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Quantum transport at the Dirac point and Klein tunneling in disordered graphene JENS H. BARDARSON, Materials Sciences Division, Lawrence Berkeley National Laboratory, Berkeley, CA 94720, E. ROSSI, Condensed Matter Theory Center, Department of Physics, University of Maryland, College Park, Maryland 20742-4111, P.W. BROUWER, Dahlem Center for Complex Quantum Systems and Institut fur Theoretische Physik, Freie Universitat Berlin, Arnimallee 14, 14195 Berlin, Germany, S. DAS SARMA, Condensed Matter Theory Center, Department of Physics, University of Maryland, College Park, Maryland 20742-4111 — We describe a robust method to obtain transport properties at the Dirac point in disordered graphene that uniquely combines three crucial features: 1) fully quantum mechanical calculation of transport properties using the transfer matrix approach, 2) a microscopic treatment of the effects of charged disorder with the self-consistent Thomas-Fermi-Dirac density functional method, and 3) the ability to treat experimentally relevant system sizes. As an application we discuss the effects of disorder on Klein tunneling in p-n-p junctions.

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