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3ω Thermal Conductivity Measurement of $La_{2-x}Sr_xCuO_4$ in pulsed high magnetic field DONGKYUN KIM, JON BETTS, FEDOR BALAKIREV, ALBERT MIGLIORI, NHMFL, Los Alamos National Laboratory, BO SOO KANG, QUANXI JIA, STC, Los Alamos National Laboratory, JIA-QIANG YAN, J. B. GOODENOUGH, University of Texas at Austin — It is difficult to study the normal state behavior of High T_C superconductors below T_C, because high magnetic field is required to suppress the superconducting state. National High Magnetic Field Laboratory in Los Alamos has a high magnetic field facility up to 75T using pulsed magnets. Users can perform a variety of measurements including resistivity, Hall effect, magnetization, photo-luminescence, and specific heat. Recently, we developed thermal conductivity measurement in high magnetic field utilizing the 3ω technique. $La_{2-x}Sr_xCuO_4$ is reported to have enhanced thermal conductivity in the superconducting state. By applying magnetic field, this enhancement is reduced. The intriguing feature is that the temperature T_K below which thermal conductivity is reduced by magnetic field is higher than T_C. Furthermore, it was shown that small substitution of Cu by Zn prevents this reduction. In this talk we will report the recent thermal conductivity data of $La_{2-x}Sr_xCuO_4$ in high magnetic field to shed lights on this subject, by totally suppressing the superconducting state.

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