

Abstract Submitted
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The Persistence of Superconducting Fluctuations in Underdoped LSCO¹ LUCAS BILBRO, R. VALDES AGUILAR, JHU Dept. of Physics and Astronomy; JHU Institute for Quantum Matter, G. LOGVENOV, I. BOZOVIC, Brookhaven National Laboratory, N.P. ARMITAGE, JHU Dept. of Physics and Astronomy; JHU Institute for Quantum Matter — Using Terahertz Time Domain Spectroscopy (TTDS), we investigate the pseudogap phase of the high-temperature cuprate superconductors. We measure the frequency and temperature dependence of the complex conductivity at terahertz frequencies in LSCO for dopings effectively covering the entirety of the underdoped regime. A number of issues are investigated, including evidence for a non-zero finite frequency superfluid stiffness in regions outside the superconducting phase boundary. We find a much smaller extent of superfluid stiffness above T_c as compared to the prevailing interpretation of Nernst and diamagnetic responses. We discuss the significance of our measurements regarding the extent of the fluctuation regime and the impact of these fluctuations on the physics of the pseudogap.

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