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The effects of local inhomogeneities on the phonon modulated DOS in Bi2212 STEVEN JOHNSTON, THOMAS DEVEREAUX, University of Waterloo — Recent scanning tunneling microscopy experiments on Bi2212 have revealed microscopic inhomogeneities in the local density of states and anomalous signatures of coupling to a bosonic mode. Gap referenced estimates for the mode energy are negatively correlated with the local gap size and the distribution of the mode estimates shows a clear isotope shift upon ^{18}O substitution. Motivated by the clear isotope effect we examine electron-phonon coupling to the 55 meV apical oxygen mode in Bi2212 within the framework of Migdal-Eliashberg theory. The interplay of this interaction with local inhomogeneous broadening effects are also considered. The effects of the local dopant atoms on the electron-phonon interaction strength are examined using the Ewald summation technique.

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