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Carrier transport in 2D graphene layers near the Dirac point

SHAFFIQUE ADAM, E.H. HWANG, S. DAS SARMA, Condensed Matter Theory Center, University of Maryland, College Park, MD 20742-4111, USA — In a recent work we studied carrier transport in gated 2D graphene monolayers theoretically in the presence of scattering by random charged impurity centers using a Boltzmann theory formalism (cond-mat/0610157). Comparing our results with available experimental data suggested that the low density saturation of conductivity arises from charged impurity induced inhomogeneity in the graphene carrier density. In the present work, we develop a model for carrier transport in a disorder-induced inhomogeneous potential and examine the consequences on conductivity. This work was partially supported by U.S. ONR.

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