650 MHz beta = 0.92 cavity

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650 MHz beta = 0.92 cavity

a) Status/plans for HB650 MHz cavity development, single cells and multi-cell:

Status:

- Fabricated two Nb HB (Beta=0.90)650 MHz single-cell cavities (1+1)
- Cavity fabricated with IUAC was sent to Fermilab in July 2013 and same was processed & tested during Jan 2014.
- Second cavity was processed (EP~ 50 micron) and tested in Dec 2014 at RRCAT.

Plan:

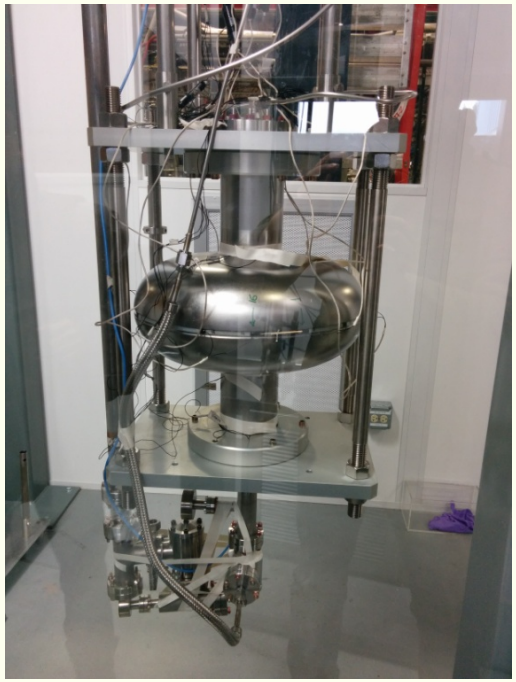
- Third single cell cavity (Beta=0.92) is under fabrication expected by April 2015.
- Fabrication of first 5-cell cavity* with simple end group will taken up after successful testing of single-cell cavity (expected by Dec 2015).

(* Subject to the design finalization for stiffener ring by April 2015)

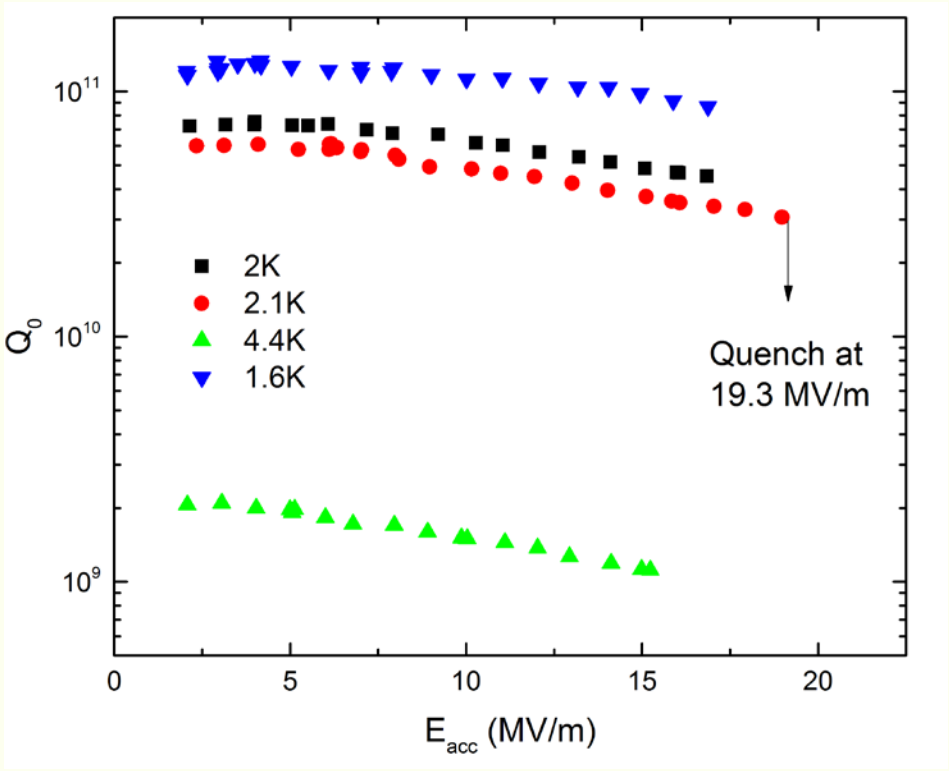
Status of 650 MHz Beta=0.9 single-cell cavity

Fabricated one Nb HB (Beta=0.90) 650 MHz single-cell cavities with IUAC was sent to Fermilab in July 2013 and same was processed & tested during Jan 2014.

The 650 MHz (β=0.9) single cell SCRF cavity has achieved Eacc 19.3 MV/m with Q > 4E10 at 2K.



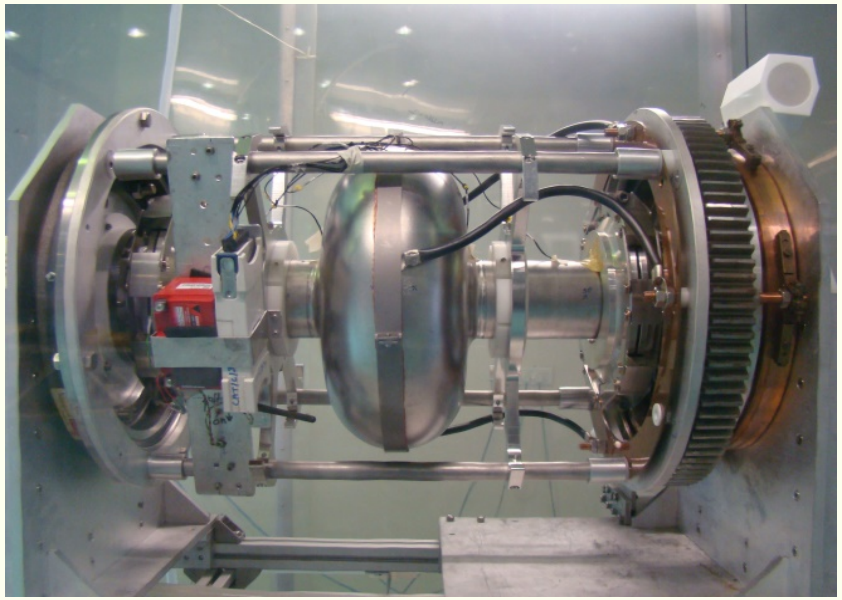
Cavity VTS mounting



Q0 vs Eacc plot of Cavity

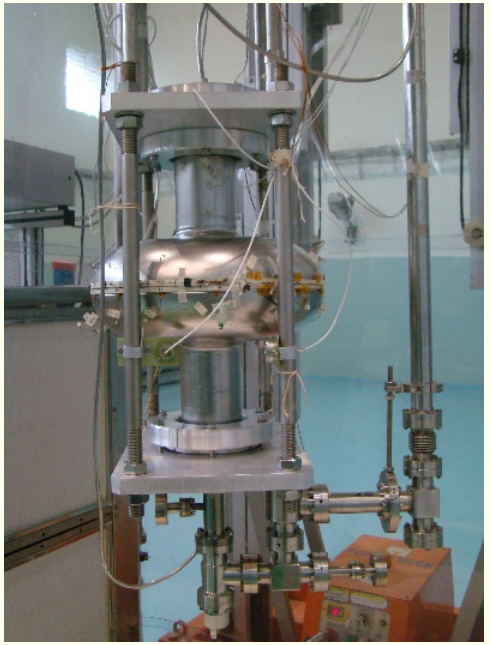
Status of 650 MHz Beta=0.9 single-cell cavity

Second cavity was processed (EP~ 50 micron) at RRCAT and tested in Dec 2014.



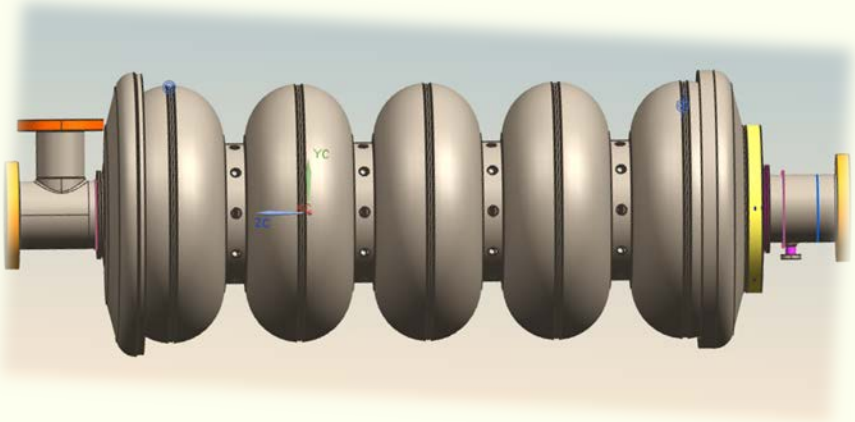
Electro-polishing of 650 MHz single-cell cavity

HPR of 650 MHz single-cell cavity

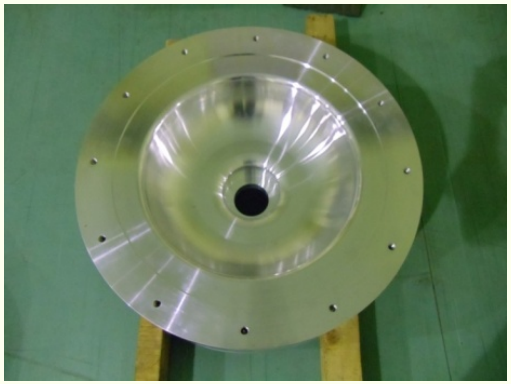


650 MHz single-cell cavity on VTS insert

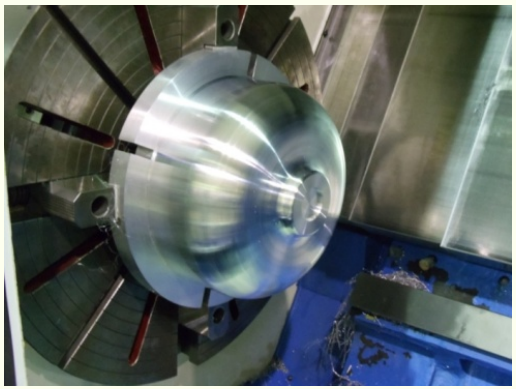
Plan for 650 MHz Beta=0.92 Cavity



Drawing received from FNAL with revised geometry (β=0.92)
Development of forming tools and welding and machining fixture ongoing
Initially a single cell cavity would be fabricated and tested.
This will be followed by Five cell cavity development.



650 MHz (B=0.92) Die set



650 MHz (B=0.92) Punch Set

Half-cell forming trial

b) Status of end groups, stiffening rings, He vessel transitions

Status:

- Drawing received, design details for stiffener ring and helium vessel transition and end-group are to be finalized.

Plan:

- To be discussed during meeting,
- Information to be submitted and accepted jointly.
- Time-line to be indicated

c) Status of He vessel, magnetic shielding, dressed cavity

Status:

- Design not available for Helium vessel, magnetic shielding, dressed cavity.

Plan:

- To be discussed during meeting,
- Information to be submitted and accepted jointly.
- Time-line to be indicated

d) Slow and fast tuner, status/plans,

Status:

- Design not available for Slow and fast tuner.

Plan:

- To be discussed during meeting,
- Information to be submitted and accepted jointly.
- Time-line to be indicated

e) Electron Beam welding commissioning

Status:

- E-beam machine has been installed and will be commissioned during March 2015.
- Operators are using the machine for last one year
- Various types of Nb samples and joints including linear and circular welding have been carried out.
- One HB 650 MHz single-cell Nb cavity will be welded during machine commissioning.

f) Status/plans for ordering niobium

Status:

- Material for R&D activities for initial trial has been procured for first multi-cell cavity.
- Material for 5 numbers of HB 650 MHz five-cell cavity:

Procurement under IIFC Project.

Details will be discussed in the following presentations:

Cavity : Avinash Puntambekar

Helium Vessel : Jishnu Dwivedi

Tuner : Vikas Jain

Processing : S. Raghavendra

VTS : P. Shrivastava