



RF Module Update

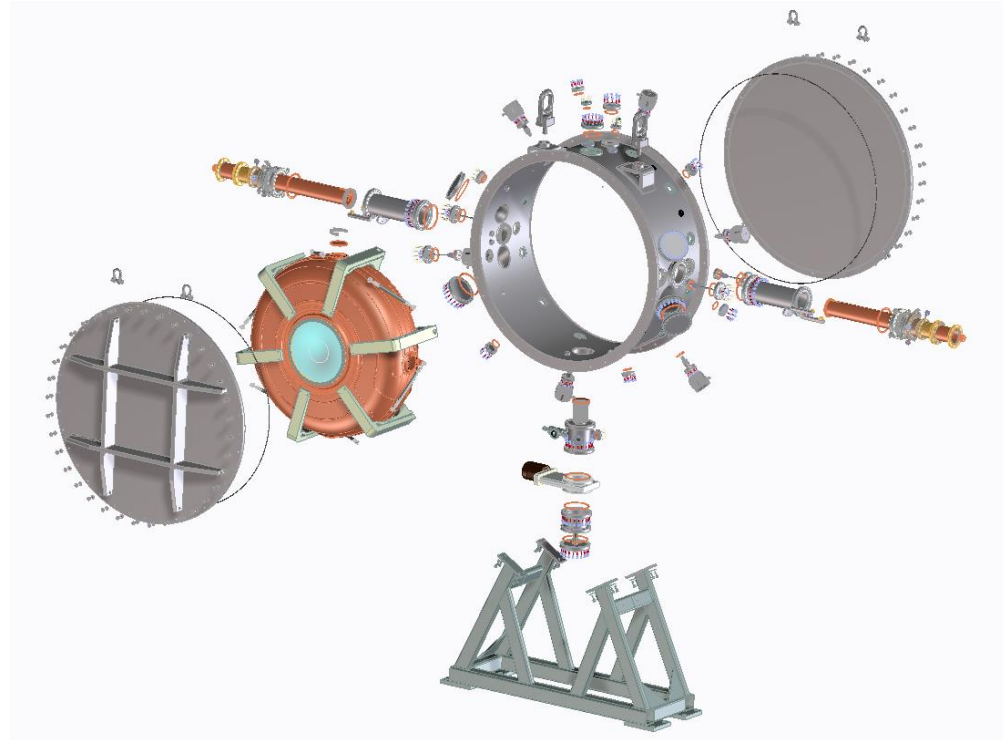
MICE Collaboration Meeting 45

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- **Each MICE RF module has**
 - One 201 MHz RF cavity
 - Two Beryllium windows
 - Two RF power couplers
 - One vacuum vessel hosting the 201 MHz RF cavity
 - Six tuner arms and six actuators
 - Cavity support struts
 - Vacuum pump system and water cooling
 - Diagnostics and bypass lines





Current Status of MICE RF Module

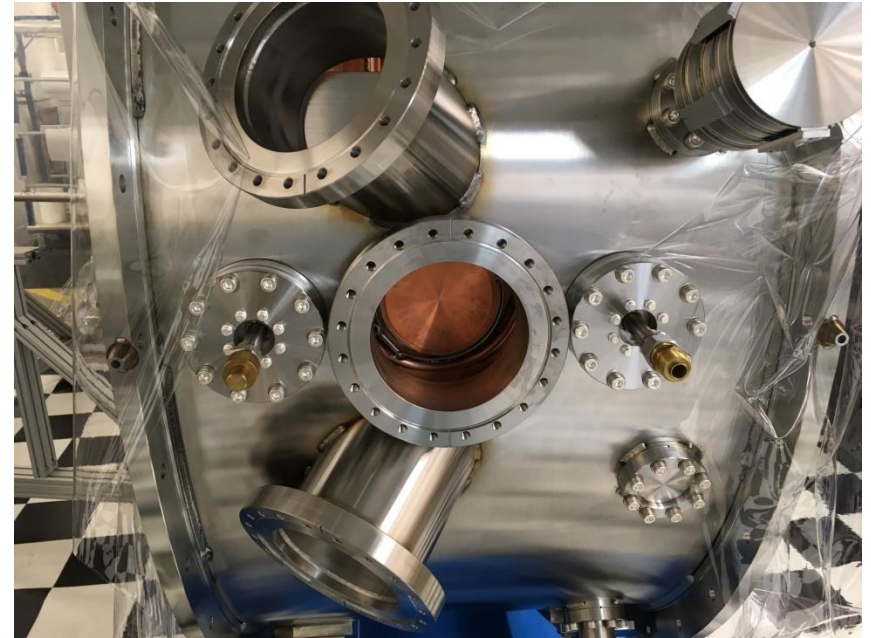


- **Vacuum vessel for the RF Module**
 - Fabrication complete, delivered to LBNL early May 2016
- **RF power coupler fabrication complete**
 - Fabrication complete, assembled at LBNL
- **New tuner actuator design, prototype and fabrication complete**
 - 12 production actuators completed + 2 spares completed
- **25 tuner arms shipped from University of Miss. to LBNL**
 - Fabrication complete
- **Vacuum system design (protection of Be windows) complete**
 - Bypass line with limited conductance
 - Differential pressure box to protect against fault
- **RF cavities**
 - 4 cavities selected; 2 for operation, 2 spares
 - Cavity cleaning complete
- **RF module assembly**
 - Vacuum vessel cleaned and installed to assembly stand
 - RF cavity installed on six strut system in vacuum vessel
 - Tuners and actuators installed in the RF module
 - Water feedthrough fully assembled and mated to vacuum vessel
 - RF couplers installation in process

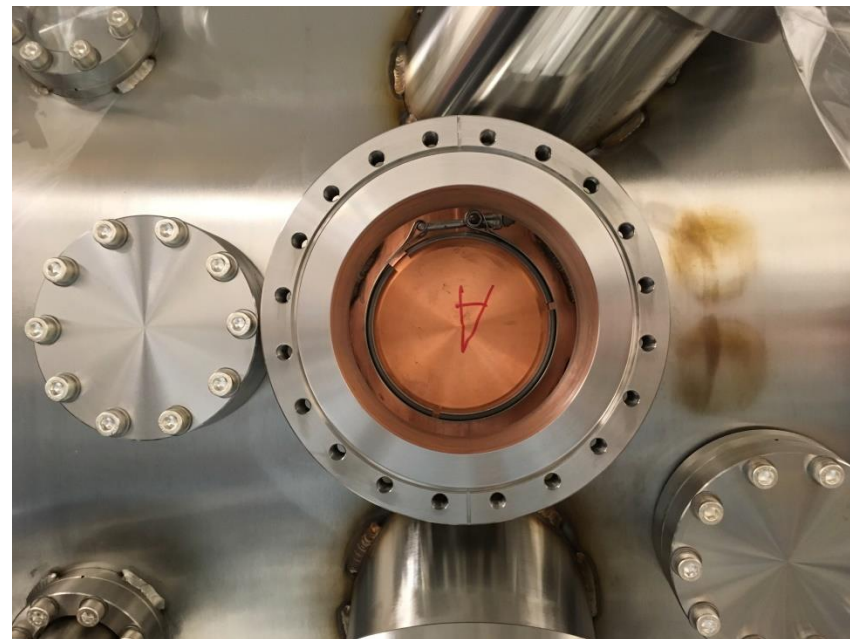
RF Module 1 Assembly



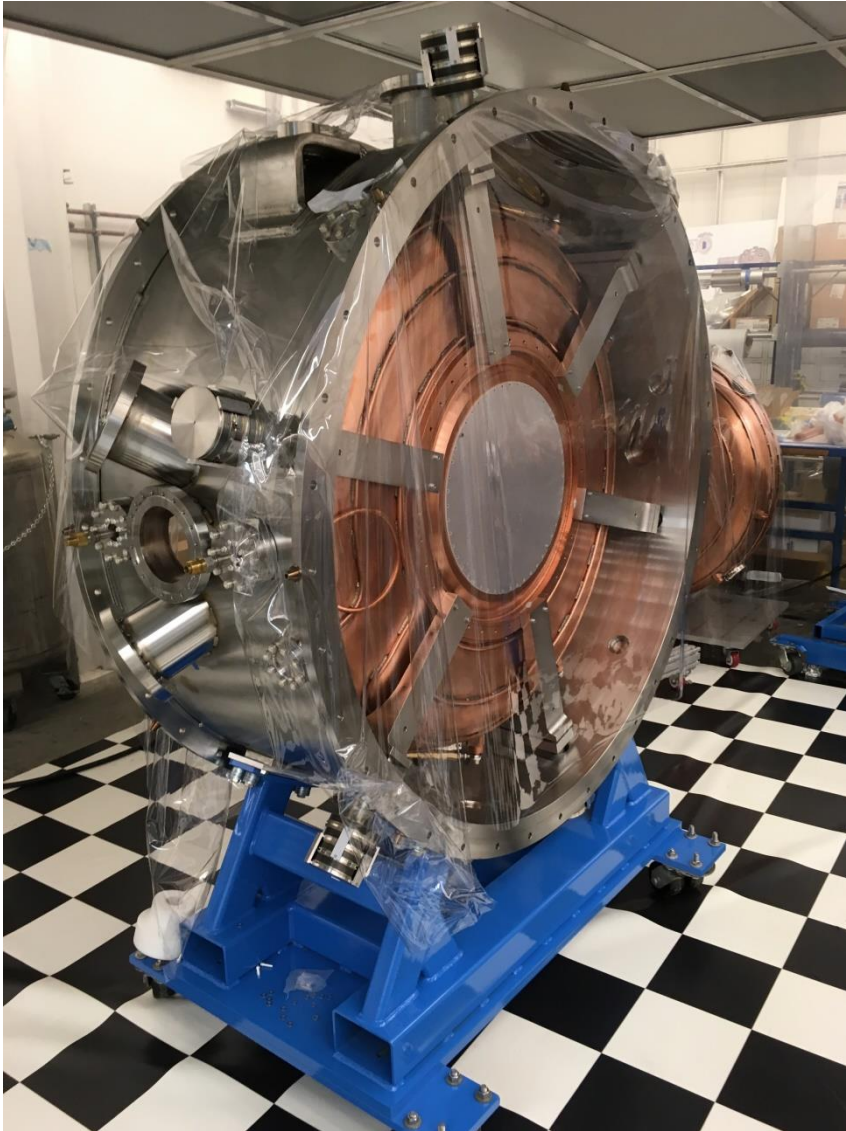
- Tuners and actuators installed
 - Six tuners on cavity body for frequency tuning
 - Actuators thread into tuner bodies; pressurize bellows “squeezes” or “stretches” the cavity to change the frequency
 - +/- 200 kHz



- Water feedthroughs welded and installed on the cavity
 - Provide cooling water to the RF cavity and Be window
 - Leaked checked
 - Conflat flange seal, will be vacuum checked



- Six strut system holds cavity in the vacuum vessel
 - Laser tracker survey of the vacuum vessel and the RF cavity help to determine strut length pre-installation
 - Allowed for quick installation and alignment
- RF coupler ports are well aligned
 - Couplers undergoing final cleaning
 - Installation on 08/01/2016
 - High power tested at MTA
 - Successful



- RF module 1 assembly nearing completion -> remaining work
 - Install RF couplers
 - Re-install to support stand
 - Install vacuum system
 - Vacuum system and low-level RF tuning checks and testing



Schedule



Date	Task
Mid August	Complete assembly of RF Module #1, Prep for RF Module #2 assembly
End of August	Begin vacuum system testing and low-level RF testing of RF Module #1
	Final vacuum check completed
	Complete cleaning and survey of RF Module #2
Early September	Begin assembly of RF Module #2
	Crate RF Module #1
	Insert cavity, install tuners, actuators, RF couplers, vacuum system, instrumentation
End of September	RF Module #2 assembly complete
	Begin vacuum system testing and low-level RF testing of RF Module #2
Mid October	Crate RF Module #2
	RF Module #1 and RF Module #2 assemblies complete and stored



Summary



- RF module #1 assembly is near-complete, testing will begin in mid to late August
- RF module #2 assembly will immediately follow the completion of RF module 1 assembly
- Low-power RF testing on tuners and vacuum system testing will be completed at LBNL
- LBNL has the necessary resources to complete two RF modules