Abstract Submitted
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Semiclassical model for the magnetoresistance and Hall coefficient of inhomogeneous graphene[1] RAKESH TIWARI, DAVID STROUD, The Ohio State University — We show that when bulk graphene breaks into n-type and p-type puddles, the in-plane resistivity becomes strongly field dependent in the presence of a perpendicular magnetic field, even if homogeneous graphene has a field-independent resistivity. We calculate the longitudinal resistivity ρ_{xx} and Hall resistivity ρ_{xy} as a function of field for such a system, using the effective-medium approximation. The conductivity tensors of the individual puddles are calculated using a standard Boltzmann approach suitable for the band structure of graphene near the Dirac points. The resulting resistivity saturates, provided that the area fractions f_n and $1-f_n$ of n and p type puddles are slightly unequal, and agrees with experiments if the relaxation time is weakly field-dependent. The Hall resistivity ρ_{xy} found to change sign at $f_n = 1/2$.

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