Abstract Submitted
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Klein tunneling in disordered graphene p-n-p junctions[1] ENRICO ROSSI, CMTC, Department of Physics, University of Maryland, J.H. BARDARSON, Laboratory of Atomic and Solid State Physics, Cornell University, P.W. BROUWER, Dahlem Center for Complex Quantum Systems and Institut fur Theoretische Physik, Freie Universitat Berlin, Berlin, Germany, S. DAS SARMA, CMTC, Department of Physics, University of Maryland — The unavoidable presence of disorder makes the interpretation of the experimental results on "Klein tunneling" effects in graphene systems not trivial. Charged impurities profoundly alter the ideal potential profile created electrostatically in graphene p-n-p junctions to observe the Klein tunneling. We calculate the screened potential profile in graphene p-n-p junctions taking into account the presence of charged impurities and many-body effects. We then solve the full quantum mechanical transport problem for the massless Dirac fermions in presence of the calculated screened potential profile. Using our theoretical model we are able to quantify the effects of disorder on the signatures of the "Klein tunneling" and identify the necessary experimental conditions to unambiguously observe "Klein tunneling" phenomena in graphene.

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