Abstract Submitted
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Magnetization curves in underdoped cuprates measured at low T in fields up to 45 Tesla LU LI, YAYU WANG[1], Physics Department, Princeton University, MIKE NAUGHTON, Boston College, S. ONO, YOICHI ANDO, Central Research Inst., Electric Power Industry, Tokyo, NAI PHUAN ONG, Physics Department, Princeton University — Torque magnetometry is capable of resolving the weak diamagnetic which extends to temperatures $T \gg T_c$ in hole-doped cuprate crystals. Recently, we reported[1] that the magnetization M above T_c scales accurately as the Nernst signal e_N and remains robust to fields of 33 T. The results strongly support the scenario in which thermally created vortices destroy long-range phase coherence at T_c. We have extended these studies to explore the fluctuation magnetization to 45 T in underdoped LSCO and Bi 2201 in a series of samples doped near the critical value $x_c \sim 0.055$. We investigate the loss of phase coherence as we decrease x below x_c keeping T as low as 0.5 K. We use the M-H curves to explore how singular phase fluctuations occur as superfluidity is destroyed when x approaches the insulating Mott limit at low T.
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1. Yayu Wang et al., Phys. Rev. Lett., **95**, xxx *in press*, cond-mat/0503190; Lu Li , Eurpophys. Lett. **72**, 451-457 (2005).

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