

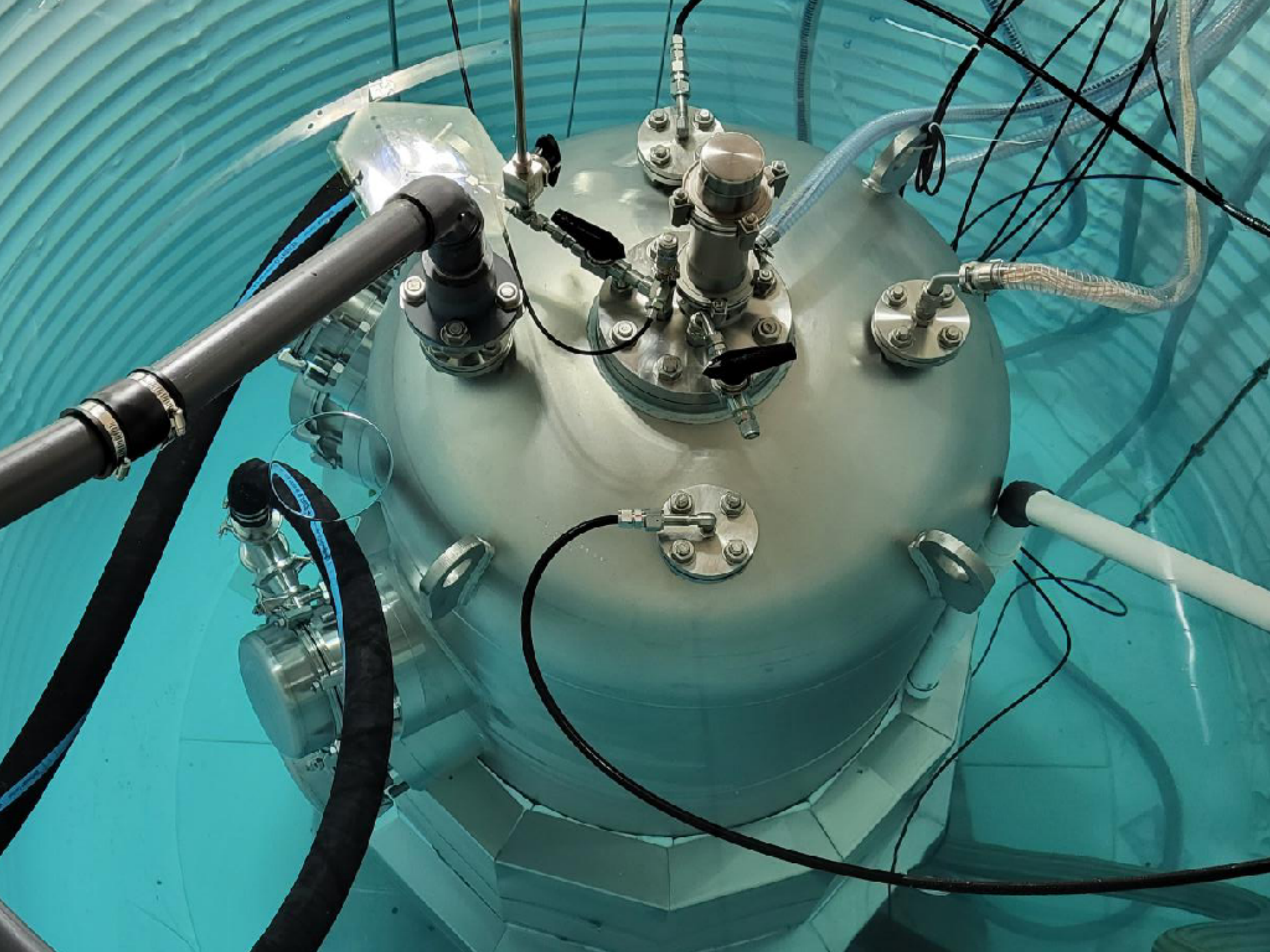


Update from the PICO Experiments

Carsten B. Krauss for the PICO collaboration
Feb 4 2025, SEF meeting Toronto

Outline

- PICO-40L progress
- PICO-500 construction
- Coming publications
- Timeline

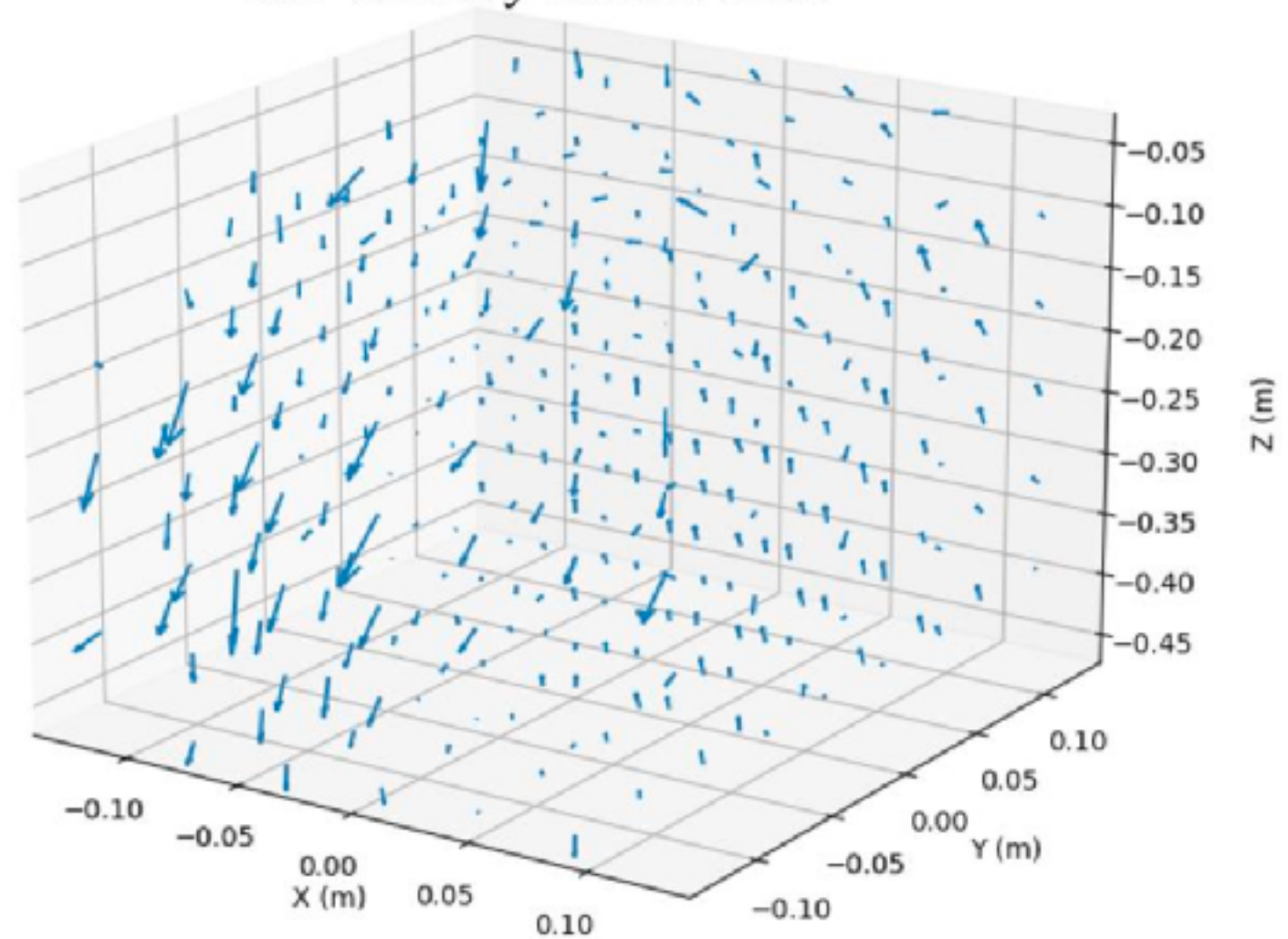
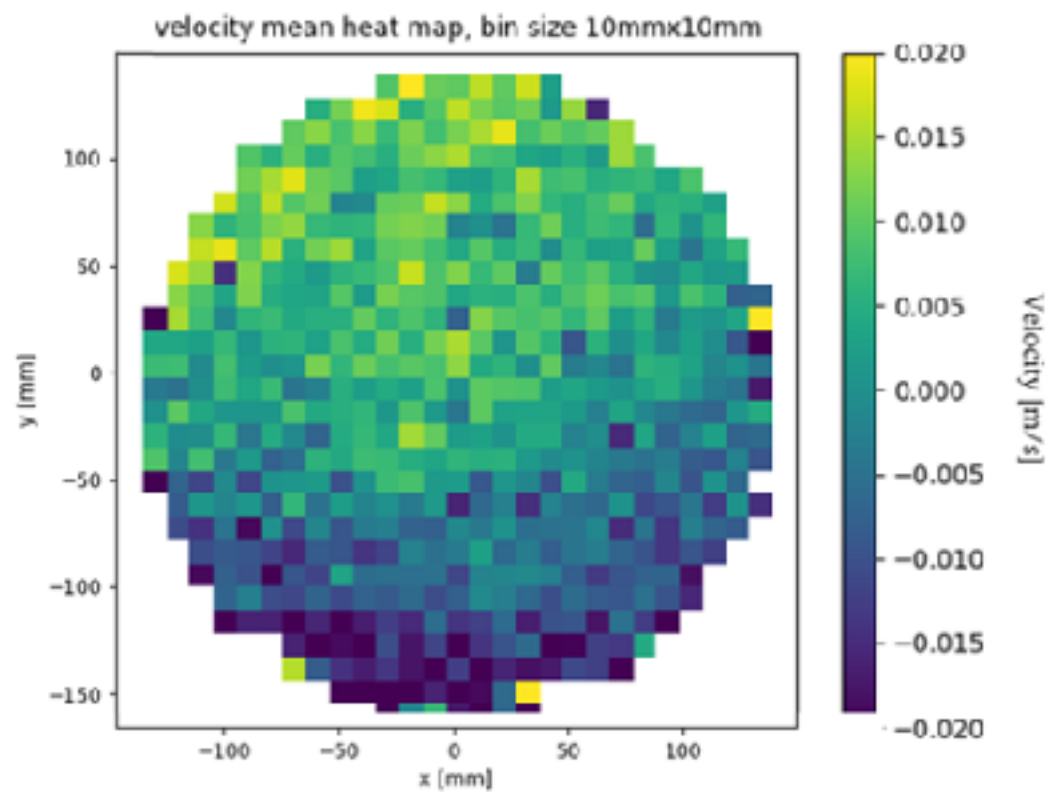


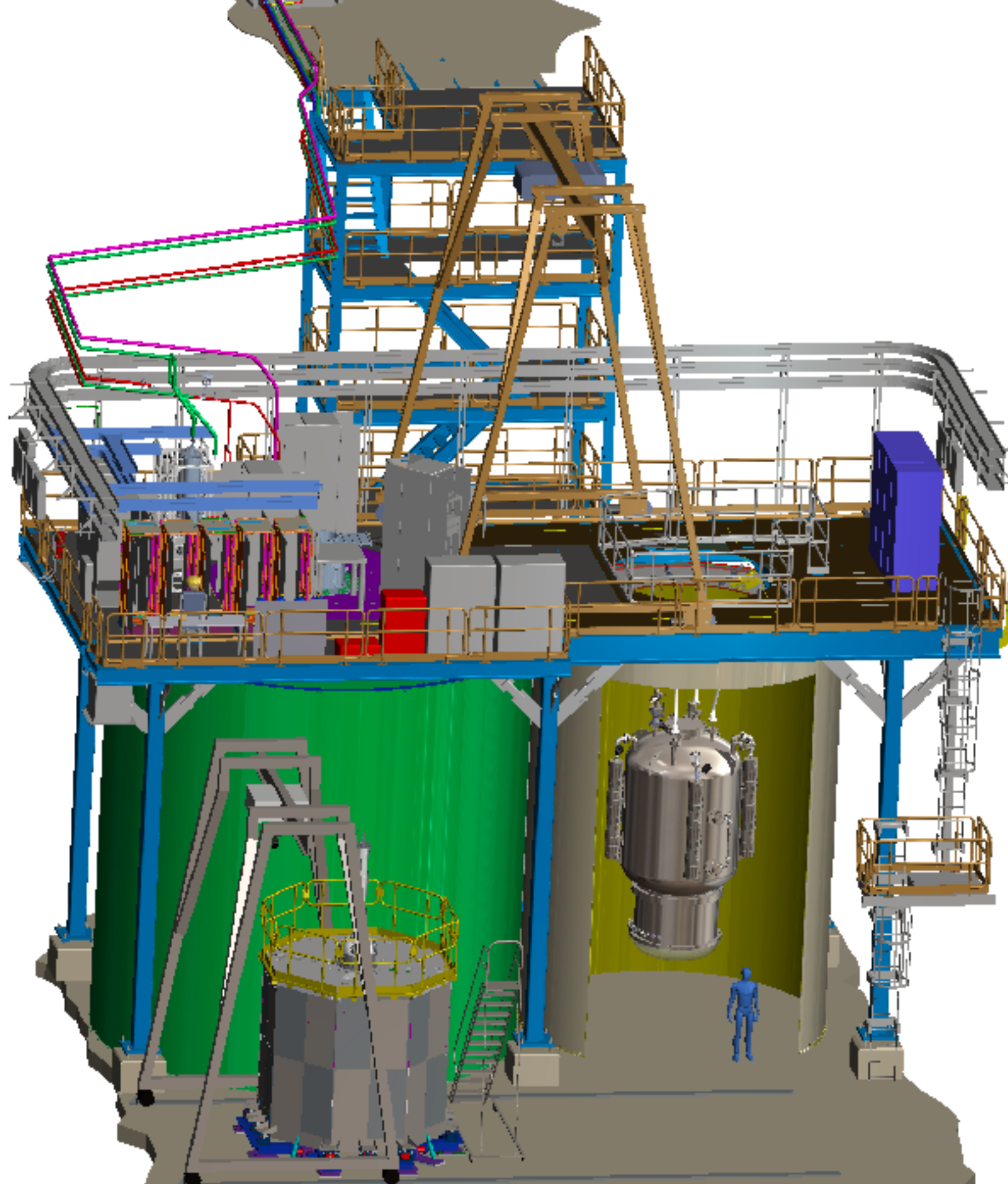
PICO-40L

- Two chillers broke last year (one brand new, one well worn and tested)
- Very limited new data was taken in October 2024
- Progress with analysis was made with the 2023/2024 datasets
- Focus now on understanding backgrounds (wall, bellows, alpha, other)

Convective Current in PICO-40L

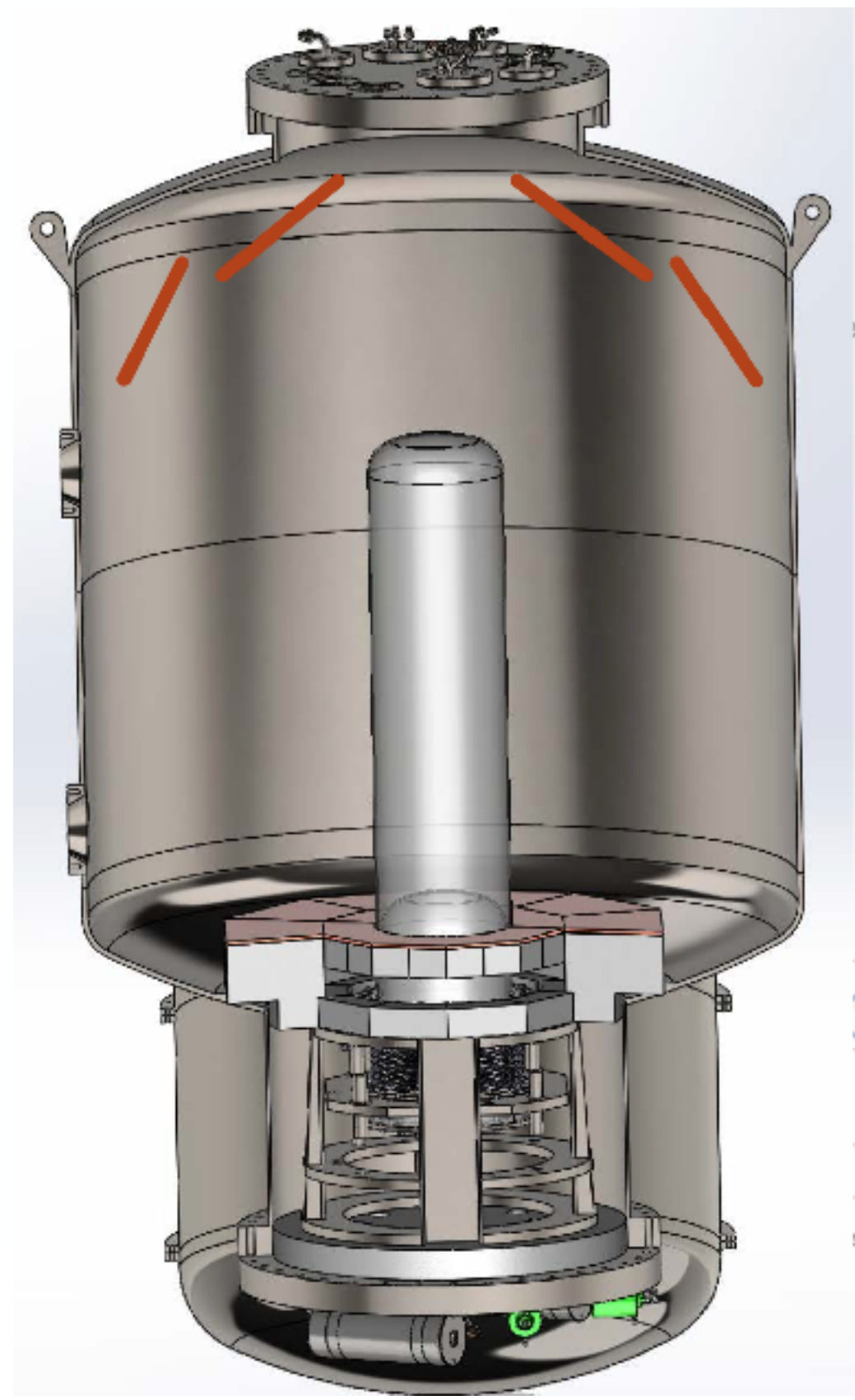
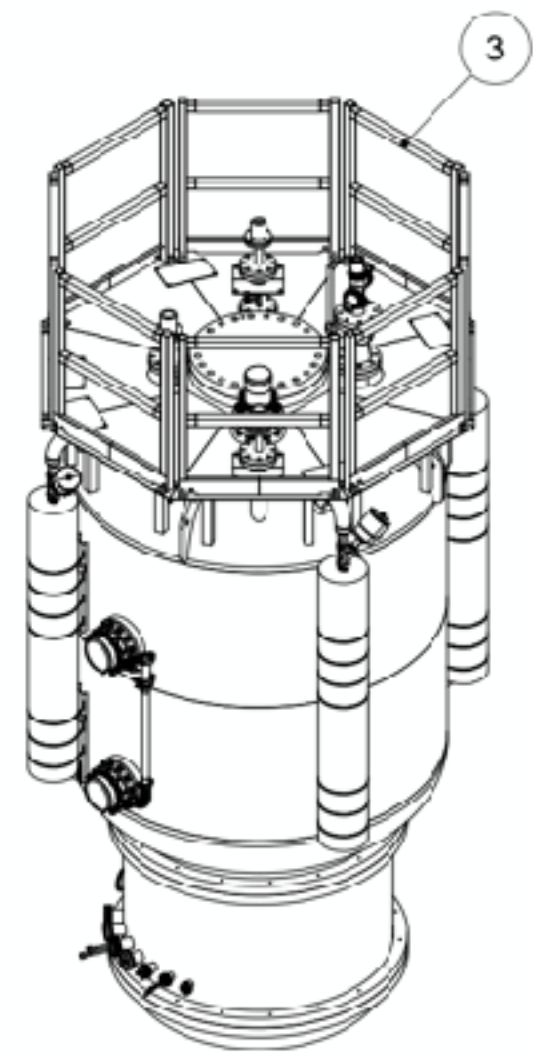
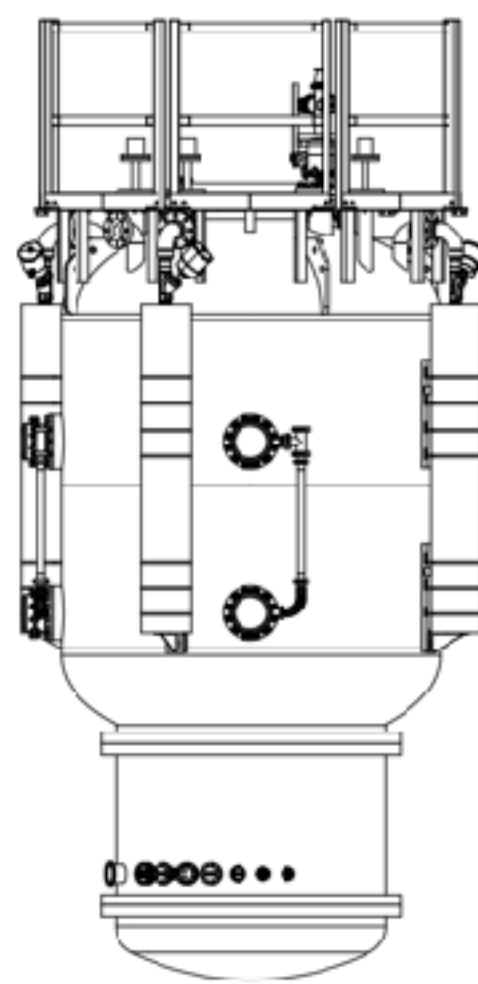
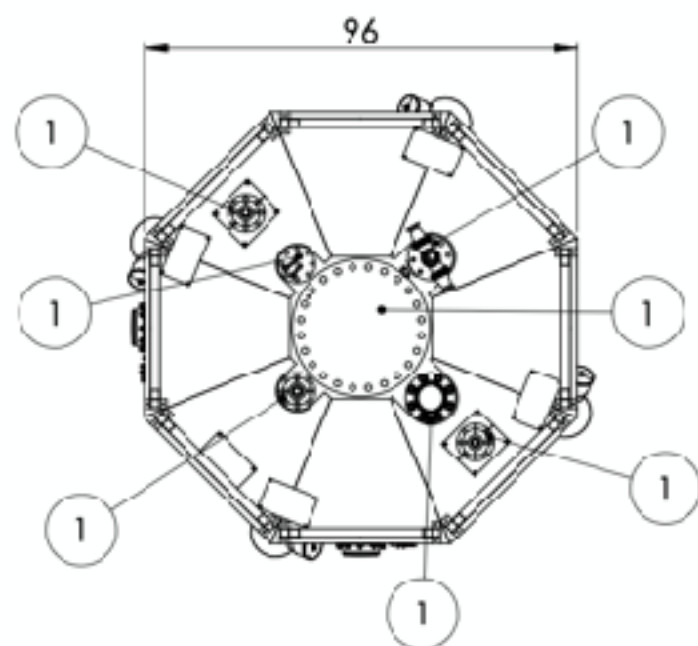
3D velocity Arrow Plot



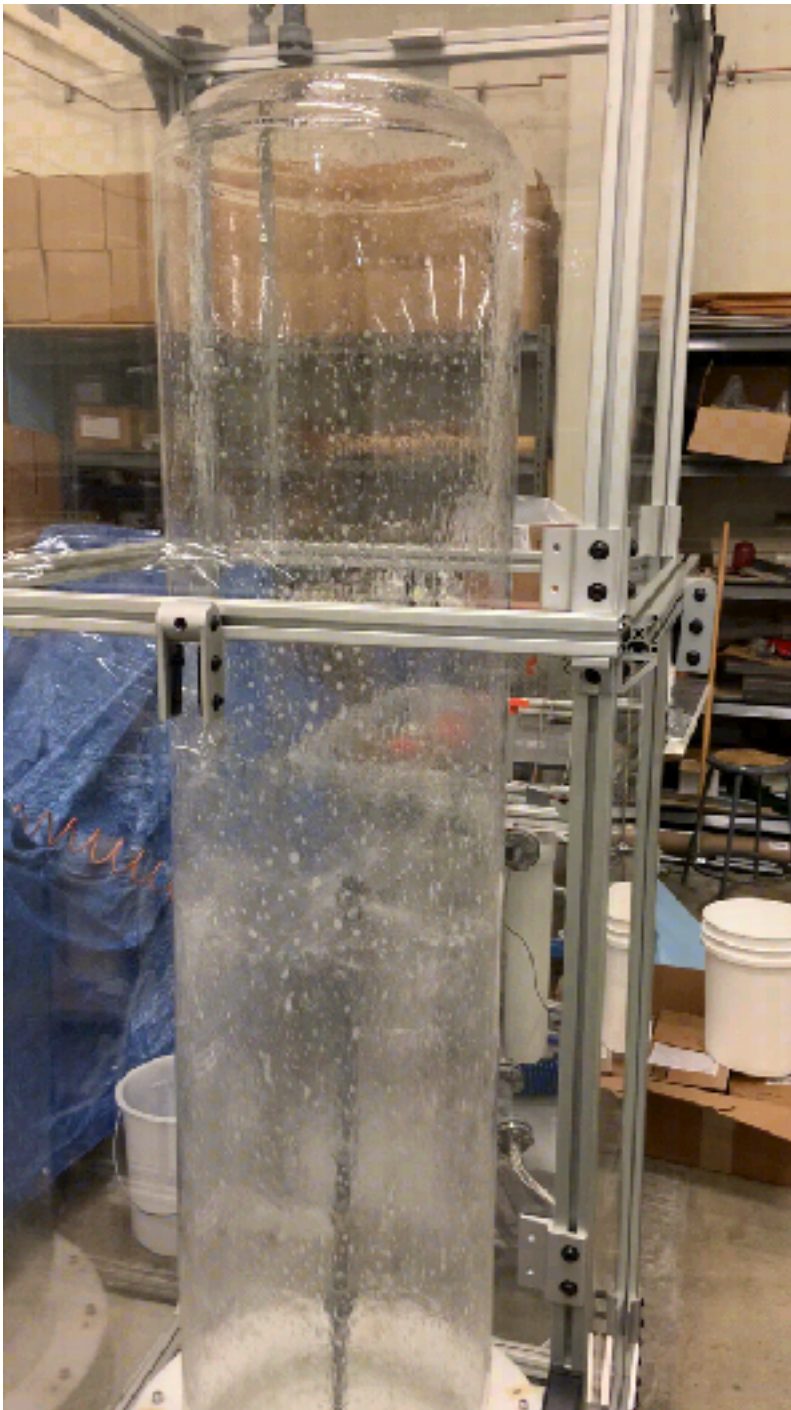


PICO-500

- The inner detector assembly is progressing well in Cryopit
- All pressure vessel parts. Are underground for welding, scheduled to start March 10
- Now installing the water tank lid which is a prerequisite to the welding activity
- The detector suspension has been finalized and approved after an external review
- The active liquid is underground already
- Nearly all items have been procured, with exception of the Freon fill cart. The design of the Freon fill cart is ready, procurement is starting now.
- Once the welding is done, interference with other experiments in the cube hall should be minimal. There are a few short periods of crane operations that could be disruptive going forward.



PICO-500 Inner Detector





Lid!



Yesterday!



Papers in works

- PICO-40L detector paper
- Excited dark matter using PICO-60 data
- Instrumental papers
 - Radon permeation through vessel seal
 - Acoustic alpha spectroscopy in PICO-40L
 - Radon adhesion and cleaning from quartz surfaces

Timelines

- PICO-40L will be running for all of 2025 and most of 2026 to learn all we can about the operational realities of the Right-Side-Up chamber
- PICO-500 will be assembled through 2025 and 2026 with commissioning starting late 2026.
- The first new PICO papers will be submitted this year!

Outlook

- Bubble chamber dark matter searches remain a strong SNOLAB domain
- PICO-40L is being used as testbed for the operation of PICO-500.
- The construction of PICO-500 is progressing well, after some delays due to the modification of the old MiniClean lid and the finalization of the vessel suspension system
- The cleanliness standard for the inner vessel cleaning we were able to reach in the Cryopit is better than what was achieved for either PICO-60 or PICO-40L before