Abstract Submitted
for the MAR07 Meeting of
The American Physical Society

Determination of the dynamical scaling exponent in the superconducting to normal metal phase transition[1] HUA XU, SU LI, CHRIS LOBB, STEVEN ANLAGE, Center for Superconductivity Research, Department of Physics, University of Maryland, College Park, MD 20742-4111 — In the high Tc superconductors, measurements of fluctuation effects reveal interesting behavior. Thermodynamic measurements have been done to investigate scaling behavior, to obtain critical exponents and to test the universality of the transition and the 3D XY model. Transport measurements of critical fluctuations, such as the AC conductivity, are less explored, and a wide range of critical exponents have been reported. We have investigated critical fluctuations in the microwave conductivity of $YBa_2Cu_3O_{7-\delta}$ films. Our improved temperature stability and conductivity calibration(10 MHz to 50 GHz) allow us to take high quality data at small temperature intervals(50mK). This improves the conventional data analysis method and allows a new method of extracting exponents to be developed. With these two methods, we determined consistent values of T_c and the critical exponent using eight different samples.

[1]This work was supported by NSF grant number DMR-0302596.

Hua Xu
Center for Superconductivity Research, Department of Physics
University of Maryland, College Park, MD 20742-4111

Date submitted: 22 Nov 2006 Electronic form version 1.4