

Abstract Submitted
for the MAR07 Meeting of
The American Physical Society

Real Space Mapping of Electronic States in $\text{Bi}_2\text{Sr}_{2-y}\text{La}_y\text{CuO}_6$ as a function of Temperature.¹ AAKASH PUSHUP, ABHAY PASUPATHY, KENJIRO K. GOMES, Princeton Nanoscale Microscopy Laboratory, Department of Physics, Princeton University, NJ US, SHIMPEI ONO, YOICHI ANDO, CRIEPI, Tokyo, Japan, ALI YAZDANI, Princeton Nanoscale Microscopy Laboratory, Department of Physics, Princeton University, NJ US — We have studied the single layer $\text{Bi}_2\text{Sr}_{2-y}\text{La}_y\text{CuO}_6$ system using high resolution scanning tunneling microscopy and spectroscopy at various temperatures. From these measurements, we have determined the evolution of the local density of states from the superconducting to the non-superconducting state. In this talk, we will describe the evolution of the gap and other spectroscopic features as a function of doping ($y=0.2$ to 0.9) and temperature (20 - 100K). Real space maps of the electronic states that show strongly modulated patterns will also be presented. These experimental results are used to determine the connection between the superconducting gaps and the pseudo-gaps in this compound. Finally, we will discuss the similarities and differences between the measurements on the single-layer $\text{Bi}_2\text{Sr}_{2-y}\text{La}_y\text{CuO}_6$ and the double-layer $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_{8+x}$.

¹Work supported by NSF-DMR and through PCCM-MRSEC at Princeton University

Aakash Pushp
Princeton Nanoscale Microscopy Laboratory,
Department of Physics, Princeton University, NJ

Date submitted: 03 Dec 2006

Electronic form version 1.4