

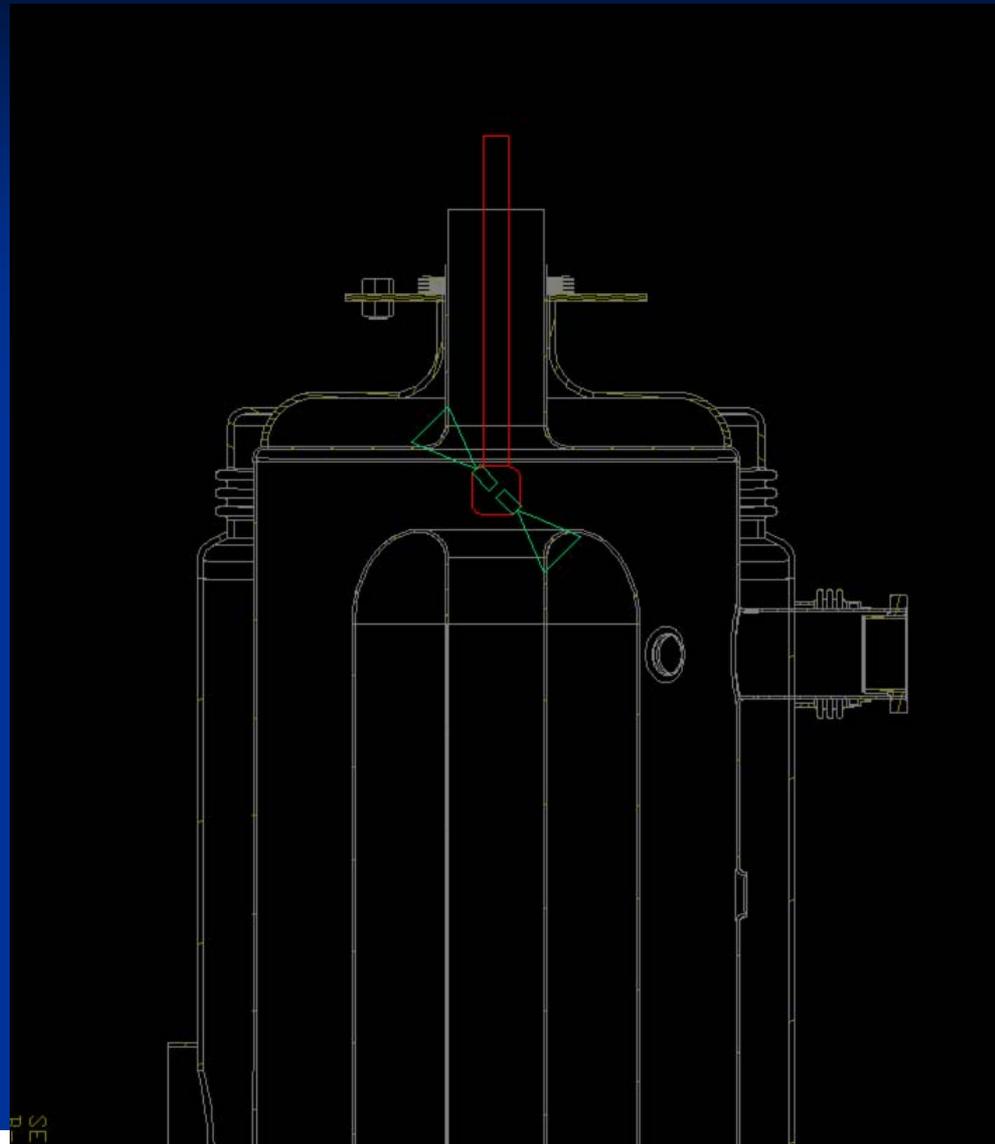
Cryomodule Assembly and beamline integration cleanliness

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56 MHz AIP Review
January 9, 2009

Field Emission mitigation

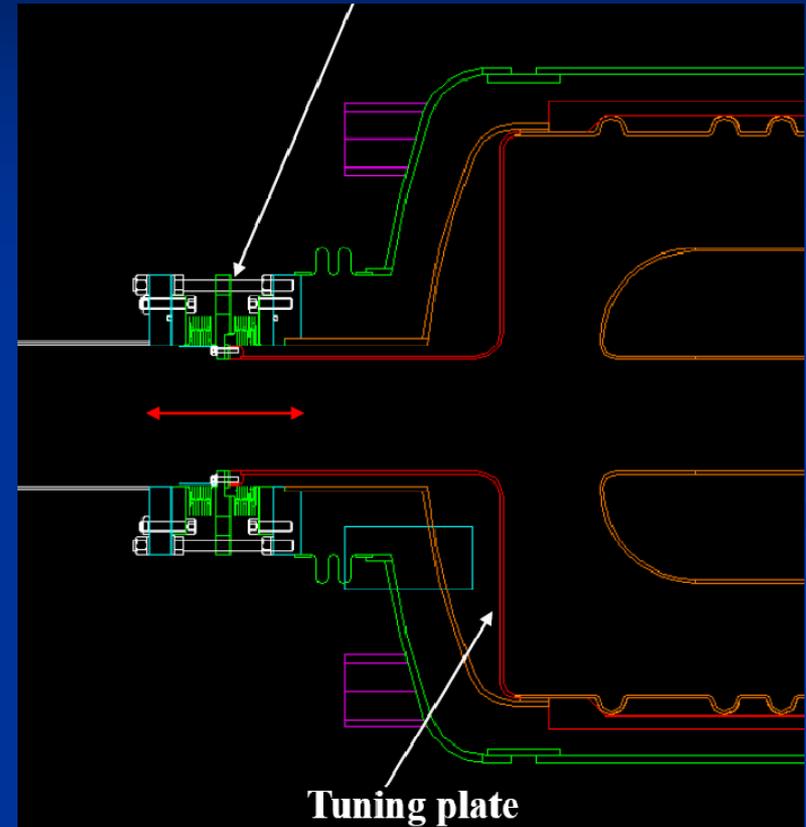
- VTF testing will be our first indication of potential field emission problems.
- The dewar top plate vacuum connection will be equipped with a He charging volume, and .04 um filter for introduction of clean He gas for He processing of the cavity.
- The HPR nozzle geometry will be chosen such that the high field region will be directly sprayed to optimize cleaning

- HPR spray head threads onto wand arm.
- Head can be designed to maximize cleaning of high field region



Cryomodule Assembly

- Process Steps following final VTF Test
 1. Weld He vessel with cavity left under vacuum
 2. Return to VTF, if satisfactory prepare for cryomodule assembly
 3. 20 um BCP
 4. 5 Hour HPR, hot N2 dry, class 10 cleanroom drying.
 5. Assembly of 2 blank cleaning port flanges, and tuner assembly plate
 6. HPR, hot N2 dry, class 10 dry
 7. Assembly of HOM, FPC, PU in class 10 area, blank fundamental damper and beamline flanges
 8. Transition to rail system in class 100 area for horizontal assembly, install gate valves, fundamental damper



Helium vessel support
Radial

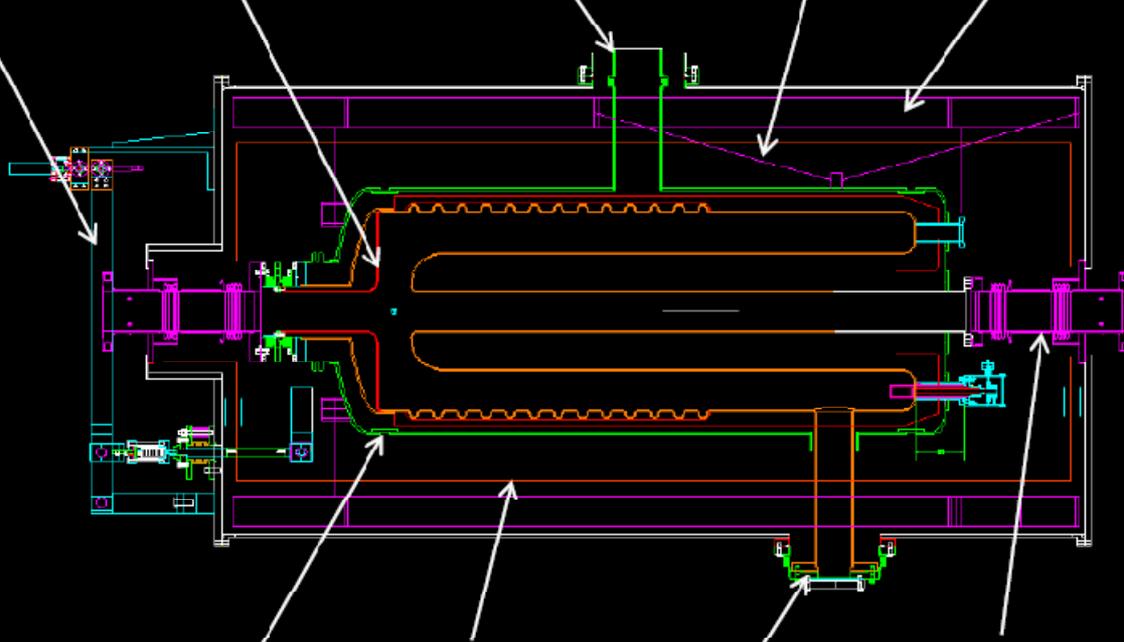
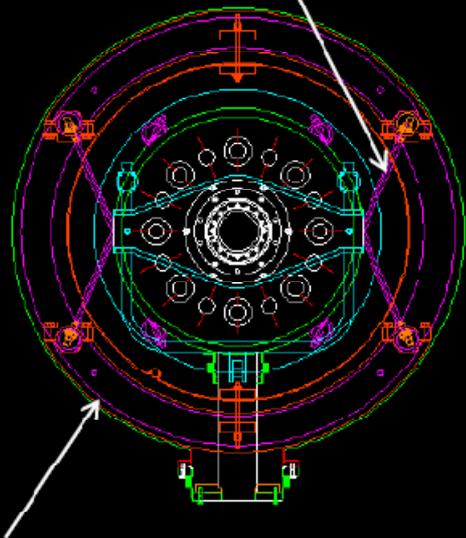
Helium supply port

Helium vessel support,
Axial

Tuner

Tuner plate

Space Frame



Cryostat

Cavity/Helium
vessel

Heat Shield

Fundamental
damper

Thermal
Transition
(Cooling loop
with bellow)

Note: For clarity Magnetic shields and

Cryomodule Assembly

- Once hermetic string is complete, leak check and transfer to BNL for cryomodule construction
- Once cryomodule is complete transfer to tunnel
- In tunnel new beampipe components will be processed in the cleanroom and brought to the tunnel double bagged
- A portable class 100 cleanroom will be used for connection of the new beamline components and insertion of the cavity into the beamline.
- All parts, hardware, gaskets, tools etc. will be brought to the area pre-cleaned and ready for use in the portable cleanroom.
- Trained vacuum group personnel, with experience in the cleanroom will be used for assembly work.
- Parts that cannot be brought in clean will be blown down with filtered dry nitrogen over a particle counter to minimize particulate matter
- A provision can be made on one of the cleaning ports for the attachment of a UHV needle valve and filtered He boil-off for He processing of the cavity in the tunnel if needed.
- RF system can be configured for pulsed processing of the cavity in the tunnel