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The potential for persistent current measurements in mesoscopic rings of underdoped cuprates THOMAS LIPPMAN, Stanford Institute for Materials and Energy Sciences, SLAC National Accelerator Laboratory, 2575 Sand Hill Road, Menlo Park, CA 94025, USA, ILYA SOCHNIKOV, Geballe Laboratory for Advanced Materials, Stanford University, Stanford, California 94305-4045, USA, KATHRYN MOLER, Stanford Institute for Materials and Energy Sciences, SLAC National Accelerator Laboratory, 2575 Sand Hill Road, Menlo Park, CA 94025, USA — Dimensionality, disorder, order parameter symmetry, competing phases, quantum critical points, thermal phase fluctuations, and quantum phase fluctuations all play a role in the physics of the underdoped cuprates. Measurements of the persistent current in mesoscopic rings near phase transitions can provide valuable information about underlying coherent states. We evaluate the prospects for such measurements in the underdoped cuprates, considering both likely signatures of various theoretical scenarios and experimental feasibility in terms of fabrication and signal levels.

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