Abstract Submitted
for the MAR07 Meeting of
The American Physical Society

Magnetic field effect on the superconducivity fluctuation of cuprates, LSCO and LCCO measured by microwave broadband technique A. MAEDA, T. OHASHI, Dept. Basic Sci., Univ. Tokyo, H. KITANO, Dept. Basic. Sci., Univ. Tokyo, L. GOMEZ, CREST, JST, and Dept. Basic. Sci., Univ. Tokyo, I. TSUKADA, CRIEPI, A. TSUKADA, M. NAITO, Dept. Appl. Phys., Tokyo Univ. Agriculture and Tech. — Understanding of the electronic phase diagram is essential to clarify the mechanism of high-T_c superconductivity (SC) of cuprates. Previously, we studied the SC fluctuation of hole doped LSCO by microwave broadband technique, and found that there was a sharp crossover from the 2D-XY (BKT) behavior to the 3D-XY behavior by changing the doping. However, behaviors in the overdoped region and the effect of disorder were remained to be seen as future issues. To answer these, we investigated the effect of magnetic field on the SC fluctuation on LSCO with various carrier concentrations. For underdoped samples, the BKT behavior observed in zero-field experiemnts sruvived. However, the divergence of correlation length was found to be supressed by the externally applied magnetic field. In contrast, for optimally doped samples, the range of the 3D-XY behavior became narrowed definitely under finite magnetic field. These provide strong support for our previous conclusion that there is a sharp change in the SC nature around at the optimum doping. The data in the overdoped LSCO and in electron doped cuprate LCCO will also be presented in a comparative manner.

Atsutaka Maeda
Dept. Basic Sciences, Univ. Tokyo

Date submitted: 27 Nov 2006 Electronic form version 1.4