

Americas Status

CM Ginsburg

16 Mar. 2010

9-cell Cavity Coordination

- Objective: Identify and prepare 8 cavities + backups for dressing for CM2 (and beyond)
 - Favor cavities which have gradient performance >31.5 MV/m in vertical test without substantial field emission
- Timescale
 - CM2: dressed cavities March 2010
 - Reminder: after a bare cavity is qualified, need
 - A minimum of 2 weeks for dressing, and
 - 1 month if horizontally testing
- Prioritization: To get as many qualified cavities as quickly as possible,
 - Prioritize first in terms of fastest preparation, then
 - Take lowest risk cavities first
 - In case of poor performance, put cavity aside (aka R&D path) and start with the next one; address R&D cavities as time permits
- Other high priority: Qualify FNAL/ANL processing facility for 9-cell cavities – facility not yet proven for CM cavity preparation
- Other high priority: S0 production yield data accumulation - compatible so far only with JLab effort
- Other high priority: R&D topics
- Other high priority: New vendor development

highest priority

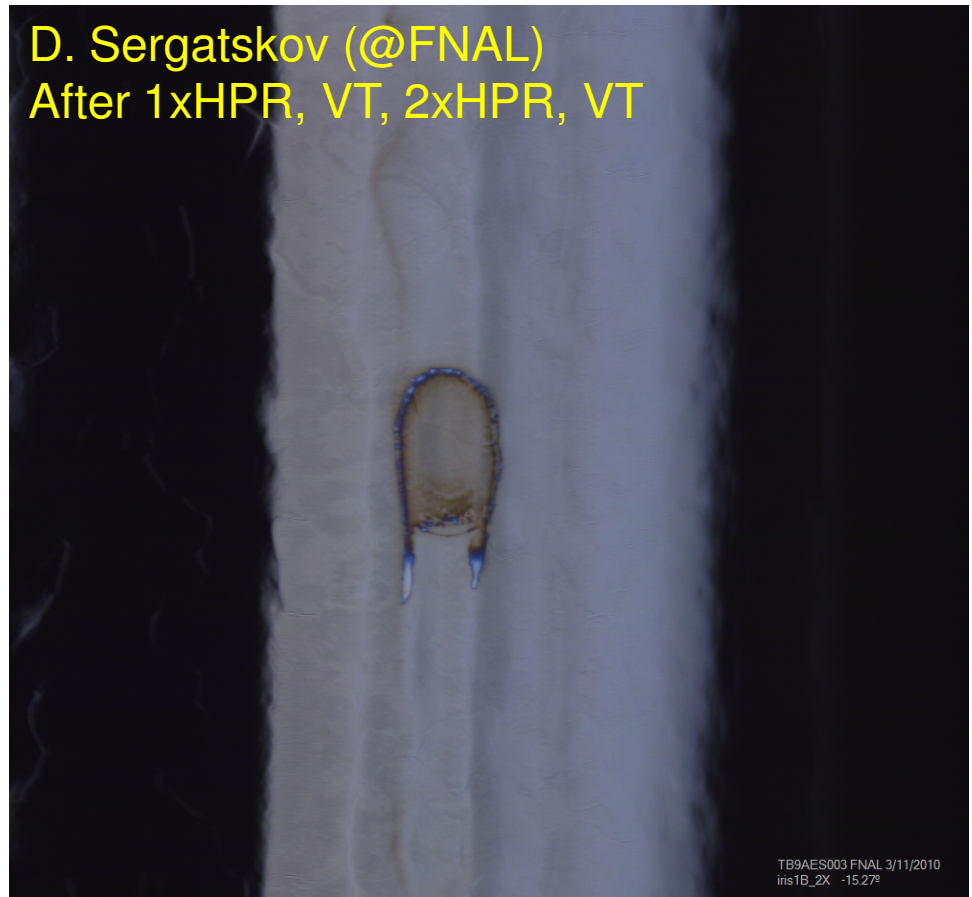
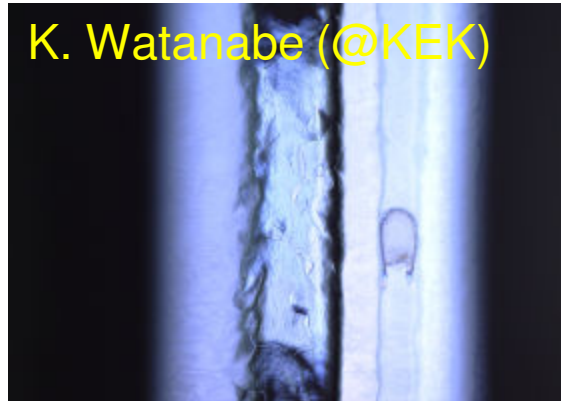
9-cell Production Cavity Status

- AES004 and TB9ACC011 went to KEK for S1G
- 8 cavities plus backups needed for CM2 [and then more cavities, more CM's...]
 - Dressed cavities
 - TB9ACC013 [in HTS], TB9AES009 [in HTS prep; installation this week], ACCEL8, TB9AES008, TB9AES010
 - Qualified and ready for dressing
 - TB9ACC016
 - Potential backup cavities which, although not fully qualified, are essentially useable now [>31.5 MV/m but significant FE]
 - ACCEL7 [35 MV/m (quench/FE)], AES003 [34 MV/m (FE)], ACCEL6 [32 MV/m (quench/FE)]
 - In process/test cycle with unknown performance – split between JLab & FNAL
 - TB9AES007 [test this week], TB9RI026, TB9RI024, TB9RI018 [few weeks remaining]
 - 8 FNAL-received new cavities to be processed/tested (RI)
 - 12 more cavities will arrive at FNAL at least one month from now (AES&Niowave-Roark)

9-cell R&D activity

- NB: As a rule, we don't do fundamental R&D on 9-cells, only confirmation of 1-cell research findings and R&D associated specifically with 9-cell fabrication
- EP qualification at FNAL/ANL facility
 - ACCEL6 [light EP, moderate performance], ACCEL7 [light+ EP; moderate performance], TB9ACC017 [full EP, poor performance]
 - TB9RI026 [production cavity, bulk EP completed] – few weeks to know performance
 - TB9RI024 [production cavity, planned for light EP] – few weeks to know performance
 - 5 others bulk EP'd at RI to arrive regularly for light EP within the next few months
- VEP qualification at Cornell (partially correlated with pits/bumps and tumbling)
 - ACCEL9, TB9AES005, TB9ACC010, TB9ACC015, plus 2 new ones
- Fixing broken cavities – to return to production path
 - TB9ACC014, TB9ACC012, JLAB-1
- Pits and bumps studies, instrumentation development, etc. at FNAL
 - TB9ACC017, JLAB-2
- Dressed cavity R&D, e.g., dressed EP or BCP
 - AES002 [20 MV/m (quench)], AES001 [22 MV/m (quench/FE)]
- New vendor development
 - 6 Niowave-Roark cavities to arrive in next 6 months

AES003



Suspected field emission location at cell 1 near beampipe; plan mechanical removal, then light EP

Summary

- Of the eight cavities (plus backups!) for CM2
 - We have 1 in HTS
 - We have 2 dressed and ready (to be HTS tested before CM assembly)
 - We have 3 which will probably become dressed and ready in the next few weeks
 - We have 3 backup cavities which may be useable now
 - We have 4 in process/test with unknown performance
- The R&D program is very busy and split among several important targets at the Americas Labs
- There is (still) more demand for cavities than availability



- My focus has been on the training of a new technician in the Cornell cavity processing facility.
- He is learning how to BCP and VEP now.
- We are noticing that we do not need to agitate the VEP as much as we did before (in line with C. Reese @ JLAB's recommendation).
- LR9-1 will be tested again after field flatness tuning in the next 2-3 weeks.

JLab Updates for 21st Cavity Group Meeting

RG

12mar10

9-cell Processing & Testing at JLab

- A16 qualified (39.3 MV/m) and sent back to Fermi for CM2.
- AES7 processing and testing progressing
 - Heavy EP struck by power outage near end of run, cavity was forced to leave in EP machine with electrolyte over night.
 - RF surface appeared to be fine – but two defects observed in cell#1 (2nd half cell) at stiffening ring radius.
 - Defects remained observable after light EP.
 - Cavity now under 120C bake out.
 - RF test planned today (March 16).
- RI18 heavy EP and 800Cx2hr HT completed.

Cavity Heat Treatment for Fermi Lab

- RI24 (heavy EP at RI) was vacuum furnace heat treated 800Cx2hr and sent back to Fermi.
 - Strong black contamination/discoloration on vacuum sealing surface at HOM coupler port and incident power coupler port. Polishing was done to avoid furnace contamination.
- RI26 (heavy EP at ANL) received and furnace HT 800cx2hr today
 - Good impression of RF surface and vacuum sealing surfaces.

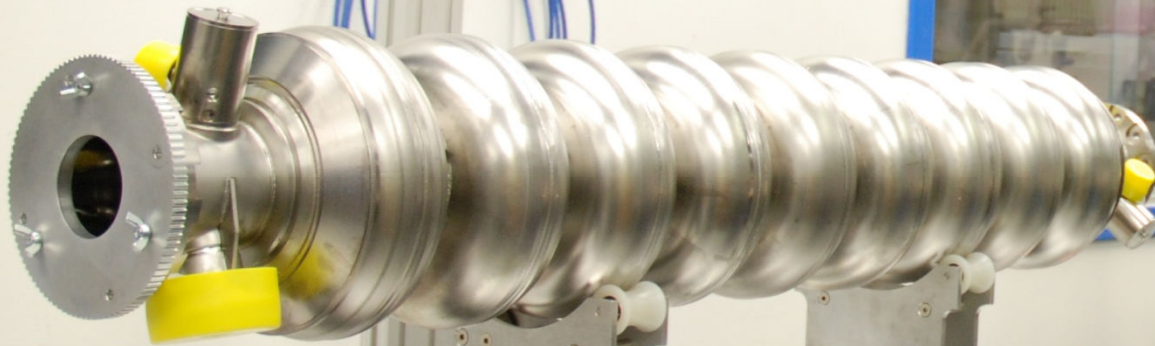
KEK/JLab Collaboration on ICHIRO7 Processing and Testing at JLab

- Field flatness preserved well during transportation and handling.
- HPR only for baseline test.
- Successful test at 2K by JLab and KEK people.
- S0 processing and testing at JLab is next by people from both labs.
- Goal is to demonstrated very high gradient (45-50 MV/m regime) in a 9-cell cavity.



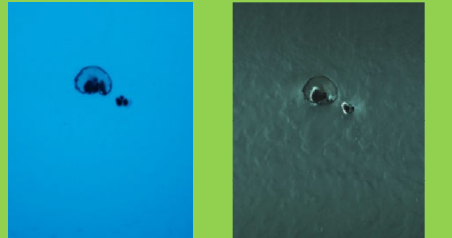
KEK Ichiro7 cavity finished clean room assembly at JLab

Kyoto Camera Commissioning at JLab

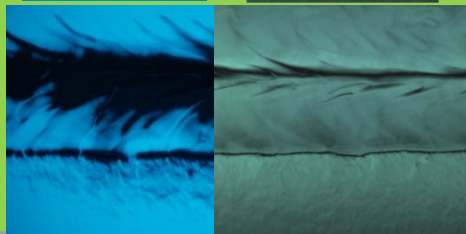


Initial experience by re-inspecting AES6 quench locations

JLab LDM image



Kyoto camera image



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