

Coupon Results: What's Next?

- **Bad Pits, Good Pits**

Cavities - have many pits, why do some lead to quench?

Need to take coupons from quench spots and do surface studies including tunneling probes of the local superconducting gap.

- **Low T Bake, What does it do? Need more study**

Correlate superconducting gap from tunneling maps to those from low field Q vs. H.

No evidence of polluted layer. Need more study of suboxides

Dislocations need something else (hydrogen?) to affect superconductivity. How do we probe this.

Vacancies – US labs to do positron annihilation spectroscopy?

What is the best tool to study hydrogen concentration within the depth of interest?

- **Magnetic Oxides, Can we fill oxygen vacancies?**

Anneal in NO?

Surface chemistry of oxide formation is important

Coupon Results: What's Next?

- GBs do serve as magnetic flux penetration sites at lower than in-grain magnetic fields
 - Topography not the cause, then what?
 - If aligned with H_{ext} , no role otherwise?
 - Magneto-optical imaging – only perpendicular to surface magnetic field, tools for parallel (as in cavities)?
- Improvement in thermal conductivity with 600C+ heat treatments – phonon peak recovered large in grain Nb, bi-crystal Nb
- FNAL/UC/IIT/NU/FSU collaboration funded – will address some of the questions