



14.02.2008 Summary: 'S0'

- Thanks to Rongli, Peter, Bob, Warren, Charlie, Joe and the JLAB team!
- In 2007, and (we expect) through 2008, JLAB will lead US in high gradient R&D
 - **Fermilab / ANL will work hard, with extremely limited FY08 funding, to commission and validate the NI infrastructure**
- JLAB/Cornell will retain technical leadership role for some time as Fermilab teams come up to speed
 - **Decades of experience**



Long Term (through '12):

- JLAB strength is in its *R&D infrastructure*
 - **And its support team ←**
- Fermilab plans are focused on production infrastructure (?) → 10x throughput
 - **These are somewhat complementary**
 - **(Single cell cycle system under development through 'TD')**
- JLAB focus on understanding and development
 - **Cornell similar**
 - **US program (should/must) recognize that**



Specific *suggestions (and requests)*

- Invest in JLAB/Cornell infrastructure
 - **Tooling, instrumentation, process control**
 - **Integration**
 - **Protect this investment**
- Help us develop ‘replan’ for high gradient R&D
 - **Using TTC / TB**
 - **The replan must include:**
 - Multi-cell mainstream
 - Single cells for development
 - Diagnostic development
 - Analysis



Specific *suggestions (and requests)* 2

- Build blemish-free cavities
 - **Using the Iwashita Kyoto / KEK viewer**
 - **And effective Tmap**
- Understand and promote full utilization/analysis of existing data
- Improve process controls / process basis as indicated



Proposal for an R&D Plan towards better Understanding of the Electropolishing of Niobium Cavities

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During the last year issues concerning the electropolishing of niobium cavities have been discussed at various meetings such as the TTC meeting at DESY in March 2005, the ILC Snowmass workshop, the SMTF workshop at FNAL in October 2005 and now at the TTC meeting in Frascati.

A summary report about Electropolishing activities worldwide will be published in the near future [1]

It has become very clear that the major problems have to do with contamination of the electropolished surfaces as well as with unpredictable hydrogen dissolution, resulting in some cases in “Q-disease”. Better “on line” monitoring of the process seems to be a desirable QA/QC activity.

A. Contamination and Rinsing studies

Already in 1971, when the electropolishing process was developed at Siemens AG in Germany [2] it was recognized that the electropolished surfaces were

- 2007 – succeeded in reducing relative rate of field emission
 - **Average gradient increase to 31.5**
- 2008: Quench & Quench variability
 - **Publication of ‘replan’ through TTC**
 - **Post-EP rinsing**
 - **Development of internal inspection**
 - **Correlation with Tmap**
 - **Full use of pass-band data**