Fourier-Transformed Inelastic STM Tunneling into High-Temperature JIAN-XIN ZHU, A.V. BALATSKY, Theoretical Division, Los Alamos National Laboratory — There are heightened interest in relating the STM observations with other spectroscopy measurements with momentum resolution in high-$T_c$ cuprates. We have proposed earlier that STM can be used to detect the 41 meV ($\pi, \pi$) mode as observed in neutron scattering experiments. Recent ARPES on optimally doped Bi$_2$Sr$_2$Ca$_{0.92}$Y$_{0.08}$Cu$_2$O$_{8+\delta}$ suggests an anisotropic electron-phonon coupling. Here we address the role of these phonons (O B1g mode and in-plane Cu-O breathing mode) and the Fourier-transformed STM features they might generate in the local density of states. We also look into the effect of a distributed random potential on these features. The Fourier-transformed inelastic electron tunneling spectroscopy STM would allow one to extract the Eliashberg function in both frequency and momentum space, if successful.

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