Abstract Submitted
for the MAR13 Meeting of
The American Physical Society

Electron-Phonon Coupling in Silicene JIA-AN YAN, Department of Physics, Astronomy, and Geosciences, MEI-YIN CHOU, School of Physics, Georgia Institute of Technology, Atlanta, Georgia 30332, USA and Institute of Atomic and Molecular Sciences, Academia Sinica, Taipe — We report here a first-principles study of the electron-phonon coupling (EPC) in silicene and compare the results to graphene. The E_g mode at Γ and the A_1 mode at K of the first Brillouin zone are shown to exhibit Kohn anomalies, similar to that in graphene. Detailed calculations show that although the EPC matrix elements are much smaller than in graphene, the linear band with smaller slope compensate this effect, resulting in a slightly larger phonon linewidth. Finally, the phonon frequency shift and the linewidth of the E_g mode as a function of the Fermi level E_F have been calculated.

Jia-An Yan
Department of Physics, Astronomy, and Geosciences

Date submitted: 09 Nov 2012 Electronic form version 1.4