Abstract Submitted
for the MAR08 Meeting of
The American Physical Society

Electric Transport Theory of Dirac Fermions[1] YOUSEF ROMIAH, Department of Physics, University of Houston, TX. 77204 and Texas Center for Superconductivity, University of houston, TX. 77204, XIN-ZHONG YAN[2], Chinese Academy of Sciences, P. O. Box 603, Beijing 100080, China, CHIN-SEN TING, Department of Physics, University of Houston, TX. 77204 and Texas Center for Superconductivity, University of houston, TX. 77204 — The self-consistent Born approximation is employed to calculate transport properties in graphene with finite-range impurity potentials. The current-current correlation function is determined by a system of four coupled integral equations, unlike the case of short-range impurity scattering, and yet the results for the latter can exactly be reproduced in our formalism. As a test, we numerically calculate the dc electric conductivity of graphene for charged impurities with screened Coulomb potential, the linear dependence of the dc conductivity on the carrier concentration and the extrapolated value for zero-doping is shown to be finite, in a qualitative agreement with the experimental observations.

[1]Supported by a grant from the Robert A. Welch Foundation, No. E-1146 and TCSUH.
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Date submitted: 27 Nov 2007 Electronic form version 1.4