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## **Electron-phonon coupling in cuprates**

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Photoemission and neutron scattering indicate substantial electron-phonon coupling in high- $T_c$  cuprates. We study the interplay of the electron-phonon and Coulomb interactions for a (weakly) doped Mott-Hubbard insulator. Using sum-rules, we find that the effects of the electron-phonon interaction on the phonon self-energy are strongly suppressed by the Coulomb interaction, while there is no corresponding suppression for the electron self-energy or the phonon-induced carrier-carrier interaction. Using these sum rules we also address the effects of vertex corrections for the half-filled Hubbard model in the large  $U$  limit. Photoemission spectra suggest polaronic self-trapping behavior in undoped cuprates. Calculating the electron-phonon interaction in a shell model of an undoped cuprate, we find sufficiently strong coupling to give polaronic behavior. Using an adiabatic approximation, we discuss the dispersion and width of the corresponding phonon side-band.