

# Status of CC Cryostat

MAP Collaboration Meeting

June 22, 2013

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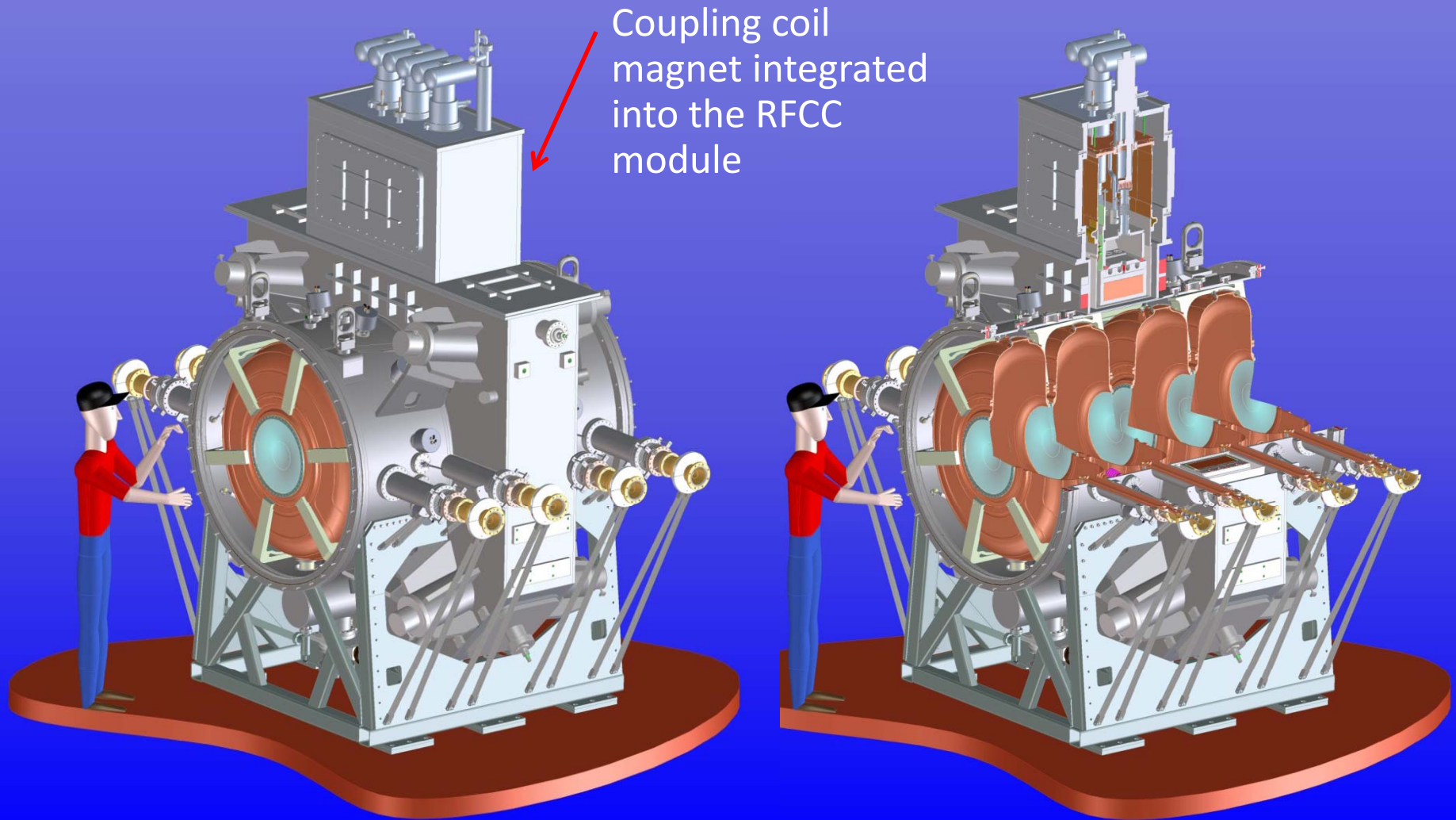
Lawrence Berkeley National Laboratory

# Status of Coupling Coil Cryostat

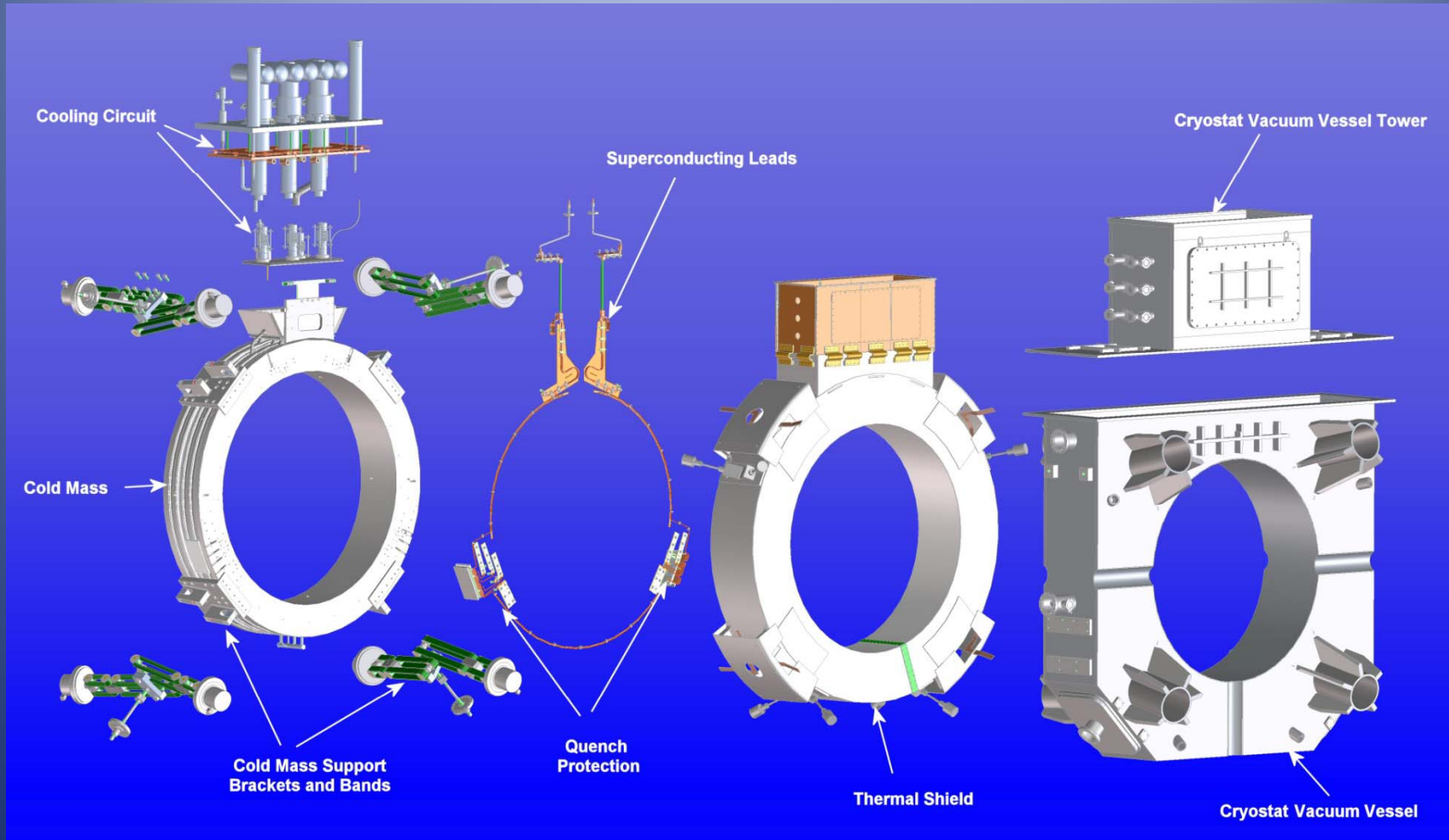
- **Cryostat Vacuum Vessel**
  - LBNL mechanical shops are fabricating the first cryostat vacuum vessel
  - Scheduled finish date is July 2013
- **Thermal Shield**
  - Drawings will be finalized by LBNL starting in early July
  - LBNL mechanical shops will fabricate the first thermal shield
- **Cooling Circuit**
  - Drawings will be generated by LBNL
  - LBNL mechanical shops will fabricate the cooling circuit parts
  - LBNL will assemble components into sub-assemblies



# Coupling Coil of the RFCC Module

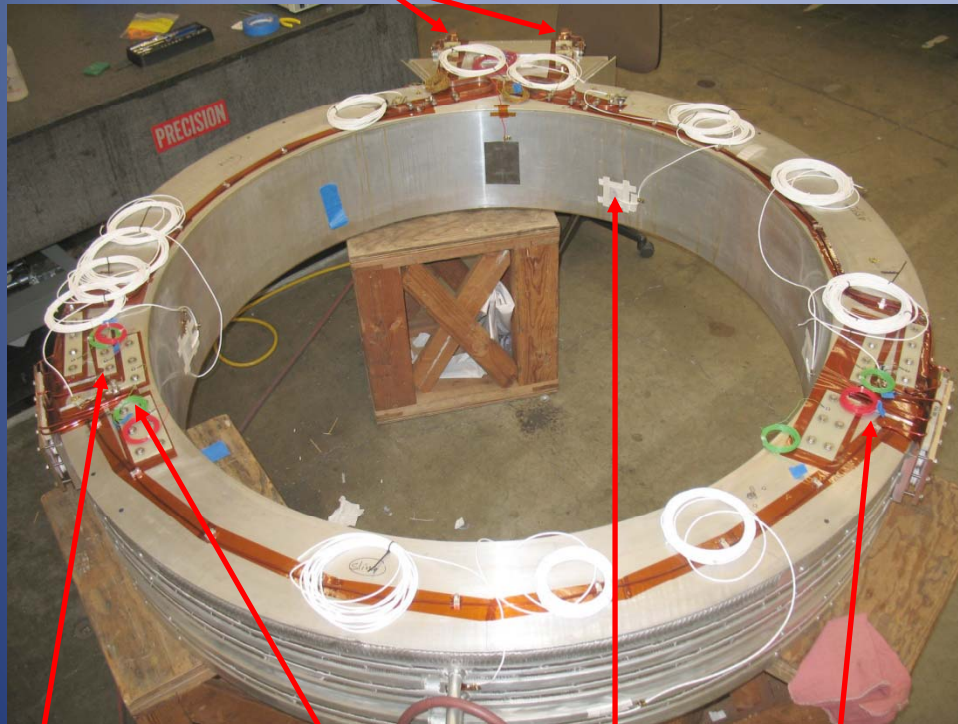


# Coupling Coil Sub-assemblies



# Coupling Coil Cold Mass - Review

Superconductor  
Lead Stabilizers



Quench  
Protection

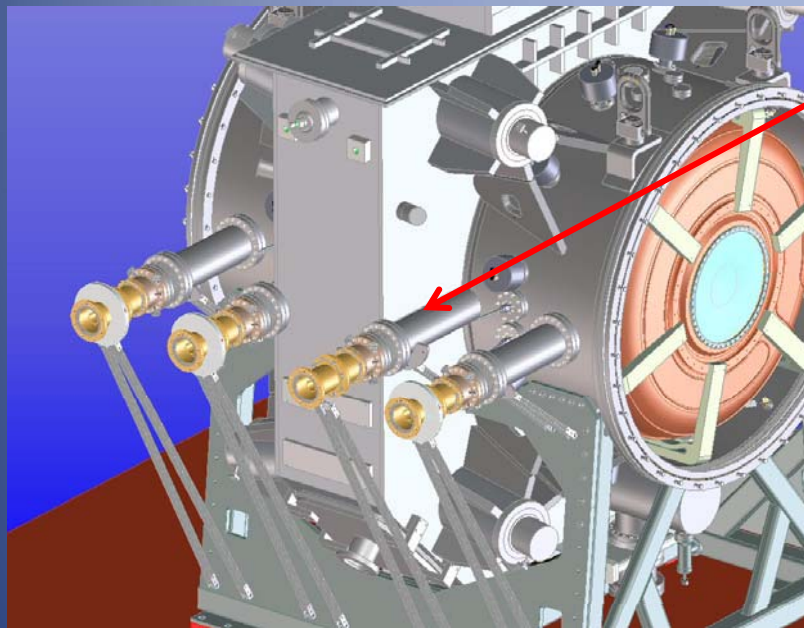
Cernox  
Sensor

Strain  
Gauges

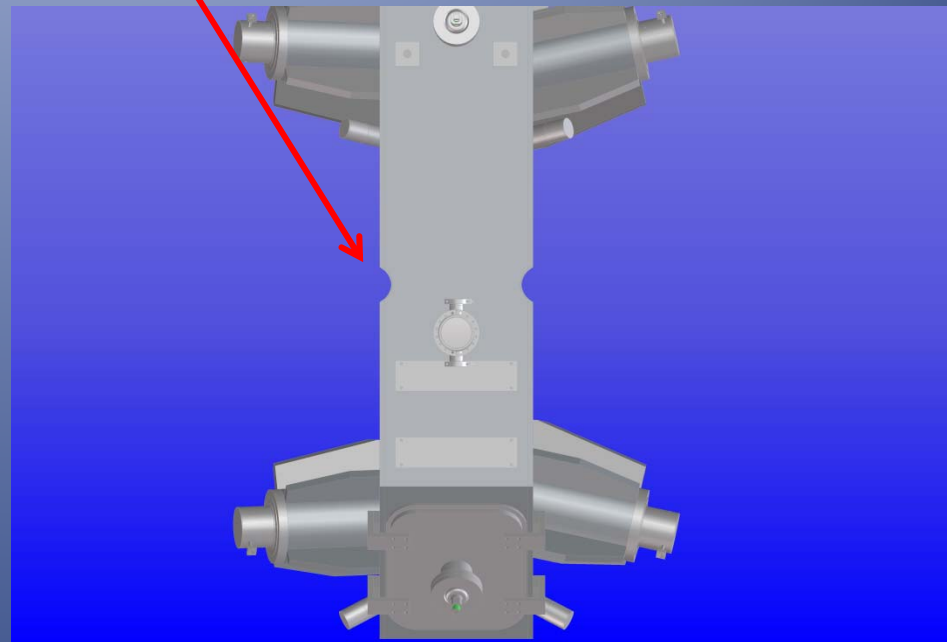
Voltage  
Taps

- Preparation of cold mass coil #1 finished at LBNL January 2013
- Preparation cold mass coil #2, #3 and #4 at LBNL scheduled to begin in 2014

# RF Coupler and Coupling Coil Clearance

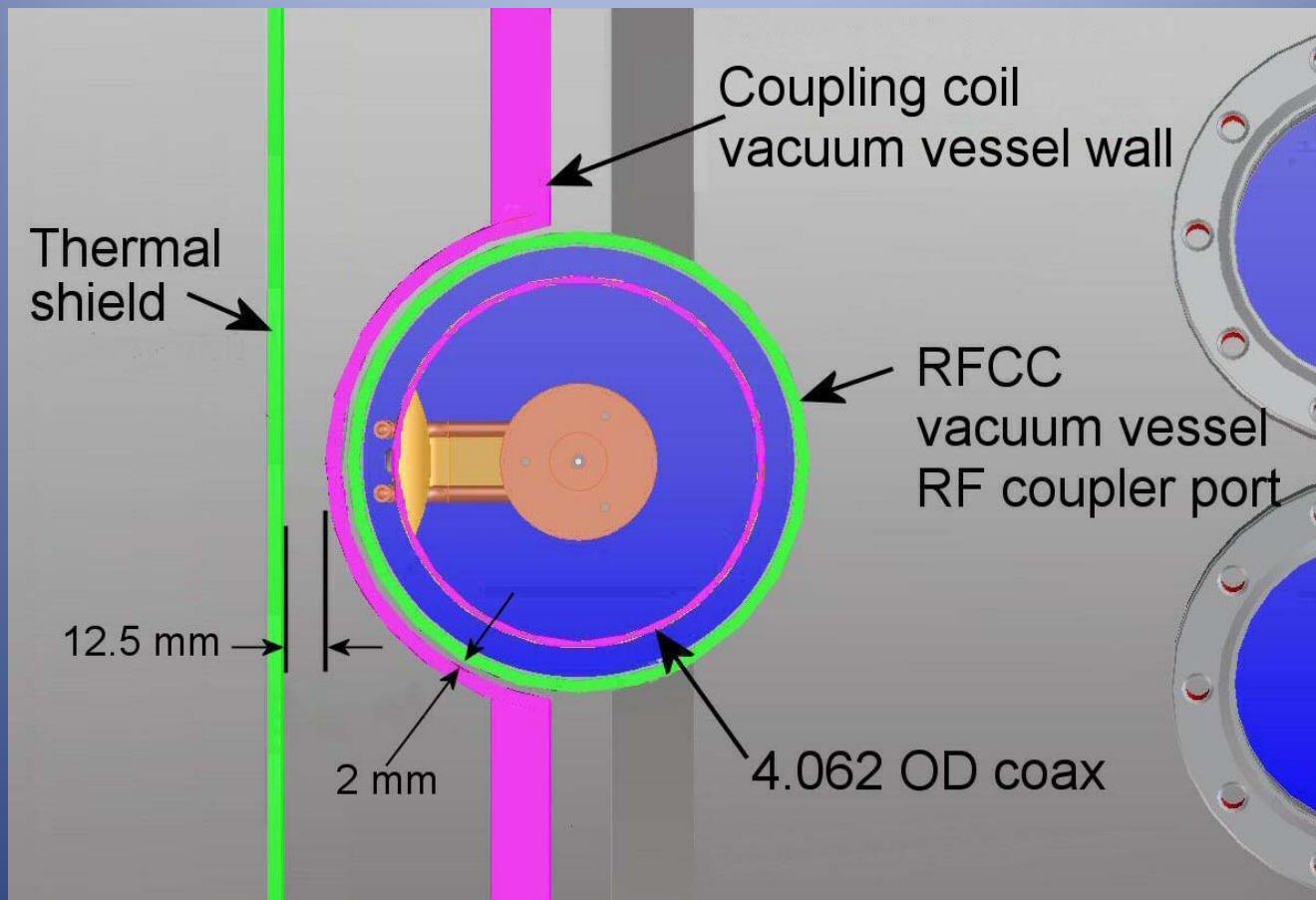


Scallop in coupling coil cryostat for the RF coupler



RFCC vacuum vessel RF coupler spool is nested into the scallop in coupling coil cryostat vacuum vessel

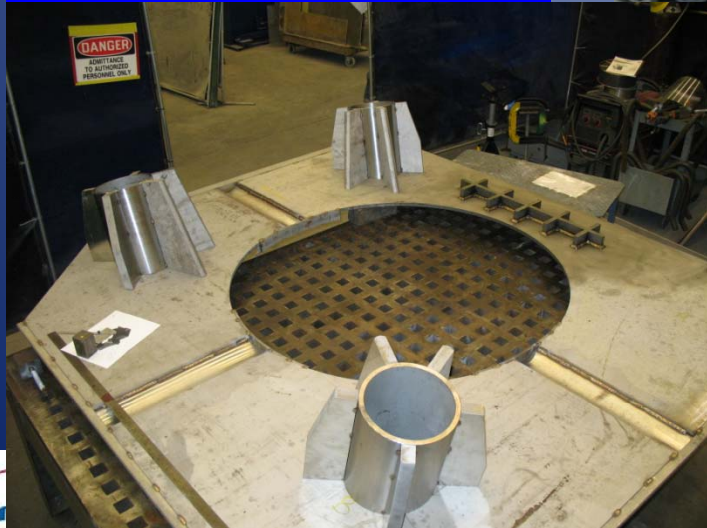
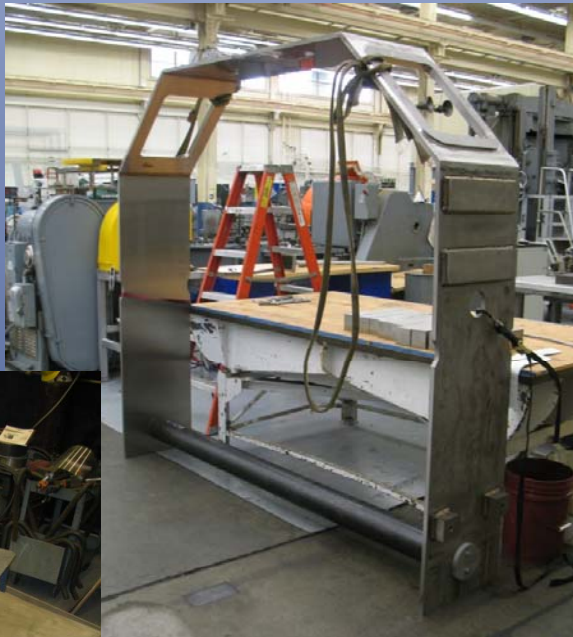
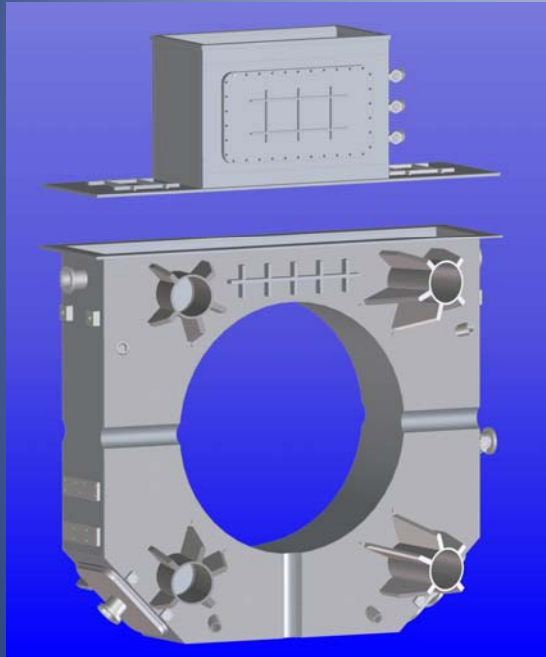
# RF Coupler and Coupling Coil Clearance



Partial section view of the interface between the RFCC vacuum vessel and the coupling coil vacuum vessel

# Coupling Coil Cryostat Vacuum Vessel

- LBNL mechanical shop is in the process of fabricating the first cryostat vacuum vessel
- Estimated completion July 2013
- Drawings will be updated to reflect the “as built” cryostat vacuum vessel

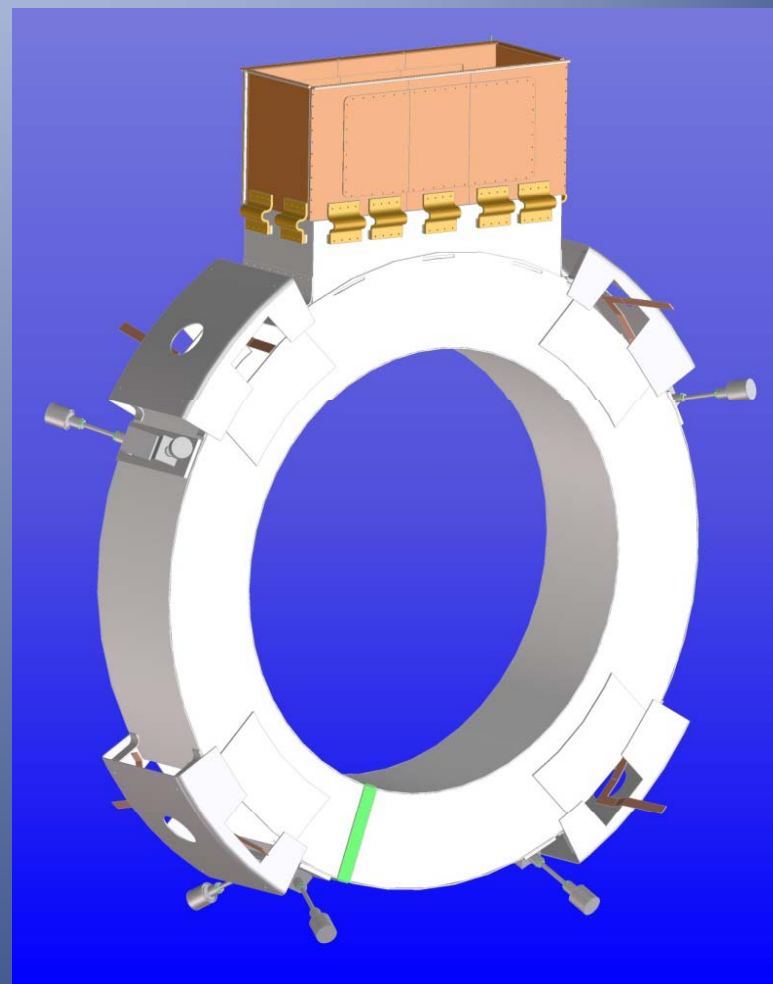




# Coupling Coil Thermal Shield

## Remaining Tasks

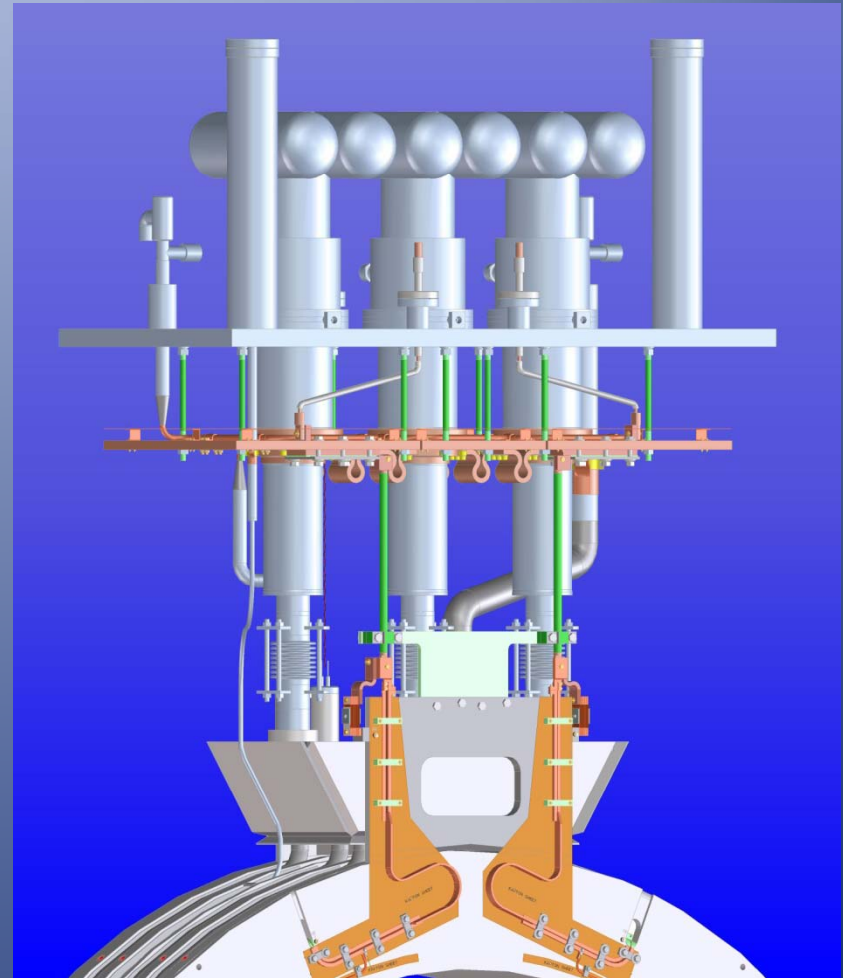
- Thermal shield design is nearly complete
- SINAP drawings will be finalized by LBNL starting in early July
- LBNL shops will fabricate the first thermal shield
- Scheduled to be delivered to Fermilab February 2014



# Cooling Circuit Assembly

## Remaining Tasks

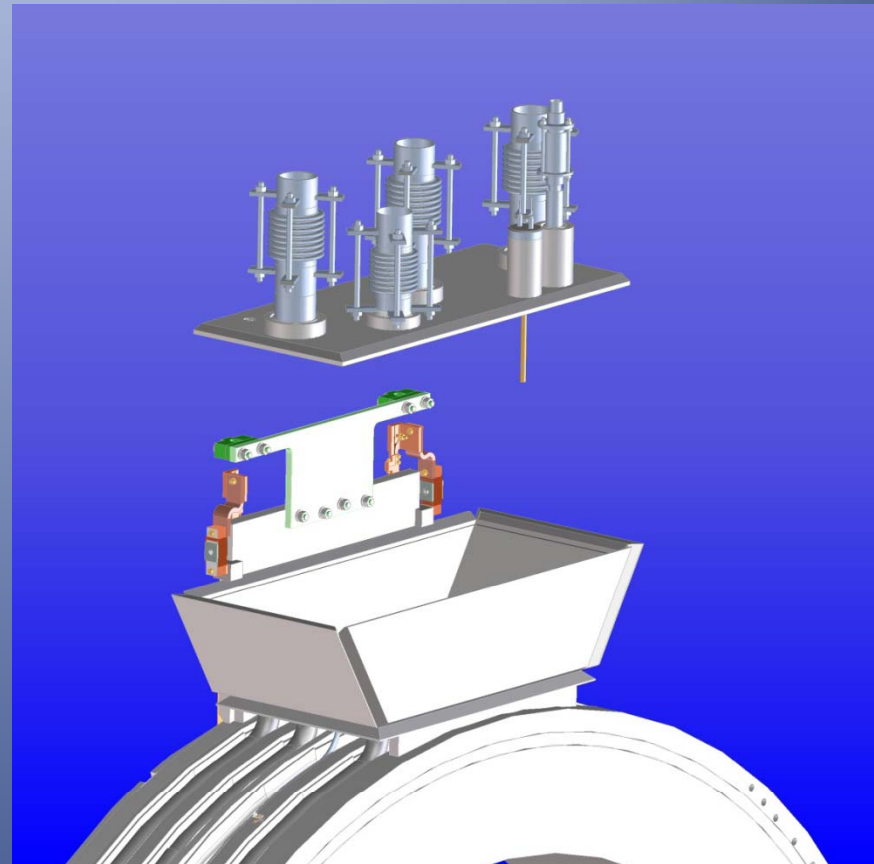
- Finalize cooling circuit design
- Create detail fabrication drawings
- Fabrication of component parts
- Assemble components into sub-assemblies
- Scheduled to be delivered to Fermilab February 2014



# Cooling Circuit Reservoir Cover

## Remaining Tasks

- Assemble reservoir cover with feedthroughs and bellows
- Weld reservoir cover to top of cold mass
- Vacuum check the reservoir

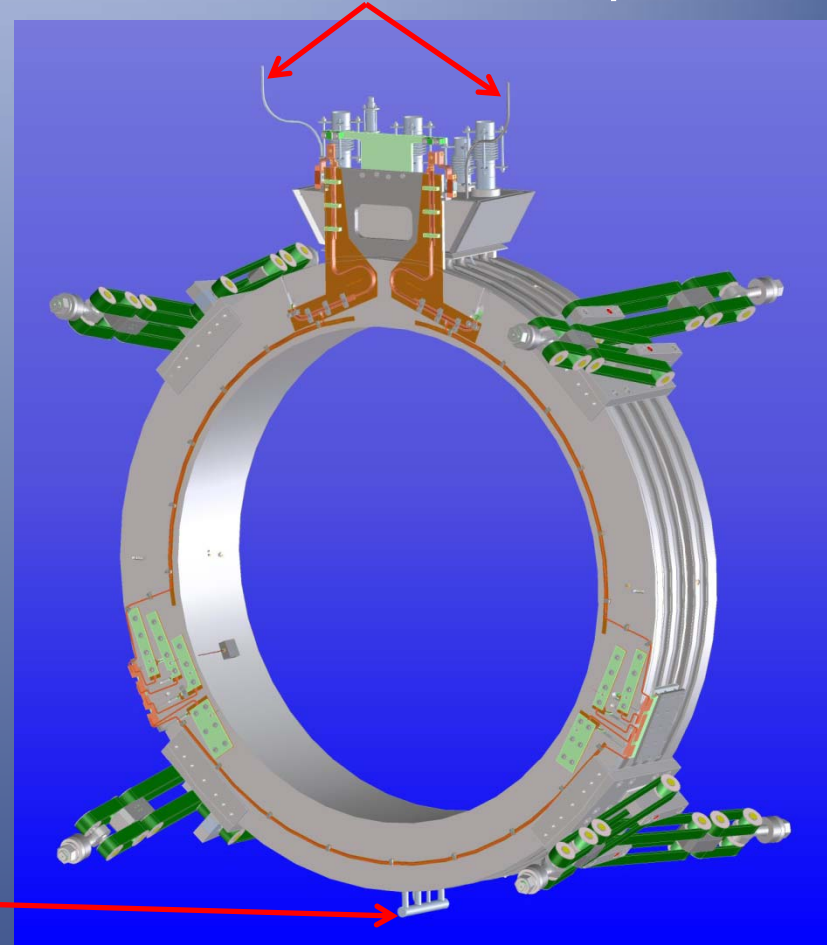


# Cold Mass Assembly

## Remaining Tasks

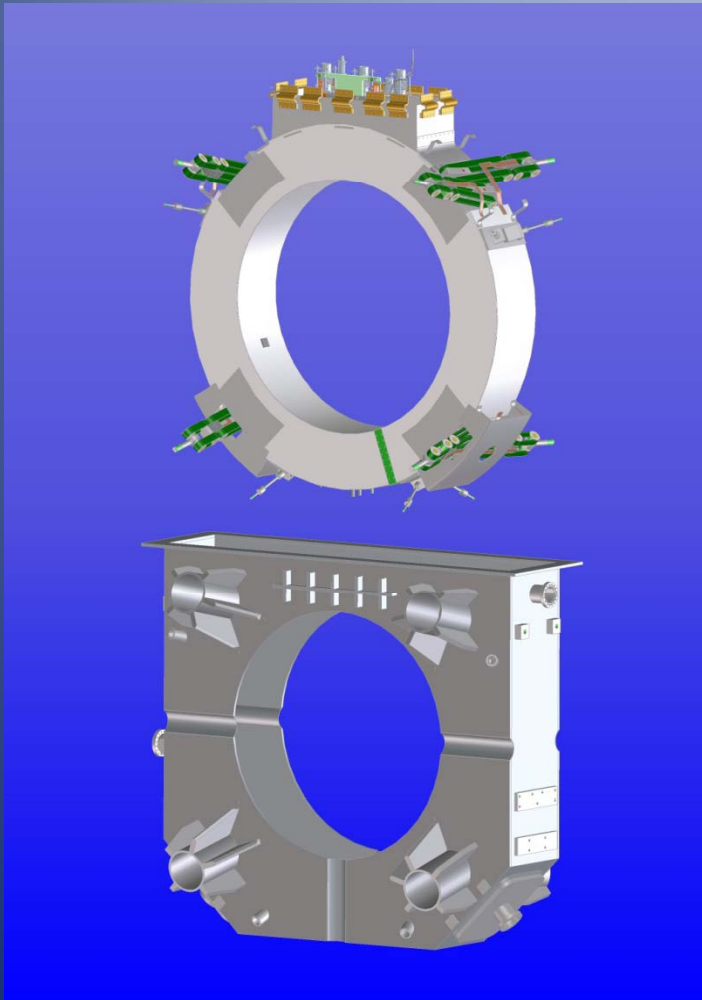
- Complete the cooling circuit with the installation of the helium fill tube, top off tube and bottom manifold
- Install the cold mass support brackets and support bands
- Wrap the cold mass with MLI

Fill and top off tubes



Bottom manifold

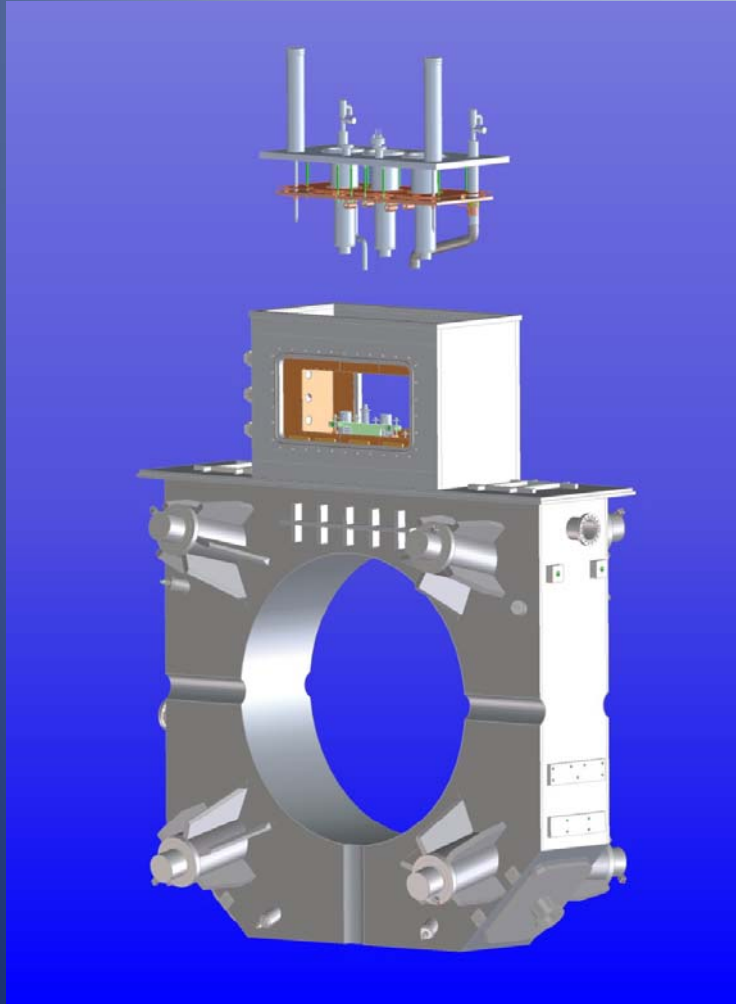
# Coupling Coil Integration



## Remaining Tasks

- Cold mass prepared for integration with cryostat vacuum vessel
  - Assemble thermal shield around cold mass
  - Wrap assembly in MLI
- Insert cold mass into cryostat vacuum vessel from above (fixturing will need to be designed)
- Attach cold mass support bands to cryostat vacuum vessel
- Align magnet in the cryostat vacuum vessel

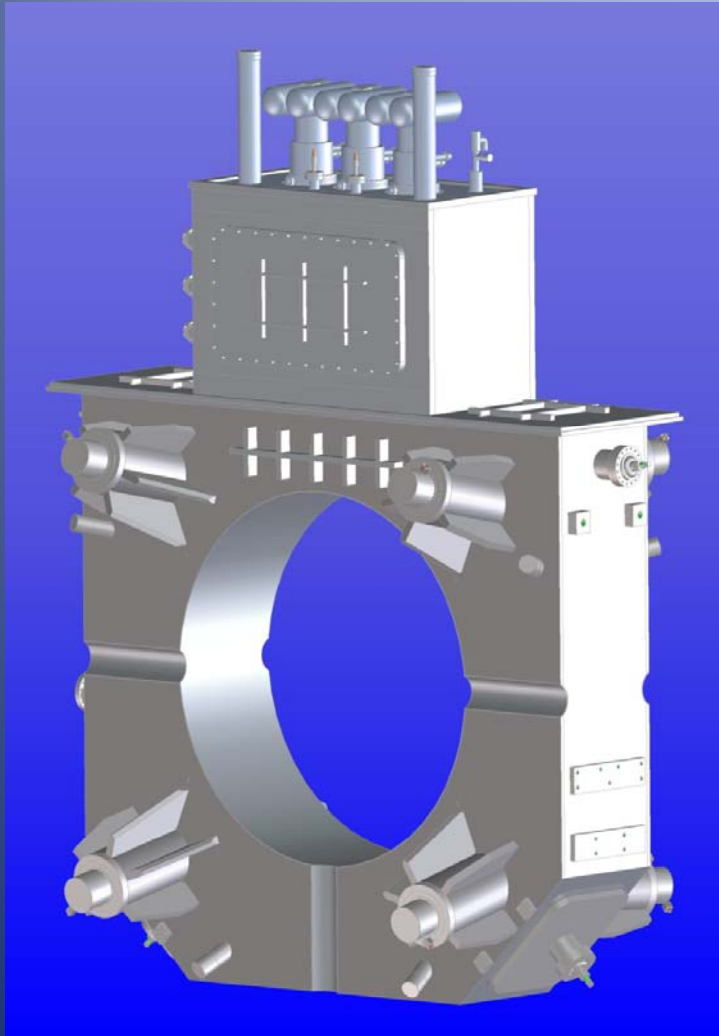
# Finish Coupling Coil Integration



## Remaining Tasks

- Weld tower assembly to cryostat vacuum vessel
- Weld inner bore into cryostat vacuum vessel
- Weld the upper cooling circuit to the tower
- Weld the upper cooling circuit to the cold mass cooling circuit
- Vacuum check the cooling circuit

# Test Prototype Coupling Coil



## Remaining Tasks

- Vacuum check the complete cryostat assembly
- Add cryocoolers to cooling circuit
- Coupling coil training and testing

# Summary

- Cold mass is currently at Fermilab for magnetic testing
- Cryostat vacuum vessel is currently being fabricated at LBNL
- Will start the process of finalizing the drawing of the thermal shield beginning in early July
- Fabrication of the first thermal shield will take place at LBNL
- All drawings for the cooling circuit components will be generated at LBNL
- Fabrication of cooling circuit parts will be done at LBNL
- This week Derun Li and I met with Nikolai Andreev to begin defining the coupling coil integration process at Fermilab

