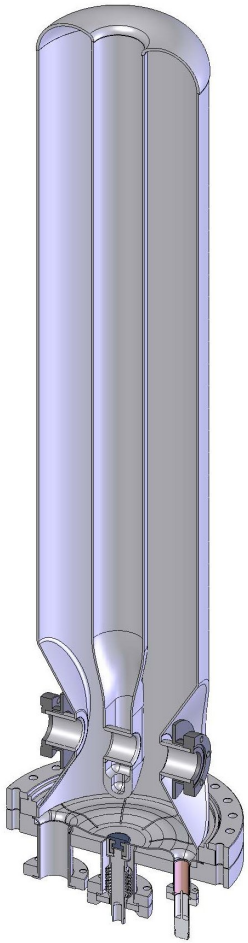
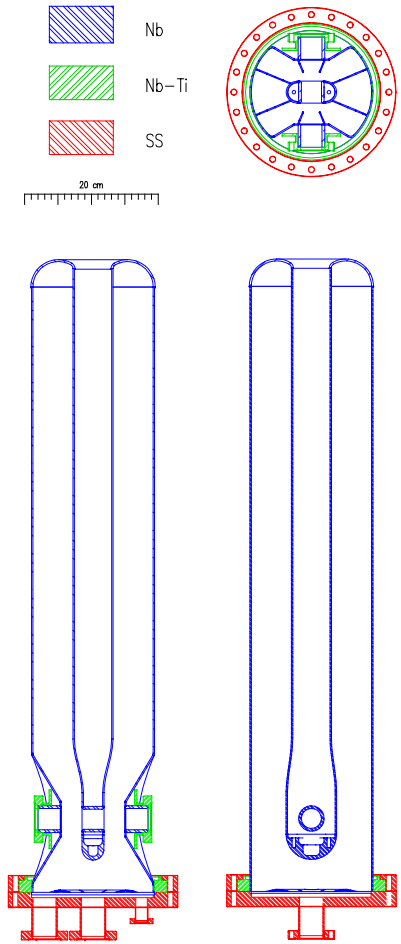
SUPERCONDUCTING QUARTER-WAVE RESONATOR CAVITY AND CRYOMODULE DEVELOPMENT FOR A HEAVY ION RE-ACCELERATOR

W. Hartung, J. Bierwagen, S. Bricker, C. Compton,
J. DeLauter, P. Glennon, M. Hodek, M. Johnson, F. Marti,
P. Miller, D. Norton, J. Popielarski, L. Popielarski,
D. Sanderson, J. Wlodarczak, R. York;
A. Facco (INFN-Legnaro); E. Zaplatin (FZ Jülich)

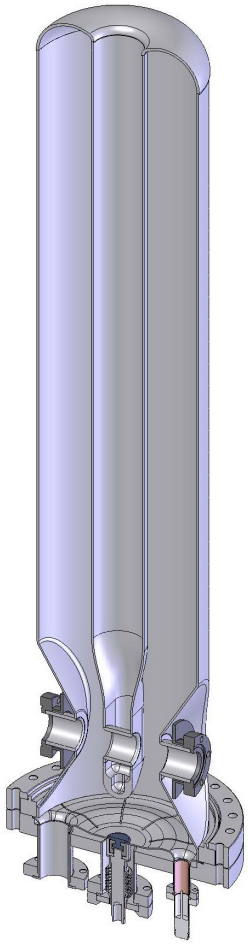
National Superconducting Cyclotron Laboratory
Michigan State University

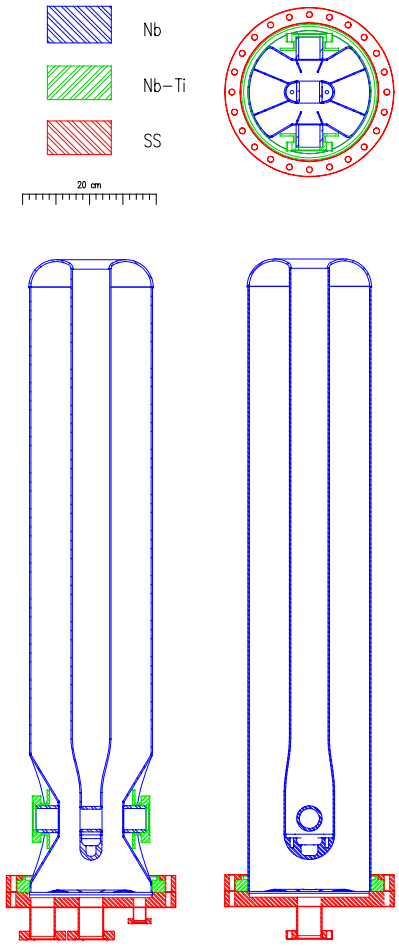
Poster THP033
XXIV Linear Accelerator Conference
29 September to 3 October 2008, Victoria, BC



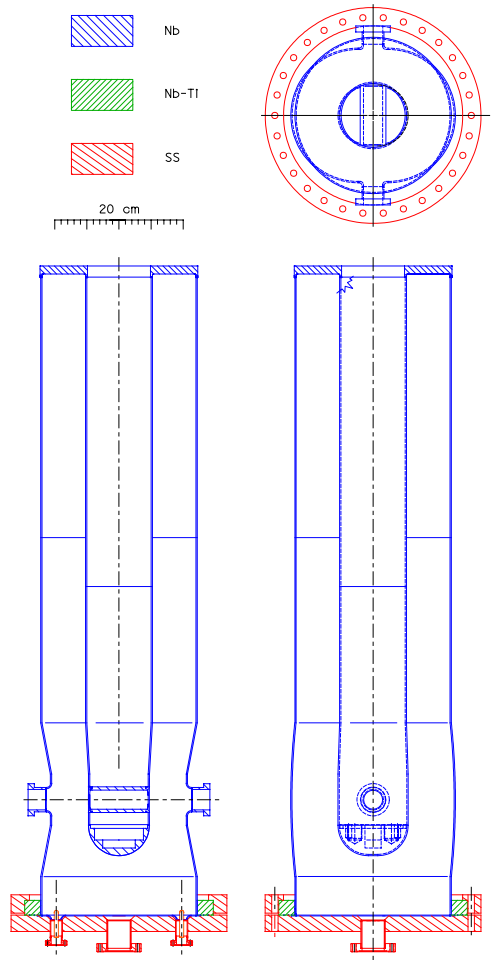


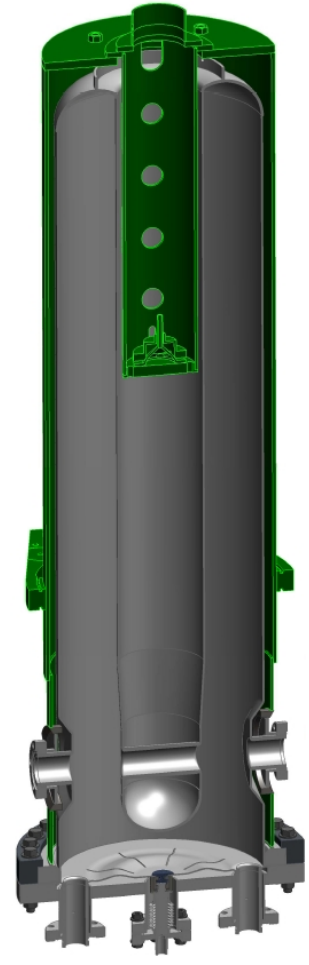
$\beta = 0.041$ QWR





$\beta = 0.041$ QWR





$\beta = 0.085$ QWR

Prototype $\beta = 0.041$ QWR

Parts

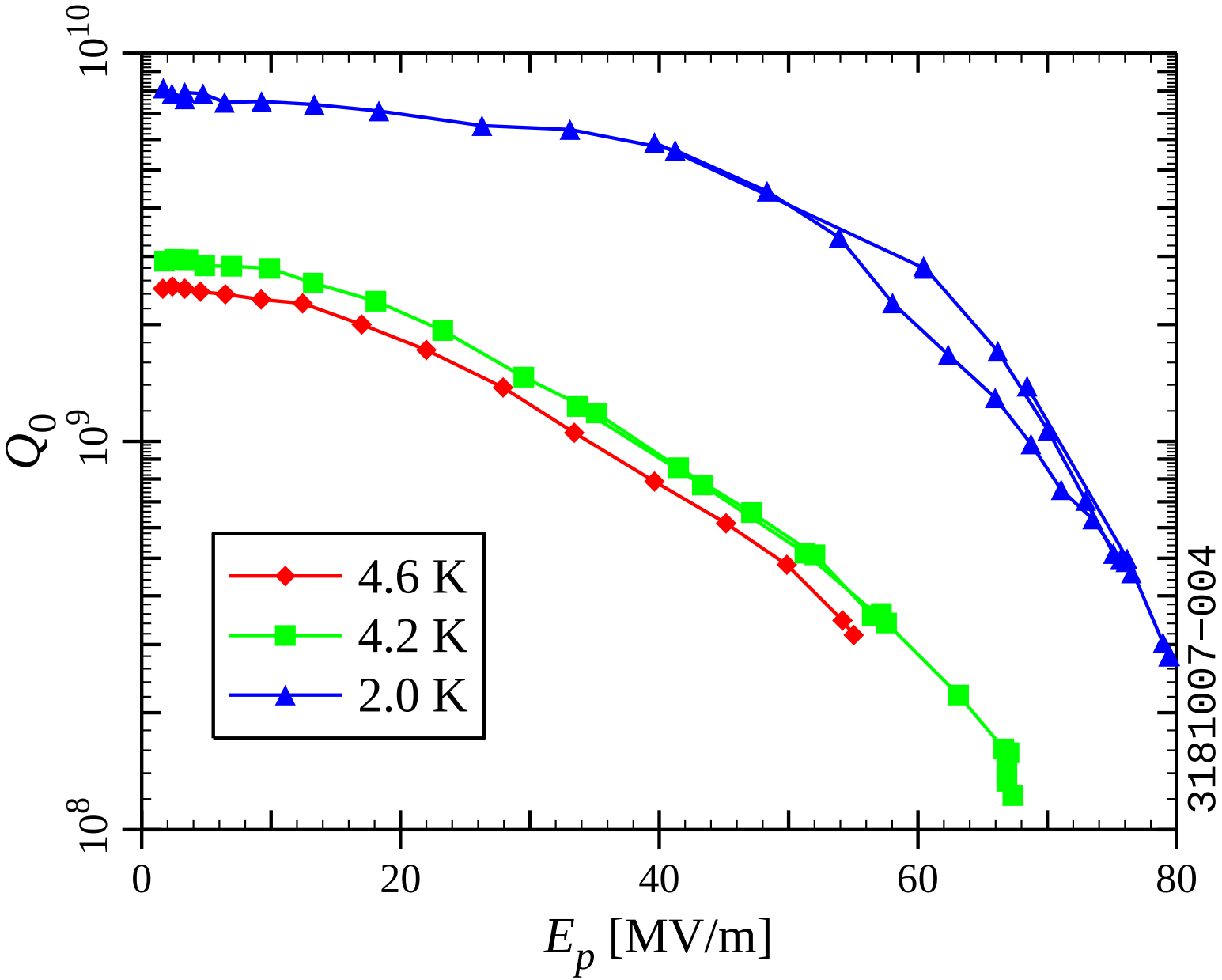
Tuning Plate

Inside

Etching

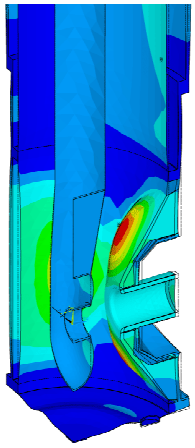
Rinsing

Insert



Dewar Test of $\beta = 0.041$ QWR

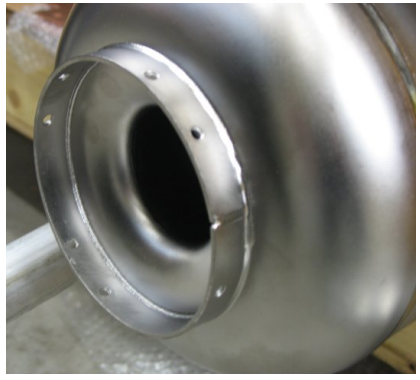
Stiffening of $\beta = 0.041$ QWR



ANSYS

IC plate

welded plate

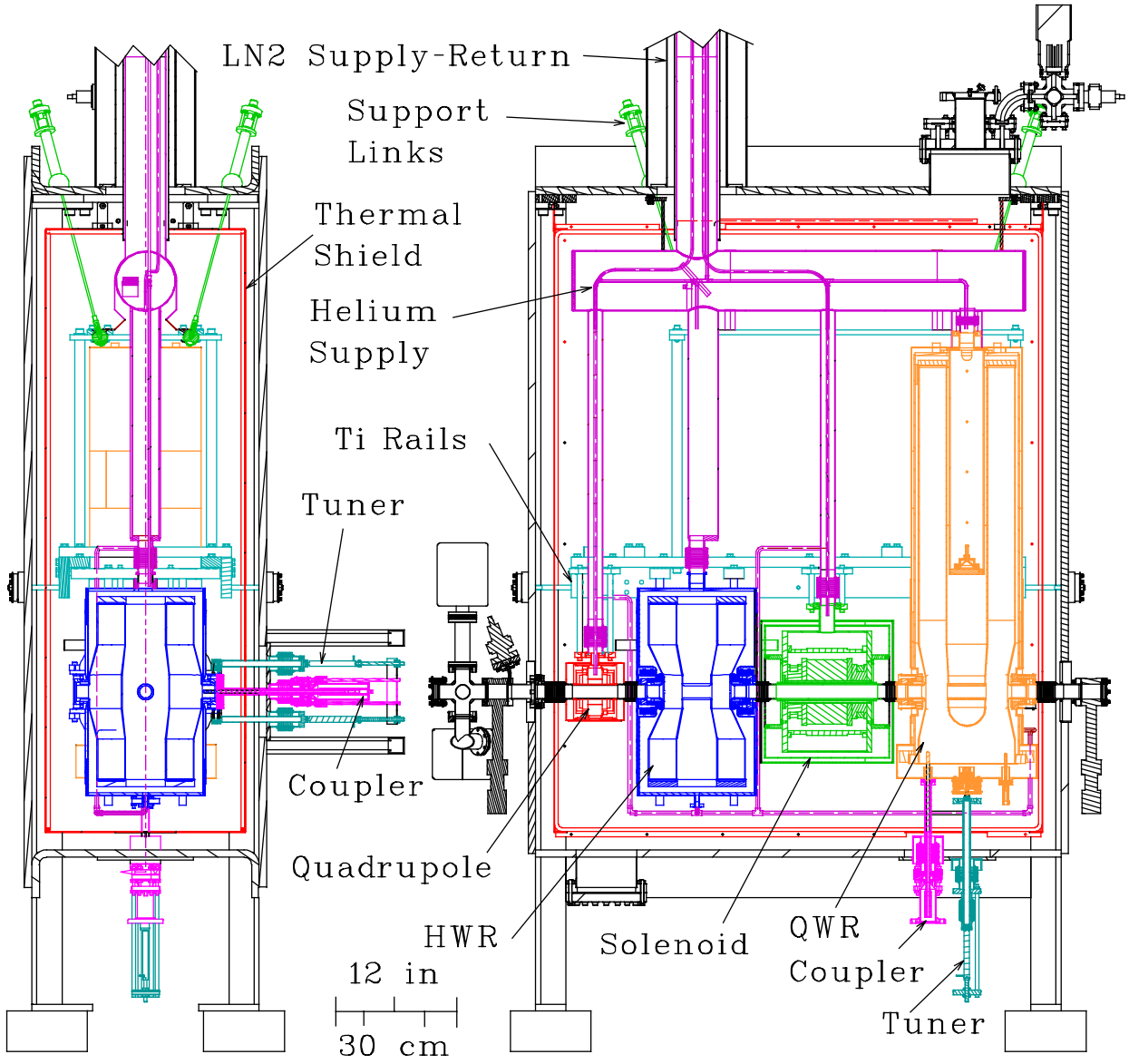


top ring

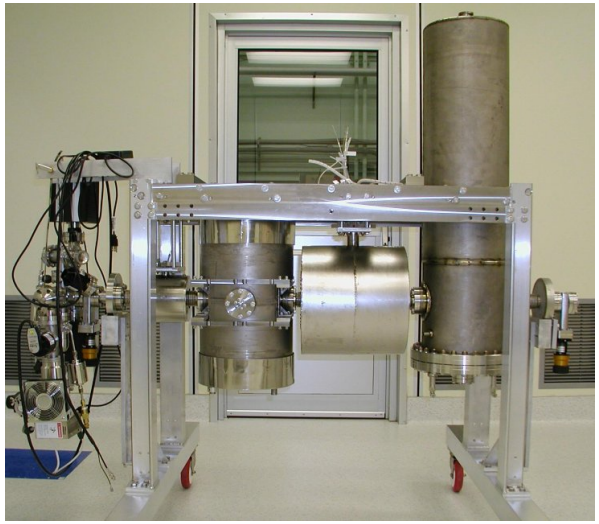
buttress

welded buttress

ANSYS model: predicted deformation for stiffened QWR with He vessel.



Prototype low-β cryomodule



(a) cold mass

(b) top plate

(c) inner MLI

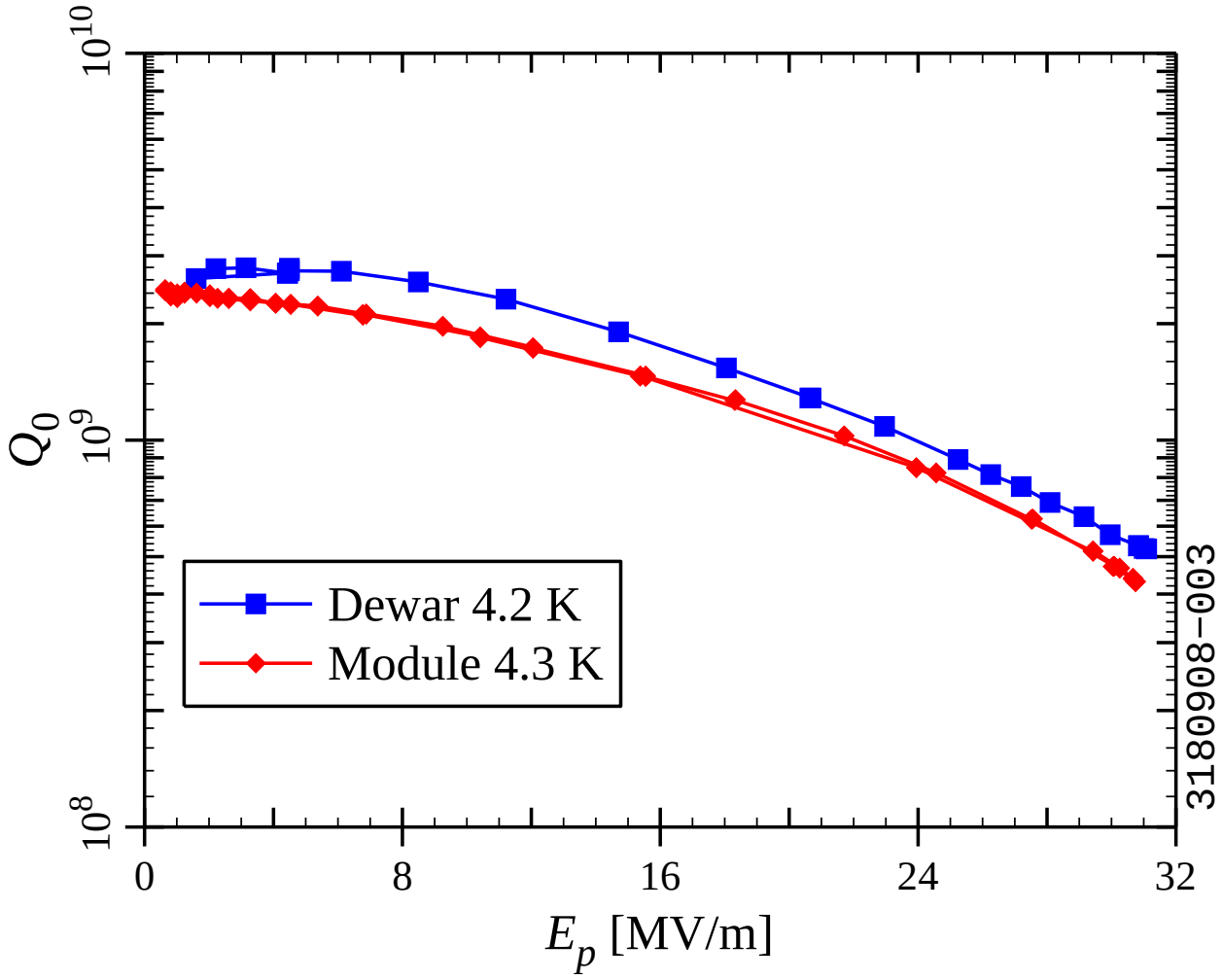
(d) 77 K shield

(e) outer MLI

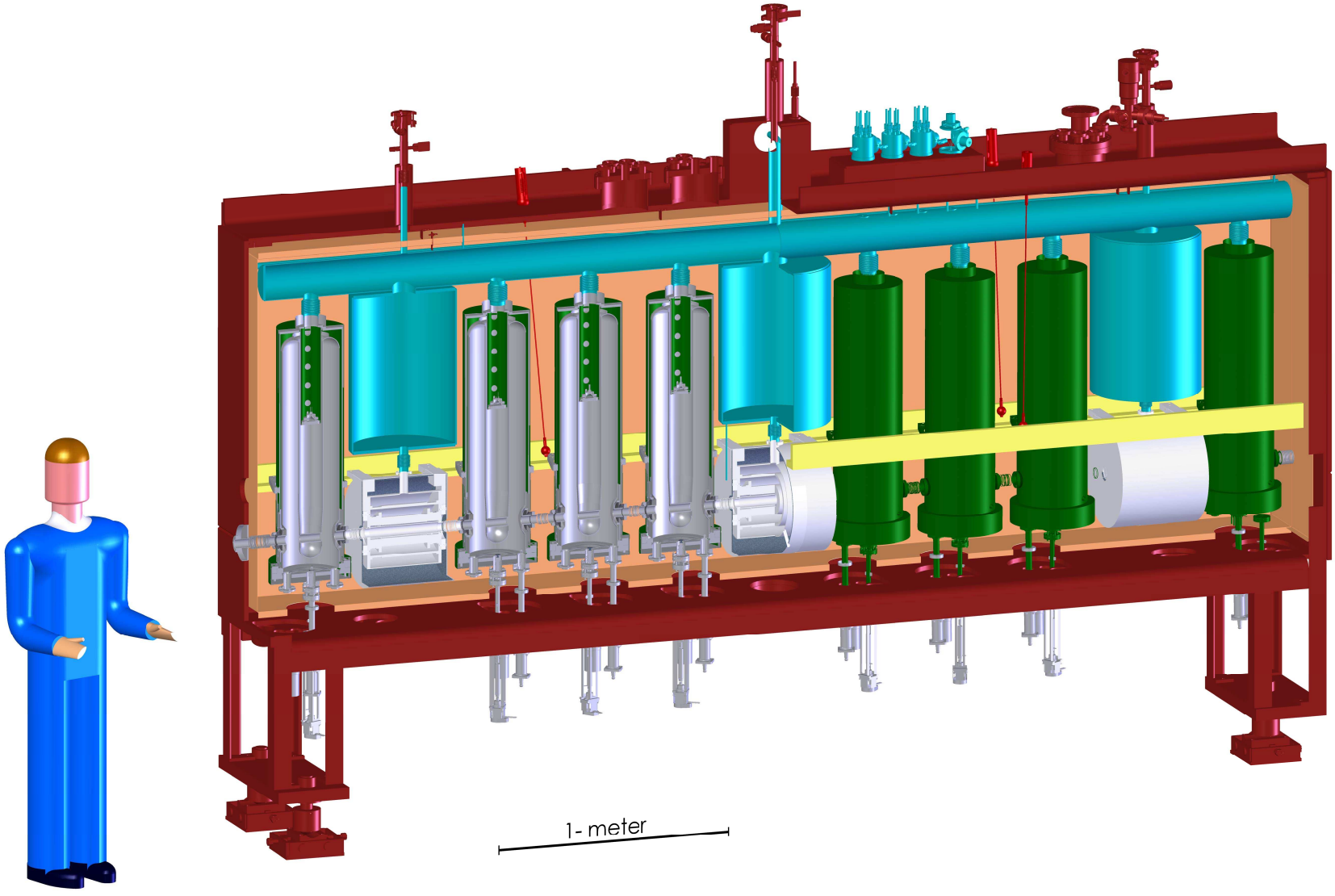
(f) vacuum vessel

Construction of low-β cryomodule

RF Testing of $\beta = 0.085$ QWR



Test in Dewar vs test in cryomodule (after magnet operation, temperature cycle, and He processing; preliminary analysis)



$\beta = 0.085$ cryomodule for the reaccelerator

Conclusion

- Prototype cavities for the NSCL reaccelerator have been fabricated and tested.
- The design goals for the RF performance have been achieved in Dewar tests (both cavity types) and cryomodule test (one cavity type so far).
- In progress: production cavities and cryomodules for the NSCL reaccelerator.