Abstract Submitted
for the MAR05 Meeting of
The American Physical Society

Fourier Transform Inelastic Electron Tunneling Spectroscopy: A new tool for exploration of electron-boson interactions in High-Tc superconductors JINHO LEE, Cornell University, KYLE MCELROY, University of California, Berkeley, Cornell University, JAMES SLEZAK, Cornell University, S. UCHIDA, University of Tokyo, Japan, H. EISAKI, AIST, Japan, J.C. DAVIS, Cornell University — Since the early works, Inelastic Electron Tunneling Spectroscopy(IETS) has been the most sensitive tool to probe collective modes in the solid state. McMillan/Rowell utilized this technique to elucidate the phonon structures in the conventional superconductors, and Stipe et al. succeeded in IETS using low temperature STM(LT-STM). So far none of these works had momentum space resolution. Recently, McElroy et al. introduced the Fourier Transform Scanning Tunneling Spectroscopy(FT-STS) technique to get k-space information about quasi-particles in the high-Tc Superconductors using LT-STM. Here we report developement of the FT-IETS technique, on the basis of the previous works above, for the study of the high-Tc. This technique has the potential to be a powerful tool for probing local characteristic, as well as the momentum space information of the bosonic modes in the high-Tc superconductors. We will also present some preliminary results from this technique on Bi-2212.

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Date submitted: 01 Dec 2004 Electronic form version 1.4