

Abstract Submitted
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AC-Susceptibility and Ultrasonic Attenuation Measurements of Vortex Dynamics in the Vicinity of the Peak Effect in V-Ti Alloys - Multicriticality Revisited I.K. DIMITROV, N.D. DANILIDIS, V.F. MITROVIĆ, C. ELBAUM, X. S. LING, Brown University — In-situ SANS and ac-susceptibility measurements have provided evidence for a first-order Bragg glass transition into a disordered vortex state in a Nb single crystal. This transition manifests itself in the peak effect (PE) in the critical current density, widely believed to be associated with the sudden softening of the vortex lattice. Subsequent studies mapping the full phase diagram in the same sample have suggested the existence of four distinct phase boundaries meeting at a single multicritical point (MCP). The natures of the transition lines combined with simple thermodynamic requirements suggest that the MCP is a bicritical point. This would rule out either the bulk transition line $T_{c2}(T)$ or the surface superconducting transition $H_{c3}(T)$ as being related to the MCP. Mutual inductance magnetic ac-susceptibility and ultrasonic attenuation measurements in V-21at.%Ti have unequivocally established the presence of a PE in this alloy. The H-T phase diagram for this sample will be presented and vortex dynamics in the vicinity of the PE will be discussed. We are indebted to Prof. Shapira of Tufts University for providing us with the sample. This work was supported by the NSF under Grant No. DMR-0406626.

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