

Abstract Submitted
for the MAR05 Meeting of
The American Physical Society

Specific Heat Measurements at the Bragg Glass Disordering Transition¹ N.D. DANILIDIS, I.K. DIMITROV, VESNA MITROVIĆ, C. ELBAUM, X.S. LING, Brown University — We will report specific-heat measurements on a Nb single crystal, in which previous neutron scattering studies showed that the peak effect (PE) coincides with an order-disorder transition of the vortex lattice. The PE transition shows metastability and is believed to be first order. In addition, the PE transition line has been uncovered to merge with the low-field continuous transition $H_{c2}(T)$ line at a multicritical point. Thermodynamic considerations imply that this is a bicritical point. Measurements of specific heat and latent heat throughout the H-T phase diagram are essential for understanding the nature and relevance of the observed transition lines and the different phases of vortex matter in the presence of quenched disorder. In specific, the measurements will elucidate the nature of the disordered phase, vortex liquid or vortex glass, for bulk type-II superconductors. The measurements are performed in a home-built calorimeter cryostat. The cryostat allows for continuous-heating temperature measurements in vacuum with a heat-leak regulating stage included between the sample and the helium bath.

¹This work was supported by the National Science Foundation under Grant No. DMR-0406626.

Xinsheng Ling
Brown University

Date submitted: 14 Dec 2004

Electronic form version 1.4