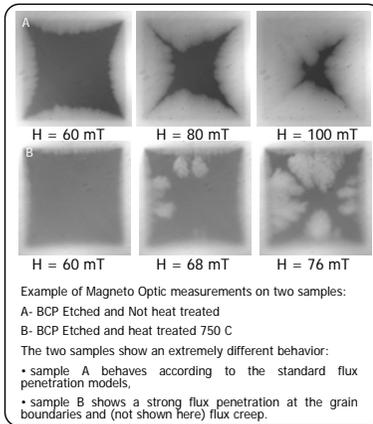
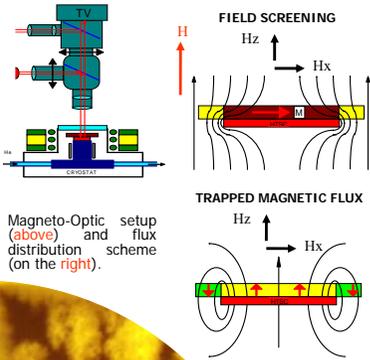


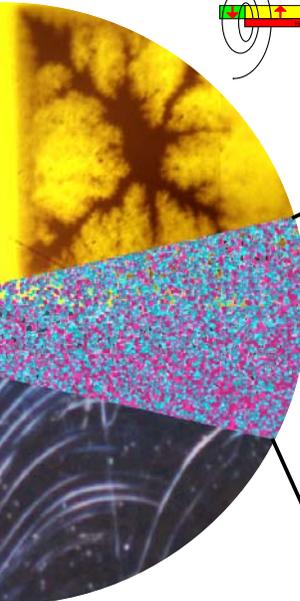
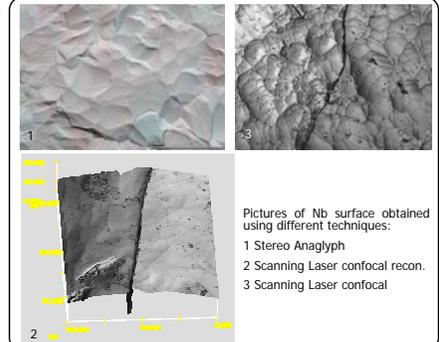
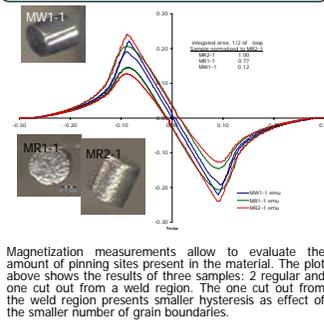


Superconductivity of Nb

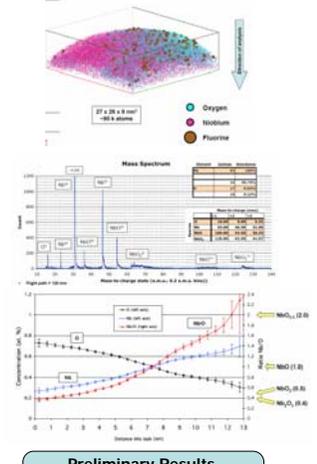
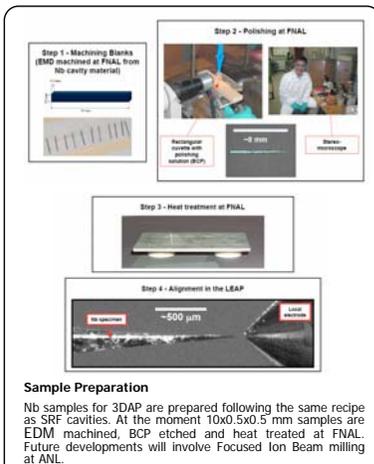
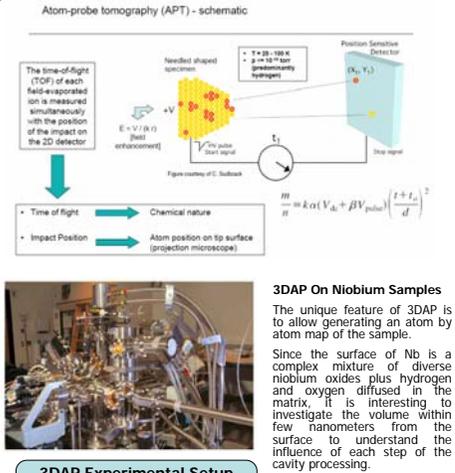
Magneto - Optic Measurements



Magnetization

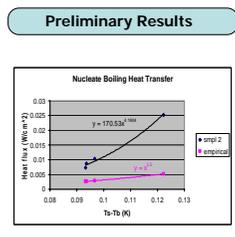
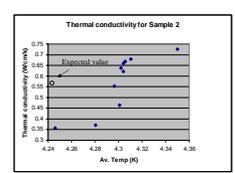
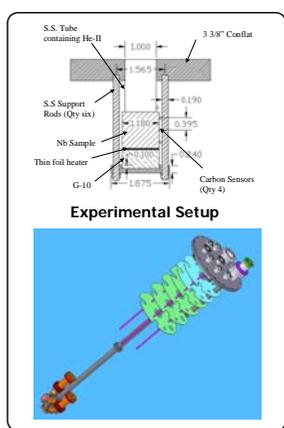
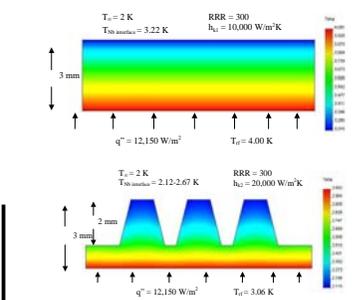


3DAP Atomic Probe Tomography



Enhanced heat transfer in SRF cavity through:

- Improvement in helium heat transfer coefficient or Kapitza conductance
- Improvement in peak heat flux of super-fluid helium
- Reducing effective material thickness and increasing cooling area through embedded cooling channels or fins



Preliminary Results



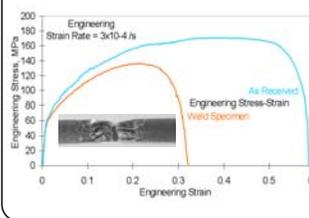
Kapitza Conductance – Mechanical Properties

Nb Mechanical Properties

Engineering Stress-Strain shows degraded tensile properties in weld specimen

Maximum stress is 140 MPa, 10-20 MPa less than normal material

Specimens all failed between center and edge of weld



Commercially available 2 mm recrystallized Nb sheet has strong <111> fiber texture, and some <100> fiber on surface – Desirable? Yes and No

<111> // ND texture is good for deep drawability for steels, also good for deep drawability for Nb (Yes).

Would understanding of cold rolling and recrystallization texture evolution for interstitial free (IF) or extra-low carbon steels be transferable to pure niobium?

Different surface grain orientations etch differently, causing grain boundary ledges (no) that are centers for electron emission

<100> // ND grains have lower work function for undesirable electron emission