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**Phonon spectra on ultrathin Pb films with scanning tunneling spectroscopy** HYOUNGDO NAM, CHIH-KANG SHIH, Department of Physics, The University of Texas at Austin, Austin, Texas 78712, USA — After Blatt and Thomson's prediction [Phys. Rev. Lett. 10, 332 (1963)], several groups have reported the quantum size effect on transition temperature( $T_c$ ) as a function of thicknesses of atomically flat ultrathin Pb film. In those cases,  $T_c$  oscillation related to film thickness was attributed to oscillation of the density of states (DOS) near the Fermi energy. However, the  $T_c$  oscillation amplitude is much smaller than that derived from the DOS oscillation. One therefore would ask: What is the role of electron-phonon interaction? Also as reported by Qin, et. al. [Science 324, 1314 (2009)], when the film is only 2ML thick, the pseudomorphically strained film has lower  $T_c$  than the unstrained one, suggesting that interfacial phonons may play a role. To answer to above question, we perform layer-dependent scanning tunneling spectroscopy of Pb films on Si(111) at 2.3 K to observe the phonon related features in the tunneling spectra. Detailed analysis of thickness dependence of photon spectra will be reported.

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