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Magnetoresistance induced by inhomogeneity in graphene JINGLEI PING, Center for Nanophysics and Advanced Materials, University of Maryland, College Park, INDRA YUDHISTIRA, NAVNEETH RAMAKRISHNAN, Graphene Research Centre and Department of Physics, National University of Singapore, SUNGJAE CHO, Department of Physics, University of Illinois at Urbana-Champaign, SHAFFIQUE ADAM, Graphene Research Centre and Department of Physics, National University of Singapore, MICHAEL FUHRER, School of Physics, Monash University — We study the magnetoresistance of graphene samples with varying disorder as a function of carrier density. We observe a quadratic low-field classical magnetoresistance which is largest at low carrier density reflecting the inhomogeneous nature of transport in the electron-hole puddle dominated minimum conductivity region, as observed previously[*Phys. Rev. B* **77**, 084102(R) (2008)]. However we observe the magnetoresistance persists to carrier densities well outside the electron-hole puddle region, where single band transport is expected. We find that the magnetoresistance for all samples follows a universal form which depends only on the ratio of the carrier density n to the characteristic electron-hole puddle density $n*$. The results are in excellent quantitative agreement with a recent theory based on an effective medium approximation for disordered graphene.

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