Abstract Submitted
for the MAR07 Meeting of
The American Physical Society

Atomic Scale Investigation of the Effects of Pb doping in $Bi_2Sr_2CuO_{6+x}$ W. D. WISE, KAMALESH CHATTERJEE, M. C. BOYER, MING YI, MIT, TAKESHI KONDO, Ames Laboratory, E. W. HUDSON, MIT — In the study of the Bi-based high temperature superconducting cuprates, an incommensurate structural "supermodulation" that runs throughout the crystal can often lead to experimental complications, especially for scattering studies. In order to eliminate this problem, a fraction of the Bi atoms are occasionally substituted by Pb, leading to a suppression of the supermodulation. As even a relatively large substitution has only a modest effect on transition temperature, it is widely believed that this suppression has little or no direct effect on superconductivity in the crystal. We will present the results of temperature dependent scanning tunneling microscopy studies of Pb doped $Bi_2Sr_2CuO_{6+x}$ (Bi-2201) which demonstrate local spectroscopic variations associated with Pb doping. Although the exact cause of these variations is still unknown, we hypothesize that a modulated strain field due to the presence of Pb may play a role.

W. D. Wise
MIT

Date submitted: 20 Nov 2006 Electronic form version 1.4