

Abstract Submitted
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Spectral and optical properties of doped graphene with charged impurities in the self-consistent Born approximation FERNANDO DE JUAN, Instituto de Ciencia de Materiales de Madrid (ICMM-CSIC), EUYHEON H. HWANG, Condensed Matter Theory Center, Physics Department, University of Maryland, MARIA A. H. VOZMEDIANO, Instituto de Ciencia de Materiales de Madrid (ICMM-CSIC) — Spectral and transport properties of doped (or gated) graphene with long range charged impurities are discussed within the self-consistent Born approximation. It is shown how, for impurity concentrations greater than the electron concentration, $n_{imp} \geq n$, a finite DOS appears at the Dirac point, the one-particle lifetime no longer scales linearly with the Fermi momentum, and the lineshapes in the spectral function become non-lorentzian. These behaviors are different from the results calculated within the Born approximation. We also calculate the optical conductivity from the Kubo formula by using the self-consistently calculated spectral function in the presence of charged impurities.

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