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Strongly enhanced diamagnetism and the vortex-Nernst effect in Bi2Sr2CaCu2O8+x YAYU WANG, Department of Physics, University of California at Berkeley, LU LI, Department of Physics, Princeton University, MIKE NAUGHTON, Department of Physics, Boston College, GENDA GU, Department of Physics, Brookhaven National Lab, S. UCHIDA, School of Frontier Science, University of Tokyo, NAI-PHUAN ONG, Department of Physics, Princeton University — The magnetization of the $Bi_2Sr_2CaCu_2O_{8+\delta}$ (Bi-2212) cuprates has been measured using high-resolution cantilever magnetometer. In underdoped Bi-2212, the fluctuation-induced diamagnetism onsets at temperatures much higher than the critical temperature T_{c0}. Both the temperature and field dependence of the diamagnetic signals closely match the vortex-Nernst effect measured on the same sample. These new results strongly support the previous finding of the Nernst effect: the vortex-liquid state extends to temperatures well above T_c in underdoped cuprates. The transition at T_c is caused by the loss of long-range phase coherence among the Cooper pairs. *Supported by NSF (DMR 02-13706).

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