

Abstract Submitted
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Thermodynamic Measurements at the Bragg Glass Transition in Nb¹ N. D. DANILIDIS, I. K. DIMITROV, V. MITROVIC, C. ELBAUM, X. S. LING, Brown University — We report measurements of mixed-state entropy changes and specific-heat on a Nb single crystal, in which previous neutron scattering studies showed that an order-disorder transition of the vortex lattice occurs at the peak effect (PE). Preliminary measurements of (dS/dH) as a function of field applied in the [111] direction reveal a sharp peak at the PE. This corresponds to a discontinuity in the entropy of the vortex system of order $\Delta s = 2.7 k_B$ per vortex per (111) Nb plane at 5.16 K. The entropy discontinuity is found to decrease and finally disappear as the multicritical¹ point is approached on increasing temperature. The behavior of $S(H,T)$ in the vicinity of the PE shows hysteresis on increasing and decreasing field due to nonequilibrium magnetization effects. In specific heat measurements there is no sign of latent heat at the PE, indicating that the latent heat is very small in this system. ¹ S. R. Park *et al.* PRL **91** 167003 (2003).

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