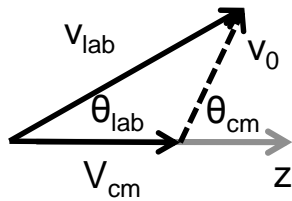
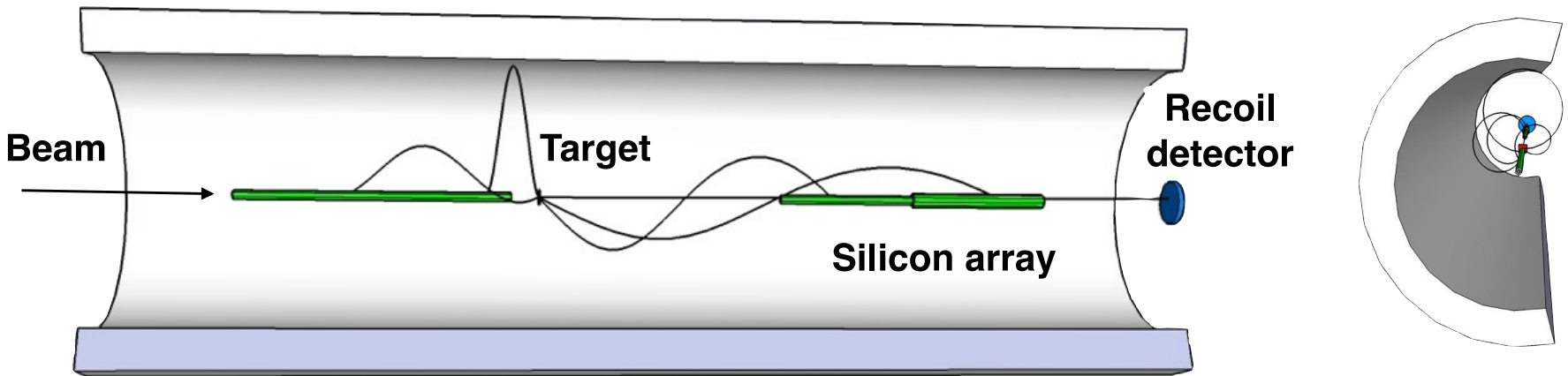


# Status of the ISOLDE Solenoidal Spectrometer



# Solenoidal spectrometer concept



$$\text{CM Energy: } E_{cm} = E_{lab} + \frac{mV_{cm}^2}{2} - \frac{mzV_{cm}}{T_{cyc}}$$

$$\text{CM Angle: } \cos \theta_{cm} = \frac{v_{lab}^2 - V_{cm}^2 - v_0^2}{2v_0V_{cm}}$$

- Magnet
- Silicon array
- Mechanics
  - Support structure
  - Drive system

# Magnet leaving Brisbane hospital February 2016



# Preparation & cleaning at CERN



magnet bore ~90 cm diameter

# Vacuum test



937B GAUGE CONTROLLER

CC N2	8.60E-07	MBar
CC N2	OFF	Leak
CP N2	2.00E-01	Test
CP N2	LO<E-03	

# Cooling down, January 2017



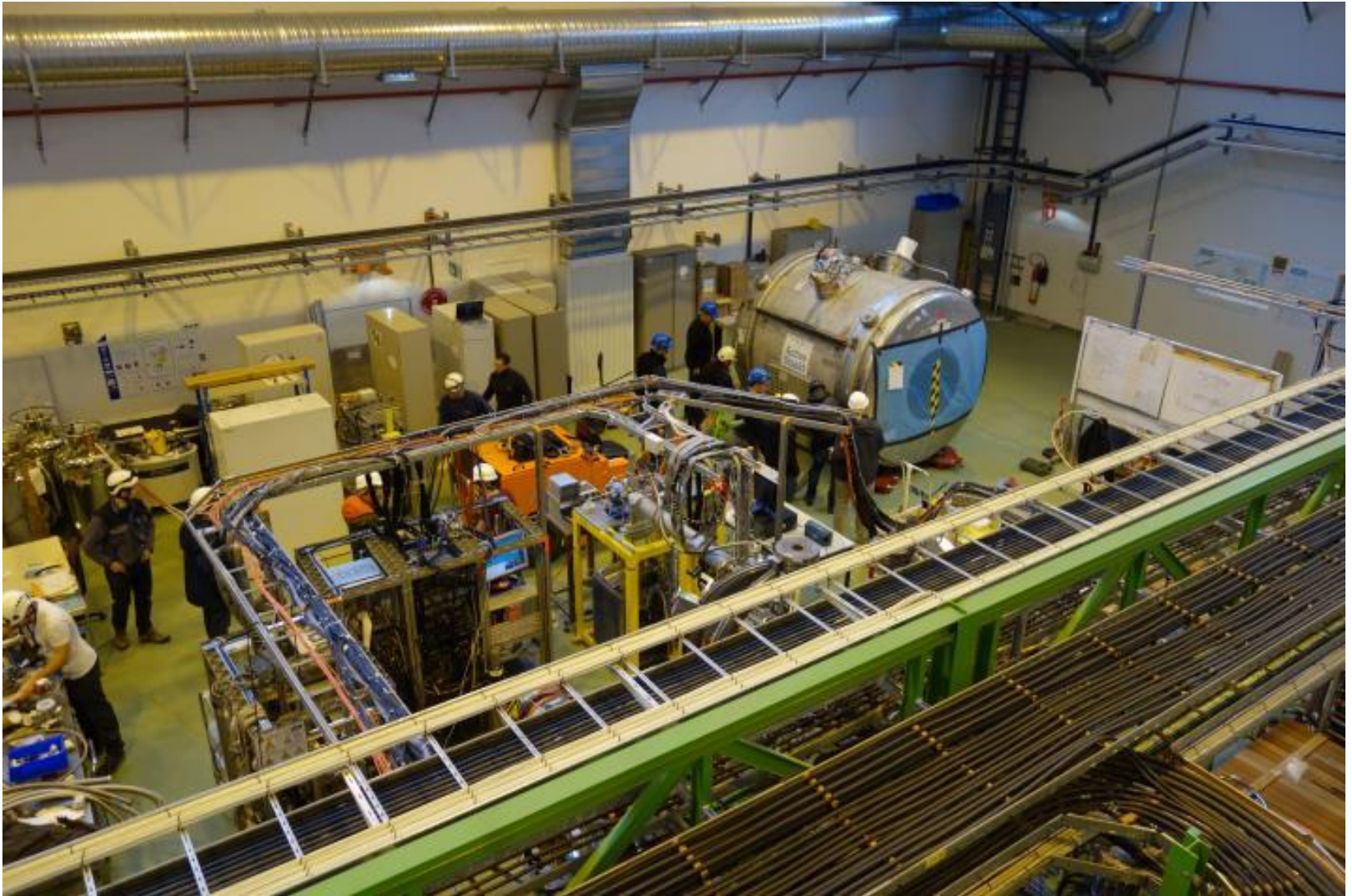
Thanks to CERN cryogenics team, Patrick Retz, ...

# Energising, February 2017



ramped up to 2.75 T, held for 1 hour then ramped down

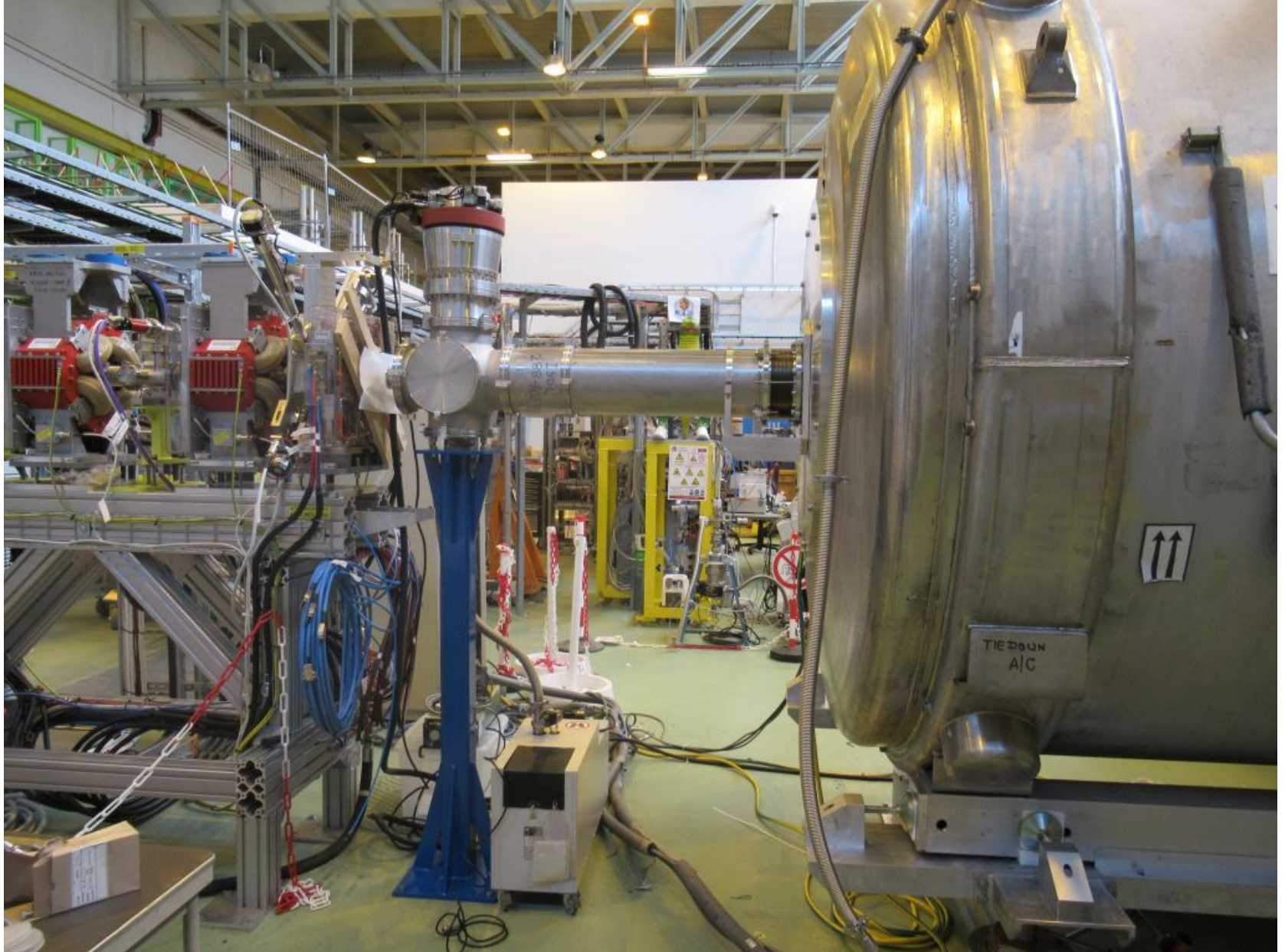
# In the ISOLDE Hall



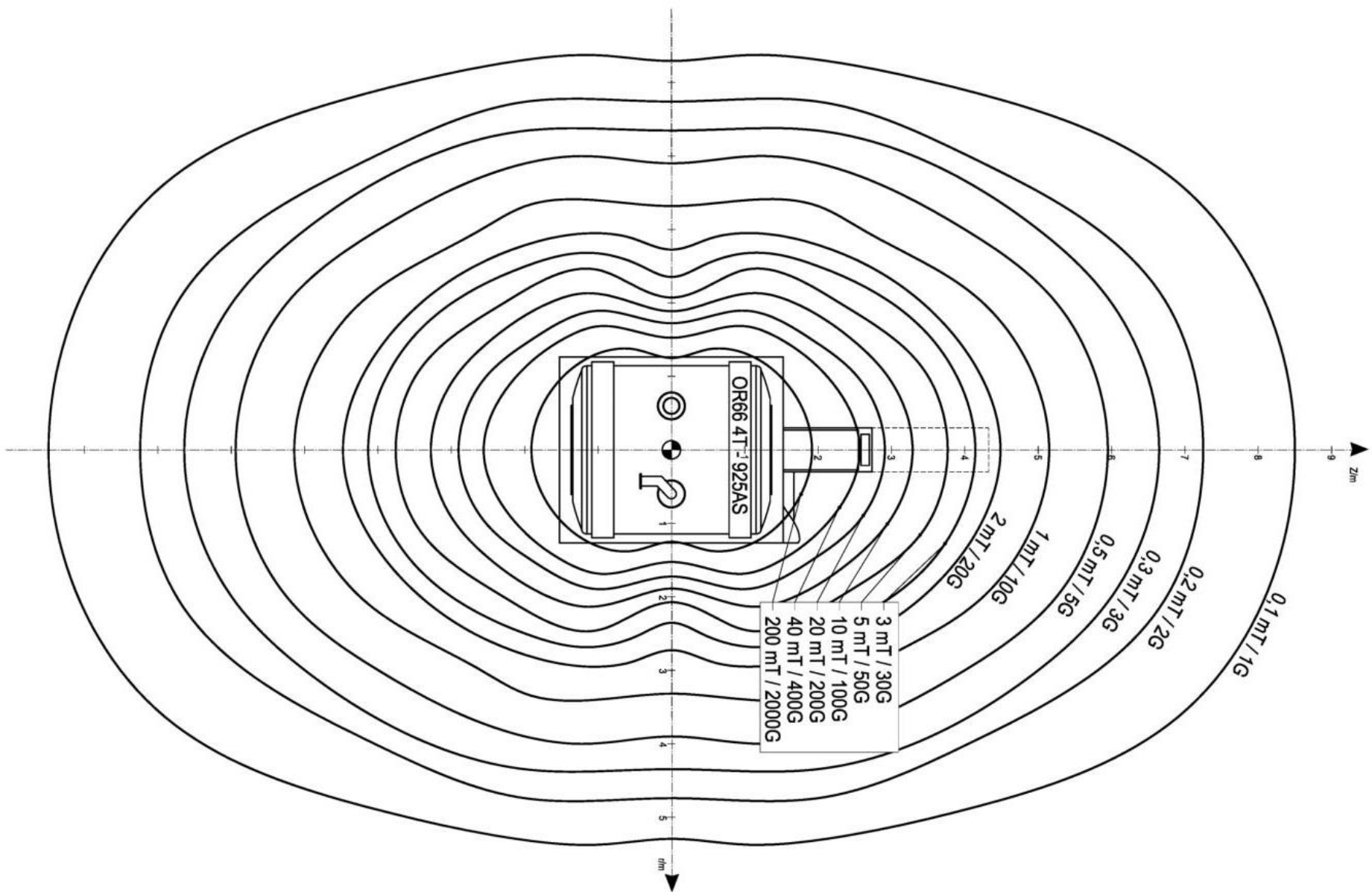
~18 tons – too heavy for ISOLDE hall crane!



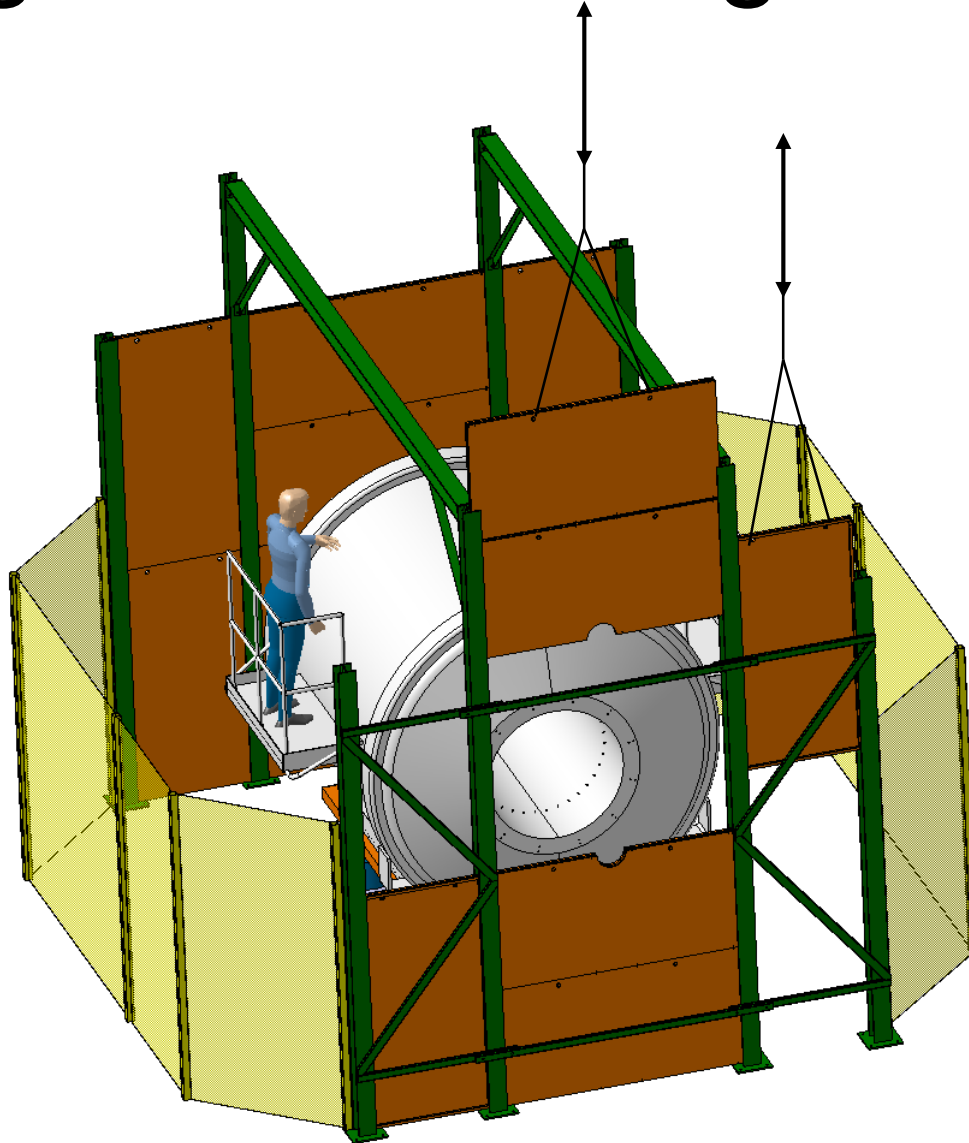
# Aligned & connected, June 2017



# Stray field



# Magnetic shielding design

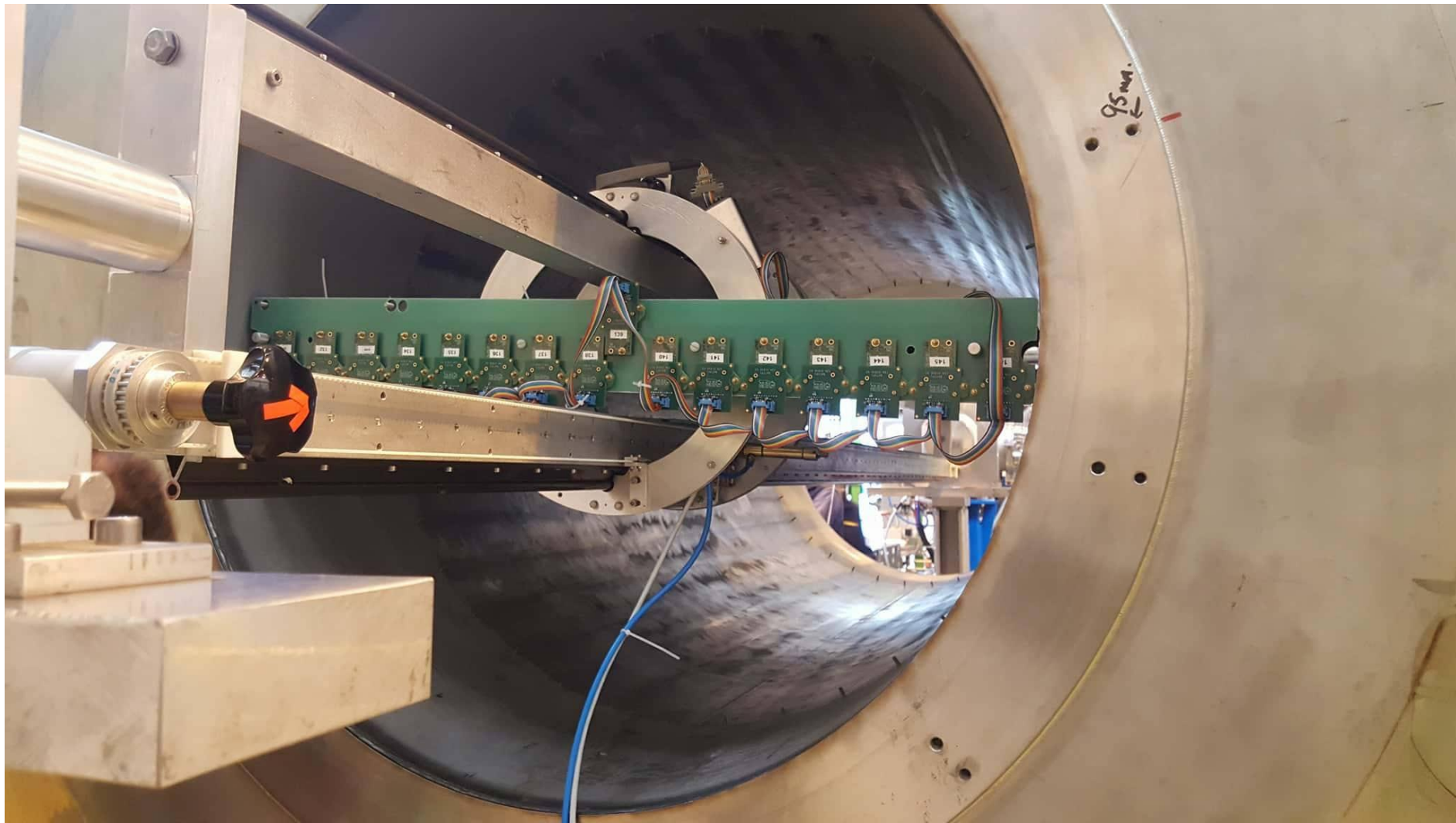


Jérémie Bauche, Kevin Buffet & Yacine Kadi (CERN)

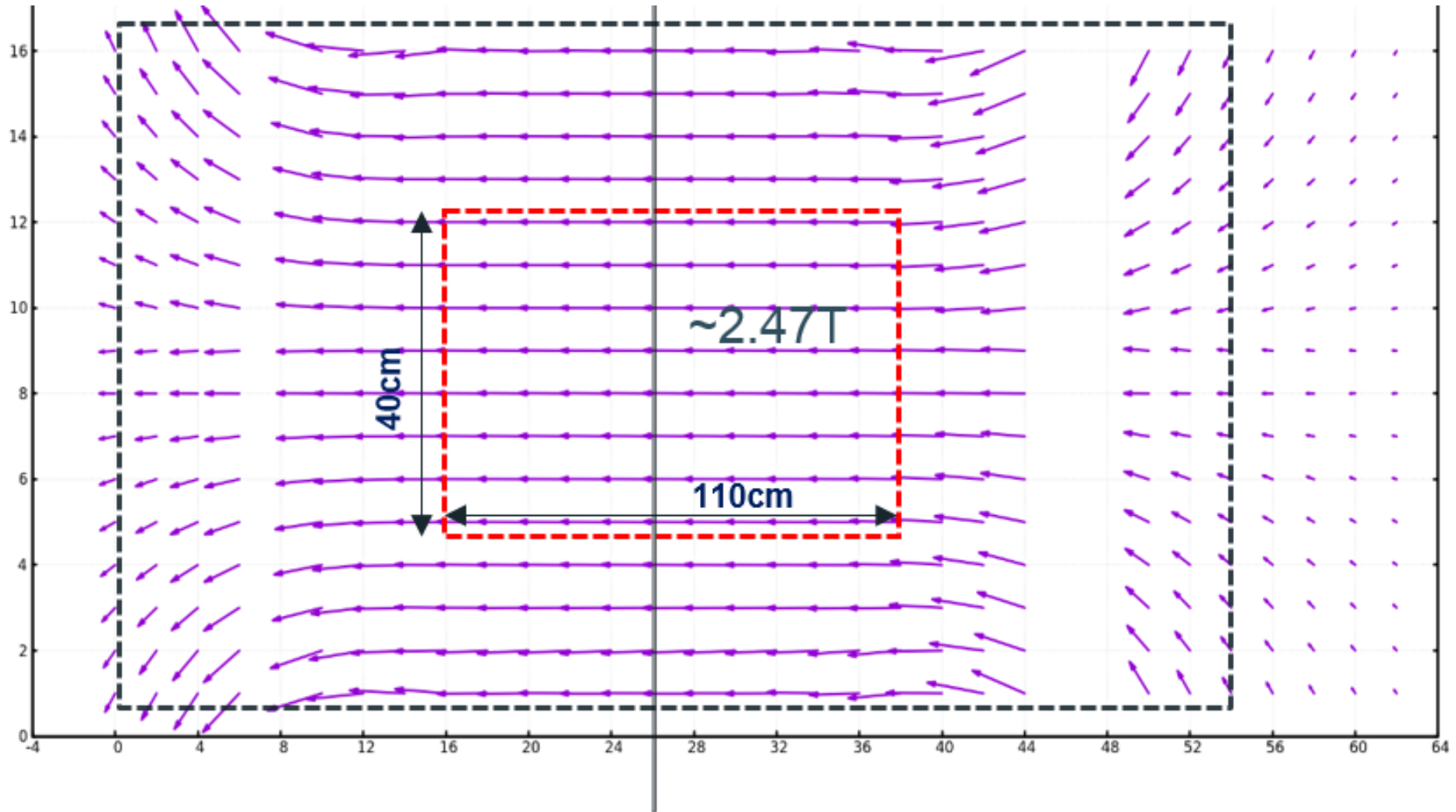
# Magnetic shielding installed, Nov 2017



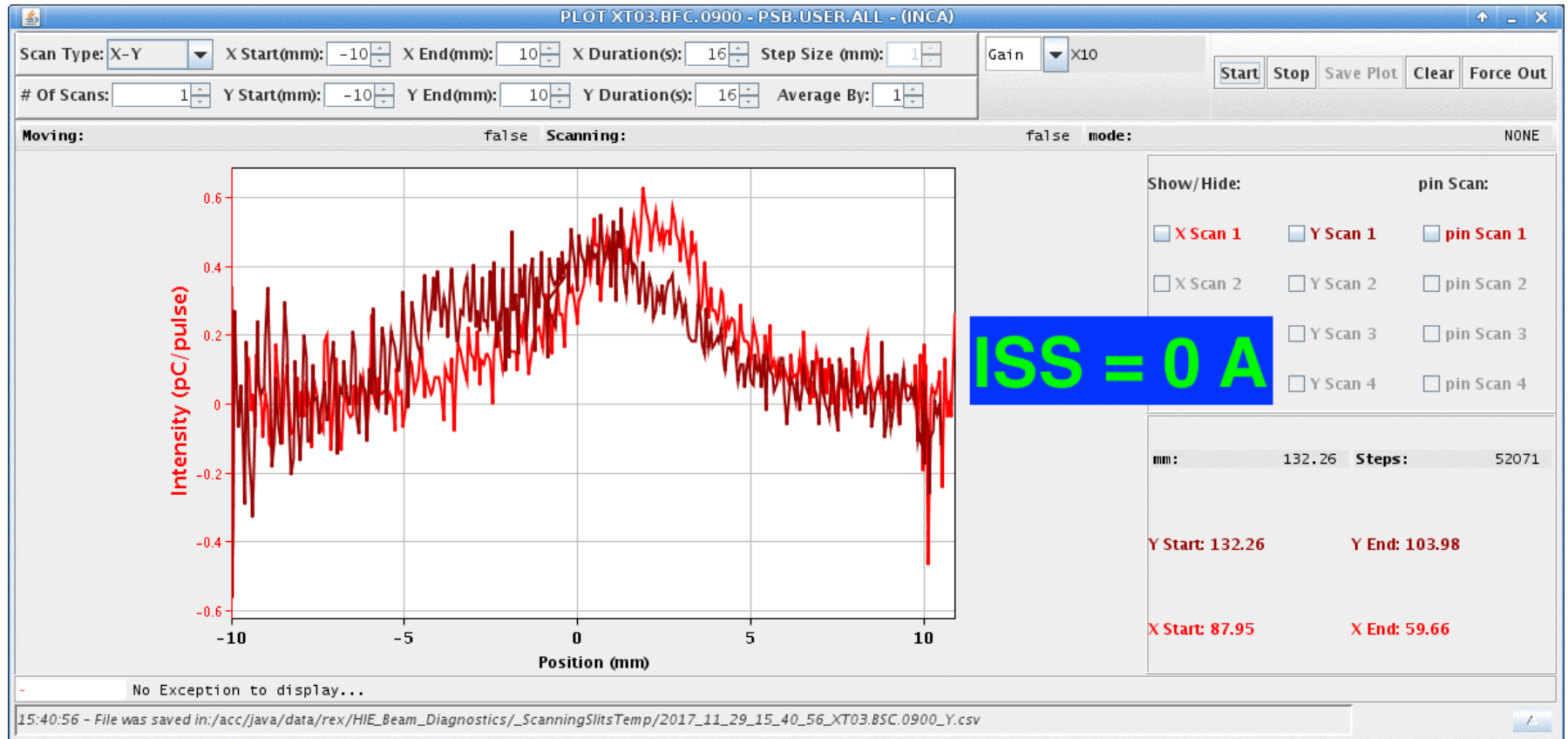
# Magnetic field mapping, Nov 2017



# Magnetic field mapping, Nov 2017

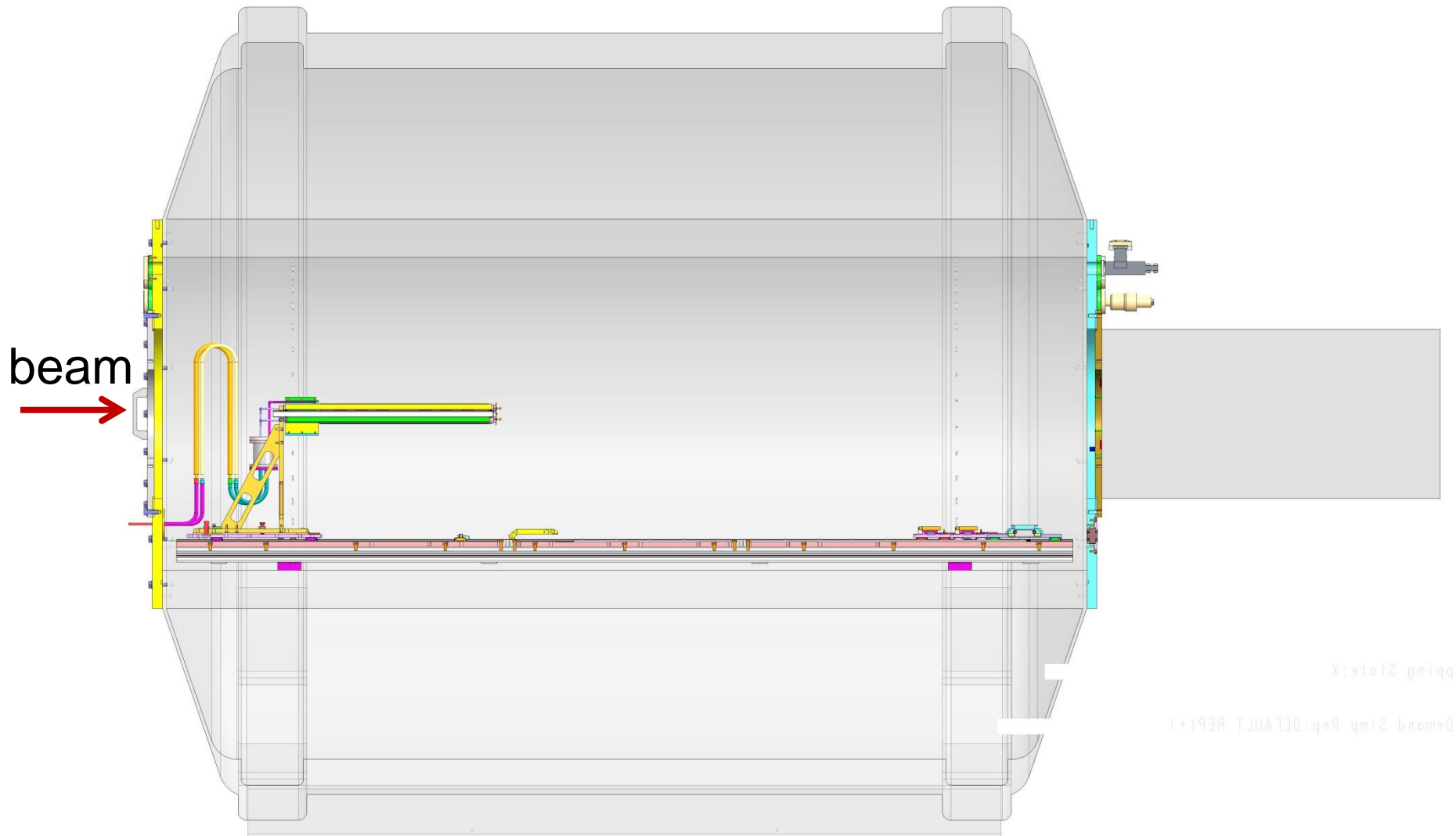


# XT02 beam tuning, Nov/Dec 2017



Completed before 2017/18 winter shutdown  
Beam shifts < 10 mm

# ISS inside the magnet





# ISS Mechanical Design

Target & detector drive systems

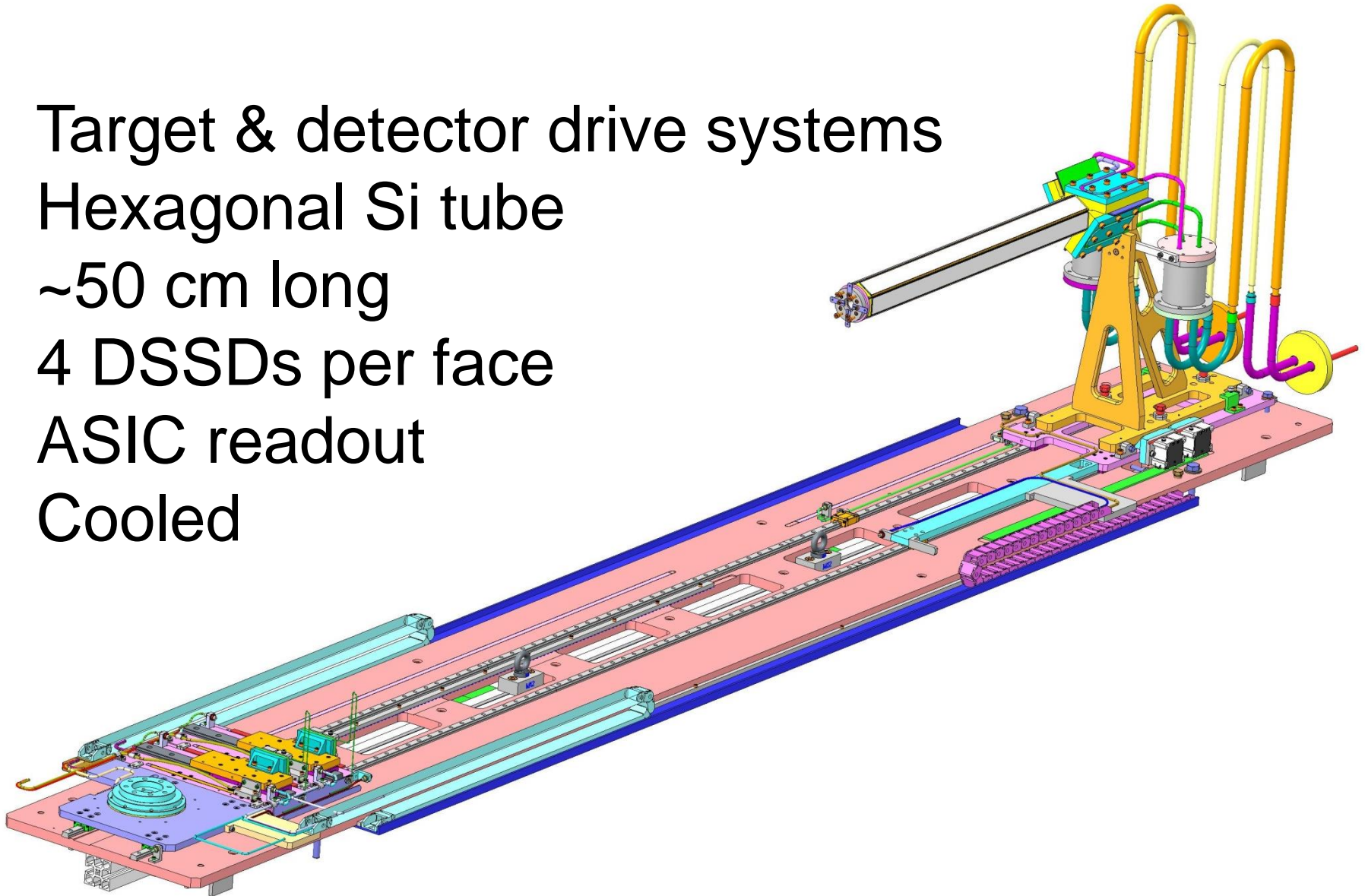
Hexagonal Si tube

~50 cm long

4 DSSDs per face

ASIC readout

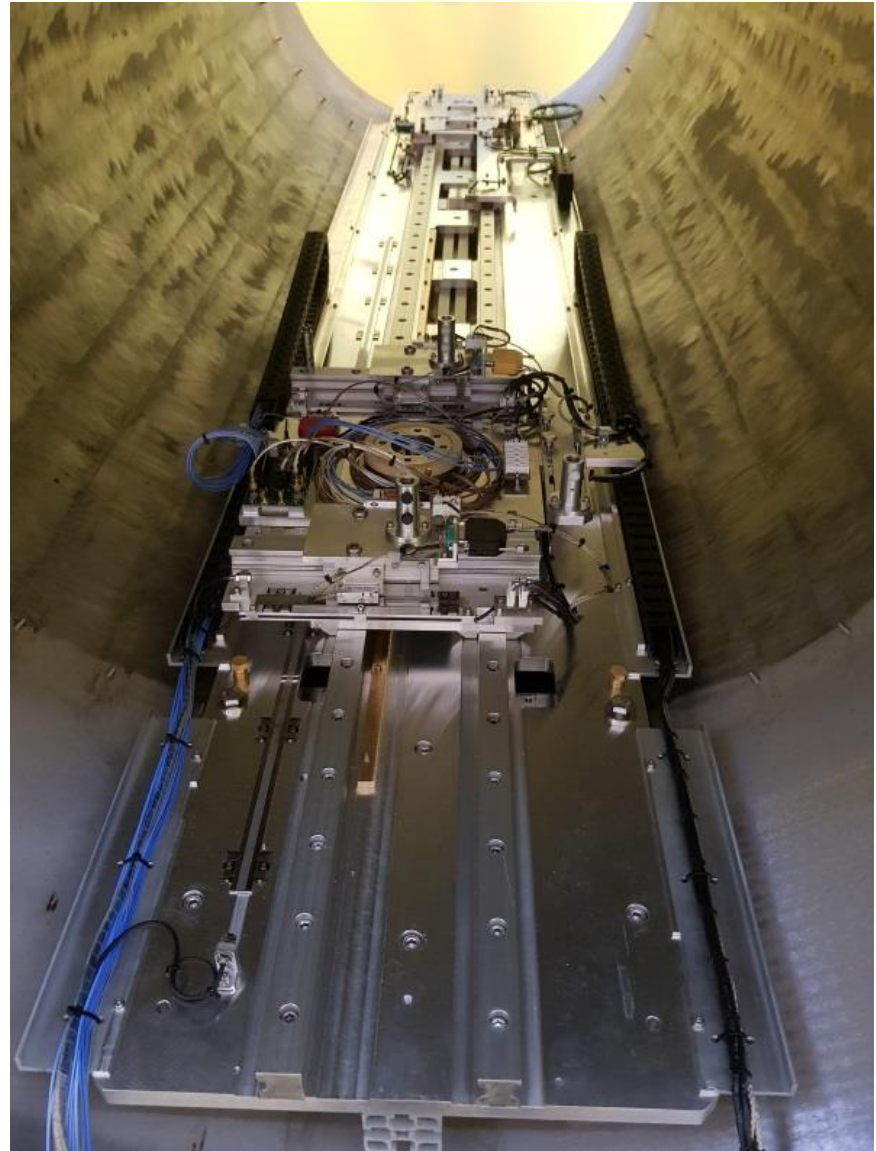
Cooled



# Target & detector drive system



Daresbury



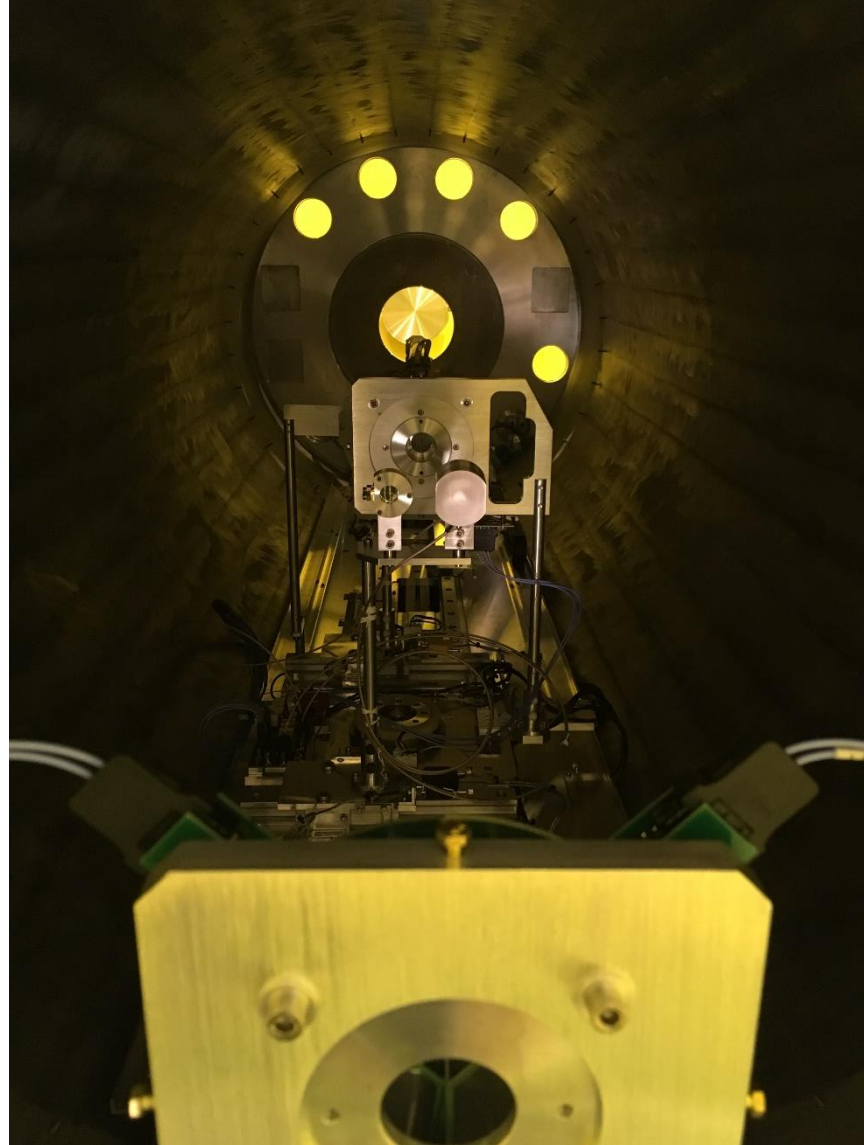
ISOLDE

# Target & detector drive system

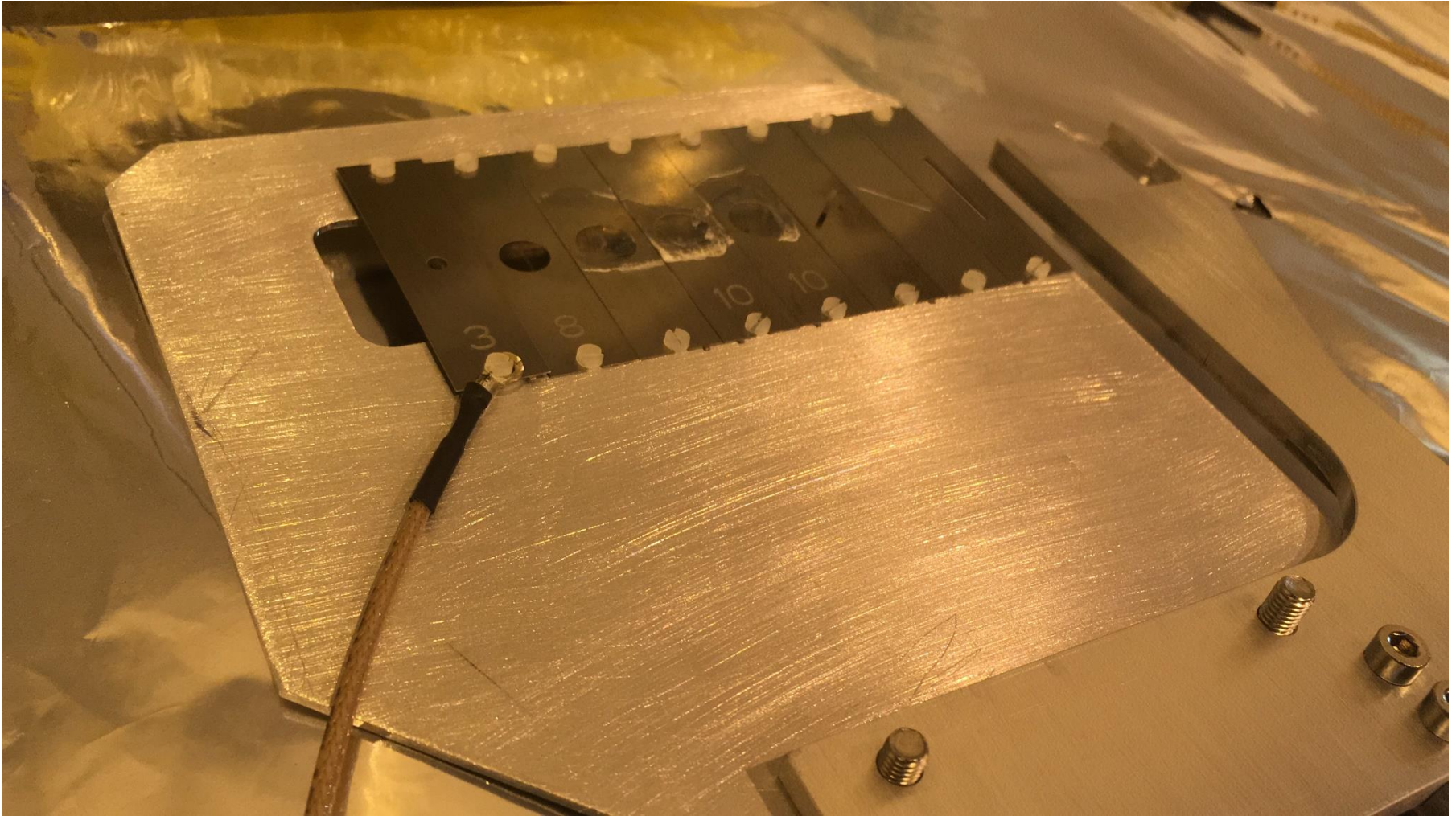


Assembled system including Argonne's full array

# Faraday cup and $\Delta E$ -E detector behind the luminosity monitor

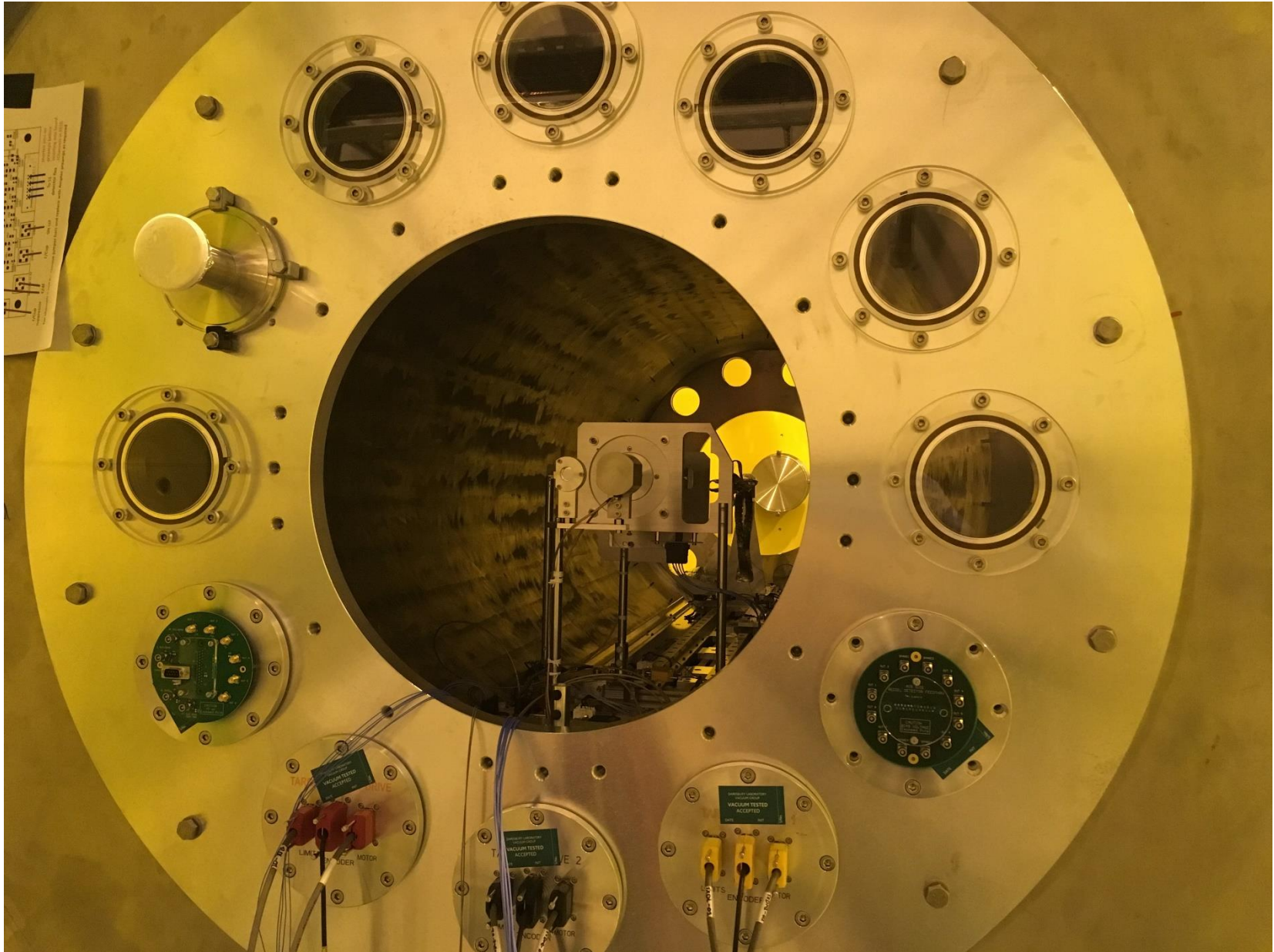


# Target ladder

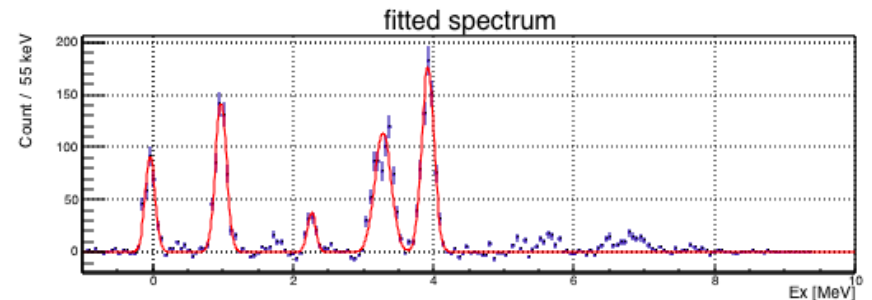
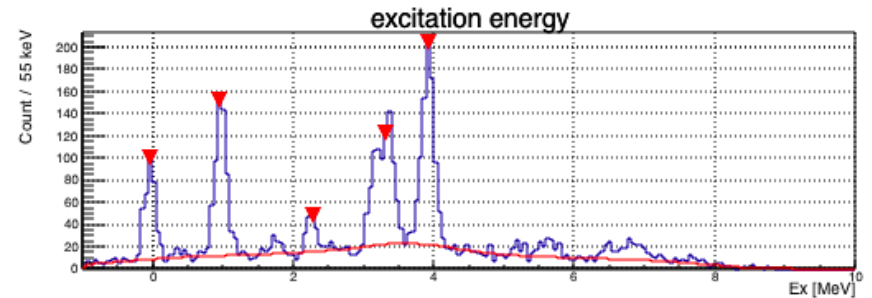
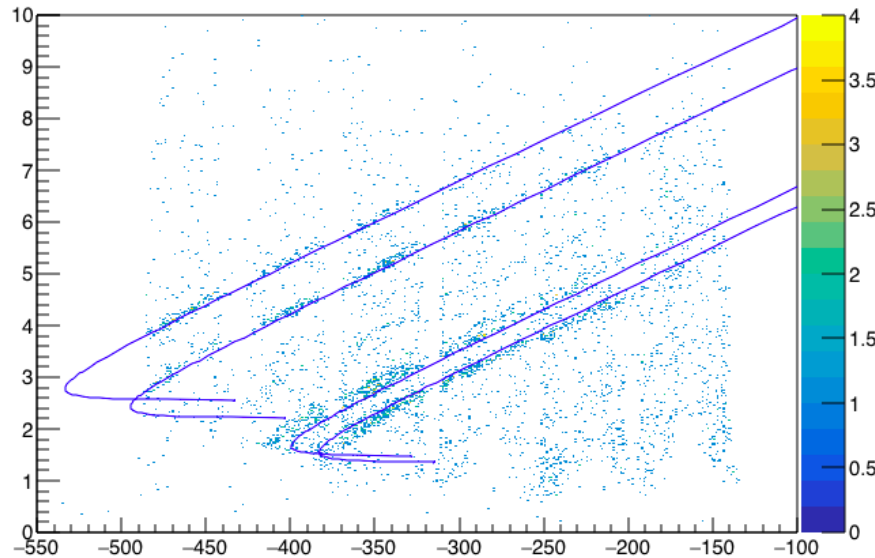
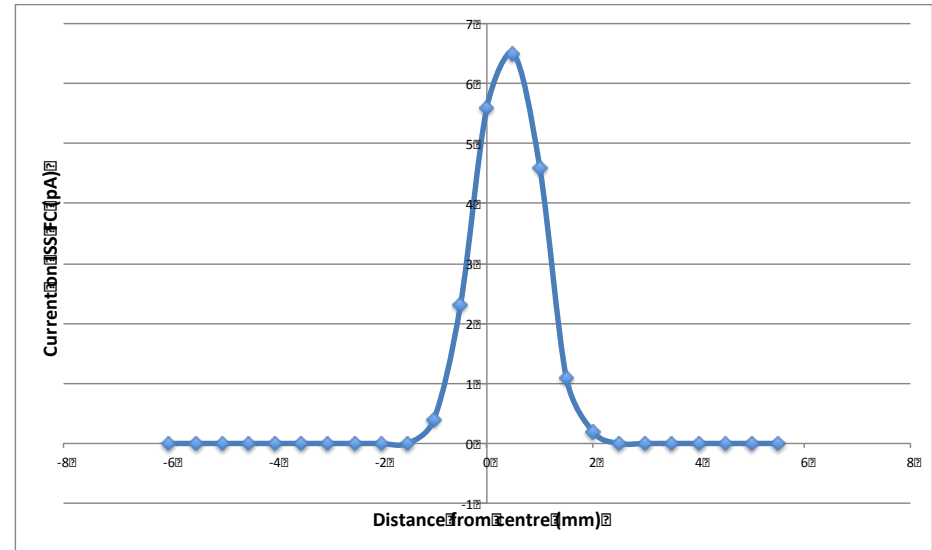


CD<sub>2</sub> targets, plus 3 mm and 8 mm apertures, diagonal slits and a vertical slit (1 mm)

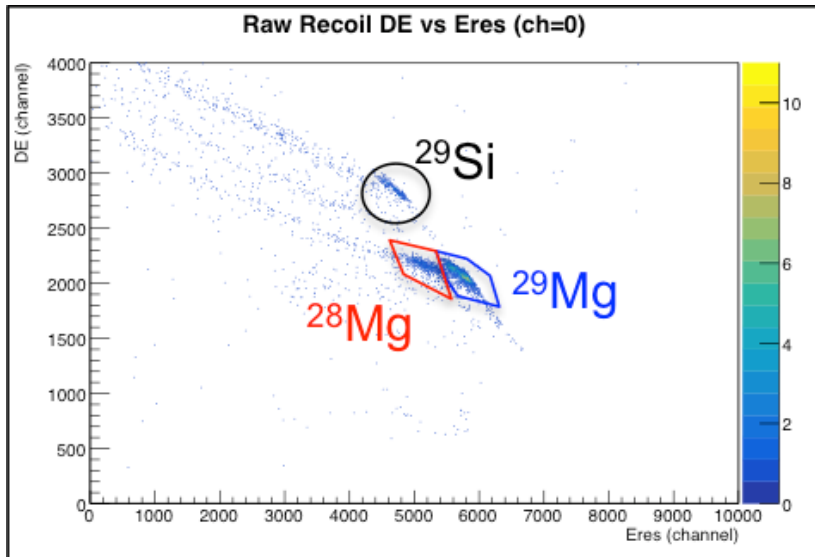
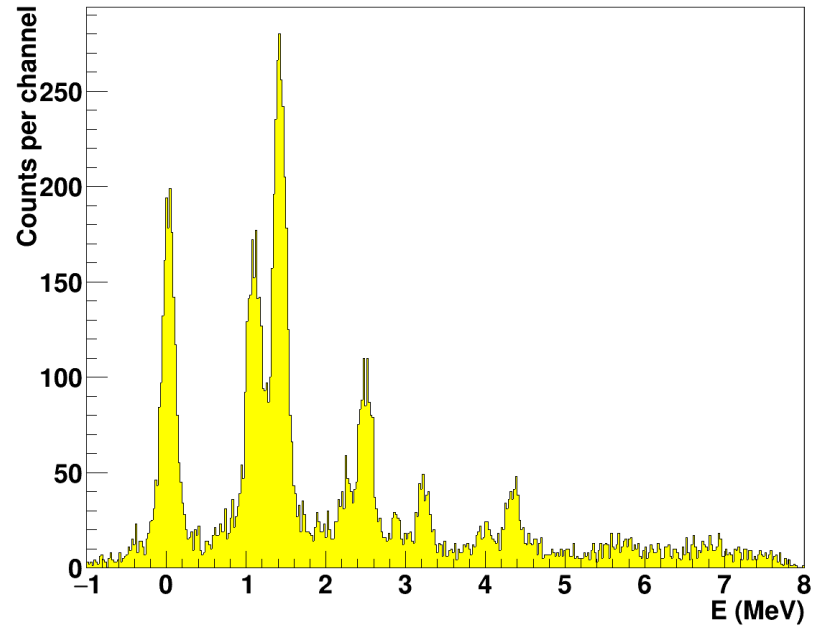
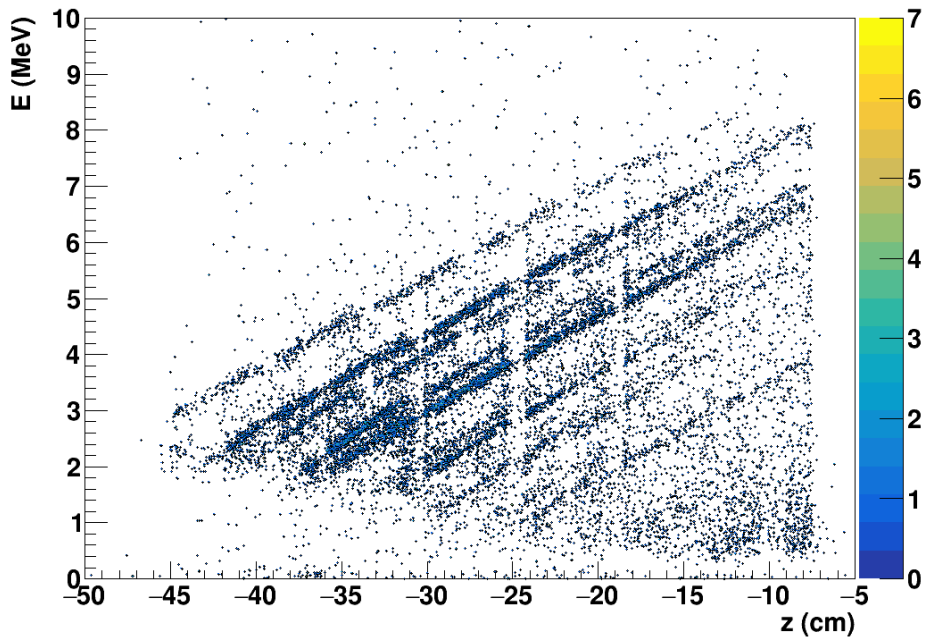
# Outer flange & feedthroughs



# Stable $^{22}\text{Ne}$ beam test – Sept 2018

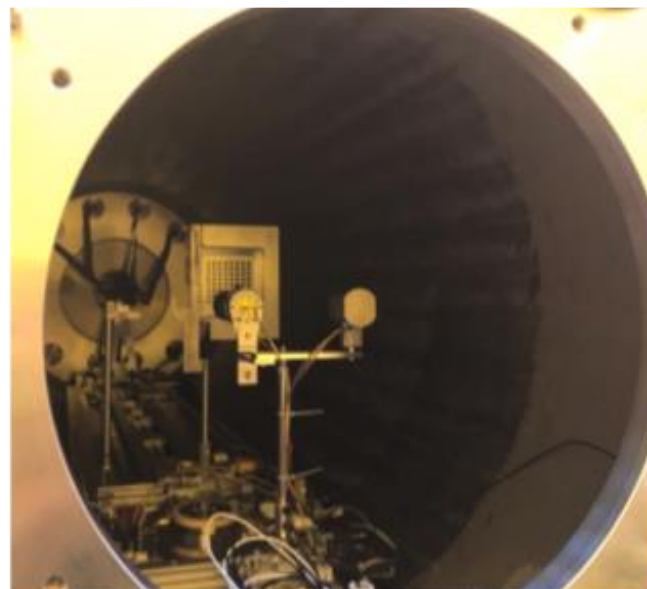
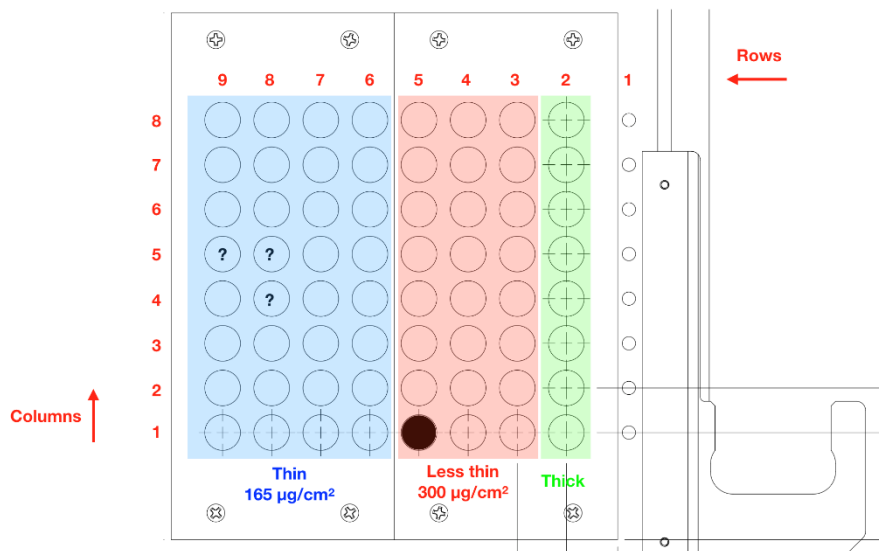


# $^{28}\text{Mg}(d,p)$ experiment – Sept 2018

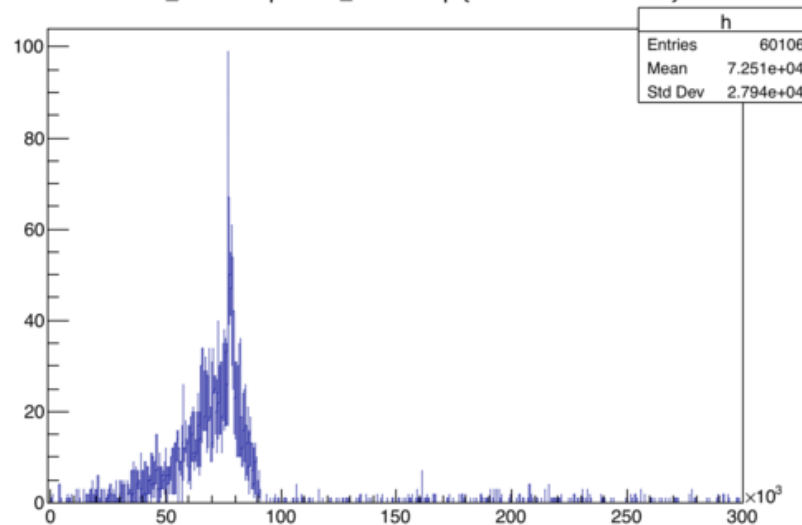
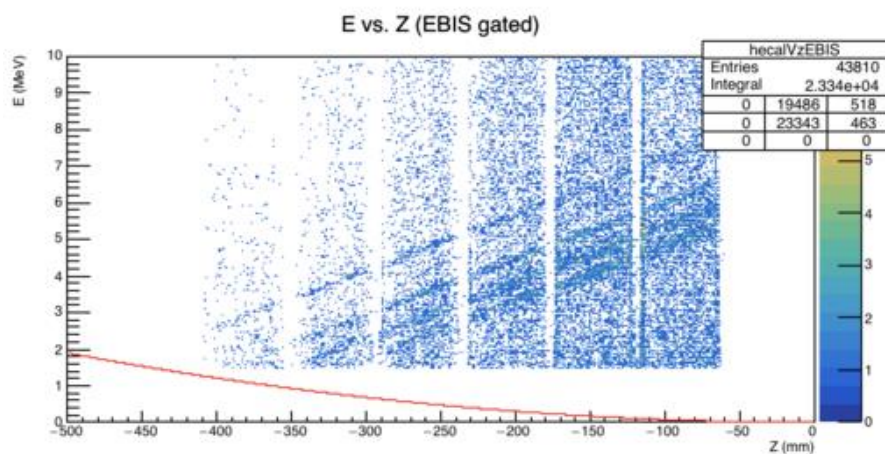




# $^{206}\text{Hg}(d,p)$ experiment – Oct 2018



event\_timestamp-EBIS\_timestamp {id!=1010&&id!=1024}

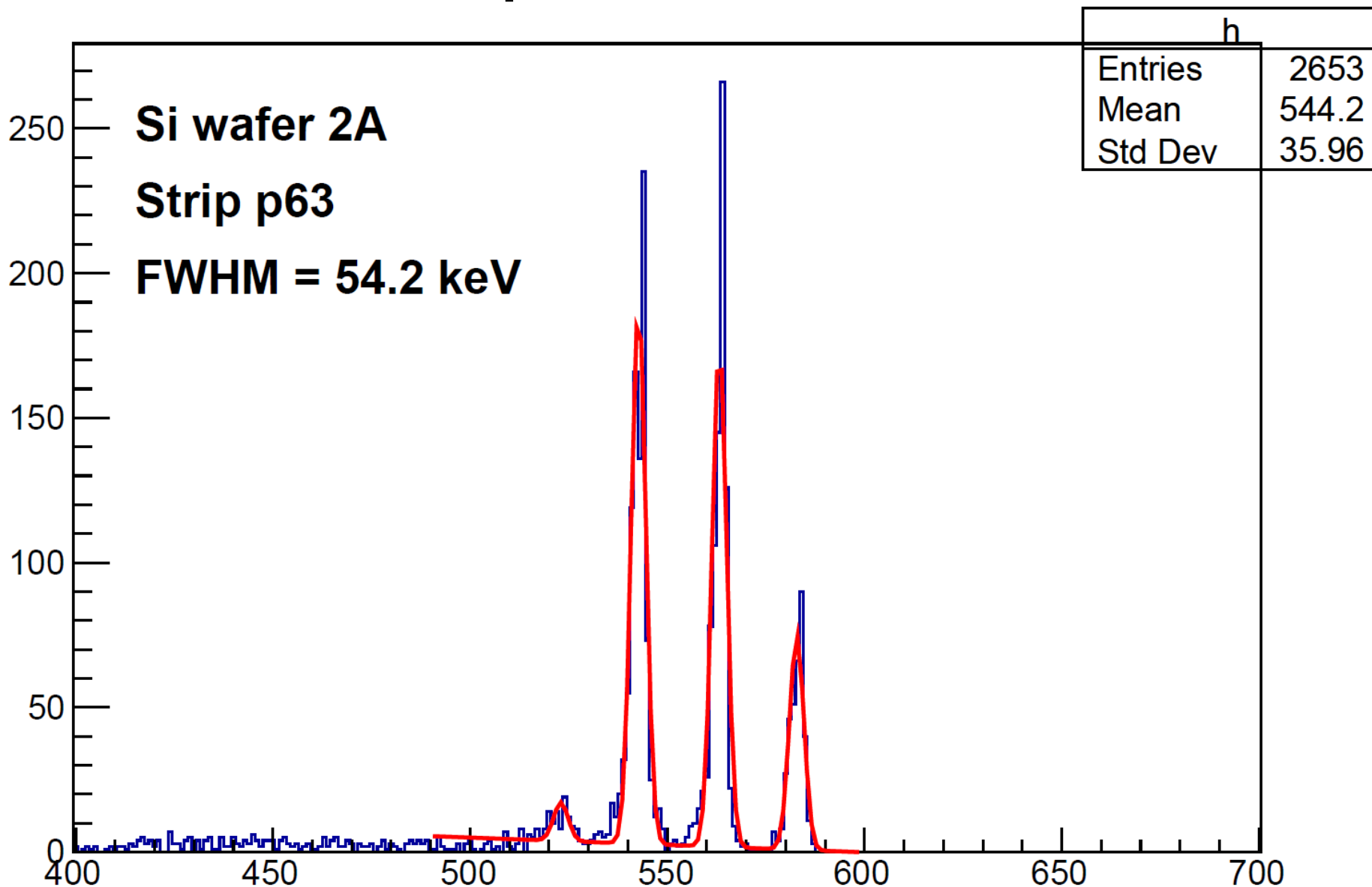


# Complete ISS detector – June 2019

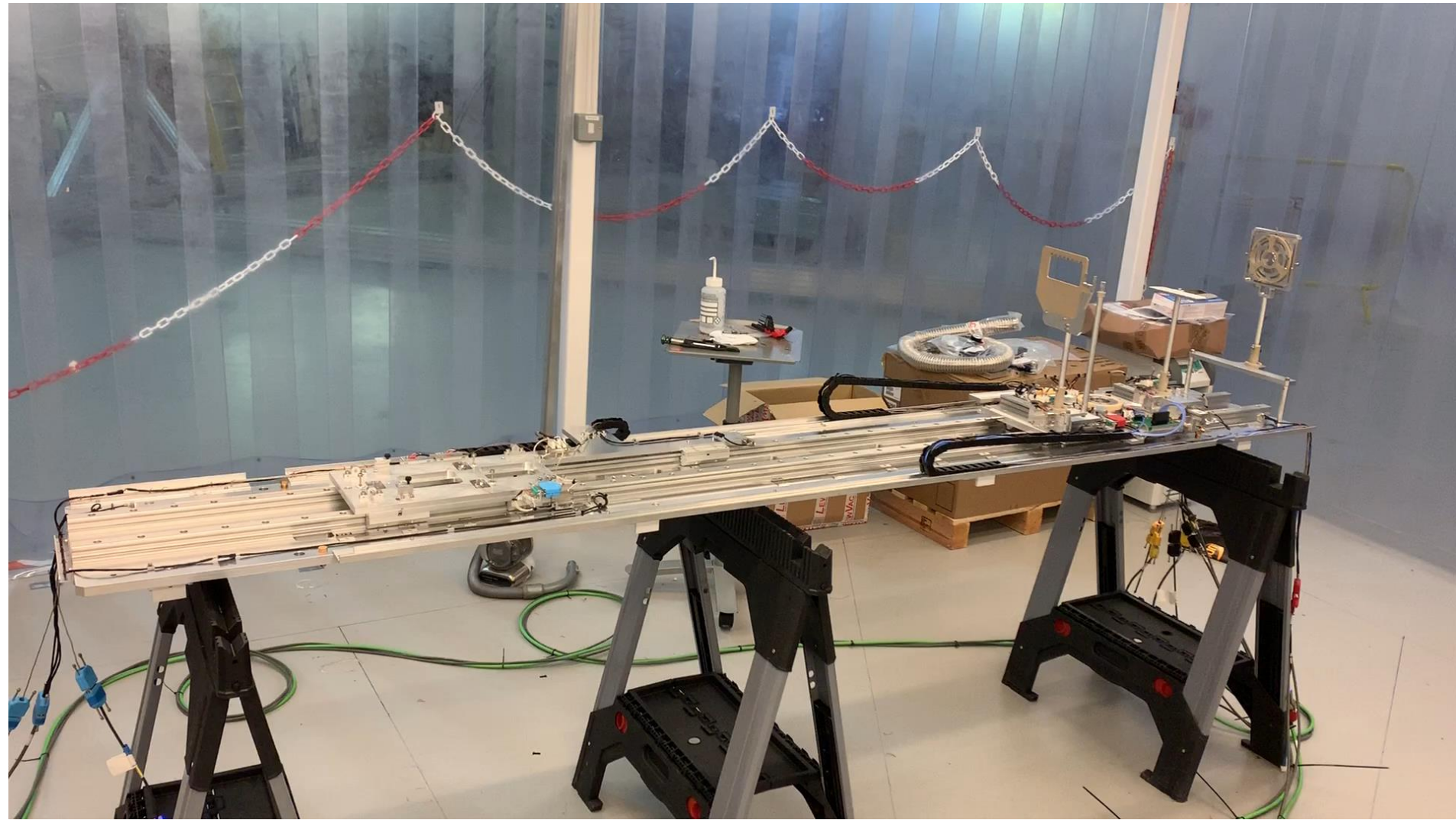


Liverpool Semiconductor Detector Centre

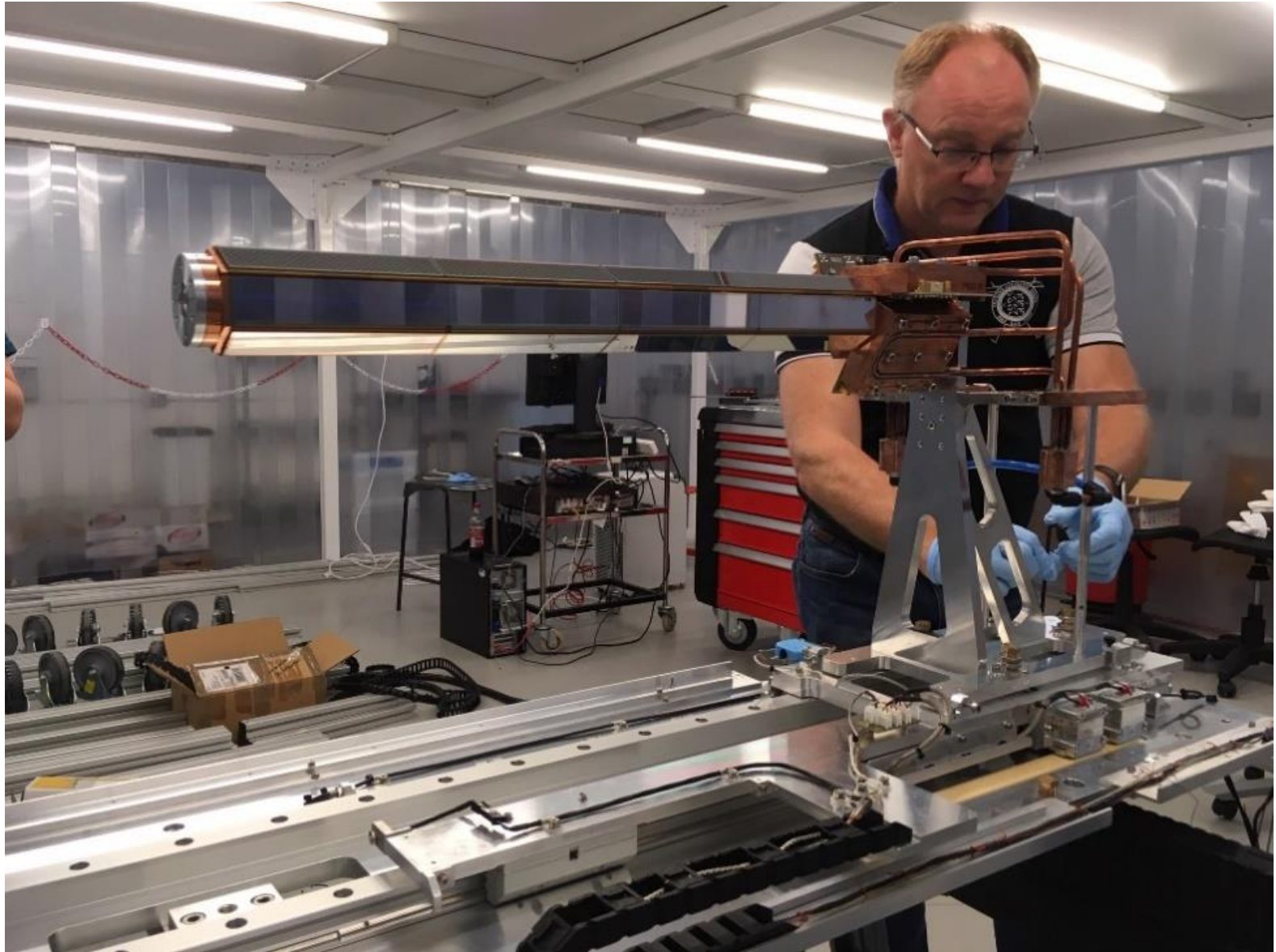
# First alpha-source tests



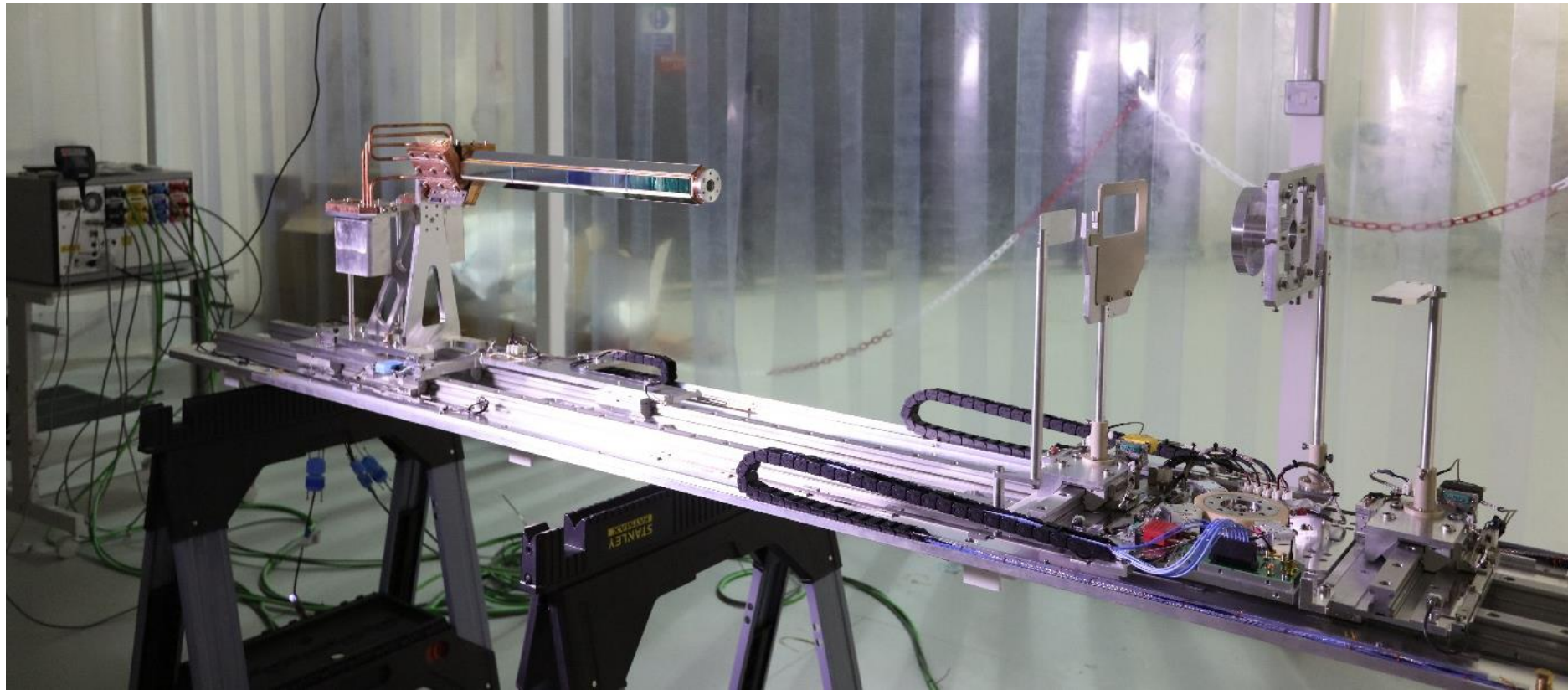
# Drive system tests at Daresbury



# Mounting ISS detector

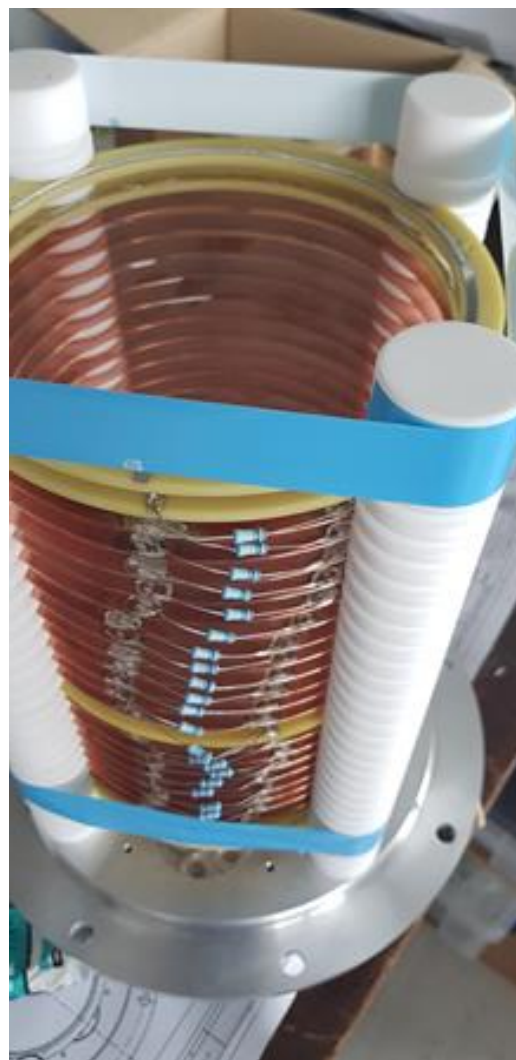
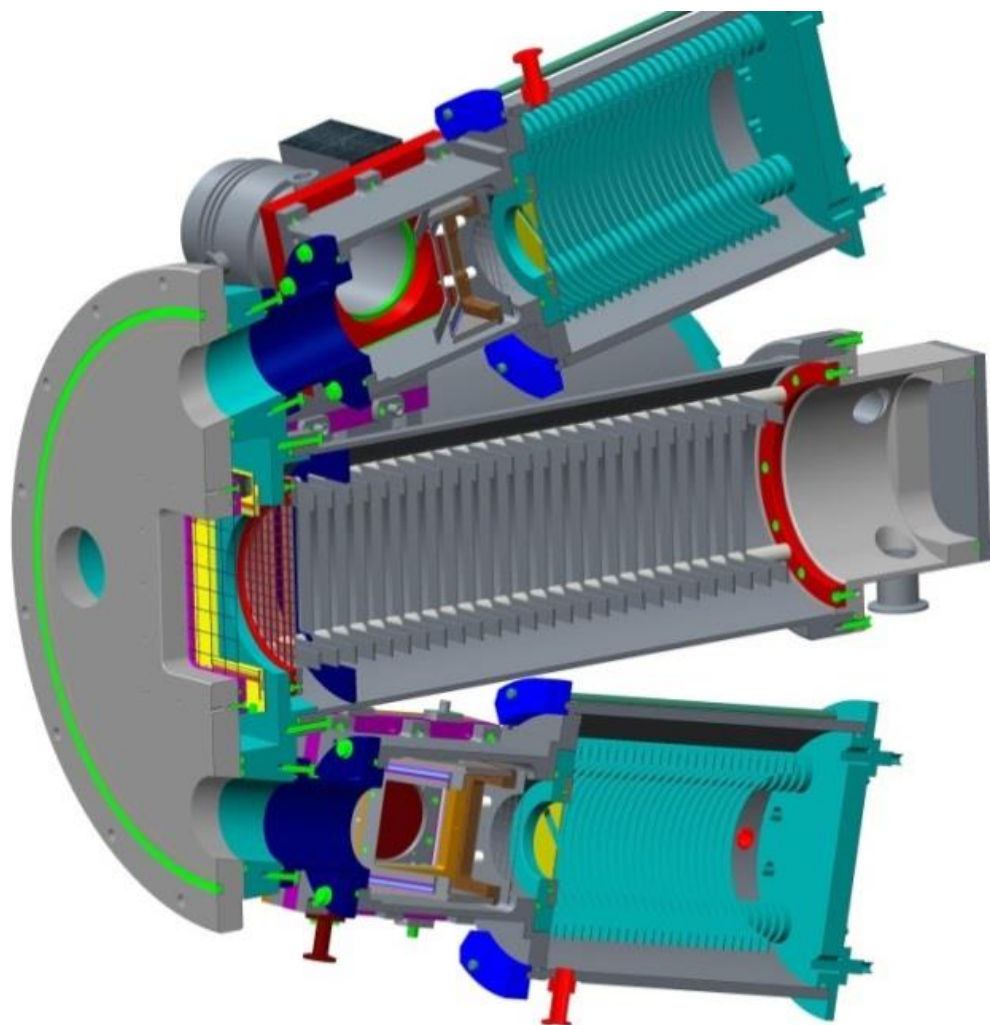


# Complete ISS system on drive



Drive system tested in Daresbury clean room  
ISS detector safely shipped to CERN  
Support structure to follow soon...

# Recoil + fission fragment detectors



Under construction at Manchester

# Summary & next steps

- Magnet operational
  - Cold head upgrade
- ISS detector complete
  - Test programme ongoing
- Mechanics commissioned
  - Ship to CERN & install inside magnet
- Start planning first full physics campaign



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The University of Manchester

