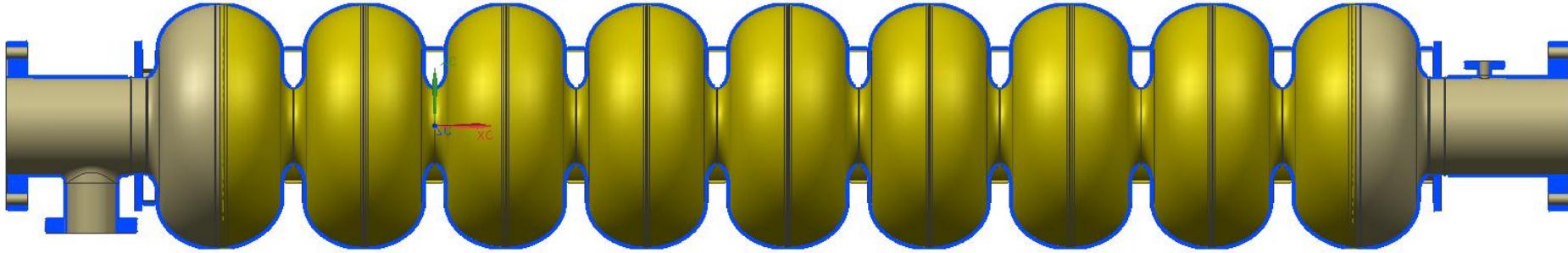

JLab Update

Rongli Geng

November 6, 2013

2nd LCC ILC Cavity Group Meeting

JLab Status: 9-cell Cavities

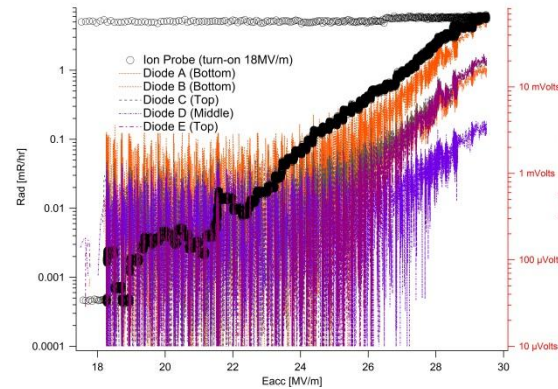


- New 9-cell Low-Surface-Field shape (SLAC design) cavity.
 - Nb half cell frequency measurement completed, excellent repeatability.
 - Work on hold due to budget.
- Two large-grain ICHIRO shape cavities
 - Both baseline tested
 - Cavity #1 limited by quench at 20 MV/m
 - Cavity #2 limited by FE.
 - Cavity #2 completed in-house CBP.
- 9-cell cavity NR1 (first in-house CBP processed 9-cell to mirror finish)
 - Light EP, first RF test, limited by FE at low gradient.
 - Work on hold due to budget.



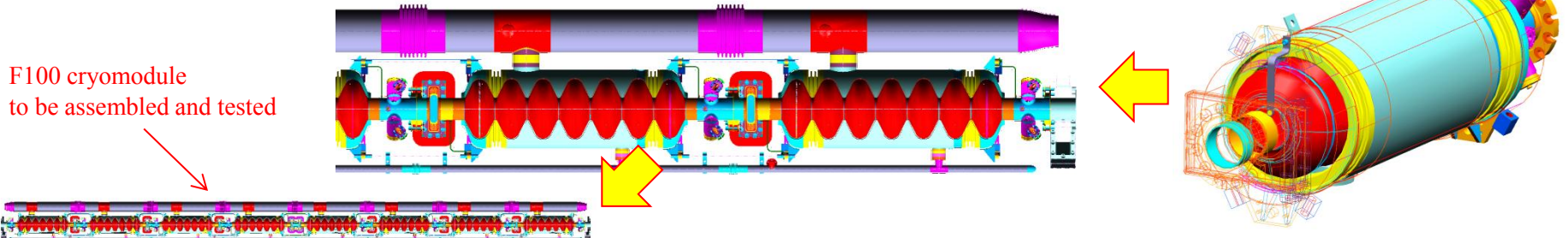
JLab Status: Field Emission Instrumentation

- X-ray diode sensors (Hamamatsu S1223-01) and DAQ fully validated in multi-cell vertical testing in Jlab VTA.
 - Recent testing with diodes attached to dressed cavity for Jlab FEL cryomodule



- Next step to install X-ray sensors at all cavities in full FEL cryomodule
 - Compare field emission data at VTA testing with cryomodule testing
 - Establish correlation between FE induced X-ray and FE induced Q0 loss and dark current at end of cryomodule

F100 cryomodule
to be assembled and tested



JLab Status: High Q0 at 45 MV/m

- **Two single-cell large-grain niobium cavities under processing and testing for high Q0 at ultra high gradient regime of > 45 MV/m**
 - **Cavity PJ1-1**
 - In collaboration with Peking University, Ningxia Large grain material.
 - Processing procedure: Mirror-Finish (Mf) CBP + BCP10um + 800Cx2hr + EP30um + 120C48hr.
 - Second test, good Q0, no FE up to 30 MV/m, high field Q-slope.
 - Next step 120Cx48hr bake and re-test.
 - **Cavity G2**
 - Processing procedure: MfCBP + 800Cx2hr + EP30um + 120Cx48hr.
 - Max. Eacc 35.2 MV/m with Q0=1.5E10 at 2K, limited by quench, no FE.
 - Max. Eacc 35.8 MV/m with Q0=2.2E10 at 1.8K, limited by quench.
 - Series of Cryogenic Thermal Cycling (CTC) measurements underway to study the effect of Q0
 - CTC below Tc
 - CTC above Tc
 - In both cases, we observed 30% drop in Q0. Further studies on-going.
- **One new single-cell large-grain niobium cavity under processing and testing**
 - **Cavity PJ1-2**
 - In collaboration with Peking University and OTIC, Ningxia large-grain Nb material.
 - CEBAF upgrade cavity Low-loss shape.
 - RF test on-going.

1-Cell 1300 MHz Cavity G2

RLGENG26jun13

