Abstract Submitted
for the MAR07 Meeting of
The American Physical Society

Inelastic tunneling spectroscopic imaging study of electron-lattice interactions in $Bi_2Sr_2CaCu_2O_{8+\delta}$.[1] KAZUHIRO FUJITA, U. of Tokyo, J. LEE, Cornell U., K. MCELROY, U. of Colorado, J. SLEZAK, M. WANG, Cornell U., Y. AIURA, H. BANDO, AIST. Tsukuba, M. ISHIKADO, U. of Tokyo, T. MASUI, Osaka U., J. -X. ZHU, A. BALATSKY, LANL, H. EISAKI, AIST. Tsukuba, S. UCHIDA, U. of Tokyo, J. C. DAVIS, Cornell U. — We investigated impact of oxygen isotope effect on d^2I/dV^2 spectroscopy on ^{16}O and ^{18}O substituted $Bi_2Sr_2CaCu_2O_{8+\delta}$,respectively, with the same doping level (nearly optimally doping. $^{16}O \rightarrow ^{18}O$: Tc=89K→88K), using the newly developed inelastic spectroscopic imaging technique (Jinho Lee *et al.*, *Nature* **422**,546 (2006)) . We found that oxygen isotope effect ($^{16}O \rightarrow ^{18}O$) leads to reduction of mode energy from 52meV to 49meV, while superconducting gap remained unchanged. Oxygen isotope re-substitution shifted mode energy back to the original energy ($^{18}O \rightarrow ^{16}O$) as well as T_c back to 89K, completing the series of isotope effect probed by STM/S. We concluded that renormalization effect seen in dI/dV spectra is caused by strong electron-lattice interaction from a mode near 52meV. We will also discuss about relevance of this lattice vibration mode as a pairing glue in the talk.

[1]K.F. acknowlegds fellowship support from I2CAM.

Kazuhiro Fujita
The University of Tokyo

Date submitted: 20 Nov 2006 Electronic form version 1.4