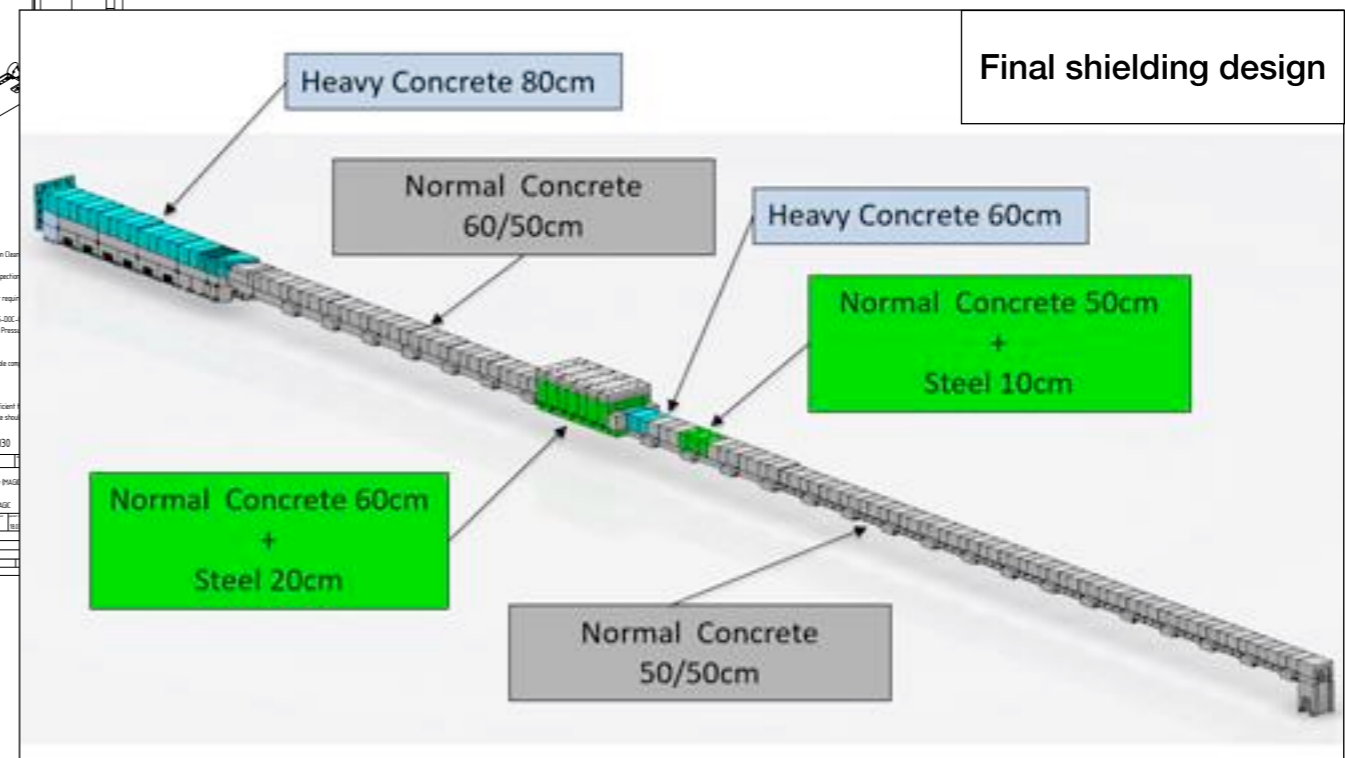
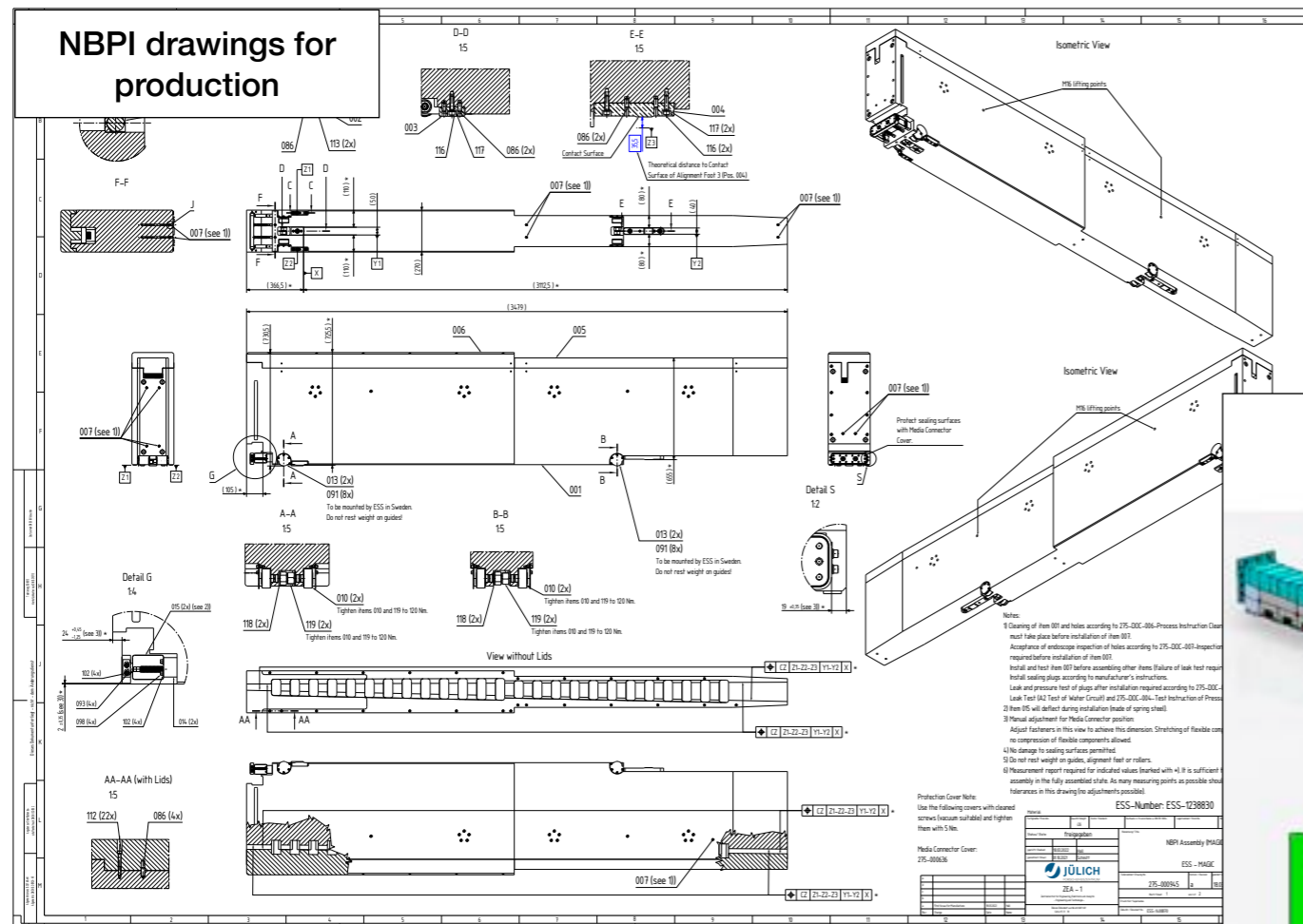
- Tendering process of all major components in progress
 - > Kick-off meeting of **Polarizer** on September 15th
 - > Kick-off meeting of **Experimental cave** on September 30th
 - > To come:
 1. In-Bunker: solid-state bender, BWI, in-Bunker Vacuum Housing
 2. Polarization Analyzer: early procurement of raw materials
 3. Exp. Cave fitout: radial collimator, sample station, detector support, beam-stop
- Review process
 - > Sub-TG3:
 - # **IB super-mirrors and Heavy Shutter**
 - # **Bunker Wall insert super-mirrors**
 - # Next to come: Detector A (Nov-22), IDR Analyzer (Nov-22), XYZ + Analyzer sub-TG3 (Feb-23)
- Deliveries
 - > Guide system in Q1/23 (IB) and Q3/23 (OB)
 - > Cave in 12/23
 - > Detector A & B + Exp. Cave equipment in 2024

Ressources on site

- No permanent staff on site as of today.
- Discussion to hire an IPL for the instrument:
 - > ESS will provide an IPL for MAGiC free of charge (excellent news)
 - > Priority on a technician for installation activities on site (paid by french IK)
 - > Ideally start in March-23 for two years.
- Instrument lead scientist:
 - > Half of the time on site starting in March 23
 - > To be maintained up to TG5 if efficient
- Instrument lead engineer:
 - > Missions to Lund as needed (for critical phases of installation, support to the technical teams, ...)

NBPI, BBG and Shielding

- NBPI installation scheduled in next wave (Dec-22)
- Shielding manufacturing drawings released.
- BBGOA: rail system design released by ESS



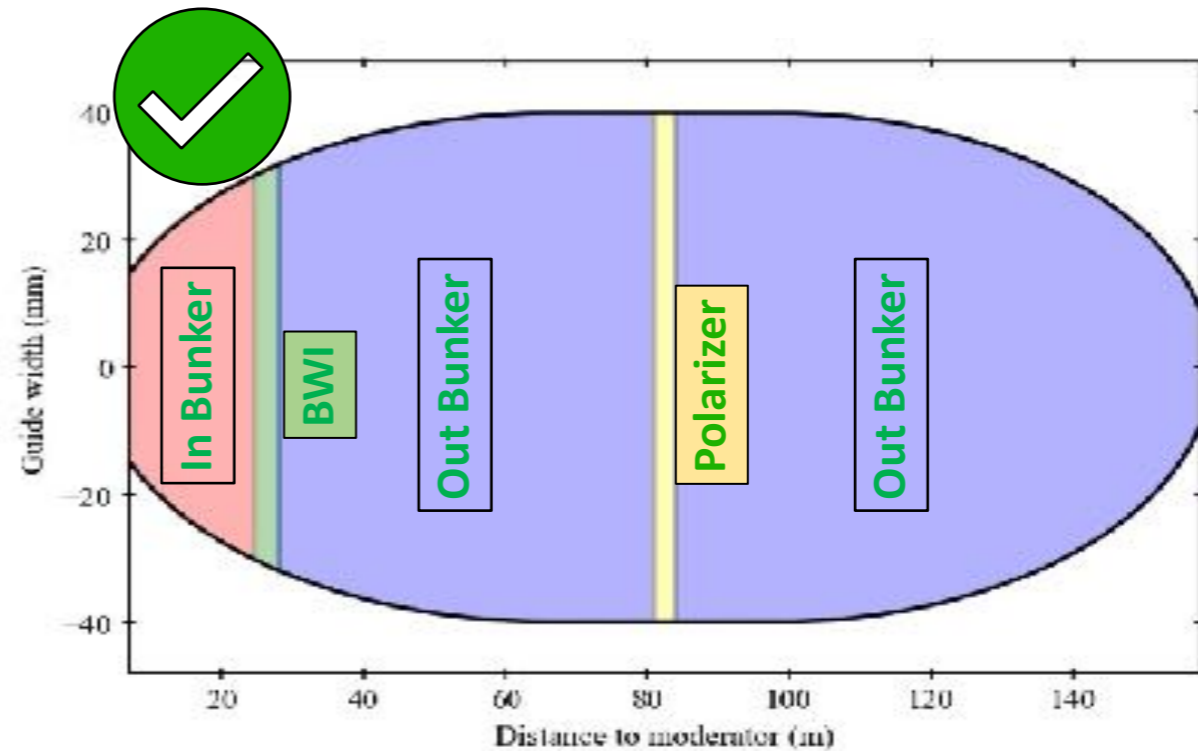
Choppers

- FE and BC housing needed re-machining
- FE
 - FAT requires vacuum tests \Rightarrow early 2023
 - Installation possible in Apr-23 IB
 - Magnetic Guide Field: support from LLB required for integration
 - Monitor integration
- BC
 - FAT at the end of the year
 - Installation possible in Jan/Feb-23 in E02 hall
- Racks location to be checked in D03



Guide system

- Lot 1
 - Manufacturing in progress
 - Delivery Q1-23
- Lot 2
 - Manufacturing in Dec-23
 - Delivery in Q1-23
- Lot 3
 - Substrate polishing in progress
 - Delivery in June & October 23
- Lot 4
 - Kick-off meeting on September 14th
 - CDR to come before end of year



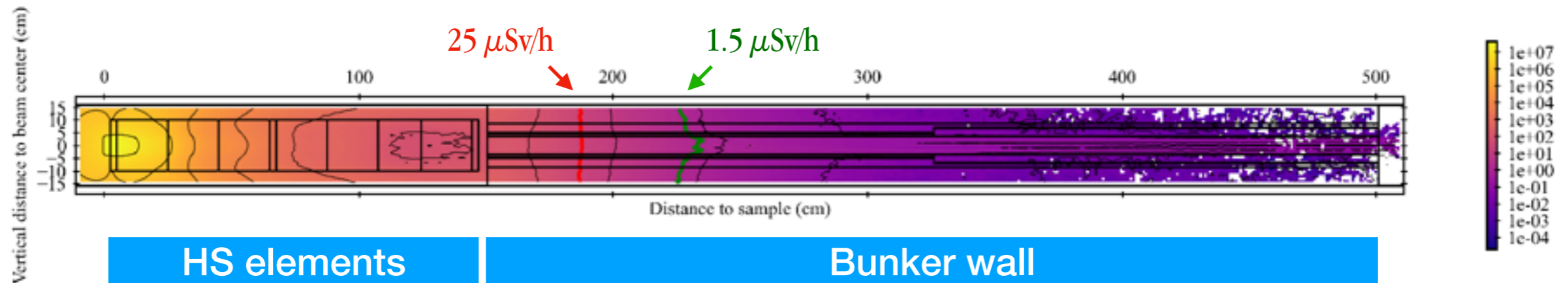
Vacuum Housing and Supports

- Preliminary design done in-house for IB
- Drawings in progress (Dec-23 release)
- Budget quote received for in-Bunker section (100 k€)



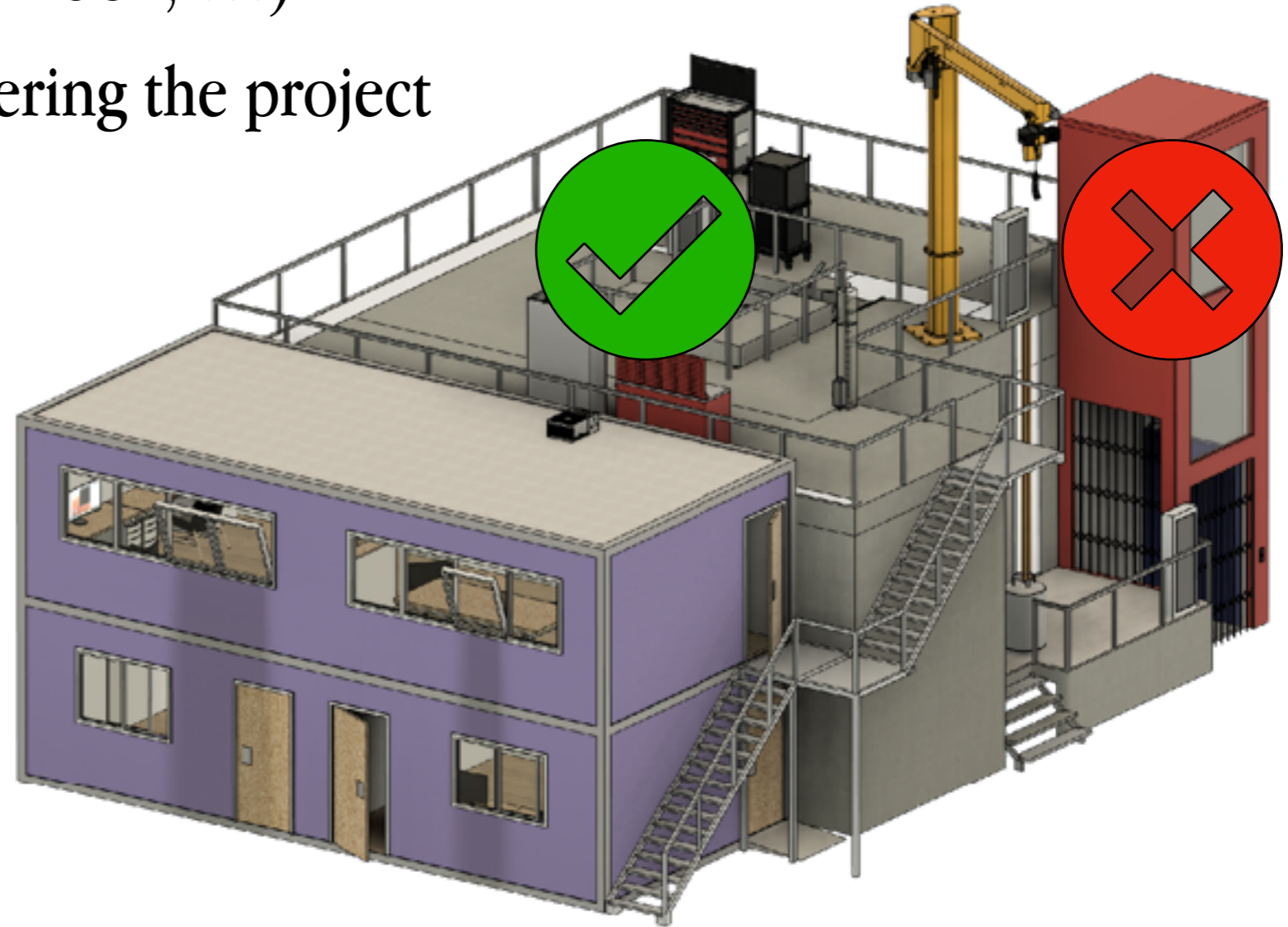
Heavy Shutter

- Manufacturing in progress (coating stage)
- Within budget
- Delivery at LLB for FAT in Nov-23
- Manufacturing of beam-stop to follow



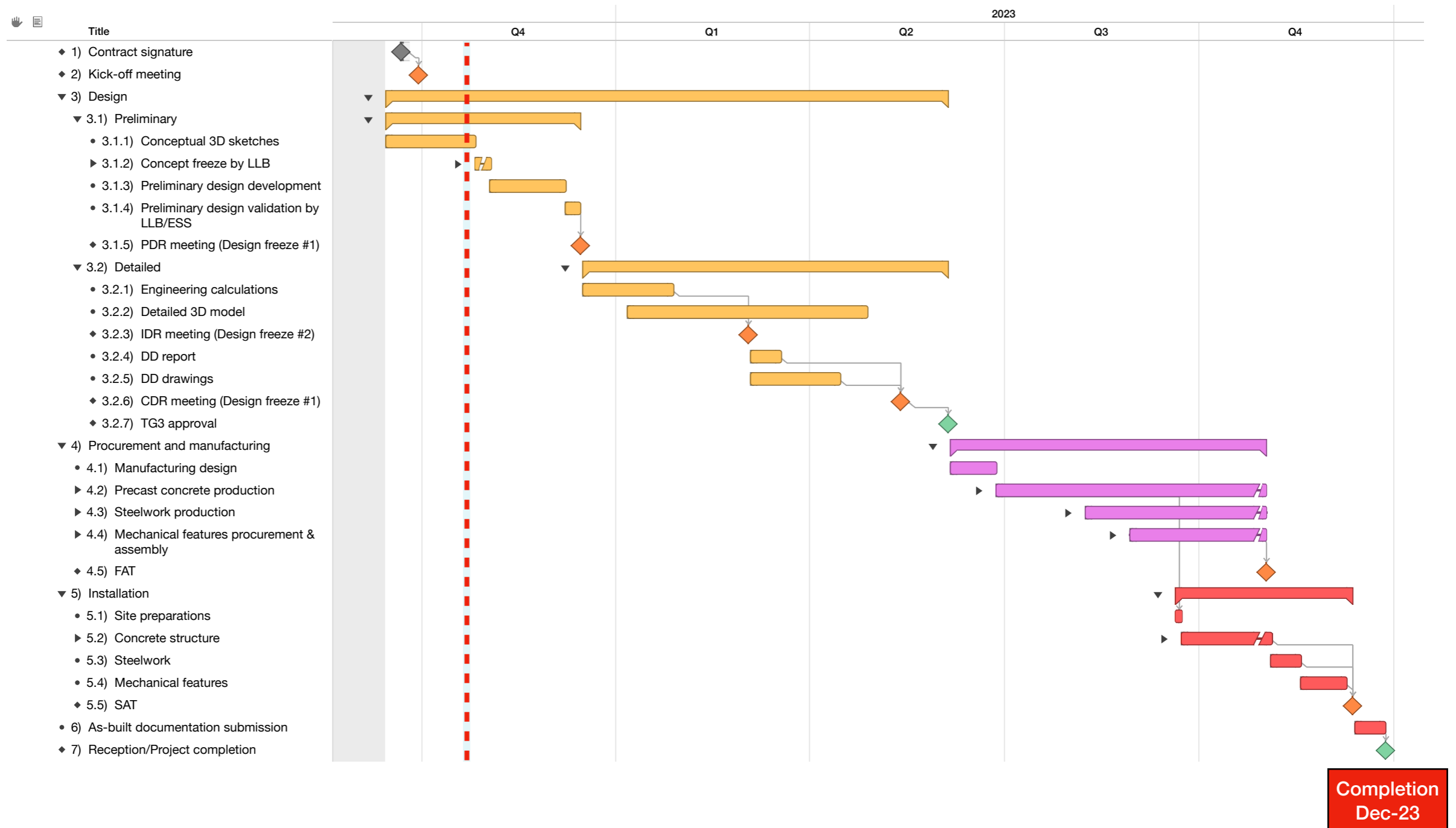
Experimental Cave

- MShield selected as supplier
- Huge experience (DREAM, BIFROST, ...)
- Above budget but not endangering the project
- Kick-off meeting on September 30th
- First technical meeting on October 13th
- **No offer for the elevator**
- Individual tender to be released (3 months before delivery)



Experimental Cave

- Preliminary installation plan
- Based on time required for DREAM and BIFROST



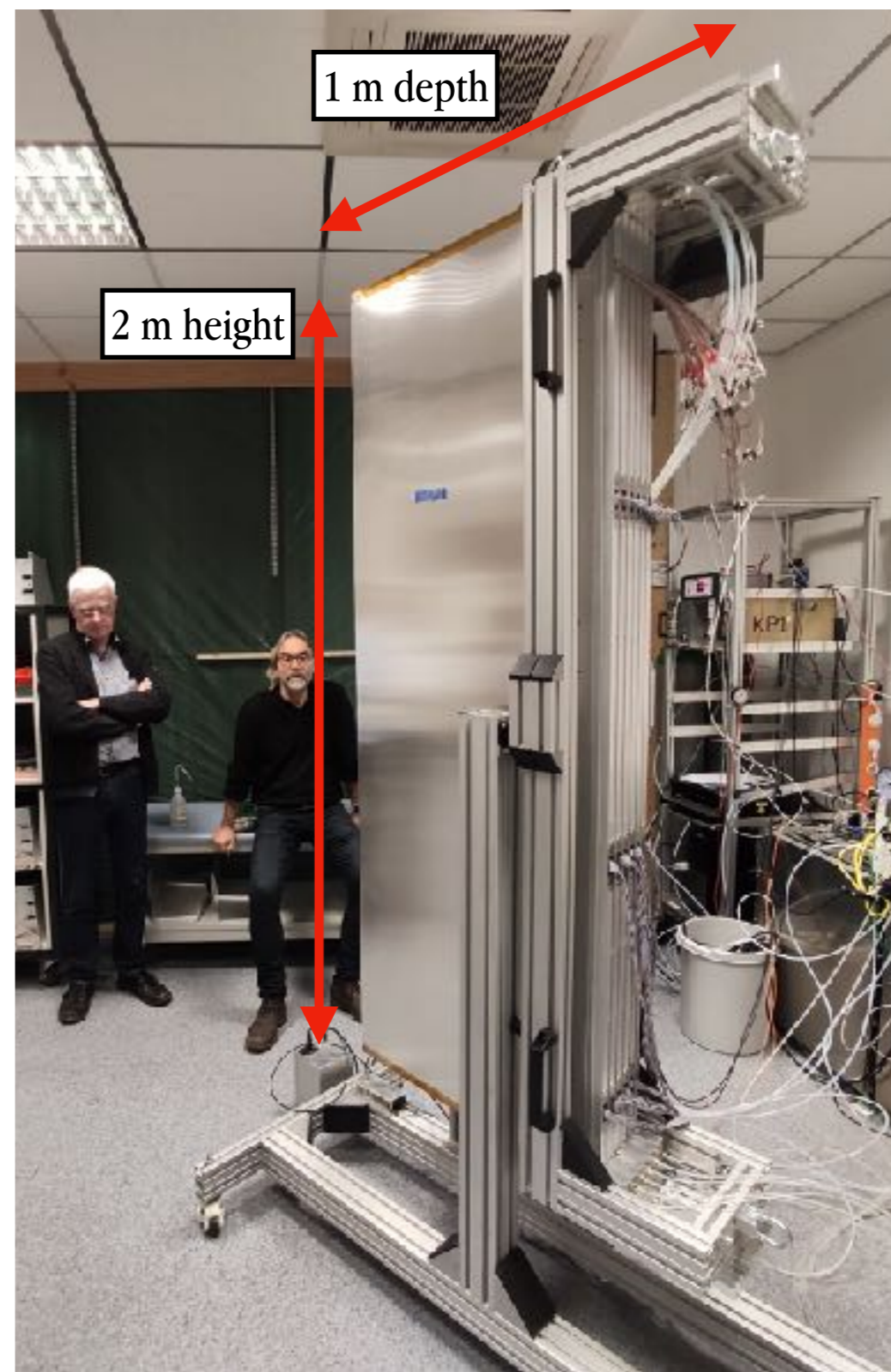
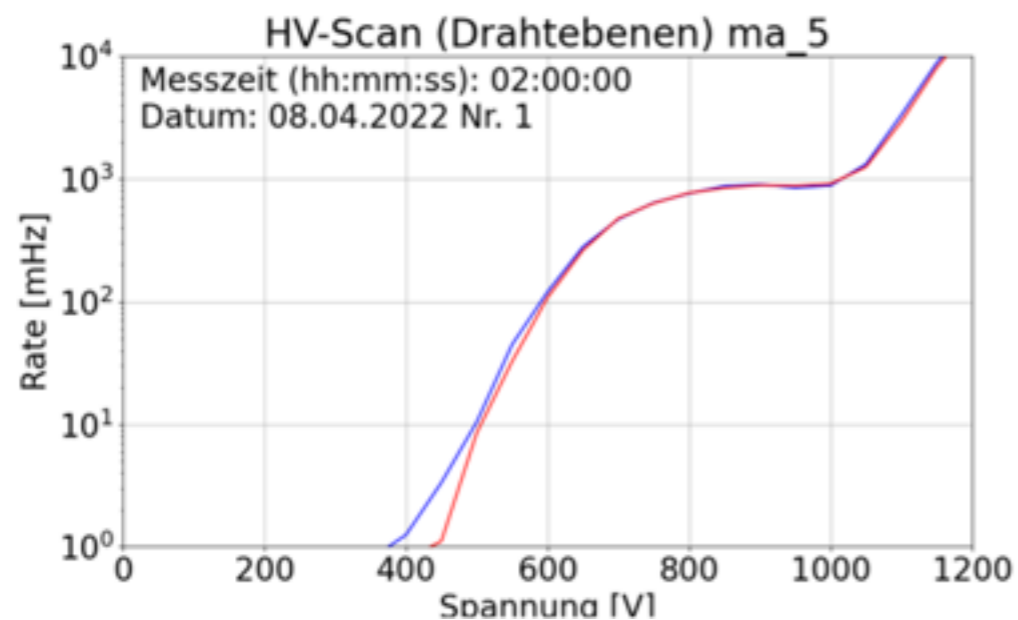
Detectors

- Detector B : manufacturing completed as of March 20th !
- Test on a neutron source to be held next year
 - ESS collaboration with ISIS
- CE marked
- Delivery in Q4/23 - Q1/24



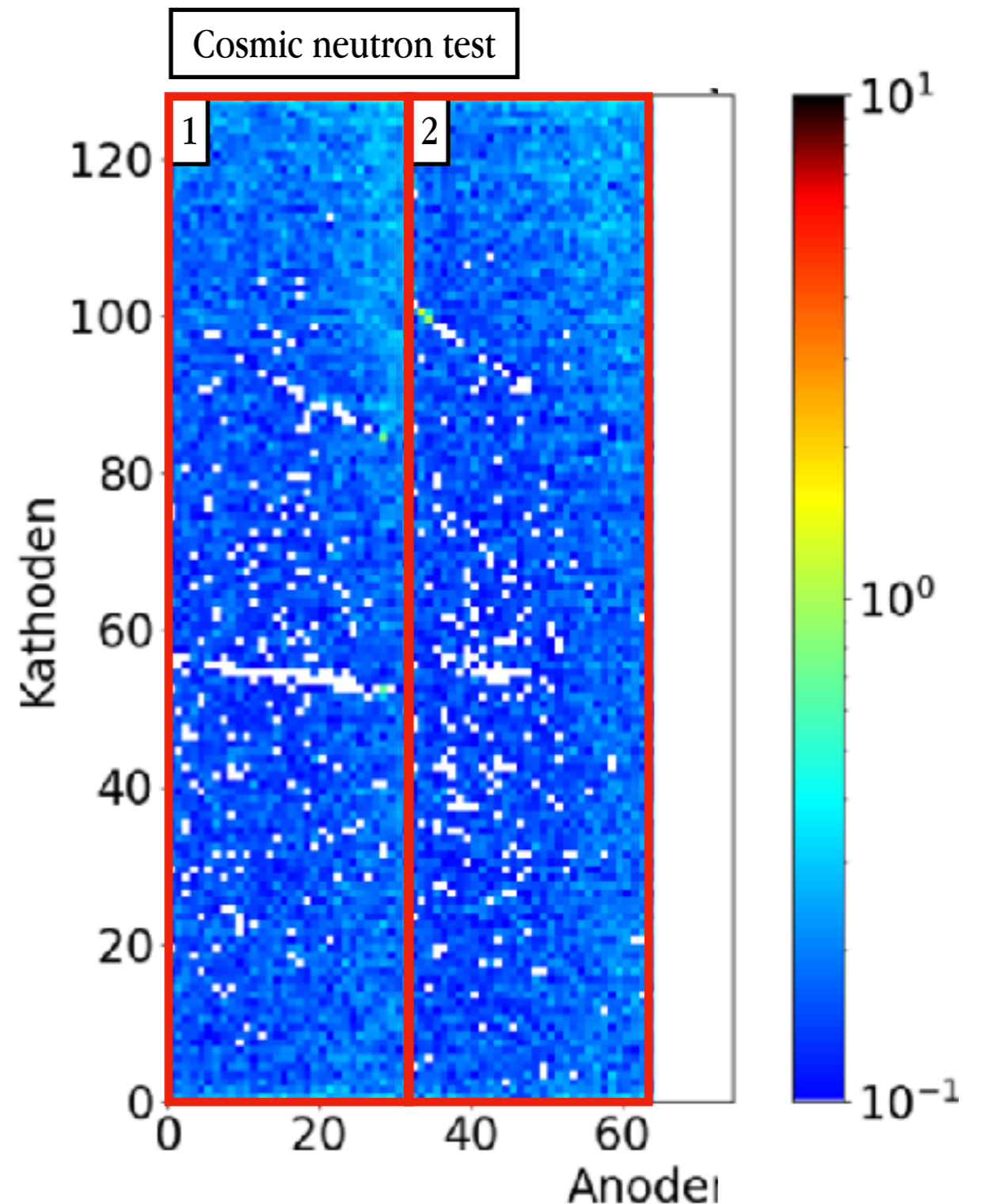
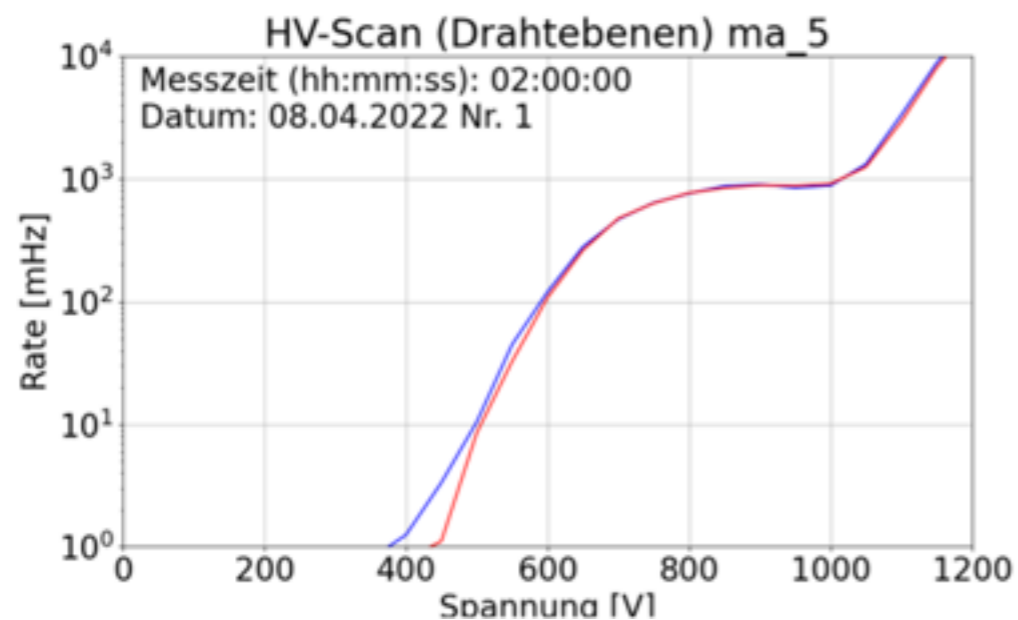
Detector A

- Detector A
 - First segment manufactured for test
 - Internal IDR with detector group representative on October 19th
 - Work on the interface with support table and shielding will start based on the 1st segment.
 - sub-TG3 in November 22
 - Manufacturing in first half of 2024








Detector A






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Polarization Analyzer May 2022

- Report submitted to STAP members
- Huge work done to ensure performance/feasibility/optimisation of the Solid State Design (SSD).
- At this stage:
 - > Magnetic design 
 - > mcstas simulations 
 - > first prototype tested with neutrons 
 - > mechanical design 
 - > assembly workflow/methods 

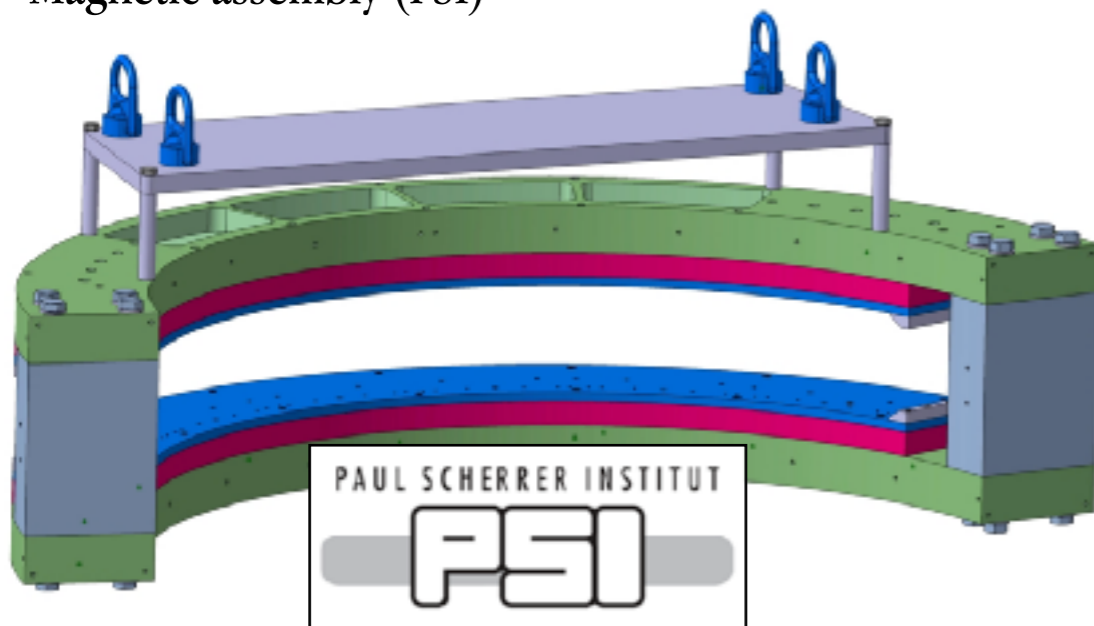
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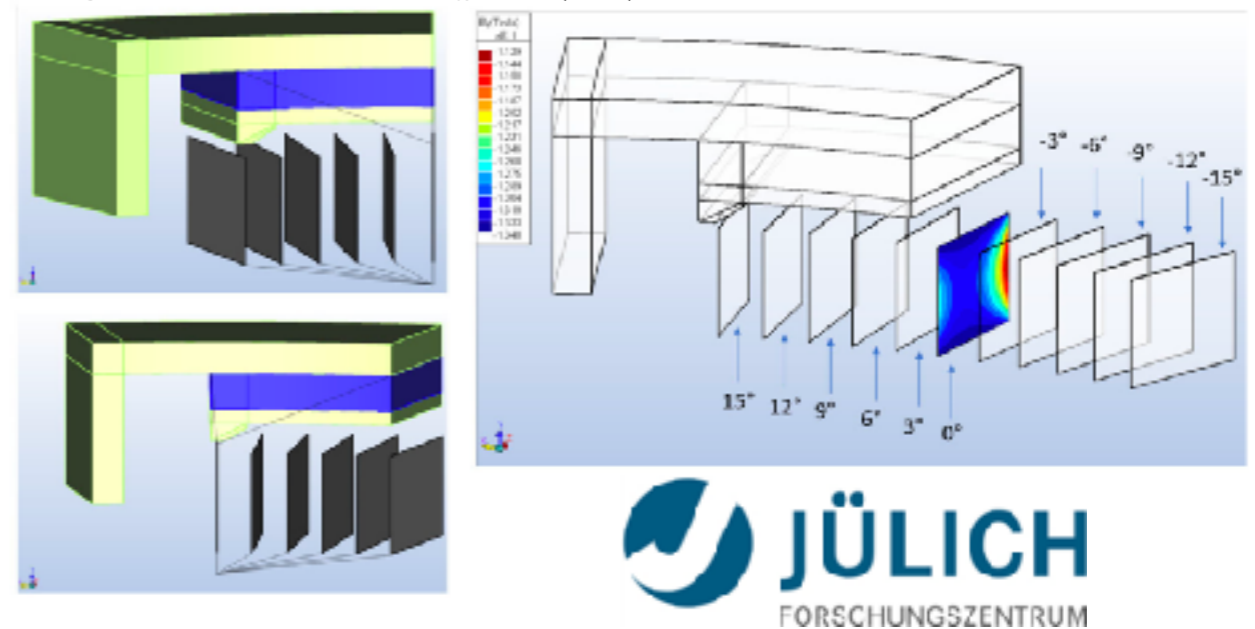
Polarization Analyzer

- An IDR is in preparation with ESS to validate the early procurement of critical materials (magnets, steel and silicon wafers) which are subject to unpredictable price variations. Documentation sent yesterday.

Magnetic assembly (PSI)



Magnetic simulation report (FZJ)

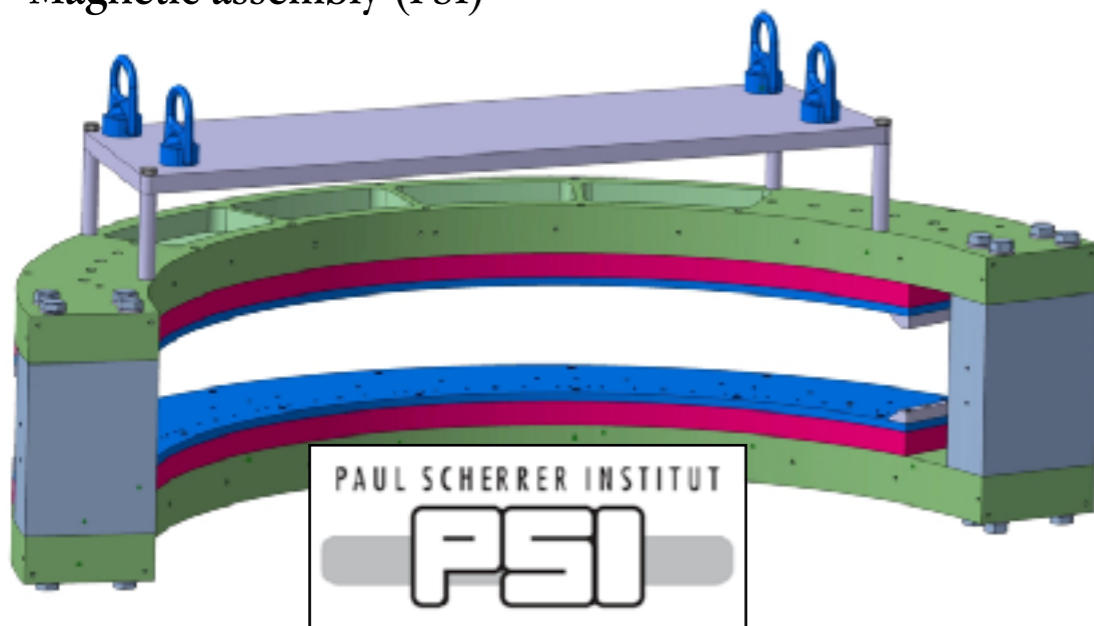


- A common subTG3 with the XYZ is in preparation (Jan/Feb 23).

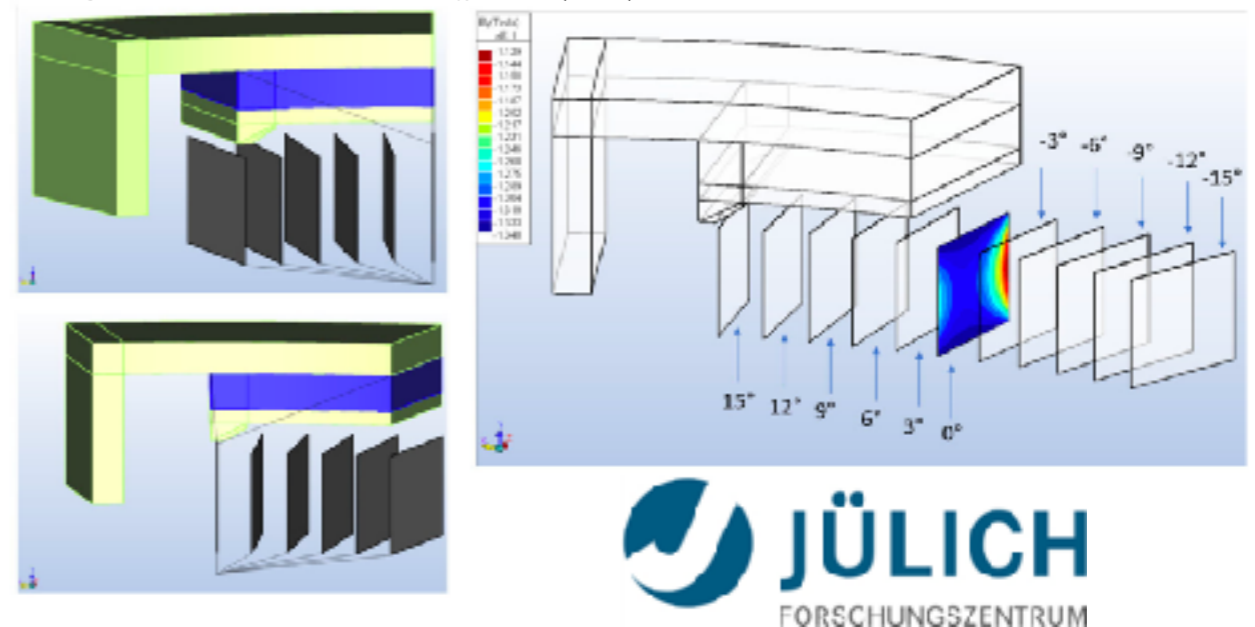
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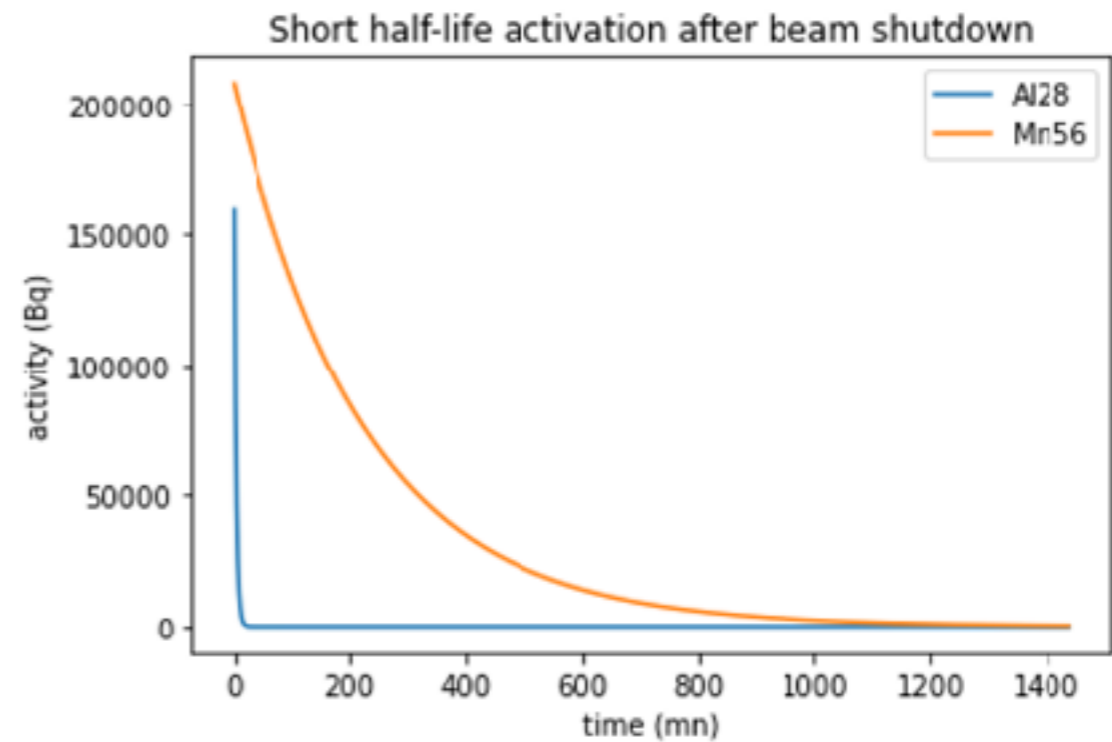
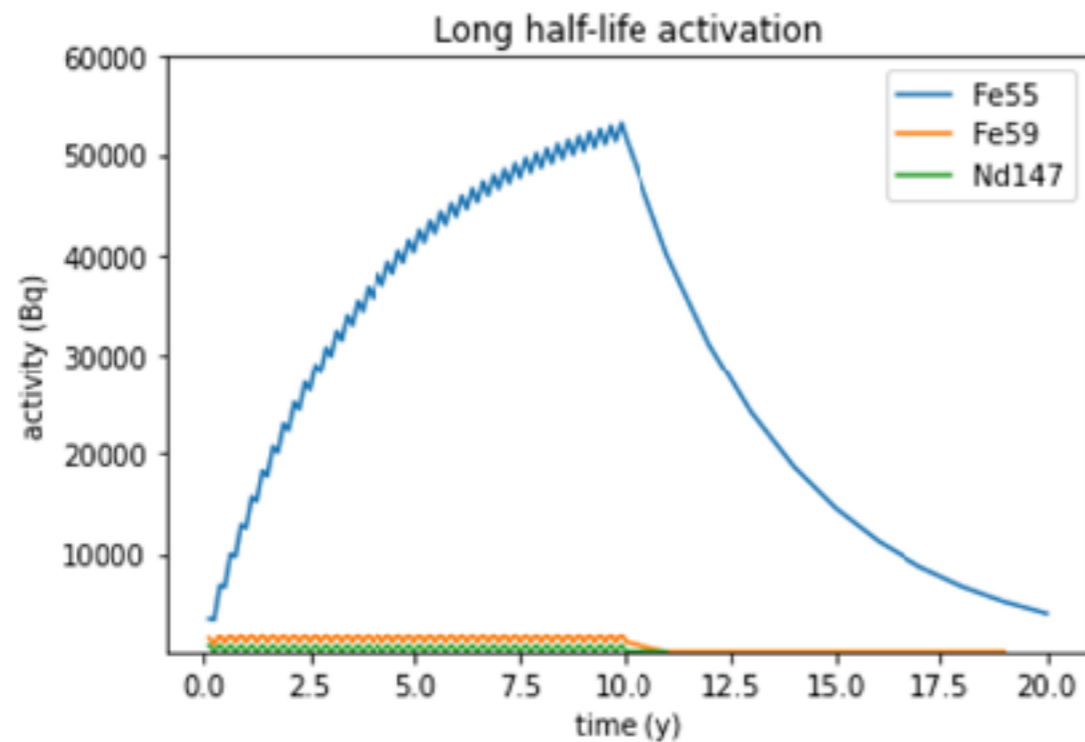
Magnetic simulation report (FZJ)



- A common subTG3 with the XYZ is in preparation (Jan/Feb 23).
- Internal developments to go from prototype solid state stack to mass production

Polarization Analyzer

- Activation calculations have been carried out to ensure safe handling and maintenance of the Analyzer.
- A 10 years exposure 200 days per year is simulated. The main source of dose rate comes from the iron.
- ^{28}Al and ^{56}Mn are the major source of short term dose rate.



Common project: shielding, CUP, CEP

- Shielding
 - > Manufacturing drawing released
 - > Delivery when needed by instrument team.

- Utilities: no clear timeline for MAGiC

- Electrical: still in progress

- MCA
 - > Potential MCA common project to come
 - > Evaluation of instrument needs to be done (racks, cabling, E-plan, ...)

Questions