

Abstract Submitted
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Far infrared study of magnetic field induced normal states of $\text{La}_{1.94}\text{Sr}_{0.06}\text{CuO}_4$ THOMAS TIMUSK, Department of Physics and Astronomy, McMaster University, Hamilton ON, Canada, TOOMAS RÕÕM, URMAS NAGEL, DANIEL HÜVONEN, National Institute of Chemical Physics and Biophysics, Tallinn, Estonia, DAVID HAWTHORN, Department of Physics University of Waterloo, Waterloo, ON, Canada, S. WAKIMOTO, H. ZHANG, Department of Physics, University of Toronto, Toronto, ON, Canada, JUNGSEEK HWANG, Department of Physics and Astronomy, McMaster University, Hamilton ON, Canada — We report on the ab-plane optical properties of the magnetic field induced normal state of $\text{La}_{1.94}\text{Sr}_{0.06}\text{CuO}_4$ ($T_c = 5.5\text{K}$), the first such study. We apply strong magnetic fields (4 T and 16 T) along the c-axis. We find that at 4 T fields, which are strong enough to destroy superconductivity, the normal state at 1.4 K is very similar to the normal state at 20 K in zero field. However at higher fields we observed a gap-like depression in the optical conductivity at low frequency along with parallel growth of a broad absorption peak centered at higher frequency. The spectral weight loss in the depression at low frequency is recovered by the spectral weight in the broad peak. We attribute the magnetic field induced gap-like depression and the broad peak to a competing charge order to superconducting order or charge localization in ab-plane of the system.

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