Abstract Submitted
for the MAR12 Meeting of
The American Physical Society

Effect of electron-phonon coupling on energy and density of states renormalizations of dynamically screened graphene J.P.F. LEBLANC, University of Guelph, J.P. CARBOTTE, McMaster University, E.J. NICOL, University of Guelph — Motivated by recent tunneling and angle-resolved photoemission (ARPES) work [1,2], we explore the combined effect of electron-electron and electron-phonon couplings on the renormalized energy dispersion, the spectral function, and the density of states of doped graphene. We find that the plasmarons seen in ARPES are also observable in the density of states and appear as structures with quadratic dependence on energy about the minima. Further, we illustrate how knowledge of the slopes of both the density of states and the renormalized dispersion near the Fermi level can allow for the separation of momentum and frequency dependent renormalizations to the Fermi velocity. This analysis should allow for the isolation of the renormalization due to the electron-phonon interaction from that of the electron-electron interaction.

[1] Brar et al. Phys. Rev. Lett. 104, 036805 (2010) [2] Bostwick et al. Science 328, p.999 (2010)

James LeBlanc
University of Guelph

Date submitted: 03 Nov 2011 Electronic form version 1.4