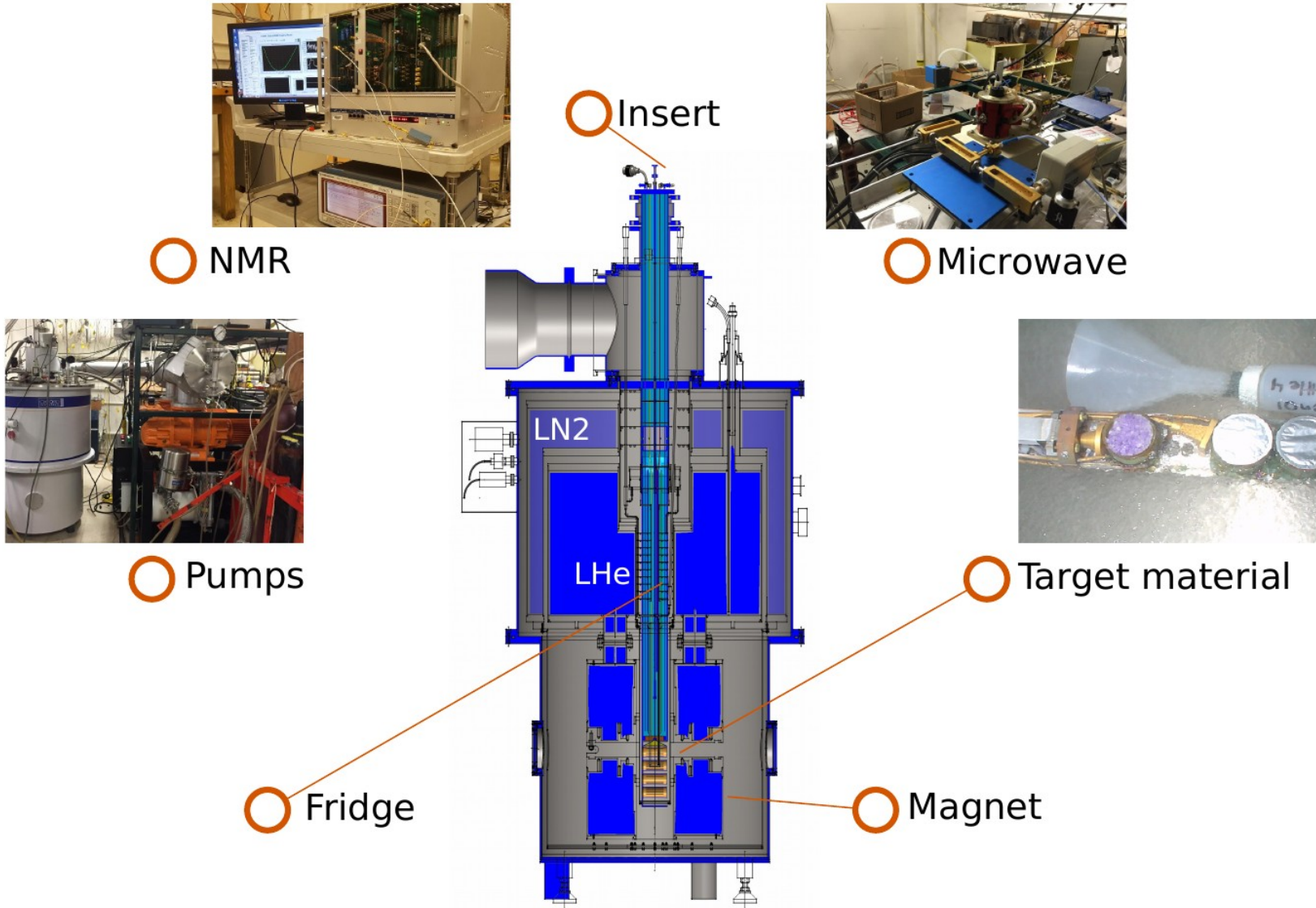


January Cooldown

Dustin Keller
University of Virginia

Progress and developments with E1039 polarized target system

E1039 Polarized Target



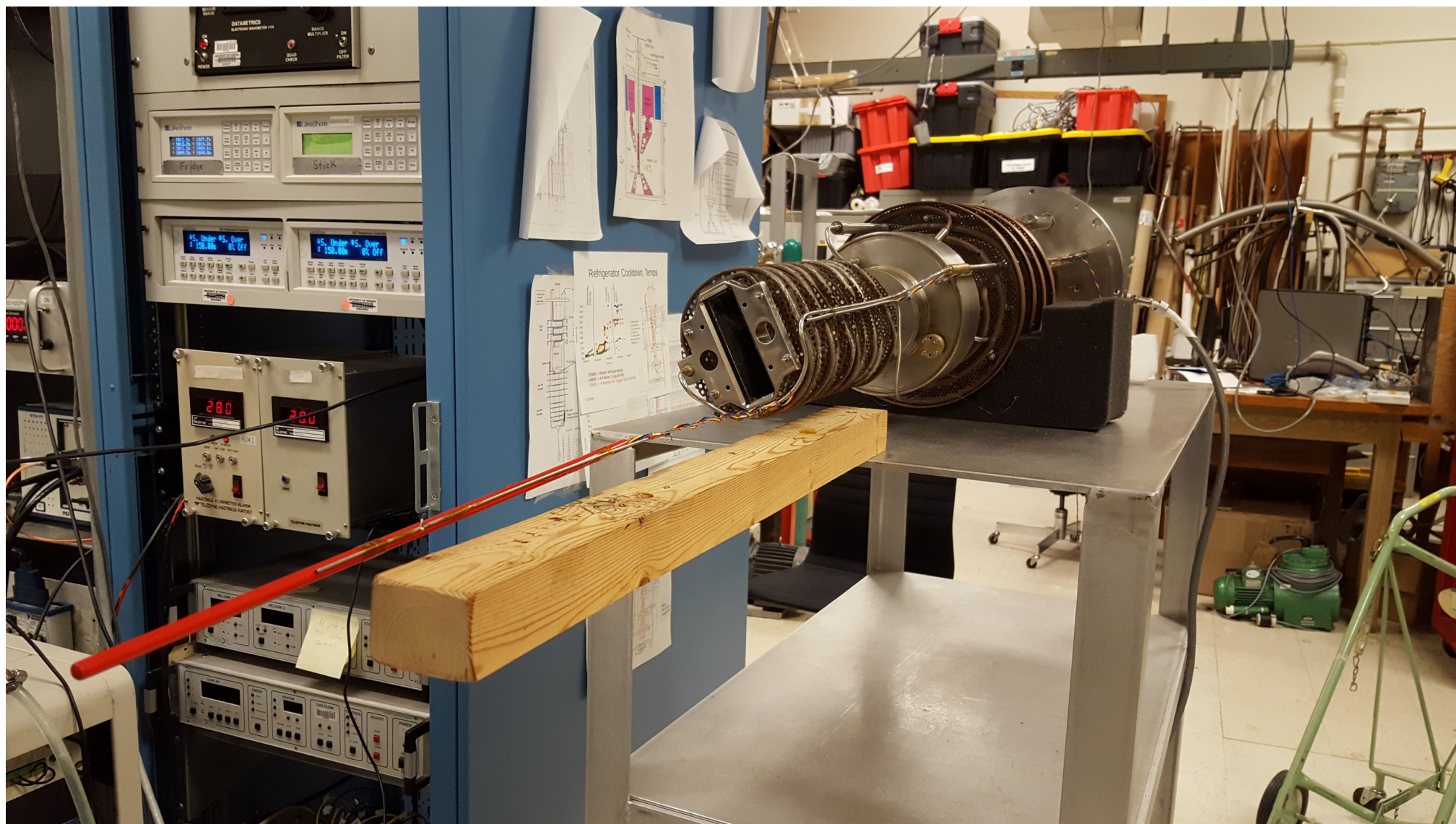
Cooldown Goals

- Microwave/Polarization optimization (all coils/cups)
- Study position field/cup polarizing through cells
- NMR UVA-LANL system compare
- Study cryocontrols and microwave SC
- Field maps outside above fridge and beamline
- Check functionality of insert, target loads, and infrastructure

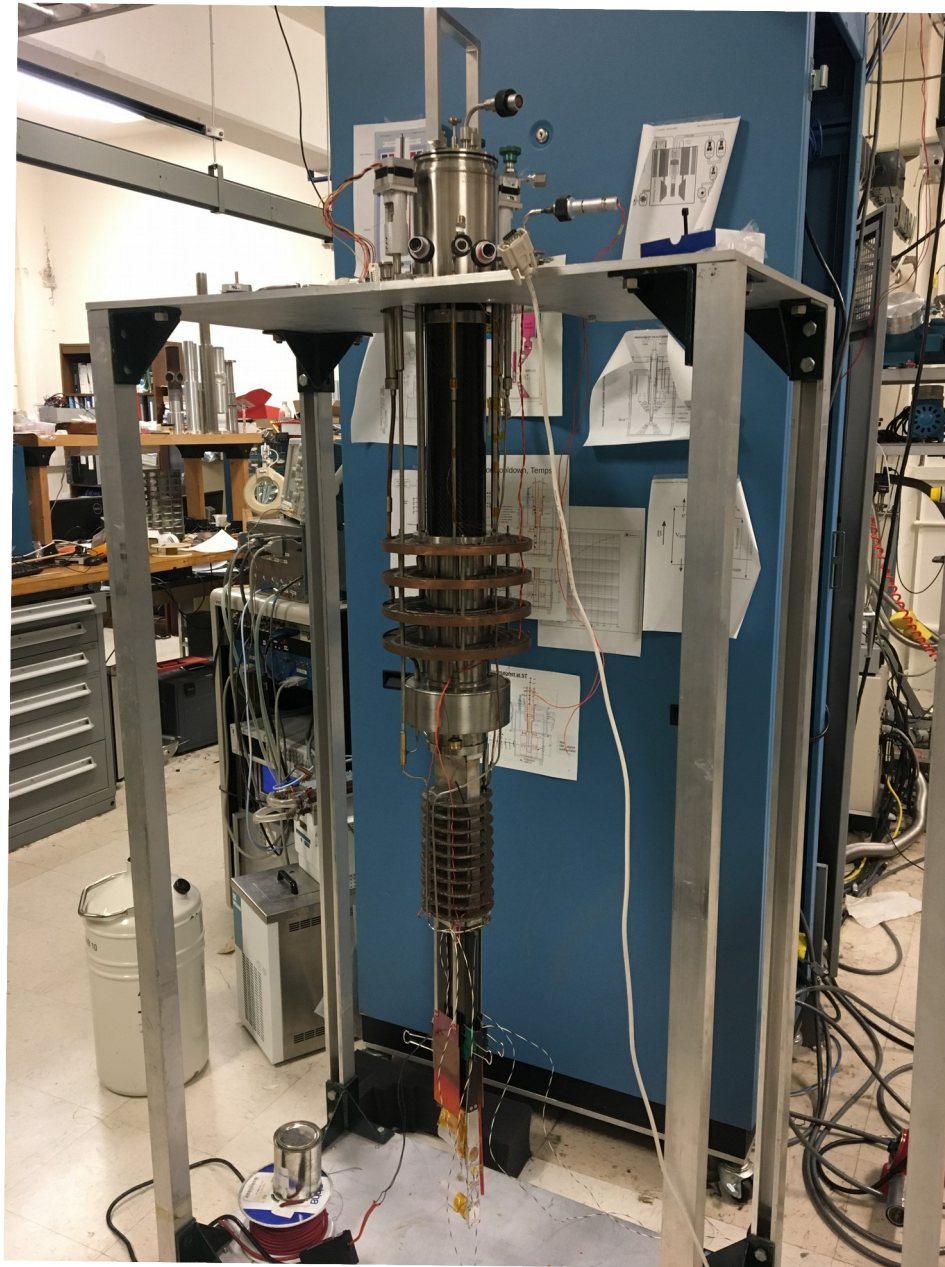
Prior-So Far Accomplished

- Rotation/Modification of Magnet
- Fridge Repairs/Modifications
- Design Build Target Insert (second one under construction)
- Redesign/Build NMR for VME (low noise cold system needed)
- Machine 2 nose pieces with beam window
- Production of some material (90% for proton 10% of deuteron)
- Automated Microwave Control system (final testing)
- Integrated Cryocontrols (ready for beta test)
- Fully integrated Polarized Target run (several test runs)
- Target Annealing system test

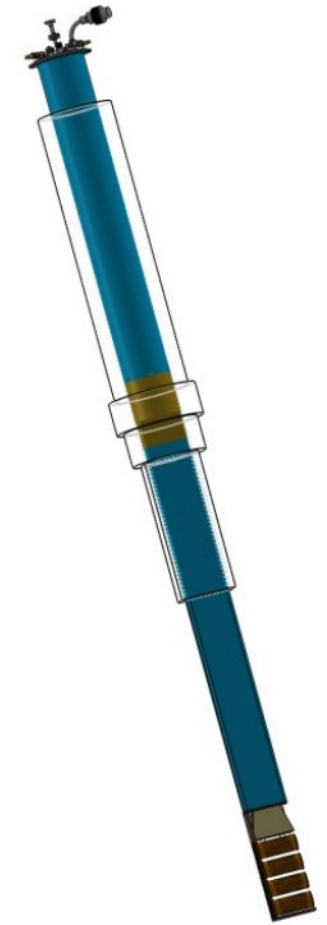
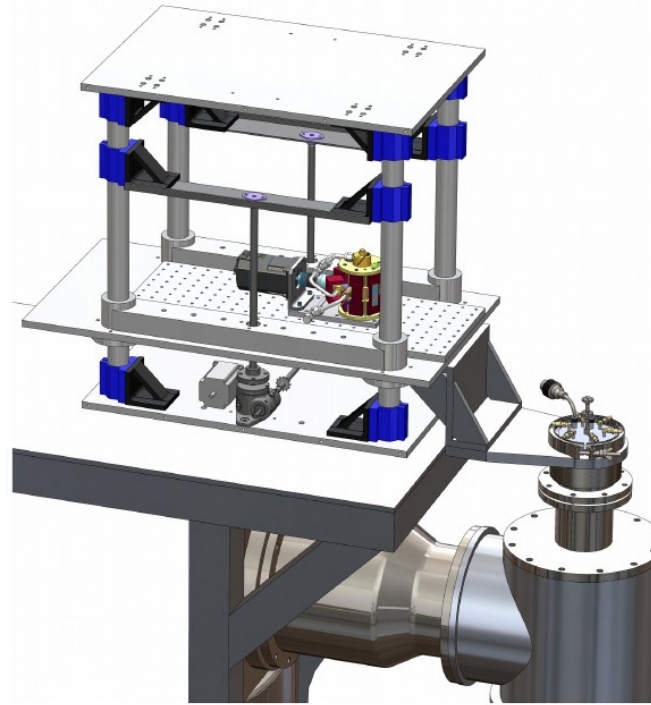
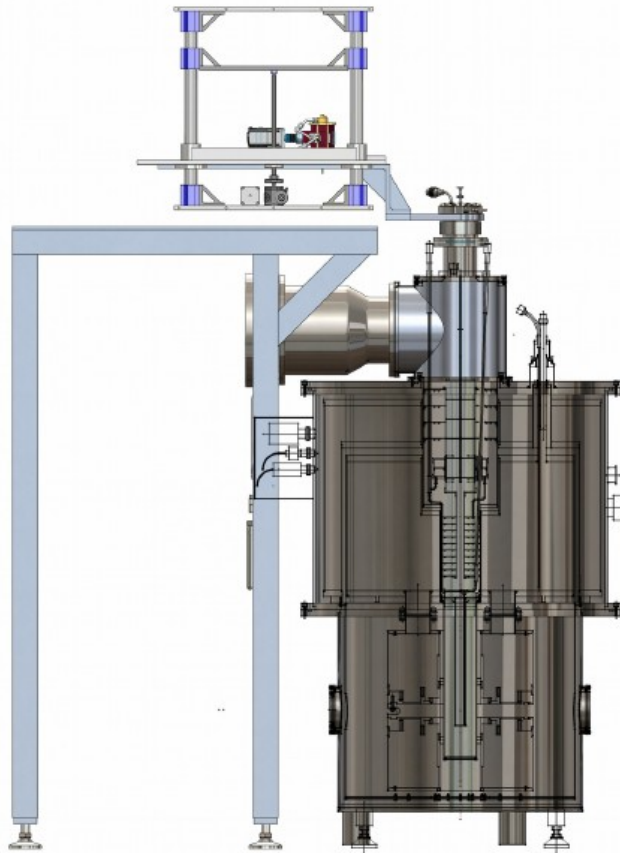
Bottom of Fridge



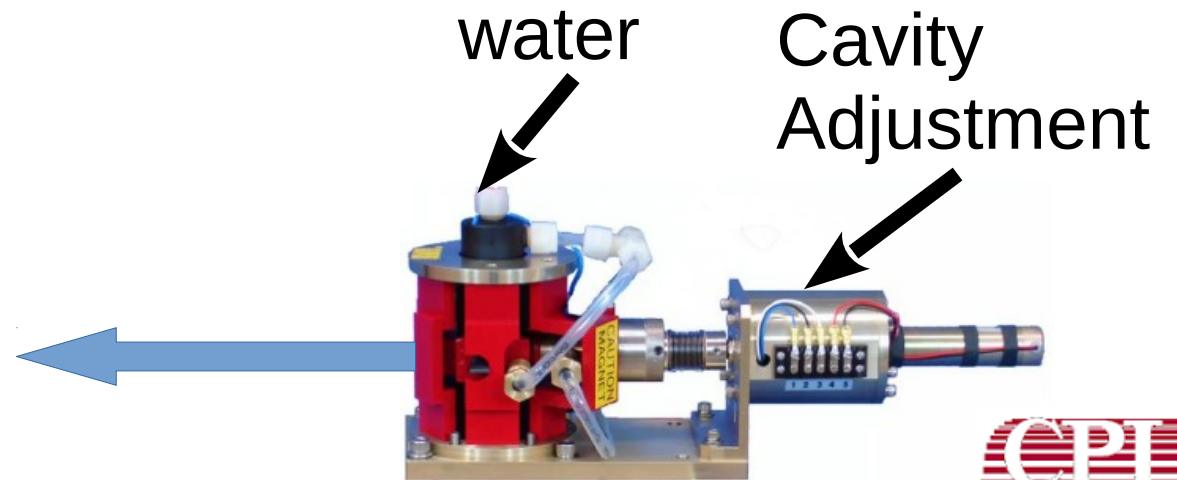
Upright Full View



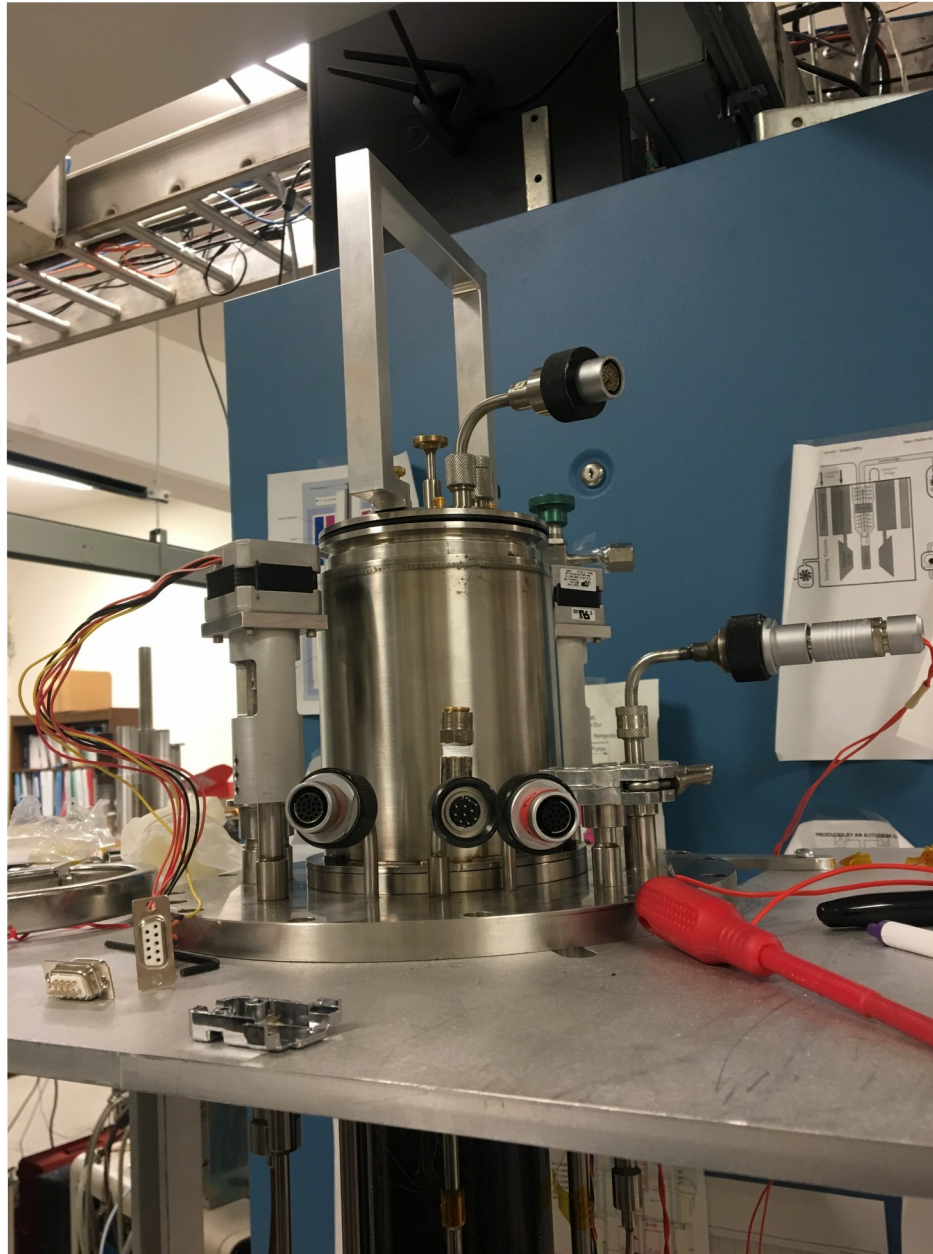
Microwave Setup



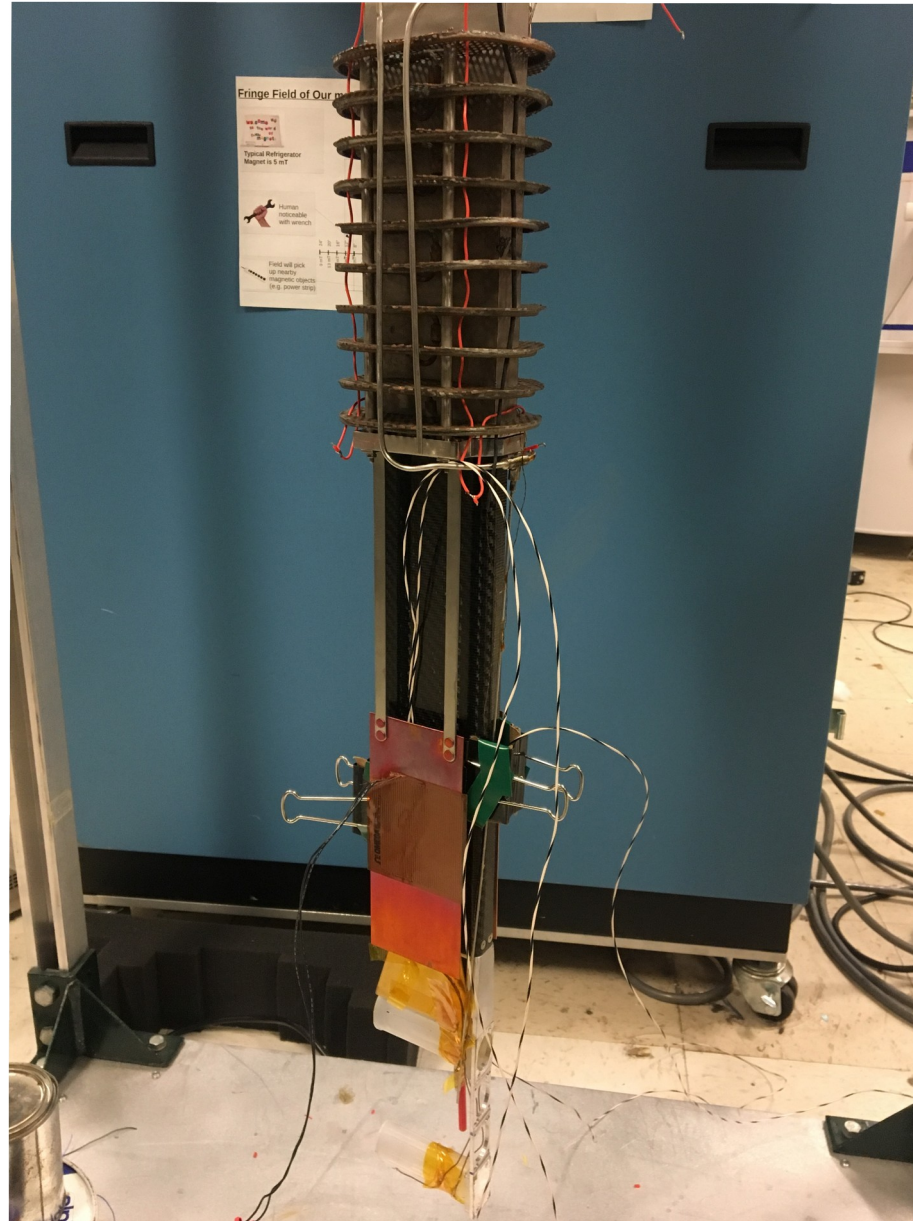
Target



Upright top



Upright Heater



Results of Cooldown

- There is a power restriction (think we got it)
- All coils are doing about the same
- All cell location are doing about the same
- Warm NMR seem OK
- Polarization multiple cells/coils ~85%
- All functionality tests went well
- System runs smooth but uses lots of LHe (~17 SLM with vacuum 7×10^{-7} torr)

Still to Come

- Secondary pressure/temp sensor calibration (^3He bulb-Just test)
- Infrastructure for target changes
- Cold NMR system optimal signal to noise for Deuteron/Neutron
- Configure one stick with 3 active cells 2 cold-NMR one warm
- Remote Control for Microwave (further testing)
- Cryosystem auto-control (further testing)
- Annealing system (testing needed with temp sensors on insert)
- Material purchase and irradiation (ND_3 ~\$40K)
- Making material and doing the irradiations (only 500g done out of 2.6kg)
- Lots of work on radiation protection for equipment (motors, etc...)
- Lots of work on setting up full cryocontrols and target variables data flow to run and test all at once
- Need more cooldowns coming up soon but where?

Thank You