

Abstract Submitted
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Self-Energy and Excitonic Contributions to the Drude Conductivity of Doped Graphene FELIPE JORNADA, STEVEN LOUIE, UC Berkeley
— There has been a growing interest in the far infrared AC conductivity of doped graphene because of possible applications in optoelectronics, but there is still disagreement between recent experiments [1,2] and theories [3] with respect to the Drude weight. In this work we study from an ab-initio GW-BSE perspective the effects of the electron-electron interactions and excitons in the renormalization of the Drude weight. We discuss the role of quasiparticle lifetimes due to electron-electron and electron-phonon interactions, and we determine the AC conductivity in the forbidden region (i.e., for $\omega < 2E_F$). This work was supported by NSF grant No. DMR10-1006184, U.S. DOE under Contract No. DE-AC02-05CH11231 and the U.S. DOD - Office of Naval Research under RTC Grant No. N00014-09-1-1066. Computational resources have been provided by NERSC. [1] J. Horng et al., PRB 83, 165113 (2011). [2] H. Yan et al., ACS Nano 5, 9854 (2011). [3] S. H. Abedinpour et al., PRB 84, 045429 (2011).

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