Universität Hamburg
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Project200 Setup Status

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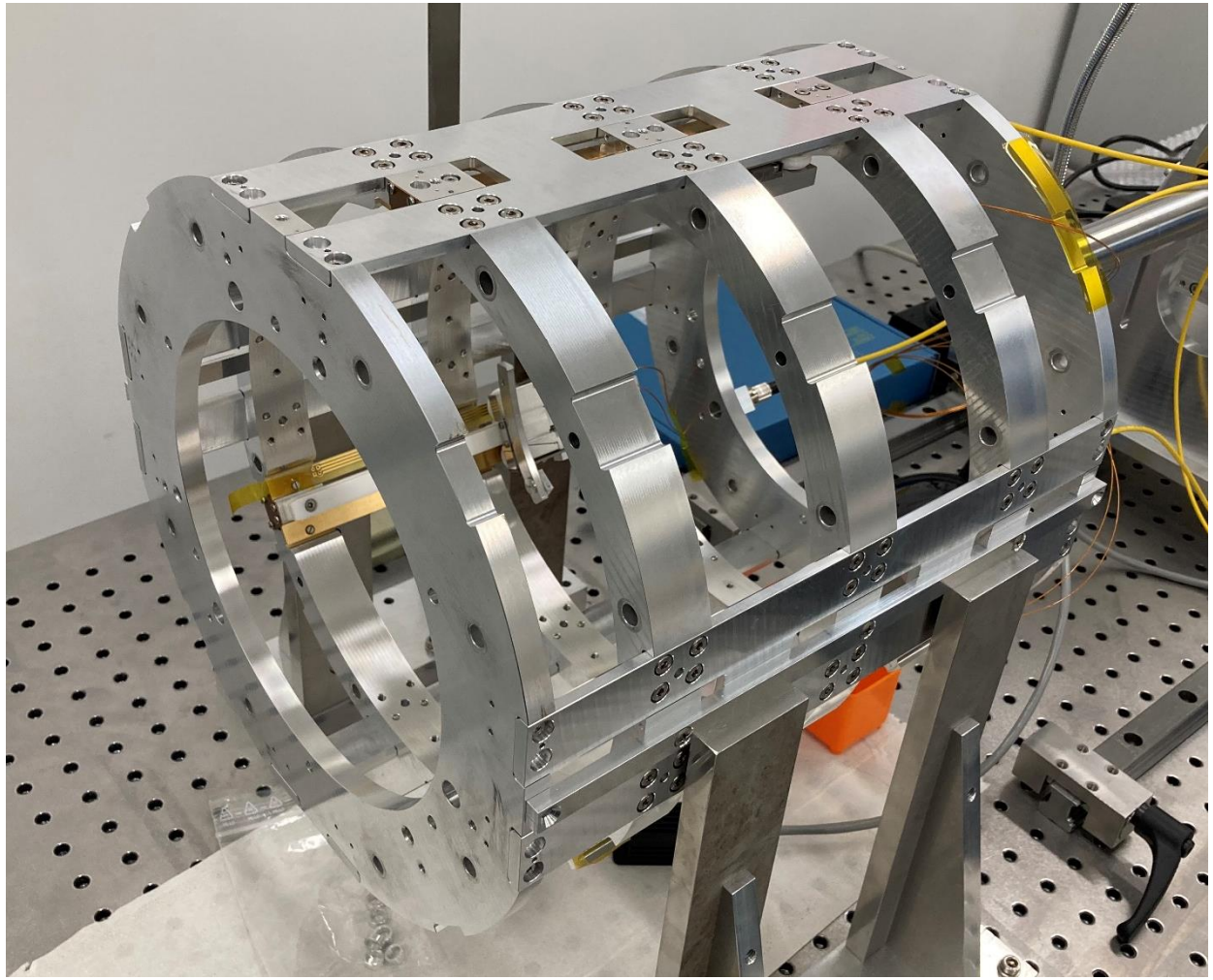
Mechanics

Assembly & Alignment

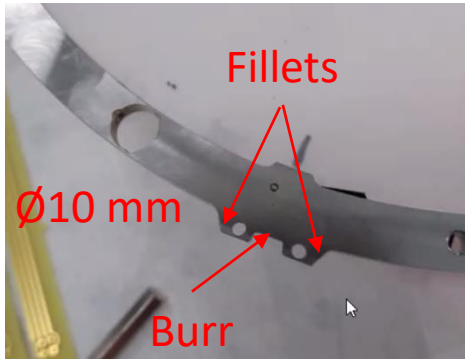


- P200 was (re-)assembled by Michael in the first week of Jan 2022
- Alignment of back-bone structure and motor rails with high precision dial gauges
- Titanium Disk Ring was fitted incl. titanium leaf springs
  → fits after small modifications
- Disk ring replaced by “cloth hangers” for individual driving of motors during testing and commissioning

Disk Ring Modifications

Issues with Titanium Disk Ring manufactured at CPPM:

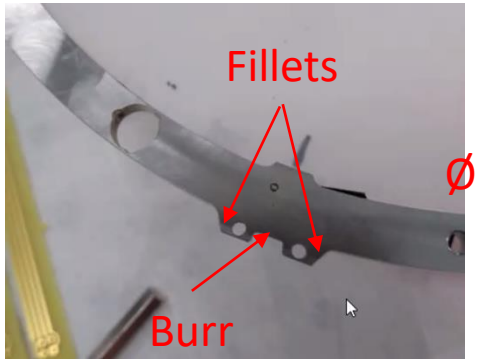
1. Small burrs from machining at interface to leaf spring/carriage
2. Fillets at interface to leaf spring/carriage which were removed in the latest design (Possible miscommunication and/or mix-up of designs at different stages)
3. Through holes for interferometer mirrors Ø10 mm instead of Ø8 mm (Possible miscommunication and/or mix-up of designs at different stages)

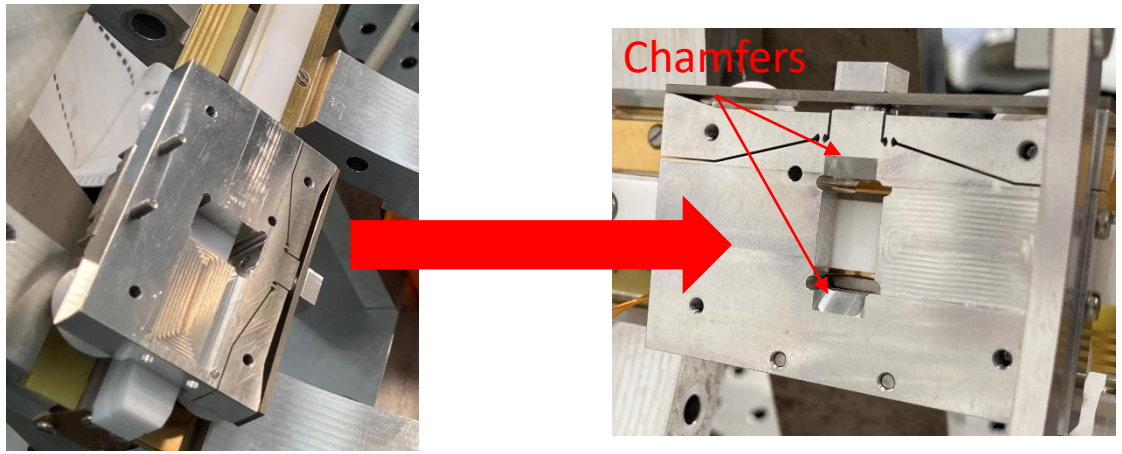


Disk Ring Modifications

Dealing with with the Titanium Disk Ring issues:

1. Small burrs from machining at interface to leaf spring/carriage
   → Manually removed by Michael with file
2. Fillets at interface to leaf spring/carriage which were removed in the latest design
   → Added chamfers at the carriages to accommodate for fillets
3. Through holes for interferometer mirrors Ø10 mm instead of Ø8 mm
   → Adapter rings for Attocube retro reflector holders

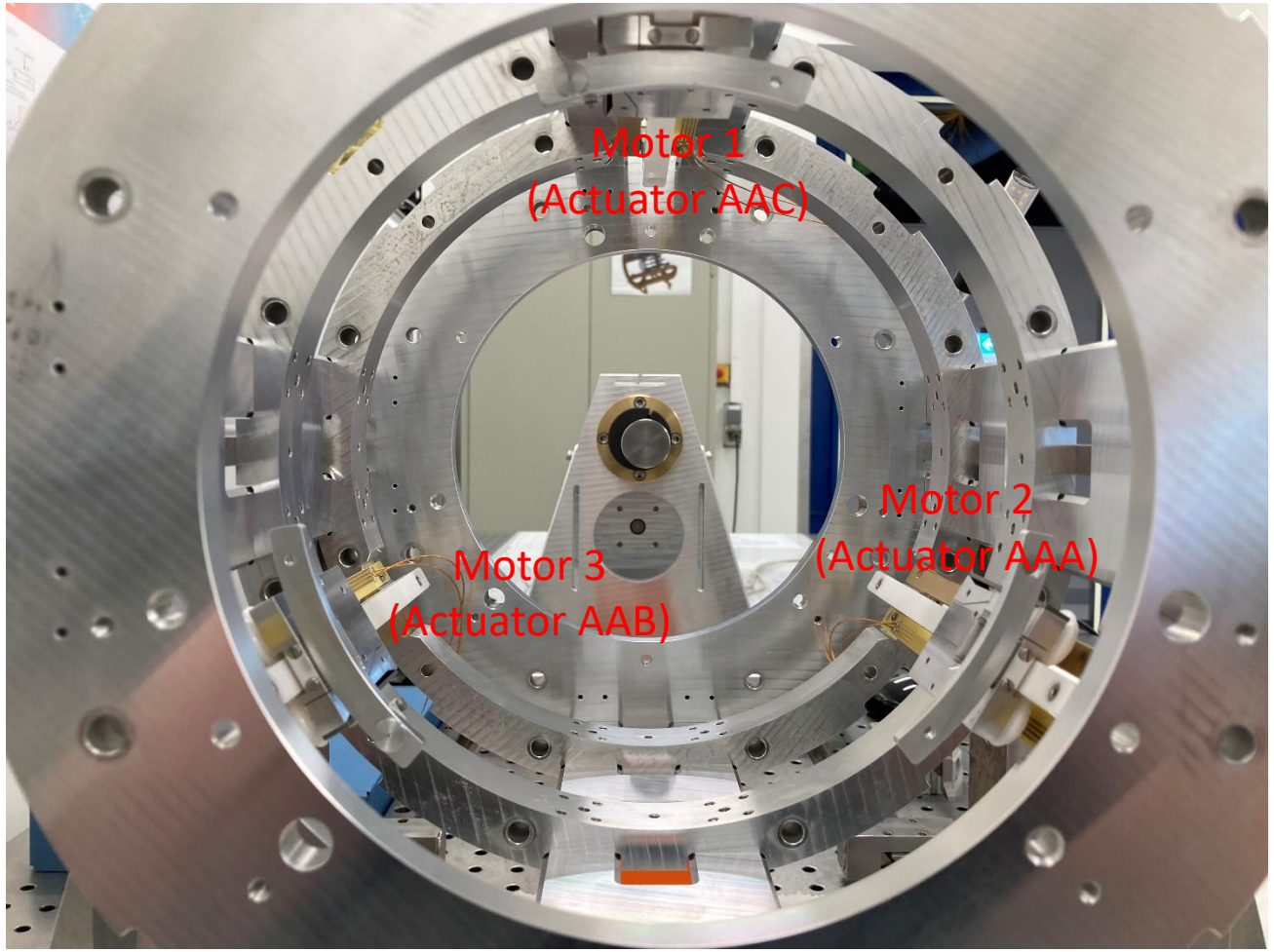




Motors

Motor Integration

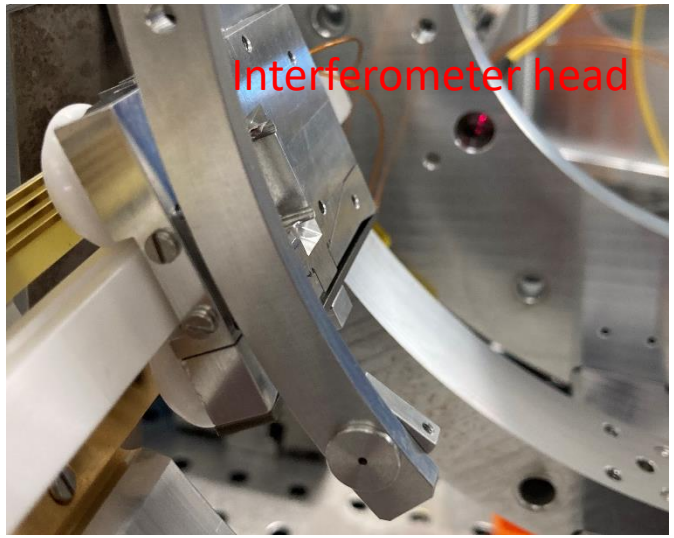
- Three motors and carriages are installed in Project200
- Electrical contact rails are installed and wired
- Electrical wiring incl. vacuum feedthrough have been tested successfully
- First test drive along full length of rails was successful
- More intricate tests (stable movement/step size) still to be done

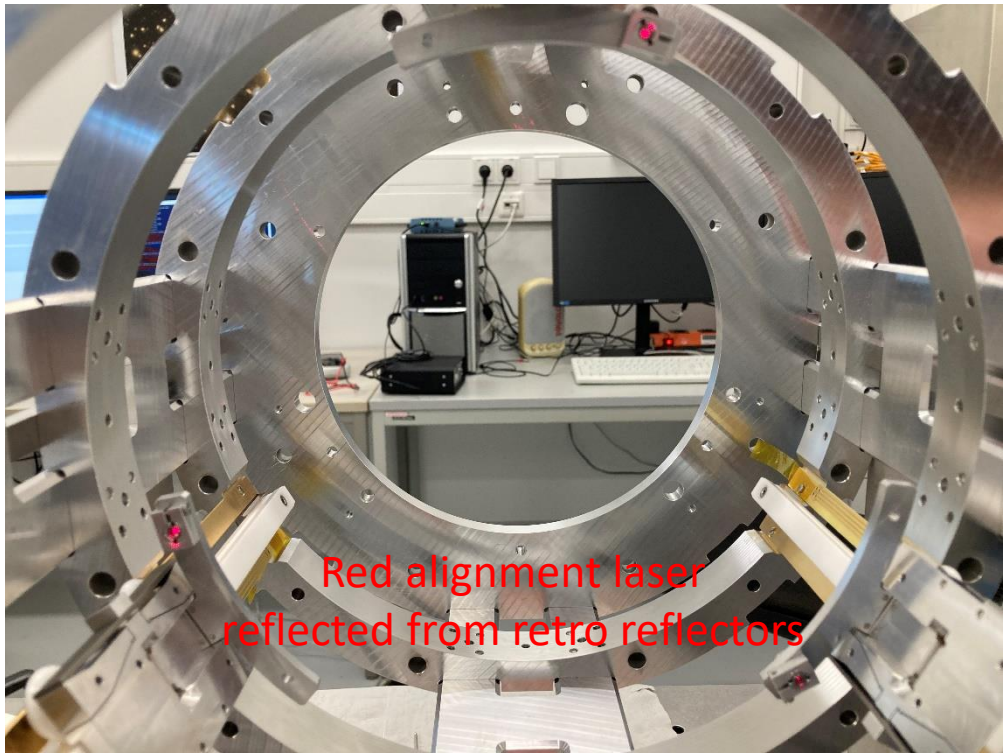


Attocube

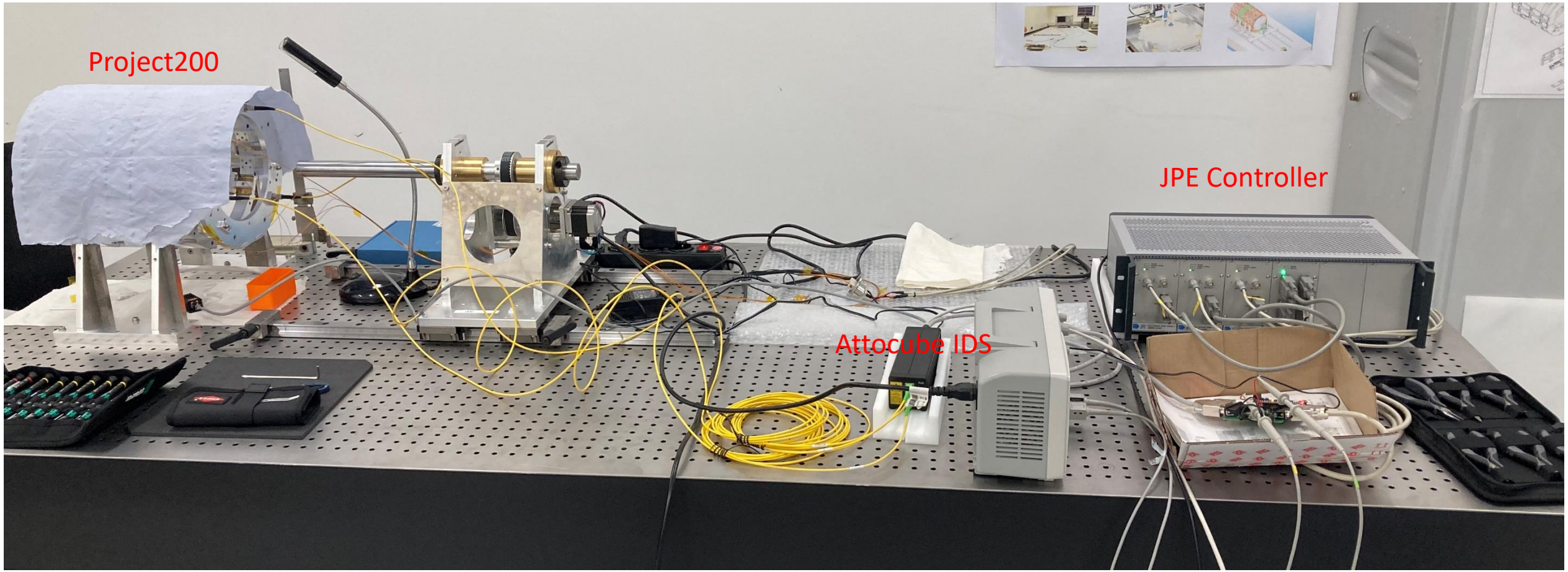
Attocube Integration

- Attocube interferometer arrived at UHH on 23.12.2021
- Package was “found” on 06.01.2022
- Fast and easy commissioning (works out of the box!)
- Integration in Project200 went smooth thanks to Michael’s preparation (fine threaded adapters for the interferometer heads and mounting adapter for the retro reflectors)
- Alignment of heads and retro reflectors worked



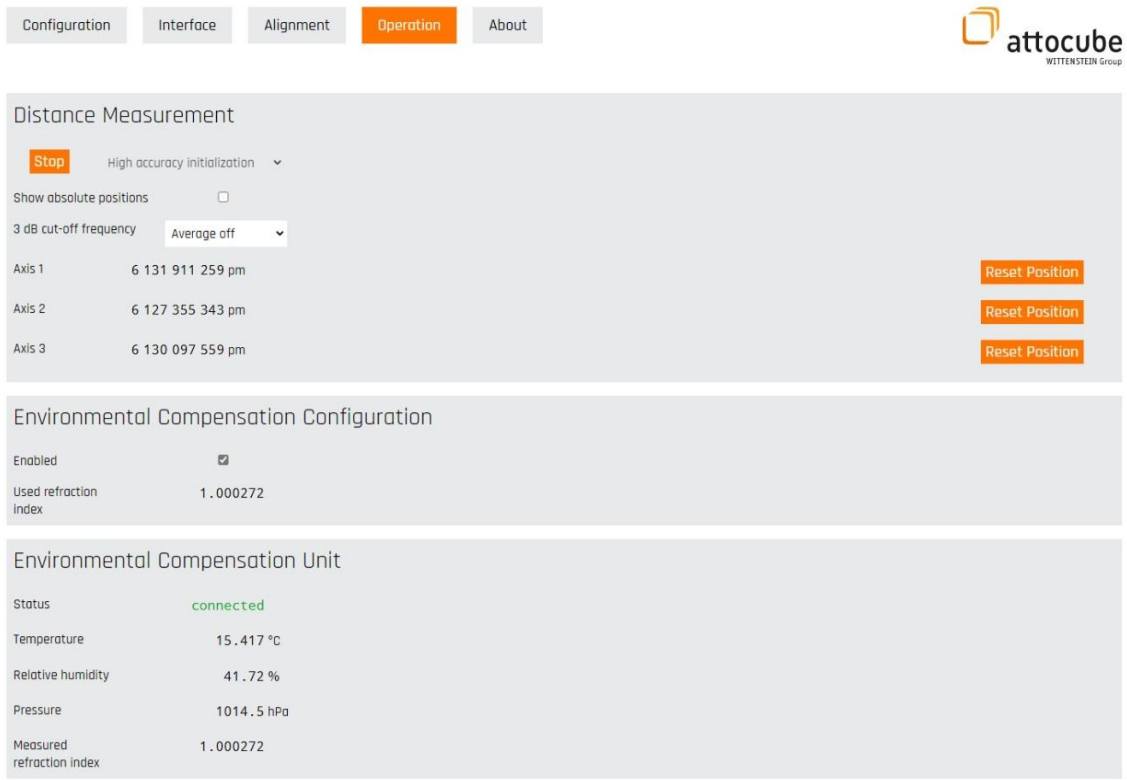


Attocube Integration

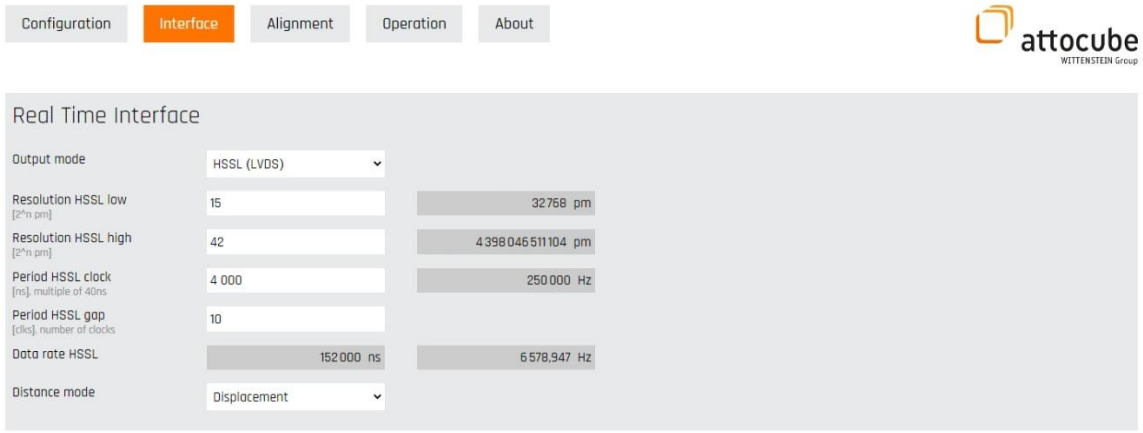


Attocube Integration

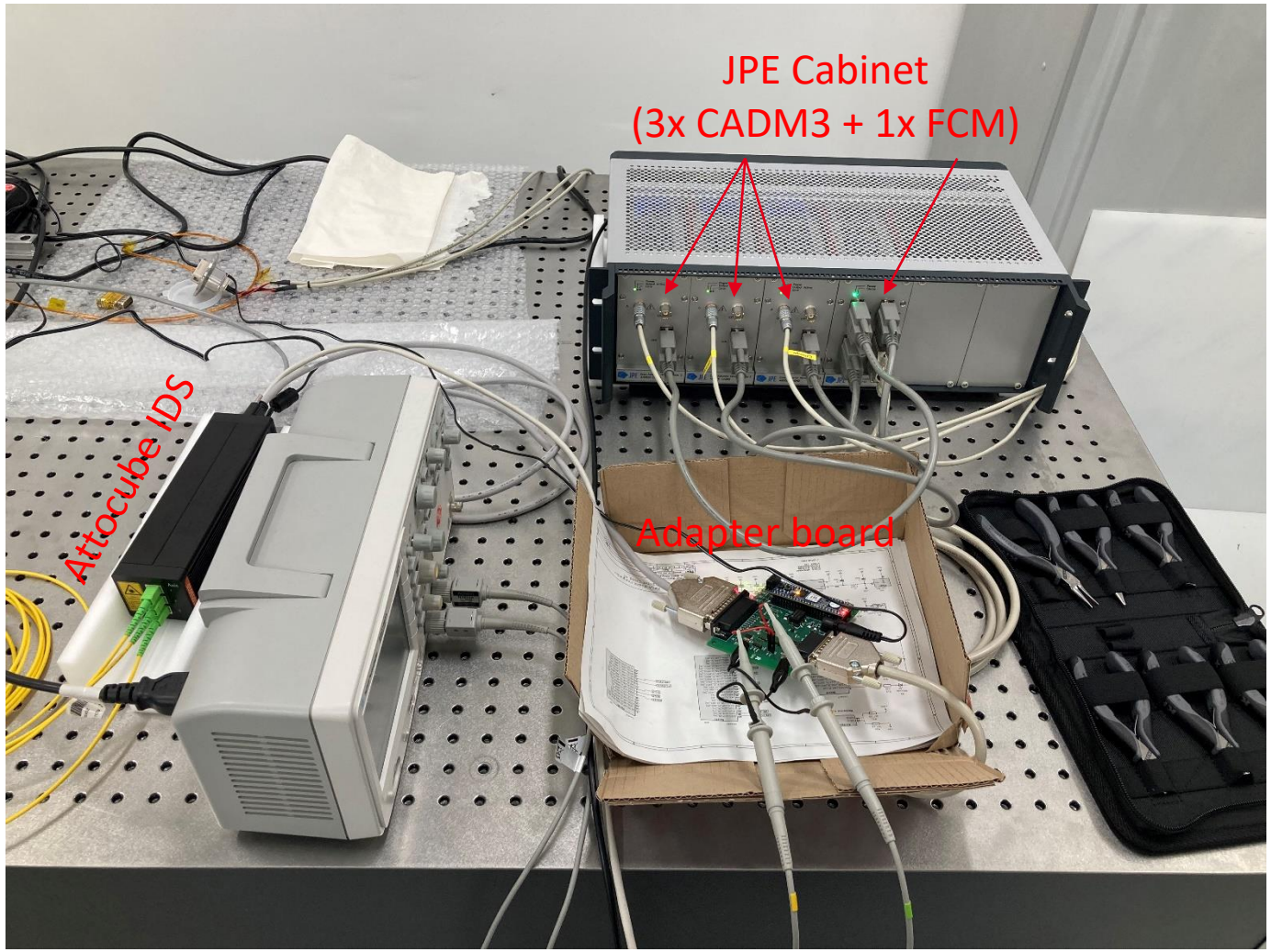
Attocube measurement from IDS Web Interface



Configuration of Real Time Interface



Attocube Integration



Attocube JPE Adapter Board

- Planned and build by
  Jens Scharschmidt
  (UHH electronic technician)
- First test on 19.01.2021
- Adapter board works
- Successfully established data link between Attocube IDS and JPE FCM Controller
- Displacements measured by IDS are correctly read by JPE FCM

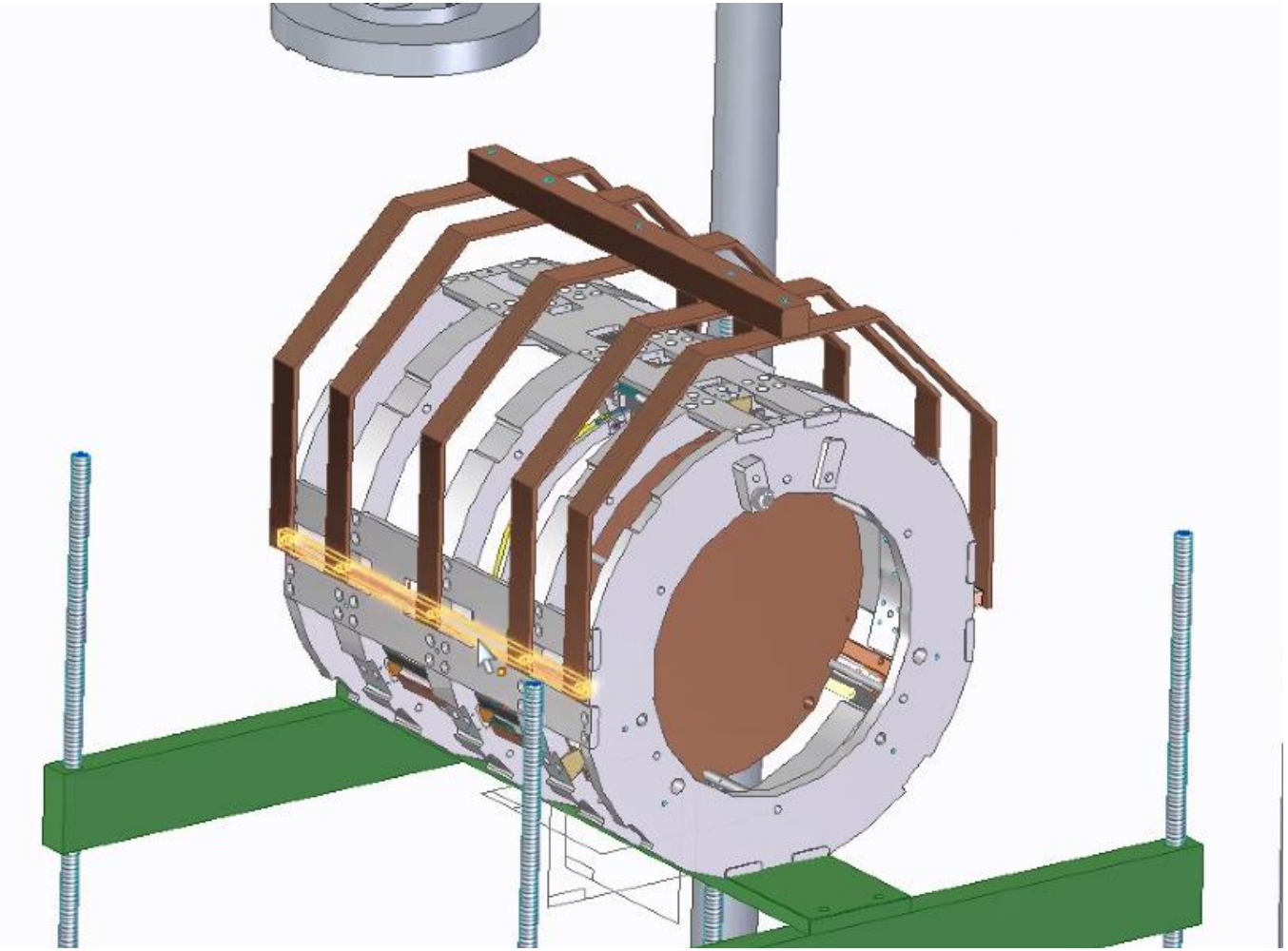
Synchronized Motor Drive

Synchronized Motor Drive

- Attocube IDS provides position data (here displacement with arbitrary origion point as substitute for absolute position data) via adapter board to JPE FCM controller
- Link between IDS and FCM set up successfully
- Cloth hangers instead of disk ring to avoid damage and to have no additional mechanical constraints during first tests
- Position data correctly read by FCM after initilaization
- Driving of motors via FCM does **NOT** work **yet**
  → Error report with detailed description send to JPE, waiting for reply from engineer responsible for FCM development
  → Still a few features to sort out (and probably to discover…), e.g. position is read by FCM only after setting the first target position blindly (only then link between IDS and FCM is established)

Cryostat

Cryostat Integration



- Copper structure for thermal connection to cryocooler head via copper braids
- GFK (G10) structure to suspend Project200 in octagon cryostat via G11 threaded rods
- Copper structure produced by RWTH Aachen (minus holes for copper braids)

ToDo

ToDo

List of items/actions still to do prior to the tests in octagon cryostat @ CERN:

- Perform individual motor tests/characterization in Project200 configuration
- Write software to readout interferometer data while driving
  (Attocube provides a Python interface for the IDS ☺)
- Get synchronized motor drive running → Waiting for reply from JPE
- Test-fit titanium disk ring incl. retro reflectors and test driving it with all three motors
- Fit temperature sensors
  (cryogenic tape and MLI available for fixing sensors on disk (ring) and carriage)
- Manufacture G10 supports
- Add holes for copper braids to copper structure (meeting with CERN cryolab on Wed)
- Test operation (interfaces, drivers, software, etc.) on notebook to be used for CERN tests
- Test optical fibre setup for cryostat (feedthrough and additional/other fibres)